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ADRENALECTOMY FOR BREAST CANCER*

BY

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It is now recognized that cancer of the breast and prostate are hormone-dependent tumours—that is, cancers which can be controlled by the administration of sex hormones. That removal of the ovaries influences advanced breast cancer has been known since 1896, when George Beatson published the first reports on this method of treatment. By 1905 Hugh Lett had reported 99 cases of oophorectomy for the late stages of mammary carcinoma. The popularity of this operation waxed and waned during the following half-century owing to the development of radiation-induced menopause. To-day it is thought by many that radiation menopause is not equivalent to surgical castration and that it does not abolish oestrogen formation. Huggins and Bergenstal (1951, 1952) demonstrated that the adrenal cortical hormones sustain mammary cancer and that their withdrawal is followed in a number of cases by marked regression of the tumour. Prolonged survival of adrenalectomized patients on cortisone maintenance has given a great impetus to this method of treatment (West *et al.*, 1952; Taylor *et al.*, 1953; Pyrah and Smiddy, 1954).

Huggins has drawn attention to the following important observations: (1) Gonadectomy is followed by a compensatory hypertrophy of the adrenals and by increased cortical function. (2) In men, removal of the testis is followed by an increase of 17-ketosteroids in the urine, and these high values are eliminated by bilateral adrenalectomy. (3) Following oophorectomy, women continue to excrete oestrogens in the urine, but these compounds disappear from the urine after adrenalectomy. Further, Huggins and Dao (1953) formed the opinion that in a number of post-menopausal women the ovaries continue to have an active endocrine function, which indicates oophorectomy even after the menopause.

The rationale of bilateral oophorectomy and adrenalectomy is therefore the elimination of all known sources of hormones which can influence the growth of mammary cancer and the creation of a physiological environment poor in steroids.

The Natural Course of Breast Cancer

Mammary cancer varies in its rate of growth and power of dissemination from the slow and apparently harmless course of the "atrophic scirrhus" on the one hand to the rapidly fatal course of the "acute inflamma-

tory" type on the other. The variation noted in different histological types, in different age groups, in different hormonal states (pre- and post-menopausal and in pregnancy and lactation) indicates that the hormonal influence is variable and that some tumours are hormone-dependent to a greater degree than others and that some are independent of hormones. But in nearly all cases after a variable period of quiescence and localization the disease spreads locally, to the regional lymph nodes, to the skeleton, and to the viscera.

The early and localized stage of the disease can be controlled by surgical treatment; moderate extension can be alleviated by radiotherapy; in the early stages of dissemination the use of androgens or oestrogens may arrest the spread of the disease for variable periods. Bilateral adrenalectomy is indicated when the disease is disseminated and no longer amenable to treatment by surgical, radiological, and hormonal means. It is therefore a most important advance in the treatment of cancer of the breast and should be considered in patients in whom the disease is no longer amenable to the established methods of treatment.

This report is based on the experience of 69 bilateral adrenalectomies, 56 of these in advanced and disseminated breast cancer. The study of these patients has shown that about one-third are no longer under hormonal influence, and in these no benefit is obtained; that in the remaining two-thirds there is an improvement varying from complete control of the disease to an amelioration which varies in degree and in the length of time which the improvement lasts. The longest period of improvement in this series is 24 months. No other method of treatment has as yet achieved control of disseminated, widespread, and often terminal stages of breast cancer comparable to that following bilateral adrenalectomy.

Selection of Cases

In all the 56 adrenalectomized patients cancer of one or both breasts had been present for various periods of time and had been treated previously according to its stage and extent by appropriate methods. In every patient skeletal, visceral, or soft-tissue metastases were widespread and the expectation of life was very limited. The selection of patients was, in fact, simple: only those to whom nothing further could be offered were submitted to adrenalectomy. The operation was therefore put to a severe test and was deemed a justifiable experiment. It was soon found that patients with disseminated disease in the pulmonary lymphatics, with involvement of the pericardium and the heart, were not likely to benefit from adrenalectomy and that the

*Based on a Hunterian Lecture given at the Royal College of Surgeons of England on June 17, 1954.

operative risk in such cases was high. In fact, involvement of the lungs and heart to an extent which impaired vital function is regarded at present as the main contraindication for the operation.

Management

Pre-operative.—All the patients are carefully assessed, as regards the extent of the disease and the general state of health, by clinical, radiological, and chemical investigations. In addition the output of 17-ketosteroids and oestrogens is studied and the Thorn test for adreno-cortical function done. The pre-operative preparation consists in the correction of the blood state by transfusion and the administration of cortisone. In this series of patients cortisone only was used. There seemed to be no need for D.C.A. (deoxycortone) or for extra salt. Cortisone acetate is given in 100-mg. doses by intramuscular injection forty-eight, twenty-four, and one hour before the operation.

Post-operative.—During the operation and in the immediate post-operative period noradrenaline is used only if

there is a marked fall in the blood pressure. Noradrenaline is not used as a routine, only as an emergency measure. On the first post-operative day cortisone is given by injection in 100-mg. doses six hourly; this is reduced by a half on the second post-operative day; from the third to the fifth post-operative day 25 mg. of cortisone acetate is given by mouth six-hourly; this is further reduced to 75 mg. a day and finally to 50 mg. daily as a maintenance dose. Patients are given instructions about the need of extra cortisone during intercurrent illness or following an operation or an accident. Medullary failure occurs very rarely, sometimes several weeks or even months after adrenalectomy, and is corrected by noradrenaline.

The Operation

Bilateral adrenalectomy and oophorectomy can be done in one stage. The practice at present is to carry out bilateral oophorectomy and unilateral adrenalectomy in one stage and postpone the second adrenalectomy for seven days. The best approach to the adrenal is through the bed of the twelfth rib, the patient lying on her side, in the position usually adopted for renal operations. When the twelfth rib is small, it is necessary to remove the eleventh rib. The operation is technically simple, but the adrenal must be handled with care as it is friable, and in some patients there occurs a marked fall or rise in the blood pressure when the gland is manipulated. Haemorrhage is controlled by careful ligation of the adrenal veins, which show considerable anatomical variations, and with which the surgeon should be familiar. Accidents which can be guarded against are injury to the pleura, the renal vein, or inferior vena cava. In most patients convalescence is smooth, and the post-operative course gives rise to anxiety only in patients with pre-existing or pulmonary involvement by disease or following operative difficulties.

Mortality.—Of the 56 patients, 8 died following the operation, a mortality of 13.6%. The causes of death in these cases were: one from pulmonary embolus; one from cardiac arrest during the operation; two from renal failure on the sixth and twelfth post-operative days; one from cerebral metastases; and four from pleural and pericardial involvement by disease. A most careful study of these cases indicates that the very precarious state of the patient as well as the operative risk accounted for the deaths. It is interesting to note that there has been no operative death in the last 27 cases.

Failures.—Twelve patients derived no benefit at all from the operation: the disease progressed, and most patients died from it within a period of a few months. In 14 patients there was no alteration in the metastases, although some improvement in the general state of health and relief of symptoms was obtained. In four patients there was no relief of symptoms, although local improvement of the lesions was noted.

Successful Cases.—These patients have been studied as regards subjective and objective improvement. In 13 patients the results were remarkable, in the sense that bedridden patients with severe pain became ambulatory and no longer required pain-relieving remedies. The subjective improvement was accompanied by increase of weight and a return to a near-normal life. Objective improvement was assessed by healing of pathological fractures, alteration of osteolytic lesions to a normal bone structure, shrinkage of visible external tumours, such as the primary tumour, skin nodules, enlarged lymph nodes, and disappearance of metastases in the omentum, peritoneum, lungs, liver, and in the choroid. In one patient, nearly in extremis when adrenalectomized, with extensive destruction of the base of the skull, multiple cranial nerve palsies, and pleural, pulmonary, and intra-abdominal metastases, most lesions disappeared and the patient regained a near-normal state of health for a period of fourteen months, when the disease became active again

and the patient died fifteen months after adrenalectomy. So far, the longest survival period in this series is twenty-four months and the shortest six weeks. Examples reported here show regression of various types of lesions—skeletal, visceral, and soft tissue. Improvement can usually be noticed within a few days of the operation. If no improvement occurs within one week the case is likely to prove a failure.

Prognosis.—There is no method at present by which to forecast if adrenalectomy will be a success or a failure. Attempts have been made to correlate the results with the age of the patient, the extent of the disease, and the histological type of the primary growth. Both successes and failures were noted in all histological types, although Huggins and others think that the adenocarcinoma is more likely to regress than the carcinoma simplex or other varieties. The incidence of metastases in the adrenal is very high and reproduces accurately the histological variety of the primary growth. The Table shows the results in 48 patients.

Results in 48 Patients: Adrenalectomy for Breast Cancer

	Alive		Dead
	Subjective	Objective	
Excellent	13	10	1 (14 months)
Satisfactory	22	16	1 (12 months)
No effect	7	14	9
Too early for assessment	6	8	—
	48	48	11

Illustrative Cases

The following successful cases illustrate the benefit which has been achieved by adrenalectomy in some patients with advanced and disseminated breast cancer no longer treatable by other methods. The cases chosen show the effect on skeletal, pulmonary, and soft-tissue metastases.

Case 1. Aged 50. Right radical mastectomy in January, 1950, for a carcinoma simplex with involvement of axillary lymph nodes. Post-operative x-ray therapy. In August, 1951, left radical mastectomy for a histologically similar tumour; lymph nodes in axilla involved. Post-operative x-ray therapy. In January, 1952, multiple skeletal metastases in spine, ribs, and skull. Testosterone propionate given by injection. In July, 1952, bilateral oophorectomy: both ovaries infiltrated by metastases. In November, 1952, the skeletal metastases had spread widely. Nearly all the ribs and all the vertebrae were involved. The sternum was the seat of a large tumour; 17-ketosteroid excretion: 6 to 7 mg./24 hours. Bilateral adrenalectomy performed. This was followed by immediate relief of pain and a fall in the 17-ketosteroid excretion to 2.5 mg./24 hours, and the Thorn test showed no fall in the eosinophil count. Both subjective and objective improvement was very marked. The effect on the skeletal metastases in the skull, sternum, and spine was a return of the bones to a normal structure. The patient remains well to date, twenty-four months after adrenalectomy. Fig. 1 illustrates the patient's present appearance; there is an alteration in her face (moon-shaped) due to the cortisone; marked increase in weight and complete relief from pain.

Case 2. Aged 42. Right radical mastectomy for a pleomorphic carcinoma of the breast in December, 1950. Post-operative x-ray therapy. In April, 1952, skeletal metastasis in lumbar and dorsal vertebrae. Pain relieved by x-ray therapy, but further metastases in the spine developed. From July to October, 1952, given testosterone propionate, but extensive skeletal

metastases found in right humerus (pathological fracture), skull, ribs, pelvis, femora; collapse of third lumbar vertebra. Patient was bedridden and in considerable pain on movement. 17-ketosteroids, 9.4 mg. 24 hours. Bilateral adrenalectomy performed on April 9, 1953. Both adrenals contained metastases. Skeletal pain relieved within twenty-four hours. Rapid recovery: healing of pathological fracture of humerus and other skeletal metastases. Fig. 2 shows the right humerus before adrenalectomy and ten months later; Fig. 3 shows extensive osteolytic lesions of the skull before and five months after operation. The patient is ambulatory and remained well seventeen months after adrenalectomy.

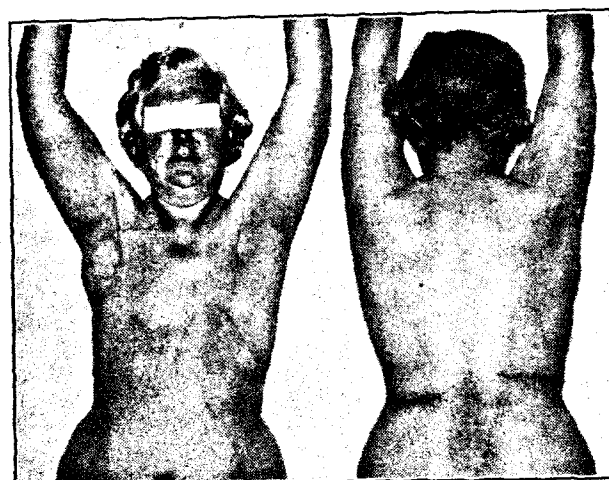


FIG. 1.—Case 1. Bilateral carcinoma of breast. Multiple skeletal metastases. Survival to date: 24 months after adrenalectomy. Marked increase in weight; regression of skeletal lesions. A, Moon-shaped face. B, Scars of bilateral adrenalectomy.

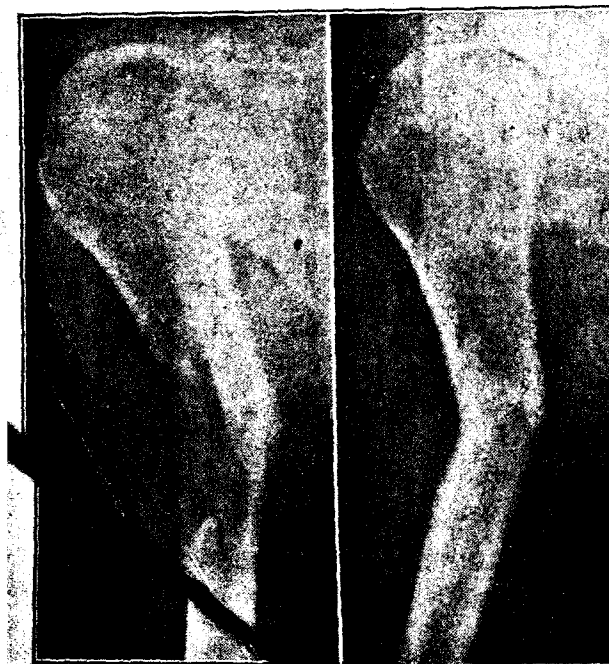


FIG. 2.—Case 2. Metastasis in humerus before and 10 months after adrenalectomy.



FIG. 3.—Case 2. Osteolytic lesions in right parietal and frontal bones. Before and five months after adrenalectomy.

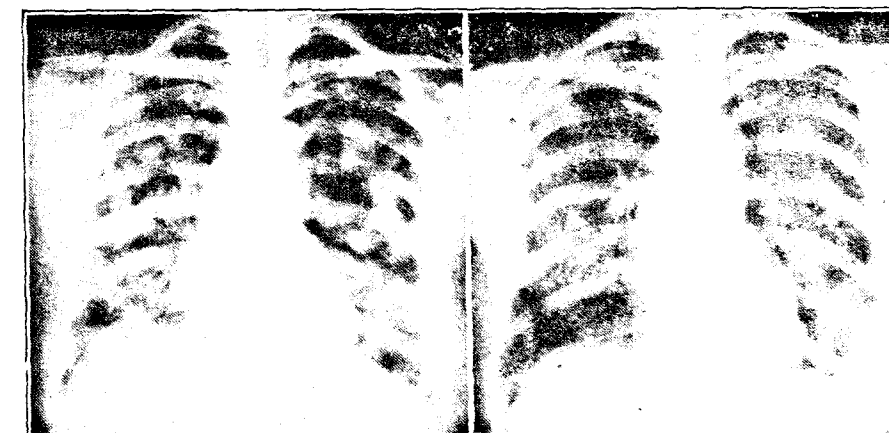


FIG. 4.—Case 3. Pulmonary metastases from carcinoma of breast before and three months after adrenalectomy.

Case 3.—Aged 53. In September, 1952, mastectomy and post-operative x-ray therapy for an adenocarcinoma of the right breast. In August, 1953, patient noticed "flashes of light" in the right eye with progressive visual impairment. Seen by Mr. E. F. King at Moorfields Hospital and found to have a large choroidal metastasis in the right eye. X-ray examination of chest showed extensive bilateral pulmonary metastases (Fig. 4). Bilateral oophorectomy and adrenalectomy in October, 1953; the right ovary contained a metastasis; no metastases in either adrenal. Rapid improvement followed; complete disappearance of choroidal metastasis within three weeks and nearly complete regression of pulmonary metastases within three months (Fig. 4). Patient remains well to date, twelve months after adrenalectomy.

Case 4.—Aged 35. In November, 1951, radical mastectomy for an adenocarcinoma of the right breast with metastases in the axillary lymph nodes. Post-operative x-ray therapy. In July, 1952, metastases in the ribs and dorsal spine with destruction of several mid-dorsal vertebrae and marked kyphosis. X-ray menopause and testosterone failed to control the disease. In November, 1953, there was widespread involvement of the skull, pelvis, lower dorsal and lumbar vertebrae, ribs, both scapulae, and both femora. Sterna puncture showed numerous malignant cells in the bone marrow. Bilateral adrenalectomy performed on November 10. Rapid recovery; complete relief of bone pain. Increase in weight by 2 stone (12.7 kg.) and return to duty as a nurse in an administrative capacity. Improvement lasted nine months. Died twelve months after adrenalectomy.

Case 5.—Aged 43. Left radical mastectomy for a carcinoma simplex of the left breast in March, 1950. Two years later, local recurrence in scar (Fig. 5A) which was not controlled by radiotherapy. Bilateral oophorectomy and adrenalectomy in November, 1953. Rapid disappearance of lesion (Fig. 5B). Remains well to date, twelve months after adrenalectomy.

Case 6.—Aged 39. Radical mastectomy for a carcinoma simplex of the right breast in January, 1951. Post-operative x-ray therapy. In May, 1952, carcinoma of the left breast which did not respond to x-ray therapy. In December, 1952, there was a condition of carcinoma-en-cuirasse on the left side of the chest wall; enlarged supraclavicular lymph nodes. No improvement from testosterone. In February, 1953, bilateral oophorectomy was done with temporary improvement. In October, 1953, there were extensive local disease; an orbital metastasis causing proptosis of the right eye; skeletal metastases in the pelvis and the right scapula; and a pleural effusion. Bilateral adrenalectomy was performed on November 24, 1953. This was followed by remarkable subjective and objective improvement: relief of pain, return to a normal life, and complete disappearance of the lesion on the right side of the chest wall and supraclavicular gland. Remains well to date, twelve months after adrenalectomy.

Case 7.—Aged 40. Right radical mastectomy for a late stage II scirrhous carcinoma of the right breast in October,

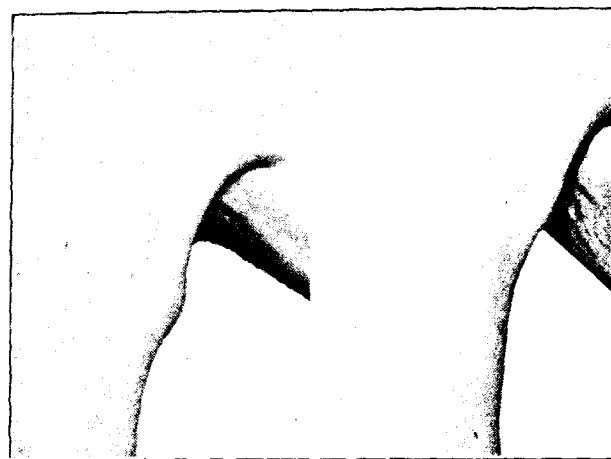


FIG. 6.—Case 7. Enlarged lymph nodes in contralateral (left) axilla following right radical mastectomy. This patient also had multiple skeletal metastases. A, Before adrenalectomy. B, Five months after adrenalectomy.

1949. Post-operative x-ray therapy. Three years and three months later, in January, 1954, metastases in pelvis, femora, and opposite axilla (Fig. 6A). Bilateral oophorectomy and adrenalectomy in February, 1954. Both adrenals but not the ovaries involved by metastases. Uneventful recovery. Rapid disappearance of contralateral lymph node (Fig. 6B); complete relief of pain from skeletal metastases to date, eight months after adrenalectomy.

Summary and Conclusions

A series of 56 patients is reported on whom bilateral adrenalectomy was performed for disseminated breast cancer. Extended survival on cortisone maintenance has been obtained, so far up to 24 months. In a proportion of cases both subjective and objective improvement has been achieved which has never been accomplished before by any other method of treatment. Relief of pain from skeletal metastases, regression of visible and palpable lesions, reossification of skeletal metastases, and union of pathological fractures have followed adrenalectomy. There is no method, so far, to forecast if a patient will be benefited by the operation or not. Beneficial effects have been achieved in about 60% of patients; and in a proportion of these—23% of all cases—the improvement was quite remarkable and surprising.

The risk of the operation is reasonable and maintenance of life on cortisone simple. Although there is no likelihood of any permanent effect, the results are encouraging, and it seems justifiable to advise the operation at an earlier stage of the disease.

I would like to express my thanks to the Medical Research Council for the provision of cortisone and to my colleagues at Westminster Hospital for their help and co-operation, especially to Dr. F. D. Hart and Dr. C. J. M. Clark for the medical care of the patients, to Mr. A. Jessiman and Mr. G. Westbury for the help at the operations and post-operative care, and to Miss Worcester, the sister in charge of my wards, and her staff, on whom fell the burden of nursing care of these very ill patients.

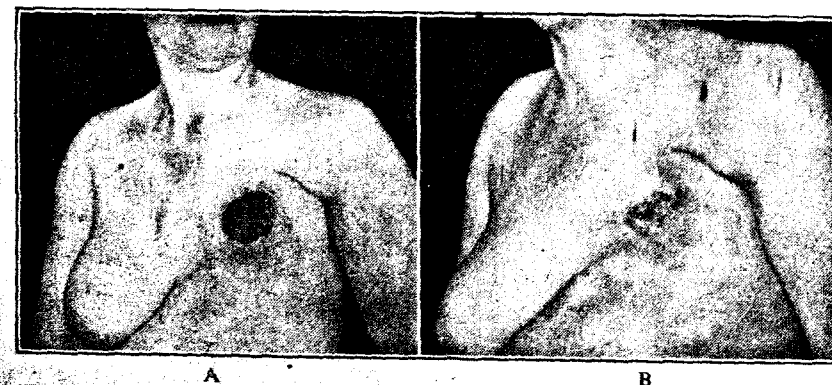


FIG. 5.—Case 5. Local recurrence following radical mastectomy and radiotherapy. A, Before adrenalectomy. B, Five months after adrenalectomy.

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PROBLEMS INVOLVED IN PREVENTION OF BACTERIAL COMPLICATIONS OF MEASLES WITH SPECIAL REFERENCE TO PROPHYLACTIC SULPHADIAZINE*

BY

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There is general agreement that sulphonamides and penicillin have contributed greatly to the fall in the mortality of measles in recent years (*British Medical Journal*, 1952), but the need for further study of the prevention of morbidity arising as a result of measles is also recognized (*British Medical Journal*, 1953). Since this essay was submitted, the *Lancet* (1954), in discussing the prophylaxis of measles complications, makes the following statement: "In this country quite satisfactory prevention of bacterial complications can still be obtained by the simpler and cheaper method of sulphonamide prophylaxis. This is one of the few forms—if not the only form—of routine sulphonamide prophylaxis that can be generally recommended." Two questions, however, have not yet been satisfactorily answered. The first is whether sulphonamides are, in fact, effective in the prophylactic as opposed to the curative treatment of the bacterial complications of measles. The second is whether the preventive dose, if effective, is sufficiently lower than the curative to warrant the expense involved by putting every case of measles on a prophylactic, even when no evidence of bacterial infection is present at the onset of the virus illness.

Historical

Haerem (1943) attempted to evaluate the effect of sulphonamides as antiviral rather than antibacterial agents in patients, probably mainly adults, admitted to a military hospital with measles. The dosage was 1 g. four times daily for four days. He found no significant differences in the duration of fever or the stay in hospital between treated and control cases, and he could find no previous mention of the use of sulphonamides in measles.

Begg *et al.* (1947) attempted to assess the total bacterial and haemolytic streptococcal counts in measles cases nursed in an L.C.C. hospital, and made a subsidiary study of the value of sulphadiazine in such cases. They concluded that sulphadiazine in a dose of 0.25 to 1 g. daily according to age was "of very doubtful prophylactic value," but were dissatisfied with their controls. The ages of the children are not given.

Badr El-Din (1951) attempted to assess the possible value of chlortetracycline ("aureomycin") "as an antiviral agent" in measles by attention to three things:

*Based on the Sir Charles Hastings Clinical Prize Essay, 1954.

(a) the increase or decrease of "catarrhal signs"; (b) the development and fading of the rash; and (c) the presence or absence of complications. The ages of only some, possibly the youngest, of the children are given. They were treated in hospital. Two out of 10 controls developed bronchopneumonia. No case of acute otitis media was reported, and no complications occurred in cases treated prophylactically, either with chlortetracycline or with combined penicillin and sulphadiazine. He found that chlortetracycline, given in the phase before the rash, diminished the catarrhal signs and also the intensity of the rash, if given early enough. He interpreted these as actions of chlortetracycline on measles virus, but other possible interpretations are discussed below.

No report has been traced of the use of sulphonamides or antibiotics in measles treated at home, nor of any attempt to assess the prophylactic value of these drugs in relation to the age of the child, to its past medical history, or to the presence or absence of bacterial infection at the onset of its measles. The present paper is an attempt to do this, as well as to define more clearly the limits of the problem, and to suggest what still remains to be done in any future, more extensive investigations.

Present Investigation

From December, 1950, to May, 1951, I attended 142 cases of measles in a rural partnership practice in the south-east of England, and the notes made at the time of seeing these patients, many of whom were treated prophylactically, mainly with sulphadiazine, have provided the material for this paper. As my notes were not then made with this particular research in mind, desirable details have sometimes not been recorded. Details of late complications after the children were out of the house from their attack of measles have not been analysed, as I was not then the only doctor seeing them. Particular care, however, was being taken during the epidemic to determine what signs of bacterial infection were present in each child at the onset of measles, and what evidence arose later in the illness to show that bacterial invasion had occurred. The details in this respect are therefore as accurate as circumstances allowed, and were all observed and recorded by me.

In defining the virus illness for myself, I took as its onset the first day of fever or typical symptoms, such as coughing or sneezing; and the end as the day when the rash had faded from the abdomen. At this stage a child was allowed up in the house, and outside on the next suitable occasion; but it was not returned to school or other crowds until three weeks after the onset of the rash, so as to minimize the risk of bacterial infection for that time. The episode which appeared to throw open the air passages of the head and chest to bacterial infection was the rash, first in the form of Koplik's spots. As the rash faded, so the mouth and eyes visibly healed, and one pictured the whole epithelium of the head and chest gradually recovering its resistance. Each of these stages in the virus illness might be defined more exactly in terms of changes in the leucocyte count, as is suggested below.

Information about the drugs used is incomplete in respect of dosage. The system I used for prophylaxis as a rule was a dose of tablets daily that totalled one more than the child's age in years, up to a total of six, in divided doses—that is, a child of 2 would have three tablets (each 0.5 g.) daily, in halves, while a child of 5 or over would have six tablets daily, one at a time. The duration of prophylactic treatment was from the day the child was first seen until at least the day the rash began to fade from the legs, sometimes until the rash had completely faded from the abdomen. I usually gave out the tablets at the time of my visit, working on this basis.

Results

The first case was seen on December 3, 1950, and the last on May 25, 1951. Table I shows that the peak of the epidemic came in February and that the proportion of children on prophylactic drugs rose to a peak then and fell away again.

TABLE I

	Dec.	Jan.	Feb.	Mar.	Apr.	May	Total
On antibacterial prophylaxis	7	15*	38	25*	3	2	90
Not on drugs	13*	11	5	6*	2	4	41
On treatment for complications	1	1	2	2	1	0	7
On gamma-globulin	1	1	0	2	0	0	4*
Record of drugs missing	0	0	1	3	0	0	4
Total cases	21	27	46	36	6	6	142

* The four cases on gamma-globulin are shown in two places.

In later tables two cases on gamma-globulin alone are excluded from those receiving antibacterial prophylaxis, being shown as among those "not on drugs." Aspirin in some form was used for most children at the height of the fever. Details of the drugs used in the 90 cases receiving antibacterial prophylaxis are as follows: sulphadiazine alone, 74 cases; sulphadimidine alone, 10; "sulphatriad" suspension alone, 2; injection of penicillin alone, 1; sulphadiazine + sulphapyridine, 1; sulphadiazine + gamma-globulin, 1; sulphadimidine + sulphatriad suspension + gamma-globulin, 1.

Ages of Children Affected.—The epidemic began among the older schoolchildren of one village towards the end of term. From there it spread to their families and to other villages. Table II shows how, by February, it was the youngest schoolchildren and the older pre-school children

TABLE II.—Monthly Distribution of Cases by Age Groups (The Number on Prophylactic Drugs is Shown in Parentheses)

Age	Dec.	Jan.	Feb.	Mar.	Apr.	May	Total
1-2	1	1 (1)	0	5 (3)	2 (1)	0	9 (5)
3-4	3 (2)	2 (2)	1 (1)	8 (4)	1 (1)	0	15 (10)
5-6	1	4 (4)	6 (4)	7 (4)	2 (1)	1	21 (13)
7-8	1	3 (3)	4 (4)	3 (2)	0	1 (1)	12 (9)
9-10	1 (1)	4	9 (8)	1 (1)	0	2	17 (10)
11-12	2	3 (2)	10 (8)	1 (1)	0	1 (1)	17 (12)
13-14	5 (3)	5 (2)	3 (2)	2 (2)	0	0	15 (9)
15-16	3 (1)	1 (1)	6 (6)	3 (3)	0	0	13 (11)
17-18	0	1	0	4 (3)	1	0	6 (3)
19-20	2	1	2 (1)	2 (2)	0	0	7 (3)
21-22	2	1	3 (3)	0	0	0	6 (3)
23-24	0	0	1	0	0	0	1 (0)
Over 25	0	1	1 (1)	0	0	1	3 (1)
Total	21 (7)	27 (15)	46 (38)	36 (25)	6 (3)	6 (2)	142 (90)

who were being most heavily attacked. Not until March was the brunt of the attack borne by the youngest children at home. During April and May, which included the Easter holidays, the epidemic spent its force on the non-immune population.

Selection of Cases for Drug Prophylaxis

During December, and especially during January, as will be seen from Table II, drug prophylaxis was given particularly to the youngest children on the basis of the teaching in textbooks, as it was among them I expected the worst complications. Price (1947) states: "Measles is most fatal to infants and young children, 70% of the mortality occurring in children under 3 years of age." Gunn (1951) confirms this view, as follows: "Case fatality is highest under 1 year of age, but the greatest number of patients die in the second year because morbidity is much higher at this period." The two youngest children infected in this epidemic were each 14 months.

Children under 3.—The number of cases in infants was too small to allow more than a tentative opinion to be formed; but the impression gained from this outbreak was

that if bacterial infection was absent, prevented, or adequately treated in children under 3 years of age, who had been breast-fed and whose mothers had had measles, the illness due to the virus infection was less severe than in older children of, for example, 10-12 years, some of whom were amongst the most prostrated, even in the absence of complications. The mildness of measles in a group of children between 8 months and 3 years, to whom Badr El-Din (1951) gave chlortetracycline in the stage before their rash, he attributed to an action of the drug on the virus itself; it may, however, have been due solely to the antibacterial effects of this drug. The duration of benefit derived from maternal immunity should be studied again among a larger number of the very young.

Other "Poor-Risk" Groups.—In addition to any which might occur in very young children, complications were also expected to be particularly prevalent among two other groups—namely, those who started their measles with evidence of bacterial infection already upon them, and those who, though evidently free of such infection, had a bad past history of naso-bronchial catarrh.

Evidence of Bacterial Infection Present at the Onset of Measles

The nature and severity of any signs of bacterial infection present in every child examined, whether for measles or not, was being recorded in detail at that time even though no symptoms referable to these signs were mentioned. From those records the Tables which follow have been prepared. The term "acute chest" has been used in the sense of Fry's (1953) paper, but limited to conditions that are usually febrile. "Subacute chest" includes the afebrile cases and others with minimal abnormal signs.

In Table III the incidence and severity of such preliminary bacterial infection is shown, followed by details of the actual conditions allotted to each degree of severity.

TABLE III.—Monthly Incidence and Severity of Bacterial Infection Present at Onset of Measles

	Dec.	Jan.	Feb.	Mar.	Apr.	May	Total
Total No. of cases	21	27	46	36	6	6	142
No. showing signs at onset	3	4	15	20	0	2	44
% showing signs at onset	14%	15%	33%	55%	—	30%	31%
Severe	1	1	4	5	0	0	11
Moderate	1	2	6	9	0	2	20
Mild or doubtful	1	1	5	6	0	0	13

In the 11 severe cases the following conditions were present: both drums very red, 4 cases; one drum very red and "subacute chest," 3; one drum very red, 2; bronchopneumonia, 1; "acute chest" and symptomless otitis media, 1.

In the 20 moderate cases were found: both drums injected, 4 cases; one drum reddened, 3; one drum opaque, healing, or old otitis media, 4; one drum with red malleolus, 2; both drums injected, one or both eyes sticky, 2; one drum reddened and "subacute chest," 1; one drum injected and mucopus in throat, 1; both drums injected and chronic tonsillitis, 1; tonsils exuding pus, 1; "subacute chest," 1.

The 13 mild or doubtful cases included: one drum slightly or partly injected, 7 cases; earache but drums not reddened, 2; both drums slightly injected but with good light reflex, 1; one meatus and drum reddened by heavy rash, 1; grossly enlarged tonsils but no exudate, 1; doubtful "moist sounds" in chest, 1.

In case the differences in severity of bacterial infection might merely be because the patients were seen early or late in the virus illness, the records have been analysed to show the stage reached by each case and the severity when the signs were first seen. This has been done in relation to "R" day—the day the rash appeared; "R minus" includes those seen before, and "R plus" those first seen after the rash appeared.

Table IV demonstrates that the severe infections were not necessarily seen late in the virus illness and confirms that these children were entering their measles already harbouring in varying degree the often symptomless seeds of possible bacterial complications.

TABLE IV.—Severity of Bacterial Infection in Relation to Date of Rash

	Time First Seen			Total
	R—	R	R+	
Severe	4	5	2	11
Moderate	7	7	6	20
Mild	3	7	3	13

Table III also reveals that the peak of preliminary bacterial infections was reached slightly later than the peak of the measles epidemic; but the relative incidence of severe, moderate, and mild bacterial infections did not materially alter with the change of season. The need, therefore, for an effective antibacterial prophylactic was greatest at the height of the bacterial rather than of the virus epidemic. This fact was not appreciated at the time, and Table V gives the monthly distribution of cases receiving antibacterial drugs in relation to the stage of their virus illness.

TABLE V.—Cases Receiving Antibacterial Prophylaxis in Relation to "R" days, by Months

	Dec.	Jan.	Feb.	Mar.	Apr.	May	Total
Total No. of cases	21	27	46	35	6	6	142
Prophylaxis:							
Starting on "R minus"	1	2	14	5	0	0	22
Starting on "R"	2	10	18	15	1	0	46
Starting on "R plus"	4	3	6	5	2	2	22
Total	7	15	38	25	3	2	90
% of monthly total	33	59	83	78	50	30	

It shows that the proportion of cases treated prophylactically more than doubled between December and February and that prophylactic doses of antibacterial drugs were being given earlier and to a slightly higher proportion of children at the peak of the measles epidemic in February than at the peak of the bacterial epidemic in March. The use of these drugs was evidently aimed more at preventing the complications of measles than at treating any bacterial infections which were found incidentally, though undoubtedly the latter factor was an influence.

"Catarrhal" Children

There were a number of children affected by measles in this epidemic who had suffered from recurrent previous attacks of respiratory infection often enough to merit being called "catarrhal" children. The number of such children seen is set out in Table VI, showing whether they presented with signs of bacterial infection as well as measles.

TABLE VI.—Monthly Incidence of Bacterial Infection at Onset of Measles Among Normal and Catarrhal Children

	Dec.	Jan.	Feb.	Mar.	Apr.	May	Total
Total cases	21	27	46	36	6	6	142
Normal children	17	22	32	22	6	5	104
With bacterial infection at onset	2	2	8	7	1	0	20
Catarrhal children	4	5	14	14	0	1	38
With bacterial infection at onset	19	19	30	39	—	20	27
With bacterial infection at onset	1*	2	7	13	—	1	24

Severity of These Infections

	Severe	Moderate	Mild	Total
Normal	4	6	10	20
Catarrhal	7	14	3	24

* No percentages were calculated for a total of fewer than six.

Table VI shows that in this epidemic the incidence of signs of bacterial infection at the onset of measles was three times as great in catarrhal children as in children with normal histories; and a higher proportion of those infections in the catarrhal children were severe or moderate, as opposed to mild.

As the catarrhal state should be considered in relation to age, Table VII gives the age distribution of these infected children.

The numbers involved in Table VII are too small for conclusions to be drawn, but there is a suggestion of two separate peaks in the incidence of the catarrhal state; one

TABLE VII.—Ages of Catarrhal Children and Number Showing Signs of Bacterial Infection at Onset

	1-	2-	3-	4-	5-	6-	7-	8-	9-	10-	11-	12-	Over 20	Total
All children	9	15	21	12	17	17	15	13	6	7	6	1	3	142
Catarrhal:														
No.	1	2	4	5	3	4	6	6	3	2	2	—	—	38
%	10	13	19	42	18	24	40	46	50	30	30	—	—	27
No. infected	1	2	4	3	1	2	3	4	2	2	0	0	0	24
% infected*	1	2	4	3	1	2	3	4	2	2	0	0	0	63

* No percentages were calculated for a total of fewer than six.

comes in the 4-5 age group, at the end of home contact before school begins, and the other in the 7-9 age group after several years of school contact. If this were shown to be generally true, it might be that the catarrhal state is brought about, at least in part, by undue contact with carriers of bacterial infection, at first in the home and later at school. Mawson *et al.* (1953) noted a variation by age groups with a peak at 6 years, in the incidence of acute otitis media, among children treated at hospital, and suggested that, after going to school, "exposure of the child to an alteration in its usual bacterial environment plays a part in the causation of this disease." This is a subject that would repay further research.

Complications Resulting from this Epidemic

Table VIII sets out the number of children who were free of infection at onset, and the percentage of these who at a later visit showed signs of bacterial infection, complicating their measles.

TABLE VIII.—Monthly Total of Children Free of Bacterial Infection at Onset of Measles, and Percentage of these Developing Complications Later

	Dec.	Jan.	Feb.	Mar.	Apr.	May	Total
Total clear at onset	18	23	31	16	6	4	98
No. of these developing complications	5	6	8	4	2	0	25
% with complications	28	26	26	25	30	0	26

One should, however, differentiate between children with normal and catarrhal past histories in estimating the risk of complications arising in any particular child who is free of signs of bacterial infection when starting measles. This is done in Table IX.

Part A shows the high percentage of children with normal past histories who were clear of signs of bacterial infection at the onset of measles; more than three-quarters of these remained clear. On the other hand, it was found that the proportion of catarrhal children who started their measles clear diminished steeply from February onwards, and of all those who started clear one-half later developed signs of bacterial infection during their virus illness.

Badr El-Din (1951) reported that chlortetracycline, given in the phase before the rash, diminished the catarrhal signs of measles. He attributed this to an effect of the drug on the measles virus, but it is more probable that the effect was an antibacterial one. This raises the question of what abnormal signs in the chest in measles can be attributed wholly to the action of the virus and which are the results

TABLE IX.—Number of Complications Arising During this Epidemic of Measles

A. Among those who were clear of signs of bacterial infection when first visited for measles, but who showed signs later

	Total Cases	Clear at Onset			
		No.	%	Showing Signs Later	
				No.	%
Normal histories	104	84	79	18	21
Catarrhal "	38	14	37	7	50

B. Among those with signs of bacterial infection when first visited for measles, showing the number in whom these signs were changed

	Total Showing Signs at Onset	Signs After Measles			
		Aggravated	I.S.Q.	Reduced	Not Noted
Normal histories	20	3	5	11	1
Catarrhal "	24	6	2	11	5

of any concomitant bacterial infection. Should any moist sounds, for example, be expected in the chest of a child with measles who is quite free from bacterial infection?

Part B of Table IX reveals at first sight a puzzling result—namely, that among 20 normal and 24 catarrhal children who started measles with signs of bacterial infection already present about half in each group showed a diminution or clearance of these signs during their virus illness. In discussing Table V, however, it was suggested that the presence of bacterial infection at onset had undoubtedly influenced the selection of cases for prophylactic treatment. This possibility is analysed in Table X, which shows separately, for both a pre-existing bacterial infection and a catarrhal history, how these factors influenced the selection of cases for prophylaxis.

It was shown in Table VI that signs of bacterial infection at onset were three times as common in catarrhal as in normal children during this epidemic. In Table X there is greatest

TABLE X.—Distribution of Prophylactics Among those With and Without Preliminary Bacterial Infection or a Catarrhal Past History

	Bacterial Infection at Onset		Past History	
	(1) Absent	(4) Present	(2) Normal	(3) Catarrhal
Total	98	44	104	38
No. on prophylactics	56 (57%)	34 (79%)	64 (62%)	26 (68%)

similarity between group 1 and group 2 with regard to the proportion on prophylactic drugs, while group 3 lies somewhere between those two and group 4, which had the largest proportion of children on prophylactics. In other words, the influence of selection for antibacterial prophylaxis was acting more strongly when I saw a case of measles in a catarrhal child with bacterial infection at the first visit, and was least active when I was dealing with normal children showing no early abnormalities.

The anomaly in Part B of Table IX now becomes understandable. Among those with signs at onset, whether with normal or catarrhal histories, such signs abated or disappeared in about half from each group because they were being given drugs in doses which were curative rather than prophylactic. The figures are too small for conclusions, but there is a further slight suggestion in part B of Table IX that, among catarrhal children, more often than among normal children, if the signs already present did not diminish, they were more likely to be aggravated than to remain *in statu quo* as a result of an attack of measles. In them the curative treatment had been insufficient.

What was the fate of those other children who were given drugs prophylactically, but who had shown no signs

of bacterial infection when first examined for their measles? This touches the crucial problem of prophylactic versus curative treatment. The results obtained in this epidemic are set out in Table XI. This Table shows an unexpected result: proportionately more fresh late bacterial infections were seen among those on prophylactic drugs than among those not taking any. In point of fact, 19 out of these 25 fresh late infections occurred during December to February, before the peak of the "bacterial infection at onset," shown in Table III.

TABLE XI.—Number of Complications in those who had no Signs of Bacterial Infection at the Onset of Measles; With Reference to Prophylactic Drugs

Part I				
	On Drugs	Not on Drugs	Record Incomplete	Total
Total clear at onset	56	41	1	98
No. with complications	17 (30%)	8 (20%)	—	25 (26%)

Part II.—Summary of Complications		
	On Drugs	Not on Drugs
Acute otitis media	2	—
Symptomatic otitis media	5	4
"Acute chest"	3	—
"Subacute chest"	3	—
"Acute" or "subacute chest" plus otitis media	1	1
Eyes abnormally affected	2	3
Nasal sores	1	—
Total	17	8

One possibility certainly is that by giving sulphadiazine or similar drugs to otherwise healthy children at the start of measles one was lowering their resistance to bacterial infection, should this reach them during the period of their rash. I have heard an eminent consultant paediatrician express the opinion that, since measles produces a leucopenia and since sulphonamides tend to depress the white-cell count, therefore sulphonamides should never be given to children during measles. While this may well be wise advice, it is possibly not the whole explanation of the anomalies revealed in Table XI, for one would then expect more evidence of infection in these treated children at the peak of the bacterial epidemic. Furthermore, it was shown in Table IX that in some children sulphonamides had exerted a beneficial action during measles.

Another possibility is that during the early months of the epidemic one was examining the children more closely. If this were true it could perhaps explain the larger proportion of cases noted during the first three months, but the overall difference in complications rate would still remain to be explained.

This difference between the complications rate of prophylactically treated and untreated children becomes even more striking if the children are divided into those with normal or catarrhal histories, in order also to test whether there had been any unconscious selection of bad-risk cases among those on prophylactics. This difference is shown in Table XII.

TABLE XII.—Complications Rate in Prophylactically Treated and Untreated Children with Normal or Catarrhal Histories

	Total	No.	No. Untreated	Clear at Onset				Complications			
				On Drugs		Untreated		On Drugs		Untreated	
				No.	%	No.	%	No.	%	No.	%
Normal histories	104	84	36	48	57	4	11	14	29	—	—
Catarrhal histories	38	14	5*	8	57	4	90	3	40	—	—

* One record of drugs incomplete.

Of those clear at onset, 57% were given prophylactic drugs, whether they were catarrhal or not; there was evidently no increased tendency for catarrhal children to be given these drugs, so long as they were free of signs of bacterial infection at the time measles began (see discussion of Table X). Table XII also reveals that, whereas sulphonamides given to those who showed no signs of bacterial infection when they first attended for measles may have prevented complications among catarrhal children, these same drugs appeared to increase considerably the risk of complications occurring in normal children.

The distribution of complications among the age groups was studied to see whether there was any difference in this respect between treated and untreated children.

Table XIII shows that in the untreated group the three severe or moderate complications all occurred in younger children than did the five mild complications; while in the

TABLE XIII.—Number and Severity of Complications by Ages Among Prophylactically Treated and Untreated Children

	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	Over 20	Total
Untreated: Complication	—	—	—	—	—	—	—	—	—	—	—
Sev. + mod.	—	—	1	1	1	—	—	—	—	—	3
Mild	—	—	—	—	3	1	1	—	—	—	5
Nil	5	2	6	5	4	2	1	1	3	1	33
On drugs: Complication	—	—	—	—	—	—	—	—	—	—	—
Sev. + mod.	3	—	2	1	2	1	1	—	—	—	11
Mild	—	—	3	1	1	1	—	—	—	—	6
Nil	6	3	5	6	7	2	6	—	1	1	38
Record incomplete	—	1	—	—	—	—	—	—	—	—	1

treated group there were relatively more severe or moderate complications, and the 11 which occurred were at both younger and older ages than the six mild ones.

Discussion

In this epidemic the action of sulphadiazine appears to have been twofold. When given in near-curative doses to children, especially catarrhal children, who showed signs of active bacterial infection at the start of their measles, the drug acted beneficially by reducing the severity of the bacterial infection in about half the treated cases, while the remainder had probably received an insufficient dosage; but when sulphadiazine or another sulphonamide was given to normal children, apparently free of bacterial infection at the start of their measles, the drug appeared to confer no benefit, but rather to increase the rate and severity of complications as compared with similar untreated children.

If these findings were to be confirmed by other observers and in a larger series of cases, the whole question of the use of sulphonamides in any disease associated with leucopenia—for example, also influenza—would have to be re-examined. It might be possible to do serial white-cell counts throughout a sufficient number of cases of measles and influenza to determine the incidence and degree of leucopenia in relation to bacterial complications, both in prophylactically treated and in untreated cases. Penicillin and sulphonamides could be compared as antibacterial prophylactics in diseases associated either with leucopenia or with leucocytosis. It may be that when bacterial infection is already present at the onset of such a virus illness there is already a sufficient leucocytosis to offset any later drop in the white-cell count, due either to the superimposed virus infection or to drugs. In such cases sulphonamides may not be so harmful, though they are not necessarily to be preferred to penicillin.

Puckey (1941) reported a hospital case in which granulopenia had developed after a leucocytosis due to pneumonia, treated with sulphapyridine; measles and infective hepatitis developed during the treatment. At the end of the pneumonia, after ten days on sulphapyridine and three days after the measles rash appeared, the white-cell count was 25,000 per c.mm. In spite of stopping sulphapyridine the white-cell count dropped steadily to 4,600 per c.mm.

(24% neutrophils) on the fourteenth day after the rash. How much of this leucopenia was due to sulphapyridine, and how much to measles and infective hepatitis it is not possible to judge, but the question is one which undoubtedly needs to be examined again.

Conclusions

A fresh investigation of the problem of antibacterial prophylaxis in measles should be carried out soon by those with access to a large number of cases treated at home, bearing in mind the following conclusions which can be drawn from the present report of an outbreak in a country practice of 142 cases of measles, 90 of which were given prophylactics.

(1) The complications rate in untreated normal children during this outbreak was 4 out of 36 (11%), whereas in untreated catarrhal children it was 4 out of 5 (80%).

(2) Among all children, irrespective of age or past medical history, who were free of signs of bacterial infection at the onset of their measles, the complications rate was higher in those given sulphonamides prophylactically (17 out of 56=30%) than in the untreated (8 out of 41=20%).

(3) Some children already showed signs of bacterial infection when their measles began. This occurred in 24 out of 38 (63%) of catarrhal children, but in only 20 out of 104 (19%) of normal children.

(4) Twice as many such infections, already present, were graded as moderate or severe as opposed to mild in the catarrhal children, as compared with those in normal children.

(5) There was a seasonal variation in the amount of preliminary bacterial infection, especially among catarrhal children. In this outbreak the peak of such bacterial infection fell in March, though the peak of the measles epidemic passed during February.

(6) There was no evidence that the severity of the virus illness of measles was unduly marked in children under 3 so long as bacterial infection was absent; in fact, the impression was gained that such children suffered less from their measles than did some of their older siblings.

(7) There was evidence that the sulphonamides given had been acting curatively rather than prophylactically in those children who started measles showing signs of preliminary bacterial infection; but that in about half of these the dose had been insufficient.

(8) There was some evidence to suggest that the catarrhal state of a child was not something permanent, but that it might vary according to undefined circumstances both before and after the age of starting school.

(9) Since it appears from an analysis of the present observations that sulphonamides are of value to some children, but not to others, in preventing bacterial complications of measles, a further investigation is needed into the incidence, severity, and duration of any changes in the white-cell count of normal and of complicated measles, in both treated and untreated children, some receiving sulphonamides and some penicillin. Such an investigation might reveal ways of defining stages of the virus illness of measles in terms of leucopenia and the consequent risk of bacterial complications.

(10) Such an investigation, if also carried out in other diseases associated with leucopenia and apt to be followed by bacterial complications, such as influenza,

might further reveal a general principle of value in determining the choice of antibacterial drugs for prophylactic or curative use, especially in virus infections.

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Note.—Since this essay was presented, the College of General Practitioners has begun a two-year investigation into the value of sulphonamides and antibiotics in the prophylaxis of the bacterial complications of measles. The conclusions reached in this essay were made available to the College, which hopes to obtain records of 2,000 to 3,000 cases of measles by the end of 1955.

THE EARLY DIAGNOSIS OF SPINAL TUMOURS

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The first patient to be successfully treated for spinal tumour was a British Army officer who was operated on by Sir Victor Horsley in 1887 (Gowers and Horsley, 1888). He recovered from paraplegia and lived for twenty years before he died from an unrelated condition. Since this demonstration that at least some spinal tumours were surgically accessible, and indeed curable, it has been of the utmost importance to diagnose such neoplasms early in their course and to locate them accurately.

It is not the purpose of this paper to describe in detail the established clinical syndromes, excellent accounts of which already exist (Elsberg, 1941). Rather is it intended to make use of the opportunity afforded the Service medical officer of having patients under observation from an early stage, and to comment on the clinical picture and diagnosis at this stage. Failure to make an early diagnosis may lead to incomplete recovery or even permanent disablement, despite the removal of a benign tumour, due to prolonged cord compression.

This paper is concerned with primary and secondary tumours which involve the spinal cord or nerve roots: such lesions develop in the vertebrae or in the structures within the spinal canal. The material for the investigation consists of 36 verified cases of spinal tumour treated between January, 1940, and December, 1951, at the Military Hospital for Head Injuries, Oxford. During this period there were approximately 1,150 admissions with spinal symptoms, 813 bearing the label of prolapsed intervertebral disk. These cases were drawn from the three Services and therefore represent a special cross-section of the population in regard to age and sex. There were 32 males and 4 females, the ages ranging from 17 to 60 years, 30 of them being under 35 years (see Table III).

Pathology

The lesions met with in this series are given in Table I. The frequency of the histological groups may be compared with those in a civilian series of 275 cases reported

TABLE I.—Pathology

Present Series		Civilian Series (Elsberg, 1941)	
Tumour	No. of Cases	Tumour	No. of Cases
Neurofibroma	15 (41.6%)	Meningioma	73 (26.5%)
Metastatic	8 (22.2%)	Neurofibroma	64 (23.2%)
Vascular	4 (11%)	Sarcoma	31 (11.2%)
Ependymoma	3 (8.3%)	Glioma	14 (5%)
Glioma*	3 (8.3%)	Metastatic	14 (5%)
Osteoclastoma	2	Ependymoma	11 (4%)
Melanoma	1	Vascular	9 (3.3%)
		Others	59 (21.5%)

* Two histologically unverified.

by Elsberg (1941). Table I reveals two important differences between the two series in the relative incidence of these tumours. There are no meningiomas and there is a high proportion of metastases in the military series. These points require further comment.

Meningiomas are found most often in middle-age, and when they occur in the spine women are affected twice as often as men (Learmonth, 1927); this group of patients not being represented in the section of the population from which our cases are drawn thus accounts for their absence in this series.

Metastatic tumours occurred in no less than 22% (8 out of 36) of the patients in this series, mainly young adults; the oldest patient with a secondary tumour was 42, four patients were in the thirties, one was 19, and two were 17 years of age. However, the incidence of metastatic spinal tumours is doubtless underestimated in civilian series based on statistics from surgical explorations: many overtly metastatic tumours, frequently presenting in the terminal stages of malignant disease, never reach the neurosurgeon. Nevertheless, it is important to appreciate that a metastatic neoplasm cannot be ruled out on age alone, nor on the apparent absence of a primary growth.

In six patients (Cases 29–34) the histological sections of the spinal tumour revealed secondary anaplastic carcinoma, suggestive of bronchial origin. Although the presence of a primary bronchial carcinoma was later confirmed by a post-mortem examination in only one instance (Case 34), the available facts favoured a bronchial origin for the primary growth in all six cases. Pulmonary or hilar shadows were present in four of the five patients in whom x-ray films were available.

Another patient with a secondary neoplasm (Case 35) died elsewhere, and a post-mortem examination revealed anaplastic secondary carcinomatous deposits in the spine, liver, lung, and iliac glands; a primary tumour was not found. The final patient in this group (Case 36) had vertebral collapse associated with a tumour in the lower end of the humerus, the radiological diagnosis being "osteogenic sarcoma"; no further information about the pathology is available.

The proved or probable bronchial origin of six of the eight metastases indicates the importance of x-raying the chest of every patient suspected of having a spinal cord tumour. A carcinoma of the lung may, however, remain clinically latent or not be apparent radiologically for some time in the presence of spinal metastases (see Case 31, described below). Occasionally the primary growth may be very small and be revealed only after a careful search at the post-mortem examination (Turner and Willis, 1938).

Although we have emphasized the frequency of metastatic growths it should be stressed that essentially operable and benign tumours were present in 40% of the Service cases and in 48% of the civilian series. It is in these cases that early diagnosis is so important.

Symptoms

With primary spinal tumours the symptoms usually have a gradual onset, preceding physical signs by many months. As some 70% of them are situated posteriorly or posterolaterally in the spinal canal it is natural that sensory should precede motor disturbances as a rule. Spinal cord disorders usually occur later.

With secondary neoplasms, however, the course is characteristically rapid, paraplegia often developing within days of the first symptoms. In two cases in this series this interval was less than 10 days, whilst the longest history given by a case of secondary tumour was three months. All eight patients with metastatic lesions were unable to walk on admission, while this advanced picture was seen in only 6 of the 29 patients with primary spinal neoplasms. The rapid advance of some of these metastatic growths is illustrated by the following case.

Case 31. Extradural Metastatic Tumour with Three Weeks' History.—A trooper in the Life Guards, aged 17, was perfectly well until three weeks before admission, when he began to have backache. Pain down the right leg developed twelve days later, and three days before admission he rapidly developed a complete flaccid paraplegia below L4. Plain x-ray films of the spine showed only some doubtful erosion of the pedicle of D 11, but lumbar puncture revealed a manometric block and a cerebrospinal fluid protein of 1,000 mg. per 100 ml.; myelography showed the block to be at D 11. Laminectomy exposed an extradural tumour which was shown histologically to be a metastatic carcinoma, suggestive of bronchial origin. A chest x-ray film on the day of operation was clear. Later, supraclavicular, axillary, and intercostal glands became involved and a subcutaneous tumour which appeared over the scapula showed on biopsy the same appearances as had the spinal mass. The patient was transferred later to another hospital, where he was said to have developed cough and dyspnoea with signs of pulmonary collapse three weeks before his death, which followed three months after the laminectomy. A post-mortem examination was not made.

In contrast, the following case report illustrates the gradual onset of symptoms due to a benign spinal tumour.

Case 9. Dorsal Neurofibroma with Two Years' History.—An A.T.S. woman aged 26 first noticed numbness and a burning sensation in her right leg some two years before admission. For seven months she had experienced pain in the lower back and in both calves. During the four months before admission her gait had become increasingly unsteady, and for two months there had also been urgency and frequency of micturition. Examination revealed increased tone and weakness of the left leg, a sensory level at D 8, and bilateral extensor plantar responses. A spinal x-ray film showed erosion of the pedicle and scalloping of the body of D 7. Lumbar puncture revealed an almost complete spinal block and a cerebrospinal fluid protein of 120 mg. per 100 ml. She made a good recovery following removal of neurofibroma attached to the left seventh dorsal nerve root.

Pain is the commonest symptom, but it is not a constant feature. It occurred in 29 cases of this series (81%), which agrees with the findings of Craig (1936), who recorded pain as being present in 80% of 300 cases from the Mayo Clinic. Not uncommonly, and especially with tumours of the cauda

equina, there may be partial or complete temporary remissions of this symptom. Such remissions were found in five of our nine cauda equina tumours, and Allen (1930) reported remissions in 25% of 69 patients with tumours in this region.

Two types of pain are experienced: root pain and dull central backache. Root pain, which is the more common, was a manifestation in 24 of our cases (66%), and in 19 patients (53%) it was the initial symptom. That root pain is not confined to extramedullary tumours was pointed out as long ago as 1914 by Pearce Bailey. Indeed, such pain was found in nearly half the intramedullary growths studied by Kernohan and his colleagues (1931). In two of the five intramedullary tumours in the present series there was root pain, but in each case motor symptoms had preceded this by many months.

Root pain has certain characteristics. It may be aching or lancinating, is referred to the appropriate dermatome, and may be so severe as to require morphine for its relief. It is often accentuated, and sometimes precipitated, by raising the intrathecal pressure, as by straining and coughing; this is probably due to an alteration in the relationship of the tumour to near-by roots. It may be worse at night and be relieved by walking about or sleeping in a chair. Eaton (1941) suggests that this may be due to the lengthening of the spine which he has demonstrated experimentally to occur in recumbency. It is thought that the disks increase in thickness on lying down and that this is responsible for the pain by altering the relationship between the roots and surrounding structures.

Dull backache is common as a symptom of cauda equina tumours, but so frequently is this a complaint of other disorders that few sufferers should be suspected of having a spinal tumour on this account alone. It is backache which persists and fails to respond to rest that should arouse suspicion. Moreover, in the presence of a spinal tumour it is commonly accompanied by root pain; in only 4 of the 22 patients with backache in the present series was this the only type of pain. Though most constant in cauda equina tumours, backache is often a distressing feature of metastatic deposits in the vertebrae. It may even occur in intramedullary tumours, as evidenced by two patients in this series.

Pain was not a feature in seven patients (19%). This agrees with the figure of 20% reported by Craig (1936) and of 25% by Spurling and Mayfield (1936). The type of lesion present in our cases without pain varied, but included three examples of vascular malformation. There were two neurofibromas, one extradural secondary carcinoma of the bronchus, and one intramedullary tumour.

In other cases sensory disturbances apart from pain may be predominant, such as a sensation of tingling, pins-and-needles, burning, or numbness. These are common as early manifestations which occasionally occur alone, but more frequently are associated with backache and root pain.

Loss of power usually follows sensory disturbances, but it may occur as an initial symptom, and this is especially likely to happen with intramedullary tumours. In three of our cases this led to a diagnosis of poliomyelitis.

Sphincter Disturbance.—Although complete retention or incontinence of urine or faeces is a late manifestation, increasing constipation or some difficulty in micturition is not an uncommon symptom in patients with spinal tumour. Apart from 10 paraplegic patients who had incontinence or retention on admission, nine patients had experienced some difficulty in micturition, but in none was this a presenting feature.

Physical Signs

The presence of suspicious symptoms, such as root pain and persistent backache, warrants a thorough examination of the whole patient. In the majority of cases with spinal tumour this will yield further evidence of such a lesion. The spine is tested for local tenderness or deformity, muscle spasm, and limitation of movement. Spinal tumours in the lumbar region—that is, of the cauda equina—commonly

produce erector spinae spasm, a stiff spine, and even scoliosis. The range of straight-leg raising and the effects of jugular compression and of coughing are recorded. Careful examination of the nervous system will often indicate the level of the lesion fairly accurately, especially if the patient is paraplegic. Weakness, wasting, reflex changes, and sensory loss all contribute to this localization. The general examination should include in particular a search for the cutaneous pigmentation or tumours of neurofibromatosis and for angiomas of the skin or retina; and palpation of the abdomen, rectum, and breast for evidence of primary malignancy. The chest is x-rayed for primary or secondary neoplasms and to visualize any thoracic extension of dumb-bell tumours of the spine.

Dandy (1925) claimed that over 90% of tumours could be both diagnosed and located in this way, but he was referring to the established picture. Such signs may be minimal if the patient is seen at an early stage, and indeed in some cases when special investigations give definite evidence of a tumour. These investigations normally consist of plain x-ray films of the spine, lumbar puncture, and myelography. There were five cases in this series with minimal signs, and they are mentioned later in relation to the differential diagnosis from prolapsed intervertebral disk, which they all closely resembled. One may be noted here as an example.

Case 4. Neurofibroma of the Cauda Equina with Minimal Neurological Signs.—A major aged 60 complained of pain in the left buttock and thigh, accentuated by coughing and sneezing, for eleven months. He had massage and short-wave diathermy, following a diagnosis of fibrositis and osteoarthritis. Six weeks before admission he developed low lumbar pain. There was no weakness or sensory or sphincter disturbance even to direct questioning. The only signs on admission were a stiff lumbar spine, a slight depression of the left knee-jerk, and slightly impaired sensation, to pin-prick only, on the outer side of the left thigh. A preliminary diagnosis of prolapsed intervertebral disk was made. Plain x-ray films were normal, but a lumbar puncture showed a cerebrospinal fluid protein of 360 mg. per 100 ml., and myelography suggested a possible tumour at L 4. At operation a neurofibroma was removed from the left side of the cauda equina. He made a good recovery.

Though not a feature of any of our cases there may be no physical signs whatsoever, even when investigations reveal a tumour (Cohen and Kaplan, 1943; Toumey *et al.*, 1950). In all these reported cases, together with the five patients in this series with minimal signs, the tumour was situated in the cauda equina. Here the bony canal is relatively roomy, and this may be the explanation for the paucity of signs.

Ancillary Investigations

Radiography

Plain X-ray Films.—In 16 cases (44%) plain x-ray films of the spine showed appearances suggestive of spinal tumour. There may be gross vertebral destruction (three cases), but, more frequently, less well-marked changes occur such as erosion of the pedicles and laminae (10 cases), widening of the intervertebral foramina (three cases), and scalloping of the posterior aspect of the vertebral bodies (three cases). The value of such films is obvious, and in addition the changes produced by a primarily vertebral tumour or other spinal disease may be revealed.

Myelography. using ethyl iodophenylundecylate ("myodil"), was employed in the final localization of the tumour in 22 cases. Although myelography is by no means always necessary for the detection of a spinal tumour, it is invaluable in accurate localization, and may be the only way in which a neoplasm can be excluded in suspicious cases. Owing to oedema and secondary vascular effects the clinical level may be false, and at the best the clinician has only clues concerning the extent of the lesion. The myelogram may also suggest whether the neoplasm is intramedullary or extramedullary, the longitudinal extent of the lesion, or the presence of multiple tumours. It also gives the surgeon the opportunity to mark the lesion in relation to the spinous processes pre-operatively and so render exposure more

Lumbar Puncture

This procedure revealed an abnormality in every case in the present series. The changes were partial or complete manometric block, xanthochromia, and raised cerebrospinal fluid protein, though all three features were not always present.

Manometry.—Partial or complete manometric block was found in 26 of our cases (76%). So important is the detection of spinal block that manometry must be carefully carried out in every case. In patients with suspected tumour it has been our practice, where possible, to have two observers—one to apply bilateral jugular pressure and the other to watch the manometer. First, light compression of the neck is applied, as this may reveal an incomplete block, past which fluid could be driven by firm compression (Stookey *et al.*, 1925); normally a rise of 10–30 mm. is to be expected at this stage. Then firm pressure is applied for ten seconds, and this should, in the absence of a block, produce a steady rise up to 300 mm. with a more rapid fall on release. If there is a complete block there will be no rise at all, whilst any definite delay in either the rise or the fall indicates an incomplete obstruction. The application of a sphygmomanometer cuff to the neck with the pressure raised to approximately 80 mm. may be used as an alternative to manual jugular compression.

The patient must be warned to relax during the manometry, and in particular reassured about the neck compression, since if, as is natural, he reacts to it by holding his breath and tensing his abdominal muscles, this alone will produce a rise in the manometer reading even in the presence of a complete block. If no obstruction was demonstrable at the beginning of the test then manometry should be repeated after the removal of a few millilitres of fluid for analysis, before the needle is withdrawn.

It has been shown experimentally by Poppen and Hurxthal (1934) that manometric abnormalities are not to be expected until the diameter of the remaining patency of the spinal subarachnoid space is less than the diameter of the lumbar puncture needle used. Occasionally a block will be evident only after the removal of fluid, possibly due to the meninges collapsing down on to the tumour (Ayer, 1920). Repeated dry taps suggest obliteration of the subarachnoid space by a large cauda equina neoplasm; the needle may have entered the neoplasm.

Cerebrospinal Fluid Protein.—The cerebrospinal fluid was examined in 35 cases, and all showed a rise of protein from 50–6,000 mg. per 100 ml. (upper limit of normal taken to be 45 mg. per 100 ml.). Of the four cases with slight increases only (50–65 mg.), three had manometric evidence of block, so that the significance of the slight abnormality was not likely to be overlooked. Whilst the increase in protein is usually the result of a spinal block, it may occur in the absence of such obstruction, and is then thought to be due to exudation from the surface of the tumour. Raised protein from this cause may thus be found in those cases of cauda equina tumour in which the cerebrospinal fluid is withdrawn above the site of the neoplasm. Of the nine cauda equina tumours reported here, five were associated with over 1,000 mg. of protein per 100 ml.

Xanthochromia.—This was present in 16 of the 29 cases in which the appearance of the fluid was recorded. Whilst usually associated with a very high protein, whether below a block or above a cauda equina tumour, there was one case with xanthochromia but only 110 mg. of protein per 100 ml., and two others with 150 mg.

Cells.—In most patients there was no increase of cells in the cerebrospinal fluid, but in seven cases a slight increase in lymphocytes was reported (7–12 per c.mm.). This feature gave no hint of the type of lesion present, since it was found in cases of neurofibroma, angioma, glioma, and secondary carcinoma.

In view of the obvious diagnostic value of lumbar puncture, the question arises of how readily, or at what stage, should one recommend it. Two factors influence the

decision. The first is the appreciation that a spinal block may exist, due to a tumour, when neither plain x-ray films nor clinical examination of the central nervous system have shown any abnormality—or nothing diagnostic (see Case 20, described below). The second is the possible risk of the procedure, fear of which may dissuade investigators outside special units from pursuing their cases to this vital stage. During the past two years in this hospital over 2,000 diagnostic lumbar punctures have been performed safely without sequelae other than headache in a few cases. However, there are some cases reported from time to time of the precipitation or aggravation of the neurological signs after puncture in cases of spinal cord tumour. Because of this possibility, Horrax (1947) has suggested that lumbar puncture should be carried out in cases of suspected cord tumour only when there are facilities for proceeding, if necessary, to immediate laminectomy.

From a survey of our own experience and of cases in the literature, we think that the risk of lumbar puncture has been exaggerated, with the important exception of cervical cord tumours in which puncture may precipitate respiratory paralysis. In such suspected cases, and also in rapidly progressive cases, it is advisable to postpone this examination until the patient is in a special unit. Apart from these instances, we hold the view that if a patient complains persistently of backache or root pain for which there is no obvious cause, and the films of the spine are normal, a lumbar puncture should be performed, as this may be the only way by which a spinal tumour may be excluded with confidence. So common are these symptoms, and so uncommon are spinal tumours, that there clearly will be numerous investigations of this kind which will come to nothing, and it would be quite impracticable to restrict lumbar punctures to neurosurgical units.

The value of lumbar puncture is exemplified in Cases 3 and 20.

Case 3. Neurofibroma of the Cauda Equina; Minimal Neurological Signs.—A flying officer aged 22 gave a history of an attack of left-sided sciatica aggravated by coughing for a period of a fortnight, nine months before admission. The pain recurred during a bumpy car journey three months prior to admission, and two days later he went to bed for an unrelated condition (duodenal ulcer). While in bed the left-sided sciatica became worse, and a month before admission he also developed sciatic pain on the right. On examination he walked stiffly and there was slight weakness in both legs. No sensory loss was demonstrated and the reflexes were symmetrically brisk. Straight-leg raising was reduced to 20 degrees on each side. Plain films were normal, but lumbar puncture revealed partial block with xanthochromic fluid containing 950 mg. of protein per 100 ml. A myelogram showed a block at L 1. A cystic neurofibroma was removed from the cauda equina and he made a good recovery.

Differential Diagnosis

It is clear that in most cases the diagnosis of an intraspinal lesion is easy once the suspicion is aroused, although its exact nature may require special study. However, it will be apparent from the symptomatology that in the earlier stages, and in other cases in which neurological abnormalities remain minimal, a spinal tumour may readily be confused with other conditions. Some of the difficulties are well exemplified in the Services, where in general the patients come under medical observation early.

The average delay between first consulting a doctor and undergoing operation was 6.4 months in the present series. On the other hand, reports from civilian centres point to much longer delays; in one series the corresponding interval was seventeen months (Van Wagenen and Rossier, 1938). Specialist medical advice is particularly easy of access in the Services, and this probably accounts for the shorter delay. Late operations are due largely to the multiplicity of common conditions (see Table II) which can give rise to the same types of pain, and to the considerable rarity of spinal tumours. Added to this is the not infrequent paucity of abnormal signs in the central nervous system even in many long-standing cases. In the majority of cases there is

TABLE II.—Some Incorrect Diagnoses in 28 Patients

Diagnosis	Cases
Fibrositis, rheumatism	10
Prolapsed disk, sciatica, neuritis	10
Functional, hysteria, neurosis	9
Disseminated sclerosis	5
Tuberculous spine	4
Poliomyelitis	3
Peripheral neuritis	2
Syringomyelia	2
Subacute combined degeneration	1
Neurosyphilis	1
Cervical rib	1
Renal colic	1
Peptic ulcer	1
Total	50

for some time no specific neurological disability to draw attention to the central nervous system, whilst even in retrospect it is difficult to discern any single characteristic of the pain complained of, other than its persistence, that should have led to the suspicion of a spinal tumour as its cause. In short, we wish to stress that there is often a period of many months in the natural history of a spinal tumour when confusion with other conditions may readily arise, with consequent delay in surgical treatment.

Late diagnosis may prove disastrous to the patient with a benign spinal tumour. Irreparable damage may occur either from prolonged compression of the cord or from interference with its blood supply, so that even if a total removal is still possible recovery is slow and perhaps incomplete.

Although the possible differential diagnoses are legion certain conditions are more commonly simulated than others.

Prolapsed Intervertebral Disk

This diagnosis was made at some stage in 10 cases of the present series. The five patients already mentioned with minimal signs in the central nervous system closely simulated disk lesions, and two of them have been described (Cases 3 and 4). A further example illustrates the difficulty in diagnosis (Case 20).

Case 20. Ependymoma of the Cauda Equina Resembling Prolapsed Intervertebral Disk.—A man aged 28 had attacks of back pain for twelve months before operation. These would last five or six days and resolve with physiotherapy. A month before operation right-sided sciatica complicated an attack and he came into hospital. His pain increased in bed, but the only abnormal physical signs were flattening and rigidity of the lumbar spine and slight scoliosis, straight-leg raising was limited to 60 degrees bilaterally and there was a doubtful depression of the knee- and ankle-jerks on the right. In this hospital the diagnosis after x-ray examination, but before lumbar puncture, was of prolapsed intervertebral disk, as had been thought elsewhere. Further investigation showed, however, a complete spinal block and xanthochromic fluid containing 2,500 mg. of protein per 100 ml. A myelogram revealed a block at L 1, and at operation an ependymoma of the cauda equina was partially removed.

Two not infrequent features of tumour cases may render the simulation of the disk syndrome very close: (1) Temporary remissions of pain, which may even coincide with treatment applied for a supposed disk lesion and so be taken as confirming the suspicion. (2) Signs of disordered spinal mechanics—stiff spine with diminished straight-leg raising.

Although in most cases the history and evolution of the clinical picture are quite different in the two conditions, in some cases it may be impossible to make the distinction clinically, and Case 4 shows the value of lumbar puncture in settling the problem. Lumbar puncture is not everywhere a routine procedure before disk surgery is undertaken, but it would seem to be a wise precaution in the light of this experience. It has always been the practice in this centre.

"Backache"

There were 10 cases diagnosed at some stage as "fibrositis" or "rheumatism"—that is, non-articular rheumatism—on account of the complaint of backache alone. One of the cases (Case 20) had attacks of backache as the only symptom for eleven months, and, furthermore, these bouts

TABLE III.—Service Patients with Spinal Tumours

Case No.	Sex and Age	Duration of Symptoms	Main Symptoms	State on Admission	Lumbar Puncture			Plain X-ray Spine	Pathology
					Colour	Block	Protein mg. 100 ml.		
1	M 32	8 years	Back and root pain (sciatic)	Minimal signs	Y	B	6,000	+	Neurofibroma, cauda equina
2	M 27	11 months	Back and root pain (to testicle)	Slight weakness left leg	Y	B	1,600	—	" " "
3	M 22	9 "	Back and root pain (sciatic)	Minimal signs	Y	P.B.	950	—	" " "
4	M 60	11 "	" " "	" " "	N	Reproduced pain	360	—	" " "
5	M 20	9 "	Neck pain and weakness of all limbs	Tetraplegia	Y	P.B.	3,000	—	Neurofibroma, C1-2
6	M 22	5 "	Weakness right leg	" " "	?	P.B.	50, later 70	+	" " "
7	M 26	7 "	Mild paraparesis	Paraplegia	Y	B	4,200	—	Neurofibroma, T12
8	F 22	2½ "	Back and root pain (to chest) Weakness legs	" " "	N	P.B.	960	—	Neurofibroma, T7
9	F 26	22 "	Back and root pain (to both calves)	Slight weakness left leg	?	P.B.	120	+	" " "
10	M 19	3½ "	Neck and root pain (to shoulder). Weakness all limbs	Tetraparesis	N	B	55	+	Neurofibroma, C5
11	F 31	6 "	Root pain (sciatic)	Weakness right leg	Y	B	1,200	+	Neurofibroma, cauda equina
12	M 28	16 "	Numbness and weakness legs	Mild paraparesis	N	B	65	+	Neurofibroma, C7-T1
13	M 36	13 "	Root pain (to abdomen). Weakness of legs	Flaccid paraplegia	Y	B	1,000	+	Neurofibroma, T9
14	M 19	3 "	Weakness legs	Paraparesis	?	B	130	—	Neurofibroma, T6-7
15	M 23	6 "	Progressive weakness all limbs	Tetraplegia	Y	N	300	—	Neurofibroma, cervical
16	M 45	3 years	Weakness leg	Weakness leg	N	P.B.	200	—	Angioma, cervical
17	M 24	22 months	Root pain (to abdomen)	" " "	Y	N	150	—	Angioma D12
18	M 60	18 "	Numbness and weakness legs	Mild paraparesis	N	N	80	—	Angioma D9-11
19	M 33	5 "	" " "	Flaccid paraplegia	N	N	220	—	Angioma D10-11
20	M 28	12 "	Back and root pain (sciatic)	Minimal signs	Y	B	2,500	—	Ependymoma cauda equina
21	M 29	7 "	Root pain (sciatic)	Weakness leg	Y	N	150	—	" " "
22	M 20	7 "	Back and root pain (sciatic)	Paraparesis	Y	N	Clotted	+	" " "
23	M 23	2 "	Back and root pain (sciatic). Weakness legs	Paraplegia	Y	Not done	—	+	Osteoclastoma L4
24	M 19	8 "	Back and root pain (to chest)	Mild paraparesis	N	N	80	+	Osteoclastoma D8
25	M 36	5 "	Weakness legs	Paraplegic	N	B	80	—	" Intramedullary tumour " D10-12
26	M 31	8 "	Back pain. Weakness leg	Weakness leg	N	N	55	+	" Intramedullary tumour " D3
27	M 22	3 "	Back pain. Weak legs	Paraplegic	Y	B	2,000	—	Spongioblastoma D2-3
28	F 22	7 "	Neck pain	Mild tetraparesis	Y	N	110	—	" Primary malignant melanoma " C3 root
29	M 35	3 weeks	Back pain. Weak legs	Paraplegic	N	B	300	—	Anaplastic secondary car. D4. ? Bronchogenic
30	M 17	9 days	Root pain (to chest). Unable to walk	" " "	N	B	200	+	Anaplastic secondary car. D1-3. ? Bronchogenic
31	M 17	3 weeks	Back and root pain (to leg)	" " "	?	B	1,000	+	Anaplastic secondary car. D12. ? Bronchogenic
32	M 19	5 "	Root pain (to chest and arms). Unable to walk	" " "	Y	P.B.	240	+	Anaplastic secondary car. C7. ? Bronchogenic
33	M 42	3 months	Back and root pain (to chest). Weakness legs	" " "	Y	B	350	—	Anaplastic secondary car. D10. Bronchogenic
34	M 30	10 days	Unable to walk	" " "	?	P.B.	120	—	Secondary car. D7-10. Bronchogenic (P.M.)
35	M 31	3 weeks	Back and root pain (to thighs). Unable to walk	" " "	N	B	150	+	Secondary car. D7. Unknown primary (P.M.)
36	M 35	7 "	Back and root pain (to legs). Weak legs	Paraparesis	?	B	600	+	" Secondary osteogenic sarcoma " D8

Y=Yellow. N=Normal. B=Block. P.B.=Partial block. +=Abnormal. —=N.A.D. P.M.=Post Mortem

responded to physiotherapy. Case 1 illustrates that a long history cannot exclude tumour even when pain in the back remains the principal complaint.

Backache, especially if there is restricted spinal movement with muscle spasm, may raise the possibility of disease of the spine itself such as tuberculosis, ankylosing spondylitis, and osteoarthritis. A plain x-ray film usually disposes of these diagnoses.

Case 1. Neurofibroma of Cauda Equina—Prolonged Complaint of Backache without Neurological Disability.—A man of 32 was admitted in 1943 with a history of intermittent backache since 1935, when he had fallen, injuring his back. On that occasion he recovered after three weeks in bed, but two months later backache recurred and pain radiated down the left leg into the calf. There was no relief of symptoms in spite of five months in hospital, and he returned to work. In 1940 he joined the Army and, although able to manage a twenty-five-mile route march, he could not do physical training, and in 1942 "collapsed" with pain in his back during an assault course. Examination in hospital on several occasions did not reveal any obvious organic causes. On admission here he complained of backache and pain down the left leg which was continuous and aggravated by coughing. There were no other symptoms. Examination showed minimal sensory loss over the lateral aspect of the left thigh, slight diminution of the left knee-jerk, and an abnormal plantar response; no weakness could be detected. Straight-leg raising was normal, but jugular compression aggravated the pain. There was spasm of the erector spinae muscles with some limitation of spinal flexion. X-ray examination of the spine revealed

some flattening of the pedicle of L3. Manometry demonstrated a complete spinal block, the cerebrospinal fluid being yellow and containing 6,000 mg. of protein per 100 ml. Myelography showed a complete obstruction at the level of L3. At operation, eight years after the onset of symptoms, a neurofibroma was removed from the third left lumbar nerve root. He made a good recovery.

In this story there was nothing about the pain, apart from its persistence, which was suggestive of a tumour. The neurological signs, even after eight years, were not gross.

Visceral Diseases in the Thorax or Abdomen

Root pain is produced by many types of visceral disease, and this pain may be indistinguishable from that produced by irritation of the same roots by spinal neoplasm. Not uncommonly, abdominal operations of varying severity have been carried out for persistent pain before the correct diagnosis of spinal tumour has been made (Spurling and Mayfield, 1936; Craig, 1936).

Case 2. Neurofibroma of the Cauda Equina Resembling Visceral Disease.—An Army driver aged 27 had increasing pain in the left loin, radiating to the testicle and the front of the thigh, for eleven months; the pain was accentuated by coughing. It was thought to be of renal origin, but when intravenous pyelogram and urinary examinations were repeatedly negative he was referred to a psychiatrist, who diagnosed prolapsed intervertebral disk. The patient was transferred to this hospital, where examination showed slight weakness and depression of reflexes in the left leg and some diminution of sensation below L1 segment.

Lumbar puncture revealed a complete spinal block and a yellow fluid containing 1,600 mg. of protein per 100 ml. Myelography confirmed the block, and removal of a neurofibroma from the second lumbar nerve root completely relieved the symptoms.

Non-neoplastic Diseases of the Spinal Cord

In a few cases of neurological disease such as disseminated sclerosis, poliomyelitis, transverse myelitis, and motor neurone disease, clinical examination may suggest a focal spinal lesion, and if the cerebrospinal fluid protein is elevated the presence of a tumour may be suspected. It is in such cases that resort to myelography may be necessary. There were no cases in the present series in which a diagnosis of disseminated sclerosis was made after admission to this hospital. However, this is a common initial diagnosis in spinal cord lesions, and in these cases a lumbar puncture should always be carried out.

The importance of examining the blood and cerebrospinal fluid for the Wassermann reaction may be mentioned here; in relation to this it is interesting to remember that the original description of the Froin syndrome probably referred to three cases of syphilitic meningomyelitis (Greenfield and Carmichael, 1925).

Extradural Abscess

This is commonly simulated only by metastatic tumours, but the resemblance can be close. In this series three of the eight metastatic tumours were initially thought to be extradural abscesses, and emergency laminectomy was performed in one case (No. 34).

Case 34. Extradural Metastasis Resembling Extradural Abscess.—A man of 30, who had been treated for secondary syphilis three months previously, developed increasing weakness of the legs over three days. Examination showed a spastic paraparesis with pyramidal reflex changes, and a diagnosis of syphilitic meningomyelitis was made. Spinal x-ray films were normal, but a lumbar puncture showed a partial block with 120 mg. of protein per 100 ml. and 5 cells per c.mm. Paraplegia was rapidly progressing, and a neurosurgeon was consulted. A diagnosis of extradural abscess was made and an emergency laminectomy performed. A mass of pathological tissue was found extradurally which was said to be suggestive of a healing abscess, both macroscopically and microscopically. Two months later chest x-ray examination showed a hilar mass; only "congestive changes" at one base had been seen on a film a week before operation. Death occurred three months after laminectomy, and post-mortem examination showed a primary bronchial tumour with widespread secondary deposits, including those in the spinal dura.

These cases, then, illustrate the difficulties besetting the clinician confronted with a patient suffering from a spinal tumour. Two points emerging from a study of this series are, firstly, the value of lumbar puncture, and, secondly, the necessity for exploring the possibility of an intraspinal lesion in puzzling cases of backache or root pain and of periodic examination of the nervous system in search of minimal signs.

Treatment

Laminectomy should be carried out as soon as the diagnosis is established and the location determined. Complete removal of the tumour is, of course, the ideal procedure and is usually possible in cases of neurofibroma. Of the 14 neurofibromas operated on in this series all were totally resected and 11 made a complete recovery. The only unoperated case in the whole group was that of a dumb-bell fibroma with a large extraspinal mass in the neck, and the patient succumbed within nine weeks of admission (Case 15). The remaining tumours were only partly removed or else were left with decompressions, and the majority were then treated with radiotherapy. Incomplete removal followed by radiotherapy gave a satisfactory immediate recovery in two cases of ependymoma of the cauda equina. There was one operative death due to aspiration pneumonia. No long-term follow-up has been possible.

Conclusions

Spinal tumours in their early stages often present a difficult diagnostic problem. This is partly because the presence

of such a lesion may not be even thought of owing to its comparative rarity, and partly because it may simulate other more common disorders for many months or even years before there is total cord compression.

A variety of conditions may be confused with spinal tumour, the most frequent being "rheumatism," prolapsed intervertebral disk, neurosis, disseminated sclerosis, and visceral disease within the thorax or abdomen. However, a careful evaluation of the type of pain and a full neurological examination will in most cases of spinal tumour suggest the possibility of such a lesion. Furthermore, diagnosis is often possible, at a stage when neurological signs are minimal or debatable, by performing a lumbar puncture. Less often, plain x-ray films of the spine lead to detection.

Surgical treatment is often completely curative, but only if the diagnosis is made before irreversible pressure changes have occurred in the cord or nerve roots.

Summary

Service patients tend to come under observation early, and this opportunity has been taken to comment on the early clinical picture and diagnosis of spinal tumours based upon a study of 36 cases at the Military Hospital for Head Injuries, Oxford.

The average delay between the first consultation and operation was 6.4 months, which is shorter than in most civilian series. Common diagnostic errors were "fibrositis" or "rheumatism" in 28% of cases, prolapsed intervertebral disk or "sciatica" in 28%, and "neurosis" in 25%.

The most frequent complaint was backache and/or root pain, occurring in 81% of cases; in 61% it was the initial symptom. In five cases there were only minimal or doubtful neurological signs, although pain had been present for nine months or more.

The most frequent neoplasm was the neurofibroma (41%). An unexpectedly large number of metastatic tumours was present (22%), most of which appeared to be of bronchial origin; three of these tumours occurred in patients between 17 and 19 years of age. A metastatic lesion should be suspected if the history is short and the clinical picture advanced.

Reference is made to the ancillary investigations, and attention is drawn to the value of lumbar puncture in early diagnosis, especially in doubtful cases. Evidence of spinal block was obtained in 76% of cases, and in all 35 patients whose cerebrospinal fluid was examined the protein content was raised.

Lumbar puncture may be the only way of excluding a tumour with any confidence in patients with persistent back or root pain for which there is no obvious cause. The possible dangers of the procedure are negligible, except in rapidly progressive cases and those with suspected cervical tumours, the investigation of which should be delayed until neurosurgical aid is available.

We are indebted to the medical officers responsible for the detailed clinical notes, often made under considerable wartime difficulties, without which this study could not have been possible. We have received much encouragement from members of the staff of the Nuffield Department of Surgery, Oxford, and are particularly grateful to Mr. Joe Pennybacker for suggestions and to Dr. Peter Daniel for help with some of the pathological data. Above all, our gratitude is due to Mr. Walpole Lewin for much helpful advice and criticism at all stages in the preparation of this paper. We wish to thank the War Office for permission to publish these cases.

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COARCTATION OF THE AORTA AND PREGNANCY

REPORT OF FIVE CASES

BY

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Coarctation of the aorta is an uncommon finding in adults and shows its higher incidence in males in a proportion of 3 males to 1 female (Abbott, 1928). The association of this anomaly with pregnancy must therefore be of some rarity. Benham (1949) was able to find records of only 53 cases in the literature and added three personal reports. To these can be added the following cases: Dieckmann (1941), 4; Magnin (1944-5), 1; Novak (1947), 1; Clark and Koenig (1947), 1; Cohen (1949), 1; Marcorelles (1949), 1; Money (1949), 1; Sundföer (1950), 3; Vander Veer and Kuo (1950), 2; Brown (1950), 4; Greig and Parker (1951), 1; Bond (1951), 1; Kerr and Sodeman (1951), 5; Soulié *et al.* (1951), 3; Notter (1952), 1; Miller and Falor (1952), 2; Stéphan (1952), 1; Peterson *et al.* (1953), 1; and Taylor and Pollock (1953), 1; making a total of 91 recorded cases.

In view of the infrequency of pregnancy complicating coarctation of the aorta the assessment of the risks involved and the prognosis and management of any individual patient become considerations of great importance and difficulty for the physician and obstetrician whose experience of this association of conditions must necessarily be limited. It would seem desirable that as many records as possible be reported so that a firmer basis for judgment may be provided. With this in view the following five cases are reported.

Case 1

The patient, aged 25, was referred from the local antenatal clinic at the third month of her first pregnancy for the diagnosis of a suspected heart lesion. A "rheumatic heart" was said to have been discovered when she was 5 years old, and from about the age of 10 she had had symptoms very suggestive of mild intermittent claudication. These lasted on and off for about five years. The only symptom of note after this had been mild dyspnoea on exertion, which she thought was probably a little more prominent since the beginning of her pregnancy. Except for this and very occasional "bilious attacks" (vomiting, mild headaches, but no eye symptoms) she was perfectly fit and well.

Examination showed the classical signs of coarctation of the aorta. Blood-pressure readings were: right arm, 170/100; left arm, 150/95; right leg, 120/100; left leg, 115/90. The heart size was within normal limits. She had a mild ichthyosis, mostly involving the skin of the trunk, upper arms, and thighs, and this had been present since childhood. She had no other abnormal physical signs. X-ray examination of the chest showed a poorly developed aortic knuckle and notching of the third, fourth, sixth, seventh, eighth, and ninth ribs of both sides. Blood counts, blood urea, and Wassermann reaction were normal. Intravenous pyelography studies and an electrocardiogram were within normal limits. The amylobarbitone test resulted in an average blood pressure of 130/95 compared with 155/100 before the test.

She attended the medical clinic regularly and the pregnancy proceeded uneventfully. At the 27th week a slight generalized enlargement of the thyroid gland was noted. She was admitted to hospital at the 36th week for a final rest prior to confinement. One week later she began to complain of nausea, hot flushes, palpitations, and precordial pain. Over the course of three hours her pulse rate rose from 80 to 115 a minute, the systolic blood pressure from 135 to 165 mm. Hg, and the diastolic pressure from 95 to 100 mm. Hg. It was decided to perform caesarean section at once. The lower segment operation was done under spinal analgesia, and a living infant weighing 5 lb. 6 oz. (2.4 kg.) delivered. The patient was not in labour and there was much bleeding from the thickened lower segment of the uterus. It was noted that the abdominal aorta was half normal size. The puerperium was uneventful, and she was discharged from hospital after three weeks.

The patient was seen again at the medical clinic three months later. She had remained fit and well with no complaints except for slight dyspnoea on exertion, which was no worse than before the pregnancy. There were no notable changes in the physical signs. She remained in good health for five months after delivery. One night, about one and a half hours after going to bed, she awoke, told her husband she felt "queer," rapidly became unconscious, and died within half an hour. A post-mortem examination was not carried out.

Case 2

A primipara aged 21 was referred from the local antenatal clinic for diagnosis of a suspected heart lesion. She had had no serious illnesses as a child and had played games and cycled as other girls of her age. She had no complaints of headaches or pains in the legs. Eighteen months previously she had been off work for three months with dyspnoea on exertion, lethargy, and ankle oedema. These symptoms returned when she became pregnant, but on stopping work she regained her former good health.

On examination she was found to be 20 weeks pregnant. The blood pressure in the arms was 165/85 mm. Hg, and the systolic pressure in the legs, by palpation of the dorsalis pedis artery, 105 mm. Hg. A systolic murmur could be heard at the base of the heart at the level of the second rib on the left side close to the sternum. A loud systolic murmur was heard over the whole posterior chest, maximal in the mid-zone on both sides. A systolic thrill was felt in the left supraclavicular region. X-ray examination showed the heart to be normal in size and configuration, though the aortic knuckle was not seen. Rib notching was not present.

The pregnancy continued uneventfully until the thirty-eighth week, when she was admitted with uterine haemorrhage. A central placenta praevia was diagnosed and a living infant of 5 lb. 14 oz. (2.7 kg.) delivered by lower segment caesarean section. No note was made of the size and pulsation of the abdominal aorta. Except for a mild pyrexia and anaemia the puerperium was normal. On the tenth day the cardiac bruits were unchanged. No collateral circulation could be felt or seen. The blood pressure in the arms was 150/75 mm. Hg, while that in the legs could not be determined. The femoral artery pulsations were not felt.

Case 3

A woman aged 43 was referred to the local maternity hospital because of a raised blood pressure, upper abdominal pain, and malaise three weeks before her fifth child was due. She had had four previous normal pregnancies and labours, and her past medical history was uneventful.

On examination, except for a blood pressure of 130/90 mm. Hg, no abnormalities were noted. The urine was free from albumin. For the next two weeks she did not complain, had blood pressures of 150/90 and 140/98, and the urine remained albumin free. She was admitted to hospital at term complaining of headache and vomiting, her blood pressure was 130/90, and a very faint trace of albumin was found in the urine. She was treated conservatively and the blood pressure varied from 140/90 to 170/110 with no albuminuria. One week after admission, with the blood pressure 190/130, labour was induced surgically. The next day her blood pressure was 120/70 and she was noted to be "bright and cheerful." In the afternoon she was allowed to walk around the ward in order to encourage the start of labour. Fifteen minutes later she dropped down dead.

Post-mortem examination showed the pericardial sac to be full of blood. Coarctation of the aorta was present at the origin of the left subclavian artery, and at this point the aorta measured $\frac{1}{2}$ in. (1 cm.) across. The ascending aorta was dilated to a diameter of 3 in. (7.6 cm.), and showed a split in the intima with a dissecting aneurysm which had ruptured through the adventitia into the pericardial sac. The left ventricular muscle was slightly hypertrophied. A bicuspid aortic valve was present. The uterus contained a normal full-term foetus, and except for congestion of the lungs all other organs were normal.

Case 4

A 1-para 2-gravida aged 24 was walking through the backyard of her home carrying her 15-months-old baby on her arm when she suddenly collapsed, quickly lapsed into unconsciousness, and died after about 30 minutes. No further history was available.

Post-mortem examination showed a small ruptured aneurysm at the bifurcation of the right middle cerebral artery. The subarachnoid haemorrhage was greatest around the optic chiasma, the brain stem, and between the cerebrum and cerebellum. It had tracked along the sulci and was present in the ventricles too. The skull was intact and there were no injuries of the scalp. The heart was slightly enlarged owing to hypertrophy of the left ventricle. The mitral valve showed some fibrosis and scarring, while the aortic valve had two functioning cusps only. Stenosis of the aorta was present at the junction of the arch and descending portions, and measured $\frac{1}{2}$ in. (1.3 cm.) at this point. The uterus contained a normally developed foetus $9\frac{1}{2}$ in. (24.2 cm.) long, corresponding to the pregnancy of 20 to 22 weeks' gestation. Except for venous congestion the remainder of the organs were normal.

Case 5

A woman aged 30 had been attending her local antenatal clinic for her first pregnancy and was said to have enjoyed perfect health both before and during her pregnancy. At about the 38th week she suddenly collapsed at home and died within a few seconds.

On post-mortem examination the pericardial sac was distended with blood which had poured through a small rupture in the posterior wall of the root of the aorta. The ascending and transverse parts of the aorta were very thin and were dilated to a point just behind the left subclavian artery. Here the aorta became narrow and "completely obliterated," while below this point the vessel was noted to be "abnormally narrow." There was marked hypertrophy of the left auricular and left ventricular muscles. The aortic orifice was very narrow and would not admit one finger. The uterus contained a normal 38-weeks foetus, while all other organs were macroscopically normal.

Discussion

The comparatively small number of cases on record do not allow of any valid conclusions of a statistical nature to be drawn from them. Many of the reports are deficient in important details; some are only mentioned in textbooks and articles. Again there is a tendency to report only the unusual and dramatic, and therefore no detailed statistical analysis is possible if an imbalanced picture is to be avoided.

Coarctation of the aorta in an adult carries with it well-defined risks, and the association of pregnancy increases these hazards, especially of rupture of the aorta. There are records of 11 patients with the anomaly whose death was directly associated with pregnancy, and in 6 of them death was due to rupture of the aorta just before term or during labour. In 9 out of the 11 cases the coarctation remained undetected during the pregnancy. Earlier diagnosis, and therefore appropriate supervision and management, may have a large part to play in improving the prognosis. However, perusal of the literature shows that many women have successfully negotiated repeated pregnancies without any demonstrable adverse effects in spite of the presence of coarctation, which in many cases remained undetected until after the pregnancy. One woman of 56 (Weber and Price, 1912) had produced 11 children and died 12 years after her last pregnancy, and another of the same age (Strassmann, 1922) produced seven children. While not diminishing the seriousness with which this association of conditions has to be regarded, these facts suggest that a uniformly gloomy prognosis for all cases is unwarranted. The records, however, give no indication of those women with coarctation of the aorta who are likely to be unaffected by pregnancy—information which might be a useful guide in the management of future patients. Comparative studies of blood-pressure readings or the degree of collateral circulation appear to have no value in deciding prognosis in an individual patient.

Antenatal supervision of pregnancies is now an established practice, and it is usual to examine the chest at least on the first attendance and to measure the blood pressure frequently throughout the pregnancy. These are unusually favourable conditions for detecting those patients who have an existing coarctation of the aorta, and routine palpation of the femoral pulses in all patients with hypertension, however mild, would undoubtedly disclose further examples of the associated conditions.

The advice regarding management of these patients has varied according to the personal experience of the physician and his reading of the literature at the time. Some have advised that all cases should have therapeutic abortion with sterilization (Mendelson, 1940), some have advised caesarean section at term with or without sterilization (Walker, 1943; Baber and Daley, 1947; Brown, 1950), while others have allowed labour to proceed normally (Soulié *et al.*, 1951). Surgical treatment of coarctation of the aorta has not only stimulated early diagnosis of the condition but will now influence the management of pregnancy cases. The patients of Marcorelles (1949) and Peterson *et al.* (1953) were both operated on successfully during their pregnancies, and Miller and Falor (1952) describe the case of a woman who was operated on three months after her first pregnancy and successfully negotiated a second a year later.

It is suggested that all patients in whom these conditions coexist should be referred to a thoracic unit, where the possibility of surgical intervention might be considered. A pregnancy of less than 20 weeks' duration should, in itself, be no contraindication to operation. Until more experience is available it would be wiser to defer surgery if the diagnosis of the coarctation is first made in the later months of pregnancy. Management otherwise is, in general, similar to that applied to pregnant women suffering from rheumatic heart disease. Undue enlargement of the heart, signs of aneurysmal dilatation of the ascending aorta, or symptoms suggestive of cerebral aneurysm indicate the advisability

of terminating the pregnancy. A rise of blood pressure in the last few weeks of pregnancy or during labour should be viewed seriously and caesarean section undertaken.

Summary and Conclusions

There are records of only 91 patients in whom coarctation of the aorta was associated with pregnancy. Five further cases are reported.

The association carries with it serious risks, especially of rupture of the aorta, but, in spite of these, many women have not been adversely affected by multiple pregnancies and have lived to an age well beyond the average expectation of life in coarctation of the aorta. Earlier diagnosis and surgical treatment of the coarctation offer means of improving the prognosis.

Diagnosis is not difficult, and depends mainly on the awareness of the examiner and routine palpation of the femoral pulses in all patients with hypertension. The antenatal clinic offers unusual opportunities for early diagnosis.

General principles in management of these patients are described and the importance of individual assessment and surgical treatment for the coarctation is stressed.

I thank Mr. J. M. McKiddie, who kindly allowed me to quote Cases 2 and 3; the late Mr. B. L. Jeaffreson, who operated on Case 1, and Dr. A. Green, who supplied the after-history; the late Professor P. L. Sutherland and Drs. D. E. Price and W. L. Rose for post-mortem reports; and Drs. G. Grimshaw and D. Gray for help with some of the translations.

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It is recorded in the annual report of the Chalfont Colony for 1953-4 that an arrangement has been made with the National Hospital for Nervous Diseases whereby patients, either before or immediately after entering the Colony, will go to the Queen Square or Maida Vale Hospitals for full investigation and report. The executive committee believes that a certain percentage of cases now going to the Colony will be intercepted, treated at Queen Square or Maida Vale, and returned to normal life in a few weeks. The medical staff of the Colony will also receive guidance from the staff of the National Hospital about the treatment of those patients who are finally admitted to the Colony.

HAEMORRHAGIC GANGRENE OF THE SKIN IN CHRONIC LYMPHATIC LEUKAEMIA

BY

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AND

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In chronic lymphatic leukaemia both specific and non-specific skin lesions may occur, but distinction between the two often rests on the histological picture.

In a study of the dermatological manifestations of the lymphoblastoma-leukaemia group, Epstein and MacEachern (1937) found that out of 60 patients with chronic lymphatic leukaemia 27 (45%) had non-specific skin lesions. Of these, the haemorrhagic type was commonest (15 patients), and usually occurred in the terminal stages. Although Sutton and Sutton (1941) mention that purpura sometimes results in necrosis and ulceration of the skin and mucous membranes, we are unable to find any reference to the occurrence of haemorrhagic gangrene of the skin in chronic lymphatic leukaemia.

Case History

A 58-year-old male librarian was admitted on October 5, 1952, having been found unconscious in his garden. There was a past history of chronic bronchitis. A provisional diagnosis of subarachnoid haemorrhage was confirmed by lumbar puncture. During routine examination he was found to have moderate splenomegaly but no palpable glandular enlargement, and there were no other abnormal signs. A blood count showed: Hb, 92%; red cells, 4,680,000 per c.mm.; white cells, 12,900 per c.mm. (polymorphs 22%, eosinophils 0.5%, monocytes 1%, lymphocytes 76.5%); no primitive forms; platelets, 168,750 per c.mm.; E.S.R., 1 mm. in the first hour (Wintrobe); clotting-time, 6 minutes 30 seconds; bleeding-time, 3 minutes. A sternal marrow puncture showed a typical picture of chronic lymphatic leukaemia.

As it was uncertain whether the subarachnoid haemorrhage was in any way connected with the leukaemia, and as the leukaemia was symptomless, with the possible exception of being related to the subarachnoid haemorrhage, it was decided not to treat the patient at this stage. He was discharged in November, having made an uneventful recovery from the subarachnoid haemorrhage, and he was seen regularly as an out-patient.

In January, 1953, he was readmitted to hospital with a three-days history of fatigue with fever and the coughing up of sputum flecked with bright blood. On examination he was wasted and there were symmetrical localized areas of ecchymoses over both upper arms and both malar eminences. The only other abnormal physical finding was splenic enlargement, which was of the same degree as on the previous admission. A blood count at this time showed no marked change from the previous count, and the bleeding- and clotting-times were still within normal limits. The possibility of a leukaemoid reaction to generalized tuberculous infection was considered, and accordingly the sternal marrow was re-examined in February, 1953. No evidence of tuberculous histology was seen, and the appearance was still that of a lymphatic leukaemia. A chest x-ray examination showed extensive cavitation in the right upper lobe, but repeated sputum tests and examination of laryngeal swabs did not reveal any evidence of tuberculosis.

The skin lesions became more numerous. Each would start as a small patch of purpura which enlarged rapidly

and then developed superficial gangrene. Progressively and symmetrically they involved the pinnae, arms, forearms, buttocks, legs, and toes (see Fig.).

"Acthar gel," in a dose of 50 mg. 12-hourly intramuscularly, was begun, but two days later the patient went into coma and died on February 8.

Necropsy Findings.—External Examination: There was a dark-purple discoloration of ears and face, except for the circumoral area, with ulceration of both ears and cheeks. Dark-purple patches were present in the region of both nipples, on the outer side of both arms, with ulceration of the upper arms, on both buttocks, and on the outer side of both thighs and legs, with purpuric spots at the border.

Circulatory System: A large pericardial effusion was present

consisting of clear yellow fluid. **Respiratory System:** The lungs were emphysematous, with a cavity in the right upper lobe approximately 2 cm. in diameter, and an adjacent dark solid area with a hyperaemic border showing central softening. There was no macroscopic evidence of tumour.

Digestive System: The liver was enlarged (weight 2,326 g.) and extensively infiltrated with pale semi-translucent nodules. These swelled above the cut surface, and were approximately 1 cm. in diameter. **Haemopoietic System:** Lymph nodes around the coeliac axis and at the hilum of the spleen and para-aortic nodes were prominent. Cut surface was mottled, with reddish areas. The spleen (weight 1,162 g.) showed a pale cut surface with prominent Malpighian bodies. **Nervous System:**

An intact berry aneurysm arose from the anterior communicating artery of the circle of Willis. Adjacent to the aneurysm there was brownish discoloration of the arachnoid.

Histology.—Right Lung: An old infarct was present with central necrosis and peripheral haemorrhage and infiltration with lymphocytes and polymorphs. Elsewhere there were foci of lymphocytes. **Liver:** Lymphocytic infiltration had occurred and there were many deposits of irregular polygonal-celled trabecular carcinoma with a fine stroma. Mitoses were numerous. The appearances were those of metastases of an aplastic bronchial carcinoma. **Spleen:** Pulp spaces and sinusoids were distended with lymphocytes. **Coeliac Lymph Node:** Germ centres were no longer distinguishable, and the whole node was packed with lymphocytes of adult type. **Skin:** Both superficial and deep corium contained small recent haemorrhages, and in the same situation the veins contained organizing thrombi. The arteries appeared normal. There was no leukaemic infiltration.

Comment

Progress of the skin condition to extensive symmetrical gangrene had occurred as a terminal event, and it is difficult to assess the degree to which this contributed to the patient's death, particularly so when the double pathological condition found at necropsy is considered. Carcinoma, especially of the bronchus, is common nowadays, and

chronic lymphatic leukaemia is by no means rare, so that the association of the two conditions in the case here reported is probably fortuitous. Nevertheless, only 27 cases of carcinoma with leukaemia had been reported up to 1950 (Berk and Movitt, 1945; Even, Vibert, and Oury, 1950). In our case no primary growth was found in the lungs or in any other organ, but the histological appearance of the deposits in the liver was suggestive of primary carcinoma of the bronchus.

We wish to thank Dr. A. R. Kelsall for permission to publish this case.

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THE EPIDEMIOLOGICAL APPROACH TO OBSTETRIC MEDICINE*

BY

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The annual report of a well-known teaching maternity hospital says that it had 1,413 admissions during the year 1950. These contributed 1,270 deliveries and 85 abortions. The stillbirth rate was 9.34 per 1,000 (an exceptionally low figure) and the neonatal death rate 17.32. In 31 tables are listed some of the features of numerous abnormal cases. How cases were chosen for admission and how they relate to the community as a whole are not indicated. The clinical detail presented is reduced to a bare minimum and there is no text or discussion whatever. The lay-out and scope of such annual reports are time-honoured, but make it very difficult to extract figures of scientific value. The time has surely arrived when all statistical reports should be drawn up according to the laws of epidemiology. Now that maternity services are organized on a regional basis, the leading hospital in an area might collate data from all sources and prepare reviews illustrating and discussing trends of morbidity and mortality in a defined population.

Maternity records are particularly suitable for systematic surveys because birth and death certification provides an automatic and accurate statistical framework for every administrative area. There is little difficulty, of the kind which arises in the study of chronic disease, in arriving at a biologically meaningful epidemiological "unit." A "maternity"—the cycle of pregnancy, childbirth, and recovery—is easily defined, and takes place in a limited and relatively constant period of time.

The group of maternities to be studied having been defined, the next step is to classify them. To reduce the population to a series of fairly homogeneous groups it is desirable to classify by legitimacy; by the maternity service to which a case has been booked, irrespective of the place of delivery; and perhaps by home address, if it is desired to limit the study to the residents of an area. Multiple maternities should be separated from single.

*Read in the Section of Preventive Medicine and Infectious Diseases at the Annual Meeting of the British Medical Association, Glasgow, 1954.



Photograph showing skin lesions in the early stages.

Most analyses will be carried out on groups of single legitimate maternities, which should be classified by age and parity.

Influence of Maternal Physique and Health

Since reproduction is a physiological function it is reasonable to suppose that maternal physique and health will be an important influence. It is, unfortunately, very difficult to assess health objectively, but a social classification is a useful indirect measure of the way of life of patients which is highly correlated with health and physique. Even better and more simple, it is useful to classify mothers by height. Height is associated statistically with social class and with general health. As one moves down the social scale, the proportion of small women and of unhealthy women increases (Baird, 1952b; Baird and Illsley, 1953). It has been shown that mothers in different height categories experience different rates of foetal mortality, prematurity, and difficult labour (Baird, 1949, 1952a, 1952b). The theory is that mothers who have been brought up in a satisfactory environment will grow to the maximum stature permitted by their genetic constitution, and will be in good general health, whereas those brought up in poor surroundings will be stunted and less healthy.

The Epidemiological Method in an Aberdeen Inquiry

I propose to illustrate the use of the epidemiological method in obstetrics by describing an inquiry made in Aberdeen into the nature and means of preventing unexplained deaths among mature babies. Accounts in greater detail have been published by Baird, Walker, and Thomson (1954), Walker (1954), and Walker and Turnbull (1953).

Prematurity has for long been recognized as a major cause of "unexplained" neonatal mortality. It is not so widely known that many babies which are mature by birth weight—that is, over 5½ lb. (2.5 kg.)—die for no very obvious reason. In a classification of obstetric deaths (stillbirths plus first-week deaths) by clinical cause (Baird, Walker, and Thomson, 1954) we distinguished two "unknown" categories, classified in terms of birth weight into "premature, cause unknown," and "mature, cause unknown." In both, pregnancy and labour were clinically uneventful, and at necropsy only uninformative conditions such as "prematurity," "atelectasis," "anoxia," and so on were found, the underlying cause of death being unexplained. Of 1,008 consecutive obstetric deaths in Aberdeen Maternity Hospital booked cases during the 15-year period 1938–52, 13.7% were classified as "mature, cause unknown."

A comprehensive analysis of these deaths by age, parity, and other factors was undertaken. Since booked hospital cases, especially multiparae, are more or less selected (Baird and Thomson, 1954), a study based on all city maternities, whether delivered in hospital or not, would have been preferable. Information on a city-wide basis has become available only recently, and in a relatively small city obstetric deaths are not numerous enough to permit dependable statistical analysis unless the results of many years are pooled. All stillbirths (not first-week deaths) in the city since 1938 could be classified by clinical cause, but complete information on age and parity was not available. In the booked hospital series, the stillbirth and first-week death rates behaved in relation to age, parity, and social class in much the same way as comparable national statistics, and long experience has shown that booked hospital primiparae at any rate may be regarded as a representative sample of first maternities in general; it was therefore believed that the behaviour of the obstetric death rate was fairly typical of the childbearing population as a whole.

The "mature, cause unknown" obstetric death rate was 6.3 per 1,000 total births in primiparae, 4.5 in second and third pregnancies, and 4.4 in fourth and later pregnancies. In primiparae, especially, there was a steady rise as maternal age increased—from 2.3 at age 15–19, to 19.0 at age 35 and

over. Obviously elderly primiparae (say 30 and over) form a high-risk group for deaths in this category.

Since the data were compiled from a 15-year series, during which time the overall obstetric death rates had fallen considerably, trends in the "mature, cause unknown" obstetric death rate were investigated in relation to time. In the hospital series this rate behaved rather erratically, and certainly showed no sign of a consistent fall such as had occurred in the rate from all causes. Examination of data for the whole of Aberdeen showed that the "mature, cause unknown" stillbirth rate fell from just over 7 per 1,000 in 1939–40 to slightly under 5 in 1944–5. During 1946–8, the period of the post-war rise in the birth rate, when there were relatively more first births and an increase of average maternal age, the rate rose to the pre-war level, falling again in 1949–51 to about 5 per 1,000 (Baird, Thomson, and Duncan, 1953).

Examination of the hospital data for primiparae by social class and maternal height showed no consistent trends.

"Premature, cause unknown" death rates, on the other hand, show consistent trends in the expected direction by social class and height: the rates fell steadily during the war and showed no post-war rise; the gradient by age in primiparae is not so steep and steady as in the "mature, cause unknown" group, and very young as well as elderly mothers seem to have a relatively high death rate. Excess deaths in the "premature, cause unknown" group seem to be statistically associated with poor social class, small stature, and poor general health and nutrition of mothers; this is by no means obvious in the case of "mature, cause unknown" deaths. Though the two groups no doubt overlap aetiologicaly, the distinction by birth weight—above or below 5½ lb. (2.5 kg.)—seems to be fairly effective in separating deaths of different character.

Obstetric Death Rate in Post-maturity

Clinically, we had the impression that many "mature, cause unknown" deaths took place when pregnancy was prolonged past term (40 weeks) and that death was frequently preceded by foetal distress—that is, marked irregularity or slowing of the foetal heart, or the passage of meconium. To check these impressions statistically it was necessary to have very detailed and uniform notes on the duration of pregnancy and on the occurrence of foetal distress during labour. That recent hospital records sufficed for a fairly accurate analysis shows that an interest in epidemiology has had the useful effect of raising the standard of clinical recording in the hospital to a very high level.

It has been known for some time that the stillbirth and neonatal death rates (especially the former) increase when pregnancy goes past term (Clayton, 1941, 1953; McKiddie, 1949). Analysis showed that the rise in the obstetric death rate in post-maturity could be attributed to two groups of deaths, "mature, cause unknown" and "trauma." The association of these two groups is not unexpected, since if a baby is liable to die without obvious cause it is presumably all the more likely to die if the stress of prolonged or difficult labour is added. Furthermore, it is known that the incidence of difficult labour increases after term.

Analysis of the incidence of foetal distress in labour showed that it behaves similarly to the "mature, cause unknown" death rate, increasing rapidly with maternal age in primigravidae and in post-maturity.

On the basis of these facts an attempt is being made to reduce the incidence of "mature, cause unknown" deaths by (a) routine induction of labour at the end of the forty-first week in all post-mature primigravidae over 25 years of age, and (b) more frequent resort to caesarean section when foetal distress, especially the passage of meconium, is noted during labour. Results to date are encouraging. Epidemiological research has thus pointed the way to a positive method of saving lives when the real cause of death is unknown.

It may be noted in passing that this kind of epidemiological research is possible only if very detailed clinical

information is available, and therefore ought to be undertaken primarily by clinicians rather than by statisticians. Some knowledge of statistical methods is useful, but it is much more important to tabulate accurate information sensibly and to interpret trends with insight than to calculate precisely the vagaries of chance among data which may be neither accurate nor meaningful.

Impaired Foetal Oxygenation

Finally, what is the cause of "mature, cause unknown" death and of foetal distress during labour? The association with post-maturity and the fact that anoxia is a common finding at necropsy suggest that impaired oxygenation of the post-mature foetus may be the immediate cause. This is supported by the work of Barcroft and Young (1945) on animals. Walker (1954) has undertaken a study of the oxygen content of human foetal blood and has found that the percentage saturation—that is, the content in relation to the capacity—falls after term in normal pregnancy, and is unusually low where there is foetal distress and in a second labour in cases in which the first pregnancy ended in a "mature, cause unknown" death. These findings confirm the hypothesis that impaired foetal oxygenation is the main reason for the excess foetal mortality after term; presumably the basic reason has to do with a decline in the functional efficiency of the placenta when pregnancy is unduly prolonged. We have yet to determine whether the high obstetric death rate in elderly primiparae is due to exceptionally low foetal blood-oxygen levels or to normal levels together with foetuses of low general vitality; it is not due to an unusually high incidence of post-maturity.

Summary and Conclusions

The study of morbidity and mortality statistics requires detailed clinical knowledge and good clinical case records if it is to be most fruitful. Statistics of maternity present many natural advantages for such a study, which should preferably be based on an administrative area. The scientific value of the traditional annual reports compiled by maternity hospitals is extremely limited.

The epidemiological approach in obstetrics is useful in providing insight into the nature and means of prevention of conditions which cannot be fully understood by detailed study of the individual case. Besides providing perspective, epidemiological research in a clinical unit increases precision of clinical observation, improves the quality of case records, suggests fruitful lines of laboratory investigation, and provides the means of checking the results of treatment.

The approach is illustrated by researches into the nature of unexplained stillbirths and first-week deaths in Aberdeen.

I am indebted to Professor Dugald Baird, Dr. James Walker, and other colleagues for valuable help and for allowing me to report these results of team research: to members of the Medical Research Council's Social Medicine Research Unit (Director, Dr. J. N. Morris); and to the Advisory Committee on Medical Research (Scotland).

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THE TREATMENT OF SUBACUTE AND CHRONIC SUBDURAL HAEMATOMAS

BY

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Wilfred Trotter (1914) recognized that some of the poor results in treating chronic subdural haematomas were due to failure of the brain to expand after their evacuation. This observation has been confirmed many times. The head-down position, intravenous fluids, and drainage of the subdural space have been used to help the brain to resume its volume after removal of the compressing mass. LaLonde and Gardner (1948) showed that better results were got when saline was injected into the subarachnoid space to help the brain to expand. Since then no other series of cases so treated has been reported.

Details of Treatment

It is common practice to seek and treat subdural haematomas by making burr-holes in the skull. There is no value in raising an osteoplastic flap, and it may be detrimental. Improved methods of diagnosis have precluded cases in which a subdural haematoma was a surprise finding at craniotomy for a cerebral tumour.

The making of burr-holes is always done under local analgesia, no matter how restless the patient. The usual site for the initial burr-hole is in the mid-temporal region about 1½ in. (4 cm.) above the zygoma. Further burr-holes may be made in the frontal and parietal areas. The most useful site for the second burr-hole is in the posterior parietal region. While a fluid haematoma can be easily treated through one burr-hole, a clotted haematoma needs multiple explorations. Bilateral burr-holes are always made, as the haematomas are bilateral in many cases. Incision of the dura mater will allow the haematoma contents to gush out. A fine rubber catheter is introduced into the subdural space in all directions and irrigation is carried out gently with Ringer's solution, which is preferable to normal saline. The washing is continued until the returning fluid is clear. In favourable cases the brain will expand to fill the dead space left by evacuation of the haematoma. The skin incision is closed in two layers and no drainage tubes are inserted.

The intrathecal injection of Ringer's solution is used in every case in which the brain does not expand after removing the haematoma. Ringer's solution can be injected into the lumbar subarachnoid space or into the ventricles of the brain by way of one of the burr-holes. Ventricular injection may be difficult if the ventricles are collapsed, and some experience is needed for ventricular puncture. Lumbar puncture is easier, and is safe and effective. When the haematoma is unilateral the towelled patient is not greatly disturbed on being turned from the supine to the lateral position for lumbar puncture. It is unsatisfactory, however, to turn patients with bilateral subdural haematomas. This difficulty has been overcome by operating with the patient in the prone position. The head is held in a cerebellar head-rest, which is adjusted to the patient's comfort, no flexion of the head being needed. No respiratory embarrassment occurs in this posture if the chest is raised on the shoulder-pieces, as the tongue cannot fall back into the pharynx. The lumbar-puncture needle may be inserted before the burr-holes are made. The prone position gives good access to all parts of the head except the forehead. It is satisfactory also for making burr-holes in cases of acute head injury. The patient is in an ideal position if the posterior fossa has to be explored for a haematoma.

Between 50 and 200 ml. of Ringer's solution will be needed for brain expansion. The injection should be continued until the brain is in contact with the edge of the burr-hole. A recent case of bilateral subdural haematomas of infancy had 160 ml. of fluid injected by lumbar puncture without any adverse effect. When a single burr-hole is used as a means of treatment it is better to leave the catheter as a vent over the convexity of the brain until expansion has removed surplus fluid and air from the subdural space.

The after-treatment consists in keeping the patient flat and maintaining a good fluid intake. When the inflation method has been used it is desirable to do a daily lumbar puncture for at least four days. If the cerebrospinal fluid pressure is below 150 mm. H₂O Ringer's solution is injected to raise the pressure to this level. The state of consciousness and the absence of headache are reliable guides to clinical improvement.

Clinical Material

Twenty-eight cases of subacute and chronic subdural haematomas have been treated in the neurosurgical unit at Dunedin Hospital. Subdural haematomas of infancy and one case of chronic subdural haematoma in a child of 5 years with a successful outcome are excluded from the series. The subacute haematomas occurred between seven and twenty-one days of a known head injury. The chronic haematomas had a latent period of over three weeks, or a history of previous injury was unobtainable. The ages of the patients ranged from 17 to 77 years.

No fresh observations can be added to the well-known clinical picture. Many patients were seriously ill and had come long distances—often up to 500 miles by air ambulance. Eighteen had had lumbar puncture, mostly in other hospitals, and eight were made much worse by this procedure. In most cases the information gained by lumbar puncture did not materially assist in the diagnosis, and its danger in these cases cannot be too greatly stressed.

The diagnostic procedure of choice was carotid arteriography. When an arteriogram indicated a haematoma, an examination of the other side was not inflicted upon the patient, and a subsequent burr-hole was used instead. If the previous head injury was clear-cut or the condition of the patient with suspected haematoma was parlous, immediate burr-holes were preferred to any other diagnostic method. We have been reluctant to use arteriography in patients over the age of 65, and have not used it at all in those over 70. At this age there are few alternatives in the diagnosis of subdural haematoma, and the making of burr-holes is a benign matter.

In 1952 it was decided that the inflation method should be used whenever the brain did not expand after removal of the haematoma. Ten patients come under the old regime and 18 are in the new group. In 14 of the latter inflation was used. The subdivisions showed the same degree of neurological severity. However, there were four patients over 70 years and three with bilateral haematomas in the later group. This 10% incidence of bilaterality is at variance with the 30% incidence in most other series.

There was one death, and that was in the first group. The patient was a semi-comatose man who died 24 hours after burr-holes had been made. The necropsy showed that the brain had not expanded. Inflation might well have saved him.

The outstanding difference between the two groups was in the degree of recovery. Under the old regime, patients often remained confused and had headaches for several days—sometimes a week or more—and during that time gave cause for concern. There was one recurrence, and that was dealt with successfully. The new method brought a more rapid return to full consciousness. This improvement was often apparent on the operating table, and the post-operative period was less worrying. It was common for the headaches to disappear from the time of inflation. The greatest advantage was in elderly patients, who seem to be prone to develop dehydration and intracranial hypotension. While

it is impossible to be dogmatic, it is felt that a fatal issue was averted in several cases by the use of inflation. No ill effects from this treatment were seen.

When inflation was first used it was hoped that a single injection would be enough and that recurrences would be avoided. There were two patients over 70 years who made a dramatic improvement for a few days and then suddenly relapsed: further collections of fluid were successfully treated. Experience has shown that the only way to prevent recurrences is to do a daily lumbar puncture and to keep the C.S.F. pressure at 150 mm. H₂O by further injection as recommended by Munro (1952). The minimum period for this procedure is four days, and it must be continued until the patient's condition has stabilized.

Six patients had their inflation done by lumbar puncture and six had direct ventricular injection. The other two had combined lumbar and ventricular puncture. There is nothing to choose between the results of each method.

Discussion

The conclusions of LaLonde and Gardner (1948) on the value of injection of normal saline into the subarachnoid space or ventricles in the treatment of subdural haematomas are confirmed; but they did not give their results before using the method. Munro (1952) recommends the same treatment for all types of subdural haematoma. His use of repeated lumbar puncture to sustain the C.S.F. pressure is essential if recurrences are to be prevented.

The critical features in the train of events initiated by a subdural haematoma are compression of the brain, tentorial herniation by the temporal lobe of the brain, and intracranial hypotension. Jefferson (1938, 1951) has given good reviews of tentorial herniation, and intracranial hypotension has been reviewed by Page (1953) and Holmes (1953). In many cases removal of the haematoma leads to immediate expansion of the brain and rectification of these three complications; but they may persist singly or in combination and be responsible for a slow recovery or a fatal issue. The method of expanding the subarachnoid space and the cerebral ventricles, and also the brain, will counteract these adverse features. So long as there are no irreversible changes, the mortality should be lower and convalescence more rapid than with mere evacuation of the haematoma. This series, however, is too small for dogmatism regarding the mortality, though there is no doubt about the improvement which occurred in the recovery period when the injection method was used.

The method of brain expansion, whether ventricular or lumbar, does not make any difference to the end-result. The lumbar route is the easiest for the less experienced. The use of the prone position for the patient is an advantage for lumbar puncture and for access to the head.

Summary

The treatment of subacute and chronic subdural haematomas by the injection of Ringer's solution into the lumbar theca or cerebral ventricles is advocated.

Comparison is made between 10 cases before and 18 cases after this method was used.

Some of the pathological features of subdural haematoma are discussed in relation to treatment.

I wish to thank Mr. A. James for permission to use the cases admitted under his care and for access to the departmental records. He has given every encouragement in treating some of these cases and in writing this paper.

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SPONTANEOUS RUPTURE OF OESOPHAGUS

REPORT OF THREE SUCCESSFUL CASES TREATED SURGICALLY

BY

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Spontaneous rupture of the oesophagus, until 1947 a fatal disease, can now be effectively treated by surgical means. The criterion for success requires that such a lesion be known about and kept in mind, that it may be recognized early and treated promptly. The general practitioner is as able to make the diagnosis as the specialist; and, like perforated duodenal ulcer, early recognition and treatment gives satisfying results (Borrie, 1953).

This paper reports three cases seen within an eight-months period at one Thoracic Surgical Unit dealing with a regional area of 250,000 people. In none of the three cases was the diagnosis at first suspected; in all, however, it was later established and operation was followed by complete recovery.

Case 1

A married woman aged 65 was an emergency admission to the medical wards of Dunedin Hospital on December 15, 1952, under Professor J. E. Caghey, with a diagnosis of haematemesis. Earlier that evening, while hungrily eating a fish meal, she tried to make herself sick because she thought she had swallowed a fishbone. She vomited copiously 1 pint (570 ml.) of bright blood-stained gastric contents, and was immediately seized with severe chest pain.

On examination she complained of pain behind the lower third of the sternum. It was severe and gripping, and came in spasms. There were no abnormal respiratory, cardiovascular, or abdominal physical signs, and no cervical emphysema. Her blood pressure was 180/110 mm. Hg, and her haemoglobin 90% (Sahli).

A diagnosis of haematemesis secondary to a foreign body in the lower third of the oesophagus was made, and she was referred to the ear, nose, and throat department. It was decided to keep her under close observation, with nothing by mouth, a rectal drip, penicillin, and "omnupon" to relieve her pain.

On the morning of December 16 she had ceased vomiting, looked better, but still had retrosternal pain. Later that day she could not swallow her sputum, and regurgitated blood-stained mucus. Oesophagoscopy was performed that evening by Mr. Alan Wardale, surgeon in charge of the ear, nose, and throat department. He found a considerable amount of dark blood lying in the oesophagus. The upper two-thirds of the oesophageal mucosa in particular was haemorrhagic. There was no foreign body. The possibility of rupture of the oesophagus at the junction of the middle and lower thirds was entertained, and on December 17 she was referred to the thoracic surgical department.

Clinically there was still no pleural effusion or cervical surgical emphysema. Radiopaque oil was given, and fluoroscopy showed a vertical rent on the left side of the lower third of the oesophagus, lying 1 in. (2.5 cm.) above the diaphragm. The diagnosis of spontaneous rupture of the oesophagus was established and left thoracotomy advised.

Operation.—Pre-operative oesophagoscopy confirmed haemorrhagic oedema of the entire oesophageal mucous membrane together with a vertical ragged area in the lower third of the oesophagus. Under general anaesthesia, the left

chest was opened through the bed of the resected left eighth rib. There was an extensive extravasation of blood-stained fluid under the mediastinal pleura and extending from the level of the oesophageal hiatus in the diaphragm up to the left inferior pulmonary vein, and midway between the necks and angles of the lower left ribs. Through a 3-in. (7.5-cm.) incision in the mediastinal pleura, the oesophagus was mobilized and retracted with a Jaques rubber catheter sling. On its left border was the vertical tear, approximately $\frac{1}{2}$ in. (1.9 cm.) in length. The points of dissecting scissors were easily introduced through the tear into the oesophageal lumen. The tear was closed with four interrupted twenty-day No. 1 chromic catgut sutures passed through all layers. The mediastinal pleura was not sutured. The left chest was closed over water-seal drainage, using interrupted catgut for the muscle layers and fine nylon for the skin.

The patient was allowed sips of water by mouth and over a period of three days gradually increased her intake by mouth to a fluid diet. She took solid food a week after operation. The intravenous fluid was discontinued on the third post-operative day, and the intercostal drainage was removed on the fifth post-operative day.

She was discharged, convalescent, three weeks after admission, swallowing normally. Subsequent fluoroscopy and oesophagoscopy showed no abnormality of the foregut. When seen 18 months after operation she remained well.

Comment.—This patient illustrates the typical onset following violent vomiting, and shows how a small tear need not be associated with rupture into the pleural cavities or with detectable emphysema. The constant retrosternal pain following vomiting alone suggests the diagnosis, which is further suspected after unusual findings at oesophagoscopy, and convincingly established by careful fluoroscopy with radiopaque oil. Untreated, she would undoubtedly have developed a serious mediastinal abscess.

Case 2

A bachelor aged 53 was brought to the casualty department of the Dunedin Hospital at 9 p.m. on June 29, 1953. Earlier that day he was well, and between 5 and 6 p.m. drank six pints (3.4 litres) of beer in a hotel. When the bar officially closed at 6 p.m. he staggered into the street and vomited copiously into the gutter. He started to walk away, but had just gone five paces when he suffered an agonizing retrosternal pain which radiated to the left shoulder and leg. He drove his car home with great difficulty, the pain becoming more intense and breathlessness more acute. There was no further vomiting.

When examined on admission he still had excruciating pain, was restless, and quite unable to find relief either by sitting up or lying down. He was convinced he would die. His pulse was 120 and blood pressure 170/110 mm. Hg. The casualty officer found the apex beat normal. What was believed to be a pericardial friction rub, crackling in quality, was detected. There were left basal crepitations. The abdomen was board-like, but with no definite tenderness. Although acute pancreatitis or rupture of the gall-bladder was entertained, these diagnoses were not supported by the general surgeon who was called to see him.

An E.C.G. showed T-wave inversion, with tall R waves in V₅ strongly suggesting left ventricular strain. With the diagnosis still in doubt, a chest radiograph was ordered. At this stage surgical emphysema above the suprasternal notch was noted, the correct diagnosis established, and the patient admitted to the thoracic surgical department. The chest radiograph showed left hydropneumothorax with air around the aortic arch and soft tissues of each side of the neck.

Operation.—At midnight, under general anaesthesia, the left chest was opened through the left ninth rib bed. The pleural cavity contained 1½ pints (850 ml.) of brown alkaline fluid. The mediastinum was emphysematous and the lacerated pleura had lifted from off the aorta and oesophagus. A catheter sling was passed around the oesophagus,

which was then lifted up for inspection. On its left side was a vertical rent 1 in. (2.5 cm.) long, and starting 1 in. (2.5 cm.) above the oesophageal hiatus in the diaphragm. Through this rent protruded oesophageal mucosa. After inserting mucosal stay sutures, the tear was closed with a series of interrupted chromic catgut sutures passed through all oesophageal layers. The chest wall was closed as in Case 1.

On July 1, because of sputum retention, aspiration bronchoscopy was performed and gave relief. The intercostal drainage was removed on the third post-operative day, and the skin sutures on the seventh day. The patient was discharged fit three and a half weeks after admission. The post-operative feeding regime was the same as in Case 1.

Subsequent barium study of the foregut revealed no pleural or oesophageal abnormality, but suggested a deformity of the duodenal cap without any definite evidence of active ulcer. Eleven months after operation the patient continued well and was working.

Comment.—This case illustrates the classical onset of symptoms first graphically described by Boerhaave in 1723 (Barrett, 1946). It illustrates their confusing severity, and how tell-tale cervical emphysema gave the key to diagnosis. Physical findings in the chest had been difficult to elicit and interpret, and an E.C.G. record was definitely misleading. It further shows how prompt surgical intervention materially altered the course of a catastrophe, with minimal convalescence and a most gratifying result.

Case 3

A farmer aged 52 was admitted as an emergency case to a county town hospital on July 20, 1953, suffering from severe epigastric and right chest pain. For years he had had an active duodenal ulcer; for four days before admission there had been an acute exacerbation of his ulcer symptoms, and he took only milk diet until 7 p.m. on July 20, when he ate a pear. Half an hour later he vomited twice and suddenly developed severe pain in the right chest, shoulder, and upper abdomen. The vomit was "coffee ground" material.

On admission he was distressed, with grunting respirations and slight cyanosis; pulse 120 and blood pressure 140/90 mm. Hg. The tongue was dry and furred. There was generalized abdominal rigidity, and absent bowel sounds. Examination of the chest at that time revealed no obvious abnormalities. A diagnosis of perforated duodenal ulcer was logically made, and the patient was prepared for operation—a Ryle tube being passed into the stomach and aspirated, and an intravenous drip being started.

First Operation.—At 11.30 p.m. that same night, under general anaesthesia with endotracheal intubation, laparotomy through an upper right paramedian incision showed the presence of a chronic duodenal ulcer in the first part of the duodenum and firmly adherent to the pancreas. There was no perforation, and the pylorus was patent. The large dilated stomach was further aspirated, 42 oz. (1,200 ml.) of brown fluid being removed. The abdomen was closed and the patient returned to the ward.

On the morning of July 21 a chest radiograph revealed a right-sided hydropneumothorax without tension phenomena. Spontaneous rupture of the oesophagus was established. Throughout the morning his condition gradually deteriorated, nor was it improved by aspirating a few millilitres of that same brownish fluid from the right pleural cavity. His pulse was 140 and blood pressure 55 mm. Hg. Plasma infusion, oxygen, and penicillin were given with no great improvement.

After telephone consultation with the thoracic surgeon in Dunedin, a Malécot catheter was inserted into the right pleural cavity and connected to water-seal drainage. His blood pressure steadily rose to 90 mm. Hg. A pint (570 ml.) blood transfusion was started and the patient was transferred 70 miles by ambulance.

At 11 p.m. on July 21 he was admitted to Dunedin Hospital, having withstood the journey well. Both the blood drip and the intercostal drainage were working satisfactorily. His temperature was 100.5° F. (38° C.), pulse 114, respirations 48, and blood pressure 110 mm. Hg systolic. A further chest radiograph showed little alteration, and the right lung was still partially collapsed.

Second Operation.—An hour later general anaesthesia was induced and the right chest opened through the ninth intercostal space. The pleural cavity contained $\frac{1}{2}$ pint (280 ml.) of brownish fluid. With positive pressure, the right lung was made to re-expand. Below the azygos arch was an irregular tear in the mediastinal pleura, with surrounding oedema. The oesophagus was isolated from the mediastinum and a catheter sling passed round it. Inspection revealed a vertical rent $\frac{1}{2}$ in. (3.8 cm.) long, starting 2 in. (5 cm.) above the diaphragm, and extending upwards to the azygos arch. This was closed with a series of No. 4 silk sutures, placed $\frac{1}{2}$ in. (3 mm.) apart and passed, as before, through all oesophageal layers. The chest was closed over water-seal drainage.

Post-operatively, bronchoscopy was performed and he was returned to the ward, where graduated continuous suction was applied to the water-seal drain. Fluids by mouth were restricted for four days, during which time intravenous therapy was continued. He was given penicillin and streptomycin.

A chest radiograph on July 24 confirmed that the right lung had re-expanded and was aerating satisfactorily. On July 27, however, there was evidence of a loculated basal pleural effusion, and on July 31 this was drained. The presence of a fistula and also staining after swallowing methylene blue solution confirmed that there was a leak from the oesophageal suture line.

On August 1 a second anterior pocket of pus in the right pleural cavity was cleared by intercostal drainage, and a Stamm gastrostomy performed. Progress thereafter was slow. The partially collapsed lung required a third apical intercostal drain and continuous suction for two weeks before it had re-expanded.

By September 30, almost two months after admission, the oesophageal fistula had healed and normal swallowing was again allowed.

On October 8 the gastrostomy tube was removed, by November 5 the anterior pleural sinus was healed, and by November 18, as the posterior sinus was negligible, he was discharged. He was last seen on March 10, 1954, when his sinuses were well healed and his swallowing was satisfactory.

Comment.—This is an interesting case of cause and effect. It demonstrates a further and unusual complication of duodenal ulcer—a complication which must always be kept in mind when sudden and severe abdominal symptoms follow vomiting. One can readily appreciate how the rupturing of the oesophagus into the right pleural cavity, with associated epigastric pain and rigidity, led to the possible diagnosis of perforated duodenal ulcer. Undoubtedly a pre-operative chest radiograph would have revealed the true diagnosis. This case, and two others not yet in the literature but known by me to have been explored as acute pancreatitis, induce me to plead for a pre-operative chest radiograph in all difficult acute abdominal cases. Nowadays, in such circumstances, a preliminary abdominal radiograph is common practice. The same film can well be adjusted to include the diaphragm and the lower chest, and thus avoid needless laparotomy. The case further illustrates how a patient in civilian practice, with pneumothorax and empyema made safe and temporarily relieved by intercostal drainage and by blood transfusion, can travel 70 miles by ambulance and be improved at the end of his journey.

Although Susman (1953) wisely points out that some cases of spontaneous rupture can recover without suture of the rent, and that Barrett's (1948) case of suture in fact leaked after surgical closure to produce a further oesophageal fistula and empyema, yet such conservative measures must

SPONTANEOUS RUPTURE OF OESOPHAGUS

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include adequate treating of the accompanying empyema. In a late case, with fully established empyema, to attempt to free the oesophagus and perform suture would be undoubted folly. In an early case, however, possibly up to 48 hours after perforation, the right attitude should be to explore and if possible suture the rent.

In this third case—with a long rent—there was a late leak. By performing a gastrostomy as an oesophageal bypass, and thus restricting swallowing purely to saliva, local pleural drainage together with gastrostomy ultimately gave sound closure.

Summary and Conclusions

Spontaneous perforation of the oesophagus is an acute emergency which must always be kept in mind and which may simulate many lesions. It can masquerade as coronary thrombosis, or acute abdominal catastrophes, especially perforated gastric ulcer, acute pancreatitis, and acute cholecystitis. Frequently the patient is too distressed to give a rational history.

As the oesophagus may perforate into the mediastinum alone, into the right or left pleural cavities, or into both, there is a diversity of signs and symptoms. Convincing chest clinical signs are often hard to elicit. Not all cases have cervical emphysema, but, if present, it is diagnostic. Chest radiographs, including, if necessary, the swallowing of radiopaque oil, confirm the diagnosis.

Pre-operative management embodies prompt relief of any tension pneumothorax, restriction of all food by mouth, intravenous fluids, passage of a Ryle tube to the stomach, and antibiotics.

Thoracotomy is then required, and wherever possible the rent should be sutured. In early cases, healing is sound and convalescence greatly shortened.

A plea is made to include a chest radiograph when faced with a difficult diagnosis of the acute abdomen.

I gratefully acknowledge help and co-operation with these patients from Professor J. E. Caughey, Mr. Alan Wardale, Mr. C. L. Tucker, Dr. R. L. Coulter, Dr. T. O'Donnell, and my resident staff in the Dunedin Hospital. I also wish to thank Dr. James Thomson, acting medical superintendent of the Dunedin Hospital, for permission to publish these records.

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An observing station for measuring the smoke and sulphur dioxide pollution in the London atmosphere has been established in the Science Museum by co-operation with the Fuel Research Station of the Department of Scientific and Industrial Research. The station is one of a number that are being established to permit a more detailed examination of atmospheric pollution in London and elsewhere. The sampling equipment is displayed as a working exhibit in the Meteorology gallery. The smoke particles are captured on filter paper through which air is drawn from just above museum roof level by means of a small electric pump. As a result a grey stain appears on the filter paper, the intensity of which is a measure of the degree of smoke pollution. The same air is bubbled through a weak solution of hydrogen peroxide, where the atmospheric sulphur dioxide is dissolved to form an acid solution, the strength of which is measured by standard chemical methods. Observations of smoke and sulphur dioxide pollution are made daily by a member of the museums staff and reported to the Fuel Research Station, who are in charge of the investigation.

The following case of spontaneous rupture of the oesophagus is placed on record, even though treatment was unsuccessful, as this condition is still thought to be rather rare. The records of this hospital for the past six years, covering 28,725 admissions, show only one comparable case—that of an eclamptic patient who died thirty-two hours after admission—in which two perforations involving the lower end of the oesophagus were found: unfortunately the data about this case are too scanty for an accurate diagnosis to be made.

Increasing awareness of the condition seems to be bringing more cases to light. Mallam, Whitelocke, and Robb-Smith (1940) stated that the total number of published cases was 40. Barrett (1946), in a comprehensive review of the subject, put the figure at about 50 cases. Mauro (1952) discussed 103 cases in the literature. Barrett (1947) was the first to describe recovery following correct diagnosis and deliberate operation to repair the rupture. Frink (1947) published details of a successfully treated case of 1941, and Samson (1951) recorded two such cases mentioned by Graham in 1944. Nanson and Milnes Walker (1953) added the twenty-third recovery to the literature.

It would be wrong to publish only the successes in the treatment of this condition if a correct record of mortality rate is the aim. The mortality rate may be even higher and the disease commoner than the records would suggest, as up to 1949 only 16 cases had been diagnosed in life and the remainder at necropsy (Russell, 1953), and it may be possible to miss a ruptured oesophagus at necropsy unless one is looking especially for the condition (Barrett, 1946). Many cases of death in a period of hours to a few days after the onset of retrosternal pain, collapse, and perhaps vomiting must have been certified as being due to coronary thrombosis without necropsy confirmation, and these might well include a number of cases of spontaneous rupture of the oesophagus.

Summary of Case Notes

A 73-year-old widow, about to begin her tea, complained of severe upper abdominal pain which rapidly spread to both sides of the lower chest and back. After 30 minutes she vomited a little blood-stained fluid and then collapsed with pain. She was admitted to the medical wards, and after several hours was transferred to the surgical side. A long history of dyspepsia which she relieved by making herself vomit was obtained.

Examination.—Grossly obese, very shocked, and in great pain. Respirations 24, pulse 80, temperature taken rectally 99.8° F. (37.7° C.); blood pressure 150/90 mm. Hg. Tongue stained with altered blood. Marked surgical emphysema of front of neck. Equal aeration of both lungs and no detectable effusion or pneumothorax. Abdomen very fat, with large irreducible umbilical hernia; tender in right epigastrium but no guarding. A Ryle tube was passed and 90 ml. of thick bloody material was aspirated.

A provisional diagnosis of spontaneous rupture of the oesophagus was made and the patient was transferred to the x-ray department. Films of the chest were taken and then three mouthfuls of barium mixture were given to her to swallow before repeating the pictures. The following

information was obtained from these. The Ryle tube was folded on itself in the oesophagus. There was marked widening of the mediastinum and much free gas was present in it. There was slight collapse of the medial lung substance at both bases and a very little free pleural effusion on each side, but no pneumothorax. Barium was found to have passed into the posterior mediastinum to the left at the level of the lower part of the body of the seventh thoracic vertebra (see Fig.).



Radiograph showing barium in posterior mediastinum.

but the left side of the lower oesophagus could not be seen satisfactorily from this approach. The search was not prolonged, and a wide-bore stomach tube was passed without revealing the tear. The chest was closed after inflating the right lung, and two intercostal drainage tubes, leading from the mediastinum and the pleural cavity to underwater seals, were inserted.

After 36 hours her condition deteriorated and she died 48 hours after operation.

Post-mortem Examination.—The right lung was fully aerated and adhering to the parietal pleura; the mediastinum was dry and relatively clean. The left pleural cavity contained 2 pints (1,140 ml.) of clear brownish inflammatory exudate, but the mediastinal pleura was intact. The oesophagus had a vertical tear 2 in. (5 cm.) long on its left posterior aspect, the lowest part of the tear being 1½ in. (3 cm.) from the oesophago-cardial junction. The myocardium was pale and fatty and the right side of the heart was dilated; other organs showed evidence of congestive failure. Microscopical examination of many sections of oesophagus about the tear showed no evidence of pre-existing disease and the appearances were consistent with spontaneous rupture.

Discussion

Mackler (1952) distinguishes between rupture and perforation of the oesophagus, the term "rupture" applying when it occurs in a previously normal oesophagus and is not caused by direct trauma. Spontaneous rupture is usually associated with vomiting, but occasionally with other causes of increased intra-abdominal pressure. Mackler experimented with 65 oesophagi from fresh cadavers, by inflating them with air, and in all but three cases rupture took place as a longitudinal tear at the lower end of the oesophagus in its left lateral wall. McKenzie (1884) had also demonstrated this.

In the present case the tear was typical, as were the symptoms. The pleural cavity was not directly involved, as it often is (usually on the left side). No history of vomiting prior to the rupture could be obtained, though there was a long history of habitual voluntary vomiting.

Recent writers mention the value of radiography in the diagnosis. Dorsey (1951) states that the patient should be

given radiopaque material to swallow, and if none escapes from the oesophageal lumen no harm will follow; if it does escape, operation is indicated. Nanson and Milnes Walker (1953) used a barium compound, screening their patient; provided surgery follows if indicated, there can be no danger in using barium mixture. Priviteri and Gay (1951) prefer lipiodol to demonstrate the fistula, its site and extent.

In the above case barium mixture was used. It escaped only from the uppermost part of the tear, giving the impression that the tear was perhaps smaller and higher than it was eventually found to be.

Most writers are agreed that early diagnosis and immediate operation are necessary if there is to be recovery. Operation and drainage of the mediastinum, with the rupture of the oesophagus being adequately by-passed for some time, has been successful in a number of cases, and Jelliffe and Ferguson (1953) suggest that it may be sufficient. But most authors appear to feel that repair of the oesophageal defect increases the patient's chances of recovery. Mackler (1952) assesses the percentage of recoveries after drainage alone at 33%, and after definitive repair of the oesophagus at 69%.

Operation should preferably be performed at a centre with experience of operating in this field, but, as in the above case, the patient may not be fit to be transported any distance.

Summary

A case of spontaneous rupture of the oesophagus is briefly described.

The value of radiography and the use of radiopaque media as a swallow, to establish or confirm the diagnosis, is affirmed.

I should like to express my appreciation to Mr. L. Wynn Houghton for his advice and assistance with this case, and his permission to publish it.

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A new British-American hospital, established to serve the constantly growing needs of the English-speaking community, has been opened in Madrid by Sir Ivo Mallet, the British Ambassador. The opening ceremony, attended by representatives of the Spanish Government and British and American residents, marked the end of three years' work to provide more adequate accommodation than that available in the 5-bed British-American nursing-home opened in 1923. Built on rising ground in the faculty of medicine area of Madrid's University City, the new 21-bed hospital stands on land leased free of charge for 50 years by the university authorities. A long, low, red-brick building on three floors, so constructed that three more floors can be added to meet future needs, it has a large garden and a wide view across the University City to the snow-capped peaks of the Guadarrama mountains north of Madrid. Several American firms gave medical and surgical equipment or sold it at cost, and an iron lung, said to be the only one in Spain for civilian use, was given by the U.S. Public Health Service. Equipment bought in England was shipped free of charge by a British mining company operating in Spain. The idea of building a new hospital for the British-American colony was proposed in June, 1951, by Sir John Balfour, then British Ambassador, in collaboration with Mr. Stanton Griffiths, an American businessman, who at that time was U.S. Ambassador to Spain.

BRUCELLOSIS AS A HAZARD OF BLOOD TRANSFUSION

BY

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Since the introduction of low-temperature banks for the storage of blood, transmission of disease by transfusion has become negligible; Mollison (1951) and Whitby and Britton (1953) quote only syphilis, malaria, hepatitis, and some virus diseases as a possibility. Meno Brito (1948) refers to two cases reported at the second Mexican Brucellosis Congress in 1944, in which brucellosis was clearly transmitted by blood transfusion. Subsequently, during two years' work at a children's hospital he found five more instances in which brucella was isolated from the blood of donors, with no indication of clinical brucellosis, but whose blood on transfusion gave rise to the disease in recipients. He gives a table, showing the percentage of positive agglutinations against *Br. abortus* (1.31% in 2,899 donors) recorded at the hospital in 1945 and 1946, and states that, although a positive reaction is not sufficient for the diagnosis of active infection, he recommends that, in Mexico, tests should regularly be carried out to exclude the presence of agglutinins in the donor's blood. Brucellosis has a much lower incidence in this country, but the occurrence of the case described below shows the importance of questioning prospective donors and rejecting those whose state of health is unsatisfactory, particularly those who may be in the incubation stage of an infective disease.

History of the Donor

A married woman aged 53 was a regular donor who had never before felt any after-effects, but who returned home from her donation on October 11, 1952, feeling "very unwell." She did not consult her doctor for 10 days, but complained afterwards that she had been ailing all this time, and a fortnight later, on November 5, she was admitted to Southmead Hospital, Bristol, with undulant fever. On November 7 her serum agglutinated *Br. abortus* to a titre of 1:1280. A blood culture taken at the same time was sterile after 14 days' incubation.

In view of the history and the diagnostic level of the titre four weeks after donation, it seems likely that this woman's blood would have shown a bacteraemia at that time.

History of the Recipient

The recipient, a man aged 27, had lived a "transfusion life" since 1946, when he developed a complete red-cell aplasia shortly after painting with "aeroplane dope." On October 17, 1952, he received his usual weekly transfusion of one pint (570 ml.) of blood, and early in November a report was received from the Regional Transfusion Centre that the donor was suffering from brucellosis. Questioned at his next visit, the patient admitted that he had had a cold, but his temperature was normal and his serum agglutination tests were negative, as they were on three subsequent occasions up to December 28. Indirect questioning failed to elicit any other complaint, and it was not until January 17, 1953 (13 weeks after the transfusion), that he admitted feeling unwell; he then complained of malaise, worse in the morning, slight sweating, also more pronounced in the morning, anorexia, some diarrhoea, and vague pains in the limbs. His temperature was 99° F. (37.2° C.), and examination showed a purpuric rash on both limbs; the liver and spleen were just palpable. His

liver function was known to have been depressed since a homologous serum jaundice in 1949, and there was a severe transfusional haemosiderosis. On January 18 his serum agglutinated *Br. abortus* to a titre of 1:2,560; he was treated with chlortetracycline ("aureomycin"), 250 mg. six-hourly for six days, and his temperature fell to normal. He remained depressed, however, and failed afterwards to attend regularly for transfusions.

He was unable, or unwilling, to give an account of the beginning of his illness, and a visit was paid to his home in the hope of obtaining some information. His mother remembered that he first complained of nausea and abdominal discomfort towards the end of October, when he thought "the jaundice was coming back"; she bought him some medicine from a chemist but did not consult a doctor. Jaundice did not, however, develop. It was decided that he had "gastric flu," and he was in bed, on and off, for several weeks. By Christmas he was very unwell, eating little and feeling increasingly depressed, but by the middle of January his illness was, in his mother's opinion, abating. His milk-drinking habits were investigated, and it seemed certain he took very little milk, and that scalded, in tea and milk puddings. A report from Mr. H. G. L. Harvey states that in his opinion the weight of evidence points to the absence of brucellar abortion on the farm supplying the milk; unfortunately only one of the two cows owned at the time could be traced, but tests on this animal were negative.

Discussion

Spink and Anderson (1950) discuss the transmission of brucella through the blood of an asymptomatic but bacteraemic individual; they believe that, although a scanty inoculum of brucella will remain viable up to six months at 4° C., from a practical point of view the likelihood of transmitting disease by this route is remote because the organism would be destroyed by the blood or tissues of the recipients. That patients with active disease have relatively few organisms is shown by the difficulty of blood culture and the few colonies generally obtained.

In the above case the recipient had been suffering from a severe regenerative anaemia and was dependent on transfused red cells for his continued existence. His reticulo-endothelial system was known to be damaged, and it is tempting to speculate that as a result of this he was less competent than a normal individual to deal with the small number of organisms transfused. Agglutinins in this man developed late, but ultimately were in high titre, and it is recognized that a delay of weeks or months may occur even in the normal individual—indeed, that the whole process may pass without any detectable agglutinins being formed at all (Evans, 1934). Hardy *et al.* (1938), studying cases diagnosed in New York whose onset can be accurately dated because the entire milk supply to the city is pasteurized and infection by this means can result only from visits outside the Metropolitan area, stress the insidiousness of onset of the disease and the uncertainty regarding the early symptoms in the patient's own mind. They showed that the prodromal period is often measured in weeks rather than days, and gave the mean incubation period computed to the onset of earliest symptoms as ten weeks and to severe symptoms as 13 weeks (the time at which the disease was diagnosed in the above case). Morales Otero (1930), in experimental inoculation of volunteers, found that symptoms ordinarily causing attention took 28 to 35 days to develop, but he did not use the intravenous route. Unfortunately no clinical details are given in Meno Brito's paper, for it might be expected that symptoms develop more rapidly when infection occurs through the blood stream.

No evidence was found to incriminate milk as a source of infection in the above case, but there was, unfortunately, some difficulty and delay in tracing the two cows responsible for the patient's milk supply at the time. It would, however, seem to be pressing coincidence rather far to postulate a milk-borne source of infection developing

concurrently with exposure to infection through the blood of an individual known to have been in the bacteraemic stage of the disease.

Summary

A case of brucellosis diagnosed 13 weeks after transfusion with blood from a donor in the bacteraemic stage of the disease is described. If accepted, it is the first time that such an infection has been reported in this country, but such cases have been confirmed in Mexico.

Its occurrence illustrates the importance of questioning prospective donors about their health and rejecting those who might be in the incubation stage of an infectious disease.

The insidious onset of symptoms in undulant fever and the delay which may occur in the development of the antibody response are demonstrated.

I would like to express my thanks to Sir Weldon Dalrymple Champneys and to Professor Robert Cruickshank for their interest in this case; to Mr. Geoffrey Harvey, M.R.C.V.S., for investigating the patient's milk supply; to Dr. G. H. Tovey, of the Regional Transfusion Centre; and to the donor's medical attendant, Dr. R. C. Clifford, of Portishead, for his helpful notes. My thanks are also due to Dr. C. T. Andrews, physician to the West Cornwall Clinical Area, for permission to publish this case.

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Medical Memoranda

Lactation from Axillary Tail of Breast

Studying the literature on polymastia, which is taken to include supernumerary breasts, polythelia, and accessory aberrant or ectopic breast tissue in any form or situation outside the normal gland, one is impressed by the universal complaint of those few authors who have interested themselves in these interesting developmental anomalies that the subject has been somewhat neglected by medical writers.

In view of the relative rarity and the paucity of recorded cases, it was thought worth while publishing the following case, especially as no record of an identical one could be found, that of Anderson (1930) being closest in similarity.

CASE REPORT

A 25-year-old primigravida was on October 1, 1953, delivered normally at term of a live female infant weighing 7 lb. 2 oz. (3.2 kg.). On October 4 both breasts were engorged and tender. With expression, they were improved by the next day, but the patient became aware of moisture running down from the right armpit. On closer inspection this proved to be milk, and she was found to have bilateral moderately tender axillary breasts continuous with the main organs. Gentle pressure over the right-sided one caused milk to exude from a skin pore. The swellings were in the situation and relation of the axillary tails of Spence. The one on the left was of the same consistency but slightly smaller, and from it no milk could be expressed through the skin. There was no vestige of nipple or areola related to either swelling or elsewhere in the "milk line." The main breasts were normal, and satisfactory feeding was soon established, with subsidence of engorgement of the axillary tails. These had at no time caused gross discomfort.

Upon discharge from hospital on October 10, the axillary swellings were about half the size initially observed, and

non-tender. Milk could still be expressed from the one on the right, but no longer ran out spontaneously. The infant had regained its birth weight. The patient was seen again on October 21, when the findings were the same as on the day of discharge.

Her mother, who has five children, had not been able to feed any of them, lactation failing in each case at the end of the lying-in period. She has no form of polymastia.

The patient has one sister, aged 24. She attended the antenatal clinic on October 27, when she was about 10 weeks pregnant, expecting her first child, and was found to have a unilateral swelling in the left axilla in the same situation as that of her sister. It was of the same consistency as the main breasts, but with no palpable communication with the one on that side, which was decidedly smaller than the right breast. On the right she has two rudimentary nipples in the "milk line," 3 in. (7.5 cm.) above and below the nipple of the main breast respectively.

COMMENT

Cases of axillary breast previously reported in which milk secretion occurred through a skin pore differ from the above case in that no connexion with the main breast was described (Anderson, 1930; Storey, 1936; de Cholnoky, 1939, 1951). More commonly, cases have been reported in which no milk-secreting duct opened on the surface of axillary breast tissue (Anderson, 1930; Christie, 1938; de Cholnoky, 1939, 1951; Masor, 1952). Some of these had been shown to communicate with the main breast by an isthmus of mammary tissue, others not. Most of these swellings had presented for the first time in the puerperium with the establishment of lactation, and most were very uncomfortable to the patient. De Cholnoky noticed that subjective complaint is much less where there is a connexion with the breast, as the secretion is discharged to and through the normal channels. None of the cases described, however, in which a communication with the main breast could be demonstrated, had milk coming through a skin pore over the axillary swelling.

In order that the presence of axillary breast tissue should not be missed, perhaps a suggestion that the best time to look for it is at or before the first post-natal examination would not be out of place. Storey's criteria are most useful.

I am indebted to Mr. C. W. F. Burnett, under whose care this patient was, for permission to publish the case report.

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Case of Kaposi's Varicelliform Eruption (Accidental Vaccinia)

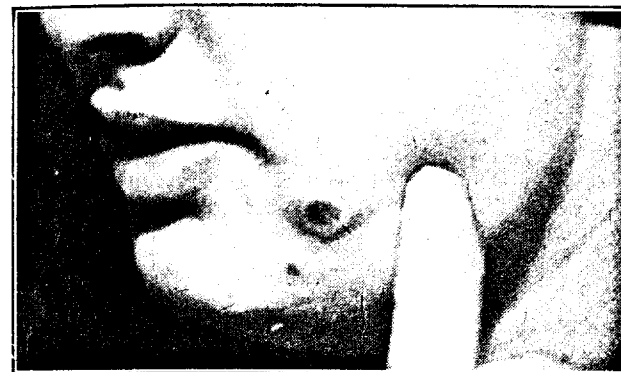
The following case shows the possibility of accidental vaccinia in a mother from contact with her vaccinated baby.

CASE REPORT

A 10-months-old child was vaccinated on April 2, 1953, in the upper and outer part of the thigh. This was successful, and the usual reaction followed. On April 18 the mother, who had never been vaccinated, developed a papule on the lower part of the left cheek and a sore in the left nostril in the naso-facial angle. A papule appeared on the following day on the posterior aspect of the terminal phalanx of the left index finger and also one on the interscapular part of the back. On April 22 the papules became pustular and there was a tendency towards umbilication. Considerable left infraorbital oedema developed with sub-maxillary adenitis. The temperature rose to 101.4° F. (38.6° C.) and the patient felt ill generally. As there had been several cases of smallpox in the North, a suspicion

arose about this case, and the medical officer of health was informed about it on April 23. A complement-fixation test of the pustular content was negative for vaccinia.

Dr. J. P. Marsden, Home Office Consultant, who saw the patient on April 24, was of the opinion that this was a case of accidental vaccinia, which he thought was rather rare. The accompanying photograph, taken on the same day, shows the typical appearance of the lesions and the facial oedema. A repeat complement-fixation test on egg membrane on April 27 proved positive for vaccinia, and so was



Photograph showing typical appearance of lesions.

an egg culture. Crusts began to form on the pustules on the 27th and the oedema was beginning to subside. The crusts separated about a week later, and small slightly depressed scars were left on the cheek and nostril.

This was a definite case of Kaposi's varicelliform eruption, as it fulfils the two requirements: (1) it was acquired by contact with a vaccinated person, and (2) it was definitely due to vaccinia virus, as proved by the complement-fixation test and egg culture.

COMMENT

Considering the large number of vaccinations performed, the number of reported cases of accidental vaccinia is comparatively very small; and although this case ran a benign course, the possibility of serious complications and sometimes of a fatal issue should be borne in mind. Finn *et al.* (1952) report a case of accidental generalized vaccinia in a child 6 months old, contracted from another child admitted thirteen hours previously into a cot adjacent to the patient's and who had had an active vaccination sore for ten days. The patient developed lesions twelve days later and died after ten days, in spite of treatment. Good and MacLachlan (1950) report a case of accidental generalized vaccinia in a boy of 6, who played in bed with a recently vaccinated infant; the boy died in hospital nine days later from vaccinia.

Vaccinia may also develop in a person who has been vaccinated, as illustrated in a case reported by Blattner (1951) of a child who developed impetiginous lesions after a smallpox vaccination. Vaccinia changes were demonstrated in the material taken from the lesions fifteen days after vaccination. According to Blattner *et al.* (1946), humoral antibodies to vaccinia begin to appear at the end of the first week following cutaneous vaccination; they increase in amount during the second and third weeks and reach their maximum at the end of the third week.

Bigler and Slotkowski (1951) maintain that the microscopical changes in vaccinia are identical with those of variola. It is believed that vaccinia and variola are caused by the same virus. When variola is inoculated into cattle and carried through several transfers in these animals the virus (variola) becomes attenuated and approaches the nature of vaccinia. The changes in the Malpighian layer of the epidermis consist of swelling, cytoplasmic degeneration and liquefaction, formation of multilocular vesicles, and eosinophilic inclusion bodies—Guarnieri's bodies—which are swollen nucleoli that have migrated from the nucleus into the cytoplasm.

It would therefore seem advisable to issue warnings about the possibility of accidental vaccinia from undue contact with recently vaccinated persons. The risk appears to be greater in people who have never been vaccinated.

I would like to express my thanks to Dr. J. P. Marsden, consultant, Joyce Green Hospital, for his kind help and advice about the case, and to Dr. J. C. Birchall, assistant medical officer of health for Croydon, for his great interest in the case and for the repeated complement-fixation tests and cultures done through him in the virus laboratories.

A. FRY, M.R.C.S., L.R.C.P., D.M.R.

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Torsion of Gall-bladder

Torsion of the gall-bladder is a relatively rare emergency, which can occur only in those cases in which the gall-bladder is suspended from the liver by a mesentery. Bean and Symond (1953), in a review of the literature, found 100 cases reported up to 1953. The first case was reported by Wendel in 1898. In his case there was a floating gall-bladder, with a long cystic duct, and a floating kidney, with cholelithiasis and perforation of the gall-bladder. Brewer (1899), in 100 consecutive dissections, found only five cases in which the gall-bladder had a mesentery. A mesentery is only one of the several possible congenital anomalies of the gall-bladder. Recht (1952) reported a case in which he found a double gall-bladder, one part of which had undergone torsion. According to Maingot (1948) most cases of torsion occur during later life—that is, at the age of 60–70. Short and Paul (1934) estimated that 84% of cases occur in females. A further case is here presented.

CASE REPORT

On admission the patient, a woman aged 71, complained of severe abdominal pain, mostly in the upper part and down the right side of the abdomen. She stated that the pain had started in her neck, and seemed to pass down her chest to settle in her stomach. She had vomited several times prior to admission. There were no other symptoms of note. Her own doctor had diagnosed angina pectoris. She stated that for the past two years she had had severe breathlessness on slight exertion.

On examination she was noted to be a frail, thin, ill-looking old lady, obviously in severe pain. She was edentulous. The tongue was clean and moist. No abnormal physical signs were detected on examination of her chest, apart from the fact that the apex beat was $1\frac{1}{2}$ in. (3.8 cm.) outside the nipple line. There was no abdominal distension; only slight movement with respiration was noted, and the abdomen was rigid down the right side, where it was also very tender. A distinct zone of maximal tenderness was noted about $1\frac{1}{2}$ in. (3.8 cm.) above and to the right of the umbilicus, this area being approximately 1 in. (2.5 cm.) in diameter. No mass could be felt and no loss of liver dullness was detected. Her temperature was 99° F. (37.2° C.), pulse 95 and regular, and blood pressure 290/120.

A provisional diagnosis of perforated duodenal ulcer was made and the patient prepared for operation.

A laparotomy was performed through a right upper paramedian incision. When the peritoneum was opened a pyriform black mass presented, which, on further inspection, was found to be a gangrenous gall-bladder. The gall-bladder was suspended from the liver by a mesentery and had undergone torsion in an anticlockwise direction. The mesentery extended from near the fundus to the proximal part of the cystic duct and was $\frac{1}{2}$ in. (1.3 cm.) across its widest part. The torsion involved the proximal half of the cystic duct, which was longer than usual. The gall-bladder was easily removed after the cystic duct and artery had been identified

and divided, only the mesentery remaining to be dealt with. A drainage tube to the gall-bladder bed was brought out through the upper part of the wound, which was then closed in layers. The patient's general condition remained satisfactory during and after the operation. Her general condition improved considerably during the next twenty-four hours; she continued to make good progress until her discharge from hospital on the fourteenth post-operative day.

COMMENT

One very interesting clinical sign in this case was the distinct zone of acute tenderness over a small area. This had previously been noted by Case (1951). The gall-bladder was relatively free and mobile, but when torsion occurred it became relatively fixed and firmly abutted against the anterior parietal peritoneum. The small zone of maximal tenderness therefore corresponds fairly accurately to the area in contact with the gangrenous gall-bladder.

The patient's convalescence was without incident, which is not only gratifying but interesting; Arthur (1937) estimated the mortality to be 16%.

I wish to thank Mr. G. Townsley for permission to report this case.

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Successful Femoral Embolectomy 17 Days After Acute Coronary Occlusion

Instances of successful removal of large emboli are not numerous. In a series of 19 femoral or iliac embolectomies performed during a five-year period (1946-51) at the Cook County Hospital (Klingensmith and Theis, 1952) only one patient was discharged with a surviving embolectomized leg. 15 died in the hospital, and 3 were discharged with an above-knee amputation. There are other reports in the literature claiming better results than this, but, even so, the percentage of successes is small.

A common cause of peripheral embolism is mural thrombus following myocardial infarction. Boas and Boas (1949) state that such thrombi are found in about 50% of cases of myocardial infarction that come to necropsy. Hellerstein and Martin (1947) found that the incidence of clinically detectable thrombo-embolic lesions in myocardial infarction in 1,600 cases was 11.5%. The incidence of embolism in the extremities was 5.5%.

CASE REPORT

A woman aged 64 was admitted to hospital on March 24, 1953. She was brought in by ambulance after an attack of severe substernal pain, which came on suddenly while she was walking.

On admission she was not shocked; pulse 82, irregular owing to extrasystoles; blood pressure 145/85. The heart sounds were normal, no murmurs or pericardial rub were heard, and there were no signs of cardiac failure. A diagnosis of myocardial infarction was made. This was confirmed by an electrocardiogram, which showed a recent anterior coronary occlusion. The patient was treated by rest in bed. No anticoagulants were used.

Satisfactory progress was made, apart from some chest infection, until April 10, when she complained of sudden onset of pain, first on the left side of the abdomen, and then, shortly after, by very severe pain in the right leg. On examination the right leg was pale, cooler than the left, and no arterial pulses were palpable. After ten minutes the limb had become mottled and blue. She was treated with

morphine, $\frac{1}{4}$ gr. (16 mg.), tolazoline hydrochloride, 50 mg. intravenously; heparin, 10,000 units; and ethyl biscoumacetate, 900 mg. After one hour the limb was still cold and cyanosed, but the pulsation of the external iliac artery had become palpable.

Three hours after the onset of pain an operation was carried out under local analgesia. No premedication was given, as the patient had had morphine for her pain.

One per cent. procaine was infiltrated and an incision made over and in line with the right femoral artery, in the femoral triangle. The artery was freed. Its wall was not thickened or calcified. Tapes were applied around the artery, which was opened between the tapes. Several small clots were removed. By releasing the pressure on the proximal tape, a thrombus 50 mm. long shot out of the lumen of the vessel. A ureteric catheter was inserted in the distal part of the artery, and 5 ml. of sodium citrate and 1 ml. of heparin was injected through the catheter. The incision was closed with an arterial suture. The sheath of the artery was not closed. The deep subcutaneous tissues were closed with plain catgut. The skin wound was closed and a firm bandage applied.

At the end of the operation there was a marked improvement in the circulation. The pulsation of the popliteal, dorsalis pedis, and posterior tibial arteries was palpable. The limb, however, remained mottled and cyanosed for some 12 hours post-operatively. At the end of the operation the patient complained of pins-and-needles in the toes.

An intermittent venous occluder was applied to the limb in the mid-thigh and left on for 24 hours, after which it was discontinued, as the circulation appeared to be normal.

Heparin therapy, 10,000 units eight-hourly, was given for 24 hours, and ethyl biscoumacetate, controlled by prothrombin times, was given daily for three and a half weeks.

Post-operative progress was uneventful. The patient was allowed up after four weeks, and was discharged quite well on May 16, five weeks after the embolectomy.

Our thanks are due to Mr. J. Thompson Fathi for his help and encouragement in the preparation of this article, and to Dr. P. J. Mills for his permission to publish this case.

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The Diagnosis of Mongolism in Infancy: Small Auditory Meatus

It was pointed out in a previous publication (Wallis, 1951) that the diagnosis of mongolism in infancy is made easier by the observation of Brushfield's spots. In Brushfield's (1924) own words these are: "Speckled white or very light yellow clearly defined pin-points near the outer margin, generally placed at regular intervals in a ring and appearing to be placed on the iris. I have not been able to find these in the brown iris."

Observation of a further 10 cases has confirmed my surmise that at birth all mongols have blue eyes and show Brushfield's spots. Unfortunately some normal children show the spots as well. However, at least if a newborn infant has not got them we may be sure that it is not a mongol.

Another sign which has come to light is the smallness of the external auditory meatus. In all 10 cases it has been found impossible to insert an auriscope speculum of 3 mm. diameter into the ear, and in fact in not one of them could the drumhead be seen on either side. This is merely an expression of the general lack of development of the basal bones of the skull, but it has not apparently been recorded previously.

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Reviews

THE BRAIN IN EPILEPSY

Epilepsy and the Functional Anatomy of the Human Brain. By Wilder Penfield, O.M., C.M.G., M.D., F.R.S., and Herbert Jasper, M.D., C.M. Chapter XIV by Francis McNaughton, M.D., C.M. (Pp. 896+xv; 314 illustrations, 8 coloured plates. £5 15s.) London: J. and A. Churchill Ltd. 1954.

This large volume, which is a sequel to *Epilepsy and Cerebral Localization*, written by Penfield and Erickson in 1941, presents material collected at the Montreal Neurological Institute since Dr. Jasper joined Dr. Penfield there in 1938. It deals, through detailed fact and copious illustrations, with the experimental neurosurgery and human electrophysiology that these workers have undertaken in that time. The historical background of their subject is also summarized.

The importance of the work can be judged from the fact that before the second world war, when this work began, to record directly from the cortex of man was a remarkable event and to stimulate it electrically an isolated experiment. Dr. Penfield's greatest achievement has probably been to secure such close co-operation from hundreds of patients who, having simply local analgesia of the operation area, have been able to describe their experiences under cortical stimulation and to help in hours of clinical and electrophysiological recording. Everyone who is concerned with cerebral physiology will wish to study the detailed observations included in this volume. As the methods and circumstances of recording are also fully described they can be collated and interpreted by the reader himself. This must have been the authors' intention, as they suggest in the preface, for such a wealth of fact, including the invocation by stimulation of every sensation, most movements, and some of the emotions which man experiences, cannot be interpreted by one school or in one era.

Roughly, the first part of the book considers epilepsy, especially from the neurosurgeon's point of view; the last sections deal with clinical, surgical, and electrophysiological techniques; and the larger middle portion presents the observations made by Dr. Penfield and his team of workers. The method employed is to illustrate a chapter with relevant case histories, though these differ from those usually found and from clinical texts in their intimate nature. They include photographs of the stimulated brain at operation, with verbatim accounts of important observations made by the patient or one of the team. Epileptic experiences are reproduced and past events invoked by cortical stimulation, and the psychologist and philosopher can make of it what he will. That this wealth of accumulated observations cannot yet be logically integrated is apparent in those sections of the book dealing with memory or the concept of a centrencephalic mechanism.

Although "the dedication of this book to Hughlings Jackson is prompted by the knowledge that many of the conclusions reported here were long ago the surmise of the founder of the English School of Neurology," there is surely still a long way to go before the facts presented can lead to consistent conclusions which would have been acceptable to him. It is this rather than any conclusions suggested which makes the book so valuable and provocative. It is particularly welcome to those who have followed Dr. Penfield's work through the years, for its publication coincides with his retirement from the Chair at McGill.

DENIS WILLIAMS.

ATOMIC MEDICINE

Atomic Medicine. Edited by Charles F. Behrens, M.D. Second edition. (Pp. 632+xiv; illustrated. 84s.) London: Baillière, Tindall and Cox, Ltd. 1953.

The development of atomic energy has introduced entirely new medical problems in connexion with many of its potential uses and abuses. The atomic industries require health

precautions of a novel kind which are already highly developed; the clinical and experimental use of isotopes and of nuclear radiations is constantly yielding new methods of investigation and therapy; and nuclear weapons can cause widespread radiation hazards in a variety of different ways. This is the broad subject, or rather the group of subjects, which is designated "Atomic Medicine" and discussed in detail in the second edition of a valuable work originally produced in 1949, largely by members of the medical and scientific staff of the United States Navy.

In many ways this is an important book, and particularly for its account of severe radiation injury and for the practical survey of health precautions in atomic industries. These are unfamiliar fields of medical responsibility on which it is useful to have the available information so well assembled. The section on particular isotopes is sometimes rather more superficial, perhaps because a large field, which has been the subject of several excellent textbooks, is here attempted in a few chapters. The bibliography of some chapters shows signs of inadequate revision since the 1949 edition, although in the work as a whole both the references and the tabulated material are of considerable value for reference. Inevitably in a composite work by different authors there are reduplications and omissions, but the planning and editing are usually careful and good, considering the rather disconnected subjects that the book attempts to cover. Parts of the chapter on "Survival Methods in Atomic Disaster" are somewhat trivial or naive, but a picture emerges which is coherent and practicable. Readers of this book will, incidentally, enjoy the conception of "the World War II figure of the 'air-raid warden' idly swinging his baton or flash-light during an 'alert' or a 'blackout,'" and agree that this figure needs replacing.

This book is important to those concerned with nuclear radiation and shows clearly to what extent the biological hazards are serious and are controllable.

E. E. POCHIN.

TROPICAL MEDICINE

A Manual of Tropical Medicine. Edited by Thomas T. Mackie, M.D., Colonel M.C., A.U.S. (Retired), George W. Hunter III, Ph.D., Colonel M.S.C., U.S.A., and C. Brooke Worth, M.D. Second edition. (Pp. 907; illustrated. 60s.) Philadelphia and London: W. B. Saunders Company. 1954.

In tropical medicine the size of a textbook has always been of special importance, for those working in this field are likely to travel and to need a textbook while doing so. A volume which covers the subject-matter in the minimum of space has therefore a very special appeal. This one is intended not to be a voluminous work of reference, but to contain sufficient detail to be an authoritative guide to those practising tropical medicine. It is of readily transportable size, it is packed with up-to-date, well-presented information of a high degree of accuracy, and it covers all the diseases likely to be encountered by a practitioner in the Tropics. To deal in detail with such a wide range of diseases is now beyond the scope of any small group of authors, and the editors are to be complimented on calling upon twenty-four contributors to help them.

As is right in an American publication, special emphasis is given to diseases of the tropical parts of the New World. American enthusiasm for the use of antibiotics has in places been allowed to obscure the value of older but highly effective standard remedies. Thus it is said of emetine bismuth iodide, which outside America is regarded by the majority of workers as being the most effective drug for the treatment of amoebic dysentery, that it and similar preparations are now seldom necessary or desirable.

Diseases of military importance are also given special attention, and the fact that the work is up-to-date is emphasized by a section on the recently described epidemic haemorrhagic fevers. Unfortunately nutritional diseases, which to tropical peoples are of tremendous importance, are dealt with inadequately. Sprue is classed as a nutritional disease, and to it and all other diseases in this section a mere

twenty-two pages are devoted. To macrocytic anaemia and kwashiorkor, which together probably affect many millions of tropical inhabitants, less than one page is devoted, as compared with six pages dealing with epidemic haemorrhagic fever, of which only a few hundred cases have so far been reported. In spite of these shortcomings, however, the book is a good one, and it is certain to be warmly received. The printing, paper, and the 304 illustrations are excellent.

A. W. WOODRUFF.

AN ANATOMICAL ATLAS

Atlas of Descriptive Human Anatomy. By J. Sobotta. Edited and translated by Eduard Uhlenhuth, Ph.D. Volume III. Blood vessels—Nervous system—Sense organs—Integument and Lymphatics. 5th English edition. (Pp. 390+xix; 164 coloured and 142 black and white illustrations on full page plates and additional 67 partly coloured figures in the text. £6 5s.) New York: Hafner Publishing Company Inc. London: Lange, Maxwell and Springer. 1954.

The late Professor Sobotta was not only a distinguished teacher of topographical anatomy but also famous for his many accurate investigations in the field of early mammalian development. His contributions to the study of the maturation, fertilization, and cleavage of the ovum of the mouse are regarded as classics. The present volume of his *Atlas of Anatomy* is the fifth English edition of this now famous book, first produced in German in 1904. After an absence of nearly ten years this edition will be welcomed by teachers and students alike. The first English edition was prepared by Professor McMurrich, of the University of Toronto; the fifth has been edited and translated by Professor Edward Uhlenhuth, of Baltimore. As in earlier editions, arteries, veins, and nerves are shown together in a single illustration. This has many advantages in that the student is able to see the relationships of these structures as they are found in the body and not as separate entities when they are illustrated in separate diagrams. The only criticism I would make is that in several of the illustrations too many fine branches of nerves and arteries have been shown, and in certain figures such detail obscures the essentials. The text is clear and concise. The atlas is one of the best available to-day and can be recommended with confidence.

W. J. HAMILTON.

CARDIOVASCULAR SURGERY

Cardiovascular Surgery. By Gerald H. Pratt, M.D., F.A.C.S. (Pp. 843; 358 illustrations, 4 coloured plates. £5 10s.) London: Henry Kimpton. 1954.

The rapidly increasing scope of cardiovascular surgery makes it difficult to condense the sum total of our present knowledge into a reasonable space. Dr. Pratt has, however, achieved this end and has given a concise and yet comprehensive account of the subject in one volume. Diseases of the heart and blood vessels are becoming increasingly important in a society whose expectation of life is steadily improving, and surgery in this field has, therefore, a similarly increasing significance, even though only a proportion of the disorders are amenable to treatment.

The book is divided into sections, starting with a classification and the general examination of the patient, and passing via anaesthesia, fluid balance, and the like to surgery of the heart, of the arteries, of the veins, and of the lymphatics and thence to special technical procedures. Each section has an adequate, though not complete, bibliography, and there are numerous well-chosen illustrations to amplify the text.

In the chapters on heart surgery the description of mitral stenosis and its treatment is very satisfactorily handled. Other cardiac lesions suitable for surgery are more briefly, though adequately, discussed. Occlusive arterial disease is described in detail, and not only are surgical procedures well illustrated, but conservative measures, including dietary instructions, are given in a practical manner. The treatment of threatened and actual diabetic gangrene is similarly dealt with. Arterial thrombosis, embolism, aneurysm, and

arteriovenous fistula are discussed with a wealth of detail that is based on the author's considerable experience and makes valuable reading.

There is little that the author has omitted in his comprehensive survey of the whole subject, and if there is a certain unevenness in some sections it is a very minor criticism of a book which must well remain for some time a standard work on this complex subject.

T. HOLMES SELLORS.

ANGIOGRAPHIC STUDY OF PATHOLOGY

Atlas Postmortaler Angiogramme. By J. Schoenmackers and H. Vieten. (Pp. 203; illustrated. D.M. 57.) Stuttgart: Georg Thieme. 1954.

This most original volume consists of a series of radiographs taken from cadavers after injection of the blood vessels with opaque material, thus enabling a large number of pathological conditions to be studied from a very unusual point of view, often with surprising results. The technique employed is described in detail, and the superb radiographs which have been obtained are a proof of its success. The skill and labour involved must have been very great, but they were fully justified by the result.

Every region of the body has been covered and in a large variety of pathological conditions. Each print is accompanied by a full description and frequently by an explanatory diagram. At the end of each section a summary is given in four languages, but in general the plates speak for themselves. They number in all 131, and in every case the production is perfect. Perhaps the most interesting are those of the lungs and of the heart. Angiograms of the lungs include acute infection, asthma, emphysema, tuberculosis, silicosis, and carcinoma, while those of the heart are devoted to the coronary arteries, showing variations of the utmost significance.

The importance of this laborious study as a background will be realized when the great development of such radiographic study of the living in clinical practice is considered. Comparison of a clinical angiogram with the corresponding plate in this atlas should greatly facilitate an appreciation of its meaning and assist in diagnosis. But perhaps it is the pathologist himself who will best appreciate these superb plates and the perfect technique which their production demanded.

HENRY SOUTTAR.

PHYSIOLOGY OF THE MOUTH

The Physiology of the Mouth. By G. Neil Jenkins, M.Sc. (Liverpool), Ph.D. (Cantab.). (Pp. 288; 53 figures. 30s.) Oxford: Blackwell Scientific Publications. 1954.

The physiology of the mouth and dental tissues has not in the past received the attention it deserves, and it is most useful to have a modern work on the subject with very excellent references collected together in one volume. Although written primarily for undergraduate students, for whom it will be most valuable, its greatest value will probably be to the postgraduate student and those interested in research in this field, since it deals with current aspects of research which may be somewhat beyond the basic training of the dental student. The author is to be congratulated on producing a most interesting book.

A. MACGREGOR.

Alumni Cantabrigienses, compiled by J. A. Venn, is a biographical list of all known students, graduates, and holders of office at the University of Cambridge from the earliest times to 1900. The four volumes of Part I covered from the earliest times to 1751, and the sixth and final volume of Part II (from 1752 to 1900) has recently been published, the names in this volume running in alphabetical order from Square to Zupitza. The compiler and publishers (Cambridge University Press) are to be congratulated on successfully completing this immense biographical task. The cost of the final volume is the same as that of its predecessors, £10 10s.; and the whole set of ten volumes can be bought for £89 5s.

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ADRENALECTOMY FOR BREAST CANCER

Most of our present-day knowledge of the aetiology of breast cancer is based on animal experimentation. Although as early as 1919 Loeb and his co-workers had demonstrated the carcinogenic potency of the ovaries in mice with a high susceptibility to breast cancer, it was not until 1932 that Lacassagne¹ finally established the relationship between the ovarian factor and mammary neoplasia. His discovery that oestrone induces breast cancer in male mice, which normally never develop it, was important because oestrogen was proved to be the first substance originating in the body which causes cancer. Further research into the biological activities of the sex hormones showed that administration of the male sex hormone could prevent the development of mammary cancer in female mice belonging to high cancer strains. These results produced a wave of optimism, for many then took the view that cancer which arose in organs under endocrine control could be prevented, or at least held in check, by administering a hormone antagonist.

Loeser² was one of the first in the clinical field to try testosterone therapy in cases of inoperable breast cancer, and Adair and Hermann,³ among others, reported later on this form of treatment. Haddow and his colleagues,⁴ Nathanson,⁵ and Stoll and Ellis,⁶ relying on the depression of pituitary function and hence inhibition of ovarian secretion in preference to a hormone antagonist, used massive doses of oestrogen for treatment of breast cancer in women. These different forms of treatment gave variable results. Some breast neoplasms were temporarily held in check, others failed to respond. Apparent recovery, however, was extremely rare, and reactivation of tumour growth invariably occurred. This is probably due to the fact that when an endocrine imbalance is created, either by the surgical removal of an organ or by the administration of a hormone,

the anterior pituitary gland stimulates other endocrine organs to make up for the deficiency. Thus the adrenal cortex might be stimulated to secrete both oestrogens and androgens, the ovary to secrete androgens, and the sertoli cells of the testes to secrete oestrogens sufficient in amount according to some authors⁷ to induce cancer of the male breast.

Huggins,⁸ working on the assumption that steroid hormones of the adrenal cortex might be responsible for reactivation of tumour growth, was the first to advocate bilateral adrenalectomy combined with castration in cases of breast cancer which had failed to respond to other forms of hormone treatment. He has recently published a review⁹ of these results, and Sir Stanford Cade makes another important contribution in the opening pages of this *Journal* to the knowledge being gained about this method of treatment. Nearly 20% of deaths from cancer in women in Great Britain are from mammary carcinoma, and the importance of the recent work must be judged against this background, but both Huggins and Cade are emphatic in claiming only that this form of therapy controls the growth of the disease rather than cures it. The operative mortality, considering the physical state of the patients, is very low. Post-operative adrenal insufficiency is made good by the administration of cortisone acetate. Those with skeletal metastases obtain immediate relief from pain, and begin to gain weight. Cade reports on 56 patients who had bilateral adrenalectomy for disseminated breast cancer. The results have been good in 60% of these cases, including 23% which showed remarkable improvement, regression of palpable lesions being accompanied by reossification in skeletal metastases. Survival so far has been up to 21 months. Huggins, in his recent review, reports that out of 17 patients subjected to adrenalectomy for mammary cancer in May, 1951, there was only one post-operative death. Six patients were alive two to three years after the operation, and secondary deposits had regressed in all of them. One patient, three years after the operation, has apparently recovered and has returned to work. Unfortunately only some breast cancers respond to this treatment: in fact there appear to be three distinct types, none of which with any certainty can be histologically diagnosed. There are those tumours which are adrenal-dependent for sustained growth and respond to adrenalectomy. The second type are those which are ovary-dependent, and these likewise respond to the combined operation of castration and adrenalectomy. Growths of the third type, which are rarer, are hormone-independent and fail to respond to any form of hormone therapy. This resistance may possibly be due to a factor of hypophyseal origin. Since there are no reliable means

¹ *C.R. Acad. Sci. Paris*, 1932, 195, 630.

² *British Medical Journal*, 1940, 1, 479.

³ *Ann. Surg.*, 1946, 123, 1023.

⁴ *British Medical Journal*, 1944, 2, 393.

⁵ *Endocrine Aspects of Human Cancer*, 1947, Academic Press, p. 261.

⁶ *British Medical Journal*, 1953, 2, 796.

⁷ Barrows, H., and Horning, E. S., *Oestrogens and Neoplasia*, 1952, Oxford, p. 90.

⁸ *J. Urol.*, 1952, 68, 875.

⁹ *J. nat. Cancer Inst.*, 1954, 15, 1.

whereby it can be ascertained beforehand whether a breast cancer is hormone-dependent, the results obtained by adrenalectomy must remain unpredictable.

Admittedly there are many gaps in our present knowledge of the functional inter-relationships of the endocrine system, and until a method of controlling the activity of the anterior pituitary gland can be found the treatment of mammary cancer by hormone therapy will remain incomplete and often unsatisfactory. Nevertheless, as Sir Stanford Cade rightly states, "No method of treatment has as yet achieved control of disseminated, widespread, and often terminal stages of breast cancer comparable to that following adrenalectomy."

YELLOW FEVER IN AFRICA

Until the early years of this century yellow fever had been one of the great plagues of the Tropics and sub-Tropics for more than two hundred years. In 1900 the discovery of the transmission of the disease by the mosquito *Aedes aegypti* was the first of many important advances, and since then epidemiological investigations have led to methods of control so efficient that a major epidemic need no longer occur anywhere. At first it was believed that yellow fever was essentially an urban disease carried only by *A. aegypti*, but experiments in 1928 showed that certain other mosquitoes could transmit it under laboratory conditions. In 1932, in Brazil, a rural epidemic was studied in which *A. aegypti* was not the vector, and similar outbreaks, in which secondary cases were much less common than in urban areas, were noted in populations living in or close to uncut forest. These facts suggested the existence in the jungle of a transmission cycle involving a mosquito and an animal host, human infection being only incidental. This theory was supported by the presence of protective antibodies in locally captured monkeys, and in 1944 it was confirmed by the recovery of yellow fever virus from a wild marmoset and from the forest mosquito *Haemagogus spegazzinii*.¹

In Africa the study of rural yellow fever has been actively pursued in the Bwamba forest of Uganda since 1936, and there a similar epidemiological pattern was found. In Brazil jungle yellow fever was contracted mainly in virgin forest, but in the Bwamba area infection mainly occurred in farm clearings in the forest. As the local epidemiology was elucidated it was found that the main sylvan hosts were monkeys

living in the treetops and never descending to ground level. The virus was carried between them by *Aedes africanus*, a night-biting, treehole-breeding species which also lived in the tree canopy.² A further link was required to bring the disease to man. This was provided by other species of monkeys which rested in the trees at night where they could be infected by *A. africanus*, but during the daytime they raided farms and were then bitten by *Aedes simpsoni*.³ This species fed during daylight on both monkeys and man, and it bred in the leaf axils of banana and colocasia plants in the edges of clearings and forest fringes. By this chain of transmission in the Bwamba forest the virus is transported from the tree canopy to man at ground level and can then be carried to towns, where man-to-man transmission by *A. aegypti* may result. The epidemiology requires clarification, however, in some other African areas where there are insufficient monkeys to support continued transmission of the virus and where a prolonged dry season eliminates or reduces the vector population to a very low level for some months. In this connexion it may be significant that protective antibodies have been demonstrated in wild African lemurs living in savannah country. It has also been shown that certain mites and ticks can ingest and conserve yellow-fever virus for days or weeks, though transmission by their bites has not been effected.⁴ Infection of a sandfly has also been recorded in nature.⁵

Modern methods of controlling yellow fever are based on the specific epidemiology of the disease. In urban areas transmission is prevented by eliminating *A. aegypti* by means of larval control and residual insecticidal spraying of houses, or by reducing its density below that necessary for epidemic spread. Control of the sylvan form of transmission is a much more difficult problem because no practical means exist of attacking the insect vectors or the monkey hosts. A method of prophylactic treatment of man by live attenuated virus is, however, available. Two vaccines are in use, 17D vaccine produced by the Rockefeller Foundation by culture in denervated chick embryo, and a vaccine prepared by the Institut Pasteur in Dakar from infected mouse brain. The former is administered subcutaneously, while the latter can be given either subcutaneously or by scarification, in which case it may be combined with smallpox vaccine. The period of protection given by both preparations is officially recognized as six years, and is probably longer. Reactions following 17D vaccine are rare and mild and many millions of people have been protected by it. The Dakar vaccine in a small proportion of cases causes neurotropic reactions, but it has been used extensively in French West Africa,

where more than 38 million doses have been administered.⁶ The results of this method of control have been excellent. In treated areas sylvan yellow fever is no longer seen in the human population, or occurs only exceptionally, usually in remote localities in persons who have escaped vaccination. The spread of sylvan yellow fever from the permanent foci to urban areas can thus be prevented, while *Aedes* control in towns obviates epidemic transmission if the disease is introduced and reduces the risk of its export to other parts. *Aedes* control on airfields and the use of insecticides in aircraft are necessary to prevent the carrying away of infected vectors. There still remains a risk of spread from centres so far unrecognized, but this is becoming more remote as immunity surveys delineate more accurately the endemic zones and foci of the disease.

SEQUELAE OF ERYTHROBLASTOSIS

Rhesus incompatibility is a risk run in about one-eighth of pregnancies, with harmful antibodies developing only in about one in two hundred. A further 20% of maternal sera contain anti-A or anti-B agglutinins incompatible with the infant's cells,¹ though haemolytic disease complicates only a small proportion of these cases. The most important complication of the disease is kernicterus; before the introduction of exchange transfusion it was reported in up to 30% of cases. Deep jaundice is accompanied by such signs as head retraction, eye rolling, squint, opisthotonos, hyperpyrexia, convulsions, and terminal respiratory failure. A hypotonic phase usually follows in the one-third who survive the acute stage, and this is generally succeeded by choreo-athetosis with or without deafness, in some cases accompanied by mental retardation. Minor abnormalities may also occur in jaundiced babies in the first few days, such as lethargy, reluctance to feed, and vomiting, sometimes with increased muscle tone or mild cerebral irritation, but such cases apparently carry a better prognosis, and several have been reported as being entirely normal at the age of a year.² A correlation between hyperbilirubinaemia and kernicterus was suggested by the identification of the staining pigment as bilirubin,³ the discovery that the indirect type has a special affinity for the basal ganglia,⁴ and by the experimental kernicterus produced by bilirubin infusion in animals.^{5,6} Thus it has been established that kernicterus is rare if the serum bilirubin level remains below 18 mg. per 100 ml.⁷ Exchange transfusion removes the source of approximately 1,000 mg. from the infant's blood and is therefore indicated if there is anaemia with cord haemoglobin below 15 g.

per 100 ml., prematurity, or a history of a previous affected sibling; otherwise it is given if the bilirubin level rises above 18 mg. per 100 ml.¹ Armitage and Mollison last year reported⁸ the results of a therapeutic trial encompassing about 450 liveborn infants wherein alternate anaemic babies with haemoglobin below 15.5 g. per 100 ml. were treated by exchange and simple transfusion. In the whole series there was still a 9% overall mortality from kernicterus up to the end of the first year, while a further 5% of 350 tested survivors were backward or showed neurological abnormality in a 1-3-year follow-up. In spite of effecting a reduction of 50% in the mortality from kernicterus, a single exchange transfusion did not avert this complication in 11% of anaemic full-term babies and 35% of anaemic premature babies. Better results are attained by repeating the exchange transfusion if further jaundice or hyperbilirubinaemia develops, which measure succeeded in reducing the immediate mortality from kernicterus to 2% in 250, mostly full-time, sensitized babies.⁹ One case is also worth recording of an infant who received exchange transfusion subsequent to the onset of acute kernicterus and later apparently developed normally.⁹

Apart from the sequelae of frank kernicterus, there remains the question whether blood group incompatibility can lead to mental retardation in cases where there is no evidence of acute or subsequent neurological damage. Creak and Durward¹⁰ found normal distribution of intelligence in the 45 physically normal survivors of 50 children originally treated at Great Ormond Street for the neonatal effects of rhesus incompatibility. Another method of investigation has been to determine the rhesus blood groups of undifferentiated mental defectives and their parents. Yannet and Lieberman,¹¹ comparing the blood groups of neurologically normal mental defectives whose defect was of unknown aetiology with the blood groups of their mothers, found an increased incidence of rhesus incompatibility as compared with aments of known aetiology, but numerous later investigators¹²⁻¹⁴ have failed to confirm these findings or similar ones for ABO incompatibility.¹⁵ More satisfactory have been two

¹ Mollison, P. L., *Recent Advances in Paediatrics*, edited by D. Gairdner, 1954, Chap. 5, p. 110. Churchill, London.

² Armitage, P., and Mollison, P. L., *J. Obstet. Gynaec. Brit. Emp.*, 1953, 60, 605.

³ Waters, W. J., et al., *Pediatrics*, 1954, 13, 319.

⁴ Chaireux, A. E., et al., *Lancet*, 1953, 2, 1225.

⁵ Küster, F., and Krings, M., *ibid.*, 1950, 1, 979.

⁶ Day, R., *Amer. J. Dis. Child.*, 1947, 73, 241.

⁷ Mollison, P. L., and Cutbush, M., *Blood*, 1951, 6, 777.

⁸ Diamond, L. K., et al., *Pediatrics*, 1952, 10, 337.

⁹ Abelson, N. M., *Mod. Clin. N. Amer.*, 1953, 37, 609.

¹⁰ *Gr. Ormond Str. J.*, 1953, 6, 81.

¹¹ *Amer. J. ment. Defic.*, 1944, 49, 133.

¹² Zwerling, L., et al., *Amer. J. Dis. Child.*, 1951, 82, 7.

¹³ Böök, J. A., et al., *Amer. J. hum. Genet.*, 1949, 1, 66.

¹⁴ Gilmore, D., *J. ment. Sci.*, 1950, 96, 359.

¹⁵ Yannet, H., and Lieberman, R., *Amer. J. ment. Defic.*, 1945, 50, 242.

¹⁶ *J. Pediatrics*, 1950, 36, 342.

¹⁷ *Pediatrics*, 1954, 13, 333.

¹⁸ Evans, P. R., and Polani, P. E., *Quart. J. Med.*, 1950, 19, 129.

¹⁹ Fisch, L., and Osborn, D. A., *Arch. Dis. Child.*, 1954, 29, 309.

²⁰ Gellis, S. S., et al., *Amer. J. Dis. Child.*, 1954, 88, 285.

¹ Laemmert, H. W., and Ferreira, L. de C., *Amer. J. trop. Med.*, 1945, 25, 231.

² Smithburn, K. C., et al., *Ann. trop. Med. Parasit.*, 1949, 43, 74.

³ Mahaffy, A. F., et al., *Trans. roy. Soc. trop. Med. Hyg.*, 1942, 36, 9.

⁴ Davis, N. C., *Amer. J. trop. Med.*, 1933, 13, 547.

⁵ Breteau, H., *Bull. Wld Hlth Org.*, 1954, 11, 453.

well-controlled mental and neurological follow-up studies by Day and his colleagues on babies known to have had haemolytic disease of the newborn without having developed clinical signs of acute kernicterus or any subsequent neurological deficit. Gerver and Day¹⁶ reported a normal average I.Q. of 102.7 in a series of 68 such babies, but the sibling controls were on the average 11.8 points higher, while five of the affected babies and none of the siblings had I.Q.s below 70. In a second study, after the introduction of exchange transfusion, Day and Haines¹⁷ reported that deeply jaundiced babies with severe anaemia suffered a significant depression of 23 points, as opposed to the entirely normal intelligence found in babies with absent or moderate jaundice. This danger from deep jaundice, which was also present to a lesser degree in cases without severe anaemia, could presumably be reduced but not entirely prevented by the prophylactic use of exchange transfusion repeated as often as necessary, though the new threshold level of bilirubinaemia has yet to be determined.

Deafness afflicts 30% or more of survivors from kernicterus,¹⁸ though haemolytic disease itself does not account for more than 3% of cases of congenital perceptive deafness.¹⁹ The deafness is usually of high frequency type, similar to that occurring after prematurity or birth hypoxia, which raises the question of a common factor in pathogenesis. Haemolytic disease accounted for 15% of a large series of infants with obstructive jaundice,²⁰ but the prognosis is good, and permanent obstruction of the bile ducts does not occur, though rare cases of cirrhosis of the liver are reported. Congenital malformations and hepatolenticular degeneration are now known not to be connected with blood group incompatibility. In conclusion, it is heartening that 95% of the Armitage and Mollison series and 90% of Creak's series showed entirely normal mental and physical development on follow-up.

THE NUFFIELD FOUNDATION

The Nuffield Foundation, which was established nearly twelve years ago, in the middle of the war, has issued two progress reports.^{1,2} One of them is technically an annual report, but the work supported by the Foundation is largely long-term and cannot be fitted into a single year, some of it not even into a five-year period. The annual report is really a report of what has been done during the last quinquennium and a prospectus of what it is proposed to do during the next. The other volume gives the list of the grants made over the last ten years, amounting to well over £4m. Research has been subsidized in many laboratories and university and other departments at home and overseas, the subjects ranging from nuclear physics to the effects of ageing, from dental health to soil science, from foetal physiology to

the impact of television on children, from studies of the aborigines of Arnhem Land to the health services of the Aden Protectorate, from malnutrition of children in Uganda to the insect fauna of the game reserves of South Africa, and so on almost interminably.

The first grant of the Foundation in the medical field—£100,000 over ten years—resulted in the establishment of the Institute of Child Health of the University of London. Then industrial health departments were promoted in three universities in industrial areas of Great Britain, help being given to a total of £150,000. Dental health claimed attention, and a chair of oral medicine was set up in the University of Durham and research units in preventive dentistry in Leeds and Manchester. The Foundation has not concerned itself with particular diseases, with the exception of rheumatism; and on research in rheumatism, assisted by what is known as the Oliver Bird Fund, it has spent a total of £228,693 since the initiation of the Manchester centre in 1947. The care of the aged is another of the objects enjoined upon the Foundation by its trust deed. To the National Corporation for the Care of Old People it has contributed over half a million pounds in five years, and another half-million has been given by the Lord Mayor's National Air-raid Distress Fund. Finally, there is a large scheme of fellowships, scholarships, and bursaries, for residents both in the United Kingdom and in other parts of the British Commonwealth, to the number of several hundreds, about one-third of them in medicine. Seventy pages of this ten-year chronicle are devoted to a bibliography of published research attributed in whole or in part to the Foundation's grants and awards. Under the heading of research in the field of rheumatic diseases alone there are well over 100 entries, and that is only a selected list.

In the other volume, which is described as the ninth annual report, it is stated that during the last five years the Foundation has set aside nearly £400,000 for projects outside the United Kingdom. In the overseas parts of the Commonwealth private aid is "more keenly needed, sought, and valued" than in the United Kingdom, because in this country there is increasingly generous provision for scientific and medical research from public funds supplemented by industry. The Foundation's main concern during the next five years will be with the natural sciences (giving preference to biology), with continued support for research in rheumatism and some other medical projects, and with the social sciences. It will assist research and practical experiment in the employment of elderly people, and the various fellowship schemes will also be continued into the next quinquennium, but perhaps not all of them throughout the period. Some may be replaced by new schemes, for the Foundation is not committed to a rigid formula of beneficence. Indeed, apart from the scale of its benefactions, its chief characteristics seem to be its adaptability, imagination, and capacity for adventure—qualities also favoured by the great industrialist who provided this immense capital fund of £10m. for the advancement of health and of social well-being.

¹ *The Nuffield Foundation—Report on Grants, 1943–53, 1954*, London.
² *The Nuffield Foundation—Report for the Year ended March 31, 1954*, London.

THE GUT PROVOKED

"Diagnostic roentgenologists basically are organologists," says Friedman,¹ and in the interests of their search of the gut for growths, ulcers, polyps, and so on they usually do their best to soothe and console the patients committed to their rays. Friedman did exactly the opposite. By what he calls "superficial psychic probing" he provoked an emotional disturbance in patients under radiological examination, and claims thereby to have demonstrated the appearance of a "deficiency" or "motor dysfunction" pattern in the small intestine of persons in whom it was absent when they were in a state of composure. This is the pattern typically seen in pictures of the small intestine in cases of steatorrhoea, provided barium capable of flocculating is used. Friedman's patients were not suffering from steatorrhoea, and the illustrations of the small-intestine pattern before and after provocation are impressive. The main interest, however, of this study lies in its dual approach, the use of physical and psychological methods to study intestinal function.

A perusal of the work of Cannon² and the later studies of Wolf and Wolff^{3,4} and their colleagues, aided perhaps by a little intelligent self-observation, must convince all but the most hard-boiled of organologists that the digestive apparatus may be profoundly upset in states of emotion. But whether these disturbances are of importance in the aetiology of so-called organic disease is a vexed question, for the technical difficulties of proving or disproving such a thesis seem at present almost as great as the philosophical ones in such questions as, Can mental events cause physical disease?

In the meantime the observation and measurement, when possible, of changes in function during emotional states is of value both for its own sake and to define more clearly the normal limits, thus to prevent these changes from being misinterpreted as evidence of structural disease. Friedman has shown that radiological methods can be used successfully for this purpose in the gut, but the danger of excessive irradiation must seriously limit the scope of the method. Colonic movement, for instance, has been studied in animals by means of serial x-ray pictures, and would appear to be an admirable subject for this kind of observation in man were it not for the excessive amount of irradiation necessary to obtain an adequate serial record of the movements of the colon.

Perhaps one of the most interesting aspects of this study is to illustrate how the old distinction between "organic" and "functional" in the sense of physically or mentally determined is breaking down. Is the disturbance which appears on x-ray plates as the "deficiency" or "motor dysfunction" pattern organic or functional? Perhaps the question does not make sense, and what we should ask in this, as in all changes of function in living persons, is: How far can this behaviour be explained by physical methods, and how far by psychological? The further applications of such a

¹ *Amer. J. Roentgenol.*, 1954, 72, 367.
² Cannon, W. B., *Bodily Changes in Pain, Hunger, Fear and Rage*. New York, 1929.
³ Wolf, S., and Wolff, H. G., *Human Gastric Function*, 1943.
⁴ Grace, W. J., Wolf, S., and Wolff, H. G., *The Human Colon*. London, 1951.

dual approach to gut function, whether by means of x rays or not, may well bring information of clinical value, and at the same time further illuminate gut-mind relationships.

UNEQUAL TRANSRADIANCY OF THE LUNGS

Chest radiographs showing one lung to be more translucent than the other are commonly seen when pulmonary distension has occurred to compensate for lobar or segmental collapse of a lung. A similar radiological picture is seen when partial bronchial occlusion has led to obstructive emphysema, and more rarely when an abnormality of the chest wall, such as loss of breast tissue following amputation, or congenital absence of the pectoral muscle, gives the illusion of abnormal translucency. Recently Macleod¹ drew attention to a group of patients whose radiographs showed abnormal transradiancy of one lung but in whom none of the usual causes were apparent. In nine such cases care had been taken to exclude abnormalities of the bronchi by bronchography and bronchoscopy. Most of the patients investigated suffered from increasing shortness of breath; cough was uncommon, but many of the patients were troubled by wheezing. Physical examination demonstrated diminished chest movement and reduced breath sounds on the affected side. Rhonchi, when present, were evenly distributed over both sides of the chest. Radiographs taken in inspiration showed increased translucency of one lung, the mediastinum being displaced towards the affected side in six of the patients. On expiration the difference in transradiancy was increased, and mediastinum shifted towards the normal side. Bronchograms showed that the finer bronchial radicles scarcely filled with oil and that there was almost no alveolar filling at all; there was, however, no abnormality in the calibre or distribution of the main bronchi.

These features made it clear that the patients were not suffering from obstructive emphysema, bullous emphysema, or cystic disease of the lung. In seeking an explanation for the underlying abnormality, only clinical evidence was available, since in no case had morbid anatomical or histological examination been possible. Macleod thought it unlikely that there was a congenital basis to these cases. He thought that some of them might be examples of unilateral emphysema, and measurements of the intrapleural pressures in one patient were in keeping with this diagnosis. The six cases in which the mediastinum was displaced to the diseased side were more difficult to explain. Here, Macleod thought the most likely explanation was that the affected lung had, during the time when growth was taking place, been affected by some disease which temporarily retarded its development. Later, when the primary disease had abated, the affected lung was stretched beyond its normal capacity in an effort to fill the hemithorax. It is quite conceivable that such a sequence of events could take place as a result of primary tuberculosis with transitory partial bronchial obstruction. The natural history of this disorder needs further observation before it is fully understood.

¹ *Thorax*, 1954, 9, 147.

HEALTH OF SCHOOLCHILDREN

Since the end of the war children's mortality rates for infectious diseases have startlingly diminished, and even for diseases less susceptible to antibiotic attack they have shown a gratifying fall. The death rate per 100,000 for children aged 5-9 was, for infectious diseases (including tuberculosis), 22.7 in 1946 and only 6.5 in 1952. For children aged 10-14 the fall was from 19.6 to 4.9.¹ Rates for other causes combined fell to about two-thirds of their 1946 values. It is against this background that the Chief Medical Officer of the Ministry of Education can report² that in 1953 the health of schoolchildren was everywhere satisfactory. The general condition of the children examined at medical inspections was found to be "good" in just under 45%, "fair" in 53%, and "poor" in just over 2%. Diphtheria is now an uncommon disease owing to the immunization campaign. There were fewer outbreaks of food-poisoning, and probably no increase in the prevalence of rheumatic fever—possibly a fall. But in contrast to the great improvement in response to serious disease the C.M.O. has to record deterioration in other respects, though the diseases concerned are milder or relatively trivial. Perhaps most notable is the increase in dental caries. Indeed, "the figures of all areas show a substantial increase of caries in 1953 as compared with 1948." The most likely cause seems to be the almost incessant consumption of sweets, chocolate, and buns³ that has become habitual to the children of far too many ignorant or over-indulgent parents. In spite of modern pesticides, over 300,000 children were found to be verminous, a figure that the report concedes to be disappointing even though it is the lowest so far recorded. No doubt education has a large part to play here, for in some sections of the population lice are looked upon as more or less normal commensals, and lousy parents provide a constant supply of fresh reserves as the lice infesting their children are wiped out. More and better co-operation between school doctors and general practitioners is a happy feature of the report, and by and large relations with hospitals seem to be cordial. But as Dr. C. W. W. Jeremiah, of Nottinghamshire, is quoted as recording: "Co-operation is a matter of personal relationship and cannot be dictated by 'powers that be,' be they national or parochial."

AGENE TREATMENT TO END

Last week the Minister of Food announced in Parliament⁴—some would think rather belatedly—that the agene treatment of flour is to end after December 31, 1955. Almost five years ago the Ministries of Health and Food concluded that the use of nitrogen trichloride (the agene process) for improving flour ought to be discontinued, and, as this *Journal* commented at the time,⁵ "it is disquieting that not until over three years after a possible danger to health was shown to exist have steps been taken to combat it." Now that those steps have

plodded on for another five years—and are to continue for almost twelve months more—the disquiet may at last give way to congratulation that the care of Parliament for its subjects' and of industry for its consumers' health has caught up with a scientific discovery made eight years ago. It was in 1946 that Sir Edward Mellanby reported in this *Journal*⁶ that agenized bread is a cause of canine hysteria, and a year later he found that it could cause the same symptoms in ferrets.⁷ In 1950 Mellanby, together with his colleagues P. N. Campbell and T. S. Work, isolated a crystalline toxic factor from agenized flour which on administration to ferrets caused severe epileptiform fits.⁸ It was apparently the same as a product obtained independently by a team working in the laboratory of the British Flour-Millers Association. Mellanby *et al.* emphasized that the poison was cumulative in effect: a fatal toxic reaction was produced by feeding to ferrets over five to ten days doses that were only a fraction of those that caused an immediate toxic response.

While animal experiments showed that the product of agenization is exceedingly poisonous to some animals, no satisfactory evidence has been adduced that it is harmful to man. The presumption is nevertheless reasonable that a substance so poisonous to some mammals ought not to be incorporated in human food, especially in such a staple food as bread. Popular taste may well demand "improved" flour, and limits of storage space necessitate it, but the replacement of agenization by another process can only be welcomed. What the best method will be is still under investigation. The chief chemist of J. Lyons and Co. recently referred to some of them,⁹ and in particular to a new method of mixing the dough so as to oxidize the flour by means of aeration. To anyone who has a healthy scepticism about adding chemicals to food this line of research would seem to be well worth following up.

EMERGENCIES IN GENERAL PRACTICE

The first of a new series of articles in the Refresher Course for General Practitioners appears in this issue at page 39. The articles will all be concerned with emergencies in general practice—medical, surgical, obstetric, and psychiatric—and will range in subject from such common disorders as cardiac asthma, discussed this week by Dr. J. G. M. Hamilton, to the accidental swallowing of poisons by children, and from post-partum maternal collapse to acute lumbago and sciatica. Articles previously printed in the Refresher Course series have proved popular in book form, two volumes having so far been published and the third, *Clinical Pathology in General Practice*, being in the course of preparation. The aim of the new series on emergencies is to provide reliable, up-to-date, and practical advice, bearing in mind the nature of domiciliary practice and the special problems of the general practitioner.

EMERGENCIES IN GENERAL PRACTICE
CARDIAC ASTHMA

BY

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The term "cardiac asthma" is applicable to a clinical syndrome—paroxysmal dyspnoea due to heart failure—with a range of severity extending from urgent acute pulmonary oedema to transient nightly attacks of cough, wheezing, and breathlessness, though used by some to refer only to the latter. Although such paroxysms sometimes occur in the presence of mitral stenosis, they are most commonly an expression of left ventricular failure in hypertensive, coronary, or aortic valvular disease. A sudden attack of intense dyspnoea is not infrequently caused by acute myocardial infarction, and the occasional absence of the characteristic pain or the overshadowing of pain by the intense dyspnoea may result in the basic lesion being missed.

Clinical Picture

The patient is most commonly in the second half of life and may or may not be known to suffer from hypertension or coronary disease. He is awakened from sleep, or roused from quiet, recumbent rest, by cough and breathlessness which may rapidly reach urgent severity so that he is obliged to sit up gasping for breath and hardly able to speak. Soon some frothy, watery sputum appears, becoming in the most severe attacks profuse and pink through blood-staining. Wheezing may be prominent. The patient's distress is often accentuated by the occurrence of Cheyne-Stokes periodic respiration. During the phases of apnoea he may fall back on his pillows and close his eyes in thankful comfort, only to be roused in a few seconds by terrifying distress as the phase of hyperpnoea develops. The tantalizing repetition of the cycle may be almost unbearable.

In less severe attacks of breathlessness with cough and wheezing the intensity of the symptoms may decline spontaneously after the patient has been sitting up for 20 to 30 minutes and he may return to sleep without medication. While a severe attack is sufficiently alarming for medical help to be summoned, in the case of the lesser attack the patient commonly consults his doctor only after several disturbed nights. He may be free from breathlessness by day or admit only to some effort distress if questioned. The described picture of cough, wheezing, and breathlessness all too often leads to an erroneous diagnosis of bronchitis or bronchial asthma and the prescription of an ineffectual expectorant or linctus, or the administration of isoprenaline or adrenaline.

The patient taken urgently ill in the night is seen to be sweating and cyanosed, with cold extremities. The heart is accelerated, while the rhythm, commonly regular, may be disturbed by extrasystoles or auricular fibrillation. The blood pressure is usually elevated, often grossly, pulsus alternans being often observable, but may have fallen from a previously hypertensive level to a normal or low level either because of the severity of the heart failure or because the attack has been precipitated by the occurrence of acute myocardial infarction. A complaint of gripping, crushing, or burning retrosternal pain, severe or slight, prior to or coincident with dyspnoea may draw attention to this possibility, which is of more than academic interest, even in the middle of the night, for in several respects treatment should be varied according to whether or not infarction has or seems likely to have taken place. Cardiac enlargement is almost invariably to be found and should be looked for by palpation of the apical impulse, for this provides the necessary conclusive evidence of the existence of organic cardiac

disease, and, in the presence of a normal or low blood pressure and the absence of aortic valvular disease, establishes that hypertensive heart disease underlies the condition. Further valuable evidence of heart failure is provided by the finding on auscultation at the apex of triple or gallop rhythm. The neck veins are often somewhat engorged, but oedema of ankles or sacrum is generally absent, since attacks of cardiac asthma usually antedate the appearance of right heart failure and indeed may cease to occur when right ventricular failure supervenes.

Although respiration may be noisy with wheezing rhonchi, crepitations are to be heard over both lungs, in severe cases in all areas to such an extent and in such profusion that the lungs seem waterlogged, in less severe cases predominantly at the lung bases.

In the case of the patient examined between milder attacks similar evidence of heart disease will be found—hypertension, cardiac enlargement, and basal crepitations, although these last may be scanty at such a time.

The need to elicit these signs of heart disease has been stressed, since there is no little chance that hasty consideration of the symptoms of cough, wheezing, and dyspnoea, and the finding of harsh respiration with rhonchi and crepitations, may focus attention on the respiratory tract and lead to a diagnosis of bronchitis.

Paroxysmal dyspnoea of this type—cardiac asthma—except in the instances in which it is actually precipitated by myocardial infarction or paroxysmal tachycardia, occurs for the most part at night before or during sleep. It may be the first clear manifestation of heart failure in the hypertensive subject, though it often comes after a decline in effort tolerance has set in. Cardiac asthma, however, seldom develops for the first time in patients already under adequate treatment for hypertensive heart failure unless it is due to the occurrence of some complication such as infarction or a paroxysmal arrhythmia. Severe nocturnal attacks may follow unduly vigorous exertion during the preceding day, or an injudiciously large meal in the evening, or high excitement, including intercourse.

Cause of the Dyspnoea

The symptoms of cardiac asthma are immediately due to pulmonary engorgement. Quiet rest in bed with its decline in physical effort and reduction in metabolism is associated with reabsorption of tissue oedema fluid, even where this has not been manifest, and therefore with an increase in circulating blood volume. The recumbent posture results, owing to the removal of the influence of gravity, in an increased venous return to the right side of the heart which, through increased venous filling pressure, is a stimulus to increased ventricular output. In the presence of hypertension or aortic valvular disease or coronary sclerosis, whose main detrimental influence is upon the left ventricle, this chamber, beginning to reach the stage of dilatation and failure, may be less able to respond to such a demand for greater effort and output than the less directly burdened right ventricle. The vascular bed between these chambers—that is, the pulmonary capillaries and venules—is congested therefore to accommodate the excess of the right ventricle's output over that of the left, tiny though that excess may be at each stroke.

Pulmonary congestion and the resulting transudation of oedema fluid into the alveolar walls and cavities progressively reduce the vital capacity, while the emergence of this fluid on to the sensitive bronchial epithelium touches off

¹ Martin, W. J., *J. Hyg. (Lond.)*, 1954, 52, 417.
² *The Health of the School Child: Report of the Chief Medical Officer of the Ministry of Education 1952-3*. H.M.S.O. 5s.
³ Dental Health of Children: Memorandum by the Child Dental Health Committee of the British Dental Association, *Brit. dent. J.*, 1954, 96, 199.

⁴ See *Journal*, p. 50.
⁵ *British Medical Journal*, 1950, 1, 295.
⁶ *Ibid.*, 1946, 2, 885.
⁷ *Ibid.*, 1947, 2, 288.
⁸ *Nature (Lond.)*, 1950, 165, 345.
⁹ *British Medical Journal*, 1954, 2, 1410.

the cough reflex. Either the dyspnoea of reduced vital capacity and stiff congested lungs or the cough wakens the patient. The intense effort of the dyspnoea and cough constitutes very vigorous exercise which itself aggravates the cardiac embarrassment. An additional factor operating in some cases is general peripheral arteriolar constriction. The increase in arterial pressure which this causes throws a sudden additional load on a left ventricle already prejudiced by established hypertensive disease, coronary ischaemia, or both, and precipitates left ventricular failure. In such cases the blood pressure is found to be elevated well beyond what is known to be that patient's customary level.

In the mild or moderate case the assumption of the erect posture when the patient sits up in bed, or better still in a chair with his feet on the floor, may break the vicious cycle of pulmonary engorgement→dyspnoea and cough→exercise→further pulmonary engorgement→worse dyspnoea, by allowing a reduction in venous return so that the labouring left ventricle can gradually overtake its debt and clear the pulmonary congestion below the critical level. Then the attack may end spontaneously. In the worst cases the vicious cycle progresses and the patient dies, drowned by his own pulmonary transudate.

Partial ischaemia and anoxia of the respiratory centre resulting from diminished arterial output from the overloaded left ventricle, combined probably with a measure of cerebral vascular stenosis, especially in the elderly, is the cause of Cheyne-Stokes respiration in cardiac asthma. It is not to be attributed to uraemia in the circumstances under discussion.

Immediate Treatment

Treatment of cardiac asthma resolves itself into the handling of the emergency and the long-term management of the underlying disorder with the object of rendering less likely the repetition of such disturbing and dangerous crises which are almost certain to recur if the crisis is taken on its own and sustained treatment neglected.

In the emergency morphine should be administered immediately the diagnosis of cardiac asthma has been made. The object here is twofold: first, to reduce the sensitivity of the cough reflex and of those respiratory reflexes having their origins in the stiffened congested lungs, whereby the intensity of the effort of coughing and breathing may be diminished, and, secondly, to calm the apprehension, even panic, and the restlessness which a severe attack of cardiac asthma causes in even the most phlegmatic person. With these effects achieved venous filling pressure on the right heart and therefore right ventricular output are reduced and the left ventricle given an opportunity of partially clearing the congested pulmonary vascular bed. The effects must be achieved with the maximum certainty and without delay, since any severe attack of this condition must be regarded as critical and immediately endangering life. For a patient of average or over-average weight morphine sulphate, $\frac{1}{2}$ gr. (15 mg.), should be injected intravenously and the same quantity subcutaneously. In the presence of acute heart failure absorption of the whole dose from a subcutaneous injection is undesirably slow, and if intravenous injection is for any reason impracticable, half of the total dose of $\frac{1}{2}$ gr. (30 mg.) should be given by intramuscular injection. In the case of patients of under-average weight the total dose can be reduced to $\frac{1}{4}$ gr. (20 mg.), but again half of this dose should be given intravenously. When the attack is of only moderate severity the ordinary subcutaneous injection of morphine, $\frac{1}{2}$ gr. (15 mg.), may suffice.

Many practitioners combine a dose of atropine sulphate with the subcutaneous injection of morphine or even give atropine alone. This habit is based upon a misconception that the excessive fluid in the respiratory passages is due to excessive bronchial secretion. However, the fluid is in reality transuded oedema fluid whose production cannot be controlled by paralyzing by atropine the bronchial secretory glands. If atropine has any action in cardiac asthma it is by depressing vagus-mediated reflexes involved in the pro-

duction of dyspnoea. Atropine is better omitted altogether, since the dryness of the mouth which it induces makes the patient demand fluid to drink which he would be better without.

Although Cheyne-Stokes respiration, if present, may be expected to be aggravated by the injection of a large dose of morphine, this must not deter the physician from giving morphine in an adequate dose. The distressing dyspnoea (which is what immediately matters) of the hyperpnoeic phases will be suppressed. The periodicity of the respiration, however, can usually be rapidly relieved by an intravenous injection of aminophylline, 0.5 g. Such an injection should be given in all severe or moderate cases, even in the absence of Cheyne-Stokes breathing, for its vasodilator and bronchodilator action.

The patient should be propped securely on a high bank of pillows or made comfortable in an easy chair.

Other Measures

The question of the administration of digitalis or digitalis glucosides requires rather more careful consideration in each case. When the patient is known not to have been taking digitalis or digoxin for at least a week before the attack, and when there is no reason to suppose that acute myocardial infarction has occurred, digoxin, 1 mg., should be injected intravenously directly after the administration of morphine. It may be combined with the injection of aminophylline. When the patient is known to be fully under the influence of an adequate maintenance dose of digitalis or digoxin already, it is wise to assume at the time of the acute episode that the attack is due to the occurrence of myocardial infarction and withhold the intravenous injection of digoxin. Such should also be avoided, even in the undigitalized patient, when the features of the case strongly suggest that an infarction has precipitated the crisis. The risk of inducing paroxysmal ventricular tachycardia or even fatal ventricular fibrillation is not negligible. Reliance should then be placed on intravenous morphine and aminophylline for the emergency and digoxin, 0.5 mg., given by mouth as the starting point of a more gradual process of digitalization.

Where there is a strong clinical indication that acute myocardial infarction has taken place, early and rapid anticoagulant therapy with heparin may prevent an immediate extension of the infarct, with serious and perhaps fatal results. Heparin, 10,000-15,000 units (100-150 mg.) according to body weight, should be given intravenously and repeated six hours later, after which it can be decided whether a full course of anticoagulant therapy is to be undertaken.

If oxygen is readily obtainable it should be used. It is desirable that a flow-meter should be employed and a flow of 6-8 litres a minute administered by double nasal catheter or by a light plastic nose-and-mouth mask. The patient should be allowed to go to sleep with this in place, but naked lights should not be permitted near the oxygen cylinder or the mask.

If in a severe case dyspnoea does not subside within 10 to 30 minutes of the injection of morphine, venous tourniquets should be applied on the proximal parts of all four limbs to reduce venous return. They should be tight enough to hamper the venous outflow from the limbs but not tight enough to impede the arterial inflow. After about an hour the tourniquets should be slowly released one at a time to avoid a sudden augmentation of venous return which would again overload the recovering heart.

Rapid venesection of one pint (570 ml.) through a wide-bore needle, or by simply slashing a vein, may be usefully employed instead of the above "bloodless phlebotomy," especially in plethoric patients.

When a striking rise in blood pressure is observed, suggesting a hypertensive crisis, the use by intravenous injection of powerful vasodilators and hypotensive agents such as tolazoline and the methonium compounds has much to

commend it on theoretical grounds. In patients suffering from severe acute left ventricular failure due to hypertension the rapid reduction of an extravagantly high blood pressure may so reduce the load on the failed left ventricle as to contribute importantly to the interruption of the vicious cycle. Beneficial effect has been obtained in many such cases, but the use of methonium compounds by intravenous injection is fraught with risks and is better avoided except by those with experience of their use in this and other fields.

Long-term Management

On the morning after the severe attack the long-term measures should begin. Arrangements should be made for the patient to be confined to bed, well propped up at night, or to bed and a chair in his room according to the severity of the condition, in the "uncomplicated" case for about two weeks, but of course for longer when myocardial infarction has been diagnosed. Mersalyl, 2 ml., should be given by intramuscular injection, to be repeated two days later, twice weekly for two to three weeks, and weekly thereafter, even though manifest peripheral oedema be absent. A more cautious approach to the use of full doses of a mercurial diuretic—for example, mersalyl, 0.5 ml. for the first dose and 1 ml. for the second—is indicated where previous symptoms of prostatic hypertrophy suggest the possibility of acute retention being precipitated by the sudden massive diuresis of the full dose. The process of thorough digitalization should be continued by ordering, for example, digoxin, 0.25 mg. thrice daily by mouth. Later, when a full digitalis effect has been achieved, as indicated by the appearance of anorexia and squeamishness, the dose should be adjusted, after 24 to 48 hours' "desaturation-holiday," to one suitable to maintain an optimum digitalis effect for the rest of the patient's life. The occurrence of cardiac asthma should be the signal in the untreated patient for the institution of the "digitalis life."

Moderation of salt intake should be arranged by the prohibition of salty foods and added salt, the limitation of salt in cooking, and the avoidance of sodium-containing medicines. If severe sodium restriction can be achieved and if a mercurial diuretic is regularly given the patient can be permitted a normal fluid intake.

For three or four nights after the acute attack of cardiac asthma morphine, $\frac{1}{4}$ gr. (15 mg.), should be given subcutaneously and for a week thereafter an opium-containing hypnotic given by mouth, such as:

Chloral hydrate	gr. 20 (1.5 g.)
Tincture of opium	min. 20 (1.2 ml.)
Liquid extract of liquorice	min. 10 (0.6 ml.)
Water	to fl. dr. 2 (7 ml.)

It is important that until the full effect of digoxin, mersalyl, and rest has been obtained the patient be protected by opium against a recurrence of the nocturnal crisis.

In the case of the patient complaining of recurrent milder attacks of cardiac asthma at night an opium-containing hypnotic is indicated for seven to ten nights. For this purpose a mixture like the above, but with 30 gr. (2 g.) of chloral hydrate and 30 min. (1.8 ml.) of tincture of opium, is suitable, half the dose being given in the last few nights of the period or for a few further nights if required. He should be advised to use extra pillows and to avoid slipping down to a low position if he can. While the patient is thus protected against the nocturnal attacks he should be brought fully under the influence of digoxin in the usual way and a permanent maintenance dose established. Again, even in the absence of manifest oedema, intramuscular injections of mersalyl, 2 ml., should be given in the morning twice a week for two or three weeks, and weekly thereafter.

The other measures called for in the treatment of cardiac failure—salt limitation and modification of habits in respect of physical and mental effort—will if necessary be inaugurated at the same time. In the milder cases under consideration, unless there are manifest features of chronic heart failure or frank evidence of serious coronary disease, it is seldom necessary to confine the patient to bed for more

than perhaps a day or two, though a week or two off work with modified rest about the house is desirable while the full effect of treatment is being attained.

Conclusion

There must be few acute disorders in the non-surgical realms of adult medicine in which treatment is so immediately rewarding as in cardiac asthma. The utter relief of the acutely dyspnoeic patient, or the achievement of nights blessed by sound sleep undisturbed by attacks of wheezing breathlessness in the less severely ill patient, does, for me at any rate, amply reward the night-call, the bloody mess of the venesection, or the early morning injection of mersalyl. However, it cannot be too often or too forcibly emphasized that the foundation of the emergency treatment of this serious and dangerous disorder is its recognition as heart failure and not bronchitis, and the use of morphine, aminophylline, and digoxin, and of its prevention the permanent treatment of hypertensive and coronary heart disease with digoxin, mersalyl, and salt restriction.

Next article on Emergencies in General Practice.—"Respiratory Insufficiency in Poliomyelitis and Other Diseases," by Dr. W. Ritchie Russell.

Refresher Course Books.—Copies of the first two volumes of collected articles from the Refresher Course for General Practitioners published in the *Journal* are still available at 25s. (postage 1s.) each. The first volume contains 55 articles and the second 60. Each article has been revised and brought up to date by its author.

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THE SWEEP-FREQUENCY METHOD OF MAKING SCREENING TESTS OF THE HEARING OF SCHOOLCHILDREN

STATEMENT PREPARED BY PROFESSOR A. W. G. EWING AT THE REQUEST OF THE M.R.C. COMMITTEE ON THE EDUCATIONAL TREATMENT OF DEAFNESS*

In a recent investigation it was found that approximately 70% of pupils in English schools for the deaf and partially deaf have suffered from their handicap since before the age of 2 years. From the Ministry of Education's returns and from the results of recent surveys it seems that nearly all deaf children are admitted to special schools by the age of 7 years, but that the ascertainment of partial deafness as a cause of educational retardation is at present less effective among children under 7 than among those who are older.

The sweep-frequency technique has been shown to be a reliable and efficient method of making screening tests of the hearing of 5- and 6-year-old schoolchildren. A pure-tone audiometer is used, and, when the range of frequencies that are used is extended from 250 to 6,000 cycles per second, early symptoms both of conductive and of perceptive deafness can be detected. It has been established that a sweep check over this range of frequencies at 15 decibels above normal threshold of detectability is more thorough and reliable as a screening test than the use of word material (as in the test by gramophone audiometer), the loudness of which cannot be monitored satisfactorily for this purpose. The fading-intensities, called-number test has been shown to be sometimes ineffective for the detection of high-tone deafness.

*Sir Frederic C. Bartlett (chairman), Mr. T. E. Cawthorne, Professor A. W. G. Ewing, Mrs. J. R. Ewing, Dr. D. B. Fry, Mr. C. S. Hallpike, Mr. D. Lloyd James, Mr. J. Lumsden, the late Mr. J. Spalding, Mr. A. B. Swayne, and Professor R. C. Oldfield (secretary).

Audiometricians who have been trained to work with young children are able to make a sweep check of auditory acuity, as an individual test, at a rate of three minutes per child. It has been shown that extraneous noise in a room in which a screening test of hearing is to be made should not exceed about 30 decibels. The sweep-frequency test can be made in a small room. When it is necessary to make screening tests of children's hearing in school buildings it is much less difficult to find small rooms that are quiet, in schools, than large rooms.

The sweep-frequency test can be made immediately or soon after children are first admitted to school, whereas the gramophone audiometer test, as normally administered, is a group test, in which children are required to write down numbers that they hear. It cannot therefore be used with children younger than 8 years. The sweep-frequency test is very valuable in screening out children who are likely to need hearing-aids and special educational treatment, before they have been exposed to the risk of educational subnormality as a result of defective hearing.

A comparative study of the relative reliability of the sweep-frequency and gramophone audiometer tests, when both were administered to 6-year-old children individually, showed the sweep-frequency test to be superior. The called numbers that are used in the gramophone audiometer test involve a constrained context and are therefore often recognizable by children suffering from loss of hearing to a significant degree.

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Nova et Vetera

BLEEDING, CUPPING, AND PURGING

When Roderick Random, newly qualified, was seeking a position as an assistant to a well-established practitioner, he was faced with the pertinent question: "Can you bleed and give a clyster, spread a plaster, and prepare a potion?" From the beginning of history these three arts—together with that of providing more active counter-irritation by the seton or by the cautery—had formed the basis of the doctor's technique. In his recently published FitzPatrick Lectures for 1950-1* Dr. William Brockbank discusses authoritatively as much of the vast history of these subjects as can be fitted into the compass of a volume of reasonable size, and he has added an interesting summary of the history of intravenous injection. There is no similar work which covers the same field.

The enema, or clyster—for though philologically distinct the words are practically synonymous—has a very ancient history. Pliny appears to have been the originator of the myth that the black stork of Egypt used its long beak to give itself an enema of Nile water. Mediaeval illustrations show the bird carrying out the operation. But in fact the bird is probably only taking oil from its preen gland to preen its feathers. No modern observer has ever seen a bird acting as in Pliny's account.

The antiquity of the enema is shown by its distribution among primitive peoples. For example, the Eskimos use a

*William Brockbank, M.A., M.D., F.R.C.P.: *Ancient Therapeutic Arts. The FitzPatrick Lectures delivered in 1950 and 1951 at the Royal College of Physicians*. London: William Heinemann Medical Books, Ltd., 1954. Pp. 162. Price 25s. net.

portion of the gut of a seal, into one end of which a bone nozzle is bound. The simple enema tube was used by the Aztecs of Mexico and by the Maya of Yucatan. Other ancient races, such as the Peruvians, fitted a bulb to the enema tube, the bulb being often formed by the bladder of an animal. Both in Africa and in America gourds are commonly used as enemata at the present day, and a reed is frequently fitted to the narrow end of the gourd.

Excelsior

From the very earliest times the use of the enema has been cursed by an erroneous motto—*Excelsior*—on the part of its adherents. The Babylonians tried to reach the whole of the intestinal tract by giving their nauseous mixtures both by mouth and by the rectum at the same time. The ileo-caecal valve was not known until 1588, and much damage must have been caused by those appliances which attempted to drive the injection round the bowel by force. The most powerful apparatus of this type was finally invented by Equisier in 1848. In this apparatus the fluid was injected suddenly by means of a powerful spring.

In general all practitioners up to the mediaeval period used what might be termed "rectal polypharmacy," and many an inflamed colon must have been violently irritated by the drugs employed. Avicenna was the first to use soap and water as the common basis. John Arderne, who practised surgery at Newark-on-Trent in the second half of the fourteenth century, wrote a celebrated treatise on fistula, and he gave a description and illustration of his enema apparatus. Arderne used a swine's bladder to inject the fluid. (There is, incidentally, no justification for calling him, as Dr. Brockbank does, John of Arderne.) The piston syringe as a means of propelling the injection is shown in a fifteenth-century carved-wood apothecary's sign which was presented to the Museum at Bruges in 1880; but the syringe may have been in use earlier, since such a method is employed by certain primitive races, notably the Catawba Indians of North Carolina.

At certain periods patients appear to have been shy of allowing themselves to be treated by this method, while at other times they were just the opposite. Ambroise Paré seems to have been the first to introduce an enema syringe by using which the patient could administer the enema to himself. De Graaf and others invented similar types of apparatus, and in the eighteenth century the enema stool became popular. Molière and the Roi-Soleil unintentionally popularized the use of the enema, and from that time onwards it appeared in cartoons and on the canvases of the great artists. In 1695 Dekkers published a practical manual at Leyden, and in this he devoted nearly 100 pages to the use of the enema. In 1480 Louis XI, suffering from apoplexy, was relieved by an enema, and from then on he had his pet dogs treated by this method. Early in the nineteenth century an engraving was published showing a pet dog receiving an enema under the supervision of learned physicians. Satirists such as Rowlandson and Gillray frequently introduced the enema in their political cartoons. The rubber bulb attached to an enema tube seems to have been used in the Amazon region from early times. It was brought to Europe by the Portuguese shortly after 1740, and its use spread widely. Higginson invented his syringe about 1850.

Cupping Horns

Cupping has also an ancient history. The ends of animal horns are still used by primitive races, and in the Wellcome Collection there is the equipment of the personal physician of Cetewayo, the Zulu chief. It contains no fewer than thirteen such cupping horns. Dry cupping is performed by inverting over the skin a glass vessel which has been exhausted by a flame. It is an interesting and harmless experiment to carry out this simple operation on oneself. I have never seen the method used on a patient,

but as a student its use was demonstrated to me as a method which had practically died out. Dr. Brockbank also says he has never seen a patient cupped; but he quotes very appositely George Orwell's description of his treatment for pneumonia in a Paris hospital in 1929—six cupping glasses, followed by scarification of the blisters, reapplication of the cups, and then a mustard poultice. This was really wet cupping, in which the aim was to draw blood into the evacuated cups. Paré introduced the mechanical scarifier, a devilish instrument which produced at once up to eighteen incisions within the area of the cup. These scarifiers were used until well into the nineteenth century. In some instruments the movement of the blades is so rapid that it is quite invisible.

Dr. Brockbank deals with the subject of leeching less fully than one might have expected. He might have said something about the bloody war which raged in France during the 1830's. On the one side Broussais, on the other P. C. A. Louis. In nine years (1824-33) the teaching of Broussais increased the number of leeches used in France from 3 to 40 million annually. It was at this period that a physician at the Val-de-Grâce was in the habit, when he arrived at the hospital for his visit, of asking how many patients had been admitted. He thereupon ordered 30 leeches each before he had examined them. There is a well-known satire which shows Broussais ordering a further ninety leeches for a moribund patient—"and continue the diet." Dr. Brockbank gives a most interesting account of the variations in the number of leeches used in the Manchester Infirmary between 1782 and 1882. These variations correspond with those described by Marshall Hall at the General Hospital, Nottingham.

On the subject of counter-irritation by other means Dr. Brockbank is very interesting. Cantharides as a blistering agent is of course of great antiquity, and, as the "fly-blisters," was used in the early years of the twentieth century, and may indeed still be used. The seton is essentially a cord of silk or cotton inserted through the soft parts and left to drain away the resulting pus for a period of a year or more. Very frightening were the instruments for the insertion of setons invented by Paré, Glandorp, Bartisch, and others. An issue, or fontanelle, was a pea or a metal cylinder inserted in the superficial tissues to produce supuration. It disappeared from practice early in the nineteenth century, and the seton a few decades later. A moxa was a cone of *Artemisia moxa* which was applied to the skin and slowly burned to produce a blister. This Chinese method of counter-irritation came to Europe in the seventeenth century and had been discarded before the middle of the eighteenth.

Dr. Brockbank's very readable and valuable book would be enhanced by the addition of an index. It is well produced—though the style of production may be rather modern to suit everyone. Some may still think that the best place for a caption is below its illustration and not on the opposite page. In this, as in some other "modern" books, the "title-page" can no longer be termed such, for it has been shorn of one-third of the title of the book. The erring word has wandered over to the reverse of the page traditionally known as the "half-title." The bibliographer will have to revise his terminology.

E. ASHWORTH UNDERWOOD.

A study group set up by the World Health Organization to consider the identification and classification of the snail vectors of bilharzia found that confusion existed not only in the nomenclature of the species but even in the delimitation of the genera and the family to which snails belong. It was therefore unanimously agreed that the family name should be "Planorbidae" and that the intermediate hosts should be placed in the two subfamilies "Planorbinae" and "Bulininae." *Wld Hlth Org. techn. Rep. Ser.* No. 90, 1954, Geneva.

Preparations and Appliances

A FOOT EXERCISER FOR USE WITH A THOMAS SPLINT AND A TULLOCH BROWN U-LOOP

Dr. R. C. LEMON, accident and orthopaedic registrar, Royal Buckinghamshire Hospital, writes: All leg splints to-day have attachments for the prevention of foot-drop. The two exercisers in use at this hospital were designed not only to prevent foot-drop but also to enable the patient to plantar-flex his foot actively and against a spring resistance. They are easy to make, are simple in construction, and have been a great aid in keeping up the tone of the patient's leg muscles. They have been used in fractures, and in cases of arthroplasty of the hip in which traction has been deemed advisable by means of a Tulloch Brown U-loop. Both exercisers are basically the same in construction. The first can be used on any Thomas splint or its Pearson attachment (Figs. 1 and 2). It consists of a foot-rest, in this case made of aluminium, which can be adjusted up or down by means of a screw-bolt so that its curved upper end is at the level of the metatarsal heads. The foot-rest is attached to an axle which clamps to the side bars of the splint, the axle itself having a telescopic device so that it can be adjusted to any width of the splint (Fig. 2). The resistance is obtained by a spring attaching to the bottom of the foot-rest and to a clamp which can be screwed to either side bar of the splint at any required distance from the foot-rest to increase or diminish the resistance against which the foot has to work.

In the case of the exerciser for the Tulloch Brown U-loop, advantage has been taken of the Nissen foot-plate already provided with the splint. The foot-rest has been made adjustable up and down by means of a screw-bolt again.

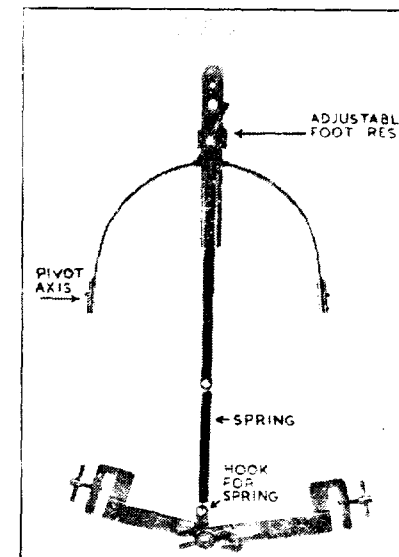


FIG. 1.—Tulloch Brown U-loop exerciser. The side bars of the splint are seen in the bottom of the picture.

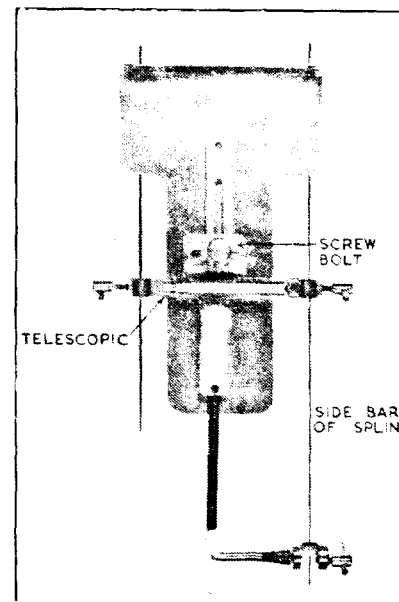


FIG. 2.—Thomas splint exerciser. The black lines indicate the side bars of the splint.

Mobility is attained by cutting off the flanges on the side pieces. The attachment for the spring is made by fixing a rigid steel bar vertically downwards from the foot-rest (Fig. 1).

The exercisers are placed against the foot and the spring tension is adjusted so that when at rest the foot is held at 90 degrees. Plantar flexion can then be carried out with the greatest of ease.

A thick woollen bed-sock is used on the foot to prevent any sores developing and to facilitate movement of the foot against the foot-exerciser. Padding attached to the foot-exerciser itself interferes with the movement.

I am indebted to Mr. G. Platt for his helpful criticism and advice; to Mr. Dudley, who made the exerciser to my design; and to Mr. Mason for the photographs.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Changes in the Mental Health Services

SIR.—Dr. J. B. S. Lewis (*Journal*, December 4, p. 1354) and Dr. J. Gibson (*Journal*, December 18, p. 1484) strongly advocate the abolition of mental observation wards, but a mental observation ward attached to a general hospital and administered by a general physician can do valuable work, for these reasons: (1) Facilities for laboratory tests and consultant medical and surgical opinions being more easily obtained at a general hospital, the investigation and treatment of physical causes for mental illness can conveniently be carried out there. In my own observation ward a large number of people have been admitted as mental cases when their illness was entirely due to physical causes such as pneumonia, empyema, meningitis, cerebral tumour, G.P.I., bromide intoxication, hypoglycaemia narcolepsy, myxoedema, Addison's disease, Simmonds's disease, and many other conditions.¹ The early detection and treatment of these organic cases is surely of importance and more easily done by a man who is in daily contact with acute medical work. (2) In a general hospital many patients with medical or surgical illnesses may develop mental symptoms—the delirious pneumonias, the head injuries, and others. If there is an observation ward attached to the hospital these people can continue treatment under the doctors that know their case without being transferred to mental hospital. It is also most beneficial to the other patients in a general ward if their mentally disturbed fellows can be temporarily moved out of the general ward. (3) The unfortunate compartmentation of medical from psychiatric work is lessened, particularly if an appointment is established where one man has charge of both general medical and mental observation cases. (4) For teaching a mental observation ward is invaluable. The assessment of the acute psychotic case and the early detection of organic causes for mental illness are just what are needed by students. (5) There are many people with mental illnesses that only last a few days, and it is an advantage if these people can be managed in an observation ward without their having to go to mental hospital. (6) Where the assessment of a suspected case of mental illness is difficult, it is far easier to judge the patient if he is under observation for a few days rather than decide at a short interview in his home. A fair decision as to his sanity is hence more easily made when the question of certification arises, and for other patients the choice of voluntary status, temporary order, or discharge can be more wisely made.

For all these reasons I think that observation wards ought to continue and that the L.C.C. are right in recommending this to the Royal Commission. To argue, like

Drs. Lewis and Gibson, that they should be abolished because some of them are overcrowded or badly staffed is not very sensible; some general hospitals are overcrowded and badly staffed, but one could not reasonably suggest abolishing all the general hospitals in the country for that reason. It is more logical to suggest that the staffing and equipment of observation wards should be improved where it is inadequate.

Observation wards are not always the places of noisy, nightmare horror your correspondents suggest. Often after a patient with delirium from pneumonia has been transferred to the mental observation ward from the general side I have, when he has begun to recover, said, "You can go back to the other side now," to be told, "I think I'd rather stay here, doctor—it's so much quieter."—I am, etc.,

London, N.W.10.

RICHARD ASHER.

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¹ Asher, R. (1954). *Trans. med. Soc. Lond.*, 70, 93.

Premedication of Children for Tonsillectomy

SIR.—The summary of Dr. Christine M. Rendell's article (*Journal*, December 11, 1954, p. 1397) indicated that in methylpentynol had been found an almost ideal drug for pre-operative sedation of children prior to tonsillectomy. This appraisal is not, I contend, justified by the text, with the findings of which I am largely in agreement, though not with Dr. Rendell's evaluation of them. In a smaller series than Dr. Rendell's a clinical impression has been gained by me that methylpentynol is in fact a very unsatisfactory pre-operative sedative.

Everyone would agree that some premedication is helpful in allaying fear, and in my series it was entirely "verbal" and carried out by the ward sister or anaesthetist, the only pre-operative drug used being atropine 1/100 gr. (0.65 mg.) prior to guillotine tonsillectomy. Our experience indicates that with this preparation alone the apprehensive or frightened child is rarely encountered—rather less often than once in ten cases. At the present time an investigation is under way to test this impression on a scientific basis. In the light of this clinical impression, then, Dr. Rendell's claim for the success of methylpentynol is open to doubt, and is rather weaker than for cases where only atropine was used. Methylpentynol did not rob the procedure of psychic trauma; Dr. Rendell admits that an inquiry after the children's discharge established that "many . . . retained a vivid and unpleasant memory" of the induction despite the statement that at the time they were "peculiarly happy and co-operative." It is hard to reconcile these two observations, since surely distaste on recollection of the event must imply the same feelings at the time. I cannot endorse Dr. Rendell's assertion that children find the "oblivion elixir" pleasant to take. All of my series were questioned immediately prior to induction, at a time when a favourable reply might have been expected. Only two in fifty-six children admitted liking the preparation, one, I suspect, out of politeness; the remainder disliked it intensely.

Dr. Rendell states that "in about a tenth of the cases the induction, always slower than after barbiturate premedication, was delayed by vomiting the elixir." On the first point I concur wholeheartedly; the effect is most noticeable. As to the incidence of vomiting (the summary states that unpleasant side-effects were not observed), I have been more fortunate in having only two such cases, but even this incidence I regard as highly unsatisfactory when one has not oneself, nor one's colleagues, encountered a single case of vomiting during induction in many hundreds of guillotine tonsillectomies where atropine alone was the premedicant. Post-operative vomiting following methylpentynol was almost invariable.

It is asserted that the children settled quickly post-operatively, a statement at variance with the implication that "nepenthe" was needed frequently post-operatively. This bears out my own observations to the extent that ward staffs actively disliked the use of methylpentynol on account of the almost universal post-operative restlessness and lack of co-operation that accompanied its use, after which nepenthe was invariably required. This by contrast to children who, having had atropine alone pre-operatively, very rarely require any post-operative sedation at all following ethyl chloride for the guillotine operation. My clinical impression on this point is that, whereas the non-drug-sedated child is soon completely "round" after the operation and after suitable explanation and reassurance will lapse into quiet sleep,

a child who has had methylpentynol is still confused and incapable of appreciating the situation, and thus reacts accordingly. This variation between the two groups, at the same operating sessions, has been most striking, and in the latter instance has certainly increased rather than decreased the nursing care required post-operatively.

Dr. Rendell points out that in fact the ill-behaved or frightened child, whom surely it is most important to sedate, is best premedicated with a barbiturate. Despite the fact that methylpentynol was liked by ward staff and anaesthetists its use was discontinued. My own impression of methylpentynol as a sedative, which bears out Dr. Rendell's recommendation above, is that its effects are, not surprisingly, as varied and to some extent as unpredictable as the more familiar ethyl alcohol when indulged in by persons of varying temperament and mood.—I am, etc.,

Portsmouth.

N. G. P. BUTLER.

SIR.—Using methylpentynol as a premedicant before tonsillectomy, Dr. Christine M. Rendell (*Journal*, December 11, p. 1397) found approximately 15% of children either tearful and apprehensive or screaming and resistant, and 85% calm and co-operative. The state of apprehension before premedication is not recorded, nor is there a comparable control series. Dr. Rendell concludes in her summary that methylpentynol "successfully diminished pre-operative apprehension." It may be argued just as reasonably, or unreasonably, that the failure rate showed pre-operative apprehension to be unaffected or increased. Indeed, the latter conclusion may be nearer the truth, as many observers will argue that these figures compare unfavourably with those following atropine premedication alone.

Dr. Rendell found that 10% of the children vomited during induction and a still greater proportion vomited in the theatre at some stage. Such vomiting may endanger life, and be distracting and disagreeable to both surgeon and anaesthetist. In the text of her article Dr. Rendell attributes this vomiting to gastric irritation induced by the drug. It is therefore a surprise to learn that the second conclusion in Dr. Rendell's summary (only too often the only part read when attempting to keep abreast of the literature) is that with this drug "unpleasant side-effects were not observed." It is unfortunate and misleading that this summary should contain such unsubstantiated conclusions divorced from Dr. Rendell's earlier statements that the drug "fell short of the ideal" and that she had since abandoned the method.

Finally, Dr. Rendell found that methylpentynol when compared with other premedicants prolonged the induction period, and that many children retained a vivid and unpleasant recollection of their experiences. Furthermore, in this series the children awaiting operation were allowed to observe the return from the theatre of their comrades, never a pleasant sight even under ideal conditions. May I be allowed to doubt yet another of Dr. Rendell's contentions, that "the importance of psychic trauma has long been realized"?—I am, etc.,

Portsmouth.

R. J. HAMER HODGES.

SIR.—The old question of premedication for tonsillectomies in children is a perpetual recurrent. Atropine gr. 1/100 (0.65 mg.) by injection and a kind and calm nursing staff is the safest and most satisfactory premedication there is. After all, any premedication swallowed gives increased gastric motility and increased risk of vomiting and its sequelae, any morphine derivative depresses respiration and makes it difficult to obtain the required depth of anaesthesia, and most children object more to rectal injections than a gas tactfully given. All the barbiturates make the children restless and difficult to control post-operatively unless there is a nurse for each patient. I give anaesthetics for upwards of five ear, nose, and throat lists a week, and I remain convinced that the best and safest premedication is atropine 0.65 mg. and nothing else.—I am, etc.,

Kew, Surrey.

D. B. HALSTEAD.

Appendicectomy in Chronic Appendicitis

SIR.—Professor J. Chassar Moir (*Journal*, December 11, p. 1415) has done well to draw attention to the paper by Mr. Iain McLennan and Mr. Kennedy Watt in which they claimed that the incidence of alleged chronic appendicitis is between three and four times as great in women of the menstrual age as in other females and of males of all ages.

This disparity is enough to justify strong criticism of the correctness of the diagnosis in females of the reproductive age. If it were true it would indicate a special vulnerability of the appendix as a result of the physiological processes of menstruation, but we know that the appendix and the pelvic organs have no specific association, for they belong to different parts of the body. Apart from the waste of time and energy, not to emphasize the distress caused by an unnecessary laparotomy, the patient suffers two other hazards which are even more serious. Only too often we hear after the operation that the right ovary was removed with the appendix. The general surgeon, who chiefly performs these operations, naturally cannot have the same specialized knowledge of the female pelvic organs as a gynaecologist of experience. On finding, as so frequently, a normal appendix that shows no evidence of previous inflammation, he is tempted to seek a further source of the patient's pain. The right ovary is near by and is easily picked up. It will usually contain a follicle cyst or corpus luteum, perhaps some old unruptured follicle, and is thereby incriminated and removed. The ovary seldom is the seat of pain. Perhaps in endometriosis, but not always, possibly if prolapsed with a varicocele of the pampiniform plexus of veins, and as a part of salpingo-oophoritis. It is a serious matter to remove a normal ovary from a young or not so young woman, but it is a common part of the unnecessary operation for so-called chronic appendicitis.

A second hazard is a diagnosis of "adhesions" to explain the recurrence of the old pain after a few months, which may lead to a further operation or even more than one. And thus in some introspective types of feeble personality is laid the foundation of the "chronic abdominal woman." When I was a house-surgeon one of my chiefs used to warn us "never to open the abdomen for pain alone." Unless there are some other symptoms, physical signs, a significant history, or positive tests, the surgeon will usually draw a blank. So few of these women who are diagnosed as cases of chronic appendicitis, especially the young ones, can show any supporting evidence of true appendicitis.—I am, etc.,

London, W.1.

ALECK BOURNE.

SIR.—It is a fortunate thing that the lower abdominal pain and tenderness, which is so frequently associated with chronic inflammation of the cervix uteri, is rather more common on the left side than on the right. There is no doubt that this is the reason why more women than would otherwise be the case have been able to preserve their normal appendix from its surgical removal.—I am, etc.,

Glasgow, S.W.1.

JAMES MAIR.

SIR.—General practitioners naturally see things differently from those whose work is limited to hospitals, and as a G.P. I am afraid that I must disagree profoundly with several of Professor J. Chassar Moir's laudable attempts (*Journal*, December 11, 1945, p. 1415) to lay down the law about chronic appendicitis. But, before I do so, may I suggest that "a more plausible explanation" is not necessarily more correct, and certainly not more scientific, especially when its plausibility lies in assuming the other fellow to be wrong. But in fact the chart of age incidence, to which he refers, has very little validity from which to argue as he does, for any general practitioner of experience knows how frequently patients deny that they have had pain or other symptoms previously until confronted with his written record of such occurrences, often years before.

From the data given the chart should be more correctly construed (with a slight shift to the right) as a chart of the time at which the patients came to operation. If this is done, several suggestions seem reasonable, the first being that the sudden increase at the age of 16 (if the relatively small numbers justify any conclusion, though they accord with my impressions) represents the time when the girls leave school and become more able to decide their destinies for themselves. Also, if the pain is at all serious it interferes with their earning capacity and makes operation more desirable. After a woman has begun to have a family she finds it increasingly difficult to get away for an operation, and all practitioners are familiar with the way women struggle on with all sorts of disabilities. Until these personal and family factors are taken into consideration it would be risky to draw even the most "plausible" conclusions from the chart, particularly as we do not know what proportion of the younger age group were treated at children's hospitals.

Professor Chassar Moir's final paragraph, "facing the facts," is quite contrary to my thirty-odd years' experience here, during which we have had the inestimable advantage of being able to operate on any case which seemed to require it. Pain may be completely absent in cases of chronic and even pretty acute appendicitis, and if present it may be felt far from the right iliac fossa or the umbilicus; there may be no apparent history of gastric disturbance. An enormous amount of time, money, and energy is consumed by "complete investigations," which are mostly unnecessary, for a patient's sensations are much more delicate than most tests, and a thorough clinical investigation on old-fashioned and, alas, outmoded lines, which paid careful attention to these, would in most cases lead to a correct diagnosis, even where the investigations are negative, as they so frequently are. Tests are most valuable in research, but in appendicitis anyhow a doctor should be above all a clinician and not a signpost to a clinical laboratory.—I am, etc.,

Winsford, Cheshire.

W. N. LEAK.

Infantile Scurvy

SIR,—The reminder by Drs. G. Howells, P. E. S. Palmer, and W. H. St. John-Brooks that infantile scurvy is not extinct, and should not be forgotten in differential diagnosis, is timely (*Journal*, November 13, p. 1143). Three weeks ago a 15-month-old male infant was admitted to the Evelina Children's Hospital, under the care of Dr. B. Buckley Sharp, suffering from this disease, with a two weeks' history of painful lower limbs and a classical clinical picture. The gums were bluish, swollen, and bleeding; tender swellings were present at the lower ends of both femora and just above both ankles; and the skin was generally scaly with perifollicular hyperkeratosis on forearms and legs. There was pitting oedema of both feet and a palpable scorbutic "rosary" was present. In contradistinction to the cases quoted by the above authors, this infant was undernourished and weighed only 15 pounds (6.8 kg.). The relatively late onset was also of interest. Although the mother had had three children previously who had all maintained good health, this was the only one she had been unable to breast feed. The diet from the age of 2 months consisted of boiled cows' milk with cereals, with the addition of some orange juice diluted with boiling water.

The diagnosis was confirmed by the characteristic x-ray appearances in the long bones, a 24-hour urinary ascorbic acid excretion of 1.4 mg., and by the satisfactory response to treatment by injection of ascorbic acid 200 mg. intramuscularly on alternate days. Other biochemical features were the low levels of serum calcium (8 mg./100 ml.), and of inorganic phosphate (2.2 mg./100 ml.), and of serum alkaline phosphatase (4.5 King Armstrong units). Rickets was suggested as an additional diagnosis despite the low alkaline phosphatase. Vitamin D was also given, and these biochemical anomalies were quickly rectified (serum calcium 9.4 mg./100 ml., serum inorganic phosphate 3.4 mg./100 ml., alkaline phosphatase 26 King Armstrong units).—I am, etc.,

London, S.E.1.

S. E. LEVIN.

Cantharidin Poisoning

SIR,—With reference to the last paragraph in your leading article on cantharidin poisoning (*Journal*, December 11, p. 1405), you state that Craven and Polak say "there are no grounds whatever for retaining preparations of cantharidin in the *Pharmacopoeia*." In fact, cantharidin and its preparations have not appeared in the *British Pharmacopoeia* since the edition of 1932, and you misquote Craven and Polak in having mentioned the *Pharmacopoeia* in the paper to which your leading article refers. In it they simply say that "since cantharidin preparations have no special virtue but are highly dangerous they should no longer be made available for therapeutic purposes"—a statement with which I heartily agree.—I am, etc.,

D. M. DUNLOP,
Chairman,
British Pharmacopoeia Commission.

Edinburgh.

SIR,—In the leader entitled "Cantharidin Poisoning" (*Journal*, December 11, p. 1405) a statement is made that "it (cantharidin) survives in the *British Pharmaceutical Codex* to-day in six preparations for use as counter-irritants . . ." and later that "there are no grounds whatever for retaining preparations of cantharidin in the *Pharmacopoeia*." During the recent revision of the *British Pharmaceutical Codex* it was decided that the monographs for cantharidin and its preparations should not be retained in the *Codex*, and so they have been omitted from the *B.P.C.*, 1954, which was published on October 29, 1954.—I am, etc.,

K. R. CAPPER,
Editor,
British Pharmaceutical Codex.

London, W.C.1.

Chlorpromazine

SIR,—I have been re-reading the articles and letters about chlorpromazine (*Journal*, August 21, p. 439, and September 4, pp. 560 and 565), in the light of my own, very limited, recent experience in general practice. This leads me to suppose either that my patients have been particularly unfortunate or that the sentence in your leading article (p. 581), "The drug seems to be relatively non-toxic," needs revision.

I have now given "largactil" to 18 patients, nearly all of them psychoneurotics with marked emotional tension. In no case has the dose exceeded 25 mg. three times daily or the period of administration been more than five weeks. Despite this, three patients have developed clinical jaundice. In none of these three was there any evidence in the history to suggest previous liver damage. One man of 56, who had only been taking the drug for eight days, became deeply jaundiced and remained so for over a week; he also had severe initial symptoms of vomiting, anorexia, and nausea. In the two other cases, a girl of 20 and a woman of 53, the jaundice was transient; both had been taking 25 mg. three times daily, the former for 10 days and the latter for about four weeks. In these three cases chlorpromazine therapy was stopped and has not been resumed.

One other patient had to stop taking the drug because of a severe febrile reaction after only a few days of treatment. Two others asked for therapy to be discontinued because of other side-effects. In three cases the treatment was stopped after two to three weeks because no benefit had been obtained. Five patients seem to have been helped by chlorpromazine; one of these developed jaundice and expostulated bitterly when the drug was withheld. The remaining few patients are still under treatment, the effect of which cannot yet be assessed.

In view of the anti-emetic and emotional effects of chlorpromazine, it is very tempting to use the drug in cases of hyperemesis gravidarum. In view of the danger of liver damage, I feel that this temptation should be resisted. I gave one girl with hyperemesis 40 mg. daily in divided doses. She asserted very vehemently that her vomiting was made much worse. This statement was somewhat borne out by the rapidity with which she settled down when the therapy was discontinued.

In general, my experience of chlorpromazine has been disappointing. It is not such a stand-by for the G.P. as its admittedly valuable and interesting properties would lead one to suppose.—I am, etc.,

Huddersfield.

J. BRYAN EAGLES.

Flourpaper Tuberculin Jelly Test

SIR,—In the recent correspondence on tuberculin testing, it has been argued that there is some urgency to evaluate the Heaf multiple puncture test. We have been using this test in Cardiff for the past four years for child contacts, hospital staff, and, this year, as a single tuberculin test prior to giving B.C.G. vaccine to "school-leavers." When introducing our school-leaver scheme we were anxious to give B.C.G. vaccine following a single tuberculin test. For the first term we used the Heaf multiple puncture test with P.P.D. tuberculin (2 mg. per ml.) on the left arm, and the Mantoux test using P.P.D. tuberculin (10 I.T.U.) on the right arm. The results were as follows:

	Positive	Negative	Doubtful	Total
Heaf test	325	620	6	951
Mantoux	323	620	8	951

It is thus seen that in this series of children there is greater agreement between the Heaf and Mantoux tests when using P.P.D. (10 I.T.U.) than in the series reported by Dr. H. G. Calwell (*Journal*, November 27, 1954, p. 1292), when a dose of 100 units of old tuberculin was used. As Dr. Calwell has pointed out, some of the results that are regarded as positive are in fact false positives. We have retested and given B.C.G. vaccine to a number of contacts who were negative to the Heaf test but were originally regarded as positive when retested with a dose of 100 units of old tuberculin. In these contacts we have not had an accelerated or untoward reaction to the B.C.G. vaccine. As Dr. R. Stevenson Doig (*Journal*, December 4, 1954, p. 1357) points out, the advantages of the Heaf multiple puncture test are many, particularly as it can be used as a single test prior to vaccinating "school-leavers."—I am, etc.,

Cardiff.

P. M. BOWEN.

Spontaneous Rupture of the Spleen

SIR,—In view of the recent discussion on the association between perforation of a peptic ulcer and rupture of the spleen, we feel that the following case throws further light on this condition.

A man aged 55 years was admitted to Poplar Hospital and operated on 10 hours after the perforation of a chronic peptic ulcer. The perforation, which was on the anterior wall of the duodenum, was closed and covered with omentum. Post-operatively the patient developed a productive cough with an evening pyrexia to 102° F. (38.9° C.), and this responded to the exhibition of sulphamethazine and streptomycin for five days. From the fifteenth day he had evening rigors for which no cause could be found. Examination of the blood showed no malarial parasites. On the twenty-first post-operative day he suddenly collapsed and died within a few minutes. Post-mortem findings: the peritoneal cavity contained three pints (1.7 litres) of blood with evidence of recent clotting. A small abscess surrounded the splenic pedicle, and there was a septic thrombophlebitis of the first inch of the splenic vein. The spleen was softened and twice the normal size, with a large subcapsular haematoma of the lower pole and an irregular tear in the capsule. The ulcer was satisfactorily sealed by omentum.

This case is similar to that recorded by Babson and Morgan.¹ Their patient, a man of 49 years, collapsed five days after an operation for the closure of a perforated duodenal ulcer. After conservative treatment, continued for six days, laparotomy was performed. The peritoneal cavity was found to contain eight litres of blood, and the spleen, with the laceration on its superior border, was removed. The patient recovered.

Mr. Blair Thompson (*Journal*, November 20, p. 1209) reported that in his case, at laparotomy, the spleen had a large subcapsular haematoma and the splenic vein contained clots. We agree with him that the progress in these cases

is most likely: (1) perforation of the peptic ulcer, (2) local inflammation and thrombosis of the splenic vein, (3) congestion of the spleen leading to a subcapsular haematoma. It is difficult to imagine that severe muscular rigidity suggested by Mr. J. A. Shepherd² can damage an organ which is normally protected by lower ribs. The effect of coughing suggested by Babson and Morgan is similarly unlikely. The case described by Mr. Shepherd does not fall into this group: blood was not found in the peritoneal cavity until after the perforation had been discovered an inch from the oesophageal opening. It is possible that this case may come into another category—namely, traumatic rupture.

We wish to thank Mr. Alan Perry, M.S., F.R.C.S., under whose care this case was admitted, for permission to publish these details.—We are, etc.,

ANTHONY R. ANSCOMBE,
D. J. CROWTHER.

London, E.1.

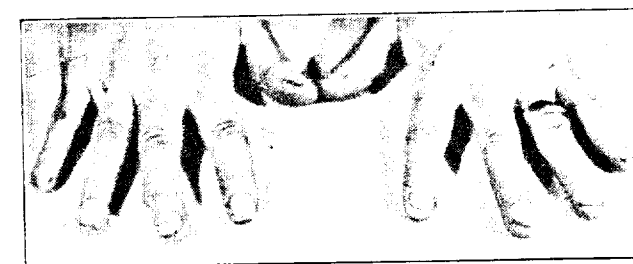
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Chicken-neck-wringer's Finger

SIR,—The digital occupational deformities described as window-cleaner's finger by Mr. P. J. Moir (*Journal*, September 25, p. 757) and paper-folder's fingers by Dr. M. W. Partington (*Journal*, November 13, p. 1166) prompt me to record this case seen in the out-patient department at the Royal Free Hospital in 1940.

The patient was a lady aged 45 who had worked in Smithfield market from the age of 14 until she was 36 at the occupation of killing chickens. The bird was placed



across her lap, the wings and legs being held in her left hand, and, by stretching the neck with the right hand, she dislocated the cervical vertebrae with her middle finger. She stated that she could kill a bird up to the size of about 11 lb. (5 kg.) weight. She gave up the occupation when she was 36 owing to an increase in domestic duties, and the condition was quite painless until she was 45 years old, when she first noticed some pain in the joint and came to hospital.

X ray showed subluxation and osteoarthritis of the distal interphalangeal joint of the right middle finger. She was seen again a few weeks ago, at the age of 59; the condition is very little worse and gives her no trouble in her household duties.—I am, etc.,

London, W.1.

GEORGE QVIST.

Professional Secrecy

SIR,—Dr. E. C. Dawson's richly informative discussion (*Journal*, December 18, 1954, p. 1474) of the doctor's duty as witness and informer may be supplemented by reference to a related problem concerning the psychiatrist. It happens, for instance, that litigants in divorce actions try to exploit the analytical treatment received by the other party, or a family member, and propose that the therapist is called as a witness and be subjected to cross-examination. It is thus hoped to elicit personal particulars damaging, or at least embarrassing, to the other party.

All persons consenting to unreserved communication in the interest of their treatment do so because they have been reassured as to the unconditional secrecy of the whole material thus disclosed. Without this absolute belief in the therapist's integrity, few people might seek this type of

treatment; and certainly very few would make satisfactory progress. Many in the legal and medical professions may not realize the widespread damage bound to result if the Press reported that a psychotherapist had been compelled to divulge anything entrusted to him by his patient, who had been made to believe that such a betrayal was impossible.

On two occasions I was approached for advice by colleagues pressed and intimidated by solicitors desirous of involving them in the lawsuit. I advised my friends to reply that the evidence thus enforced might easily result in harm to their clients' interests, and almost certainly be of no benefit to them. I have so far not heard of a case of a psychotherapist being actually forced to give evidence in such repugnant circumstances. But, if ever a psychiatrist finds himself in such a situation, ought he not to risk going to prison and cause public indignation, rather than yield to pressure and destroy the trust we psychotherapists enjoy and so much need in our professional activities? Otherwise, how could he afterwards face his current patients, or reassure new ones as to the absoluteness of professional secrecy?

We understand that ministers of religion are in practice not asked in court to divulge confessional secrets. I think this is so because the clergy would at any rate refuse to submit. This legal attitude should be extended to those handling intimate psychiatric material, even though members of the medical profession are unlikely to defend the principle in question with the same intransigence as manifested by priests. The refusal by the psychotherapist to testify would be certainly the only moral alternative where no crime or serious harm is to be prevented by divulging the patient's secrets.—I am, etc.,

London, N.W.4.

S. Lowy.

SIR,—The day the Association alters its present views on professional secrecy we shall see headlined in the Press: "Doctors Can Divulge Your Secrets" (and, in smaller print) "Under Certain Circumstances." Once this has happened irreparable harm will have been done to the profession. Let us not meddle with high principles, but rather let us strive to attain them.—I am, etc.,

London, S.E.2.

PETER H. SHERWOOD.

Renal Complications after Sulphonamides

SIR,—It was purely by chance that, in looking up a past reference in your *Journal*, I saw the correspondence on renal complications due to sulphonamides. Ever since seeing a case of incipient obstruction due to the use of sulphathiazole in the Tropics in 1943 a special routine was evolved, since when a case of renal complication from the use of sulphonamides (including sulphanilamide, sulphathiazole, sulphadiazine, sulphamerazine, "sulphatriad," sulphaguanidine, and sulphadimidine) in doses up to 30 gr. (2 g.) four-hourly for many days has not been encountered. Two precautions were necessary: (1) All sulphonamides except the sulphaguanidine type were given as a mixture containing as well sodium citrate 60 gr. (4 g.), the mixture being taken in a large glass of lemon squash. (2) Fluid intake was not used as a criterion, but each specimen of urine was kept and examined, the last specimen being thrown out of the clear glass container just before passing urine. A yellow coloration indicated not enough fluids (whatever the fluid intake chart said), and a very pale light green to colourless was considered just right. This was acting on the principle that it is not the fluid intake which really matters but the fluid output.

Adhering strictly to these two principles, I have not seen any case of renal complications using sulphonamides even in the Tropics, and would be very interested to hear from correspondents who have had any failures, not due to the failing of this routine itself.—I am, etc.,

Kuala Belait, Brunei State.

K. F. D. SWEETMAN.

Obituary

ELIZABETH CASSON, O.B.E., M.D., D.P.M.

Dr. Elizabeth Casson, founder and medical director of Dorset House School of Occupational Therapy, Oxford, died at Bristol on December 17, 1954, at the age of 73.

Elizabeth Casson was born at Denbigh on April 14, 1881, the third daughter of Major Thomas Casson, J.P., who brought an original mind to organ building, and brother of Sir Lewis Casson, the well-known actor. After leaving St. Mary's College, Paddington, she became interested in housing estate management and worked under Miss Octavia Hill from 1908 to 1913. During this time she was secretary of Red Cross Hall at Southwark. At the age of 30 she took up the study of medicine at Bristol University, graduating M.B., Ch.B. in 1919 and proceeding M.D. in 1926. After holding a resident appointment at the West Herts Hospital in Hemel Hempstead she took the D.P.M. in 1922 and joined the staff of the Royal Holloway Sanatorium at Virginia Water. It was while she was a



medical officer there that she called a meeting of medical women who were interested in psychological medicine, and from this beginning grew the Standing Committee in Psychological Medicine of the Medical Women's Federation, as well as an informal group of medical women with interests in this field who have met at intervals ever since. Dr. Casson gained the much-coveted Gaskell Prize and Medal of the Royal Medico-Psychological Association in 1927, and she later founded the Gaskell Club, the members of which are past winners of the medal. The club has met yearly for many years to welcome new medallists, to dine, and to discuss matters of common interest. Dr. Casson was always an outstanding personality at the dinners, taking the chair at the last meeting a few weeks ago.

In 1929 she returned to Bristol as medical officer in charge of a residential clinic for mental disorders, and she was also in due course appointed to the staffs of the Bristol General Hospital and the Walker Dunbar Hospital. In 1930 she founded the first school of occupational therapy in this country. It was opened at Dorset House, on the Promenade, Clifton. Dr. Casson herself wrote that the importance of occupational therapy was impressed on her when she was in hospital one Christmas and found the enormously improved atmosphere in the hospital ward was directly due to the interest of the patients in preparing the Christmas decorations. She acknowledged that her first introduction to occupational therapy came from a description by Dr. David (now Sir David) Henderson of the small department he had opened at Gartnavel Hospital, Glasgow. During the first three years of the existence of this school the training given was chiefly for mental hospital work, but in due course an occupational therapy department was opened at the Bristol General Hospital for the treat-

ment of patients with physical disease. Occupational therapists are nowadays able to take the diploma for either physical or mental work or the combined diploma for both. In the early years of the school Dr. Casson herself gave the lectures to the students on anatomy and physiology. During the war the school moved to Barnsley Hall Hospital, Bromsgrove, Worcestershire, but after the war ended it was attached to the Churchill Hospital, Headington, Oxford, where Dr. Casson was a frequent and welcome visitor. She was elected an honorary fellow of the World Federation of Occupational Therapists, and in 1951 was awarded the O.B.E. for her work as founder of the Dorset House School of occupational therapy.

In the years before the war Dr. Casson worked actively for the B.M.A. and represented her Division at nine Annual Meetings. She also took a keen interest in Bristol University and was a member of the university court. Her whole heart was in her work, and what she gained in knowledge she put to the service of others. But that was not all, for apart from her work she was affectionately devoted to innumerable friends, patients, and students and to a wide family circle. During the war her home in Bristol was bombed, and since then she had lived in Clevedon.

The death on November 19, 1954, of Dr. P. H. J. TURTON, of Heanor, Derbyshire, removed an outstanding personality from the district. He was 59 years of age. Philip Henry Job Turton was the son of the late Dr. William Henry Turton and, like his father, was a native of Heanor, where he was born on August 13, 1895. He interrupted his medical studies at Edinburgh University to serve in the R.A.M.C. in the first world war, returning to graduate M.B., Ch.B. in 1921. Four years later he proceeded to the M.D., receiving a high commendation for his thesis on the aetiology of endemic goitre, based on his own observations in Heanor. In 1929 he obtained the Manchester D.P.H. When his father, who was part-time medical officer of health for Heanor for 54 years, died in 1942 he succeeded to the appointment, which he retained until his death. For many years he was also honorary physician to Ilkeston Hospital and Heanor Memorial Hospital. He retained his particular interest in the incidence of "Derbyshire neck," and in 1933 read a paper before the Section of Epidemiology and State Medicine of the Royal Society of Medicine on the distribution of simple goitre in Derbyshire. Dr. Turton was a man of many parts who brought a keen and inquiring mind to all branches of medicine.

J. S. and T. B. F. write: It was always stimulating to attend a patient with Dr. Philip Turton. His knowledge of up-to-date research in medicine was quite striking in one who was so busy in his practice. His annual reports as medical officer of health were a delightful mixture of classical quotations and solid facts on the health of the district. He bore his recent severe illness with great fortitude and never lost interest in the people of the district, whom he served so well. To his widow and family goes our sincere sympathy in their loss.

C. M. E. writes: It was a privilege to work as Dr. Philip Turton's assistant, and, later, as his junior partner. He was outstanding as a general practitioner, being a brilliant diagnostician, and he never spared himself in the service of his patients, who thought of him not only as their doctor but as their guide, counsellor, and friend.

Dr. MARY A. T. RITCHINGS died on December 9, 1954, at her home at Swansea, where she had been in practice for over fifty years. She was 77 years of age. The daughter of a herbalist, Mary Ann Thompson Ritchings was born on July 20, 1877, and was educated privately and at Glasgow University, where she graduated M.B., Ch.B. in 1903. After

graduation she held the appointment of resident medical officer at Drumcondra Hospital, Dublin, before settling in general practice at Swansea. In 1918 she was appointed M.B.E. for her work as medical officer in charge of the Y.M.C.A. auxiliary hospital at Swansea during the first world war. The first woman general practitioner at Swansea, Dr. Ritchings built up an extensive practice, mostly among her own sex, and was greatly loved and admired by her patients. Although she did not accept service under the National Insurance Act of 1911 or under the National Health Service Act of 1946, she was keenly interested in the latter during its initial stages. Of a retiring disposition and in the last few years not very active, Dr. Ritchings was not known to many members of her profession or to many of the general public, but as a young woman she was a frequent speaker on political platforms. She is survived by two sisters.—J. C. O.

SIR WILLIAM HASLETT, who died at his home at Weybridge on December 17, 1954, at the age of 88, was not only a specialist in mental and nervous disorders, but also a man who contrived to devote much time to public and political work over many years. William John Handfield Haslett was born on September 10, 1866, the son of Dr. S. Torrens Haslett, of Laghey, Co. Donegal, and was educated at the Academical Institute, Londonderry, receiving his medical training at Trinity College, Dublin, where he won first-class honours in anatomy, and at Sir Patrick Dun's Hospital, Dublin, Meath Hospital, and the London Hospital. After qualifying M.R.C.S., L.R.C.P. in 1889, he held appointments at Meath Hospital, the Poplar Hospital for Accidents, and St. Luke's Hospital for the Insane. In 1892 he became resident medical superintendent of Halliford House, a private mental hospital at Shepperton-on-Thames, in which he had a proprietorial interest, and soon afterwards began to take an active part in public affairs. This work included membership of the Staines Board of Guardians, the Middlesex Insurance Committee, and the Sunbury Urban District Council, and later he was for some time a commissioner for income tax. From 1913 to 1928 he was a member of the Middlesex County Council, and as chairman of the committee for the care of mental defectives did valuable work in connexion with the establishment of special colonies for defectives. He was also a justice of the peace. In professional circles he was a member for many years of the British Medical Association, the Royal Medico-Psychological Association, whose certificate he obtained quite early in his career, the Windsor and District Medical Society, of which he was a past president, and the Kingston Medical Society. He was chairman of the South Middlesex Division of the B.M.A. from 1914 to 1919 and represented the Division at the Annual Representative Meeting held in London in 1917. Earlier, he attended the first Annual Meeting of the Association to be held in Canada—at Montreal in 1897—and read a paper on the influence of physical upon mental disease before the Section of Psychology. In 1938 he was created a knight for his political and public services in the Spelthorne Division of Middlesex, having been for many years president of the local Conservative and Unionist Association. Just before the last war he gave up his appointment at Halliford House, but continued to render useful service as consulting physician, and some six years ago he left Shepperton to go to live at Weybridge, just across the Thames. He married Miss Norah Macan in 1922 and had one son and three daughters.

P. M. J. writes: Having just had the unusual experience of reading the obituary notices (*Journal*, December 11) of two men to whom I have been secretary, may I add a little to what has already been said of them? My outstanding recollection of Dr. N. S. GILCHRIST during the 1930's is his tremendous capacity for work—nothing stood in its way for him. He would often start out at eight in the morning in order to be with "the other side's doctor" when the latter finished his morning surgery, and he would continue driving

and examining all day and well into the evening. In those days cases in the provinces provided his recreation, because he would enjoy the change of scenery. He was a perfectionist, and had a great gift for wording his reports in such a way that the layman had no difficulty in understanding them. During the 1940 blitz it was not uncommon for him to drive through the debris and over hosepipes whilst dictating his report on the last case we had visited.

I worked for Dr. A. C. ROXBURGH only during the last three years of his life, his previous secretary having been with him for 24 years. During that time, however, I realized how much his patients loved him. His ability as a skin consultant is known by all, but only those who knew him personally appreciated that his courtesy, humour, kindness, and great humility were not a façade for his patients and the medical profession only, but they pervaded his dealings with all and sundry, even his secretary. A day or two before he died I suggested that the forthcoming publication of the tenth edition of *Common Skin Diseases* might provide something of a record. His reply was, "Oh, I don't know; let's see," and he led me to his bookcase. He always marvelled—never boasted—that his private practice kept at such a level for so long after his retirement from his hospital appointments. Indeed a great man, and a great loss to all.

Medical Notes in Parliament

Agene in Flour to be Discontinued

Mr. HEATHCOTE AMORY, Minister of Agriculture and Food, announced on December 21, in answer to a question by Mr. N. DODDS (Dartford, Lab.), that he had received a report from the subcommittee set up under the chairmanship of the Chief Medical Officer of the Ministry of Health to consider the question of flour improvers.

A detailed experimental study had been made under the aegis of the Medical Research Council, he said. The methods of flour improvement which had been examined were agene, chlorine dioxide, potassium bromate, ascorbic acid, and an aeration process. The experiments had confirmed that agene-treated flour when fed in large quantities caused fits in dogs, and had shown that none of the other improvers tested did the same. Since other methods of flour improvement existed which had not produced these symptoms in animals, the Government was of opinion that, although no ill effects in man due to the use of agenezed flour had been established, effect should now be given to the decision taken in 1950 to discontinue agene. In view of this decision, the National Association of British and Irish Millers had agreed to recommend their members to discontinue the use of agene and to give an undertaking that the equipment for treating flour in this way would be removed from their mills by December 31, 1955. Some delay was inevitable, because new equipment had to be obtained to treat flour by other means. The National Association of Flour Importers had similarly agreed to recommend their members to ensure that no flour treated with agene would be imported by them. The further investigations undertaken by the Medical Research Council had revealed some differences between the effects on flour of the other methods of improvement, but the effects demonstrated were not sufficient to require the discontinuance of any of the other four improving processes. These methods of flour improvement would continue to be kept under close scrutiny, in collaboration with the milling and baking industries.

Medical Evidence on Mrs. Christofi

The HOME SECRETARY was questioned by several M.P.s on December 20 about the reasons why he had decided not to advise the Queen to exercise the prerogative of mercy and reprieve Mrs. Christofi. Sir LESLIE PLUMMER (Deptford, Lab.), who asked why he had refused to see a deputation of M.P.s, also asked if the Home Secretary would

publish all the medical evidence he considered in making his decision; and Mr. S. SILVERMAN (Nelson and Colne, Lab.) asked what opportunities Dr. T. Christie, principal medical officer at Holloway Prison, had of forming an opinion about the mental condition of Mrs. Christofi, what opinion he formed, and in what circumstances other medical evidence was sought, obtained, or provided.

Major G. LLOYD-GEORGE stated in reply that Parliament had on many occasions recognized the undesirability of pressing the Home Secretary to disclose the reasons why he did or did not tender advice to the Crown with regard to the exercise of the Prerogative of Mercy in a capital case. So far as concerned the particular case of Mrs. Christofi, the principal medical officer at Holloway Prison stated in a report dated October 5 that after observation of the prisoner since July 30 he had formed the conclusion that she was insane, but was medically fit to plead and to stand trial. A copy of that report was furnished to the defence. At the trial, which began on October 25, the defence did not raise the issue of insanity.

After the dismissal of the prisoner's appeal to the Court of Criminal Appeal (he continued) it fell to him to consider the case. In view of Dr. Christie's report he appointed three distinguished and experienced doctors to conduct an inquiry in accordance with statutory provision. The three doctors reported that the prisoner was not insane, and they added that in their view she did not suffer from any minor mental abnormality which would justify them in making any recommendation on medical grounds relevant to the question of a reprieve. After very full consideration he regretfully came to the conclusion that there were no sufficient grounds for recommending any interference with the due process of law. It would be contrary to long-established practice, and open to considerable objection, to disclose any advice tendered to the Home Secretary in a case of this kind by the trial judge, or to disclose the terms of the medical report submitted by the statutory inquiry, and he was not prepared to make these documents available.

Mr. KENNETH ROBINSON (St. Pancras, North, Lab.) asked what results were obtained from electroencephalographic examination of Mrs. Christofi while she was in custody. Major LLOYD-GEORGE said that there was no such examination in this case, as the prisoner would not agree to the examination being made.

Local Medical Committees

Mr. JOHN RANKIN (Glasgow, Tradeston, Lab.) asked the Secretary of State for Scotland on December 21 who was responsible, under his regulations, for setting up the local medical committees, and what was their purpose in the administration of the general medical service. Mr. J. STUART replied that these committees were formed by the medical profession themselves, and were accorded statutory recognition by the Secretary of State. They appointed medical members to the local executive council; they must be consulted by the council on certain specified matters, and were normally consulted on other matters, affecting the general medical services; and they had a number of specific functions under the regulations, including particularly the investigation of excessive prescribing.

Mr. RANKIN said there was widespread dissatisfaction with the manner in which many of the committees were carrying out their functions, and that they were tending by their attitude to limit the doctor's right to give the type of treatment he considered necessary. As they were assuming something of a judicial attitude, should not a doctor be represented when he appeared before one of these committees? Mr. STUART said he would like to look into that. He did not wish any dictatorial attitude to be adopted by these committees. He thought they were working very well.

Mr. RANKIN said that one of the interviews to which a doctor was called started by the chairman informing him that he need not worry because on this occasion he would not be fined. Mr. STUART said he was not aware of that. If Mr. Rankin would give him details he would look into them.

Industrial Health Survey

Mr. A. BLENKINSOP (Newcastle-upon-Tyne, East, Lab.) asked the Minister of Labour on December 21 whether he was satisfied that the Advisory Committee on Industrial Health would have all the powers and resources necessary to enable them to carry out an effective survey, so as to make clear the main deficiencies of the existing health provisions in industry. Mr. HAROLD WATKINSON, the Parliamentary Secretary, stated that the committee would be an advisory body. The scheme for the development of industrial health services, including any necessary surveys, would be carried out through the Factory Inspectorate, which possessed wide powers under the Factories Acts. Mr. BLENKINSOP asked if the Minister was satisfied that they had powers to inspect conditions in some of the smaller factories, where there was most need. Mr. WATKINSON pointed out that the committee was only working at the moment on premises which came under the Factories Acts.

Mr. BLENKINSOP asked if the Minister had completed his discussions with interested bodies on the composition of the advisory committee and whether he had agreed to the inclusion of persons with experience of local government work. Mr. WATKINSON said "No." Further requests for membership of the committee had been received, and the whole subject was still under consideration. Mr. BLENKINSOP pressed the Minister to give public health authorities some place on this committee in view of their heavy responsibilities. It was fantastic, he said, not to include representation from this important section. Mr. WATKINSON replied that local authorities had only limited responsibility in industrial health. That did not prejudice the Minister's decision, which had yet to be taken.

Clinical Experiments

Mr. S. SWINGLER (Newcastle-under-Lyme, Lab.) asked the Minister of Health to what extent clinical experiments were being carried out in hospitals under the regional hospital boards; what regulations governed the conditions of such experiments; and on whose authority, and under what circumstances, clinical experiments on infants in hospital, such as that to which his attention had been drawn, were permitted to be carried out. Miss PAT HORNSBY-SMITH, the Parliamentary Secretary, replying on December 20, stated that hospital authorities were given power to conduct research by Section 16 of the National Health Service Act, 1946. Individual clinical investigations were undertaken on the authority of the clinician in charge of the case, and the Minister had not complete knowledge of the extent of all the work in progress at hospitals. Such investigations involved medical and ethical problems which were not susceptible of control by regulations.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The Raymond Horton-Smith Prize for 1953-4 has been awarded to Dr. P. A. G. Monro.

In Congregation on November 13 the following degrees were awarded:

M.A.—W. E. Hick, M.D., Reader in Experimental Psychology; Bernard Towers, M.B., Ch.B., University Demonstrator in Anatomy; Christopher Parish, F.R.C.S., Associate Lecturer in Thoracic Surgery; L. M. Rouillard, F.R.C.S.Ed., Associate Lecturer in Plastic Surgery.
M.B., B.Chir.—P. Gortval.
M.B.—E. Burkinshaw.

Dr. A. P. Waterson has been elected into a Research Fellowship at Emmanuel College.

*By proxy.

UNIVERSITY OF LONDON

The following candidates at the Institute of Psychiatry have been approved at the examination indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN PSYCHOLOGY.—Section D: Patricia M. Bannister, H. R. Beech, Marian Black, Genevieve L. Castrodale, Esther R. Gottstein, D. Hall, J. H. G. Hewlett, V. F. W. Newham.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending December 11 (No. 49) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1954					1953				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	15	0	8	0		28	1	3	0	1
Dysentery ..	357	67	165	7		362	61	177	3	1
Encephalitis, acute	1	0		0		6	1	0		1
Enteric fever: Typhoid ..	2	2	4	0		2	0	0	0	0
Paratyphoid ..	7	1	0	0		9	0	0	0	0
Food-poisoning ..	134	11		0		132	23			0
Infective enteritis or diarrhoea under 2 years ..				11	16				16	19
Measles*	6,298	473	493	312	61	793	15	38	16	99
Meningococcal infection ..	21	0	6	0	3	36	2	9	1	
Ophthalmia neonatorum ..	30	6	3	0		25	2	5	0	
Pneumonia†	768	49	212	4	3	583	41	183	8	4
Poliomyelitis, acute: Paralytic ..	30	2		1		54	3		17	2
Non-paralytic ..	13	2				34	4			
Puerperal fever‡	214	33	6	1		223	38	13	3	2
Scarlet fever ..	709	39	151	66	37	1,613	85	268	46	74
Tuberculosis: Respiratory ..	723	85	134	51				123	23	
Non-respiratory ..	85	13	22	11				22	3	
Whooping-cough ..	2,047	123	165	25	56	2,510	106	318	68	81

DEATHS In Great Towns	1954					1953				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	1	0	0	0	0	0	0	0	0	0
Dysentery ..	1	0		0		0	0	1	0	
Encephalitis, acute ..		0			0		1			0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	5	0	0	1	1	6	1	3	1	0
Influenza ..	56	5	1	0	0	11	1	1	0	1
Measles ..		0	0	0	0		0	0	0	0
Meningococcal infection ..		0	0				1	2		
Pneumonia ..	301	43	19	8	12	237	31	28	9	5
Poliomyelitis, acute ..	2	1			0	3	0			0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory ..	112	18	18	1	3	87	10	16	1	6
Non-respiratory ..		0	20	0	1		0	1	2	1
Whooping-cough ..	0	0	1	0	0	3	0	1	0	0
Deaths 0-1 year ..	226	32	23	6	12	215	28	29	9	25
Deaths (excluding stillbirths) ..	5,703	762	589	110	189	5,165	728	561	88	187
LIVE BIRTHS ..	6,646	999	798	200	311	6,918	1036	814	210	321
STILLBIRTHS ..	186	25	24			182	21	18		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenzal pneumonia.

‡ Includes puerperal pyrexia.

Vital Statistics

Scottish Life Tables

The remarkable decline in mortality rates of young people during the last eight decades in Britain is reflected clearly in the life tables for Scotland based on the 1951 census.

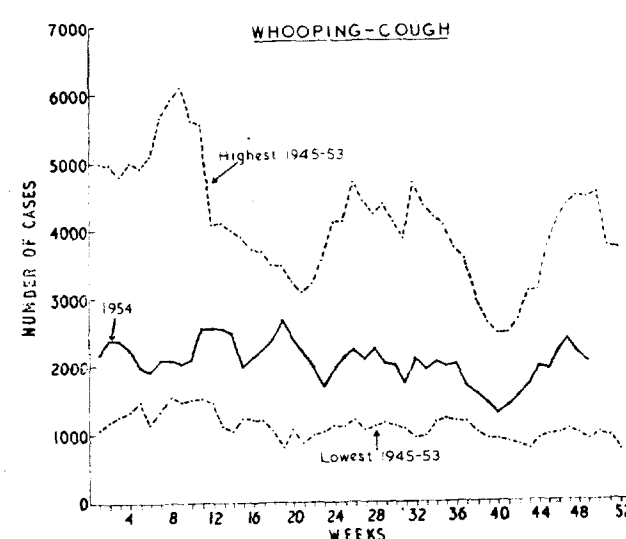
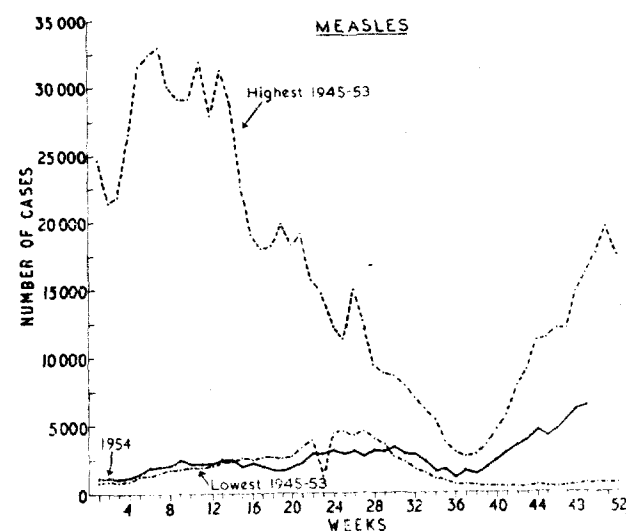
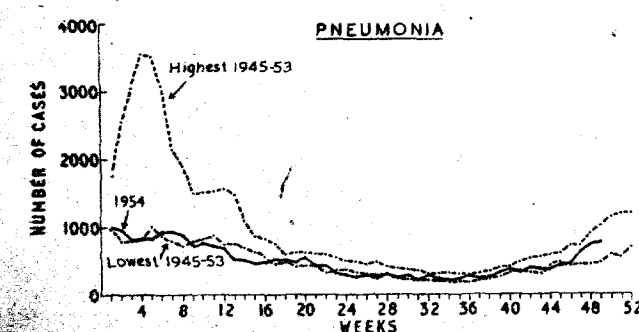
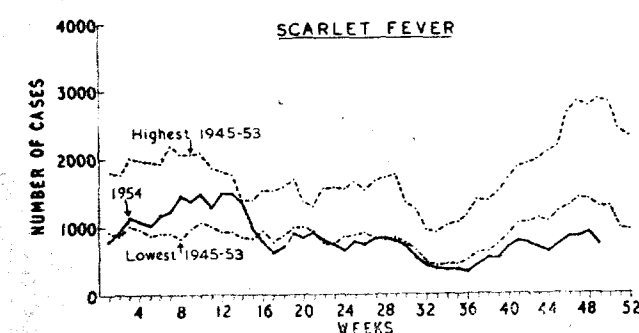
The expectation of life at birth in 1871 was 39.8 years for males and 42.0 for females; in 1951 it was 64.4 for males and 68.7 for females. But for those people who reached the age of 60 the increase was much less striking—from 13.3 to 14.3 years for males and from 14.8 to 16.8 years for females.

Middle childhood is the age at which mortality has been most sharply reduced. At age 10 mortality in 1951 was only 9% for males and 6% for females of mortality in 1871. At age 60 it was 79% for males and 58% for females of mortality in 1871, while at age 80 mortality was slightly worse in 1951 for males, being 105% of the 1871 rate and 100% for females.

The mortality of married persons is lighter than that of single or widowed for men in all age groups, and lighter for younger women; the mortality of older women is much the same in all three categories. In the twenty years between 1930-2 and 1950-2 a change has been noted in the mortality rates of single and married women. In 1930-2 the single women's mortality rates were less than those of married women; in 1950-2 they were some 60% greater on average. Two probable reasons are advanced to account for this. First, the risks of childbirth were greatly reduced; secondly, marriage rates were high, with the result that those who remained unmarried included an unusually high proportion of women who were unmarried because of ill-health. (*Life Tables 1950-2*. Supplement to the 99th Annual Report of the Registrar-General for Scotland. H.M.S.O. 1s. 3d.)

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus -----, the figures for 1954 thus ———. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

In England and Wales during the week ending December 11 a fall was recorded in the number of notifications for scarlet fever of 184, from 893 to 709, 109 for whooping-cough, from 2,156 to 2,047, and 106 for dysentery, from 463 to 357, and a rise of 281 was recorded for measles, from 6,017 to 6,298.

The largest increases in the incidence of measles were 137 in Cheshire, from 304 to 441, 83 in London, from 390 to 473, 72 in Yorkshire West Riding, from 408 to 480, and 63 in Staffordshire, from 162 to 225, and the largest fall was 71 in Nottinghamshire, from 207 to 136. The largest falls in the number of notifications of scarlet fever were 32 in Yorkshire West Riding, from 100 to 68, 30 in London, from 69 to 39, and 29 in Lancashire, from 132 to 103. The largest variations in the returns of whooping-cough were a rise of 47 in Kent, from 114 to 161, and a fall of 53 in Lancashire, from 271 to 218. 15 cases of diphtheria were notified, being 2 more than in the preceding week. The largest returns of diphtheria were Liverpool C.B. 5, and Birmingham C.B. 3.

43 cases of acute poliomyelitis were notified during the week. These were 1 more for paralytic and the same for non-paralytic cases as in the preceding week. The largest returns were Yorkshire West Riding 5 (Leeds C.B. 3), Lancashire 5 (Manchester C.B. 3), Cheshire 4 (Wallasey C.B. 2), and London 4.

The number of notifications of dysentery was the lowest for the past ten weeks. The largest centres of infection were Lancashire 96 (Oldham C.B. 24, Liverpool C.B. 21,

Morecambe and Heysham M.B. 11), London 67 (Hackney 25, Islington 10), Yorkshire West Riding 37 (Sheffield C.B. 25), Staffordshire 27 (Stoke-on-Trent C.B. 17), and Norfolk 22 (Norwich C.B. 17).

56 deaths were attributed to influenza in the great towns. The number of deaths is at a higher level than in recent years; in the past month there have been 156 deaths, compared with 56 in 1953 and 65 in 1952 during the corresponding period.

Week Ending December 18, 1954

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 798, whooping-cough 1,833, diphtheria 18, measles 6,523, acute pneumonia 736, meningococcal infection 24, acute poliomyelitis 36, dysentery 340, paratyphoid fever 9, typhoid fever 1.

Medical News

Royal Society.—Once again the medical profession is honoured by the fact that both the president of the Royal Society and one of the four vice-presidents are medical men. Dr. E. D. ADRIAN, O.M., was re-elected president at the annual meeting in December, and among the members of the council are Sir EDWARD MELLANBY, a vice-president, Sir ALAN DRURY, and Professor J. H. GADSDON. The Royal Society has awarded Locke Research Fellowships to Dr. M. DE BURGH DALY, lecturer in physiology at University College, London, to support work on the haemodynamics of the pulmonary circulation, and to Dr. J. C. F. POOLE for work at the Sir William Dunn School of Pathology, Oxford, on the effects of fat absorption on blood coagulation and thrombosis.

Psychoanalysis at McGill University.—With the appointment of Dr. W. CLIFFORD SCOTT as associate professor in the department of psychiatry, a full psychoanalytical training programme will now be offered at McGill University, Montreal, for the first time. Dr. Scott graduated at Toronto in 1937, and then studied under the late Professor ADOLF MEYER and Professor MACKIE CAMPBELL. Until recently Dr. Scott was director of the London Clinic of Psychoanalysis and chairman of the Board of Directors of the Institute of Psychoanalysis. He was also on the staff of the Bethlem Royal and Maudsley Hospital. Applications for psychoanalytical training should be made directly to Dr. SCOTT, Allan Memorial Institute, McGill University, Montreal.

Impressions of the Russian Doctors.—Before they left on December 23 at the end of their three-week tour the group of Soviet doctors who have been visiting Britain gave their impressions of medicine here (see *Journal*, December 11, p. 1431, and December 18, p. 1495). Professor A. N. SHABANOV, who led the delegation, said that they were leaving England with a good deal of satisfaction at all the things which they had seen, and about which they would tell their colleagues on their return. This exchange of scientific information was of great importance, because it gave a true understanding of the work being carried out in each country. He hoped that there would be exchange of technical information in the future, and that the contacts which the delegation had established in this country would lead to further invitations to Soviet scientists to come to Britain. Professor Shabanov then announced that he had invited British surgeons to a conference of surgeons to be held in Moscow next month, of which he was a member of the organizing committee. The Soviet doctors, Professor Shabanov continued, left with a good impression of all the medical institutions which they had visited. One specific feature of medicine characteristic of this country was the system of general practitioners, which seemed popular. It was at first very difficult for the

visitors to understand the National Health Service. They had got to know quite well that part which was administered by local government, but they had seen less of the part administered by the Ministry of Health. Britain had not such a unified health service as in the U.S.S.R., where all institutions were under the Health Ministry. All the doctors whom they saw were carrying out their work with a sense of responsibility. In the medical centres and institutions which they had visited the work being done was of a high standard. A woman member of the delegation, Dr. Z. M. DZHAMALOVA, deputy Minister of Health, Uzbek Republic, an obstetrician and gynaecologist, said that the antenatal clinics were well organized in Britain and the obstetrical departments were very good. Methods of anaesthesia in childbirth differed from those in the Soviet Union, where pain in childbirth was alleviated by psychological preparation and drugs and a short application of ether in the second stage where medically indicated.

Hostel for Deaf Children.—The Astor Shield, presented by Lord Astor for outstanding work in the field of infant welfare, has been awarded this year to the Royal National Throat, Nose, and Ear Hospital in recognition of its work in opening a hostel for deaf babies and their mothers. Dr. D. H. GEFFEN, vice-chairman of the National Baby Week Council, made the presentation at a small function at the hospital on December 15. The hostel is at Ealing and provides for the accommodation of mothers who can stay with their deaf babies and very young children in order to learn to apply a deaf aid to a child at a time when there is a readiness to listen and later to talk. Dr. Geffen described this as the finest concept in child welfare that his council had come across during the last few years. If young children were to learn to talk it must be through the mother, and this was the only way of really doing something for a sadly neglected portion of the population—namely, congenitally deaf children. Miss EDITH WHETNALL, director of the audiology unit of the hospital, whose lecture on the management of deaf children was reported in our last issue (December 25, p. 1542), said that mothers and babies were kept at the hostel for from three weeks to a month. The house had been bought by the hospital, but the Nuffield Foundation was responsible for the salary of the teacher, the mothers receiving a grant from the Ministry of Health, if needed, to enable them to take advantage of its facilities.

Anatomical Society of Great Britain and Ireland.—At the annual meeting at Guy's Hospital Medical School on November 26 Professor W. J. HAMILTON and Professor F. GOLDBY were re-elected president and secretary respectively. Professor E. W. WALLS was elected treasurer in place of Professor T. NICOL.

Wright-Fleming Institute of Microbiology.—Professor ROBERT CRICKSHANK has been appointed Principal of the Wright-Fleming Institute of Microbiology in succession to Sir ALEXANDER FLEMING, who retired on December 31, 1954. Professor Robert Crickshank will continue to hold the chair of bacteriology in St. Mary's Hospital Medical School.

Wellcome Historical Medical Museum.—For the past seven years the Wellcome Historical Medical Museum in London has been carrying on its activities at 28, Portman Square. It has now moved to the Wellcome Research Institution at 183-193, Euston Road, London, N.W.1 (Tel. Euston 4688). Exhibitions dealing with primitive medicine and with child welfare through the ages are open to the public in the new premises (Monday to Friday, 10 a.m. to 5 p.m.).

News in Brief.—Sir LIONEL WHITBY will be visiting professor of medicine at the New York State University College of Medicine this month.

Oxytetracycline ("terramycin"), and preparations of it, intended for parenteral injection, have been brought under the Therapeutic Substances Act, 1925, by Regulations

coming into force on January 1. The provisions relating to insulin under the Therapeutic Substances Regulations, 1952, have also been amended.

At the Swedish National Medical Congress in Stockholm last month a new Swedish vaccine against poliomyelitis was announced. It is reported to be less likely to give rise to allergic reactions than the corresponding American product.

The inaugural meeting of the Polarographic Society was held in London recently. The society is open to all interested in polarography. The secretary is Mrs. B. LAMB, 25, Grittleton Avenue, Wembley.

COMING EVENTS

Institute of Diseases of the Chest.—Open clinical demonstrations on various aspects of chest disease are given on Fridays at 5 p.m. in the lecture room of the Institute (in the grounds of the Brompton Hospital, Fulham Road, London, S.W.3). These demonstrations are intended for candidates for higher qualifications. They are open without fee to medical practitioners on signing the attendance book. The next series will begin on January 7 and end on April 1.

London County Medical Society.—Annual dinner on January 18 at the Talbot Restaurant, 64, London Wall, London, E.C.2, at 7 for 7.30 p.m. Dr. ROBERT FORBES, secretary of the Medical Defence Union, will speak on "Recent Developments in Medical Litigation." Tickets 11s. 6d., from Dr. A. M. RAMSAY, Royal Free Hospital, Lawn Road, London, N.W.3.

Israeli Scientific Publications.—The exhibition at the Consulate of Israel, 18, Manchester Square, London, W.1, will remain open until January 7.

Goulstonian Lectures.—Dr. G. M. BULL will lecture at the Royal College of Physicians, Pall Mall East, at 5 p.m. on January 18 and 20 on "The Uraemias."

Pan American Congress of Ophthalmology.—Fifth congress in Santiago, Chile, January 15–22, 1956. Details from Dr. RENE CONTARDO, Huerfanos 930—Of. 74, Santiago, Chile.

Association of Industrial Medical Officers.—The association will be celebrating the 21st anniversary of its foundation by holding a special anniversary meeting in London from September 25 to 29, 1956.

NEW ISSUES

Archives of Disease in Childhood.—The next issue (Vol. 29, No. 148) is now available. The contents include:

IDIOPATHIC HYPERCALCAEMIA IN AN INFANT. I. M. P. Dawson, W. S. Craig, and J. J. C. Petera.
THE INVESTIGATION OF A LARGE FAMILY AFFECTED WITH VON WILLEBRAND'S DISEASE. J. C. W. MacFarlane and M. J. Simpkins.
NORMAL RENAL FUNCTION IN THE FIRST TWO DAYS OF LIFE. R. A. McCance and E. M. Widdowson.
THE INFLUENCE OF EVENTS DURING THE LAST FEW DAYS IN UTERO ON TISSUE DESTRUCTION AND RENAL FUNCTION IN THE FIRST TWO DAYS OF INDEPENDENT LIFE. R. A. McCance and E. M. Widdowson.
PROGNOSIS IN IDIOPATHIC THROMBOCYTOPENIC PURPURA OF CHILDHOOD. G. M. Kornfower and G. B. Watson.
CHRONIC GENERALIZED OEDEMA AND HYPOPROTEINAEMIA OF OBSCURE ORIGIN. R. S. Illingworth and E. Finch.
TEMPORARY GENERALIZED OEDEMA OF OBSCURE ORIGIN. R. S. Illingworth and E. Finch.
COLLOIDION SKIN OF THE NEWBORN. O. D. Fisher and Kathleen G. McKee.
CONTROL OF THE BLOOD SUGAR LEVEL IN THE NEONATAL PERIOD. James W. Farquhar.
FIVE CASES OF ACUTE INFECTIVE POLYNEURITIS (GUILLAIN-BARRÉ SYNDROME) IN CHILDREN. Pamela Aylett.
THE TREATMENT OF TICS IN CHILDHOOD. David M. Zausmer.
THE RETINOPATHY OF PREMATURITY. J. D. Kerr and G. I. Scott.
A CONTROLLED INVESTIGATION ON THE EFFECT OF DIET ON ACUTE NEPHRITIS. R. S. Illingworth, M. G. Philpott, and John Rendle-Short.
TRICHORHEZOA. F. C. Friedlander and P. Kushlick.
RADIOIODINE (¹³¹I) IN JUVENILE MYXOEDEMA DUE TO ECTOPIC THYROID TISSUE. E. M. McGirt and James H. Hutchison.
NEONATAL ASCITES ASSOCIATED WITH URETHRAL OBSTRUCTION. N. E. France and E. H. Beck.
CHRONIC MYELOGENOUS LEUKAEMIA IN INFANCY. Edward G. Fox and Janet L. P. Hunter.
NON-ENDERMIC GOITROUS CAETINISM. A. D. M. Jackson.
THE TREATMENT OF HYPOPLASTIC ANAEMIA AFTER CHLORAMPHENICOL. R. McLaren Todd.

Issued six times a year; annual subscription £3 3s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Medical and Biological Illustration.—The new issue (Vol. IV, No. 4) is now available. The contents include:

SOME CONDITIONS OF THE NAILS. Part of a Teaching Display from Westminster Hospital Medical School.
JOSEPH LEIDY. W. J. Bishop.
THE VALUE OF GRAPHICAL MATERIAL. M. D. Vernon.
MOTION STUDY. John Hall.
THE PHOTOGRAPHY OF PAPER CHROMATOGRAMS. J. P. Berry, J. D. Cheshire, and L. I. Wood.
SELF-CONTAINED UNIT FOR KINEMOGRAPHY WITH BUILT-IN EXPOSURE DEVICE. H. M. Dekkinge.
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SOCIETIES AND LECTURES

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

Monday, January 3

INSTITUTE OF DERMATOLOGY.—Fourth of a series of semi-permanent exhibitions from January 3 to 21, by Dr. J. A. Milne, on Histology of Acute Vascular Disease of the Skin.
INSTITUTE OF NEUROLOGY.—5 p.m., Sir Geoffrey Jefferson, F.R.S.: Benign and Malignant Tumours of the Gasserian Ganglion.

Tuesday, January 4

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. L. Forman: Skin Lesions with Deeper Significance.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Erasmus Wilson: Demonstration by Dr. G. D. Lumb: Some Pathological Aspects of Ulcerative Colitis.

Wednesday, January 5

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Parapsoriasis, Psoriasis, and Mycosis Fungoides.
INSTITUTE OF LARYNGOLOGY AND OTITIS.—5.30 p.m., Professor F. C. Ormerod: Indications for the Use of Antibiotics in Otolaryngology.

Thursday, January 6

ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Centenary Lecture by Dr. Muriel Robertson, F.R.S.: Sir David Bruce—An Appreciation of the Man and His Work (lantern slides).
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Mr. J. M. Potter: Angiomatous Malformations of the Brain: Their Nature and Prognosis.
ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.—4.30 p.m., demonstration and discussion of clinical cases.

Friday, January 7

● INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. J. E. M. Wigley: Psoriasis.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Dr. J. Smart: Congenital Abnormalities of the Chest.
● ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Dr. I. Anderson: Electrolyte Balance.
WHIPPS CROSS HOSPITAL MEDICAL SOCIETY.—8.30 p.m., clinical meeting. Members of the Stratford Division, B.M.A., are invited.

Saturday, January 8

MIDLAND TUBERCULOSIS SOCIETY.—At Birmingham Chest Clinic, 3 p.m. Dr. J. Morrison Smith: Polythene Plombage; Dr. P. A. Thorn: Gastrectomy and Tuberculosis; Dr. R. G. May: Some Observations on Segmental and Lobar Opacities in Primary Tuberculosis in Children.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Blend.—On December 18, 1954, at the London Hospital, London, E., a daughter, wife of Dr. David Blend, 22, Compton Terrace, London, N. a son—Jonathan William Eliot.

DEATHS

Bryce.—On December 13, 1954, at 2, Kennedy Gardens, St. Andrews, Fifeshire, William Henderson Bryce, M.B., C.M.
Cameron.—On December 12, 1954, at Kingston, Jamaica, John Joseph Cameron, M.D., aged 72.
Eunson.—On December 3, 1954, Leonard Harvey Eunson, M.C., M.B., Ch.B., of Dudley Port House, Tipton, Staffs., aged 58.
Goodwin.—On December 15, 1954, Edward Knox Goodwin, M.R.C.S., L.R.C.P., of 2, Marten Road, Folkestone, Kent, aged 86.
Hes.—On December 12, 1954, at Starcross, Devon, John Hyde Hes, M.B., Ch.B., aged 76.
Saaler.—On December 9, 1954, at Golders Green, London, N.W., Bruno Carl Saaler, M.D., aged 71.
van Someren.—On December 4, 1954, in hospital at Newcastle, Staffs., Gerald Antony van Someren, M.R.C.S., L.R.C.P., D.P.M., of Mount St. George, Second Avenue, Porthill, Stoke-on-Trent, Staffs., aged 43.
Wallace.—On December 13, 1954, at Simpsons, Glenalmond, Perth, Alexander Frank Wallace, M.C., M.D., formerly of Northern Rhodesia.
Watson.—On December 13, 1954, at an infirmary, Glasgow, Henry Currie Watson, M.C., M.B., Ch.B., of 187, Neilston Road, Paisley, Renfrewshire.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Risk of Agranulocytosis with Sulphonamides

Q.—What is the incidence of agranulocytosis with the commoner sulphonamide preparations? Are any more dangerous than others in this respect, and is there a maximum dosage which if not exceeded is likely to prevent the occurrence of this complication?

A.—It is not possible to give a precise figure for the incidence of agranulocytosis during sulphonamide therapy, since many cases are either not recognized or are not reported. It is probably of the order of one in a thousand to one in ten thousand of cases treated. There is no convincing evidence that one sulphonamide is more likely to produce agranulocytosis than another, but sulphadiazine and sulphadiazine are probably safer in this respect than sulphathiazole and sulphapyridine. Most of the reported cases have arisen after heavy dosage for a week or more, or after the prolonged use of small doses as in the prophylaxis of acute rheumatism. As a crude guide it may be said that the total dose should not exceed 50 grammes nor the period of administration twenty-one days. If these figures are exceeded the patient should have weekly total and differential white cell counts carried out. Administration of a sulphonamide should be immediately stopped in any patient showing drug fever or developing a sore throat, and the blood picture should be investigated.

Treatment of Agranulocytosis following Drugs

Q.—What is the best treatment for agranulocytosis following drug therapy? How may the prognosis be assessed?

A.—Many substances, including pentose nucleotide, pyridoxine, folic acid, liver extracts, and A.C.T.H. and cortisone, have been used in the treatment of the agranulocytosis following drug therapy. However, there is no convincing evidence that any of these remedies has a specific effect in stimulating leucopoiesis under these circumstances. The transfusion of leucocytes is likewise of little or no value. Fortunately, as for instance in thiouracil agranulocytosis, the dangerous phase of acute granulocytopenia usually lasts only for a few days and seldom persists longer than one week. After stopping the responsible drug at once, all that is necessary, therefore, is for the patient to be kept under observation in bed so that any septic lesions which develop may be vigorously treated by an appropriate antibiotic.

The prognosis can be assessed by marrow puncture. This may show signs of leucocyte regeneration a day or two before the neutrophil count in the peripheral blood starts to rise. If the marrow puncture also reveals depression of erythropoiesis and thrombopoiesis, as in sensitivity to chloramphenicol, the outlook is much more serious than when leucopoiesis alone is depressed.

Mechanism of Blood Clotting

Q.—What is the modern view of the mechanism of blood coagulation?

A.—The following is an outline of the modern theory of blood coagulation. Blood clots when the protein fibrinogen is changed to fibrin. This change is brought about enzymatically by thrombin. Thrombin does not exist normally in blood *in vivo*—if it did the blood would clot in the blood vessels; it is formed from a precursor, prothrombin. It is

the processes which result in the activation of prothrombin to thrombin that have been the subject of the greatest controversy and research in recent years.

It is now believed that the activation of prothrombin is brought about by "intrinsic" thromboplastin, and that this thromboplastin is formed as the result of the interaction of at least five factors in the presence of ionized calcium. Four of the five factors exist normally in the plasma—anti-haemophilic globulin, the Christmas factor, and Factors V and VII; the fifth factor is derived from blood platelets as the result of contact with a water-wettable surface.

Strongyloidiasis

Q.—I have a male patient who became infected with *Strongyloides stercoralis* while in a Japanese P.O.W. camp. This condition persists in spite of intensive treatment with gentian violet, and he has frequent attacks of urticaria and pruritus. What further measures can be taken? Would phenothiazine be of any value?

A.—It is now generally agreed that there is no effective treatment for infection with *Strongyloides stercoralis*. There is no evidence that phenothiazine is of any value in such infections. Fortunately, these worms very seldom give rise to symptoms, and patients harbouring them may generally be reassured and encouraged to ignore the fact that they have a worm infection. In the case in question it is possible that the urticaria is the result of sensitivity to the worms and their products, but other causes of urticaria should be excluded. If it is decided that the *Strongyloides stercoralis* are responsible for the urticaria, symptomatic treatment should be employed.

Skin Ink

Q.—Can you give me the prescription for an efficient skin dye for the pre-operative marking of varicose veins? Those that I have already tried are immediately removed by the application of surgical spirit.

A.—An efficient skin ink for the pre-operative marking of varicose veins is a solution made up as follows:

B. Pyrogallol	1 g.
Methylated spirit	20 ml.
Liquor ferri perchlor. ..	2 ml.
Acetone	10 ml.
Hydrochloric acid	1 drop

After the patient has been shaved and bathed, he should stand in a good light while the veins are marked by a pledget of cotton-wool dipped in the ink and held in dissecting forceps. The longer the interval between the application of the skin ink and the pre-operative skin preparation the more indelible the ink becomes. An interval of 12–18 hours is advisable, and even then spirit must not be scrubbed over the markings or some will be removed. The dye gradually wears off during the usual post-operative desquamation once baths are resumed.

Scarlet Fever and Nephritis

Q.—Is it correct to treat scarlet fever cases, however mild, by rest in bed for at least two weeks in order to reduce the incidence of nephritis? If this is so, should not all cases of haemolytic streptococcal sore throat be treated in the same way for the same reason?

A.—Post-scarlatinal nephritis is regarded, probably correctly, as a toxic-allergic manifestation. There is no conclusive evidence that patients allowed up early are in greater danger of developing nephritis. When the disease was common and dangerous, nephritis occurred even in the most carefully nursed cases, but only rarely in those efficiently treated with antitoxin. Nevertheless, it is probably unwise to submit to strain and overactivity organs that have recently

been subjected to a toxic or bacterial attack, and for this reason alone it is wiser to allow reasonable rest after the temperature has subsided.

Many authorities allow the discharge of patients from hospital about one week after onset of the disease; it is commonplace to release patients in from 10 to 12 days. And this would not be practised if it were thought that a greater risk of nephritis would result.

Not all streptococcal throats are caused by scarlatinal strains, and some scarlatinal strains are poor toxin producers. The nephritic reaction is almost certainly linked with the specific toxin. Furthermore, the patient with a scarlatinal streptococcal tonsillitis may have a high immunity to the toxin. It is probable, therefore, that streptococcal throats without rash are even less likely than scarlet fever to end in nephritis.

This answer is taken from the third book of *Any Questions?* Copies of both the second and third books of *Any Questions?*, each containing some 200 expert answers, are available from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or through any bookseller, price 7s. 6d. a copy (postage 6d.). The third book contains a cumulative index.

Virtues of Hair-oil

Q.—In India hair-oil is used practically by everyone, partly as a fashion and partly owing to the popular belief that oil is necessary to protect the hair. It is also believed that oil protects the head against the heat and thus helps to prevent sunstroke. During my stay in England I saw that hair-oil was used very little. Is there any truth in the fact that oil is beneficial to the hair, particularly in the Tropics?

A.—It would seem that the use of hair-oil to-day by Indians, as with many other races, is essentially for cosmetic reasons and is practised as a toilet routine with little other purpose.

There is a natural tendency to maintain a definite "head" of sebaceous secretion in the skin, and this is soon restored if grease is removed from the skin, so that the addition of more oil would not seem to have any physiological value. Climatic conditions, particularly heat, determine the normal secretion of sebum, and the natural output of the skin and scalp is no doubt adequate for all protective purposes. The coloured races secrete much larger quantities of sebum in their native climate when in good health. Ill-health is commonly indicated by a loss of greasiness of the skin, and this may have led to the idea that the addition of oil, even in health, is of value.

Furthermore, from the earliest times there has been an association between the anointing with oil and the driving out of evil influences, the conferring of divine grace and blessing, and a general sense of protection. This ritual may perhaps underlie the widespread use of oil on the hair. It is doubtful if there is any physical benefit resulting from the practice.

Hypercholesterolaemia

Q.—What are the present views on the aetiology of hypercholesterolaemia, its relationship to coronary thrombosis, and treatment by dieting and the administration of oestrogens?

A.—The cholesterol level in the blood depends upon the amount eaten in the diet and formed in the body on the one hand, and upon the amount excreted in the faeces and metabolized on the other. Although in animals overfeeding with cholesterol produces atheroma, it is now thought that in man the amount of ingested preformed cholesterol is less important in influencing the blood level than the amount being synthesized and metabolized in the body.

There is an association between premature arteriosclerosis and diseases characterized by hypercholesterolaemia such as occurs as a familial disorder of lipid metabolism in familial xanthomatosis, in nephrosis, and in diabetes. There

is little doubt that coronary thrombosis relatively early in life can be correlated in many instances with abnormally high and fluctuating serum-cholesterol levels.

In some subjects, but not in all, a cholesterol-free diet may lower the plasma cholesterol level, and there is evidence that in women the cholesterol concentration fluctuates throughout the menstrual cycle, the lowest levels being found at the time of maximum oestrogen secretion. Whether a cholesterol-free diet or oestrogens will prove of value in preventing atherosclerosis by lowering the plasma cholesterol level remains to be proved.

Corns Between the Toes

Q.—I should be grateful for advice on the treatment and prevention of painful soft corns between the toes in an elderly woman.

A.—In very many cases soft corns between the toes are the result of fungus infection. A careful search should therefore be made for the organism and if it is found appropriate treatment instituted. Failing this, treatment should aim at keeping the interdigital folds slightly separated and dry. The skin between the toes should be washed night and morning with soap and water, swabbed with surgical spirit, and freely dusted with talcum powder. A few thicknesses of gauze will keep the opposing surfaces apart.

A Case for Thoracoplasty

Q.—A man of 48 years suffered from tuberculosis of the left apex with cavitation which has responded satisfactorily to rest and chemotherapy, but for which it is considered that a thoracoplasty should now be made. The left lower lobe, however, invariably produces showers of persistent unchanging fine crepitations. On radiography, screening, bronchography, and bronchoscopy no abnormality is detected. The right lung is apparently normal. The patient has no sputum. Vigorous physiotherapy has not altered the signs. What is the nature of the disturbance in the left lower lobe and is it safe to perform thoracoplasty on that side?

A.—A shoal of fine crepitations is sometimes an early indication of a spread of disease which has not yet become apparent radiologically. Occasionally it indicates a minor degree of fibrosis. Before considering operation it might be advisable to wait for several weeks to see if there are any radiological changes. On the assumption that there is no change it should be possible to carry out a thoracoplasty in slow stages (2 to 2½ ribs at a session). The main risk would be basal atelectasis, but if bronchostenosis has been excluded by bronchoscopy and bronchograms this should not be allowed to weigh unduly. Antibiotics should be used before and during surgery.

NOTES AND COMMENTS

Health Education.—Dr. JOHN BURTON, medical director of the Central Council for Health Education, writes: In contrast with the Hospital Service Group at the Central Council for Health Education Summer School for 1954 (see *Journal*, November 27, p. 1263), groups concerned with public health accepted in principle the need for a trained health educator. In one case it was suggested that this officer should be on the staff of the M.O.H. and responsible to the latter.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Altology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: *Britmedads, Westcent, London.* MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association, TELEPHONE: EUSTON 4499. TELEGRAMS: *Medisecra, Westcent, London.* B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.



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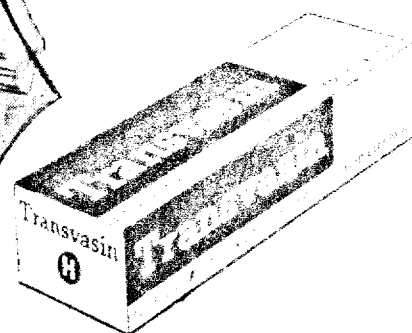
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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 8 1955

TREATMENT OF PHENYLKETONURIA WITH A DIET LOW IN PHENYLALANINE

BY
L. I. WOOLF, Ph.D., B.Sc. RUTH GRIFFITHS, M.A., Ph.D.

AND

ALAN MONCRIEFF, C.B.E., M.D., F.R.C.P.

(From The Hospital for Sick Children, Great Ormond Street, London)

Phenylketonuria is one of the very few conditions in which mental deficiency is associated with a demonstrable metabolic error. It has been suggested that the mental defect is due to an intoxication by phenylalanine or one of its metabolites, and that the mental deficiency may be relieved by feeding a diet low in phenylalanine (Woolf and Vulliamy, 1951). Such a diet must be adequate to permit normal health and growth.

All dietary proteins are about equally rich in phenylalanine (Block and Bolling, 1951), and a suitable diet can therefore be devised only by supplying the bulk of the nitrogen as a mixture of amino-acids. While it would be possible to mix pure amino-acids to obtain such a diet, the cost would render any long-term treatment of even a few cases impossible. Protein hydrolysates have been commercially available for some years, and it is known that they can be freed from phenylalanine, tyrosine, and tryptophan by passing through a column of charcoal (Schramm and Primosigh, 1943). It seemed likely that a suitable amino-acid mixture could be obtained at a reasonable cost by passing an acid hydrolysate of casein through charcoal and adding tyrosine and tryptophan. This was suggested by one of us (L. I. W.) to Dr. H. Bickel, who at that time had a suitable phenylketonuric patient under his care. Bickel carried out the preparation of the suggested diet, fed his patient on it, and reported a very marked improvement in the child's mental condition (Bickel, Gerrard, and Hickmans, 1953). No psychometric measurements were made, and it seemed worth while repeating this work, making as objective and as accurate measurements as possible of intelligence level before feeding the diet and at intervals after. Electroencephalograms were used as a second objective measurement.

The findings are described for two children, both aged 2 years 8 months at the start, who have been fed a diet low in phenylalanine for nine and ten months respectively; marked intellectual improvement resulted, and the E.E.G. became normal in the one case in which it was previously abnormal. A third child, aged 5 years 5 months, has been fed this diet for a shorter period, but presents interesting features, and the preliminary finding of intellectual improvement is described.

Diet

The major dietary components (Table I) were fed as a soup made by cooking the starch in the milk and water,

adding the other components, and homogenizing. In the first stage (till the urine was free from phenylpyruvic acid, two to ten days) milk was omitted and the other ingredients were increased. In the second stage the amount of milk fed was gradually raised till phenylpyruvic acid became just

TABLE I.—Daily Dietary Intake for a 3-year-old

Casein hydrolysate*	26.5 g.
DL-Tryptophan	1 "
L-Tyrosine	5 "
Wheat starch	28 "
Glucose	85 "
Calcium hydrogen phosphate (CaHPO ₄)	1 "
Iodized salt (NaCl)	2 "
Kosher vegetarian margarine	70 "
Arachis oil	3.5 ml.
Milk	240 "
Water	300 "

* Low in phenylalanine, tyrosine, and tryptophan.

TABLE II.—Daily Vitamin Intake

As tablets:	
Aneurine hydrochloride	1.5 mg.
Riboflavin	1.5 "
Pyridoxine	1 "
Nicotinamide	10 "
Calcium pantothenate	3.5 "
Ascorbic acid	50 "
α-Tocopherol	1 "
Acetomenaphthone	1.5 "
Meso-inositol	50 "
Biotin	0.5 "
Lactose	q.s.

As liquid:	
Crude liver extract	6 ml.
Choline chloride	25 mg.
"Adexolin"	10 drops

TABLE III.—Daily Mineral Intake

Potassium chloride (KCl)	1.5 g.
Magnesium sulphate (MgSO ₄ .7H ₂ O)	0.324 g.
Zinc sulphate (ZnSO ₄ .7H ₂ O)	0.0017 g.
Ferrous sulphate (FeSO ₄ .7H ₂ O)	0.069 g.
Manganous sulphate (MnSO ₄ .4H ₂ O)	0.00111 g.
Cupric sulphate (CuSO ₄ .5H ₂ O)	0.00393 g.
Hypophosphorous acid	0.05 ml.
Water	11 ml.

detectable in the urine; then it was dropped to a level at which no more phenylpyruvic acid was excreted. The wheat-starch is a protein-free preparation as fed to children with coeliac disease. The soup was fed in divided feeds four or five times daily.

Vitamins were added in tablet form, made up in the pharmacy of The Hospital for Sick Children, supplemented by a liquid crude liver extract containing added choline chloride and by an oily solution of vitamins A and D (Table II). Minerals (other than calcium phosphate, sodium chloride, and iodine) were added as an aqueous solution (Table III).

Water, orange juice, and glucose water were allowed *ad lib*. Biscuits, composed of wheat starch, kosher margarine, sugar, and flavouring, were also allowed up to 50 g. a day.

Clinical Summaries

Case 1

The parents of this child are Irish and unrelated. Five elder brothers and both parents are normal and have no phenylpyruvic acid in the urine. Pregnancy was normal except that the mother had high blood pressure; the birth was rapid but otherwise normal; he was jaundiced for about a week. His "milestones" were all passed late; he did not hold up his head until he was 6 months old. He began to have "fits" at the age of 6 months, and at 19 months was thought to be deaf by his parents; this led to a medical examination, when his mental retardation was noted, but he had had otitis media, which might have contributed to his deafness. At 2 years 3 months his "fits" had increased in frequency, and his backwardness was more obvious; he could not stand by himself, was incontinent of urine and faeces, and made only unintelligible sounds. Phenylpyruvic acid was found in his urine and he was admitted for dietary treatment when 2 years 8 months old.

Physical examination showed a slightly small skull, 18 in. (46 cm.) in circumference. There were no signs of abnormality in the cranial nerves or central nervous system and the disks were normal. The Wassermann reaction was negative. His "fits" consisted of transient losses of consciousness when, if sitting up, he fell forward.

An E.E.G. on October 2, 1953 (before starting the diet), was reported as "abnormal and diagnostic of epilepsy." There were frequent sustained outbursts, bilateral and synchronous, consisting of irregular high-voltage slow activity associated with spikes. The special diet was started on October 9. His weight then was 31 lb. (14 kg.) and there was some initial loss, but within three weeks the weight curve was climbing steadily.

He was readmitted on January 18, 1954. No "fits" were seen and an E.E.G. showed "none of the previously recorded high-amplitude slow wave and spike." His weight was 32 lb. 8 oz. (14.7 kg.).

In May an E.E.G. showed "a medium-voltage dominant rhythm of about 5 cycles per second. From this background occasional brief high-voltage specific epileptic outbursts occurred, having generalized distribution and consisting of slow waves associated with spikes. There was considerable general improvement over the first record of October 2, 1953."

An E.E.G. on August 3, 1954, showed a medium-voltage activity of 5 cycles per second dominant, but no well-sustained rhythmical runs of activity. No specific epileptic activity was seen. The weight was only 32 lb. 8 oz. (14.7 kg.) and there had been some difficulties at home. On ward "discipline" he gained nearly 2 lb. (0.9 kg.) in a few days, and was later transferred to the branch hospital at Tadworth, where a further weight gain was recorded.

An interesting observation was that his hair, which was almost ash-blond when he was admitted, became noticeably darker during the special diet period.

Case 2

One older brother of this child is a proved phenylketonuric ament. The parents are of normal intelligence, do not excrete phenylpyruvic acid, and are unrelated; one parent comes from Yorkshire and the other from Cheshire. The pregnancy was normal and delivery normal at full-term. The child appeared to recognize her mother at the age of 6 to 8 weeks. She was 1 year of age before sitting up, stood at 2 years, and walked at 2 years 4 months. She had had no illnesses and there had been no fits.

At the age of 2 years/7 months the state of mental retardation was confirmed, phenylpyruvic acid was found in the urine, and she was admitted for dietary treatment. This was started on October 21, 1953, when her weight was 33 lb. 4 oz. (15.1 kg.). There was a slight initial loss, which was quickly regained. Nearly a year later, after a continuous period of the special diet, she weighed 38 lb. 11 oz. (17.5 kg.).

The skull was a trifle small, measuring 19 in. (48 cm.) in circumference; the fontanelle was closed. There was no evidence of disease in the central nervous system other than the mental backwardness. The disks were normal. An E.E.G. was considered to be within normal limits; there was no evidence of epilepsy.

The hair, very pale originally, became darker during the year of treatment.

Case 3

One older brother of this child is a proved phenylketonuric ament, an older sister is mentally normal and does not excrete phenylpyruvic acid. The parents are Irish, unrelated, of normal intelligence, and do not excrete phenylpyruvic acid. The pregnancy was normal and delivery normal at full-term. Nothing abnormal was noted during the first three months of life and then it was thought the child did not recognize her parents. She could sit unsupported by 1 year, and by 15 months showed signs of recognizing her parents.

At this time (1951) she started having "fits" of a petit-mal type and occasional major attacks in which she screamed and fell forward unconscious, the attack lasting two or three minutes. Phenylpyruvic acid was found in her urine. The Wassermann reaction was negative. An E.E.G. showed generalized spike-and-wave discharges.

At the age of 18 months an attempt was made to assess her intelligence in Guy's Hospital, and her mental age was put at 8 months. She was given a trial of glutamic acid for six months, but showed no improvement (Woolf and Vulliamy, 1951). Aloxidone was given for the fits, resulting in partial control, but the fits ceased abruptly when amphetamine sulphate was added in December, 1953. At the age of 3 years she could stand when holding a support. She was admitted for dietary treatment at the age of 5 years 4 months.

Physical examination showed that she was well developed for her age. She would not sit erect and preferred a flexed posture, making frequent rocking movements and dribbling saliva. There was a divergent strabismus, but no other signs of abnormality in the cranial nerves or central nervous system. An E.E.G. on April 30, 1954, showed, when sleeping, generalized slow spike-and-wave complexes.

The phenylalanine-free diet was started on May 3, when her weight was 35 lb. (15.9 kg.). There was an immediate gain, followed by a steep fall. Then she showed a steady gain except during the acute episodes described later. On September 16 she weighed 40 lb. (18.1 kg.).

After 25 days on the diet low in phenylalanine (May 28) she had a curious attack of unconsciousness with severe twitchings of arms and neck. Similar episodes lasting an hour or so at a time continued for three days, and cardiac failure then developed with persistent tachycardia. Digoxin, primidone, aloxidone, and amphetamine sulphate were given, the fits came under control, the general condition of the heart and circulation gradually returned to normal, and digoxin was stopped.

This child's hair also darkened considerably during the period of the special diet—even more so than in the other two patients.

Psychological Observations

The scale of tests used for these investigations is the "Griffiths mental development scale for testing infants from birth to 2 years." This scale was recently devised and standardized on a fairly representative sample of about 600 babies ranging in age from 2 weeks to 2 years (Griffiths, 1954). The severe retardation of the cases to be studied brings them well within the range of these tests in spite of their higher chronological ages. The scale consists of 260 finely graded items placed in strict order of difficulty on a percentage basis. The items are classified and divided into five subscales which measure separately five significant aspects of development: A, locomotor-development; B, personal-social development; C, hearing and speech

development; D, hand and eye co-ordination; and E, performance. These five subscales are very closely equal in difficulty at each month of age throughout the scale. It is therefore possible to compare a child's level of attainment in several directions at once and watch the changing development as the child's interests swing from one aspect of learning to another.

Case 1

First Test

October 6, 1953, and before treatment began. Chronological age (C.A.), 137½ weeks; mental age (M.A.), 27½ weeks; general quotient (G.Q.), 20.

The child was excessively fatigable, and could concentrate for only very brief periods.

The profile, with the trough at C (Table IV), is suggestive of deafness. The child made no responses to auditory stimuli—bells, tuning-fork, the human voice. Subsequent results go to show, however, that this boy now hears quite well, and we can safely regard this early lack of response to sounds as functional rather than organic. All the results at this time showed a low-grade defective level with general quotient 20.

The child could sit in his cot among pillows and take his weight a little when held on his feet, but could not lift his head when lying in the dorsal position, roll from back to stomach, or make any attempt towards crawling. (Q.A. 21.)

He could smile and laugh, recognize his mother, stop crying when talked to, look at himself in a mirror, etc. (Q.B. 20.)

There was some slight vocalization and one-syllable cooing, but no definite response to auditory stimuli. (Q.C. 8.)

He was somewhat better at manipulation, but thumb opposition was not yet complete and he could manipulate only one object at a time; when offered a second, he immediately relinquished the first. He could pass a cube from one hand to the other, and did this continually with objects given to him. He played with paper. (Q.D. 25; Q.E. 25.)

Second Test

January 20, 1954, three months after diet was started. (C.A., 151½ weeks; M.A., 34½ weeks; G.Q. 23.)

As before, there was very slight ability to respond or concentrate. Some progress in the total result had been achieved, particularly in the direction of speech (Table IV). The total quotient had risen by three points to 23 and the profile had become more even, the trough at C being very largely corrected.

Some slight progress was recorded in regard to locomotor development. His lower limbs were still feeble and underdeveloped; there was no attempt at crawling. He could lift head and shoulders in the dorsal position, sit alone on the floor, make stepping movements when held up, and almost stand when held. (Q.A. 24.)

He was taking more notice of people, beginning to return affection, and responding more definitely to situations. (Q.B. 23.)

Quite remarkable progress had taken place in the direction of speech. He was now able to shout, make sing-

ing noises, respond and listen to sounds (bell, tuning-fork, stop-watch). He was making more noises but no clear syllables yet. (Q.C. 21.)

There was practically no progress yet in scales D or E. (Q.D. 24, Q.E. 22.)

Third Test

April 7, 1954, six months after diet was begun. (C.A., 162 weeks; M.A., 44½ weeks; G.Q. 28.)

This test indicated definite progress in each of the five scales. The improvement at speech was being maintained and accelerated. Also scales D and E showed definite movement forward (Table IV).

The total quotient had risen by five points, to 28, since the previous test. Considerable progress had been made all round. Manipulation of objects was increasing and becoming more effective.

At this time the child could sit himself up from both prone and dorsal positions, walk round the railings of his cot and playpen holding on, pivot on the floor, and roll over to get about. He was not yet crawling. (Q.A. 29.)

The child was also reacting more normally to the presence of people; he looked at them more definitely and co-operated in activities better. (He gave the impression that he had "become a human being.") (Q.B. 26.)

At speech he was making slow but definite progress. Most significant was the improved capacity to attend to sounds (active listening). (Q.C. 25.)

A gain of as much as six and seven points was recorded in scales D and E respectively. Thumb opposition had become complete. He showed preference for the right hand and was handling toys and materials with more interest and more efficiently. (Q.D. 30; Q.E. 29.)

Fourth Test

August 4, 1954, ten months after diet was begun. (C.A., 179½ weeks; M.A., 53½ weeks; G.Q. 30.)

This test showed quite dramatic progress in this child on scales A, B, and C, but practically no movement on scales D and E, on which he made such remarkable improvement between the second and third tests. This produced again a changing profile (Table IV).

The total quotient had again risen somewhat, though not so much as during the previous period. None the less, the results suggest that further and most important stages had been reached in several directions.

The boy could not only balance on his feet and stand alone but had begun to walk alone. He demonstrated this by taking half a dozen steps between the mother and the psychologist in the ward. This brought him well into the second year for locomotor development. From this time on he no longer sat endlessly in his cot, but was eager to be moving about the room. (Q.A. 33.)

He was much more alert and aware of people. He obeyed simple commands, played pat-a-cake, and tried to "help" with dressing. His facial expression had become quite different, alive, watching people, laughing at the examiner's approach, and wanting to be lifted up. He accepted and returned affection. He helped to hold the cup when drinking, but could not yet manage a spoon to feed himself. (Q.B. 29.)

TABLE IV.—Case 1

Test No.	Chronological Age (Weeks)	Mental Age (Weeks)	General Intelligence Quotient	Subscale A Locomotor		Subscale B Personal-Social		Subscale C Hearing and Speech		Subscale D Hand and Eye		Subscale E Performance	
				Mental Age (Weeks)	Q.A.*	Mental Age (Weeks)	Q.B.*	Mental Age (Weeks)	Q.C.*	Mental Age (Weeks)	Q.D.*	Mental Age (Weeks)	Q.E.*
1	137½	27½	20	28½	21	26½	20	11½	8	35	25	35	25
2	151½	34½	23	36½	24	35	23	31½	21	36½	24	33½	23
3	162	44½	28	46½	29	41½	26	40	25	49	30	47½	29
4	179½	53½	30	59½	33	52½	29	57½	32	49	27	49	27

* Q.A., Q.B., Q.C., Q.D., and Q.E. are the intelligence quotients (subquotients) calculated on subscales A, B, C, D, and E respectively.

Speech showed improvement greater than in any other direction. He could say two clear words and produced much meaningful babble. He tried to sing, knew his own name, and enjoyed and recognized familiar rhymes. (Q.C. 32.)

At the sitting stage he had made a remarkable spurt in scales D and E (between the second and third tests), but now that he was on his feet this new activity claimed his interest, together with his newly found skill at verbal expression. (Q.D. 27; Q.E. 27.)

Case 2

First Test

October 16, 1953, immediately before the diet was started. (C.A., 138½ weeks; M.A., 58½ weeks; G.Q. 42.)

The child was much less severely retarded than Case 1 and was already walking. As with Case 1 this child showed great fatigability and sleepiness.

The results produce an unusual profile (see Table V). The child did best at locomotor development. She was walking alone but with an unusual gait, her feet rather wide apart and swaying from side to side, like a child of 14 to 15 months just learning to walk. (Q.A. 54.)

She showed friendliness and liked attention from adults, but became easily excited when noticed. An affectionate child, she put her face up to her mother, but, like a 12-months-old baby, she was unable to kiss. She could hold a cup for drinking, take off her shoes and socks, etc. She liked her mother to show pictures to her, but was not able to recognize objects in pictures. (Q.B. 49.)

Her level at speech was very low. The mother reported that the child used to say one or two words but had ceased to do so. There was no indication of deafness. She enjoyed rhymes and responded to auditory tests including the voice. (Q.C. 36.)

Her hands were developed only to a 12-months level. She could point with her index finger, and thumb opposition was complete. She held a pencil and made a slight mark with it. (Q.D. 39.)

At performance she did poorly. She could rattle a box and crumple paper, but had no other interest in objects except to carry them to her mouth or send them to the floor. (Q.E. 32.)

Second Test

January 18, 1954, three months after diet was started. (C.A., 152 weeks; M.A., 70½ weeks; G.Q. 46.)

Genuine improvement in the child's condition had taken place since she was first seen. Although progress was slow, it was definite and noticed in all directions. She was more active and alert, and firmer on her feet. The general quotient had risen by four points to 46.

Locomotor development was at this time still somewhat ahead of the other scales. She was trotting about like a child of 18 months, able to climb into chairs and climb up stairs (but not down), and had improved in balance and liked pushing a pram, etc. (Q.A. 52.)

In personal-social development she "showed shoes" on request, pointed out "hair" and "hands," and had begun to use a spoon. Her relationship to people was developing. (Q.B. 47.) Speech, still poor, was developing very slowly. (Q.C. 38.) At manipulation, considerable improvement was

shown. She had learnt to roll and throw a ball, to scribble on paper, and to play a little with toys, pushing cars, etc. (Q.D. 51.) At performance she not only rattled the boxes, but opened them and explored the contents, and did the first two items of the form-board series. (Q.E. 44.)

In this case, as with the first, the profile is seen to change as the child begins to progress and take interest in her surroundings.

Third Test

April 14, 1954, six months after diet was started. (C.A., 164 weeks; M.A., 77 weeks; G.Q. 47.)

The third test showed the child maintaining progress at her new level and developing more in relation to speech, the general quotient remaining approximately the same. The profile has become more even (see Table V).

Only slight progress was made in regard to walking. She was at this stage more competent on stairs and climbing about more. (Q.A. 50.) In social development also there were very few gains, only five weeks' progress being achieved in the three months. (Q.B. 47.) At speech, however, very great progress was made, 16½ weeks' progress being recorded. At this stage she had a vocabulary of about 10 words, clearly and consistently used, and could identify objects by name. (Q.C. 45.)

Only slight progress was recorded on scales D and E. (Q.D. 47; Q.E. 44.)

Fourth Test

July 14, 1954, nine months after dietetic treatment began. (C.A., 177 weeks; M.A., 86½ weeks; G.Q. 49.)

This examination showed the child maintaining the improvement achieved earlier, and the general quotient was again slightly improved (Table V). The general shape of the profile is much as it was in the previous test, and is still fairly even, except that scales A and B still tend to be somewhat higher than the other scales.

The child had ceased to climb stairs on hands and knees and was able to walk up and down holding the banisters. She could run and jump. (Q.A. 53.) She was learning self-help to some extent, could open doors, feed herself with a spoon more competently, and point out three parts of the body. (Q.B. 51.) She had a vocabulary of about 16 words, recognized pictures, and was beginning to name them. (Q.C. 48.) Only slight progress could be reported on scale D. (Q.D. 45.) She showed more definite interest in performance material. She did form-boards and brick boxes to a 20-months level. (Q.E. 48.)

Case 3

This little 5-year-old girl was seen before treatment was started, and given the Griffiths scale. She was seen again after periods of 9 weeks and 21 weeks on the diet. This child being older than either of the other two cases, the severe retardation produces a still lower quotient.

First Test

April 21, 1954. (C.A., 278½ weeks; M.A., 30½ weeks; G.Q. 11.)

When seen in April this child was in most respects like a child of about 7 months' mental development (see Table VI). She was somewhat more advanced than this in locomotor development and less advanced in regard to hearing and speech.

TABLE V.—Case 2

Test No.	Chronological Age (Weeks)	Mental Age (Weeks)	General Intelligence Quotient	Subscale A Locomotor		Subscale B Personal-Social		Subscale C Hearing and Speech		Subscale D Hand and Eye		Subscale E Performance	
				Mental Age (Weeks)	Q.A.*	Mental Age (Weeks)	Q.B.*	Mental Age (Weeks)	Q.C.*	Mental Age (Weeks)	Q.D.*	Mental Age (Weeks)	Q.E.*
1	138½	58½	42	74½	54	68½	49	50	36	54	39	45	32
2	152	70½	46	79½	52	72	47	58	38	77	51	67	44
3	164	77	47	82	50	77	47	74½	45	77	47	72	44
4	177	86½	49	94½	53	89½	51	84½	48	79½	45	84½	48

* Q.A., Q.B., Q.C., Q.D., and Q.E. are the intelligence quotients (subquotients) calculated on subscales A, B, C, D, and E respectively.

The child could sit alone, and sat rocking back and forth in the cot. She twisted her rather thin limbs about in unusual positions. She could roll over and turn around on the floor, but could not crawl. She could not pull herself up to stand, or balance holding on to a support. She could make stepping movements when held in a standing position and encouraged to try to walk (an eighth-months item). (Q.A. 14.)

She appeared indifferent to strangers, but gradually began to co-operate to some extent in the examination. She reacted to her mirror image, smiling and turning the mirror over as if in search of the child in it. She was not yet drinking from a cup but was still on the bottle. (Q.B. 10.)

She could make a few vague noises and blow bubbles like a young baby. She had a vocabulary of four vague sounds (er-er, ah, m-m-m, g-g-g). She listened to the tests with bells, tuning-fork, and voice. (Q.C. 8.)

Manipulation was very poor. She could attend to only one small object at a time. She could not retain two cubes; when offered a second one she invariably dropped the first. She could pass a toy from one hand to the other, and did this continually. Thumb opposition was complete. (Q.D. 11; Q.E. 11.)

Second Test

June 23, 1954, nine weeks after treatment started. (C.A., 287½ weeks; M.A., 40½ weeks; G.Q. 14.)

The child showed marked improvement in appearance. She seemed to be more active mentally, and definitely more able to co-operate. Dropping of saliva had ceased. She looked at the examiner and appeared to remember (see Table VI).

Some slight progress had been made in locomotor development, the child being more active on the floor, rolling, lying, and sitting, frequently changing her position in order to secure toys beyond her reach, but without actually crawling. She could still not pull herself to standing. (Q.A. 15.)

Social progress was quite good. She had learned to drink from a cup instead of the bottle previously used. She turned her head to people talking and took more interest in her surroundings. (Q.B. 13.)

The child was now able to pay better attention to sounds—bells, tuning-fork, watch, etc.—and listened to the voice of the examiner, but the simpler, clearer sounds of the instruments gave definite pleasure. She herself could make many sounds and noises; no definite speech, nor prolonged babble, but cooing, cooing, squeaking noises, much like a young baby makes. She tried to sing. (Q.C. 12.)

On the manipulative scales D and E progress was most pronounced. The right hand had become dominant. She was handling objects more freely, still spending much time passing toys from hand to hand and back again. She accepted the third cube, and watched the scribble but did not handle the pencil. She could take the lids off the test boxes and remove the bricks. She did not understand the first form-board. (Q.D. 15; Q.E. 16.)

Third Test

September 15, 1954, 21 weeks after start of diet. (C.A., 299½ weeks; M.A., 42½ weeks; G.Q. 14.)

The child's reactions during this third test were very similar to those made at the second test. She passed only

six new items. After the rapid progress made between the first and second tests, there was in this second period a slowing up of development. At the same time there was no deterioration. On the contrary, her progress was sufficient to maintain the slightly higher quotient that she showed at the second test. Her progress rate over the entire period of 4½ months was 55.5.

At locomotor development she had gained two points (Q.A. 15). No progress can be reported on scales B (Q.B. 12) or C (Q.C. 12), where her mental ages remained the same; but slight gains were made on scale D, hand and eye development (Q.D. 16) and scale E, performance (Q.E. 16).

[NOTE ADDED DECEMBER 16, 1954.—The three children continue to progress: Case 1, at C.A. 44½ months, had M.A. 14 months, G.Q. 31, and no epileptic activity; while Case 2, at C.A. 191 weeks, had M.A. 100 weeks, and G.Q. 52.]

Chemical Investigations

In each case at least one 24-hour specimen of urine and a corresponding specimen of blood were obtained before starting the diet. Once the child was placed on the diet single specimens of urine were obtained daily until it went home, in addition to one or more complete 24-hour specimens of urine and corresponding blood specimens once the diet was stabilized. At home the parents collected single specimens of urine at weekly intervals and sent them, preserved with chlorbutol and acetic acid, to the laboratory. Every three months, when the child returned for an intelligence test, a complete 24-hour urine specimen and a specimen of blood were obtained.

The blood specimens and the 24-hour urine specimens were examined by paper chromatography for amino-acids (Woolf, 1951b). In addition there was determined, on the 24-hour specimens of urine, phenylpyruvic acid (Berry and Woolf, 1952), phenylacetylglutamine (Woolf, 1951a), and phenylalanine and phenyllactic acid (Kapeller-Adler, 1932; Woolf, unpublished). The daily or weekly single specimens of urine were used for a qualitative ferric chloride test for phenylpyruvic acid.

In Cases 1 and 2 phenylpyruvic acid could no longer be detected in the urine by the tenth day after starting a completely phenylalanine-free diet. Then 8 oz. (230 ml.) of milk was added daily for nineteen days; no phenylpyruvic acid could be detected in the urine either by the direct ferric chloride test or by the far more sensitive method of Berry and Woolf (1952). The milk was increased to 10 oz. (285 ml.) daily, phenylpyruvic acid remaining undetectable in the urine for 28 days, when it became just detectable by the direct ferric chloride method. The milk was then dropped to 8 oz. (230 ml.) daily and kept there, no more phenylpyruvic acid appearing in Case 2. In Case 1 occasional weak positive reactions and, later, strong ones were obtained from urine specimens sent from his home. The mother admitted that he had occasionally been fed food not included in the diet.

On the diet phenylalanine quickly dropped to a low level in both blood and urine, but remained a little above the normal; phenyllactic acid, and the unidentified phenolic keto-acid (Berry and Woolf, 1952) vanished, and phenylacetylglutamine dropped to the normal level.

TABLE VI.—Case 3

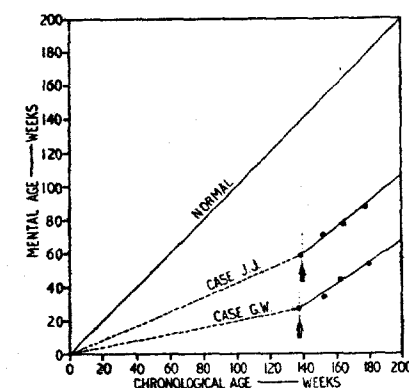
Test No.	Chronological Age (Weeks)	Mental Age (Weeks)	General Intelligence Quotient	Subscale A Locomotor		Subscale B Personal-Social		Subscale C Hearing and Speech		Subscale D Hand and Eye		Subscale E Performance	
				Mental Age (Weeks)	Q.A.*	Mental Age (Weeks)	Q.B.*	Mental Age (Weeks)	Q.C.*	Mental Age (Weeks)	Q.D.*	Mental Age (Weeks)	Q.E.*
1	278½	30½	11	40	14	28½	10	23½	8	31½	11	30	11
2	287½	40½	14	41½	15	36½	13	36	12	42½	15	45	16
3	299½	42½	14	45	15	36½	12	36	12	47½	16	46½	16

* Q.A., Q.B., Q.C., Q.D., and Q.E. are the intelligence quotients (sub-quotients) calculated on subscales A, B, C, D, and E respectively.

In Case 3 the withdrawal of phenylalanine from the diet produced more dramatic results, all phenylpyruvic acid vanishing from the urine by the third day. Milk (10 oz. (285 ml.) daily) was added to her diet on the fourth day, but phenylpyruvic acid did not reappear in the urine. The blood phenylalanine level dropped to normal by the third day after withdrawal of phenylalanine and continued to drop, being below normal by the eighteenth day and completely absent on the twenty-eighth day, in spite of the presence of phenylalanine in the diet; later the phenylalanine levels in blood and urine returned to normal. Phenyl-lactic acid, phenylacetylglutamine, and the phenolic keto-acid had dropped to normal levels by the tenth day after starting the diet.

Discussion

The results of the psychological testing prove conclusively that there is at least in some cases considerable intellectual improvement in phenylketonurics fed a diet low in phenylalanine. The increase in the general intelligence quotient, from 20 to 30, in ten months in Case 1 is highly significant, as is that in Case 2 (from 42 to 49 in nine months). It is extremely unlikely that such an improvement, as indicated by mental testing, would ever occur spontaneously in children with phenylketonuria. The changes in these two children have been dramatic. The boy (Case 1) lay inert, sleepy, unaware of much that was going on around him and subject to frequent slight epileptic attacks. Unable to do more than sit among pillows, and endlessly finger-fanning or twisting his limbs about, with eyes half-closed, unable to roll over or sit himself up, with no speech other than the murmured vocalization of a very young baby, his general level was that of a child of 6 months. After ten months of treatment he is upon his feet, walking, has begun to talk, and is developing in all directions. This development goes forward irregularly, swinging now in one direction and now in another, but the total quotient shows the degree of mental growth that is definitely taking place. The girl (Case 2), not quite so severely handicapped, just beginning to walk when treatment was started, and without speech other than a few babbled phrases, is now able to run about more normally and has a small vocabulary of clearly spoken words, and has also developed socially.



Mental age plotted against chronological age for Cases 1 (J.J.) and 2 (G.W.). For discussion see text. (O) = Result of test on the Griffiths scale. ↑ = Point at which diet was started.

This improvement could result only if the mental deficiency were due to an intoxication by phenylalanine or one of its metabolites; there is evidence that the toxic agent is not phenylalanine itself (Woolf and Vulliamy, 1951), but more work is needed to prove its identity.

The concept of progress rate is particularly useful in evaluating the results of the diet. The progress rate is the increase in mental age divided by the increase in chronological age between tests multiplied by 100. Thus over a period of 43 weeks the mental age of Case 1 increased from 27½ to 53½ weeks; his progress rate over the period is $\frac{53\frac{1}{2} - 27\frac{1}{2}}{43} \times 100 = 60$. The progress rate can be defined as the slope of the curve of mental age plotted against chronological age and multiplied by 100 (see Chart). In the majority of children in whom the quotient is constant, the

progress rate is equal to the I.Q. and does not vary with time. An increase in progress rate to a new steady level indicates a mind that has improved and is maintaining its improvement. In such a case the new progress rate will be higher than the intelligence quotient, which will steadily rise. The I.Q., being a ratio, is always affected by the magnitude of the chronological age at the beginning of treatment.

The notation of the infinitesimal calculus can be used with advantage; if M represents the mental age, Q the intelligence quotient, t the chronological age, and R the progress rate,

$$\text{then } Q/100 = M/t$$

$$\text{and } R/100 = dM/dt;$$

$$\text{therefore } M = 1/100 \int_0^t R \cdot dt$$

$$\text{and } Q = 1/t \int_0^t R \cdot dt$$

$$\text{If } dR/dt = 0, \text{ then } Q = R.$$

If, at a chronological age t_1 , the progress rate changes from R_1 to R_2 , and these are constant from birth to t_1 and from t_1 to t_2 respectively, then, at the age of t_2 ,

$$Q = 100 \cdot M/t_2 = 1/t_2 \left(\int_0^{t_1} R_1 \cdot dt + \int_{t_1}^{t_2} R_2 \cdot dt \right)$$

$$\text{Therefore } Q = 1/t_2 (R_1 \cdot t_1 + R_2 (t_2 - t_1))$$

In the Chart the mental ages of Cases 1 and 2 are plotted against chronological age. It is assumed that the progress rate was steady from birth (when the mental age was presumably zero, these children being normal at birth) to the time of withdrawing phenylalanine from the diet immediately after the first psychological test; it is not unlikely that the curve should be convex to the abscissa over this period—that is, decreasing progress rate—but we have no evidence in these or other cases that it should be concave or irregular. The three determinations of mental age after starting the diet in each case clearly lie on a new straight line of slope—that is, progress rate—considerably greater than that before the diet. The kink in each curve is sharp and would be even sharper if the curve before starting the diet were convex to the abscissa; it occurs at the time of starting the diet. From the curves the progress rate in Case 1 has increased from the assumed consistent value of 20 to 64, and in Case 2 from 42 to 76. The actual ratio between the total increase of mental and chronological age between the first and the fourth test gives a progress rate of 60 in Case 1 and 71 in Case 2.

The intellectual improvement has been maintained at a fairly steady rate over nine and ten months respectively and is therefore not a matter of a sudden spurt followed by a return to the previous rate. This sudden jump in progress rate to a high but fairly steady level and the consequent steady improvement in the intelligence level is just what would be expected if the brain were continuously under the action of a depressant that did not cause any irreversible damage to the brain tissue. It must be remembered that post-mortem examinations have failed to show any consistent changes in the brains of phenylketonurics (Corsellis, 1953).

In Case 3, though the result can only be regarded as preliminary, the initial improvement in progress rate, even though this dropped again, is so striking that it strongly suggests that even at the age of 5 years the brain has suffered relatively little permanent damage. The appearance, for the first time, of major epilepsy soon after this child was placed on the diet is unlikely to be due to coincidence. A possible explanation is that the cerebral cortex, for over five years under the action of a depressant, began functioning more actively once this agent was withdrawn, and at first cortical activity was poorly co-ordinated. This child is of interest for another reason: she shows clear evidence of a deterioration in intelligence before being placed on the diet. When first seen she was 15 months old and had an estimated mental age between 6 and 9 months (Woolf and

Vulliamy, 1951, Case 5), and her mental age was assessed at 8 months when she was 18 months old. Her mental age had not increased when seen at the age of 5 years 5 months, and her I.Q. has therefore dropped very considerably.

Petit mal is far more frequent among phenylketonurics than among the population as a whole, and an association of petit mal with phenylketonuria is generally accepted. The cessation of attacks of petit mal (formerly very frequent) in Case 1 and the change of the E.E.G. from a typical spike-and-wave pattern to a normal pattern when placed on a diet low in phenylalanine is particularly interesting; it suggests that the petit mal is due to the same intoxication as the mental deficiency and, like it, yields to withdrawal of the toxic agent.

In Case 1 the diet was not very strictly adhered to at home, particularly from the sixth to the tenth month. It seems probable that the reversion of the E.E.G. from normal to a rather improved epileptic pattern, and the decrease in the progress rate over this period, are associated with these dietary indiscretions.

The profile varies in an interesting way from test to test and from child to child. It is as though the small amount of mental energy available to these children becomes, at a particular stage, almost completely absorbed in one dominant phase of development.

The prognosis for these three children can be made only tentatively. If the intoxication theory is correct the improved progress rate may be maintained. The I.Q. at the age of 14 would then be about 70 for Case 2, and about 60 for Case 1. Either of these children may eventually reach an educable level. It may be possible to improve the diet in such a way as to raise the progress rate still further. However, the present progress rate, being below 100, may possibly indicate true, though relatively slight, long-term damage to the functioning of the brain. Only repeated psychological testing throughout childhood can settle this point.

The difference in final I.Q. tentatively predicted for the two children is the result of their differing progress rates, and their different mental and chronological ages when placed on the diet. These differences are in themselves interesting; presumably the children, had they not had this error of metabolism, would have had differences in innate intelligence—that is, different progress rates; the differences in mental age are, however, far greater than those to be expected for individuals chosen at random, and it is necessary to postulate a difference in degree of intoxication, whether due to differing concentrations of the toxic agent or to differing susceptibilities.

The difference between the mental and the chronological age at the time treatment is started is a "time lag" that may never be made good. The child who at 5 years has the mental age of a 7-months-old infant has to learn to babble and then to speak, and then to walk, omitting nothing of the developmental sequences before babyhood is passed. Even if, as the result of treatment, his progress rate became 100 at this age, this would enable him to make the same amount of progress in a year as would be made by a normal baby between 7 and 19 months of age. Then at 7 years his mental age would still be only 2½; only at 9½ would he reach a mental age of 5 years and be ready to start formal education, and then he would presumably progress at the normal rate for a 5-year-old. This raises special educational problems, such a child being clearly distinguished on the one hand from children of similarly low intelligence whose progress rate is constant and as low as their I.Q., and on the other from normal children. His educability should not be judged on the basis of his I.Q. but on his progress rate, starting formal education at a mental age of 5 years so far as administrative difficulties allow. Of course the progress rate of Case 1 is only 64, and that of Case 2 76, but their educability should have been more accurately assessed by the time these children reach a mental age of 5 years. It is, at present, useless to speculate

on the mechanism of learning for a brain structurally more mature than one corresponding to its mental age, or on the more distant problem of the age at which increase in mental age will cease.

Presumably the improvement in intelligence in these patients can be maintained only while a diet low in phenylalanine is adhered to, and any return to a normal diet would be likely to lead to re-intoxication. The economic aspects of this form of "treatment" must be considered. It has been estimated that the incidence of phenylketonuric amentia is about 4 for every 100,000 of the population. This gives a figure of about 1,600 patients for England and Wales—and without treatment most of these will eventually reach an institution, where the cost each week is said to average at least £5. The special dietary constituents—casein hydrolysate, tryptophan, tyrosine, the vitamin tablets (made in the pharmacy of The Hospital for Sick Children), the liver extract and choline (see Tables I and II)—cost 10s. 9d. a day at present prices. If all the phenylketonuric aments came under "treatment" and some form of central manufacture of the special diet ingredients could be organized, the cost would fall considerably.* The grades of many of these patients might be raised so that the ineducable become educationally subnormal and the E.S.N. group might get accepted at ordinary schools, thus saving the cost of institutional care. Later on, society may gain productive members. These financial considerations must, however, not be allowed to influence decisions on the treatment of afflicted individuals. The most important point is that if costly treatment is to be justified it must be started early. *This means that the urine of every baby or young child in whom there is the slightest suspicion of mental retardation must be tested for phenylpyruvic acid.* This is an extremely easy screening method: a few drops of 5% ferric chloride solution are added to the fresh urine; the appearance of a deep green colour (sometimes an opaque deep blue-grey owing to precipitated phosphates) within five minutes is a positive result. In phenylketonuric aments the test should be positive by the age of 3 weeks at latest.

The Diet

The diet has to supply adequate amounts of total nitrogen, the essential amino-acids, carbohydrates, fats, minerals, and vitamins. The bulk of the nitrogen is supplied as the charcoal-treated casein acid hydrolysate (hereafter called casein hydrolysate) now commercially available as a dry powder. Casein is a protein of quite high biological value—that is, it contains adequate amounts of all the essential amino-acids; an acid hydrolysate, unlike an enzymatic hydrolysate, is free from peptides which might complicate the removal of phenylalanine. L-Tyrosine and DL-tryptophan are added to the casein hydrolysate; L-tyrosine is not normally an essential amino-acid, but, since in phenylketonuria phenylalanine cannot, or can only very slowly, be converted to tyrosine (Jervis, 1947, 1953; Udenfriend and Bessman, 1953), tyrosine should be an essential amino-acid in phenylketonuria. DL-Tryptophan is harmless, has about 70% of the dietary value of L-tryptophan, and costs only one-tenth as much.

Phenylalanine is an essential amino-acid, the minimum requirement for a normal adult being 1.4 g. a day (Harte and Travers, 1947). A diet containing less than this causes a negative nitrogen balance, loss of appetite, and rapid loss of weight. The minimum daily requirement of phenylalanine for a young child is unknown. Phenylalanine is very rapidly converted to tyrosine in normal individuals (Woolf and Edmunds, 1950), but since this metabolic path is closed in phenylketonuria, less dietary phenylalanine should be required for anabolism by a phenylketonuric than by a normal person. The success of the diet depends wholly on this point; in effect an "unbalanced protein" with a deficiency of phenylalanine is being fed, and in a normal

* Reductions in the prices of the casein hydrolysate and of the other amino-acids had reduced the daily cost to 7s. 4d. at the time when proofs of this article were received.

individual this would result in reduced protein utilization and excessive nitrogen excretion, but the dietary amino-acids are balanced for a phenylketonuric. It follows that the best daily intake of phenylalanine in our cases could only be determined empirically. Phenylalanine is added in the form of whole milk, which contains 42 mg. of phenylalanine per oz. (1.35 mg. per g.) (Block and Bolling, 1951).

Since the diet is almost entirely synthetic, it seemed advisable to feed a salt mixture (similar to that fed by Rose, Johnson, and Haines, 1950), a comprehensive selection of vitamins as well as a liver extract, and arachis oil to supply arachidonic acid. *p*-Aminobenzoic acid was originally included in the vitamin mixture, but later excluded on the grounds that there was no proof that it played any part in human nutrition, and it might, at some future date, have complicated the sulphonamide treatment of an acquired infection. Tomato purée and agar-agar (to supply "bulk") were at one stage included in the diet, but they appeared to have no beneficial effect.

The mental ages of all three children being initially below 1 year, the diet was fed in the form of a soup. As their mental ages increased some of the starch, sugar, and fat was presented as biscuits or bread. Our latest patient (not included in this paper), with a mental age of over 2 years, has potatoes, carrots, and cabbage with, instead of the soup, a thick gravy flavoured with tomato purée; the phenylalanine in the vegetables is allowed for by reducing the amount of milk, which she has separately with a breakfast cereal; she eats fruit, jam tarts, and bread with butter and honey (both made with protein-free wheat starch), and even an egg may be allowed occasionally if the amount of other protein is correspondingly reduced.

The amount fed was varied with age according to the accepted desirable intakes of calories and protein nitrogen.

A careful watch was kept for any signs of incompleteness of the diet. While the children were in hospital they were weighed daily and their appetites watched. Their blood haemoglobin content and erythrocyte count were determined fairly often. Only when it was considered that they were thriving satisfactorily on the diet were they sent home, and they returned for examination at intervals. The weight loss while on a diet completely free from phenylalanine was expected; once phenylalanine was added to the diet (as milk) the children started gaining weight satisfactorily and their blood haemoglobin levels remained normal. It appears that the diet is adequate in all respects for normal health and development.

Choice of Subjects

Two factors suggested that children should be as young as possible when placed on the diet low in phenylalanine: (a) if the mental deficiency is due to an intoxication starting in the neonatal period and continuing throughout life, the brain may possibly become permanently damaged by prolonged exposure to the toxic agent; and (b) removal of the intoxicant would probably result, at best, in a child with the ability to learn and the intellectual content of a normal infant of the same mental age. There are, however, considerable difficulties in detecting mental retardation in the very young. It is worth emphasizing again that in every instance of mental retardation the urine should be tested for phenylpyruvic acid.

It may be argued that if a patient of initially relatively high level of intelligence is chosen, a socially useful person is more likely to result. On the other hand, a patient of initially low level would be expected to show a more clear-cut and dramatic effect. In practice, however, the number of children under 3 years of age in whom phenylketonuria is diagnosed is so small that there is little opportunity for choosing them on other grounds.

Where experimental therapy is prolonged, as in this case, the child will, in general, have to be treated at home. The parents must be able and willing to feed the child this rather complicated diet, and in accepting a child for treatment this had to be taken into account.

Summary

An economically practicable diet low in phenylalanine has been devised.

Three phenylketonurics (two idiots and one imbecile) have been fed this diet for four and a half to ten months. Their mental ages have been measured before and at intervals after starting the diet.

The rate of increase of mental age of all three rose markedly on the diet, their I.Q.s have risen, and they may reach educable levels.

One child ceased having attacks of petit mal and his E.E.G. became normal soon after starting the diet.

The other child with petit mal developed major epilepsy and status epilepticus on the diet, but later improved.

Otherwise normal physical health and growth were maintained.

It is concluded that the mental deficiency in phenylketonuria is due to intoxication by phenylalanine or one of its metabolites and can be relieved by decreasing the dietary content of phenylalanine. The petit mal may also be due to this intoxication.

We wish to thank Dr. P. R. Evans for permission to quote Case 3; Miss Dilliston for working out details of the diets; Dr. W. W. Payne, Mr. Rae, and Mr. Philips for helpful discussions; Mrs. S. Zisman and Mr. A. Jarrett for technical assistance with the laboratory investigations; Dr. D. A. Pond and Dr. C. C. Evans for the E.E.G. reports; the nursing staff for their intelligent co-operation; and the Research Committee of The Hospital for Sick Children for financial support.

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Delivering the Florence Blair Memorial Lecture before the Liverpool Medical Institution on December 1, 1954, Sir CHARLES DODDS, F.R.S., spoke on two human menaces— infection and cancer. After briefly reviewing current theories on cancer, Sir Charles turned to the question of infection, a hundred years ago a scourge of equal mystery and seriousness to cancer. He wondered whether a lesson could be learnt from that study. The problem of infection had been solved by Pasteur's realization that the question of spontaneous generation must be settled finally before a real advance in biology could take place. It was his demonstration that the development in broths, etc., of living creatures was due not to their spontaneous generation but to their introduction from outside. This fact, that the air contained living organisms, was the basis of Lister's work which indicated clearly that infection of wounds came from outside. It might well be, Sir Charles continued, that a solution of the cancer problem would come from the application of some principle discovered as a result of general research. Also the possibility of what might be termed "a piece of luck" should not be entirely lost sight of.

DISAGREEMENT BETWEEN OBSERVERS IN AN EPIDEMIOLOGICAL STUDY OF RESPIRATORY DISEASE

BY

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The investigation of the incidence and severity of a disease in a community may depend on the clinician's skill in taking histories and observing physical signs. The less opportunity there is of using objective measurements, such as x-ray films, blood pressures, and blood counts, the more does the clinician have to depend on his skill and on the memory and veracity of the patient.

In a study of byssinosis in Lancashire cotton-workers the investigators had to depend almost entirely on their clinical observations and on the patients' histories, because, unlike most industrial pulmonary diseases, byssinosis shows no specific x-ray changes in the lungs. In its later stages the clinical picture is often that of chronic bronchitis with emphysema, which is endemic in Lancashire. The diagnosis is made on an odd but characteristic history of chest tightness and breathlessness on Mondays, gradually extending, as the disease progresses, to other working days (Schilling, 1952).

Cochrane *et al.* (1951) and Fletcher (1952) have shown that clinical observations in respiratory disease may be very unreliable. In this study, therefore, it seemed to be necessary for two investigators to examine each worker independently to see if the method of diagnosing byssinosis was reliable. The two examinations also made it possible to assess the reliability of a number of other clinical observations and of patients' histories.

This paper deals with the disagreement between observers, and shows that there was fair agreement in diagnosing byssinosis on the history, but some of the clinical data were so unreliable that they cannot be used to indicate the nature or the severity of disease.

Procedure

The subjects studied were 187 men aged between 40 and 60 years exposed to fine cotton dust in 27 mills and 88 men (the controls) of similar ages who worked in two factories in which there was no known hazard of industrial pulmonary disease and who had never been exposed to cotton dust. The survey was made between March and December, 1953. Each observer examined about half of the subjects in the first part of the survey and saw the other half in the second part. There was an interval of approximately four months between the two examinations of each worker. Practically all the 275 men were examined at their place of work, but a few were seen at their trade union office. All were seen privately and usually in a reasonably quiet room. Neither observer knew of the other's findings until the field work was completed.

An occupational history and a record of previous illness were taken at the first examination. Both observers asked detailed questions about chest complaints and examined each man for the following signs: clubbing of fingers;

cyanosis; movement of chest *en bloc*—in which the chest wall moves up and down as a whole, without showing the normal progressive expansion (Hart and Aslett, 1942); kyphosis graded as normal, moderate, severe; Hoover's sign—in the early stages of emphysema the subcostal angle remains constant during inspiration; as the disease progresses the subcostal angle is narrowed on inspiration; the observer's thumbs are placed symmetrically along the costal borders as indicators (Hoover, 1913); absence of apical impulse; abnormal chest sounds. Chest expansions and systolic and diastolic blood pressures were also recorded.

Results

Diagnosis of Byssinosis in the Cotton-workers

Both observers graded the men for byssinosis as follows: Normal no chest symptoms. Grade I chest tightness and/or breathlessness on Mondays only. Grade II chest tightness and/or breathlessness on Mondays and other days.

TABLE I.—Comparison of Byssinosis Grading in 183* Cotton-workers

	Grade	Observer A		
		Normal	I	II
Observer B	Normal	72	6	—
	I	6	47	17
	II	1	14	20

* Complete agreement in 139 men (76%). Agreement on the presence or absence of byssinosis (139:14, 17:179 men (93%).

* Four men could not be compared because their working conditions had changed completely when they were seen on the second occasion.

The observers disagreed in their findings in 24% of the subjects* (see Table I). On the actual presence or absence of byssinosis there was only a 7% disagreement, which was not due to one observer diagnosing byssinosis more readily than the other.

Clinical Signs

For signs recorded as either present or absent the observer error was considerable, and ranged from 30% in absent apical impulse to 4% in cyanosis (Table II). These figures, however, tend to exaggerate the reliability of the observers in detecting those abnormalities which were found infre-

TABLE II.—Observer Error in Clinical Signs in 275 Men

Clinical Sign	Agreement		Disagreement			
	Found by		Found by		Observer Error	Significance
	Neither	Both	A Only	B Only		
Absent apical impulse	106	85	20	64	84 (30%)	B > A P < 0.0001
Abnormal chest sounds	188	22	32	33	65 (24%)	—
Movement of chest <i>en bloc</i>	205	10	10	50	60 (22%)	B > A P < 0.0001
Kyphosis	213	18	35	9	44 (16%)	A > B P < 0.0001
Hoover's sign	229	6	16	24	40 (15%)	—
Clubbing of fingers	248	6	6	15	21 (8%)	—
Cyanosis	265	0	10	0	10 (4%)	A > B P < 0.001

quently. For example, Observer A found 10 men with cyanosis and B none. Comparing the disagreement on the positive cases, A found significantly more men with kyphosis and cyanosis, and B significantly more men with an absent apical impulse and movement of chest *en bloc*.

The different findings of each observer for the cotton-workers and controls are compared in Table III. Observer A found similar incidences of abnormalities in both groups, and Observer B found consistently a higher incidence among the cotton-workers. A likely explanation of the different standards of diagnosis of the two observers is that either Observer A was biased against or Observer B was biased

* These percentage disagreements will from now on be referred to as observer error.

One observer appeared to be biased against and/or the other towards finding abnormalities in the cotton-workers. The same observer bias occurred in taking histories of symptoms.

The importance of observer error in epidemiological studies and possible methods of reducing it are briefly discussed.

We are grateful to the Medical Research Council for a grant to study byssinosis. We have had much helpful advice and criticism from our colleagues inside the Department and others, particularly from Dr. J. C. Gilson and his colleagues in the Pneumoconiosis Research Unit, and from Dr. C. M. Fletcher. The lateral x-ray films were read for kyphosis by Dr. J. C. Gilson and Dr. W. E. Miall. To all the above we gratefully acknowledge our indebtedness and to the many workers and employers whose co-operation has made this work possible.

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CLINICAL EXPERIENCE OF THE INSULIN ZINC SUSPENSIONS*

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In introducing the insulin zinc suspensions, Hallas-Møller *et al.* (1952) claimed that they enabled the majority of diabetics requiring insulin to be controlled with a single daily injection. By mixing in different proportions the relatively quick-acting amorphous and the longer-acting crystalline forms, insulins with a wide range of prolonged action could be obtained. These mixtures were consistent in their effect, unlike, for example, those of protamine zinc (P.Z.I.) and soluble insulin (S.I.). The Danish workers found that a mixture of seven parts crystalline with three parts amorphous was suitable for most patients; this was placed on the market as "lente insulin" and is known in this country as insulin zinc suspension (I.Z.S.). The amorphous and crystalline forms are also available separately as insulin zinc suspension (amorphous)—I.Z.S.(A)—and insulin zinc suspension (crystalline)—I.Z.S.(C). It was claimed, too, that the absence of any foreign protein and the use of thrice-recrystallized insulin in the preparation of the insulin zinc suspensions reduced the incidence of sensitivity reactions. Preliminary studies in this country (Lawrence and Oakley, 1953; Oakley, 1953; Murray and Wilson, 1953; Nabarro and Stowers, 1953a, 1953b) confirmed these

*The results in this paper formed the basis of a communication given at the Annual Scientific Meeting of the British Diabetic Association on July 16, 1954.

findings, and the new insulins were made generally available in Great Britain in October, 1953. We have now used them in the routine management of 240 diabetic patients in the clinics at University College Hospital and in the Dundee area, and this report is a critical review of the results we have obtained.

Results

Patients already on insulin were selected for trial of the new preparations only if their previous regime was proving unsatisfactory. They therefore do not represent a cross-section of all diabetics requiring insulin, but rather some of the more difficult ones. A series of 205 patients already taking insulin have been tried on the insulin zinc suspensions, and the indications for transfer and the results obtained are shown in Table I. The term "poor control—hyper-

TABLE I.—Indications for Transfer (205 Cases)

	No.	Trial Discontinued	Satisfactory Result
Multiple injections	120	5	98 (81%)
Poor control—hyperglycaemia	93	4	70 (76%)
" hypoglycaemia	47	—	39 (83%)
Allergy	9	1	6

The sum of the number of indications exceeds the total number of patients because in a proportion multiple indications were present.

glycaemia" is used for patients with diabetic symptoms (thirst, polyuria, or unintentional loss of weight) or in whom the blood sugar was found to be over 250 mg. per 100 ml. on an ordinary day. Of the patients transferred because their previous regime involved multiple injections, 81% were satisfactorily controlled with a single injection of the new preparations. About 80% of those who had hyperglycaemia, diabetic symptoms, or repeated hypoglycaemic attacks were improved. Of those in whom the results of transfer have so far proved unsatisfactory, the trial was discontinued in 10 for reasons that are given in a subsequent paragraph. In the remainder further adjustments of the proportions of I.Z.S.(A.) and I.Z.S.(C.), as well as alterations of the diet, are being tried to improve the control of the diabetes.

The alterations in dose that were required when the patients were transferred from different insulin regimes to the insulin zinc suspensions are shown in Table II. Patients who had been taking two or three doses of S.I. usually

TABLE II.—Alterations of Dose in Transfer to I.Z.S.

	No.	Mean Previous Dose	Mean Alteration	% Change
2 or 3 doses S.I. ...	19	47 (20-116)	+1.7 (-24 to +26)	+3.6
2 doses G.I. ...	11	53 (44-88)	+12 (-12 to +24)	+23
1 dose G.I. ...	19	40.5 (20-124)	+5.7 (-16 to +36)	+14
1 .. P.Z.I. ...	36	32.2 (10-60)	+12.4 (0 to +40)	+38.5
P.Z.I.+S.I. a.m. ...	82	53.9 (10-104)	+5.9 (-28 to +58)	+10.9
P.Z.I.+S.I. .. and S.I. p.m. ...	21	78.5 (36-128)	+10.2 (-16 to +78)	+12.9
Miscellaneous	7			

needed little if any change in dosage, whereas those previously on a single dose of P.Z.I. required on an average 40% more. The difference between these two figures is highly significant, being five times the standard error. Patients previously using globin insulin (G.I.) or P.Z.I. plus S.I. required usually a slight increase in dose, but the differences do not attain the level of statistical significance. The alterations of insulin requirements that follow transfer from P.Z.I. or S.I. to the insulin zinc suspensions can to some extent be explained by the pharmacological properties of these insulins. P.Z.I., if given in a dose large enough to control postprandial hyperglycaemia in the day, is virtually certain to produce hypoglycaemia in the night or early morning. Therefore patients on P.Z.I. alone usually have to take a

smaller dose of it than of an insulin which acts mainly in the day and less at night, like I.Z.S. S.I., on the other hand, has a rapid hypoglycaemic action, which is apt to bring into effect counter-regulatory mechanisms for raising the blood sugar, and, to control this, extra S.I. may need to be given at the next injection. With some patients on two or three doses of S.I. this leads to an increase in the apparent insulin requirement. The moderate increase of dose in the case of patients previously taking G.I. or P.Z.I. + S.I. may reflect in part the closer attention accorded by the physician in an attempt to obtain optimal control with a new preparation. FitzGerald *et al.* (1954) found that four out of eight patients transferred from two doses of S.I. to the same total dose of I.Z.S. suffered a deterioration in control, and although this experience has proved exceptional in our series, it illustrates the variability in individual response in the same circumstances. It is such variations that require adequate numbers of cases to be studied before reliable conclusions can be drawn.

In deciding the initial dose to be given when transferring a patient to the new insulins the previous regime must be taken into consideration. If the patient was on P.Z.I. alone we now suggest an increase of 20% for the initial dose of I.Z.S., with patients on G.I. or P.Z.I. + S.I. an increase of 10%, and for those who had been taking two or three doses of S.I. the same total dose as before, assuming that the patient had been having an optimal dose of the previous insulin.

The present insulin dose of patients transferred to the insulin zinc suspensions is shown in the Chart. Most cases fell into the group requiring 30 to 70 units a day, but a

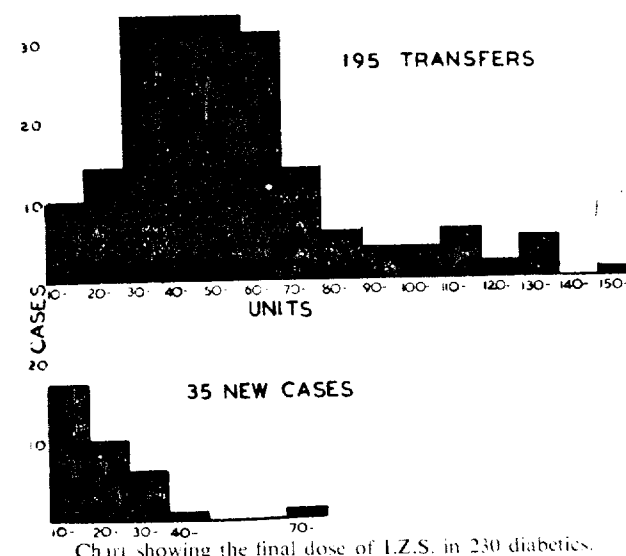


Chart showing the final dose of I.Z.S. in 230 diabetics.

number were well controlled on a single dose of over 100 units, and one patient takes 160 units. We have previously pointed out (Nabarro and Stowers, 1953b), that patients needing large doses may require more I.Z.S.(C.) than in the standard 3:7 mixture (I.Z.S.). On the latter these patients, despite the exclusion of a bed-time snack, tended to get early morning hyperglycaemia, and any attempt to increase the insulin dose resulted in the development of hypoglycaemia during the day. In this series we have so far found that about 14% of the patients required the addition of extra I.Z.S.(C.) to the standard I.Z.S. mixture, whereas only 2.5% needed extra I.Z.S.(A.). It therefore appears that, although 3:7 is the ratio most commonly required, a significant proportion of diabetics need a modification of the standard mixture. Results from other British clinics (Oakley, 1953; Venning, 1954) have differed to some degree regarding the proportions of patients needing more or less crystalline zinc suspension than is present in the I.Z.S. (lente) mixture. Such differences are probably based mainly on different distribution of the diet and a different timing of the blood

and urine tests. Where mixtures other than the standard I.Z.S. have been indicated, we provide them already mixed in sterile phials, or the more capable patients prepare them themselves. Since the 80 units per ml. strength of I.Z.S.(A.) and I.Z.S.(C.) has become available, it has been possible to provide special mixtures for patients with high insulin requirements.

It is our practice when transferring patients to the new insulins to review the distribution of the dietary carbohydrate. I.Z.S. acts most strongly between about 12 noon and 6 p.m., and therefore the carbohydrate content of the lunch and tea meals should be considerable. The usual distribution used for these patients is shown in Table III. A few tended to get hypoglycaemic before lunch, and in these the carbohydrate content of the mid-morning snack was increased. Dietary adjustments have proved a valuable help in improving control in patients taking the insulin zinc suspensions. The patients were advised to take their insulin

TABLE III.—Distribution of Dietary Carbohydrate Equivalents (Calculated from the Grammes of Carbohydrate Plus 58% g. Protein—10% g. Fat.)

Breakfast	..	17%	Tea	..	25%
Mid-morning	..	5%	Supper	..	21%
Lunch	..	32%			

three-quarters to one hour before breakfast when possible, in order to prevent the postprandial hyperglycaemia which occurs if the interval is shorter.

Nine patients were tried on the new insulins because they were getting sensitization reactions at the site of injection of their previous insulin, and in six there was a considerable improvement. One had been getting local reactions to P.Z.I. and continued to do so with the British I.Z.S.; they ceased, however, when Danish I.Z.S. was used.

The trial of the insulin zinc suspensions was abandoned in 10 cases. In one this was because local sensitization reactions were unimproved and the patient asked to return to his previous insulin, and in six there was a considerable improvement. One had been getting local reactions to P.Z.I. and continued to do so with the British I.Z.S.; they ceased, however, when Danish I.Z.S. was used. In the remaining eight cases the transfer to I.Z.S. was followed by a steep increase in insulin requirement, and in two ketosis developed. It was not an uncommon experience for the diabetes to escape from control following transfer, if the initial dose of I.Z.S. was the same as that of the previous insulin, especially if the latter was a single injection of P.Z.I. To regain control a large increase of dose was required, sometimes supplemented with S.I. In the cases mentioned above the trial of I.Z.S. was discontinued because the patient, and on occasion the physician as well, became alarmed at the increase of insulin requirement.

The steep increase of dose needed to regain control if the initial dose of I.Z.S. at the time of transfer had been inadequate has also been noted in patients well balanced on I.Z.S. whose stabilization has been upset by an intercurrent infection. When a patient on I.Z.S. becomes unbalanced the insulin dose must be increased more boldly to control the hyperglycaemia and avert ketosis than is the case with patients on S.I. or G.I. Three of our patients have developed ketosis after being satisfactorily balanced on I.Z.S. After treatment with S.I. two of them were re-balanced on I.Z.S. and needed a dose very similar to that taken before the episode of ketosis. This danger of the insulin zinc suspensions has so far not been emphasized. It is important to realize that if thirst and polyuria develop during an intercurrent infection the insulin dose should at once be increased by about 20%, and if the symptoms persist S.I. should be given before the later meals of the day.

In addition to the 205 patients already on insulin 35 new diabetics have been given the insulin zinc suspensions. In the more severe cases which required admission to hospital the symptoms were first controlled with S.I. and in the remainder the insulin zinc suspensions were used from the

start. These new preparations proved very satisfactory for the management of fresh cases of diabetes, and the final doses required are shown in the Chart. One of these patients has had mild local reactions at the site of the injections.

Discussion

Colwell (1954), in a recent editorial discussing the insulin zinc suspensions, suggested that "before new preparations are introduced it should be clearly apparent that they possess decisive advantages over those now available." If the value of the insulin zinc suspensions is to be assessed, the advantages and disadvantages of the insulins previously available must be reviewed briefly and compared with those of the new preparations.

Soluble Insulin.—S.I., with its quick action, is very valuable for emergency use in diabetic ketosis, and for conditions in which the insulin requirement is changing rapidly and is unpredictable—for example, in the presence of an acute infection or after surgery. On the other hand, if it is to be used for the day-to-day routine management of patients, at least two and often three injections are needed.

Protamine Zinc Insulin.—This form is suitable for the treatment of very mild cases, and the exact timing of the injection in relation to breakfast is relatively unimportant. However, its action is slow and the total duration prolonged (up to thirty hours or more). It acts as strongly by night as by day, and, in all but the mildest diabetics, if enough is given to control the daytime blood sugar, hypoglycaemia is apt to occur in the early hours of the morning. For this reason it is often necessary to supplement its action with a dose of S.I. given before breakfast, either mixed with the P.Z.I. or by a separate injection. If the mixing technique is used, inconsistent effects may result from variable degrees of mixing and from the variable excess of protamine present that tends to combine with the S.I. Diabetics requiring doses of 60 units or more may escape from control in the evening unless another dose of S.I. is given before supper. This means that the treatment is somewhat complicated, involving two or three injections daily and two kinds of insulin which have to be varied independently according to the timing of any hypoglycaemic attacks or hyperglycaemic peaks during the twenty-four hours. Regimes with P.Z.I. plus S.I. seldom lead to hypoglycaemic attacks in the late afternoon, a period that is rather difficult for working men with the small tea meal followed by the journey home. Patients taking P.Z.I. and S.I. in the morning and S.I. in the evening are able, when necessary, to vary both the time and the amount of the latter, and this may be very convenient for those who make a practice of dining out. Local reactions at the site of the injection are quite common, and these are usually due to the protamine content of the preparation.

Globin Insulin.—Diabetes of mild or moderate intensity may often be treated by a single daily injection of this insulin, and severe "brittle diabetics" may be well controlled by two injections—one given about three-quarters of an hour before breakfast and the second before tea or supper. Severe diabetics cannot be controlled with a single injection because its action is too short and the blood sugar rises in the evening and during the night. Hypoglycaemia tends to occur in the late afternoon and a large tea meal is required. Sensitivity reactions to the globin in this preparation are not uncommon.

Isophane (N.P.H.) Insulin.—This modification of P.Z.I. has only recently been made available in this country, although it is at present the most popular insulin in the U.S.A. It is designed to exert its hypoglycaemic action for twenty-four hours, and, since it contains no excess protamine to combine with the insulin, it can be mixed with S.I. without significantly modifying the rapid action of the latter. Apparently in a proportion of cases its action fails to last for the full twenty-four hours, and early morning hyperglycaemia may be troublesome. Like P.Z.I., it contains a foreign protein and, as would be expected, produces local sensitivity reactions in a number of patients.

The insulin zinc suspensions overcome many of the disadvantages of these preparations. The duration of action of the I.Z.S.(C.) is more than twenty-four hours, and during the day this can be reinforced by the addition of I.Z.S.(A.). The actions of mixtures of these two preparations are consistent and predictable, being those of the two insulins given separately. Most diabetics are well controlled on the 3:7 mixture—I.Z.S.—but a few require a different ratio. The insulin zinc suspensions cannot be mixed with S.I. because the acid in the latter overcomes the weak buffer in the suspensions, and, by lowering the pH, may modify the particle size and lead to unexpected alterations in the duration of action. This is not a serious disadvantage, because I.Z.S.(A.) and S.I. come into action at much the same rate and if it is necessary to accelerate the action of I.Z.S. it can be done by adding extra I.Z.S.(A.). The morning injection of I.Z.S. should probably be given three-quarters of an hour to one hour before breakfast, and this may be a disadvantage in later risers. The maximal hypoglycaemic action of I.Z.S. is in the afternoon; and if hypoglycaemic attacks at that time are to be avoided a good lunch and tea are required; some patients find this difficult to arrange.

The theoretical advantages of the insulin zinc suspensions have been borne out by our finding that 80% of the more difficult diabetics attending our clinics have benefited from being transferred to them. At the same time they have been in general use in this country for only one year, and it is possible that further experience will reveal shortcomings. We are a little apprehensive about the difficulty in regaining control with them once it has been upset by, for example, an intercurrent infection.

Summary

The results of a trial of the insulin zinc suspensions in 240 diabetic patients are described. Thirty-five were new patients and satisfactory stabilization was achieved. The remainder were transferred to the new insulins because their previous regime had disadvantages. Over 75% of these cases benefited from the transfer. Patients previously on a single injection of protamine zinc insulin needed a 40% increase in dose, those on other programmes with long-acting insulins needed smaller increases. Patients having two or three injections of S.I. were balanced on a similar total dose of the insulin zinc suspensions. When patients are being transferred to the new insulins it is necessary to take into consideration the type of insulin the patient had been using when assessing the initial dose of insulin zinc suspension to be given.

In the majority of patients insulin zinc suspension (lente), with the ratio three parts amorphous to seven parts crystalline, proved satisfactory: 14% needed a larger proportion of the crystalline and 2.5% a larger proportion of the amorphous.

The comparative advantages and disadvantages of the current British insulins have been reviewed. It is concluded that the insulin zinc suspensions have definite advantages over the other preparations, and that probably over 90% of all diabetics requiring insulin can be satisfactorily controlled by a single daily injection of suitable proportions of crystalline and amorphous insulin zinc suspensions. Attention is, however, drawn to the difficulty in regaining control with these preparations if the balancing of the diabetes is upset by an intercurrent infection.

Grateful acknowledgment is made to Dr. K. Hallas-Møller and to Evans Medical Supplies Ltd. for making supplies of I.Z.S. available to us before their general release, and to Dr. W. M. Wilson (Perth), Dr. R. McNeil (Maryfield Hospital, Dundee), and the physicians working in the Diabetic Clinic at University

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TREATMENT OF DIABETES MELLITUS WITH INSULIN ZINC SUSPENSION

A CLINICAL STUDY BASED ON 479 CASES

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The clinical assessment of the new insulin zinc preparations introduced by Hallas-Møller *et al.* (1952a, 1952b) has necessarily been divided into two stages. The first, in which detailed observations were made on a small number of diabetic patients in hospital under controlled conditions, was necessary to verify their metabolic activity and provide familiarity with their clinical potentialities. Our own initial observations (Lawrence and Oakley, 1953; Oakley, 1953) have been confirmed by those of Drury (1953), Murray and Wilson (1953), Nabarro and Stowers (1953), and Venning (1954), all of whom obtained satisfactory results. From this preliminary work it was evident that in carefully selected and well-treated groups of patients a considerable measure of success could be obtained using insulin zinc suspension ("insulin lente"; I.Z.S.) in a single daily injection.

The second and equally important stage in its evaluation was the study of a large number of diabetics in conditions of everyday life. Variations in diet and activity, exposure to intercurrent disease, and the inevitable spontaneous day-to-day fluctuation in the diabetic state might lead to results at variance with those obtained in the earlier studies.

Present Study

This paper is based on our observations on 479 patients seen in the Diabetic Department of King's College Hospital, treated with I.Z.S. in the period July, 1953, to June, 1954. The length of treatment ranged from three months to one year, the majority having been maintained on I.Z.S. for over six months. When out-patients were changed to the

new insulin, readmittance was demanded during the first six weeks at intervals of a week or a fortnight. Special notes were kept with records of the night and morning urine tests for sugar and ketone bodies, blood sugar, weight, hypoglycaemia, local reactions, the patient's subjective observations, and alterations in diet. Some degree of selection was inevitable, as cases already on insulin tended to be chosen because they were judged likely to do well on I.Z.S., and those with insulin requirements of over 80 units a day were usually excluded. A relatively larger proportion of patients were, for instance, on protamine zinc (P.Z.I.) rather than soluble insulin (S.I.). Almost all new patients seen during this period were tried on a single injection of I.Z.S., those with severe ketosis being first treated with S.I. We must emphasize that at this time it was our policy not to alter the treatment of well-controlled diabetics, and only about 10% of insulin cases attending the clinic were changed to I.Z.S. The frequency of visits also made big demands on the patient's co-operation, and those who could not attend as often as we required were not permitted to change. The total of patients treated at King's College Hospital on I.Z.S., I.Z.S. amorphous ("semilente"), or mixtures of the latter with I.Z.S. crystalline ("ultralente") is now well over 700, and we think that enough clinical experience has been gained to justify a definite decision on their value.

Criteria of Control

There are no clear-cut criteria by which the clinical superiority of any type of insulin can be assessed. We have analysed our results so as to take into account both subjective and objective factors, and have compared these with the degree of control previously achieved using other types of insulin.

Subjective.—By this we mean the opinion of the patient concerning his well-being and freedom from hypoglycaemia and diabetic symptoms, as compared with his condition either before any form of insulin was started in new cases or on his previous regimen. Since the patient's attitude to any new form of therapy is likely to be biased this information is of limited value.

Objective.—To assess *absolute control* we have taken into account (A) the degree of night control as indicated by the early morning urine tests; (B) day control, judged by the blood sugar before the midday meal; and (C) alterations in weight. Night control was regarded as good when on at least 75% of examinations the early morning Benedict's test was blue or green (3+; one plus). Day control was accepted as satisfactory if the capillary blood sugar was under 200 mg. per 100 ml. (Folin and Wu). Changes in weight of ± 2 lb. (0.9 kg.) were ignored, and only larger variations were deemed significant. When both night (A) and day control (B) were good, and when weight was static or had increased (C), control was considered excellent and the A B C classification applied. As in many patients a slight loss of weight was desirable, we have grouped those with A B C and A B classifications together and described the control as good. When only one or two of the criteria were satisfied control was assessed as fair, and if none were satisfactory it was assessed as poor and recorded as O.

Comparative control was assessed in the same way by comparing the results achieved with I.Z.S. with those over a similar retrospective period of treatment with other insulins, and classified as better, the same, or worse.

Analysis of Results

In order to facilitate discussion we have divided our cases into the following groups:

Adults:	{ O'd insulin cases	..	..	312
	{ New cases	..	..	122
Children:	{ O'd cases	..	..	30
	{ New cases	..	..	15
I.Z.S. abandoned, including adults and children				46

Table I shows that 433 of the 479 cases receiving I.Z.S. remained on it at the close of the trial, and that in only 32 was this form of treatment regarded as a failure.

TABLE I.—Proportion of Successes and Failures in 479 Cases Treated with I.Z.S.

	No. Treated	Maintained	Abandoned	
			Failed	Other Reasons
Old cases	342	299	30	13
New ..	137	134	2	1
Total	479	433	32	14

Adult Old Cases

In the 312 adult old cases I.Z.S. was abandoned in 43, of whom only 30 were assessed as failures. The age distribution of the 269 patients who remained on I.Z.S. is shown in Fig. 1. Their previous insulin arrangements were as follows: S.I., 75; S.I. + P.Z.I., 94; P.Z.I. alone, 89; and globin, 11.

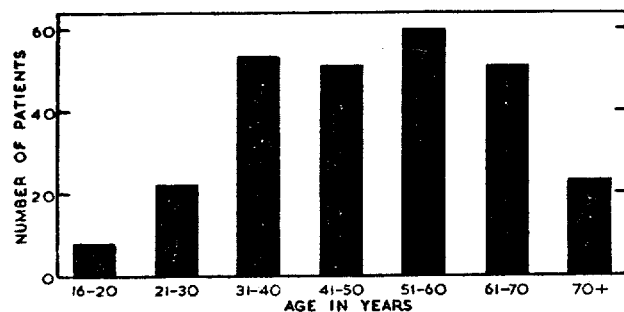


FIG. 1.—Age distribution of adult cases.

Subjective assessment (Fig. 2) showed that 43% (117) felt better on I.Z.S. than on their previous treatment, while 55% (147) noticed no change, and only 2% (5) felt worse. In this latter group objective control was, however, not necessarily any poorer. Assessment of control was equally satisfactory from both the *absolute* and the *comparative* point of view. Night control was good in 174 (65%), but bad in 83 (31%), whilst the renal threshold was sufficiently low in 12 to invalidate the urine tests. Day control was good in 179 (67%) and unsatisfactory in 90 (33%), proportions very similar to those for night control, though not necessarily

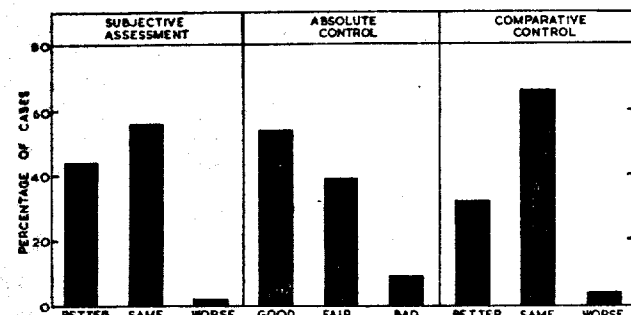


FIG. 2.—Analysis of results in adult old cases.

in the same patients. The correlation of these factors is mentioned later. There was a weight gain in 108 (40%), no change in 88 (33%), and a loss in 66 (24%), whilst in 7 (3%) the weight was unreliable because of oedema or significant alterations in diet. As shown in Fig. 2, absolute control was good in 53% (143), and bad in only 9% (29). Comparison with the degree of control on their previous insulin arrangements showed that 32% (84) were better, and that in 64% (172) control was the same. There were only 4% (10) in whom control was worse.

Alteration in Insulin Dose.—It is important to know whether this general improvement was in fact due to the superior action of I.Z.S. *per se* or merely to an increase in the total insulin dose compared with that administered

previously. The changes in dose are shown in Table II, an increase of over 10%, being made in 61%, whilst in only 28% was no significant alteration ($\pm 10\%$) necessary. Analysis according to the type of insulin previously administered showed that there was a dose increase of 10% or more in approximately the same number of patients on two injections of S.I. as on a mixed dose of S.I. and P.Z.I. It was in the group on P.Z.I. alone that the highest proportion

TABLE II.—Adult Old Cases—Change in Dose on Transfer to I.Z.S.

Dose Change	Original Insulin				Total	
	Two Injections of S.I.	S.I. + P.Z.I.	P.Z.I.	Globin	No.	%
Less	8	16	5	1	30	11
Same $\pm 10\%$	24	30	17	4	75	28
+25% ..	17	22	19	3	61	23
+50% ..	20	18	25	2	65	24
+75% ..	3	5	6	—	14	5
+100% ..	3	—	6	1	10	4
>100% ..	—	3	11	—	14	5

(75%) needed more insulin, and it was among these patients that the 100% rises occurred. This is probably because the dose of P.Z.I. was limited by the danger of nocturnal hypoglycaemia, control during the day being poorer than that achieved with an increased dose of I.Z.S., with which there is less risk of insulin reactions at night. From these

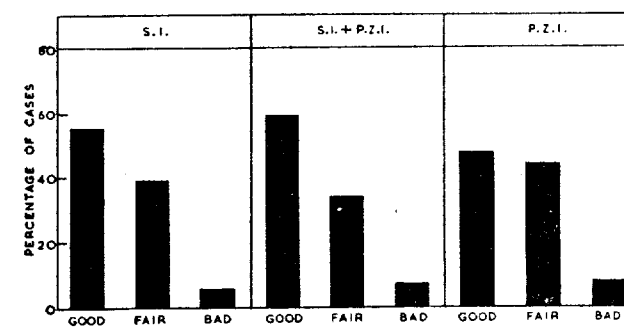


FIG. 3.—Absolute control on I.Z.S. in relation to previous types of insulin.

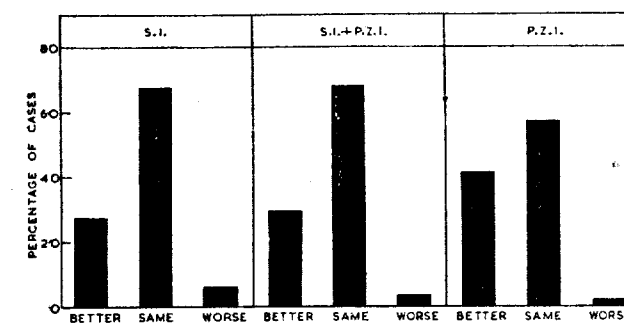


FIG. 4.—Comparative control on I.Z.S. in relation to previous types of insulin.

figures it can be seen that most patients needed a larger dose of I.Z.S. than of other types of insulin. In order to decide which patients could best be changed to I.Z.S. the results were analysed according to their previous insulin arrangements (Figs. 3 and 4). Our figures show that the proportion of patients in whom better control was achieved was remarkably similar in all groups. There was no evidence that improvement was directly related to increase in insulin dosage. It is, however, true that patients on very large doses of S.I. were rarely changed, and the highest dose of I.Z.S. that was used with success was 104 units.

Hypoglycaemia in Adults.—I.Z.S., like any other insulin may produce hypoglycaemia. The symptoms and signs are of the usual type, palpitations, sweating, and tremor being

the most common. The times at which reactions most commonly occurred are shown in Table III. Insulin reactions were reported by 119 of the 269 adult old insulin cases and by 35 of the 122 new cases. Only 5 experienced

TABLE III.—Incidence of Hypoglycaemia in I.Z.S.-treated Cases

Time of Reaction	Adults	
	Old Cases	New Cases
Breakfast to lunch	84	28
Lunch to evening meal	55	7
Night to breakfast	32	5
No. of patients reporting reactions	119	35

severe reactions with loss of consciousness; the majority occurred between breakfast and lunch, with a smaller proportion between 4 and 6 p.m. It did not appear that I.Z.S. was particularly liable to cause hypoglycaemia or that the reactions were in any way different, more severe, or more difficult to prevent by carbohydrate buffers.

Adult New Cases

This group consisted of 122 patients, of whom 55 were men and 67 women. The age distribution shows a surprisingly high proportion in the third decade (Fig. 5).

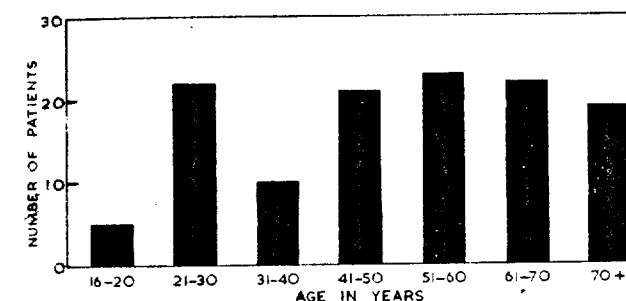


FIG. 5.—Age distribution of adult new cases.

The treatment of new cases presents a less difficult problem because they are relatively insulin-sensitive, pay more attention to their diet, and usually do well in the early stages. The satisfactory nature of these results is shown in Table IV. To find out whether these results were

TABLE IV.—Comparison Between Control in I.Z.S. New Adult Cases and a Series on Other Insulins

	I.Z.S. Group	Control Group
No. of patients	122	122
Night control good	102	86
Day ..	98	68
Weight—gain or I.S.Q.	110	110
Absolute control:		
Good ..	93	62
Fair ..	29	52
Bad ..	0	8
Subjective assessment:		
Better ..	112	102
No change ..	8	18
Worse ..	1	2

better than with other types of insulin we have analysed the degree of control in a consecutive series of 122 new diabetics treated in a corresponding period in 1952 and 1953. It is impossible to obtain two strictly comparable groups, but it can be seen that subjective assessment showed little difference, slightly favouring the I.Z.S.-treated group. There was a higher proportion of objective successes with I.Z.S., particularly in day control, and the same proportion of patients gained or remained constant in weight in both groups. Since the control series included many combinations of S.I. and P.Z.I., nothing is to be gained from analysis of the incidence of hypoglycaemia, but reactions were slightly more frequent in the I.Z.S. group, in 28% of patients as compared with 23% in the controls.

Children

Under this heading we have included patients of 15 years or younger; the total of 45 is made up of 30 old and 15 newly diagnosed, the youngest being 2 years old. As with the adult patients, about 10% of the children attending the clinic were changed to I.Z.S., but a higher proportion were tried on I.Z.S. because previous control was poor. At least three were difficult diabetics in whom treatment by other means had been unsatisfactory.

Old Cases.—Subjective assessment of these 30 children based on their own and their parents' opinions revealed that half felt better on I.Z.S. and none felt worse. Assessment of absolute control was also satisfactory, being good in 12 and fair in 17, whilst in only one was treatment inadequate; this lad did not respond as well as was hoped to over 80 units of I.Z.S. a day, but control was slightly better than with two injections of S.I. Assessment of comparative control suggested that in no case did I.Z.S. give poorer results; 11 had improved and 19 remained unchanged. Gain in weight was often striking, and indicated that frequently there was room for improvement in previous régimes. Our observations accord with those of Engelson (1953), who found all 22 of his diabetic children improved by I.Z.S., but we would not agree that it is always as effective in what he terms the "brittle" cases.

New Cases.—During the past nine months we have used a single injection of I.Z.S. in all new cases, though we have treated no infants under the age of 12 months. These results, as with adults, have been encouraging. Absolute control was good in 12 and fair in 3.

Hypoglycaemia.—In this group of 45 children insulin reactions were experienced by 19, the incidence being high before lunch, lower in the afternoon, and most infrequent after supper or before breakfast. It did not appear that hypoglycaemia was unduly frequent or that the effect of physical activity or missed meals was any greater than with other insulins. Insulin reactions in children are apt to develop suddenly, and it is not surprising that they were severe in three patients.

Treatment Abandoned

At the close of the trial 46 (9%) of the 479 patients were no longer taking I.Z.S., but not all were failures. Only 3 of the 137 new patients had abandoned it, against 43 of the 342 old patients (see Table I).

The actual number of failures was as low as 32 (7%) of the whole series. The most common reason for failure was poor control, yet in many instances this bore favourable comparison with that achieved previously. Among the 20 patients with bad control, only 2 were worse on I.Z.S., the remainder being equally bad on both types of treatment. Seven patients in the failed group were unsatisfactory because of poor subjective assessment in spite of reasonable objective control, of whom five complained of diabetic symptoms and two of troublesome hypoglycaemia. The proportion of failures in patients transferred from two doses of S.I. and from mixed doses of S.I. and P.Z.I. was similar, but there were no failures among those changed from P.Z.I. alone. In most cases the dose of I.Z.S. had been raised by 20 to 100% before failure was acknowledged, and it seemed that lack of success was due to insulin insensitivity or inadequate dieting rather than to any primary fault in the insulin. Previous control had often been poor, and there was no doubt that in many such patients there was a definite improvement with I.Z.S. Five patients returned to their previous insulin arrangement after inadequate trial, in spite of apparently good control, sometimes because of undue alarm at the increase in glycosuria shortly after transfer, and also because of personal preference for the flexibility of two injections. It is a tribute to the value of I.Z.S. that no case in this trial had to be admitted to hospital because of ketosis due to the change-over, and that a reasonable dose never failed to correct loss of control due to minor infections.

Local Reactions

Local reactions were never bad enough to cause cessation of treatment, but in one case the injections were thought to be more painful than the previous mixed dose of S.I. and P.Z.I. Erythema and pain are often troublesome for a few weeks in any newly treated diabetic, and the impression has been gained that I.Z.S. is less irritating than the more acid soluble insulin. There were five patients in whom local reactions appeared to be worse on British preparations of I.Z.S. than on the original insulin lente, but to all intents and purposes there is nothing to choose between either preparation. It is too early to draw any conclusions about the incidence of fat atrophy or insulin tumour formation.

Discussion

These observations, coupled with a general clinical appreciation, have left us in no doubt that I.Z.S. is a valuable preparation. We can also confirm the opinion of Hallas-Møller that the proportion of I.Z.S. amorphous to I.Z.S. crystalline of 3 to 7 is a satisfactory one for routine use. It has not been possible to predict which cases are most likely to need significantly more of the new insulin, but some increase is usually found to be necessary, especially in patients changed from a single dose of P.Z.I. No patient should be changed to I.Z.S. without adequate supervision. An increase in glycosuria is very common for the first three or four days, until the prolonged action of the crystalline component is fully available, and patients should be warned of the possibility of this. When thirst or polyuria is troublesome a small additional evening dose of S.I. may be advisable for a few days. If after a week the urine tests are still bad, an increase of at least 10% should be made, with still further additions in the following week if necessary. We now usually prescribe a 10% larger dose of I.Z.S. from the start, and the patient is warned not to be disappointed at having to take more insulin.

Progress can be adequately followed by the usual tests provided the renal threshold is normal. For routine purposes the urine should be tested before breakfast and again before lunch, tea, or the evening meal, whichever gives the best result. Clearly it is unsafe to increase the dose of insulin if the urine is sugar-free at any of these times, and in this respect treatment with a single mixed preparation, such as I.Z.S., allows rather less latitude than varying mixtures of S.I. and P.Z.I., or I.Z.S. amorphous and crystalline. It is helpful to modify the dietary arrangements at the time of the change, or in new cases to give at least 160 g. of carbohydrate daily without restriction of fat or protein. A suitable distribution is as follows: Breakfast, 30 g. carbohydrate; mid-morning, 10 g.; midday meal, 40 g.; tea, 30 g.; supper, 30 g.; bedtime, 20 g.

Such a basic diet can usually be increased by the addition of more carbohydrate, especially at breakfast and the evening meal. Since I.Z.S. amorphous comes into action about half an hour later than S.I., it is wise, when convenient, to give the injection one-half to three-quarters of an hour before breakfast; the risk of hypoglycaemia is slight, and the immediate postprandial rise in blood sugar is controlled better.

When these precautions are taken a high proportion of patients on two doses of S.I. as well as those on a mixed dose of S.I. and P.Z.I. with a total daily dose of up to 80 units a day can be safely changed to I.Z.S. Once the dose has been properly adjusted, and an increase is to be expected, about one-third of the patients ought to secure better control of their diabetes. Provided the dose is increased sufficiently, nearly every patient on P.Z.I. alone does well, and there is no doubt that the blood sugar during the day runs at lower levels. Our experience over the last year has shown that I.Z.S. is a reliable insulin, certainly superior to P.Z.I. alone, and in many cases the equal of a mixed injection, or of S.I. alone, without the necessity of two injections. There is no reason why it should not be widely used in the future. Newly discovered diabetics, both

children and adults, should always be given the benefit of a single injection of I.Z.S. once severe ketosis has been dealt with. S.I. still remains indispensable during surgical operations, pregnancy, periods of severe ketosis, and in the treatment of diabetic coma.

Summary

I.Z.S. has been used in the treatment of 479 diabetic patients. The degree of control has been assessed both subjectively and objectively, the latter both from an absolute standpoint and in comparison with that achieved with previous forms of therapy.

In less than 7% of cases I.Z.S. was a failure, whilst 31% of adults and 37% of children previously treated with insulin were found to be improved.

I.Z.S., as at present constituted, is considered to be a satisfactory preparation which should enable an increasing number of diabetics to be adequately controlled on one injection of insulin a day.

Some practical points in the use of I.Z.S. and in the management of the patients are discussed.

We are indebted to Dr. Hallas-Møller and the Novo Laboratories in Copenhagen, as well as to Evans Medical Supplies Ltd., Liverpool, for generous supplies of Novo lente insulin. We also wish to thank the nursing, laboratory, and clerical staff of the Diabetic Clinic, particularly Sister Maureen Tomlinson, our out-patient sister, Mr. H. R. Millar, our chief technician, and Miss E. P. Comley, secretary to the department.

ADDENDUM.—Since we made the above analysis of our results with I.Z.S. our views on its usefulness and application to the treatment of diabetes have been modified by further experience. We are now convinced that there exists a recognizable group of patients in whom I.Z.S. fails to control hyperglycaemia and prevents ketosis. These cases are relatively insensitive to all the long-acting insulin preparations and cannot successfully be treated for any length of time without the use of S.I. Temporary control may sometimes be achieved with the use of large doses of I.Z.S., but this is poorly maintained, or completely lost, when infection or intercurrent illness further reduces insulin sensitivity. It is now our practice not to attempt to change over such cases to one injection of I.Z.S., but rather to leave them on some arrangement which includes the use of S.I.

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At Barrow-in-Furness, as elsewhere in towns which have room to spread, new housing estates have developed on the outskirts. The additional child-welfare clinics which are needed to serve these new estates cannot yet be built, and the medical officer of health, Dr. James MacLachlan, has got over the difficulty by establishing a mobile clinic service in a second-hand single-deck omnibus at a cost of £1,500. The clinic contains three rooms, the rearmost being a waiting-room with accommodation for ten mothers; then comes the nurse's room, containing baby-scales and a weighing machine; and the third room is the doctor's, which has an examination couch, washbasin with gas water-heater, instrument stand, sterilizer, and desk. The rooms are warmed by convection heaters, specially modified for use with calor gas, and there are electric extractor fans in the roof of the vehicle. The water supply is carried on the roof, and waste water is collected in a tank under the floor. The staff consists of a doctor, a health visitor, and an ambulance driver. The usual clinic facilities are provided, including immunization and vaccination.

CRYING IN INFANTS AND CHILDREN*

BY

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Considering that crying is universal among children, and that the crying of children occasions so much distress to adults, there is comparatively little in the literature on the subject. In this paper I have attempted to bring together data concerning crying from my own experience and from a wide variety of sources.

How soon does a Child Cry?

He may cry before birth. There have been numerous reports in the literature about infants crying *in utero*—the so-called vagitus uterinus. King and Bourgeois (1947) collected 25 cases from the literature from A.D. 1800. According to Parviainen (1949) vagitus uterinus was renowned in fable and legend. He wrote that there are stories of it in ancient Hindu, Babylonian, Assyrian, Greek, and Roman writings. St. Bartholomew and Mahomet were said to have cried *in utero*. One child was said to have cried 14 days before birth. McLane (1933) described a case which occurred in an operating theatre. The cry was heard by all present, and a superstitious nurse spent the rest of the time on her knees in prayer. Crotty and Kuehnle (1948), in reviewing the subject, wrote that for a cry to be heard the membranes must have ruptured and air must have entered the uterine cavity. The cry may result from some manipulative procedure, or merely from uterine contractions. In the past vagitus uterinus was associated with a high foetal mortality, but it is thought (Field, 1943) that this was merely due to panic at what was wrongly thought to be foetal distress, with consequent precipitate efforts to deliver the child. The cause of crying *in utero* is unknown.

How does he Cry?

Charles Darwin was greatly interested in the manifestations of emotion in man and animals (Darwin, 1889), and went to great trouble to find out how animals in countries abroad expressed pleasure and displeasure. He wrote a very accurate account of the facial changes when a person cries. More recently Collins (1932) reviewed the literature on the subject.

Crying is normally involuntary, though some actors, including an occasional politician in a foreign country, appear to be able to produce tears at will. When a small child cries out when put into his bed at night, the cry is often voluntary at first, and has been termed the "testing cry," implying that it represents an attempt to get the mother back into his room (Illingworth, 1951, 1953), but if he fails to get his own way the voluntary cry is apt to be followed by an involuntary cry, with the shedding of tears and sobbing. According to Weingrow (1933) the crying centre is in a cerebro-thalamo-lenticulo-rubro-ponto-cerebellar pathway, connected by association fibres and tracts with many parts of the brain and cord. Magoun and his co-workers (1937) wrote that co-ordinated facial and vocal activity, like that seen or heard in man during the expression

*Based on a lecture given to the Doncaster and Harrogate Medical Societies in April, 1954.

of unpleasant emotion, is caused by electrical stimulation of a localized area in the mid-brain and pons of the monkey and cat. It is of interest that whereas in a peripheral lesion, such as Bell's palsy, there is paralysis of both automatic and volitional facial movements, in cases with a central lesion, causing a hemiplegia, there may be paralysis of volitional facial activity with normal automatic facial movements, in the way of laughing and crying.

The first sign of crying is often the flushing of the face and the wrinkling of the forehead. Darwin described the vertical wrinkles in the forehead when a child begins to cry, due to the contraction of the corrugator supercilii ("grief muscles") drawing the inner end of the eyebrows downwards and nearer together. Not infrequently the first sign of crying in a child is the pouting of the lower lip. Darwin wrote that oranges, gorillas, and chimpanzees show a similar pouting of the lower lip when they are annoyed. Another early sign of crying is trembling of the lower lip or alae nasi.

The next stage in crying is the drawing downwards of the corners of the mouth, so that the nasolabial folds are exaggerated. The upper lip is raised, and the mouth opens, assuming a square shape. The tongue is slightly elevated from the floor of the mouth and hollowed out, so that it is concave. It often trembles. The eyes close, and tears may then appear.

Darwin was particularly interested in the closure of the eyes during weeping. He and his friends showed that the tension of the eyeball increases during weeping, in association with the flushing of the face and engorgement of the superficial veins, and suggested that the closure of the eyes represents nature's effort to compress the eye to protect it from congestion. It is true that if one forces the eyelids open at the start of crying there is no congestion of the scleral vessels, but the vessels rapidly become filled with blood, while after a period of crying the eye is "congested" and pink. The closure of the eyes in crying may be of similar origin to their closure in sneezing or coughing.

Tears are not usually produced on crying till a baby is 3 to 4 weeks of age, and they do not run down the face until a few weeks later. Darwin accidentally showed, however, that in one of his own children tears were produced when he caught the eye with his coat sleeve, though no tears appeared on crying for a further three weeks. The shedding of tears, except in actors, is involuntary.

Collins (1932) reviewed the literature about weeping in animals, and concluded that no animals, not even crocodiles, shed tears. Deer are said to "weep" when they shed their horns, and Hamlet exclaimed, when the King stopped the play which was designed to expose his crime, "Why, let the stricken deer go weep," but they do not produce tears.

The Australian koala bear is said to whimper and cry when chased, as is the ape and monkey, but they do not produce tears. Darwin quoted a story about an Indian elephant shedding tears when mortally wounded in a hunt, but the possibility of direct injury to the eye could not be excluded.

Associated with the facial changes are the altered respirations, consisting of sudden deep inspirations with prolonged expiration. The slow decrease of pressure in the chest is probably related to the congestion of the face and neck veins. When a small child has been left crying for a long time he is apt to "sob." Long after he has been soothed, and begun to smile and laugh, sudden jerky inspiratory movements due to some degree of glottic spasm continue at decreasing intervals, until eventually they stop. The longer a child is left crying the longer the "sobbing" continues. It does not usually pay to put a child back into his cot, having soothed him after a night terror, if these sudden inspiratory movements are still occurring (Illingworth and Illingworth, 1954), for the child is very likely to start crying again as soon as he is left. Sobbing does not occur in animals (Darwin, 1889).

In addition to facial and respiratory changes, the baby shows generalized mass activity when he is crying—moving his arms and legs up and down, and alternately bending and extending his back. As he grows older this generalized mass activity disappears, though adults are known to grind their teeth and stamp their feet in rage—a relic of this primitive mass activity.

Types of Cry

A clinician recognizes the hoarse gruff cry of a cretin, the hoarse cry of laryngitis, the shrill cry of hydrocephalus, meningitis, or cerebral irritability, the grunting cry of pneumonia, the feeble cry of amyotonia or of a severely debilitated infant, and the whimper of a seriously ill child.

Experienced mothers claim that they can often tell the reason for a child's crying by the nature of the cry. Sherman (1927) is frequently quoted in this respect. She subjected a group of babies, all under 12 days of age, to a variety of stimuli—hunger, sudden change of posture, restraint of the head, and needle pricks—and asked nurses, undergraduates, and graduates, in another room within hearing distance but out of sight, to name the nature of the stimulus in each case. They all failed. This has long been quoted as evidence that the nature of the cry does not depend on the type of stimulus causing it. An obvious criticism of her work, however, is that she did not state whether the graduates and others had children of their own, and, more important still, she did not include the mothers of the babies in the audience. The mothers might well have recognized the cause of crying in their own baby. I have often been told by mothers in a four-bedded ward in a maternity unit that they do not awaken when a baby other than their own cries, but they waken immediately when their own baby does.

It would seem to me to be obvious that the cry of hunger or of loneliness is quite different from the cry of pain: how much of that difference lies merely in the intensity of the crying is a matter of opinion.

Why does he Cry?

I do not propose to discuss here the classical work of Barcroft (1946) concerning foetal respirations, but I will quote some work of psychologists. Adler described the first cry as "an overwhelming sense of inferiority at thus suddenly being confronted by reality without ever having to deal with its problems." Rank (quoted by Ruja, 1948) wrote that birth represents "a loss of paradise. The pleasurable primal state is interrupted." It is not clear how Rank knew that the baby finds it pleasant *in utero*. Petö (1946) thought that the movements of crying represent originally an attempt of the body to remove foreign material. "We behave towards pain as though it were something removable from our bodies, and in order to bring about this removal we mobilize the whole body apparatus: we try to get rid of it, to project it into the outer world." Sperling (1949) wrote that crying out at night in night terrors is due to "the repression of intense sexual and aggressive impulses stemming from the oedipal complex. Another cause is sibling rivalry, with repressed hostility and resentment toward the mother and death wishes toward the sibling." Greenacre (1945) declared that there is a strong connexion between weeping and urination. Concerning the different attitude towards weeping in the two sexes, she wrote: "It seems probable that this difference in social custom came originally out of the fact that the male child's urination early assumes the significance of achievement of an aggressive activity to an extent much greater than that of the female child ever can. In consequence it is a greater outlet for his tension and a projectile weapon as well." She thought that much weeping in girls is due to subconscious penis envy. "They weep with a quiet resentful approximation of the stream which comes from above rather than from below."

The causes of crying in infants and children have been discussed in detail elsewhere (Illingworth and Illingworth, 1954). It was emphasized there that an important factor which governs the amount they cry is the personality. Some are placid easy babies who will accept almost anything. They will wait for a time for food when they feel hungry, and they are content to lie in a pram for hours without being picked up. Others are determined difficult babies who almost from the moment of birth do not hesitate to let their wants be known and to express their disapproval of what is being done or not being done for them. It is very easy to ascribe the constant cries of a baby to mismanagement, when in fact the wisest management in the world would not stifle much of his crying. It is quite untrue to say that every baby who cries a lot is naughty, "nervous," or spoiled. Critics who say this have either not possessed a child of their own, or have had an easy-going placid child who was very different from the one in question. Nevertheless a great deal of crying is due to wrong management.

The common causes of crying can be summarized as follows:

(a) The First Three Months

The chief cause is discomfort, of which hunger is the most likely source. Excessive or prolonged crying may be the result of keeping the baby waiting a long time for food when he is ready for it, owing to adopting a rigid feeding schedule in the mistaken idea that a baby will learn bad habits if he is fed more or less when he wants it. Prolonged crying at night in the first ten weeks is caused by the same totally unfounded fear of bad habit formation. He may be caused to cry from hunger even when there is enough breast milk, if he is not given long enough to obtain the milk. It is common to find that nurses and doctors have instructed mothers to feed babies exactly ten minutes on each breast—as if all breasts and nipples are alike in the ease with which milk may be obtained from them, and as if all babies are alike at all ages in the speed and efficiency with which they suck. Many babies are caused to cry from hunger because someone—the doctor, nurse or mother—is so obsessed by the fear of overfeeding that the baby is half starved. I have yet to see a baby who cries because of overfeeding.

Discomfort may arise from wind, but most crying which is ascribed to wind is in fact due to something else—hunger, the desire to be picked up, boredom, or other causes. Nevertheless, pain from wind does occur, and it causes high-pitched screams which can only be due to pain. Crying in the evenings of the first three months, mostly between 6 and 10 p.m., in a baby who is receiving adequate amount of food, and which continues even when he is picked up, is most likely to be due to the so-called "three months colic." It is probably caused by localized collections of wind in loops of intestine (Illingworth, 1954). Crying from discomfort may be due to his being too hot, too cold, or to having a wet or soiled napkin. Some babies cry when passing urine.

A most important cause of crying in this period is loneliness or a desire to be picked up. At least, it seems as if this is the cause of the crying, for the crying promptly stops when the baby is picked up and cuddled. It is remarkable how many mothers fail to realize that babies want and need cuddling, and so make the mistake of thinking that all the baby's crying is due to hunger. The basic feature which differentiates crying from hunger from that of loneliness is the fact that crying from hunger or any other cause of discomfort is not stopped by picking the baby up.

Less important causes of crying in this period are sudden noises, the shining of light into the eyes, sudden changes of posture, holding the baby's head or limbs, undressing or bathing the baby, or cleaning his nose. Even in the first three months babies cry when they are tired and about to go to sleep, or when they need sleep. The cause of the

excessive crying on the breast shown by so-called "irritable" babies in the first 10 days or so after birth is unknown. It may be related to their personality.

Aldrich and his co-workers (1945) made the interesting observation that the crying of a baby in a nursery is not infectious, in that it does not cause other babies to cry.

(b) The Older Baby

Discomfort due to hunger or other causes continues to cause crying, but to a lesser degree than in the younger baby, for tolerance increases with age.

A most important cause of crying in this period is boredom. Many babies are left to cry for hours in a pram outside, with nothing but a brick wall to see, and their mothers cannot understand what is wrong with them. All the babies want is to see what is going on and to have company. Many such babies are perfectly content in a pram in the kitchen, where they can see the mother working. Many older babies are left outside, crying and screaming, with nothing to see or do, when they should be indoors, with toys to play with and people to talk to them. Much crying from boredom is thought by mothers to be crying from wind or hunger.

Crying may be due to efforts to force a child to take food, especially in the weaning period, and to refusal to let him help to feed himself. It may be due to forcing him to sit on the "pottie" against his will. It may be due to an unaccustomed face or room, to departure of the mother from the baby's cot or from the place where he is playing. It may be due to his inability to reach a toy. It is caused by cleaning his nose at bedtime. Crying at night is basically due to the baby's desire for the company of the mother whom he loves. Crying may be due to the pain of an erupting tooth, but much crying ascribed to this is due to other causes, such as boredom and mismanagement. A most important cause of crying is fatigue. A baby may cry for long periods if not put to bed for his rest before he is too tired.

(c) The Older Child

Most crying is related to the child's developing ego and negativism, or to his need for love and security. Attempts to force a child to eat, sleep, or use the "pottie," or to learn good manners and good behaviour before he is ready for it, lead to refusal to comply and to crying. Between the age of 1 and 3 years or more children go through a stage of negativism, and crying is very common when they fail to get their own way and are thwarted. They need to be recognized as persons of importance, and readily cry if discouraged or ridiculed. Much crying is merely a device for seeking attention. When too much fuss is made of a child who has a minor fall or injury, crying is apt to be excessive.

The need for love and security leads to much crying between the ages of 1 and 5 or 6. Crying at night continues to be due basically to the child's love for his mother, even though an essential factor is mismanagement, in leading to bad habits. When a child succeeds in getting his mother to visit him 10 times in the night or succeeds in his desire to be taken into his parents' bed, his crying is due to a combination of his love for his parents and their mismanagement in acceding to his wishes. Some crying at night is due to fear of the dark or of shadows on the wall, and some is due to nightmares or night terrors. Crying on being awakened is characteristic of the 2½ to 3-year-old. It is a developmental feature, with no other apparent reason for it.

Insecurity from any cause, whether due to unhappiness at home or school, unkindness, impatience, excessive discipline or lack of discipline, jealousy, or overprotection, leads to excessive crying in the young child. The amount of crying is always increased by fatigue, boredom, or hunger.

Except in the case of gross neurological disorders, such as pseudo-bulbar palsy, there is always a cause for crying, but it is not always easy to find it. Children go through good and bad phases without any apparent reason, though it is satisfying to ascribe a child's excessive crying to teething or to his going through a bad phase, when in fact it is due to one's own intolerance and impatience. Phases of excessive crying do occur, however. They may follow periods of overstimulation, as at Christmas. More often they are merely related to stages in his development.

The list given above is not intended to be complete, but it does include the main causes. I set a question in an examination paper on the causes of excessive crying in a 3-months-old baby. One of the students wrote, "The baby may be crying excessively because he is being irritated by a wasp."

Treatment of Crying

Although it would seem obvious that, except when a bad habit is being broken, the cause of a child's crying should be sought and attended to, so that he is comforted and soothed, there is no unanimity about this. There are still some who teach that many babies should be fed strictly by the clock, however much they cry, that they should never be fed at night, and that they should never be picked up when they cry. Sackett (1953), for instance, advises mothers to fondle and cuddle their babies only when they are happy and never when they are crying. John Gibbens (1950) wrote: "Many mothers believe that a baby is too young to understand, but this is not so. Even the youngest baby is quick to learn that he is being a perfect nuisance with his grizzling, that you'll do nothing for him as long as he persists in this idiotic behaviour. Many babies will stop at once if you say firmly, 'Stop that horrible noise. I won't have it!' No one has ever spoken like that before, and they are so surprised that they often hush up at once." Would that it were so easy. Foxe (1941) wrote: "A mother who does not permit the child to cry by itself binds the child more closely to her. A child that cries by itself achieves a great degree of independence from personal attachment." He discussed in a sensible way the question of which is best for the child. It would seem obvious that the young child should be closely attached to the mother. Jahr (1944) warns against giving a baby too much attention. He says, with some reason, "Infants don't cry aimlessly. They cry because they want something, and it is up to the parents to decide in each case whether or not the need is justifiable."

It would seem that the points at issue are these. Does it do any harm to leave a child to cry for prolonged periods? Does it do any harm to pick a child up when he cries and attend to his needs? The answer to the first question is that it may do harm to leave a baby or small child to cry for prolonged periods. Firstly, he may make himself sick. Some small children vomit if left crying for more than 15 to 30 minutes. The mechanism is obscure, but it may be due to air-swallowing. Secondly, there is some evidence that prolonged crying in infancy, with separation from the mother, may cause psychological harm. We have all seen babies who fail to thrive in hospital until the mother is admitted to the hospital to look after the baby and feed it. Bakwin and Bakwin (1953) described defective weight gain, poor appetite, and low-grade fever in babies who were separated from their mothers in this way. I regularly see children from an institution in order to assess their eligibility for adoption, and I am always impressed by their subdued and cowed behaviour, which is not due to any unkindness but is presumably due to prolonged deprivation of mother-love.

Bowlby (1951) in his famous monograph has marshalled the evidence that separation of the child from his mother for the first three years may have a permanent effect on his character—rendering him aggressive, unable to give or receive affection, selfish, lacking

in regard for the rights of others, and bitter. It may well be that if complete separation from the mother is so harmful, prolonged crying in the home, with a refusal of the mother to pay heed to it, may render the child unhappy and insecure later, and lead to a variety of behaviour problems. It is certain that when babies are left to cry for prolonged periods in this way they do not quickly grow out of it. It is a matter of common observation that the crying may continue for week after week, and month after month, until eventually with increasing age they stop it. Aldrich and Aldrich (1938) wrote: "Most spoiled children are those who as babies never had essential gratifications owing to a mistaken attempt to fit them into a rigid regime. The spoiled child who has missed satisfaction as a baby adopts the efficient technique of whining and temper tantrums to get what he wants. The mechanism of spoiling is the neglect of needs rather than overindulgence. Twenty-five years' experience has taught me that responsive adults breed responsive babies, and that rigid disciplinarians of babies at this age breed spoiled, unhappy children with no confidence in themselves or their parents."

The idea held by some that crying may lead to convulsions is untrue. The so-called "crying convulsions" or "breath-holding convulsions" are due to holding the breath in expiration. They frequently follow a short cry, but they are not the result of it.

As for the second question, whether it does any harm to pick a baby up when he cries, it can be said with certainty that there is no evidence that it does harm. Some babies are a great deal more demanding than others, and experience has shown that when demanding babies are picked up as often as they reasonably can be when they ask for it they settle down and stop demanding so much attention after the first few weeks. They do not, in other words, develop a bad habit of constantly expecting to be picked up. In any case, if such a habit did develop, as a result, perhaps, of unnecessary picking up, it can be broken as soon as it is realized that the crying has become a habit. Crying out at night certainly does become a habit in the older baby, and it has to be dealt with firmly (Illingworth, 1953). The young baby should be picked up when he cries, certainly when by the nature of his cry it is obvious that if left he will continue to cry for a long time. He should not be picked up at the slightest whimper. He should not be picked up when he is crying from fatigue and about to go to sleep—unless he has been allowed to get so tired that he cannot go to sleep, when he may have to be rocked until he lapses into slumber. A baby who screams because of colic or because of pain from teething should certainly be picked up and soothed. No baby should ever be left crying for prolonged periods—except when one is breaking a habit produced by mismanagement.

A baby is spoiled by being constantly picked up when he is lying perfectly content in his pram, or by being constantly played with when he is quite happy in his play-pen or elsewhere. He is spoiled by being picked up at the slightest whimper, but there is nothing whatsoever to be said in support of those who advocate leaving a baby to cry for prolonged periods so that he will "learn good habits" or "learn that he cannot have all his own way." It should not be forgotten that babies are human beings, and all human beings want love. Why not give it to them?

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AN AMIDO-NITROTHIAZOLE FOR TRICHOMONIASIS

BY

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Some 16 different drugs have been recommended at various times for the treatment of vaginitis due to *Trichomonas vaginalis*, but methods of treating this infection are still unsatisfactory. Although acute vaginitis is much improved by treatment with some of the drugs, relapses are common and the evidence of infection often persists as a chronic leucorrhoea. The unsatisfactory results have been attributed either to reinfection or to incomplete eradication of the trichomonads. Whether the origin of the infection be primarily venereal, or due to accidental contamination from infected lavatory seats, towels, and other fomites, it seems probable that the prevention of reinfection will always be difficult in practice. Failure to eradicate the primary infection, however, can only be due to the use of insufficiently active drugs or to inaccessibility of some of the trichomonads. If failure is due to inaccessibility then no topical drug, however active, will be fully successful. If, however, the failure is due solely to low activity of the drug, then the solution to the problem should be relatively simple, for more active drugs than those generally used are available.

Up to the present nitrothiazoles have not been used for the treatment of human infections, but Waletzky *et al.* (1949) found 2-amino-5-nitrothiazole, "enheptin T," to be effective for the treatment of turkeys experimentally infected with *Histomonas meleagridis*, a flagellate related to the trichomonads; and Carmichael and Maclay (1952), McGreggor (1952), and Swales (1952) found it effective for the natural disease. Stabler and Mellentin (1953) have reported that it cures pigeons infected with *Trichomonas gallinae*, and they suggested that it should be tried for human infections. Enheptin T is, however, bright yellow and stains skin and clothing intensely, an undesirable property for a drug that is to be used as a vaginal pessary. Bushby and Copp (1955), who made an independent study of the activity *in vitro*

of nitrothiazoles for *T. vaginalis*, found that some of them which were only slightly coloured had about ten times the activity of enheptin T and more than a hundred times that of acetarsol.

In this investigation we have compared the activity *in vitro* of the most active of these compounds, 2-formamido-5-nitrothiazole (291 C 51), with 14 of the



antitrichomonal drugs which have been recommended during the last 10 years, and which are still readily available. We have also used it in the treatment of 96 women with trichomoniasis, comparing the results with those obtained in the 49 women treated with acetarsol.

The 14 drugs which were compared with the nitrothiazoles were: phenylmercuric dinaphthylmethane disulphonate ("penotran"), phenylmercuric acetate, 5-chloro-7-iodo-8-hydroxyquinoline ("vioform"), silver picrate, 5-nitro-2-furaldehyde semicarbazone (nitrofurazone), sodium perborate, mild silver protein ("argyrol"), chlortetracycline, 2-methoxy-6-chlor-9 (α -methyl-*o*-diethyl-aminobutyl)-aminoacridine dihydrochloride (mepacrine hydrochloride), 3-acetyl-amino-4-hydroxy-phenylarsonic acid (acetarsol), 5,7-di-iodo-8-hydroxy-quinoline ("diodoquin"), 4:4'-diamidino-diphenoxypropane di-(β -hydroxyethane sulphonate) (propamidin), 7-iodo-8-hydroxyquinoline-5-sulphonic acid (chiniofon), *p*-carbaminophenyl-arsonic acid (carbarsone).

Activity in vitro

Methods.—A recently isolated strain of *T. vaginalis* grown in serum-glucose-nutrient broth enriched with an extract of ox liver (pH 6.4) was used for comparing the trichomonastatic and trichomonacidal properties. The drugs were added to the medium usually at a concentration of 10,000 μ g. per ml., serially diluted 1 in 3, and then sterilized by heating for half an hour at 56° C. For the trichomonacidal tests 1 ml. of a suspension containing 400 trichomonads per c.mm. was added to 1 ml. of the dilutions and incubated at 37° C. Each tube was examined microscopically for motile organisms, and viability tests were made on those containing no motile organisms by subculturing into fresh medium free of the drug and incubating for 48 hours.

In the trichomonastatic tests the inoculum was 1/10 of that used in the trichomonacidal tests, and the tubes were examined for increases in the number of trichomonads after 48 hours' incubation.

Results.—The activity of the various drugs is shown in Table I.

Drug	References to Clinical Use*	Minimum Effective Concentration (μ g. ml.)			
		Trichomonacidal Activity			Trichomonastatic Activity
		1 Hr.	6 Hrs.	24 Hrs.	48 Hrs.
291 C 51	—	1,000	100	10	3
Penotran	1, 2	3	3	1	1
Phenylmercuric acetate	3	3	3	3	3
Vioform	4, 5, 6, 7	100	30	30	30
Silver picrate	8, 9, 10	300	100	100	100
Nitrofurazone	11, 12	1,000	100	100	100
Sodium perborate	13, 14, 15	300	300	300	300
Argyrol	16	1,000	1,000	300	300
Chlortetracycline	17, 18	10,000	10,000	1,000	1,000
Mepacrine	19	10,000	10,000	1,000	100
Acetarsol	20, 21, 22	10,000	10,000	10,000	1,000
Diodoquin	23	1,000	1,000	1,000	1,000
Propamidin	24	10,000	10,000	3,000	100
Chiniofon	25	10,000	10,000	10,000	3,000
Carbarsone	26, 27, 28	25,000	25,000	25,000	25,000

* See page 80.

Chemical Properties and Pharmacology

291 C 51 is a weak acid; a saturated aqueous solution (0.1% at 37° C.) has a pH of 4.5. The solid compound and the aqueous solutions are faintly yellow, and the colour increases slightly when the solutions are made alkaline. Animal experiments show that 291 C 51 has a low toxicity: 5 mg. produced no reaction when placed on the conjunctivae of rabbits once daily on three consecutive occasions; the insertion twice daily for 15 days of one of the 100-mg. pessaries used in the clinical trial (see below) into the vagina of each of two dogs caused no irritation; and the daily instillation of 30 ml. of 0.5% aqueous solution of the sodium salt into the bladders of two dogs for three weeks also caused no ill effects.

The oral and subcutaneous L.D.₅₀ single doses in mice are approximately 400 mg. per kg. Subcutaneous doses of 100 mg. per kg. twice daily for four days to mice and two daily oral doses of 200 mg. per kg. to rabbits were non-toxic. A daily oral dose of 100 mg. per kg. to a monkey for 44 days and a single oral dose of 600 mg. to man produced no toxic effects. After oral or parenteral administration the urine becomes a deep yellow colour and paper chromatographic analysis shows that the drug is not excreted in its original form. The urine and the serum of the rabbits, monkey, and man, collected during the toxicity experiments, one, two, and four hours after dosing, possessed no trichomonastatic activity when tested *in vitro*, showing that 291 C 51 is changed *in vivo* to an inactive form.

Clinical Trials

Material and Methods

The patients treated in this trial were attending the Whitechapel Clinic of the London Hospital. They were divided into three series: the first consisted of 10 whose treatment was restricted to seven days; the second, of 38 treated for 14 days; the third, of 98 treated for 14 days with 250-mg. pessaries of acetarsol or with 291 C 51, in alternate cases. Series I and II consisted of patients who had relapsed after treatment with acetarsol or some other antitrichomonal drug. The patients of series III had not been previously treated in this clinic. 291 C 51 was used as a foaming pessary* containing 100 mg. of the drug, and the procedure ordinarily followed in this clinic when using acetarsol was employed. The routine procedure was: two tablets were inserted high into the vagina nightly for 14 days except in the first 10 cases (series I) in which the treatment was for seven days only. After the initial insertion of the first two tablets by nursing staff, patients were instructed in the method of inserting the tablets "as high up as possible," and subsequent treatment was left to the patient.

Assessment of Results

These fell into three groups—cure, relapse, and defaulters. For the assessment of cure the following criteria had to be fulfilled: (1) After completion of the course there must be no symptoms or clinical evidence of vaginitis for at least three months. (2) Smears taken from the vagina must remain negative for trichomonads in a series of tests extending over three menstrual periods after completion of treatment. Relapses also included probable cases of reinfection because it was impossible to differentiate these. Defaulters were patients who failed to renew their appointments in spite of letters of reminder to each of them.

During treatment the signs and symptoms of vaginitis disappeared and no trichomonads could be seen in smears, but in each series the relapse rate was high. The results are given in Table II, and the ultimate effect of treatment is not significantly different with either drug. Seven days' treatment with 291 C 51 produced no cures and is presumably insufficient. The high proportion of defaulters is unfortunate, especially in the third series. The reason for patients not attending again are unknown and it is purpose-

*The trade name for these pessaries is "aroxine."

TABLE II

	Series I	Series II	Series III	
	291 C 51	291 C 51	291 C 51	Acetarsol
Duration of treatment	7 days	14 days	14 days	14 days
No. treated	10	38	49	49
Cures	0	3	5	6
Relapses:				
After 1 week	2	7	5	1
" 1 month	—	4	7	6
" 2 months	—	5	8	8
" 3	3	3	1	2
Defaulters	5	16	23	26

less to speculate on whether they considered themselves cured or decided that the treatment was useless. A high incidence of defaulters is the rule among these patients, however treated. In series III the defaulter rate is almost identical in the groups treated with 291 C 51 and with acetarsol. Whatever the causes, they appear to have operated equally in both groups.

None of the patients treated with 291 C 51 complained of toxic side-effects, except one who suffered from a reaction due to sensitization. This produced irritation and burning of the vulva with visible oedema early in the course of treatment. The condition quickly subsided when antihistamines were given and treatment with 291 C 51 was stopped. No evidence of hypersensitivity to 291 C 51 was obtained in this patient by intradermal testing with 0.1% solution or by patch testing with a crushed pessary on a scarified area of skin of the forearm. The patient denied using any additional drug during the course of treatment.

Discussion

The examination *in vitro* confirms the high antitrichomonal activity of this nitrothiazole. Of the drugs that have been previously recommended for the treatment of trichomonal vaginitis, only penotran and phenylmercuric acetate are somewhat more active than 291 C 51, and this applies especially to the rate at which they kill the organisms. Both of these drugs, however, have to be used in the relatively low concentration of 1:500 or less, whereas 291 C 51 is used with only slight dilution and so has the higher therapeutic index.

Compared with acetarsol, 291 C 51 has a very much higher activity *in vitro*, yet clinically it is no more effective. Both drugs are, however, very effective in suppressing the infection, and most of the patients who had relapsed after treatment with 291 C 51 had no symptoms of vaginitis, the relapse being judged solely on microscopical or physical examination.

The fact that a drug with about a hundred times the activity *in vitro* of acetarsol should prove no more effective *in vivo* suggests that the failure of local treatment to prevent relapses is not due to the lower activity of the drug. Whether systemic treatment would be more efficacious by reaching inaccessible organisms is unknown, for as yet there is no suitable drug available; 291 C 51 is too rapidly inactivated when taken orally or parenterally to be used systemically, and Bushby and Copp found it inactive when given orally or subcutaneously to mice infected intraperitoneally with *T. vaginalis*. Chlorotetracycline is a highly efficient systemic drug for bacterial infections, but its antitrichomonal activity is too low for it to be effective except when applied locally. The antibiotic trichomycin has antitrichomonal properties *in vivo* when given to mice with peritoneal infections (Hosoya *et al.*, 1953), but so far there are only reports of its use locally in women (Hosoya *et al.*, 1953; Magara *et al.*, 1954), and information about its systemic effects are awaited with interest. In the meantime if the resistant character of trichomonal vaginitis, due either to failure to eradicate the infection or to unavoidable reinfection, necessitates prolonged and suppressive treatment, 291 C 51 has the advantages of being non-arsenical and non-toxic, and in our experience it is as effective as any non-arsenical drug at present available.

Summary

2-Formamido-5-nitrothiazole has an antitrichomonal activity *in vitro* some 100 times greater than that of acetarsol. It has low toxicity.

Nevertheless in a clinical trial it proved no more effective than acetarsol in preventing relapses, which suggests that relapses are not necessarily due to low activity of the drug. This new antitrichomonal drug is a non-arsenical and therefore possibly more suitable than acetarsol as a suppressant.

Our thanks are due to Mr. A. J. King, senior physician at the Whitechapel Clinic, and to Professor Clifford Wilson, of the London Hospital, for encouragement and advice, and to Miss Joyce Peacock, A.I.M.L.T., of the Wellcome Research Laboratories, for technical assistance in the *in vitro* work.

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Asking "What is a Virus?" Dr. K. M. SMITH, F.R.S., begins by outlining two theories (*Nature*, 1955, 175, 12). First, they may be parasitic organisms that have developed their parasitism to the highest possible degree. Alternatively, viruses, or at least some of them, may have no external origin; they may be derived from the cell proteins of one organism and become viruses only when introduced into the cells of another organism. Some support for this second theory may be obtained from a study of certain plant viruses. The potato King Edward, Dr. Smith points out, is invariably infected with a virus, yet the infection is entirely symptomless. The virus can be detected by transferring the sap to other plants, when they show signs of virus infection. Such a wholly latent virus, which causes no symptoms at all in its normal host, Dr. Smith compares with the partially latent virus of herpes simplex, which causes symptoms only when activated by some stimulus, emotional or infective, as during an attack of the common cold. Dr. Smith also discusses the use of viruses to exterminate insect pests, a method already used with some success in Canada and the U.S.A.

CONTROL OF CROSS-INFECTION BY MEANS OF AN ANTISEPTIC HAND CREAM

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From the early days of antiseptics the problem of bacterial cross-infection has attracted increasing attention, first in maternity work, and more recently in burns, accident, and plastic surgery units.

Control of this cross-infection is concerned with the prevention of organisms reaching patients from their environment, which includes all persons attending them. Methods of control of infection due to droplet airborne particles, dust, ward utensils, linen, and contaminated dressings have been extensively investigated, and methods of prevention are well described (Medical Research Council, 1951). A recent appraisal of the use of dust-free air in special units has been made by Lowbury (1954).

The purpose of this paper is to describe attempts to reduce the incidence of cross-infection by treatment of the hands of persons attending patients.

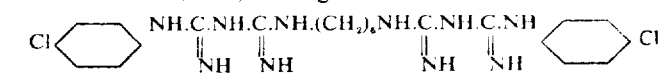
The commonest and most important organisms encountered in cross-infection in maternity hospitals are pyogenic staphylococci and streptococci. Nowadays infection with the β haemolytic streptococcus is confined to relatively rare single cases and small outbreaks, and the measures for its control are well understood. *Staphylococcus aureus* produces a large variety of minor infections in a considerable percentage of babies, and a much smaller number of more serious infections in both mothers and babies.

Hospitals are then faced with the problem of a pool of pyogenic organisms which not only is circulating in the personnel but is spread throughout the buildings in the form of contaminated dust, fluff, bedding, towels, etc. At this hospital we have found that about 60% of nurses carry pyogenic staphylococci in their noses. This figure is similar to that reported by Barber *et al.* (1949) from another maternity unit, and contrasts with the lower incidence in the general population found by the same authors, and also by Rountree and Thomson (1949).

We are convinced that these nasal carriers provide a substantial reservoir for hospital infections, and that the main method of transfer of these organisms is by way of the nurse's or doctor's hand. This view is in agreement with the observations of Moss *et al.* (1948), who established that the nose was the predominant source of *Staph. aureus* on the hands.

In the course of our general investigation into modern antiseptics we became impressed by the possibility of utilizing the persistent antibacterial action of certain antiseptics applied to the skin, as suggested for the control of streptococci by Colebrook and Maxted (1933).

It became clear that these antiseptics might provide a method of interrupting the cycle of transfer of organisms. Amongst a group of antiseptics tested in an investigation to be described elsewhere, we were struck by the high antibacterial levels attainable in therapeutic concentrations, using a new compound (10,040) described by Davies *et al.* (1954) having the basic formula



the diacetate and dihydrochloride of which we have had the opportunity of testing.

As a result of satisfactory experience using an obstetric cream incorporating 1% of this substance, we persuaded the manufacturers to prepare a hand cream with the same comparatively high concentration. This cream ("hibitane") when spread thinly on the hands is capable of suppressing the majority of normal hand bacterial flora, and, as we shall show, renders the hands resistant to bacterial contamination for a considerable period.

Methods

Finger Sampling Technique.—Initial experiments showed that if sterile surgical gloves or fingerstalls were worn on "socially clean" hands for periods up to two hours the number of organisms which could be recovered from the interior varied according to the amount of sweating which occurred.

Thus, if dry gloves were worn for two hours, during which the subject sat still, and then the gloves were rinsed out with nutrient broth, very few colonies indeed were found on plate culture. Whereas if sterile gloves were moistened with broth before being put on, and worn for 30 minutes, very large numbers of organisms could be recovered on culturing the interior of the gloves. Based on these observations, a method of culturing the skin of fingers was therefore devised.

Sampling of Normal Untreated Fingers.—The hands were washed with soap and water, rinsed, and dried on clean towels. Sterile rubber fingerstalls moistened inside with 0.5 ml. of nutrient broth were slipped on and worn for 30 minutes. On removal, 1 ml. of broth was placed inside and shaken so as to rinse the interior thoroughly. Then 0.5 ml. of the broth rinse was withdrawn with a pipette and added to 9.5 ml. of 25% sterile serum water. A further tenfold dilution was then made, giving a final dilution of 1/200. From this last dilution 1 ml. was withdrawn and a poured plate prepared. Colonies were counted after 48 hours' incubation at 37° C.

Normal "Resident" Skin Bacteria.—Results of a typical experiment are shown in Table I, where it can be seen that the variation in the number of colonies recovered from adjacent fingers of the same hand is on the whole not very great.

TABLE I.—Normal "Resident" Finger Organisms

Subject	Control Test of Adjacent Untreated Fingers		
	Index	Middle	Ring
A	368	121	2,548
B	662	670	2,984
C	696	1,292	1,088

Colonies counted on plate (1:200 dilution).

Sampling of Treated Fingers.—Fingers treated with antiseptic creams were sampled in a similar manner, starting at various times from immediately after application, up to two hours afterward. In each experiment untreated fingers of the same hand were used as controls.

Quantity of Antiseptic Creams Used.—The weight of antiseptic cream used was limited to the amount which could be

rubbed into the skin so that no excess cream remained. Quantities of 0.1 to 0.25 g. were tried for each finger, and ultimately 0.15 to 0.2 g. was used in most of the experiments. The results obtained with varying amounts of cream were remarkably similar.

Preliminary Tests

To exclude the possibility of the fingerstall tests being vitiated by the carry-over of antiseptic into the culture plates, blank tests were done.

For these 0.1 and 0.2 g. quantities of cream were emulsified in tubes containing 1.5 ml. of nutrient broth. From each of these tubes 0.5 ml. was transferred to 9.5 ml. of 25% serum peptone water and was allowed to stand for ten minutes as in the tests proper.

A final dilution to 1/200 was made and a poured plate prepared containing 1 ml. of this dilution and seeded with a weak suspension of an overnight culture of *Staph. pyogenes*. At the same time control plates were poured containing the same inoculum of bacteria but no dilution of cream.

The precise dilution of inoculum of *Staph. pyogenes* necessary to give countable colonies on the control plates was first determined, and at a culture dilution of 1 in 1,000,000 the control plate gave 62 colonies. With the use of the same inoculum, plates containing the dilutions from 0.1 and 0.2 g. of antiseptic cream gave 55 and 60 colonies respectively. It is therefore clear that no antiseptic activity could be carried over on to the test plates with this technique.

Results

In these experiments the tests were carried out simultaneously on the same finger of three subjects—A, B, and C.

Suppression of "Resident" Skin Bacteria

The reduction of recoverable bacterial flora is demonstrated well by Tables II and III, in which control and test

TABLE II.—Suppression of "Resident" Organisms by Antiseptic Cream (0.1 g. of 10,040 Diacetate Cream was Rubbed Into Each Test Finger)

Subject	Fingerstalls on for			
	30 Minutes		60 Minutes	
	Test (Index Finger)	Control (Middle Finger)	Test (Index Finger)	Control (Middle Finger)
A	8	1,336	32	204
B	3	58	12	53
C	0	233	305	610

Colonies counted on plate (1/200 dilution).

TABLE III.—Suppression of "Resident" Organisms by Antiseptic Cream (0.2 g. of 10,040 Dihydrochloride Cream Rubbed Into Each Test Finger)

Subject	Fingerstalls Worn for 30 Minutes	
	Test (Middle Finger)	Control (Index Finger)
A	1	333
B	5	324
C	2	1,330

Colonies counted on plate (1/200 dilution).

ingers are compared. It can be seen that similar results are obtained with either the diacetate or the dihydrochloride of 10,040 as the antiseptic in the cream.

A similar experiment to that shown in Table II was made, using 0.25 g. of antiseptic cream, and the results may be seen in Table IV, where the figures for both controls and tests are very low in the two-hour experiment. The most probable reason was that all the fingers used had had 0.2 g. of antiseptic cream applied five hours previously for a different experiment. The hands had, however, been washed several times and used for normal laboratory duties in the interval.

TABLE IV.—Suppression of "Resident" Organisms by Antiseptic Cream (0.25 g. of 10,040 Diacetate Cream Rubbed Into Each Test Finger)

Subject	Fingerstalls on for			
	1 Hour		2 Hours	
	Test (Index Finger)	Control (Middle Finger)	Test (Index Finger)	Control (Middle Finger)
A	3	4,000	1	20
B	17	387	1	59
C	3	1,450	0	18

Colonies counted on plate (1/200 dilution).

Finger-tip Contamination Technique

For the contamination tests a strain of *Bact. coli* was chosen, because these organisms are more resistant to contact with antiseptics than staphylococci.

Test fingers were treated with 0.2 g. of 10,040 cream, which was rubbed in completely, leaving no surplus to be seen on the surface. Contact was then made after periods of 30 minutes and one hour by pressing the fingers for 30 seconds on to filter paper moistened with a culture of *Bact. coli*. For this purpose to sterile 5-cm. filter papers in Petri dishes were added 1-ml. quantities of a 1/100 dilution of an 18-hour culture of *Bact. coli*. This dilution contained approximately 25,000,000 organisms per ml.

The fingers were allowed to dry in the air for one minute and then pressed on to horse-blood-agar plates for 30 seconds. These plates were examined at 24 and 48 hours, and the colonies in the fingerprints were counted.

A remarkable reduction was found in the number of bacteria which could be transferred by "creamed" fingers as compared with control untreated fingers. Table V shows the results of an experiment using the finger-tip contamination technique.

TABLE V.—Finger-tip Contamination

Subject	Test Fingers (0.2 g. of 10,040 Cream Rubbed into Each Test Finger)			Control
	Index Finger		Middle Finger	Ring Finger
	30 Minutes	Recontaminated after further 30 Minutes	Contaminated after 1 Hour	Not Creamed
A	1	1	6	65
B	1	4	7	64
C	0	0	0	42

The figures represent number of colonies counted in each fingerprint on blood-agar plate.

Included in the second column of Table V are the results of contaminating the same finger twice—first, 30 minutes after application of antiseptic cream, and, secondly, after a further 30 minutes—and they indicate the excellent persistent qualities of the antiseptic.

Clinical Use in the Hospital

When the laboratory investigations were completed it was decided to try the effect of 10,040 hand cream throughout the hospital.

For this purpose tubes of the antiseptic cream were placed beside each wash-basin in wards and nurseries. The nursing and medical staffs were encouraged to rub about 1.5 to 2 g. of the cream on to their hands after washing. While the concentration of antiseptic cream was maintained at 1%, the formulation of the base was altered from time to time in order to find a compatible formulation which was cosmetically attractive and which therefore would be freely used by the staff. The preparation of acceptable emollient hand creams is made difficult by the fact that many of the modern antiseptics are inhibited by the presence of some of the bases of the popular commercial creams.

The 10,040 cream has been in use in the hospital for more than 18 months, and has proved successful. The antiseptic incorporated in the cream was originally used in

the form of the diacetate of 10,040, and latterly in the form of the dihydrochloride, laboratory tests having shown no difference between these two salts. Throughout the 18 months that the cream has been in use, no cases of idiosyncrasy to the antiseptic have occurred.

During the period of this clinical trial not only have the number of clinical cases been reduced, but there have been no patients with serious staphylococcal infections in the hospital: but possibly of greater significance is the observation that those staphylococcal infections which did occur no longer appeared as groups in particular wards, but were scattered sporadically throughout the hospital. It may well be that other factors played a part in the remarkable results achieved and that the use of the antiseptic hand cream was not alone responsible. Nevertheless, the improvement was very real.

Discussion

In a maternity hospital staphylococcal lesions of the newborn are by far the commonest forms of cross-infection, although minor infections of mothers are by no means rare. We have stressed our view of the importance of the hands as a vehicle for transfer of organisms. Our experimental results show beyond doubt the ability of a suitable hand cream to provide a bactericidal layer of prolonged activity against this type of organism, and they have also shown that hands so treated will not readily transfer even more resistant organisms, such as coliform bacilli, from heavily contaminated material.

A possible fallacy of the fingerstall technique was the carry-over of antiseptic into the final poured plates. It was calculated that in the unlikely event of all the antiseptic becoming dissolved in the broth with which the fingerstalls were lubricated the quantity reaching the final dilution would be too small to have any inhibitory action. As an additional precaution, however, 25% serum peptone water was used in the first dilution. The preliminary blank tests amply confirmed the absence of carry-over to the final plates.

While our work has been carried out largely with 10,040 cream, we have no doubt that other antiseptics might be used in the same way, and that a variety of formulations could be employed for application of the antiseptic to the hands. For example, the particular preparation which we have tried most extensively throughout the hospital is in the form of an emollient hand cream for use after washing, in order not only to render the hands antiseptic but also to assist in the prevention of "chapped" hands. This formulation would not be satisfactory for application before putting on surgical gloves. For such purposes powders or quick-drying lotions might be more suitable.

We have had the opportunity of trying a number of hand preparations of different antiseptics, and, while some are active, in others a base was employed by makers which inactivated the original antiseptic. For example, one of the creams had so little antibacterial activity that staphylococci could be recovered abundantly from cream inoculated and incubated for 48 hours. There were others again which, although very active against skin bacteria, were unsatisfactory from the point of view of repeated application to the hands.

It is not our intention to specify these unacceptable preparations, as they were in most cases specially prepared by the manufacturers for our experimental work, and are not at present available for general use.

Our experience with antiseptic hand creams in the laboratory and in practical hospital use leads us to conclude that a considerable contribution to the control of cross-infection can be achieved by the wide use of such creams. We therefore recommend that in departments where cross-infection is likely to occur each wash-basin should be provided with a "dispenser" or tube of antiseptic cream, and that the nursing and medical staff should be encouraged to use the hand cream as often as possible after washing between cases.

Summary

The incidence of staphylococcal infection in babies born in a maternity hospital is shown to be related to the prevalence of carriers of the staphylococcus among nurses, the organism often being conveyed by the hands. The use of an antiseptic hand cream would to a large extent prevent this transfer of bacteria from nurse to baby.

A new antiseptic compound—1:6-di-4'-chlorophenyl-di-guanidohexane 10,040—was incorporated in a cream ("hibitane") and its effectiveness in keeping the skin free from bacteria tested in the laboratory, two new methods being used. Both methods showed that this cream was capable of greatly reducing the bacterial count of the skin.

Use of the cream in the wards led to a marked decrease in the number of clinical cases of staphylococcal infection: during the period of trial no groups of infection were seen in any ward or nursery.

Recommendations for the regular use of antiseptic hand cream are made.

We would like to thank our obstetric colleagues and the nursing staff of the hospital for their co-operation in the clinical trials, and we are glad to thank Mr. E. Clark for technical assistance. We are grateful to Imperial Chemical (Pharmaceuticals) Limited for generous supplies of materials, and in particular to Dr. K. G. Green, without whose continued interest and help the investigation would have been impossible.

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RUPTURE OF A COLD ABSCESS INTO THE BRONCHUS

BY

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According to Cleveland (1940) a cold abscess is the most common complication of tuberculous spondylitis and occurs in 68–86% of cases. Ruptures of these abscesses to the body surface, with fistula formation, are less common, while rupture of cold abscesses into the pleural cavity or into the bronchopulmonary system or oesophagus is rare.

Review of Literature

Loeffler (1922) cites Ideler, who by 1911 had seen six cases of cold abscess communicating with a bronchus or pleural cavity. He does not state how many cases were pleural, and how many were bronchial, or a combination of the two. Nor does he say anything about the outcome of these cases.

Cameron (1925) reported a case of long-standing tuberculous spondylitis in which a cold abscess developed in the inguinal region. During an iodoform injection into the abscess the patient tasted iodoform in his mouth, and after several minutes expectorated iodoform. Coughing lasted for several days, then gradually lessened and stopped completely after six weeks. Evidently an old bronchial fistula

must have opened as a result of the injected liquid. Presumably this bronchial fistula was normally symptom-free, because the pus from the abscess followed the line of least resistance and drained by gravitation through the inguinal sinus.

Mayet and G  n  vier (1928) reported two cases of cold abscess rupturing into a bronchus; both remained latent, however, and were discovered only when iodoform was therapeutically injected into a skin fistula. Strasser (1938) reported two similar cases with skin fistulae coexistent with a bronchial and tracheal fistula respectively. He proved the fistulous communications by radiography.

Imbach (1938) described a case of combined cutaneo-bronchial fistula. Here again the diagnosis was demonstrated after a therapeutic injection of lipiodol was expectorated by the patient; otherwise there were no other symptoms of bronchial fistula. Imbach mentioned that he had ten case reports of rupture of a cold abscess into the bronchial system.

Brooks (1942) described six cases of rupture—two into the lung, three into the pleural cavity, and a combined one. In five cases the abscess was of tuberculous aetiology, and one was due to actinomycosis. All the ruptures into the lung caused fatal results from bronchopneumonia, pulmonary abscess, or amyloidosis, but it is significant that none of them caused disseminated tuberculosis.

Morgan and Bosworth (1946) reported a case of rupture of a cold abscess through the pleural cavity into the bronchus. This was the first case to be treated with antibiotics. The patient began to recover with streptomycin, but the eventual outcome is not recorded. Finally, Heuck (1949) described a case with a coexisting fistula to the inguinal region and to the bronchus in which there were no troublesome bronchial symptoms.

The following is a report of a case with a fistula between a cold abscess and the bronchus without fistulous communication with any other part of the body.

Case Report

A farmer aged 38 had perfect health until 1942, when, after a gunshot wound, he had his left leg amputated below the knee. In June, 1951, he started coughing, and this increased in spite of treatment by his family physician. He expectorated abundant sputum, sometimes malodorous but never blood-stained. He lost 25 lb. (11.3 kg.) in weight and observed that the left side of his body sweated profusely. The family history was without significance. The patient was admitted to hospital in November.

On examination he was seen to be tall, slim, and pale. His thorax was symmetrical and without impairment of respiratory movements. Normal resonance was found on percussion, except paravertebrally on the right side, where there was an area of dullness corresponding to the spinal processes of D 2-4. Air entry was slightly diminished on the right side, where rales were also present. The blood picture showed: red cells 3,650,000; white cells, 10,300, with 76% segmentary neutrophils. The sedimentation rate was 43 mm. Westergren in the first hour and 81 mm. in the second. *Streptococcus haemolyticus*, *Str. viridans*, *Str. non-haemolyticus*, *Bact. coli*, and *Bacillus fusiformis* were present in the sputum. The results of other investigations were within normal limits.

By the time of admission the patient was expectorating about 300-350 ml. daily. No elastic fibres could be shown in the sputum. Bronchoscopy showed massive purulent secretion into the left main bronchus, stemming mainly from the upper left bronchus. No pathological processes were to be seen in the lumen of the bronchus. X-ray examination of the chest showed abnormal hilar shadows on both sides. A tomogram of the mediastinum revealed a sharply limited shadow as large as an apricot in the posterior part. An x-ray film of the thoracic vertebrae showed destruction of the lower part of the body of D 7 and the upper part of D 8, together with a partial fusion of the vertebral bodies in their anterior

parts with some angulation. The presence of *Mycobacterium tuberculosis* in the sputum was demonstrated microscopically and by culture. From these findings it was evident that the cold abscess had ruptured into the bronchus.

A left paravertebral puncture of the abscess was performed under x-ray control with the idea of proving the communication of the abscess with the bronchopulmonary system. A 1% solution of Congo red was injected and was immediately expectorated by the patient. A further puncture was made a few days later—this time on the right side—but the injected solution was expectorated only after half an hour. The prompt expectoration of the Congo red solution when injected into the left side of the abscess proved that the cavity communicated with the left bronchus and confirmed the bronchoscopy finding that pus came only from the left bronchus, although the actual site of the fistula was not visible.

Daily injections of 200,000 I.U. of penicillin for ten days into the abscess to control the secondary infection thinned the sputum but did not lessen the amount. The dose of penicillin was therefore increased to 600,000 I.U. each day, given intramuscularly. The quantity of sputum then fell to 50 ml. a day.

By the end of January, 1952, the daily sputum amounted to only 10 ml., and streptomycin was substituted for penicillin. Leucocytes, which rose to 14,400 during the treatment, now fell to 11,600. The patient had obviously improved and his weight had increased from 115 to 132 lb. (52 to 60 kg.).

The Mantoux reaction, which was negative at the beginning of the treatment in dilutions of 1:100,000 and 1:1,000,000, became positive by the end of January in the same dilutions.

With streptomycin alone the quantity of sputum increased to 60 ml. a day, and in February penicillin was given in combination with streptomycin. The sputum again lessened. The erythrocyte sedimentation rate was 16 mm. in the first, and 30 mm. in the second hour. From the beginning of January the patient was constantly afebrile. On February 25 streptomycin was stopped, after a total of 68 g. had been given, but penicillin was continued. On March 31 treatment with nitrogen mustard was started. This treatment is based upon the experiences of Aleksandrowicz (1948), who stated that nitrogen mustard has a favourable effect upon tuberculous cold abscess. The patient was given four doses each of 7 mg. There were no troublesome reactions.

On April 8, after the treatment with nitrogen mustard was finished, a control tomogram showed that the abscess cavity had not diminished. On April 11 his erythrocyte sedimentation rate was 11-45 and the blood picture showed: erythrocytes, 4,040,000; haemoglobin, 80%; leucocytes, 3,600 (eosinophils 4%, non-segmented 4%, segmented 73%, lymphocytes 5%, monocytes 15%). The fall in the leucocyte count was due to the effect of nitrogen mustard, not to the lessening of the inflammatory process. The patient's weight was 141 lb. (64 kg.). Unfortunately he discharged himself from hospital on April 22 after having received 54,600,000 I.U. of penicillin, 68 g. of streptomycin, and 28 mg. of nitrogen mustard.

According to subsequent information the patient felt well at home for two months, but then expectoration increased, and by August it was as abundant as before treatment. Thereafter he went steadily downhill, and died on October 30, 1952.

Discussion

This case is worth recording because of its rareness and because, according to the literature, it is the second of its kind to be treated with antibiotics. But there is a difference between the two cases. The first one (Morgan and Bosworth, 1946) was treated with streptomycin immediately after a sudden rupture of an abscess in which secondary infection had not developed, while the present case had predominant

symptoms of established secondary infection. That explains the beneficial effect of the penicillin when streptomycin was ineffectual. Nitrogen mustard was also ineffective.

The course of the disease in this case is also interesting in comparison with others reported. The latter had a chronic, nearly always benign, clinical course on every occasion when, in addition to the bronchial fistula, there was a skin fistula through which most of the pus drained. But in those cases, like my own case, in which a fistula into a bronchus or lung was the only clinical finding (Brooks, 1942), the patient died quickly of bronchopneumonia or pulmonary abscess when the abscess ruptured. However, my patient had a relatively favourable course before he came to hospital, in spite of the abundant suppuration and the fact that it was two months before he had treatment.

The interruption of the treatment, with the return of secondary infection and abundant sputum, was obviously fatal. The final decline was probably due to a progressive anaemia and amyloidosis.

Summary

A case of tuberculous spondylitis of the thoracic spine with a cold abscess which ruptured into a bronchus is described. The abscess was later contaminated with pyogenic micro-organisms, and in the clinical picture abundant expectoration predominated. An abscess of the mediastinum and caries of the seventh and eighth thoracic vertebrae were demonstrated radiologically. The communication between abscess and bronchus was proved by the injection of Congo red into the abscess. The dye was immediately expectorated. The patient was treated with penicillin and streptomycin, and with nitrogen mustard. While under treatment with antibiotics a significant amelioration of the clinical picture was achieved, but the nitrogen mustard was ineffectual. The patient voluntarily refused further treatment and left hospital; he gradually deteriorated and died of cachexia.

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On the subject of the notification of infectious diseases, the Medical Officer of Health for Barnsley, Dr. G. A. W. NEILL, writes as follows in his annual report: "Notification by general practitioners of infectious disease has improved somewhat, but is still far below the standard required by law. It is appreciated that many practitioners consider that notification of certain diseases is of little value. In neglecting to notify they overlook the fact that they are still required by statute to carry out the procedure of notification and that by their omission they commit an offence. This causes a very great deal of difficulty for everyone concerned and could well give rise to great unpleasantness and friction. It would seem that a better way would be for doctors who hold this view to attempt to alter the law constitutionally by representation through the appropriate professional body than by persistent breach of it. No notifications on the statutory forms were received in respect of some 99 cases of infectious disease seen by general practitioners and admitted to hospital. On this account it should be emphasized that a telephone call to the medical officer of an isolation hospital to arrange admission does not constitute notification in the manner required by the Public Health Act, 1936, s.144."

TRAUMATIC RUPTURE OF A MAIN BRONCHUS

BY

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Rupture of a main bronchus is a rare complication of closed injuries to the chest. In the following case of complete rupture of the left main bronchus the patient died after 55 hours. It is recorded because it illustrates some important diagnostic problems. Had these been understood at the time the patient might have survived.

Case Report

A healthy girl aged 18 was run over by a bus at 7 p.m. on December 27, 1953. On admission to hospital she was distressed and dyspnoeic, and complained of severe pain in the back and left shoulder. Examination of the chest revealed an area of paradoxical respiration beneath the right scapula and a left-sided pneumothorax. The maximal cardiac impulse was felt just to the left of the sternum. A radiograph of the chest (Fig. 1) showed fractures of the posterior angles of the sixth and seventh ribs on the left, and fractures of the necks of the sixth, seventh, and eighth ribs on the right. There was a left pneumothorax with partial collapse of the lung and displacement of the trachea and mediastinum to the right. Following an injection of morphine, 1 gr. (16 mg.), the patient settled down to sleep. In the absence of cyanosis and with a respiration rate of 30 a minute no treatment of the pneumothorax was thought necessary. The next day she seemed a little better; respirations were steady at 32 a minute and the colour remained good.

At 1 p.m. on the third day, however, she collapsed with extreme dyspnoea and cyanosis. A radiograph (Fig. 2) now showed complete collapse of the left lung and a small pneumothorax on the right. Within a few minutes a needle was inserted in the left pleural cavity and connected to an under-water seal. A small negative pressure developed with each inspiration and air bubbled out with each expiration. The expected improvement in the patient's condition did not occur. An exhaust pump was then connected to the outlet of the bottle so that air was drawn off the chest continuously. There was still no improvement, and it was noted that when the air was drawn off rapidly there was an increase of respiratory distress. A bronchial fistula was then diagnosed, and after inserting an intercostal catheter an attempt was made to re-expand the left lung by a combination of vigorous pleural suction and bronchoscopic aspiration. Several ounces of fluid was drawn off through the bronchoscope, but the lung remained completely collapsed. By this time the patient was *in extremis* and no further treatment was possible. She died at 2 a.m. on December 30.

Necropsy revealed a small quantity of blood-stained fluid in the left pleural cavity. There was a small tear in the pleura over the root of the left lung which exposed a completely divided main bronchus. The ends of the divided bronchus were widely separated. None of the other hilar structures was damaged. The left lung was completely collapsed but undamaged. The right pleural cavity contained about 10 oz. (284 ml.) of blood. The right lung was partly collapsed and contained extensive haemorrhages. A probe was passed down the trachea and left main bronchus before disturbing the thoracic contents; this went straight into the pleural cavity, thus demonstrating the source of the fluid obtained by bronchoscopic suction. Many more rib fractures were found than were visible on the radiographs; 14 were recognized with certainty. The effect of

must have opened as a result of the injected liquid. Presumably this bronchial fistula was normally symptom-free, because the pus from the abscess followed the line of least resistance and drained by gravitation through the inguinal sinus.

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By the time of admission the patient was expectorating about 300-350 ml. daily. No elastic fibres could be shown in the sputum. Bronchoscopy showed massive purulent secretion into the left main bronchus, stemming mainly from the upper left bronchus. No pathological processes were to be seen in the lumen of the bronchus. X-ray examination of the chest showed abnormal hilar shadows on both sides. A tomogram of the mediastinum revealed a sharply limited shadow as large as an apricot in the posterior part. An x-ray film of the thoracic vertebrae showed destruction of the lower part of the body of D 7 and the upper part of D 8, together with a partial fusion of the vertebral bodies in their anterior

parts with some angulation. The presence of *Mycobacterium tuberculosis* in the sputum was demonstrated microscopically and by culture. From these findings it was evident that the cold abscess had ruptured into the bronchus.

A left paravertebral puncture of the abscess was performed under x-ray control with the idea of proving the communication of the abscess with the bronchopulmonary system. A 1% solution of Congo red was injected and was immediately expectorated by the patient. A further puncture was made a few days later—this time on the right side—but the injected solution was expectorated only after half an hour. The prompt expectoration of the Congo red solution when injected into the left side of the abscess proved that the cavity communicated with the left bronchus and confirmed the bronchoscopy finding that pus came only from the left bronchus, although the actual site of the fistula was not visible.

Daily injections of 200,000 I.U. of penicillin for ten days into the abscess to control the secondary infection thinned the sputum but did not lessen the amount. The dose of penicillin was therefore increased to 600,000 I.U. each day, given intramuscularly. The quantity of sputum then fell to 50 ml. a day.

By the end of January, 1952, the daily sputum amounted to only 10 ml., and streptomycin was substituted for penicillin. Leucocytes, which rose to 14,400 during the treatment, now fell to 11,600. The patient had obviously improved and his weight had increased from 115 to 132 lb. (52 to 60 kg.).

The Mantoux reaction, which was negative at the beginning of the treatment in dilutions of 1:100,000 and 1:1,000,000, became positive by the end of January in the same dilutions.

With streptomycin alone the quantity of sputum increased to 60 ml. a day, and in February penicillin was given in combination with streptomycin. The sputum again lessened. The erythrocyte sedimentation rate was 16 mm. in the first, and 30 mm. in the second hour. From the beginning of January the patient was constantly afebrile. On February 25 streptomycin was stopped, after a total of 68 g. had been given, but penicillin was continued. On March 31 treatment with nitrogen mustard was started. This treatment is based upon the experiences of Aleksandrowicz (1948), who stated that nitrogen mustard has a favourable effect upon tuberculous cold abscess. The patient was given four doses each of 7 mg. There were no troublesome reactions.

On April 8, after the treatment with nitrogen mustard was finished, a control tomogram showed that the abscess cavity had not diminished. On April 11 his erythrocyte sedimentation rate was 11-45 and the blood picture showed: erythrocytes, 4,040,000; haemoglobin, 80%; leucocytes, 3,600 (eosinophils 4%, non-segmented 4%, segmented 73%, lymphocytes 5%, monocytes 15%). The fall in the leucocyte count was due to the effect of nitrogen mustard, not to the lessening of the inflammatory process. The patient's weight was 141 lb. (64 kg.). Unfortunately he discharged himself from hospital on April 22 after having received 54,600,000 I.U. of penicillin, 68 g. of streptomycin, and 28 mg. of nitrogen mustard.

According to subsequent information the patient felt well at home for two months, but then expectoration increased, and by August it was as abundant as before treatment. Thereafter he went steadily downhill, and died on October 30, 1952.

Discussion

This case is worth recording because of its rareness and because, according to the literature, it is the second of its kind to be treated with antibiotics. But there is a difference between the two cases. The first one (Morgan and Bosworth, 1946) was treated with streptomycin immediately after a sudden rupture of an abscess in which secondary infection had not developed, while the present case had predominant

symptoms of established secondary infection. That explains the beneficial effect of the penicillin when streptomycin was ineffectual. Nitrogen mustard was also ineffective.

The course of the disease in this case is also interesting in comparison with others reported. The latter had a chronic, nearly always benign, clinical course on every occasion when, in addition to the bronchial fistula, there was a skin fistula through which most of the pus drained. But in those cases, like my own case, in which a fistula into a bronchus or lung was the only clinical finding (Brooks, 1942), the patient died quickly of bronchopneumonia or pulmonary abscess when the abscess ruptured. However, my patient had a relatively favourable course before he came to hospital, in spite of the abundant suppuration and the fact that it was two months before he had treatment.

The interruption of the treatment, with the return of secondary infection and abundant sputum, was obviously fatal. The final decline was probably due to a progressive anaemia and amyloidosis.

Summary

A case of tuberculous spondylitis of the thoracic spine with a cold abscess which ruptured into a bronchus is described. The abscess was later contaminated with pyogenic micro-organisms, and in the clinical picture abundant expectoration predominated. An abscess of the mediastinum and caries of the seventh and eighth thoracic vertebrae were demonstrated radiologically. The communication between abscess and bronchus was proved by the injection of Congo red into the abscess. The dye was immediately expectorated. The patient was treated with penicillin and streptomycin, and with nitrogen mustard. While under treatment with antibiotics a significant amelioration of the clinical picture was achieved, but the nitrogen mustard was ineffectual. The patient voluntarily refused further treatment and left hospital; he gradually deteriorated and died of cachexia.

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On the subject of the notification of infectious diseases, the Medical Officer of Health for Barnsley, Dr. G. A. W. NEILL, writes as follows in his annual report: "Notification by general practitioners of infectious disease has improved somewhat, but is still far below the standard required by law. It is appreciated that many practitioners consider that notification of certain diseases is of little value. In neglecting to notify they overlook the fact that they are still required by statute to carry out the procedure of notification and that by their omission they commit an offence. This causes a very great deal of difficulty for everyone concerned and could well give rise to great unpleasantness and friction. It would seem that a better way would be for doctors who hold this view to attempt to alter the law constitutionally by representation through the appropriate professional body than by persistent breach of it. No notifications on the statutory forms were received in respect of some 99 cases of infectious disease seen by general practitioners and admitted to hospital. On this account it should be emphasized that a telephone call to the medical officer of an isolation hospital to arrange admission does not constitute notification in the manner required by the Public Health Act, 1936, s.144."

TRAUMATIC RUPTURE OF A MAIN BRONCHUS

BY

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Rupture of a main bronchus is a rare complication of closed injuries to the chest. In the following case of complete rupture of the left main bronchus the patient died after 55 hours. It is recorded because it illustrates some important diagnostic problems. Had these been understood at the time the patient might have survived.

Case Report

A healthy girl aged 18 was run over by a bus at 7 p.m. on December 27, 1953. On admission to hospital she was distressed and dyspnoeic, and complained of severe pain in the back and left shoulder. Examination of the chest revealed an area of paradoxical respiration beneath the right scapula and a left-sided pneumothorax. The maximal cardiac impulse was felt just to the left of the sternum. A radiograph of the chest (Fig. 1) showed fractures of the posterior angles of the sixth and seventh ribs on the left, and fractures of the necks of the sixth, seventh, and eighth ribs on the right. There was a left pneumothorax with partial collapse of the lung and displacement of the trachea and mediastinum to the right. Following an injection of morphine,    gr. (16 mg.), the patient settled down to sleep. In the absence of cyanosis and with a respiration rate of 30 a minute no treatment of the pneumothorax was thought necessary. The next day she seemed a little better; respirations were steady at 32 a minute and the colour remained good.

At 1 p.m. on the third day, however, she collapsed with extreme dyspnoea and cyanosis. A radiograph (Fig. 2) now showed complete collapse of the left lung and a small pneumothorax on the right. Within a few minutes a needle was inserted in the left pleural cavity and connected to an under-water seal. A small negative pressure developed with each inspiration and air bubbled out with each expiration. The expected improvement in the patient's condition did not occur. An exhaust pump was then connected to the outlet of the bottle so that air was drawn off the chest continuously. There was still no improvement, and it was noted that when the air was drawn off rapidly there was an increase of respiratory distress. A bronchial fistula was then diagnosed, and after inserting an intercostal catheter an attempt was made to re-expand the left lung by a combination of vigorous pleural suction and bronchoscopic aspiration. Several ounces of fluid was drawn off through the bronchoscope, but the lung remained completely collapsed. By this time the patient was *in extremis* and no further treatment was possible. She died at 2 a.m. on December 30.

Necropsy revealed a small quantity of blood-stained fluid in the left pleural cavity. There was a small tear in the pleura over the root of the left lung which exposed a completely divided main bronchus. The ends of the divided bronchus were widely separated. None of the other hilar structures was damaged. The left lung was completely collapsed but undamaged. The right pleural cavity contained about 10 oz. (284 ml.) of blood. The right lung was partly collapsed and contained extensive haemorrhages. A probe was passed down the trachea and left main bronchus before disturbing the thoracic contents: this went straight into the pleural cavity, thus demonstrating the source of the fluid obtained by bronchoscopic suction. Many more rib fractures were found than were visible on the radiographs; 14 were recognized with certainty. The effect of

pressure on the thoracic cage after death convinced me that the bronchus had been severed by being nipped between the anterior chest wall and the vertebral column.

Review of the Literature

Comprehensive reviews of the literature by Vaccarezza and Raimondi (1943) and Kinsella and Johnsrud (1947) provide clinical details of 38 cases of rupture of a main bronchus recorded between 1848 and 1942. Twenty other cases have been described since 1942, giving a total of 58 cases for analysis. Of the 55 cases in which the cause of

life is to be saved. Such a case was the one encountered by me, and the challenge was not met because of the delay in diagnosis. If the bronchial rupture had been diagnosed before function in the opposite lung had become impaired by oedema and collapse then surgical treatment would have been possible and might have been successful.

A traumatic pneumothorax usually indicates a perforation of the lung. In most cases this quickly seals off and absorption of the air takes place. Occasionally an opening in the lung or bronchus acts like a valve and tension develops, necessitating urgent decompression. However, it is evident that a complete rupture of the bronchus which results in free communication between the trachea and pleural cavity will not give rise to a tension pneumothorax. In our patient there was never any evidence of intrapleural tension; when the pneumothorax was first connected to the underwater seal, air bubbled out only on expiration. When continuous suction was applied the pneumothorax remained stationary, but vigorous suction increased the dyspnoea by drawing off from the trachea a large volume of the tidal air. It is often stated that the presence of a pneumothorax does not demand treatment unless it is of the tension variety. In the vast majority of cases this is true, but where there is a bronchial rupture an expectant policy can be disastrous. It is suggested, therefore, that a diagnostic needling should be done in all cases of pneumothorax due to crushing injury whether there is tension or not. (A simple and readily available apparatus for this procedure can be made by changing around the tubes entering the bung of an empty blood-transfusion bottle to which a small quantity of sterile water is added.) If, in spite of continuous aspiration of air, the lung does

not re-expand, then a large broncho-pleural fistula must be present. In this event thoracotomy should be seriously considered, and should not be delayed if there is evidence of damage to the opposite lung.

Only two emergency thoracotomies for the treatment of ruptured bronchus in a closed chest injury have been recorded. Kirkpatrick (1950) did a pneumonectomy on a boy of 13 who had a complete division of the right main bronchus, and Scannell (1951) sutured a hole in the right main bronchus in a boy of 10. Both these operations were successful, and it is significant that both were done within four hours of the accident. No one has yet recorded a primary suture of a completely ruptured main bronchus, but there are three reports of successful suture of a main bronchus divided accidentally during the course of a lobectomy. The clean division of the bronchus in our patient seemed to indicate that suture would have been technically possible.

Summary

A case of complete division of the left main bronchus in a run-over accident is described. The patient died after 55 hours, but might have survived if diagnosis had been early and thoracotomy had been done. It is suggested that all severe crushing injuries to the chest complicated by pneumothorax should be immediately investigated with the possibility of bronchial rupture in mind.

I wish to thank Mr. Dilwyn Thomas for help in the preparation of this paper.

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Medical Memoranda

A Case of Human Anthrax

Anthrax is a comparatively rare disease in this country, although its true incidence is difficult to arrive at in view of the fact that it is not a notifiable disease unless contracted at work. The following case is of general interest in view of this comparative rarity and also because of the possibility of an unusual mode of infection.

CASE REPORT

The patient, aged 49, is manager of a hardware store in a South London suburb which sells the usual articles, including brushes, brooms, and dehydrated animal manure. On December 2, 1953, while pruning a tree in his garden at Farnborough, Kent, he felt what he thought to be an insect on his neck and brushed it off. Next day he noticed a pimple on his neck where the insect had been. The following day he felt ill, having nausea and anorexia. The pimple was larger but not painful. On December 5 he saw his doctor, who gave him an injection of penicillin for a "boil." Next day he felt much worse, having anorexia, nausea, and abdominal pain. His doctor was called, and he was given another injection of penicillin. On December 7 he was extremely ill and was delirious. He was sent into Farnborough Hospital, a diagnosis of anthrax having been made by his own doctor.

On admission five days after he felt the insect on his neck the patient was very toxic and obviously had to concentrate hard to understand questions. He complained of continuous severe headache and spots before his eyes, also of anorexia and nausea. He vomited several times, and had a feeling of tightness across his chest and epigastrium, with colicky abdominal pain. His temperature was 101° F. (38.3° C.); pulse 84, and respirations 20. On the right side of his neck over the lower third of the sterno-mastoid was an oval ulcer 1 by 1½ in. (2.5 by 3.8 cm.); it had a raised edge consisting of many small vesicles surrounding a blackish central slough. There were large tender cervical glands deep to the ulcer and above it. The whole of his right side from the ear to below the nipple was red and the site of a brawny oedema.

He was admitted to a side room under full precautions. A swab was taken, and after an initial dose of soluble penicillin he was kept on "distaquine" 300,000 units four times a day for seven days. Under this treatment he improved rapidly. The oedema of his neck and chest disappeared by December 13, and on that date also he was afebrile. He had a slight recurrence of abdominal pain on the 14th. The local lesion remained relatively unchanged, although the vesicles were a little smaller. He was discharged on the 16th on his own insistence, although the ulcer was still present. A swab from the ulcer was negative at this time. He was seen in the casualty department daily for dry dressings. On January 3, 1954, the scab was off, the lesion was healed, and he was symptom-free. He had been quite well during the period as an out-patient, but had had periodic slight episodes of abdominal pain.

The following investigations were undertaken: (1) A swab from the ulcer yielded a growth of an organism which on culture and biochemically resembled *Bacillus anthracis*. A guinea-pig was inoculated for virulence and died within 24 hours. A virulent *B. anthracis* was found in the animal's spleen. (2) The E.S.R. was 12 mm. in the first hour, and the white blood count was 8,000 per c.mm. on December 12. (3) X-ray examination of his chest with a portable apparatus on December 11 gave normal results. We are at a loss to explain the abdominal pain, but feel that it may have been due to an associated mesenteric adenitis.

The public health department was notified, and the hardware shop and its contents, including samples of brushes, were inspected. Nothing suspicious was found. His home was examined for a possible source of infection and speci-

mens of clothing were taken. Nothing helpful was found. The only new garment he had bought that year was a shirt, and this was examined and found blameless. He had not bought a new shaving-brush and his old one was cultured, with a negative result. Although we realize the possibility of the dehydrated animal manure being a very likely cause in this case, he does not carry it on his shoulder and it is kept in carefully wrapped packets.

We feel that there is quite a likelihood of an insect being the vector in this case, but this possibility is not mentioned in any of the standard textbooks of medicine or surgery to which we have referred. It is, however, discussed by Topley and Wilson (1946).

Added interest is given to this case in view of a similar one in the same London suburb (Baker, 1953). In this case a woman was infected, and an insect seems to have been a very likely cause. We have been in touch with this patient and with her medical adviser, and she has never at any time entered our patient's store. We have been unable to confirm any cases of animal anthrax in the district in the last six months.

Two main points make this case worth reporting. Firstly, the possibility of an insect vector in spite of no animal cases being reported in the neighbourhood; and, secondly, the rapid and complete recovery, on penicillin, from a relatively rare and serious condition.

We wish to thank Mr. C. C. Cookson for permission to publish this case, Dr. L. Griffiths for bacteriological help, and Dr. J. J. P. Ferguson, the general practitioner; we wish also to thank Dr. G. P. Baker, of the Mayday Hospital, for information about his case.

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Sudden Death in Labour Following an Injection of Penicillin

This is an unusual case of sudden death occurring in labour in an apparently healthy patient following an injection of penicillin. It was concluded that death was due to anaphylaxis.

CASE REPORT

The patient, aged 42, was a 10-para, with one stillbirth, five normal deliveries, and three miscarriages. She had been given crystalline penicillin following a miscarriage in 1949 with no ill effect. She had had rheumatic fever at the age of 16. There was a history of syphilis, for which she had had treatment, but details were not known. She had also had chronic bronchitis.

History of Present Pregnancy.—L.M.P., September 12, 1952; E.D.D., June 19, 1953. On her first attendance at the antenatal clinic, examination of the chest showed nothing abnormal. The Kahn test was "weakly positive" and the Wassermann reaction was negative. Her blood group was O Rh positive. She attended the clinic at irregular intervals. She showed no symptoms of toxæmia at any time.

She was admitted to the Hull Maternity Hospital, supposedly in labour, at 10.30 a.m. on June 30. The membranes had ruptured and she was having very vague pains. On admission her blood pressure was 130/80 and temperature 98° F. (36.7° C.); the urine was normal and there was no oedema of ankles or sacrum. She was examined at 11.30 p.m. on the same day, and was found to be in early labour. Morphine, ½ gr. (16 mg.), was given. In the evening of July 1 she developed a temperature of 101° F. (38.3° C.), and was given 400,000 units of "distaquine" penicillin intramuscularly at 6.30 p.m. Other patients had received injections from the same batch without ill effect. At about 7.30 p.m. the patient vomited; after this she was quite normal and felt all right. A few minutes later she

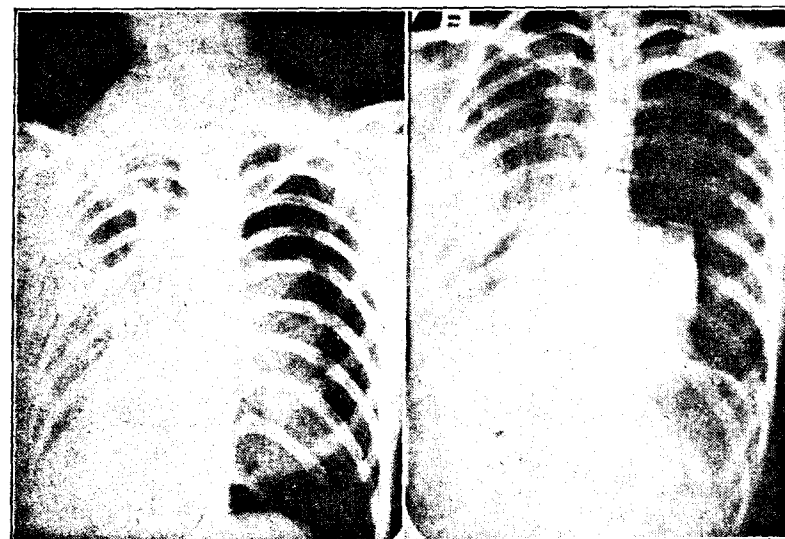


FIG. 1

FIG. 2

Fig. 1.—Radiograph taken shortly after admission. Note the partial aeration of the left lung. Fig. 2.—Radiograph taken on the third day. The left lung is totally collapsed and there is a partial pneumothorax on the right.

the injury was stated all were due to being crushed. Forty-eight were caused by road vehicles, and in many of these the wheel of the vehicle passed over the chest.

The cases fall into three groups according to the mode of presentation. Twelve victims (20%) died instantly or within an hour of the accident from associated injuries. The bronchial rupture in most of these cases was no more than a post-mortem finding.

Twenty-three patients (40%) presented with serious intra-thoracic injuries. Twelve of these died, some under conditions similar to those described in our case. Of the 11 patients who survived 9 recovered from the acute illness without the aid of surgery, but they subsequently developed bronchial stricture. The two operative cases are discussed later.

Twenty-three patients (40%) were referred to the authors as cases of established pulmonary collapse due to bronchial stricture. They gave a history of chest injury weeks, months, or years before which had been treated elsewhere. Some of these patients were said to have been very ill at the time of the accident, but nearly all had recovered without the true nature of the injury being suspected. Probably most of these were cases of partial rupture of the bronchus without interruption of the continuity of the lumen. Where there had been no history of pneumothorax or emphysema the injury has been more correctly described as a bronchial fracture (Griffith, 1949).

Discussion

From this brief summary of recorded cases of rupture of a main bronchus it is apparent that many survive the emergency in the absence of surgical treatment. Aspiration of air may well be all that is necessary to tide the patient over the acute injury, and the inevitable bronchial stenosis can be treated later. But among the acute injuries there are a few which present a challenge to the surgeon. These demand early diagnosis and urgent operative treatment if

had a contraction and at the height of it she suddenly called out and collapsed. She was unconscious and her breathing was stertorous. The nurse administered oxygen and sent for medical aid. The patient was found to be dead. The face was cyanosed, there was no breathing or heart beats. An attempt was made at resuscitation by artificial respiration with oxygen and an airway, but without success.

A post-mortem report by Dr. Mackenzie, senior registrar pathologist, was as follows: "Chest.—The heart was normal in size and showed no disease of the valves or of the coronary arteries. The blood in the heart and great vessels was quite fluid, no P.M. clots being present. Over the surface of the lungs were many petechial haemorrhages. The lungs showed a mild emphysema only. The trachea and bronchi were normal . . . otherwise there was nothing of note."

The pathologist decided that death was due to anaphylaxis caused by the penicillin injection to which she had been previously sensitized.

COMMENT

This case appears to have a certain resemblance to the case described by Thompson (1952). There were the same symptoms: vomiting, cyanosis becoming very intense, stertorous breathing, protruding tongue. The main difference is in the matter of time: in Thompson's case the reaction occurred about ten minutes after the injection, and in our case it did not occur until approximately one hour ten minutes after the injection. The other, more startling, difference is that in Thompson's case, and also in that of Waldbott (1949), there was a warning non-fatal reaction. Our patient had none.

A further case of death by anaphylaxis caused by penicillin has been described by Mayer *et al.* (1953). This was referred to by the *Lancet* (1953), when various other references were given.

My thanks are due to Mr. D. Hyslop, consultant obstetrician, Hull (A) Group Hospital Management Committee, for permission to publish this case.

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Spontaneous Adrenal Haemorrhage in Ulcerative Colitis

As the Friderichsen-Waterhouse syndrome, bilateral adrenal haemorrhage is a well-recognized complication of acute infections by meningococci and, more rarely, by other organisms. Adrenal haemorrhage has also been reported in cases of pregnancy and in single cases in a heterogeneous group of miscellaneous morbid conditions. These include such diverse conditions as burns, hypertension, hydatid infection of the liver, leukaemia, and carcinoma of the lung (Altschule, 1939; Godfrey, 1947; Lauckner and Hebbert, 1947; Dewhurst, 1951). The present report is concerned with a case of acute ulcerative colitis which terminated in a massive bilateral adrenal haemorrhage.

CASE REPORT

The illness began when the patient, a farmer aged 47, previously very fit, had an acute attack of diarrhoea accompanied by abdominal colic, and also, a few days after the onset, by fever. Examination of the stools failed to demonstrate any pathogens. For the first fortnight the general condition remained very good, but in the third week of the illness some deterioration became apparent. The patient was passing, on an average, 12 offensive fluid stools a day, but blood and mucus were not present. At the end of the fourth week he was admitted to hospital, having been given at home an intensive course of chloramphenicol without any improvement.

On the day of admission blood and mucus appeared in the stools, and the patient was pyrexial; there was obvious loss of weight. No other significant findings were elicited on clinical examination. Stools contained many pus and red cells, but no pathogens. There was polymorph leucocytosis. Agglutination tests and blood culture were negative. The next event, three days after admission, was the sudden and quite unexpected collapse of the patient. The pulse became imperceptible, and after a steadily deepening coma of a few hours' duration death occurred.

Necropsy revealed an extensive ulcerative colitis extending from the caecum to the rectum. The cause of death was a massive bilateral adrenal haemorrhage. The adrenals were converted into sacs of blood, a thin rind of cortical tissue being all that remained of the parenchyma. Haemorrhage was not found in other organs, the only other abnormality noted being coronary atheroma.

DISCUSSION

We have been able to find accounts of two cases in which adrenal haemorrhage has been associated with ulcerative colitis. Wilson and Roth (1953) reported a case in which a massive bilateral adrenal haemorrhage occurred in a woman aged 51 who was receiving corticotropin treatment for an exacerbation of ulcerative colitis. The aetiological relationship in this case between the colitis and the adrenal haemorrhage is not quite clear. An acute upper respiratory tract infection was present, and Wilson and Roth thought that corticotropin treatment or the infection may have been the determining factors of the haemorrhage. In a survey of the complications observed in a series of 129 cases of ulcerative colitis admitted during eleven years to the Radcliffe Infirmary, Oxford, Rice-Oxley and Truelove (1950) encountered one case in which there was adrenal haemorrhage. The patient died within one month of the onset of a severe ulcerative colitis. Necropsy revealed multiple small areas of haemorrhage in both adrenals. The authors thought that adrenal failure might be a factor contributing to the extremely rapid loss of weight and dehydration often seen in fulminating types of ulcerative colitis.

In the case reports referred to in the opening paragraph various theories have been advanced to account for the occurrence of adrenal haemorrhage. Haemorrhage has been ascribed to the operation of vascular damage, allergy, toxæmia, and a general tendency to bleed. Because ulcerative colitis has been included in the list of adaptation diseases we have been interested by the views of Selye (1950). The adrenal stimulated by the anterior pituitary plays an important part in the general adaptation response to stress, and Selye believes the Friderichsen-Waterhouse syndrome may be the result of cell damage following exhaustive overstimulation of the gland. (If this is true the part played by the corticotropin treatment in Wilson and Roth's case can readily be understood.) If adrenal haemorrhage in ulcerative colitis is to be ascribed to the operation of a stress factor it would not be surprising if the complications of this disease included other recognized manifestations of the diseased adaptation response. It is of interest, therefore, that Rice-Oxley and Truelove found a relatively high proportion of skin and joint lesions of an allergic type in their survey of the complications of ulcerative colitis.

Our thanks are due to Dr. A. W. Hansell for notes on the patient's condition before admission to hospital.

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Reviews

COLLECTED LECTURES

An Autumn Gleaning. By Sir Henry Hallett Dale, O.M., G.B.E., F.R.S., M.D., F.R.C.P. (Pp. 226+x. 21s.) London: Pergamon Press Ltd. 1954.

This book contains lectures on a variety of subjects given by Sir Henry Dale between 1935 and 1953. They are mostly medical, though in addition there are extracts from five presidential addresses to the Royal Society, a Pilgrim Trust lecture on the freedom of science, given in Philadelphia, and one on personal memories of Lord Rutherford. All are illuminated by the author's close personal knowledge of his subject and by his admirable historical presentation. The account of the discovery of insulin by Banting and Best is perhaps one of the most interesting chapters of the book, describing as it does how Banting had begun to practise medicine in London, Ontario, in 1920, and had accepted part-time duty as a demonstrator of physiology in the University of Western Ontario. In the course of preparing a lecture on diabetes he was seized with the idea that the previous failures to find insulin in the gland were due to its destruction by trypsin. He then sold his practice and his house and furniture and went off to Toronto to find an opportunity of putting his idea to the test of experiment. The whole of this story from the beginning makes fascinating reading and gives much material for reflection on the general question of medical research as an aim in life, to which a later chapter is devoted.

In selecting other subjects the treatment of which seems to deserve special mention, that of Thomas Addison as a pioneer of endocrinology must be of interest to all physiologists, and that of the mechanism of anaphylaxis must be of interest to all pathologists and physiologists. The presentation of this latter subject brings out many points which are usually misunderstood. It is interesting to learn that Isaac Newton nearly failed to write the *Principia*.

J. H. BURN.

RAMÓN Y CAJAL

Don Quixote of the Microscope. An interpretation of the Spanish savant Santiago Ramón y Cajal (1852-1934). By Harley Williams. (Pp. 255; 3 illustrations. 15s.) London: Jonathan Cape. 1954.

The life of Ramón y Cajal exerts a fascination on all who become acquainted with its many facets. Whether it be the simplicity of his character as opposed to the richness of his thought, of the fact that, brought up as he was in a poor rural district of Spain, he yet succeeded in breaking down the obscurity of man's most complicated physiological process; or, yet again, whether it be the fact that from a wild and uncouth childhood he developed into a manipulator of the first rank and a philosopher in whom his countrymen universally recognized their champion in the great world of science—each one will himself decide. From whatever angle it is regarded, his life is indeed an epic.

Cajal was born in a small town among the mountains of north-eastern Spain. As a boy he fought his way to eminence among his fellows. His father, a doctor, intended him to follow his own profession, but Ramón was stubborn and he had artistic instincts. From the long battle between these two developed Cajal's respect for his father's wishes and his determination in pursuing to their end those problems to which he later devoted his life. No sooner was he qualified in medicine than he joined the army and had a taste of guerrilla warfare in Cuba. Malaria and dysentery led to his discharge, and for a time his sturdy physique seemed broken. A few years later he developed tuberculosis, and he seems to have cured himself by strenuous walking in the mountains. While an assistant professor of anatomy at the University of Saragossa, and still only 25 years of age, he acquired a microscope and a microtome. It was possibly

the first modern microscope in the university. He plunged at once into the study of histology, and soon had a number of papers to his credit. When he died he had written nearly 300 papers and 15 books. The bulk of his researches dealt with the minute structure of the brain and arose from his adaptation of Golgi's process of staining with silver. Golgi had himself found the process difficult and unpredictable, but Cajal made it the key which unlocked for him the structure of the nerve cell and its fibres. One of the first foreign honours which Cajal received was the invitation to deliver the Croonian Lecture to the Royal Society. There was a fund of incident in his first brief and memorable visit to London.

Cajal wrote a long autobiography in which he described his life in considerable detail, and others have in their various ways attempted to place before the reader a picture of the man as seen through other eyes. Dr. Harley Williams has in this little book written a very charming biography. His sympathy with his subject is evident throughout, and his simple explanations of what Cajal's various researches really achieved will be much appreciated by the non-professional reader. The author has obviously spared no pains to augment his material from independent sources. The addition of an index would have enhanced the value of the book.

E. ASHWORTH UNDERWOOD.

MUSCULAR CONTRACTION

Muscular Contraction. By M. Dubuisson, Ph.D. (Pp. 243 +ix; illustrated, 47s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1954.

Dr. Dubuisson is the Director of the Laboratory of General Biology at Liège. In this volume he has rewritten some lectures given in America. It falls naturally into three parts: the chemical composition of the muscle cell, the location of the constituents in the muscle fibre, and the physicochemical aspects of muscular contraction. The first part presents a very thorough discussion of proteins of the muscle fibre, giving the history of their discovery and their role in considerable detail. Of great value is the threefold approach to the question: the enzymatic properties, the solubility, and the electrokinetic properties of the proteins. In the second part are summarized the results obtained with the electron microscope, and in the final part is an excellent account of recent biophysical work of the school and followers of A. V. Hill.

This monograph is entirely at the honours-school and postgraduate level of physiology and biochemistry. It is not to be recommended to the clinician unless he is interested in the scientific background of this field of medicine. It is reasonably critical, particularly in those fields where Dr. Dubuisson and his colleagues have been working. It has arrived at a timely moment, since a synthesis of the varied lines of approach (biochemical and biophysical) has long been needed. The author feels it is at the moment immature to sketch a general view of the mechanism of muscular contraction, since there is as yet a gap between the physicochemical aspects of contraction and properties of the muscular constituents when in the cell and in close relation with each other. The illustrations, references, index, binding, and printing are excellent.

A. ST. G. HUGGETT.

BRONCHOVASCULAR ANATOMY

Anatomy of the Bronchovascular System: Its Application to Surgery. By George L. Birnbaum, M.D. Foreword by Everts A. Graham, M.D. (Pp. 300+xv; illustrated. \$15 or £5 12s.) Chicago: Year Book Publishers Inc. London: Interscience Publishers Ltd. 1954.

The title of this volume is a good indication of its contents, since the author has taken certain facets of thoracic work in detailed consideration and has not attempted to produce a balanced survey of thoracic surgery as a whole. He starts with an orthodox embryological study of the tracheo-bronchial tree and pulmonary blood vessels, illustrating a

number of the common anomalies; he then proceeds to the anatomy of the bronchial tree, using the classification of Jackson and Huber. This is perhaps a little unfortunate in view of the recent introduction of the standard international nomenclature. Short sections on bronchial blood vessels, lymphatics, and innervation make useful but not outstanding reading. Then follows a well-illustrated section on congenital heart disease depicting the type of case which can be treated successfully by surgery. The section on abnormal pulmonary vessels gives nearly all the variations that have been encountered and affords a useful reference to any surgeon who may come across one of these unusual cases; there is also a short account of experimental surgery of the pulmonary vessels. Turning again to the bronchial tree, the author gives a good description of excision and grafting of the trachea and bronchi and of the various operations that have been used with limited success in asthma. The final chapters are concerned with pulmonary resection and give a detailed catalogue of the various methods commonly employed.

Dr. Birnbaum at the outset admits that he was aiming to produce an atlas of pulmonary vessels, and he has included an illustrated appendix giving the anatomy of the vessels based on a study of fifty adult lungs. The book, however, exceeded this boundary, and as a series of descriptive essays on individual subjects it makes interesting reading and affords a valuable source of reference.

T. HOLMES SELLORS.

OPERATIVE GYNAECOLOGY

Die Gynäkologischen Operationen, und Ihre Topographisch-anatomischen Grundlagen. By Heinrich Martius. Seventh edition. (Pp. 434+xvi; 450 illustrations. D.M. 87.) Stuttgart: Georg Thieme. 1954.

Martius's handbook continues to flourish as the hardest of perennials. It has been the vade-mecum of German gynaecologists for a generation, and with little alteration from the first edition this seventh issue looks like maintaining its original popularity. And rightly so, for in format the book is excellent. It is concisely written and beautifully illustrated, the copious drawings being closely integrated with the text. There are, of course, many variations from English and American practice, for German gynaecology has not yet recovered from its wartime isolation. For example, no fewer than twenty-three pages are occupied with operations for retroversion; implantation of the ovary into the uterus, a generally discarded procedure, is described minutely, but the use of plastic tubing in salpingostomy, a notable advance, is not mentioned. On the other hand, British surgeons might profitably study the chapters on the Pfannenstiel incision and colpotomy, two valuable approaches much neglected in this country.

The print is spoiled by poor spacing and the writing marred by the archaic use of composite words. Some of these are the etymologist's delight, such as "die Bulbo-kavernosusfettlappenzusatzplastik" and "der Scheiden-dammbeckenbodenschnitt." But on the whole the presentation is first-class, and, though the book cannot compare with the larger classics of Bonney, Peham, or Wilfred Shaw, its size is more convenient and its contents more than adequate for graduate use.

A. DAVIS.

SYMBOLISM OF THE SELF

The Self in Psychotic Process: Its Symbolization in Schizophrenia. By John Wier Perry, M.D. Foreword by C. G. Jung. (Pp. 184; illustrated. 37s. 6d.) Berkeley and Los Angeles: University of California Press. London: Cambridge University Press. 1953.

The word "self" has a special significance in analytical psychology: it implies a wholeness of personality embracing the conscious and the unconscious components. The notion of the self implies a new centre of gravity comprising ego and non-ego. This centre is believed to contain the

power through which the individual life attains or may attain fullness. Dr. Perry gives an account of a schizophrenic patient in whom the process of achieving wholeness was observed and noted, particularly in a series of drawings made by the patient. This development was not due to something new, but to the release of latent power striving for expression.

The book is in two parts. The first is a description of the process of recovery and reorientation. The author claims that this occurred spontaneously. The patient had no analysis, and from this it is apparently inferred that development towards recovery was unaffected by the therapist. In other words, the healing process is said to come from the psyche itself as a spontaneous effort of the unconscious towards wholeness and health. The validity of this argument—at all events in this instance—may be doubted. While the therapist said little he was nevertheless present, though we are given no information about the frequency or the nature of the interviews. He did, however, "promote a general attitude towards the symbol," and certainly the patient paid close attention to his observations. Furthermore, there was "a strongly toned transference." Dr. Perry is modest in his claims, but it would seem that he is over-impressed by the clinical material and disposed to interpret it according to his own expectations.

The second part of the book deals with the mandala and other symbols of the self as found in the East and in the West. There is nothing original in this section, but it is well done and provides an excellent introduction to the study of symbolism. This second part is an admirable addition to an interesting clinical study. The index is full and accurate, so that the book can be used for reference purposes.

E. A. BENNET.

BIOMATHEMATICS

Biomathematics: The Principles of Mathematics for Students of Biological Science. By Cedric A. B. Smith, M.A., Ph.D. Third edition and rewritten version of the work by the late W. M. Feldman, M.D. (Pp. 712+xv. 80s.) London: Charles Griffin and Co., Ltd. 1954.

This is a new version of the well-known book of the same name by W. M. Feldman first published in 1923 and revised in 1935. Dr. Smith has kept some of Feldman's material, particularly the physiological examples, but he has completely rewritten the exposition. The new book is more comprehensive than its predecessor; it includes an introduction to matrix algebra, and there is an up-to-date account of statistical methods which were inadequately treated in the older book.

The reader of a new popular book on mathematics will be interested as much in the style of exposition as in the choice of subject-matter. Such books frequently adopt a simplified approach which sometimes fails to reach the heart of the problem. *Biomathematics*, although not a formal textbook, has the flavour of real mathematics about it. This means that the reader who wants to benefit most from it will often have to work hard to absorb the argument. His reward will be an insight into mathematical procedures which is not usually achieved. Regarded as a work of reference, this book contains more than one would have thought possible to include in a single volume.

It is always possible to criticize mildly an author's choice of material in this sort of book. Many readers will regard some of the diversions (such as a chapter on a reform of arithmetical notation) as dispensable luxuries; others will welcome them as light relief. I should have liked a fuller treatment of chemical kinetics introducing the logistic function. The Poisson distribution, which has wide applications in biology, is scarcely mentioned. There is a rather startling treatment of logarithms, which, although theoretically neat, may not succeed as well as the familiar approach.

Biomathematics is a refreshingly original book, and should be widely used by students and research workers.

P. ARMITAGE.

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SMOKING AND CORONARY THROMBOSIS

The steadily accumulating evidence to show that smoking greatly increases the risk of developing lung cancer has reawakened interest in the physiological and medical effects of an almost universal habit. Five years ago Bülbring, Burn, and Walker¹ showed how smoking can affect the coronary blood flow: they found in dogs that nicotine caused an initial increase in flow followed by a prolonged reduction, and that the reduction was similar in rate of onset and duration to that produced by an extract of the posterior lobe of the pituitary. Moreover, the amount of pituitary extract required was equivalent in amount (taking into consideration the difference in the volume of circulating blood) to the amount released in man by the smoking of one to two cigarettes. To extend laboratory investigations to observations on large numbers of human beings is seldom easy, but fortunately individual variability is such that men have created the conditions of a vast experiment. Not everyone smokes, and those who are smokers do not all smoke the same amount. Moreover, there is a tendency for a person who has once begun to smoke to remain within the same broad category of light or heavy smoker—unless he gives up smoking altogether. All that is necessary, therefore, to obtain evidence of a relationship between smoking and disease in man is to record the smoking habits of a large enough group of persons and to wait till the passage of time reveals the nature of the illnesses from which they subsequently suffer.

An extensive investigation of this type has been undertaken in the U.S.A. by the American Cancer Society, and the first findings have been reported by Hammond and Horn.² The basic data were collected with the co-operation of over 22,000 volunteer helpers, scattered throughout 394 counties and covering farming districts as well as large cities and small towns. The helpers were organized in groups of 5 to 15 persons, each of whom was invited to collect data on a standardized questionnaire from approximately 10 white men aged between 50 and 69—a condition which was imposed because the investigation was primarily

concerned with the study of lung cancer. By this means smoking histories were obtained from 190,134 men between January 1 and May 31, 1952. Subsequently on each November 1 the original helpers have been asked to return a simple form stating whether the men they had originally interviewed were alive or dead; and the State health departments have then been asked to supply an abstract of the death certificate for each man reported as having died. Follow-up data after eighteen months have been obtained for 187,766 men (99.8% of the total), of whom 4,854 (2.6%) were found to have died. Details of the certified cause of death have been obtained for 4,710. The most striking finding is that the general death rate from all causes was appreciably higher, within each quinquennial age group, for regular cigarette smokers than for non-smokers, and—in all save the oldest age group—became progressively higher as the amount smoked daily increased. On the other hand, among smokers of pipes or of cigars who had never at any time regularly smoked cigarettes the death rate was little or not at all higher than the rates suffered by the non-smokers. The number of deaths among men who had at some time regularly smoked cigarettes was 53% higher than it would have been if the death rates had been the same as they were among non-smokers, and 75% higher among those who were currently smoking more than twenty a day. So great an increase cannot be explained by an increased risk of lung cancer alone—which accounted for 167 deaths (3.5% of the total)—and it was found that there was also a clear-cut relationship between cigarette smoking and the death rate from disease of the coronary arteries. Owing in part to the method of collection of the data (by which men who were already seriously ill were unlikely to have been interviewed), the deaths in the first eighteen months included a particularly high proportion due to acute illnesses; consequently nearly half the total deaths were attributable to coronary disease. Between the ages of 50 and 64 the death rates for coronary disease were 95% higher among men who had ever regularly smoked cigarettes than among non-smokers and 120% higher among those who were currently smoking more than twenty a day. At ages 65–69 the differences were much less, being about 15%. Among cigar and pipe smokers there was no increased mortality at all.

The strength of the association is less than that observed with lung cancer, but owing to the large number of cases recorded there is no doubt about its statistical significance. The results are similar to those which have been reported in this country by Doll and Hill³ and on which we have previously commented.⁴ In the British study of the mortality of doctors, 230

¹ *Quart. J. Med.*, 1949, N.S., 69, 73.

² *J. Amer. med. Ass.*, 1954, 155, 1316.

³ *British Medical Journal*, 1954, 1, 1451.

⁴ *Ibid.*, 1954, 1, 1480.

⁵ Morris, J. N., Heady, J. A., Raffle, P. A. B., Roberts, C. G., and Parks, J., *Lancet*, 1953, 2, 1053 and 1111.

⁶ *New York Times*, October 23, 1954.

deaths were attributed to coronary disease and the death rate was found to rise steadily from 3.9 per 1,000 among non-smokers aged 35 and above to 5.2 per 1,000 among smokers of 25 or more grammes of tobacco a day; whether the increase was limited to cigarette smokers could not be determined because of the relative paucity of smokers of tobacco in other forms. The agreement between these two investigations—the one large-scale, the other smaller but based on a more homogeneous population—makes it difficult to believe that the association is not real. Whether it is causal can, in the long run, be most effectively proved by seeing whether abstention from cigarettes brings about a reduction in the mortality from the disease. Some will doubtless prefer to believe that the habit of smoking and death from coronary disease are related only in that both are the product of a third and common cause. Occupation requiring only light physical work, which has been shown to be associated with coronary thrombosis,⁵ might, for example, provide greater opportunities for heavy cigarette smoking. The association would, however, need to be very strong to account for the results, and it is difficult to believe that it could in any way account for those obtained among doctors. At all events the American Cancer Society—whose vice-president said not long ago that the problems raised by the effects of smoking on the heart and arteries were even more pressing than were the more publicized findings linking smoking and lung cancer⁶—has decided that the time has come to call a conference of Federal and voluntary agencies to discuss the whole subject as a public health problem.

MAINTAINING A PATIENT

The hospital costing returns published by the Ministry of Health have been criticized often enough by the experts; but they have now appeared again, in more detail than before, for the financial year 1953-4 with summarized comparisons going back to 1950-1.¹ What is the purpose of them? They purport to show the cost, or rather the average cost, of maintaining an in-patient in each of the 2,500 hospitals of England and Wales. The cost is calculated from the expenditure under the various subject headings—food, drugs, wages and salaries, fuel and power, and so on—from which the hospitals' budgets are estimated. This method, however, has some serious drawbacks. A hospital with a large out-patient department will have a larger expenditure on staff—and consequently food—than another hospital with the same number of beds but with few out-patients. The result, so far as the first hospital is

concerned, will be an inflation of the cost of maintaining an in-patient. It is true that the returns try to get round this obstacle by eliminating out-patient costs on the basis that five out-patient attendances equal one in-patient day. But no one pretends that this assumption is anything but arbitrary. It is generally recognized that a true costing system would allocate to each medical or surgical unit, or even each ward, its proper share of the hospital's total bills. Overheads, such as administration, would then be reflected in a unit's costs, but not the cost of the medical and nursing staff of other units. By this method the distorting effect of out-patient expenditure would be properly eliminated, and the cost of running the gynaecological unit could be compared with that of the orthopaedic unit and so on.

Over two years ago both the Nuffield Provincial Hospitals Trust and King Edward's Hospital Fund for London published reports on the feasibility of a system of unit costing in hospitals, and the Ministry of Health has set up a working party to devise a scheme for introducing such a system. Until then we have to make do with the present returns, which provoke some interesting speculation—even if allowance is made for the arbitrary assumption behind them. The published summary of the figures for the different types of hospitals put out by the Ministry is misleading in that it does not give the adjustment, made in the returns themselves, for staffed but unoccupied beds. The adjustment may be arbitrary, but at least it explains the apparent high cost of maintaining a patient in an isolation hospital. This is given as £19 9s. 2d. a week, compared with an average for the general hospitals of £15 15s. 5d. and of £19 2s. 9d. and £25 4s. 2d. respectively for the provincial and London teaching hospitals. But when adjusted for the "vacant bed factor"—isolation hospitals are naturally very under-occupied over the year as a whole—the cost of isolation beds falls to under £11 a week. Over and over again, when the costs of two hospitals of comparable size are examined closely, it will be found that it is a high occupancy rate in one that reduces its maintenance costs by comparison with the other's. The low cost of mental hospitals (£4 12s. 6d. per patient a week) can also be partly explained by their very high occupancy rate, which is another way of saying that they are overcrowded. But it is also due to the small proportion of staff to patients—the cost of medical salaries per patient a week is only 11s. 3d., compared with £1 9s. in large general hospitals, and of nursing salaries £1 8s. 9d., compared with £3 2s. 5d. When

¹ National Health Service Hospital Costing Returns, Year Ended March 31, 1954, H.M.S.O., 17s. 6d.

costs are divided among 2,000 patients, instead of, say, 500, they are bound to shrink significantly. The expenditure on drugs varies too: in a large general hospital it amounts on the average to 12s. 8d. a patient a week, and in a "chronic hospital" to 2s. 2d. The average for the mental hospitals is only 11d., and even though a mental hospital is now spending, say, £1,000 a year on chlorpromazine, this sum divided among 2,000 patients barely affects the weekly maintenance costs.

It is when two comparable hospitals are examined, with roughly the same occupancy rates for their beds, and large discrepancies are found in their costs, that official explanations may be called for. Of two London undergraduate teaching hospitals, for instance, with a difference of only 15 in the number of their beds and in each case with an occupancy rate of 89%, the one has a maintenance cost per patient about £3 a week higher than the other. Does this indicate more extravagant staffing?—it is noteworthy that nursing and ward orderly costs combined are over £1 a week more. Or does it merely reflect the arbitrary assumption behind the elimination of out-patient costs, for the one had many more out-patient attendances than the other? Perhaps questions such as these cannot be answered until unit costing has been introduced. The present returns merely provoke the questions, they cannot provide the answers.

SPECIFIC TREATMENT FOR MENTAL DEFECT

The total number of mental defectives under statutory care in England and Wales in 1953 was 118,963,¹ and there is evidence to suggest that more than half of them are above imbecile level.² In this high-grade group social factors are more important than lack of cognitive ability when it comes to living and working among normal people.³ With idiots and imbeciles, however, it is the gross inadequacy of cerebral function which is important. Crome has shown that almost all low-grade mental defectives have obvious structural alterations in the brain, and, if this is so, it seems that specific therapy designed to achieve a radical cure of mental defect has little chance of success. The best that can be done is, by suitable training, to enable the maximum use to be made of such potentialities as are located in a shrunken, scarred, or deformed brain. From time to time enthusiastic claims are made, and often widely disseminated in the lay press, for some new drug as a general treatment for the miscellany of clinical conditions included under

the heads of "idiocy" and "imbecility." More critical trials—such as those carried out on glutamic acid^{4,5}—have not usually given grounds for optimism.

A minority of children with severe mental defect are in an exceptional position because their condition is due essentially to metabolic disorder. If these children are treated early, when the structural defect is minimal, it would seem theoretically possible to restore the function of the brain to normal by correcting the metabolic error. The great value of specific treatment was first seen in cretinism, though optimism based on physical improvement was sometimes modified by less satisfactory response in the mental state. At the present time, however, cretinism makes only a small contribution to the total of mental defectives. In the Fountain Hospital for mentally defective children there are at present no diagnosed cretins in a population of some 800. Phenylketonuria is another comparatively rare disorder which has come under investigation more recently.⁶ The nature of the metabolic block in this condition, which is invariably associated with mental backwardness, is not clear. On the assumption that it was due to a deficiency in tyrosine synthesis Cowie⁷ fed this substance to patients at the Fountain Hospital, where 26 cases have been seen during the past five years. No appreciable benefit resulted, and the patients excreted more phenylpyruvic acid in the urine. Meantime other workers, taking the view that the symptoms are due to an excess of toxic metabolites rather than to a deficiency, have been trying out a diet low in phenylalanine, which may be compared to a pre-insulin diabetic diet.⁸ Bickel⁹ has published the findings in one case so treated, and in the opening pages of this issue Dr. L. I. Woolf, Dr. Ruth Griffiths, and Professor Alan Moncrieff give a more complete account of three cases treated at the Hospital for Sick Children. The results are encouraging, though the clinical improvement described is more convincing than the intelligence-quotient changes, which are notoriously subject to variation, especially in young mental defectives. The outlook for the treated children seems much brighter than it might have been, but psychologists must be even more cautious than biochemists about projecting their curves into the future, especially when no controls are studied. None the less, this is an important piece of work, and more early cases should be collected for study under carefully controlled conditions. It is to be hoped that this first glimpse of success will encourage further work on metabolic diseases causing brain damage.

THE BABY'S CRY

"Infants," wrote Walter Harris in 1689, "give no light into the knowledge of their diseases other than what we are able to discover from their uneasy cries." The subject perhaps deserves deeper study than it has received, and in a lecture which appears at page 75 of the *Journal* this week Professor R. S. Illingworth makes an instructive contribution to it. Crying (with the shedding of tears) is peculiar to human infants, and indeed it is their most potent means of asking for nourishment, summoning assistance and protection, and acting aggressively.

¹ Report of the Ministry of Health for the Year Ended December 31, 1953, Part I. H.M.S.O., London.
² O'Connor, N., and Tizard, J., *British Medical Journal*, 1954, 1, 16.
³ Amer. J. ment. Defic., 1954, 59, 173.
⁴ Oldfelt, V. J., *Pediatrics*, 1952, 40, 316.
⁵ Zabarenko, V. J., and Chambers, G. S., *Amer. J. Psychiat.*, 1952, 108, 881.
⁶ Fölling, A., *Hoppe-Seyl. Z. physiol. Chem.*, 1934, 227, 169.
⁷ Cowie, V., *J. ment. Sci.*, 1951, 97, 505.
⁸ Woolf, L. I., and Vulliamy, D. G., *Arch. Dis. Childh.*, 1951, 26, 487.
⁹ *Ann. Proc. Midl. ment. Defic. Soc.*, 1953, p. 22.

It is all the more important to them because, compared with other mammals, human babies are so helpless and immobile. Small wonder, then, that this immensely strong force for survival sometimes goes awry, driving mothers to distraction and fathers from their homes.

There is some uncertainty whether the cause of the crying can be discerned by listening alone, but even if there is no qualitative variation between the cry of hunger and that of pain the difference in intensity is sufficient to allow mothers usually to make the correct diagnosis. Most paediatricians believe that they can recognize pathological cries, such as the high-pitched one indicative of some intracranial disorder. The meaning and purpose of the first cry after birth is variously interpreted by different workers. To the physiologist it is simply a neat mechanism for ensuring deep respirations, but to the psychoanalyst it is a vigorous protest against an uncomfortable ejection from the peace and security of the womb. Many far-fetched theories to account for crying in older children have been propounded, but we are on firmer ground in thinking that some infants show a constitutional predisposition to cry at the slightest provocation whereas others are placid and easy from birth.

All normal babies cry from time to time, and the common causes change with age. In the first three months persistent crying is usually due to hunger. Unfortunately the easy remedy is often not applied for fear of overfeeding or because the symptoms are mistakenly attributed to wind. However, not all crying can be cured in this way: "three-months colic" is a clinically recognizable syndrome which is apt to run in families and may be linked with a particular kind of temperament, though some believe that it is due to gas trapped in a loop of bowel. Loneliness and frustration are other common causes of crying in infancy, which, unlike hunger and colic, are relieved by picking the baby up. In older infants and young children the picture becomes more complicated. In children with an irritable temperament and a determined negativism lie the foundations for this kind of difficulty, and contributory causes in the environment may be lack of love or security, over-stimulation, jealousy, over-protection (producing the "cry-baby"), and parents' demanding a too high standard. The happy child in the good home will occasionally go through bad phases which may be unaccountable, or these may follow a period of excitement, as in the aftermath of Christmas.

The treatment, as with other medical problems, must depend upon the cause. Difficulties arise when the crying has, or seems liable to, become a purely attention-seeking device. Violent crying indicates a need which most mothers know they should satisfy, but on the other hand some mothers artificially engender a need in order to satisfy their own wish to be wanted, with the result that the baby becomes spoiled and a vicious circle is begun. Striking the happy medium may be easy to the observer but hard to the parents or guardians. In general, paediatricians now favour gratifying the infant's needs, because they believe that a sense of comfort and security

then is the soundest foundation for future emotional stability. In short, this means plenty of mother-love and a fully adequate diet. Professor Illingworth, in his otherwise admirably comprehensive study, makes one curious omission from the treatment—namely, the use of the dummy. Mothers have used this device for centuries as a solace to infants, and, in spite of the active disapproval of doctors, dentists, and nurses, many babies are pacified with one. The recent Newcastle study¹ of a thousand families revealed that over 50% of the satisfactory mothers used them, and there was no evidence that they predisposed to infantile infection. M. A. Wessel *et al.* have also reported² that mothers in a series they studied found no difficulty in discontinuing them later on. When all is said and done, the mother must remain the best judge of what calms a crying baby most effectively. When sick infants are admitted to hospital they are deprived of their mother, and very often their dummy too, at a time when they need both most. We are trying to reduce the former deprivation so far as practicable, but objections are still raised to allowing dummies in the children's ward. Perhaps some of these objections are unreasonable.

RAYNAUD'S PHENOMENON AND OCCUPATION

Recognition that Raynaud's phenomenon is sometimes due to occupational causes dates from 1911. Alice Hamilton,¹ and other workers between the two world wars, found that working with pneumatic hammers was a predisposing cause, and pounders-up in the boot and shoe trade were also known to be affected. Since 1945, with the papers by Telford *et al.*² and Agate *et al.*³ describing outbreaks in other trades, has come the realization that there may be several occupations potentially harmful to workers' hands because of vibration. Agate⁴ has described the incidence and course of the disease in a large outbreak, raising questions of disability, and has made a study of harmful vibrations. Raynaud's phenomenon of occupational origin does not differ materially from that due to other causes. Attacks are intermittent, consisting of discoloration and numbness of the fingers in response to cold. It is usually difficult to distinguish from the constitutional disorder sometimes called "hereditary cold fingers" which Lewis and Pickering⁵ found to affect at least 25% of young adults. The occupational variety tends to affect first those fingers most subjected to vibration, but this is by no means the rule, and as the condition progresses its pattern becomes indistinguishable from the phenomenon arising from other causes. So close is the clinical resemblance that an abnormally high incidence of vascular disorder in a given group of workers has to be proved before the blame can fairly be laid on some occupational factor. The real existence of an

occupational form of Raynaud's phenomenon cannot, however, be doubted, for in some industrial processes the disorder has been found to affect 85–90% of the workers. In nearly all the occupational cases the disability is slight: often the attacks come on out of doors or only in a man's leisure time. The disease does not progress to trophic skin changes or gangrene, and where these are seen some other causal factor is to be suspected: only rarely have patients been seen with aching pain and cramps giving rise to real hardship.

In the last decade, with the increasing mechanization of manual tasks, more and more cases of the phenomenon have been coming to light in various industries. Some claims of disability were made and some cases reached the courts, and the question had to be considered whether Raynaud's phenomenon should be prescribed under the National Insurance (Industrial Injuries) Act of 1946. A report⁶ has now been submitted to the Minister by the Industrial Injuries Advisory Council, to which he had referred the question in March, 1950, and which in turn referred it to its Industrial Diseases Subcommittee. The delay of almost five years is an indication of the complexity of the matter. The obstacles to the prescription of this disorder have been squarely faced. First is the difficulty of distinguishing occupational from non-occupational cases of Raynaud's phenomenon. The subcommittee, in a majority report, considers that the distinction would usually be possible, but clinicians may doubt this (and it is they who would have to deal with cases under any new regulation). Physical examination is often unhelpful, and may at the time show no evidence of any disease. A successful claim would depend on establishing that symptoms appeared for the first time after exposure to significant vibration of the right type. Too often the only evidence would be the claimant's word, and realists will agree that bias, however unintentional, cannot be excluded where money is at stake. Yet to allow only those claims where objective signs of disease were present and accepting them as *post hoc* would be to exclude many that were genuine. The majority report considers limiting the "cover" to those specific trades in which the hazard is well recognized. But the chances of exposure to some kind of vibration are so many and varied that the inevitable disputes could be settled only by a succession of protracted surveys of incidence trade by trade. Particular difficulty is to be expected in assessing disability, for it is often negligible, and complete days are not lost from work. The report suggests that even in those few cases where basic disablement benefit would be payable the assessment would be of the order of 3%, and very few men indeed would qualify for special hardship allowance. The possibility of a special form of prescription to cover disablement of not less than a certain figure was considered—and, in fact, recommended in a dissenting note to the subcommittee's report by Dr. L. G. Norman—but found impracticable and unlikely to have its intended effect of reducing the number of trivial claims made.

In adopting the majority report of its subcommittee and advising the Minister against prescription, the Indus-

trial Injuries Advisory Council has taken a realistic course. The technical and clinical difficulties in putting the contrary decision into practice would be very great. Regulations likely to lead to thousands of claims—many based only on the claimant's own statements and not often succeeding—would probably fall into disrepute. The fairness with which the facts were considered will be apparent even to those who will disagree with the majority report. The subcommittee's minority report, by Mr. C. R. Dale, subscribed to by four other members of the council, eloquently and with some logic advises prescription for the sake of the few. But the fact remains that it has yet to be proved beyond a doubt that there are a significant number of men seriously incapacitated by this occupational disease.

THE OXFORD MEDICAL SCHOOL

It was announced last week that extensive building will take place at the Radcliffe Infirmary for the academic clinical departments of the Oxford Medical School. There will be new departments for the next Regius Professor of Medicine (if a clinician) and for the newly appointed Nuffield Professor of Surgery, and much larger facilities than at present for the Nuffield Professors of Clinical Medicine and of Anaesthetics, in addition to improved accommodation for biochemistry and pathology. Although a few students had previously carried through their clinical training at the Radcliffe Infirmary, no complete clinical school existed at Oxford until 1940. Then, under the stress of war, an undergraduate clinical school was hastily created on the basis of the post-graduate research units set up from 1936 onwards as a result of Lord Nuffield's benefaction, and many students began to receive their whole medical course at Oxford. By 1943 the University had decided that it wished to have a permanent undergraduate clinical school, but that it should be small and of a special type in which emphasis would be laid on the scientific aspects of clinical medicine. On the strength of this expressed intention of the University the Goodenough Committee recommended that public funds be allotted for a clinical school at Oxford and that the University itself be left free to decide what form the school should take. The University Grants Committee acted on this recommendation, and the clinical school has remained. Since the end of the war about one-third of Oxford preclinical students have stayed on for their clinical training, and some students have come from other universities.

By 1952 the University had gained enough experience to review the progress and future of the clinical school. After careful deliberation a letter was sent to the Minister of Health in March, 1954, setting out what is needed in the teaching hospital for the success of a clinical school of the special type to which the University is committed. In brief, the University asked for a more effective voice in the management of the hospital, with special reference to clinical facilities (beds and laboratories) and the appointment of consultants. The approval by the Board of Governors of the United Oxford Hospitals and by

¹ Bulletin No. 236, 1918, Bureau of Labor Statistics, U.S. Department of Labor.

² Lancet, 1945, 2, 359.

³ Brit. J. Industr. Med., 1946, 3, 159 and 167.

⁴ Ibid., 1949, 6, 144.

⁵ Clin. Sci., 1934, 1, 327.

⁶ Raynaud's Phenomenon, Cmd. 9347, 1954, H.M.S.O., London. Price 6d. net.

¹ A Thousand Families in Newcastle-upon-Tyne, 1954, London. See British Medical Journal, 1954, 2, 292.

² Pediatrics, 1954, 54, 421.

the Minister of Health of the £400,000 building programme (to which the University is contributing nearly half) is the first tangible sign that the University's plan is to be put into effect. The Board of Governors has been hesitant about offering full facilities to the University, perhaps for a reason which is peculiar to Oxford—namely, that the teaching hospital is the only general hospital in Oxford and consequently must provide a complete hospital service for the city. Some members of the Board may have been uneasy lest further development of teaching and research might conflict with this duty. But Oxford is unique in possessing a new clinical school and a clear mandate to teach clinical medicine as a science, and the recent outcome of the efforts to achieve a fuller co-operation between the University and the Board are greatly to be welcomed. The further development of the medical school should only enhance the medical care available to the citizens of Oxford.

ERRORS IN CLINICAL JUDGMENT

Since medicine is still chiefly practised at the bedside it is important to understand the value and limitations of time-honoured clinical methods. Although for "exam" purposes clinical signs are apt to be treated as infallible, in practice the deductions based purely on clinical observation are found often to be unreliable and sometimes false. Fletcher¹ showed that expert physicians varied greatly in their interpretation of the physical signs in patients with emphysema, and he concluded that emphysema, in its early stages, could not be diagnosed with confidence by clinical examination alone. Even the answers to simple questions put to a patient about his symptoms may vary according to how the question is asked. In a study of the symptoms of coalminers with chest disease Cochrane and his colleagues² found that the interpretation of symptoms was markedly influenced by the bias of the questioning doctor. At page 65 of this issue of the *Journal* Drs. R. S. F. Schilling and J. P. W. Hughes and Mr. I. Dingwall-Fordyce report their investigations into the diagnosis and clinical features of byssinosis in Lancashire cotton workers. Byssinosis, unlike pneumoconiosis, produces no radiological changes in the lungs, so that the disability must be assessed purely on clinical observations. Two investigators made an independent assessment of the history, symptoms, and signs in 187 mill workers exposed to cotton dust and in 88 other workers not so exposed. The results showed that one observer consistently found more evidence of disease among the cotton workers than did the other. Thus one or both of the investigators, though fully aware of the possibility, showed bias for or against finding abnormal signs. Where objective measurements could be made, as in blood-pressure recordings, there was very little bias. As might be expected, divergence of opinion between the two observers was greatest in assessing those signs lacking a clear definition.

One of the salutary lessons to be learned from this investigation is that epidemiological studies carried out by a single observer might inadvertently lead to false

deductions and unwarranted claims. It also serves as a reminder that physical signs are not necessarily reliable because they are traditional. No doubt the individual clinician becomes more discerning about physical signs as he gains experience; he comes to know on which physical signs he can rely, and he rarely makes a diagnosis on an isolated clinical finding. Nevertheless, a more general appreciation of the limitations of clinical signs will lead to more critical standards of medical practice.

INDUSTRIAL HEALTH

On the whole the report of the Chief Inspector of Factories for 1953 is one of progress and improvement both in accident prevention and in the maintenance of health of the industrial population.¹ The one source of dissatisfaction arises from the figures for accidents to young persons, which show that the rate per 1,000 for girls is higher than at any time since 1949 and for boys equal to the 1952 level. Repeating his last year's remarks, the Chief Inspector points out that "young persons constitute industry's most precious material, and employers would do well to ask themselves if they are watching over it with all the care it needs." Management is not, however, always to blame; "sky-larking," not entirely confined to boys, disobedience to and misunderstanding of instructions, and lack of concentration have been responsible for a number of accidents. The establishment of good traditions by the example of older workers is recommended as a most valuable factor in the prevention of much unnecessary and regrettable disablement in the young worker.

A general improvement in the design of new machinery in the form of metal guards and interlocks has taken place, and special consideration has been given to hydro-extractors and centrifugal machines, which may become very dangerous if metal decay leads to bursting of the baskets. The mechanization of steel rolling mill processes has eliminated the danger of burns from hot metal, and accidents to the hands of cold-rolling mill operators have been greatly reduced, though one serious casualty occurred during the absence of a guard. In spite of these and other improvements there was an accident increase of 2.33% over the figures for 1952, but the number of fatal accidents decreased from 796 to 744. There is always some difficulty in persuading workers to make use of protective equipment of any kind, as shown in two cases of aniline poisoning, which were due to failure to change clothes and wash thoroughly after contamination with aniline. Goggles are especially disliked, but the rewards of such eye protection are sometimes dramatically obvious, as when two men, whose spectacles and goggles became encrusted with molten aluminium suddenly ejected into their faces, were undoubtedly saved from blindness by the protection afforded. Gassing cases showed a slight decrease in the total number notified, but the proportion of fatalities was high—9%. Carbon monoxide, with 121 cases, 19 fatal, and blast furnace gas, with 33 cases,

11 fatal, both showed a slight increase, and chlorine, with 36 cases, showed the highest number since 1945.

The general health of the working community, as affected by the factory environment, is difficult to assess accurately in the absence of satisfactory records of sickness absenteeism in the majority of factories, particularly the smaller ones, which represent a greater proportion of industry as a whole than the larger firms, with a high standard of working conditions. The standard of amenities for personal hygiene has certainly improved enormously since 1939, when washing facilities were first made compulsory in all factories, while the provision of canteens and the fulfilment of requirements of adequate ventilation, heating, and lighting have undoubtedly contributed greatly to the raising of the level of industrial health. First-aid and ambulance facilities have shown a special development in the growth of joint schemes, by which one factory provides a central clinic shared by a group of others on an estate. Among cases of notifiable industrial disease, lead poisoning occurs chiefly in ship-breaking, electric accumulator works, and with contact with molten lead, but for the fourth year in succession no fatal case was reported. Benzol, or benzene, one of the most potentially hazardous substances used in industry, was relatively innocuous in 1953. Only four cases of acute poisoning, or "gassing," were reported, and, though blood examinations of a large number of benzol workers showed some abnormalities consistent with benzene absorption, no cases of severe chronic benzene poisoning, with its characteristic irreversible depression of the bone marrow, occurred. The use of x rays and radioactive materials, though recognized as a grave potential hazard, appears to be well controlled. X-ray installations conform in general with the recommendations of the British X-ray and Radium Protection Committee; even where mobile sets are used the cabins are amply shielded. The majority of sets used for fluoroscopic examination of packed confectionery, tinned foods, sparking-plugs, etc., are generally also well protected, but need constant inspection to detect leaks and misuse by workers. There has been a great extension of the application of radioactive isotopes, in both strength and variety. Personal dosimeters are a valuable means of assessing the risk to operatives and of keeping the dosage to a minimum; the estimated dosage per operative per week in one of the major steel factories averaged only one-fiftieth of the minimum recommended dose. "Luminizing," the application of radioactive compounds to watch and instrument dials, has decreased considerably since the end of the war, only 144 luminizers now being employed in the whole of Great Britain. Their general health, and that of former luminizers followed up after some years' cessation of work, is good, and their blood picture, while suggesting, as in previous years, a transitory overstimulation of the reticulo-endothelial system, shows no evidence of bone-marrow depression. Records of radiation dosage, estimated by film badges supplied by the National Physical Laboratory, showed in most cases satisfactory low levels; a few reached or nearly approached the recommended tolerance level of 0.3 r per week.

Two codes of special regulations were issued during the year—the Mule Spinning (Health) Special Regulations, specifying the type of oil used with a view to the prevention of mule spinners' cancer, and the Iron and Steel Foundries Regulations for promoting safer and healthier conditions in iron and steel foundries.

NEW YEAR HONOURS

The full list of medical men in the New Year Honours List appears at p. 101. Medical representation in the House of Lords will be much strengthened by the barony conferred on Dr. E. D. Adrian, O.M., P.R.S. As a physiologist Dr. Adrian achieved an international reputation at an age when many medical men are completing their training. In 1932 he was awarded, jointly with Sherrington, the Nobel Prize in medicine and physiology "for their discoveries regarding the function of the neurons." Ten years later he was awarded the Order of Merit. His great distinction of character and mind has been universally recognized, not least, perhaps, by his appointment as Master of Trinity College, Cambridge, in 1951. As honour has succeeded upon honour through a life of achievement and service Dr. Adrian has remained imperturbably modest, and by his example and grace of speech, whether as President of the Royal Society or of the British Association, or as lecturer at Cambridge on the physiology of the nervous system, has put the undergraduate and the learned world deeply in his debt. Sir John Stopford, who has so conspicuously combined the careers of science and administration at Manchester University, becomes a K.B.E. Elected to the chair of anatomy in 1919 (in succession to the late Sir Grafton Elliot Smith) and a Fellow of the Royal Society in 1927, Stopford early won distinction for his neurological researches, particularly into the components of sensation. In 1935 he was appointed vice-chancellor of the university, and has rendered signal service not only to his university but to university education in general. The science of anatomy is also fittingly recognized in the knighthood bestowed on Professor W. E. Le Gros Clark, F.R.S., of Oxford. An authority on the primates and fossil remains of human ancestors, and on the anatomy of the brain, he has been a powerful influence in the teaching of his subject in this country. Professor L. S. P. Davidson, President of the Royal College of Physicians of Edinburgh, is also made a knight: he has written original contributions on a variety of subjects and been a great influence as a teacher and contributor to textbooks. Knighthoods have also been bestowed on Mr. A. A. Gemmell and Professor R. R. Macintosh. Mr. Gemmell is President of the Royal College of Obstetricians and Gynaecologists and was for many years its treasurer. Professor Macintosh holds the Nuffield chair of anaesthetics at Oxford and has contributed much to the development of this specialty. The many friends of Dr. A. J. Collins, of Sydney, both in Britain and in Australia will join in congratulating him on his knighthood. As teacher and consultant, and in the affairs of the B.M.A., Dr. Collins has been a beneficent influence in the medical world of Australia, where he is now President of the Federal Council of the B.M.A.

¹ *Proc. roy. Soc. Med.*, 1952, 46, 577.
² *Lancet*, 1951, 1, 1007.

¹ *Annual Report of the Chief Inspector of Factories for the Year 1953*, H.M.S.O. 6s. 6d.

EMERGENCIES IN GENERAL PRACTICE

RESPIRATORY INSUFFICIENCY IN POLIOMYELITIS AND OTHER DISEASES

BY

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The term "bulbar paralysis," or "bulbar involvement," in diseases such as poliomyelitis is correctly used only when the disease in question is affecting brain-stem nuclei in the pons or medulla, especially the nuclei of the motor cranial nerves. Of these latter, the nuclei which cause special anxiety are those which protect the airways from inhaling foreign substances—namely, those which innervate the throat and larynx. The term bulbar paralysis should not therefore be used when the chief disability depends on paralysis of the muscles of respiration—the intercostals and diaphragm—without any difficulty in swallowing.

It should, of course, be appreciated that either paralysis of the throat or paralysis of the muscles of respiration may lead to a very similar picture of respiratory insufficiency; and yet they must be distinguished from each other, as the appropriate treatments for the two conditions are quite different one from the other. There is, moreover, a third type of respiratory difficulty which may develop either from direct involvement of the respiratory centre by disease or, if respiratory insufficiency is not quickly treated, from the effects of anoxia on the respiratory centre. Finally, there may develop any combination of these various causes of respiratory insufficiency, so that the assessment of a complicated case may present great difficulties.

Presenting Symptoms and Signs

The patient (child or adult) developing bulbar poliomyelitis soon becomes obviously ill and fevered, with head pain and neck stiffness. Drowsiness may alarm the relatives quickly, but often the patient remains fully conscious. Various visible palsies of cranial nerve muscles may develop, such as those concerned with eye movements, the face or jaw, the palate, pharynx, larynx, or neck. The most dangerous by far are those which affect the throat and interfere with swallowing. There may be a history of choking and subsequent refusal of food or regurgitation of fluid through the nose.

This state of affairs requires careful treatment by the general practitioner if dangerous complications are to be prevented. His task is to recognize the various paralytic and pulmonary complications which may occur, to provide first aid for these, and to supervise the safe transfer to a hospital where the necessary apparatus and skilled personnel are available. Generally that is all he should do, and no attempt need be made to diagnose in greater detail at this stage. It will, of course, be appreciated that cases of bulbar poliomyelitis can only be cared for successfully by nurses and doctors experienced in this difficult condition, and the general practitioner's efforts will be unavailing if the care of the patient after reaching hospital is left in the hands of inexperienced personnel.

Clinical Signs and Treatment

The patient is usually found lying in bed on his back (supine), with one or more pillows, and a most essential part of the examination is simply to listen carefully to the breathing before disturbing him in any way. When there is paralysis of the swallowing mechanism the air for each breath often bubbles through a pool of secretions in the

pharynx. This closely resembles the well-known "death-rattle," in which the deep unconsciousness of approaching death leads to a similar state of affairs. The death-rattle of pharyngeal paralysis is, however, modified by the patient's conscious effort to avoid inhaling secretions, but when, as in some cases of bulbar poliomyelitis, the patient is also stuporous, then the development of a death-rattle may cause the doctor great anxiety if the true state of affairs is not promptly recognized. When collapse of a lung has already occurred the condition may closely resemble primary pneumonia.

When this rattle in the throat develops in bulbar poliomyelitis or in some other condition, its recognition calls for immediate action, and for this the principles of postural drainage of the airways require to be understood, as their prompt application will save many lives, not only of patients with poliomyelitis but also of those with poisoning, in drowning, with concussion, and with other neurological diseases which cause either dysphagia or deep coma.

Postural Drainage of the Air Passages

As soon as the doctor recognizes that there is a pool of mucus in the pharynx, he must remove all pillows from the bed and turn the patient on his face (prone), with the head to one side (Fig. 1) as for first aid in drowning or

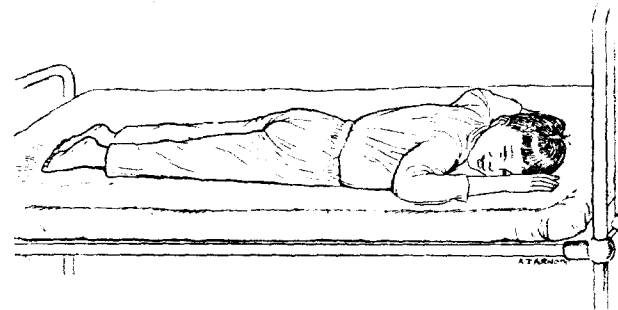


FIG. 1

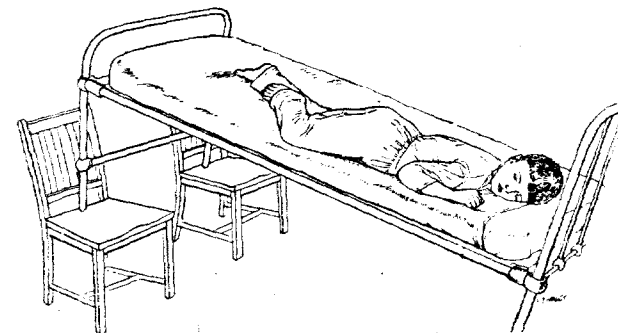


FIG. 2

after throat operations. This simple manoeuvre in itself will often save life in cases of pharyngeal paralysis, and these patients must be prevented from turning on their back into the supine position except under supervision, until the ability to swallow returns.

If, as often happens, secretions have already been inhaled by the time the patient is seen, the foot of the bed should in addition be raised at least 18 in. (45 cm.)—the height

of the average wooden chair (see Fig. 2)—and the chest squeezed manually during expiration to assist the expulsion of inhaled secretions.

The improvement in the patient's condition which follows these simple manoeuvres is often most gratifying. Large quantities of secretions may flow from the patient's mouth, so that a towel under the head and plenty of swabs are helpful. Some physicians attempt to establish adequate postural drainage with the patient lying on his back, but this is much less satisfactory than with the patient in the prone or semi-prone postures, and very steep angles of tilting are required to maintain adequate postural drainage in the supine position. The prone position not only allows fluid in the pharynx to flow safely out of the mouth and nose, but also assists drainage of the trachea, as the trachea is placed more anteriorly in the neck than in the chest. The prone or semi-prone posture should therefore be insisted on, but frequent changes of posture under supervision to right and left semi-prone, and to right and left lateral are helpful. The lowest placed lung may accumulate secretions, therefore the foot of the bed should be well raised for a short time before and after changes of posture to ensure that dislodged secretions flow safely out of the lungs, and not into healthy lung tissue.

Paralysis of Respiration

The airways having thus been cleared, it is now possible to observe whether the strength of spontaneous respiration is sufficient or whether there is also a developing paralysis of the respiratory muscles. The strength of the respiratory excursions may be judged by inspecting the movements of the chest and abdomen, and by listening with a stethoscope over the trachea. In most cases of bulbar poliomyelitis with paralysis of swallowing sufficient strength of respiration is maintained provided that the airways are clear and the lungs are healthy. If, however, pulmonary atelectasis or other lung complications have been allowed to develop, even a slight degree of respiratory weakness may lead quickly to a critical state of affairs in which artificial respiration as well as postural drainage is required to save life. Bronchoscopy may also be necessary.

Death in poliomyelitis is usually due to respiratory complications, and is only rarely due to the direct effects of the virus on the brain-stem centres—brain-stem lesions are common but will recover sufficiently if life is preserved by protecting the lungs.

Even the healthy individual can choke owing to a failure of the physiological mechanisms which separate what is intended for the oesophagus from what is intended for the trachea and lungs. This separating mechanism is at the best a delicate affair, and when disordered by disease may lead to a very dangerous situation in which secretions, blood, or vomit may be inhaled into the lungs. Of these, vomit is the most dangerous, as the inhalation of acid gastric secretions on a single occasion leads rapidly to necrosis of lung tissue, which is likely to cause circulatory collapse and death a few hours after inhalation has occurred. More commonly, however, the inhalation of secretions leads to collapse of one or more lobes of the lungs. It is thus obvious that the inhalation of vomit and secretions must be carefully prevented by recognizing when this danger exists, and instituting prophylactic treatment before serious damage occurs.

Other Conditions Requiring Similar Care.—All severe brain disease, such as meningitis, brain abscess, or head injury, may develop accumulations of secretions in the pharynx which require postural drainage just as urgently as in bulbar poliomyelitis. Paralytic conditions which lead to similar dangers include acute infective polyneuritis (Guillain-Barré syndrome), myasthenia gravis, and botulism.

Transfer to Hospital

The transfer to hospital of a patient with bulbar poliomyelitis often requires careful planning. In the first place he must be made fit for transfer by full drainage of the throat and trachea by means of postural drainage as

described above. Vomiting is likely to occur in the ambulance, so the prone or semi-prone posture without pillows must be maintained on the stretcher. A doctor should accompany the patient in the ambulance, and should be prepared to raise the foot of the stretcher to improve postural drainage and to introduce some form of artificial respiration should it be necessary.

Artificial Respiration

As has already been emphasized, the major problem in most cases of bulbar poliomyelitis is concerned with the associated paralysis of the pharynx and larynx. However, the development of paralysis of the muscles of respiration or of the respiratory centre may greatly complicate the patient's handling and transfer.

In many of these difficult cases the services of an experienced anaesthetist are required, and the local poliomyelitis centre may be able to send an anaesthetist to accompany a difficult case during transfer. Modern methods of anaesthesia cause both unconsciousness and muscular paralysis, and thus reproduce closely the types of disorder seen in poliomyelitis. The anaesthetist should be prepared to suck out the trachea, and if necessary to pass an endotracheal tube and to maintain positive-pressure breathing during transfer to hospital.* Mechanical suckers are of great value but are no substitute for postural drainage. Even a simple type of manually assisted respiration during transfer to hospital will greatly relieve the patient who is developing respiratory paralysis.

The Unconscious Patient

When the patient is unconscious there may be great difficulty in distinguishing between a disease affecting the brain-stem centres and the effects of cerebral anoxia. These are difficult cases to care for, but it is important to know that patients with bulbar poliomyelitis who become stuporous often make an excellent recovery if life can be preserved for the period of the acute illness. Every effort must therefore be made to tide these alarmingly ill patients over the early days of the acute disease, and such a patient should never be left without an experienced nurse or doctor at the bedside. It may be necessary for some days to listen to every breath. It is better to avoid attempting to reduce throat secretions with drugs such as atropine, as profuse watery secretions flow out freely and cause less harm than sticky mucus, which may soon become dangerous, and for the same reason humidification of the air may be desirable. Children with bulbar poliomyelitis are often very restless, and their clinical condition demands sedation. The use of sedatives, however, may in such cases precipitate failure of the respiratory centre, and so should not be given until mechanical methods of artificial respiration are available under experienced supervision. In such cases restlessness is often a symptom of respiratory insufficiency.

Finally, it should be pointed out that every region requires a nucleus of experts to deal with cases of threatening respiratory insufficiency, and their skill should not be dissipated on the 80% of patients with poliomyelitis whose lives are never in danger.

Next article on Emergencies in General Practice.—"Shock," by Sir Heneage Ogilvie, F.R.C.S.

Refresher Course Books.—Copies of the first two volumes of collected articles from the Refresher Course for General Practitioners published in the *Journal* are still available at 25s. (postage 1s.) each. The first volume contains 55 articles and the second 60. Each article has been revised and brought up to date by its author.

These books may be obtained from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or through any bookseller.

*See also *Lancet*, 1954, 1, 939.

THE ASSESSMENT OF INTELLIGENCE

RECENT TRENDS IN MENTAL MEASUREMENT

The last of a series of lectures on "Psychology and Education," given recently at the University of London Institute of Education, was by Professor P. E. VERNON, who holds the chair of educational psychology in the University.

Professor Vernon gave three interpretations of the term "intelligence." What he called intelligence A was the underlying inborn potentiality, some quality of the central nervous system, determined ultimately by the genes. Intelligence B was the all-round ability or mental efficiency displayed in adult life, and very largely acquired. Intelligence C was the I.Q. or mental age or other score obtained from standard tests. This last might or might not correspond very closely with intelligence B, and, like intelligence B, it was very largely the product of environment, though limited by the innate potentiality or intelligence A.

Intelligence B, neurologically, corresponded to the amount of cerebral activity of which the individual was capable. In the absence of adequate environmental stimulation at the appropriate age many patterns of discharge in the association areas of the brain might not be properly formed, so that the intelligence was impaired. A dog brought up in the restricted environment of a cage was less intelligent and less capable of problem-solving than a dog brought up as a pet, with the free run of a rich environment; and so with humans. Intelligence could not properly be distinguished from acquired information and education, but a relative distinction might be useful. On the one hand, there were concepts which depended largely on knowledge specifically taught in school or in books, whose absorption and retention was also governed by the person's interest in the subject and by his industry. On the other hand, there were more general qualities of comprehension, judgment, and reasoning which could be manifested through responses to verbal stimuli or through practical skills that had been picked up in the course of everyday living without much specific instruction.

What do Intelligence Tests Measure?

Mental tests were often seriously misunderstood. They were looked on as a psychologist's magic for finding out things that could not be revealed in any other way. The tests were simply well-chosen samples of people's thinking and behaviour. If intelligence testers could collect a sufficiently broad sample of everything that the layman recognized as intelligence then the I.Q. (or intelligence C) would be identical with all-round ability (or intelligence B), but the latter covered the whole of the mental life whereas intelligence tests covered only rather narrow and partial samples. Legitimate deductions about intelligence B might be made from a study of intelligence tests, but the tests were apt to be too restricted and unrepresentative.

The extent of variations in I.Q. on retesting had been underestimated. Over the primary and secondary school period and early adulthood the average person did stay within the same band or region of I.Q. But he might vary on retesting by 7 points either way, or 10 points if frequently retested, and a small number of persons might gain or lose 30 or even 40 points.

These facts, however, must be set against the still greater unreliability of any other form of assessment such as school examinations and teachers' ratings. An individual intelligence test at age 5 or 6 provided a useful indication of general educability in infant and junior school; a well-constructed group test at age 10 or 11 yielded as a whole slightly better predictions of secondary school success than almost any other single instrument; and tests around age 15, although they seldom correlated highly with success in any specific job, gave strong indications of the intellectual level of employment for which the individual was suited and his likelihood of benefiting from more advanced education. But

fluctuations in intelligence and education were such that few psychologists were happy about any rigid scheme of segregation or streaming by ability, though big fluctuations in ability were the exception rather than the rule.

Environmental Effects on Intelligence

After discussing the several reasons for the imperfect reliability of intelligence tests, Professor Vernon turned to the evidence of the effect of environment on intelligence, and quoted work of Freeman and Newman to suggest that the differences between good and poor upbringing could produce differences of only 10 or at most 20 points in I.Q. The statement (which was accepted by a large number, though not a majority, of teachers in a questionnaire), that differences between the average I.Q. of children from different social classes arose simply because better-off parents could provide better opportunities for developing the abilities measured by the tests, was definitely false, because there was some correlation between the I.Q. of orphans and the social class of their true parents, who had not brought them up. At the same time there was also an appreciable correlation with the social class of the foster parents, showing that environment as well as heredity did contribute. Another strong argument was the big differences in I.Q. between children in the same family or orphans in the same institution, which could hardly be attributed purely to differences in upbringing.

Some critics had said that if intelligence tests were affected by environment there was no justification for using them for educational screening, since they were supposed to show inborn potentiality for acquiring further education. The answer was that what intelligence tests showed was the joint product of the genetic potentiality and the upbringing. The tests worked all the better because they were impure. If it ever did become possible to measure intelligence A (inborn potentiality) completely it would not be possible to give anything like as good predictions of future educational and vocational success. Potentiality for acquiring further education was not entirely inborn.

Future Developments in Mental Measurement

In the United States there was a definite trend away from talk about intelligence tests, and American psychologists preferred to develop batteries of differential aptitude tests, or sets of tests designed to elicit the individual's group factors or abilities along a number of different lines. The pattern or profile of such scores was likely to be much more revealing for educational or vocational guidance than the single, vague global I.Q. Professor Vernon suggested that a good deal of controversy would be avoided if at 11+ something like academic aptitude were substituted for intelligence tests and the types of items for such tests were chosen, not because somebody thought they measured inborn intelligence, but because they effectively predicted subsequent grammar school success and added appreciably to predictions based on attainments tests or examinations alone. He considered that it would be a real advance to give up putting together a hotchpotch of items and calling it an intelligence test, and, instead, choose a series of important aspects of general ability appropriate to a limited age range, measure these by homogeneous scales or subtests, and finally combine the results of the subtests in a rational manner designed to give the most effective predictions of whatever it was desired to predict.

In conclusion Professor Vernon suggested that no one should bother too much about improvements in selection techniques. A well-known statistician had said that if it went much further there would be no need to have any general certificate examination, because they would all know at age 11 who would pass, and in what subjects. This remark brought home the futility of expecting to segregate with absolute accuracy by age, ability, and aptitude. Of course children developed and changed between age 11 and 16 or

18. Instead of laying all the blame for mistakes on the psychologists' intelligence and attainments tests it would be better to modify the system which forced them to be used in an artificial competitive atmosphere. In that way better diagnostic instruments for use in educational and vocational guidance might be developed.

MEDICAL NEW YEAR HONOURS

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

EDGAR DOUGLAS ADRIAN, O.M., M.B., F.R.C.P., President of the Royal Society; President of the British Association for the Advancement of Science; and Master of Trinity College, Cambridge.

K.B.E. (Civil Division)

SIR JOHN SEBASTIAN BACH STOPFORD, M.D., F.R.C.P., F.R.S. Vice-Chancellor and Professor of Experimental Neurology in the University of Manchester.

Knighthood

WILFRID EDWARD LE GROS CLARK, M.D., D.Sc., F.R.C.S., F.R.S. Dr. Lee's Professor of Anatomy in the University of Oxford.

ARCHIBALD JOHN COLLINS, D.S.O., M.C., M.B., Ch.M., F.R.A.C.P. President of the Federal Council of the British Medical Association in Australia. Honorary Consulting Physician, Royal Prince Alfred Hospital, Sydney, New South Wales.

LEYBOURNE STANLEY PATRICK DAVIDSON, M.D., F.R.C.P., F.R.C.P.Ed., F.R.S.Ed. Professor of Medicine in the University of Edinburgh and President of the Royal College of Physicians of Edinburgh.

ARTHUR ALEXANDER GEMMELL, M.C., T.D., M.D., F.R.C.S.Ed. President of the Royal College of Obstetricians and Gynaecologists.

ROBERT REYNOLDS MACINTOSH, D.M., F.R.C.S.Ed., F.F.A.R.C.S. Nuffield Professor of Anaesthetics in the University of Oxford.

C.B. (Military Division)

CHARLES WILLIAM GREENWAY, C.B.E., M.R.C.S., L.R.C.P. Major-General, late R.A.M.C., Honorary Surgeon to the Queen.

JAMES HAMILTON, C.B.E., M.B., Ch.B. Surgeon Rear-Admiral.

C.B. (Civil Division)

The Hon. WALTER SYMINGTON MACLAY, O.B.E., M.D., F.R.C.P., D.P.M., D.T.M.&H. Senior Medical Commissioner, Board of Control.

C.M.G.

CYRIL FRANCIS FERNANDO, O.B.E., M.D., M.R.C.P. Medical Officer and Physician, General Hospital, Colombo.

RAYMOND LEWTHWAITE, O.B.E., D.M., F.R.C.P. Director of Colonial Medical Research, Colonial Office.

C.V.O.

JOSEPH GRAEME HUMBLE, M.R.C.S., L.R.C.P. Honorary Consulting Haematologist, Westminster Hospital, and Senior Lecturer in Haematology, Westminster Hospital Medical School.

C.B.E. (Military Division)

JOHN HENRY BREUELL CROSBIE, M.B., B.Ch. Surgeon Captain, R.N. (ret.).

FREDERICK CAVENDISH HILTON-SERGEANT, M.B., Ch.B., D.P.H. Major-General, late R.A.M.C. Honorary Physician to the Queen.

C.B.E. (Civil Division)

ARTHUR FREDERIC ALFORD, M.B., Ch.B. Senior Medical Officer, Ministry of Education.

WILLIAM EDWARD LODGEWYK HAMILTON CROWTHER, D.S.O., V.D., M.B., B.S., F.R.A.C.P. A prominent physician in the State of Tasmania.

MAURICE WALTER GOLDBLATT, M.D., Ph.D., D.I.H. Director, Industrial Hygiene Research Laboratories, Imperial Chemical Industries Ltd.

JOSEPH HAROLD SHELDON, M.D., F.R.C.P. Director of Medicine and Senior Physician, Royal Hospital, Wolverhampton.

DENIS JOHN WILLIAMS, M.D., D.Sc., F.R.C.P. Civilian Consultant in Neurology and Electroencephalography to the Royal Air Force.

O.B.E. (Military Division)

THOMAS WILSON FROGGATT, M.B., Ch.B. Surgeon Commander, R.N.

JOHN IRVINE, M.B., Ch.B. Lieutenant-Colonel, R.A.M.C. In recognition of services in Korea during the period February 1 to July 31, 1954.

THOMAS MCGREGOR MCNIE, M.B., Ch.B., M.R.C.O.G., D.Obst.R.C.O.G. Lieutenant-Colonel, R.A.M.C.

JOHN HOPE POOL, M.D. Acting Wing Commander, Royal Auxiliary Air Force Reserve of Officers.

O.B.E. (Civil Division)

BASIL WILLIAM ARMSTRONG, M.C., M.B., B.S. Lately Medical Superintendent, Royal Sea-bathing Hospital, Margate.

DAVID ALEXANDER BAIRD, M.B., Ch.B. Director of Medical Services, Somaliland.

ARTHUR BEAUCHAMP, M.R.C.S., L.R.C.P. General Practitioner, Birmingham, and Deputy Chairman of the Representative Body of the British Medical Association. For services to the Ministry of Health.

ELIOT CECIL CURWEN, M.B., B.Chir. Honorary Physician to the Police Convalescent Seaside Home, Hove.

WELIWATTAGE LIVERIS PERERA DASSANAYAKE, L.R.C.P.&S.Ed., D.P.H., D.T.M.&H. Superintendent, Filariasis Campaign, Ceylon Government Medical Service.

WILLIAM MARSDEN FORD-ROBERTSON, M.D. Medical Director of the Lebanon Hospital for Mental and Nervous Disorders, Beirut.

THASSOS CHARIDIMOU GIRCOTIS, M.D. For medical services in Cyprus.

GEORGE RAJANAYAGAM HANDY, M.D., M.R.C.P. Visiting Physician, General Hospital, Colombo.

WILLIAM EDWARD HUTCHINSON, E.D., M.D., D.P.H., J.P. Assistant Director of Medical Services (Civil Defence), Singapore.

EDWARD NORMAN JAMIESON, F.R.C.S.Ed. Surgeon, Lewis Hospital, Stornoway.

JAMES HUTCHINSON KENNEDY, B.M., B.Ch., D.T.M. Government Medical Officer at Ndanga, Southern Rhodesia.

ARTHUR GENTRY PITTS, F.R.C.S., F.R.A.C.S. A medical practitioner at Waimate, New Zealand. For services to the community.

JOHN HERBERT OWEN ROBERTS, M.D., D.P.M., J.P. Medical Superintendent, North Wales Hospital for Nervous and Mental Disorders, Denbigh.

LORIS ROHAN SHARPLES, M.B., Ch.B. For public services in British Guiana.

WALTER ANSLEY YOUNG, M.R.C.S., L.R.C.P., J.P. For public services in the Federation of Malaya.

M.B.E. (Military Division)

ALEXANDER JOSEPH ZOSIMUS NAVARATNE, Captain, Ceylon Army Medical Corps.

ERNEST SIDNEY ODBERT, M.B., B.Ch. Squadron Leader, R.A.F.

LESLIE FRANK RICHMOND, T.D., M.D. Major, R.A.M.C., T.A.

M.B.E. (Civil Division)

MOYA KATHLEEN BAILEY, M.B., B.S., D.Obst.R.C.O.G. (Dr. Blackall). A prominent medical practitioner in the Australian Capital Territory.

FRANK HOWARD BUDDEN, M.B., B.S., D.T.M.&H., D.O. Medical Officer (Ophthalmology), Northern Region, Nigeria.

MARIA LEONORA DU TOIT, M.B., Ch.B. For medical services in the Tiv Division, Northern Region, Nigeria.

LUCIFERN ARNOLD GUNESKERA, Medical Practitioner, Colombo.

JAMES DONALD HOLMES, M.B., C.M. Admiralty Surgeon and Agent, Finchley and District, London.

THOMAS AFFLECK MORRISON, M.B., Ch.B. Chairman, Brighton Executive Council, National Health Service.

CHARLES VINCENT MTAWALI, African Assistant Medical Officer, Tanganyika.

IDA MIRRIE LEES SEYMOUR, L.R.C.P.&S.Ed. Lately Medical Officer, Department of Health for Scotland.

CARDIOVASCULAR DISORDERS AND MORTALITY RATES IN AMPUTEES

Two years ago a medical committee under the chairmanship of Sir Ernest Rock Carling presented a final report to the Ministry of Pensions on the results of an investigation into the longevity and liability to cardiovascular disease of Service amputees from the First World War (see *British Medical Journal*, 1953, 1, 717). The investigation suggested that those who had had severe wounds and amputations experienced later a higher mortality rate, that in those with leg amputations cardiovascular disorders were a commoner cause of death than would be expected, and that a history of "serious sepsis" following wounding was somehow related to these findings. The committee has now reviewed the evidence, and has written to the Chief Medical Officer of the Ministry of Pensions and National Insurance in the following terms:

"In our 'Final Report' on 'Cardio-vascular Disorders and Mortality Rates in Amputees' we stated that although the conclusions affirmed earlier in the Interim Report were not materially altered by our subsequent deliberations we nevertheless found upon analysis some variation in particular groups and we indicated that specialized pathological and clinical research might contribute advantageously to our knowledge. Accordingly the Ministry of Pensions made arrangements for the medical examination of some 4,500 amputees with 1,000 non-amputee pensioners as 'controls.' It is regrettable that the figures obtained by the examination of living amputees failed to provide statistically significant evidence largely because of the failure of a considerable number of those, in what was intended to be a representative sample, to attend for examination. So far as it goes the evidence obtained discloses no excess of high blood pressure among amputees and no material excess of cardiovascular disease.

"Having now reviewed the whole of the evidence from all sources, we find that:

"Out of every 1,000 amputees alive in 1930 there was a mean annual mortality of 12.6 in the years 1930 to 1950. Out of every 1,000 of the general population of comparable sex and age alive in 1930 there was a corresponding mean annual mortality of 11.4. The mean annual mortality rate of amputees was therefore just over one per thousand in excess of that of the corresponding general population. Expressed differently this means that, starting, say, with 100 amputees alive in 1930, 25 had died by 1950 compared with 23 of the corresponding general population.

"Out of every 1,000 who had suffered wounds not leading to amputation there was a mean annual mortality of 13.15 in the years 1930 to 1950. Out of every 1,000 of the general population of comparable sex and age alive in 1930 there was a corresponding mean annual mortality of 11.9. The mean annual mortality rate of the wounded was therefore just over one per thousand in excess of that of the corresponding general population. Expressed differently this means that, starting with, say, 100 wounded pensioners alive in 1930, 26 had died by 1950 compared with 24 of the corresponding general population.

"With so small a difference of total mortality the actual distribution among the certified causes of death assumes very little importance. Some members of the Committee think that within the limitations of the statistical material available there is evidence of some slight excess of cardiovascular disease as compared with the normal population, with a consequential deficiency of deaths from other causes. The Committee as a whole, however, are still of the opinion indicated in the Interim Report that cardio-vascular diseases have not been experienced more frequently to an extent of any significance amongst the causes of death in limb amputees as compared with those with serious leg wounds without amputation.

"Some amputees, especially those with a high thigh amputation, necessitating a tilting-table, with excessive obesity or with severe stump pain find the wearing of a prosthesis an increasing burden as age advances. These may deserve individual reconsideration though other classes of pensioner will also find their disabilities more burdensome with the passage of time. Neither as regards their mortality nor

their morbidity do amputees form a class apart. They have neither a higher mortality rate nor a higher cardio-vascular rate than other classes of seriously wounded.

"The committee have reconsidered the evidence as to sepsis as a factor and feel that they over-emphasized its importance in the last report.

"In conclusion the committee now advise on the terms of reference as follows:

"Limb amputations, and the subsequent wearing of a prosthesis, do not, in time, produce effects on the body as a whole which may initiate, or aggravate, cardio-vascular disorders to any significant extent.

"There is no material difference between the mortality rates of amputees, by reason of amputation, and that of the corresponding rates for pensioners who have suffered wounds not leading to amputation. Such excess as there is in both classes over that in the general population is quite small."

Correspondence

Brain Injury in Boxing

SIR.—I would like to congratulate you on the very able leader on boxing (*Journal*, December 25, p. 1535), as well as your decision to publish the pragmatic article by experienced experts (Drs. J. L. Blonstein and E. Clarke, *Journal*, December 25, p. 1523). I fear, however, that the latter article might be interpreted as indicating that all was well with amateur boxing, in regard to the incidence and severity of harmful sequelae, in so far as useful recommendations had already been made and some prudent practices adopted. I venture to doubt whether such a conclusion would be valid.

The sorbo-rubber floor (or the American equivalent) should not only be recommended but should be made compulsory. The matching of age and weight is not enough. Experience, competence, and adequate training are much more important, and no match should be allowed to take place in which one boxer is unskilled and unable to put up a reasonable defence. This not infrequently happens in inter-hospital boxing, where a novice is persuaded to enter on the chance of scoring a point, even without a win. It is true that referees do, nowadays, make better use of their right (and duty) to stop a bout where one opponent is obviously outclassed or has received a severe blow that renders him incapable of effective defence for a period of uncertain duration; but the possibility of the "loser" turning the tables by a lucky blow, or an unexpected recovery, often makes a referee unwilling to face the criticism of alleged untimely or premature intervention. Education of boxers and onlookers in this regard is still needed. Apart from physical injury, there is also the adverse psychological effect of taking one or more severe hidings from tougher and more experienced opponents.

Nevertheless, and in spite of the ominous stress your annotator felt bound to make on the fact that an aim of a boxer was to knock his opponent out (concussion), I still feel from the experience of some ten years of active participation, and many more years of interest, that boxing is sufficiently worth while as a virile character sport to justify our taking every precaution to ensure its continuation under conditions of reasonable prudence. Trials of skill, endurance, and courage will still remain in very full measure for those who enter the ring in combat.—I am, etc.,

London, W.1.

S. LEONARD SIMPSON.

The Handicapped Adolescent

SIR.—In your leading article (*Journal*, December 25, 1954, p. 1536) under this heading you say, "There may in fact be some medical neglect of the problems of the adolescent," and you suggest that appropriate "attention is not always paid by our medical services to the late teenagers." One illustration of the truth of your statement concerns school-

children with pulmonary tuberculosis. Few of these call for prolonged institutional treatment, but those that necessitate such a regime should be sent only to sanatoria fully equipped to deal with both their therapeutic and educational needs. Unfortunately this is not always the case. Not infrequently children are admitted to my sanatorium who have undergone previous residential treatment in conditions quite unsuited to their youth and their educational needs. The following are typical examples:

Girl, 14 years of age, admitted after undergoing many months' residential treatment with adults. She had received no education for one year. Girl, 12 years of age, previous residential treatment intermittently for past two years. Approximately one year spent in convalescent home where one teacher for about 100 children ages 2-14. "Boys had teacher one week and girls the next." Girl, 13 years of age, admitted after 15 months' residential treatment among adults; no schooling.

These scanty facts have come to light whilst taking the children's own histories. No effort has been made to confirm them. There may be some inaccuracies, but it is clear that there are instances where education is allowed to drift seriously whilst treatment for tuberculosis is undertaken. There can be little doubt that inquiry would bring many similar cases to light. Neglect of this sort is inconsistent with national standards of child welfare.

It should be axiomatic that institutional treatment for children with pulmonary tuberculosis cannot be efficiently conducted without adequate concurrent education. The organization of such facilities can only be undertaken economically if the area to be served covers a very numerous population. It is doubtful whether even the regional boundaries are large enough for this purpose. Probably the whole country could best be served by about half a dozen national centres. Such centres should be prepared to admit boys and girls up to 16 years of age, and, in addition, to accept a small number of tuberculous adolescents over this age if still receiving education. Parents will not always accept treatment for their children which precludes frequent visiting because of long distance, but experience proves that most parents prefer efficient treatment at a distance to doubtful facilities near by. If parents were encouraged to look upon such centres as residential sanatorium schools few would raise any objection. It is realized, however, that there would always be a residuum of children who could not be accommodated in these special centres. These might still have to be dealt with in small groups or as individual cases in circumstances where medical and educational facilities could not be up to the standard required. There would be much advantage in such cases being known to the medical staff of the special centre, who could visit or advise as required.

Tuberculosis in childhood has too long been dominated by ideas and practice arising out of a knowledge of the disease in adults. But the disease in young people has its own pattern and calls for different management. It is high time it became generally realized that special arrangements are required.—I am, etc.,

Brentwood, Essex.

F. J. BENTLEY.

Treatment of Bronchial Obstruction

SIR.—The paper on the treatment of bronchial obstruction by Dr. G. S. Kilpatrick and Mr. P. D. Oldham (*Journal*, December 11, 1954, p. 1388) disturbs me. My scientific friends will be aware that I have been very diligent in pressing for the use of statistical methods in experimental medicine; but when a deduction from a statistical analysis conflicts with common sense I suspect some inadequacy in the analysis. And the conclusion that the authors arrive at that their observations cannot be taken to show that treatment with calcium chloride is worse than that with adrenaline seems to me to be not sense. Eight patients chosen substantially at random each show no important change with calcium chloride, and all give a positive response to adrenaline. The decision to adopt a sequential scheme apparently prevents me saying that the odds are 2⁸ to 1 that calcium

chloride is worse than adrenaline; but, whatever the odds, in my view there is sufficient evidence to be reasonably confident that calcium chloride is no good. Perhaps some statistician will help me out of what must appear to be a lapse into heresy.—I am, etc.,

London, S.E.25.

J. W. TREVAN.

Trilene in Domiciliary Midwifery

SIR.—The report of the M.R.C. Committee¹ and the action of the Central Midwives Board (*Journal*, December 18, 1954, p. 1470) will be generally welcomed, and it is to be hoped that a considerable increase in the use of "trilene" will follow, both in domiciliary work and in maternity units. However, the patients for the trial were selected "solely on the basis of the expectation that the confinement would be normal." Therefore neither the report nor your leading article deals with a possible complication.

A proportion of the labours where the mother receives trilene will for various reasons end in operative delivery. Such patients will still be excreting trilene from the lungs, so that if general anaesthesia is used the closed circuit method must be avoided. Toxic products may be produced when even small amounts of trilene come into contact with soda-lime. These toxic products can cause cranial nerve palsies and even death. In view of this danger, anaesthetists called to obstetric emergencies must pay more attention than in the past to the exact nature of the analgesia previously employed.—I am, etc.,

Bromley, Kent.

H. A. CONDON.

REFERENCE

¹ *The Use of Trilene by Midwives*, Medical Research Council Memorandum No. 30, 1954. H.M.S.O., London.

Cheyne-Stokes Respiration

SIR.—Our experience with ear oximetry in Cheyne-Stokes respiration in heart disease is the same as that of Drs. H. R. Gilmore and H. Kopelman (*Journal*, December 18, 1954, p. 1439) and of Matthes²—namely, that the lowest arterial saturation occurs at the peak of the hyperpnoea. We agree that these cases have both a prolonged lung-head circulation time and some abnormality of the respiratory centre, but we hold that dynamic sensitivity of the centre is increased rather than depressed. The sequence, hyperventilation → decreased stimulus → hypoventilation → increased stimulus → hyperventilation, will be self-perpetuating if the second hyperventilation is as great as the first; and for this to be so, the response of the centre to changes in the stimulus (to be understood as comprising both $p\text{CO}_2$ and hypoxia) must be sufficiently great. Only the dynamic sensitivity, change of ventilation produced by change of stimulus, is important here, and this can vary independently of the response to a given steady stimulus.

Figures 4 and 5 of Gilmore and Kopelman's paper, illustrating the effects of oxygen and carbon dioxide inhalation, support this analysis. The first effect of oxygen is to moderate the hyperpnoea—that is, to lessen the response to the high $p\text{CO}_2$ produced by the preceding apnoea. The oxygen evidently does not equally depress the response at low levels of $p\text{CO}_2$, or apnoea would still follow the moderated hyperpnoea. Carbon dioxide also decreases the dynamic sensitivity by maintaining ventilation where there was previously apnoea, without adding equally to the hyperpnoea, which was already virtually maximal. The relation between this type of periodic breathing and that occurring at high altitudes or with cerebral injury is still uncertain. In animal experiments it has been demonstrated that cerebral injury may produce periodic respiratory movements even when the blood gases are maintained constant by artificial ventilation.³ The topic is thus more complex than might appear.—We are, etc.,

London, S.E.1.

A. C. DORNHORST.
G. DE J. LEE.

REFERENCES

- ¹ *Kreislautuntersuchungen am Menschen mit Fortlaufend Registrierenden Methoden*, 1951, p. 202. Georg Thieme, Stuttgart.
- ² Hoff, H. E., and Breckenridge, C. G. (1954). *Arch. Neurol. Psychiat.*, 72, 11.

Carcinogens in Cigarette Smoke

SIR.—Most smokers are fastidious about preventing cigarette smoke from reaching their nostrils and eyes, and except in comparatively rare types—ex-pipe smokers who retain the cigarette between their lips throughout the smoke (and, incidentally, spill the ash over their persons) and ex-cigar smokers who chew the cigarette-end—I have not observed staining of the lips or eyebrows of heavy cigarette smokers, and would consequently not expect an increase in epithelioma of these parts as a result of cigarette smoking. The skin of the fingers is so tough—by comparison with the epithelium of the bronchi—that carcinoma of the fingers would be most unlikely unless the amount of carcinogen in tobacco smoke were extremely high.

It is probable that the frequent mopping of the lips, tongue, and buccal cavity by salivation, eating, and drinking wipes away carcinogens before these have time to act and that this accounts for the absence of an increase in carcinoma of these parts in smokers. But this does not apply in the larynx and I am unable satisfactorily to account for the situation there. It may be significant that severe degrees of laryngitis are much less common among heavy cigarette smokers than similar degrees of bronchitis. Perhaps the vocal cords are so well tucked away during smoking that they escape heavy exposure to tobacco smoke.

For almost a decade I have heard nothing of the plausible untruth, at one time widely current, that the amount of nicotine absorbed in smoking is infinitesimal, and I may have helped to dispose of it.¹ Professor R. D. Passey's attempt (*Journal*, December 18, 1945, p. 1485) to show that the amount of carcinogen in tobacco smoke is, in effect, infinitesimal, so far as carcinoma of lung is concerned, is strikingly reminiscent of this old untruth.—I am, etc.,

Wallasey, Cheshire.

LENNOX JOHNSTON.

REFERENCE

¹ *Lancet*, 1942, 2, 742.**Talc Pneumoconiosis**

SIR.—I read with interest the account by Drs. Bertram Mann and J. B. Deasy (*Journal*, December 18, 1954, p. 1460) of miliary lung opacities in a worker exposed to talc. In view of the non-specificity of radiological miliary mottling, it will be interesting to learn whether the future brings confirmation of their opinion. In 1950 I reported similar findings in a printing works employee.¹ This man operated a guillotine for trimming book edges, and the cheap paper used gave off a large quantity of dust. Analysis of the dust by Professor King at Hammersmith Hospital showed it to contain 5.8% of silica (from talc used as "filler"). However, histological examination after his death three years later failed to demonstrate any fibrous silicate in the lungs. The changes were considered to be accounted for by the repeated attacks of bronchopneumonia from which he suffered and which eventually caused his death.—I am, etc.,

London, N.W.8.

DAVID WEITZMAN.

REFERENCE

¹ *Proc. roy. Soc. Med.*, 1950, 43, 906.**Changes in the Mental Health Services**

SIR.—Scotland has had another injustice thrust upon her. Dr. John Marshall (*Journal*, December 18, 1954, p. 1484) has made the fatal mistake of not verifying his facts before adding his enthusiastic support to the establishment of mental observation wards. After reading his letter I applied to the secretary of the General Board of Control for Scotland for detailed information on this subject. In their annual report for 1906 the Board expresses its sympathy with a movement set on foot in 1901 to establish wards in public infirmaries for the study and treatment for short periods (up to six weeks) of cases of incipient or unconfirmed mental disorder. Even in 1890 such accommoda-

tion existed in the Glasgow area, and so great was the benefit that in 1904 Dr. John Garswell became responsible for the care and treatment of a group of 50 patients (25 of each sex) in Duke Street Hospital, Glasgow. Dr. Garswell was succeeded by Dr. Ivy McKenzie, whose work is so well known. In more recent years excellent observation wards were developed at Stobhill Hospital, Glasgow.

In Edinburgh since the beginning of the century one of the wards of the Royal Infirmary has served the beneficent purpose of caring for cases of delirium, attempted suicide, and other acute episodic nervous and mental states. Furthermore, during the 1914-18 war the late Professor G. M. Robertson started his campaign to "de-asylumize asylums." He established nursing-homes which care for 70 patients and, in addition, inaugurated a psychiatric clinic known as Jordanburn Hospital which accommodates 50 patients. No formality whatsoever governs the admission and treatment of patients to any of the above-mentioned establishments. Dr. Marshall's statement, therefore, to the effect that if a person "is unable or unwilling to sign voluntary papers there is no alternative in Scotland but to certify him" is entirely contrary to the actual facts. The vast majority of all toxic and episodic states are successfully dealt with in the Glasgow and Edinburgh areas, at least, without recourse either to voluntary or certification forms. There is much to be said in favour of mental observation wards, but the reasons given for their establishment should be accurate.—I am, etc.,

Edinburgh, 3.

DAVID K. HENDERSON.

SIR.—Dr. J. B. S. Lewis (*Journal*, December 4, 1954, p. 1354) attacks the mental observation wards on the basis of his L.C.C. experience, which must be before 1948, a time when the wards had not recovered from war conditions. Dr. J. Gibson (*Journal*, December 18, p. 1485), in supporting him, freely admits, "I have not myself seen one." Dr. R. Asher (*Journal*, January 1, p. 44), however, goes too far in wanting these wards run by general physicians; he would not take kindly to psychiatrists running general wards because so many illnesses are psychosomatic. I agree that the strength of the observation ward lies in its being part of a general hospital, not only by providing rapid and effective treatment for the organic confusions and psychoses, but by integrating more closely psychiatry with general medicine, thus overcoming the fear and ignorance implied in the attitude "they are only lunatics"—an attitude not confined to administrative staff, but found too often among doctors without psychiatric understanding.

Dr. Lewis opposes the upgrading of observation wards to "first-class treatment centres." I have recently completed one year's work in an observation ward attached to a London teaching hospital, where over one-third of admissions are discharged directly home (in 1953, 567 patients were discharged out of 1,445 admissions); therefore the unit is, in fact, an acute treatment centre, with a gratifying percentage of recoveries in the 14-day observation period. If there is close integration with the psychiatric out-patient department, surely the work is satisfying enough to attract the best type of doctor and nurse. In our unit there is no overcrowding, the number of beds is laid down by the Board of Control, and further admissions can be, and are, refused. Effective separation is achieved by the use of two floors, side rooms, small side wards, and adequate partitions. Dr. Lewis's alternative, direct admission to mental hospital, fails through lack of beds (recently an important regional hospital had a waiting-list of six weeks for voluntary patients and three weeks for certified patients). Even if accommodation were found, staff could not be. Our unit has, full-time, two psychiatric registrars and a psychiatric consultant for 76 beds. In the average mental hospital a medical officer usually has up to 200 beds.

Much irrational fear of mental hospitals still exists, and many patients are more willing to enter an observation ward than go direct to mental hospital. Relatives are more likely to agree to certification if they feel that the patient has been under continuous observation before a decision is made, and if their trust and co-operation are built up during the daily visiting, which is encouraged. Moreover, one-third of our

transfers to mental hospitals are voluntary patients. If one bears in mind that most admissions are of acutely disturbed patients who could not wait to go as voluntary patients in the normal way, this result debunks the horror stories so naively accepted by some of your previous correspondents (are not similar stories told of general wards?). I feel that these functions of the observation ward are not provided elsewhere, and these units play an irreplaceable part not only in the mental health services but in the Health Service as a whole. They need support, extension, and improvement—not suppression.—I am, etc.,

London, W.1.

I. S. KREEGER.

The Corneal Grafting Act (1952)

SIR.—The increasing numbers of inquiries which are received from doctors, solicitors, and the general public indicate that the provisions of the Corneal Grafting Act (1952) need further elucidation, especially with reference to the bequest of donor eyes. Briefly, the Act enables a person to make a verbal or written bequest of his or her eyes for therapeutic purposes, but the bequest can be nullified by the objection of surviving spouse or nearest relative. The collection of donor eyes is the responsibility of those who require them, subject to the provisions of the Act, and collection entails a certain amount of organization and effort: in practice death is usually notified to the hospital by the doctor in attendance or by a relation. The duty team then proceeds to collect the material, taking sterilized enucleation equipment, which is always maintained in readiness: eyes have to be removed within 10 hours of death to be suitable for optical grafts. In our experience these melancholy occasions are invariably treated with a sense of dignity and respect by the bereaved relatives, who derive consolation from the fact that the last wishes of the deceased are carried out. The only occasion on which umbrage has occurred was when it was not possible to comply with a bequest because notification of death did not reach the surgeon in time, and the relatives felt that they had not kept faith.

For administration purposes and to arrange the orderly admission of patients for corneal grafting to hospital the preservation of donor eyes has become an essential part of this method of treatment. At the present time the most suitable method of preservation, beyond a few hours, is to bank the eyes in sterile antibiotic-liquid-paraffin solutions at 4° C. in a refrigerator: such material is suitable for subsequent grafting up to 14 days after removal, provided it is sterile. The sterility of cadaver donor eyes has become a matter of great importance, as it has been found that about one-third of such eyes have initial contamination by pathogenic organisms and have to be discarded. This wastage can be checked by antibiotic preventive measures at the time of excision or before preservation. The eyes or corneas are well irrigated with penicillin solution before removal and are immersed in penicillin-streptomycin solution before being placed in the eye bank. Control cultures are taken at various stages of preparation and preservation: a positive culture excludes the use of the eye for donor material.

At East Grinstead the supply of donor eyes has been more than doubled since the Corneal Grafting Act became law, but it is still far from adequate for all purposes. The indications of corneal graft surgery continue to expand, and the selection of material and cases becomes more and more critical. As a result of these measures, and the use of improved material, the standards of visual success are steadily rising, and about three-quarters of those cases on whom a corneal graft operation is performed may expect improvement of vision in varying degrees to normality. A recent valuable adjunct to the final success of corneal graft surgery is the use of the contact glass.

It is hoped that this summary may help to answer some of the many inquiries which are received, and it is stressed that the collection of this valuable material has been much facilitated by the co-operation of the general practitioner, house-surgeon, relations, and ophthalmic surgeon.—I am, etc.,

London, W.1.

B. W. RYCROFT.

Tuberculin Testing

SIR.—In a letter from Dr. W. H. Tattersall (*Journal*, November 6, 1954, p. 1105) a plea was made that the "Heaf gun" be evaluated speedily as an alternative to the jelly test to provide a standard tuberculin test. When a physician is attempting to exclude tuberculosis as the possible cause of a patient's illness, it is unlikely that he will be satisfied with the single test and will probably wish to use ascending concentrations of tuberculin as in the Mantoux test. But for the purpose of conducting epidemiological surveys, of testing contacts of cases of tuberculosis, and of selecting and retesting subjects for B.C.G. vaccination, it would be of great value if there were available a single test, simple to execute and to interpret. For such a purpose it is probably important that not only the jelly and Heaf tests should be examined but also the von Pirquet and Mantoux tests, using varying strengths of old tuberculin and of P.P.D.

It may interest those of your readers who are concerned with this problem to learn that the Research Committee of the British Tuberculosis Association is planning such an inquiry. The task is by no means a simple one and it may well take time to reach conclusions of value.—We are, etc.,

JOHN CROFTON,

Acting Chairman.

G. MAHER-LOUGHNAN,
Hon. Secretary.

London, N.W.9

Low Backache

SIR.—I must support Dr. L. S. Calvert's statements in his letter on low backache (*Journal*, December 18, 1954, p. 1488). For the past two years I have been using the method of diagnosis and treatment advocated by Dr. Cyriax at St. Thomas's Hospital with most gratifying results. Prior to learning of Dr. Cyriax's methods, I too, like the orthopaedic panel, had no answer to the problem of low backache with, or without, sciatica. Now, using the manipulative technique and methods of traction described in Dr. Cyriax's textbook,¹ backache due to disk lesions is no longer a major problem. There are still a number that fail to respond to these methods, but the large majority are completely relieved in a very few treatments.

I feel sure that one answer to the problem is the training of more interested general practitioners in the technique of manipulation and also ensuring that all physiotherapists are able to apply these methods as well. Dr. Cyriax has proved beyond any shadow of doubt that his methods are effective and free from danger.—I am, etc.,

Southampton.

DAVID B. RAMSAY.

REFERENCE

¹ *Textbook of Orthopaedic Medicine*, 1950, London.**Fluoridation of Public Water Supplies**

SIR.—I share the perturbation of many who live in North Wales at the published intention of the Anglesey County Council, acting on the invitation of the Government, which has actually gone to the length of offering indemnity against possible legal costs and damages in the matter, to conduct a controlled experiment in the fluoridation of the public water supply in a part of Anglesey. Despite some verbal quibbling about it, this undoubtedly amounts to compulsory medical treatment with a toxic substance intended to produce a physiological change in the body, to be administered indiscriminately by medically unqualified persons, and in amounts varying widely with the consumption of water and the concentration of salts in it by boiling.

The public is being assured that the medical profession is virtually unanimous in its approval of this project both in its ethical aspect and in its positive certainty of the complete innocuousness of fluorides at the proposed low concentration, even for daily consumption for an indefinite period. Indeed, the writer, a non-medical biologist, has been challenged to produce any medical opinion in this country which is critical of fluoridation, and so far has failed to do so. If this unanimity really exists, or is allowed, as at present, to pass by default, then the profession must

be prepared to bear the brunt, for the Government, of the inevitable public opposition to mass-dosing without consent, as well as the responsibility for any damage, physical or psychological, which may result from it. However, inquiries among my own medical acquaintance seem to show that, whereas any professional meeting can be relied upon to pass a resolution favouring fluoridation, no individual doctor can be discovered who claims to know much about its effects, or to be able to diagnose slow chronic fluoride poisoning if it should occur. If this is the situation the "experiment" could do widespread damage without anyone's being the wiser, and the value of statistics "proving" the absence of fluoride poisoning at the proposed concentrations would be nil. I should very much like to see this important matter discussed in your columns.—I am, etc.,

Bangor.

C. G. DOBBS.

Dyspareunia Clinic

SIR,—Owing to the fact that for some years I have been particularly interested in the problem of infertility, I have become increasingly aware of the large part which dyspareunia plays in the causation of this complaint. It is sometimes the only bar to conception, but it is one of the most difficult to overcome because it is frequently a condition not capable of easy remedy either by surgery or medicine. A patient often seeks her doctor's help on the grounds of infertility, whereas her real complaint is her inability to adjust herself to participate in a normal married life.

The cure of such a condition nearly always entails the expenditure of more time than the busy practitioner has to give, and even if the patient is referred to a gynaecologist the latter can do little to help in the course of one consultation or in the pressure of his out-patients clinic. I am writing, therefore, to bring to the notice of your readers the fact that a clinic for the exclusive purpose of treating such cases has been opened under the auspices of the Family Planning Association—namely, the Marriage Welfare Centre at 12, Telford Road, Ladbroke Grove, London, W.10. The aim of this clinic is to provide expert guidance to such patients, giving to them the time and patience which it is a practical impossibility to give in clinics which are run for the purpose of investigating infertile marriages or in a doctor's busy surgery. Sessions are run on Mondays from 6 to 8 p.m. and patients are seen by appointment.—I am, etc.,

London, W.1.

R. CHRISTIE BROWN.

Placental Globulin in the Prevention of Measles

SIR,—A recent paper by Drs. H. Ganguli and S. N. Mukherjee (*Journal*, December 11, 1954, p. 1395) reported a follow-up on the use of placental gamma globulin for measles prophylaxis in 32 cases in a Calcutta hospital ward. From the investigation it was concluded that the low incidence of measles obtained was due partly to prompt isolation of the patients and partly to the injection of gamma globulin. From observations made during a large-scale follow-up on gamma globulin distributed in Scotland by the Scottish National Blood Transfusion Association it seems probable that under hospital conditions, without special isolation precautions, a low rate of infection (under 25%) may be expected even when no prophylactic injections are given. Some physicians maintain that with strict nursing procedures cross-infections in the open ward may be eliminated almost completely. If special isolation measures are taken, as in the above investigation in Calcutta, it is possible that the low incidence of measles obtained could be due solely to the quarantine precautions. This would make it difficult to draw any conclusion regarding the efficacy of the placental gamma globulin under trial.

At a recent symposium on gamma globulin organized by the International Children's Centre in Paris (December 2 to 4, 1954) mention was made of the fact that certain placental preparations which had been distributed in Europe contained a considerable amount of protein other than gamma globulin. In a follow-up designed to check the

potency of such materials the following are desirable: (a) the use of intimate contacts as test subjects—for example, house contacts—in preference to hospital contacts; (b) a control group, not receiving injections, or, if this is not practicable, a valid estimate of the expected incidence; (c) numbers of cases sufficient to give statistically significant results; and (d) accurate records of the dosage given on a body-weight basis. In the paper quoted, particulars were not given of the source of the placental gamma globulin, of the concentration, nor of the electrophoretic composition. Assuming the highest probable figure of 16.5% for the concentration, it appears that "protective" doses—15 mg. per pound (0.45 kg.)—were given to only a few of the patients.—I am, etc.,

Edinburgh, 3.

DRUMMOND ELLIS.

Tendo Achillis Bursitis

SIR,—The condition called tendo achillis bursitis (winter heel), described by Professor N. W. Nisbet (*Journal*, December 11, 1954, p. 1394), is seen not infrequently in Army personnel. It develops during the first week or two of basic training and would appear to be caused, as Professor Nisbet writes, by the rubbing of the boot against the back of the heel. There is severe pain over the tendo Achillis, radiating into the calf, and all cases exhibit crepitus, identical with that seen in tenosynovitis of the wrist. This crepitus extends from the insertion of tendo Achillis for one to two inches (2.5–5 cm.) upwards—that is, reaching as high as, but no further than, the back of the boot. Most cases are unilateral, but I have seen some men with the condition affecting both tendons.

In this regiment at least one case is seen weekly, often more. Serving in an all-male regiment, I have only seen it in men, and there appears to be no seasonal change. All cases are treated with "elastoplast" strapping and are ordered to wear loosely tied light shoes; a few of the more resistant cases are further aided with chiropody felt beneath the elastoplast, over tendo Achillis. Under this treatment the pain and swelling disappear in most cases in about four to seven days, but I can record one case which persisted for over three weeks. No case has been severe enough to merit reference to hospital for operative treatment. All the men had been wearing new boots, and the condition rarely returns when the men recommence wearing their boots. It would be interesting to record the frequency of this condition in the basic training units of the women's Services.—I am, etc.,

Catterick, Yorks.

B. W. LAITHWAITE.

A Rational Approach to Prostatectomy

SIR,—I was very interested in the comments of Mr. T. L. Chapman (*Journal*, December 11, 1954, p. 1418) on my recent paper (*Journal*, November 20, p. 1201). With regard to the bad-risk patients, if these are "tided" over by a Riches catheter inserted suprapubically it is often possible to deal with the prostate at a later date. For example, I have dealt with many patients in whom acute prostatic obstruction has supervened on congestive cardiac failure, hemiplegia, etc., and in a matter of several weeks have been able to carry out a perurethral prostatectomy when the general condition had improved. In a recent case it proved to be worth while performing a cold-punch prostatectomy in a man who had had a resection for carcinoma of the lung; as a result of the prostatectomy the patient was able to micturate normally for the last nine months of his life and was considerably more comfortable as a direct result.

I have always been a great admirer of Mr. Chapman's work, and his great skill with the Gershom Thomson cold-punch resectoscope is well known. It must, however, be remembered that when a large obstruction is removed by the perurethral method this is a tedious and lengthy procedure and necessitates the presence of the resectoscope in the urethra for the whole of that period. The constant friction of the resectoscope must thus be taken into account.

and it is for this and other reasons that I have suggested that the suprapubic approach is better for the large adenomatous obstruction in the great majority of cases. Finally, I agree entirely with Mr. Chapman when he says that it is only by a careful and prolonged follow-up of results that a final decision can be made.—I am, etc.,

Liverpool, 1.

J. COSBIE ROSS.

Torsion of Normal Fallopian Tube

SIR,—I read with interest the letter of Drs. D. Mayiakos and Alex Romanos (*Journal*, September 25, 1954, p. 754). As this condition seems to be very rare, I would like to publish the following case.

My patient had her second child on September 9, 1953, a normal confinement. She came to my consulting-room on October 28, 1953, seven weeks after her confinement, complaining of an intermittent pain which had started two days before in her waist, low down, on her left side. She was nursing at the time. The pain passed gradually round to the front on the same side, still intermittent, and she now felt it as far down as her left knee. The pain came on sharply, lasting for about a minute, then disappearing altogether. She was passing urine more frequently than usual, but the pains had no connexion with micturition. The urine was cloudy, there was a trace of albumin, with both red and white corpuscles under the microscope. The uterus was small and anteverted. Behind the uterus and to the left side there was a round, very tender swelling, slightly movable. She complained of feeling faint. Pulse and temperature were normal, and the abdomen generally soft and supple. A provisional diagnosis was made of an intermittent twisting of an ovarian cyst. She was sent home. Seen 24 hours afterwards, she had passed a bad night and the pain was now constant and very severe. Per vaginam the swelling was larger and acutely sensitive. She felt very faint, but no vomiting. Pulse and temperature were normal. A diagnosis of a twisted ovarian cyst was made and an immediate operation was advised. A round, smooth, haemorrhagic swelling was found, somewhat larger than a tangerine orange. The left ovary was normal. After removal the tumour consisted entirely of the left Fallopian tube, which had four complete twists in it. Convalescence was normal. Early this year she started her third pregnancy, and she had a normal confinement on November 9, 1954.

What is the cause of torsion of a normal Fallopian tube? —I am, etc.,

Valparaiso, Chile.

STANLEY M. WELLS.

Uveitis with Deafness

SIR,—The case report by Dr. P. K. Robinson (*Journal*, October 2, p. 792) has attracted my attention because, having carried out an extremely thorough series of investigations, he has omitted (or failed to record) the investigation which I should have placed first on the list. The patient, a male stoker aged 41 years, had a clean medical history apart from an attack of urethritis of uncertain cause seven years before. Most urologists would, I think, agree that the man, seven years after his attack, would very probably still harbour a chronic low-grade infection involving perhaps the posterior urethra, prostate, or seminal vesicles. For this is often the trend in such cases, and total eradication of the infection is a prolonged and difficult matter. Then, three months before admission to hospital, the patient noted what was apparently a swollen left inguinal lymph node, and in a matter of a few weeks the insidious illness affecting the eyes and ears began its morbid course. I would suggest the possibility that this inguinal node was a visible manifestation of an extension of the infection from the posterior urethra and neighbouring areas to the anterior urethra. In other words, an old chronic dormant infection had temporarily flared up and extended beyond its customary limits.

To any believer in the theory of chronic local infection as a cause of irido-cyclitis, the above chain of circumstances would appear to be exactly right as a precipitating factor in such an eye condition. And if the ocular tissues are capable of responding in a certain pathological fashion to such an exciting cause, why not also the delicate cells of the meninges, and the cochlear and vestibular apparatus? The investigations carried out in this case were extensive, but one wonders

why prostatic massage with meticulous analysis of the expressed fluid was not done. This could conceivably have produced the clue to the solution of a difficult case. At the least, I think this investigation would have been as relevant and desirable as, for example, the tests for brucellosis and toxoplasmosis. Again, it is noted that x-ray examination was made of the skull, chest, hands, and feet, but no mention is made of the teeth. Even in an edentulous patient I would advocate dental x-rays in this type of case (for infected dental roots).

The omission of these two investigations leads one to the conclusion that the investigators concerned hold no brief for local sepsis as a cause of irido-cyclitis of the type encountered here. But if this be so, are they justified in such a view? My purpose in writing this letter is to direct the spotlight back on to the small, chronic, low-grade, walled-off, apparently harmless local lesion as being the guilty party in the causation of many cases of irido-cyclitis. I also express the hope that further research will be done on this important problem.—I am, etc.,

Brisbane, Australia.

FERGUS M. YEATES.

Foreign Currency for Patients

SIR,—Since the war it has been necessary to restrict the use of British currency abroad, and seven years ago the Exchange Control Medical Advisory Committee was set up to deal with applications by patients advised to seek medical treatment overseas. No one, in the Government or otherwise, liked the idea of restricting facilities used for health, and the responsibility of allocating foreign exchange on medical grounds was entrusted to a medical committee, with the duty to safeguard the interests of the patient as well as conserve, so far as possible, our limited foreign exchange.

It is the Government's policy to simplify exchange control procedure, and in future the patient's bank will be authorized to grant foreign currency solely on the strength of a doctor's recommendation that it is required "on medical grounds." Banks will provide a printed form, but the doctor may write his own certificate, provided similar wording is used. When currency is required for the United States of America or Canada the patient's doctor will be asked to certify that the dollars are required "for medical or surgical treatment" which cannot be obtained elsewhere.

The Exchange Control Medical Advisory Committee would like to take this opportunity of thanking their medical colleagues all over the country for their patience and forbearance. The doctor has generally had the delicate responsibility of deciding whether he ought to support a patient's desire to go overseas, or whether treatment at home would be equally satisfactory. Judging applications has not been easy, but the Committee is happy to think that, even in the most stringent financial period, over 75% of applications were granted, and during most of the Committee's existence more than 85%. Few, if any, sick people in genuine need of treatment which could not be obtained in this country or the sterling area have been unable to obtain it.—I am, etc.,

London, W.C.1.

HARLEY WILLIAMS.

POINTS FROM LETTERS

Intramuscular Iron

Dr. CONN LUCEY (Galway) writes: "Imferon" and "ferri-venin" are put up in identical ampoules. It is impossible to distinguish one from the other except by close scrutiny of a legend which is easily erased from the ampoule by slight friction. Since imferon may be given intravenously as well as intramuscularly, might it not be as well to abandon the use of ferri-venin and use one preparation only—that is, imferon—for both intravenous and intramuscular therapy?

Advertisements by Post

Dr. DOROTHY G. E. POTTER (Cleve, near Bristol) writes: We suffer a daily bombardment of postal advertisements. Now Father Christmas has been enlisted into the service of prescribing asthmatic relief. I feel that the Christmas card has reached its lowest stage of debasement by caricaturing Father Christmas.

Obituary

C. JENNINGS MARSHALL, M.D., M.S., F.R.C.S.

Mr. C. Jennings Marshall, senior surgeon to Charing Cross Hospital at the time of his sudden death on December 29, 1954, was within a few months of retirement from the staff of the hospital which he entered as a university scholar in 1909. He was 64 years of age.

Born at Cardiff on June 6, 1890, Charles Jennings Marshall received his early education and preclinical medical training in that city before he enrolled at the Charing Cross Hospital Medical School. He was an exceptionally brilliant student who showed early promise by being awarded honours in three subjects and a gold medal when he graduated M.B., B.S. at London University in 1912. After holding house appointments in several departments of the hospital he proceeded to the M.D. in 1914 and was awarded the Murchison Scholarship of the Royal College of Physicians in the same year. While surgical registrar at Charing Cross he gained the F.R.C.S. in 1915 and another gold medal at the M.S. examination in 1916.

In company with his old chief, Sir Herbert Waterhouse, he went to Petrograd (now Leningrad) during the first world war to act as assistant surgeon at the Anglo-Russian Hospital which had been established there as a good-will gesture to our allies. He was part author of an article which appeared in this *Journal* in 1917 under the title of "Notes from the Anglo-Russian Hospitals." Upon his return from Russia he joined the R.A.M.C. and served on the Salonika front. Shortly after the end of the war he was appointed assistant surgeon and junior orthopaedist at King's College Hospital and he also began his long association with the Victoria Hospital for Children, Tite Street. A few years later, however, he returned to his mother hospital as assistant surgeon and thus became one of the small number who have been on the staff of two teaching hospitals in London. At the time of his death he was a member of the board of governors of the hospital. He was, in addition, consulting surgeon to the Bromley Hospital, to the L.C.C. at St. Charles's Hospital, and to the Surrey County Council. During the last war he was director of the surgical section at Sutton Emergency Hospital. From 1919 to 1932 he served as a Ministry of Pensions consultant. He returned to his birthplace in 1953 to be a vice-president of the Section of Surgery at the Annual Meeting of the British Medical Association. As became a general surgeon, Jennings Marshall's professional interests were catholic, with perhaps a special emphasis on genito-urinary work, and as a result of a wide experience his diagnostic powers were of a very high order. In the theatre he was a rapid and clean operator whom it was a delight to watch, and he was responsible for many valuable innovations of technique, details of which he did not trouble to publish but which his students will well remember to their advantage. He was a good teacher who impressed upon everyone the value of clinical examination and who could be scathingly opposed to a too precipitate resort to the laboratory for help. His knowledge of surgical history was extensive, and it was a commonplace to hear him comment on some claim to a new operation, "Oh, but that was advocated and practised by so-and-so fifty years ago."

During the course of his career he produced three textbooks—*Surgical Pathology* (with A. Piney), *Surgical*

Anatomy and Physiology (with Norman C. Lake), and *Chronic Diseases of the Abdomen*—and a small volume entitled *The Surgeon* in a series on careers. His writings all displayed a precise turn of phrase and a detailed attention to the exact meaning of words which made the books characteristic. He had also been examiner in surgery for the universities of London and Manchester.

Jennings Marshall had many interests outside medicine. In the early days of wireless broadcasting he experimented with many receiving sets which his knowledge of the subject enabled him to construct well in advance of current commercial practice. He was also interested in music and the arts, and was for many years an active member of the Savage Club, to whose Saturday dinners it was his delight to invite his friends. His personality and teaching will long be remembered at Charing Cross, and there must be a large number of his students, house-surgeons, and registrars who have reason to be grateful for all they have learned from him, and a now reduced number of his contemporaries and colleagues who are equally grateful for his friendship and help. He is survived by his widow, formerly Miss Hope Embleton-Smith, whom he married in 1945.

Dr. R. H. YOLLAND writes: I first knew Mr. C. Jennings Marshall in 1920 when he was assistant orthopaedic surgeon at King's College Hospital and I was casualty officer there. He was a wonderful teacher, and I still remember to this day how interesting he made his surgical anatomy classes, which were always packed out by students. He was also a very fine hockey player, receiving a trial cap for Wales. He played hockey for King's in 1921–2 and was a great inspiration to the side, as he was always so keen and before the cup-ties always spent hours coaching the team, of which I had the honour to be a member. He was a very fine surgeon and it was a joy to watch him doing a partial gastrectomy. He was appointed surgeon to Bromley Hospital many years ago and I often saw him there. He was a fine diagnostician and will be greatly missed.

ELIZABETH CASSON, O.B.E., M.D., D.P.M.

E. M. M. writes: A wide circle of associates and friends will have heard of the death of Dr. Elizabeth Casson, the pioneer in the organized training for occupational therapy in this country, with profound sorrow and a feeling of personal loss, a loss shared with her family, to whom she was particularly devoted. The details of her career were recorded in the obituary notice published last week (p. 48). Dr. Casson, having first engaged in house property management under Octavia Hill, and having taken up medicine only in her thirties, may be said to have had a number of irons in the fire, but it was all the same fire, burning to bring personal consideration into the treatment of people, particularly of sick people. "Re-ablement" was the keyword to all her work.

Dr. Casson's name is perhaps most often associated with Dorset House, the nursing-home opened in 1929 at Bristol for the treatment of psychoneurotic and early psychotic patients. In 1930 the training school of occupational therapy was added to it, the training of students being run always in the closest association with treatment of patients. In 1938 the venture extended to the opening, near Dorset House, of a workshop for the treatment of physical cases by occupational therapy. Here, in addition to light occupations, heavy work was introduced. But no hours set apart for occupational therapy were, in Dr. Casson's view, the time basis of the treatment: the whole of the daily programme and the future establishment of the patient had to be considered, and this was a matter for the entire staff. Many patients, while still linked with the rehabilitation centres, were placed experimentally in suitable work and were helped to progress to permanent employment.

Linked with this background of treatment and enterprise at Bristol was another nursing-home at Clevedon. When,

owing to blitzes, Bristol became untenable, there followed the dispersal, but not the disintegration, of the various sections of Dr. Casson's work. The original building, Dorset House, was requisitioned. Another house was taken at Clevedon, where the nursing-homes made their centre. The school was moved to temporary quarters in the Midlands. At the end of the war the former Dorset House was not de-requisitioned immediately. Therefore, in order to make it more accessible, the school was moved to Oxford. Throughout these and succeeding years the link between the two centres has been maintained by the regular visits of Dr. Casson and exchange visits of staff and students. Both groups, working somewhat separately, and each now with its own responsible and separate management, jointly mourn the loss of their founder.

To have worked in association with Dr. Casson was an inspiration and an adventure. To quote an old student: "She was one of those rare people, entirely herself. . . . I can, at any moment, conjure up a picture of her extraordinary vividness." It was a vividness of undeterred determination, kindled by, in her own terms, "motives of organized activities," directed always to the fulfilment of her aims. She showed an intense sense of the practical, but those who knew her best could not have failed to discover her very real dedication, her capacities for affection, and her generosity. Throughout the whole of her work she, in the terms of Andrew Boorde, the sixteenth-century physician, deemed it important that "the physician and the cook must consult together" lest "a wearish dish . . . the which the sick cannot take" be the result. Those who were privileged to work with and for her were aware of this partnership, and can only hope that they will be enabled to continue with something of her wisdom and inspiration.

Dr. G. DE M. RUDOLF writes: May I add to the obituary notice of Dr. Elizabeth Casson something about her philanthropy? Having seen the plight of patients who were unable to afford the full fees of private psychiatric hospitals and yet were able to pay smaller amounts, Dr. Casson founded, in 1929, a residential clinic for them at Bristol. By good management she was able to make a small profit, of which she used up to £1,000 a year for financing the occupational therapy school in the same buildings. She continued this help for many years. By the beginning of the war in 1939 the residential clinics, which then also included Mount Pleasant at Clevedon, had grown to hold 100 patients. Owing to enemy action Dr. Casson moved the Dorset House home to Clevedon, where she continued the principle of low fees. Dr. Casson spent little on herself, using her income to benefit her patients. Often she made no charge, or asked a sum less than the usual small fees.

Dr. WILLIAM MCALISTER, who retired from the post of physician superintendent of Bangour Hospital, West Lothian, in May last year, died at his home at Dunbar, Berwickshire, on October 5, 1954. He was 66 years of age. William McAlister was born at Campbeltown, Argyllshire, on May 15, 1888. He graduated M.A. at Edinburgh University in 1910, and before taking up the study of medicine was for two years a teacher in George Watson's College in Edinburgh. He graduated in medicine at Edinburgh in 1918, having served for a period of his medical course as a surgeon probationer in the Royal Navy in the first world war. In the same year he began his career in psychiatry as an assistant physician at the Royal Edinburgh Hospital for Mental and Nervous Disorders. His ability was quickly recognized by the physician superintendent, Professor George Robertson, and he was soon promoted to the post of deputy physician superintendent, holding the post until he was appointed physician superintendent of Bangour Mental Hospital in 1931. In 1926 he obtained the Diploma in Psychiatry of Edinburgh University and became a Member of the Royal College of Physicians of Edinburgh. Three years later he was elected a Fellow of the College. He was a lecturer in psychiatry in Edinburgh University and an examiner for the Royal College of Physicians of Edinburgh. When the British Medical Association

held its Annual Meeting at Edinburgh in 1927 he served as one of the honorary secretaries of the Section of Mental Diseases. During the second world war he acted as psychiatric consultant to the Scottish Command. He was the secretary of the Scottish Division of the Royal Medico-Psychological Association from 1935 to 1943 and chairman of the Division in 1945–6. He was also a member of the National Health Services Council and of the South-eastern Regional Hospital Board (Scotland). He is survived by his widow and one daughter.

We are indebted to Dr. ANGUS MACNIVEN for the following appreciation: William McAlister possessed qualities which would have earned him distinction in any profession. He had a first-class mind. He had a remarkable memory and was a quick, effortless thinker, his ready grasp of the essentials of any problem placed before him being both impressive and enviable. He was a fluent speaker—his debating powers were formidable—and he was a most successful lecturer and teacher. His admirable qualities as an administrator were strongly tested at the outbreak of the second world war when Bangour, while continuing as a mental hospital, became an emergency hospital of about 800 beds for medical and surgical cases. The heavy additional burden of administrative work which he had to discharge during the war years was carried with outstanding success and apparently without effort. His valuable work during that period was recognized by his appointment as O.B.E. in 1945. William McAlister was a modest, unassuming man who inspired confidence and affection in all who knew him. He was tolerant and considerate of other people's views, but firm in his own convictions. He was a humane man who had a keen sense of justice and great sympathy for those oppressed and in trouble, and he was inflexible in his determination to do what he felt was right. Many are indebted to him for acts of kindness known only to himself and the recipient. When in 1950 he developed a serious illness from which he never fully recovered he continued until his retirement to carry out his duties and his responsibilities to the full with quiet, uncomplaining fortitude.

Lieutenant-Colonel R. S. ASPINALL, I.M.S. (ret.), died in a London hospital on December 25, 1954, at the age of 59. Robert Stivala Aspinall was born on February 5, 1895, and on the outbreak of war in 1914 left his medical studies at Guy's Hospital to serve for a time in the ranks. He returned to England to take the London conjoint diploma in 1916, and immediately after qualification took a commission in the R.A.M.C. He was wounded in action in 1917 while serving as a regimental medical officer in France. In 1922 he joined the Indian Medical Service, and after only two years in the military division was selected for employment in the Foreign and Political Department, in which he spent the rest of his service. The Foreign and Political Department, working as it did mainly in Indian States and frontier tracts, required the services of officers of high all-round professional ability with special gifts for tactful dealing with princely personalities and with delicate diplomatic problems. "Robbie" Aspinall, as he was affectionately known throughout the areas in which he served, was well equipped by nature and study to deal with any professional or social emergency. For some years he was the chief official practitioner (civil surgeon) in the winter and summer capitals of India (Delhi and Simla) and was a notable success in both appointments. In 1929 he became a Fellow of the Royal College of Surgeons of Edinburgh. He was appointed C.I.E. in the New Year Honours List in 1936, while still a major, and was promoted lieutenant-colonel later in the same year. During the greater part of the second world war he was residency surgeon in Mysore State and was stationed at Bangalore, the headquarters of the Southern Army. The enormous increase in the population of Bangalore, both civil and military, threw a great strain on the residency surgeon in both his clinical and his administrative capacities, but Aspinall coped with both aspects of his work with great skill. He was selected for promotion to the post of inspector-general of civil hospitals in the Punjab just

before the transfer of power in 1947. Two years later he retired from the I.M.S. He had but recently remarried and settled in practice in the West End of London when his fatal illness supervened. A clubbable man with a host of friends in London and all over India, Robbie Aspinall will be much missed. To his widow and his two sons by a former marriage we extend our sympathy.

Dr. G. A. VAN SOMEREN died on December 4, 1954, after a short illness, at the age of 43. Gerald Antony van Someren was born on January 6, 1911, and was educated at Epsom College and at the Middlesex Hospital, qualifying M.R.C.S., L.R.C.P. in 1936. His interest in psychiatry was aroused early in his student days, and, after holding several house appointments at Acton Hospital, he went to Carlton Hayes Mental Hospital, Leicester, in 1938 as assistant medical officer. In the second world war he served with the R.A.F. from 1940 to 1945, being graded psychiatrist in 1944. After demobilization he took his D.P.M. in 1946, and in the following year became senior physician at Runwell Mental Hospital, holding the post until 1950, when he was appointed consulting psychiatrist to the City General Hospital, Stoke-on-Trent, where he organized and built up the psychiatric department. He was also part-time psychiatrist to other hospitals in the area.

Dr. PETER STOCK writes: Dr. G. A. van Someren's extraordinary success and personal popularity were due not only to his great skill as a psychiatrist but also to his outstanding qualities as a man. Anyone who came in contact with Tony van Someren recognized in him a man of the highest intellectual and moral integrity, which he combined with a ready and understanding sympathy for human suffering or weakness. No limit was set to the trouble he would take over a case when he felt his help was needed. He even on one occasion took a patient with him on holiday when he felt that interruption of treatment would be detrimental. His clarity of thought and expression always made his reports about patients a pleasure to read, whether they were intended for professional colleagues or for laymen. He was an accomplished musician and had a wide variety of social interests, but his unsparing devotion to his work left him little time for relaxation. To those who were privileged to see him during his last illness, the courage and tranquillity with which he faced death were as much an inspiration as had been the honest integrity and human kindness which formed the keystones of his professional life. Much sympathy will be extended to his widow, who had been his unfailing support and help throughout his professional career, and to his three children.

A. T. writes: May I offer a little tribute to the memory of Dr. G. A. van Someren from those of us who went to his Highland dancing evenings? There will be no more Petronellas on September evenings at "Mount St. George," nor eightsome reels in the courtyard on Midsummer night, but what a store of happy memories we have.

Medico-Legal

LEGAL AID STATISTICS

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

The annual report of the council of the Law Society contains statistics of the working of the legal aid scheme which are of some interest in view of the fact that most actions for negligence against doctors are now brought by plaintiffs who receive help under the Legal Aid and Advice Act, 1949. During the period April 1, 1953, to March 31, 1954, in the whole of England and Wales, but Scotland excluded, civil aid certificates for actions in the Queen's Bench Division numbering in all 5,468 were accepted by applicants. It is in the Queen's Bench Division that actions against doctors are brought. A substantial number of applicants do not accept civil aid certificates because they will not pay the

amount of the assessed contribution, but no figures for the number of refusals are included in the report. During the same period a total of 3,581 actions in the Queen's Bench Division involving assisted persons and 22 actions started under the old "Poor Persons" procedure and continued under the 1949 Act were disposed of. Of these, 1,346 and all 22 of the former Poor Persons procedure actions were won by the assisted person: 462 were lost by the assisted person; and 1,773 were compromised. There is no separate figure for actions abandoned by plaintiffs. Depending upon the procedure followed, such cases were compromised in the 462 lost or the 1,773 compromised, if they have been disposed of at all. If they have simply been allowed to go to sleep they are not included in the statistics.

Dr. Cochrane Shanks, president of the Medical Defence Union, has given¹ the following figures for actions for negligence against doctors referred by the M.D.U. to its solicitors in the period 1947 to 1953. The plaintiffs won one-third of the cases actually tried and lost two-thirds of such cases. Of all cases brought, one-third were either won by the plaintiff or settled by the M.D.U.; two-thirds were lost or abandoned by the plaintiff.

Apart from the 22 old Poor Persons procedure actions, all of which were won, the general Queen's Bench Division figures for the year to March 31, 1954, expressed in percentages, were: won, 37.6%; lost, 12.9%; settled, 49.5%.

It would be of considerable interest to know what the equivalent figures were for actions against doctors in which the defence societies were involved and which were disposed of during the same period. A comparative analysis on these lines year by year since the legal aid scheme started would furnish some sort of objective evidence on whether the scheme has resulted in any hardship on doctors which is not shared by all who are involved in litigation against assisted persons.

INJECTION THAT WENT WRONG

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

On May 28, 1950, Mrs. Ellen Thomas, then aged 30, was admitted to Sharoe Green Hospital, Fulwood, Preston, where a child was born to her later in the day. On June 3 the baby died, and in order to arrest her lactation Mrs. Thomas was given the usual treatment in such circumstances of hexoestrol dipropionate injections. A first injection was given by a staff sister into Mrs. Thomas's left thigh, and later injections were given into the left and right buttocks. A few days later the first injection became painful, the area in which it had been made became discoloured, and an abscess developed which caused Mrs. Thomas much trouble and pain over a period of many months. On June 10 a specimen of pus from the abscess was submitted to the pathological laboratory, and on culture it produced a heavy growth of a haemolytic streptococcus belonging to Lancefield's Group A, *Streptococcus pyogenes*.

There was no clinical evidence to show the origin of the organism. The staff sister had no sore throat or cold at the time the injection was given. Mrs. Thomas was noted as suffering from an irritant cough on June 6, but was not shown to be carrying the organism in her nose and throat. Bacteriological examination of the bowel content of the dead baby produced no trace of staphylococcus or streptococcus. Dr. A. A. Miller, consultant pathologist to the Manchester Regional Hospital Board and Group Pathologist to the Preston and Chorley Hospital Management Committee, thought it possible that, although Mrs. Thomas showed no signs of puerperal infection, she might have been suffering from a latent infection which was activated by the irritation of the tissues caused by the hexoestrol dipropionate injection.

In due course Mrs. Thomas brought an action for damages against the Preston and Chorley Hospital Management Committee, in which she alleged that the infection was caused by negligence on the part of the staff sister in giving the injection. The action was tried before Mr. Justice Sellars,

¹ The Times, October 25, 1954.

who was satisfied by the staff sister's evidence that the proper routine for sterilizing the equipment used and the proper aseptic precautions in administering the injection were carried out. Mr. Justice Sellars held that the probable cause of the trouble was that Mrs. Thomas's nose or throat was infected, that in those few days after the birth the infection got into the blood stream and attacked the tissues damaged by the injection. That would arise with no negligence on the part of the defendants whatsoever. Judgment was accordingly given for the defendants, the hospital management committee.

Universities and Colleges

UNIVERSITY OF OXFORD

Leave of absence and dispensation from statutory duties has been granted to R. R. Macintosh, D.M., Fellow of Pembroke College, Nuffield Professor of Anaesthetics, for three months from January 1, 1955, in order that he may visit Africa under the Nuffield Scheme for Dominion Demonstratorships and Clinical Assistantships.

In Congregation on November 20, 1954, the following degree was conferred:

D.M.—C. B. Wynn-Parry

UNIVERSITY OF CAMBRIDGE

In Congregation on November 27, 1954, the following degrees were conferred:

M.A.—A. D. Dickson, M.B., B.Ch., University Demonstrator in Anatomy; Christopher Parish, F.R.C.S., Associate Lecturer in Thoracic Surgery; L. M. Rouillard, F.R.C.S.Ed., Associate Lecturer in Plastic Surgery.
M.D.—G. Hildick-Smith, P. J. Wormald, H. G. Mather, P. F. D. Naylor
M.B., B.Chir.—R. J. Vince
M.B.—R. K. Gilbert, R. N. Galloway, F. L. Johnstone, M. R. K. Plaxton, R. G. D. Small

*By proxy.

UNIVERSITY OF ABERDEEN

At a Graduation Ceremonial on December 15, 1954, the following degrees were conferred:

M.D.—W. H. R. Auld (with honours), L. A. Wilson (with honours), I. W. Caldwell, J. K. W. Morrice, J. H. S. Whyte.
M.B., Ch.B.—Helen C. Brown, T. G. Hamilton, A. N. Hepburn, J. Hepburn, G. B. Knox, K. J. Mackay, W. J. Macrae, R. Muir, I. M. Munn, D. R. Pratt, R. MacD. Rowland, M. A. Shields, A. N. B. Stott, Catherine H. Tullett (formerly Park).

UNIVERSITY OF EDINBURGH

At a Graduation Ceremonial on December 17, 1954, the following degrees and diplomas were conferred:

M.D.—G. S. Kilpatrick, I. W. Lusk (in absentia), G. M. Maxwell (highly commended for thesis).
Ph.D.—In the Faculty of Medicine: S. M. Ghosh, M.B., B.S.
M.B., Ch.B.—A. J. Bennett, A. A. H. Brown, J. A. Brown, C. F. M. Caird, P. G. Colley, R. W. Davidson, H. P. Davis, G. F. Davis, P. G. Drummond-Smith, W. D. Fanner, A. Ford-Hunter, D. A. K. Geldenhuys, H. C. R. Henwood, P. Y. Kyle, M. H. Lea, Kian Poon Lim, A. G. Mackinnon, D. G. Macfie, D. Moore, Sheila M. L. Moore (in absentia), D. R. Oliver, W. E. Parrott, Shirley A. Peacock, W. H. Rabie, J. L. Smith, A. T. Thomson, R. A. P. Whitelaw, J. Wood, I. F. Young.
DIPLOMA IN PUBLIC HEALTH—D. F. Baxter
DIPLOMA IN MEDICAL RADIOLOGY—W. N. Boyd, R. F. Cant, J. H. Greig, A. H. Morris, A. A. Wild.
DIPLOMA IN PSYCHIATRY—J. G. Henderson, P. J. Zeck.

The following fellowship, scholarship, bursaries, and prizes were awarded in the Faculty of Medicine: *George Guthrie Research Fellowship in Child Health*, J. F. L. Collins. *Hastlow Research Scholarship in Rheumatism*, W. R. M. Alexander. *Andrew Graham Ritchie Bursaries*, Rosemary McCredie, A. W. McKenzie, A. Ramsay. *Mackie Bursaries*, J. C. Macintosh, J. G. Westerman. *E. B. Jamieson Prizes in Anatomy*, H. A. Crispin, J. S. Munro, D. O. Oliver.

UNIVERSITY OF DUBLIN

SCHOOL OF PHYSIC, TRINITY COLLEGE

The following degrees were conferred on December 2, 1954:

M.D.—R. S. Crone, W. G. Keane, T. J. C. Warriner.
M.Ch.—D. F. V. Lane.
M.A.O.—H. McVey.
M.B., B.Ch., B.A.O.—D. A. Akintunde, W. Bottomley, T. P. Cairns, R. Chesney, A. G. P. Cotter, W. S. Crawford, Dorothea H. M. Dalling, R. I. Dankyi, G. P. O. Fenton, V. Gouws, S. W. D. Hall, M. M. Haniff, A. N. Henry, D. N. Johnstone, Anne J. Kevany, E. L. Kostick, J. G.

Leather, W. McGuinness, O. A. Ojo, W. McN. Orr, J. L. Parker, P. J. P. Pillar, Danuta E. Pollard (formerly Kolodziejka), J. W. Redmond, A. A. Skuce.
L.Med., L.Ch., and L.A.O.—T. J. Stack.

The following candidates have been approved at the examinations indicated:

FINAL M.B., B.Ch., P. R. D. Black, Jean R. Ellis, Marie M. Johnston, M.D., K. Campbell.
FINAL M.B., B.Ch., D. L. Kelly.
FINAL B.Ch.—A. C. A. Hempel (with second-class honours), Margaret H. S. Clements.
FINAL B.A.O.—G. A. Weaver, I. B. Sangmaah.

UNIVERSITY OF DURHAM

In Congregation on December 18, 1954, the following degrees were conferred:

M.B., B.S.—A. L. Brown, P. J. Burnett, Mary Campbell, J. R. Clark, J. L. Colville, G. S. Coxon, Joan A. Davidson, I. Dunlop, E. E. Egan, J. F. Fenby, A. L. Ferguson, W. G. Gerner, C. B. Hackett, Susan I. A. Hart, N. C. Haswell, C. A. Nott, B. J. O'Neil, A. W. O'Sullivan, J. P. P. F. W. Rowell, Joan C. Russell, Elizabeth J. Stodart, E. Thompson, B. R. Tindie, S. V. J. Watson, Pamela White, and Frank Kwee Chuan (in absentia).

UNIVERSITY OF LONDON

The following degrees were awarded by the Senate on November 17, 1954:

M.D.—C. I. Levene
M.S.—B. A. Ward

The following candidates have been approved at the examinations indicated:

THIRD M.B., B.S.—D. N. Cons, J. R. C. O. Erichsen, J. W. W. Holland, Mary P. Meerman, Kathleen C. Martin, Freda Newman, P. J. Taylor, Joan M. Adams, R. L. W. Adson, S. J. P. Adcock, A. M. O. Akintunde, M. R. Alderson, A. B. Allen, A. Allibone, D. A. Ampolo, G. H. Anderson, D. A. Andrewes, F. M. Andrews, I. S. Andri, B. S. Baker, Elizabeth S. M. Barnes, A. A. Barton, A. E. Bashford, Norma A. Beardwell, R. W. R. Beasley, Felicity M. Bedford, D. L. Bee, N. L. Beisly, J. G. Benfield, D. A. Bennett, G. Berks, R. V. Baily, H. R. Bisson-Dath, A. A. Black, M. W. Black, J. Blake, R. S. Blewett, P. Bliss, M. Bloom, Diana Boyd, Patricia M. Boyd, P. S. Boyne, M. G. Bridger, L. R. Bromwich, W. E. Brooks, D. K. Brown, J. P. Brumby, A. L. Bruce, A. M. Brown, D. P. Brown, M. Brown, P. H. Brown, A. L. Bruce, Patricia Burne, M. F. Campton, B. R. J. Carroll, A. P. Carter, R. H. Castle, W. B. Castle, J. F. Catchpool, N. F. B. A. Chav, A. R. Chiswick, R. Chynoweth, K. A. Clare, Margaret A. Clark, J. G. Cochran, Sheila E. Cozins, J. A. Collins-Wells, B. B. Collins, R. A. Cooper, P. S. V. Cox, Anne S. Crabtree, D. F. Croxall, Caroline J. Crumlin, Anne M. Davies, Dilys K. Davies, J. L. Davis, C. F. Day, J. M. de Mowbray, P. J. Denvir, L. J. A. Dodds, I. Downes, P. Drummond, A. H. Dunkley, R. G. Dunning, M. O'N. East, W. M. Easther, Maria S. Edwards, B. Ekins, M. Entwistle, F. A. Fairweather, H. P. L. Fala, I. V. Farman, C. D. Farrer, C. L. Finn, Lorna O. A. Fletcher, H. Forbes, Y. N. P. Forget, Julia M. Fourman, Patricia J. Fowler, R. M. Franklin, Patricia E. Frisby, P. C. Fulford, Celeste U. Furlong, Beatrix L. Gampell, A. B. Gardner, A. H. M. Gaze, S. A. A. George, D. A. Gill, Pauline M. Gilling, J. S. Goodall, G. C. L. Goss, G. Gower, M. A. H. Graham, S. T. Guest, P. M. Gurrin, Elizabeth W. Hall, G. S. Hall, I. Hall, J. Harrison, D. R. W. Hartley, R. J. Hawkins, G. A. Heasman, I. Heller, W. T. Henry, G. H. Herd, Margaret Hooper, P. J. Hornblow, Margaret W. Hughes, A. B. Hugo, R. J. Hunter, H. Inceman, P. B. C. B. Ivory, D. C. O. James, K. S. Jap, Marjorie L. Jones, I. W. Jordan, A. N. Katta, H. Keen, A. E. M. Kirk, J. L. H. Lacey, R. Lacey, P. Lallan, N. Landau, Patricia A. Laslett, Diana E. Lathbury, R. H. U. Laurence, J. L. Leaney, W. M. Lennox, Pamela A. Liddstone, D. C. Linch, Marion D. Lindsay, Ann H. List, J. R. Lockwood, C. Lawson, A. H. Macdonald, J. McKenna, Agnes M. Maclean, L. R. MacLean, Margaret L. Macpherson, A. R. Manwaring, R. E. W. Manton, B. H. Markham, K. D. F. Martin, Richmond M. Martin, Pamela Matheson, C. D. May, G. W. E. Meers, A. P. Mcgrath, R. J. J. Meyrick, Joan M. Montague, C. E. G. F. Morris, R. N. Morris, Patricia E. Muir, Margaret Muller, W. A. Murphy, Rachel F. Need, V. A. Neuf, D. W. Norrie, P. L. I. Nwabakozu, D. B. A. Odomata, M. I. M. Osadebe, P. O'Gorman, R. A. Onofade, R. O. Ormerod, R. A. Osborn, M. J. Ostme, D. C. Ower, R. T. Perkins, Catherine Parry, Pamela B. Passmore, M. B. Pepper, M. V. Perkins, J. O. Peskett, K. D. Phillips, D. S. Pickup, G. K. Padesley, J. A. Pollock, D. S. Porter, Marjorie E. Postons, R. E. Price, W. L. G. Quinlan, J. K. Radnor, G. D. Ramsden, A. G. Ratcliffe, G. S. Rawson, P. B. Read, Pamela A. M. Rendell, E. G. Revnard, P. C. G. A. Reynolds, C. J. Rhodes, A. R. Rirk, D. J. C. Roberts, J. G. Robertson, L. Robertson, M. S. Robertson, T. J. F. Rockey, P. S. Rolland, I. C. Rose, G. Ross, S. M. Ross, B. C. Roughton, C. A. Rushmer, Patricia M. Russell, S. Sackwood, G. J. Sadow, A. A. Said, H. J. Saller, C. M. Samuel, T. G. Scott, E. R. R. Scrivener, A. S. Shalom, M. S. Shalom, I. Sherlick, K. L. Shimmings, Geraldine M. Shire, J. R. Silver, I. Sinclair, A. Skarbeck, T. G. Skinner, A. G. Slark, I. L. Slone, Margaret H. Smith, A. Smithies, W. G. Sodipe, J. A. B. Spalding, G. T. Spencer, J. S. G. P. Stablenford, P. S. Stack, P. Stanesby, M. H. Stanton, E. B. Stephens, A. Taylor, D. E. Taylor, R. C. Taylor, D. E. H. Tee, A. P. Thatcher, M. A. Theaman, D. P. Thomas, Pauline M. A. Thomas, T. M. Tibbets, Patricia A. Topham, H. M. D. Uddifian, I. Valentine, Alice van Waterschoot, A. H. C. Walker, Angela M. Wallace, K. H. Warden, A. B. Watson, I. Watts, Hilary F. West, Joan M. Wetherall, J. Weyland, B. R. Wheeler, W. White, Rosemary Whitmore, J. D. W. White, Helen M. Wilkinson, P. N. Williams, Rosemary J. Willing, A. S. Willis, Doreen M. Wilson, E. G. Wilson, J. R. Wilson, Sheila A. Wood, E. J. Wrigley, S. E. A. Wyrer.

¹With honours. ²Distinguished in pathology. ³Distinguished in medicine. ⁴Distinguished in applied pharmacology and therapeutics. ⁵Distinguished in obstetrics and gynaecology.

The degree of M.S. was awarded to G. J. Hadfield on October 20.

UNIVERSITY OF MANCHESTER

The following candidates have been approved at the examination indicated:

FINAL M.B., Ch.B.—N. M. Bailey, J. T. Birless, M. A. Bloomfield, Margaret A. E. Boyce, J. D. Bradshaw, J. J. Burke, R. A. Butler, Alison M. Carrie, D. F. G. Clegg, Jean C. M. Collins, K. M. Dickinson, H. E. Godfrey, H. L. Green, S. F. Greenwood, G. E. B. Grove, Jane Hargreaves, I. S. Ingleby, Gwneith M. Jones, J. D. Knight, P. Lomax, J. Potter, Margaret J. Pybus, I. Ramage, E. Roditi, R. Schofield, Betty West, G. A. Wilcock, D. B. Wooldridge.

UNIVERSITY OF BIRMINGHAM

In Congregation on December 17, 1954, the following degrees were conferred:

M.B., Ch.B.—Y. Asirifi, P. H. Astill, Joyce E. Bailey, Patricia A. Bramley, J. Bullock, E. P. C. Hadley, Olga R. Harbron, Ella E. L. Holt, J. W. P. Jarrams, D. Learmont, A. P. Mayne, E. T. Melley, W. K. Merfield, K. Middleton, J. D. Nicholas, P. A. North, L. J. T. Pearson, A. Sutherland, Elizabeth M. Tilsen, D. Wright, R. A. Yeomans.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examinations indicated:

M.D.—E. F. B. Cadman, B. R. Frisby, S. Gillis, G. Hughes, D. E. Paterson, G. W. Storey, E. H. Wilson.
M.Ch. (Orth)—B. S. Jones, M. A. Vail.
M.B., Ch.B.—J. D. Aarow, J. A. Barlow, I. K. Brown, B. J. Chatlick, G. O. Dubourg, T. R. Evans, Patricia O. Grundy, P. A. Harrison, T. R. T. Hughes, R. A. Johnson, J. L. Mason, W. V. N. Pugh, Mary E. Shepherd, D. Taylor-Robinson, R. A. Yorke.

DIPLOMA IN RADIOLOGY (RADIOTHERAPY).—Part II: P. K. Ganruli.
DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—B. A. Chaudhary, J. Ghosh, June H. Green, B. A. Johnson, A. J. Jones, G. P. Lowther (recommended for the Milne Medal in Tropical Medicine), M. L. Marotta, A. M. Maiden, B. C. Onyiah, D. J. Patel, B. Prasad, C. I. Somaya, J. K. N. Yearley.

DIPLOMA IN PUBLIC HEALTH.—Part I: Jessie I. Anderson, S. M. Bieber, Sheila C. Blackburn, Barbara Briges, R. D. Choudhury, Diana Daniel, Phyllis J. Disley, O. L. Evans, R. G. Hendry, Irene Lynch, C. A. McKeagney, R. S. Male, T. O'Shea, F. Seymour, J. M. Sword, J. C. Taylor, A. H. Wilde.

UNIVERSITY OF LEEDS

Mr. C. R. Berkin has been appointed Senior Registrar and Tutor in Orthopaedic Surgery from a date to be arranged for the period ending December 31, 1955, in the first instance.

UNIVERSITY OF SHEFFIELD

At a meeting of the University Council on November 19, 1954, Dr. C. E. Davies was appointed part-time Lecturer and Clinical Teacher in Medicine and Dr. Isabella G. Monypenny part-time Instructor in Anaesthetics.

Dr. Margaret M. Platts was appointed to the J. G. Graves Medical Research Fellowship and Dr. R. Kilpatrick to the James Morrison Research Fellowship.

The following full-time appointments are announced: Mr. O. Daniel, Senior Lecturer in Surgery; Dr. D. Balducci, Research Assistant in Bacteriology and Virus Diseases.

Mr. P. A. King, Tutor in Surgery, has resigned his appointment.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At the annual meeting of the College held on December 2, 1954, Professor L. S. P. Davidson was re-elected President, Dr. A. Rae Gilchrist was elected Vice-President, and the following were elected Members of Council: Dr. E. R. C. Walker, Dr. W. Lindsay Lamb, Dr. I. Simson Hall, Dr. J. G. M. Hamilton, and Dr. Thomas Anderson.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At a meeting of the College held on December 15, 1954, with Professor Walter Mercer, President, in the chair, the following were admitted Fellows after having passed the requisite examinations:

W. A. Baker, G. T. F. Braddock, G. K. Chaudhuri, J. N. de Klerk, C. J. Dewhurst, J. B. Doss, J. M. du Toit, M. M. El Fiki, H. Fine, W. D. Graham, J. J. Ironside, A. J. A. McCormick, G. T. Mair, K. P. P. B. Menon, M. J. Meter, D. P. Misra, G. F. Murnaghan, B. V. Nabar, J. S. Pathak, J. Pigot, N. B. Reddy, W. C. Robinson, R. S. Krishna, P. K. Sethi, G. Singh, R. G. D. Taylor.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

The following candidates were admitted to the Licence of Medicine and Midwifery of the College on December 3, 1954:

P. Barnes, I. D. Bosman, P. J. Browne, I. W. Browne, P. J. Campbell, D. Elloff, A. A. Endelman, V. B. Gautama, J. W. D. Hand, R. J. Hayes, D. P. McCarthy, W. F. McCourt, B. G. Nanji, Anne T. Nolan, B. M. Nolan, M. C. O'neley, D. E. Page, L. G. K. Quarcoo, G. I. Roberts, S. K. Roy, A. P. Ryan, W. T. Salmon, T. A. Scully, S. Sugarman, N. H. Webb.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At a meeting of the Council of the College held on November 27, 1954, with the President, Mr. Arthur A. Gemmell, in the chair it was reported that a further gift of £5,000 from Mrs. Margaret Black to the Sims-Black Travelling Professorship Fund has been received.

The following awards were made for 1955: *Leverhulme Research Scholarships*, Professor I. Donald, Dr. J. Gardiner, Dr. F. H. Leckie, and Dr. M. L. Paterson. *Bernhard Baron Travelling Scholarship*, Professor S. L. Townsend (Melbourne). *Green-Armistage Short-term Travelling Scholarship*, Dr. J. W. F. Scrimgeour.

The Council acknowledged a further grant for research from the British Empire Cancer Campaign.

The following candidates were admitted to the Membership: R. K. Banerjee, K. Das Gupta, W. G. McBride, and L. H. Wilson.

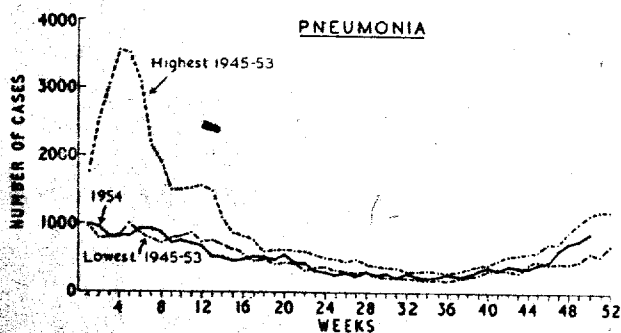
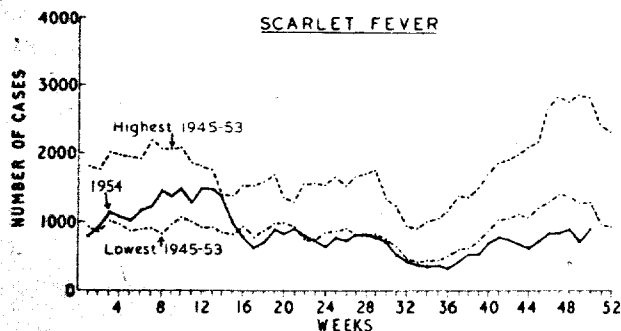
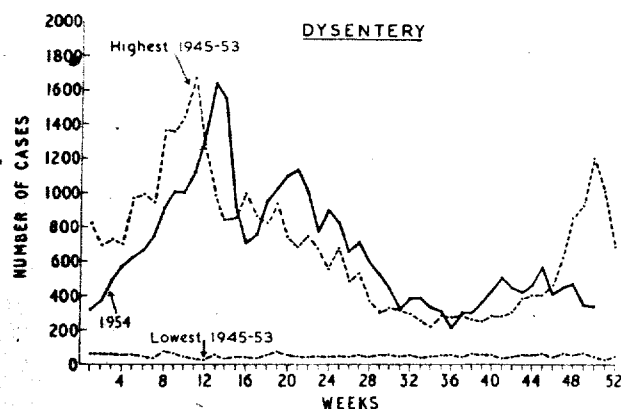
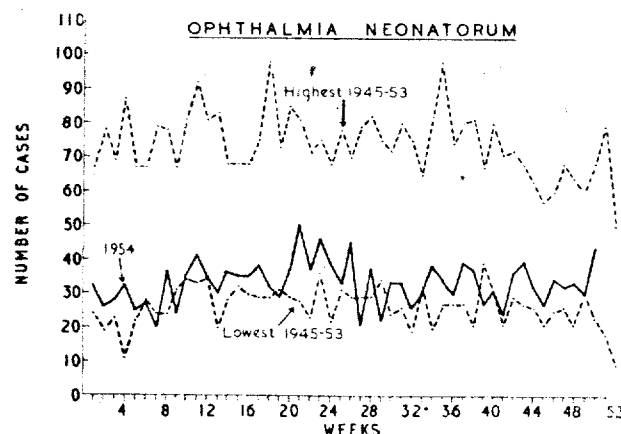
The following candidates have been awarded the Diploma in Obstetrics:

Mavis J. Affarson, Barbara D. Allen, D. L. Archer, R. Armistage, W. M. Baird, C. E. Ballance, A. P. Barter, S. G. A. Bartlett, D. A. V. Bearblock, W. M. Bealey, F. X. Bencini, B. R. A. Binnewald, Ethel A. L. Blake, R. A. T. Boland, J. M. Bolton, G. M. P. Boyes, D. S. N. Brierley, R. C. Brookes, T. Brown, Jennifer Browne, J. C. Bryce, D. Budge, A. R. Burnett, Margaret H. Butler, A. P. Camilleri, Kathleen M. Carruthers, D. Cavanagh, A. F. Champion, J. Chapman, B. Charterjee, H. D. Chomse, T. K. Chong, Agnes Clark, J. M. Clark, A. G. Clow, Winifred J. Coates, Sheila M. Cochrane, R. L. K. Colville, E. Cooper, K. Coventry, W. H. A. C. Cox, A. V. Craig, D. O. Craig, D. S. Craig, A. A. Craigen, D. J. Cross, L. Crouch, S. H. Dallas, D. D. Davies, R. Davis, G. R. C. Deacon, P. A. De Raeye, R. F. Dingley, Marjorie J. Duckworth, Sheila G. F. Duncan, I. M. Dunhie, A. E. Elliott, Cathleen M. Elliott, Mary A. Eldale, L. A. J. Evans, Noreen M. H. Evans, F. H. Evans, P. G. Fildes, A. G. Findlay, Anna L. Frenkiel, C. J. Friend hip, Margaret P. Gardiner, N. S. C. Gent, A. K. Ghosh, J. G. O. Gill, R. M. H. Gompertz, C. J. Goosen, A. C. Gow, Dorothy M. Gratton, June H. Green, P. J. Guly, Frances M. W. Hamilton, J. N. Harkness, N. B. Harris, J. D. Harrie, Charlotte Harstein, Kathleen F. Hastings, D. B. Hawkins, W. P. Hayne, J. B. Heard, K. R. Heber, E. R. Herst, J. McL. Hill, Barbara M. Hitch, K. S. Holmes, E. T. R. Holt, Helena E. Hughes, K. R. Hughes, Muriel M. Hughes, H. A. Hurwood, Jane C. Iles, A. Ingram, Doreen L. Ireland, E. P. James, G. Jayaswal, D. S. Jeffery, A. H. John, M. Johnstone, R. S. Johnstone, D. R. Jones, E. W. P. Jones, I. S. Jones, R. D. Jones, Catharina J. Joubert, P. J. Joubert, Victoria K. Kelly, D. M. Kirkwood, Ethel E. D. Knowles, K. K. Lazarus, W. E. Lewis, W. G. Lewis, J. F. Lowe, S. J. H. Lowry, I. B. Lyon, I. S. Macdonald, Jean M. Mackay, Frances E. A. McVey, Doreen M. Gratton, June H. Green, P. J. Guly, Frances M. W. Hamilton, J. N. Harkness, N. B. Harris, J. D. Harrie, Charlotte Harstein, Kathleen F. Hastings, D. B. Hawkins, W. P. Hayne, J. B. Heard, K. R. Heber, E. R. Herst, J. McL. Hill, Barbara M. Hitch, K. S. Holmes, E. T. R. Holt, Helena E. Hughes, K. R. Hughes, Muriel M. Hughes, H. A. Hurwood, Jane C. Iles, A. Ingram, Doreen L. Ireland, E. P. James, G. Jayaswal, D. S. Jeffery, A. H. John, M. Johnstone, R. S. Johnstone, D. R. Jones, E. W. P. Jones, I. S. Jones, R. D. Jones, Catharina J. Joubert, P. J. Joubert, Victoria K. Kelly, D. M. Kirkwood, Ethel E. D. Knowles, K. K. Lazarus, W. E. Lewis, W. G. Lewis, J. F. Lowe, S. J. H. Lowry, I. B. Lyon, I. S. Macdonald, Jean M. Mackay, Frances E. A. McVey, Doreen M. Gratton, June H. Green, P. J. Guly, Frances M. W. Hamilton, J. N. Harkness, N. B. Harris, J. D. Harrie, Charlotte Harstein, Kathleen F. Hastings, D. B. Hawkins, W. P. Hayne, J. B. Heard, K. R. Heber, E. R. Herst, J. McL. Hill, Barbara M. Hitch, K. S. Holmes, E. T. R. Holt, Helena E. Hughes, K. R. 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London 55 (Hackney 19, Islington 9); Norfolk 39 (Norwich C.B. 31); Yorkshire West Riding 38 (Sheffield C.B. 27); Lincolnshire 21 (Scunthorpe M.B. 20).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus -----, the figures for 1954 thus ————. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending December 18 (No. 50) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included). London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1954					1953				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria	18	0	6	0	3	16	1	5	0	2
Dysentery	340	55	257	11	2	503	95	156	3	1
Encephalitis, acute	1	0		0		3	0	0	0	
Enteric fever:										
Typhoid	1	0	0	0	4	1	0	1	0	
Paratyphoid	9	2	1	1		4	0	0	0	
Food-poisoning	163	12		0		141	10		0	
Infective enteritis or diarrhoea under 2 years				17	9				14	14
Measles*	6,523	548	472	405	39	778	12	42	16	66
Meningococcal infection	24	1	14	1	4	22	1	13	1	2
Ophthalmia neonatorum	47	5	5	0		30	2	6	0	
Pneumonia†	736	43	237	3	1	692	43	242	12	
Poliomyelitis, acute:										
Paralytic	26	5		0		39	2		8	3
Non-paralytic	10	2	7	0		12	1			
Puerperal fever‡	217	32	11	1		259	47	10	0	
Scarlet fever	798	62	112	39	41	1,284	61	202	30	46
Tuberculosis:										
Respiratory	665	90	127	21				142	22	
Non-respiratory	84	6	21	5				24	4	
Whooping-cough	1,833	106	171	19	19	2,304	101	396	60	32

DEATHS in Great Towns	1954					1953				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	0	0		0		0	0		0	
Encephalitis, acute		0			0		1			0
Enteric fever	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	7	0	2	2	1	7	1	0	1	1
Influenza	66	2	2	1	0	17	3	3	1	0
Measles	0	0	1	0		0	0	1	0	
Meningococcal infection		1	1				0	1		
Pneumonia	335	43	31	19	16	226	28	21	10	6
Poliomyelitis, acute	2	1			0	6	1			0
Scarlet fever		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory	101	13	14	3	8	88	14	17	6	6
Non-respiratory		0	3	0	0		1	1	0	0
Whooping-cough	1	0	0	0	0	2	0	0	0	0
Deaths 0-1 year	242	31	34	15	14	217	20	25	10	21
Deaths (excluding stillbirths)	6,363	868	690	148	201	5,072	725	559	106	184
LIVE BIRTHS	6,804	1024	870	217	357	6,680	996	783	212	352
STILLBIRTHS	210	21	29			199	25	19		

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

Medical News

Swedish National Health Insurance Scheme.—At the New Year Sweden started compulsory health insurance in place of voluntary schemes run by State aided benefit societies. According to a report in the *Manchester Guardian* every wage-earner of 16 and over must join the scheme. Benefits include free hospital treatment, cheap medicines, reduced doctor's bills, and sick pay during absence from work.

The Common Cold.—The Common Cold Research Unit is again appealing for healthy volunteers between the ages of 18 and 45 years. The Unit wants 500 this year. Prospective volunteers should be advised to write to the Medical Officer, Harvard Hospital, Salisbury, who will gladly provide full details. Last year a new strain of common cold virus, which resulted in a high proportion of colds in the volunteers, was studied. The common cold virus can be cultured on human embryonic lung.

Atomic Power.—According to the science correspondent of *The Times* the problem of the disposal of atomic waste is not nearly so formidable as once was thought. There is no great difficulty with radioactive elements of short half-life (of less than a year), as their activity diminishes rapidly on storage; nor, rather surprisingly, with those with a very long half-life: the amount of radiation they produce is small compared to their bulk; but it is the intermediate group, consisting of radioactive strontium with a half-life of about 20 years, and radioactive caesium with a half-life of 33 years, that is likely to prove troublesome. However, methods of separating these isotopes of strontium and caesium from other radioactive products have already been worked out on the laboratory scale. Practical steps to use atomic power for generating electricity in Britain are now being taken. Near Thurso, in the north of Scotland, the Atomic Energy Authority has taken over a former naval air station and will soon be starting work on the installation of a nuclear reactor for generating electricity, according to reports. The reactor will make steam which in turn will operate conventional electricity generating plant. On the international scale, plans for the peaceful use of atomic energy are now making headway. The United Nations Assembly resolved last month to hold an international conference not later than August, 1955, on the development of atomic power and problems such as radiation protection and the role of atomic energy in medicine and biology. With this in view Dr. M. G. CANDAU, Director-General of W.H.O., has been conferring with experts in this field, including Dr. J. F. LOUIT, of Harwell.

Medical Visitors to Canada and the United States.—The Ciba Foundation, in conjunction with the Horse Shoe Club of Great Britain, is collecting the names of British doctors now visiting or intending to visit Canada or the United States for a period of three months or more. These doctors will be sent a letter containing information which, it is hoped, will be of use to them during their stay abroad. Further information may be obtained from Dr. GORDON WOLSTENHOLME, of the Ciba Foundation, 41, Portland Place, London, W.1.

Nuffield Dental Fellowships.—Details of the Nuffield Foundation's dental fellowships and scholarships are given in our advertisement columns this week at page 47. One of the purposes of these fellowships is to enable selected graduates in medicine and science to receive training that will qualify them to undertake teaching and fundamental research on dental health and disease.

Eli Lilly Medical Research Fellowship (South Africa).—Applications may now be made by medical practitioners registered in South Africa for the 1955 Eli Lilly Medical Research Fellowship. It is valued at 250 dollars a month

for 12 months plus return travelling expenses to the point of study in the United States. Further details from Dr. H. A. SHAPIRO, P.O. Box 7605, Johannesburg.

Colouring Matter in Food.—The use of colouring matter in food is the subject of a report, published this week, based on the work of the Preservatives Subcommittee of the Food Standards Committee of the Ministry of Food. Under the Public Health (Preservatives, etc., in Food) Regulations, 1925-53, the addition of any colouring matters to articles of food is permitted, with a few specific exceptions. The main recommendation of the present report, which examines the situation in the light of modern knowledge, is that the regulations should be amended so as to permit the use in food of specified colours only; and in an appendix to the report there is a list of 13 natural colours and 32 synthetic colours which the subcommittee suggests should be permitted. The report states: "The introduction of a list of permitted colours adjudged to be suitable for use in food would afford greater protection both to the consumer and food manufacturer, since merely to prohibit use of colours known to be harmful would still leave in use a very large number for which there is little or no biological information."

Anaesthetic Appointment at Glasgow.—The University of Glasgow in conjunction with the Western Regional Hospital Board has created a senior lectureship in anaesthetics within the St. Mungo Department of Surgery at Glasgow University and Glasgow Royal Infirmary. This appointment carries the clinical ranking of consultant. Dr. ALFRED C. FORRESTER, consultant anaesthetist at Glasgow Royal Infirmary, has been appointed to the lectureship. Dr. Forrester is chairman of the Anaesthetic Services Subcommittee of the Central Consultants and Specialists Committee (Scotland), and is the Scottish representative on the B.M.A. Anaesthetists Group Committee. Dr. R. C. O. SALMONS has been appointed assistant to the post.

Fellowship to North America.—The International College of Surgeons offers a Fellowship of 3,000 dollars to a young medical graduate from Europe or South America. The award is to enable the holder to spend a year working at one of the teaching centres in the United States or Canada. Before the Fellowship can be confirmed, the candidate must secure a year's appointment as a resident or fellow at the teaching centre of his choice. The scholarship has been provided for by the generosity of the Woman's Auxiliary of the United States and Canadian Sections of the College. British applications should be made to Dr. J. F. BRILSFORD, 20, Highfield Road, Edgbaston, Birmingham, 15.

Prizes in Laryngology and Otology.—The Royal Society of Medicine announces the award of the W. J. Harrison Prize in Laryngology to Mr. C. P. WILSON, senior surgeon in the E.N.T. Department, Middlesex Hospital; the W. J. Harrison Prize in Otology to Miss M. R. DIX, of the Otological Research Unit at the National Hospital for Nervous Diseases; and the Norman Gamble Prize to Mr. J. C. SEYMOUR.

News in Brief.—Dr. ALBERT SCHWEITZER will be 80 on Friday, January 14. There will be a short tribute to him on the Television Service at 10 p.m. on that day.

In South Africa, where a severe outbreak of poliomyelitis is proceeding, the South African poliomyelitis research foundation proposes to vaccinate 2½ million children against the disease later in the year.

The Eugenics Society is starting an investigation of the family backgrounds of bright pupils nominated by their teachers. The society is looking for Britain's "promising families."

Prostitution under State supervision has been legalized in the Argentine after a twenty years' ban.

British Tuberculosis Association has changed its address to 59, Portland Place, London, W.1. (Tel.: Museum 3810.)

COMING EVENTS

Hunterian Festival Dinner at the Royal College of Surgeons.—The Hunterian Festival Dinner will be held this year on Monday, February 14. Normally admission is by invitation, but this year, as the dinner will be held for the first time in the new Great Hall of the College, it will be possible to admit, on payment, up to 100 Fellows and Members. Will any Fellow or Member of the College who wishes to attend please write immediately to Mr. W. F. Davis, Deputy Secretary, Royal College of Surgeons, Lincoln's Inn Fields, W.C.2 (HOL: 3474), enclosing a cheque for £2 15s. to cover the inclusive cost of the dinner. Evening dress and decorations will be worn.

Chronic Rheumatic Diseases.—Concentrated week-end course at the Rheumatism Unit, St. Stephen's Hospital, Chelsea, S.W.10, on March 19 and 20. Details from the secretary, Fellowship of Postgraduate Medicine, 1, Wimpole Street, London, W.1.

Royal Institute of Public Administration.—The Edinburgh and East of Scotland Regional Group is holding a conference on "Health Services" at Peebles on March 31 and April 1 and 2. The general theme is "Working Together—Progress and Prospects." Fee one guinea. Details from hon. sec., 245 High Street, Edinburgh, 1.

Congress on Urinary Lithiasis.—At Evian, France, from September 2 to 4, under the presidency of Professor L. DE GENNES and Professor J. CIBERT. Details from Professor C. LAROCHE, 16, rue Christophe-Colomb, Paris, 8.

NEW ISSUES

British Heart Journal.—The new issue (Volume 17, No. 1) will be available in a week's time. The contents include:

VECTOCARDIOGRAMS OF NORMAL AND PREMATURE BEATS IN DIFFERENT LEAD SYSTEMS. W. Den Boer, H. C. Burger, and J. B. Van Milaan.
MYOCARDIAL CHANGES OCCURRING IN POTASSIUM DEFICIENCY. P. M. McAllen.

THE DISTINCTIVE ELECTROCARDIOGRAM OF CORONARY ARTERIOSPASM. William Evans.
SECONDARY R WAVES IN RIGHT CHEST LEADS. Fulvio Camerini and L. G. Davies.

RADIOLOGY OF THE LUNG IN SEVERE MITRAL STENOSIS. D. S. Shoff.
A NEW METHOD OF DETERMINING THE DEGREE OR ABSENCE OF MITRAL OBSTRUCTION. S. G. Owen and Paul Wood.

AORTIC STENOSIS. A POST-MORTEM CINERADIOGRAPHIC STUDY OF VALVE ACTION. I. K. R. McMillan.

PALPABLE VENOUS PULSATIONS IN A CASE OF TRANSPOSITION OF BOTH ARTERIAL TRUNKS AND COMPLETE HEART BLOCK. J. D. Archison, R. J. Duthie, and J. S. Young.

THE MECHANISM AND SIGNIFICANCE OF THE AURICULAR SOUND. David Weizman.

UNILATERAL MEMBRANOUS PULMONARY VENOUS OCCLUSION, PULMONARY HYPERTENSION AND PATENT DUCTUS ARTERIOSUS. D. Emslie-Smith, I. G. W. Hill, and K. G. Lowe.

PATENT DUCTUS ARTERIOSUS WITH PULMONARY HYPERTENSION. Peter Harris.

LONG SURVIVAL WITH INFERIOR VENA CAVA DRAINING INTO LEFT ATRIUM. D. L. Gardner and Leslie Cole.

REDISTRIBUTION OF SYSTEMIC BLOOD FLOW IN PULMONARY STENOSIS. R. J. Shephard.

CONTINUOUS VENOUS HUM IN A CASE OF PORTAL CIRRHOSIS. A. I. S. Macpherson and E. V. B. Morton.

EBSTEIN'S ANOMALY: REPORT OF A CASE DIAGNOSED DURING LIFE. A. J. Kerwin.

PULMONARY ARTERY THROMBOSIS FOLLOWING CARDIAC CATHETERIZATION. J. A. Nighthale and B. L. Williams.

ABSTRACTS OF CARDIOLOGY.

Published quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

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

Saturday, January 8
E.E.G. SOCIETY.—At National Hospital, Queen Square, W.C., 10.30 a.m., scientific papers.

Monday, January 10
ASSOCIATION OF CLINICAL BIOCHEMISTS (SOUTHERN REGION).—At University College Hospital, 3.15 p.m., annual general meeting. 4.30 p.m., scientific papers.

INSTITUTE OF PSYCHIATRY.—5.30 p.m., Dr. E. Stengel: lecture-demonstration.

Tuesday, January 11
BRITISH DENTAL ASSOCIATION: WOLVERHAMPTON AND DISTRICT SECTION.—At Star and Garter Hotel, Wolverhampton, 6.30 for 7 p.m., informal meal; at Royal Hospital, Wolverhampton, 8 p.m., Professor J. M. Webster: Forensic Aspects of the Teeth and Lower Jaw. Members of South Staffs Division, B.M.A., are invited.

CHELSEA CLINICAL SOCIETY.—At Rembrandt Hotel, Thurlow Place, S.W., 8.30 p.m., discussion to be opened by Sir Charles Peirce and Mr. E. D. O'Brien: Some Problems of Modern Diplomacy.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. G. Cochrane: Leprosy.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Watson Smith Lecture by Dr. G. B. Dowling: Scleroderma and Dermatomyositis.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Imperial Cancer Research Fund Lecture by Dr. J. Bamforth: Early Beginnings of Carcinoma.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Dr. P. L. Mollison: The Rhesus Factor.

Wednesday, January 12

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. J. D. Fergusson: Prostatic Cancer.

MIDLAND MEDICAL SOCIETY.—At Birmingham Medical Institute, 154, Great Charles Street, 8.15 p.m., Dr. Robert Forbes: Recent Developments in Medical Litigation.

NOTTINGHAM MEDICO-CHIRURGICAL SOCIETY.—8.30 p.m., Sir Charles Dodds, F.R.S.: Influence of Chemistry on Medical Practice.

ROYAL STATISTICAL SOCIETY.—STUDY SECTION.—At E.L.M.A. Lighting Service Bureau, 2, Savoy Hill, London, W.C., 6 p.m., joint meeting with Study Circle on Medical Statistics. Dr. R. H. Thouless: Statistics in Parapsychology.

Thursday, January 13

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, W., 8 p.m., Dr. A. A. Mason: Use of Hypnosis in Skin Disorders.

LIVERPOOL MEDICAL INSTITUTION.—8 p.m., discussion to be opened by Dr. R. P. Kemp and Dr. I. Harvey Flack: Medical Education in Patient and Public.

NUFFIELD ORTHOPAEDIC CENTRE.—At Wingfield-Morris Orthopaedic Hospital, 8.30 p.m., Major L. C. Hollister: Internal Splinting of Fractures.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Mr. C. P. Wilson: Lateral Cysts and Fistulae of the Neck of Developmental Origin.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Medical School, Small's Wynd, Dundee, 5 p.m., Dr. T. Cecil Gray: Anaesthesia in the Age of Stress.

SURREY INTER-HOSPITAL PSYCHIATRIC ASSOCIATION.—At St. Ebba's Hospital, Epsom, 7.30 p.m., clinical meeting.

Friday, January 14

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. R. G. Cochrane: Leprosy.

INSTITUTE OF LARYNGOLOGY AND OTITIS.—3.30 p.m., Mr. S. A. Beards: Headaches of Nasal and Sinus Origin.

●ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Mr. Arthur H. Jacobs: Surgical Approach in Surgical Pathology of the Kidney.

ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., Mr. A. W. McKenzie: Addison's Disease.

Saturday, January 15

BIOCHEMICAL SOCIETY.—At King's College, Strand, W.C., 2 p.m., scientific papers.

CAMBRIDGE UNIVERSITY MEDICAL SCHOOL.—10.30 a.m., Symposium: Dermatology.

APPOINTMENTS

BETTS, J. WOODROW, M.B., B.S., F.R.C.S., Consultant Surgeon to Lincoln County Hospital, John Coupland Hospital, Gainsborough, and the Grace Swan Memorial Hospital, Spilsby, under the Sheffield Regional Hospital Board.

BRITISH RAILWAYS (LONDON MIDLAND REGION)—J. F. Kelly, M.B., B.Ch., D.P.H., and J. Havdn Williams, M.B., B.S., Assistant Medical Officers.

DOYLE, WILLIAM J., M.B., B.Ch., B.Sc. (Public Health), D.P.H., County Medical Officer of Health for Devon, following the retirement of Dr. L. Meredith Davies in May, 1955.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—E. J. Delaney, M.B., B.Ch., B.A.O., L.M. Anaesthetic Registrar, United Norwich Hospitals; M. W. Partington, M.B., B.S., Ph.D., Medical Registrar, United Norwich Hospitals; A. K. Ghosh, M.B., D.G.O., D Obst R C O G., Registrar in Obstetrics and Gynaecology, Peterborough Memorial Hospital.

BIRTHS, MARRIAGES, AND DEATHS

MARRIAGES

Mulcahy—Hanton.—On December 30, 1954, at the Church of the Immaculate Conception, Wexford, Risteárd Mulcahy, M.D., M.R.C.P., to Aileen Hanton.

DEATHS

Dicks.—On December 20, 1954, at Lapin, Warren Edge Road, Southbourne, Bournemouth, Hants, Eustace James Carey Dicks, M.B.E., M.D., late of Ealing, London, W.

Eland.—On December 14, 1954, Arthur John Charles Eland, M.D., of Filkins, Lechlade, Glos.

FitzGerald.—On December 21, 1954, at his home, Penharbour, Greystones, Co. Wicklow, Eire, FitzGerald Gabbett FitzGerald, C.B., D.S.O., L.R.C.P.S.I., Major-General, late R.A.M.C., retired, aged 76.

Hardwick.—On December 16, 1954, at Island House, Newquay, Cornwall, Arthur Geoffrey Patte-on Hardwick, M.C., M.R.C.S., L.R.C.P.

Henderson.—On December 18, 1954, George Henderson, M.B., C.M., of Haddenley, Foley Road, Claygate, Surrey, aged 83.

Lomas.—On December 17, 1954, at 1069, Manchester Road, Castleton, Rochdale, Lancs, Alfred Lomas, M.B., Ch.B., aged 80.

Morris.—On December 21, 1954, at Royal Infirmary, Edinburgh, John Rutherford Morris, L.R.C.P.S. Ed., late of Sedburgh, Yorks.

Mullally.—On December 19, 1954, the result of an accident, Joseph Gerard Pius Mullally, M.B., B.Ch., of St. Anne's, Ridge Way, High Wycombe, Bucks.

Rao.—On December 21, 1954, at Wanstead Hospital, Bantwal Narasinga Rao, M.B., B.S., of 5, Hermon Hill, Wanstead, London, E., aged 60.

Rosa.—On December 21, 1954, at 4, Bellevue Crescent, Edinburgh, Albert Frederick Rosa, M.D.

Sellar.—On December 20, 1954, at The Bield, Juniper Green, Edinburgh, Thomas McCall Sellar, M.C., M.B., Ch.B.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Oral Penicillin in Children

Q.—Since the advent of benzathine penicillin we have been treating mild infections—especially in children—with one dose of crystalline penicillin followed by benzathine penicillin suspension, two drachms (7 ml.) six hourly for the first 24 hours and then one drachm six hourly. A recent publication suggests that this is unduly extravagant and that an oral tablet is as effective; previously we had used the oral tablets only in children under six months. Is there any difference in the oral tablets on the market?

A.—It is true that, in comparisons which have been made between the absorption of benzathine penicillin suspensions and that of procaine or soluble penicillin when given by the mouth, the blood concentrations attained with the latter have generally been higher. The precise form of soluble penicillin used in these tests was not always the same, but in view of the consistency of the results it does not appear that the differences—e.g., between tablets and solutions, and the presence or absence of a buffering agent—are of much consequence. Wright *et al.*¹ found absorption to be rather better from a buffered than an unbuffered tablet of penicillin G: the B.P. tablet of penicillin is required to contain penicillin G and may also contain up to 5% of sodium citrate, the usual buffering agent employed. Either the official preparation or other tablets manufactured in this country, some containing more sodium citrate than this and some none, may be used with the expectation of a satisfactory effect in any conditions suitable for oral treatment.

REFERENCES

- ¹ Finberg, L., *et al.* (1953). *Antibiot. and Chemother.*, 3, 353.
- ² Wright, S. S., Purcell, E. M., Kass, E. H., and Finland, M. (1953). *J. Lab. clin. Med.*, 42, 417.
- ³ Faubrother, R. W., and Daber, K. S. (1954). *Lancet*, 1, 858.

Leucotomy in Schizophrenia

Q.—Has leucotomy proved successful in the treatment of schizophrenia?

A.—While schizophrenia is usually a chronic progressive illness it is often characterized by spontaneous remissions in its early stages, and permanent recovery initiated by treatment with insulin or with electrical convulsant treatment is also quite common. It is thus very difficult to assess the value of any form of treatment in arresting the disease. The possibility that leucotomy might itself produce full arrest is not now considered likely, and its function is thought to be one of eliminating or compensating for certain of the symptoms. It is thus able to relieve distress or may allow the patient to adapt himself to life in the community instead of living in a mental hospital. For this reason, and because the operation is destructive and its effects irreversible, it is no longer recommended in early schizophrenia, and other physical methods which leave no permanent deficit are normally given full trial before it is used. A possible exception to this is the schizophrenic illness in which distressing obsessions are a prominent feature in the early stages.

The effects of the classical operation, which is carried out through burr-holes without exposure of the cortex, have been shown by post-mortem studies to be very variable in their location, and many neurosurgeons now favour one of the more exact and limited sections, including the lower medial cut, which appears in favourable cases to lessen mental tension with a minimum of adverse side-effects. In

addition the extent to which the frontal-deficit syndrome appears after the operation must depend on individual differences of structure, just as the extent to which the deficit disables the patient will depend on the previous personality. Broadly speaking, apathetic patients are not helped, but those who suffer from morbid thoughts and from hallucinations or whose behaviour is unpredictable and impulsive are improved, as are those with depressive features, especially when the onset is later in life. The operation cannot be regarded as a full treatment in itself and can only be considered as a preliminary to the rehabilitation procedures by which the patient is retrained to live a normal life in the months following the operation. Patients can be made worse by the operation—by losing the capacity to inhibit morbid impulses, or by losing all spontaneity and leading a vegetative existence, or by developing epilepsy. Relapse is not uncommon but second operations are quite often successful. The operation may thus be indicated in the schizophrenic the chronic and severe character of whose illness is proved, and who either is distressed by his symptoms or causes distress to others by his behaviour. The selection of patients must always be based on a detailed study of each individual in the light of the known effects of the operation and the environment to which the patient will return if he recovers. Even so, it is very rash to predict its effects in detail. It is hardly justifiable, in view of the fact that the patient can be made worse, to carry out the operation for negative reasons—that is, because all other treatment has failed.

Like convulsive therapy, leucotomy was originally introduced as a treatment for schizophrenia, but it has been shown to give its best results in other psychological disorders.

Climate and Osteoarthritis

Q.—What climatic conditions are contraindicated for a sufferer from osteoarthritis? He is going to live abroad.

A.—Patients with osteoarthritis usually feel best in warm equable climates and appear to suffer most during periods of rapid climatic change. Conditions such as obtain in South Africa have proved satisfactory in individual cases.

Sneezing in the Surgery

Q.—What measures can a general practitioner adopt to prevent the patient with a streaming head cold from passing the infection to (a) other patients in the waiting-room, (b) the practitioner himself? At this time of year the number of people attending the surgery with severe colds greatly increases. The waiting-room is full of sneezing and spluttering, and as I look through the haze of cigarette smoke and droplet infection it is disheartening to see the regular attenders—the chronic bronchitics, the asthmatics, and the early heart failures—subjected to this potentially lethal atmosphere. It is also depressing to reflect that in due course I myself shall become infected. Colleagues adopt various remedies: notices in waiting-rooms, gauze face-masks, an occasional sniff at a sample of nasal inhalant, a brandy and soda after the surgery, sucking hexylresorcinol lozenges, installation of expensive ultra-violet lighting, etc. There has been little success.

A.—The protection of people from infection with the common cold is difficult to achieve. An effective gauze mask worn by the sufferer should in theory prevent the dispersal of virus, but of course a person with a heavy cold would find it very unpleasant or perhaps impossible to wear such a mask. It cannot be hoped that spread would be controlled by the use of nasal inhalations, brandy and soda, lozenges, or ultra-violet light. There should be less concern about exposure of the doctor, as he must inevitably have constant exposure in the course of his daily work, and the risk in his surgery will not be disproportionately great. It is likely that the development or otherwise of colds depends not only on exposure to virus but on other factors at present difficult to define precisely.

Visceroptosis

Q.—Is visceroptosis still accepted as a cause of abdominal symptoms?

A.—The answer to this question must certainly be "Yes." The diagnosis of visceroptosis is probably more accurately made now than 30 years ago; the disease is a quite definite entity. The crux of the situation would seem to be a mobile caecum rather than a displaced caecum. It is possible to have both a very high and a very low caecum entirely without symptoms. But, if the caecum is mobile, gravitational stasis occurs in the ascending colon, and as a result the mesentery becomes a supporting structure. This leads to secondary circulatory changes (in duodenum, intestine, etc.), so that a state of chronic ileus is established leading to the well-known symptoms of distension, discomfort, constipation, flatulence, and toxic manifestations. If these symptoms are relieved by lying down—particularly after the ingestion of food—the diagnosis of visceroptosis is probably quite genuine.

This answer is taken from the third book of *Any Questions?* Copies of both the second and third books of *Any Questions?*, each containing some 200 expert answers, are available from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or through any book-seller, price 7s. 6d. a copy (postage 6d.). The third book contains a cumulative index.

Drugs and Fertility

Q.—Are any drugs, given in therapeutic doses, known to affect fertility, temporarily or permanently?

A.—There have been few, if any, systematic studies of the effect of drugs on fertility, and consequently knowledge on this subject is scanty. However, there seems good evidence that the sulphonamides in therapeutic doses may suppress temporarily the development of spermatozoa within the testis and so lead to impaired fertility. Testosterone in sufficient doses is well known as a depressant of spermatogenesis, and it has been claimed that on cessation of treatment the recovery of spermatogenesis may be followed by a rebound in which sperm production becomes better than it was before treatment. Such a rebound often does not occur, and occasionally the suppression of spermatogenesis appears to be permanent. Evidence has been produced that over-indulgence in tobacco (for example, 30 or 40 cigarettes a day) may lead to marked oligospermia which improves on giving up smoking. Many other chemical agents such as alcohol, benzene, mercury, phosphorus, lead, etc., have been thought to produce impairment of fertility, which, in some cases at least, would appear to be permanent.

Little is known about the effect of drugs on ovulation in women, apart from the fact that oestrogens in sufficient doses will inhibit ovulation—temporarily. The evidence for the efficacy of various anti-fertility factors, such as lithospermum and *metaxylohydroquinone* (the alleged active principle of pea oil), has not yet reached the stage of acceptability.

Urticaria and Malaria

Q.—Is giant urticaria recognized as a presenting symptom in malaria? If so, what is the relationship of the two conditions—could the urticaria be due to a definite allergy to the malaria parasite?

A.—From time to time cases have been reported in which urticaria has accompanied the malarial paroxysm and has disappeared following the administration of antimalarial drugs. It has been suggested that this is an allergic phenomenon due to infestation with malaria parasites, analogous to that which occurs in hydatid disease. Thomas and Ridout¹ described a case of vivax malaria in which the initial paroxysm was accompanied by giant urticarial weals covering the whole body and extremities and considerable oedema of the glottis. The symptoms cleared up following the administration of quinine, but reappeared on the third day, when a second paroxysm occurred, with a temperature of 106° F. (41.1° C.), a pulse rate of 160, and severe

dyspnoea. Adrenaline was then administered; there was a rapid response and no further anaphylactic symptoms were observed.

REFERENCE

¹ Thomas, G. C., and Ridout, G. B. (1931). *Nat. med. Bull. (Wash.)*, 29, 470.

Treatment of Amyotrophic Lateral Sclerosis

Q.—Is there any effective treatment for amyotrophic lateral sclerosis?

A.—Amyotrophic lateral sclerosis is part of the wider picture of motor neurone disease or progressive muscular atrophy. The aetiology of this condition is completely obscure, and there is no proof that any form of treatment has the slightest effect on the inexorable progress of the disease. At different times claims have been made for the value of vitamins, endocrine preparations, and vital dyes, given by various routes, but there is no shred of evidence that they have any effect. In most examples it is essential to examine the spinal fluid, because occasionally the disease can be closely mimicked by neurosyphilis, in which case both prognosis and treatment become quite different. Although in its florid form the diagnosis is one of the easiest in neurology, it would perhaps be true to say that more mistakes are made over this diagnosis than any other in the neurological field. Common mistakes are to attribute wasting of small hand-muscles to ulnar palsy or cervical spondylosis. When the disease presents with purely pyramidal signs a diagnosis of disseminated sclerosis or cerebral tumour may be made. In the past therapeutic claims have no doubt frequently been based on inaccurate diagnosis.

Cracking One's Fingers

Q.—I have a patient of 29 who is a teleprinter operator. Before taking up this occupation he had a habit of pulling his fingers to make them crack. He found that he was unable to operate the teleprinter easily until he had cracked his fingers. What happens when one cracks fingers? Is it harmful when done habitually?

A.—This appears to be an example of the condition termed "vacuum click." This click occurs in the metacarpophalangeal joint, and the most likely explanation of its occurrence is that given by Wiles (*Essentials of Orthopaedics*, 1949, p. 210, London)—namely, that slight separation of the joint surfaces increases the potential capacity of the joint and thus creates a vacuum into which the capsule is sucked with an audible snap. It is impossible to explain why cracking the fingers appears to improve their performance on a teleprinter, but the exercise certainly does no harm, and can safely be done to the patient's heart's content.

NOTES AND COMMENTS

Cold in Bed.—Dr. A. W. B. LONDON (Peterston-super-Ely, Glam.) writes: I wonder if the 60-year-old woman has enough bedding underneath her, as well as above ("Any Questions?" December 18, 1954, p. 1497). Every camper knows that you can pile on bedclothes "ad smotheram" and hot-water bottles, but if you do not have enough underneath you will still feel cold. I suggest this as I do not see it mentioned in the answer to the question.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Atiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad. ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: *Britmedads, Westcent, London.* MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association, TELEPHONE: EUSTON 4499. TELEGRAMS: *Medisecra, Westcent, London.* B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 15 1955

THE CIRCLE OF WILLIS*

BY

Sir CHARLES SYMONDS, K.B.E., C.B., D.M., F.R.C.P.

Physician for Nervous Diseases, Guy's Hospital; Physician, National Hospital, Queen Square

My first task is to thank you, Mr. President, Fellows and Members of the College, for appointing me to make this Oration according to Harvey's instructions, wherein he designed the pattern for a tradition now almost three centuries old. Whoever is charged with the duty must feel at this moment proud of the honour and humbled by the greatness of the occasion.

Of the directions given to the Orator two are simple—to commemorate the benefactors of the College, and to bid you continue in mutual love and affection among yourselves. The other is the exhortation to the Fellows and Members to search and study out the secrets of Nature by way of experiment. In this connexion we must remember that Harvey was what to-day would be called a physiologist. It is true that he practised medicine, but not very much, nor, according to one of his biographers, very well (Anon., 1830). His great discoveries, including that of the circulation of the blood, were based mainly on observations upon animals. It was natural, therefore, that he should direct the Orator to appeal for recruits to this branch of learning, and that the appeal should be addressed to the Fellows and Members of the College, for it was only physicians who were then qualified for this work. Since then the scene has changed. There is specialization of function such as Harvey could not imagine. The physiologist and physician are different persons.

The Urge to Discover

Moreover, the science of medicine, which had hardly begun in Harvey's day, now has values of its own which he would doubtless have found satisfying. He would not, I am sure, have wished you all to turn physiologists. He would none the less have urged you to prosecute research. This, I believe, is what most of us want to do when we enter the practice of consulting medicine, and for many of us the urge to discover something new is one of the motives that directs our choice of career. We start with enthusiasm, but the later results are on the whole disappointing. For this there are many reasons, of which the first and most obvious is that to want to do a thing well is not the same thing as having an aptitude for it, but I do not think this is so widely applicable as is sometimes supposed. Another reason often given is that research in medicine is a full-time employment, with the implication that a man must choose between research and practice. This idea has been fostered by the growth of units whose senior members give the whole of their time to clinical re-

search and are not engaged in the ordinary practice of medicine.

It is true that the whole-time clinical research worker has great advantages, from which he has not been slow to profit. Witness the volume and quality of the work published from these units during the past thirty years. The practising physician also has some advantages, which are not so apparent and deserve mention. One lies in what I may call the range and intensity of his exposure to stimulus. He goes to his out-patient clinic, his wards, or his consulting-room not knowing in the morning what the day will bring to him of the phenomena of disease. No sooner has he focused his attention on one problem than it is switched to another. At the end of the day his mind carries a load of unanswered questions. This you may say is distracting and an impediment to thought, but the variety of experience has a value.

There is much darkness in the world of medicine, and light may come from an unexpected quarter, so that the man who is compelled to shift his gaze from one point of the compass to another may be better off than he who is always looking in one direction. It may happen to those wholly engaged in clinical research that they miss the opportunity of seeing in matters outside their scope something of fundamental importance to their inquiries, while to the practitioner chance may offer a new concept of disease from the observation in the same week of two cases which are clearly alike but like nothing else that has ever been seen. For the practising physician also the unanswered questions are perhaps more often invested with a sense of urgency than is the case with his whole-time research colleagues. The practitioner cannot thrust problems aside merely because they are insoluble. He cannot discard speculation because it is not susceptible to experiment. Every case he sees of motor neurone disease or disseminated sclerosis must become for the moment a personal issue wherein he has to acknowledge defeat. He is very often made to feel very uncomfortable.

Practitioners' Handicaps

In so far, then, as the impetus to research may be derived from external stimuli, the practising physician has no handicap, but he has others. First, he lacks time for quiet thought. This was what Sir Thomas Browne (1646) felt when he wrote that his work had been composed by snatches of time from his practice, envying those whose "quiet doors and unmolested hours afford no such distractions." The right man, you

*The Harveian Oration delivered at the Royal College of Physicians of London on October 18, 1954.

may say, will make time, but in the press of sessions, practice, and committees this is difficult, and is made no easier by the social conditions of our present days. I believe it right that time should be given to the consulting physician for thought, and that under present conditions it should be given by the State in the sense that some of the time he spends at his hospitals should be allowed for study and research. Provision for this has been made under the National Health Service, and it is to be hoped that the boards and committees of hospitals will make full use of their opportunity in this direction. Looking back myself, I can see how much I might have gained from an hour or two spent each week at hospital making notes of particular cases, for my own use. There is need also for a place for study, and I hope that in the building plans of our new hospitals rooms will be provided adjacent to the wards for the use of the physicians.

The second handicap carried by the practising physician is lack of training in methods of laboratory investigation. Time was when no more was necessary for research than the use of the five senses. Thomas Willis discovered diabetes mellitus from the observation that among those who had frequency of micturition, or what was then called the "Pissing Evil," there was a group who wasted and died, and that in them all the urine was wonderfully sweet to the taste. Discoveries of fundamental importance may still be made without recourse to the laboratory. In our own time one of the most remarkable has been the proof that what we knew as sciatica is almost invariably caused by intervertebral disk disease. It is, however, generally true that a man who would do research in these days must augment the scope of his senses by using an ever-increasing number of technical devices, the mastery of which itself consumes the months. There is no adequate provision for such training in our plan for the education of the consulting physician, but it would surely not be impossible to include a year for the senior registrar in a laboratory where he could learn the rudiments of at least one technical method of investigation, and if such experience came to be generally regarded as of advantage to the candidate for staff appointment the best men would naturally be attracted.

On the other side I would suggest that some at least of the senior appointments in full-time clinical research should be given to men who have been engaged in consulting practice. If a man had before going into practice worked long enough in a laboratory to have learned its methods he would return to it with a mind enlarged and refreshed and, what is perhaps more to the point, with enough unanswered questions to keep him busy for a long time. I believe that among those engaged in consulting practice there would be some who at the end of five years would turn with enthusiasm to whole-time research employment. Some interchange of the kind suggested seems needed to bridge the gap between practitioner and clinical research worker which now exists, to the detriment, I believe, of both parties.

Thomas Willis

Thomas Willis, born forty-three years after Harvey, was a physician who managed to combine research with a busy private practice. Willis was elected a Fellow of the College in 1664 at the age of 43. He had had an unusual career. Born at Great Bedwyn, Wiltshire, he became at the age of 15 a batler to a Canon of Christ Church, Oxford, and subsequently took his B.A. On the death of his father and at

the outbreak of the Civil War he went to his home at North Hinksey, but we are told by his brother-in-law, John Fell (Willis, 1684b) that, being "harassed by the incursions of the Rebels, who were possessed of a Garrison strong enough Five miles from thence, and every where Plundering, he betook himself again to Oxford, being the Tents of the King as well as the Muses; where listing himself a souldier in the University Legions, he received Pay for some years, until the Cause of the Best Prince being overcome, Cromwell's tyranny afforded to this wretched nation a peace more cruel than any war." Soon after the end of the war Willis took his Bachelor of Medicine degree, and we are informed by his contemporary, Anthony Wood (1813-20), that he then "fell to the practice of it and every Monday kept Abingdon market." Thenceforward he became a busy practitioner and remained so until the end of his life, though for six years he combined with this the office of Sedleian Professor of Natural Philosophy at Oxford before moving to London in 1666. And there, Wood tells us, "in very short time after he became so noted, and so infinitely resorted to, for his practice, that never any physician before went beyond him or got more money yearly than he." He died of pneumonia in his house in St. Martin's Lane in November, 1675, and was buried in Westminster Abbey.

During the early years of his practice in Oxford Willis was one of a dozen learned men, four of them physicians, who met regularly for discussion. This was an offshoot of the invisible college, a name given by Robert Boyle to a group who before the war used to meet weekly for philosophic discourse at a London tavern. When the war broke out they split, those remaining in London meeting as before, and those at Oxford in rooms at Wadham. Some time before 1659 the meetings ceased in Oxford and were continued in London, and out of this association was born the Royal Society, of which Willis was one of the original Fellows.

Interesting Conclusions

Willis is, of course, best known for his studies of cerebral anatomy, but, besides being the first person to recognize diabetes mellitus, he was led by his reasoning from clinical observation to certain other interesting conclusions. He was, I believe, the first to envisage a hormone, arguing that "about the time of ripe age as the blood pours forth something through the Spermatic Arteries to the Genitals so also it receives a certain ferment from those parts through the veins: to wit, certain particles imbued with a seminal tincture are carried back into the blood which make it vigorous and inspire into it a new and lively virtue. Wherefore at that time . . . hairs break out, the voice becomes greater, the courses of women flow," and so on. He wrote much on epilepsy and introduced the idea of an explosion in the brain as the cause of seizures, using the analogy of gunpowder. He opposed the current view that the origin of what we call focal seizures lay in the part in which the spasm or sensation appeared, and declared his opinion that the primary cause was always in the brain, "to wit that the spirits inhabiting it being disposed to explosions, and there being exploded, bring on or cause every Falling Evil"; though he thought a peripheral stimulus might excite the explosion.

He wrote well of migraine and gives us an excellent description of this malady in the case of Lady Conway, whose letters (Nicolson, 1930) leave no doubt that she found in him a better doctor than Harvey, who had previously attended her.

In his dissertation "Of the Palsie" he describes clearly the disease we now know as myasthenia gravis, observing it to be distinct from all other kinds of paralysis on account of the variability of its occurrence and the effects of fatigue. Patients with this affliction, he says, may appear well in the morning, "able to walk firmly, to fling about their arms hither and thither, or to take up any heavy thing; before noon . . . they are scarce able to move Hand or Foot." And he goes on to quote the case of a patient under his care, "a prudent and honest woman, who for many years

hath been afflicted by this sort of spurious palsy, not only in her members but in her tongue: she for some time can speak freely and readily enough, but after she hath spoken long, or hastily or eagerly, she is not able to speak a word but becomes mute as a Fish, nor can she recover the use of her voice under an hour or two."

Of his methods he wrote thus: "After I had not found in Books what might satisfy a mind desirous of Truth, I resolved with myself to reach into living and breathing examples: and therefore sitting oftentimes by the Sick, I was wont carefully to search out their cases, to weigh all the symptoms, and to put them, with exact Diaries of the Diseases, into writing; then diligently to meditate on these; and then began to adapt general Notions from particular events. . . . He was first and foremost a clinician, but he was also a fine anatomist, who made great and lasting contributions to the advance of knowledge, especially of the structure of the brain and lungs, their value being enhanced by the beautiful drawings of Christopher Wren.

Association with Lower

In his work on the brain Willis was ably assisted by Richard Lower, who was later to earn fame for his work on the heart and the first blood transfusion. Lower was a younger man than Willis, and afterwards succeeded him in his practice. Wood, in his biographical sketches of the two men, suggests that Lower received too little credit for his contributions to the success of his senior. Willis, for example, was credited with the discovery of a spa, doubtless to the benefit of his practice. But Wood (1813-20) writes that in April, 1664, Lower in his travels with Dr. Willis "made a discovery of the medicinal water at East Throp . . . in Northamptonshire, the doctor being then, as usually, asleep or in a sleepy condition on horseback." Afterwards he says Lower imparted his discovery to the doctor, who claimed it for his own. Whatever may be the truth about East Throp, Willis (Franklin, 1931), in his introduction to *Cerebri Anatome*, pays handsome tribute to Lower, "a doctor," he says, "of outstanding learning and an anatomist of supreme skill. The sharpness of his scalpel and of his intellect, I readily acknowledge, enabled me to investigate better both the structure and the function of bodies, whose secrets were previously concealed." And later he writes: "When we were entering upon a much more difficult task, the dissection of the nerves, the really wonderful dexterity of this worker and his untiring perseverance were conspicuous in the extreme and no obstacle could withstand his effort."

Wood, however, could not let this pass, and, writing of Lower, tells us that after taking his degree at Christ Church he "entered upon the physic line, and practised that faculty under Dr. Tho. Willis, whom he helped, or rather instructed, in some parts of anatomy, especially when he was meditating his book *Cerebri Anatome*," and in his list of Willis's published works (Wood, 1813-20) adds under *Cerebri Anatome* this sentence, "Whatsoever is anatomical in that book, the glory thereof belongs to the said R. Lower, whose indefatigable industry at Oxon produced that elaborate piece." Lower himself does not appear ever to have complained that he was not given his due, and his first published work was a spirited defence of Willis's treatise on fevers against the critics, which, as Fulton (1935) has observed, is testimony of the harmonious relations between the two men. Why, then, did Wood write as he did?

Biased Opinions

Anthony Wood, who would have liked to earn fame as a historian, lived in Oxford from 1632 to 1695. His most notable work was the publication, under the title *Athenae Oxonienses* (Wood, 1813-20), of short biographies of distinguished Oxford graduates up to his time. In these his love for gossip so far outran his discretion that a copy of the second volume of the *Athenae* was burned in public by order of the Vice-Chancellor, and the author was expelled

from the University. The book, however, was well received in Cambridge. Wood also kept voluminous diaries (Wood, 1891-1900), which give an entertaining account of his life and times and reveal him as a prejudiced and quarrelsome man. John Fell, the great Dean of Christ Church and later Vice-Chancellor and Bishop of Oxford, who has already been mentioned as the brother-in-law of Willis, was at the same time Wood's benefactor and one of the targets for his abuse. Fell paid for the printing of some of his books, and claimed the right to edit them. Wood could not accept criticism, grumbled, and quarrelled with him.

Richard Lower appears from the diaries to have been one of Wood's intimate friends. During the years 1658 to 1662 Lower's name appears frequently as a companion in the taverns of Oxford. The entries begin with the mention of Mr. Lower, who later becomes Mr. Richard Lower until July 28, 1660, when the entry reads "Spent on Dick Lower at the Mermaid Tavern one shilling." Of Thomas Willis there is no mention in the diaries until 1664, when there is a note of the discovery—by Lower—of the healing well at East Throp. The omission is curious, for Willis was not a negligible person, and it is hardly to be supposed that in a city the size of Oxford the two men never met. That they must in fact have been known to one another is proved by a passage in a letter written in 1725 by Browne Willis, Thomas's grandson, to Bishop Kennett, and preserved in the Bishop's copy of the *Athenae*.

Browne Willis was a scholar and antiquarian of repute, and the purpose of his letter was to refute the statement made by Wood in the *Athenae* that Thomas Willis's grandfather was a tailor. This letter begins, "I most readily obey your lordship's commands in communicating something of my good grandfather Dr. Willis. A. Wood, who was his next neighbour in St. John Baptist's parish Oxon. and had a disagreement with the family, says several things untrue of his descent." From these observations it seems likely that Wood had a prejudice against Willis and a favourable inclination towards Lower, and it is certain that as a historian he would have been influenced by whatever prejudices he may have had.

There is, moreover, evidence that Wood's account of the relative contributions of Willis and Lower to *Cerebri Anatome* was derived from a source already biased. Henry Stubbe, philosopher and physician, published (Stubbe, 1670) a series of papers the sole object of which was to discredit the Fellows of the Royal Society (whom he called contemptuously the Virtuosi), and he attacked Willis among others. He alleges that Willis could not have spared the time from his great practice to compose *Cerebri Anatome*, and writes, "Whatsoever there is in that Piece, which is Anatomical, the glory thereof belongs to Dr. Lower, whose indefatigable industry produced that elaborate Treatise" (p. 95). We know from Wood's diary that he had purchased Stubbe's book, and his comment in the *Athenae*, published many years later, is an almost exact transcription of the sentence I have just quoted; but what he ignored, or perhaps had never read, was a postscript. This is to be found out of its context at the end of Stubbe's little volume. It begins "I think myself obliged to adde one thing more where I speak as if Dr. Willis had had little to do in the discoveries of Dr. Lower about anatomy," and goes on to say that, although Lower did the dissections, Willis's was the master mind which inspired and directed the work. The last sentence of this recantation is revealing: "Thus much I thought fitting to annex, lest the Virtuosi should censure me as partial to my old School-fellow, Dr. Lower, or swayed by any regard then that of Truth" (p. 178).

It is due to Willis that this story should be told in full, for some of those who have written about him have followed Wood, including Michael Foster (1901), who tells us that Lower was "the henchman of the fashionable Willis whose false fame in large measure rested on Lower's careful, unacknowledged work." In this I scent something of the odour in which the physiologist held the successful practitioner 50 years ago.

Willis's "Cerebri Anatome"

Cerebri Anatome was published in 1664 and is chiefly distinguished for the description of the cranial nerves, but better known for the dissertation upon the arteries at the base of the brain. Wren's drawing shows the anterior cerebral arteries joining where the anterior communicating artery should be and bifurcating a little further forward, but, apart from this, there is no fault. Willis, however, saw that there was a circle and that it must have some physiological significance. In discussing this he first suggests that the function of the circle is to mix the blood before its distribution to the brain, but on a later page adds:

"But there is another reason far greater than this of these manifold ingraftings of the Vessels, to wit, that there may be a manifold way, and that more certain, for the blood about to go into divers Regions of the Brain, laid open for each; so that if by chance one or two should be stopt, there might easily be found another passage instead of them: as for example, if the Carotid of one side should be obstructed, then the Vessels of the other side might provide for either Province. . . . Further, if both the Carotids should be stopt, the offices of each might be supplied through the Vertebrals" (Willis, 1684a)

He goes on to say:

"It is not long since we dissected the dead body of a certain man, whom a great Scirrhus or hard Swelling within the Mesentery, growing at last ulcerous, had killed. When his Skull was opened, we beheld those things belonging to the Head, and found the right Carotid, rising within the Skull plainly bony or rather stony, its cavity being almost wholly shut up; so that the influx of the blood being denied by this passage, it seemed wonderful, wherefore this sick person had not dyed before of an Apoplexy: which indeed he was so far from, that he enjoyed to the last moment of his life, the free exercise of his mind and animal function. . . . This Gentleman, about the beginning of his sickness, was tormented with a cruel pain of the Head towards the left side. The cause whereof I know not how better to explain, than that the blood excluded from the right Carotid Artery, when at first it rushed more impetuously in the left, had distended the Membrane" (Willis, 1684a).

Dissertations on the Circle

It is perhaps remarkable that Willis nearly three hundred years ago asked himself why this man did not have a hemiplegia, and perceived from his dissections of the circle that anatomy might supply the answer, but it is even more to his credit that he should have remembered the episode of headache and found what was probably the correct explanation for it. Willis was an indefatigable student of symptoms. This is apparent in the case histories illustrating his clinical writings, and when he was at his dissections he was ever thinking not only of the function of the structures he laid bare but of the disorder of function that might result from their disease. This, you may say, is the way any liberal-minded anatomist thinks, but Willis was a busy practitioner, able to draw upon his own experience of symptoms unexplained. We may be sure that he would have been interested in what we now think about the functions of his circle, and the symptoms that occur when one of the internal carotid arteries is occluded. His observation that this may happen without hemiplegia has, of course, been amply confirmed, and also the appearance of headache as a symptom of the event. That it may be the only symptom we know from an example in which headache in a young woman without other symptoms was investigated by arteriography and internal carotid occlusion demonstrated; and in patients with hemiplegia headache as a preliminary symptom is not uncommon. The explanation we believe to be correct is that which occurred to Willis—distension of other vessels—for we know that when the wall of an artery of the head is stretched beyond physiological limits headache results.

Recent Experimental Work

As to what happens in the circle after occlusion we can only speculate, but our speculations may be guided by methods of observation and experimental records which

were not available to Willis. The experiments in which he would have delighted most are those in which a dye or other visible substance is injected into one of the afferent arteries of the circle, for such experiments he performed himself in the cadaver. Cerebral arteriography has now enabled us to see in man the course of radio-opaque solutions injected into the internal carotid and vertebral arteries, both in the normal state of the circulation and when one or both internal carotids are occluded. What we see in the arteriograms cannot be an accurate picture, for the opaque solution is injected under pressure, but arteriography has taught us a great deal. Provided that the anterior communicating artery is of fair calibre, fluid injected into one internal carotid artery, when the other is occluded by digital compression, flows into both hemispheres, and if there is bilateral carotid occlusion proximal to the circle a vertebral injection enters the branches of the internal carotid arteries by way of the posterior communicating branches, as Willis imagined.

A way of learning what happens in the normal circle is to watch the flow of injected dye in a living animal, the brain being exposed by operation. This had been done before, but not with the essential precaution of introducing the solution of dye into a vertebral or carotid artery without disturbing the normal pressure. McDonald and Potter (1951), observing this precaution, have shown that the dye entering a vertebral artery flows into the basilar and posterior cerebral arteries and forward into each posterior communicating artery up to a point about midway along its length. Conversely, dye injected into a carotid artery passes into the anterior and middle cerebral arteries of that side and the anterior cerebral artery, and backwards into the posterior communicating artery up to a point halfway along its length. At this point injection into either the vertebral or the carotid artery results in an interface of blood and dye, a dead point, at which the pressure of the two opposing streams is balanced. There is in fact no flow of blood through the posterior communicating arteries at all.

In the rabbit, which was used for these experiments, there is a single anterior cerebral artery and therefore no anterior communicating artery, but, having regard to the observation that in man a radio-opaque solution injected into one internal carotid ordinarily fills only the anterior cerebral of the same side, it is probable that in the normal circle of Willis there is another dead point at the mid-point of the anterior communicating artery. Thus there are virtually three separate streams of arterial blood supplying the brain, one from the basilar and one from each internal carotid artery, separated from one another not by any physical barrier, but by the dead points in the posterior and anterior communicating arteries, the position of each of these dead points depending upon the balance of pressure in the opposing streams.

Internal Carotid Occlusion

The most frequent cause of internal carotid occlusion is atherosclerosis, and the site is usually in the neck within a centimetre of the origin of the artery. Before the advent of total obstruction there must be a gradual narrowing of the lumen, which favours the establishment of collateral circulation. We may compare this with what happens when there is atherosclerosis of a coronary artery, for in the heart as in the brain occlusion may occur without infarction if the process of narrowing is slow and there is time for a good collateral circulation to develop. In the brain there is opportunity for widening of anastomotic channels between the superficial branches of the posterior and middle cerebral arteries, and, as we know from arteriography, the communication in the orbit between branches of the external carotid and the ophthalmic branch of the internal carotid can short-circuit the obstruction in the neck. The direction of flow in the ophthalmic artery being then reversed, it receives blood from the external carotid which, entering the lumen of the internal carotid above the obstruction, fills the middle cerebral artery. But the circle of Willis must

provide the most important source of compensatory flow. When pressure falls on the obstructed side there must be a shift of the dead point in the anterior communicating artery and a flow of blood from the unobstructed side to fill the anterior and probably the middle cerebral arteries on the obstructed side. Both hemispheres must then obtain their main blood supply from the unobstructed internal carotid, which, being in a part of its course enclosed within a bony canal, cannot be capable of any great dilatation, though even a small increase in its diameter would be an important contribution, since the volume of fluid passing through a tube varies with the fourth power of its radius. It is probable that under these conditions the maintenance of cerebral blood flow in patients who do not develop hemiplegia as an immediate effect of carotid occlusion depends mainly upon a rise of mean arterial blood pressure, for this has been observed as an effect of carotid ligation.

The equitable distribution of blood to the two hemispheres after occlusion of one internal carotid artery requires an anterior communicating artery of adequate diameter, but it seems probable that alterations of calibre in the peripheral vessels of the two hemispheres must play a part. The local effect of cerebral ischaemia is vasodilatation from the accumulation of CO₂. The hemisphere on the obstructed side, therefore, at any rate for a time, may claim more than an equal share of blood with a corresponding vasoconstriction in the hemisphere on the unobstructed side. This surmise finds support in the observation immediately after common carotid ligation of abnormal waves in the electroencephalogram in both hemispheres and occasionally only in that supplied by the unobstructed artery (P. Schurr, personal communication). If after internal carotid occlusion by disease, the total cerebral blood flow is at times less than normal and the hemisphere on the obstructed side simultaneously demands more than its fair share, this might explain the occurrence of transient loss of function in the limbs on the ipsilateral or obstructed side of the body in certain cases.

Compensatory Mechanisms

When cerebral function remains intact after internal carotid occlusion we may assume that the various compensatory mechanisms have come into action, but the situation must still be precarious. The haemodynamic crisis that has occurred is not a transient affair. There is a perpetual struggle both for the maintenance of the total cerebral blood flow and for its equitable distribution; and loss of blood volume, a fall of blood pressure, or a temporary upset of the balance between vasoconstriction and vasodilatation may cause local ischaemia or infarction with reversible or irreversible loss of function. An irreversible hemiplegia is the commonest ending, and is indeed often the first event, but it is the preliminary symptoms occurring in certain cases which invite explanation. Headache, as Willis first observed, may be one. Hemiplegia may be preceded by episodes of weakness or numbness over a period which may extend from a few hours to several years. The loss of function in these episodes may be severe, with rapid and complete recovery, and this may recur so often that occlusion of peripheral branches, by extension of clot from the site of the original obstruction, or by detached emboli, can hardly explain them. I suggest that this episodic loss of function, which must be ischaemic, is not due to any fresh vascular obstruction, but to a temporary failure of the compensatory mechanisms.

I shall venture, following the example of Willis, to relate some particulars of a patient in whom the brain was finally inspected.

This patient was a woman aged 53, known to have had mitral stenosis with auricular fibrillation for several years. The first symptom of cerebral disorder was headache, which had begun to trouble her three years previously. Its first onset was sudden, and thereafter it occurred almost daily for several hours and continued thus for six months, after which it became much less frequent and severe. Eighteen months before I saw her she had transient loss of vision in the right eye, shortly followed by

numbness and weakness of the right limbs with recovery in 24 hours. A month later there was another episode of transient right hemiparesis. A few days after she had recovered from this she had a left hemiparesis, from which recovery was complete in 48 hours. From this time onwards she had frequent attacks of a similar nature in which sometimes the right limbs were affected, sometimes the left. On the last occasion, six weeks before I saw her, she suddenly found her left hand weak and tremulous and then her right leg. This was accompanied by right-sided headache. Recovery occurred as usual in 24 hours. These episodes had been attributed to cerebral emboli, but when she came to see me in my consulting-room she was active and well, apart from the complaint of general tiredness, and on examination showed no trace of weakness or loss of sensation nor any abnormality of the reflexes apart from a relative briskness of the left arm jerks. She was admitted to hospital a few days later and died from the effects of an embolus in her left internal carotid artery. At the post-mortem inspection the findings relevant to this story were an old organized embolic occlusion in the right internal carotid artery just proximal to the circle of Willis, and two small areas of infarction of old standing, one in each hemisphere in the neighbourhood of the internal capsule.

I suggest that the occlusion of the right internal carotid artery was responsible for the phase of headache, which became less as anastomosis improved. At some time thereafter she had a small embolic infarction in each hemisphere. Each of these lesions could have caused a transient hemiparesis but could not have accounted for the very frequent attacks that have been related. Each, however, may well have resulted in a special local demand for compensatory circulation, and so have added to the effect of temporary failure of the compensatory mechanism as a whole in determining transient weakness and numbness of the limbs.

Only in one other patient have I encountered the story of transient loss of function in the limbs on the same side as the carotid obstruction, a woman who finally developed a left hemiplegia with arteriographic proof of occlusion of the right internal carotid artery in the neck. She had first attended hospital six years previously for attacks which were then regarded as hysterical. They continued up to the time of the hemiplegia. They never occurred except during menstruation, and then quite often. The onset was rapid, with a feeling she described as that of going under ether, and this feeling persisted throughout the attack. The next sensation was that of weakness and numbness experienced in those parts of her body which were in use—the arm or leg on one side of the body, never on both sides, but as often on the right as the left. If she were talking at the onset of an attack indistinct speech would be the first evidence of weakness. The whole episode lasted about five minutes, and with it she would have a bursting sensation in the neck. She had very occasionally lost her senses briefly at the height of the attack. There may be in this case some anomaly of the circle of Willis. I mention it as an example of symptoms which seem to depend upon some recurrent haemodynamic crisis following internal carotid occlusion, for I suppose this existed from the first and that the hemiplegia was the final result of a complete failure of compensation.

A Well-recognized Symptom

Transient blindness on the same side as the obstructed internal carotid is now a well-recognized symptom, though by no means common. These attacks, usually occurring at irregular intervals of days or weeks, are of a fairly constant pattern, of sudden onset and lasting from one to five minutes. As a rule they precede hemiplegia, often by many months, and frequently cease before that event. There is no doubt that the blindness is due to transient retinal ischaemia, for the retinal arteries have been observed in an attack and are bloodless. I suspect this is an example of what may be happening elsewhere in the cerebral circulation, but here with a more impressive clinical effect, for the reason that the retinal arteries have no anastomosis. The cessation of these attacks of blindness some time after internal carotid occlusion may be due to an increase of the flow from the external carotid side as anastomotic channels widen.

Conclusion

I imagine it may have been the lot of more than one Harveian Orator, as he comes to the end of his discourse, to fear that he has disappointed expectation and fallen short in the performance of an honourable duty. I have taken the name of Thomas Willis for commemoration as one of the Benefactors of the College. He gave well of the fruits of his labours preserved in those many pages which even Anthony Wood (1813-20) praised for the "natural smoothness, pure elegance, [and] delightful, unaffected neatness" of their Latin style. I have occupied some part of your time with speculation about the cause of symptoms resulting from occlusion of the internal carotid artery. If there be anything in this of the least value let me exhort you, as I have the right, to search and study out these secrets of nature by way of experiment. Willis would have approved this exhortation and perhaps have thought us laggards. He foresaw great works. The ancients, he said, bound to false suppositions, might be excused the faulty structure of their reasoning, but "those who come after should take care for the Re-edifying of the Building even from the ground, on which our most famous Harvey hath laid the Circulation of the Blood as a new Foundation in Medicine."

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PANCREATITIS FOLLOWING PREGNANCY

BY

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The relation between pregnancy and pancreatitis is little discussed in the literature, although many reports of pregnancy complicated by pancreatitis have been published (Kingsley, 1934; Cassel and Malewitz, 1950; Burger, 1952) since the cases of Schmitt (1818) and of Lawrence (1831) early last century. Langmade and Edmondson (1951) collected 53 cases from the literature and reported nine more of their own.

The earliest report of pancreatitis occurring in the post-partum period seems to be that of Haidlen (1884). Watts (1918) and Fallis and Plain (1939) have each reported two cases, and others have been described or mentioned by Deaver (1918), Paxton and Payne (1948), Roberts *et al.* (1950), Rose (1951), and Comfort and Steinberg (1952). McWhorter (1932) reported 64 cases of pancreatitis in two of which "the onset of pancreatitis occurred shortly after childbirth." Langmade and Edmondson (1951) noted that, in pancreatitis compli-

cating pregnancy, liability to an exacerbation during the puerperium was an outstanding characteristic.

Nevertheless, most recent writers do not stress pregnancy as an aetiological factor in pancreatitis (Paxton and Payne, 1948; Warren, 1948; Macnab, 1949; Fallis, 1951; Saint and Weiden, 1953). There is, however, increasing evidence to support the idea of Whipple (1907) that "acute" and "chronic" pancreatitis are differing phases of the same disease process (Comfort *et al.*, 1946), while Saint has rightly emphasized that "pancreatitis" is a general term covering several diseases which have in common only the feature of localization to the pancreas (Saint and Weiden, 1953).

This paper reports six patients with pancreatitis, in all of whom the disease was first manifest a few weeks or months after completion of pregnancy, in whom the clinical and laboratory findings were similar, and none of whom presented any evidence of the known causes of pancreatitis. It is suggested that these patients may be representative of one type of pancreatitis which forms a distinctive syndrome, to be separated from the large group of patients with "pancreatitis of unknown aetiology." For convenience, some of the features of these cases are given in Table I.

Case 1

A woman aged 20 was admitted on May 29, 1954. One year before admission she had been delivered of a stillborn child. Six weeks after this she developed flatulent dyspepsia and intermittent epigastric distress, later followed by severe constant epigastric pain radiating through to the back on the left side. She vomited occasionally. The pain was worse after fatty foods. Two weeks before admission she had more severe pain than previously, and this was followed by persistent vomiting and then jaundice with dark urine and pale stools.

On examination she was jaundiced. Her temperature was 99.8° F. (37.7° C.), pulse 80, blood pressure 120/90 mm. Hg. There was rigidity and guarding over her abdomen, but she was more tender in the epigastrium. The liver and gall-bladder were palpable. The diagnosis of obstructive jaundice due to pancreatitis was made. The urinary diastase level was 400 units.

Laparotomy was performed on June 1. The gall-bladder was normal and contained no calculi, while the pancreas was irregularly enlarged and thickened. The common bile duct was drained and a pancreatic biopsy was performed: this showed pancreatitis (Fig. 1).



FIG. 1.—Pancreatic specimen taken for biopsy at operation in Case 1. At this stage the patient was still jaundiced and the urinary diastase elevated. The specimen shows increased fibrous tissue and cellular infiltration without necrosis of the parenchymal cells; the pancreatic ducts are slightly dilated. (Van Gieson, x144.)

TABLE I.—Some Clinical Features of Six Patients with Post-partum Pancreatitis

Case No.	Family History	Parity	Pregnancy	Child	Time of Onset of Symptoms after Pregnancy	Time of Onset of Acute Pancreatitis	Abdominal Pain	Vomiting	Jaundice	Gall-stones	Result
1	Aunt had cholelithiasis	1	Normal	Stillborn	6 weeks	12 months	+	+	+	0	Well
2	Nil	1	"	Living	3 months	3 "	+	+	+	+	Recurrent pain two years later
3	"	1	Hypertension, induction of labour	"	2 weeks	6 weeks	+	+	+	+	Well. Again pregnant
4	"	1	Normal	"	9 months	11 months	+	+	0	+	Well
5	"	1	Some flatulence and vomiting	"	A few days post partum	2 years	+	+	Slight	+	Well
6	Father had cholelithiasis	2	Normal	"	11 weeks	14 weeks	+	+	0	?	?

Her convalescence was uneventful. A cholangiogram through the tube in the common bile duct on June 28 showed the anatomy of the biliary tree to be normal, and the contrast medium entered the duodenum freely (Fig. 4). The tube was removed on June 30. She has remained well since.

Case 2

This patient, aged 23, was first admitted on February 3, 1954. Three months before admission she had a normal delivery after a normal pregnancy. Two days before admission she had a sudden onset of severe colicky pain in the epigastrium radiating through to the back and associated with nausea and persistent vomiting. This was followed next day by jaundice with dark urine and pale faeces.

On examination she was icteric. Her temperature was 99° F. (37.2° C.), pulse 100, blood pressure 125/80 mm. Hg. There was tenderness in the epigastrium. The diagnosis of pancreatitis and cholelithiasis was made, although no urinary diastase estimation was done at this stage. She responded to conservative treatment with pethidine and antibiotics.

A cholecystogram on March 1 showed multiple non-opaque calculi in the gall-bladder. At laparotomy on March 5 the pancreas was enlarged, firm, and nodular. The common bile duct was normal. The gall-bladder was not thickened, but it contained small stones. Cholecystectomy was performed uneventfully. The patient has since remained well.

Case 3

A young woman, aged 19, was first admitted on December 31, 1951. Eight weeks previously she had been successfully delivered of her first child after a pregnancy complicated by hypertension and terminated by medical induction of labour. Two weeks later she had developed sudden severe pain in the back, followed by two milder attacks. Four days before admission she had a fourth attack, more severe than the earlier ones, felt both in the back and in the epigastrium and associated with vomiting. Her urine was dark and her faeces were pale.

On examination she was icteric; temperature 99° F. (37.2° C.), pulse 96, blood pressure 140/80 mm. Hg. She was thought to have cholelithiasis, and a cholecystogram on January 14, 1952, showed multiple radiolucent calculi. At operation on January 17 the gall-bladder was thickened and contained calculi. Cholecystectomy was performed. The pancreas was not examined. Convalescence was delayed by a wound infection producing erythema nodosum and necessitating secondary suture. She was discharged on March 1.

When seen again on January 28, 1954, she complained of flatulent dyspepsia and recurrent severe abdominal pain radiating through to the back and with occasional vomiting. The attacks had occurred every two or three weeks for some months. She had noted no jaundice. The clinical diagnosis of relapsing pancreatitis was confirmed by a urinary diastase of 160 units on January 28. She has been treated with a low-fat diet and atropine and ephedrine orally, with decrease in the frequency and severity of her pain.

Case 4

A woman aged 22 was admitted on March 22, 1954. Two months before admission, and nine months after a normal pregnancy, she developed flatulent dyspepsia and recurrent epigastric pain radiating through to the back, associated with vomiting and a dark coloration of her urine. Three days before admission she had severe persistent pain in the left upper quadrant of her abdomen radiating to the back, and frequent vomiting.

On examination she was not jaundiced. Her temperature was 101° F. (38.3° C.), pulse 100, blood pressure 140/90 mm. Hg. There was tenderness and rigidity in the upper abdomen, more marked on the left side. A clinical diagnosis of pancreatitis was confirmed by a urinary diastase estimation of over 2,000 units. She responded to conservative treatment with gastric aspiration, intravenous fluid replacement, pethidine, and antibiotics.

Oral cholecystography on April 7 failed to outline the gall-bladder, but an intravenous cholelithogram on May 20 showed a large gall-bladder containing multiple stones up to 1 cm. in diameter.

Laparotomy was performed on June 4. An operative cholangiogram showed the dye medium to enter the duodenum freely. There was no evidence of residual pancreatitis. The common bile duct was normal. The gall-bladder contained multiple stones and was removed, and a pancreatic biopsy was done (see below). The patient has remained well since operation, although she is again pregnant.

Case 5

A woman aged 26 was first admitted on March 22, 1949. Two years previously, a few days after childbirth, she developed epigastric pain and flatulence lasting a few days and recurring thereafter at intervals of weeks. Six days before admission she had sudden severe epigastric pain radiating through to the back and associated with nausea and vomiting.

On examination she was acutely ill and slightly icteric. Her temperature was 100.6° F. (38.1° C.), pulse 120, blood pressure 150/100 mm. Hg. Epigastric tenderness and rigidity were present. The diagnosis of acute pancreatitis was confirmed by a urinary diastase level of over 1,000 units. She was treated conservatively with morphine and antibiotics, and gradually improved over the following week.

A cholecystogram on April 8 showed multiple small calculi in the gall-bladder, and laparotomy was performed on May 4. There was fat necrosis in the omentum and mesocolon; the pancreas was thickened and irregular; the gall-bladder was thickened and contained calculi, but the common bile duct was normal. Cholecystectomy was performed uneventfully.

When last seen twelve months after operation she was well and free of pain and dyspepsia.

*Working with the aid of a grant from the National Health and Medical Research Council of Australia.

Case 6

A woman aged 22 was admitted on March 17, 1954. Fourteen weeks previously she had completed a normal pregnancy. Three weeks before admission she had a mild attack of epigastric pain lasting two days. Two days before admission she had sudden onset of severe constant epigastric pain radiating to both flanks, with nausea and vomiting.

On examination she appeared flushed and drawn, but was not jaundiced. Her temperature was 100.6° F. (38.1° C.), pulse 136, blood pressure 130/90 mm. Hg. Her abdomen was slightly distended, with generalized tenderness, and there was guarding in the epigastrium.

A urinary diastase estimation of 2,000 units confirmed the clinical diagnosis of pancreatitis. Conservative treatment with intravenous therapy, pethidine, and antibiotics resulted in rapid improvement in her condition, and she was discharged on March 31. No follow-up studies have yet been possible on this patient.

Laboratory Investigations

The laboratory investigations in all patients followed a similar pattern, and may conveniently be considered together (Tables II and III).

TABLE II.—Salient Laboratory Findings in Six Cases of Post-partum Pancreatitis. In Cases 2 and 3 the Urinary Diastase Estimations were Made After recovery from the Acute Stage of the Disease

Case No.	Urine				Blood		Total Serum Lipides (mg. 100 ml.)	Serum Cholesterol (mg. 100 ml.)
	Proteinuria	Glucosuria	Bile	Diastase	Hb (g.%)	Leucocytes (per c.mm.)		
1	+	+	+	400	13.3	6,000	480	160
2	0	0	+	30	12.1	7,000	520	210
3	0	0	+	160	11.3	11,200	500	195
4	0	+	+	2,000	9.9	16,000	—	—
5	+	0	+	1,000	14.0	28,800	—	—
6	0	0	+	2,000	7.8	15,000	—	—

TABLE III.—Liver-function Tests in Six Cases of Post-partum Pancreatitis. The Significant Abnormalities are slight Elevation of the Serum Bilirubin and Alkaline Phosphatase in Cases 1, 3, 4, and 5

Case No.	Serum Bilirubin (mg. 100 ml.)	Cephalin Flocculation	Serum Albumin (g.%)	Serum Globulin (g.%)	Serum Gamma Globulin (g.%)	Serum Alkaline Phosphatase (K-A Units)
1	4.0	Weak positive	4.7	2.0	0.8	23
2	0.2	Negative	4.5	2.3	0.9	7
3	0.2	"	5.6	2.1	1.3	29
4	2.5	Weak positive	4.3	1.9	0.9	12
5	6.0	Negative	4.8	2.3	—	25
6	0.5	Weak positive	3.7	2.0	—	—

Urine Examination.—Two patients (Cases 1 and 5) showed transient proteinuria, two (Cases 1 and 4) transient glucosuria, and all cases had bile in the urine during the acute stage of the disease (Table II). In all cases examination of the urine was normal on discharge from hospital.

Urinary Diastase.—In four patients estimations of the urinary diastase level on admission to hospital with severe symptoms revealed diagnostic levels confirming the clinical diagnosis of pancreatitis (Table II). In Case 3 a less marked elevation to 160 units was recorded when the patient presented with post-cholecystectomy dyspepsia three years after the attack of "acute cholecystitis." This reading is regarded as diagnostic in this laboratory. In Case 2 no significant elevation of the urinary diastase was found, but it was not possible to examine the urine during an exacerbation of symptoms. In this patient the diagnosis of pancreatitis was confirmed at laparotomy. Serum amylase levels were not investigated.

Blood Examination.—The results of blood examinations were variable. Two patients had a moderate hypochromic anaemia. Acute exacerbations were accompanied by a polymorphonuclear leucocytosis, which in Case 5 reached 28,800 per c.mm. (Table II).

Liver-function Tests.—The results of liver-function tests are detailed in Table III. They show slight elevation of the serum bilirubin and alkaline phosphatase, without change in plasma protein levels. When symptoms were severe a weakly positive cephalin flocculation was sometimes noted. The findings suggest that jaundice in these patients is obstructive in type, although slight hepatocellular damage may accompany peritoneal irritation in exacerbations of the disease. None of these patients was subjected to liver biopsy.

Gastric Investigations.—Because of the frequency with which the patients complained of flatulent dyspepsia, a histamine test-meal examination was made in five cases (Cases 1, 2, 3, 4, and 5), and in all it revealed a normal gastric acidity. Gastric biopsy in Cases 1 and 4 by the method of Wood *et al.* (1949) showed normal mucosa in both.

Glucose-tolerance Tests.—Oral glucose-tolerance tests after 50 g. of glucose were performed on three patients (Cases 1, 2, and 4), and none had hyperglycaemia or a diabetic type of curve.

Serum Lipide and Cholesterol Levels.—There was no elevation of the total serum lipides measured by the turbidimetric method of Kunkel *et al.* (1948) or of the serum cholesterol in those cases in which they were measured (Table II). In Cases 2, 3, and 4 fat-tolerance curves after ingestion of 50 g. of butter were performed after recovery from the acute stage. In all three cases these suggested poor absorption, consistent with impaired pancreatic function (Fig. 2).

Other Investigations.—The intravenous secretin test was not used in this study, as in our hands it has produced results too variable to be of great diagnostic value. Similar variations have been reported from other centres (Dornberger *et al.*, 1948; Heffernon and Gunter, 1951). In all patients the Wassermann reaction was negative. The erythrocyte sedimentation rate was raised during exacerbations of symptoms.

Radiological Studies

Plain x-ray films of the abdomen and chest were normal in all cases.

Oral cholecystography was performed in Cases 2 to 5 after recovery from the initial "acute pancreatitis," an interval of about three weeks. In Cases 2, 3, and 5 this revealed multiple small non-opaque calculi in the gall-bladder. However, in Case 4 there was no radiological demonstration of the gall-bladder, and an intravenous choledochogram was done six weeks later, eight weeks after initial admission to hospital. This showed the gall-bladder to be enlarged and to contain multiple calculi; the bile ducts were not outlined.

A cholangiogram was performed at operation in Case 4 (Hughes and Kernutt, 1954b). There was good filling of the biliary tree. The contrast medium flowed freely into the duodenum, and there was no demonstrable abnormality at the lower end of the common bile duct. In one film the medium had entered the main pancreatic duct by retrograde flow, and no obstruction to this was noted (Fig. 3).

In Case 1 a cholangiogram was performed four weeks after operation before removal of the T-tube from the common bile duct. The medium entered the duodenum freely and the common bile duct was normal, with the usual anatomical tapering at the lower end (Hughes and Kernutt, 1954a). No evidence of cholelithiasis was obtained (Fig. 4).

Pancreatic Biopsies

Biopsy of a specimen from the body of the pancreas was obtained at operation in Cases 1 and 4. There were no adverse sequelae from these procedures.

In Case 1 the biopsy was carried out a year after completion of pregnancy and three weeks after the onset of jaundice, at a time when the urinary diastase was still slightly raised. This biopsy showed slight increase in fibrous tissue, distorting the normal pancreatic architecture. There was some infiltration by fibroblasts, lymphocytes, and polymorphs. The acini were slightly irregular but without areas of necrosis of the parenchymal cells (Fig. 1).

The biopsy in Case 4 was carried out twelve months after the birth of her child and five months after she first developed dyspepsia. At the time of operation she had been free of symptoms for two months. The biopsy showed normal pancreatic tissue, without evidence of the preceding inflammation and with no residual fibrosis or fatty infiltration.

Discussion

These patients, and those reported by other authors, have many features in common. All were young women who developed flatulence and recurrent bouts of abdominal pain and vomiting within a few days or weeks of pregnancy, culminating in an attack of "acute pancreatitis." In all of them the clinical and laboratory findings were closely similar.

The aetiology of the pancreatitis is of the greatest interest. None of the six patients presented clinical or epidemiological evidence of infection with mumps or the other viruses known occasionally to cause pancreatitis. All had excellent dietetic histories, with no suggestion of alcoholism or malnutrition. In only two of the six was there a family history of cholelithiasis; none had a family history of cardiovascular disease, xanthomatosis, diabetes mellitus, or pan-

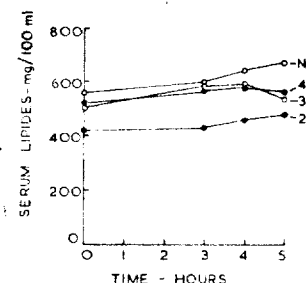


FIG. 2.—Fat-tolerance curves in Cases 2, 3, and 4. In all there is a low fasting lipide level and a rise of less than 100 mg. per 100 ml. after 50 g. of butter orally.



FIG. 3.—Operative cholangiogram in pancreatitis following pregnancy (Case 4). There is no biliary obstruction and the anatomy of the bile ducts appears normal. There has been some filling of the main pancreatic duct.



FIG. 4.—Post-operative cholangiogram in post-partum pancreatitis (Case 1). The arrangement and calibre of the bile ducts are normal, and the contrast medium enters the duodenum freely. There has been some retrograde filling of the main pancreatic duct.

creatitis, and in four cases estimations of serum lipide and cholesterol levels revealed normal values (Table II; Fig. 2). One patient (Case 2) has a binovular twin who has borne two children without evidence of pancreatic disease. These facts render unlikely the hereditary type of pancreatitis recently described and associated frequently with hyperlipaemia (Holt *et al.*, 1939; Collett and Kennedy, 1948; Comfort and Steinberg, 1952; Klatskin and Gordon, 1952). It should nevertheless be noted that one patient (No. 11) in the family reported by Comfort and Steinberg (1952) first developed symptoms a month after the birth of her first child.

The relation between the pancreatic lesions and cholelithiasis must also be considered. Cholelithiasis was present in four of the five cases in which full radiological studies and laparotomy were performed, but in none were stones found in the common bile duct, and in none was any abnormality of the sphincter of Oddi demonstrated. In Cases 1 and 4 cholangiography showed the duct of Wirsung to be freely patent (Figs. 2 and 3). Langmade and Edmondson (1951) in their survey of 53 reported cases of pancreatitis complicating pregnancy found 34 in which the gall-bladder was examined at operation or after death, but calculi were noted in only 12 of these. They stated that "there was no particular difference between those with and those without [gall-stones] as far as the onset and course of their pancreatitis was concerned." There is also statistical evidence to suggest that there is little direct relation between pregnancy and cholelithiasis (Gross, 1929; Joske *et al.*, 1954). For these reasons it is thought improbable that cholelithiasis in these patients has any aetiological significance, but rather that biliary stasis due to pancreatitis may be responsible for the development of cholelithiasis, or that both cholelithiasis and pancreatitis are sequelae of the lipaemia of pregnancy.

Reflux filling of the main pancreatic duct was shown radiologically in two patients (Cases 1 and 4). The work

of Hicken and McAllister (1952) suggests strongly that reflux into the main pancreatic duct is a frequent and normal finding in man, and of no pathological significance. They found also that this reflux may occur whether or not there is a common entry of the common bile and pancreatic ducts into the duodenum. Experience with cholangiography in this hospital agrees with this (Hughes and Kernutt, 1954b), and the relation of biliary reflux to pancreatitis in man is thought to be slight.

It is therefore postulated that these patients were in fact suffering from a type of chronic relapsing pancreatitis which is in some way related to pregnancy, and that this may represent an entity within the large group of diseases considered together as "pancreatitis."

The abnormality in pregnancy causing pancreatitis remains unknown. Liver-function tests and biopsies on pregnant women show no suggestive pattern in this regard (Ingerslev and Teilum, 1945; Day and Hellestrand, 1947; Dieckmann *et al.*, 1951). Boyd (1934) has shown that neutral fat, phospholipids, and cholesterol are all increased in the plasma during pregnancy, while Potter (1936) states that the gall-bladder is distended and that there is hypercholesterolaemia at term in most women.

The management of this disorder is poorly understood. Treatment has been conservative, surgery being indicated only in the presence of cholelithiasis, for the relief of obstructive jaundice, and for drainage of residual abscesses after an acute exacerbation. Internal biliary drainage by sphincterotomy does not seem to be indicated, because of the apparently normal state of the ducts and sphincters found in these patients, and the recent anatomical studies of Hughes and Kernutt (1954a) and of Sterling (1954).

Where symptoms of flatulence and pain have persisted the patient has been placed on a high-protein, low-fat diet and given atropine and ephedrine by mouth. It is not yet possible to speak of the efficacy of this regime or of the possible effects of further pregnancies in these patients. The recurrence of symptoms in Case 3 after cholecystectomy suggests that this syndrome may be one cause of the "post-cholecystectomy syndrome," although the normal biopsy finding in Case 4 two months after cessation of symptoms indicates that resolution may be complete.

Summary

Six cases are reported of young women who developed pancreatitis shortly after pregnancy. In all of them the clinical and laboratory findings were similar.

The aetiology of the pancreatitis is considered to be related to the preceding pregnancy, although the mechanism of this is unknown.

It is suggested that these patients, and others in the literature, form a distinct subgroup within the general group of patients with pancreatitis.

Until the aetiological factors are better understood, it is suggested that the term "post-partum pancreatitis" be applied to this subgroup.

My thanks are due to Dr. Ian Wood, head of the Clinical Research Unit, and Mr. E. S. R. Hughes for their interest and help in this work; to my colleagues in the clinical research unit for the many investigations performed on these patients; and to the physicians and surgeons who referred these cases. The photographs were prepared by Dr. J. D. Hicks and Mr. Roy Ingles, of the Royal Melbourne Hospital.

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TUBERCULOUS MESENTERIC ADENITIS IN CHILDREN*

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The purpose of this essay is to draw attention to a cause of minor illness in children which is usually overlooked in this country. It is intended to show that tuberculous mesenteric glands may sometimes cause symptoms and continue to do so even after they have become calcified.

The condition is well recognized on the Continent. Klein in 1927 reported cases from Poland and commented: "Beaucoup de médecins, en présence de cette maladie, ne croient pas à la possibilité de son existence." In Sweden, Strömbeck (1932) made a thorough review of the published work on the subject. Alexandre (1949), in France, gave another excellent account.

The symptoms described are colicky central abdominal pain, nausea, vomiting, sweating, meteorism, diarrhoea, constipation, pallor, lassitude, and loss of weight. The physical signs are palpable tumours in the abdomen, local tenderness, fever (especially in the evenings), and calcification visible in the x-ray film.

Most physicians, when confronted with calcified glands, assume that calcification signifies a healed lesion and that they must look elsewhere to account for the symptoms. If this assumption be true then we must assume also that the calcification appears suddenly and instantaneously, and that at that moment

*Condensed from the Nathaniel Bishop Harman Prize essay, 1954.

all symptoms cease. It would be better if we were to say, with the prisoner of Chillon (he was referring to his hair):

Nor grew it white
In a single night.

Strömbeck (1932) has shown the progress of calcification over a long period while symptoms continued, and in the cases here reported the same phenomenon has been demonstrated.

In this country the condition has received more attention from surgeons than from physicians (Carson, 1918; Struthers, 1921; Braithwaite, 1926). Rendle Short (1928) pointed out that an evening temperature rising to 100-101° F. (37.8-38.3° C.) may persist for months or even years.

More recently the condition appears to have been overlooked. This is probably because medical teaching centres are situated in large cities where the milk supplied to children is free from tubercle bacilli. Conway (1951) analysed the history and diagnoses of 250 children in London who complained of abdominal pain. Not one case of tuberculous mesenteric adenitis was discovered.

The following are some of the cases met with during a period of two years in consulting paediatric practice. They have been selected to show the different ways in which the disease may present itself. All the children were tuberculin-positive. All of them had had their chests x-rayed, and no tuberculous lesions were found. None of them had been in contact with infectious tuberculosis.

Case 1. Abdominal Pain

A boy who lived in the country and who had consumed raw milk from the age of 1½ years began to have attacks of pain in the left hypochondrium at the age of 8 years. This pain had no relation to meals, and occasionally woke him up. It was sharp and doubled him up, and was sometimes severe enough for him to be sent home from school. When it occurred he felt sick and turned pale. There were no abnormal physical signs. He was admitted to hospital with a tentative diagnosis of hiatus hernia or renal abnormality. His temperature, blood counts, urine, blood urea, x-ray films of the chest and sinuses, barium meal, and intravenous pyelogram were normal. An x-ray film of the abdomen showed calcified glands over the fourth and fifth lumbar vertebrae.

Progress.—He was treated with 20,000 units of calciferol daily for one month. A year later he had gained 4½ lb. (2 kg.) in weight. He still complained of pain occasionally, but it was not as severe as before. X-ray examination of his abdomen showed condensation of the calcium in the affected glands and a new area of calcification opposite the second lumbar vertebra.

Case 7. Incident Mimicking Acute Appendicitis

A Ukrainian girl who in early childhood had lived in Germany and had drunk raw milk there was admitted to hospital at the age of 11 as a case of acute appendicitis. She had then had intermittent pain in the right iliac fossa for six months. Her temperature was 100° F. (37.8° C.), pulse 92, and respirations 22. A blood count showed 8,200 white cells per c.mm. (72% polymorphs). Next day her temperature fell to normal and remained between 98 and 99° F. (36.7 and 37.2° C.) for five days. Her pulse rate remained below 100. Nevertheless on the seventh day her appendix was removed. The operation notes state that it was "inflammatory." She made an uninterrupted recovery.

Two and a half years later she was referred to the outpatient department complaining of abdominal pain in the left side. This was worse when she ran, but also occurred

at rest. On examination there was some tenderness on deep pressure at the umbilicus. She was admitted for investigation, but no abnormality was found in the chest, heart, urinary system, or gastro-intestinal tract. X-ray examination of the abdomen showed some calcified glands in front of the fourth and fifth lumbar and the second and third sacral vertebrae.

Progress.—She was treated by a course of ultra-violet light and 20,000 units of calciferol twice daily for six weeks. Six months later she was well, and said that she had more energy. She had occasional pain, but it occurred less often. The glands were palpable just below the umbilicus. X-ray examination showed an increase in the calcification of those in the pelvis, whilst the others were unchanged. Three months after this she had no pain at all.

Case 5. Abdominal Pain and Vomiting. Primary Infection Observed

A girl who lived in the country and had raw milk began to complain at the age of 4 of left-sided abdominal pain at intervals. She was usually constipated, and occasionally had frequency of micturition and pain on passing water. In one of these attacks she vomited once and was admitted to hospital in another part of the country. The summary of her notes states: "On examination, a rather pale unwell-looking child, E.N.T. normal. Chest clear. Abdomen slightly resistant to palpation, especially in the left renal angle. Physical examination otherwise showed no abnormalities. Progress and investigations: urine x 6 normal; Hb 89%; W.B.C. 10,000; Mantoux 1 in 1,000 positive; x-ray film of chest, no lesion seen; E.S.R. 10 mm. in one hour. She was allowed up before discharge, during which time she appeared well and made no complaints. Discharge note: the period of ill-health during the last 18 months was possibly due to a primary tuberculous complex. There is no evidence of activity now."

During the next two and a half years she had repeated attacks of abdominal pain lasting for periods varying up to a week. In one attack she began to vomit, and her general practitioner referred her to hospital with the following note of his findings and opinion.

"Pale and looks ill. Temperature 100.5° F. (38° C.), pulse 90. There is a tender knobby mass in the left iliac fossa. Per rectum, very tender anteriorly. I feel sure the diagnosis is tuberculous adenitis, but I cannot exclude a low-grade appendix or other pathology." The patient was admitted and the findings were confirmed. Investigations showed a normal blood count. E.S.R. 15 mm. in one hour (Westergren). Several examinations of urine for tubercle bacilli were negative. X-ray film of the abdomen showed several large calcified glands to the left of the fourth and fifth lumbar vertebrae and one small gland to the right of the third lumbar vertebra. An intravenous pyelogram showed no abnormality, and the calcified opacities were seen to be separate from the renal tract.

Progress.—The patient was treated with 20,000 units of calciferol twice daily for one month and a course of ultra-violet light. Her temperature subsided rapidly. Five weeks later she had gained 9 lb. 12 oz. (4.4 kg.) and had less pain. A year later she was very well, had gained 16 lb. (7.3 kg.) since admission, and had no pains or sickness.

Case 17. Pyrexia of Unknown Origin. Tuberculous Rheumatism

A boy who lived in the country and had drunk raw milk regularly complained of pain in the left knee and groin at the age of 7½ years. He was admitted to hospital with a diagnosis of synovitis of the left hip. This was considered to be a simple synovitis, not tuberculous, and he was transferred to an orthopaedic hospital. His temperature was normal. The E.S.R. was 2 mm. in one hour (Westergren). A blood count and his urine were normal. A chest x-ray film was normal. The condition was treated by simple traction, and six weeks later it had improved considerably. The boy's temperature, however, was raised to 99.4° F.

(37.4° C.), or even 100° F. (37.8° C.) in the evenings, and the orthopaedic surgeon in charge could not explain this. The E.S.R. had risen to 38 mm., and his weight was stationary. A second x-ray film of the chest was normal. The urine contained no pus cells or tubercle bacilli. X-ray examination of the abdomen showed calcified glands on the right side of the fourth lumbar vertebra. It was considered that the cause of the temperature was the mesenteric adenitis, and that the synovitis of the hip was a manifestation of tuberculous rheumatism.

Progress.—He was treated by rest in bed, ultra-violet light, and 20,000 units of calciferol daily for a month. At the end of this time his temperature had settled, his E.S.R. was 11 mm. and he was discharged home. Two months later he had gained 4 lb. (1.8 kg.) and was very well. His mother stated that he had an enormous appetite. A year later he was very well and had no symptoms. X-ray examination showed no change in the glands.

Case 19. Coeliac Syndrome

This boy, who lived in the country and drank raw milk, suffered from phlyctenular conjunctivitis at the age of 2 years. Two years later he complained of anorexia and vomiting, and upper abdominal pain. His abdomen appeared to be "blown out with wind." His stools were loose and offensive. He was admitted to hospital, where his weight was found to be 30 lb. (13.6 kg.). The stools were typical of the coeliac syndrome. A fat-balance test showed only 66% absorption of fat. Trypsin was present in several specimens of stool. One physician who saw him commented, "On clinical grounds I do not think that this can possibly be coeliac disease because he is so happy and cheerful, and there has never at any time been any wasting of his muscles." He suffered from a microcytic type of anaemia. X-ray examination of the abdomen showed calcified glands to the left of the second lumbar vertebra.

Progress.—He was given iron for the anaemia, but had no special treatment for the coeliac syndrome. He did very well, and when seen 13 months later had gained 6 lb. (2.7 kg.) and grown 2 in. (5 cm.). He had no pain or diarrhoea. X-ray examination showed the glands to be more firmly calcified.

Summary of Cases

Altogether 20 children were seen in whom tuberculous mesenteric glands were considered to be causing symptoms. Of these, 14 had pain as the main complaint, one had pain and pyrexia, four pyrexia alone, one showed the coeliac syndrome, and one was a case of primary infection. Details of these cases are given in the Table. There were 15 boys and five girls.

Details of Cases

Case No.	Sex	Age at Onset (Years)	Length of History	Nature of Case	Site of Glands (Quadrant of Abdomen)
1	M	8	4 weeks	Abdominal pain	Left upper, central
2	M	5	1 year	" "	Right lower
3	M	9	4 months	" "	Left upper, right lower
4	M	7	3 "	Abdominal pain, tuberculous rheumatism	Left lower
5	F	4	2½ years	Abdominal pain	" "
6	F	6	2½ "	" "	Right "
7	F	13	6 months	" "	Central, pelvic
8	M	9	1 month	" "	Right lower
9	F	8	2 years	" "	Pelvic
10	M	3	3½ "	" "	" "
11	M	6	1 year	" "	Right lower
12	M	3	9 months	" "	" "
13	M	2	7 years	" "	" "
14	M	5	7 months	" "	Left "
15	M	10	1 week	Abdominal pain, pyrexia	Right "
16	M	6	1 month	Pyrexia	Pelvic
17	M	7	Found in hospital	Pyrexia, tuberculous rheumatism	Right lower
18	F	9	" "	Pyrexia	" "
19	M	4	8 months	Coeliac syndrome	Left " upper
20	M	2	Nil	Primary infection	" "

The age of onset was fairly evenly spaced throughout the third to eleventh years of life. The duration of symptoms before the first contact with a paediatrician varied from one week to seven years. Most cases were seen during the first year, and a small group at two to four years. The average length of history was one year four months.

All the patients except one lived in the country. The exception was a boy living in Bath who had previously lived in the country.

The glands demonstrated by x-ray examination were most often seen in the area of the ileo-caecal junction, but there were nearly as many along the line of attachment of the mesentery of the small intestine. In four cases the glands appeared to be in the pelvis. In two cases in which the infection took place at an early age the glands were demonstrated high up to the left (Cases 19 and 20). It may be that early or overwhelming infection occurs high up in the small intestine in an area which drains into glands on the left of the midline, whereas later and milder infections take place lower down the gut, where the mesentery is attached to the right side of the abdomen. In the infants at Lübeck the majority of the glands were found on the left.

In four of the cases it was possible, on looking back, to disclose illnesses which might have been due to primary infection (Cases 4, 5, 6, and 7). In one case the primary infection was observed in hospital and the glands were discovered by chance when the patient returned later with a different illness (Case 20).

Differential Diagnosis

The condition must be differentiated from non-tuberculous causes of pain, pyrexia, or vomiting, and these are legion. During the two-year investigation described below the following diagnoses were made in children who complained of abdominal pain; acute nephritis, dietary indiscretion, empyema, hernia of the linea alba, idiopathic epilepsy, idiopathic thrombocytopenic purpura, inadequate dentition, non-specific mesenteric adenitis, pneumonia, psychological disturbance, pyelitis, recurrent neutropenia, and salmonella food-poisoning. The causes of pyrexia are too numerous to mention.

If the tuberculin test is positive it is important to make sure that there is no active tuberculous lesion in any other organ. Pulmonary tuberculosis, especially when accompanied by pleurisy, may cause abdominal pain; and tuberculous peritonitis and inflammation of the spine must also be considered. Affection of the renal tract must be excluded by repeated examination of complete morning specimens of urine for pus cells and tubercle bacilli.

The radiological appearance of tuberculous glands is usually unmistakable. They are round or oval; the shadows are not homogeneous, but mottled, and appear like a mulberry or an archipelago as seen on a map. They may lie anywhere in the abdomen, but are usually seen along the line of attachment of the mesentery of the small intestine. In the lateral view they are often in front of the spine.

During the two-year survey other causes of shadows in the abdomen found were: stones in the gall-bladder, calcified phleboliths in a girl with multiple angiomas, calcification in an adrenal neuroblastoma, and various pills and tablets. No renal stones were seen.

The Lübeck Catastrophe

At Lübeck in 1930 virulent tubercle bacilli were administered inadvertently by mouth to 251 infants (Schürmann and Kleinschmidt (1935). Seventy-two died from tuberculosis within a year. Practically all the children who developed primary lung lesions died, while the majority who had primary alimentary lesions survived. In many cases the abdominal infection produced no symptoms or very vague ones. Calcification of the abdominal glands was seen at the earliest 18 months after the infection; and after

three years it had reached its final stage. Late results such as obstruction and the coeliac syndrome were not observed.

X-ray films were taken of 173 children at 4 years of age, and 126 of them had calcification in the abdominal glands. This was rather more common on the left side, suggesting that the site of infection was usually high up in the small intestine.

One most important point is the benign course of the disease in the abdomen compared with the serious outcome when the lungs were affected.

Treatment

In the majority of cases the disease proceeds to heal spontaneously, and it may be that there is no need to interfere with this natural process. Previous workers have usually approached the problem from the surgical angle. Arguments have been put forward for and against removal of the affected glands. It has been pointed out that sometimes when the diagnosis is in doubt it is imperative to operate rather than run the risk of neglecting to remove an acutely inflamed appendix. It has also been noted that after an exploratory laparotomy tuberculous mesenteric adenitis may improve in a spectacular manner, even though the glands are not removed, just as tuberculous peritonitis may.

Wallace (1946) and Gauvain (1948) have reported favourably on the calciferol treatment of tuberculous glands in the neck. Macrae (1947) has studied the effect in tuberculous peritonitis. Gauvain stated: "Calciferol causes an early flare-up of activity, followed generally by rapid healing, which is of such a sound degree that the glands can be immediately and, so far as we can tell at this early stage, safely excised with little risk of recurrence."

The dose of calciferol used by Gauvain was 100,000 units daily for several months. Macrae used even larger doses. He reported some alarming reactions. One of his patients died from haemoptysis from a very small cavity, the presence of which had been unsuspected. None of the patients consuming large doses of vitamin D felt fit, and all of them lost weight.

Results of Treatment.—It seemed that it might be dangerous to produce a flare-up in the abdominal glands, and that the ideal to aim at would be to produce a more gradual healing, imitating the natural process, but gently expediting it. It was therefore decided to give the children only 40,000 units of calciferol daily and to support this with a course of ultra-violet irradiation when this could be conveniently arranged. The treatment was continued for six weeks. Results are difficult to assess in a condition which usually proceeds to spontaneous cure. The numbers available are not sufficient for definite conclusions to be drawn, but on the whole the impression was that treatment gave considerable benefit. In most children the pains abated, the appetite improved, the weight increased, and after three to six months there were no more symptoms.

Flare-up.—Two of the treated children (Cases 8 and 16) demonstrated phenomena which might be considered to be due to mild exacerbations or flaring up of the disease. Neither was seriously inconvenienced and both were eventually regarded as cured.

Case 16.—A boy aged 6 years who lived in the country and consumed raw milk complained of pain in the legs and had fever of 99 to 100° F. (37.2 to 37.8° C.) for a month. He was admitted to hospital and found to have a positive tuberculin reaction. Calcified glands in the presacral region were seen on the x-ray film. Other investigations were negative. He was treated with calciferol and ultra-violet irradiation. Two months later he stated that he had had two attacks of abdominal pain lasting for two days. The pain was colicky and was felt at the umbilicus. He had lost 1½ lb. (0.7 kg.) in weight in the first month, but had regained it. Three months after this he had had no pain or pyrexia. He had gained over 5 lb. (2.3 kg.). X-ray examination showed firmer calcification.

Recommendations

When active tuberculous mesenteric adenitis has been diagnosed as the cause of symptoms it seems reasonable to recommend that the child should be given the benefit of treatment with calciferol. A convenient dose is 50,000 units daily, as tablets are made in this strength. This treatment is not expensive: the retail price of 50 tablets is 2s. 9d. and 500 cost 19s. 6d. Treatment should be continued for six weeks. In this dosage no fear need be entertained about toxic symptoms, but if headache, anorexia, or vomiting occurs the situation should be reviewed, especially with regard to raised blood pressure and protein in the urine.

In the acute case in which the possibility of appendicitis has to be considered a count of the white blood cells may be of value. If this is low or normal and an x-ray film of the abdomen shows calcified glands a policy of watching in hospital is probably justified. If there is any serious doubt it is better to proceed with a laparotomy.

There is no justification for treating this mild disease with streptomycin, para-aminosalicylic acid, or isoniazid.

Incidence in Consulting Practice

The Bath clinical area consists of a city of some 90,000 inhabitants and a large surrounding rural region with a total population of approximately 200,000. For medical purposes the area is covered by two consultant paediatricians. An analysis was made of all patients seen by one of these paediatricians during a period of two years (from October 1, 1951, to September 30, 1953, inclusive).

The total number of children seen for the first time either in the out-patient department or in the wards was 825. In 58 (7.03%) of these the main complaint was abdominal pain. Eight of the 58 had pyrexia also. Twenty-two other children were referred for pyrexia alone (2.73%).

Of the 58 children with pain 8 had tuberculous abdominal glands (13.79%). Of the 22 with pyrexia 1 (4.55%) had infected glands. Of the 80 who had either pain or pyrexia nine had infected glands (11.25%).

Relation to the Tuberculin Test.—Of the 58 cases with pain, 13 were tuberculin-positive. Eight of these had active tuberculous glands. Of the other five, one had a tuberculous infection of the lung, one a hernia of the linea alba, and in the remaining three cases a diagnosis could not be made. It may be that some of these children were undergoing a tuberculous process in the abdomen in which calcification had not yet appeared, or would never appear. Follow-up has so far revealed no such calcification.

Comparison With Tuberculosis of Other Systems.—During the two-year period, in addition to the nine cases of tuberculous mesenteric adenitis, one case of tuberculous peritonitis was encountered. There were 10 cases of tuberculosis of the lungs, two cases of tuberculous meningitis (both with primary lesions in the lung), one case of phlyctenular conjunctivitis, and one of tuberculous cervical adenitis. The total number of cases of active tuberculosis was 24. In 10 of them the abdomen was principally affected, and in 14 it was not. It may be inferred that in this clinical area abdominal tuberculosis is very nearly as important as the pulmonary variety.

In passing, three children were found to have healed calcified lesions in the lung, and two had healed inactive glands in the abdomen.

Incidence in a Group of Schoolboys

This is not a satisfactory control series. It is made up of boys only, of a social status not comparable to that of the population at risk. However, it consists of observations on healthy normal children who were not selected by reason of any medical symptom, and the results obtained were so startling as to be worthy of publication.

The boys were boarders aged 11 to 16 entering a public school in two successive years. They came from all parts of the country. A large number of them were the sons

of parsons; the rest were mainly sons of other professional men. Of the 128 boys seen and tested with tuberculin jelly, 25 reacted positively. These 25 boys were subjected to x-ray examination, and 18 (72%) of them were found to have calcified abdominal glands. One had calcified glands in the neck as well. Four (16%) had healed lesions in the lung, and the remaining three (12%) had no demonstrable tuberculous lesion.

The parents of the 18 boys with abdominal glands were asked for details of any unexplained pain, pyrexia, or obscure prolonged illness in the past. Seven reported unexplained pain and pyrexia, one pain and vomiting, one pain and anorexia, and one pyrexia alone. Only eight could recollect no symptoms at all. That the illnesses were not minor is shown by the following extracts (verbatim) from the replies.

Case 21.—"From the age of 4 years his health history has been one of recurring attacks of headache, raised temperatures, vague tummy-aches, intermittent diarrhoea, and marked lethargy. . . . He saw a number of doctors in each place where we lived, but none could find a reason for the symptoms, and I was assured 'He would probably grow out of it.' He was x-rayed in — about two years ago; three doctors failed to agree on the diagnosis. The tuberculosis specialist said there was nothing 'in his department'; but our doctor was not so happy about it, and, acting on his advice, I put the boy to bed for six months' complete rest. Since then he has seemed better."

Case 22.—"When he was 2 years old he first complained of a pain in his abdomen, but it did not trouble him very much. When he was 2½ he suddenly ran a temperature. We called in a doctor, who seemed unable to diagnose. When he was almost 5 he again ran a temperature, and very shortly afterwards our doctor suggested we called in a specialist. He examined him thoroughly, but could find nothing abnormal. After a further slight recurrence at about 7 years I arranged for Professor — to examine him, and he too could not find anything wrong. Since then he has had occasional spasms of pain which were relieved by resting for a short while."

Case 24.—"He certainly has had stomach pains, in which case we have always called our doctor in, but he has never been able to find anything wrong with him. Incidentally, he has for a period of a week run abnormally high temperatures, for no apparent reason, not once but many times. Secondly, he was always complaining of feeling very tired. I used to think he was lazy, when the doctor assured me at all times that he was a very healthy boy."

Case 26 (son of a medical man).—"He had repeated attacks of tonsillitis, and occasional attacks of abdominal pain when he was younger. I made the diagnosis at that time of tuberculous ileo-caecal glands, and x-ray examination of the abdomen at the age of 8 revealed what you have found—a calcified mass in the right iliac fossa."

Case 28 (from the family doctor).—"Six years ago he had symptoms of appendicitis, and a laparotomy was done. The appendix was mildly inflamed and there were definite tuberculous glands in the right iliac fossa."

Milk Supply

Abdominal tuberculosis is usually thought to be contracted by drinking infected milk. There are occasions when it may be traced to contact with open cases of pulmonary tuberculosis, but they are rare. Toddlers put most small objects in their mouths, and may thereby ingest some dried sputum from dust on the floor or road. Ashby (1923) reported cases of abdominal tuberculosis from Manchester in which no unboiled milk had been drunk. Strömbeck (1932) refers to cases occurring in Japan in 1904, when cow's milk was unknown as a food there.

Pasteurized and tuberculin-tested milks are usually considered to be safe. Pasteurized milk has been proved to be satisfactory and a stringent check is kept on its production. Tuberculin-tested milk, however, may occasionally contain

tubercle bacilli. The intervals between inspections are fairly long and tuberculous cows are occasionally found in the herds. The danger arising from this is made worse by the practice of bulking milk in 1,000-gallon (4,500-litre) containers for transport. Accredited and non-designated milks cannot be regarded as free from infection.

In the cases described above it was usual to obtain a history of drinking raw milk for prolonged periods, though the parents of some of the children would admit to no such exposure.

Wilson *et al.* (1952), writing on infection with bovine tubercle bacilli, state: "Many of the records suggested that the consumption of raw milk must have been only slight or occasional, pointing to the danger of drinking raw milk at any time or in any form."

It is possible that one draught of raw milk is enough to start a primary infection; and there must be few country children who have not at some time had a glass. However careful their parents may be, children are bound to go out for meals or snacks sometimes and to drink milk of unknown quality. Perhaps boys will do so more than girls, and this may be the explanation of the preponderance of boys in the series.

Of the milk supplied by retailers in Bath in 1953 85% was heat-treated, 14% tuberculin-tested, and only 1% raw. In Wiltshire, however, in the same year, 12.16% was heat-treated, 50.72% tuberculin-tested, and 37.12% raw. Some of the raw milk was transported out of the county and pasteurized elsewhere (mainly in London), but the situation is nevertheless alarming.

Figures for morbidity and mortality of non-pulmonary tuberculosis show the result of this. The morbidity rate for non-pulmonary tuberculosis in Wiltshire in 1952 was 0.1673 per thousand, compared with 0.1200 for Bath and 0.1410 for England and Wales. The death rates for 1952 were: Wiltshire, 0.0309, Bath, 0.0000, England and Wales 0.0280.

It would be fair to comment that a number of deaths occurred in the county from a disease which could and should be prevented. At some future date the county will become a "designated area" under the Milk (Special Designations) (Specified Areas) Order, 1952, and from then on the condition described in this essay will gradually become rarer until it goes the way of scurvy, rickets, and congenital syphilis.

Summary

Attention is drawn to the importance of tuberculous abdominal glands as a cause of pyrexia and abdominal pain in childhood. Twenty cases are described, including examples presenting with pain, pyrexia, attacks resembling acute appendicitis, tuberculous rheumatism, and the coeliac syndrome. Reference is made to the experience at Lübeck in 1930.

Treatment with 50,000 units of calciferol daily for six weeks is recommended as a means of expediting the natural process of healing. This is not expensive.

The incidence of abdominal tuberculosis has been investigated. It is concluded that in the area under review it is now nearly as common as pulmonary tuberculosis. It seems to be more common in boys than in girls.

A survey of unselected normal schoolboys led to the discovery of further cases which had in the past caused baffling symptoms. In this group abdominal tuberculosis was more common than pulmonary.

The relation between the incidence of the disease and the consumption of raw milk is discussed.

I have much pleasure in placing on record my thanks to Dr. John Apley for his continued encouragement and for providing ready access to cases under his care; and to the consultant

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ADDENDUM.—Since this essay was written cases of tuberculous mesenteric adenitis have been encountered with undiminished frequency, and another case of tuberculous rheumatism has been seen. The main problem encountered has been the diagnosis of cases in which the clinical picture is typical, the tuberculin test is positive, no other tuberculous lesion can be found, but no calcification is seen on x-ray examination. In these cases the diagnosis is vague, being arrived at by exclusion and therapeutic test. The use of radioactive calcium for tracing the process of calcification in the glands might be of value. Unfortunately no suitable isotope has yet been discovered.

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A COMPARISON OF VACCINATION WITH VOLE BACILLUS AND B.C.G. VACCINES

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B.C.G. vaccine was first used as a measure to prevent tuberculosis in human subjects in 1922. While, so far, there is no direct evidence that B.C.G. vaccination does in fact protect against tuberculosis, the experience gained in many countries, such as Denmark, goes far to support such a contention, and the vast majority of tuberculosis physicians throughout the world advocate the extension of anti-tuberculosis vaccination, believing that if it was adopted on a wide scale it would quickly reduce the number of new cases. A murine form of acid-fast bacillus found in voles was described in 1937 by Wells (1946), and from this organism he prepared a vaccine which he showed produced tuberculin conversions and acted in a manner very similar to B.C.G.

The course of vaccination with B.C.G. has been fully described: it is usually uneventful and produces little or no discomfort. However, there appear to be good reasons for carrying out investigations into new forms of vaccination. B.C.G. vaccine is not necessarily the ideal immunizing agent, as it is an artificial organism which might lose its potency. It would be wise to have available a proved substitute, and vole vaccine might well be suitable.

Any investigation of the action of vole vaccine must be controlled by a corresponding group treated with B.C.G., and all the conditions regarding surroundings and observations must be identical.

As vaccination with either B.C.G. or vole vaccine is a harmless procedure, neither giving rise to any systemic reactions, a comparison between the two vaccines can best be made by noting the ease of administration: the conversion rates; the early local reactions; the reversion rates; and the late reactions, or the late cosmetic effects. The final comparison must obviously include a note of any subjects who subsequently develop tuberculous disease. This is a matter of a long-term observation and cannot be completed until a period of at least fifteen to twenty years has elapsed.

The present investigation, which is being carried out at the Orphan Homes of Scotland, Bridge of Weir, began in the autumn of 1951. Of the 783 children between 1 and 15 years of age resident in the homes, the 575 included in the initial series and the 130 in subsequent series were negative reactors to 100 I.T.U., using old tuberculin. Details of the preliminary tuberculin survey have already been reported (Frew *et al.*, 1953). In all the cases x-ray examination by the M.M.R. unit failed to show any chest lesions. For the principal series, in 1951, two equal groups were selected by random methods, care being taken to ensure that both groups were as nearly as possible equal in regard to sex, age, school class, and cottage. B.C.G. was given to 288 children and vole vaccine to 280.

Administration

The B.C.G. vaccine was obtained from normal supplies prepared in the State Serum Institute in Copenhagen and given in the normal manner.

The vole vaccine used was in three forms: (a) Dry, reconstituted vaccine (2 mg. dry weight per ml.), used in 1951. (b) Liquid vaccine (2 mg. dry weight per ml.), used in 1952. (c) Liquid vaccine (half-strength) (1 mg. dry weight per ml.), used in 1953.

In 1951 the under-5-year group (numbering 55) were given the vole vaccine by intradermal injection, the dosage and method being identical to those used for B.C.G. In the case of the children of 5 years and over, vaccination was carried out by multiple puncture. The apparatus used consists of a spring-loaded gun which, on release of the trigger, projects 40 needles through a predetermined distance. For the present work the needles were adjusted to penetrate a depth of 2 mm. A sterile circle of rice paper of the same diameter as the end plate of the gun was dipped into the vaccine, applied smoothly to the skin, and the punctures were made through it. Little pain was felt, many of the children stating that they felt only a dull knock, and no dressings were required.

Conversion Rates

1951 Group.—Routine tuberculin-testing was begun at the end of the second week and was continued at weekly intervals until each case was recorded as positive. In children of 5 years and over, Mantoux-testing, using 100 units old tuberculin, was used, while in children under 5

years the tuberculin jelly test was used without flourpaper. The conversion rates for the various groups are shown in Table I. Very rapid conversions were noted in the B.C.G. group, the percentage after three weeks being 93% (99% in those over 5 years of age). The conversion rate in the vole group was slower, being 66% after three weeks and 79% after four weeks. Table I shows, however, that by

TABLE I.—B.C.G./Vole Conversion Rates

Total	Positive					
	2nd Week	3rd Week	4th Week	6th Week	8th Week	
B.C.G.						
Kinder- garten (1-4 yrs.)	56	18 (32%)	39 (70%)	48 (86%)	53 (95%)	55 (98%)
Primary Sec. and outside schools	174	86 (49%)	171 (98%)	172 (99%)	173 (99%)	174 (100%)
	58	48 (82%)	58 (100%)	58 (100%)	58 (100%)	58 (100%)
	288	152 (53%)	268 (93%)	278 (96.5%)	284 (98.6%)	287 (99.6%)
Vole						
Kinder- garten (1-4 yrs.)	55	18 (32%)	42 (76%)	53 (96%)	54 (98%)	55 (100%)
Primary Sec. and outside schools	169	27 (16%)	102 (60%)	119 (70%)	160 (94%)	167 (98.8%)
	56	27 (48%)	40 (71%)	49 (87%)	53 (95%)	56 (100%)
	280	72 (26%)	184 (66%)	221 (79%)	267 (95%)	278 (99.3%)

the sixth week the percentages were B.C.G. 98.6% and vole 95%; and 99.6% and 99.3% at the eighth week. Further testing at 12 weeks showed that in both groups there was a final 100% conversion. It was also noted that in the under-5-year group (intradermal vole) the rate of conversion was more rapid than in the corresponding B.C.G. group, and it is interesting to note that subsequent tuberculin testings at 6, 12, and 24 months have shown that no reversions have occurred in this vole group.

1952 and 1953 Groups.—In these groups tuberculin-testing was carried out at three and six weeks, and by the latter date complete conversion had taken place (Table II).

TABLE II.—Vole Vaccine Conversion Rates

	Total	3rd Week	6th Week
1952	38	—5 years 42% +5 .. 92%	100%
1953	49	—5 .. 38% +5 .. 86%	100%

Local Reactions: 1951 Series

B.C.G.—The reactions followed the usual course—macule, papule, and ulcer. On the whole they were rather more severe than expected and greater than met with in similar groups vaccinated as contacts or school-leavers. In the under-5-year group ulceration was noted in 96% and enlargement of the axillary glands in 48%. This adenitis was first noticed at five weeks, but in two cases it did not develop until the fourteenth week. In only one case did the condition progress to abscess formation. The average diameter of the ulcers noted was 4–5 mm. They were usually at their largest at approximately seven weeks, and healing occurred in from eleven to twenty weeks. In the children of 5 years and over ulceration was noted in the majority. The ulcers were on an average from 5 to 8 mm. in diameter (in nine it exceeded 8 mm.); they were at their greatest size at from five to eight weeks and healing took place in a very variable time from nine to twenty-six weeks. In five cases an axillary abscess formed between the third and ninth months, and in two cases acid-fast bacilli were demonstrated in the pus obtained from the abscesses. The presence of pus did not seem to have any adverse effect on the rate of healing or on the rate of conversion. Auto-inoculation was noted in a number of cases—usually on the skin of the arm adjacent to the vaccination.

Intradermal Vole.—The local reactions in this group were marked by their severity. Deep ulcers were noted in 100% of the cases, and all showed enlargement of the axillary glands. This adenitis was first noted at three weeks, and in all cases was present by eight weeks. Axillary abscesses occurred in 25 cases, or 45%. Several of these axillary abscesses were late in developing. Examination of the pus obtained from these glands showed acid-fast bacilli in 18 out of the 25 cases. The ulcers were 7 to 8 mm. in diameter, were deep, and reached their largest at seven to eight weeks, and, on an average, healing took place in from fourteen to twenty-eight weeks. A feature of this group was the very satisfactory healing which followed the admittedly very severe local reactions.

Multiple Puncture Vole.—In vaccination by multiple puncture no generalized reactions were noted and no child complained of pain or discomfort. The typical rosette began to develop in two to three weeks and varied greatly in size. Ulceration was noted in one case, but this was due to secondary infection following a severe blow on the vaccination site. In only three cases did an abscess develop in the axillary glands—one at a very late date—and in none of these cases was this complication accompanied by any systemic upset. Acid-fast bacilli were demonstrated in the pus obtained from the glands in all three cases. In no case was there any suggestion of auto-inoculation.

Local Reaction: 1952 and 1953 Series

The multiple-puncture vole vaccinations followed the pattern already described. The development of the rosettes was more satisfactory and the percentage of complete rosettes greater than in 1951. A 100% conversion was obtained by the sixth week.

Reversion Rates: 1951 Series

The data so far collected, relating to reversions, concerns the 1951 series only. Tuberculin-testing was carried out at six months, one year, and two years. As before, Mantoux-testing was employed in those aged 5 years and over, and the tuberculin jelly tests—without using flourpaper—in the under-5-year group. The initial Mantoux tests were carried out using 10 I.T.U. and all negative reactors were retested with 100 I.T.U.

Since the beginning of the investigation an increasing number of children have left the homes. We have made every effort to have these children followed up by the local public health departments, but unfortunately it has not been possible to carry out the periodic tuberculin-testing in all. The number of reversions reported here are a percentage of the children actually tested at the periodic surveys.

Table III shows that the percentage of reversions at six months and one year showed little difference between B.C.G. and vole groups, but by the end of the second year the

TABLE III.—Reversion Rates

	Under 5 Years				5 Years and Over			
	Vole		B.C.G.		Vole		B.C.G.	
	No. Tested	Reversions	No. Tested	Reversions	No. Tested	Reversions	No. Tested	Reversions
Start	55	0	56	0	225	0	232	0
6 months	54	0	55	0	223	0	219	2 (0.9%)
1 year	53	0	54	0	221	4 (1.8%)	217	4 (1.8%)
2 years	50	0	45	1	200	14 (7%)	195	20 (10.3%)

percentage of reversions was higher in the B.C.G. group. Furthermore, no reversions had occurred in the intradermal vole group at the end of the second year. No case which had reverted to negative at one year was found to be tuberculin-positive at two years. It was noted at each routine tuberculin-testing that a number of cases required retesting with 100 I.T.U. The number of such cases was small at six months, larger at one year, and much greater at two

years. The number of children requiring retesting was definitely greater in the B.C.G. than in the vole group (Table IV).

TABLE IV.—Cases Requiring Retesting with 100 I.T.U.

	Vole				B.C.G.			
	No. Tested	—5	5+	Total	No. Tested	—5	5+	Total
6 months	277	—	12	12	274	1	19	20
1 year	274	3	37	40	271	1	71	72
2 years	250	4	61	65	240	10	86	96

It is too early to place much importance on these figures, but they appear to suggest a greater diminution of allergy in the B.C.G. than in the vole group.

The percentage of reversions would seem to be high. Routine retesting of a group of contacts in the County of Renfrew shows a reversion rate of 1.5% after two years and 5.2% after three years. In this connexion it should be noted that the children in the homes were all examined by the M.M.R. unit each year and that no cases of active tuberculosis were found at any of these visits. They therefore did not receive the minimal doses of infection such as one would expect if they had been living outside the homes, and this fact is very possibly responsible, at least to some extent, for the high reversion rate.

Reversion Rates: 1952 Series

Routine tuberculin-testing carried out at one year confirmed these findings. The fact that further tuberculin-testing with 100 I.T.U. was required in 26.5% of the B.C.G. group as against only 5.1% of the vole group again suggests that the allergy produced by the vole vaccine is more permanent, or at least stronger, than that resulting from vaccination with B.C.G.

Late Cosmetic Results: 1951 Series

The late results of the B.C.G. vaccinations were those normally observed, and no ugly or objectionable scarring was noted. It was particularly pleasing to note the excellent healing and absence of bad scars which followed intradermal vole vaccination in spite of the severe early reactions. In multiple-puncture vole vaccinations the routine weekly inspections showed that the individual puncture marks developed induration which became progressive and subsequently increased over a period of nearly one year. This induration was first noted in the older children during the seventh and eighth weeks, and in the younger ones during the tenth week. At the final reading of the entire series, at the end of six months, induration was noted in 62 cases (30% of those available for inspection). At the end of the first year 154 (67%) out of the 229 cases still resident in the homes were inspected, and the results of this inspection are summarized in Table V.

TABLE V.—Cosmetic Results with Vole Vaccine

	1951 Series				1952 Series	
	After 1 Year		After 2 Years		After 1 Year	
	No.	%	No.	%	No.	%
A. Complete healing, with no residual marks	50	32.5	60	44.1	4	10.5
B. Small needle prick (size of original ones) still seen (no induration)	20	13.0	14	10.3	11	28.9
C. As for B, but individual marks a little larger	66	42.9	30	22.1	19	50.0
D. Indurated arms	8	5.2	20	14.7	2	5.3
E. Complete healing, with residual scarring	10	6.5	12	8.8	2	5.3
Total Satisfactory	154	95%	136	89.7%	38	95%

It was noted that complete fading had occurred in 32.5%; almost complete fading in 13%; while in a further 42.9% the resultant scars were slight and could not cause any

adverse criticism. In 88.4% the rosette had completely or almost completely disappeared. The 6.5% which showed scarring were not in any way unsightly, and our inspections have therefore shown that in almost 95% of the cases the late appearances of the vaccinations were satisfactory. In 5.2% of the cases, however, definite induration of the individual parts of the rosette was noted, and in 4% this was severe.

Inspection of the rosettes was repeated at the end of the second year and 136 arms were seen at this examination. The results are classified in Table V.

During the second year the proportion of arms with complete healing and no residual marks increased from 32.5% to 44.1%. Arms showing induration of the lesions rose from 5.2% to 14.7%, being slight in 4.4% but definitely unsightly in 10.3%. All these reactions were in children vaccinated by the multiple-puncture method. The term "induration" is used to describe local reactions of a lupoid character, varying from a few dry, indolent, crusted spots to a confluent, raised patch, similar in size to the area of the multiple-puncture gun. The increase in the proportion of lesions of this type between the observations made after one and two years was surprising and quite unexpected. Equally unexpected and disappointing was the fact that the appearances noted in arms showing marked induration at one year showed practically no change at the inspection at the end of two years. Several recorded at two years were seen in arms which had been regarded as healed at the end of one year and no explanation can yet be advanced to account for them. They are lupoid in appearance. While their cause is obscure we feel that trauma and possibly superinfection in the wide area of vaccination by the multiple-puncture gun are contributing factors. There has never been any suggestion of any lupoid reaction in any of the children receiving intradermal vole vaccine.

The 1952 series of vole multiple-puncture vaccinations were inspected at the end of one year, and the results were similar to those noted in the previous series. These late reactions are tabulated for comparison in Table V.

Discussion

After considerable experience with both methods we believe that multiple puncture has many advantages. There is no danger of injecting the vaccine at too deep a level, as may happen with the intradermal method in young and nervous children.

It is too early to draw firm conclusions on the results. Even though conversions take place more quickly with B.C.G. vaccine, the fact that by six to eight weeks the rates in the B.C.G. and vole are equal, and that conversions ultimately took place in 100% of our cases, indicated that the allergy produced is equally satisfactory with both vole and B.C.G. vaccines. When the reversion rates are considered there is no doubt that those relating to vole vaccine are more favourable. In our first series of cases, which have already been followed up closely for over two years, the proportion showing late lupoid reactions after multiple-puncture vole vaccine is, we consider, too high, and although the vaccine has distinct potentialities, we feel that it cannot be employed on more than an experimental basis until these difficulties have been overcome. We have noted that conversion always took place if any part of the rosette developed. We felt that satisfactory results could be obtained with half-strength liquid vaccine. The 1953 vaccinations were carried out to test this point, and so far we can report 100% conversion after six weeks.

All our 1951 cases have been followed up for over two years, and no case of tuberculous infection has yet been reported. One point which must be kept in mind is the definite loss of allergy after two years. What percentage of reversions can be expected after three, four, or five years? Any final comparison and decision regarding the merits of the vaccines must obviously await further testing of each of the three (and any other) groups over a further period of at least three to four years.

Summary

This report describes an investigation designed to compare vaccination with B.C.G. and vole bacillus vaccines, and records the preliminary results after one and two years. The B.C.G. was given in the routine intradermal manner and the vole vaccine by multiple puncture to those of 5 years and over and intradermally to those under 5 years. Vaccination by the multiple-puncture method is probably slower than by intradermal injection, but it is considered to be the method of choice and is simpler and more certain in young children.

The rate of conversion after vole vaccination is a little slower than after B.C.G., but the percentages—95% after six weeks and 100% after twelve weeks—are very satisfactory, and compare closely with those obtained with B.C.G.

We believe that vaccination with vole bacillus has certain advantages because of the milder clinical course and the smaller rate of reversions.

The periodic surveys showed that induration developed in a substantial proportion of the cases receiving vole vaccine by the multiple-puncture method, and that, later, lupoid reactions occurred in the vaccination area. These later complications were noted in 5% and 15% of the cases inspected after the first and second years. The discovery of lupoid reactions at the second yearly inspection in arms regarded as healed at the first yearly inspection was unexpected and unfortunate, and we regard the rate of these reactions to be too high to permit of the routine use of the vaccine until these difficulties have been overcome.

We are indebted to the Council of Management of the Orphan Homes of Scotland for permission to carry out the investigation; to Dr. J. S. M. Gray, County Medical Officer of Health, Renfrewshire, for help in carrying out the work; and to Professor F. R. G. Heaf, Dr. A. Q. Wells, and Dr. K. Neville Irvine for advice and assistance.

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At the North of England Education Conference held in Sheffield on January 6, Mr. L. J. BARNES, director of Social Training at Oxford University, unfurled, in the words of the *Manchester Guardian* (January 7), "the banner of professional syndicalism." "We know," Mr. Barnes said, "that health centres don't exist because in the main the doctors don't want them." There was no evidence, however, of any opposition among teachers to county colleges. If the doctors wanted health centres they would get them; educationalists did not get county colleges whether they wanted them or not. The difference lay in the different types of professional organization in the two fields. The National Health Service, Mr. Barnes said, had come into being on the basis of professional syndicalism, subject only to parliamentary control. The doctors had managed it very cleverly and ingeniously, and he believed they were right to have done so. Professional syndicalism, subject only to lay control at the top, was the traditional pattern of the British public services; in education alone there was not yet any trace of it. "That fact is a great misfortune," Mr. Barnes concluded. "We shall never get anywhere in the field of adolescent education and welfare until the teaching profession takes effective steps in the direction of professional syndicalism."

TREATMENT OF PAPILLOMA OF
BLADDER WITH RADIOACTIVE
COLLOIDAL GOLD AU¹⁹⁸

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Villous papillomata of the bladder are usually multiple, and the possibility of distinguishing between benign and malignant tumours is an open question, both from the urologist's point of view, depending on interpretation of cystoscopic appearances at one and successive examinations, and from the point of view of the interpretation by the pathologist of the histological findings. In a proportion of patients papillomata in other situations, such as the larynx, breast, large intestine, and rectum, undergo malignant change, and it may be that villous papilloma of the bladder could correctly be regarded as a pre-malignant condition, as suggested by Riches (1948).

Buerger (1915) suggested that changes in size and staining properties, atypical mitoses, and multinucleate cells are evidence of malignant change. These changes would probably now be called "carcinoma *in situ*," but the further changes which he has described—invasion of the basement membrane and subsequent infiltration of the connective-tissue stroma of the papilloma and the presence of epithelial cells in the bladder wall and in blood vessels—are undoubted evidence of carcinoma. In 30% of 52 cases of carcinoma of the bladder reported by Buerger the carcinoma had been preceded by a papilloma. The true proportion of such malignant changes is masked by the fact that the papillomatous nature has been lost when a large, frankly malignant tumour is first found. These facts, and the fact that clinically benign and malignant papillomata often co-exist in the same bladder, accord with the view of Willis (1953) that pathological distinction between benign and malignant papillomata may be impossible.

Methods of Treatment

The treatment of these lesions by cysto-diathermy has for many years been the method of choice, but the results of such treatment are difficult to find. It is certain, however, that a number of patients develop incurable malignant disease after many years' cystoscopy and diathermy. Others may be cured by total cystectomy, which has been advocated as the treatment of choice even in relatively early cases. Total cystectomy, however, has a mortality and a morbidity which seem a high price to pay in the early cases.

X-ray treatment is used, but involves treating the whole bladder and some of the surrounding pelvic organs to a high dose of radiation.

The use of an intravesical rubber balloon containing radioactive solutions (Walton and Sinclair, 1952) or a central solid radioactive source emitting gamma radiation (Cones and Gregory, 1952) in a suitable balloon has also been tried, but, although the dose falls off relatively rapidly from the surface of such a balloon, the dose given to the subepithelial connective tissue is likely to be 70–90% of the dose to the bladder wall, and is likely to result in undesirable vascular and connective tissue changes which may, after some years, produce atrophic or metaplastic changes in the bladder epithelium.

Rationale of a New Method of Treatment

Because of these considerations, when presented with a patient suffering from haematuria due to myriads of papillomata covering the whole bladder surface, it was decided to explore the possibilities of using beta radiation to treat the papillomata. If the radioactive fluid could be used to fill the bladder without any containing balloon, the papillomata would float freely in it and be irradiated from all sides. The normal bladder wall, on the other hand, would be irradiated from only one aspect and the limited range of the beta emission would provide a very rapid fall in dose. Thus only the epithelium of the bladder would be treated and the subepithelial connective tissue would be almost unirradiated.

For such a method radioactive colloidal gold from A.E.R.E., Harwell, appeared to be the most suitable material available, since its beta emission (0.96 MeV) had a half-value layer of about 0.3 mm., which is comparable to the thickness of the papilloma as shown in Fig. 1, and its colloidal nature would militate against its absorption. It had the advantage that it could be introduced through a catheter, without opening the bladder, in a sufficient concentration to give a large enough dose of radiation during the relatively short time before the patient had to empty his bladder. It was estimated that some 300 mc. should be given in about 100 ml. of saline, so that, taking account of the dilution by urine passing into the bladder from the ureters, the dose to the bladder wall in two to three hours would be of the order of 3,000 r.

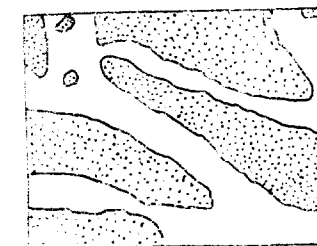


Fig. 1.—Relation of the half-value layer to thickness of the papilloma.

Preliminary Tests

Dangers in using such a large amount were anticipated from two points of view: (1) The absorption into the blood or lymph of 5 or 10% of such a large dose might have undesirable consequences. (2) The retention by sticking to the bladder wall of a relatively small amount could result in huge doses (about 1,000,000 r for 1 mc. per square cm.) of radiation to the bladder epithelium. (This had been found to occur in similar work with thorium-X before artificially produced isotopes were available. Thorium-X is an alpha-particle emitter with a range of only about 10 microns, however, and only beneficial results were observed.)

It was necessary to confirm that the colloid would remain in suspension while in the bladder. The solution is supplied slightly alkaline (about pH 8 in samples tested), and it was considered that the gelatin might become unstable and the colloid precipitate in acid conditions. Alkalinization of the urine would prevent acidity in the bladder but lead to a large excretion, diluting the radioactive solution and limiting the maximum period of retention.

Actually a sample of inactive gold colloid was acidified with HCl to about pH 2 without any precipitation occurring immediately, on standing, or after incubation at 56° C. for about half an hour. Therefore 95 ml. of this inactive gold was introduced into a male patient's bladder through a catheter, which was then tied off. After two hours 340 ml. of fluid was drained off. The pH was only about 7 and no precipitation could be observed.

On the next occasion a similar volume of colloid was used with a total activity of about 400 µc. After two and a half hours 235 ml. of fluid was drained off and the bladder washed out three times with saline, each lot of fluid being retained. Also urine was collected for the next 12 hours. The activities of these samples, determined by comparison with a standard dilution from the original colloid,

were 97%, 4.5%, 0.5%, 0.05%, and 0.05% respectively in fluid drained from the bladder, in the first, second, and third rinses, and in the urine. This total (102%) corresponded to the whole of the injected activity within the experimental accuracy. The gamma count rate over the bladder was not significantly above background, and a blood sample taken just before the bladder was drained showed no detectable activity.

Treatment

As these tests showed that the colloid was not precipitated in the bladder or absorbed, it was decided to proceed with treatment. Following cystoscopy, a Foley catheter was passed into the bladder. Three hundred mc. of radioactive colloidal gold in 100 ml. was taken into a syringe, a small sample was retained for making a standard dilution, and the rest was introduced into the bladder after the balloon of the Foley catheter had been inflated with 5 ml. of fluid. The end of the catheter was then securely tied off and the catheter fixed by strapping so that the balloon was used to close the neck of the bladder. After two and a half hours the bladder contents were drained off and the bladder washed out eight times with warm saline, by which time the washings were practically colourless.

The fluid and rinses were retained for activity measurements, and urine was collected for 24 hours. Care was taken to avoid leakage round the catheter and spillage of the active fluids during injection, draining, and rinsing. Gamma counter measurements were also made over the patient immediately and about 24 hours after the bladder was emptied. It was estimated that very much less than 0.5% of the injected gold was retained in the bladder and no other site of activity was observed. The dose received by the bladder epithelium was estimated to be 3,000 r (2,700 rep beta dose, 300 r gamma dose).

After two months the treatment was repeated, using an ordinary catheter, and a dose of about 2,400 r was delivered to the bladder wall.

When examined cystoscopically six weeks later, no papillomata could be seen except for a ring of small nodules around the internal urethral meatus where the contact of the Foley bag had protected them from the beta radiation. It was decided to treat these locally with radioactive cobalt so arranged in a Foley balloon at the neck of the bladder as to give a dose of 3,000 r, using a source-epithelium distance of 1 cm.

The patient is now well and symptom-free, and at his last cystoscopy, 15 months after the last treatment, his bladder wall was normal in appearance throughout. No other treatment has been given. The case summary is given below.

A man aged 67 was referred on September 8, 1952, by Mr. Till. He had had three weeks' haematuria in June, 1952, and occasionally since, and dysuria and nocturnal frequency since June, 1952; now D'S=3-hourly 2-hourly. Cystoscopy on August 29 had shown that the bladder was covered with villous papillomata, the main mass of growth being above the right ureteric orifice and around the left ureteric orifice.

October 10.—Biopsy: transitional-cell papilloma. Injection of non-radioactive colloidal gold into the bladder for two hours to test for possible precipitation. Blood: Hb, 81%, white blood cells, 5,000 per c.mm.

October 14.—110 ml. slightly active colloidal gold for two hours to ensure that no residual radioactivity remained after washing out the bladder.

October 18.—Radioactive colloidal gold, 377 mc. in 105 ml. for three hours. Total dose to surface, 3,000 r.

January 9, 1953.—Cystoscopy. Two papillomata: (A) above right ureteric orifice; (B) medial to left ureteric orifice; (C) fronds at bladder neck. Suggested diathermy of (A) and (B). Radium in Foley catheter to (C) and another treatment with colloidal gold.

January 27.—Coagulation of (A) and (B) (Mr. A. S. Till). Second injection of radioactive colloidal gold, 274 mc. in 100 ml. for three hours. Total dose to surface, 2,950 r.

April 14.—Radioactive cobalt in Foley catheter to treat neck of bladder, 3,000 r in 5 hours 20 minutes. Blood urea, 27 mg. per 100 ml.

June 16.—Cystoscopy. Redness of bladder wall. No neoplasm.
December 1.—Cystoscopy. Normal bladder mucosa. Symptom-free except for nocturnal frequency. The patient says this is a habit—he empties his bladder whenever he wakes up. Blood: Hb, 96%; white blood cells, 5,100 per c.mm.
April 20, 1954.—Symptom-free. Cystoscopy: normal bladder.

Suggested Routine

As a result of this treatment, experience has now been gained which makes it possible to recommend the following routine procedure in centres where the drill for the handling of isotopes is established.

1. It is necessary to get the permission of the Medical Research Council to use the method.

2. After cystoscopic examination the plan of treatment of the case is decided, bearing in mind the morbid anatomy and pathology and the possible effects of the various surgical and radiotherapeutic steps in treating and possibly spreading the growth. For instance, in a recent case with multiple large malignant papillomata the plan decided upon was 3,000 r x rays (275 kV) to the bladder, 4,000 r with radioactive cobalt in a balloon introduced via a perineal urethrotomy, diathermy of any residues six weeks later, and then gold to be used only if seedlings began to develop subsequently.

3. Having decided to use the colloidal gold method, fluid intake is forbidden on the day of treatment. An ordinary rubber catheter of a large size is introduced, the bladder emptied, and the end of the catheter double tied. In females a purse-string linen suture is passed around the catheter at the external urethral meatus and tied tightly so as to prevent any risk of leakage.

4. Using the special protective gun (see Figs. 2 and 3) which has been made to enclose a 100-ml. syringe, some 300 mc. of colloidal gold is drawn into the syringe and made up to 100 ml. with saline.

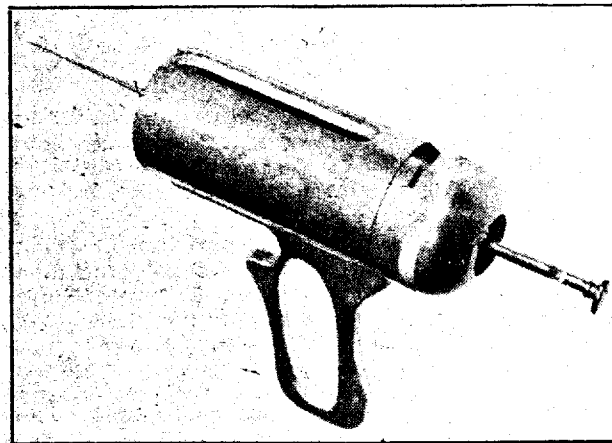
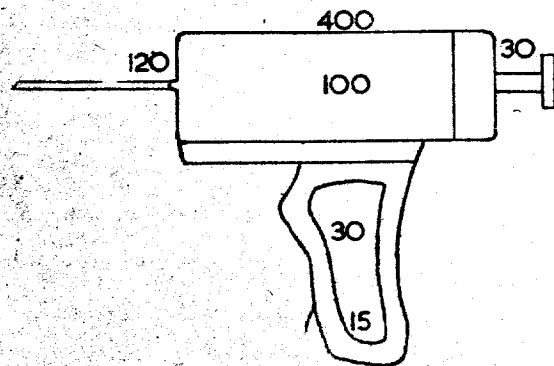


FIG. 2.—Lead-protected gun for 100-ml. syringe.



D/R in MR/min. for 300 mc. Au^{198} in 100 ml.

FIG. 3.—Diagram of the syringe gun with 5-mm. lead protection.

5. The solution is injected, using a thin Record needle passed obliquely through the wall of the catheter.

6. Two samples of about 2 ml., one taken at the start and one at the end of the injection, are retained as standards for measurement of the activities of the fluid drained from the bladder and washes.

7. The patient is returned to the ward and put to bed. If he is active the solution mixes well with the urine passing into the bladder, but if he is sleepy following an anaesthetic it is necessary to move him about, tilting the bed and turning him on to his side so as to ensure mixing. This has been done because in one patient, who was asleep and stationary until the bladder was emptied, the bladder contents showed definite lack of mixing.

8. At the appropriate time (two and a half hours to three hours, determined as being likely with the dose used and the expected dilution to have given a dose of 3,000 r), with suitable precautions, the contents of the bladder are run off into a glass jar, and the bladder is washed out five or six times with warm saline into a succession of glass jars until the washings are free from the colour of the gold colloid.

9. The percentage of the gold in these washes is determined and the gamma-ray measurements are made over the suprapubic region with a counter, so as to determine if further washing is needed. This has not been necessary so far.

10. The urine is collected for 24 hours.

11. The dosage is estimated as described in the Appendix below.

Discussion

The points which it is required to know in connexion with any new method, apart from its rationale and technique, are: (a) if it is safe and if there are any untoward effects; (b) the type of case in which it is effective; and (c) other possible uses.

Safety

The method as detailed above has now been used on 22 occasions with no untoward effects on the patient and no suggestion of danger to staff. All patients have been sufficiently free of radioactive material and free of symptoms to leave hospital the next day.

Type of Case

(i) As previously indicated, the method was designed to treat cases of multiple villous papillomatosis. We have had only one such case referred. This has been described in detail above.

(ii) The method has been used also to treat the bladder in cases of papillomatosis with carcinoma. It is clear that the thickness of the tumour must determine the dose it receives, and so, when there are thick papillomata or a carcinoma, the dose received at a depth below the surface will be too small to be effective. Nevertheless, in some cases a rapid shrinkage may easily be obtained of part of a tumour, making easier a decision regarding subsequent treatment. This is illustrated by the following case summary:

A married woman aged 79 was referred by Mr. D. C. Corry on January 9, 1953. Her history was that she had the first attack of painless haematuria three years ago for two to three days and the second attack two weeks ago. She saw Dr. Wase after one week and continuously since.

January 5, 1953.—Cystoscopy. Papilliferous tumours of base of bladder obscuring both ureteric orifices. Suggested radioactive gold to clear the bladder and diminish the size of the tumour. Then Co^{60} balloon.

January 20.—Radioactive colloidal gold, 289 mc. in 86 ml. for three hours. Total dose to surface, 3,050 r.

February 24.—Cystoscopy. Tumour much smaller. Ureteric orifices seen. Three papilliferous tumours seen close to right ureteric orifice.

March 10.— Co^{60} in balloon. 5,500 r in ninety-three hours at 3.3 cm. distance.

May 1.—Cystoscopy. Tumours still smaller, but three papillomata still present.

August 14.—Cystoscopy. Biopsy of one lesion remaining just above right ureteric orifice. Transitional cell carcinoma—Broders's Grade 1.

August 21 to 28.—Treatment by uterine and vaginal radium to base of bladder—2,500 mg.hr. in uterus and 2,500 mg.hr. in vagina.

(iii) Treatment with radioactive colloidal gold has also been used as a method of treating the bladder to diminish the surface activity of a malignant growth three to four weeks before opening the bladder in cases in which cystostomy for implantation of radium, radon, or radioactive tantalum or for partial cystectomy was intended.

(iv) It would theoretically be possible to treat with radioactive colloidal gold the pelvis of a kidney which is the seat of papillomata. However, it is doubtful whether accurate diagnosis of such cases or adequate follow-up afterwards will ever be possible.

Summary

A technique is described for the treatment of multiple villous papillomatosis of the bladder whereby some 300 mc. of radioactive colloidal gold (Au^{198}) may be introduced per urethram so as to deliver a dose to the bladder epithelium of about 3,000 r in three hours. The recommended course is two such treatments with about two months' interval.

The procedure is safe for the patient and for the staff, if properly carried out.

It has caused complete disappearance for fifteen months of myriads of papillomata in a 67-year-old man, leaving him symptom-free.

In cases unsuitable for complete treatment by this method it may be used to bring about the disappearance of multiple small tumours and to stop haemorrhage. Accurate cystoscopic examination may thereby be rendered possible and the surface of a carcinoma devitalized preparatory to subsequent cystostomy.

APPENDIX

Estimation of Dose.—Beta Dose: The maximum range of the Au^{198} beta particles is only some 3.8 mm., so that with any layer of active fluid of thickness greater than this the dose rate at the surface will be half that in an infinite medium and will be proportional to the specific activity. From data given by Marinelli, Quimby, and Hine (1948) the dose rate at the surface for an activity of 1 mc. per ml. would be 405 rep/h.* (340 rad/h.†). The depth dose will be small, falling to 50% at 0.3–0.4 mm. depth. **Gamma Dose:** Au^{198} also emits gamma radiation of 0.41 MeV energy, and the gamma dose rate at the surface will depend on both the specific activity and the dimensions of the cavity. If the bladder is considered as a sphere of radius r cm., the dose rate is given by 15.1 r (see Mayneord, 1950). This figure is based on a dose rate of 2.4 r/h. at 1 cm. from 1 mc. The depth dose here will be greater, but will have fallen to 50% at depths of 0.75–1.5 cm. for radii of 2.5–5 cm.

Deducting the volume of the catheter itself, the initial bladder volume is taken as equal to the volume of fluid injected, and the volume of fluid drained from the bladder is measured. It is assumed that urine drains into the bladder to increase the fluid volume at a constant rate, and the initial and final beta and gamma dose rates are calculated from the corresponding specific activities and volumes. The gamma dose rate does not, of course, increase linearly with volume, but, as this contributes only 10–15% of the total, the surface dose is given with sufficient accuracy from the average beta and gamma dose rates.

A nomograph for calculating these dose rates is given in Fig. 4.

We acknowledge the helpful co-operation of Dr. C. Lewis and Dr. P. J. van Miert in carrying out this technique, of surgical colleagues on the staff of the United Oxford Hospitals and Swindon Hospitals in referring patients for treatment, and of Mr. G. E. J. Jackson in the design and construction of the protected syringe gun.

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*1 rep=83.5 ergs/g.
†1 rad=100 ergs/g.

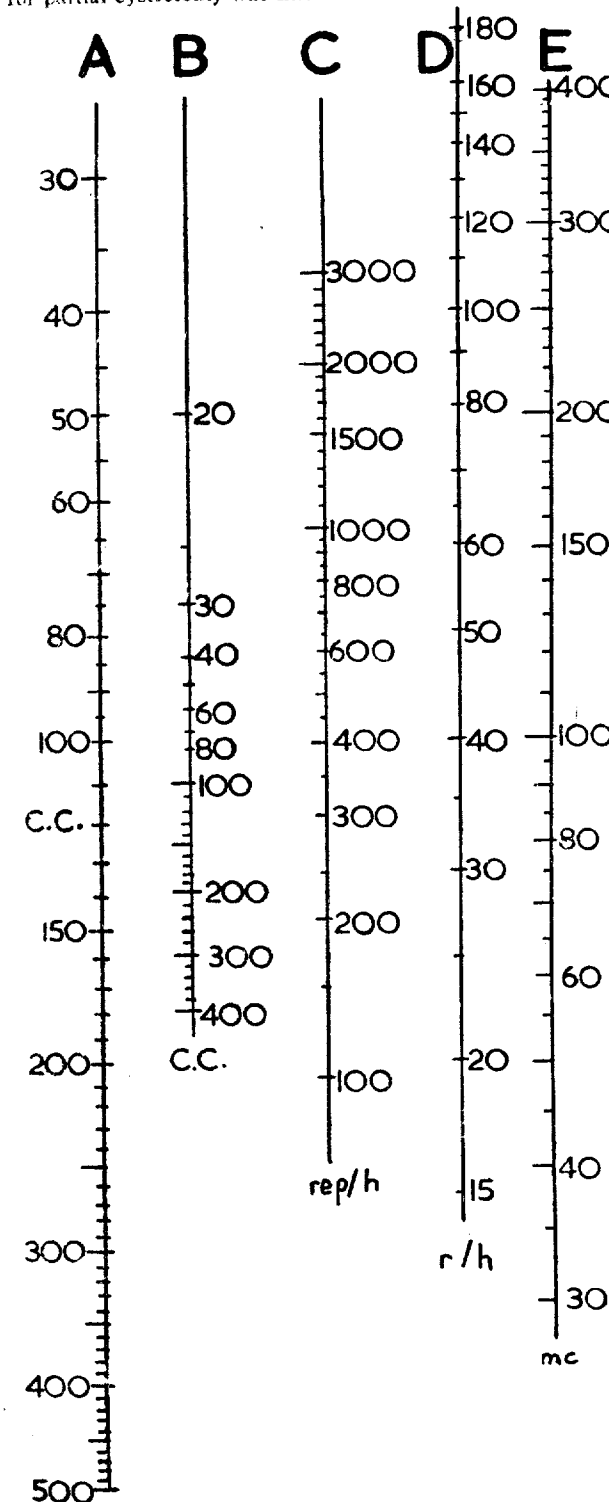


FIG. 4.—Nomograph for calculating the surface dose rate in the bladder. Read volume on "A" and mc. on "E" to give beta D/R on "C"; then from this value on "C" and volume on "B" read gamma D/R on "D."

SPINAL DISK LESIONS

AN ASSESSMENT AFTER TWENTY-ONE YEARS

BY

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Physician to the Department of Physical Medicine,
St. Thomas's Hospital*"One-third of all orthopaedic out-patients complained of low backache. Had the panel any suggestion for coping with this vast number?"**"They had none."* (One of the questions put at the autumn meeting of the British Orthopaedic Association.)

In 1934 Mixter and Barr published their epoch-making paper describing relief from sciatica after the removal at laminectomy of part of a low lumbar disk. At the time the lesion was thought most rare, but in due course increasing experience enabled this diagnosis to be made more often. By ten years later the common cause of what had been called "sciatic neuritis" was beginning to be recognized as a low lumbar disk protrusion. Actually, Goldthwait (1911) had already ascribed lumbago and sciatica to disorders of the lumbo-sacral joint.

Cervical disk lesions soon came to the fore—the analogy was obvious—and by, say, 1950, root pressure from a cervical displacement was beginning to be widely regarded as a common cause of "brachial neuritis."

Thoracic disk lesions have only just begun to gain appreciable acceptance as the cause of "intercostal neuritis."

So much for root pain. But it had been known for centuries that lumbago often led to sciatica; that scapular "fibrositis" usually preceded brachial neuritis, and that "intercostal neuritis" might follow posterior thoracic pain. By 1950 the idea was gaining ground that lumbago was caused by internal derangement at a low lumbar level (Cyriax, 1945), and soon afterwards, that scapular and thoracic "fibrositis" might have their source in disk lesions at the relevant spinal levels (Cyriax, 1948). All this has now ceased to be particularly controversial, and the concept of a disk lesion causing pain solely in the trunk is already firmly established. Given that this is so, what effect has all this new knowledge had on the prescription of treatment? To-day, attending every hospital are large numbers of patients correctly diagnosed as suffering from disk lesions causing pain in trunk or limb. Is enough effort being made to employ effective measures on this large number of patients, some already severely disabled, and others in danger of such disablement unless given immediate attention? The answer is "no."

Cervical Disk Lesions

These usually present a unilateral scapular aching associated with pain on moving the neck. At this stage the displacement is small and immediate manipulative reduction succeeds in 99% of all cases, provided that general anaesthesia is avoided. One, seldom two, sessions suffice. Traction has been shown by radiography (Cyriax, 1954) almost to double the space at the intervertebral joint; strong manual traction is therefore maintained while the manipulations are carried out. Only slight discomfort is felt. This simple measure not only affords immediate relief from the scapular pain but prevents the later onset of brachial neuritis.

Occasionally a cervical disk protrusion causes central neckache or bilateral scapular discomfort, or bilateral brachial pain or paraesthesiae in the upper, lower, or all four limbs. In such cases immediate reduction is more important than ever: for any of these events implies that the protrusion is passing backwards in the midline. Since it has become evident that pressure from a central herniation on the spinal cord (Middleton and Teacher, 1911; Brain, 1954) and on the anterior spinal artery is responsible for cases hitherto diagnosed as amyotrophic lateral sclerosis or progressive muscular atrophy, it is reasonable to suppose that immediate reduction followed by its repetition whenever necessary may spare patients crippledness in later years.

Once root pain down the arm has begun, manipulative reduction is more difficult. When muscle paresis is absent, it remains successful in two-thirds of all cases; if a marked root palsy has supervened, failure is almost certain. The change from scapular discomfort to root pain may take years in one patient, hours in another. Hence there should be no delay; in each suitable case the manipulation should follow the establishment of the diagnosis within a few minutes.

Thoracic Disk Lesions

Whether causing posterior or anterior thoracic pain, a protrusion irreducible by manipulation during manual traction is a rarity. Should one be encountered, daily sustained traction seldom fails. By keeping the prevalence of thoracic disk protrusion in mind and examining the thoracic spinal joints for articular signs, the clinician can avoid many mistaken diagnoses of visceral lesions, hitherto obscure pain of months' or years' standing being found relievable within a few minutes. Moreover, since a thoracic protrusion can compress the spinal cord, reduction provides the prophylaxis of one cause of postero-lateral sclerosis and paraplegia.

At the thorax the maintenance of reduction is difficult. Lordosis is unobtainable; hence the patient must do his best not to stoop or lift; for eventual redisplacement is a virtual certainty. Manipulative reduction must then be repeated.

Lumbar Disk Lesions

These often start by causing chronic backache in women and attacks of lumbago in men. In the former case a small posterior displacement is present the whole time; in the latter the patient suffers bouts of acute lumbar pain and fixation caused by a major attack of internal derangement, but is symptom-free between-whiles. In backache, manipulative reduction, without anaesthesia, is usually successful; should it fail, sustained traction is called for. Between 100 and 200 lb. (45 and 90 kg.) is applied while the patient lies on a special couch for up to an hour daily. Manipulative reduction is also the treatment of choice in lumbago if the patient can bear it. If he cannot, epidural local analgesia is indicated; this abolishes the pain for one and a half hours, during which time he lies prone on a couch in hyperextension. The pain seldom returns to anything like its previous intensity.

Once reduction has been achieved redisplacement is obviated so far as is possible by postural instruction in the maintenance of lordosis and the provision, when necessary, of a corset or a plastic jacket. I have no patience with those who apply a plaster—belladonna or plaster of Paris—to the patient without reducing the displacement first. No one would dream of applying a plaster to a fracture without reducing it first, and, in my view, identical considerations apply at the lumbar spine.

When root pain has come on, reduction is often successful when straight-leg raising is limited but conduction is either not affected or only slightly. Should manipulation fail, traction is often quickly successful. Marked root paresis designates a protrusion too large ever to retrace its steps, but often implies an early cessation of pain; it is often best left alone. Primary postero-lateral herniations—that is, root pain without previous backache—in young patients are usually best left to recover spontaneously, with

or without the help of epidural local analgesia. Long-standing sciatica can sometimes be cured outright by one or two epidural injections.

When conservative treatment fails and the symptoms warrant, operation is indicated, but it is important not to confuse minor lesions in hypersensitive patients with major lesions. Laminectomy or arthrodesis is called for in 1 in 200 of the cases seen by me. It is difficult to escape the impression that, were conservative treatment on the lines set out above employed, many cases would not get to the point of laminectomy at all. Certainly many patients who had been considered unrelievable except by laminectomy have been found to respond satisfactorily and quickly to the above methods of conservative treatment.

Discussion on Treatment

Though the patient does not realize it, a disk lesion is a medical emergency. Future trouble is obviated so far as is possible if reduction can be carried out as soon as the diagnosis is established. Not only does the patient lose his symptoms there and then, but stretching of the posterior longitudinal ligament is reduced to a minimum. Since this ligament forms the only bar to further protrusion, every effort must be made to spare it the prolonged pressure of continuing displacement, especially at the cervical and thoracic regions, where the spinal cord is in danger. Moreover, nearly all disk lesions set up pain in the trunk before the root pain supervenes; hence if reduction is carried out at this stage increased protrusion leading to root pressure is avoided.

This has been the policy for years at our physical medicine department. The methods are based on logic, are simple, and have proved effective. Manipulative reduction is usually carried out by the physiotherapy staff and students; they too attend to traction. My registrars and I give the epidural injections. In the last 17 years I have given some 15,000 such injections to unprepared out-patients without serious mishap.

The fact remains, however, that there is scarcely a hospital in the country where a minor disk subluxation is manipulated back into place while it remains minor and easy to reduce. Since patients with reducible displacement of part of a disk abound in every hospital, and the technique of reduction involves manipulation without anaesthesia, we have found that there is seldom any need for the doctor to give the treatment himself. This is delegated to trained personnel, and for the last 10 years our physiotherapists have carried out these manoeuvres with manifest success.

The adoption of mechanical traction has proved less tardy, and within only five years of its advocacy for disk lesions (Cyriax, 1950) a number of hospitals have installed, or are considering installing, a traction couch. Epidural local analgesia appears everywhere unobtainable as an immediate out-patient measure. It is sad to reflect that these three main stand-bys of early treatment are not available to most sufferers. Only recumbency, a plaster jacket, and operation remain—all methods that, in my view, are called for only should the simple and quick methods fail.

But the patients know better. They go to the lay manipulator. And many medical men, knowing that neither themselves nor their hospital can help in such cases, recommend osteopathy. But why, when doctor and patient know that manipulation is the treatment of choice, is the patient forced to have recourse to a layman—not only that, but to pay him as well? Such a state of affairs would be unthinkable in any other branch of medicine and would not be tolerated for one moment were the displacement osseous. Yet a cartilaginous displacement requires reduction no less than a bony one. It is remarkable that this medical hiatus exists in the case of the spinal joints only—the very joints at which internal derangement is most frequent. The gift to the unqualified manipulator represented by this situation must astonish him; for great public esteem attaches to

instantaneous relief from pain. Doctors thus render their own profession great disservice when the possessor of the common reducible disk lesion is left to wander to a layman.

Manipulation by Laymen

Neglect by medical men to consider manipulating a spinal joint, even after they themselves have stated internal derangement to be present, has created a group of laymen styling themselves osteopaths, chiropractors, and bone-setters. Patients do not wish to seek treatment outside the medical profession—even less so now, when they already pay the State for all medical care—but they discover that the appropriate treatment is not obtainable within the Service. So they have to go to a lay manipulator. And one must admit that, though devoid of diagnostic skill, such laymen often, in spite of not realizing the nature or the level of the lesion, relieve the patient immediately by a few simple manipulations. How easy it must therefore be for doctors or trained physiotherapists, with their anatomical knowledge, and basing themselves on a proper diagnosis, to do so too (Cyriax, 1949).

Were manipulation of the spinal joints restored to the medical sphere, not only would all suitable patients be relieved at once and the liability to further trouble be reduced to a minimum, but much abuse would be avoided, since the evil inherent in unsupervised recourse to laymen would cease—namely, repeated, fruitless, and expensive visits for conditions insusceptible to manual treatment.

Sooner or later, public agitation that spinal manipulation shall be obtainable within the Health Service will encourage the osteopathic fraternity to press again for State recognition. Luckily their fantastic claims put them outside the pale at the inquiry at the House of Lords in 1935. Let medical complacency not go too far; in Switzerland osteopaths are officially recognized, and in France osteopathy is a compulsory subject for medical students. The medical profession of Great Britain would be put in a most awkward position were another inquiry held to-day and the question asked of a number of hospitals—what arrangements exist in your out-patient department for spinal manipulation? Are the medical students shown, and the physiotherapy students at your school well grounded in, manipulation for disk displacement? It is no answer to say that manipulation is obtainable under anaesthesia by the orthopaedic surgeon on in-patients; this approach touches only the fringe of the problem, as the existence of some two thousand lay manipulators in this country demonstrates. The orthopaedic surgeon has many far more important operations to perform and, with the best will in the world, cannot deal with more than a tiny fraction of suitable cases, even if the beds were available.

Medico-legal Aspect

This has its anxious side. When a patient consults a medical man and is found to have a fracture out of alignment, a dislocated bone, or a displaced cartilage at the knee, reduction (usually by manipulation) is the accepted treatment. Were no effort made to reduce the displacement, or a good reason for refraining not set out, the attending practitioner might well find himself in medico-legal difficulty. In these times of increasing litigation it will not be long before some enterprising patient, after he has developed a major disk lesion, points out that, when he first consulted his doctor, the displacement was slight and that no effort at reduction was then made. Moreover, it may well happen that after various medical men have been consulted—and it is agreed by all that a displacement is present—the patient gives way to his friends' exhortations and visits a lay manipulator, who may afford him immediate relief. The patient can now argue very plausibly that he had an easily reducible disk lesion but that none of those whom he consulted treated him skilfully. This might be construed as negligence, not on the part of the general practitioner, but on that of any consultant he may have seen. In my

view the time is not far off when the illogical but time-honoured attitude of leaving a minor disk lesion to get larger or smaller as fortune dictates will provide us with another legal hazard.

Economic Considerations

If a family doctor is asked how many patients in bed with lumbago he has at any one moment, the usual answer is one, two or three. This implies that between 20,000 and 50,000 patients are off work at any one time because of a displaced fragment of disk. Were patients off sick because of a stiff neck, brachial neuritis, "fibrositis," pleurodynia, and sciatica all added to the list, a huge total of largely avoidable disablement would be reached. This costs the Health Service in sickness benefits far more than the expense that would be entailed in securing adequate treatment for the sufferers. Without further research, merely by a more general application of methods already evolved and continuously tested since, a great saving in pain and disablement would accrue, with huge advantage to the financial aspect of health insurance. From the economic point of view it is the logical treatment of the common disorders of the vertebral column that would make the biggest immediate contribution to industrial health to-day.

Summary

The rediscovery 21 years ago of intervertebral disk lesions explains the cause of many pains in the trunk and limbs, previously misunderstood. This clarification has not been followed by enough change in methods of treatment. Measures thought appropriate in previous decades—for example, heat, massage, exercises—remain in use at a time when reduction by manipulation or traction is required.

At present spinal manipulation for disk lesions is largely in the hands of laymen. This is a sad state of affairs; for if a patient requires treatment for an intervertebral displacement this should be administered by a doctor; failing that, by a physiotherapist working under his direction. The economic benefit is no less important than the humanitarian aspect.

Physiotherapists should be trained in accurate manipulation and thus make treatment for the reducible disk lesion possible on a large scale within the Health Service. It can be done, as our experience at St. Thomas's Hospital proves, and would render lay manipulators superfluous.

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The Association of Universities of the British Commonwealth has just published, as a pamphlet entitled *United Kingdom Postgraduate Awards (Fellowships, Scholarships, Grants, etc.)*, Appendices II and III of the *Commonwealth Universities Yearbook, 1955*. The *Yearbook* itself will be published in May. Appendix II contains a list of postgraduate awards "for advanced study and research tenable in the United Kingdom." It has been prepared as the result of a resolution of the Congress of Universities of the Commonwealth that each of the countries of the Commonwealth should draw up a list of postgraduate and research awards available at its universities for overseas graduates. Appendix III contains a list of postgraduate and research awards tenable outside the United Kingdom. It applies only to United Kingdom graduates and does not claim to be exhaustive. The pamphlet can be obtained from the secretary, Association of Universities of the British Commonwealth, 36, Gordon Square, London, W.C.1.

PRIMARY TUMOURS OF THE SMALL BOWEL

BY

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It is now well recognized that tumours of the small bowel, though rare, account for about 3% of tumours found in the gastro-intestinal tract, and that most surgeons will encounter several in the course of their career. The incidence of tumours of the small bowel is greatest in the duodenum. Willis (1948), quoting a series published by Hoffman and Pack (1937), mentions that, of 228 small-bowel tumours, 104 were situated in the duodenum. As the distance along the small bowel from the duodeno-jejunal junction increases so the incidence of tumours decreases, the symptomatology is different, and there are types of neoplasm met with in the jejunum-ileum seldom seen in the duodenum. One may therefore consider the two categories, duodenal and jejuno-ileal neoplasms.

Tumours of the small bowel are of four main types and may be innocent or malignant:

Types of Small-bowel Tumour

	Innocent	Malignant
I. Epithelial tumours	Adenoma	Adenocarcinoma
II. Connective-tissue tumours	Fibroma, myoma, lipoma, neuro-fibroma	Fibrosarcoma, leiomyosarcoma
III. Tumours of lymphatic or vascular origin	Angioma	Lymphosarcoma, reticulo-lum-cell sarcoma, Hodg-kin's disease
IV. Special group		Carcinoid

In general, it may be said that these tumours produce symptoms in one of four ways: (1) Obstruction, which may be due to an annular stricture, to intussusception with the tumour at the apex, or to volvulus. (2) Jaundice due to obstruction at the ampulla of Vater. (3) Melaena, anorexia, and loss of weight. (4) Perforation, which is a rare method of presentation.

It is not intended to discuss the signs and symptoms in detail, but rather to present the experience gained at a provincial hospital in dealing with these tumours over a period of ten years. In this period 16 cases have been diagnosed as suffering from small-bowel neoplasms. The details of these cases are shown in the table on the opposite page.

If we consider these cases together it will be seen that 12 presented with symptoms of acute or subacute small-bowel obstruction, 2 with abdominal discomfort and jaundice, and 2 with abdominal discomfort and melaena. In most of these cases pre-operative investigation was of little help in establishing the diagnosis, as in many of them operation was performed forty-eight to seventy-two hours after admission for the relief of obstructive symptoms. However, in four cases a barium meal examination was made, but was negative in each instance. The benzidine test for occult blood was performed in four cases and in each case gave a positive result. A plain film of the abdomen with the patient

standing in order to demonstrate fluid levels was done in six cases, and in none of these were fluid levels seen. Other investigations included barium enemata and sigmoidoscopy in isolated instances with negative results. All the diagnoses were confirmed by section of material removed at operation or at post-mortem examination. We shall now consider these lesions individually in more detail—8 carcinomata, 5 sarcomata, 1 argentaffinoma, and 2 benign tumours.

Carcinoma

Adenocarcinoma of the small bowel may affect the duodenum or the jejunum-ileum, though it usually appears not more than 2 feet (60 cm.) from the duodeno-jejunal junction (Ewing, 1940); although in a series published by the Mayo Clinic (Mayo, 1940) there were 31 tumours in the jejunum and 21 in the ileum. Of those arising in the duodenum, 22.5% are situated above the ampulla of Vater, 59.2% are peri-ampullary, and 18.3% are situated below the ampulla, these figures being given in a review of the subject by Locke (1953). Those growths situated around the ampulla of Vater may in fact be arising from the lower end of the common bile duct, and it is very difficult in many cases to decide whether they are duodenal or ampullary in origin: in advanced cases it may even be difficult to decide whether the tumour arises from the duodenum or the pancreas. Adenocarcinoma of the small bowel may be proliferative, may form an ulcer or an annular stricture, or may be a mixture of these varieties. Symptoms will depend on the site and type of growth present. Lesions of the duodenum are often associated with obstructive jaundice; ulceration produces melaena, and obstruction when it occurs is late. Ulcerating lesions in the jejunum-ileum may produce melaena, but obstructive symptoms are also late owing to the fluid nature of the small-bowel contents. Vomiting is more pronounced in duodenal than in jejuno-ileal lesions. The diagnosis in

these cases may be helped by straight x-ray examination of the abdomen, which will sometimes show fluid levels above the site of the lesion. Barium meal and follow-through is sometimes of use, and is safe if a Miller-Abbott tube be first passed down to the site of the obstruction. Barium studies may show a filling defect, an ulcer, or annular constriction at the site of the lesion. In cases in which ulceration has occurred the benzidine test on the stool should be positive.

In our series there are eight adenocarcinomata, situated as follows: second part of duodenum—peri-ampullary, 3; duodeno-jejunal junction, 1; proximal jejunum, 3; terminal ileum, 1.

Of the three tumours in the duodenum, two were associated with obstructive jaundice and subacute bowel symptoms of an obstructive nature. The only symptom associated with the third case was the recent appearance of an epigastric mass in a person who had had steatorrhoea for years. Case 6 is interesting because of its mode of presentation and subsequent history.

Case 6.—A woman aged 61 was admitted in December, 1951, complaining of jaundice for three months which was becoming progressively worse. Her urine was dark and the stools were clay-coloured. There was no other relevant history. On examination she was seen to be an obese, markedly jaundiced, middle-aged woman. Abdominal palpation revealed a moderately enlarged liver, but the gall-bladder was not palpable and no other abnormality was detected. Biochemical investigation indicated that her jaundice was of an obstructive type, and straight x-ray examination of the abdomen, including the gall-bladder area, was negative. Laparotomy was carried out in December, 1951: the gall-bladder was dilated and a firm mass was felt in the head of the pancreas. No glands were palpable and there were no secondaries in the liver. A duodenectomy and removal of the head of the pancreas were done in one stage, but section showed the tumour to be a papillary adenocarcinoma of the duodenum. Convalescence was uneventful, and she remained well until June, 1953, when multiple pulmonary metastases were demonstrated.

Details of Cases

Case No.	Date	Sex and Age	Symptom	Duration	Operative Finding	Section	Result
1	18/2/51	F 82	Colicky abdominal pain	2 months	Carcinoma terminal ileum. R. hemicolectomy	Adenocarcinoma	Death, 28.6.52
2	26/1/52	F 19	Recurrent abdominal colic	1 month	Laparotomy. Reticulosarcoma. Biopsy gland	Reticulosarcoma	Untraced
3	Feb., '47	M 50	Abdominal pain—colic. Vomiting	4 days	Carcinoma jejunum. Resection and anastomosis	Adenocarcinoma	Secondaries. Death, Dec., '47
4	28/12/51	F 76	Jaundice. Vomiting. Abdominal pain	6 weeks	Laparotomy. Carcinoma ampulla of Vater. Cholecystostomy	P.M.: carcinoma of ampulla	Death, 3.1.52
5	13/12/51	M 38	Abdominal discomfort. Vomiting	1 week	Laparotomy. Chylous ascites. Thickened rigid bowel. Mesenteric glands enlarged—grey	Reticulosarcoma	Death
6	12/12/51	F 61	Painless obstructive jaundice	4 months	Hard mass 2nd part duodenum. Duodenectomy and removal head of pancreas	Adenocarcinoma duodenum	Alive. Pulmonary secondaries
7	3/8/50	F 33	Colicky abdominal pain	3 "	Multiple tumours ileum; glands	Argentaffin carcinoma	Alive
8	4/5/50	M 5	Abdominal pain. Vomiting	2 weeks	Chylous ascites. Bowel thickened. Liver, spleen enlarged. Mass in pouch of Douglas	Lymphosarcoma	Death 8.5.50
9	20/9/50	F 30	Recurrent colicky abdominal pain	3 months	Intussusception. Adenoma ileum	Adenoma	Alive
10	29/12/50	M 33	Abdominal colic. Haematemesis	4 days	Subtotal gastrectomy	P.M.: lymphosarcoma involving stomach and small bowel	Death
11	28/10/51	F 48	Repeated melaena. Epigastric pain	6 months	? Carcinoma pancreas. Duodenectomy and partial pancreatectomy	Polypoid carcinoma duodenum	"
12	3/5/50	F 50	Generalized abdominal pain. Melaena	4 weeks	Resection of terminal ileum with Meckel's diverticulum and leiomyoma	Leiomyoma	Alive
13	Sept., '48	F 65	Abdominal pain. Constipation	2 months	Carcinoma jejunum 4 in. from duodeno-jejunal flexure. Glands ++. Resection and anastomosis	Reticulosarcoma	Death
14	21/1/53	M 40	Steatorrhoea for years. Abdominal discomfort	3 "	Carcinoma duodeno-jejunal junction. Resection and anastomosis	Adenocarcinoma	Death. Thrombosis superior mesenteric artery
15	10/1/46	M 50	Colicky abdominal pain	2 weeks	Carcinoma jejunum 2 in. beyond duodeno-jejunal junction. Glands ++. Gastro-enterostomy	P.M.: adenocarcinoma	Death
16	19/8/52	F 44	Recurrent attacks of colicky abdominal pain. Vomiting	3 months	Annular carcinoma jejunum 12 in. from duodeno-jejunal junction. Glands ++	Adenocarcinoma	Readmitted June, 1953. Large mass in pelvis. Laparotomy. Krukenberg tumour right ovary

All the growths in the jejunum and ileum were associated with obstructive symptoms varying from 2-3 days to 2-3 months in duration. In each case laparotomy was performed shortly after admission. Case 3 is illustrative.

Case 3.—A man aged 50 was admitted to hospital in February, 1947, complaining of colicky abdominal pain of four days' duration; there was no vomiting. His abdomen was slightly distended and he was tender to the left of his umbilicus. His symptoms subsided with expectant treatment but recurred at intervals until April of that year. A test for occult blood was positive, but barium enema and sigmoidoscopy were both negative. Haemoglobin was 94%. In April a tender mass was noticed in his left iliac fossa and laparotomy was performed. He was found to have an annular carcinoma of the jejunum approximately 2 ft. (60 cm.) from the duodeno-jejunal flexure, and this had led to a small-bowel volvulus. Secondary glands were felt in the mesentery and peritoneal deposits in the pelvis. The affected portion of bowel was resected and an end-to-end anastomosis performed. Convalescence was satisfactory, but he died from secondary carcinomatosis in January, 1948.

The duodenum and jejuno-ileum both have an abundant lymphatic drainage, together with a rich blood supply, and this probably accounts for neoplasms of the small bowel tending to metastasize early to the mesenteric lymph nodes and to the liver. Lesions in the duodenum produce symptoms at a rather earlier stage than do those in the jejuno-ileum, even before any metastases have occurred. The treatment of choice is resection of the involved segment together with its lymphatic field, followed by end-to-end anastomosis. General experience has shown these lesions to have a very poor prognosis, symptoms severe enough to cause the patient to seek treatment not occurring until comparatively late in the disease. This is borne out by our cases.

The Sarcoma Group

Amongst our cases there were five which came within this category. Two of these patients, aged 5 and 33, were diagnosed as suffering from lymphosarcoma, while three, aged 65, 38, and 19, were shown to have a reticulum-cell sarcoma. These two diseases together with Hodgkin's disease may primarily involve the mesenteric lymph nodes and lymphatic tissue in the wall of the small bowel. They frequently cause a chylous ascites due to lymphatic obstruction. The peritoneum may be studded with firm greyish nodules of tumour tissue. Large masses may be produced by glandular enlargement and the matting together of thickened and rigid loops of small bowel, resulting in subacute small-bowel obstruction. In some of these cases the liver and spleen may be involved. Diagnosis is often difficult, though the presence of an enlarged liver or spleen or of glands elsewhere may help, but in the present series the child of 5 was the only patient with a palpable liver and spleen. Full blood examination and glandular biopsy will help in establishing the diagnosis. One patient had previously been admitted elsewhere with a haematemesis for which he had undergone partial gastrectomy before the correct diagnosis was reached. In Cases 2, 8, and 13 there was a palpable mass in the lower abdomen. In all cases, at laparotomy, a large mass was found involving both the wall of the small bowel and its mesentery. In suitable cases resection of the involved segment followed by radiotherapy would appear to be the treatment of choice, although in none of our cases was this possible. Case 2 demonstrates these points.

Case 2.—A girl of 19 was admitted to hospital on January 26, 1952, having had an attack of severe colicky upper abdominal pain. Prior to admission she had had frequent attacks of less severe pain, each associated with vomiting. Bowel and urinary history were normal, menstruation was trouble-free. On examination there was an ill-defined lower abdominal tumour, but no other abnormality was noted. Laparotomy was performed on January 29, when the peritoneal cavity was found to contain a large quantity of chylous fluid. The mesentery of the terminal ileum together with the bowel itself formed a large mass. There were numerous grossly enlarged glands, the lymphatics were dilated, and there were several large lymphatic cysts, some 3 in. (7.5 cm.) in diameter, along the mesenteric border of the bowel. The bowel itself was thickened and rigid. It was only possible to

remove a gland for biopsy, and the report was as follows: "Great increase of reticular elements at the expense of lymphoid tissue in the gland. No normal lymphoid follicles seen. Probably a reticulosarcoma." There is no record of this patient having been seen since at the hospital.

The prognosis in these cases is that of the general disease, and, as is well known, is uniformly poor. Fibrosarcoma and leiomyosarcoma may both occur in the small bowel but have not been met with in this series.

Carcinoid Tumours or Argentaffin Carcinoma

These deserve special mention, occurring as they do in two special situations, the appendix and the terminal ileum.

These tumours arise from granular cells lining the depths of the crypts of Lieberkühn. They were described by Kultschitzky and have a special staining reaction with silver stains, thus often being referred to as argentaffin cells. Freidin (1953) states that these tumours occur as a result of abnormal proliferation of the argentaffin cells, the tumour first appearing in between mucosa and the muscularis mucosa and forming a yellowish-white mass over which the mucous membrane is stretched. As the mass increases in size it comes to involve the serosal surface of the bowel, where it may be seen as a yellowish or greyish plaque which, as a general rule, does not completely encircle the bowel, and thus obstruction may not be a prominent feature. The mucous membrane seldom becomes ulcerated over the tumour. Microscopically, the tumour is made up of columns of round or polyhedral cells with a granular cytoplasm and a darkly staining nucleus. There is no attempt at gland formation.

Tumours in the appendix are characteristically single and most frequently occur near the tip: they are usually discovered following routine appendicectomy or at necropsy. Ileal growths may be multiple, but, as they may not always encircle the bowel completely, symptoms may be absent. In his series Freidin reports that 13 of 16 ileal carcinoid tumours were found incidentally at post-mortem examination, the others causing obstructive symptoms. Metastasis from appendiceal lesions is seen in about 5% of the cases. Metastasis from ileal lesions is more frequent, and secondary deposits are found in the regional lymph glands and in the liver. Though similar in appearance and in microscopic structure, appendiceal and ileal lesions have several important differences which are summarized below, the figures being taken from Freidin's series of 30 cases.

	Appendix	Jejuno-ileum
Sex incidence	M:F=4:10	M:F=14:2
Age	Average 26 years	Average 26 years
Number	Single	May be multiple
Metastasis	Rare	Common

One of our cases (No. 7) is worth reporting.

Case 7.—A married woman aged 33 was admitted to hospital on August 3, 1950, complaining of lower abdominal pain of a colicky nature which had been present for three months. A straight x-ray film of the abdomen and a barium meal and follow-through showed no abnormality. Laparotomy was carried out on August 4 and in the ileum 17 isolated yellowish-coloured tumours were found almost completely encircling the bowel. The mesenteric glands were enlarged with similar growth and there were peritoneal seedlings. Approximately 8 ft. (2.4 metres) of ileum containing these tumours together with the mesentery and as many glands as possible were removed and an end-to-end anastomosis was performed. Convalescence was uneventful and the patient was alive and well three years after operation.

This case is remarkable in that there seems to have been no progression of secondaries in the three years since operation.

Benign Tumours

Many types of benign tumours may occur in the small bowel from time to time, and in this series we have two such cases. The first of these was an adenoma situated in the terminal ileum and forming the apex of an intussusception in a woman aged 30. The intussusception was reduced and the adenoma removed. The patient was still alive and well at the time of writing. The second tumour occurred in a

woman aged 50 who presented with melaena. Laparotomy showed her to have a Meckel's diverticulum and a rounded tumour in the wall of her terminal ileum distal to the diverticulum. Resection of the involved segment of ileum was carried out, section showing the tumour to be a leiomyoma.

Summary

We have reviewed briefly the primary tumours met with in the small intestine and report a series of 16 such tumours dealt with in this hospital over the past ten years.

Adenocarcinoma is the commonest of these tumours. It occurs most frequently in the duodenum and upper jejunum. Symptoms occur late owing to the fluid nature of the bowel content at this level. Prognosis is uniformly poor, and this has been our experience. The age incidence of these growths corresponds to the general cancer age, and women were affected more often than men.

A description of the lesions produced by lymphosarcoma and allied conditions is given. Five such cases are reported, and it is suggested that in suitable cases resection of the involved segment followed by radiotherapy is the treatment of choice.

A description is given of the carcinoid or argentaffin carcinoma. The different behaviour of this tumour occurring in the appendix and ileum is discussed, and one such case is reported.

Our thanks are due to other members of the staff of the Essex County Hospital for allowing access to their case records, and to Dr. J. B. Penfold for his helpful criticism.

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ASSOCIATION OF JEJUNAL DIVERTICULOSIS AND STEATORRHOEA

BY

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It seems justifiable to report the following single case of steatorrhoea, macrocytic anaemia, and glossitis associated with multiple jejunal diverticulosis, in view of the considerable theoretical interest of the association and the apparent rarity of the occurrence. No similar case can be found in the literature. Moreover, the diarrhoea was relieved for a period of eight months after a course of chlortetracycline ("aureomycin"), and during this time the anaemia remained in remission without other treatment.

Diverticula of the small intestine between the duodeno-jejunal flexure and the ileo-caecal valve are usually symptomless and are found by chance in the course of a barium-meal examination or at necropsy. Their incidence has been recorded as 9 cases in 2,820 necropsies at King's College Hospital and as 0.31% by Edwards (1939), but it may be commoner than this. Benson, Dixon, and Waugh (1943) state that 122 cases had been recorded at the Mayo Clinic, of which 100 were jejunal, 17 in the ileum, and in 5 cases the diverticula were present in both. They are commoner in older people (Edwards, 1939). They are said on occasion to

give rise to vague abdominal symptoms such as flatulence and postprandial discomfort, but in some instances it may be that the presence of these symptoms from other causes has led to the performance of a barium meal and the discovery of the diverticula.

Complications such as acute intestinal obstruction, volvulus in relation to diverticula (Stiven, 1934), haemorrhage (Braithwaite, 1923; Waterson, 1952), perforation (Butler, 1937), diverticulitis (Butler, 1933), and the syndrome of chronic intestinal obstruction (Phillips, 1953) have all been described. The latter consists of symptoms varying from vague abdominal discomfort to more definite colic, vomiting, and constipation with loss of weight and deterioration in general health. Phillips, in discussing this syndrome, points out that there is no organic obstruction at laparotomy, although distended hypertrophic loops of bowel may be found, and he in fact suggests that there is a "dyskinesia" of the bowel which produces this syndrome and which also causes the pulsion-diverticula. He quotes Benson *et al.* (1943) as stating that non-organic chronic small-bowel obstruction was the commonest observed complication in their series of 122 cases—and that the changes resemble those in small intestine which has been obstructed for a long period. One of two cases which he describes had loose stools.

No reference to their association with deficiency syndromes from failure of small-intestinal absorption can be found in the literature other than a single case report by Montuschi (1949). He reported the case of a man aged 66 with a history of eight years' recurrent abdominal pain and bouts of diarrhoea and four years' oedema of the legs. Investigation showed a lowered plasma albumin and a raised faecal fat. Barium examination revealed multiple diverticula in the small intestine and colon, with precipitate passage of barium through the small intestine and loss of the normal mucosal pattern. It was thought that a low-grade inflammatory process in the diverticula was probably the cause of the small-intestinal hurry which led to deficient absorption of protein.

Case Report

A housewife aged 71 was first seen in December, 1949. She had been in good health until five years previously, when she began to have two or three loose motions a day, the stools being sometimes pale. She did state that her bowels had always tended to be easily upset, but that it was seldom this occurred. Three years before she developed a sore tongue, and shortly afterwards in November, 1946, a blood count showed some macrocytosis and anisocytosis. (Details of blood counts are given in the Table.) On December 20 a barium meal showed a small hiatus hernia. On the second part of the duodenum and on the duodeno-jejunal flexure there were large diverticula, and there were multiple diverticula throughout the jejunum. These showed some stasis in the erect position (Dr. F. R. Berridge). She was apparently diagnosed as suffering from pernicious anaemia, and it was thought that the diarrhoea was due to achlorhydria.

She was treated with a purified liver extract ("ana-haemin") intramuscularly once a fortnight at first, and subsequently monthly for the next three years until she was admitted to hospital. No test meal had been done. Full particulars of her blood counts during this time are not available, but she still had macrocytosis in 1949. Her diarrhoea remained unchanged during this time, and her tongue continued to be sore most of the time, with occasional periods when it did not trouble her. One month before admission she developed much more severe diarrhoea, having 10 watery stools a day and copious vomiting. The

Treatment:	Anaheamin i.m.						Ascorbic Acid, Vit. B, Folic Acid		Nicotinic Acid, Riboflavine, Vit. B, Folic Acid	Folic Acid	Plexan, 4 ml. i.m. Weekly
	Nov. 1946	Jan. 1947	May '47	6.1.49	30.12.49	10.1.50	20.1.50	3.2.50	17.3.50	14.7.50	
R.B.C. (mills)	4.12	4.15	5.12	4.11	3.64	3.67	3.81	3.7	4.37	4.66	3.76
Hb (g.%)	15.6	14.1	15.6	14.0	12.8	11.7	13.4	14.0	14.5	15.1	14.0
M.C.H. (γγ)	38.0		30.5	34.1	35.2	31.9	35.0	38.0	34.0	32.5	37.3
M.C.V. (cubic μ)		34.0		109.3	107.2	100.5	110.0	117.0	102.0	94.0	109.6
M.C.H.C. (%)				31.1	32.7	31.6	31.8	32.2	32.4	34.4	34.1
Reticulocytes (%)					Less than 0.5		0.5	1.3	0.1	1.4	
W.B.C.	4,000			Normal	Normal	Normal	Normal		Anisocytosis +	Anisocytosis +	Normochromia. Anisocytosis. Macrocytosis
	Macrocytosis. Anisocytosis			Some macrocytosis	Macrocytosis. Anisocytosis	Normochromia. Some macrocytosis					

Treatment :	Plexan, 4 ml. i.m. Weekly	Plexan, 4 ml. i.m. Fortnightly					Chlortetracycline. Total in 9 days = 9.25 g.	No Treatment			
	26.1.51	25.5.51	17.8.51	1.2.52	2.5.52	6.2.53		10.7.53	16.10.53	15.1.54	23.4.54
R.B.C. (mills)			4.76	4.87	4.79	4.53		4.75	4.8	4.73	4.2
Hb (g.%)	13.8	15.0	13.3	14.5	13.6	14.8		13.6	14.0	14.0	13.5
M.C.H. (γγ)			28.0	29.8	28.4	32.7		28.6	29.2	29.6	32.1
M.C.V. (cubic μ)			88.5	88.5	90.8	99.3		88.5	87.7	91.0	95.0
M.C.H.C. (%)			31.8	33.7	31.3	32.9		32.3	33.4	32.6	33.8
	Normochromia. Some anisocytosis	Normochromia. Normocytosis	Normochromia. Normocytosis	Normochromia. Some anisocytosis	Normochromia. Normocytosis	Normochromia. Anisocytosis		Normochromia. Some anisocytosis	Normochromia. Anisocytosis		Normochromia. Anisocytosis

diarrhoea lasted for 14 days, and the vomiting for a further week, when she was admitted to another hospital and treated with gastric lavage and a fluid diet. The vomiting ceased after three days on this regime. She was transferred to Addenbrooke's Hospital on December 22, 1949, when she gave the above history. She had had no other serious illnesses in the past. Her husband and two children were alive and well and there was no family history of diarrhoea or abdominal illness.

She was a thin, white-haired woman. Her tongue was smooth, and red at the tip and round the sides, but was otherwise normal. Her abdominal wall was very thin and

intestinal peristalsis could be seen. There were no other abnormal physical signs. On December 28 barium meal examination showed multiple duodenal and jejunal diverticula and a large diverticulum on the duodeno-jejunal flexure (see Fig.). Diverticula contained fluid levels in the erect position. Barium flocculated in the jejunum and ileum. Transit time slow, 7½ hours. The calibre of the small gut was wide (Dr. F. R. Berridge). Blood count (see Table) showed a slight macrocytic anaemia.

On January 2, 1950, the serum calcium was 11.1 mg. per 100 ml.; serum phosphorus, 2.8 mg. per 100 ml.; plasma protein, 5.6 g. (albumin 2.6 g., globulin 3 g.); non-protein nitrogen, 53 mg. per 100 ml.; thymol turbidity, 3 Maclagan units; thymol flocculation, negative. X-ray film of forearm bone with control—no significant abnormality. An amino-acid absorption test was normal. A sternal puncture on January 14 showed: total cell count, 20,000 per c.mm.—megakaryocytes 6 per 10,000 nucleated red cells, M/E ratio 3.2:1; polymorphs—neut. 36.5, eos. 2.6; metamyelocytes—neut. 15.6, eos. 1.8; myelocytes—neut. 9.4, eos. 0.6; premyelocytes, 2.4; myeloblasts, 0.2; lymphocytes, 9.4; plasma cells, 0.2; monocytes, 0.6; normoblasts—late 12.6, intermediate 2.0, early 0.6; megaloblasts—late 4.0, intermediate 1.0, early 0.8; pre-erythroblasts, 0.4; haemocyto blasts, 0.2; megaloblasts of nutritional macrocytic anaemia type (Dr. Martin Hynes). On January 17 a glucose-tolerance test showed: fasting, 0.095%; 30 minutes, 0.176%; 60 minutes, 0.204%; 90 minutes, 0.148%; 120 minutes, 0.132%. A fat balance was unfortunately not completed successfully, and the patient did not wish further investigation.

She was discharged home on a low-fat (50 g.) high-protein diet, ascorbic acid, vitamin B₁, nicotinic acid, and riboflavin; and also folic acid, 10 mg. t.d.s., which was begun on January 17. The reticulocytes on January 20 were only 0.5%, and on the 27th they were 1.8%. She continued with folic acid, 5 mg. b.d., and on February 3 a blood count showed no improvement. By March 17 the red-cell count had risen, and the macrocytosis was less, but the diarrhoea had persisted, and the tongue was still sore, with a smoother appearance than previously. In April, 1950, the folic acid was discontinued for one month, with no change in symptoms. The vitamins were discontinued in



Radiograph after barium meal, showing multiple duodenal and jejunal diverticula, and a large diverticulum on the duodeno-jejunal flexure.

May, and folic acid, 5 mg. b.d., was started again. Symptoms remained unchanged, with the tongue sore most of the time, but the patient felt better in herself. By July 14 the blood count had returned to normal and the macrocytosis had disappeared. She continued with folic acid, and in spite of this in September a blood count showed a fall in the red cells and a return of macrocytosis. Her serum calcium was 9 mg. per 100 ml., plasma proteins 5.8 g. (albumin 3.6 g., globulin 2.2 g.). The patient complained of feeling generally tired and unwell, and agreed to come back into hospital, which she did on November 27.

A fat balance investigation was carried out, the balance period being four days on a standard 50-g. fat intake, and the result was as follows: dry matter, 6.4% of faeces; total fat, 28.2% of dry matter; neutral fat, 0.8%; free fatty acid, 26.2%; soap fatty acid, 1.2%; fat hydrolysed—93% of total fat. Fat intake was 202 g. over four days, and fat lost 31 g.=15.3% of fat intake. Fasting gastric juice free HCl 0.045%, total 0.073%. After histamine, free HCl 0.273%, total acidity 0.310%. Duodenal juice showed some lipase and tryptic activity, but no quantitative test was attempted. The patient complained of a sore tongue, and it was moderately smooth and reddened. She was treated with two injections of riboflavin, 10 mg., vitamin B₁, 50 mg., nicotinic acid, 50 mg., followed by a further six injections at twice-weekly intervals. Her tongue became extremely sore, and was dark red and beefy in appearance, with complete loss of papillae. She was discharged home, and her tongue remained sore.

In December, 1950, she was started on injections of crude liver extract ("plexan"), 4 ml. twice weekly. Within 14 days the soreness of her tongue disappeared and in a month it looked virtually normal. She continued on injections of plexan, 4 ml., which after a month were changed to weekly, and then to fortnightly after a further two months, until July, 1953. During this time her blood count remained very satisfactory, being normochromic and normocytic. She did, however, continue to have looseness of her bowels with three or four stools a day, and occasionally more severe diarrhoea. At intervals she experienced abdominal discomfort, vague indigestion, and occasional attacks of vomiting lasting a day or two. In May, 1953, she developed more frequent indigestion with vomiting every few days for a period of about a month.

On June 4 she was started on a course of chlortetracycline, 250 mg. six-hourly, which she continued for nine days, receiving 9.25 g. in all. The injections of plexan were discontinued in July. Following the chlortetracycline her stools became more normal over the course of a fortnight, and since July, 1953, she has had two, or occasionally three, normally formed motions each day for the first time for several years. Unfortunately the patient was unwilling to be admitted for a further fat balance investigation. This improvement in her bowels continued until March, 1954. During this period of eight months she had had only three or four slight vomiting attacks. She had no recurrence of soreness of the tongue, and her blood count, carried out at monthly or two-monthly intervals, remained normal. She is a patient who has always complained very readily in the past, but she said that she had felt better since she had the course of chlortetracycline than she had done for years.

This satisfactory state of affairs ceased at the end of March, 1954, when she began to have more frequent attacks of vomiting and developed a sore smooth tongue again. She was started again on weekly injections of plexan, 4 ml., on April 23, and these were continued for three weeks. On April 26 an analysis of one specimen of stools showed that 37.6% of the dry matter was fat. On April 30 she was started on a week's course of chlortetracycline, 250 mg. six-hourly, totalling 7 g. Following this she continued to feel unwell for two weeks, but then began to improve again. Her sore tongue had begun to improve before this, and by May 28 was normal. At the time of writing she appears to be well.

Discussion

It is of interest that although the anaemia responded to refined liver extract and to folic acid, the glossitis showed no improvement. Treatment with crude liver extract, however, resulted in disappearance of the glossitis within a fortnight, and improvement in the patient's feeling of well-being. There was no change in the diarrhoea. Following the course of chlortetracycline her stools became formed for the first time for several years, and she felt better than she had done for a similar period. The anaemia and glossitis also remained in remission without further injections of crude liver extract after the course of chlortetracycline, but this may have been the result of the necessary factors having been stored from the large quantities of crude liver she had received during the previous two years. It does appear, however, that the chlortetracycline exerted some effect on her intestinal function.

Of the various possible mechanisms whereby small-intestinal dysfunction, with impairment of absorption, may be provoked, the presence of infection inside the small bowel is one which has been put forward as responsible in several distinct pathological conditions. Cameron, Watson, and Witts (1949), in experiments on rats, showed that transection of the small gut followed by end-to-side anastomosis, in such a way as to produce a small blind loop which emptied itself downwards, was not followed by anaemia unless there was some stenosis of the opening of the blind loop causing stagnation. If, however, the blind loop was made at the end of the proximal piece of gut, so that stagnation occurred in it, a percentage of the rats so treated developed a macrocytic anaemia. These authors noted that it was important to place the blind loop in the upper or middle part of the small intestine. When the loop was in the lower ileum very few rats developed anaemia. It seems very probable that the steatorrhea associated with gastro-colic fistula is due to soiling of the small-intestinal contents by material from the large bowel. It has been suggested that the steatorrhea which sometimes develops after a Polya type of gastrectomy, and which may appear many months after the operation, is the result of stagnation in the afferent loop, with subsequent infection.

The state of affairs existing in multiple jejunal diverticulosis is clearly one in which stagnation and infection in the sacs might be expected to occur. To prove that infection is present in the diverticula is an extremely difficult matter except by the method of direct sampling should the patient require a laparotomy. Taking samples through a Miller-Abbott tube introduces too many possibilities of contamination. In this patient the reversion of the bowel habit to normal after a course of chlortetracycline does suggest that the removal of infection might have been one factor responsible, and it does seem possible that infection in the diverticula may have been in part responsible for the small-intestinal dysfunction.

Summary

A case of jejunal diverticulosis, complicated by steatorrhea, macrocytic anaemia, and glossitis, is described.

Parenteral crude liver extract produced a complete remission of the glossitis and macrocytosis. Parenteral refined liver extract, oral folic acid, and massive vitamin B therapy had no effect on the glossitis, while the macrocytosis showed a variable response to refined liver extract and folic acid.

Improvement in the diarrhoea and in general health occurred after a course of chlortetracycline, and the glossitis and anaemia remained in remission, without further treatment with crude liver extract, for a period of eight months.

It is suggested that the multiple jejunal diverticulosis was responsible for the steatorrhea in this case, and

that stagnation and infection in the diverticula may have been the most important factor in producing the small-intestinal dysfunction.

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ANTIBIOTIC SENSITIVITY SPECTRA THEIR USE IN INVESTIGATING EPIDEMICS

BY

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Staphylococcal infections in hospital wards are the cause of considerable morbidity and mortality, and for many years bacteriologists have been devising methods to facilitate the detection of sources of infection. One of the difficulties has always been the fact that coagulase-positive staphylococci are commonly found in the upper respiratory tract and skin of apparently healthy people, and it is not practicable to eliminate all of these. "Unless the epidemic strain has some special characteristic, it is impossible to decide whether, for instance, a carrier of the species concerned is to be incriminated. It is here that the definition of individual 'types' within species has been found so valuable" (*Lancet*, 1947). Serological typing and phage-typing were used by Allison and Hobbs (1947) in their brilliant investigation of neonatal infections. Phage-typing has indeed been a new and successful weapon in tracing the sources of wound infections, but it requires some experience, and it is not used by many routine laboratories. When we were faced with investigation of an epidemic of wound infections in our surgical wards it was thought that antibiotic sensitivity patterns might help to determine the cause of the trouble.

Investigation

Between September 12 and 24, 1953, five patients developed wound abscesses seven to ten days after an elective operation. The pus from the wounds yielded pure cultures of *Staphylococcus pyogenes*, and these infections appeared to be confined to patients operated on by one surgical team.

Nose and throat swabs were taken from all the nursing staff in the theatre and wards (22 in all), from the anaesthetist, and from two members of the surgical team. (The third member of the surgical team was away for three weeks when this investigation was started, but he had been present at all the operations done on the cases that became infected.) Coagulase-positive staphylococci were found in over half of the nursing staff. It was thus most desirable to determine whether all these staphylococci belonged to the same strain. Sensitivities to penicillin, streptomycin, chloramphenicol, chlortetracycline ("aureomycin"), and oxytetracycline ("terramycin") were determined with standard pads of these antibiotics on blood-agar plates, and three different patterns were obtained from the nursing staff (see Table I). Although the organisms derived from the

wounds all gave the same pattern (Table II), this did not coincide with any of the patterns derived from the nursing staff. The pattern, however, did coincide with that derived from organisms obtained from the nose and conjunctivae of

TABLE I.—A, B, and C are Antibiotic Sensitivity Patterns of Strains of *Staph. pyogenes* Obtained from the Nursing Staff. All Coagulase-positive Staphylococci Derived from Them Belonged to One of these Three Strains

Antibiotic	A	B	C
Penicillin	++	—	—
Streptomycin	+	+	—
Chloramphenicol	+	+	+
Aureomycin	+	+	+
Terramycin	+	+	—

++ = Very sensitive, + = sensitive, — = resistant.

TABLE II.—Sensitivity Spectra of Strains of *Staph. pyogenes* Obtained from the Pus of the Patients (D), and the Nose and Conjunctivae (E and F Respectively) of the Missing Member of the Surgical Team

Antibiotic	D	E	F
Penicillin	—	—	—
Streptomycin	—	—	—
Chloramphenicol	—	—	—
Aureomycin	+	+	+
Terramycin	+	+	+

+ = Sensitive; — = resistant.

the missing member of the surgical team (Table II), who had just returned from his holiday at this stage of the investigation. (While on holiday he had suffered from acute blepharitis and conjunctivitis.) Intensive antibiotic therapy was given and his infection was eradicated. There have been no further staphylococcal wound infections in the wards of his surgical team. It should be added that none of the patients operated on while he was on holiday developed staphylococcal wound infections.

Discussion

The value of *in vitro* sensitivity tests in the treatment of infections is still a somewhat controversial subject. The same can be said of our views on the action of antibiotics in their role as antibacterials. The most widely accepted and most plausible theory seems to be the one which ascribes to the antibiotics a power of interfering with some enzyme system which is essential either for bacterial survival or for their multiplication. Where a species of micro-organism displays great variations in sensitivity to an antibiotic, such as, for instance, *Staph. pyogenes*, the organisms that are sensitive would rely for survival or multiplication on some enzyme system which is interfered with by the antibiotic—for example, by poisoning, competition, or blocking—and the ones that are resistant either do not require this enzyme system or have developed an alternative one. It would seem to be a reasonable assumption that a variant strain of one species relies in its metabolism on the same or similar enzyme systems. Antibiotic sensitivity patterns may therefore be useful in tracing strains of bacteria and in finding sources of infection. The determination of antibiotic sensitivity spectra is a simple procedure that can be carried out in routine bacteriological laboratories, and if it can be relied upon to separate different strains of a species of micro-organism this should provide a useful screening test for sources of infection.

The absence of further wound infections after eliminating virulent organisms from the eyes and respiratory tract of a member of the surgical team is, it is felt, strong evidence that he indeed was the source of infection, as is the fact that none of the patients operated on during his absence developed staphylococcal wound abscesses. Antibiotic sensitivity patterns suggested that the staphylococci in the wounds and in his nose were the same strains, and thus showed us where to find the cause of our trouble and how to deal with it.

Phage-typing was carried out on some of the cultured strains by the Staphylococcal Reference Laboratory, Colindale. This showed that staphylococci with different sensitivity patterns were of different phage types and that those with the same patterns were of the same phage types (Table III). That there is a close analogy between phage

TABLE III.—Phage Patterns of Staphylococci Obtained from the Nursing Staff (A, B, C), the Infected Wounds (D), and the Surgeon (E and F)

Phage Patterns	A	B	C	D	E	F
Diluted	52A v.w.	73+	29+	75+W	75+W	75+W
Undiluted	52 52A 79	73+	29+	75+W	75+W	75+W

type and antibiotic sensitivity is also suggested by investigations on penicillin-resistant strains and their phage types (Selbie, 1953). In the case of erythromycin- and carbomycin-resistant staphylococci there would appear to be no correlation between antibiotic resistance and phage type (Robson, 1954), although the author does not state whether the phage type was checked after the development of antibiotic resistance.

Sensitivity spectra, using penicillin, streptomycin, chloramphenicol, and the tetracyclines, certainly seem to be of use in the determination of strains of staphylococci, and they were of considerable value in rapidly tracing the source of wound infection in this instance.

I wish to thank Mr. Weait and Mr. Oke, who did most of the technical work and played a vital part in this investigation, Mr. D. Morris and his surgical team for asking for this investigation to be carried out and for supplying the specimens of pus, and Dr. W. F. Hamilton for permission to publish. Dr. R. E. O. Williams of the Streptococcus and Staphylococcus Reference Laboratories very kindly did the phage-typing.

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Medical Memoranda

Two Cases of Favism in Israel

Favism is an acute febrile haemolytic anaemia caused by an unknown factor present in *Vicia faba*, the broad-bean. The disease is contracted by ingestion of the fruit, leaves, roots, stem, or flowers of this plant. It has been said that even the pollen can give rise to the condition. The toxic factor is resistant to weather and heat, and is transmitted via the milk of both the cow and the nursing mother.

No age is exempt, but favism occurs chiefly in children, and males are affected more than females. Some hereditary factor may be present, as the condition has been seen in Israel only among the Oriental population—the Sephardic and Yemenite Jews and the Arabs. So far no authentic case has been reported in the European or Ashkenazi communities. There is a definite seasonal incidence. Most of the cases occur in spring, during February, March, and April, when the broad-bean blossoms. Favism has an affinity with two other haemolytic anaemias—namely, Bagdad spring anaemia and the acute febrile haemolytic anaemia of Lederer. The former, an acute haemolytic anaemia, occurs in Bagdad during a few weeks in the spring, and is said to be due to an allergic reaction to contact with flowers (*Verbena hybrida*) and young fruits. Lederer's anaemia, which gives rise to a similar clinical picture, is said to be due to an allergic response to the streptococcus, the pneumococcus, or the dysentery bacillus. It occurs chiefly in children. The following two cases of favism occurred in Be'erva, a Yemenite village situated some nine kilometres from Acre in Western Galilee, Israel.

CASE 1

A boy aged 12 suddenly fell ill on the night of April 17, 1952. At 7 p.m., after supper, he felt sick and vomited twice. Up to that time he had been perfectly well. A little later he passed a small amount of "bloody" urine and felt very faint; at about 9.30 p.m. he had a fit (probably due to acute central anoxia). Some relatives obtained transport and called me, and I reached his bedside at 10.15 p.m. The boy was shocked, very pale, and semicomatose. Ocular and tendon reflexes were present and brisk, but there was no plantar response. The limbs were twitching spasmodically. There was no neck rigidity. He was sweating profusely and the extremities were cold. The pulse was small and thready, with a rate of 140 a minute, and the tongue dry and coated. There were no abnormal signs in the chest. The liver was palpable two fingerbreadths below the costal margin, but the spleen could not be felt. Rectal temperature was 100.4° F. (38° C.). The urine was of a deep port-wine hue, and almost opaque against the light. There was no history of malaria or intake of any drugs. The only positive fact in the history was that the patient, like everyone else in the village, had been eating broad-beans for the past two weeks.

After receiving 2 ml. of nikethamide intramuscularly, the patient was taken to the Haifa Government Hospital, arriving there 45 minutes later. His haemoglobin was found to be 3 g. per 100 ml. (Sahli). He was transfused immediately with 500 ml. of bank blood, and the next morning his haemoglobin had risen to 5 g. per 100 ml. A further 750 ml. of blood was given, and the haemoglobin rose to 7 g. per 100 ml. and the erythrocyte count to 2,360,000 per c.mm. The results of other investigations were:—Urine: acid, albumin +++, haemoglobin +++, and crystals of haemin +++ in the deposit. W.B.C., 22,000 per c.mm. (polymorphs 80%); serum bilirubin, 10 mg. per 100 ml.; thymol turbidity and Takata-Ara, negative; Weltmann, 8 units; plasma proteins, 7.6 g. per 100 ml. (albumin globulin ratio 1.81:1); blood urea, 100 mg. per 100 ml.; blood cholesterol, 125 mg. per 100 ml. Mantoux, negative at 1:1000.

Recovery was uneventful and the patient was sent home after eight days, on continued treatment with ferrum redactum 3 g. daily and a full diet.

CASE 2

This boy, also aged 12, became ill 10 hours after Case 1. If anything, his condition was even worse. His haemoglobin level was 3.5 g. per 100 ml. when he left for the hospital, but by the time he reached Haifa (within one hour) it had fallen to 2 g. per 100 ml. Ultimately he also recovered after two blood transfusions, and was discharged home after two weeks. Likewise in his history there was nothing relevant, except that he also had been eating broad-beans.

COMMENT

No other case of favism occurred in the village during the year (1952). Once the condition had been recognized the villagers were warned neither to eat broad-beans nor to bring them into their homes, and particularly to keep their children away from them. One does not know how far this affected the incidence of the disease, as up to then they all had been eating the bean, cooked as well as uncooked. But the fact remains that none of the other 150 children developed the disease.

Favism has been confounded with divers conditions such as food-poisoning, acute haemorrhagic nephritis with uraemia, blackwater fever, drug haemolysis, and pneumonia. Toxic haemoglobinuria due to drugs such as quinine, the sulphonamides, potassium chlorate, nitrites, pyridine, the aniline drugs, etc., also enters into the differential diagnosis. Particularly in Israel, especially in the malarious districts of upper and eastern Galilee, one must rule out the possibility of blackwater fever. Acute infections such as typhus,

septicaemia, meningitis, pneumococcal infections, etc., may at times be associated with toxic haemoglobinuria as a result of an acute haemolytic crisis.

One is struck by the dramatic onset of favism: it can result in the destruction of more than 75% of the red cells in the blood within 24 hours. However, the response to blood transfusion is nothing short of miraculous. Favism can recur, and the only prevention is to refrain from eating the broad-bean.

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Acre, Israel.

Treatment of Rheumatoid Arthritis with Organic Copper Compounds

Improvement in cases of rheumatoid arthritis treated with an organic compound of copper was reported by Forestier and Certonciny (1946), who referred to the previous work of Fenz (1941) in Germany.

The drug, cuproallyl-thiourea-sodium benzoate, is a yellowish-brown crystalline powder containing 19% of copper and readily soluble in water. The solution is irritating to the tissues and must be administered intravenously. It accumulates in the liver and to a lesser extent in the spleen, kidneys, lungs, heart, and brain. Excretion is mainly by the intestine and is slow, continuing after administration has ceased.

Forestier and Certonciny, following the German workers, at first used small doses of 0.01 to 0.1 g., averaging 1 g. for a course. Finding that the drug was well tolerated, they increased the dose, giving 0.25 to 0.5 g. twice weekly, administering up to 5 g. in a course. Doses were given intravenously, dissolved in 10 ml. of sterile distilled water. Courses of treatment were repeated at the end of a month and again at intervals of two or three months. No toxic effects were encountered.

Results were better with the higher dosage. Out of a series of 40 cases improvement was noted in 80%, the result being excellent in 15%. But most of the good results were in early cases of less than one year's duration.

A trial by Tyson *et al.* (1950) in a series of 20 cases was not encouraging. Kuzell *et al.* (1951), in a group of 31 patients, failed to confirm the claims made for the drug: at the best they thought there might be a slight therapeutic effect in cases associated with psoriasis.

Through the courtesy of Lumière a small quantity of the preparation was obtained and tried in a few cases with indefinite results.

May & Baker Ltd. then synthesized two compounds: "alcuprin" (sodium *m*-(N-allylcuprothiocarbamide) benzoate) for intravenous use, and "cuprimyl" (a copper complex of 8-hydroxyquinoline bis-(diethylamine sulphonate)) for intramuscular injection. A trial was begun with these on a group of well-established cases of rheumatoid arthritis, in four of which chrysotherapy had been given. For descriptive purposes the cases are graded as follows: grade 1, physical signs slight; grade 2, well-marked physical signs but general condition good; grade 3, extensive physical signs with wasting and poor general condition; grade 4, extensive physical signs with poor general condition, wasting, and crippling.

Case No.	Sex	Age	Duration of Illness	Grade	Sedimentation Rate		Result
					Before	After	
1	M	24	3 years	1	6	3	Slightly improved
2	M	41	6 "	1	8	5	"
3	M	62	5 "	1	5	12	Unchanged
4	F	35	3 "	2	22	21	"
5	F	57	10 "	2	20	25	"
6	M	43	5 "	3	18	9	"
7	F	45	3 "	3	37	38	"
8	M	52	13 "	3	25	25	"
9	F	65	3 "	3	27	75	Worse
10	M	45	2 "	4	87	100	Unchanged

All patients had two courses of treatment, each course comprising 10 doses of 0.25 g. of alcuprin with a total of 2.5 g., or 0.5 g. of cuprimyl with a total of 5 g. Patients were under observation for three months before treatment and one year after. Toxic effects were not observed. The results are set out in the Table.

No therapeutic effect was demonstrated in the group. The trial was an exacting one on a selected group from which early cases had been excluded, and in consequence a sustained improvement could with confidence have been attributed to the drug. Early cases were excluded because the fluctuating course of some and the occasional occurrence of spontaneous remissions make assessment difficult: also the early stage of the disease may be modified by a number of drugs which have no lasting effect. Though a further trial in this early type of case seems worth while, assessment is difficult.

Two patients (Cases 3 and 5) had psoriasis, which was not influenced by the drug.

I am indebted to May & Baker Ltd. for ample supplies of both drugs for this trial.

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Fat Embolism in Thoracic Operations

Fat embolism as a complication of operative procedures has been described in association with orthopaedic and abdominal surgery, but little reference has been made to its possible occurrence in thoracic operations. In view of the growing importance of cardiac surgery it is felt that the following observations are worthy of record.

Over the past two years small fragments of lung tissue from patients subjected to mitral valvotomy have been submitted for routine histological examination. During study of these biopsy specimens in two cases the large and medium-sized pulmonary arteries were found to contain bone marrow. Frozen sections stained by Scharlach R were employed on all subsequent lung biopsies from valvotomy patients, and in 4 out of 24 a minor degree of fat embolism was noted. Similar studies were made on pneumonectomy and lobectomy specimens. In one case bone marrow was present in the major pulmonary arteries, and in 10 out of 17 cases a slight degree of fat embolism was noted in frozen sections.

The occurrence of fat embolism in valvotomy patients is not altogether surprising, since the operative procedure entails continuous rib retraction and considerable trauma is possible. Fractures have even been recorded in some cases. The actual severance of ribs during pneumonectomy and other thoracic operations accounts for the higher incidence of fat embolism in this group. Vance (1931) has suggested that a slight degree of fat embolism cannot always be regarded as confirmatory evidence of trauma, since he found it in a small percentage of cases of non-traumatic deaths, but the presence of bone marrow in three cases in this series indicates a definite relationship to surgical trauma.

Whilst it is extremely unlikely that the degree of fat embolism evoked by such operative procedures as mitral valvotomy might assume clinical significance, it should, however, be borne in mind that it can occur, and even to such an extent that bone marrow is discharged into the pulmonary vessels.

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Reviews

THE STORY OF GUY'S

Mr. Guy's Hospital, 1726-1948. By H. C. Cameron, M.D., F.R.C.P. (Pp. 520+xiii; illustrated. 30s.) London, New York, Toronto: Longmans, Green and Co. 1954.

It is over sixty years since there appeared the interesting *Biographical History of Guy's Hospital* by Wilks and Bettany. During this time much has happened, and with the great changes incidental to the introduction of the new health service there was need for a complete history of this famous institution. Dr. Cameron, for many years a distinguished member of the medical staff of Guy's, has undertaken this difficult and arduous task and achieved a remarkable success. It is indeed a notable feat to have compressed within 500 pages the story not only of the hospital itself but of the medical, dental, and nursing schools, not to mention short biographical sketches of about sixty of the past members of the staff. The book is well illustrated, and there are four beautiful coloured plates. We would warn the reader that many of the 174 footnotes in small print are of great interest and should not be missed.

It is impossible to do justice to this book within the limits of a short review, but some outstanding impressions remain. In the early part the figure of the famous treasurer, Benjamin Harrison junior, stands out boldly, the perfect picture of the absolute autocrat. He created the medical school and controlled it so efficiently and fully as to illustrate aptly the view that the best form of government is a wise and benevolent autocracy. In later years, when the superintendent shared with the treasurer the weight of administration, Cooper Perry was most influential. The tradition of complete independence and self-sufficiency, very satisfactory in the earlier years, later became a drag on the wheels and appears to have been responsible for the late adoption of some methods which had already proved their worth elsewhere. One reads with amazement of the bitter dispute between the medical staff and the governors over the introduction of the nursing reforms of 1880.

Dr. Cameron's deep knowledge of the history of the Society of Apothecaries enables him to throw much light on the growth of the medical curriculum; indeed, he gives a better outline of the history of medical education in this country during the past century than can be found anywhere else.

In the short biographies of past members of the medical staff one finds many pen-pictures which remain in the memory: Addison denouncing the system of scholarships and prizes because he thought they encouraged the student to concentrate too much on one subject; Bright demonstrating albuminuria by heating a little urine in a teaspoon with the aid of a candle; Cooper Perry, looking the picture of misery in the lecture room, sitting down with his head between his hands and his eyes glued to his manuscript; Herbert French writing his famous *Index* while he was being whirled along in a car to a distant consultation; the kindly and hard-worked Rowlands speaking fluently in English but always thinking in Welsh; the earnest young Ryle taking the names and addresses of out-patients whom he later visited with a view to helping them out of difficulties—these and many other pictures delight the reader.

We should think that every good Guy's man will want to have this book on his shelves, and we are sure that everyone interested in the history of medicine or medical education will need to refer to it.

ZACHARY COPE.

HUMAN PHYLOGENY

Man's Ancestry: A Primer of Human Phylogeny. By W. C. Osman Hill, M.D., F.R.S. (Pp. 194; illustrated. 21s.) London: William Heinemann Medical Books Ltd. 1954.

Dr. Osman Hill's book had its origin in a course of lectures given at Edinburgh University to a group of students, mostly of social anthropology, some of whom had no previous bio-

logical training. His aim has been to provide a short textbook for students of human affairs who need to understand something of man's evolutionary origins, and in doing this to cater also for the intelligent layman. In general he has succeeded admirably, although the book, being set out in the systematic fashion appropriate to a student's text, may seem rather heavy going to the layman whose interest is not very determined.

Dr. Hill paints on a broad canvas. The first chapter summarizes the general evidence for evolution, the emphasis being on a rather old-fashioned approach which tends to neglect the more recent genetical work. There follows a summary of the phylogeny of invertebrates and then of chordates as deduced from comparative anatomy. We then pass on to an outline of the evolution of the nervous system, and thus to the rise of the primates. This is illustrated by clear diagrams of the various tracts in the brain as they appear to the morphologist. These have considerable heuristic value, but the caution in their interpretation suggested by recent physiological analysis might have been more stressed.

Finally we come to the core of the book—four chapters devoted to the anthropoids and the emergence of man. This contains an adequate and systematic survey of the fossil evidence, and most of the current theories concerning this controversial field are briefly mentioned. Dr. Hill's own views tend to be conservative; he considers the South African Australopithecinae to be much nearer apes than man, and he seems unwilling to accept fully the recent work which suggests that Piltown man was a fake. In his final section also, on the evolutionary mechanisms which brought about the rise of man, little attention is paid to the recent developments of evolutionary genetics. Nevertheless Dr. Hill's book will undoubtedly be very useful as a text for students who are making their first acquaintance with this complex subject.

C. H. WADDINGTON.

PERIPHERAL CIRCULATION

Peripheral Circulation in Man: A Ciba Foundation Symposium. Edited for the Ciba Foundation by G. F. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., and Jessie S. Freeman, M.B., B.S., D.P.H., assisted by Joan Etherington. (Pp. 219; 72 illustrations. 25s.) London: J. & A. Churchill Ltd. 1954.

This book contains not only the papers read at a recent meeting sponsored by the Ciba Foundation, but also a full account of the discussions that followed. These add greatly to its value and reproduce some of the give and take of a successful scientific meeting. It provides a stimulating account of progress in an important field of vascular physiology, and is complementary to a previous similar volume on visceral circulation.

All the articles reach a high standard. Burton contributes an admirable critical survey of methods available for the measurement of peripheral blood flow which could be read with advantage by anyone interested in general physiology. A new and versatile method of detecting and measuring changes in blood flow by the electrical strain gauge is described by Whitney. Those to whom it appeals would be well advised to read the discussion of this paper, which brings out clearly its merits and defects. Von Euler gives an authoritative account of the capacity of the suprarenal glands to produce either adrenaline or noradrenaline to meet the homeostatic requirements of the body. Whelan describes the effects of these substances on the blood flow through human skeletal muscle in a short paper which led, however, to the longest and perhaps most illuminating discussion in the book.

Various aspects of blood-flow responses to alterations in temperature are dealt with by Carlson, by Greenfield, and by Barcroft and Dornhorst. The last two authors put forward the unusual view that there are in muscle two functionally independent circulations—one subserving metabolism and controlled by local conditions, and another concerned with circulatory homeostasis subserved by the sympathetic nerves and certain hormones. Papers with a more direct bearing

on clinical problems are provided by Dible in a thoughtful article on peripheral ischaemia in man, and by Guttman on the circulation in spinal man. Martin outlines the methods of investigation he has found most helpful in surgical practice.

The book is highly recommended to all those who are interested in circulatory problems.

E. J. WAYNE.

EXPERIMENTAL ALLERGY

Experimental Allergic Reactions Induced by Simple Chemical Compounds. By Mitsuteru Ishikawa, M.S., M.D. (Pp. 122; \$2.00.) Tokyo: Maruzen Company, Ltd. 1953.

This is an account of a series of studies of the inducement of hypersensitivity to simple chemical compounds. The compounds include arsenious acid, aspirin, salicylates, picric acid, and formaldehyde. Hypersensitivity was induced by intracutaneous injection; better results were obtained if the compounds were mixed with horse serum or with other adjuvants, including gum arabic and agar. The hypersensitivity was manifested by mild delayed skin reactions rising to a maximum in 20 to 24 hours after the inducing compound had been injected into the skin; all that is said about the histology is that the characteristic changes were swelling of the fibrous tissue and diffuse hyperaemia of varying degrees. Hypersensitivity could be transferred to normal skin by injection of serum of a sensitized animal; this is unusual in this type of hypersensitivity. As all but two of the 168 papers quoted are in Japanese and some of the results are rather unexpected, it is a pity that some of the experiments are not described in fuller detail. Neither Landsteiner nor Chase is mentioned in the discussion.

J. R. MARRACK.

RADIOLOGICAL DIAGNOSIS OF THE CERVICAL SPINE

Funktionelle Röntgendiagnostik der Halswirbelsäule. By Dr. C. Buetti-Baumli. (Pp 160+viii; illustrated. D.M.42.) Stuttgart: Georg Thieme. 1954.

This monograph on functional radiodiagnosis of the cervical spine was awarded its Jubilee Prize by the Swiss Röntgen Society. It is a brilliant and thorough discussion of a difficult and important subject and will well repay careful study. It is fully illustrated by 154 radiographs, taken with great skill and ingenuity and superbly reproduced full-scale. They show normal and abnormal conditions of the cervical spine in various positions, each taken in such a way as to bring out clearly the precise details required. Each is accompanied by a short account of the case and frequently by an explanatory diagram.

It is indeed a remarkable volume, founded on wide experience, infinite patience, and quite exceptional ingenuity. The descriptions are brief and accurate, and with the accompanying radiographs give a clear view of each case. We could not imagine any account of greater value to those who wish to study the complex and difficult conditions which may arise in this region of human anatomy.

HENRY SOUTTAR.

CHILD CARE

Babies and Young Children: Feeding, Management, and Care. By Ronald S. Illingworth, M.D., F.R.C.P., D.C.H., and Cynthia M. Illingworth, M.B., B.S., M.R.C.P. (Pp. 360 +vii; illustrated. 18s.) London: J. and A. Churchill Ltd. 1954.

A new book called *Babies and Young Children* by Professor R. S. Illingworth and his wife should really be reviewed by the mother of a family. The authors make it clear that they are writing for parents and not for doctors, and it is in this light that it must be judged. In general they appear to have succeeded well in imparting information in an easily understood style, although here and there a bit of jargon creeps in. A description of some phenomena

as of no significance may be quite plain to the medical mind, but for the lay parent it would perhaps have been better to say that it was "nothing to worry about." Again, it is of doubtful value to say much about common ailments in a book which is primarily intended to preach health and prevention. However, perhaps the intelligent mother will like these sections. The reviewer was especially pleased with the sections dealing with the psychological aspects of child development. Two chapters headed "On Love and Security" and "Discipline" especially go to the root of the matter.

Clearly Professor and Mrs. Illingworth have learnt much from their own family, and this gives a personal touch to the book. The drawings and photographs are well chosen. Family doctors should have no hesitation in recommending this book to parents. Despite the authors' declared intention, most doctors, including paediatricians, will also learn from it.

ALAN MONCRIEFF.

RADIOLOGY OF THE DIGESTIVE TRACT

The Digestive Tract in Roentgenology. Volumes I and II. By Jacob Buckstein, M.D. Second edition. (Pp. 1202 the two volumes; illustrated. £12.) Philadelphia, London, and Montreal: J. B. Lippincott Company. 1953.

The second edition of this work runs into two volumes, with over 1,500 illustrations—half as many again as the single-volume edition of 1948. A very large amount of clinical material is discussed in the illustrative cases described under different disease entities, all being beautifully illustrated. Discussion in all sections is clear and precise, and adequate bibliographies are included. Many useful clinical as well as radiological comments are made by the author, and for this reason alone the book deserves the attention of all interested in the subject. Though rare diseases are discussed in detail, balance has not been lost, and important subjects like the radiological diagnosis of malignant ulceration of the stomach receive merited treatment. The section dealing with small-bowel conditions is most valuable, and the radiologist faced by the occasional neonatal small-bowel obstruction or mesenteric tumour will find them dealt with comprehensively. In any publication of this size omissions are almost inevitable, and when dealing with ulcerative colitis the author makes no mention of the possibility of carcinoma of the colon developing as a late feature in the chronic case in which clinical cure appears to have been achieved. Again, in the section on diverticulitis of the colon the differential diagnosis of diverticulitis and carcinoma is not discussed, though the fact that one may simulate the other is referred to. Yet these are only minor faults in an excellent book, of which the only really unpleasant feature is its price.

F. PYGOTT.

PNEUMOCONIOSIS ABSTRACTS

Pneumoconiosis Abstracts. Volume II. Reprinted from the *Bulletin of Hygiene* for the years 1939 to 1950 inclusive, by permission of the Honorary Managing Committee of the Bureau of Hygiene and Tropical Diseases. Foreword by Charles Wilcocks. (Pp. 518. 80s.) London: Sir Isaac Pitman and Sons, Ltd. 1954.

This book is the second of two volumes in which are collected all the abstracts relating to pneumoconiosis which were published in the *Bulletin of Hygiene* from 1926 to the end of 1950. The first volume was reviewed in the *Journal* of January 2 of last year (p. 30). The second volume is arranged similarly to the first and maintains the same high standard of editing and indexing. The two volumes will be of very great value. It is to be hoped that they may be followed by further similar volumes every five years or so: the series so constituted would become an indispensable standby for all who are interested in industrial pulmonary disease.

J. G. SCADDING.

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FAMILY CENSUS

The science of demography, the study of human populations by statistical methods, makes much use of facts about mortality and fertility, two subjects of interest to medical men. As used by demographers the word "fertility" means not the ability to have children ("fecundity") but the actual occurrence of births; and, since the concern is primarily with the influence of fertility upon population, often only live births are considered. Much detailed information about the trend and pattern of fertility in Great Britain has just been published in the form of a report¹ on the Family Census of 1946, constituting the sixth and final volume of the papers of the Royal Commission on Population, which was appointed in 1944 and reported in 1949.²

During the nineteenth century mortality statistics aroused much interest. But fertility statistics were largely neglected until 1911, when a fertility census was undertaken as part of the general census³—pioneer work which threw much light on trends of fertility during the latter half of the previous century. This rather dated information, supported only by the very limited new official registration data that were becoming available as a result of the Population (Statistics) Act of 1938 and published annually in the Registrar-General's fertility tables, was insufficient for the Royal Commission, which on the recommendation of its Statistics Committee therefore undertook an *ad hoc* sample inquiry into the fertility of British women: the Commission published some of the preliminary results in one of its earlier papers.⁴

The Family Census was undertaken during January and February, 1946. A random 10% sample was

selected, from food office and national registration records, of women who were or had been married, and they were sent a questionnaire about date of first marriage, the number and date of birth of their liveborn children, and occupation of husband. Of the million or so women asked to supply such information some 87% responded, a remarkably successful achievement in a voluntary inquiry of this kind. No serious bias was found as a result of the sampling or the failure of 13% of women to co-operate, and it was considered that the resulting data could be safely used for the study of fertility movements and patterns in Great Britain. The two-part report just published consists of some 300 pages of commentary and about 800 tables, preceded by an admirably succinct and informative summary chapter presenting the main findings. The picture that emerges now provides a national pattern with which can be compared the results of such local studies as that in Luton in 1945.⁵

From an analysis of the experience of women with completed families, comprising, more or less, women married twenty years or more before the Family Census, the outstanding and not unexpected picture that emerged was one of diminishing family size. The average completed family of a woman married in 1870-9 was 5.8 children; and, of a woman married in 1925, 2.2 children. Of marriages in 1870-9, 8% were childless, at all events as regards liveborn children, a proportion which became double for 1925 marriages. Completed families of five or more children formed 60% of the total from 1870-9 marriages but only 11% from marriages in 1925, of which half of the families so far produced consisted only of one or two children. One of the factors that much influences fertility is age at marriage: a woman marrying for the first time at the age of 40 has little time left to produce a large family. This effect of age has remained fairly stable up to the time of the Family Census, though with some lessening in relative age differences among more recent marriages compared with earlier ones. Continuously there has been a low level of childlessness among women marrying under the age of 20, for the reason that many of them are already pregnant when they marry. Other factors that influence fertility are occupation and social status, something that was known to demographers as long ago as the seventeenth century,⁶ and in the analysis of the results of the Family Census nine "social status" categories have been based on husband's occupation. Relatively, the differences in family size between the various categories have remained little changed between marriages at the very

¹ Glass, D. V., and Grebenik, E., *The Trend and Pattern of Fertility in Great Britain. A Report on the Family Census of 1946.* Papers of the Royal Commission on Population, Vol. VI, Part I Report, Part II Tables. 1954. H.M.S.O. 70s.

² Royal Commission on Population. 1949. Report. H.M.S.O.
³ *Census of England and Wales, 1911.* Vol. XIII, Fertility of Marriage. Part I (1917). Part II (1923). H.M.S.O.

⁴ Glass, D., and Grebenik, E., *The Family Census: a Preliminary Report.* Vol. II, Reports and Selected Papers of the Statistics Committee of the Royal Commission on Population. 1950. H.M.S.O.

⁵ Titmuss, R. M., and Grundy, F., *Lancet*, 1946, 2, 687.

⁶ Kuczynski, R. R., *Ann. Eugen. (Camb.)*, 1934-5, 6, 139.

⁷ Stevenson, T. H. C., *J. Roy. Stat. Soc.*, 1920, 83, 401.

beginning of this century and in 1925, fertility being highest amongst labourers, agricultural workers, and manual wage earners, intermediate for farmers and farm managers, and low for professional, salaried, and other non-manual workers. The general situation remains similar to that described by Stevenson⁷ from his examination of the results of the 1911 Fertility Census. Differences in the age at marriage between different occupational groups do not account for the different levels of fertility. For example, farmers' wives marry later than the wives of other non-manual workers (with which farmers are grouped), yet have considerably larger families. If people in different occupations all married at the same average age, they would still not have the same average size of family.

The request for information about the dates of birth of children, omitted in 1911 but introduced in 1946, gave results which allowed the study of family trends and patterns to be brought up to date, freed the authors from being confined only to the study of completed families, and even permitted them to make some tentative forecasts for the future. In addition it has provided some information about spacing of births. The decline in family size has been characterized more by compression of the span of years during which children of a marriage have been born than by more widespread spacing; that is to say, women complete their families earlier in their marriage than they did formerly. The interval between marriage and first live birth is closely related to the ultimate size of the family. For marriages in 1920-4 this interval was 27 months for families totalling only the one child, and 13 months for families ultimately totalling four liveborn children. The decline in child-bearing has been greatest at the later stages of married life (within the childbearing ages), and this decline in fertility with increasing length of married life is especially marked among women of the non-manual occupational groups. In considering the future trend of family size, the authors point out that examination of the data suggests that family limitation is now more widespread in Britain than had been previously estimated, and that further reductions in family size are unlikely to occur simply through the extension of family planning; nor will possible improvements in contraceptive techniques be likely to have much effect.

Analysis of the results of this Family Census suggests that a new stability in family size has been established in recent years, but accompanied throughout the community by the spread of a small family pattern. There is nothing to suggest a change from this pattern in the near future.

RUGBY FOOTBALL INJURIES

In a notable review of 590 cases of injuries sustained by Rugby football players, Mr. T. C. J. O'Connell,¹ of St. Vincent's Hospital, Dublin, analyses various types of injury observed by himself and his colleagues during twenty years of close association with the game in Ireland. Among these injuries were 129 to the head, 110 to the shoulder, 77 to the remainder of the upper limb, 75 to the knee (ligaments and cartilages), 42 to the ankle (ligaments), and 35 to the spine and pelvis. In addition, there were 53 fractures of the lower limb. He records also four fatalities—three from fracture dislocation of cervical vertebrae (through charging into or collapse of the scrum) and one from an undiagnosed rupture of the spleen.

In the last thirty years the popularity of Rugby football has led to the widespread growth of clubs whose members come from more varying walks of life than heretofore. Those who now play on Saturday afternoons, instead of being drawn mainly from public school, Services, and university circles, as was the case in the early part of the century, now include artisans, students, young businessmen, manual workers, and members of professions; and to all of them the economic aspect of injuries is one of great importance. Employers nowadays are often less inclined to take a lenient view of absences due to injuries sustained while playing games, and most Rugby players would welcome any action that can be taken to prevent or mitigate severe injuries, relatively infrequent though they may be.

Risks arising from faulty equipment, such as buckles on clothing, bad boots, poor studs, and insufficient protection for shoulders and shins could be easily eliminated. Flexible, snugly fitting boots with toe-caps that are not too heavily reinforced will do much to prevent awkward ankle injuries, for they can then be laced up quite firmly, while detachable studs of rubber or aluminium, that can be varied for dry and wet weather, are much less dangerous to other players than the leather ones that are apt to become conical in wear and sometimes develop protruding nails. Footwork in Rugby is done mainly by means of the arch and instep, so reinforced toes and steel-plated soles, so beloved by bootmakers, are more of a hindrance than a help.

Protective clothing such as is worn by American footballers hardly seems justified for our game, but O'Connell advocates shoulder protection for forwards, either by reinforcement of the acromio-

¹ *J. Irish med. Ass.*, 1954, 34, 20.

clavicular area of the jersey (by extra layers of material such as quilting) or by providing pockets into which thin sponge-rubber pads can be slipped to cover the same area. This undoubtedly does ease the friction in the scrummage and might also help to diminish the frequency with which outsides sustain a fractured clavicle or acromio-clavicular strain from falling on the point of the shoulder. A "sweat band" made of broad elastic worn around the forehead and over the ears will protect the ears of forwards, who periodically suffer from haematoma or rupture of the ear cartilage. This is infinitely preferable to the cumbersome, old-fashioned scrum-cap, which often blocks the meatus with its flaps and causes discomfort to the cheeks and chin with its tapes. Shin guards should not be considered as "cissy," and are almost essential for front-row forwards; but they must be light and not made from material which becomes sodden and heavy in wet weather. Felt is preferable to leather and sponge rubber better than either, especially if cut to shape and attached by elastic loops above the calf and beneath the instep. Well-fitting clothing can be a protection in itself, and the player with flapping waistbands and dangling stockings is often his own worst enemy.

O'Connell rightly stresses the importance of maintaining muscle tone. "Taking up the slack" is by far the most important measure in the prevention of serious injuries, and also in the restoration of fitness after injury. The strength of joints does not depend on ligaments, but on the firm bunch of muscles above and below. Too often the injured player attempts to return to the game before fully regaining muscular tone, lays himself open to further damage, and becomes accident prone. Nor should any player take part in a game if he is feverish or has a septic infection, for serious damage can be caused thereby. The custom of going on to the field for a kick-about before the game, sometimes even before changing, was a useful insurance against injury, and it is a pity that it seems to have become unfashionable.

Many strains and muscle injuries occur in ill-trained individuals early in the game in cold weather. Few spectators who saw a recent international game played in a snow-storm at Twickenham after a six weeks' interval from play due to frost will forget the spate of cramps and muscle pulls that occurred during and after that game. It clearly showed that the only real training for Rugby football is Rugby football.

Moving from a consideration of the player to the obstructions on the field, O'Connell suggests that the

lower end of the goal-posts might be padded, as is the custom on some New Zealand grounds, and that corner flags should be made of thick rubber or similar yielding material that does not splinter on impact. These are wise precautions which could easily be adopted. The Saturday afternoon player is often apt to leave treatment of minor injuries over for two or three days, thus prolonging recovery. First-aid boxes should be in every pavilion, and an "accident treatment centre" open at week-ends in the large urban centres would be of great value to players who find that an injury is more serious than they thought it was in the heat of the game. O'Connell quotes one case of fatal tetanus, and there have been others in which early treatment (or, better still, prophylactic immunization) might have saved life.

TUBERCULOUS MESENTERIC ADENITIS IN CHILDREN

The King's evil—scrofula—was a common complaint in children during the last century and the first quarter of this, but has now largely disappeared. Out-patient departments are no longer crowded with children with chronically discharging sinuses and red, boggy swellings in the neck, and operating-lists in the theatres of children's hospitals no longer consist of cases for excision or curettage of cervical glands—previously an almost regular feature. Similarly, tuberculous peritonitis, which was as common in the medical wards as scrofula in the surgical wards, is now a rarity. Improvements in hygiene and particularly in the heat treatment of milk—especially pasteurization in urban areas—have been responsible for this change.

The primary tuberculosis still to be seen in children is usually intrathoracic, although a primary abdominal focus is by no means rare, especially in rural areas, for pasteurization is not yet carried out in all of them. In such areas cases of primary abdominal infection may rank nearly as high as intrathoracic. It is not always easy to diagnose tuberculous mesenteric adenitis, as Dr. H. R. E. Wallis shows in an article at p. 128 of the *Journal* this week. He lists thirteen differential diagnoses apart from all the cases of "P.U.O." Recurring abdominal pain is the predominant symptom; it may be colicky or aching in character—more commonly it is colicky—and the bouts may be accompanied by fever. Although the prognosis in Wallis's series was generally good, nevertheless fatal tuberculous meningitis can follow a primary abdominal focus just as readily as it can a primary intrathoracic focus, and the ingestion of raw milk—even in small quantities—by

infants and young children is to be condemned as a means of immunization against tuberculosis. The use of an attenuated organism such as B.C.G. is a more rational approach. Wallis rightly points out that calcification in the abdominal glands, while evidence of a tuberculous infection, is not necessarily evidence of complete healing; but, although he says that isoniazid, for example, is not necessary in treatment, it is always possible that it may become necessary. Tuberculous mesenteric adenitis is usually benign, and all will agree, therefore, that the routine giving of tuberculostatic drugs is both unnecessary and unwise. In view of the difficulty sometimes encountered in making a diagnosis the family doctor may well wonder whether he should have the abdomen x-rayed. This would entail considerable time and expense, and a simple tuberculin test is the real prerequisite to the diagnosis. If this is negative, no tuberculous calcification in the mesenteric glands will be found. Only those children reacting positively will need to have an x-ray examination. It would be interesting to know the findings of Russian paediatricians on the symptomatology of intra-abdominal calcification, for all infants in the U.S.S.R. are given B.C.G. orally at intervals, and there must be many thousands of children who now have calcified mesenteric glands.

Whether the pain is caused by pressure or by the drag of the calcified glands on the mesentery is not clear. Certainly such glands are found by chance in many children being x-rayed for some other condition—an intravenous pyelogram, for example—in whom there have been no abdominal symptoms at all. Clearly not all cases with these symptoms and calcified glands are necessarily suffering from active tuberculous adenitis. The other symptoms described in this condition—for example, vomiting, sweating, lassitude, and loss of weight—are likely to be connected with some activity of the tuberculous process, and it is in children with such symptoms who also have fever and a raised sedimentation rate that the use of isoniazid may have to be considered. The association of pain and vomiting with slight fever must often raise the question of appendicitis. In any doubtful case laparotomy should always be undertaken. A radiograph of the abdomen showing calcification is no guarantee that acute appendicitis is not present, and it would be most unwise to wait for 48 hours to see the result of a tuberculin test. Of the physical signs of tuberculous mesenteric adenitis, local tenderness and palpable masses are the most frequent, but both are more commonly due to constipation than to tuberculosis; radiographs must therefore be taken and calcification confirmed before the diagnosis can be

accepted with certainty. If the diagnosis is still seriously entertained in the absence of any visible calcification, a negative tuberculin test will exclude the condition.

STERILIZATION METHODS

The Report of the Central Pathology Committee of the Ministry of Health on the Sterilization of Hospital Equipment, issued to hospital authorities on December 31 last, contains directions in the light of which hospitals are invited to review their present practice, and it will serve a useful purpose. It deals chiefly with surgical equipment; "bowls, baths, bedpans and urinals, crockery and cutlery are excluded since they usually come under the direct supervision of the ward sister." Discussing autoclaving, the authors lay proper emphasis on the necessity for loose packing of fabrics, and assume that the autoclave is of a type from which only two-thirds of the air can be exhausted; they therefore recommend a double evacuation. Autoclaves now exist from which air is completely expelled by downward displacement, and some mention of the advantages of this type might have been made. For the disinfection of bedding the Report suggests that a pressure of only 5 lb. per square in. (0.35 kg. per square cm.) of steam should be used, giving after a preliminary 20 in. (50 cm.) vacuum a temperature of 100° C. This is a reasonable compromise to minimize shrinkage of blankets and other damage. The Report does not discuss the circumstances calling for this treatment, and as much damage could perhaps be prevented by stopping unnecessary disinfection as by modifying the method. It is clearly necessary for the bedding of a septic or infectious case, but in many hospitals disinfection is practised after death from any cause and in all cases of cancer, a proceeding based rather on sentiment than on any scientific reasoning. The Report gives a full account of methods for the care and sterilization of syringes and needles: autoclaving and a dry oven at 160° C. are given as alternative methods, without the expression of a preference for either. It mentions that the performance of any dry oven must be checked, but not that some types may have very wide variations in temperature between one part and another. The recent experiments of E. M. Darmady and Barrington Brock,¹ made by inserting thermocouples at multiple points in ovens of different types and thus obtaining a continuous record of temperature rise, seem to show that gas-heated

ovens are most unsatisfactory, and that even those electrically heated perform consistently only when fitted with a fan to circulate the contained air. These authors also recommend loading the oven while it is hot, whereas the Report states that it should be cold.

Two of the articles in commonest use in surgery seem to occasion the greatest difficulty in sterilization. Methods for sharp instruments are the most diverse, mainly because heat in various forms is reputed to blunt them. That advocated here is boiling in 2% sodium carbonate. The procedure advocated for rubber gloves, the other troublesome article, at least in British surgical practice, is open to criticism. The report recommends that after cleaning they should first be boiled, and then, because higher temperatures spoil them, autoclaved at a pressure of only 5 lb. per square in. (0.35 kg. per square cm.). It then admits that "such treatment by itself does not ensure complete sterility so that gloves which may have become heavily contaminated with sporing bacteria, e.g., in a case of gas gangrene, should be destroyed." It seems in the first place a pity that the hoary old operating-theatre myth about the special infectivity of gas gangrene should thus be officially perpetuated. *Cl. welchii*, the principal cause of gas gangrene, is a normal inhabitant of the human lower bowel, and the precautions called for when it happens to produce infection are equally necessary after any operation on the colon, rectum, or anus. The instructions given for sterilization conflict at every point with those of C. W. Walter,² whose monumental work on surgical asepsis is the most complete of its kind and reflects the best American practice. He states categorically that gloves should not be boiled, because they imbibe water and thus lose tensile strength. He also states that "gloves withstand sterilization by saturated steam but deteriorate rapidly in mixtures of air and steam." In other words, what matters is not absolute temperature but the admixture with steam of hot air (presumably the damage is an oxidation effect). In an autoclave giving an atmosphere of pure steam gloves can be sterilized at 15 lb. per square in. (1 kg. per square cm.) at 121° C. It is sometimes suggested that this should be maintained for only 15 minutes, but at the Peter Bent Brigham Hospital they maintain it for 30 minutes, as in autoclaving other materials, simply for the sake of uniformity, and have no complaints about the effect on the quality of the rubber. It may be concluded from the experiments of B. Schmidt and E. Möller,³ who compared the effects of 120° C. for 30 minutes and 134° C. for 5 minutes on the strength and elasticity of rubber gloves—slightly to the advantage of the former—that sterilization at full pressure is also the usual practice in

Germany. Surely the truth in this very important matter should be finally determined, and British surgical practice brought into line with it if the facts demand a change. That gloves, of all things used in an operation, should be of doubtful sterility is intolerable. If it is a fact that hot air and not steam is what damages gloves—and anyone doubting this can test the statement by experiment—then all that is needed is an autoclave giving an atmosphere of pure steam and its use as for sterilizing any other materials.

PAPILLOMATOSIS OF THE BLADDER

The treatment of diffuse villous papillomatosis of the bladder is peculiarly difficult, since despite the simple nature of the lesions they are often present in such numbers that control by cysto-diathermy or endoscopic resection is impracticable. Moreover, a proportion of tumours appear eventually to undergo malignant changes, thus adding to the hazards of incomplete destruction by such means. Alternatively, extirpation by total cystectomy may seem unnecessarily radical in early cases, while radiotherapy from a remote source carries the disadvantage of exposing the surrounding tissues to an excessive dose of irradiation. During the last few years efforts have been made to overcome this last difficulty by devising methods of intracavitary irradiation, whereby the tumours may be treated more selectively. The use of radioactive solutions (instilled into a rubber balloon within the bladder) has allowed a diffuse irradiation of the mucosa with limited deeper penetration depending on the quality of the isotope and on the screening effect of the containing sheath. In practice, however, technical difficulties have greatly narrowed the margin of safety between securing adequate destruction of the tumour and avoiding subsequent radionecrosis of the bladder wall. On the one hand the rubber sheath has discriminated unfavourably in reducing the surface dose (while permitting the passage of more penetrating rays), and on the other hand the tumour has been pressed against the bladder wall, thus permitting only one surface to be fully irradiated.

Elsewhere in this issue Dr. Frank Ellis and Mr. R. Oliver describe a modification of radiotherapy which gives promise of proving both safe and effective in the treatment of superficial papillomatosis. The essential difference in their technique lies in the direct instillation of a radioactive solution into the bladder, thus allowing the papillomata to float out and become exposed to irradiation from all sides. At the same time the screening effect of the catheter bag is eliminated and the overall dosage can thus be reduced to avoid an excessive dose in depth. Preliminary work has indicated that, with certain precautions, a standard preparation of radioactive colloidal gold is suitable for this purpose, and may be retained within the bladder for the required time without ill effect and can be subsequently evacuated by irrigation. Using this method, the authors observed the disappearance of multiple villous tumours, and they

¹ *J. clin. Path.*, 1954, 7, 290.

² *The Aseptic Treatment of Wounds*. New York. 1948.

³ *Z. Hyg. Infektkr.*, 1954, 140, 144.

describe the reduction in size of neoplasms less simple in appearance, thus making easier their eradication by other means. It must be emphasized, however, that, *a priori*, the technique is unsuitable for infiltrating growths, since effective dosage would necessarily carry the risk of damage to the normal bladder wall. Experience with previous methods has shown that late necrosis and contracture may occur up to several years after treatment, and the utmost caution is therefore required in limiting the dose of irradiation lethal to the tumour to a depth of penetration scarcely exceeding the radius of a simple papillary frond. Allowance has thus to be made for the dilution of the isotope solution by urinary secretion during its retention in the bladder, and for the ability of the patient to refrain from micturition during the prescribed period. This and other matters relating to the control of radioactive materials make it essential that for the time being further trials of this method of treatment should be conducted only under carefully supervised conditions.

EYES AND APPETITE

The use of dyes in food manufacture has become so extensive that the Food Standards Committee of the Ministry of Food has recently issued a report¹ by a subcommittee on the possible hazards arising from such practices. The report, which was briefly summarized in last week's *Journal*, provides such an astonishing record of the use of colours in food that it is perhaps reasonable to wonder whether the research resources of the food manufacturing industry are being properly used. If increased reliance is being placed on colour in order to sell food, it suggests that inadequate attention is being paid to correcting processes of manufacture so that natural colour and flavour are retained to the maximum. Doubtless there are difficulties, especially if costs are to be kept low; nevertheless there would have been much support for the subcommittee if it had taken a stronger line against this ever-growing use of artificial colours in food. The manufacturers appear to have made a plea for the retention of all the colours hitherto put to use in this country and wished to include all those permitted in other countries. In this country at present there is a short list of forbidden colours, while any others may be used. The report rightly recommends that in the future there shall be a permitted list, but when the subcommittee tried to compose such a list it had many difficulties to contend with: there are 82 different colours named on 22 permitted lists of those countries that have such lists, yet only one dye is common to them all.

Largely avoiding the technological issues and subtler matters of good taste in food manufacture, the subcommittee concentrated its attention on the possible toxic hazard from consuming these dyes. Many of the colours used have never been tested for toxicity: none has any marked acute toxic effects, and all are present in very small quantities in our diet. This raises the vexed ques-

tion of the possible possession of chronic toxic properties by these colours. Naturally the subcommittee paid most attention to the possibility of the dyes having carcinogenic properties. Some have already been incriminated as carcinogens for experimental animals: others are closely related to carcinogenic compounds either chemically or by derivation from them. Probably one shadow hanging over the inquiry is the known property of β -naphthylamine to produce bladder cancer in man. Little, however, is known about the doses needed to do this, and it is impossible to say whether a lifelong consumer of coloured foods will ever ingest a quantity of dye comparable to the amount needed to cause cancer in a worker in a dye factory where β -naphthylamine used to be handled. Ideally every dye on the permitted list should be tested in such a way as to exclude the fact that it is a carcinogen for a few laboratory animal species, but even so such screening tests might well have allowed β -naphthylamine itself to pass as harmless. Other tests for chronic toxicity are of doubtful value, and it seems questionable whether a battery of tests such as those outlined by Professor A. C. Frazer would be a practical proposition for 40-odd dyestuffs. Simple excretion tests if done on animals and perhaps on man might reveal a few dyes that the body excreted unchanged. Another important point made by the subcommittee is that these dyes are rarely manufactured specially for use in food, so that while shade may be crucial chemical purity is not so essential. It should surely be made compulsory that all dyes used in food should meet fairly rigid standards of chemical purity. This in turn might help to curtail the list, because some dyes would be more readily purified than others. The food manufacturers have successfully overcome the handicap of the withdrawal of many preservatives, and they should be discouraged from placing increasing reliance on artificial colours in order to make their products attractive. One of the great objections to mass-produced food is that it loses its natural flavour: artificial colouring, even if harmless, is poor compensation for loss of quality.

EDINBURGH MEDICAL JOURNAL

The December number of this memorial to Scottish medicine has reached us with the sad news that it is the last to appear. Rising costs of production, a sluggish circulation, and diminished revenue have combined to kill a periodical whose continuous appearance since 1805 (as the *Edinburgh Medical and Surgical Journal* until 1855) has been a steady source of entertainment and instruction to British readers, and in particular to Edinburgh graduates. Since 1908 the *Edinburgh Medical Journal* has been the property of a limited company of doctors, and its reserve funds have now all been mopped up by the cumulative losses of the last few years. This notable casualty in medical periodicals is but an example of the severe financial strains to which periodical publishing is now subject. It is indeed distressing to have to record the disappearance of a journal which traces its origins directly back to *Medical Essays and Observations* (1733-44), the fourth oldest medical periodical in the United Kingdom.

EMERGENCIES IN GENERAL PRACTICE SHOCK*

BY

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The study of shock has for many years attracted the ablest investigators in Britain and America. Men like Aub, Blalock, Bywaters, Grant, Green, Gregerson, Haist, Moon, Phemister, and Wilson (the order is alphabetical rather than chronological) have paid particular attention to this problem, and by their research work in the laboratory and their clinical observations at the bedside they have added greatly to our knowledge of the reactions of the animal and human body to various forms of injury.

The treatment of shock is essentially a practical problem. We must study the research work that has been done in the laboratory, and if it has provided an answer we must apply the lesson it brings to our clinical tasks. Very often, however, the answer is "So what?" and it is extremely important that we should leave philosophical doubt behind when we come to the side of the pale listless man who has just been rushed in by the ambulance. It is right, therefore, that from time to time a clinical speaker should try before a clinical audience to bring this important subject from the laboratory to the bedside, to turn aside from a consideration of what shock might be and consider what shock is as we see it, what steps we can take to prevent it, and what we can do to save the shocked patient.

What is Shock?

We are often criticized by our scientific friends for using the word "shock" without explaining exactly what we mean by it. The word "shock" has a very definite meaning to me, and to most surgeons. To me it means a state of collapse following injury, and I shall go on calling it shock till I find I am wrong. The definitions of the experts are no more helpful than this simple statement. Blalock defines shock as "peripheral circulatory failure." Why peripheral? Why failure? In the type of shock most commonly encountered in clinical practice, that due to haemorrhage or trauma, nothing has failed. The central pump and the peripheral mechanism are working with supreme efficiency. The motor is spluttering only because the tank is running dry. Moon defines shock as "a circulatory deficiency characterized by decreased blood volume, decreased cardiac output, and increased concentration of the blood." This may be the shock of the laboratory mouse. It is not the shock of the wounded soldier; unless he is burned or crushed his blood concentration is normal or below that figure, and it falls in subsequent days. These definitions, in attempting to give an exact meaning to a comprehensive and general term, force upon it a significance foreign to its accustomed clinical use. This is hardly surprising, since many of the experiments whereby shock is produced in the laboratory bear no relation to the manner of its causation in surgical practice.

I will return to my first definition of shock and expand it slightly. "Shock is a state of collapse following injury, characterized by a depression of the circulation." All we know when we are called to the patient's side is that he has been injured, that he is collapsed, and that he lies apathetic

* Based on a contribution to a symposium at Bristol University on "Medical Aspects of Atomic War" (see *Journal*, November 27, 1954, p. 1283).

with an ashen grey face and cold clammy hands. The diagnosis is a clinical one, and, having made it, we must set ourselves urgently to seek the cause and decide the treatment.

Mechanism of Shock

The circulation of the blood depends on three things: on the action and force of the heart beat, on the volume and viscosity of the blood, and on the peripheral resistance of the arterioles. Interference with one, two, or all of them may be found in the condition of acute circulatory depression known as shock. Heart failure may resemble shock. Many factors associated with injury, particularly with battle injury—peritonitis, blast damage to the lungs, fat embolism, acute anaerobic infection, absorption of toxins from damaged muscle—may complicate and be partly responsible for the clinical state of shock. But to label them as "shock" is to make the term completely meaningless.

Traumatic shock is, in the overwhelming majority of cases, the result of a diminution of the effective circulating volume of the blood, and the word "shock" should be used for this condition alone. The other shock-like states should be called pseudo-shock. The later changes caused in the circulatory mechanism by anoxaemia, infection, or tissue toxins of various sorts should be referred to as epiphenomena or sequelae of shock, but not as shock.

In shock the diminution of volume may be due to actual loss, or to a sudden increase in the capacity of the vascular bed, the volume being unchanged or diminished to an extent that would not in itself cause shock. In wound shock the loss is one of blood, either from the wound or into damaged tissues. In the shock which follows crush lacerations or severe surgical operations the loss is of blood and plasma. In shock from burns the loss is of plasma only, from the burned surface and into the tissues underlying it. In the vasovagal syndrome, known also as primary or nervous shock, a state which may be found alone or preceding or accompanying true oligæmic shock, the circulating volume is inadequate to the vascular bed, whose capacity is increased by widespread dilatation.

Primary and Secondary Shock

Phemister has observed that "primary and secondary shock should be recognized on the basis of difference in aetiology rather than difference in time of occurrence." Primary, or nervous, shock is a condition of circulatory disturbance associated with low blood pressure due to dilatation of the peripheral arterioles, and a slow pulse due to stimulation of the vagi. It is a cardiovascular upset of reflex origin, the result of painful stimuli or of emotional disturbance, very often a combination of the two. A painful injury is more likely to cause it than a large one, and an apprehensive individual is more likely to suffer from it than a phlegmatic one. The main features distinguishing primary from secondary shock, apart from the nature of the causative injury, are that the patient does not look ill, that his skin is warm, that he is torpid or unconscious rather than apathetic, and that his pulse is slow.

Primary shock is essentially a transient phenomenon that responds to rest, relief of pain, warmth, hot drinks, and removal from distressing surroundings, and a good response to these simple measures may be the surest method of distinguishing primary from secondary shock. It is, however, less important to recognize those who respond well than it is

¹ Food Standards Committee Report on Colouring Matters: Recommendations Relating to the Use of Colouring Matters in Food, 1954, H.M.S.O., London. Price 1s. net.

to watch anxiously for those who do not or who relapse after temporary improvement, for they are suffering from secondary shock and need immediate and active treatment. If there is any doubt, needless transfusion of a patient in primary shock is a harmless mistake compared with delay in starting the transfusion of one suffering from secondary shock.

Secondary shock must be assumed where there has been much blood loss or tissue damage. Some estimate of the loss can often be made from the history given by the patient or his friends, or from observing the amount of blood on the clothing or the stretcher. But fluid may be lost into the tissues without external loss, a mechanism repeatedly stressed by Blalock. A man can bleed to death into the thigh muscles round a fractured femur without any free haemorrhage occurring. Grant, in his observations on wound shock in the Italian campaign published in 1951 in the Medical Research Council Special Report Series, No. 277, has pointed out that the amount of blood and plasma lost into the damaged tissues in extensive muscle injuries is far greater than had been previously realized, and that the loss continues and is responsible for a relapse into clinical shock after resuscitation. The view that shock leads to endothelial damage, with loss of fluid into tissue spaces throughout the body and concentration of corpuscles in the peripheral capillaries, is no longer held.

Assessment of the Shocked Patient

A man suffering from shock looks ill. His attitude is apathetic, but he is mentally alert and answers questions readily. His skin is cold, moist, and pale, with a greyish colour, particularly about the ears and lips. His hands and feet are icy cold. His eyes, with pupils dilated, appear abnormally bright. His respirations are little altered. The pulse is rapid and of low tension. He passes little urine, and is prone to vomit any fluids given by mouth. Air-hunger and spontaneous vomiting are indications of severe shock.

An index to the presence and degree of shock, but not an entirely reliable one, is the blood pressure. While the fall in systolic pressure is usually commensurate with the loss of blood volume and the degree of shock, there are surprising exceptions. Some men show a low blood pressure rising subsequently, some show periodic rises and falls, and some maintain a high pressure till just before the end. A low pulse pressure is often of more significance than a low systolic pressure.

The whole clinical picture of shock can usually be accounted for by the loss of circulating fluid alone. The degree of shock is roughly proportional to the loss of fluid: a loss of 2 pints (1 litre) leads to moderate shock, one of 3 pints (1.5 litres) to severe shock, one of 4 pints (2 litres) (roughly 40% of the blood volume) to profound shock. A known loss of 4 pints (2 litres), even though the patient may, by supremely efficient compensation, be able temporarily to keep his blood pressure up, will eventually lead to profound shock, and, conversely, profound shock means that at least 4 pints (2 litres) have been lost and must be replaced.

Restoration of the Circulation

The treatment of oligæmic shock is the restoration of the circulating volume to its former level. If possible, the volume should be restored qualitatively as well as quantitatively—that is, lost blood should be replaced with blood, and plasma with plasma—but the immediate need is for volume, and the fluid must usually be introduced directly into the circulation. Water by mouth or by rectum or crystalloid fluids intravenously are of little value when the circulatory loss has been large enough to give rise to clinically recognizable shock; under such conditions water is poorly absorbed in the alimentary canal and poorly retained in the circulatory system.

The restoration of volume should be early and rapid. While a patient is in a state of shock, all his tissues are

poorly supplied with oxygen; organs such as the kidneys and liver are by-passed to conserve blood for the heart and brain and may suffer permanent damage, and bacteria in his wounds, particularly the anaerobes, are given a chance to establish themselves. When a total of 4 pints (2 litres) or more is needed, the first two should be run in rapidly, using pressure to assist gravity, and full restoration in four hours should be aimed at.

The choice between blood and plasma depends to some extent on the availability of the two. Plasma can always be obtained, blood only when donors have been prepared, and blood in quantity only when arrangements have been made to supply it. Plasma is free from the dangers of reaction due to incompatibility, infection, or mechanical destruction of the red cells which are present with blood, but may transmit the virus of hepatitis. It is better than blood for the shock of burns, indeed for all shock characterized by haemoconcentration. In haemorrhage it is as good as blood for restoring volume, and not greatly inferior in therapeutic results when the blood loss has been moderate. It flows more easily, so that even in transfusion for severe haemorrhage it has been advised that plasma should be used for the first 2 pints (1 litre), which are given rapidly. Blood should be used to replace a haemorrhage of more than 2 pints (1 litre), and when the haemorrhage is not merely severe but is expected to continue during resuscitation or operation, blood alone should be used. Plasma cannot bring a man who has lost more than 2 pints (1 litre) of blood into a state fit to withstand a severe operation, or enable him to overcome infection or to repulse anaerobes.

"Plasma-savers" are solutions containing large molecules—of gum acacia, a polyvinyl compound, or a polysaccharide—that remain in the circulation and can replace in volume and viscosity an equal amount of blood. What is their place in the treatment of shock? The answer is in the seventh chapter of St. Matthew's Gospel: "What man is there of you, whom if his son ask bread, will he give him a stone?" The plasma-savers provide volume and viscosity and can restore the blood pressure, but they do not carry oxygen, and they do not provide energy or any substance used by the body. On the other hand, they tend to clump the red cells, thus interfering with grouping, and they are finally fixed by the reticulo-endothelial system. By restoring the blood pressure before the cause of hypotension has been arrested, they may restart a haemorrhage that has stopped and wash out the life fluid with a fake substitute.

There is one legitimate place for the plasma-savers: to keep a patient alive in a desperate emergency till blood or plasma can be obtained. If a man has lost 5 pints (2.5 litres) of blood rapidly, or if his systolic pressure has dropped to 50 mm., his central nervous system and his kidneys will suffer irreparable damage and his acid-base equilibrium will be upset beyond recovery unless the pressure can be raised within half an hour. Plasma-savers must be given till blood arrives, for desperate situations demand desperate remedies.

I hold that every surgeon who is called upon to treat acute injuries in healthy men should act upon the belief that no haemorrhage need be fatal if it can be stopped and the lost blood can be replaced early enough and fast enough, and no shock need become irreversible if it can be reversed in time and with sufficient energy. Shock becomes irreversible chiefly because prolonged anoxia has been allowed to wreck the machinery of recovery. Many more lives are lost by tardy, hesitant, or inadequate transfusion than by excessive transfusion or transfusion for the wrong indications.

Ancillary Measures

I must touch briefly on some of the other measures used in the treatment of shock. Warmth may be beneficial in primary shock, but in secondary shock it is harmful. Experimentally shocked animals are more likely to die in a warm room than in a cold one. The cold skin of shock is an index of a peripheral vasoconstriction the purpose of which is to reduce the volume of the vascular bed and to maintain

the arterial pressure, and a drop in body temperature is beneficial in reducing the general metabolism to a level more adapted to the reduced oxygen-carrying capacity of the blood. The "shock-cradle" can be a shock producer. Patients expend their ebbing strength in trying to throw it off, and in this demonstrate that the physiological call of instinct is wiser than the teaching of the textbooks.

Morphine must be used with great caution. No more than $\frac{1}{4}$ gr. (16 mg.) should be given at a time, and it should be given into a vein, since in a state of shock it is absorbed slowly from the subcutaneous tissues. A second and larger subcutaneous dose is apt to be given if the first fails, and when later the circulation is restored the accumulated amount is absorbed and may produce a profound stupor.

The use of pressor drugs, including the adrenal preparations, is unwise. They may do good in primary shock accompanied by vasodilatation, but here they are unnecessary. In oligæmic shock, which is associated with vasoconstriction, the real need is for an increased supply of blood and oxygen to the tissues rather than for a raised systolic pressure, and further vasoconstriction may therefore do more harm than good.

When Normal Services Fail

The treatment I have discussed demands, not necessarily hospital conditions, but at any rate facilities for careful examination and constant supervision, the provision of shelter and bed-clothing, and a supply of the necessary fluids, drugs, and apparatus.

Should a casualty be moved to hospital before shock has been combated? A man in profound shock can easily be killed by a rough journey, particularly if his fractures are not adequately splinted. But part of the shock seen immediately after an accident is nervous in origin, and the patient will recover considerably after a short period of rest during which he is kept warm, reassured, and given fluids. The apparatus for intravenous fluid replacement is seldom available at the scene of an accident, but it may arrive with the ambulance. Should blood or dextran be given before the casualty is loaded for the journey? The answer depends on the state of the patient, the nature of the injury, and the length and quality of the coming journey. When in doubt it is better not to transfuse, for transfusion without control of the blood loss is apt to increase that loss, particularly if it raises the blood pressure above shock level during a bumpy trip. However, if the bleeding can be controlled by ligature or tourniquet, it may be wise to start transfusion before the man is put into the ambulance, and to send him off, with the transfusion running, as soon as a palpable pulse has returned.

What should be done in a major disaster when normal services are absent, inadequate, or disrupted? Three things that can be given to all are reassurance, warmth, and fluids. Reassurance alone will restore most cases of primary shock and benefit all. No one can dispense it better than the doctor, who by his quiet confident actions can do most to assure the victims that the crisis is over and the situation is in hand. Warmth and fluids must be dispensed with more caution, but here, fortunately, the customer is always right. The man who feels cold needs blankets. The man who is cold and does not feel it is better left uncovered. With water, also, personal desires can usually be trusted: the man who asks for a drink can usually be given one, the man who does not want water or vomits when it is given him should be left alone or given fluids another way. Pain must be allayed if the means are available, and morphine, given intravenously, is the best analgesic in shock. The administration of blood plasma and dextran will depend on whether these fluids are available; they cannot be improvised on the spot.

We must always remember that even the most severe shock is not necessarily fatal. Men have recovered after lying out all night on an icy battlefield who might have died had they been found earlier and subjected to the additional trauma of movement. The one thing that must

be remembered is that a shocked man will not stand an anaesthetic or an operation, and if the means of treating shock actively are not available he will stand a better chance if nothing is done to his injuries beyond splinting fractures, stopping haemorrhage, dressing his wounds, and keeping infection at bay by the administration of sulphonamides at regular intervals, than if he is subjected to surgical excision of wounds and mechanical cleansing of burns while still in a state of shock.

Next article on Emergencies in General Practice.—"The Differential Diagnosis of Coma," by Dr. M. J. Parsonage.

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BACTERIAL GENETICS

[FROM A SPECIAL CORRESPONDENT]

An informal meeting on bacterial genetics was held at the London School of Hygiene and Tropical Medicine from December 14 to 17, 1954. The intention was to provide reviews of the main topics in terms comprehensible to those not well acquainted with the subject, and for the most part the speakers succeeded reasonably well.

Experimental Production of New Strains

The first day was devoted to some of the methods by which two bacterial strains can interact to produce a new "hybrid" strain. In the pneumococcus, the influenza bacillus (*Haem. influenzae*), and the meningococcus, cells treated with deoxyribonucleic acid (D.N.A.) extracted from some other strain of the same species may acquire some heritable character from that strain. Many different traits can be transferred in this way; and it has recently been discovered that some pairs of traits are linked—that is, that absorption of a single particle of D.N.A. by a bacterium may confer on it two distinct new hereditary properties. These facts make it at least very probable that D.N.A. constitutes the genetic apparatus of the bacteria concerned, and that single macromolecules of D.N.A. contain differentiated regions regulating different bacterial characters—that is, different genes. The latest development in this field was reported from the Biophysics Research Unit at King's College, London. By chromatography on a column of histone adsorbed on kieselguhr it has been possible to divide D.N.A. from streptomycin-resistant pneumococci into a series of fractions which differ not only in their chemical composition (ratio of bases) but also in their ability to transform streptomycin-sensitive pneumococci into resistant ones. It remains to be seen whether the ability to effect different transformations will be found concentrated in a single fraction or distributed amongst different ones. In the latter case the isolation and chemical characterization of a specific gene may not be quite so remote a possibility as it has hitherto seemed.

The recently discovered phenomenon of transduction of characters from one salmonella strain to cells of another by treatment with a cell-free filtrate of a lysed culture now appears in essence similar to the D.N.A.-mediated transformations; the main difference being that in salmonella the genetic material requires a phage particle to carry it across from the lysed cells to the cells of the recipient strain. The chemical nature of this phage-transported salmonella

genetic material is unknown, but it seems likely that it also is D.N.A., present as contaminant material within the shell of the phage particle, and protected by its situation from deoxyribonuclease, which inactivates free D.N.A., but not the transducing activity of phage-lysed salmonella cultures.

Mating

Genetic recombination in *Bact. coli* K12 was reviewed by Dr. W. HAYES, of the Postgraduate Medical School of London. In this organism pairs of strains can be crossed, but only if the cells of the two strains are allowed to come into direct contact. In this respect the process resembles sexuality in higher organisms, but many anomalies await explanation. In particular, most of the recombinants derive the great majority of their characters from but one of the two parent strains—that is, from the strain described as *F*—, since it lacks the "fertility factor," *F*, which must be present in at least one parent strain if a crossing is to be fertile. The *F* factor may be a phage-like particle which carries across a variable amount of bacterial genetic material from an *F*+ cell to an *F*— cell with which it has fused, or it may be an "elimination locus" on the bacterial linkage group which commonly causes loss of a segment of this group after formation of a normal zygote. Dr. J. L. JINKS, of the University of Birmingham, presented a new analysis, based on the latter hypothesis, which, he stated, provides a satisfactory explanation both for his own recombination data and for all earlier data published by others. Fuller details of this work will be awaited with interest. The nature of the *F* agent is one of the most interesting problems in bacterial genetics. One of its more surprising properties is that *F*— cells readily acquire the *F*+ character if grown in mixed culture with *F*+ cells, but that they cannot be made *F*+ by treatment with any cell-free extract of *F*+ cells. If the *F* agent is indeed a particle transmissible by infection, it seems that direct cell contact is required for infection to occur.

Bact. coli K12 continues to provide surprises for the bacterial geneticist. It has been known for some time that many, but not all, sub-lines of this strain are lysogenic for a phage called λ , and that active growth of the latent phage, and lysis of the cell, can be induced by ultra-violet irradiation. Recent work in Paris shows that, when a lysogenic strain carrying the *F* factor (or its variant form called *Hfr*.) is mixed with a non-lysogenic *F*— strain, many cells lyse and liberate phage λ , and it has been proved that this results not from infection of non-lysogenic cells by free phage but from transfer of latent phage or pro-phage into sensitive cells by cell fusion (or adhesion). In matings of this kind it seems that many or most of the pairs of mating cells, and so of the potential recombinants also, are lost through this "erotic induction" of the active growth of latent phage. In other work on K12, the inheritance of lysogenicity has been studied, using precautions to avoid induction of phage activity. The property of lysogenicity behaves as though it resided at a particular locus in the bacterial linkage group, and there now seems little reason to doubt that the genetic material of the carried phage is in fact attached to, or incorporated in, the linkage group of the host at this locus, and that the pro-phage or latent phage is indeed "a parasite at the genetic level."

From the discussion on the genetics of bacteriophage it appeared that it has been established that phage particles contain a series of mutable genes which are arranged in one or more linear linkage groups, as in higher organisms, and that after infection of a cell by more than one particle of differing genotype recombination may occur. A model based on the hypothesis that recombination results from a series of matings of pairs of particles, with mutual exchange of genes, so as to produce two recombinants per mating, accounts satisfactorily for the experimental data. But another model proposes that a single recombinant arises as a result of replication in part of one "parent" particle and in part of another, so that a pairing produces one recombinant only, not two of complementary composition, and

this model also is said to be satisfactory. It seems that the bacterial cell conceals unexpectedly well the essential nature of the sexual or parasexual process in bacteriophage.

Bacterial Adaptation

One session was devoted to a discussion of bacterial adaptation. Sir CYRIL HINSHELWOOD, F.R.S., gave a brief exposition of his well-known theory which provides a satisfactory explanation for the inheritance of acquired characters in bacteria. It now appears that in this controversial field all parties are agreed that some spontaneous mutations occur, and that some adaptive changes are specifically induced by the environment. The one disagreement is on the interpretation of the experiments which purport to show that specifically induced adaptive changes are inherited in the absence of the stimulus which provoked them.

Virulence

In a session on the applications of bacterial genetics much attention was devoted to the virulence of bacterial pathogens. Dr. T. W. BURROWS, of Porton, discussed some of the characters required by an organism to make it a successful disease-producer. One such character is the ability to grow in an environment of the chemical composition of the tissue fluids of the host, and he has shown that this character may be successfully investigated at the genetic level. In a strain of *Salmonella typhi* most nutritionally exacting mutants were of about the same mouse-virulence as the parent strain, but mutants needing to be supplied with purines to enable them to grow were almost or entirely avirulent; and it appears that this is because the peritoneal fluid of the mouse does not contain enough purines for the needs of the mutant bacterium. Administration of purines to the host enables the bacteria to multiply and kill it, and loss of the exacting character by back-mutation restores the original virulence. This constitutes a new instance of the loss (and regain) of virulence as a result of alteration of a single gene regulating a character indispensable for virulence. It is noteworthy that the first instance of bacterial hybridization—that is, the type-transformation of pneumococci discovered by Griffith in 1928—was detected by study of another such character, encapsulation. Dr. D. ROWLEY, of the Wright-Fleming Institute, presented new data on the mechanism of the differing virulence for mice of two strains of *Bact. coli* of the same serological type. His experiments indicate that the difference in virulence results from the susceptibility of one strain, and the resistance of the other, to the bactericidal action of complement and properdin, in the absence of specific antibody. The genetic basis of this difference remains to be discovered.

Dr. L. F. HEWITT described work on the conversion of non-toxicogenic diphtheria strains to toxigenicity by treatment with certain phages. So far as can be judged at present, it seems that the process involved is neither genetic transfer nor the selection of spontaneous mutants, but a specific effect of lysogenization with certain phages on the metabolism of the host. This is the only known instance of such a consequence of the lysogenic state, and its mechanism is unexplained.

Population Studies

The population genetics of bacteria was briefly reviewed by Dr. P. ARMITAGE. In this field theoretical analysis has now provided adequate explanations for much that has been observed on bacterial cultures growing *in vitro*; the more difficult problems of changes in virulence of bacterial pathogens under natural conditions, and of the forces tending to maintain the constancy of bacterial characters in the wild, remain as yet little studied. Their importance for medicine is emphasized by, for instance, the increasing proportion of antibiotic-resistant strains in some bacterial species harboured by certain human populations.

In closing the meeting, Professor J. B. S. HALDANE, F.R.S., envied the microbiologists the rapidity with which they could obtain results in genetic experiments, and drew attention

to various parallel problems in the genetics of micro-organisms and of larger plants and animals. He contrasted the variety of mechanisms by which recombination of hereditary characters could occur in bacteria with the almost exclusive reliance of the metazoans on sexuality. He congratulated the microbiologists on their grasp of "classical" genetics, but regretted the absence of a control world in which the discoveries of microbial genetics would have had to be interpreted without preconceived notions; for this, he felt, might have produced useful new ideas. To the writer, however, it seems that until recent years most bacteriologists did indeed interpret their results in just such ignorance of the genetics of sexual organisms, and that the process was on the whole a very barren one.

SOCIAL PROBLEMS OF THE YOUNG DISABLED

A study of a cross-section of disabled persons aged 15-45 is the subject of a report to the Leverhulme Research Awards and the South-east Metropolitan Regional Hospital Board by Mrs. M. U. SHARP, a member of the Association of General and Family Case-workers. Thanks to the co-operation of the Kent County Council, certain voluntary societies, the National Assistance Board, and the Ministries of Pensions and of Labour, Mrs. Sharp has been able to get in touch with over 400 disabled persons in Kent, a few of them long-stay patients in hospital, but by far the greater number at home or in some institution. They were suffering from various incapacitating diseases—most of them from anterior poliomyelitis and polioencephalitis, spastic diplegia, disseminated sclerosis, and rheumatoid arthritis.

Mrs. Sharp was impressed by the need for grouping the younger patients together in small special units. Of the 354 persons in their own homes or in institutional care, about 210 were so severely handicapped as to make life a major problem for them. She found in the homes of many of these disabled persons a tendency for relatives to be too protective—an attitude responsible in some cases for preventing young people from going away for training or employment. She also makes the useful suggestion that certain gadgets which make life easier for such persons in dressing, toilet, and feeding should be supplied under the National Health Service. Such gadgets lighten the task both of the relatives and of the disabled person himself to a surprising degree, and the National Association for the Paralysed has published a useful handbook on them. But unless the patient is in a hospital which has a physical medicine department it is very difficult for him to obtain the requisite gadgets. They might well be scheduled appliances. Loneliness and idleness are the bane of the handicapped. Mrs. Sharp in her survey of the 400 persons found about 30 who needed some diversional occupation but could not make saleable products, and about 60 who could do really good handiwork but lacked a suitable market. She states that the home workers' scheme of Remploy Limited requires for home work that the disabled should work at least 30 to 35 hours a week, have two good hands and good eyes, and be prepared when trained to come off their benefits. Many people covered by her survey were incapable of sustained effort for so long, and were not prepared to risk the loss of an assured source of income.

One of several recommendations which she makes is that section 29 of the National Assistance Act, concerning welfare services for handicapped persons other than the blind and partially sighted, should be made obligatory on local authorities rather than permissive; and that welfare committees, in conjunction with county education committees, should pay special attention to the future needs of children still at school who will require institutional care, and should arrange an aftercare service for those who are considered unsuitable for either training or employment on returning to their homes.

Correspondence

Low Backache

SIR.—Dr. L. S. Calvert (*Journal*, December 18, 1954, p. 1488) makes a plea for the enlargement of departments of physical medicine to treat chronic backache. His letter suggests that orthopaedic surgeons are failing in their responsibility for dealing with backache, and that, moreover, they are tending to a dog-in-the-manger attitude. There must be many, doctors and patients alike, who share Dr. Calvert's concern, and it seems necessary that steps should be taken to attempt to teach the public "the facts about backache" so that they may know what they are entitled to expect, or not to expect, from an enlightened, humane, and sympathetic Health Service.

If the taxpayer is to foot the bill for the treatment of the backaches of his fellow citizens, he is surely justified in expecting the medical profession to be unanimous on the following three points: (1) that in the majority of cases there is a significant organic cause; (2) that the rationale of treatment is scientifically sound; and (3) that the results of treatment are worth the financial outlay, either in terms of crude economics or as a gift to human happiness. The experience of orthopaedic surgeons, with all the technique of physical medicine at their disposal, as well as many others not available to physiotherapists, suggests that these three criteria are satisfied only in a minority of cases. It is to the credit of orthopaedic surgery that it does not pamper every ache and pain in the community which the setting up of increased facilities for physical medicine undoubtedly would encourage.

The orthopaedic surgeon faces the backaching multitudes with five principal ideas in mind: (1) to make a diagnosis and, as far as possible, to exclude early and serious diseases masquerading as "low back pain"; (2) to attempt, again as far as possible, a rough assessment of the proportion of organic and functional elements in the pain; (3) for the vast majority, to reassure without treatment; (4) to treat by physical medicine, corset or plaster jacket, a selected small proportion; and (5) to operate (spinal fusion) in the hand-picked residue.

It is the problem of reassurance which is the most important yet the least satisfactory, both to surgeon and patient. In the first place, one can only reassure an intelligent, decent, and sensible patient. Most of the patients to whom these adjectives can be applied have already been reassured by the first two doctors they have seen—that is, the general practitioner and the first health service consultant on the "periphery." This means that the teaching hospitals, as final courts of appeal, accumulate an astonishing number of patients of a type impossible to reassure, and yet who have already received one or more complete courses of physical treatment at their local hospitals.

In the second place, the process of attempting to reassure a patient by sympathetic explanation is extremely exhausting for a conscientious consultant when he knows he is talking to a "brick wall." It takes a much longer time, and satisfies this type of patient less, than to send them off for a six weeks' course of quackery in the 30 seconds it takes to sign a chit. Unlike the bottle of coloured water, the cost to the State of placebo physiotherapy is fantastic. Many of these patients have the impertinence to say that "nothing has been done" for them after x-ray examinations (often in two or three hospitals), interviews with several consultants, and the fitting of a corset, when to get the same service over the same period of time in private practice would easily add up to £50.

If orthopaedic surgeons were to relax their strict grip on *ad lib.* physiotherapy, within as short a time as three years the backache problem would become totally unmanageable. Physical medicine can never cure low backache, and if pampered the first time the majority of these patients will be back again with another attack of chronic lumbago a year or so later. If given physical medicine the first time, it becomes humanly impossible to deny a second course if the patient is convinced, *post hoc propter hoc*, that the first course "cured" her. There is hope that in the near future pain arising in "collagen degeneration" may be brought

under control, which research is common ground for rheumatology, physical medicine, and orthopaedic surgery. Until this happy day dawns I believe that the majority of orthopaedic surgeons show a very highly developed sense of perspective in regard to pain and the public purse.—I am, etc.,

Manchester, 3.

JOHN CHARNLEY.

Anaemia of Newborn Following Anterior Placenta Praevia

SIR,—We were interested to read the article on this subject by Drs. N. R. Butler and J. D. Martin (*Journal*, December 18, 1954, p. 1455). They have performed a useful service in drawing attention again to the risk of blood loss from the foetal circulation if the placenta is damaged during caesarean section—although their title hardly does justice to the urgency of the post-haemorrhagic shock which may occur in the affected babies. Your annotation (p. 1472) refers to our study of the same problem, reported elsewhere,¹ and rightly emphasizes the preventive aspect. We should like to report our further experience of this aspect.

During the period covered by our study the placenta had been encountered in the uterine incision on 20 occasions: 7 of the babies had lost sufficient blood to require a transfusion, and one of them actually died at the age of 3½ hours from post-haemorrhagic shock. During the subsequent 20 months meticulous attention has been paid to the details of the delivery in all cases of this type, and the technique used has been that described in our earlier report and in your annotation. There have been 15 cases in which the placenta was encountered: none of the babies has required a blood transfusion, and in only 8 babies has it been considered necessary to carry out serial skin-prick haemoglobin estimations, after our preliminary assessment based on the relevant factors noted at the time of delivery. This experience confirms that the obstetrician can almost eliminate the hazard of foetal post-haemorrhagic shock in cases of anterior placenta praevia by using the recommended method of delivery.

But the hazard can never be completely eliminated, as illustrated by case 6 in our previous report, and we fully agree with Drs. Butler and Martin in their recommendation that appropriate arrangements should be made for dealing with such an emergency whenever caesarean section is performed in a case of placenta praevia. We are, however, surprised by their reliance on the haemoglobin level in the cord blood as an indication of the amount of blood lost. We have been astonished by the speed with which haemodilution does in fact occur in some of these babies, as judged by the fall in the haemoglobin concentration in skin-prick blood during the first few hours of life, but it seems a little much to expect a significant fall immediately, or at the most within a few minutes of the haemorrhage, particularly if the estimations are made by a method whose margin of error is as great as that of the Haldane technique. It seems wiser to make an estimation as soon as possible after delivery and regard this as a base-line; subsequent serial estimations can then give an idea of the rate of haemodilution. We have found skin-prick blood satisfactory for this purpose if the foot is well warmed and a deep "prick" is made with a scalpel blade, and the M.R.C. "grey-wedge" photometer is used for making the estimations.—We are, etc.,

G. A. NELIGAN.

J. K. RUSSELL.

Newcastle-upon-Tyne.

REFERENCE

1. *J. Obstet. Gynaec. Brit. Emp.*, 1954, 61, 206.

Pure Red-cell Anaemia

SIR,—May I be allowed to make the following remarks on the interesting article of Drs. J. N. Marshall Chalmers and K. Boheimer (*Journal*, December 25, 1954, p. 1514)? The now popular name "pure red-cell anaemia" comprises several, at least three, different morbid entities. The disorder which I described in 1927¹ as erythrophthisis, and in 1952² as erythronophthisis, is acute or subacute, fatal or self-limited, non-haemolytic, and does not respond to any

known treatment except blood transfusions. It is identical with one example of "aplastic anaemia" described previously by Kaznelson.³ The second disorder, which Cathie⁴ aptly calls erythrogenesis imperfecta and which was previously known as the Blackfan-Diamond type of hypoplastic anaemia, is congenital, has often in the early stages signs of increased haemolysis, shows some improvement with A.C.T.H. therapy and sometimes spontaneous amelioration after years of duration. A disturbance of tryptophan metabolism with excretion of anthranilic acid in the urine has been claimed, but this I could not confirm in one examined case. The third disorder is that described by Chalmers and Boheimer. The association of two such rare diseases as thymic tumour and pure red-cell anaemia is certainly not fortuitous. While the two other forms of pure red-cell anaemia occur only or mainly in children, this form seems to occur in adults only. It is of interest that the association of myasthenia gravis with thymic neoplasms (lympho-epithelioma), which is not uncommon in adults, has also not been observed in childhood. This form of anaemia may show recovery or remission after thymectomy, splenectomy, and A.C.T.H. therapy, or it may progress to typical aplastic anaemia, as in the case observed by Dr. Brewer.⁵ Finally, we have to bear in mind that an aregenerative anaemia involving only the red blood corpuscles may occasionally develop as the result of Rh iso-immunization. This I observed in a pair of twins, who, in addition to signs of increased haemolysis, such as hyperbilirubinaemia without bilirubinuria and increased amounts of faecal pigments, had very low reticulocyte counts and a decreased number of nucleated red cells in the marrow. The nucleated red cells are very scanty or absent in the bone marrow in all above-mentioned disorders, and such as seen are of the most mature type. Only in the first weeks of life in erythrogenesis imperfecta normoblasts may be slightly increased in number.—I am, etc.,

Birmingham, 16.

H. S. BAAR.

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1. *Folia haemat. (Lpz.)*, 1927, 35, 111.
2. *Acta haemat. (Basel)*, 1952, 7, 17.
3. *Verh. dtsch. Ges. inn. Med.*, 1922, 34, 557.
4. *Arch. Dis. Childh.*, 1950, 25, 209, 313.
5. Personal communication, 1954.

Tuberculous Patients in General Hospitals

SIR,—I wish to give my wholehearted support to the call of Dr. Arnold B. Cowan (*Journal*, November 20, p. 1227) for the medical profession to rise as a body against allowing patients suffering from pulmonary tuberculosis to be admitted into the wards of general hospitals. Until a few years ago we built sanatoria specially designed for the treatment of tuberculosis on what was regarded as the most healthful site, on the sound and established knowledge of the disease, and no patient with tuberculosis was allowed to be admitted into the wards of general hospitals, and if during treatment for any other condition any patient was found to have developed pulmonary tuberculosis he was immediately sent out. There was good reason for this. The general hospitals were not constructed to treat tuberculosis with safest and best methods, and student nurses are at the most susceptible age to contract tuberculosis. The exacting nature of their closed institution work for the sick, the strains to which they are subjected on duty, and the ever-increasing diminution of their leisure and rest brought about by the need for preparation for examinations constantly elaborated by the ever-increasing demands of the specialists, render them highly sensitive to tuberculosis. The Prophit Tuberculosis Survey¹ showed instances of nurses who had contracted the disease and had been kept on duty in spite of clinical and radiographic evidence of progressive disease—indeed, until, on leave, the parents detected the obvious decline.

We are short of nurses, more particularly in tuberculosis and mental institutions. The authorities have offered increased salaries and other inducements; they have repeatedly announced their needs in the public press, and have used all the methods of inducement which propaganda

offers, but the girls will not respond. The explanation is obvious to every unbiased layman. Therefore these demands for enforced labour in these institutions during the training will obviously result in less girls taking up nursing. Why should girls seek posts demanding self-sacrifice and self-denial when there are plenty of posts which have conditions which permit the commendable self-indulgence of the Welfare State?

It has been abundantly shown that improvements in housing and standard of living are far more important than quantity of medical care. Due to the former, the death rate from tuberculosis has been steadily and consistently falling from 80,000 to 8,000. There is no better place to treat tuberculosis than the home, and no one better fitted than the general practitioner to supervise it, particularly now that he ought to have available the effective drugs. Make the homes of the people fit for the general practitioner to treat the case at home and you will not only abolish the disease but lessen the enforcing factors which prevent girls becoming nurses.—I am, etc.,

Birmingham, 15.

JAMES F. BRAILSFORD.

REFERENCE

1. Daniels, M., et al. (1948). *Tuberculosis in Young Adults: Report on the Prophit Tuberculosis Survey, 1935-44*. Lewis, London.

Premedication of Children for Tonsillectomy

SIR,—I am particularly interested in the correspondence following Dr. Christine M. Rendell's article (*Journal*, December 11, 1954, p. 1397) on the use of methylpentynol for premedication in children, as I myself have for some time been working on the same subject. I would suggest that the only satisfactory way of assessing a child's reactions to the experience of tonsillectomy is for a trained and independent observer to visit the child in its own home before and after its stay in hospital. It is obviously quite unreliable to ask the child while still in strange surroundings. The other way of recording a child's reactions is by means of a cinematograph record, such as was done by Robertson, of the Tavistock Clinic, in his film, "A Two-year-old Goes to Hospital." Both these methods have been carried out by me and are at present under preparation for publication.

I have been convinced that the elixir of "oblivion" as put up by Schering is of very great value for children. Admittedly no medicine will replace careful and tactful handling, but, having for years used atropine only as advocated by your correspondents, I have been very impressed by the ease of handling and induction since I have used oblivion. This shows very well in my film record. The incidence of vomiting I frankly do not understand. I have not met a single incident in about 500 cases. The oblivion should be given one hour before induction and followed by the atropine half an hour later. The child does not then mind this insult to its feelings. To those cases which arrive in the induction room still not fully sedated I then give a small "sleep dose" of intravenous thiopentone, quite a safe and easy procedure in a quiet and peaceful child, and not followed by any unsafe respiratory depression. But I hope your correspondents will see my film when it is ready. This will be more convincing than any letter.—I am, etc.,

Worthing.

F. R. GUSTERSON.

Mobile Physiotherapy Unit

SIR—Dr. G. A. Powell-Tuck's letter (*Journal*, December 11, 1954, p. 1422) rightly stresses the value of physiotherapy in the home. There is no doubt that many who need treatment are denied it because they cannot afford to pay private fees and cannot face the travelling and waiting involved in attending busy hospital departments.

A mobile physiotherapy unit was started 11 years ago to help these people, and the service is now available in about 20 areas. It could usefully be multiplied many times, but is restricted by lack of money. There is, I believe, only one unit financed by a local authority. The majority rely upon voluntary public subscriptions, contributory schemes, and help from existing charities. Where the need exists and

enthusiasm can be aroused, advice upon starting a unit is to be had from the Mobile Physiotherapy Services Association of 12, South Audley Street, London, W.1.—I am, etc.,

Redhill.

HENRY S. ATKINSON.

Chairman,
East Surrey Mobile Physiotherapy Unit

Intussusception in the Newborn

SIR,—I have read the article by Mr. Stewart Feggetter (*Journal*, December 4, 1954, p. 1335) about a case of intussusception in a newborn baby. Recently I have sent an article to a Spanish medical review in which I refer to a case operated on by me of a strangulated inguinal hernia in a 15-day-old baby. Like Mr. Feggetter's case, my patient had melaena and I suspected an intussusception. After a complete examination the diagnosis of strangulated inguinal hernia was clear. The operation was done with good results, and I think it worth emphasizing—in agreement with Mr. Feggetter—that the operative shock in the newborn is frequently well tolerated. I agree with the author that nurses experienced in this type of work are very important. In my case I had aiding me an English nurse who specialized in babies' cases, and her work was perfect.—I am, etc.,

Rio Tinto, Spain.

T. DE VEGA RUIZ.

Fatal Rupture of Retro-pharyngo-oesophageal Abscess

SIR,—In reference to the report (*Journal*, December 25, 1954, p. 1530) of a previously healthy girl, aged 10, dying as the result of fatal rupture of a retro-pharyngo-oesophageal abscess, is it not possible that if no antibiotics had been given the natural resistance of the girl would have localized the infection, an abscess would have been discernible, incised, and recovery taken place? In a report of an address given by Sir Heneage Ogilvie entitled "The Future of Surgery" (*Journal*, December 18, p. 1435) he gives a profound warning in reference to the dangers of the indiscriminate use of the antibiotics.

Is it not significant that no record of a case resembling the one reported could be found?—I am, etc.,

Hurstpierpoint.

KENNETH EDRED PEMBREY.

Carcinogens in Cigarette Smoke

SIR.—Professor R. D. Passey (*Journal*, December 18, 1954, p. 1485) states that it is striking that "the increase of cigarette smoking has not been matched by increase in the incidence of carcinoma of lip, tongue, larynx, or buccal cavity," and that "a reduction in these sites, which, of course, are those exposed to the greatest concentration of smoke," is strange. At least three factors are concerned in carcinogenesis—namely, the concentration of particles in intimate contact with the surface concerned, the period of the latter's exposure, and its sensitivity to the particular carcinogen. Thus the mule-spinner develops scrotal carcinoma due to the prolonged contact of his oil-soaked garments on a particularly sensitive epithelial surface, and the process of carcinogenesis due to aromatic amines in bladder carcinoma takes some 15 to 20 years to develop.¹ I would suggest that these factors in carcinogenesis are more marked in the respiratory tract distal to the trachea than in the other sites described.

Concentration.—Smoke taken into the mouth is admittedly present in considerable concentration in the air, but, as it is mostly expelled at the next expiration, relatively few particles pass into the fluid lining the buccal cavity. In the respiratory tract, particularly in those inhaling deeply, it will be less rapidly cleared, and particles will tend to be retained, and reach high concentration in the mucus layer lining the tract. **Sensitivity.**—The effect of cigarette smoke on the bristling eyebrows of men and the hair-covered skins of mice, which have the function of protection as their main office, is in no way comparable to the effect of that smoke on the sensitive, delicate "naked" respiratory mucosa. Further, the specific sensitivity of two mucosae, say buccal and bronchial, to a given carcinogen could well vary, particularly when histological differences are taken into account. **Period of Exposure.**—Normally, the particle-collecting respiratory

mucus layer is passed by ciliary action, or coughing, to the larynx and thence to the pharynx to be swallowed. A heavy smoker will tend to chronic bronchitis, and, although the frequent coughing will tend to clear the trachea and proximal parts of the main bronchi, reducing their exposure time, the deleterious effects on the mucus-propelling ciliary action will result in a raised active exposure time. The cilia, further, are more abundant in the smaller bronchioles than in the larger ones and the bronchi, and predilection of carcinoma for the latter may well be due to the relative stasis of the carcinogen-bearing mucus layer at these sites.

Relative to these factors, the rapid passage to the pharynx of the particles passing into the profusely secreted and frequently swallowed buccal fluids leaves little opportunity for prolonged or concentrated buccal carcinogenic activity. There is probably some hold-up of these buccal and the returned respiratory carcinogenic particles at the crico-pharyngeal sphincter between the pharynx and oesophagus (the hypopharynx), and it is interesting to note that the incidence of carcinoma in this site has about doubled in the last decade.

Professor Passey's second point, that of the decrease of carcinoma at various sites, is not easily explained—the decrease being absolute, not relative. An awareness of the dangers of introducing carcinogens such as clay-pipes and tar-coated thread into the mouth is now widespread, and, with improvement in dental conservation and prosthetic treatment, the chronic irritations of the jagged tooth and ill-fitting dental plate have decreased. Further, and most important, with a considerable decrease of incidence of syphilis the occurrence of advanced syphilitic leucoplakia with its precancerous and malignant stages is now rare. These factors are not pertinent to the decrease in laryngeal carcinoma. This decrease, however, is not outstanding, the figures¹ for male incidence in the years 1943, 1947, 1951, and 1953 being 827, 769, 805, and 737. This may be explained by assuming that the respiratory tract is, in some unspecified way, varying sensitive to carcinogens; then individuals in the high sensitivity group are more likely to develop the bronchogenic carcinoma in the 45 to 50 age group, and leave fewer to succumb in the 55 to 65 laryngeal carcinoma group.—I am, etc.,

Manchester, 13.

MONTAGUE SEGAL.

REFERENCES

- ¹ Case, R. A. M. (1953). *Brit. J. Soc. Med.*, 7, 14.
² Registrar-General's Statistical Review of England and Wales, 1953, Tables Part I. Med., p. 16. H.M.S.O., London.

Ultra-violet Light Therapy in Paget's Disease

SIR.—It does not appear to be generally known that some cases of painful Paget's disease of bone derive a measure of relief from ultra-violet light therapy and that it is worth a trial when other measures have failed. It appears desirable to produce mild erythema and pigmentation of the skin and to irradiate not less than one-third of the total skin area. These patients are usually elderly, and the precautions or contraindications proper to their general condition must be followed. I regret that I do not remember the source of my original information in about 1938 so that due credit might be given.—I am, etc.,

Watford.

H. RHYS DAVIES.

Operator and Anaesthetist

SIR.—May I reply to the letter of Mr. S. I. Freedman and his colleagues (*Journal*, December 11, 1954, p. 1416)? I have never said that thiopentone should not be used in the dental chair, only that the operator-anaesthetist might have difficulty in defending himself against a charge of negligence. Refinements of technique may make anaesthesia safer but cannot make it absolutely safe. We have to consider the law of averages. Sooner or later a complication such as laryngeal spasm or heart failure will occur, when I venture to predict that the complaints of the patient's surviving relations will be as nothing compared with the reproaches of the operator's conscience. What good purpose is served by taking useless risks?

The suggestion that the patient's doctor should be asked to certify that the patient is in a fit state of health for outpatient anaesthesia does not come from me but from a

learned judge. The circumstances of the case (which is quoted in the article I referred to¹) and our general experience show that the suggestion is not unreasonable and is in the patient's interest. Dental surgeons may disregard it if they choose, but only at their peril. I disagree with the writers' statement that contraindications to out-patient anaesthesia "are few and obvious," and also with the opinion expressed in the last sentence of their letter, which is contrary to general experience.—I am, etc.,

London, W.1.

R. BLAIR GOULD

REFERENCE

- ¹ *Anaesthesia*, 1954, 9, 248.

Chlorpromazine

SIR.—There is a simple explanation for the occurrence of jaundice following prolonged oral administration of chlorpromazine, as reported by Dr. Bryan Eagles (*Journal*, January 1, p. 46). It has been shown¹ that chlorpromazine exerts a reversible depressant action on all forms of cellular life in a concentration of 1/400,000. Cells which possess a high degree of specialized activity, like the cells of the brain, are particularly susceptible to this action, which in part at least explains the drug's central action.

When given orally, the drug is presumably absorbed from the alimentary tract and passed into the general circulation by way of the liver, which is submitted to a relatively high concentration of the drug, before it is diluted by the general circulation. Next to those of the brain, the cells of the liver are as highly specialized and active as any in the body. It is not surprising, therefore, that after several weeks exposure to a dose of 75 mg. daily (approximately 1 mg. per kg. or 1/100,000 of gross body weight) signs of liver failure begin to appear. Even in these circumstances it is possible that some other factor depressing liver function must be present, for jaundice does not appear to be a common complication in psychiatric practice where high oral dosage over prolonged periods appears to be the rule. Nevertheless, it is a point worth bearing in mind, and the effects of continued high dosage on the livers of experimental animals needs further careful study.

In large single dosage the drug is relatively non-toxic. In one instance a patient made a complete recovery in three days after attempting suicide by taking 70 25-mg. tablets—a total dose of 1,750 mg.² This is more than can be claimed for barbiturates, prolonged oral administration of which in their early days was reported to cause serious liver damage and jaundice.—I am, etc.,

London, S.E.11.

D. A. BUXTON HOPKIN.

REFERENCES

- ¹ Decourt, Ph. (1953). *Thérapie*, 8, 846.
² Gosset, J. Personal communication.

Herpes Zoster Treated with Vitamin B₁₂

SIR.—In response to inquiries which have reached me from time to time about my letter (*Journal*, April 22, 1950, p. 959) on the use of vitamin B₁₂ in herpes zoster, may I request the courtesy of your columns for further comment? In that letter I described the extraordinarily rapid results I had obtained in the treatment of shingles by giving injections on the first, second, and fourth days respectively of 50 micrograms of B₁₂ each, and the avoidance in most cases of post-herpetic neuralgia. Treatment and dosage schedules were unavoidably in general practice, empirical.

A consulting dermatologist friend of mine was kind enough to inform me some time ago that he had been able to diagnose a severely ill child, admitted to hospital on account of meningism, as a case of herpes zoster involving the ninth cranial nerve and therefore presenting the typical eruption of shingles on the soft palate. He gave B₁₂, and to everyone's joy and satisfaction the child was well within four days. Other doctors have also taken the trouble to let me know of their experiences, and to them I wish to extend my sincere thanks. The general consensus of opinion would seem to be that this treatment is of great value. Since then I have tried variations in frequency and dosage

of the injections, but my impression is that the original schedule suits the majority of cases, and I was unable to observe any benefit from doubling the dose. Leitch¹ has recently treated cases by a single injection of 1,000 micrograms with very good results, and I am anxious to try this.

I have, however, supplemented the treatment of my more severe cases by oral administration of B₁₂, giving some 150 micrograms q.d.s., and this has undoubtedly speeded up resolution, and in one particular case of an old lady, who had a herpes zoster ophthalmicus but who "could not stand the needle," I followed her first and only injection with oral administration of the vitamin, and she was completely well within eight days. Lastly, in view of the known but aetiotogically uncertain connexion between herpes zoster and varicella, I have in the past two years been trying the effect of B₁₂ in chicken-pox, in doses ranging from 150 micrograms t.d.s. to 200 q.d.s., depending on age, and results have been most gratifying. The rash has usually cleared within a week, there has been very little or no general malaise, and my main difficulty has not infrequently been to convince the mother that the rapidly disappearing rash has indeed been that of chicken-pox.—I am, etc.,

West Bromwich.

K. E. JOLLES.

REFERENCE

- ¹ *Amer. Practit. (Philad.)*, 1953, 4, 800.

Footnote to History

SIR.—I was interested to read Dr. E. Ashworth Underwood's comment, in his review (*Journal*, January 1, p. 42) of Dr. William Brockbank's FitzPatrick Lectures, that neither he nor Dr. Brockbank had ever seen cupping performed with therapeutic intent. It fell to my lot to carry out both dry and wet cupping on several cases of nephritis when I was a house-physician in Glasgow in 1924. This fascinating, if archaic, manoeuvre took place in the Royal Infirmary, but I rather think Dr. Underwood was a student at the Western Infirmary, which had presumably outgrown these foolish things. As for Manchester, I imagine cupping was abandoned when the Infirmary moved from Piccadilly to Oxford Road. It is unlikely that the vessels survived the flitting.—I am, etc.,

Sheffield, 10.

W. A. RAMSAY.

Kaposi's Varicelliform Eruption

SIR.—The case reported by Dr. A. Fry (*Journal*, January 1, p. 28) appears to be wrongly named Kaposi's varicelliform eruption. Kaposi required the presence of eczema. An excellent paper written by Dr. G. I. Barrow (*Journal*, February 27, 1954, p. 482) covers practically all aspects of the subject. Reference to this paper, and indeed to many other papers, will reveal that Kaposi's varicelliform eruption arises on a basic eczema from infection by either herpes simplex virus or vaccinia. I suggest Dr. Fry's case is one of accidental vaccinia, the diagnosis suggested by the Home Office consultant who saw the patient.—I am, etc.,

Bradford, 8.

ALLAN BIGHAM.

SIR.—Even four swallows do not of necessity make a summer, and Dr. A. Fry's patient (*Journal*, January 1, p. 28) with four lesions of accidental vaccinia was not, as he reports, a case of Kaposi's varicelliform eruption. M. Kaposi¹ described his eruption as a very alarming complication of eczema larvale infantum. He realized that the lesions were not varicella though they resembled it. They tended to be clustered most thickly on the eczematous areas, but smaller groups appeared on the previously intact skin in the neighbourhood. He had never seen any lesions appear elsewhere. Kaposi suggested that eczema herpetiform would perhaps be the most appropriate term, and the condition is accepted to-day as being a generalized herpes simplex.

It is true that vaccinia in an eczematous individual may be as widespread as Kaposi's eruption. In fact, generalized vaccinia in such individuals is regarded by some as another form of Kaposi's eruption—in this case eczema vaccinatum. The requirements for a diagnosis of Kaposi's varicelliform

eruption are not, as Dr. Fry states, contact with a vaccinated person and the presence of vaccinia virus. They are an asthma-prurigo patient infected either with herpes simplex or with vaccinia virus.—I am, etc.,

London, W.1.

BRIAN RUSSELL.

REFERENCE

- ¹ *Pathologie und Therapie der Haut Krankheiten*, 1887, 3rd ed., p. 483. Berlin.

Still Going Strong

SIR.—I was interested in Sir Cuthbert Sprawson's letter (*Journal*, December 4, 1954, p. 1359) reporting the great age of Dr. Abdul Karim, who is still practising his profession at the age of 98. This is possibly a record. However, in Prince Edward Island, Canada, still practising at the ripe old age of 97, is Dr. Roderick MacDonald still driving his car, and out in all weathers. In Canada Dr. MacDonald is most famous, and I had the pleasure of meeting him at a Medical Society meeting in Charlottetown, Prince Edward Island, some years ago.

During the war I remember meeting in Bassingham, Lincolnshire, a physician (the father of a friend of mine) who was also practising to a very ripe old age—his name, Dr. Osborne Johnson. Dr. Johnson, besides being a physician highly thought of in the countryside around Bassingham, was also something of a poet and an artist. I remember enjoying one of his poems, "Bayard's Leap," written at that time. Dr. Johnson, I understand, refused to have a telephone installed in his home. He believed if the patients wanted him they would come and get him. Perhaps Dr. Johnson had a point! It will be interesting to know of any other nonagenarians or centenarians still in practice.—I am, etc.,

Ayer, Mass., U.S.A.

KENNETH I. E. MACLEOD.

Pre-operative Transhepatic Cholangiography

SIR.—I would be grateful for the courtesy of your columns for the following request for information. The Association of Surgeons at its meeting in Glasgow next April is discussing the subject of diagnostic procedures in obstructive jaundice. I have been asked to collect information on the position of pre-operative transhepatic cholangiography. This procedure has not been frequently carried out, and I would be grateful if any of your readers who have had experience of it would let me have a brief account of their results, including particularly any complications.—I am, etc.,

121, Harley Street,
London, W.1.

DAVID H. PATEY.

POINTS FROM LETTERS

Low Backache

Dr. HARRIS AVERY (London, S.W.16) writes: Dr. Leonard S. Calvert (*Journal*, December 18, 1954, p. 1488) does a service in reopening correspondence on the treatment of backache by manipulation. I do not think that the fault lies in the absence of efficient physical medicine departments. To my mind the whole attitude of the profession (and of our teaching) is faulty in this matter. Manipulation as a treatment is either ignored or misrepresented. I have a great respect for Mr. H. Osmond-Clarke as an orthopaedic surgeon and have often sought his opinion, but I was dismayed to read in your report of his lecture on cervical disk lesions (p. 1481): "Occasionally a manipulation under anaesthesia was a help" (the italics are mine). . . . Personally, I find the neck the easiest part of the spine to manipulate, since the muscle spasm can readily be overcome by steady, gentle manual traction. The neck should never, indeed need never, be manipulated under anaesthesia.

Medical Aspects of Boxing

Mr. T. A. MASON (London, N.8) writes: With reference to the article by Drs. J. L. Blonstein and E. Clarke (*Journal*, December 25, 1954, p. 1523) and the leading article (p. 1535), I find it curious that no mention is made in text or bibliography of Dr. Jokl's book, *Medical Aspects of Boxing* (1941, Van Schaik, Pretoria). This is full of factual matter on the subject in question.

Obituary

Sir ARTHUR KEITH, M.D., LL.D., D.Sc.
F.R.C.S., F.R.S.

We record with regret the death on January 8 of Sir Arthur Keith, whose anatomical and anthropological researches were world-renowned, and whose powers of exposition added lustre to an already highly distinguished scientific career. He was 88 years of age.

"To hear Keith," the late Lord Moynihan once said, "you would think he had never done anything—and he has re-made anatomy. The valley of dry bones, thanks to him, is full of living men." But Sir Arthur Keith was more than an anatomist; he was a physiologist, a pathologist, an anthropologist, above all a thinker. He interpreted to his own generation life in its origin and development, and no one could endow anatomy with more lively significance. In his teaching the long pathway of human history became suddenly illuminated. Like a detective reconstructing a crime from a broken lock and a finger-print, he was able from a few fossil remains to illustrate the evolutionary progress of man in a way which carried conviction with it. He made people feel that it must be so, that no other hypothesis was possible.

It was only necessary to glance at his facial contour to know that Keith came of East Scottish stock. To Aberdeen he was bound by many ties. He was born on a small farm near there, at Old Machar, in 1866, son of John Keith and Jessie Macpherson, who had ten children. One of Arthur's brothers, Robert Donald Keith, was principal of the King Edward VII Medical School at Singapore at the time of his death in 1918. Arthur Keith left school for a time at 13, but his father decided that his education must be continued. After a short time at Gordon's College he went on to study medicine at Marischal College, the founder of which, in 1593, was a Keith. He graduated M.B. in 1888, and proceeded M.D. of Aberdeen, with the highest honours, in 1894. In later life he was made LL.D. of his old university, and nearly fifty years after entering it as a student he was elected and remained three years its rector.

After graduation Keith went into general practice in Mansfield for a short time, and then, answering the call of adventure, went out to Siam as medical officer to a gold mine. Here, until the mine failed, he studied the anatomy of the Catarrhine monkeys, and on his return home he was awarded the Struthers medal and anatomy prize at Aberdeen University for his written account of

his observations. After further study at University College, London, and at Leipzig, he eventually got the start he needed in a career of scientific achievement when he was appointed senior demonstrator of anatomy at the London Hospital in 1896. He soon became recognized as an outstanding teacher, and from 1899 to 1902 he was secretary of the Anatomical Society of Great Britain. It was at this time that he wrote his well-known work, *Human Embryology and Morphology*, which has since passed into several editions. At the London Hospital Medical School he took as his guiding principle that the men he taught would do their ward work all the better if they knew something of the history of the human body. To him the criterion for the admission of new matter into the teaching of morphology was its historic value—that is to say, the

light which it threw on the origin and nature of the human body. He insisted throughout his teaching career on the close link between anatomical teaching and clinical experience. It was while Keith was at the London that he and Dr. Martin Flack discovered the sino-atrial node (often called the pacemaker of the heart) at the junction of the superior vena cava with the sulcus terminalis of the right auricle.

In 1908 Arthur Keith, who had been a Fellow of the Royal College of Surgeons already for fourteen years, became Hunterian professor and conservator of the museum, a position he held for a quarter of a century. When on a May morning in 1941 only the ruins of the museum remained after a night of enemy bombing, the thought uppermost in many minds was the tragedy that

this must mean to Keith, although by that time he had been retired from Lincoln's Inn Fields for eight years. Many men helped to make that museum the priceless thing it was, but Keith was chief among them. His knowledge and imagination and devotion made it the greatest collection in the world, illustrating the phenomena of life in both health and disease. He made it far more than a museum: he gave it character, significance, and unity. It became a great centre of instruction, a thesaurus of reference, a museum of history. Apart from the value of the specimens, which was beyond compare, it had for Keith—at least the nucleus of it—the sacredness of a legacy from John Hunter, like himself a Scotsman, a master of anatomy, a philosophic inquirer, a teacher, dissector, and experimenter. Hunter never had a more ardent disciple: nothing delighted Keith more than to show how some new advance had been foreshadowed in Hunter's teaching.

In 1932, after a severe breakdown in health from which he made a slow recovery, he resigned his work at the



J. R. Miller, Barne

College in Lincoln's Inn Fields to become Master of the Buckston Browne research farm at Downe, in Kent. Six years before, as president of the British Association, he had made an appeal for the preservation of Down House as a memorial to Darwin, who lived there for forty years, and Mr. (later Sir) Buckston Browne came forward and established a fund for that purpose. The research farm was added later. It fell to Keith to declare Down House open to the public. He spoke of the profound impression made upon him on first visiting that place: "I obtained a background for a mental picture in which the living Darwin moved, experimented, and thought. Science cannot be separated from personality. In making this place a national heritage we are acknowledging that sentiment has a place in science—not in the work of the laboratory, but in the heart of the worker." Here in his later years he found a grateful task in supervising the work of the young surgeons who studied on the research farm. Speaking of his work as Master of the Buckston Browne research farm, he said: "It brings to my door the keenest and most enterprising minds to be found in the surgical youth of the rising generation. It gives me young and congenial company." Despite his years he remained remarkably active, and when going to inspect the farm from his house, "Homefield," he still had a robust Scots look, wearing a tam-o'-shanter and a kape. Only the day before he died he was pruning his fruit trees.

Keith's first published work was his *Introduction to the Study of Anthropoid Apes*, published in 1896. Then came *Human Embryology and Morphology*, already mentioned. In the preface to the fifth edition of that work he said that successful textbooks were particularly exposed to the danger of overgrowth. Just as dominant stocks of animals have been hurried to extinction in past geological ages because their bodies became so big as to be unwieldy, so most valuable and prosperous textbooks have been killed by overgrowth. But Keith was as adept with the blue pencil as with the pen. Another work of his early years was his editing of Hughes's *Practical Anatomy*; he also assisted in Treves's *Surgical Applied Anatomy*. Later works of his bear such titles as *Ancient Types of Man*, *The Human Body*, *Nationality and Race*, *The Religion of a Darwinist*, and *Concerning Man's Origin*. For a succinct account of the evolution of man, including the lessons to be learned from the fossil skulls found in various parts of the world, Keith's article in the fourteenth edition of the *Encyclopaedia Britannica* cannot be bettered. He was for many years an occasional and much-valued contributor of signed and unsigned articles and reviews to this *Journal*. Nothing dull ever came from his pen: he seemed to enjoy writing; at any rate there was no hint of effort, though the MS. showed evidence of careful revision. The only task he declined for the *British Medical Journal* was to write about the Hunterian Museum after its bombardment, pleading (with truth) heart-sickness. Since the war he had published three books, including his long autobiography, and a book entitled *Darwin Revalued* will be published shortly. Both in his autobiography and in his *Antiquity of Man* Keith explained how he came to accept the Piltdown findings only with some critical hesitation: and in a letter to a friend (published in the *Sunday Times* of January 9), commenting on the recent discovery of the hoax, he wrote: "The story of the evolution of

man, so far as we yet know it, has not in any way been damaged. . . . The tragedy of the situation is a loss of faith in the testimony of our fellow workers. That is how the Piltdown fraud strikes me."

His eminence in the world of anthropology and anatomy is attested by his presidency of the Royal Anthropological Institute, the British Association, and the Anatomical Society, his Fullerian Professorship of Physiology at the Royal Institution from 1917 to 1923, his secretaryship of the Royal Institution from 1922 to 1926, and his honorary doctorates of six universities. In 1913 he was elected a Fellow of the Royal Society and a member of the Société d'Anthropologie de Paris. He was knighted in 1913. Lady Keith (formerly Cecilia Gray, daughter of Tom Gray, the artist), whom he had married in 1899, died in 1934. There were no children of the marriage.

We are indebted to Sir GORDON GORDON-TAYLOR for the following appreciation:

"Maecenas waits me on the Esquiline;
Hither to-night go I . . .
And shall this dawn restore us, Virgil mine,
To dawn? Beneath what sky?"

These lines from Kipling which refer to the passing of Horace so soon after the death of his patron and friend Maecenas have been ringing in my ears ever since I heard the news of the death of Arthur Keith which has followed so rapidly that of his most illustrious pupil in the world of anatomy: both Wood Jones and he were conservators of the Hunterian Museum in Lincoln's Inn Fields, and when considerations of age imposed their decree on the continuance of that office each was privileged to go on serving the Royal College of Surgeons of England in a diverse capacity till "the end of the road," and each man died, as he would have wished, in harness and full of years. It is less than two months since we read Arthur Keith's charming obituary notice of "Freddy" Wood Jones in the *Annals* of the College of Surgeons, and the admiration and affection existent between the two will be self-evident to those who did not know them intimately from the terminal paragraph in Keith's notice, which I venture to quote and which is in fact a letter from Wood Jones on Keith's birthday, February 5, 1949:

"This is to carry from Gertrude and from me all good wishes, and all hopes that these good wishes may be repeated for many years to come. It is a long time ago (1897) that as a first-year student I sneaked into, and was fascinated by, a lecture you gave on a boy with an extra pair of legs (a parasitic foetus) who was on show in Wonderland. That's more than fifty years ago. I have a fancy that in parental fashion you still look on me as a wayward youngster [which was quite true, A.K.]—(you do, don't you?); but I would have you know that I am over 70 now and almost grown up. Seventy or 20 it is no matter. I loved and admired you then and I still do and will. And Gertrude and I send our love to you."

I hesitated before acceding to the request that I would contribute something on Arthur Keith towards the columns of the *British Medical Journal*, for I feel at all times abysmally humble in the presence of Fellows of the Royal Society and deeply self-conscious of any attempt of mine at appraisal of scientific worth and stature, and it is only my loyalty to the memory of Arthur Keith that makes me take up my pen. His roots were grounded in the Turiff-Huntly area of the north-east of Scotland, where his father farmed and whence sprang my own maternal forebears: he trod the same academic groves that I was to tread more than a decade later; he was cradled in the basic sciences and in the clinical subjects by men under whom I myself was trained or who were friends of my family—men like "Jimmy" Trail and Alleyne Nicholson, and Japp, and "Johnnie" Struthers, who first stirred Keith's interest in anatomy; Smith Shand

in medicine and Alec Ogston in surgery, to whom he proudly refers in that delightful book, *The Menders of the Maimed*; Stephenson—nicknamed "Howdy"—the obstetrician; and that great old clinical teacher, Angus Fraser. But best of all he breathed the air of the Granite City and learned to work as perhaps the Aberdeen student alone can or could work in the last quarter of the nineteenth century.

Arthur Keith's connexion with the London Hospital round the beginning of the century brought him in contact with a coterie of men from the north-east of Scotland—William Bulloch, J. J. R. Macleod, and Henry Souttar had at least a temporary lodgment in old Aberdeen. I first came in touch with him personally over fifty years ago, when with characteristic generosity he lent Victor Bonney and myself all his manuscript notes and drawings dealing with the myology of the Primates, which represented his work in the Eastern Archipelago in his early postgraduate years. Although I never enjoyed the privilege of that intimate friendship with Keith that I had with Peter Thompson and F. G. Parsons, I used to see him at meetings of the Anatomical Society up to the outbreak of the first great war. Those were the days of Dan Cunningham, father of the distinguished Admiral and General, and George Thane; of Arthur Robinson, Howden, Hepburn, Waterston; of Paterson, of Liverpool; Ernest Frazer and Dixon, of Dublin; and Duckworth, of Cambridge. Fawcett made his three-monthly contributions on the ossification of still one more cranial bone; Lockwood still looked in occasionally; and there was always the stupendous frame of William Wright radiating happiness and good nature. Symington was busy cutting the body in sections, and Grafton Elliot Smith working on the morphology of the cerebrum, and the Hunterian Museum is enriched by his industry. Christopher Addison was still teaching anatomy, although already imping his wings for his brilliant flight into the empyrean of politics. War had not yet translated Auckland Geddes to ministries and an embassy. And Bertram Windle was still writing on monsters and abnormalities. Perhaps at no period was there such a galaxy of stars in the anatomical firmament, and from this group Keith was elected in 1908 to be conservator in Lincoln's Inn Fields.

In the days of his conservatorship the Museum which had for a hundred years been a lodestone for the surgeon and savant as well as for the curious became a Mecca as never before: specimens of every kind poured in, and when the Museum suffered from Hun bombardment there were some quarter of a million specimens, mounted or in the stores.

Keith's breadth of vision was enormous: although in later life he became more and more interested in anthropological problems, he always retained his interest in embryology as well as anatomico-pathological problems. I still possess a letter which he wrote me in the beginning of April, 1918, acknowledging the safe arrival of a specimen of a gunshot wound of a Meckel's diverticulum, which I resected during the terminal phase of the Fifth Army retreat in March, 1918, saying that its safe arrival during such a period of chaos was a "harbinger of the favourable tide of fortune which was shortly to roll in our direction." His Scottish industry was unflagging, and more and more he became involved in anthropological problems. He wrote books, brought out new editions; and he extended his hand to all.

The exigencies of war and the remoteness of his ivory tower at Downe curtailed the frequency of our meetings, but he was much loved by those who worked at the farm. But the vision still remains with me of the tall, active figure flitting in his white coat along the corridors and galleries of the College; and one can still hear the small, piping voice, the Scottish—though not the Aberdeen—accent, and the hurried sentences which were so attractive as they flowed from the lips of this kindly gentleman. In the words of Tacitus, writing of the Roman Agricola: "What we loved, what we admired in you endures, and will endure in the souls of men."

Professor A. J. E. CAVE writes: Keith's contributions to human anatomy embraced a wide range of original inquiries into such matters as visceral topography, the mechanism of respiration, the structure, function, and innervation of the bowel, the phylogenetic modifications of the axial skeleton, the growth of bone in health and disease, the effects of the upright posture upon the skeleton and soft parts, the growth, mensuration, and racial variations of the skull, cardiac physiology, and the development of the heart and great vessels. In investigating respiratory and alimentary function he unhesitatingly experimented upon himself in his determination to understand personally the working of the human machine. For Keith never dissociated any structure from its function, thereby proving himself a natural disciple of his fellow Scot, John Hunter, whose Museum he served with distinction as conservator for 25 years. Keith's principal anatomical achievements were perhaps his studies of the auricular musculature (1902-4), his verification (1905-6) of the Tawara cardiac conducting system, and his discovery (1906) with Martin Flack of the sino-atrial (Keith-Flack) node. His numerous and sustained researches were directed to practical ends and designed to satisfy both anatomist and clinician; his early studies in physiology, teratology, primatology, and gross anatomy fruited in later years in his valuable and distinctive addresses, official lectures, and publications. His clinical sympathies were reflected in masterly studies of progeria, acromegaly, diaphyseal acclasia, pedal orthopaedics, and the nature and origin of hernia.

As anthropologist Keith became early on in his career a principal authority on questions touching ancient and modern man, his past and present racial origins, and his phylogeny, though herein his latter-day views found more public than professional acceptance. For years he examined and reported upon ancient human remains from Britain, Europe, Asia Minor, and elsewhere, and studied the racial composition and origin of the British people. In anthropological technique he invented a special craniometer, devised and promulgated the use of the sub-cerebral plane, and stressed the significance of cerebrospinal fluid streams in the interpretation of endocranial casts. He partook in the assessment of the status of *Pithecanthropus* and *Australopithecus* and of Rhodesian and Wadjak Man; described the Galilee neanderthaloid skull and (with T. D. McCown) elaborately monographed the Mount Carmel fossil Palestinians. In the original Piltdown controversy his anatomical experience put him initially in the right and, but for his militant Darwinism, might easily have bared the underlying truth. For overlong perhaps he maintained an undue antiquity for *Homo sapiens*, an attitude not unassociated with his unfortunate championship of the Galley Hill cranium and the Ipswich skeleton. Despite his modification of outlook in later years, he never wholly surrendered his belief in a direct common ancestor for man and anthropoid ape. His numerous publications on ancient man gained a wide popularity, but his later pronouncements in the field of social anthropology, wherein he abandoned accepted anthropological terminology, failed to command a comparable respect.

H. W. B. writes about Sir Arthur Keith when he was head of the department of anatomy at the London Hospital: In his early 40's Keith had a face of singular charm, with a quality of ascetic beauty, blue eyes, an aquiline nose and a forehead surmounted by a wave of fair curly hair, and furrowed by lines which gave him an air of rather anxious perplexity. He had an engaging manner with a hint of diffidence. His voice was gentle, with at times a pleading lilt in it, and his whole personality would seem to have belied the bitterness which according to his autobiography clouded some of the controversies of his long life as a scientist. There always seemed something elusive about him, especially when he wished to escape from the importunities of the dissecting room to the quiet haven of his laboratory and research. He then wore a slightly guilty

air, and with a quaintly sidling gait seemed to be taking evasive action against his students, some of whom made it a point of honour to try to hinder his progress with questions about some real or imaginary difficulty relating to some part under dissection.

In his routine teaching his declared aim was to make anatomy of practical help to the G.P. in his daily work. To this end he devoted many of his lectures to clinical and surface anatomy, and his blackboard sketches, though of no artistic merit, usually clearly illustrated what pages of description would have left only vaguely complicated. In this facility he was perhaps equalled by that gifted teacher, Russell Howard, then his senior demonstrator, whose similarly effective diagrams were grotesquely crude, but whose knack of welding an elusive fact on to a reluctant mind with the white-hot flame of sarcasm was probably unique. Keith, as befitted a Scotsman, was given to occasional shafts of pawky humour. When bones were to be handed round his class, he was wont to remark that as with umbrellas, so with bones—no borrower ever thought it necessary to return them.

It fell out that his last lecture at the London was on bones. On his arrival the anatomy theatre was crowded with his students, who were determined to show their affection for him in no uncertain manner. All who could had secured a suitable bone from among those laid out for demonstration. By luck I had attached a fine specimen of the femur. At the end of a quiet and orderly lecture a pandemonium of cheers broke loose, and desks were pounded appreciatively by every available element of the human skeleton. In one segment at least of desk surface there was a deep acetabular-shaped depression, and a fine femoral head had lost its shape and its articular cartilage. Thus did Arthur Keith's students say farewell to a beloved teacher with the bones which were so much the powerful levers of his philosophy.

CLAUDE RUNDLE, O.B.E., M.D., D.P.H.

Dr. Claude Rundle, for many years medical superintendent of the Fazakerley Infectious Diseases Hospitals and Sanatorium, Liverpool, died suddenly at his home at West Looe, Cornwall, on December 24, 1954, at the age of 81. His parents belonged to Cornwall, but they lived for a time at Plymouth, where he was born on July 20, 1873. Other members of his family also achieved success in the careers of their choice: Engineer Rear-Admiral M. Rundle is his brother, and his sister, Miss Mary S. Rundle, who died in 1937, was the first secretary of the Royal College of Nursing, where she worked for nearly 18 years.

Claude Rundle was educated at Plymouth Corporation Grammar School and received his medical training at St. Mary's Hospital, London, qualifying M.R.C.S., L.R.C.P. in 1895. He graduated M.B. from London University in 1898, obtained the D.P.H. of the English Royal Colleges in 1901, and proceeded to the M.D. in 1904. His early appointments in the public health service included those of medical officer at the Gore Farm Convalescent Hospital, Dartford, senior assistant medical officer at the Grove Fever Hospital, Tooting, and medical superintendent at the Orchard Smallpox Hospital, Dartford—all under the old Metropolitan Asylums Board. In the great smallpox epidemic of 1901-2, which seriously affected London, he gave devoted service on hospital ships in the Thames estuary.

These experiences seemed to settle the course of Rundle's future career by creating in him an interest in the communicable diseases, and he was appointed medical superintendent of the two isolation hospitals at Fazakerley in 1906. The heavy incidence of the commoner infectious diseases as well as of tubercu-

losis in Liverpool had prompted the city council in 1898 to purchase a large estate of 118 acres at Fazakerley for hospital purposes, and when Rundle arrived to take up his new duties part of the scheme had been completed. His first important task was to deal with the organization and staffing of the main isolation hospital of 350 beds opened in the year of his appointment. During the next few years this hospital, together with the annexe built in 1901, became one of the most noted and efficient of the country's infectious diseases hospitals, and it was visited by doctors from all over the world. An additional unit was completed in 1917 under Rundle's guidance, and in 1920 a large sanatorium of 265 beds was opened on part of the estate, and he became its first medical superintendent, though retaining his responsibilities in connexion with infectious diseases. From 1920 until he retired in 1934 Rundle was in charge of all the units on the Fazakerley estate, amounting in total to more than 900 beds. He had been largely responsible for the planning and building of nearly half of this great system of hospitals and wholly, as they were completed, for their organization and administration over the long period of 28 years. *Si monumentum requiris, circumspecte.*

Rundle held a commission in the Territorial Army from 1908 onwards and attained the rank of lieutenant-colonel in the R.A.M.C. during the first world war, commanding the Berrington War Hospital and No. 55 General Hospital in France. For his services he was appointed O.B.E. in 1919. A few years later he was appointed one of the deputy lieutenants for the county of Lancaster. He was for many years lecturer in infectious diseases in Liverpool University, and accepted responsibility for the revision of the third edition of Ker's *Manual of Fevers* (1927) and the third edition of Ker's *Infectious Diseases* (1929). He published many articles in the medical journals, some on bed isolation, of which in his work at Fazakerley he was a pioneer. In his late fifties he had two severe attacks of pneumonia, and as a result retired from the service of Liverpool corporation in 1934 rather sooner than was normally required. Even before his retirement he had built a small but charming house at West Looe in his own county of Cornwall. He leaves a widow, formerly Miss Florence M. Kerruish, and a daughter, Mrs. Patricia M. Valentine, both of whom are members of the medical profession.—W. M. F.

E. A. B. writes: I had the privilege of working under Dr. Claude Rundle for 14 years, and can recall his dignified military figure riding a bicycle from ward to ward on his daily rounds, and later driving an ambulance. This was essential, as the hospital was scattered over 118 acres of ground. Infectious diseases were very prevalent at this time, and frequent epidemics called for urgent action. Dr. Rundle was at his best dealing with these emergencies. His capacity for work was prodigious, and he set a high standard of work. He suffered neither fools nor slackers gladly but made allowances for human weaknesses. He was the pioneer of bed isolation methods of nursing and showed his implicit faith in them when after an operation for appendicitis he was nursed in a ward where various infectious diseases were treated under this régime. Dr. Rundle's equanimity was proof against all the strains and stresses that medical superintendents were in those days apt to come up against. His great wisdom and diplomacy poured oil on many troubled waters. From what I have written it may be thought that Dr. Rundle was difficult to work with; on the contrary he was a delightful and most approachable superior, whose personal kindness matched his profound knowledge, for he was always ready day or night

to give advice and help to his staff, medical or nursing. There are many to-day who remember him with affection and deep gratitude.

H. N. WEBBER, B.Chir., F.F.A. R.C.S.

We record with regret the death on December 24, 1954, of Dr. H. N. Webber in University College Hospital, which he served for over 20 years as honorary anaesthetist.

Harald Norris Webber was born in 1881 and was educated at Brighton College and at St. John's College, Cambridge, where he took the natural sciences tripos in 1903. He remained at Cambridge for another five years, doing research work with the late Dr. W. H. R. Rivers, who was lecturer on experimental psychology. Rivers was Croonian Lecturer of the Royal College of Physicians of London in 1906, and his lecture—on the influence of alcohol and other drugs on fatigue—was published in book form two years later. Webber never drank alcohol at all, and he was therefore an ideal subject for this investigation, and the lecture was based largely on experiments performed on him. Rivers and Webber collaborated further in the publication of papers on the action of caffeine and alcohol on the capacity for muscular work. In 1908 Webber entered University College Hospital and soon became dresser to Professor Arthur E. Barker, who had been the first man to introduce spinal analgesia to this country three years earlier. After qualifying in 1912 Webber became successively house-surgeon, house-physician, and resident medical officer at the West London Hospital. In the first world war he served in the R.A.M.C. from 1917 to 1920, attaining the rank of major. While with the Egyptian Expeditionary Force he developed a very severe attack of typhus, which left him in indifferent health for the rest of his life. On leaving the Army he was appointed assistant medical officer to the London Fever Hospital, and in 1922 he became resident medical officer at University College Hospital. During his term of office he had to administer anaesthetics in many emergencies, and this work led him to specialize as an anaesthetist. He had at one time intended to be a surgeon, but an accident resulting in a permanently stiff finger prevented this. In 1924 he was appointed anaesthetic registrar, and six months later he was elected to the honorary staff of University College Hospital. He was also elected to the staffs of St. Paul's Hospital and the Royal Chest Hospital, and he served for a time as anaesthetist to the Central London Throat, Nose, and Ear Hospital and the Royal Dental Hospital. He took the B.Chir. in 1928, and in 1948 he was elected one of the first Fellows of the newly established Faculty of Anaesthetists of the Royal College of Surgeons of England. He was a prominent member of the Section of Anaesthetics of the Royal Society of Medicine, being secretary from 1935 to 1937, president in 1940-1, and vice-president from 1941 to 1944.

Webber did not make many contributions to medical literature. His chief work was the textbook written in conjunction with his colleague, Dr. Felix S. Rood, entitled *Anaesthesia and Anaesthetics*, which appeared in 1930 and which for many years was the standard work on the subject. He also wrote the chapter on anaesthesia in Gwynne Williams's *Minor Surgery and Bandaging*. A few years after Boyle's original apparatus came out Webber introduced a modification which placed the ether and chloroform bottles in parallel instead of in series, thus preventing the passage of

chloroform vapour into the ether bottle. This apparatus is still in use at University College Hospital and is preferred by many of Webber's colleagues to more modern apparatus. He was a sound teacher, always striving to follow the precept of his predecessor, J. L. Clover, that a man on leaving University College Hospital should be competent to give a safe anaesthetic without recourse to complicated apparatus.

Webber was reserved in character, but had a keen if rather sardonic sense of humour. His punctuality was proverbial, and on the rare occasions when he was late he would make a brief apology, and only when the afternoon's work was finished would he relax and smilingly give an account of the complications which had been encountered in the previous patient and which caused him to be late. He was wrapped up in the welfare of his hospital and devoted unsparingly his energies in working for it. Scrupulous in his care of patients, he always visited them before and after operation. During the last war he worked at University College Hospital in the Emergency Medical Service and seemed to be completely without fear, for, after being twice bombed out of his own house, he took a top-floor flat next door to the hospital. On retiring from the staff under the age limit in 1946 he became visiting medical officer to the Hostel of St. Luke in addition to carrying on his work there as honorary anaesthetist. He was a man of strong religious feelings, and gave to his patients there the same unsparing devotion he showed throughout his career right up to the time of his last illness. A year before he died he had to undergo a major abdominal operation which he met with characteristic fortitude. He married Madeleine Mary, daughter of Major J. J. Ryder, who survives him, and to whom we offer our deepest sympathy.

G. W. MILLER, D.S.O., M.B.

Dr. G. W. Miller, a general practitioner who was held in high regard in Dundee and beyond, died in a nursing home at Dundee on January 5 at the age of 80. He had been ill for some months.

George Waterston Miller was born on July 27, 1874, the son of one of Dundee's most popular and respected practitioners, Dr. J. W. Miller, and he followed closely in his father's footsteps. He was educated at Dundee High School and at Edinburgh University and first graduated B.Sc. in 1895, winning Professor Geikie's medal in geology, before he turned to medicine. As a student, as well as in later life, he was popular with everyone. Fond of dancing, and a good singer, he was also a keen athlete, a first-class swimmer, a cross-country runner, and an excellent Rugby forward. He took the M.B., Ch.B. degrees in 1898 and then acted as resident physician under the late Sir Byrom Bramwell at Edinburgh Royal Infirmary. Returning to Dundee in the following year, he was resident physician at the Royal Infirmary for a year before settling in general practice. He continued his association with the Royal Infirmary, of which he was assistant physician from 1908 to 1919, and for almost the same period he rendered good service to St. Andrews University as assistant to the professor of medicine.

A keen Volunteer, Miller passed from the Dundee Rifles to the Black Watch in Edinburgh, where he was a member of the first Maxim gun team in Scotland, a team which also included E. C. (later Sir Eric) Geddes. He held a combatant commission as a Volunteer from 1891 to 1904, when he obtained a commission as a

medical officer. During the first world war, at the outbreak of which he held the rank of major in the R.A.M.C., T.A., he served in France with the 51st (Highland) Division from 1915 to 1919, being in command of a Highland field ambulance towards the end of the war. He was twice mentioned in dispatches and was awarded the D.S.O. in 1917 and the Croix de Guerre with silver star two years later. After the war he was in command of the 152nd Highland field ambulance from 1920 to 1924 and was A.D.M.S. with the rank of colonel, of the 51st (Highland) Division for four years from 1924. His services to the Volunteer movement were recognized by the award of the Territorial Decoration some years earlier.

An enthusiastic supporter of the St. Andrew's Ambulance Association, for which he worked as a lecturer and examiner for nearly fifty years, he was awarded the King's Medal with five bars in 1949. In 1908 he was appointed an honorary Associate of the Venerable Order of St. John of Jerusalem. He was a member of the British Medical Association for fifty-five years, and served on the Council for three periods, from 1922 to 1935, 1938 to 1940, and in 1943-4. He was also president of the Dundee Branch in 1922-3 and chairman of the Scottish Committee from 1927 to 1929. During the last war he acted as secretary of the Dundee Medical War Committee and was the local emergency officer. He was a good committee-man, his benevolent smile being typical of his kindly and honest disposition. His colleagues and patients will miss him sadly. He married Miss Maria L. Gilbert in 1901, and she, with their only daughter, survives him, his only son having predeceased him.

Dr. CHARLOTTE R. BROWN died in hospital at Banbury on January 1 at the age of 86. Charlotte Rhoda Brown was born in Tipperary, the daughter of Mr. William Hodgins, on October 18, 1868. Her early years were spent in her native country, and during her long life she never lost her interest in all forms of natural history, an interest bred in her as a girl through living in a house with a large garden in rural Ireland. She received her medical education at the London (Royal Free Hospital) School of Medicine for Women and took the Scottish triple qualification in 1895 and the Brussels M.D. in the following year. After holding several postgraduate appointments she was in general practice at Bradford until her marriage to the Rev. Richard E. Brown in 1901. She was the only woman medical practitioner in Bradford at the time, being one of the early band of women who qualified under difficult circumstances and against some opposition. She took an active part in the women's suffrage movement before the first world war, and any branch of work outside the home in which women played a part was of great interest to her. She was a member of the Medical Women's Federation for many years. In 1916 she joined the staff of the East Anglian Sanatorium at Nayland, and thenceforward specialized in the treatment of tuberculosis. In the following year she was appointed tuberculosis medical officer to the Essex County Council, and in 1919 she became medical superintendent of the Children's Hospital for Surgical Tuberculosis at High Beech in Epping Forest, where she remained until 1932, when she retired, combining the work of the post with that of a child welfare appointment. She and her husband then went to live at Welwyn Garden City, where they took a very real, although not a vocal, interest in the activities of the neighbourhood. Dr. Brown was a very lovable woman with a large circle of friends in Welwyn. She had a good sense of humour and would tell many stories against herself. She was excellent company, and her Irish background—the background of the Somerville and Ross "Irish R.M." stories—gave her an endless fund of anecdote and reminiscence.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending December 25 (No. 51) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1954					1953				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	15	2	4	0	1	15	0	7	0	
Dysentery	340	33	177	7		309	52	107	0	8
Encephalitis, acute	2	1		0		3	1	0	0	
Enteric fever:										
Typhoid	2	1	0	0	3	0	0	1	0	
Paratyphoid	5	1	1	0		1	0	0	0	
Food-poisoning	138	16		1		109	11		2	
Infective enteritis or diarrhoea under 2 years				8	12				10	10
Measles*	5,840	550	328	309	103	611	1	16	9	60
Meningococcal infection	28	2	16	2	1	21	3	15	0	
Ophthalmia neonatorum	27	6	7	0		30	2	2	0	
Pneumonia†	756	42	201	7		530	26	257	13	3
Poliomyelitis, acute:										
Paralytic	8	0	3	0		19	3		7	1
Non-paralytic	1	0				10	1			
Puerperal fever‡	179	29	12	0		171	24	6	0	
Scarlet fever	673	52	108	31	20	949	50	212	26	28
Tuberculosis:										
Respiratory	493	56	102	15				109	17	
Non-respiratory	69	3	13	2				15	5	
Whooping-cough	1,256	89	110	19	7	1,424	56	252	39	52

DEATHS In Great Towns	1954					1953				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	1	0	0	0	0	0	0	0	0	0
Dysentery	0	0		0		0	0		0	
Encephalitis, acute		0			0		0			0
Enteric fever	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	2	0	0	0	0	12	1	2	1	1
Influenza	56	3	4	0	0	12	0	2	0	0
Measles		0	0	0	0		0	0	0	0
Meningococcal infection	0	0	0				2	2		
Pneumonia	301	47	27	6	10	219	29	31	9	3
Poliomyelitis, acute	0	0			0	1	0			0
Scarlet fever		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory	85	13	20	1	2	80	9	27	2	1
Non-respiratory		1	0	0	0		1	2	0	0
Whooping-cough	2	1	0	0	0	3	1	0	0	0
Deaths 0-1 year	191	17	25	4	7	188	22	47	7	3
Deaths (excluding stillbirths)	5,626	746	599	87	126	4,541	637	641	88	104
LIVE BIRTHS	5,294	806	730	165	236	4,575	659	666	184	206
STILLBIRTHS	169	12	18			153	12	14		

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

Vital Statistics

London's Health in 1954

According to a preliminary report by the County Medical Officer of Health, Dr. J. A. Scott, the 50,920 births gave a birth rate of 15.2 per 1,000. Deaths numbered 36,200. The provisional death rate was 10.9 per 1,000, the lowest ever recorded. The infant mortality rate was 22 per 1,000 live births, also a record low figure. The neonatal mortality rate was 16 per 1,000 live births, and compares with 16.1 in 1953 and 15.8 in 1952. The maternal mortality rate was 0.43 per 1,000 live and stillbirths. The incidence of epidemic diseases was low. After a rise in 1953, the infantile-diarrhoea death rate fell again and was the lowest recorded. 24 children under 2 died from this cause, compared with 65 in 1953; 8 years ago 269 died. The diminished mortality from this disease accounts for a large part of the drop in the general infant death rate.

Influenza

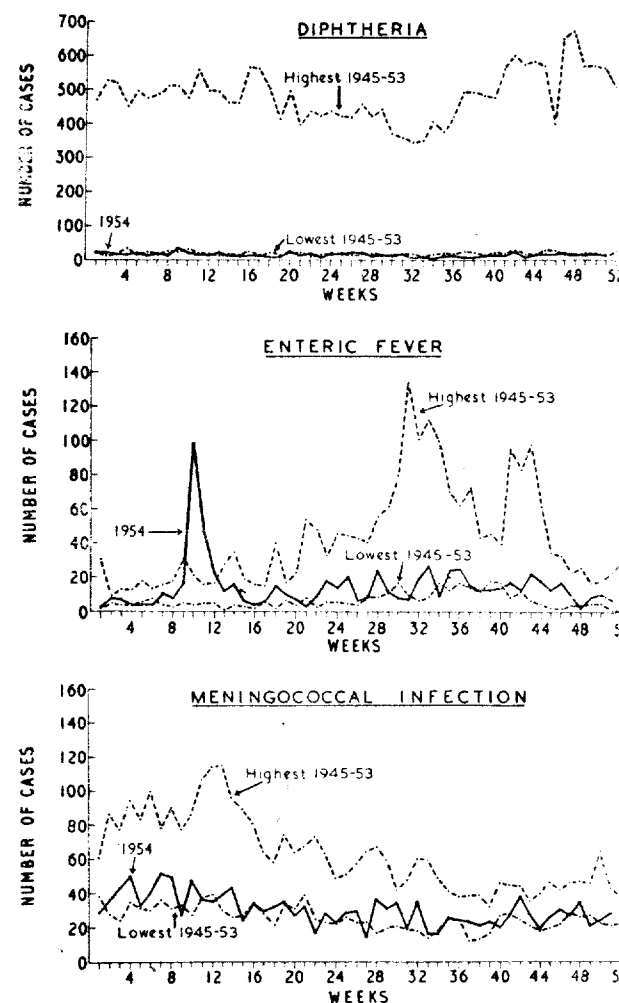
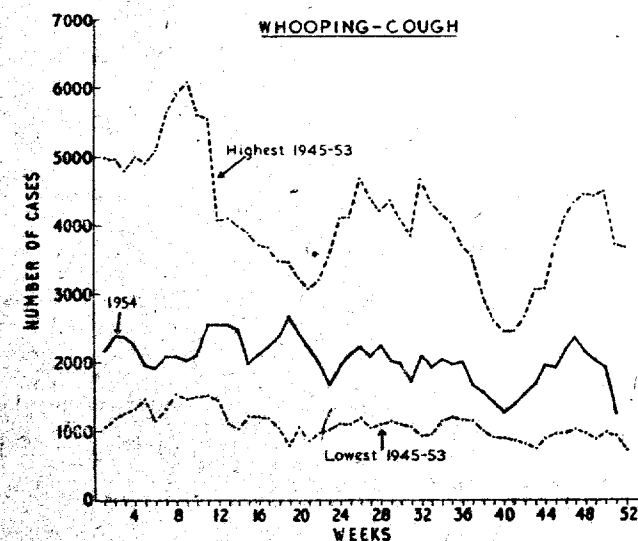
No reports have been received of further outbreaks of virus-B influenza in the northern and north-western regions or in Wales, and in these areas and in Scotland the infection is waning. In the north midlands and midlands fresh outbreaks continue to be reported in some areas not previously attacked, and additional outbreaks are apparently occurring in the south, south-west, east, and south-east. In London there are indefinite reports of a considerable amount of illness, much of which may be due to influenza. Clinically the disease on the whole remains mild. There is also some evidence of an increased incidence among adults.

Week Ending January 1

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 707, whooping-cough 1,722, diphtheria 13, measles 8,320, acute pneumonia, 1,108, meningococcal infection 31, acute poliomyelitis 23, dysentery 340, paratyphoid fever 11, and typhoid fever 4.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus -----, the figures for 1954 thus ————. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The notifications of infectious diseases in England and Wales declined during the week ending December 25, as is usual at Christmas time; the falls included 683 for measles, from 6,523 to 5,840; 577 for whooping-cough, from 1,833 to 1,256; and 125 for scarlet fever, from 798 to 673.

The largest declines in the incidence of measles were 48 in Lancashire, from 2,392 to 1,912, and 127 in Durham, from 433 to 306, and the largest increases were 161 in Yorkshire West Riding, from 397 to 558, 54 in Northumberland, from 39 to 93, and 49 in Staffordshire, from 173 to 222. A fall in the incidence of scarlet fever was recorded in most regions, but no large local variations were recorded. The largest falls in the incidence of whooping-cough were 108 in Lancashire, from 227 to 127; 68 in Staffordshire, from 96 to 28; and 42 in Durham, from 127 to 85. 15 cases of diphtheria were notified, being 3 fewer than in the preceding week. The chief feature of the returns of diphtheria was a fall from 9 to 2 in Lancashire.

Only 9 cases of acute poliomyelitis were notified, and this was the lowest number for any week for the past five and a half years. The notifications were 18 fewer for paralytic and 9 fewer for non-paralytic cases than in the preceding week. 2 cases were notified in Leeds C.B., the only area with multiple cases.

340 cases of dysentery were notified; this was the same total as in the preceding week. The largest returns were Lancashire 71 (Oldham C.B. 32); Norfolk 46 (Norwich C.B. 25); Yorkshire West Riding 41 (Sheffield C.B. 16); London 33; Warwickshire 20 (Birmingham C.B. 15).

56 deaths were attributed to influenza in the great towns, 10 fewer than in the preceding week.

Smallpox in France

The French Ministry of Health states that the port of Vannes in the Morbihan Department in Brittany has been declared infected with smallpox. Up to January 4, 13 cases, including two deaths, have occurred. Sanitary measures have been applied from that date to departing ships.

Quarterly Return for Eire

The birth rate for the September quarter of 1954 was 21.6 per 1,000 of the population, being 0.3 above the rate for the third quarter of 1953. The infant mortality rate was 30 per 1,000 births, and this was the lowest rate recorded in any quarter and 3 below that of the third quarter of 1953, the previous lowest level. The death rate was 10.5 per 1,000 of the population, being 0.8 above the rate for the September quarter of 1953 and 0.3 above the average of the five preceding third quarters. Deaths from the principal epidemic diseases included 39 from gastro-enteritis (under 2 years), 12 from influenza, 12 from whooping-cough, and 4 from acute poliomyelitis. Deaths from tuberculosis included 181 from respiratory and 45 from other forms. These deaths were, respectively, 8 above and 22 below the number registered in the preceding third quarter, and 142 and 67 fewer than the average of the third quarters of 1949-53.

Medical News

Sir Robert Robinson, O.M., F.R.S., was installed as president of the British Association on January 7. Sir Robert is Waynflete Professor of Chemistry at Oxford. He is perhaps best known to medical men for his wartime work on the structure of penicillin and for his more recent studies on the synthesis of steroids.

Pharmacology Laboratories at Leeds.—A new suite of research laboratories has been added to the Department of Pharmacology at the Leeds School of Medicine. This has been made possible by a grant of £10,000 provided by the Wellcome Trust. The new laboratories were opened on January 6 by Sir HENRY DALE, O.M., F.R.S., chairman of the Trust, during the recent meeting of the British Pharmacological Society in Leeds. The suite consists of five laboratories, office, store, and darkroom. The head of the department is Professor W. A. BAIN.

Clinical Research Fellowships.—The Medical Research Council invites applications for Fellowships in Clinical Research, tenable at centres in the United Kingdom during the academic year 1955-6. These Fellowships are open to suitably qualified medical graduates. The intention is to give each Fellow, as part of his training, an opportunity to study research methods in the basic subject most relevant to his particular clinical interest. Awards will be for one year in the first instance, and renewable annually up to a maximum of three years. Stipend will start at £850 per annum, rising by annual increments of £75 to £1,000 per annum, with superannuation provision in addition. Forms of application and further details may be obtained from the Secretary, Medical Research Council, 38, Old Queen Street, London, S.W.1, with whom applications should be lodged as soon as possible, and in any event not later than March 1.

Certificates for Meat Exports.—A certificate signed by a medical officer of health will in future be required to accompany all British exports of meat (and meat products) to Belgium. This is the result of a recent agreement between the two governments. Private certification of meat exports from Britain is quite common both to ensure customs clearance and to facilitate sales, but there are only two other official schemes—with the United States and Canada—and these date from about 1930. The reason for the new scheme is not any change in the nature of our meat trade, but recent domestic legislation in Belgium. The certificate declares

that the meat has been derived from animals subjected to ante- and post-mortem examination, that it is wholesome and fit for human consumption, and that it has been handled only in a hygienic manner in this country. Specimen certificates may be obtained from the Ministry of Food, the Department of Health for Scotland, or from the Ministry of Agriculture, Belfast.

British Journal of Anaesthesia.—With its current issue, the *British Journal of Anaesthesia* becomes a monthly. Founded in 1923 as a quarterly, during the war and until 1950 the journal appeared only twice a year. In 1950, under the joint editorship of Dr. T. CECIL GRAY and Dr. E. FALKNER HILL, quarterly publication was resumed, and last year six issues were printed. To meet increased costs the subscription has been raised to £3 15s. inland (£4 4s. overseas).

Lepers in Revolt.—Newspapers report that on January 11 the 300 patients on Trinidad's leper island, Chacachacare, seized control of the island. They were protesting against the recall of their medical superintendent, Dr. MICHAEL CORCOS, for granting many of them Christmas leave on the mainland.

Italian Honour for Cerebral Palsy Worker.—Mrs. EIRENE COLLIS, head of the Cerebral Palsy Unit at Queen Mary's Hospital, Carshalton, was decorated last month with the Star of the Order of the Italian Republic. The occasion was the opening of the third congress of the Italian Society for Medical Gymnastics in Milan. The decoration was for her work in helping to establish cerebral palsy clinics in three Italian cities. Mrs. Collis is a pioneer in this field: it was at her instigation that in 1942 the London County Council established the Carshalton unit, claimed to be the first of its kind in Britain.

Chelsea Centre for Spastic Children.—An experimental day centre for the diagnosis and treatment of children under 5 years of age suffering from cerebral palsy will be opened shortly at Cheyne Hospital for Children, 61, Cheyne Walk, London, S.W.3. By arrangement with the London County Council educational facilities will also be provided. The centre will be administered by the Chelsea Hospital Management Committee, and will be closely associated with St. Stephen's Hospital, Fulham Road, the Westminster Hospital, and establishments dealing with the treatment of cerebral palsy. Parents living in south and west London wishing to apply for admission of a child should communicate with the Group Secretary, Chelsea Hospital Management Committee, St. Luke's Hospital, Sydney Street, Chelsea, S.W.3, through their family doctor.

William Gibson Scholarship.—The Royal Society of Medicine announces that the next award of the William Gibson Research Scholarship for medical women will be made in July. The scholarship, valued at about £200 a year, is tenable for two or occasionally three years. Candidates must be British subjects. Details may be obtained from the secretary, Royal Society of Medicine, 1, Wimpole Street, London, W.1.

Mr. B. W. Rycroft has been invited to become an honorary member of the Ophthalmological Society of South Africa.

COMING EVENTS

Radio and Television.—Tributes to Dr. ALBERT SCHWEITZER on the Light Programme at 8.30 a.m. and on the Home Service at 9.15 p.m. on Sunday, January 16. "Atoms for Export," a programme from the Radiochemical Centre, Amersham, on television at 9.45 p.m. on Tuesday, January 18.

Oxford Graduates' Medical Club.—Winter dinner at the Royal College of Surgeons, Lincoln's Inn Fields, on February 11, 7 for 7.30 p.m., under the chairmanship of Professor H. R. DEAN. Tickets (25s.) from Mr. SELWYN TAYLOR, 3, Roedean Crescent, Roehampton, London, S.W.15.

SOCIETIES AND LECTURES

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

Friday, January 14

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., at Institute Lecture Theatre, open clinical demonstration by Dr. J. Smart and Dr. K. F. W. Hinson: Pulmonary Aspergillosis.

Saturday, January 15

KENT PAEDIATRIC AND CHILD HEALTH SOCIETY.—At Children's Department, Farnborough Hospital, Kent, 3 p.m., clinical meeting.

Monday, January 17

HUNTERIAN SOCIETY.—At Mansion House, 8.30 p.m., Hunterian Lecture by Professor J. Adams-Ray (Stockholm): Some Observations on a New Symptom-pallor in the Inflammation Syndrome.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. Macdonald Critchley: Parietal Symptomatology.

Tuesday, January 18

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. Douglas McClean: Substances that Increase Tissue Permeability and their Relation to Infection and Fertilization.

ILFORD MEDICAL SOCIETY.—At King George Hospital, Ilford, 8.45 p.m., Dr. P. M. F. Bishop: Treatment of the Menopause. Members of the Stratford Division, B.M.A., are invited.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. M. S. Thomson: Tuberculosis Cutis.

OXFORD UNIVERSITY MEDICAL SOCIETY.—At Radcliffe Infirmary, 8.15 p.m., Dr. S. R. Gerber (Cleveland): Case of the Osteopath's Wife.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Goulstonian Lecture by Dr. G. M. Bull: The Uraemias.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Dr. G. W. B. James: Neurosis in Gynaecology.

SOCIETY FOR THE STUDY OF ADDICTION.—At Medical Society of London, 8 p.m., Dr. M. M. Gatt: How a Treatment Centre for Alcohol Patients was Established at a State Mental Hospital and How it Works.

SOUTH-WEST LONDON MEDICAL SOCIETY.—At Bolingbroke Hospital, 8.30 p.m., Dr. P. E. Camps: Forensic Medicine and the Law.

Wednesday, January 19

EUGENICS SOCIETY.—At Royal Society, Burlington House, W., 5.30 p.m., Professor L. S. Penrose, F.R.S.: Genetics of Microcythaemia (Thalassaemia) (with a film).

HYPNOTHERAPY GROUP.—At Eastman Dental Hospital, Gray's Inn Road, W.C.1, 8 p.m., papers by Dr. W. Moodie, Dr. D. Stafford-Clark, Dr. G. F. Newbold, Dr. G. J. Ambrose, and Mr. E. Wookey.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: The Eosinophilic Granulomas of the Skin.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Dr. R. Thomson: Laboratory Aids to Diagnosis.

MIDDLESEX COUNTY MEDICAL SOCIETY.—At Ashford Hospital, 3 p.m., clinical cases; 4.30 p.m., Mr. F. G. Ward: Rehabilitation and Resettlement.

MIDLAND MEDICAL SOCIETY.—At Birmingham Medical Institute, 154, Great Charles Street, 8.15 p.m., Sir Stanford Cade: Progress in the Treatment of Cancer.

OXFORD UNIVERSITY.—At Radcliffe Infirmary, 5 p.m., Litchfield Lecture by Dr. E. J. M. Bowley: Maternal Care and Mental Health.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., John Burns Lecture by Professor W. W. Mushin: Physiological Principles in the Care of the Unconscious Patient.

WILLESDEN GENERAL HOSPITAL MEDICAL SOCIETY.—At Department of Physical Medicine, 8.45 p.m., discussion: Some Common Dermatological Topics. Speaker, Dr. I. Muende.

Thursday, January 20

BRITISH INSTITUTE OF RADIOLOGY.—7.45 p.m., special general meeting, followed by ordinary meeting which papers will be read as follows: Dr. A. H. E. Marshall, Some Actions of Hormones and Pharmacological Agents upon the Acute Skin Damage produced by X rays and Carcinogenic Hydrocarbons; Dr. L. E. Houghton, Dr. J. B. Walter, and Mr. D. E. A. Jones, The Modification of X-ray Damage by Cortisone; Dr. K. Sieber, A Clinical Trial of A.C.T.H. in Radiotherapy.

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. D. G. Melrose: Cooling of the Whole Organism.

EDINBURGH CLINICAL CLUB.—At 7, Drumshugh Gardens, 8 p.m., Professor G. H. Percival: Bullous Eruptions.

GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.—At Glasgow University Union, 7.30 p.m., Honorary Presidential Address by Mr. Roland Barnes.

LIVERPOOL MEDICAL INSTITUTION.—At Liverpool Royal Southern Hospital, 3 p.m., afternoon clinical demonstration.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—At the Emergency Bed Service, Fielden House, 28, London Bridge Street, S.E., 5.30 p.m., meetings.

OSLER CLUB OF LONDON.—At 11, Chandos Street, W., 7.45 p.m., Colonel L. W. Harrison: Neisser and Neisserian Principles in Venereology; Dr. David Nabarro: The Decline and Fall of Congenital Syphilis. (Meeting in honour of Albert Neisser, January 22, 1855-1916.)

ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Mr. C. Naunton Morgan: Advances in Surgery in Diseases of the Colon and Rectum.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Goulstonian Lecture by Dr. G. M. Bull: The Uraemias.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Ophthalmology Lecture by Professor Arnold Sorsby: Outstanding Problems in the Treatment of Ocular Infections.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—At 26, Portland Place, London, W., 7.30 p.m., Professor R. M. Gordon: Symposium on Loniass. Speakers will include Mr. W. Crewe, Mr. H. Oldroyd, Dr. B. O. L. Duke, Professor J. J. C. Buckley, Sir Philip Manson-Bahr, Dr. F. Hawking, and Dr. W. E. Kershaw.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Medical School, Small's Wynd, Dundee, 5 p.m., Professor R. E. Tunbridge: Some Problems of Diabetes Mellitus.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., psychiatry demonstration by Dr. Desmond Carran.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At Clarendon Restaurant, Hammersmith Broadway, 8.30 p.m., debate on the Motion: This House considers that Money spent on Research into Rheumatism has been wasted. Proposed and seconded by Dr. Dudley Hart and Dr. C. J. M. Clark; opposed and seconded by Dr. Oswald Savage and Dr. J. Glyn. Preceded by dinner at 7.15 for 7.30 p.m.

Friday, January 21

BRITISH INSTITUTE OF RADIOLOGY.—5 p.m., meeting of medical members. FACULTY OF RADIOLOGISTS.—At Royal College of Surgeons of England, 5 p.m., Radiotherapy Section meeting. Discussion: Cancer of the Larynx. Openers, Mr. G. S. Seed and Dr. J. R. Nuttall.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. G. B. Mitchell-Heggs: Chronic Granulomas.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., at Institute Lecture Theatre, open clinical demonstration by Mr. Vernon Thompson: Bronchiectasis.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Mr. W. S. Mack: Modern Trends in the Surgery of the Bladder and Prostate.

ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., Professor D. M. Dunlop: Present Status of Cortisone in Practical Therapy.

SOCIETY FOR CULTURAL RELATIONS WITH THE U.S.S.R.: MEDICAL SECTION, 14, Kensington Square, London, W.—8 p.m., Dr. Alex. Comfort: Soviet Science; 9 p.m., annual general meeting of section.

Saturday, January 22

BRITISH ASSOCIATION OF ALLERGISTS.—At Royal Society of Medicine, 11 a.m., general meeting. Papers by Professor R. J. S. McDowall, Dr. J. R. Riley, Mr. W. E. Brocklehurst, Dr. F. J. Prime, and Dr. H. G. J. Herxheimer.

APPOINTMENTS

ALDERS, NICHOLAS, M.D., F.R.C.S.Ed., M.R.C.O.G., F.I.C.S., Part-time Consultant Obstetrician and Gynaecologist to Bournemouth and East Dorset Group of Hospitals, South-west Metropolitan Regional Hospital Board (appointment dated June 3, 1954).

COPE, D. H. P., M.B., B.S., F.F.A.R.C.S., Consultant Anaesthetist, the Middlesex Hospital, London, W.

FLEMING, G. M., M.D., D.P.H., Medical Officer, Ministry of Education.

GEDDES, J. E., M.D., Senior Consultant Chest Physician and Supervising Tuberculosis Physician; City of Glasgow Area Western Regional Hospital Board.

HOLMAN, REGINALD ALBERT, M.D., Primary F.R.C.S., Senior Lecturer in Bacteriology, Welsh National School of Medicine, Cardiff.

MCGRATH, S. DESMOND, M.R.C.P.I., D.P.M., Resident Medical Director of St. John of God Private Psychiatric Hospital, Sillorgan, Co. Dublin.

MURPHY, JOHN T., M.B., B.Ch., D.P.H., Medical Officer of Health, Borough of Faversham; Urban District Council of Sittingbourne and Milton; Rural District Council of Swale; Isle of Sheppey Joint (Medical Officer of Health) Committee; Faversham Port Health Authority.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—J. V. Mainprize, M.B., Ch.B., part-time Assistant Venerologist at Torbay Hospital, Torquay; G. O. M. Neatby, M.R.C.S., L.R.C.P., D.O.M.S., Clinical Assistant in Ophthalmology (S.H.M.O.) at Bath Eye Infirmary; H. I. Leigh, M.B., Ch.B., Registrar in the Department of Neurological Surgery, Frenchay Hospital, Bristol; B. V. Earle, M.D., M.R.C.P., D.P.M., Consultant Psychiatrist in Exeter Clinical Area; H. D. Moore, M.B., B.S., F.R.C.S., F.R.C.S.Ed., Consultant Surgeon in Exeter Clinical Area; J. W. Payne, M.B., Ch.B., F.R.C.S., D.O.M.S., Consultant Ophthalmologist in Plymouth Clinical Area.

WARREN, JOAN E., M.B., Ch.B., Medical Registrar, Worthing Hospital.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Wolf.—On December 15, 1954, at the Whittington Hospital, London, N. to Catherine, wife of Dr. Frederick Wolf, a son—Peter.

DEATHS

Atkinson.—On January 7, 1955, George James Smith Mounay Atkinson, O.B.E., M.R.C.S., L.R.C.P., aged 78.

Brown.—On January 1, 1955, Charlotte Rhoda Hodgins Brown, M.D., of 60, Brockwood Lane, Welwyn Garden City, Herts.

Grieve.—On December 30, 1954, at 53, Beverley Road, Hull, Yorks, Robert Grieve, M.D., F.R.C.S.Ed.

Hardman.—On December 24, 1954, Richard Smith Hardman, M.B., Ch.B., J.P., of "Hopetoun," Chester Road, Woodford, Bramhall, Cheshire, aged 83.

Joekes.—On January 2, 1955, at 16, Stoeplaan, Wassenaar, Holland, Theodor Joekes, M.B., aged 72.

Lee.—On January 6, 1955, at 39, Ivenhoe Road, Liverpool, Mary Buchanan Lee, L.R.C.P.&S.Ed., L.R.F.P.S.

McCreadie.—On January 3, 1955, at 22, Bankfield Road, Shipley, Yorks, Anthony John McCreadie, M.C., M.B., F.R.C.S.Ed., aged 65.

Macintosh.—On December 28, 1954, at The Gabes, Syston, Leicester, Alexander McCheyne Macintosh, M.B., Ch.B., aged 60.

McIntosh.—On December 27, 1954, at 57, Magdalen Yard Road, Dundee, David Glass McIntosh, M.B., Ch.B., M.R.C.P.Ed., D.P.H.

Maclean.—On December 25, 1954, at Newcastle-upon-Tyne, Murdo Maclean, M.B., Ch.B., aged 75.

Moberley.—On December 17, 1954, George Keble Moberley, L.R.C.P.&S.Ed., L.R.F.P.S., of Kloof, Natal, South Africa, aged 83.

Roberts.—On January 8, 1955, the result of an accident, Adeline Mary Roberts, O.B.E., M.D., J.P., late of Welbeck Hotel, London, W.

Rundle.—On December 24, 1954, at his home, Green Borders, Looe, Cornwall, Claude Rundle, O.B.E., M.D., D.P.H.

Somerset.—On December 27, 1954, William Ralph Somerset, M.B., Ch.B., of Wolverhampton, Staffs, aged 80.

Stewart.—On January 2, 1955, at Dial House, Bourton-on-the-Water, Glos, Robert Bell Stewart, M.C., M.B., Ch.B., D.P.H., D.T.M.

Sweet.—On December 27, 1954, Samuel Henry Sweet, M.R.C.S., L.R.C.P., of Heston Lodge, Heston, Middlesex.

Webber.—On December 24, 1954, at University College Hospital, London, W.C., Harold Norris Webber, B.Chir., F.F.A.R.C.S.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Treatment of Salmonella Carriers

Q.—We have lately had an epidemic of enteritis in this area, and *Salmonella typhi-murium* has caused a number of cases apparently. The patients are now all symptomless and very fit, but the public health authorities are excluding children with the salmonella in their stools from school for weeks and sometimes months. I am urged to treat the children with succinylsulphathiazole, then sulphadiazine, then chloramphenicol, and finally oral streptomycin if the carrier state has not meanwhile settled. This regime does not seem effective in many cases. Can you advise me, please?

A.—The treatment of the salmonella carrier state has always been a troublesome problem, and no infallible solution to it is known. In attempts to eliminate an organism altogether, as distinct from suppressing its growth during an acute infection, an actively bactericidal drug is preferable to one which is only bacteriostatic, and on this ground oral streptomycin is the most promising of the three treatments mentioned. It might well be tried first instead of being used as a last resort. The dose should be 0.5 or 1 g. according to age, four times a day for five days. Recently American workers have recommended combinations of oral antibiotics for treating intestinal conditions, and a mixture of streptomycin or neomycin and polymyxin (e.g. streptomycin 250 mg., polymyxin 200,000 units, in each dose) might well be tried, although, so far as we are aware, this would be purely experimental. All these antibiotics are unabsorbed when given orally, and there is thus no risk of toxic effects. They act only in the bowel, and would therefore be ineffective if the infection involved the biliary passages, as it sometimes does. Although antibiotics, when given parenterally, are excreted in the bile, some in high concentration, there is probably no drug treatment which can be depended on to cure the carrier state when it involves this area.

Surgery in Congenital Pulmonary Stenosis

Q.—What results may be anticipated from the surgical treatment of congenital pulmonary stenosis? What cases are suitable for surgery, and at what age should operation be performed? What regime is advised for infants and children awaiting operation?

A.—It is impossible to answer all the problems contained in this question in a short paragraph. The term "pulmonary stenosis" is a generic one covering various types of abnormality. There are considerable differences in both the clinical features and the management of those due to a pulmonary valve stenosis with a normal aortic root and those of the Fallot group in which the stenosis is associated with a ventricular septal defect.

In general, operation should be considered in all cases of pulmonary stenosis unless the condition is very mild or unless the patient is *in extremis* or has other grave defects. Cases of pure pulmonary valve stenosis should be operated on, however young the patient, if the condition is severe enough to satisfy general criteria. In the Fallot group it is generally better to wait until the age of 4 or 5 years, unless there are grave features, such as severe cyanosis or syncopal attacks.

While waiting for operation the children need chiefly the general care and protection from physical strain that most

parents are only too eager to accord; special medical attention includes avoidance of the perils of catarrhal and other infections; these children are especially prone to upper and lower respiratory infection. In spite of the polycythaemia iron may be needed.

Surgery offers hope of great relief, where before there was none. In good hands the mortality is not high, ranging from 5-15% for mild to severe cases. The results are good or excellent in about 70% of survivors; the child may appear completely normal in every way. Certainly life is transformed for both the child and the parents. When the cardiac lesion is complicated (for example, tetralogy of Fallot) the late prognosis is as yet uncertain. Operations have not yet been done for as long as ten years, and a longer time must elapse before this can be assessed. In cases of isolated pulmonary valve stenosis treated successfully by valvotomy the late prognosis is probably excellent.

Toxic Effects of Amphetamine

Q.—What toxic effects may arise from prolonged use of dexamphetamine sulphate? I am particularly interested to know whether there is any risk of blood or hepatic changes, chronic dyspepsia, carcinogenesis, and such-like serious effects.

A.—The actions and toxic effects of dexamphetamine sulphate are similar to those of amphetamine sulphate, but the D-isomer is claimed to be effective in smaller dosage. Both substances have been safely used for lengthy periods in narcolepsy or obesity in doses up to 60 mg. daily. The development of psychoses has been reported, as for example in the man of 49 who had taken 250 mg. daily for five years. Reports have also appeared of damage to bone marrow: pancytopenia occurred in a girl of 21, and acute aplastic anaemia in a man of 26 who took 290 mg. during 19 days. Habituation may also occur, though this is probably not very common. Withdrawal symptoms observed included hallucinations, restlessness, and insomnia. These symptoms, together with anorexia, may be expected to follow prolonged administration in most patients. Many of those receiving amphetamine possess personality defects and may be especially prone to exhibit these side-effects. Tachycardia and hypertension have also been reported, but I am not aware of any evidence of carcinogenesis or liver damage from prolonged use of dexamphetamine.

*This answer is taken from the third book of *Any Questions?* Copies of both the second and third books of *Any Questions?*, each containing some 200 expert answers, are available from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or through any bookseller, price 7s. 6d. a copy (postage 6d.). The third book contains a cumulative index.

Blushing

Q.—A girl of 19 who appears to be perfectly healthy has complained for the last year of involuntary blushing. This occurs regularly every afternoon and sometimes during the evening. There is a feeling of burning of the skin of her face and neck, which become suffused with blood and remain so for an hour or so. There seems to be no association with digestion: the blushing happens after a very light lunch or even no lunch at all. Nor is there any menstrual disturbance. She has a fair, healthy skin, is active and intelligent, and has no sign of thyroid dysfunction. Her main complaint is of getting her leg pulled unmercifully.

A.—Not much is known of the physiological mechanism of blushing, except that it is not affected by cervical sympathectomy. It is probable, however, that the mechanism of capillary dilatation over the blush area is inherently less stable in some people than others. In view of the fact that the girl is healthy, one can presumably exclude gross lesions such as hypertension, polycythaemia, pheochromocytoma,

carcinoid tumour, and the like. The condition must therefore be an exaggeration of the normal act of blushing, which, the psychiatrists tell us, is incompatible with complete innocence or modesty. It is supposed to occur typically in individuals in whom there is conflict between morality and sexual impulses and to be particularly common and severe at phases of life when these conflicts are especially acute. It is often associated with feelings of inferiority, and teasing is therefore quite the worst treatment. "Shyness springs from secret shame," and it would be worth trying to discover tactfully whether the lady has some such secret. An inquiry into the first onset of the symptom and the reason for its occurrence in the afternoon and evening might be helpful.

Prosthesis after Mastectomy

Q.—What is the best method to adopt after mastectomy to provide a natural and comfortable bust? Most supports lift upwards on the operation side owing to the lack of weight and in spite of artificial padding.

A.—I do not think there is any real difficulty in fitting artificial breasts. Many firms supply good ones, matching exactly the breast on the other side. They are made of sorbo rubber and are contained in washable covers. Any tendency to lift can be prevented by hooking the lower edge of the cover to the corset or other garment. No method of plastic remodelling of the removed breast is altogether satisfactory, and reliance should always be placed on some such prosthesis.

Two Cases of Fetishism

Q.—(a) A wife has asked my advice about her husband, aged 40 years. They have been happily married for 16 years, have three children, and have enjoyed a completely satisfactory sexual life. However, the husband, an apparently healthy, athletic type, has always shown a strong desire for his wife to wear, on occasions, only various plastic and rubber raincoats, etc. She has been quite happy to acquiesce to his wishes until she read somewhere that it indicated some type of mental disease and must therefore stop, in case it "leads to something worse." She is rather frightened to let her husband know that she has mentioned her husband's peculiarity, and really only wants reassurance. Is there any book which might help to give some semblance of a sensible answer to these and other similar problems should they crop up? (b) A boy aged 5 years has since infancy shown an abnormal desire to touch and handle silk. His mother had hoped this little habit would have disappeared as he grew up, but the reverse is the case. Very embarrassing situations are arising, as he is not averse to touching clothing of complete strangers. Already there has been some trouble at school, as he has gone so far as to "borrow" little girls' ribbons and has taken home quite a collection of them. He has also been touching the clothing of women in shops and buses. Should I advise psychiatric advice or let well alone? The mother is quite willing to "do anything."

A.—(a) The wife in the first question may be reassured. Her husband's peculiarity is a form of sexual disturbance termed *fetishism* in which the sexual feelings are aroused in association with an inanimate object. This well-known condition, which appears not to occur in women, dates from early childhood and may be associated with emotions concerning breast feeding or with fantasies concerning the female genital organs. The condition is often relieved by psychotherapy. It is not a mental disease but a symptom of emotional disturbance. Nor is the symptom the forerunner of "something worse," which presumably means the type of sexual perversion reported in the sensational press. Rubber and plastic raincoats, often of black material, women's shoes, and corsets and many other articles of women's attire are common fetishistic objects. The husband should be advised

to consult a psychiatrist if he finds his condition distressing. But this may be impracticable. Meanwhile the couple may resume marital relations, under the old conditions, in the certainty that no disaster will befall them.

(b) The second question concerns a fetishism for silk. The "little habit" is not likely to disappear spontaneously. The mother should at once get advice at a child guidance clinic. As he grows older the boy will learn to control the wish to touch and handle silk. But he may collect silk ribbons, etc., and keep them secretly and obtain erotic pleasure by feeling them. The habit and urge, although personally distressing and even hated, can acquire a compulsive power difficult to resist. The husband mentioned in the former question can probably recall childhood experiences comparable to those of the little boy of 5.

Fetishism and allied topics are described in *Mental Health and the Psychoneuroses*, by Dr. J. A. Hadfield (Allen and Unwin, 1953), and in *The Sexual Perversions and Abnormalities*, by Dr. Clifford Allen (Oxford Medical Publications, 1949).

Treatment of Meningococcal Meningitis

Q.—What is the accepted treatment of meningococcal meningitis? Has intravenous oxytetracycline ("terramycin") any place in its treatment?

A.—Sulphonamides are usually sufficient. For a severe infection in an adult give 2 g. "soluthiazole" (a soluble form of sulphathiazole) intravenously along with 1.5 g. sulphathiazole by mouth: repeat the oral dosage every four hours for three days, reducing to 1 g. six-hourly for a second three days. Alkaline fluids should be given by mouth throughout the course. Penicillin is not usually required, but if the cerebrospinal fluid is turbid it is sound practice in any meningeal illness to give 10,000 to 20,000 units intrathecally at the first lumbar puncture pending laboratory reports on the causal organism: if meningococci are reported, further penicillin is rarely necessary. Chloramphenicol given by mouth readily passes into the cerebrospinal fluid and has been used successfully in the treatment of meningococcal meningitis, but, on the score of expense and toxicity, has no advantage over sulphonamides. There is no obvious place for intravenous oxytetracycline. In *Prescribers' Notes* issued by the Ministry of Health for November, 1954, meningococcal meningitis is listed (p. 85) as one of the infections in which chlortetracycline ("aureomycin") and oxytetracycline ("terramycin") are not indicated, being less suitable than sulphonamides.

Tincture of Belladonna

Q.—I have a patient who is taking 5 minims (0.3 ml.) of tincture of belladonna each day as an antispasmodic. Is it possible that this dose could be cumulative in its effect?

A.—This dose of tincture of belladonna is equivalent to 1/600 gr. (0.1 mg.) of atropine. It would be wholly destroyed and excreted in 24 hours and would not be cumulative.

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HUMAN NUTRITION AND THE SOPHISTICATION OF FOODS AND FEEDING HABITS

SOME OBSERVATIONS, IMPLICATIONS, AND SPECULATIONS*

BY

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In the Constitution of the World Health Organization health has been defined as a state of complete physical, mental, and social well-being. Good nutrition undoubtedly contributes to the attainment of this state, so "food and health" would be a happier theme than "food and disease." Unfortunately, we are not so accustomed to measure healthiness as we are to recognize the signs of illness, so that for the most part the effects of food have been analysed in relation to evidences of ill-health and the occurrence of diseases.

Failure to feed properly—overfeeding, underfeeding, or taking a diet in which the proportion of nutrients is imbalanced—leads to primary malnutrition; nutritional disorders may also be secondary to infections and infestations (Platt, 1954a). Since these aspects of malnutrition are now familiar, I shall consider food and disease in a context which is perhaps not so well known and which may be of special interest to the general practitioner of medicine in the years to come.

SOPHISTICATION OF FOODS

Sir Edward Mellanby (1951), commenting on the increased incidence in the past fifty years of certain morbid conditions, said that he found it "difficult to avoid the conclusion that some at least of these increases in disease are due to errors in living recently introduced or greatly expanded in modern times," and that "it may be that one of these errors is the ingestion of food treated by unnatural chemical substances." In the past, chemical manipulation or, as I shall call it, sophistication of foods was, apart from gross adulteration amounting to fraud, largely concerned with preservation, but there is now a formidable array of chemical and other treatments for a variety of purposes; these provide "at least a subject worthy of inquiry" and one which "might well be considered whenever a disease commonly found in countries which use these methods has resisted all efforts of the investigator to find a satisfactory aetiological basis" (Mellanby, 1951).

Examples of the deliberate introduction of chemicals into food for human consumption and their accidental occurrence are included in the accompanying Table.

*Based on a contribution to the Plenary Session on "Food and Disease" at the Annual Meeting of the British Medical Association, Glasgow, 1954.

which also gives references to some sources from which further information may be obtained. It will be clear, even from this limited bibliography, that the subject is so extensive that it will be possible here to make only brief comments on some selected aspects. These are dealt with in the same order as followed by the sections set out in the Table.

Unintentional Chemical Additives

The report of a Working Party on Toxic Chemicals in Agriculture and Residues in Foods (Ministry of Agriculture and Fisheries, 1953) contains a list of more than a hundred preparations, and these include some of the most powerful known poisons. The seriousness of the hazards to agricultural workers and others handling these aids to food production is recognized: but the Working Party, like a number of other authorities, reports that it has "been unable to discover any specific instances of illness which have resulted" from eating food treated with or exposed to some toxic chemical. "The position," it concludes, "does not therefore appear to have been established" (my italics) "as one of immediate danger." On the other hand, it does not consider that "it is one which allows of complacency."

I would be the last to deny the need for measures towards increasing crop production and preventing losses in storage, particularly in those parts of the world where food supplies are short. We have, however, to recognize in this, and indeed in the whole field of food technology, the possibility of a conflict of interests in which, as the *British Medical Journal* (1954) remarks, "It is doubtful if the influence of any such reformer [posing as a champion of the individual safety and protector of the public welfare] would ever equal or exceed that of a powerful commercial interest anxious to introduce a new material or technique into food production." The need for a strong and well-informed body of opinion is indeed well illustrated by an observation of the Working Party, commenting on the employment of bacterial rodenticides.

"The Public Health Laboratory Service and the Medical Research Council consider that the risks are such that the use of bacterial rodenticides should be discouraged with a view to their discontinuance. The Ministry of Agriculture's Infestation Control Division advise that immediate policy

should concentrate on ensuring proper care and attention in the preparation and use of these cultures and that any hasty action against these methods might lead to a serious dislocation in commercial rat destruction services." (Ministry of Agriculture and Fisheries, 1953.)

It is specially important to realize that much more is known about the hazards to health of these bacterial preparations than about many of the chemicals used in food whose presence may be difficult to detect and whose

effects on the human body may be subtle, insidious, and long-delayed. The problem is not so difficult when, as in the case of D.D.T., evidence has been obtained of the effects of acute poisoning in man. It is much more difficult to decide whether the occurrence of D.D.T. in the milk of cows and in a number of staple foodstuffs treated with this insecticide may have insidious and possibly long-delayed effects on the human body (House of Representatives, 1952).

Illustrations of Various Treatments Employed at Different Stages in Food Production and Technology, with some Possible Hazards

Stage	Purpose	Agent or Treatment	Examples	Possible Hazards
Production	Increase of yield	Insecticides, fungicides, herbicides, rodenticides ^{1, 2}	D.D.T. Organic phosphorus compounds—e.g., parathion ³ ; thiourea; arsenic compounds Salmonella rat bait ⁴ "Aureomycin" in chick foods Oestrogen implanted in cockerels	? Residues in cows' milk and on foodstuffs ^{3, 4, 5} Toxic residues on fruit, skin-nerve poisoning ⁶ ? Bacterial food-poisoning ¹ —
		Antibiotics ⁷ Hormones ⁸	—	—
Processing	Enhanced acceptability	Refinement	Low extraction wheat-flour Highly milled rice Sugar Salt Flour "improvers"	Reduced dietary B-vitamin calorie ratio ¹⁰ — — — — Manifested as fits in dogs fed on agerized bread ¹¹ Carcinogenic action of butter yellow ¹²
		Addition of chemicals	Colouring agents—e.g., dyestuffs Flavourings—e.g., artificial fruit essences Sweeteners—e.g., saccharin, dulcin, and P4000 Anti-oxidant ¹⁴ , anti-browning, and anti-staling agents ^{15, 16} Emulsifiers, fat extenders, and hardening agents (hydrogenation of oils and fats)	Liver tumours with dulcin and kidney lesions with P4000 ¹³ — — Renal calculus with polyoxy-ethylenemonooleate ⁴ Vitamin B imbalance ^{10, 19}
		Addition of synthetic nutrients	Some B vitamins to refined cereal products ^{17, 18} Ascorbic acid to fruit preparations ²⁰ Ergosterol to margarine Amino-acids—e.g., lysine to cereals flours ²¹	— — — —
	Increased nutritive value (enrichment, fortification, ennoblement)	Addition of mineral salts	Calcium carbonate and or iron salts to wheat-flour ¹⁷ Iodides—iodates—to common salt ²² Fluorides to drinking-water ²³	Mineral imbalance ¹⁹ — — —
		Addition of food concentrates	Fish-liver oil to margarine Skimmed-milk powder ²⁴ and fish meal to bread ²⁵ Yeast to various food preparations ^{26, 27}	— — — —
		Fermentation	Cheese Bread Many traditional preparations ²⁸ —e.g., nuocmam ²⁹	— — — —
Storage	Preservation	Chemicals: Artificial	Benzoic acid, sulphur dioxides, and nitrites ³⁰	SO ₂ destroys vitamin B ₁ and sulphites cause haemorrhagic diathesis ³¹
		Natural	Salt Sugar Vinegar	Dietary imbalance
		Physical means	Heating (including pasteurization) Drying Freezing Canning and bottling	Loss of some amino-acids by heating and in Maillard reaction ^{32, 33, 34, 35} — — —
Storage	Packaging and transport	Detergents	Quaternary ammonium compounds ³⁶	Dermatitis ³⁷
		Newly developed wrappings, etc. Gas storage	Plasticizers ³⁸ For fruit, dried milk, and eggs	See ³⁸

¹ Ministry of Agriculture and Fisheries (1953). *Report of the Working Party on Precautionary Measures against Toxic Chemicals used in Agriculture*. H.M.S.O., London.

² World Health Organization (1953). *Bull. Wld Hlth Org.*, 8, 535.

³ Fottenger, F. M., and Krohn, B. (1952). *Hearings before the Select Committee to Investigate the Use of Chemicals in Food Products*, p. 954. U.S. Government Printing Office, Washington.

⁴ Lehman, A. J. (1950). *Ass. Food Drug Officials U.S. Quart. Bull.*, 14, 82.

⁵ Laug, E. P., Kunze, F., and Prickett, C. S. (1951). *Arch. Indust. Hyg.*, 3, 245.

⁶ Barnes, J. M. (1953). *Bull. Wld Hlth Org.*, 8, 419.

⁷ Porter, J. W. G. (1953). *Vet. Rec.*, 85, 288.

⁸ *Nutr. Rev.*, 1954, 12, 166.

⁹ Bird, S. (1948). *Official Report 8th World Poultry Congress*, p. 131.

¹⁰ Elvehjem, C. A., and Krehl, W. H. (1947). *J. Amer. med. Ass.*, 135, 279.

¹¹ Mellanby, E. (1946). *British Medical Journal*, 2, 885.

¹² Greenstein, J. P. (1954). *Biochemistry of Cancer*, 2nd ed., p. 89. Academic Press Inc., N.Y.

¹³ Fitzhugh, O. G., and Nelson, A. A. (1950). *Fed. Proc.*, 9, 272.

¹⁴ Lehman, A. J., Fitzhugh, O. G., Nelson, A. A., and Woodward, G. (1951). *Food Res.*, 3, 197. Report of Food Standards Committee on Antioxidants: Revised Recommendations Relating to the Use of Antioxidants in Food (1954). H.M.S.O., London.

¹⁵ Joelyn, M. A., and Ponting, J. D. (1951). *Ibid.*, 3, 1.

¹⁶ Stadman, E. R. (1948). *Ibid.*, 1, 325.

¹⁷ Ministry of Food (1945). *Report of the Conference on the Post-War Loaf*. Cmd. 6701. H.M.S.O., London.

¹⁸ Horder, T. J., Dodds, E. C., and Moran, T. (1954). *Bread*, p. 159. Constable, London.

¹⁹ Richards, M. B. (1945). *British Medical Journal*, 1, 433.

²⁰ Bauernfeind, J. C. (1953). *Food Res.*, 4, 359.

²¹ *Nutr. Rev.*, 1954, 12, 70.

²² Murray, M. M. (1953). *Bull. Wld Hlth Org.*, 8, 211.

²³ Ministry of Health (1953). *The Fluoridation of Domestic Water Supplies in North America as a means of controlling Dental Caries*. H.M.S.O., London.

²⁴ Henry, K. M., Houston, J., Kon, S. K., Powell, J., Carter, R. H., and Hallon, P. (1941). *J. Dairy Res.*, 12, 184.

²⁵ Latsky, J. M. (1954). *Report of the 2nd Inter-African Conference on Nutrition*, p. 277. H.M.S.O., London.

²⁶ Medical Research Council (1945). *War Memorandum*, No. 16. H.M.S.O., London.

²⁷ Platt, B. S. (1946). *Nutrition in the British West Indies*. Colonial No. 195. H.M.S.O., London.

²⁸ — (1954). *Report of the 2nd Inter-African Conference on Nutrition*, p. 271. H.M.S.O., London.

²⁹ Van Veen, A. G. (1953). *Food Res.*, 4, 209.

³⁰ Statutory Rules and Orders, 1925 No. 775 and 1940 No. 633.

³¹ Lepkovsky, S. (1953). *Food Res.*, 4, 105.

³² Morgan, A. F. (1931). *J. Biol. Chem.*, 90, 771.

³³ — and Kern, G. E. (1934). *J. Nutr.*, 7, 367.

³⁴ Rice, E. E., and Beuk, J. F. (1953). *Food Res.*, 4, 233.

³⁵ Lea, C. H., and Hannan, R. S. (1952). *In Food Science*, edited by E. C. Bate-Smith and T. N. Morris. Cambridge Univ. Press.

³⁶ Dunn, C. G. (1949). *Food Res.*, 2, 117.

³⁷ Hodgson, G. (1953). *Practitioner*, 170, 166.

³⁸ House of Representatives (1950). *Hearings before the Select Committee to Investigate the Use of Chemicals in Food Products*, p. 71. U.S. Government Printing Office, Washington.

Intentional Additives

Many chemicals are added to foods in an attempt to satisfy the supposed desire of the consumer for uniformity of certain qualities of food products; for example, it is said that a large well-piled loaf of bread is demanded. Uniformity can be carried too far, and sometimes we have to deplore the success of the caterer in producing a sameness of taste whatever the dish. Those of us who are concerned with the application of the principles of nutrition do not want to conflict with the efforts of the food technologist and caterer; in fact, we believe that our interests are, or could be, in many respects identical, and often the methods of preparation of food by which the best flavours are secured are also those which retain or enhance the biological value of foodstuffs. The next section in the Table is concerned with increasing the nutritive values of foods by methods known as enrichment and fortification.

The fortification of foods is now a well-known procedure; however, the wisdom of removing a number of naturally occurring nutrients from wheat-flour and replacing them by a limited number of synthetic substances is open to question. It has been shown (Richards, 1945) that an animal given an imbalanced mixture of synthetic B vitamins may show no signs of deficiency, but if the animal bears younger offspring may show signs of deficiency of one of the factors which has not been restored to the mother's diet. When a dietary deficiency develops it would seem to be obvious that the diet should be improved—for example, by adding natural concentrates. In medicine, developments in bacteriology since Pasteur have been almost exclusively concerned with the study of micro-organisms pathogenic to man, but in food some micro-organisms may be not only non-pathogenic but actually beneficial to mankind. I would regret the passing of fermentative procedures, a natural way of improving the value of food which I have called "biological ennoblement" (Platt, 1946).

The conventional preservatives in current use are the successors of the spices of earlier days, which were used to disguise the flavours of food which had "gone off"; some of these spices also had bacteriostatic or fungistatic properties. To-day the microbiologist is wisely directing his efforts towards eliminating the contamination of food products with pathogenic organisms so that chemical preservatives should not now be so necessary.

Chemical substances added to food may not only be toxic themselves but may also destroy, alter, or interfere with the absorption or utilization of nutrients, and the altered nutrients and their decomposition products are themselves sometimes harmful: for example, the effect on flour of agene is to convert the essential amino-acid methionine into a substance, methionine sulphoximine (Bentley *et al.*, 1950; Campbell *et al.*, 1951), which has a striking effect on the behaviour of some animals. This compound belongs to a fascinating group of substances known as anti-metabolites (Woolley, 1952).

Physical Treatment

As well as the problems associated with the addition of chemicals to food there are also problems which result from the physical treatment of foods by such methods as cooking, heating, drying, canning, and freezing (Lepovsky, 1953). Although, by definition, cooking is heating, the word does imply much more than this: its aim should be to retain or enhance flavours and to make the food appetizing and palatable. It is well known that flavours and food values are lost when the art of cooking is lost; in particular, the loss of ascorbic acid has been thoroughly examined (Stewart, 1946). In some respects the retention of ascorbic acid is a guide to good cooking, as flavours, colouring agents, etc., are dependent on the presence of chemical substances which, like this vitamin, may be leached out or destroyed in the course of many cooking methods.

It has been known for some years that fats and oils decompose on heating, fortunately at temperatures which

are high compared with those normally employed in cooking, and that carcinogens are produced (Peacock *et al.*, 1953). The phenomena of denaturation of proteins and the "browning" or Maillard reaction between proteins and carbohydrates have also been familiar to biochemists for many years; they have now been associated with the lowering of the biological value of protein; there is evidence that in these changes the essential amino-acids lysine and methionine may be destroyed. With the rapidly increasing interest in protein malnutrition (*British Medical Journal*, 1952) which is now known to be prevalent in so many parts of the world these effects are likely to receive increasing attention. Are there any reasons for believing that they are relevant to unsolved problems in medicine in this country?

Lysine we know to be required for growth and for maintaining a normal blood picture; methionine and the other sulphur-containing amino-acid, cystine, are important in the nutrition of skin and hair (Platt, 1953). A relative methionine deficiency has been shown (Mann *et al.*, 1953) to be in monkeys a factor in the production of hypercholesterolaemia and atherosclerosis. The aetiology of a number of disorders of the blood, skin, blood vessels, and eyes is still in question; a case might be made out for investigating these in relation to recent developments in food technology. I want to stress the point that there may not necessarily be merely deficiency of a nutrient following destruction during some process, but this insufficiency may be combined with the effects of the altered nutrients behaving, for example, like the anti-metabolites.

Technical Difficulties

Attempts to assess the effects on the consumer of all these procedures raise great technical difficulties. Barnes (1951) states that "any substance added to food must display no demonstrable toxicity for animals and must satisfy rigorous standards of purity," but this toxicologist concludes that "the problem of the adulteration of food by chemical substances will come to lie within the field of nutrition rather than in the more strictly limited one of toxicology." It is difficult to reconcile with this the views of a pharmacologist who, for reasons which are by no means clear, would exclude nutritional and palatability effects from those used in determining an effective dose level, though he concedes that "it seems advisable that the effect of food additives on the nutritional value of the diet should be known" (Frazer, 1953). Animal experiments may afford some help, but we must face the conclusion that "it is impossible to conceive of animal experiments which will provide complete information about the toxic effects of chemicals on human beings" (Barnes, 1951). The demonstration by experimental or other techniques of the dangers to human health of a procedure introduced into food technology may follow its introduction only after a long lag period. We may note here that agene was in use in the flour-milling industry for 30 years before its toxic effects, even in animals, were recognized and explained.

If there are hazards, then I consider that they may be relatively greater if exposure occurs during the period when biochemical changes are most intense—that is, during growth; and the clinical results may appear only with advancing age. As in industrial medicine, so in food technology, each new development may raise new medical problems. The onus of assessment of hazards to the health of the consumer must be accepted by the medical profession, which must lose no opportunity to obtain, scrutinize, and weigh the evidence before countenancing existing practices in food technology and sanctioning new developments in this field.

SOPHISTICATION OF FOODS AND FEEDING HABITS

Changes have occurred and others are still occurring which affect the foods and feeding habits of mankind; prominent in the dietary history of this country are the results of the introduction of potatoes and, earlier still, the

change in the meat supply consequent on the provision of root crops for livestock. Alternating periods of shortage and comparative plenty, markedly seasonal variations in the diet, and very localized peculiarities of taste and custom are still to be found in many primitive communities. In sophisticated communities feeding now is generally characterized by an evenness of supply throughout the year and a uniformity of diet amounting often to monotony; this has been the result of advances in agriculture, food technology, and modern methods of transport. The health of the community may be affected, for better or for worse, to the extent to which these developments affect the predominating foodstuffs and influence feeding habits. I shall now discuss only one such development—the artificial feeding of infants with some form of cows' milk.

Infant Feeding

Two centuries ago, in this country, breast-feeding by the mother or wet-nurse was almost universal and was probably continued for two or even three or more years, as it still is in many parts of the world to-day (Platt, 1954b). In Western countries nowadays, however, the child is often artificially fed from its earliest days or is weaned from the breast at 6 to 9 months of age. It must be admitted that until quite recently there has been no very convincing evidence for the superiority of human milk to cows' milk (Platt and Moncrieff, 1947), and the preference for the feeding of human infants at the breast instead of with cows' milk has been almost entirely a matter of faith. Such differences as a calcium content five to six times greater in cows' milk than in human milk have been overlooked. However, the curves showing the relation between the calcium content of the infant and the duration of feeding on cows' milk and human milk are reminiscent of those mentioned below relating nitrogen content of the body to age. After six to ten months' feeding on cows' milk the proportion of calcium in the infant's body is more than half as much again as that in the infant fed on human milk (Stearns, 1939).

The fact that so few infants show gross clinical, pathological, and biochemical changes in the early months of life is a comment on the point made below about the differences that are likely to occur between individuals; there are here, however, grounds for apprehension about the possible delayed effects of excessive intake of calcium in artificial feeding. It has been stated (Lancet, 1954) that hypercalcaemia "must be quite a common disorder, for 42 cases have been reported in this country alone in the last year and many more have been recognized." The frequency with which a history of feeding on cows' milk is reported suggests that the practice is an important if not a determining factor in the causation of the condition.

I want now to offer some observations which have led me to speculate about the possibility that modern infant-feeding practices may be concerned in the causation of certain diseases which we associate with modern conditions of life and living, and for the occurrence of which we have as yet no satisfactory explanation. I have found (Platt, 1954c, 1954d) that milk in the infant rat's stomach separates into curds and whey. The curds, which are laid down in successive layers, are slowly digested and normally do not leave the stomach for 15 hours or more. The whey, however, leaves rapidly, and the greater part of it passes through the pylorus in 30 to 40 minutes. The casein of the curds appears to be broken down into its constituent amino-acids, but there are some grounds for believing that the components of the whey not only behave differently in the stomach, but may not be completely broken down before absorption. We do not know if milk behaves in a similar way in the human baby's stomach; indeed, very little appears to be known about this subject. It is customary, in the study of gastric function, to start by ensuring that the stomach is empty. If the infant animal takes milk into a stomach which has been empty for some time, an undifferentiated clot forms which contains pockets of air and mucus, and only after several hours is the usual pattern of

layers restored. I suspect (Platt, 1954b) that there may be physiological as well as psychological grounds for a return to the recently reinstated system of feeding "on demand."

Since 1892 it has been known from Ehrlich's work on mice (Ehrlich, 1892) that antibodies can be transmitted in colostrum or milk from mother to offspring. Similar observations on the transference of immunity factors have been made on calves (Howe, 1921; Orcutt and Howe, 1922; Smith and Little, 1922), and these have been confirmed by electrophoretic methods for the pig (Foster *et al.*, 1951) as well as for the calf (Smith, 1948). The low serum cholinesterase of newborn puppies has been shown to be increased (McCance *et al.*, 1949) when they were fed on bitches' milk containing this enzyme, but not when they were fed on cows' milk or human milk. There is also an interesting observation made by Rutman (1950) on rats; he found that the infants of one strain, in which a poor ability to incorporate methionine into protein was demonstrated, acquired this ability when fed by mothers which had an efficient capacity for this process; presumably this was acquired by transference of some factor in the foster-mother's milk.

The importance of the protein components of colostrum and early milk may not be so great for the human infant as it appears to be for many species of animals. However, on the basis of the evidence available, I have wondered whether we should regard the mother during lactation not merely as a provider of food but also as a supplier of substances ready made for use by the infant until such time as he can synthesize them for himself. Is breast-feeding, therefore, a device by which provision is made for a transition between complete dependence on the mother before birth and complete independence after weaning from the breast?

Galactose and Myelination

A main component of whey is milk sugar—lactose—which is entirely contained in the whey. It is a disaccharide which is made up of glucose and galactose. As well as being present in milk as lactose, which is in part combined with neuraminic acid (Trucco and Caputto, 1954; Heyworth and Bacon, 1954), galactose is known to be a component of several substances found in the mammalian body. It is found in the cerebroside of the central nervous system and in mucopolysaccharides in connective tissue (references to the occurrence of these are given below), in a galactan (Wolf from *et al.*, 1947; Wolf from *et al.*, 1952), and in the protein-bound carbohydrates of seromucoid, certain serum globulins (glycoproteins), and the carbohydrate of chorionic gonadotropin (Werner and Odén, 1949). We do not know if the human infant is able, in his early life, to synthesize galactose; indeed, we do not know if galactose can be synthesized in any human tissue at any age except in the mammary gland (Reiss and Barry, 1953). Galactose, therefore, may be a substance for which the human infant is dependent on his food—that is, in this case it would be an "essential" nutrient in the sense that some amino-acids and the accessory food factors are "essential" and the origin of any galactose laid down in later life is quite obscure.

The cerebroside is the principal lipid of myelin, most of which, as is well known, is laid down after birth (Johnson *et al.*, 1949). Myelination continues until perhaps the fifth to sixth year of life (Kennard, 1952), and the progress of myelination of nerves may well be determined by the activity of the muscles with which they are connected. In this connexion I wish to draw attention to an observation (Stearns, 1939) the significance of which has not, so far as I know, been explained. This is that an infant fed on cows' milk stores nitrogen at a much greater rate than one on breast milk, and that at 6 months of age the percentage of nitrogen in the bodies of infants fed on cows' milk is about twice that in the bodies of those fed on human milk. Presumably most of this nitrogen is stored as muscle protein, and we may infer that in the cows'-milk-fed infant the rate of muscle development may be more rapid than in the breast-fed infant. If this also entails more rapid myelination of the appropriate nerves, and if the galactose for the

synthesis of myelin must come ready synthesized from the food, we have to take account of the fact that the cows'-milk-fed baby gets only two-thirds of the amount of lactose which he would receive if he were being fed the corresponding amount of human breast milk. Does this possible extra demand, coupled with the reduced supply of galactose, have any adverse effect on the subsequent health of the individual?

We know that when unusually large quantities of cerebroside are synthesized, as in Gaucher's disease, those from the spleen and from the brain may contain glucose (Woolf, 1954). There was a report last year (Montreuil *et al.*, 1953) that glucose occurs along with galactose in the cerebroside of normal brain. It has been reported that in mammals there is a positive correlation between the percentage of lactose in the milk of the species and the cerebroside content of the brain (Brody and Sadhu, 1947). On feeding dextrose to young pigeons, glucocerebrosides were found to constitute one-third of the total cerebroside, there being none in the brain of the normal birds (Sadhu, 1953a). Changes in the proportion of cerebroside to other lipids have been observed when weanling rats are fed whole milk as compared with skimmed milk (Sadhu, 1953b). It would seem from these observations that an investigation of the composition of the cerebroside of myelin of the human infant's nervous system should be made with a view to determining whether the substitution of cows' milk for human milk has any effect on it. I suspect that the effect on the composition of myelin may be particularly profound when an infant is artificially fed on a "humanized" cows' milk preparation which may supply as little as one-third of the lactose obtainable from human milk.

If glyocerebroside occurs as a substitute for part of the galactocerebroside, does it persist into adult life? We do not know the answer to this question. It might at first be thought, in view of the dynamic equilibrium of substances in the human body, that glucose would ultimately be replaced by galactose. This would depend on whether galactose could be synthesized in the brain or elsewhere in the body, and, if outside the central nervous system, could it pass through the haemorrhagic barrier, which seems to be more difficult to cross in the mature than in the growing subject (King, 1939)? There is some evidence from isotope studies that metabolically the brain is somewhat isolated from the rest of the body. Thus there appears to be no significant turnover of C^{14} in rat-brain protein after the isotope has been incorporated in the organ during its period of growth (Schubert and Armstrong, 1949), and the general conclusion has been expressed that "there seems to be in the brain a degree of spatial permanency" (Folch-Pi, 1951). It may then be that, like proteins, the brain lipids remain throughout adult life within the brain metabolic pool.

Possible Consequences of Imperfect Myelination

If abnormal cerebroside occur and persist, do they have any adverse effect on the subsequent health of the individual? In my contribution to the symposium on Food and Disease (Platt, 1954e) I contented myself with asking whether, if the composition of myelin is affected as a result of the sophistication of a feeding habit, this might have some possible relation to the prevalence of disseminated sclerosis. I shall now, so far as I am able, discuss this possibility in more detail.

Lumsden (1951) suggests two alternative views of the causation of disseminated sclerosis, one of them being that it is "a specific form of reaction on the part of the nervous system peculiar to certain individuals and, within limits, independent of its immediate precipitating cause." May the presence of an abnormal cerebroside determine the occurrence of this specific form of reaction? If this were so, it would fit in with a recent interpretation of the meaning of the haunting term "abiotrophy" introduced by Sir William Gowers and defined as a primary nervous system disorder in which local tissue resistance is overcome, with consequent disintegration of that tissue. In a recent study of a familial

myelinating disease it has, however, been stated that "there is more than suspicious evidence that the term primary is misleading, and that actually one deals with a primary disorder of metabolism with a secondary nervous system disorder" (Stadler *et al.*, 1954). There is, it seems, an important and relevant conclusion to be drawn from the study of the pathology of disseminated sclerosis—namely, that "some property of myelin determines the localization of the pathology" (Adams and Kubik, 1952).

If a poor supply of galactose in the infant's diet contributes to this specific form of reaction, then it might well be expected that disseminated sclerosis might be even more common than it is. There are, however, two possible considerations which might account for a comparatively low incidence: (a) the occurrence of the postulated "immediate precipitating factors," and (b) individual differences in rates of development of muscle and nervous system. Lumsden offers the hypothesis that, whatever the precipitating factors may be, the pathological changes may result from the action of a myelinolytic ferment; could it be that this is a cerebroside and that the glyocerebrosides may be more readily hydrolysed than the normal compound, or that there is no anti-enzyme for this reaction? These points are now being investigated.

So far as development of muscular and nervous systems is concerned there is now good evidence of quite remarkable differences in the ages at which various behaviour patterns are seen in infants (McGraw, 1943). How far these are associated with differences in the extent of myelination does not appear to be known, nor does there seem to have been any investigation of the possible relationships between the methods of feeding infants and their rates of maturation. There is evidence that there are differences for certain forms of behaviour up to 3 to 4 years of age (McGraw, 1943), that myelination may not be complete till 5 to 6 years of age (Kennard, 1952), and that breast-feeding is uncommon nowadays beyond 1 year.

Douglas (1950), in a survey in the United Kingdom, found, out of over 40,000 infants, only nine who were breast-fed up to 2 years of age. If the amount of galactose supplied to the infant is crucial then obviously the amount of breast milk taken, the duration of breast-feeding, and the amount of galactose obtainable from other dietary sources are all important. Materials containing galactose are known to come from plant sources (Black and Cornhill, 1954), but there is no evidence that they are assimilated; galactose-containing substances are also found in snails and slugs, and it is known that small "dew slugs" were at one time recommended for the nourishment of backward children (Hartley, 1954). In communities where breast-feeding is usual, and is continued for two to three years, disseminated sclerosis is rare and the cases reported are often unconfirmed by pathological evidence. Also, in other communities where feeding with carbohydrates, including cane sugar, is common in infancy—for example, in the West Indies—a syndrome with the features of a transverse myelitis is not uncommon and is suspected to be of nutritional origin. Inquiries are being made about the precise nature of this condition.

Dietary Damage in the Young

There may be some difficulty in accepting the hypothesis of a dietary defect in infancy resulting in a disease whose earliest clinical manifestations may be delayed till the second decade in life, or later. It is, however, being increasingly recognized that dietary damage in the young—or even prenatally (Giroud, 1954)—may have effects only late in life. Acute choline deficiency in the young rat may result in hypertension, but only in later life (Hartroft and Best, 1949) and after a period equivalent in man to about 20 years. Similarly, the development in a strain of mice of a type of arthritic degeneration occurring in older animals has been shown (Silberberg and Silberberg, 1952) to be strikingly affected by the nature of the diet throughout life. There is a good deal of evidence of the occurrence of a lag between a biochemical disturbance and the appearance of

pathological and clinical manifestations: one of the longest intervals is that recorded (Henry, 1946) in the development of epitheliomata of the scrotum and penis many years after exposure to the carcinogenic agent.

Most of the evidence that disorders in early life may produce tissue changes at an advanced age is derived from observations on animals, and, whilst it may be misleading to apply inferences from experiments in animals to the explanation of disease processes in man, it is obviously convenient to study such changes in animals with a short life-span. In the human species the period of growth is uniquely long in proportion to the life-span (Brody and Ragsdale, 1922-3), and in the study of human disease, therefore, we must be particularly concerned about disturbances during growth, neonatal as well as post-natal, and be on the look-out for sequelae in the adult. Thus the possible effects of artificial feeding of infants may not be seen for many years, and perhaps only after the tissues have been exposed to stresses or the effects of noxious agents. We may indeed be reaping in medical practice and in the post-mortem room to-day the results of methods of feeding infants and young children which were prevalent 20 to 30 years ago.

A conclusion about disseminated sclerosis on which there seems to be agreement is that "the major histopathologic changes seem to conform to those seen in degenerative diseases of the central nervous system" (Davison, 1950). The phylogenetically newer systems—the pyramidal tracts and the proprioceptive system—commonly suffer permanent damage (Martin and Elkington, 1946). These observations are of interest, since presumably the maturation of the neuromuscular mechanisms of the older systems is completed early in infancy; the swimming behaviour of the newborn infant, one of the oldest phylogenetic functions (McGraw, 1943), disappears in most infants in the first few weeks of life. Many disorders of nutrition and metabolism have clinical features in common with those of old age; and it has been stated that during "the involutionary period, the individual loses his capacity for homeostasis as if involution were a mirror image of adolescence with senescence as a return to the physiological instability of infancy" (Frank, 1946). It might be, though I am not sufficiently well informed to do more than make the suggestion, that in the clinical signs of disseminated sclerosis may be found the mirror image of development, but as reflections which are revealed early and distorted as a result of imperfect myelination.

"Collagen Diseases"

Galactose is, as mentioned above, a constituent of some components of extracellular material (ground substance) and connective tissue. There has in the past been an almost exclusive interest in the biochemistry, physiology, and pathology of the cell, and until recently little consideration has been given to the nature and functions of the extracellular structures and substances. The concept of an "extracellular space" is being replaced and some of the properties hitherto attributed to the membrane of the cell are being ascribed to the extracellular matrix. One suggestion made recently is that the blood-brain barrier may be due to the existence of ground substance (Woollam and Millen, 1954).

The possibility that galactose might be a constituent of the mucopolysaccharides of the cornea was suggested by Suzuki (1939) and confirmed recently by Woodin (1952) and Meyer *et al.* (1953); its presence in connective tissue (Consden *et al.*, 1953) and in human subcutaneous tissue (Consden and Bird, 1954) has now been established. Several times has the presence of galactose in collagenous material been reported, and Glegg *et al.* (1953), who review these observations, have evidence that it is the reticular fibres of connective tissue which appear to have the sugars galactose, glucose, and mannose as integral constituents. During some work on wound healing Penney and Balfour (1949), in my unit, demonstrated the importance of mucopolysaccharides in skin for healing, and they associated this substance with

the formation of reticulin fibres, an observation which is supported by the recent demonstration of Glegg *et al.* (1953) on the composition of these fibres.

Interest is growing in a group of disorders of connective or mesenchymal tissue which have been called "collagen diseases," and Robb-Smith (1952) has claimed that there is quite a lot of evidence that the mechanisms of formation of abnormal glycoprotein are associated with the morphogenesis of these diseases. I want to do no more here than to suggest that the supply of galactose—or substitution of glucose for this sugar—in the feeding of the infant and young child may affect the nature, composition, and reaction to stress in later life of the extracellular matrix and connective tissue, and may thus be a factor in the occurrence of a number of diseases which might be identified with the sophistication of living. I would add to Mellanby's suggestion, quoted at the beginning of this paper, a plea for a study of the effects of changes in feeding habits consequent on the various methods of sophistication of foods, and conclude with the support of a pathologist (Robb-Smith, 1952) that "yet more profit may be gained by considering the biochemical morphogenesis of which something is known and more can be learnt than by restricting oneself to aetiology of which almost nothing is known."

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TREATMENT OF SCHISTOSOMIASIS WITH "NILODIN"

BY

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A mine medical officer in the Union of South Africa has undeniable advantages in assessing the effects of treatment of schistosomiasis. In the first place, the mines of the Witwatersrand and Orange Free State are situated in "clean" areas, whereas the labour force is to a large extent drawn from heavily infested areas; therefore once the disease has been successfully treated the question of reinfection is not likely to arise to cloud the issue. In the second place, a wholly adequate follow-up of cases is possible, as natives recruited from the infested areas do not sign labour contracts for periods of less than nine months, and furthermore any mine employee can be recalled for re-examination at any time. Thirdly, a very large percentage of the tropical labour force, especially the Portuguese East African contingent, is infected with both *Schistosoma haematobium* and *S. mansoni*, so that an adequate number of cases are available for treatment and assessment.

At the Brakpan Mines in the Transvaal a trial was made of the use of "nilodin" brand of lucanthone hydrochloride (1-β-diethyl-aminoethylamino-4-methylthioxanthone hydrochloride; "miracil D") in the treatment of both urinary and rectal schistosomiasis. In the former the infecting organism was *S. haematobium*, and in the latter *S. mansoni*. In reporting the results certain aspects, such as the clinical diagnosis, presenting symptoms, tribal incidence, and haematology, have been omitted for the sake of brevity.

In both forms of infection the diagnosis was based on laboratory examination of specimens of urine and faeces respectively for the presence of viable ova. Ova are considered to be viable if free-swimming miracidia are present or there are active movements of miracidia within the ova. Occasionally an ovum remains motionless after exposure to water in high dilution, but the flame cells can be observed beating in the organism and the cilia may be moving. An ovum with none of the above signs but morphologically normal is referred to throughout this paper as "inert." After treatment ova are passed which can be referred to only as "macerated." They contain an amorphous mass; no movement or "pulse" of flame cells can be observed. Some ova are shrunken, while others appear to have swollen and burst. It is

common to observe "globules" within macerated ova which are not seen in normal ova.

The nilodin used throughout the trial was in the form of tablets each of which contained 200 mg. In these circumstances it was usually impossible to adhere strictly to a particular scheme of dosage based on body weight. No patient was started on less than the specification decided upon, and when part of a tablet was indicated a whole tablet was given. Thus when the dosage was 20 mg. per kg. of body weight a day, a patient weighing 56.5 kg. would actually receive six tablets = 1,200 mg. daily instead of the 1,130 mg. indicated by his weight.

URINARY SCHISTOSOMIASIS

Results of treatment in a total of 46 cases of infection with *S. haematobium* are presented. These are divided into two series in which the dosage, the course of treatment, the method of follow-up, and the method of urine collection differed.

Series 1

This series originally consisted of 37 cases, but 13 of these were excluded from the investigation for various reasons: in 9 cases the follow-up was inadequate, 3 proved to be cases of rectal schistosomiasis, and in the other case no viable ova were demonstrable before treatment. The remaining 24 cases were followed up for at least three months. Cases were re-examined once a week for the first three months and thereafter at monthly intervals.

Laboratory Examination

In most of these cases viable ova or miracidia were found in the first (casual) specimen of urine passed. In no case were more than three specimens required to make a positive diagnosis. The technique of urine examination used for both diagnostic and follow-up purposes is as follows.

The conical glasses of urine are allowed to stand for a variable period after collection, but not less than 15 minutes. The supernatant urine is then decanted; the remainder is well stirred, poured into a centrifuge tube, and spun down at 3,000 r.p.m. for three minutes. The supernatant urine is now discarded, and the centrifuge tube filled with tap water and again spun down. The supernatant water is discarded and the sediment shaken up in the few drops remaining. With a clean pipette in every instance the remaining drops are placed on a slide and examined. The search for ova can be made very satisfactorily with the low-power objective of the microscope, but to establish viability of an ovum the high-power lens (×800) is required. It is of the greatest importance that the complete sediment—that is, four drops as a rule—be examined at every re-examination. Each centrifuge tube as used contains 14 ml. of urine.

The great advantage of this technique for follow-up purposes is that the viability of ova can be established almost at once, it being common to find miracidia swimming in the drops upon examination immediately after preparation of the slide. The World Health Organization Expert Committee on Bilharziasis (1953) recommends that centrifuging be limited to 1,000 r.p.m. to obviate the risk of ova disintegrating. I have never, however, found excessive centrifuging, either for too long a time or at too high speed, to cause disintegration of ova.

Dosage

The dosage of nilodin was worked out to give 20 mg. per kg. of body weight per day divided into three equal doses. However, as explained above, the strength of the tablets made it impossible to conform exactly to this amount; consequently, and taking into account reduction of dosage because of toxic symptoms, the average daily dose received by these patients was 22 mg. per kg. No case received less than a 12-day course of treatment, and in one case the treatment extended over 13 days.

Toxicity

Of the 37 cases in which treatment was started 21 (56.7%) had toxic symptoms. These were easily controlled and in no case was it necessary to discontinue treatment, although

the initial dosage of the drug had to be reduced in 11 cases (29.7%). (In two cases the dose had to be reduced on two separate occasions.) A list of toxic manifestations with their frequency is presented in Table I.

TABLE I.—Toxic Manifestations

Symptoms	No. of Cases	Percentage of All Cases (21) with Toxic Symptoms	Percentage of All Cases (37) Treated
Nausea and vomiting	12	57.1	32.4
Abdominal pain and discomfort	5	23.8	13.5
Anorexia and nausea	3	14.3	8.1
Suprapubic pain	1	4.8	2.7
Total	21	100.0	56.7

Toxic symptoms first appeared as early as the third day and as late as the tenth day (one case each), the average time being the sixth day. Phenobarbitone, 1 gr. (65 mg.) twice daily, was used to control such symptoms; if this was not effective, the dosage of nilodin was reduced by 200 mg. a day. Although "jaundice" has been reported (Haseeb, 1952) to occur during nilodin therapy, this was not noted in the present series. In all cases there was a very deep reddish-brown pigmentation of the palms and soles, but the conjunctivae were not affected. The urine became bright yellow and so did the tongue—the latter merely from contact with the pills. Examination of the blood on the last (12th) day of treatment in 19 consecutive cases showed that not one had a total serum bilirubin level above 0.5 mg. per 100 ml. and that the highest icteric index was 7. There was no apparent effect upon the kidney glomeruli as evidenced by tests for albuminuria following treatment. Toxic symptoms developed more rapidly and were worse, however, in patients whose renal function was already impaired.

During the 12 days' treatment 22 (59.4%) of the 37 patients had a weight loss ranging from 1 to 17½ lb. (0.45 to 7.7 kg.), with an average of 7 lb. (3.175 kg.). Of these 22 patients 14 complained of toxic symptoms, so that there is a fair correlation between weight loss and toxic effects. Loss of weight was accompanied by a marked diuresis in certain cases.

Results

The clinical response was good. In most cases of frank haematuria the bleeding stopped on about the eighth day; in only two or three cases did it persist, and was then due to granulomata. Patients who continued to pass blood were examined cystoscopically to exclude the possibility of the presence of carcinoma; if there was any doubt a urologist's opinion was sought. In pyrexial cases the temperature responded by the sixth day at the latest, and this response was obtained with nilodin alone. The temperature would probably have fallen much sooner had urinary antiseptics been used to combat the secondary infection which was usually present, but, as the effect of such drugs on *S. haematobium* infection was not known, this might have nullified any claim that the assessment was accurate. Results can be assessed correctly only by an adequate follow-up, which must extend over a period of at least six months. The more examinations which can be made in this period the more accurate will the assessment be.

Of the 24 cases reported five relapsed within the three-month period. In two more cases relapse occurred after this period, in one case eight and a half months and in one six months after treatment. Only ten cases which did not relapse within the first three months could be followed up for six months. There was only one further relapse among these ten cases. Nevertheless, out of 15 cases in which either relapse occurred or the full six-month period of follow-up was completed, six relapsed. (See Table II.) It is therefore obvious that relapse does occur up to, and even after, six months following treatment. I would like to stress that the term "relapse" is here used in its strictest sense. If only one viable ovum or miracidium was observed at any time after the first week following treatment, then

TABLE II.—Results of Follow-up Examinations

Series No.	After Three Months				After Six Months			
	No. of Cases	No. of Re-examinations	No. of Cases Relapsed	% of Cures	No. of Cases	No. of Re-examinations	No. of Cases Relapsed	% of Cures
1	24	13 each	5	79	15	16 each	6	60
2	22	4 "	5	77	18	9 "	12	33

that case was considered to have relapsed. In actual fact only one "clinical" relapse occurred.

In this series, therefore, we claim to have achieved a 60% "six-month cure," although as this figure does not include the case which relapsed after eight and a half months it is somewhat optimistic. I would, however, stress that, with only one exception, every case was of extremely long standing or chronicity. The cases which relapsed all had very heavy infections, as judged by the number (usually hundreds) of miracidia and ova found at the diagnostic examination.

It is necessary to explain why the cases in which viable ova continued to be passed seven days after treatment cannot be considered as relapses. In the first place it takes an average of six days for nilodin to reach its highest concentration in the serum, as shown by the time taken for the deep pigmentation of the palms, the coloration of the urine, and the toxic symptoms to develop. Therefore the drug is still acting on the worms six days after stopping treatment. Secondly, any ova found at the first re-examination were certainly laid at least 24 hours, and probably three to four days, previously. In chronic cases with much induration, and even calcification, of the bladder wall it may take a considerably longer period for an ovum to penetrate into the lumen of the organ. This being the case, the viability of these ova is no criterion of the state of the parent worms. Once encased within its shell, it is questionable whether the miracidium is as vulnerable to the action of a drug as the adult worm. Furthermore, the eggs lie in the tissue and not in the main blood stream and are thus not exposed to the same concentration of drug. Thirdly, any ova found at the first examination after a 12-day course were not normal; they can only be described as "deformed." Within the ovum large vacuoles and globules had formed, and any movement present was extremely sluggish. When such ova hatch the miracidia are grossly abnormal in shape; the smooth outline is lost, to be replaced by a wavy, irregular periphery; movements are sluggish and the clear protoplasmic outlines are obscured by a degenerate mottling. These changes may have been due to the effect of the drug on the egg-producing organs of the female worm, or possibly on the eggs held up in the tissues.

Of the seven cases in which relapse did occur, three were noted to have viable, though abnormal, ova at the first re-examination. This may be a prognostic point in cases treated with nilodin, as only six cases were observed to have viable ova at the first examination and three of these relapsed later. The mean time of relapse was at the seventh week after treatment.

Series 2

The second series consisted of 22 cases. Every case was seen one week after completing treatment, and thereafter at monthly intervals for six months. Four of the cases did not complete the full six-month period. Four months after completion of treatment every patient was readmitted to hospital for three days, during which time a different method of collecting urine for examination was employed. At all other examinations urine was simply passed into a urine-analysis glass, whereas, in hospital, urine was collected after each patient had taken a 15-minute "ride" on a physiotherapy bicycle every morning for three consecutive mornings. One "24-hour" specimen of urine was also collected. This was voided into a Winchester bottle, and then by a repeated process of decanting and settling a volume of urine and sediment small enough to be centrifuged and examined was obtained.

Dosage

The aim in this series was to give a more concentrated course of treatment over a shorter period. Accordingly the initial dosage was scheduled to be not less than 25 mg. per kg. of body weight per day and the course covered nine days. After the dose had been reduced in two cases because of toxic symptoms the average total dose was 225 mg. per kg. of body weight, so that the average daily dose was in fact 25 mg. per kg.

No specific notes on toxicity were made in this series, as nilodin had been proved by the first series to be relatively non-toxic and without after-effects. In this connexion it will be sufficient to point out that the dosage had only twice to be reduced.

Results

The clinical response was much the same as in the first series. Of 18 cases in which a six-month period of follow-up was completed, 12 (67%) relapsed (Table II). Of these only one was a clinical relapse and 11 were technical relapses. In 7 (58%) of these 12 cases viable ova were found at the first weekly re-examination following treatment. This would seem to confirm that the presence of viable ova at the first weekly re-examination may be a useful prognostic point. In one case relapse occurred seven months after treatment, in this instance a full clinical relapse.

Thus, regarded in the very best light, a 33% "six-month cure" was obtained. Once again this figure is optimistic when it is remembered that one case relapsed after seven months.

Discussion

The results in Series 2 are far worse than those in Series 1, but it is difficult to decide whether this should be attributed to the different scheme of treatment or to the different method of follow-up. A comparison of the three-month post-treatment period in the two series reveals that in Series 1 relapse occurred in 20.8% of cases, or 71.4% of total relapses, whereas in Series 2 the corresponding figures are 22.7% and 38.4%. This difference is due to the fact that the cases in Series 1 had three times as many re-examinations during this period as those in Series 2 (see Table II). A comparison of the six-month results shows that in Series 1 only 15 cases had either relapsed or were still undergoing re-examination. The relapse rate was 40%—6 cases out of 15, including five cases which relapsed in the first three months. In other words, only one new relapse was found in the second three-month period. Of 18 cases in Series 2 which completed the six-month follow-up, 12 (67%) relapsed. This, too, includes five cases which relapsed in the first three months. In this series, however, three cases of relapse were discovered by the special examination at four months described above, without which these cases might have been missed. Excluding these cases the relapse rate was still 50%, as compared with the 40% of Series 1. Four cases were recognized as having relapsed when examined five or six months after treatment, though they had been missed at the four-month special examination. This examination did not prove as effective as it was hoped.

To my mind the follow-up in Series 1 was more adequate than that in Series 2. In the former each case had at least 16 re-examinations in the six months following treatment, whereas in the latter each case had only nine re-examinations in that period. The fact that in Series 2 the results were worse despite a less adequate follow-up would seem to indicate that the important factor in treatment is the length of the course rather than the daily amount of the drug given. Shorter courses of treatment as previously tried have proved, in my experience, even less effective.

In any event the important fact that emerges from this investigation is that even with a nine-day course of treatment only a 33% "cure" can be expected. Even this figure may be too high. In the light of claims that have been made of an 80% cure rate following a five-day course, this should serve as a warning against over-optimism. Such claims can be attributed only to an inadequate follow-up.

It appears from the above that a good method of follow-up would be a fortnightly re-examination for six months following treatment, with a special examination, as described, at the end of that period, and thereafter a monthly examination for another six months.

Mode of Action of Nilodin.—From one to two months after treatment with this drug I have often observed abnormal, non-viable ova in patients' urine which are from one-half to one-third the normal size. Although small, these ova have a perfectly formed shell, but contain only an amorphous mass. They are totally unlike "degenerate" ova which have been held back in the tissues in chronic cases. It is my belief that these may be "sterile" or unfertilized ova, and that the male worm may be more susceptible to treatment than the female. It is also possible that oviposition in the female is affected by the drug, and even temporarily stopped completely. In cases in which such ova are found relapse may occur later or, on the other hand, the urine may become perfectly clear of ova. Another factor is that nilodin may cause temporary immigration of the worms to the liver plexuses. In view of these points it would seem that the only real test of cure would be a complement-fixation test. This would have to be done a fairly long while after treatment.

RECTAL SCHISTOSOMIASIS

In view of the paucity of information about the effect of the newer drugs on rectal infection with *S. mansoni* a short account of our treatment of this condition with nilodin may be of interest. Although a goodly number of cases have been treated, the results in only four cases which have been followed up are presented.

Method of Examination

In all cases in which dysentery was the presenting symptom the diagnosis could be easily arrived at by examination of the faeces, especially of the mucus contained in the stool. Usually the first few fields were enough to demonstrate the presence of ova. The technique used was to tease apart strings of mucus in a drop of tap-water on a slide. The first examination was made with the lowest-power objective lens available. If no ova or miracidia were seen, then a cover slip was placed over the specimen and the high-power lens used in a search for parasites of pathological import. As the clinical manifestations of amoebic dysentery and rectal schistosomiasis so closely resemble each other the differential diagnosis can be made only by an adequate examination of the stools.

In cases without dysentery and in which formed stools were passed examination for *S. mansoni* ova called for a different procedure. In such cases a proctoscope was passed with the patient in the lithotomy position on an operating table. The rectal mucosa was cleaned and then scarified until bleeding occurred by means of a clean swab held in the artery forceps, the mixture of blood and debris removed being transferred to a clean, dry slide. Two slides were prepared in this way so that a fairly large amount of material could be examined. Water was dropped on to the specimen and two cover slips placed on each slide. Slides were examined under the low-power objective of the microscope. In addition all positive cases were examined for the presence of urinary infection.

Every case was re-examined by the direct proctoscopic method—weekly, when possible, for the first three months. Thereafter a monthly proctoscopic examination was conducted until the patient left the employ of the mines. In addition, in every case the urine was examined for *S. haematobium* ova weekly for the first three months and then at monthly intervals while the patient was available. In only one case in this series was there a double infection, *S. haematobium* and *S. mansoni* infesting the urinary tract and *S. mansoni* the rectal plexuses.

Dosage

The daily dosage of nilodin aimed at was 20 mg. per kg. of body weight, though as the tablets of the drug were not divided, as explained above, patients received slightly more

than this amount. Three cases were given a 12-day course of this treatment, but the remaining case had only six days' treatment. No adjuvants were employed apart from intravenous infusion of saline and glucose in two cases in which the patient was suffering from a salt-depletion syndrome on admission to hospital.

Clinical Response

Provided that the patient's general condition was treated adequately, then the response was good. On treatment with nilodin alone, without any antibiotic therapy for the secondary infection, the cases with dysentery made a complete response by the sixth day. It is noteworthy that in many cases (not included in the present series) with symptoms due to stricture of the bowel, treatment of the schistosomal infection had no effect on such symptoms, and where necessary one had to resort to surgery.

Results

Of the four cases here reported not one relapsed clinically during the follow-up period. I stress "clinically" because in one case viable ova were recovered from the rectal mucosa on two occasions after the end of treatment. In another case an inert ovum was recovered on one occasion. This ovum was morphologically normal but the flame cells were not beating. This case should be regarded as having relapsed because, in my experience, successful treatment results in the recovery of macerated ova from the mucosa. The recovery of an inert ovum at the 20th week after treatment, as in this case, should be regarded as highly suspicious.

Results in the four cases are shown in Table III. Two of these cases had previously had courses of "fantorin" (antimony pyrocatechol sodium sulphonate)—in one case

TABLE III.—Results of Follow-up Examinations

Case No.	Length of Course (Days)	Length of Follow-up (Weeks)	No. of Re-examinations	Clinical Relapse	Technical Relapse	Time of Relapse
1	6	24	14	No	No	—
2	12	23	16	"	Yes	10th and 13th weeks
3	12	22	13	"	?	20th week
4	12	18	11	"	No	—

two months, and in the other three months, earlier. Both cases had a clinical relapse with the demonstration of viable ova in the stools. They were then given nilodin treatment as described.

Discussion

Too few cases are presented for any scientific assessment of the results. However, many more cases have been treated with nilodin although not followed up, and in all the clinical response was good.

The case of mixed *S. mansoni* and *S. haematobium* infection of the bladder is particularly interesting, because during the follow-up period macerated ova of *S. mansoni* were recovered from the urine at 7 out of 15 examinations; on one occasion, too, a macerated ovum of *S. mansoni* was recovered from the rectal mucosa.

The stumbling-block to the correct appraisal of a particular method of treatment in cases of *S. mansoni* infection is the follow-up. There seems to be no really accurate technique available, and certainly none that is simple to carry out.

With the method of follow-up here described I have been pleasantly surprised at the high proportion of positive diagnostic results obtained. At re-examination, however, recovery of ova was variable. In the first of the four cases only one macerated ovum and one macerated miracidium were recovered in the course of 14 re-examinations; in the second case macerated ova were recovered twice, and viable ova twice, in 16 re-examinations; in the third case macerated ova were recovered at seven, and an "inert" ovum at one, of 13 re-examinations; and in the last case macerated *S. mansoni* ova were recovered at only one out of 11 re-examinations of the rectum, while they were present at 7 out of 15 re-examinations of the urine.

When regarded in the light of claims made for other methods of examination our technique would appear to be very poor; but this is no doubt due to the fact that it was applied after treatment—an important point. When used to establish a diagnosis it was highly effective, although no records were kept to substantiate this claim. Furthermore, our results show that if ova are present in the mucosa this technique reveals them. This is exemplified by the third case, in which ova were recovered at 8 out of 13 examinations.

I have come to the conclusion that there is little variation in the susceptibility of *S. haematobium* and *S. mansoni* to nilodin when given in adequate dosage over a long enough period. This contention is well borne out by the case of mixed infection of the urinary tract. For this reason I am of the opinion that research workers should concentrate on urinary schistosomiasis, in which assessment of the results of treatment is much easier and far more accurate.

Summary and Conclusions

Two series of cases of urinary schistosomiasis (*S. haematobium*) occurring in mine-workers in the Transvaal have been treated with nilodin (lucanthone hydrochloride). In the first series (24 cases) an average daily dose of 22 mg. per kg. of body weight was given for twelve days, and in the second (22 cases) a daily dose of 25 mg. per kg. for nine days.

Results did not come up to expectation in either series. A "six-month cure" of 60% was obtained in Series 1 and of 33% in Series 2, the poorer results in the latter being due to what is considered an inadequate course of treatment. One case in each series relapsed after the six-month period of follow-up, so that final results were less good.

Toxic symptoms, though frequent (56.7% of cases), were never severe and were easily controlled. Loss of weight and diuresis were a striking feature in some cases. Toxicity was greater in cases in which there was renal insufficiency.

Results are also given of the treatment with nilodin of four cases of rectal schistosomiasis (*S. mansoni*). Clinical response was excellent. No case of clinical relapse occurred, though in two cases there was a "technical" relapse, as shown by the recovery of viable ova from the rectum.

An interesting case of *S. mansoni* infection of the vesical plexus which was apparently cured by the treatment is described.

Nilodin was found to be easy to administer, and, considering the high percentage of cures if it is adequately used, relatively cheap. It should be stressed that the clinical response to treatment is exceptionally good and that every case benefits in some degree. Treatment should extend over a period of at least twelve days, and preferably sixteen days, and patients should be followed up for at least six months.

It is concluded that, provided an adequate course is given, nilodin is highly effective in the treatment of *Schistosoma* infections in the non-European mine labourer in South Africa; also that the mines of the Witwatersrand and Orange Free State are ideal testing grounds for anti-schistosomal drugs.

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THE TREATMENT OF ASTHMA WITH CORTICOTROPHIN

BY

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Stimulation of the adrenal cortex by adrenocorticotrophic hormone (corticotrophin, A.C.T.H.) has been used with success in various hypersensitivity conditions, and was the subject of a review by Rackemann (1951). Naturally, asthma has featured among the disorders so treated, and further assessment of its use and possible abuse seems desirable in this condition, which has been increasingly recognized as liable to cause a fatal outcome in severe cases. While cortisone has also been used in trials by mouth, by injection, or by inhalation, its use is not here considered.

Present Cases

When the present series of 10 asthmatic cases was treated, A.C.T.H. was still scarce, and certain strict criteria were imposed before giving such treatment: (1) all were admitted to hospital suffering either from severe status asthmaticus or from prolonged and incapacitating asthma; (2) they showed little or no response to other routine forms of therapy, including intravenous aminophylline; and (3) so far as possible, they were unaware that A.C.T.H. was being given lest the idea of some new magic treatment should play a largely psychological part in any improvement. Most of the cases were so severe that it was felt scarcely justifiable or necessary to risk fatalities by a control series such as that usefully described by Ball (1954).

Case 1

A farmer aged 40 had for seven years had repeated infections of the accessory nasal sinuses, requiring operation more than once. Eighteen months before admission he had asthmatic symptoms which were thought to be mainly of infective origin. He entered hospital in a mild status asthmaticus, and treatment, including antispasmodics, penicillin, physiotherapy, and intravenous aminophylline, produced only slight improvement. X-ray examination of his sinuses showed widespread infection; he was producing on an average 1 fl. oz. (28 ml.) of purulent sputum daily.

A.C.T.H. was started in a dosage of 30 mg. eight-hourly intramuscularly, and within 36 hours he was much less distressed than he had been for many weeks. The dosage was gradually diminished until a total of 510 mg. had been given in seven days. Two days later he was able to return home in quite a comfortable state.

He started to relapse after a few weeks, and four months after discharge he had to be readmitted urgently. During bronchoscopy under thiopentone anaesthesia he suddenly collapsed and died, and at necropsy his whole bronchial tree was full of sticky mucopurulent secretion.

Case 2

An intelligent and sensible housewife aged 53 was seen at home as an emergency in status asthmaticus so severe that two hours previously her own practitioner had thought her to be on the point of death. In spite of intravenous aminophylline she was still extremely shocked and distressed in her breathing.

She was at once admitted to hospital and given A.C.T.H., 30 mg. intramuscularly six-hourly. Within 12 hours she was comfortable, and within 48 hours she was completely free from wheezing. The total dosage was 730 mg. in nine days.

It was possible to discharge her from hospital on the ninth day, and, although two further admissions were necessary in the next 12 months, she did not require further A.C.T.H. until two years later, when she was readmitted to hospital in a similar, almost moribund, condition. With 100 mg. of A.C.T.H. in the first 24 hours, followed by 200 mg. of A.C.T.H. gel in the next four days, she again made a remarkable recovery.

Case 3

A bill-poster aged 19 gave a six-year history of asthmatic attacks at intervals of some months for no known cause. He was admitted to hospital in severe status asthmaticus, which showed poor and transient response to injections of adrenaline and intravenous aminophylline. Although of fine physique, he was becoming very exhausted, and on the fifth day A.C.T.H. was started. Some improvement was achieved with a total dosage of 425 mg. in five and a half days, but 48 hours after stopping treatment his asthmatic state gradually became worse than ever. No infective element was apparent. After an interval of 12 days, a further course of A.C.T.H. was begun with a higher initial dosage, 150 mg. in the first 24 hours, and on this occasion he showed great improvement within 48 hours. The total dosage for the second course was 500 mg. in seven days, and the patient has remained remarkably well since that time, for a period of over one year.

Case 4

An unemployed man aged 47 dated his asthmatic symptoms from 1940, when he was subjected to blast and exposure followed by evacuation from Dunkirk. From 1950 to 1952 he was under constant out-patient supervision and was twice admitted to hospital for treatment, which had included left hilar denervation; to none of these attempts did he make any satisfactory response and he was never found to be free from some degree of wheezing, although his vital capacity was always well above 4,000 ml. For a few years he had also complained of Raynaud's phenomenon in both hands, and during the two-year period of observation he was unable to resume his work in a tobacco factory.

On his third admission a course of A.C.T.H., 1 g. in 12 days, was given; this produced considerable temporary improvement in his Raynaud's phenomenon, but the relief to his chest was negligible.

Case 5

A housewife aged 36, who had always had a mild asthmatic tendency, had been very much worse since the birth of her child six months previously. She was admitted in status asthmaticus and A.C.T.H. was started; after receiving 120 mg. in 48 hours her chest symptoms were greatly relieved, but mental confusion with euphoria caused the A.C.T.H. to be discontinued.

Within three months she again had to be admitted to hospital in a relapse, which responded to routine measures sufficiently well for her to take her own discharge on the third day.

Case 6

A professional man aged 41, of the keenest intelligence, was one of the series who knew he was receiving A.C.T.H. and appreciated the significance of it. In infancy he had had eczema and in childhood some asthma, which moderated during adolescence. During the preceding five years he had had several attacks of infective bronchitis during the winter, and for three months he suffered numerous bad asthmatic attacks. In view of the possible infective factor of recent years, he was admitted for investigation, including bronchography, which did show dilatation of a few scattered bronchi in either lung.

Possibly, he thought, because of the bronchogram or possibly for psychogenic reasons, he shortly had another severe asthmatic attack, which was unabated after three weeks, by which time his response to intravenous aminophylline was very poor.

He was readmitted, therefore, and A.C.T.H. therapy was started with 30 mg. six-hourly. After the second injection he described a cessation of spasm with a great feeling of relief, and a total dosage of 540 mg. was given in four and a half days. Relapse occurred on two occasions at approximately three-monthly intervals after this, demanding further A.C.T.H. therapy for nine days on each occasion. The results were good, though not quite so remarkable as during the first course.

Case 7

A housewife and schoolteacher, aged 49, with a previous history of "hay-fever" from the age of 18 up to 40, had 10 months previously started getting violent spasms of cough with tenacious sputum, soon accompanied by asthmatic symptoms. She stated that she had not had a single undisturbed night for nine months on this account, and severe exacerbations had occurred on three occasions. She was a nervous woman, severely distressed physically and mentally by constant dyspnoea, and repeatedly in mild status asthmaticus, which was only slightly, if at all, relieved by intensive routine measures, including bronchoscopic aspiration under general anaesthesia. A.C.T.H. gel was given intramuscularly in daily doses of 100, 60, and 60 mg.; and then 40 mg. for seven days.

Great improvement was felt within 24 hours, and within three days she was much clearer than she had been for many months. Although a relapse occurred three months later, it was ultimately controlled by routine measures without A.C.T.H.

Case 8

A housewife aged 54 was the most chronic asthmatic of the whole series. During the 34 years of her trouble she had seen a vast number of doctors, undergone numerous investigations, and received the widest variety of treatments. For eighteen months she had been getting worse than ever, and she stated that for six months she had never been free from wheezing unless she used an atomizer, from which she was inseparable. Every night for five years she had woken in an attack, and it was clear, as she herself admitted, that the psychogenic factor was by far the most important in the aetiology of her asthma.

Worn out mentally and physically as she was by her almost constant mild status asthmaticus, she was given 100 mg. of A.C.T.H. gel intramuscularly one evening at 6 o'clock. At 9 p.m. a kind but unwitting night nurse gave her two codeine compound tablets unaware that she was sensitive to aspirin. Within three hours the patient was in the most severe status asthmaticus, shocked, and almost pulseless, recovery taking place shortly after an intravenous injection of aminophylline, 0.48 g.

Further treatment with A.C.T.H. gel was interrupted for 10 days; she then received a total of 400 mg. in 10 days. By the third day of this course improvement was evident, and by the sixth day she stated that she felt clearer on the chest and better than she had done for many years. At this time her lungs were completely free from adventitious sounds.

She continued fairly well at home for many months after this treatment, requiring many fewer "remedies" than before, although adrenaline injections and her atomizer were still in use. For eighteen months she did not approach a state severe enough to warrant further A.C.T.H. therapy; her husband then started to obtain supplies of A.C.T.H. gel from America, and for many months she had been receiving a maintenance dose of about 20-40 mg. twice weekly. She has not attended for follow-up during this time, but reports from her own practitioner and from her husband seem to indicate clearly that the previous efficacy of the substance is much reduced and may soon be negligible.

Case 9

A woman aged 57 had suffered from asthmatic attacks for many years and had needed admission to hospital on several occasions. Complicating factors were gross sinus in-

fection and scattered fibrosis with bronchiectasis in both lungs. A well-marked psychological element also played a part in perpetuating her symptoms, and when the time came for her to undergo the most necessary sinus operations she admitted that the fear of operation and anaesthesia added very much to her chest troubles. She entered hospital in severe asthma, which was showing scarcely any improvement on routine measures, including intravenous aminophylline. She was despondent and exhausted from lack of sleep. As penicillin was having no effect on her infection chloramphenicol was substituted. After two days, although her sputum was somewhat cleaner, she was still very breathless. A.C.T.H. was started next day, and after 48 hours she showed great improvement physically and mentally. A total dosage of 300 I.U. in six days rendered her well enough to undergo operation in the following week.

Case 10

A retired man aged 72 who had suffered from a cardiac infarct two years previously, had complained of asthmatic symptoms for only about five months before admission, though he had probably experienced mild bronchitic trouble for some years. Since the onset of his bronchospasm, he had had treatment in various parts of the country with numerous medicaments and had on several occasions received a course of A.C.T.H., with the result that he had become very reliant on it and very introspective about his condition.

He was admitted, together with a vast number of drugs and remedies, in severe status asthmaticus, occasioned very largely by the misguided administration of two injections of morphine $\frac{1}{4}$ gr. (16 mg.), with atropine, 1/100 gr. (0.65 mg.), based on the idea that his asthma might have been of cardiac origin. He had already placed himself again on A.C.T.H., but clearly, after 24 hours, it was making little or no impression on his asthmatic state. Intravenous aminophylline, an iodide mixture, and physiotherapy were much more successful in producing steady improvement, with expectoration of increased amounts of slightly infected sputum.

After two weeks' relative freedom from symptoms his wheezing again flared up acutely, resulting in great

Summary of Cases

Case No.	Sex	Age	A.C.T.H. in mg.	Duration (Days)	Remarks	Response
1	M	40	510	7	Chronic asthma—infected	Good
			730	9	Severe status asthmaticus. Comfortable in 12 hours	Excellent
2	F	53	100 + 200 gel	5	" "	"
			425	5½	Status asthmaticus	Moderate
3	M	19	500 (12 days later)	7	"	Very good
4	M	47	1,000	12	Chronic asthma	Very poor, but Raynaud's phenomenon relieved
5	F	36	120	2	Status asthmaticus	Good, but treatment stopped on account of mental confusion
6	M	41	540	4½	Status asthmaticus	Excellent—relief within 36 hours. Slower improvement
			820	9	"	"
7	F	49	670	9	Chronic asthma in mild status	Excellent
			500 gel	10	"	"
8	F	54	400	10	Chronic asthma in status	"
9	F	57	300	6	Chronic asthma with infected bronchiectasis and perisinitis	Good
10	M	72	415 Several previous courses	8	Recurrent status asthmaticus	Fair

despondency; for two days he struggled on with the previous regime, finding his physiotherapy more and more exhausting, and then he felt he must demand further A.C.T.H. Starting with 30 mg. four-hourly, he experienced relief within eight hours, and was able to be transferred home within 10 days. It was clear that, in this case, the possible psychological effect of having A.C.T.H. could not be excluded; he admitted that it did not have such a dramatic effect in relieving his symptoms as on some previous occasions.

A summary of the salient features of the cases is set out in the Table at the foot of the previous page.

Discussion

In 10 cases of severe and intractable asthma treated with A.C.T.H. the initial response was considered to be very poor in one, fair in one, good in four, and excellent in four; in one of the latter it was probably life-saving on two occasions.

All patients showed relapse of symptoms sooner or later after cessation of treatment, but only three required more than one course of treatment (excepting one who had an immediate relapse). Two of these patients knew they were receiving A.C.T.H., felt the need of it during a severe exacerbation of symptoms, and were agreed that its action was slightly slower and less dramatic on each subsequent occasion.

An initial dosage of 25-30 mg. (I.U.) intramuscularly six-hourly, or even eight-hourly, appeared satisfactory, usually producing great relief within 12-36 hours; it was possible to reduce the dosage after 48-72 hours to 20 mg. eight-hourly for the next two to three days, and then to 10 mg. eight-hourly for a further two days. An average course of seven days' treatment with this diminishing dosage therefore totalled about 450 mg. However, in any statement of dosage used and compared with other authors, it must be remembered that the potency of different extracts may have shown considerable variation. The longer-acting A.C.T.H. gel, used in two cases, seemed just as efficacious as the more standard product, in a daily dosage of about half the amount, and with the added advantage of necessitating only one injection in 24 hours. It is noteworthy, perhaps, that in one of these cases an injection of 100 mg. of A.C.T.H. gel did not prevent a violent asthmatic reaction to aspirin given some three hours later.

In only one patient (Case 3) did the amount of the initial dosage seem important; a higher dose of 150 mg. in 24 hours for an immediate relapse after his first course produced a remarkably good effect, whereas 100 mg. in 24 hours had been somewhat disappointing.

An ill effect was noticed in only one patient: this woman was of rather an unstable temperament, and marked euphoria necessitated stopping treatment after 48 hours. Other reactions are unlikely to be troublesome with the dosage and duration of treatment described, while a mild degree of euphoria may be considered helpful, although not of primary therapeutic importance.

The good effects obtained are not evidently counteracted by some degree of bronchial infection, but in this series measures were being taken simultaneously to treat any such infection with antibiotics and physiotherapy when necessary. In the most heavily infected case (No. 9) it is doubtful if the patient would ever have been rendered fit for her much-needed radical sinus operation without the use of A.C.T.H.

The findings are in agreement with most other authors, that in A.C.T.H. we have a potent substance in the treatment of asthma. Friedlaender and Friedlaender (1951b) gave it to 10 severe chronic asthmatics in a dosage of 52 mg. six-hourly, intramuscularly, with total dosage of 600-870 mg. in 6-13 days. They found dramatic improvement in six patients within 24-36 hours, fair response in two, and no real improvement in two. They pointed out that the relief was of brief duration before recurrence, and that seasonal hypersensitive cases should therefore give the most satisfactory results. Possibly, symptoms recurring after

such treatment might more easily be controlled by "conventional" therapy, but the reverse could also occur.

Segal *et al.* (1951) treated 20 severe asthmatics with courses of A.C.T.H. in total dosage of 240-900 mg. over periods of 24-19 days. As five patients needed more than one course, 27 courses in all were given, and, of these, 24 produced partial or complete remission of symptoms, as follows: eight for one to two weeks, 10 for two to four weeks, and six for four weeks to seven months. They concluded it was better to give short intensive courses of A.C.T.H. therapy rather than try a prolonged maintenance dose.

Rather less impressive results occurred in 18 patients similarly treated by Arbesman (1951), as six of these showed no improvement whatsoever; the average length of remission of symptoms achieved in the rest was three to six weeks. Brown *et al.* (1951) treated 30 chronic asthmatics ambulant over 10 months, the patients giving their own injections and deciding their own requirements, which ranged from 10 mg. twice daily to 12 mg. on alternate days. Relapse of symptoms occurred in all patients soon after cessation of treatment.

Levin (1953) pointed out the benefits of using A.C.T.H. gel: he achieved good or excellent results in 10 adults and six children, some of whom were treated ambulant. One injection of 40-60 mg. was given daily for two to five days; the injections were remarkably painless and there were no undesirable reactions. He considered that with such treatment available the asthmatic should never need A.C.T.H. by intravenous drip.

The exact mode of action of A.C.T.H. in asthma remains somewhat obscure. Elkinton *et al.* (1949) made careful studies in a 12-year-old boy to assess whether adrenal cortical stimulation was proportional to the clinical improvement. With eosinophil blood counts, balances of chloride, sodium, sugar, potassium, and nitrogen, and study of 17-ketosteroids they could find no such correlation, and it has been suggested from the findings that in asthma the beneficial effect may depend upon some special function of the hormone. The lack of any definite correlation between clinical response and the eosinophil count has been confirmed by Friedlaender and Friedlaender (1951a) and by Feinberg *et al.* (1951).

It cannot be over-emphasized that the treatment described should in no way replace attempts at full assessment of the asthmatic case, so that more rational and radical therapy can be given whenever possible. If used, it is thought preferable that the patient should not know what he is receiving, as, if its dramatic effect is evident to him, he may demand it for ever afterwards when distressed, and morally it may prove very difficult for the practitioner to withhold it. In fact, one can visualize the asthmatic almost as addicted to A.C.T.H. as, say, to his inhaler, and, worse still, if used too often this substance might gradually lose its beneficial effect, a point strongly suggested by two cases in the present series. I am also of the opinion that, at present, it is wiser to restrict the use of A.C.T.H. to the relief of a severe exacerbation of symptoms by a short course, to be repeated if necessary.

Conclusions

A.C.T.H. is most efficacious in the treatment of severe status asthmaticus, and can be life-saving when all else fails.

As it should not be necessary in such a case for treatment to last for more than five to nine days, very few ill effects are to be expected.

An average initial dosage of 25-30 mg. six-hourly is satisfactory, and must be reduced gradually after improvement has occurred, usually within 48 hours.

It is suggested that the use of A.C.T.H. should at present be restricted to very severe cases that are resistant to other forms of treatment, and, if possible, the patient should not know what he is receiving.

Heavily infected cases respond as well as others do, but should be treated with extra caution.

There is no convincing evidence in the present series or in published cases to suggest that a longer remission of symptoms occurs after A.C.T.H. therapy than after any other treatment which succeeds.

A.C.T.H. in no way avoids the expediency of all the other established methods in the assessment, treatment, and management of the asthmatic case.

Summary

The use of adrenocorticotrophic hormone is described in 10 asthmatics. In eight of these there was a remarkable relief of severe acute respiratory distress, resistant to other forms of therapy.

It is suggested that this substance should at present be used in asthma only as an emergency measure.

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EXCHANGE TRANSFUSION AS A MEANS OF REMOVING BILIRUBIN IN HAEMOLYTIC DISEASE OF THE NEWBORN

BY

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Damage to the brain occurs with varying frequency in haemolytic disease of the newborn. Exchange transfusion, as ordinarily carried out, is not entirely effective in preventing it.

It is now known that brain damage is found in association with a great excess of plasma bilirubin in the following conditions: (1) haemolytic disease of the newborn from iso-immunization relative to blood-group antigens D, E, A, and S; (2) prematurity without haemolytic disease; and (3) some types of "familial" hyperbilirubinaemia. Claireaux *et al.* (1953) have shown that in the first two conditions the yellow pigment in affected brains is the indirect-reacting plasma bile pigment, bilirubin. They have reviewed the evidence that this pigment is damaging to brain tissue, and that the direct-reacting bile pigments are innocuous. Some further indications of the toxic character of bilirubin have been published by Lathe (1954).

A more detailed study of the pigment changes in haemolytic disease of the newborn was undertaken with a view to developing methods of avoiding its accumulation. It seemed possible that the role of bilirubin would be made clear from the clinical results of preventing high plasma bilirubin concentrations in infants with haemolytic disease. An encouraging report by Hsia, Allen, Gellis, and Diamond (1952) and Hsia (1953) has now come to our attention. The work described here confirms their observations regarding the pattern of bile pigment changes in the plasma in haemolytic disease,

and shows that it is possible to control the plasma bilirubin concentration by exchange transfusion.

Methods and Materials

Clinical Material.—Observations have been made on a series of infants affected with haemolytic disease at this hospital. The brief clinical descriptions of six of these have been drawn from the case records. Serological data have not been included individually, since there was a common basis for serological diagnosis of haemolytic disease in all six cases: (1) mother's group was Rh-negative, (2) maternal antibodies were present, (3) infant's group was Rh-positive, (4) infant cells gave a positive test with rabbit anti-human globulin serum (Coombs +). The blood specimens removed at exchange transfusion of three infants at the Hammer-smith Hospital have also been available for study. **Blood specimens** were taken from heel pricks when not otherwise stated. **Haemoglobin** estimations were made with a visual colorimeter (M.R.C. grey wedge) which was suitably calibrated—100% haemoglobin being taken as 14.8 g. per 100 ml. **Bile pigment** estimations were made on serum and plasma by the method of King (1951). In Cases 1 and 2 the relative proportions of direct- and indirect-reacting pigments were estimated semi-quantitatively by the appearance of pigment bands on chromatography columns (Cole and Lathe, 1953). In Cases 4, 5, and 6 the proportions of the two types of pigment were determined quantitatively by the method of Malloy and Evelyn (1937).

Plasma Bilirubin in Haemolytic Disease

No detailed study of bile pigment metabolism in a series of untreated cases of haemolytic disease of the newborn has yet been published. That such a study would have shown a wide variation from case to case is suggested by the data of Hsia, Allen, Diamond, and Gellis (1953), and of Mollison and Cutbush (1954). In this hospital there has been an opportunity of studying a number of affected infants who were not given an exchange transfusion because the cord blood contained more than 105% haemoglobin. Some of these infants later gave evidence of a considerable haemolytic process as shown by the changes in haemoglobin and plasma bile pigments. Two contrasting cases are described. Case 1 is an instance of haemolytic disease in which no exchange transfusion was given. In Case 2 only a simple transfusion was possible.

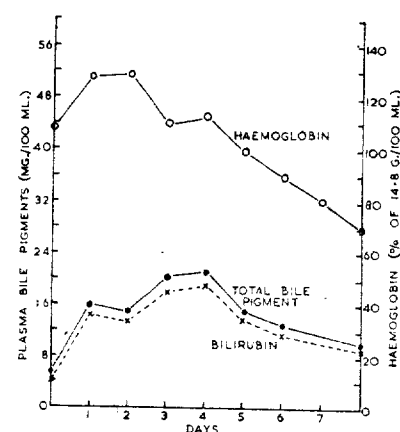


FIG. 1.—Changes in concentration of blood haemoglobin and of plasma bile pigments in Case 1.

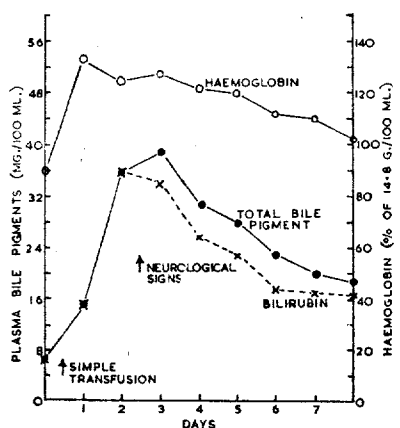


FIG. 2.—Changes in concentration of blood haemoglobin and of plasma bile pigments in Case 2.

Case 1 (Fig. 1).—Two previous siblings were unaffected. The gestation period was estimated at 39 weeks. The birth weight was 8 lb. 5 oz. (3.7 kg.) and the cord haemoglobin was 109%. Cord serum bile pigment was 5 mg. per 100 ml. The infant looked slightly yellow at birth, but its condition was otherwise satisfactory. Jaundice deepened within 24 hours and lasted about a week. The blood haemoglobin concentration dropped at the rate of 8% per day for 11 days. The plasma bile pigment concentration reached a peak of 21 mg. per 100 ml. on the fourth day. No neurological signs appeared. A simple transfusion was later given to correct the anaemia.

Case 2 (Fig. 2).—There were two previous unaffected siblings. The period of gestation was estimated at 37 weeks. At birth the infant weighed 7 lb. 2 oz. (3.2 kg.) and was pale and limp. The cord blood contained 90% haemoglobin. The serum contained 6.5 mg. of bile pigment per 100 ml. Attempts at exchange transfusion failed and 128 ml. of blood was given as a simple transfusion. Following this, the blood haemoglobin fell consistently at the rate of 4.2% per day for 15 days. The plasma bile pigment rose rapidly, and when it was between 36 and 38 mg. per 100 ml. the neurological behaviour became abnormal, with irritability, head retraction, arms held stiffly extended, increased muscle tone, and disinterest in feeding. The plasma bile pigment began to drop about the third day, and fell below 20 mg. about day 6. Although much improved, the baby had not recovered normal neurological behaviour in eight months.

Course of Plasma Bile Pigment in Exchange Transfusion

It is apparent from examining a number of graphs of the rise and fall of plasma pigment in neonatal haemolytic disease that high concentrations of bile pigment are not sustained for long. Not infrequently the period of exposure to high concentrations does not exceed 36 or 48 hours. This encouraged us to seek a means of maintaining a low pigment concentration during this critical period. In the course of studying the amount of bile pigment removed at exchange transfusion it was observed that in large transfusions the blood withdrawn during the procedure contained more bile pigment than the baby's blood volume was calculated to contain at the beginning. This could be explained only by a passage of pigment from the tissues into the circulation during the transfusion. To examine this point, the bile pigment was quantitatively estimated in each specimen of blood removed in a number of exchange transfusions.

The course of plasma bile pigment concentration, together with the calculated extent of blood replacement, at each stage throughout one exchange transfusion, is plotted in Fig. 3. The replacement of the infant's blood did not lower the plasma pigment as much as was calculated on the basis of blood exchanged. It was concluded then that the plasma pigment concentration was partly sustained by removal of pigment from the tissues. The overall effect on bile pigment concentration of 10 exchange transfusions, given im-

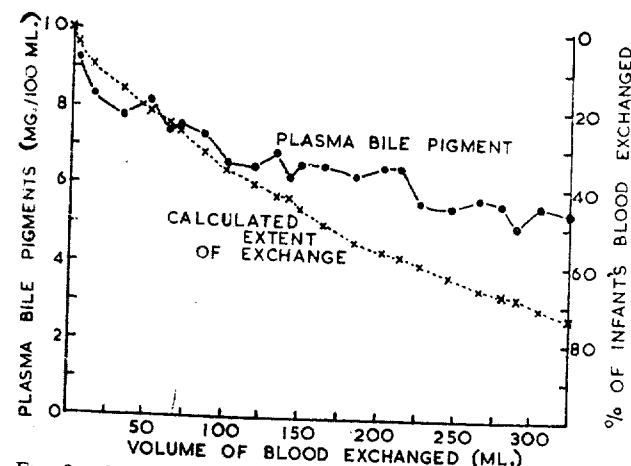


FIG. 3.—Changes in concentration of plasma bile pigment, and the extent of replacement of the infant's blood, throughout an exchange transfusion immediately after birth. (Birth weight, 6 lb. 10 oz.—3 kg.)

mediately after birth for the purpose of removing infant red cells and maternal antibodies, and studied in this way, is given in the Table (A).

Change in Plasma Bile Pigment During Perfusion with Blood

Birth Weight	Exchange	Plasma Bile Pigments		
		Initial (mg. 100 ml.)	Final (mg. 100 ml.)	Decrease %
A. Exchange Transfusion at Birth				
lb. kg.	ml. lb. ml. kg.			
5.9 2.67	68 150	7.0	4.8	31
6.6 2.99	51 112	9.2	5.3	42
5.4 2.45	41 90	7.8	4.4	44
6.7 3.09	63 139	3.2	2.2	31
6.5 2.95	75 165	10.9	2.6	76
5.8 2.63	51 112	5.1	3.6	29
5.7 2.58	62 136	10.2	5.6	45
7.0 3.18	62 136	5.0	4.0	20
7.1 3.22	81 178	8.2	6.0	27
7.7 3.49	96 211	10.8	4.8	56
B. Transfusions Because of Hyperbilirubinaemia				
9.1 4.13	39 86	16.0	14.5	9
7.0 3.18	71 156	38.0	26.0	32
6.5 2.95	35 77	17.3	9.1	47
5.7 2.58	61 134	24.0	11.6	51
5.7 2.58	42 92	20.4	10.5	48
7.5 3.40	54 119	23.3	14.0	40
7.1 3.22	105 231	21.9	8.0	60
6.4 2.90	71 156	20.2	12.1	40
6.5 2.95	61 134	21.0	15.7	25
7.4 3.36	60 132	21.3	10.8	49

Treatment of Hyperbilirubinaemia

Since it seemed that exchange transfusion could be used as a means of washing bilirubin out of the tissues of affected infants, it was next applied to babies that had not been given exchange transfusions at birth (cord blood haemoglobin greater than 105%), but in whom a marked rise of plasma bilirubin was noted during the neonatal period. In the first instance of this (Case 3) the exchange transfusion was not made until neurological signs of damage had appeared.

Case 3.—Two previous siblings were unaffected. The mother had had one miscarriage. The gestation period was estimated at 41 weeks. At birth the infant weighed 7 lb. 1/2 oz. (3.2 kg.). The concentration of haemoglobin in the cord blood was 111%. The cord serum bile pigment was 1.9 mg. per 100 ml. The liver and spleen were not palpable. The plasma bile pigment at 12 hours was 7.7 mg. per 100 ml. Icterus appeared at 18 hours and became severe at 24 hours. The plasma bile pigment was 19.3 mg. per 100 ml. at 36 hours. It continued to rise, and on the third day head retraction appeared, and there were periods of limb extension, grimaces, etc. Plasma bile pigment was then 38 mg. per 100 ml. An exchange transfusion of 71 ml. per lb. (156 ml. per kg.) was made. During it, opisthotonos developed. The transfusion reduced the bile pigment from 38 to 26 mg. per 100 ml. The pigment rose again to a peak of 32.5 mg. on day 5; it then dropped to 12 mg. during the ensuing two days. The neurological signs had meanwhile improved. At four months a diagnosis of cerebral palsy was made.

The following case is a more typical example of an exchange transfusion which was undertaken when the pigment concentration reached 20 mg. per 100 ml.

Case 4 (Fig. 4).—The mother had one previous infant without any sign of haemolytic disease. The membranes were ruptured artificially during the 38th week because

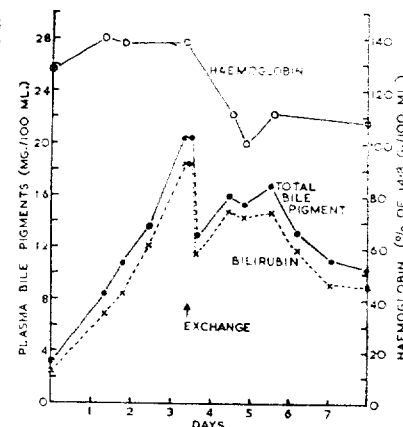


FIG. 4.—Changes in concentration of blood haemoglobin and of plasma bile pigments in Case 4.

of diminished foetal movements. Caesarean section was undertaken three days later because labour had not started. The birth weight was 6 lb. 6 oz. (2.9 kg.), and cord blood haemoglobin was 128%. Cord serum bile pigments were 3.4 mg. per 100 ml., of which 2.6 were bilirubin. Jaundice appeared in 24 hours and deepened as the bile pigment rose to 20.2 mg. on the third day. An exchange transfusion of 71 ml. per lb. (156 ml. per kg.) reduced the pigment to 12.1 mg. per 100 ml. On the following (fourth) day it rose again, but after the fifth day it fell consistently. No neurological signs appeared.

This pattern of change in plasma pigment concentration is probably the one most often observed among infants of substantial weight which are not seriously affected at birth and for whom an exchange transfusion is later performed because of rising bilirubin. The rise of pigment may be much more abrupt, however, reaching 20 mg. per 100 ml. in 24 hours. The Table (B) shows the overall effect on bile pigment concentration of 10 transfusions given because of the elevated plasma pigment. Each of these was studied throughout the whole of the transfusion. Some of these were repeat transfusions.

Obstruction Due to Haemolytic Disease

Note must be taken of the type of bile pigment present in each individual case of haemolytic disease of the newborn. In early studies of haemolytic disease, and of jaundice of the newborn in which there is no excessive haemolysis (Billing *et al.*, 1954), the type of pigment present in the plasma was examined in many cases. The predominating pigment was bilirubin, and direct-reacting pigment I and II (Cole *et al.*, 1954) were present in much smaller amounts. For a period, because of the small amounts of these direct-reacting pigments, the relative proportions of the direct pigments and bilirubin were not estimated. That this practice may lead to serious error is indicated in Case 5 and Case 6.

Case 5.—Two previous siblings showed jaundice at the third and first days of life, respectively, and the second infant died. The pregnancy was complicated by toxæmia, which necessitated a surgical induction of labour at the 37th week. The weight at birth was 5 lb. 11 oz. (2.6 kg.), and cord haemoglobin was 75%. Cord serum bile pigment was 6.3 mg. per 100 ml. The liver and spleen were greatly enlarged. The infant became jaundiced within three hours. It was given an immediate exchange transfusion of 62 ml. per lb. (136 ml. per kg.), which reduced the plasma bile pigment from 10.2 to 5.6 mg. per 100 ml. Within 24 hours the pigment had risen to 19 mg., and the rise continued to 24 mg. at 48 hours, when a second exchange transfusion of 61 ml. per lb. (134 ml. per kg.) was made. At the conclusion the bile pigment had dropped to 11.6 mg., but it rose to 20.4 mg. in another 12 hours. Some indefinite neurological signs (grimacing and twitching) were reported by the nursing staff. A third exchange transfusion of 42 ml. per lb. (92 ml. per kg.) at 75 hours reduced the pigment to 10.5 mg. It rose again 12 hours later to 18.4 mg. and remained between 18 and 20 mg. for another 36 hours, when it rose to 24 mg. At this point the character of the bile pigments was examined for the first time, and it was found that, of a total bile pigment of 24 mg. per 100 ml., only 5.3 mg. was bilirubin. In the light of this evidence that obstruction was the dominant feature further transfusions were not made. The total bile pigment remained between 22 and 24 mg. per 100 ml. (bilirubin 5.6 mg.) until the middle of the sixth day, when it dropped within 24

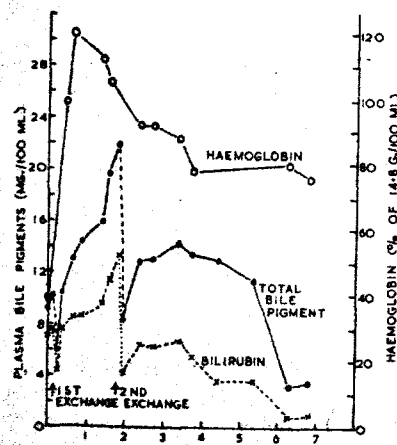


FIG. 5.—Changes in concentration of blood haemoglobin and of plasma bile pigments in Case 6.

hours to 13.2 mg. per 100 ml., of which bilirubin was 3 mg. The infant's condition at three months was satisfactory.

The amount and type of pigments present in the early stages of this case are not known. The only specimen which had been preserved was the cord serum (total pigment 6.3 mg.), which contained equal parts of bilirubin, pigment I, and pigment II, as determined by Billing (1955).

Case 6 (Fig. 5).—The mother had three previous infants. The third, which was affected with haemolytic disease, was given an exchange transfusion, following which it developed marked signs of brain damage, which persisted until death at 10 months. The present infant was 7 lb. 2 oz. (3.2 kg.) at birth. The gestation period was uncertain. The cord blood haemoglobin was 39% and plasma bile pigment 9.2 mg. per 100 ml., of which 6.8 mg. was bilirubin. The liver and spleen were greatly enlarged. Although the clinical condition at birth was precarious, it improved greatly during the course of an exchange of 81 ml. of blood per lb. (178 ml. per kg.). Because of the desire at all costs to avoid a repetition of the tragedy of the previous sibling, and because of uncertainty concerning the significance of the direct-reacting pigment, a second exchange—105 ml. per lb. (231 ml. per kg.)—was given on the second day, when the plasma bile pigment concentration was rising rapidly. It never again reached dangerous concentrations. No abnormal neurological signs appeared.

Discussion

Liver Function

The cases which have been presented illustrate some of the fundamental aspects of bile pigment metabolism in the newborn infant affected with haemolytic disease. The plasma bilirubin concentration is determined partly by the rate of pigment formation in the reticuloendothelial system, but also by the rate at which the pigment is removed by the liver. In all newborn infants this latter capacity is probably very much reduced, and in many of the small infants the reduction is extreme—down to 1 or 2% of normal (Billing *et al.*, 1954). These small infants also take much longer to develop an adequate excretory ability.

Among infants of normal weight there is considerable variation in the excretory capacity of the liver at birth and immediately after it. This may be seen by comparing Cases 1 and 2. Although the haemoglobin concentrations fell in the first case at approximately twice the rate of the second, the peaks of bile pigment concentration are of an inverse order. The apparent difference in liver capacity may arise in part from the disparity in birth weights—8.3 and 7.1 lb. (3.8 and 3.2 kg.) respectively—and in the estimated gestation periods (39 and 37 weeks respectively). The changes of plasma bile pigment concentration in these cases also illustrate the way in which the capacity of the liver to excrete bilirubin develops rapidly during the neonatal period, since in both cases the loss of haemoglobin appears to have taken place at a relatively constant rate. It is this change in liver capacity which gives the dramatic character to the rise and fall of bile pigment (Fig. 2), and not any sudden acceleration of the haemolytic process in the neonatal period, as is often inferred. Indeed, in small premature infants unaffected with haemolytic disease the same thing takes place (on a reduced scale).

Removal of Bilirubin by Perfusion

The bilirubin produced from haemoglobin does not remain free in the body fluids, but attaches itself to various constituents, and in particular to plasma albumin, which has a marked affinity for it. At abnormally high plasma pigment concentrations appreciable amounts of bilirubin pass out of the circulation and become attached to other body constituents. This process may be reversed by the continuous replacement of the pigment-laden plasma proteins of the infant with protein which is free of pigment. This is demonstrated by the course of plasma bilirubin concentration throughout an exchange transfusion (Fig. 3). The extent of this shift of pigment from the tissues is indicated by the area between the two curves in Fig. 3. The Table shows that a perfusion of 50–60 ml. per lb. (110–132 ml. per kg.) fairly consistently results in a drop of plasma pigment concentration of 30–50%.

After an exchange transfusion the bile pigment of the plasma nearly always rises again for a variable period. Although this may partly be due to a movement of further pigment out of the tissues, it seems that the previous trend of rising pigment concentration is continued in some degree, but at a lower level, until the liver capacity becomes sufficiently developed to remove bilirubin at the rate at which it is being formed. However, another aspect must also be considered. The baby receives at transfusion a very large amount of preserved blood. In the presence of an already overtaxed ability to excrete bilirubin any breakdown of the transfused blood will add to the accumulated pigment. Recent papers reveal that 10–20-day-old blood is still being used for exchange transfusion. Breakdown of 10% of such blood would lead to the accumulation of another 25 mg. of bilirubin per lb. (55 mg. per kg.) of body weight, from which a marked rise of plasma bilirubin would follow. Because of the limited capacity of the liver to dispose of bilirubin, newborn infants require a more rigorous criterion for adequate preservation of blood than do adults. For this reason some blood depots now adopt the highly desirable procedure of issuing the blood drawn during the previous 24 hours for exchange transfusions.

"Inspissated Bile Syndrome"

The predominant plasma pigment of haemolytic disease of the newborn (Claireaux *et al.*, 1953), as well as that of non-haemolytic neonatal jaundice (Billing *et al.*, 1954), is bilirubin, which is indirect-reacting in the van den Bergh test. The occasional appearance of large amounts of direct-reacting pigments I and II due to obstruction resulting from haemolytic disease is demonstrated in Case 5 and Case 6 (Fig. 5). The simultaneous appearance of direct-reacting pigments in the plasma and of bile thrombi was noted by Aschoff (1924) in experimental haemolytic anaemia in dogs. The same relation probably holds in some severe cases of haemolytic disease of the newborn. Bile thrombi have been described (Claireaux, 1950), and direct-reacting pigment may predominate as seen above. Hsia, Patterson, Allen, Diamond, and Gellis (1952) have called attention to the fact that haemolytic disease of the newborn is a frequent cause of the "inspissated bile syndrome." It may be significant that the three cases of haemolytic disease in which we observed considerable direct-reacting pigment at birth, or shortly after, had hepatomegaly at birth.

The occasional appearance of much direct-reacting pigment emphasizes the great need for further work to establish unequivocally whether or not the direct-reacting pigments are damaging to the brain, since the evidence on this point is not yet conclusive enough to allow one to withhold exchange transfusion with equanimity.

Factors Affecting Transfusion

The facility with which high concentrations of plasma bilirubin can be prevented by exchange transfusion will depend on (1) the rate at which bilirubin is produced in the infant, (2) the effectiveness of the individual exchange operation, (3) the concentration of pigment which is considered to be a serious threat to the baby, and (4) the length of time required for the liver to attain adequate excretory function. In an affected infant the rate at which bilirubin is produced is greatly reduced by removing the infant's own cells, and where there are indications for doing this at birth it is the single most effective measure which can be taken to protect the infant. The limitation of a single exchange transfusion lies in the fact that as it proceeds it becomes increasingly inefficient in the removal of affected red blood cells. However, as shown in Fig. 3, this limitation does not apply to the same extent to the removal of bilirubin, the amount of which will be determined in large measure by the volume of blood with which the infant is perfused. Thus, under some circumstances, where the infant is quite robust and the plasma bilirubin is dangerously high, there

may be some justification for increasing the amount perfused to 100 ml. per lb. (220 ml. per kg.), as was done at this hospital on one occasion.

Toxic Level of Bilirubin

Treatment is directed toward preventing a rise of plasma bilirubin above the level at which the incidence of brain damage becomes appreciable. Mollison and Cutbush (1954) state that at plasma concentrations of total bile pigment of 19–24 mg. per 100 ml. 1 baby in 13 suffered brain damage, and that this increased to 4 out of 12 if the amount of pigment rose to 24–29 mg. per 100 ml. Above that amount the majority of infants were affected. Similar results have been observed by Hsia, Allen, Gellis, and Diamond (1952) in a series of 229 infants affected with erythroblastosis: "Kernicterus occurred in 18% of the infants whose serum bilirubin was recorded at a level between 16 and 30 mg. per 100 c.c.m., and in 50% of those in whom levels above 30 mg. per 100 c.c.m. were seen."

It has been suggested that, in addition to other indications, an exchange or re-exchange transfusion should be done each time the plasma bilirubin concentration rises to 20 mg. per 100 ml. or above (British Medical Journal, 1954; Cross *et al.*, 1954). Hsia (1953) reported that in 250 cases of erythroblastosis in which exchange transfusions were performed each time bilirubin exceeded 20 mg. there were no cases of kernicterus. The experience of undertaking exchange transfusions when the bilirubin reaches 20 mg. per 100 ml. shows that, in general, an exchange transfusion maintains the pigment concentration below the danger level for one or two days. Thereafter perfusion has to be repeated unless the pigment excretory capacity of the liver has developed to an adequate extent.

Small Infants

Small infants are more likely to require repeated transfusions, since, on the average, they need a longer period for the development of the capacity to excrete bilirubin (Billing *et al.*, 1954). It may be noted, too, that the occurrence of brain pigmentation in jaundice of premature infants that are unaffected with haemolytic disease, as well as the greater incidence of brain damage among premature than mature infants with haemolytic disease (Allen *et al.*, 1950; Armitage and Mollison, 1953), suggest that small infants may be more sensitive to bilirubin, and thus may need to be protected against bilirubin concentrations of less than 20 mg. per 100 ml. of plasma. These two aspects of the small newborn infant should be taken into account when premature delivery of infants (Watson *et al.*, 1954) is being considered.

The possibility of successfully treating infants that are severely affected with haemolytic disease (and even of premature infants) is considerably extended by the fact that the concentration of plasma bilirubin can be controlled. Of course, this does not provide a reason for delaying an initial exchange transfusion for the purpose of removing the infant's sensitized cells. On the contrary, it emphasizes the necessity of doing this as soon as there is an indication of a serious haemolytic condition. In the first instance the cord haemoglobin is of major importance, but a later rapid rise of plasma bilirubin may be a significant warning.

Summary

The changes in concentration of plasma bile pigments have been followed in cases of haemolytic disease of the newborn and throughout exchange transfusions. A drop of 30–50% in the concentration of plasma bile pigment is usually brought about by exchange transfusion, during which bile pigment is washed out of the tissues. By one or more transfusions the bilirubin concentration may be kept below the level at which the incidence of brain damage becomes appreciable. The number of times

perfusion has to be repeated will be influenced by the speed with which the liver develops the capacity to excrete bilirubin.

Because of the underlying hepatic deficit in the newborn baby the importance of using recently drawn blood for transfusion is stressed.

The significance of the large amounts of direct-reacting bile pigment that have been shown to occur in the plasma of some cases of haemolytic disease is discussed.

This study has been made possible by the close co-operation of Miss M. Ashforth in following the clinical condition of the infants and in securing specimens for analysis. She has also been responsible for most of the exchange transfusions. I am grateful to Dr. A. White Franklin for opportunities of studying infants under his care. The serological and haematological examinations have been supervised by Dr. John Murray. Specimens from the Hammersmith Hospital have been obtained with the help of Professor J. McClure Browne and Dr. J. Dean. I am also grateful to P. G. Cole, C. R. J. Ruthven, and S. Bebbington for skilled laboratory assistance, and to Dr. John Murray, Dr. A. E. Claireaux, and Dr. Barbara H. Billing for frequent discussions and suggestions.

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Believed to be the only unit of its kind ever to be formed in the British Army, the Parachute Medical Team is described by Dr. J. S. Macdonald in the *Journal of the R.A.M.C.*, January, 1955. It is staffed by personnel of the 16th Independent Parachute Brigade Group and operates in the Middle East. On receiving a signal that an aeroplane has crashed in the desert, the team sets off in a "Valetta" aircraft standing by and fitted out specially for the dropping of men and containers. On finding the crashed aircraft, a suitable dropping zone is sought, a smoke canister thrown out to determine wind speed and direction, and then the medical officer and nursing orderly jump. If they find that further help is needed, they fire a green Very cartridge, and the rest of the team follow—namely, three privates R.A.M.C., and one corporal and two signalmen Royal Signals. (The main duty of one of the signalmen is to carry a radio set down, since this is still the surest way of getting these delicate instruments to the ground intact.) If the first two to jump find they do not need any assistants, they fire a red Very light, and the aircraft drops food and water. The team's task is to give such first-aid treatment as may be required until the R.A.F. ground rescue team can arrive and take them all to safety. The equipment parachuted includes intravenous fluids, splints, morphine, anaesthetics, surgical instruments, antibiotics, and a bivouac tent to provide that most longed-for solace in the desert—shade.

ALDOSTERONE IN URINE OF NORMAL MAN AND OF PATIENTS WITH OEDEMA

ITS INCREASED RECOVERY AFTER HYDROLYSIS WITH ACID AND WITH BETA-GLUCURONIDASE*

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Neutral lipid extracts of acidified urine from patients with the nephrotic syndrome, in heart failure, and in some other oedematous states cause sodium retention and potassium elimination when injected into adrenalectomized rats (Deming and Luetscher, 1950; Luetscher *et al.*, 1952; Luetscher and Johnson, 1954b; Chart and Shipley, 1953; Singer and Wener, 1953; Gordon *et al.*, 1954). The substance responsible for this mineralocorticoid activity has been separated by paper chromatography from urine extracts (Luetscher and Johnson, 1954a). Further work (Luetscher, 1955; Luetscher, Neher, and Wettstein, 1954) has shown that this sodium-retaining corticoid is identical with aldosterone (Simpson and Tait, 1953; Simpson *et al.*, 1954) in the following ways: (1) its high sodium-retaining potency in bioassay; (2) its absorption of ultra-violet and of infra-red radiations; (3) its reducing activity; (4) its melting point, and (5) the chromatographic mobility of the native substance, of its mono- and di-acetates, and of its oxidation products after treatment with periodate.

Cope and Garcia-Llaurado (1954) found a substance of similar chromatographic behaviour in the urine of a woman suffering from a severe potassium-losing condition. Their extracts of neutral urine from normal men yielded only traces of activity. Luetscher and Axelrad (1954) obtained a much larger yield of aldosterone from normal urine which had stood for a day at pH 1. Venning *et al.* (1954) found increased amounts of sodium-retaining substances in urine treated with beta-glucuronidase. Thus the amount of active material extracted depends partly upon the method of hydrolysis. This report compares the yields, after various methods of hydrolysis, from urine of normal subjects on their usual diet and after salt restriction. The present study also includes data on the hydrolysis of urine of patients showing an increased urinary output of sodium-retaining material.

Methods

Urine was immediately stored in a refrigerator without preservative. The total 24-hour specimen was mixed, the volume was recorded, and a small aliquot was set aside for chemical analysis. The remaining urine was frozen and stored at -20°C . until extraction. Immediately before extraction, urine was brought to 20°C . and the pH was adjusted as indicated.

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Methods of Hydrolysis.—"Neutral" (N): These extracts were made at once after adjusting the urine to pH 6.5 ± 0.1 . "Immediate Acid" (A): Urine was extracted within 40 minutes after acidification to pH 1. "24-hour Acid" (B): Urine which had already been extracted within 40 minutes at pH 1 was then allowed to stand at 20°C . at the same pH for 24 hours; it was then re-extracted. "Control for Glucuronidase" (Cg): Urine was adjusted to pH 4.8, and 0.02 volume of 5 molar acetate buffer of pH 4.8 was added. The specimen was then incubated at 37°C . for the specified time over 50 to 100 ml. of chloroform. The pH did not change appreciably during incubation. "Glucuronidase" (G): Specimens were prepared as described for Cg and were incubated with the enzyme (Cohen, 1951). Concentrated beta-glucuronidase prepared from calf spleen (Vio-Bin Corporation, Monticello, Illinois) was used in the first experiments. Subsequently, a solution of purified beta-glucuronidase, derived from beef liver, was obtained from the Warner-Chilcott Laboratories, New York. The activities, measured by the method of Talalay *et al.* (1946), were of the order stated by the makers. The various concentrations and times of incubation at pH 4.8 and 37°C . are noted in the tables. When urine was extracted by method A before treatment with glucuronidase, the symbol AG is used.

Extraction.—Extracts were made by shaking the hydrolysed urine with four aliquots of chloroform (0.1 volume per volume of urine, but not less than 100 ml. per aliquot). Emulsions were broken by centrifugation.

Alkali Wash.—All chloroform extracts except those designated AU in Table I were cooled to 5°C . and washed twice with cold 0.1 N solution of sodium hydroxide and once with cold distilled water. The combined aqueous washings were acidified and re-extracted with chloroform only in a few instances (Table I). Chloroform was removed under reduced pressure below 40°C . Extracts were stored in 95% ethanol at 0°C .

Chromatography.—The system used was toluene-propylene glycol (Burton *et al.*, 1951). "Fraction E" is that which contains cortisone and aldosterone in this system. In a few instances other systems described by Bush (1952) were also used.

Bioassay.—The method was described by Johnson (1954). Groups of nine adrenalectomized rats were used. Results are expressed as that dose of deoxycortone acetate (D.C.A.) which would produce in the rats an equivalent response in urinary potassium-to-sodium ratio. The 95% confidence limits of this estimate are $\pm 2.15 \mu\text{g}$. D.C.A. in a range of dosage from 0 to $10 \mu\text{g}$. D.C.A. assayed in a group of nine rats. In all assays the effect on sodium output has also been calculated, and has been found to agree well with the more precise estimates based on potassium-to-sodium ratio. The term "sodium-retaining activity" has been used because this is the predominant effect measured in the bioassay. In those instances in which the test material caused increased excretion of sodium the estimate of dosage as μg . D.C.A. has a minus sign.

The dose of extract given to each rat is a known fraction of the patient's 24-hour urine extract. Each dose is expressed in minutes; for example, 20 minutes is 1/72 of the extract from one day's urine (1,440 minutes).

Effect of pH and Alkali Wash

Extracts made from urine at pH 6.5 showed insignificant sodium-retaining activity in a dose of 20 minutes (Table I, N). When the same urine was acidified to pH 1 before extraction, significant activity was found in 20-minute doses from two patients (Ro., nephrosis with oedema, extracts AU and A; Ph., cirrhosis with ascites, extract A), but not in the extract from a healthy man (Lj., extracts AU and A). Insignificant difference in activity was noted between active extracts which had been washed with cold dilute sodium hydroxide and water (A) and those extracts which had not been washed (AU). No sodium-retaining material was

TABLE I.—Effect of pH and of Alkali Wash on Sodium-retaining Activity of Urine Extracts. Effect on K/Na Ratio in μg . D.C.A. Equivalent. Dose = 20 Minutes

Subject	Age and Sex	Diagnosis	Extract at pH 6.5 (N)	Extract at pH 1 (AU)	Extract AU after Alkali Wash (A)	Extract of Alkali Wash
Ro. Jo.	4 M	Nephrosis	0.2	8.1	8.2	-0.9
Ph.	2 M	"	—	8.4	8.3	0
Ph.	4 M	"	—	1.5	0.2	-0.2
Ph. Lj.	48 M	Cirrhosis	1.9	—	3.3	—
Lj.	40 M	Normal	-0.8	-0.1	-4.0	-2.3

recovered from re-extraction of the alkali wash. Since washing with alkali removed much pigment and other material from the extract, and thus facilitated handling and chromatography, this procedure has been followed routinely with all extracts.

Activity of Various Extracts in Normal Adults on Usual Diet

Luetscher and Johnson (1954b) found that extracts made by method A from the urine of 11 normal men and women on unrestricted diets either showed no significant sodium-retaining activity or promoted the excretion of sodium in adrenalectomized rats (range $+0.5$ to $-7.2 \mu\text{g}$. D.C.A. per 20 minutes of extract). When such extracts were chromatographed in toluene and propylene glycol, fraction E contained no appreciable activity at doses of 33 minutes. Results of further studies in three of these normal adults are included in Table II. When the dose of "fraction E" of the A extract was increased to 167 minutes there was still no activity (Cases Lj., Ab., and Da.). However, extracts made from the same urine by method B contained strong sodium-retaining activity in fraction E at a dose of 167 minutes. Insignificant activity was found in fraction E prepared from one of these urines after incubation with glucuronidase.

Extracts from Adults on Diets Low in Sodium

It has been reported that when normal men reduced their dietary sodium to 11 mEq a day for five days there was consistently an increase in sodium-retaining activity of the A extracts, but the level reached was not high (Luetscher and Johnson, 1954b). In Lj., on his usual diet (Table II), the activity of the A extract was $-4.0 \mu\text{g}$. and on a low-sodium diet it rose to $+1.4 \mu\text{g}$. per 20-minute dose, and significant activity appeared in fraction E. In the extract prepared by method B, five times as much aldosterone was found with salt restriction, for on bioassay the effect produced by a dose of 30 minutes was the same as that produced by a dose of 167 minutes when the subject was on his usual diet. Likewise, on salt restriction, glucuronidase released additional sodium-retaining material (extract AG), which appeared in fraction E on chromatography. Since incubation of urine without glucuronidase at pH 4.8 and 37°C . for four hours (extract ACg) did not release appreciable sodium-retaining material, it appears that the addition of glucuronidase was responsible for the observed activity in extract AG. Observations on two other normal men (Cases Ab. and Jb., Table II) resemble those in Case Lj.

Activity of Various Extracts in Heart Failure and Hepatic Cirrhosis

Studies were made on urine of three patients in whom congestive heart failure was associated with a marked reduction of sodium excretion (Table III). In Case Bu., extracts A and B contained far more active material than comparable extracts from normal adults on a similar sodium intake, for in doses of only 20 minutes there was highly significant activity. Glucuronidase (AG) released much additional active material, while a smaller but significant yield was obtained from the control (ACg) incubated without glucuronidase at 37°C . and pH 4.8 for 24 hours. When

these extracts were chromatographed, activity was found in fraction E in each instance. In Case Ta., similar results were obtained from extracts A and AG. Case Lo. again demonstrates the appearance of much activity after 24 hours at pH 1.

Two patients, We. and Ph., had Laennec's cirrhosis with ascites and impaired excretion of sodium (Table III). In both cases, extracts A and B contained strong activity, which could be found in fraction E after chromatography.

Activity of Extracts in Children

Previous studies of four normal children on unrestricted diets showed insignificant activity in A extracts at doses of 20-33 minutes (Luetscher and Johnson, 1954a). Extracts made by method B contained measurable activity when the dose was increased to 167 minutes. When the three methods of hydrolysis were compared in one case (Rg., Table IV), method B released aldosterone in an amount only slightly

less than that found in normal adults, but extracts A and G did not contain amounts measurable in the dosages given.

Three children with oedema due to the nephrotic syndrome were studied (Table IV). The A extracts showed strong activity in two cases, while the third was not significantly active. The B extracts were highly active, and so were the fractions E derived from them. Compared with that from a normal child these B extracts from nephrotic children contained much more aldosterone; for on bioassay the effects of doses of 20 and of 33 minutes were greater than that produced by a dose of 167 minutes from the normal child.

In one case (Co.) the substance responsible for the sodium-retaining activity was isolated from extracts prepared by methods A and B. In each instance a corticosteroid indistinguishable from aldosterone was obtained.

In Case Ro. the fraction E derived from urine incubated with glucuronidase (G) showed strong activity. When this

urine was first extracted after exposure to acid by method A and then incubated with glucuronidase, a very highly active extract was obtained (AG). However, the actual amount of activity in these two glucuronidase extracts cannot be compared, because of the different times of incubation. There were similar amounts of activity in the two "immediate acid" extracts A, and acid A after G, although one was prepared in the usual way and the other after the glucuronidase extract had been made from it. These observations suggest that there are at least two forms of conjugated aldosterone, one form being more readily hydrolysed by acid, and the other by glucuronidase.

Discussion

There are obviously two separate factors which affect the activity of urinary extracts. These are the method of hydrolysis and the amount of active material present in the urine.

Effects of Methods of Hydrolysis on Yield.—In all cases studied, the sodium-retaining activity of the extract increased with time of exposure to strong acid. Negligible activity appeared in extracts of neutral urine. Extracts prepared after 40 minutes at pH 1 were more likely to contain active material; while a second extraction after 24 hours' exposure to pH 1 regularly produced strongly active material. In one instance incubation at pH 4.8 and 37° C. for 24 hours yielded the same amount of activity as brief exposure to pH 1 at 20° C. These results parallel the enhanced extraction of glucocorticoids after acidification of urine (Venning *et al.*, 1953). Beta-glucuronidase, prepared from mammalian spleen or liver, released active material in amounts equal to or greater than the initial extract at pH 1, but less than the quantity obtained after a day at pH 1. Although some of the active material was liberated by the physical conditions rather than by the enzyme, controlled experiments indicate that the beta-glucuronidase was responsible for a part of the yield. These results again resemble the effects of glucuronidase on the release of biologically active glucocorticoids, as described by Venning *et al.* (1953).

Factors Influencing Output in Urine.—The sodium-retaining activity of the various extracts was increased when dietary sodium was reduced or when the presence of disease of the heart, liver, or kidneys was associated with abnormal sodium retention. In all these cases high sodium-retaining activity was associated with low urinary sodium. These findings and other data (Luetscher and Johnson, 1954b) suggest that sodium-retaining activity of urinary extracts reflects the intensity of conservation of sodium by the body; and it appears that the stimulus to conserve sodium can be evoked in health by sodium deprivation, and in some diseases by an as yet ill-defined mechanism.

Identity of Active Material with Aldosterone.—In previous work, cited above, it has been shown that the purified active material obtained from urine in nephrosis has properties identical with those of aldosterone. This finding was confirmed with two extracts from one patient in the present work. In the other subjects, both in health and in disease, the sodium-retaining activity consistently appeared in fraction E on chromatography. Aldosterone is the only known corticosteroid in this fraction which causes sodium retention in the assay used. In several instances fractions have been carried through additional chromatographic systems described by Bush (1952) as B₂, B₃, and C. In each case the active fraction from urine has moved at the same rate as samples of authentic aldosterone, and has shown similar pharmacological properties. For all these reasons it is presumed that the active material is aldosterone in each instance both in normal men and in patients, and when released by brief or prolonged exposure to acid or by glucuronidase.

Summary

The amount of sodium-retaining corticoid that can be extracted from urine by chloroform depends partly on

the method of hydrolysis. Of the procedures studied, the greatest yield was obtained from urine after standing for one day at pH 1. Smaller quantities were obtained after brief exposure to pH 1 or after incubation at 37° C. and pH 4.8. Mammalian beta-glucuronidase caused a further release of material. Insignificant activity was found in extracts from urine at pH 6.5.

When yields obtained by each method were compared, the sodium-retaining activity of urinary extracts was small but still measurable in health on unrestricted sodium intake. Reduction of dietary sodium was followed by increased sodium-retaining activity. Patients with congestive heart failure, hepatic cirrhosis, or the nephrotic syndrome had a high output of sodium-retaining material when the urinary sodium was low.

In all cases in which urine extracts were chromatographed, sodium-retaining material was found in a single fraction. The active component of this fraction was shown to be aldosterone in one case. It seems highly probable that the sodium-retaining corticoid with similar properties, found in the other cases, was aldosterone.

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TABLE II.—Sodium-Retaining Activity in Various Extracts of Urine from Normal Adults on Usual Diet and on Sodium Restriction

Subject	Age and Sex	Sodium mEq day		Method of Hydrolysis	Sodium-retaining Activity μ g. D.C.A. Equivalent Dose	
		Diet	Urine		Extract	Fraction E
Lj.	40 M	Usual	155	Acid (A)	— 4 0/20 mins.	0.5 167 mins.
				" (B)	—	10.3 167 "
				Glucuronidase ¹ (G)	—	1.9 167 "
				Acid (A)	1.4/20 mins.	2.9 60 "
				" (B)	—	10.5 30 "
Ab.	28 M	Usual	149	Glucuronidase ² (AG)	5.1/20 mins.	7.0 33 "
				" control (ACg)	— 1.9/20 "	—
				Acid (A)	—	— 2.1 167 mins.
				" (B)	—	6.4 167 "
				" (A)	—	0.9 130 "
Jb.	31 M	Usual	23	" (B)	—	7.7 33 "
				" (A)	—	1.6 33 "
Da.	31 F	Usual	74	Glucuronidase ³ (AG)	—	3.0 33 "
				Acid (A)	—	— 0.8 167 "
				" (B)	—	12.2 167 "

¹ Warner-Hudnut 200 units per ml. for 24 hours. ² Warner-Hudnut 400 units per ml. for 4 hours. ³ Vio-Bin 100 units per ml. for 47 hours.

TABLE III.—Sodium-Retaining Activity in Extracts of Urine from Patients with Congestive Heart Failure or Hepatic Cirrhosis with Ascites

Subject	Age and Sex	Diagnosis	Sodium mEq Day		Method of Hydrolysis	Sodium-retaining Activity μ g. D.C.A. Equivalent Dose	
			Diet	Urine		Extract	Fraction E
Bu.	18 M	Aortic insufficiency	102	4.8	Acid (A)	5.8/20 mins.	4.4 33 mins.
					" (B)	13.2/20 "	10.0/20 "
					Glucuronidase ¹ (AG)	9.6/20 "	6.6/33 "
Ta.	41 F	Mitral stenosis	68	1.2	" control (ACg)	5.6/20 "	4.8/33 "
					Acid (A)	3.2/20 "	3.4/33 "
Lo.	42 M	Aortic stenosis	345	1.8	Glucuronidase ² (AG)	—	7.4/33 "
					Acid (A)	—	— 2.0/33 "
We.	42 M	Laennec's cirrhosis	85	1.7	" (B)	—	12.6/33 "
					" (A)	8.2/20 mins.	—
Ph.	48 M	"	51	3.3	" (B)	—	10.8/33 "
					" (A)	3.3/20 mins.	—
					" (B)	8.0/20 "	—

¹ Warner-Hudnut 200 units per ml. for 24 hours. ² Vio-Bin 85 units per ml. for 69 hours.

TABLE IV.—Sodium-Retaining Activity in Extracts of Urine from a Normal Child and Three Cases of the Nephrotic Syndrome

Subject	Age and Sex	Diagnosis	Sodium mEq/Day		Method of Hydrolysis	Sodium-retaining Activity μ g. D.C.A. Equivalent Dose	
			Diet	Urine		Extract	Fraction E
Rg.	4 M	Normal	Usual	49	Acid (A)	0.5/20 mins.	0.8/33 mins.
					" (B)	—	5.7/167 "
Co.	10 M	Nephrosis	Low	0.8	Glucuronidase ¹ (G)	—	— 0.1/33 "
					Acid (A)	8.4/20 mins.	6.3/20 "
Ar.	4 M	"	"	1.7	" (B)	10.4/20 "	10.8/20 "
					" (A)	1.6/20 "	—
Ro.	4 M	"	"	0.5	" (B)	10.3/20 "	8.0/33 mins.
					" (A)	8.2/20 "	14.1/33 "
					Glucuronidase ² (AG)	—	15.7/33 "
					Glucuronidase ³ (G)	—	5.7/33 "
					Acid (A) after (G)	—	13.0/33 "

¹ Vio-Bin 100 units per ml. for 48 hours. ² Vio-Bin 150 units per ml. for 70 hours. ³ Vio-Bin 275 units per ml. for 48 hours.

In its first annual report since its incorporation, the British Rheumatic Association describes plans for a study in a London borough "to see how many of the bed-ridden, institutionalized, and chair-bound rheumatic people could be equipped for employment in open industry or for independent living in the community." A grant for this work has been received from a charitable trust, and negotiations are proceeding with the Ministry of Health and the London County Council. Other subjects discussed in the report include the association's hostel (Bracken Hill House) for the investigation of industrial workers thought to be suffering from rheumatism; rehabilitation; and the production of a documentary film to teach patients with rheumatism how to help themselves. Last year the association's total income was £3,646, and a deficit of £720 was incurred on the year's working. However, in view of the great activity and change during the year, the honorary treasurer expressed "every confidence that there was no need to be alarmed about the financial situation."

EFFECT OF METHYLANDROSTENEDIOL
ON POST-OPERATIVE LOSS OF WEIGHT

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The pattern of the metabolic response to surgical trauma is steadily becoming better defined. It is now accepted that in the early post-operative phase there is retention of water and sodium, with an increased excretion of potassium and nitrogen. In a few days there is water and sodium diuresis with potassium retention, and in less than a week normal balance of water and electrolytes is usually restored. The negative nitrogen balance, however, continues for about two weeks, and occasionally for four weeks or longer (Elman, 1940). During this period there is progressive loss in weight. This is masked in the early days by water retention. The eventual total loss in weight is often greater than that calculated from nitrogen-balance studies, and the discrepancy is probably due to oxidation of fat (Moore and Ball, 1952).

The phase of recovery is dependent on an adequate food intake. In the early post-operative phase, however, a high-protein diet and protein hydrolysates are poorly tolerated and poorly utilized (Abbott *et al.*, 1946). They seldom prevent the phase of negative nitrogen balance, and an increase in intake of nitrogen is usually mirrored by an increase in urinary excretion.

Testosterone is well established as a substance that can reduce nitrogen excretion and produce an anabolic phase in normal people and in those suffering from wasting diseases (Abels, Young, and Taylor, 1944). It has also been shown to modify to some extent the catabolic phase after trauma in man and experimental animals, and is sometimes used for this purpose, particularly after burns and in wasted patients.

Methylandrostenediol is a synthetic hormone, effective by mouth. It has been shown to have a nitrogen-conserving effect equal to testosterone but only about a tenth of its virilizing effect (Gordon *et al.*, 1951). Some reports do suggest, however, that it is quantitatively less potent than testosterone (Henderson and Weinberg, 1951). It has become a fairly popular medicament in a variety of wasting conditions and many authors claim that it is effective—for example, Albeaux-Fernet *et al.* (1952). The present study was designed to measure its effect on the loss of weight which follows operation.

Investigation

The patients in the trial were suffering from pulmonary tuberculosis. Because the metabolic response is quantitatively less in people whose tissues are already depleted, only young adults in a good state of nutrition and free from clinical evidence of toxæmia were chosen for study. Those with obesity and diabetes mellitus were not included. Patients who subsequently developed wound infection or pleural effusions requiring aspiration were excluded from the final analysis.

As the metabolic disturbance is also proportional to the extent of surgical trauma, the fairly standardized operations of thoracoplasty, extrapleural plombage, lobectomy, and combinations of these provided suitable cases for study.

Patients were weighed on the day before operation and twice weekly afterwards for a minimum of six weeks. The weighing was done at the same time of day and in the same garments. The patients were allocated by random sampling to the treatment or control group. Those in the treatment group were given 20 mg. of methylandrostenediol twice daily, starting on the day before operation and continuing for twenty-one days afterwards. In those undergoing operation in two stages the interval between the first and second varied, but was usually fourteen days. In the latter cases treatment was continued from the day before the first operation until twenty-one days after the second.

The patients remained on ordinary hospital diet throughout. Post-operative vomiting was uncommon, and patients operated on in the morning were often able to eat a boiled egg and bread-and-butter at tea-time.

Results

In patients undergoing one operation, 20 were treated with methylandrostenediol and 14 formed the control group. The groups were comparable in sex, age, and type of operation. The findings are summarized in Table I. In the treatment group the maximum weight loss varied from nil to 9 lb. (4.1 kg.), averaging 4.3 lb. (1.9 kg.). In the control group the range was 2 lb. (0.9 kg.) to 9.5 lb. (4.3 kg.), with an average of 4.8 lb. (2.1 kg.). The time of maximal weight loss was comparable in both groups.

In those undergoing two operations, 12 patients formed the treatment group and 15 the control group (Table II). Again the groups proved comparable. In the treated group one patient lost no weight, but the others lost amounts varying from 4.5 (2 kg.) to 14 lb. (6.4 kg.), the average for the group being 8.9 lb. (4.1 kg.). In the control group the loss varied from 4 (1.8 kg.) to 15.5 lb. (7 kg.), with an average of 8.7 lb. (4 kg.).

Thus there is no evidence that methylandrostenediol in the dose used has any significant effect on post-operative weight loss. No harmful effects could be attributed to its use and there was no evidence of virilization in the female patients.

Discussion

The tables show that the loss in weight after major surgery is considerable, and in some three-stage procedures studied (unpublished) it frequently exceeds 14 lb. (6.4 kg.) in people of average nourishment. The return to pre-operative weight often takes three months, and is sometimes never reached. It is generally agreed that one of the major factors in producing resistance to tuberculosis is a diet adequate in protein. Short of obesity, there is an intimate and progressive relation between gain in weight and the success and eventual result of treatment. The considerable loss of weight

TABLE I.—One-stage Operation

Treated		Control	
Maximum Weight Loss lb.	Day of Maximum Loss	Maximum Weight Loss lb.	Day of Maximum Loss
3	1.4	7.5	5.4
2	0.9	4	1.8
3.5	1.6	5	2.3
3	1.4	2	0.9
4.5	2.0	8	3.6
8	3.6	3	1.4
0	0	4.5	2.0
9	4.1	4.5	2.0
5	2.3	4	1.8
6	2.7	5	2.3
1.5	0.7	4	1.8
3.5	1.6	2.5	1.1
5	2.3	4	1.8
8.5	3.9	9.5	4.3
4	1.8		
1.5	0.7		
3	1.4		
5	2.3		
4.5	2.0		
5.5	2.5		
Average 4.3	1.9	4.8	2.2
	20		18

TABLE II.—Two-stage Operations

Treated		Control	
Maximum Weight Loss lb.	Day of Maximum Loss*	Maximum Weight Loss lb.	Day of Maximum Loss*
7	3.2	13	5.9
4.5	2.0	8.5	3.9
0	0	7	3.2
11	5.0	5.5	2.5
9.5	4.3	9.5	4.3
12.5	5.7	7	3.2
12	5.4	4	1.8
14	6.4	6	2.7
5.5	2.5	8	3.6
12	5.4	10	4.5
6	2.7	10	4.5
12.5	5.7	8	3.6
		12	5.4
		15.5	7.0
		7	3.2
Average 8.9	4.0	8.7	3.9
	19		20

* Day after second stage operation.

is therefore an unwelcome feature of the post-operative phase, and its presence may well exert an unfavourable effect on the eventual course of the disease. Methylandrostenediol has proved disappointing in its effect.

We have made no attempt at direct measurement of nitrogen balance in this investigation. Even though part of the weight loss may be due to oxidation of fat, it is reasonable to attribute most of it to nitrogen loss. It seems justifiable to assess the efficiency of an anabolic hormone in the post-operative phase by the method we have used. We feel that only when a drug can be shown to influence the weight pattern can it be regarded as effective therapy. Our results do not indicate that methylandrostenediol has no effect on nitrogen metabolism, but only that its effects are not strong enough to be apparent clinically. It remains a possibility that a fivefold increase in dose might have some measurable effect, but at this level its virilizing effect, too, would be apparent, particularly in women treated for five weeks or longer. In most reports to date, the dosage has been in the range that we have used.

Summary

The pattern of the metabolic response after surgical trauma has been described briefly.

The considerable loss of weight that takes place after operation is an undesirable feature. This is particularly so in tuberculous patients undergoing multiple operations on the chest.

Methylandrostenediol has not been found to reduce this weight loss.

We have to thank many of the medical staff at Harefield Hospital for helping us in this investigation, particularly Drs. R. S. Francis, D. Levy, and R. G. May. We are grateful to the nursing staff for undertaking the extra work so willingly.

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RAPID Rh-TYPING

A "SANDWICH" TECHNIQUE

BY

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It is necessary to perform ABO and Rh blood-grouping tests before transfusion, and recipients who are Rh-negative should be transfused with Rh-negative blood of homologous ABO group.

Blood banks are usually short of Rh-negative blood of all ABO groups and it is sometimes necessary, in the first instance, to transfuse males who have never had any previous blood transfusion, or intramuscular injections of blood, with Rh-positive blood because of such shortage. This applies only to males and to their first visit to hospital, and such a transfusion should not be continued for more than a few days in succession, nor is it desirable that Rh-positive blood should be given to Rh-negative males who will obviously require multiple transfusions. I have seen Rh antibodies produced in an Rh-negative male patient seven days after primary transfusions of Rh-positive blood.

In the case of females, all those who are Rh-negative, of whatever age, should be transfused with Rh-negative blood. It is not generally appreciated that children who are Rh-negative can be immunized as easily as adults. I have seen an Rh-negative child, 5 years old, immunized by transfusions of Rh-positive blood. Once Rh antibodies have appeared in the blood of Rh-negative females they persist for long periods of time, probably for life. In another case recently observed, Rh antibodies were present in a woman aged 73 who had never received any blood transfusions or intramuscular injections of blood and whose last pregnancy was 38 years previously.

ABO typing can be rapidly and reliably performed, but with the Rh-typing sera available the recommended techniques often take a long time, and when a cross-matching test has to be done in addition to this there may be delay before the blood can be given. Consequently some transfusions, in the minds of clinicians, become "emergency transfusions," and they take the risk of giving blood without the necessary preliminary grouping and cross-matching tests being performed. If the period of time required for the preliminary grouping tests could be reduced then perhaps fewer transfusions would be regarded as being of an emergency nature.

The purpose of this paper is to describe a rapid method of Rh-typing which can be performed on a slide in ten minutes, using Rh-typing sera ordinarily available here.

Materials and Methods

Bovine Albumin.—Armour's 30% bovine albumin and bovine plasma have both been used in this test.

Rh-Typing Serum.—Undiluted anti-Rh serum is used, suitably absorbed to remove anti-A and anti-B agglutinins so that it is universally applicable. The sera employed had been kept frozen solid for several weeks. Strengths of the reaction of a typical serum used in this test are shown in the Table.

Red-Cell Suspensions.—The blood samples are collected either as clotted or as citrated blood. If collected as clotted

Titration of Serum 474, Using Group O, R₁R₂ Test Cells

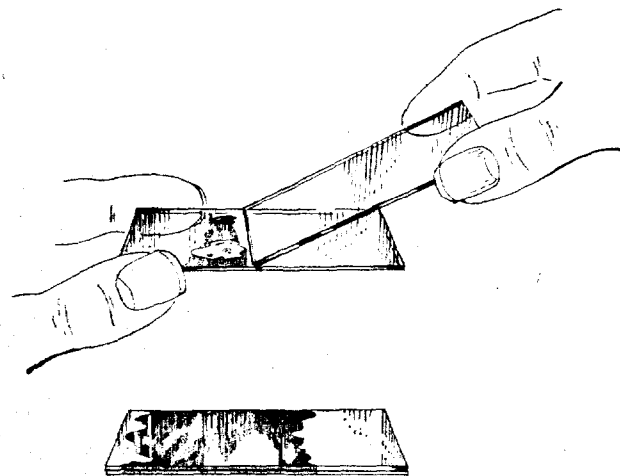
Diluting Fluid	Dilutions of Serum									Control
	1:1	1:2	1:4	1:8	1:16	1:32	1:64	1:128	1:256	
Saline	++	++	++	++	++	++	++	++	++	++
20% albumin	++++	++++	+++	++	++	++	++	++	++	++

blood, the cell-serum mixture is poured or pipetted off the clot. Citrated or clotted cells are then spun and the serum or plasma is removed. The cells that remain are then washed once in a large volume of saline and packed tightly in the centrifuge. The supernatant saline is then completely removed from the cell pack with a pipette.

Methods.—The saline tube agglutination and albumin tube agglutination techniques were performed according to standard methods (M.R.C., 1952).

Technique

One volume, about 0.03 ml., of the Rh test serum, together with one volume of the 30% bovine albumin and one volume of the packed cells to be typed, is placed in the middle of a microscope slide. The human anti-Rh serum and the 30% bovine albumin may be mixed in equal volumes prior to the test, and two volumes of the mixture used together with one volume of washed packed red cells. The volumes are delivered on to the microscope slide by using a marked Pasteur pipette. On the right-hand side of the slide the



Preparation of the "sandwich."

reference number of the cells that are being typed is marked in grease pencil. The slide is then held in the left hand and another microscope slide held by the narrow edge with the thumb and first finger of the right hand, and the serum albumin and packed red cells are mixed together with the narrow edge of the slide, as in making a blood film. The mixture is spread out on the slide for two-thirds of its length. The slide with which the mixing was done is then gently lowered and pushed on top of the bottom slide so that a "sandwich" is made and the albumin-Rh-serum-packed-cell mixture is spread out in a thin layer between the two slides (see Fig.). When the "sandwich" is made the slides should not be pushed tightly, but only gently, together. Any excess liquid is gently wiped away from the edges of the "sandwich."

Control tests are put up consisting of group AB serum, 30% bovine albumin, and the patient's packed cells, and the sandwich is prepared as described previously. The sandwiches are then carefully placed on a heated plate or in the incubator at 37° C. They are left for ten minutes, removed, and read, using the low power of the microscope. Several fields in the centre of the slide should be examined. If the result is positive, large clumps of cells will be seen, and if the result is negative the cells will be freely suspended. It is always desirable to examine a moving film, and the thumb

of one hand is pressed on top of the sandwich as it rests on the stage of the microscope. As the sandwich is compressed the cells will be observed to move either as clumps in the case of a positive result or as cells which are freely mobile and not aggregated or clumped in a negative one.

Results

One thousand red-cell samples were tested by the tube technique at 37° C., using an anti-D saline agglutinating serum. The results which were negative with this serum were tested with another anti-D serum and also with anti-C and anti-E sera; D^u positive cells were identified and suitable control tests were included.

The 1,000 blood samples were thus divided into D-positive types (including D^u) and D-negative types. These blood samples were then tested by the slide-sandwich technique described above, using anti-Rh serum No. 474, details of the titration of which are shown in the Table. The results were as follows: There were 851 D-positive bloods—847 were typed as positive, 2 as doubtful, and 2 as negative. The remaining 149 were D-negative and all gave negative results using the sandwich technique. The two cells which gave negative results and the two which gave doubtful results, using the rapid sandwich test, were all of variety D^u—either cD^uE/cde or CD^ue/cde.

Forty-two blood samples were also tested by the tube techniques detailed above and also by the sandwich technique, using five different anti-Rh sera (similar to No. 474) on each cell sample; the results were all in agreement. In order to determine whether cells which had been stored in A.C.D. mixture in a refrigerator could be typed by this method, one of these anti-Rh sera (No. 412) was used to test blood samples from outdated stored blood (average age, 21 days). Of 100 blood samples examined, 83 were D-positive and 17 D-negative, using the routine tube techniques, and identical results were given by the sandwich slide technique.

Discussion

Diamond and Denton (1945) introduced bovine albumin for the detection of incomplete Rh antibodies, and subsequently Diamond and Abelson (1945) introduced the open-slide test, using albumin for rapid Rh-typing. This test has been used in many laboratories and has been found to give satisfactory results, but for its success it is necessary to have an avid Rh-typing serum and to have considerable experience in the performance of the test. Such avid Rh-typing sera may mean reimmunizing human volunteers whose sera already contain Rh antibodies with injections of Rh-positive red cells. Such sera are not always available in this country. Another difficulty encountered during the performance of this test is the fact that the cell-serum-albumin mixture on the open slide tends to dry up towards the end of the test, making it difficult on occasion to read it. Furthermore, if people are not familiar with the methods of performing these tests, and if weak or low titre Rh antisera are used, a number of false-negative results occasionally occur, Rh-positive cells (often of type R₁r) being falsely diagnosed as Rh-negative.

Because of the need for a rapid slide test, the sandwich method was developed; it has a number of advantages. First, there is no trouble with drying up of the serum-albumin mixture, since although the mixture dries at the edges of the slides the mixture in the centre of the sandwich remains quite fluid. The drying of the edges is, in some respects, an advantage, since the sandwich becomes very stable, and even though dropped on the bench the slides will not come apart, and the patient's name or number cannot accidentally be rubbed off, as it is in the middle of the sandwich. Secondly, the anti-Rh sera that can be successfully used with the sandwich technique are readily available and need not be specially avid or hyperimmune. The test, furthermore, can be performed rapidly, and results were obtained at 37° C. in ten minutes.

It should be emphasized that the test is specifically designed for rapid Rh-typing before blood transfusion, and it

A SIMPLE METHOD OF Rh-TYPING

BY

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is not intended to be used as a routine typing method. A number of false-negative results were obtained, but these were all of the D^u variety of Rh, which are known not to be detected by the albumin technique (Renton and Stratton, 1950).

In using this test for the purpose for which it was designed, occasional false-negative results will not cause difficulty. False-positive results were not detected in the tests that were made. False-positive results do rarely occur in special circumstances—for example, in a recent case in which the cells from an Rh-negative patient suffering from acquired haemolytic anaemia were typed, they were found to be positive, but, similarly, the cells gave clumps when AB serum was substituted, as suggested in the technique, and used as a control. This false-positive result, therefore, was readily detected. Occasionally, slight rouleaux formation was observed, but this slight aggregation of cells is rapidly dispersed on compressing the slide and watching the cells under the microscope. A similar dispersal of cells does not so readily occur in the case of true agglutinates. No serious trouble was encountered in the interpretation of the results due to the presence of rouleaux formation. In avoiding rouleaux formation, care must be taken to see that the cell suspensions are washed properly, and, furthermore, that when the albumin-cell mixture is made on the slide it is not allowed to dry at all before the sandwich is made. An additional precaution is to avoid reading the edges of the sandwich. It is assumed, of course, that the Rh-typing serum has no rouleaux-forming properties, and it is often an advantage to keep these sera frozen solid for a week or two before bringing them into routine use. The bovine albumin should also be a reliable and non-rouleaux-forming batch.

If strong anti-D + D^u typing sera are used then some of the high-grade types of D^u can be detected, using the sandwich technique. One of the objects in employing this test, however, as stated previously, was to make it useful with weaker Rh-typing sera and with Rh-typing sera containing incomplete Rh antibodies, which would not normally be used for the saline agglutination test performed in tubes at 37° C.

Summary

In order to shorten the period of time required for the performance of the compatibility test, rapid methods for ABO and Rh typing are necessary. This paper describes a slide sandwich test for rapid Rh typing.

This test is intended to be used prior to blood transfusion and can be performed in ten minutes at 37° C.: it is not intended for routine use when large numbers of specimens have to be tested.

In this technique anti-Rh sera of moderate titre and avidity, such as are ordinarily available in this country, can be employed.

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In his annual report for 1953 Dr. V. Freeman, medical officer of health of Islington, refers once again to housing conditions in the borough. With an average of 76.2 persons to the acre it is one of the most densely populated boroughs in the county of London. Many of Islington's houses are out of date, being in the form of multi-story tenements, built during the early part of Queen Victoria's reign, or even earlier. Of the 82,000 private households in the borough, 53% share a water closet with other households, 42% share a piped water supply, 22% share a kitchen sink, 20% share a fixed bath, and 7% share a cooking stove. No fewer than 59% of the households are without a fixed bath. Many Islington houses are structurally sound, but it is uneconomic for the landlords to keep them in repair owing to the high cost of labour and materials.

It is generally accepted that the most reliable method of Rh-typing is that of Landsteiner and Weiner (1941), in which a suspension of red cells is incubated for two hours with an equal volume of anti-D serum in a small tube, the results being read microscopically. This method is too lengthy in cases in which blood is urgently needed, and shorter methods have been used.

The capillary-tube method originally described by Chown (1944) has been widely used, and yields results within thirty minutes. However, Poole and Williams (1951) have reported false-positive readings with this technique, and Chown and Lewis (1951) have advised that the cells should be washed for use in this test.

Poole and Williams (1951) have reported good results with a technique in which the cells and anti-D serum were first incubated at 37° C. for ten minutes and then centrifuged for five minutes at 2,000 to 2,500 r.p.m.

A modification of this technique (F. Stratton, 1952, personal communication) is called the double incubation and centrifuging method. The tubes of cells and serum are incubated and centrifuged, tapped to resuspend the cells, and then reincubated and centrifuged. This technique has been recommended by the Manchester Regional Hospital Board Advisory Committee on Pathology for use in emergencies. By this means, results can be obtained in about fifteen to twenty minutes. The method has the drawback of repeated manipulations, and it was thought that the number of manœuvres could be reduced if the centrifuge itself were heated to 37° C., thus acting as an incubator. It was hoped that this short and simple method, the "thermal centrifuging method," would yield results comparable to the standard two-hour incubation method.

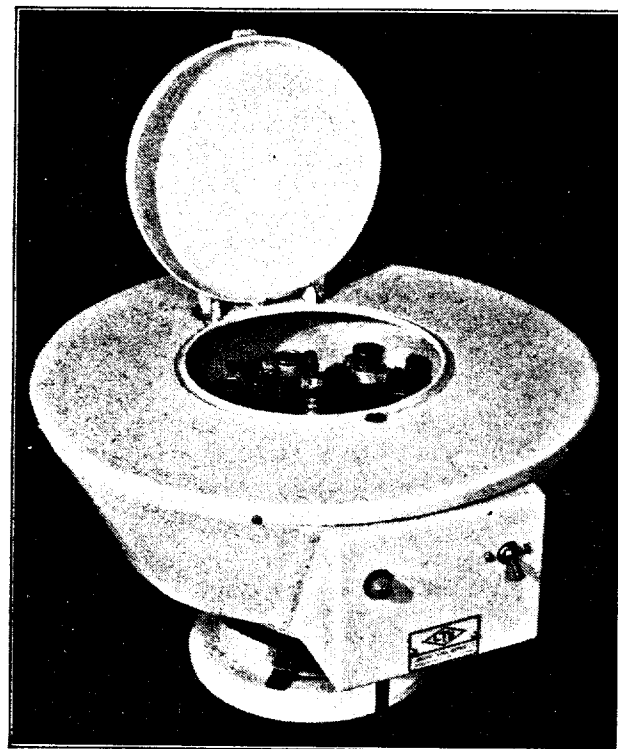
Material and Methods

The cases were routine requests received in the laboratory of a general hospital. They consisted of a small number of midwifery cases undergoing routine typing and some emergency cases received in the casualty department, but the majority were composed of general medical and surgical cases admitted from the waiting-list.

Centrifuge.—This was constructed specially for these experiments by Laboratory Thermal Equipment, Ltd., of Greenfield, near Oldham, Lancs. It consisted essentially of an M.S.E. minor centrifuge, round the outer casing of which a lagged jacket was built, and between this and the casing a thermostatically controlled electrical heating element was fitted (see photograph). No special head was provided, the normal cups being satisfactory for the test. The tubes are removed from the centrifuge cups with forceps.

Cell Suspensions.—The addition of one or two drops of the patient's blood to 2 ml. of saline gives a suspension of approximately 2%. The final concentration of the test is therefore about 1% red cells.

Anti-D Serum.—For use during Experiment 1, special serum of average titre was supplied by the regional transfusion centre and used in all 64 cases. For the other experiments the routine sera supplied by the regional transfusion centre was used, and the titre of these varied. The same serum was used for all the tests made on any cell suspension. Each batch of serum was tested with known Rh-positive and Rh-negative cells.



Centrifuge with thermostatically controlled heating jacket.

Size of Tubes.—Two sizes of tubes have been used and found to be equally satisfactory for the test. These are Dreyer's tubes and Durham's tubes, the latter measuring 5 by 0.4 cm. All tubes were boiled in chromate after each test and then washed repeatedly in water and distilled water. However, Dreyer's tubes are recommended because they are easier to clean. During Experiment 1 the tubes were warmed before use in the 37° C. incubator.

Technique

In all the techniques two tubes were used for each experiment. Both tubes contained one drop of a suspension of the patient's cells. In the first tube a drop of anti-D serum was added, and in the other a drop of normal saline. This second tube was used as a control.

Standard Two-hour Method.—The pair of tubes were placed in adjacent holes, drilled in the top of a wooden block, and the block was placed in the 37° C. incubator. After two hours the block was removed from the incubator and the tubes were examined for macroscopic agglutination. The contents of both tubes were then gently pipetted on to clean slides and read under the 2/3 objective of a microscope with reduced light. The slide was tipped slowly from side to side to facilitate the recognition of agglutination in difficult cases. This method of reading the results was followed in all the techniques. The standard two-hour method is referred to as the "standard" method.

Double Incubation and Centrifuging Method.—A modification of Stratton's technique was used. The two tubes were incubated in the 37° C. incubator for seven to fifteen minutes, then centrifuged at about 500 r.p.m. for one minute, tapped to resuspend the cells, reincubated for seven to fifteen minutes, recentrifuged, and then read. This method is referred to as the "rapid" method.

Thermal Centrifuging Method.—The two tubes were dropped into opposing cups of the special centrifuge and spun in all experiments at 100–150 r.p.m. The duration of the centrifuging varied as follows: in Experiment 1, fifteen minutes; in Experiment 2, twenty minutes; in Experiment 3, thirty minutes. At the end of the centrifuging the tubes were removed from the cups and read immediately. This method is referred to as the "centrifuging" method.

The degree of agglutination was estimated by the following scale under the microscope. 0=No agglutination. 1=Occasional agglutination of two, three, or four cells. 2=A considerable number of cells agglutinated—that is, clumps up to six or eight cells. 3=Practically all cells agglutinated. Clumps of up to a dozen cells or so. 4=Large aggregates visible with the microscope or naked eye on the slide. 5=Agglutination visible with the naked eye in the tube.

Results

Experiment 1.—Sixty-four cases were tested. The methods used were the standard method and the centrifuging method, spinning for fifteen minutes. Fifty cases were Rh-positive by the standard method, and the figures denoting the degree of agglutination were added together so that the intensity of the agglutination by both the techniques could be compared over the whole 50 cases. The results are shown in Table I. There were no false positives or false negatives.

TABLE I.—Experiment 1 (64 Cases: 50 Rh-positive, 14 Rh-negative)

Method	Total Pos.	Total Aggregate of Agglutinations	False Pos.	False Neg.	First-degree Agglutinations	False Neg. + Weak Pos.
2-hour standard	50	174	0	—	5	5
15-minutes centrifuging	50	162	0	0	6	6

Experiment 2.—In this experiment 135 cases were tested and the following methods were compared: the standard method; the rapid method, using two ten-minute periods of incubation; and the centrifuging method, spinning for twenty minutes. As it was felt that the first degree of agglutination should be listed separately, such results were called "weak positives." The results are set out in Table II. There were no false positives.

TABLE II.—Experiment 2 (135 Cases: 113 Rh-positive, 22 Rh-negative)

Method	Pos.	Neg.	Weak Pos.	False Pos.	False Neg.	False Neg. + Weak Pos.	Total
2-hour standard	112	22	1	—	—	1	135
2 × 10-minutes rapid	102	24	7	0	2	9	135
20-minutes centrifuging	107	23	4	0	1	5	135

Experiment 3.—In this experiment the following methods were compared: the standard method; the rapid method, using two fifteen-minute periods of incubation; and the centrifuging method, spinning for thirty minutes. The results are set out in Table III. It will be noted that there are no false positives.

TABLE III.—Experiment 3 (50 Cases: 37 Rh-positive, 13 Rh-negative)

Method	Pos.	Neg.	Weak Pos.	False Pos.	False Neg.	Weak Pos. + False Neg.
2-hour standard	37	13	0	—	—	0
2 × 15-minutes rapid	35	13	2	0	0	2
30-minutes centrifuging	37	13	0	0	0	0

Discussion

The results of Experiment 1 show that with the fifteen-minutes centrifuging technique the aggregate of agglutinations is close to that obtained by the standard technique and there are no false negatives.

While these results show what can be achieved in the hands of experienced workers, a technique for use in emergency cases must be capable of giving satisfactory results when used by people who practise it infrequently. It was

felt that the first degree of agglutination might be too subtle for comparatively inexperienced personnel to recognize, and such results are therefore listed separately as "weak positives" in subsequent experiments. Thus, in Experiments 2 and 3, three results were possible in each experiment—"negative," "weak positive," and "positive."

The most suitable technique would be that in which there is the smallest number of false negatives and weak positives as compared with the standard method.

In Experiment 2 the centrifuging method was used for twenty minutes, as it was hoped that by lengthening the period of spinning the number of one-plus agglutinations would be reduced. It was also compared with the rapid method with two separate incubation periods of ten minutes each. This rapid method is often used in emergencies for Rh-typing, but inexperienced personnel complain of the numerous manipulations involved.

The results show that in 113 Rh-positive cases tested, the total of one-plus agglutinations plus false negatives was five for the twenty-minutes centrifuging and nine for the two ten-minutes rapid method, as compared with one in the standard technique. Thus the superiority of the twenty-minutes centrifuging method as compared with the two ten-minutes rapid method is established, the results being slightly better and the technique easier to carry out.

The results obtained by any Rh technique must depend upon the avidity of the Rh-typing serum supplied. One batch used in Experiment 2 was weaker than the rest, and it was while this was being used that a case was tested which gave a weak positive by the standard and false negatives with both the rapid and the centrifuging techniques.

In Experiments 1 and 2 no false positives were encountered—an important point in emergency Rh-typing.

Experiment 3 was carried out to compare the efficiency of the centrifuging technique with the rapid method when they were both used for a longer period, and also to find out if false positives occurred then. No false positives were encountered, and the efficiency of the centrifuging technique in the small series tested was found to be comparable with that of the standard method.

Summary and Conclusions

A new technique is described in which Rh-typing is carried out by spinning a suspension of the patient's cells with anti-D serum in a centrifuge heated to 37° C. by a thermostatically controlled jacket.

The twenty-minutes centrifuging method gives almost as reliable results as the standard two-hour method, with no false positives. It gives slightly better results than the two ten-minutes rapid method, and, since there are fewer manipulations, it is recommended as a procedure to be adopted in emergency Rh-typing.

I am indebted to Dr. James Davson for advice and encouragement, to Dr. F. Stratton, the director of the Manchester Regional Blood Transfusion Service, for reading the paper and for criticism, and also for supplying the special serum used in Experiment 1.

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The *Bethlem Maudsley Hospital Gazette*, published quarterly, is a lively and entertaining journal produced for and by the staff of the Bethlem Royal Hospital and the Maudsley Hospital. The issue which came out at the end of last year contains all the usual features of a weekly professional journal, including editorials, letters to the editor, book reviews, reports of meetings, signed articles, and items of news about the hospital, and also reprints Professor Aubrey Lewis's Maudsley Lecture entitled "Henry Maudsley: his work and influence."

A FOREIGN BODY IN THE KIDNEY

BY

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The following case is of interest because of the diagnostic confusion it caused and its unusual outcome.

Case Report

A boy of 3½ years was admitted to the Duchess of York Hospital for Babies, Manchester, on January 25, 1954. The history obtained at the time of admission was that he had been well until a month before, when he became listless and developed painful enlarged glands in his neck. Shortly afterwards his left ear began to discharge; this persisted until the time of admission. A week after the cervical adenitis developed his urine became dark. There was no dysuria, but he started to pass urine twice during the night. About the time his urine became dark puffiness of the eyes was noted. This decreased during the interval prior to admission. For two weeks before admission he had vomited occasionally. His appetite, usually good, had become poor and he had become fretful. The only relevant previous history was an admission to another hospital at the age of 1 year for repair of an inguinal hernia. Examination showed a well-nourished, lively, but rather fractious child, with slight puffiness under the eyes. There was no oedema elsewhere. The left external auditory canal was full of thick pus and there were moderately large glands palpable in the neck. No other abnormal signs were found. In view of the history a diagnosis of acute nephritis following an upper respiratory infection was made.

The urine contained albumin and many red cells but no casts. Blood urea was 55 mg. per 100 ml.; E.S.R., 70 mm. fall in first hour; haemoglobin, 56% (Sahli); white cell count, 12,400 per c.mm. (neutrophils 61%, lymphocytes 37%, monocytes 1%, Türk cells 1%); platelet count, 450,000 per c.mm.

The profuse haematuria persisted, but no casts were seen at any time. The urine output was good and the general condition satisfactory. After two weeks there was little change in his condition, and the diagnosis of nephritis was considered to be untenable. At this time the blood urea was 42 mg. per 100 ml.; E.S.R., 20 mm. fall in first hour; haemoglobin, 66%; white cells, 15,000 (neutrophils 54%, lymphocytes 41%, monocytes 1%, eosinophils 4%). The left ear was dry and the drum healed.

As the first step in a full investigation of the renal tract a straight x-ray film of the abdomen was taken. This showed a foreign body in the right upper abdomen. A barium meal showed that this body was in close relation to the duodenum, and an intravenous pyelogram indicated that it was also in close proximity to the right renal pelvis (see Fig.).

Operation was performed on February 16 under general anaesthesia. An incision was made in the line of the right twelfth rib, the anterior half of which was removed. The perinephric fascia was opened and the kidney mobilized. The upper half of the kidney was friable and swollen, and had a dark-red mottled appearance. It was very adherent to the surrounding tissues. The duodenum was firmly stuck to the anterior surface of the pelvis of the kidney. The foreign body could be felt passing from the duodenum into the upper part of the kidney. By careful dissection the

duodenum was separated from the kidney except at the site of the short fistulous track through which the foreign body could be felt to be passing. The fistula was divided round the foreign body, which was disengaged from the duodenum with a little difficulty because of the splayed-out ends, which were really broader than the diameter of the duodenal end of the fistula. It was then easily withdrawn from the kidney. No urine leaked from the sinus in the kidney, the external end of which was situated on the edge of the renal sinus just beyond its junction with the pelvis. It appeared to be of kidney substance only and to have no direct connexion



Radiograph showing relationship of foreign body to renal pelvis and duodenum.

with the caliceal system. A piece of perinephric fat was sutured over it. The small opening into the duodenum was closed with two layers of fine catgut and the wound closed in layers, a rubber drain being left to the perinephric space.

The foreign body was identified as a hair-grip of the type known as a "kirbigrip," which was 4.8 cm. long and showed some evidence of erosion of the surface. Microscopical examination of a small piece of the upper pole of the kidney which was removed showed gross interstitial haemorrhage.

The patient made excellent progress after operation and was discharged home three weeks later. Microscopic haematuria persisted for three months after discharge, but the number of red cells in the urine has shown a progressive decrease and they have now become very scanty. At the time of writing the blood urea was 32 mg. per 100 ml. and the child was very active and in excellent health.

The parents were interviewed when the foreign body was discovered, and they remembered that about four months before admission the child had announced one day that he had swallowed a hair-grip. When told he would have to go to the doctor he promptly denied having swallowed anything, and maintained this denial in the face of repeated questioning. Since he appeared perfectly well in the next few days the matter was forgotten. Two months later he had an unexplained illness in which he became listless and anorexic but had no local symptoms. He was examined several times by his own doctor, who found nothing to account for his illness, and after a week he resumed his usual robust health. From about this time his urine was noticed to be cloudy, but it did not become red until three weeks before admission to hospital.

Discussion

The remarkable feature of this case is the behaviour of the foreign body. It had become impacted in the duodenum, and the sharp ends had become firmly fixed against the medial wall of the bowel. Thereupon the rounded end slowly worked its way through the lateral wall and entered the kidney. This whole process was completely silent—unless the vague unexplained malaise two months after the hair-grip was swallowed was to be attributed to it—and finally the child came to hospital presenting the picture of an acute nephritis. He had lost a considerable amount of blood from his renal tract, since his haemoglobin at the time of admission was only 55%.

The varieties of size and shape of foreign bodies which have successfully negotiated the alimentary tract are legion. As a general rule, those which traverse the oesophagus can be expelled per vias naturales. Thus Gross (1953) reported that only 43 of 615 to reach the stomach had to be removed by operation.

We have been able to find reports of four other cases in which swallowed foreign bodies have perforated the bowel quite silently and entered the kidney. All four were young children, and in all of them the symptoms were predominantly renal. The Table gives the relevant data on the five cases now on record.

Details of Five Recorded Cases

Case	Age in Years	Sex	Foreign Body	Symptoms	Duration of Symptoms (Months)	Operation
Capon and Wells (1938)	4	F	Kirbigrip	Frequency; haematuria	7	Nephrectomy
McEnery and Fox (1946)	2	M	Bobby pin	Fever; vomiting; haematuria; pyuria	7	Removal through duodenum
Mackby (1948)	3	F	" "	Frequency; cloudy urine; fever	6	" "
Bilger and Greiner (1949)	5	M	Hair-grip	Pyuria	4	Nephrectomy
Present case	3½	M	Kirbigrip	Haematuria; malaise; vomiting	1	Removal without opening duodenum

A bobby pin is the American equivalent of a kirbigrip. The child reported by Capon and Wells was known to have swallowed a hair-grip several months before the onset of symptoms. In none of the other cases was such an incident reported. The two American cases and the other British case are practically identical with ours. In all four the open end of the hair-grip had become stuck in the second part of the duodenum and the rounded end had perforated the wall and entered the kidney. In the French case the foreign body passed as far as the large bowel before being arrested.

These cases are so similar, and the sequence of events so remarkably alike, that we suggest that this be regarded as a definite syndrome. Toddlers are notoriously apt to put things in their mouths, and in the investigation of obscure symptoms in children of this age the possibility of a foreign body as the cause should always be borne in mind.

Summary

A boy of 3½ years developed profuse haematuria three months after swallowing a hair-grip. This was found to be due to arrest of the foreign body in the duodenum and penetration of the right kidney. The foreign body was removed at operation and complete recovery ensued. Four other cases in whom a similar sequence of events occurred are referred to.

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Medical Memoranda

Pyrimethamine in the Prophylaxis of Malaria

Therapeutic trials with pyrimethamine ("daraprim") have indicated that the drug could effectively control a clinical attack of vivax or malariae infection in two to three days but might fail in a certain percentage of falciparum infection (Chakravarty and Chaudhuri, 1953). The present report on the prophylactic value of the drug is based on another investigation carried out simultaneously in a malarious village.

MATERIAL AND METHOD

The prophylactic trial was carried out on 311 boys in a village school about 35 miles from Calcutta from July to November, which is usually the heaviest transmission period in the locality. A preliminary survey was done to find out the spleen and parasite rates; it showed that 60% of malarial infection was due to *P. falciparum* and the rest to *P. vivax* or *P. malariae*. During the course of treatment the blood was examined every month except October, and on its conclusion a final estimate was made of the spleen and parasite rates (see Table). Alternate classes received pyrimethamine (172 boys) and dummy tablets (139 boys) respectively, the latter serving as control. Both were given once a week, the dose of pyrimethamine being 25 mg. (12.5 mg. for boys under 10 years). The tablets were administered personally by a member of the clinical research unit, financed by the Indian Council of Medical Research, except for four weeks during the October vacation, when they were handed over to the boys to be taken by themselves in their homes.

RESULTS

The effect of prophylactic regimen on the parasite and spleen rates is shown in the Table.

Effect of Pyrimethamine Prophylaxis on Parasite and Spleen Rate per 100

Group		July	Aug.	Sept.	Oct.	Nov.	Dec.
Pyrimethamine (172 boys)	Parasite	5.7	0	1.2	—	0.7	2.3
	Spleen	16.1	—	—	—	—	11.6
Control (139 boys)	Parasite	3.6	3.7	8.6	—	6.6	9.2
	Spleen	16.2	—	—	—	—	23.9

The parasite rate in the control group rose, as was to be expected, from 3.6 in July to 6.6 in November, while in the treated group it dropped from 5.7 to 0.7 during the same period. In December, after the conclusion of the experiment, there was an unexpected rise in the parasite rate, which might perhaps have been due to prolongation of the transmission period. The suppressive effect of pyrimethamine was also reflected on the spleen rate, which showed some reduction, while there was about 50% increase in the control group. In all the parasite-positive cases in the treated group only *P. falciparum* was seen throughout the period.

The incidence of overt malaria could not be accurately recorded, as it was not possible to examine the blood during febrile attacks. However, on inquiry at the weekly visits it was gathered that the incidence of fever was much less in the treated group.

COMMENT

Following the observation of Goodwin (1952) on himself that 5 mg. of pyrimethamine daily could suppress malaria, Vincke (1952) carried out a successful mass prophylaxis in the Belgian Congo with a weekly dose of 25 mg. Covell *et al.* (1953) obtained complete suppression

of overt attack with 25 mg. of pyrimethamine weekly in non-immune subjects exposed to a West African strain of *P. falciparum*.

Our observation in a village school indicates that weekly doses of 25 mg. have an effective suppressive action against malaria. Both falciparum and vivax infections have been prevalent in the area, the majority being falciparum. The persistence of *P. falciparum* parasites in a few cases during pyrimethamine administration indicates that some falciparum strains are relatively less sensitive to the drug. However, the large majority of the cases were free from parasites during the prophylactic regimen.

Our thanks are due to the Wellcome Foundation Ltd. for the supply of daraprim and to Sri C. L. Mitter, S. Mitter, and B. Dutta for their help in this work.

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Fatal Case of Agranulocytosis Due to "Novalgin"

The danger of agranulocytosis due to amidopyrine and its derivatives is now so well known that few would wittingly advise the use of these drugs, yet this may be done unintentionally by prescribing certain proprietary preparations. Frequently the proprietary name gives no indication of the precise nature of the active principle, and thus cases of agranulocytosis due to amidopyrine or closely related compounds continue to occur. It seems that the exclusion by law of amidopyrine from proprietary preparations, as is done in Denmark, is the only sure way of preventing these fatalities (*Lancet*, 1951). Meantime, publication of cases may result in a wider appreciation of this hidden danger and so help to minimize it.

CASE REPORT

A married woman aged 67 was admitted to the surgical wards of the Western Infirmary, Glasgow, on November 7, 1953, complaining of vomiting and the passage of red blood per rectum of a week's duration. She had been operated on for haemorrhoids on two occasions and had received injections of liver extract for anaemia over the previous three to four years.

On admission she did not look very ill and her temperature was 100.4° F. (38° C.). The throat was red and oedematous; proctoscopy revealed an indurated, elevated sinuous ulcer on the anterior wall of the rectum. After three days in hospital she was still febrile and appeared slightly jaundiced. The diagnosis of agranulocytosis was established by blood examination, which showed: Hb, 13.4 g. per 100 ml.; P.C.V., 43%; red cells, 4,720,000 per c.mm.; white cells, 75 per c.mm.; icteric index, 25 units. The blood film showed normal red cells and adequate platelets, but white blood cells were extremely scanty. Of the first 50 leucocytes examined 2 were polymorphs, 10 monocytes, 36 lymphocytes, and 2 Türk irritation cells.

Inquiry revealed that, to control headache, novalgin had been taken occasionally for years, but during the last month 15 gr. (3 tablets) were ingested daily in divided doses up to the time of admission. The only other medicaments taken during the previous three months were a vegetable laxative and liver extract; in particular, no barbiturate drug had been used.

Intensive treatment with penicillin brought considerable improvement and a reduction in temperature, but five days after admission she suddenly became distressed and dyspnoeic. Treatment for massive pulmonary embolism was at once instituted, but she died within two hours.

The significant post-mortem findings were as follows. Slight icterus; throat merely slightly injected. A coiled embolus 1 cm. in diameter lay across the bifurcation of the pulmonary artery. The embolus was massive and as much as 25 cm. could be removed in one piece; the right side of the heart was acutely dilated. On dissection of the leg veins both femorals were found to be clear, but the intramuscular tributaries on the right side contained thrombus; it was concluded that embolus had originated in the right femoral vein. On the anterior wall of the rectum there was an elevated irregular area of ulceration 4 by 2 cm. which extended into the anal canal. The necrotic tissue was greenish on the surface and dull yellow underneath. The necrosis extended into the bowel wall for 3 cm. and the adjacent tissues were severely inflamed and oedematous. The bone marrow was hyperplastic, red marrow extending half-way down the femur. The spleen weighed 250 g., and neither it nor any of the other blood-forming tissues showed evidence of leukaemia. The liver showed merely toxic cloudy swelling.

On microscopical examination the rectal ulcer showed the typical appearance of an agranulocytic lesion, the cellular infiltrate being composed almost entirely of mononuclears, and necrosis and inflammatory oedema being very severe and widespread. The marrow contained numerous foci of erythroblasts, and megakaryocytes were also plentiful; polymorphs were absent and myelocytes were scanty. The marrow thus showed a severe maturation arrest of granulopoiesis amounting to aplasia, but no evidence of either leukaemia or pancytopenia.

COMMENT

The post-mortem findings establish the cause of death as pulmonary embolism following right femoral thrombosis in a case of agranulocytosis. The neutropenia was clearly due to failure of granulopoiesis without there being any disease process in the marrow to account for it. Since there was nothing to suggest splenic neutropenia (Hutchison and Alexander, 1954), and no history of cyclic attacks, but a clear history of the habitual use of novalgin, a sulphonated compound of amidopyrine known to have caused agranulocytosis, it seems reasonable again to incriminate this drug. The findings in our case correspond closely with previous accounts of agranulocytosis due to novalgin (Benjamin and Biederman, 1936; Klumpp, 1937; Plum, 1937); in particular, the unusually low white-cell count which we observed has been met with in other novalgin cases (Fitz-Hugh and Comroe, 1933; Ridpath, 1934), and ulceration of the rectum is recorded in the case described by Buck (1929).

The introduction of antibiotics has altogether transformed the prognosis in cases of agranulocytosis by controlling the generalized infections which formerly proved rapidly fatal. It seems probable that had embolism not occurred this patient's life might not have been forfeit to novalgin, for under treatment with penicillin she was not profoundly ill and her blood culture was negative. It is, however, evident from examination of her marrow after death that several more days would have been required to see her out of the danger period due to agranulocytosis; the precursors of the polymorphs had not returned to the marrow, and so recovery was not yet in sight.

We are grateful to Professor C. F. W. Illingworth for permission to report this case.

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Thomas's Sign, or the Silver Stool in Cancer of the Ampulla of Vater

Dr. A. M. Thomas, pathologist to the Royal Masonic Hospital, has pointed out that in cancer involving the ampulla of Vater the patient sometimes passes "silver stools"—that is, motions having the colour of oxidized silver or aluminium paint. The silver or grey stool is a combination of the white stool of obstructive jaundice and the black stool of melaena.

Biliary obstruction, whatever its cause, will produce a clay-coloured stool. Such a stool may contain blood from many sources. If the amount of blood is small it will not colour the stool appreciably. If it is large it will dominate the picture and lead to the typical black stool of melaena, but massive intestinal haemorrhage is either intermittent or fatal. If the blood comes from low down it will be red and not black. The combination of deep jaundice with steady intestinal haemorrhage coming from high up in the intestinal tract is seen regularly in cancer of the ampulla, and only rarely in other conditions.

CASE 1

A married woman aged 46 was admitted on September 30, 1952, with a history of intermittent jaundice for three months. She did not appear to have lost weight, but was very anaemic. Tests showed the jaundice to be of the obstructive type, and the stools contained occult blood in large amounts. The barium meal was reported to be normal, apart from spasticity of the pyloric antrum.

A laparotomy was performed on October 16. A carcinoma could be felt at the ampulla. The gall-bladder and common bile duct were grossly distended, and both contained white bile only. Cholecystostomy was performed. The discharge from the drain soon became green in colour. On October 30 pancreaticoduodenectomy was performed with ligature of the stump of the pancreas and implantation of the bile duct in the jejunum. Apart from some blood-stained discharge, convalescence was satisfactory.

Since discharge on January 1, 1953, the patient has remained very well, needing only small doses of insulin. She dislikes fats, but that has benefited two people—her in that she has regained her youthful figure, and me in that she sends me a regular supply of Devonshire cream.

CASE 2

A man aged 78 was admitted on February 14, 1954, with a suprapubic fistula, following prostatectomy at another hospital in November, 1953. His haemoglobin level was 50% and his general condition poor. He was given two pints (1,130 ml.) of packed cells, and shortly afterwards developed jaundice which at the time was attributed to the transfusion. His stools were sent for analysis, and Dr. Thomas reported that they had the silvery appearance that he had previously noted in Case 1. On this appearance he made a tentative diagnosis of carcinoma of the ampulla of Vater.

The jaundice deepened and the patient died on February 22 in hepatic failure. At necropsy a carcinoma 3 mm. in diameter was found at the ampulla of Vater. The haemorrhage on which the diagnosis had been made had, however, come from a colonic diverticulum.

COMMENT

The diagnosis has since been made in two further cases. So far as I am aware the silver stool has never been described before. I bring the sign to the attention of surgeons because Dr. Thomas has not yet reported it himself and, being a pathologist, he is likely to report it in a journal read only by his brother pathologists. Thomas's sign, which can be observed by a house-surgeon or nurse who is aware of its importance, is diagnostic of cancer of the ampulla of Vater, and will enable instances of this eminently curable lesion to be recognized at an early and operable stage.

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Reviews

CEREBROVASCULAR DISEASE

Cerebrovascular Disease. By James Peter Murphy, M.D. Foreword by Percival Bailey, M.D. (Pp. 408; illustrated. 90s.) Chicago: The Year Book Publishers, Inc. London: Interscience Publishers Ltd. 1954.

This scholarly work includes a survey of the anatomy and pathology of cerebrovascular disorders. These are then related to the clinical syndromes of disturbance of cerebral blood supply. There are chapters which have great contemporary interest, notably that dealing with the vexed problem of spasm of cerebral arteries and that concerned with occlusion of the whole carotid artery itself. Although cerebral angiography has so greatly increased our understanding of the events leading to brain dysfunction through anaemia or haemorrhage, knowledge of the physiology of the cerebral circulation is still pathetically inadequate, so that we are still inclined to consider events as though they were hydrostatic, in a field where hydrodynamic pressure gradients are all-important. The study of morbid anatomical specimens has encouraged the persistence of a static anatomical attitude to the problems, and so far the observation of flows through arteriography has done little to correct that attitude. Throughout Dr. Murphy's book there is apparent an awareness of this difficulty with an emphasis upon the activity of the vascular system as well as upon its structure.

Modification of intracerebral events by change in the vascular bed and in blood flow has been attempted in a number of contemporary procedures used in patients with hemiplegia of vascular origin. These have included, on the surgical side, stellate block, perfusion, and sympathectomy of the carotid vessels, and, on the medical, the immediate use of anticoagulants. Some recovery from vascular accidents being usual without intervention, it has been difficult to assess the results of these radical methods of management, but there is already a tendency to return to the more conservative methods of management which most neurologists have not forsaken. The subject remains, however, a controversial one. While the author has discussed the whole of this question in detail, he has done so in a balanced and thoughtful way which will give comfort to the conservative. At the same time, writing as a neurological surgeon, the author has included the appraisal, not obscured by details of technique, of the radical management of vascular anomalies of the convexity and of the basal vessels.

The work is a balanced one, whether dealing with the management of the lesion itself, of the symptoms to which it gives rise, or of the patient as a whole. Each chapter is followed by an adequate bibliography and is extensively illustrated by photographs of patients, specimens, radiographs, and experimental procedures. The volume contains an opportune review of the present knowledge of a subject whose literature extends to the beginnings of medicine.

DENIS WILLIAMS.

ABOUT WOMEN

Woman: Man's Equal? By Sir Adolphe Abrahams, O.B.E., M.D., F.R.C.P. (Pp. 176. 10s. 6d.) London: Christopher Johnson. 1954.

This may be regarded as a companion volume to the author's previous work, *Fitness for the Average Man*, the change in the title being made necessary by the fact that "nobody would be so foolhardy as to regard any woman as 'average.'" Whenever I read a book by Sir Adolphe Abrahams I am forcibly brought back to Laotse's "philosophy of the old rogue." Instead of reading a book about women by an eminent Western physician, I seem to be perusing the translation of an old Chinese manuscript

written by, say, Chaung-tzu or, if not by that great master himself, at least by one of his disciples. So strong is this feeling that when I lay down *Woman: Man's Equal?* I see in imagination its distinguished author no longer dressed as usual, but suitably arrayed in Chinese robes.

Far from insulting Sir Adolphe by associating him with the philosophy of the old rogue, I am according him the highest praise, for this philosophy is the product of the highest wisdom. There is a benevolence, a charitableness, and a good-natured humour in the works of Chaung-tzu and also in this book which makes them exceedingly pleasant to read. The author has undoubtedly enjoyed writing *Woman: Man's Equal*, and now his enjoyment seems to come back out of its pages to meet us.

Sir Adolphe deals with a motley of subjects, some of which at first sight would appear to be only remotely related to women, but all combine together to form an excellent dish. Everybody will find something to enjoy in this book and something to condemn in it, for, like the subject with which it deals, it is full of paradoxes, absurdities, and contradictions. I commend it to "misogynists, philogynists, feminists, romanticists, idealists, cynics, knights errant, realists, and rhapsodists"—to everybody indeed except the humourless moron. For the sake of our reputations, therefore, it will be necessary for us all to buy it.

KENNETH WALKER.

CARDIAC CATHETERIZATION

Der Herzkatheterismus bei Angeborenen und Erworbenen Herzfehlern. By Professor Dr. Otto Bayer, Dr. Franz Wolter, Loogen, and Dr. Hans Helmut. (Pp. 191+xii; 131 illustrations. D.M. 36.) Stuttgart: Georg Thieme. 1954.

In this book on cardiac catheterization in congenital and acquired heart lesions the authors give an account of this method of investigating heart disease based on 800 cases seen at Düsseldorf. Practically all the congenital lesions which exist to an age when investigation can be carried out are included. The first part of the book consists of a general description of materials and technique. There is a full account of Professor Bayer's method of calculating the areas of the pulmonary and mitral openings. The untoward results of the introduction of the catheter into the heart are described. There are well-written clinical and pathological introductions to each section, and these are usually clear and concise.

The schematic representations of the effects of lesions on the circulation need more explanation; they appear to be imitated without acknowledgment from Courmand's book, where they are much better done. The skiagrams are good. The cardiograms do not give the unipolar limb leads, and the other leads are not always labelled. Many of the recordings are marred by alternating current, and their description is often obscured with a curious use of the word "vector." The diagnosis of intra-auricular block needs some explanation. The pressure tracings are for the most part good, but some are poor and blurred and the whole curve is not always included. The phonocardiograms are also often blurred and indistinct. It is rather confusing to read first on one page that an atrial septal defect may cause a presystolic, on another a systolic, and on a third a diastolic murmur.

There is a list of references at the end of the book. This is not free from mistakes, and there is no link between it and the text.

TERENCE EAST.

OBSTETRICAL ESSAYS

Practical Obstetrics. By Bruce T. Mayes, M.V.O., M.B., B.S., F.R.C.S.(Edin.), F.R.A.C.S., F.R.C.O.G. Foreword by John A. Stallworthy, M.A., F.R.C.S., F.R.C.O.G. (Pp. 500; illustrated. 87s. 6d.) London and Sydney: Angus and Robertson. 1954.

This book first appeared in 1947, when it represented a collection of refresher "bulletins" prepared for medical officers serving in the Forces. It is now considerably modified and enlarged, and many will recognize it as a permanent

record of lectures delivered by Professor Bruce Mayes in this country while he was the Sims-Black Travelling Professor for 1954. The 38 chapters would be better termed "essays"—essays in the style of the older obstetricians who taught by detailed and graphic description of personally observed and treated cases, sometimes pointing out the moral themselves, often leaving and stimulating the reader to reach his own conclusion by approval or disagreement. They are suitable for reading in spare moments, for each is a separate entity. Most of the subjects fall within the range of obstetrics proper, but Professor Bruce Mayes does not hesitate to wander into the bypaths of dysmenorrhoea, sterility, and consulting-room technique. To one and all, however, he brings charm, wit, neat phrase, happy aphorism, and a philosophy based on clinical experience.

The book is an exposition of the art rather than the science of modern obstetrics, and it savours of the fireside chats of a wise doctor to general-practitioner obstetricians working in conditions in which they may have to take a good deal of clinical responsibility without having expert help immediately at hand. Scientific data and explanation are not allowed to take precedence over common sense; indeed, they are sometimes omitted, invented, or slightly distorted in order to provide a simple and logical working basis. But surely this falls within the bounds of teaching licence, and it is one of the secrets of the author's exceptional gifts as a teacher. Another is an appreciation of the psychological reactions of students and readers. On page 1 of Chapter I there is a footnote: "If you are in a hurry I suggest moving on to Chapter IV." This is enough to make even a reviewer hesitate to skip Chapters, I, II, and III.

T. N. A. JEFFCOATE.

CANCER

Cancer: Diagnosis, Treatment and Prognosis. By Lauren V. Ackerman, M.D., and Juan A. del Regato, M.D. Second edition. (Pp. 1,201; 702 illustrations, 23 colour reproductions. £8 10s.) London: Henry Kimpton. 1954.

This is a very unusual book containing an immense amount of valuable information and obviously based on wide experience and an extensive study of the literature, to which there are copious references. But its character can be appreciated only when it is realized that it is the work of a pathologist and a radiologist, both of great eminence in their respective fields. Their approach is therefore quite different from that of the surgeon, with his outlook primarily clinical and technical. This is perhaps best seen in the discussion of cancer of the respiratory tract, fully illustrated by diagrams and pathological photographs. But the interest is in large groups of cases and not in the treatment of any individual case.

The volume is chiefly of value for the careful and accurate description which it gives of the origin and spread of cancer in different regions, for its discussion of the relative value of surgery and radiotherapy, and for the full bibliography which it presents. It is admirably illustrated by diagrams, photographs, and photomicrographs.

HENRY SOUTTAR.

PSYCHOTIC ART

Insanity, Art, and Culture. By Francis Reitman, M.D., D.P.M. (Pp. 111; illustrated. 12s. 6d.) Bristol: John Wright and Sons, Ltd. 1954.

Psychotic patients have made drawings and paintings from time immemorial. These were not taken seriously until the latter part of the nineteenth century, when Simon and Lombroso used the productions for diagnostic purposes. The present-day revival of interest in imaginative art is focused mainly upon its use as a therapeutic agent; the diagnostic hints conveyed in the pictures are not missed, and now and then may be used to supplement other knowledge.

Dr. Reitman considers only the diagnostic significance of psychotic paintings. This narrow topic is amplified by some reflections on the symptomatic significance of the art products of psychotics in other countries. To this end material

was collected from mental hospitals in Asia, Africa, North America, and New Zealand. The aim of this comparative study is obscure, and certainly the results are not decisive, as might have been anticipated from the small number of pictures available. The author himself appears to attach little importance to the few conclusions reached.

Commenting on symbols, the author recalls the familiar fact that Freud and Jung (and their pupils) attach different values to the word "symbol." Freud's view is not given, but Jung is misrepresented as holding that symbols express "mystic collective images." Having brushed Freud and Jung aside, Dr. Reitman tells us what symbols are "in scientific usage"; they are "objects which are attended to not for their own sake, but for the sake of something else to which they refer." By this token the ringing of the telephone bell would be a symbol. But happily "scientific usage" as here understood is not the language of artists, psychotic or otherwise.

E. A. BENNET.

ELECTRONICS FOR PHYSIOLOGISTS

An Introduction to Electronics for Physiological Workers. By I. C. Whitfield, B.Sc., Ph.D. (Pp. 236; illustrated. 18s.) London: Macmillan and Co., Ltd. 1953.

It is very difficult to-day for a physiologist to avoid the use of electronic apparatus such as amplifiers, cathode-ray oscillographs, and electronic stimulators, which have become essential pieces of equipment in almost every branch of physiological research. While expert advice can always be obtained on problems of electronics, it is obviously better for the physiologist himself to have some understanding of his apparatus and methods, however complex or specialized they may be.

This book sets out to fill a gap between the elementary radio textbook and the more specialized monograph dealing with electronics and biological research. In the earlier chapters the author gives an account of the fundamental ideas of electronics, with due emphasis on those parts of the subject which have special importance in biological work. A certain background of electrical theory and elementary physics is assumed, and these chapters serve rather as a reminder of earlier and possibly forgotten groundwork. The chapters dealing with amplifiers and oscillators are more detailed, and quantitative treatment has been given when possible, thus giving the book an essentially practical slant. The problems of "noise," interference, and screening have been clearly and simply dealt with, and the author discusses in some detail the important question of electrode and inter-electrode resistance. Throughout the book there are references for further reading; as the author points out in his foreword, this book is not for those who hope, in an idle hour, to pick up something about electronics.

W. F. FLOYD.

When Rush Medical College was opened in Chicago in 1843 about thirty other medical schools were already functioning in the U.S.A., many of them patterned after the Edinburgh school. Benjamin Rush, after whom the college was named, was an Edinburgh graduate, a friend of Benjamin Franklin, a signatory of the Declaration of Independence, and the first great American physician. He introduced clinical teaching at Pennsylvania Hospital, to which he was physician for 30 years. He died in 1813. Rush Medical College was founded by Daniel Brainard. In its first year the requirements for the M.D. degree were three years of study with a respectable physician, two courses of lectures (the second at the school) and the submission of a thesis. In 1877 the college decided to establish a hospital, which opened in 1883 as the Presbyterian Hospital. After affiliation with the University of Chicago in 1898, Rush became an integral part of the University in 1923, but as time passed the plan to confine the college to postgraduate education became less appealing to Rush and to the hospital, and the union was dissolved in 1941, leaving Rush once again independent. Its history is briefly told by Ernest E. Irons in *The Story of Rush Medical College* (Chicago, published by the College, 1953), a book of 82 pages which is a useful addition to the history of medical education in the U.S.A.

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INFLUENZA

Our old winter enemy influenza is with us once again, though if it is any consolation to either patient or doctor it appears that virus B, which is usually associated with a less severe form of illness, has been mainly responsible so far. But it is too early to predict the future course of events. In its true epidemic form influenza presents a characteristic picture familiar to all, but there are many occasions when diagnosis on purely clinical grounds is not so simple. Influenza is not notifiable in the United Kingdom, but the certified deaths from influenza and pneumonia in the 160 great towns (formerly 126) of England and Wales indicate the general trend of acute respiratory infection. Clearly this is a very crude index of influenza, and the recent introduction of a "spotting scheme" in which selected general practitioners and regional laboratories have co-operated has already made progress in determining the part played by the influenza viruses in respiratory disease.¹ At an international level the World Influenza Centre is concerned with the serological classification of virus strains² and in tracing the spread of the disease.³

Two main serological types of influenza virus, A and B, are now recognized. A third, C, has been described, but its role in human disease is not yet understood. It appears to be associated with a minor form of illness.⁴ All major epidemics, which occur on an average every two to three years,⁵ have been associated with virus A. Virus B, on the other hand, tends to be endemic and an annual source of mild influenza,⁶ but epidemics have been caused by it.⁶ Recently virus A has been responsible for extensive and, in some areas, severe influenza—during the winters of 1950-1 and 1952-3. Virtually no influenza was encountered in 1951-2 and 1953-4.

In the past twelve months sporadic cases due to virus A occurred in February, 1954, and a few cases of influenza B in the spring, with a sharp outbreak

at a school in the midlands. During the summer virus A was detected in cases arriving by sea from South Africa, but the disease did not spread in Britain. In September influenza appeared in Wales, later on Tyneside. Within the next few weeks many cases were reported in Scotland and in general north of a line joining the Humber and the Severn. Serological evidence of virus B was obtained. By the end of the year similar cases appeared in the south and in the London area. Occasional cases of virus A and of virus C have also been encountered. People of all ages have been affected, but several reports have indicated a high attack rate in school-children. The weekly figures of certified deaths from influenza up to January 8 have been 56, 66, 56, 82, and 102; the deaths seem to be chiefly of elderly people. These figures show a fairly sharp rise and it is too early to say how the outbreak will compare with those of previous years. The general impression so far is one of increased prevalence, with local outbreaks, and is not unlike the behaviour of influenza B in 1945-6.⁶ On the whole the behaviour of virus B this winter is in keeping with the idea that influenza due to this virus is generally less severe than that caused by virus A, but it is impossible to distinguish the two on clinical grounds alone.

In addition to true virus influenza a number of less well differentiated respiratory infections have been reported. Influenza-like illnesses (but without influenza virus) have occurred all over the country; so-called influenza with vomiting (distinct from epidemic nausea and vomiting) and other cases with encephalitic symptoms have been seen. An increased incidence of virus or primary atypical pneumonia has also been reported. There is certainly plenty of scope for sorting out this mixed collection of acute respiratory infections into aetiological types.

Prophylactic immunization with killed virus vaccines prepared in the fertile egg has given encouraging results; the timing of the vaccination and the incorporation of the correct virus strains are important.^{7,8} The main disadvantages are the short-term effect of such vaccines—research into this is now in progress—and also the cost. Vaccination is likely to be practicable only in protecting selected groups of individuals rather than the population as a whole. No drug has yet been found effective against influenza or indeed against any of the small viruses. Many have been tried.⁹ Prophylactic chemotherapy to control secondary bacterial infection in uncomplicated influenza is best reserved for those patients with existing lung disease or for old or debilitated patients; on the other hand, influenza complicated by bronchiolitis or pneumonia requires energetic

¹ *Monthly Bull. Minist. Hlth (Lond.)*, 1954, 206.

² *Andrewes, C. H., Wild Hlth Org. Monograph Series*, 1954, No. 20, 9.

³ *Isaacs, A., and Archetti, I., Lancet*, 1954, 2, 457.

⁴ *Francis, T., et al., Science*, 1950, 112, 495.

⁵ *Isaacs, A., Brit. med. Bull.*, 1953, 9, 208.

⁶ *Dudgeon, J. A., et al., Lancet*, 1946, 2, 627.

⁷ Report by M.R.C. Committee, *British Medical Journal*, 1953, 2, 1173.

⁸ *Francis, T., Wild Hlth Org. Monograph Series*, 1954, No. 20, 125.

⁹ *Hurst, E. Weston, Brit. med. Bull.*, 1953, 9, 180.

¹⁰ *Stuart-Harris, C. H., Influenza*, 1953.

¹¹ *Mulder, J., and Stuart-Harris, C. H., Wild Hlth Org. Monograph Series*, 1954, No. 20, 141.

treatment with antibiotics.^{10 11} Until such time as a specific anti-viral compound is produced the best advice is to stay in bed and keep warm.

POST-OPERATIVE WEIGHT LOSS

It is not clear whether the phase of weight loss and protein catabolism which follows fractures^{1 2} and surgical operations³⁻⁶ is part of the defence of the body against trauma, as Moore believes,⁷ or whether it is due solely to the restriction of caloric intake in the immediate post-operative period, as the experiments of Werner suggest.⁸ What is certain is that convalescence is prolonged and wound healing delayed in patients coming to operation in a poorly nourished state. One surgeon shares Julius Caesar's preference for the fat, who he finds stand major surgery better than thin people, presumably because they have a large store of potential calories on which to draw after the operation.⁹ Poorly nourished patients have been shown to have a "predepleted metabolic response" to operation, which consists in only small negative nitrogen and potassium balances, with a potassium/nitrogen ratio approximating to that found in the tissues.¹⁰ The protein and caloric reserve of such patients should be built up before operation, and even the frailest patient may gain weight and strength to withstand major surgery by a regime of forced feeding with a high-protein and high-caloric intake.⁹ Patients who are assessed as being well nourished before operation can, by forced feeding, retain enough nitrogen in the pre-operative period to allow for their post-operative loss and still leave them in positive balance over the whole period before, during, and after operation.¹¹

In the post-operative period some investigators have found it impossible to meet the demands of the body for nitrogen to replace what is lost in the catabolic phase.^{6 12} In this issue of the *Journal* Drs. D. Davies and A. Pines report (p. 200) that they were unable to arrest post-operative weight loss in tuberculous patients, who were taking an ordinary hospital diet,

by the administration of the protein anabolic hormone methylandrostenediol. Details are not given of the amount of calories and nitrogen their patients were receiving, and it is possible that the dietary intake may have been surprisingly low, especially in calories. Sutherland has suggested a number of reasons for this from her experience in Edinburgh, which she believes may be applicable in hospitals elsewhere.¹³ On the other hand, Riegel *et al.*¹⁴ were able to maintain their patients in nitrogen balance or positive nitrogen balance during the first five days after operation with an intake which supplied 0.3 g. nitrogen and 30 calories per kg. body weight per day. This is modest compared with the amounts Brain regards as necessary for his malnourished patients during the pre-operative period.⁹ Although in short-term experiments it is possible to maintain nitrogen balance with an adequate nitrogen intake and without additional calories,¹⁵ those who have been wholly or partly successful in anticipating¹¹ or covering the loss of weight and nitrogen after operation all stress the importance of adequate caloric intake,^{14 16} particularly for patients with burns.¹⁸

When possible, food should be given by mouth. Patients unable to take it thus in the pre-operative period may receive it through a preliminary gastrostomy or jejunostomy, though care must be taken when feeding by jejunostomy not to give hypertonic feeds, which the jejunum does not tolerate well.¹⁴ Some patients regain their appetite as their nutritional state improves on this regime.⁹ Even when there is no obstacle to oral feeding, loss of appetite may make it impossible to provide an adequate caloric intake, and in such cases tube-feeding may be necessary. This is often successful if the patient can tolerate it, but may be complicated by severe dehydration.¹⁷ The amount absorbed, even of glucose and water, is too uncertain to make rectal feeding with amino-acid mixtures a desirable method.¹⁸

When some form of alimentary feeding is not possible food must be injected intravenously. Whole protein in the form of blood transfusions, plasma infusions, and human serum albumin have been successfully administered,¹⁶ or perhaps more commonly protein hydrolysates. A. W. Wilkinson *et al.*⁶ found that the use of such preparations merely increased the urinary nitrogen excretion to an amount nearly equivalent to the amount given as the hydrolysate. Whatever the method for giving the nitrogen intravenously, it is in the provision of calories that the difficulties arise. If glucose alone is added to the source of nitrogen for this purpose, extremely hypertonic solutions must be used, which cause thrombosis in peripheral veins, though they may be infused slowly

with safety into the inferior vena cava.¹⁸ Alcohol, which has a high caloric value, has been given intravenously in mixtures with amino-acids and glucose.^{19 20} It is said to have the additional advantage of raising morale and reducing the need for morphine, and to be non-toxic in the quantities employed.²⁰ But the material of choice for the caloric component of intravenous feeding is fat. Fat emulsions have a high caloric value and high molecular weight, with a low osmotic pressure, so that they can be used in only slightly hypertonic concentrations. There is considerable evidence of their value as an intravenous source of calories,^{21 22} but unfortunately they are not generally available in Britain.

FUNGUS ALLERGENS

The dense fog that suddenly enveloped part of London last Sunday was a sharp reminder again that city smoke is a menace to health. Now another aspect of air pollution has been reviewed by Kate Maunsell.¹ She has pointed out the many problems that arise from sensitization due to inhalation of fungal spores. The potential sensitizing effect of grass pollen and *Penicillium* spores was first noted by C. H. Blackley,² of Manchester, over a hundred years ago. His observations were largely forgotten, as were his classical experiments when he demonstrated by means of pollen traps and skin tests that grass pollen was the cause of summer catarrh. After sixty years W. S. Van Leeuwen,³ in Holland, became interested in the moulds as a cause of respiratory allergy, and by 1946 H. A. Hyde and D. A. Williams,⁴ at Cardiff, had begun their systematic study on the pollen and spore content of the air. The usual method of tracing the common airborne fungi was by exposing Petri dishes containing suitable culture media, though many fungi for various reasons will not grow on the ordinary laboratory media. More recently quantitative techniques have been used. A measured sample of air impinges on a sticky glass slide, and in the automatic spore trap devised by J. M. Hirst⁵ the trapped particles can be graded in size. The number and different types of fungal spores as well as other potential sensitizers and bronchial irritants can be measured hourly or daily, and the seasonal variations can be studied.

M. Richards,⁶ when working for the Asthma Research Council, made a survey of the spore content of the air at nine different stations in Great Britain.

He found that, as well as a seasonal variation, there is a considerable difference in mould spore content between town and country. The increase in spores occurs from April to November, rising to a high peak in July and August. In patients allergic to fungus spores symptoms of hay fever, sometimes with an associated asthma, occur during the months of the heaviest spore cloud. The symptoms may be combined with other inhalant allergies, particularly to grass pollen. A knowledge of both the pollen and mould spore seasons is therefore necessary before investigating patients with seasonal symptoms. Symptoms during June to mid-July are almost certainly, if confined to this period, caused by grass pollen. Symptoms from mid-July to September are probably due to fungal spores, and generally to those of *Cladosporium*. In a pollen-sensitive patient eye irritation is nearly always one of the symptoms, while a patient sensitive to mould spores does not seem to experience this. The antigenic extracts made from mould spores are much weaker than pollen extracts. Intradermal testing with pollen extracts, except with very diluted solutions, is not recommended owing to the likelihood, except in experienced hands, of a severe constitutional reaction in a sensitive patient, while intradermal testing is the method of choice in a mould-sensitive allergic patient. In general the treatment of the mould-sensitive patient is much the same as the pollen-sensitive—a careful history, confirmatory skin tests, and hyposensitization when dust elimination or symptomatic drugs do not afford relief.

Fungi are more prevalent in humid areas, and many patients report aggravation of symptoms near rivers and in valleys, especially on clay soil. The east and south-east coasts of England suit the mould-sensitive patient, but not the coastal areas of Dorset, Devon, and Cornwall. Yet it is unwise to be dogmatic about suitability of localities, because there are marked local differences. Houses that have been slightly damaged by bombs, old houses, and houses that have had a blocked rain-water pipe may have become affected by the wood-destroying fungus of dry rot (*Merulius lacrymans*). A. W. Frankland and M. J. Hay⁷ were the first to show that dry rot, which is so often quite unsuspected in a house, can give rise to inhalant allergic symptoms. Professor P. H. Gregory and his colleagues⁸ found 75,000 spores per cubic metre of air in a cellar which contained dry rot, with 16,000 spores per cubic metre in the first-floor room. The occupational hazards of sensitization by mould spores are seen in dock workers unloading infected materials, particularly grain, second-hand furniture dealers, and gardeners, especially those growing tomato plants that become infected with *Cladosporium*. But perhaps it

¹ Cuthbertson, D. P., *Biochem. J.*, 1930, 24, 1244.
² — *ibid.*, 1931, 25, 236.
³ Howard, J. E., *et al.*, *Bull. Johns Hopk. Hosp.*, 1944, 76, 156.
⁴ Brunswick, A., *et al.*, *Ann. Surg.*, 1942, 115, 1091.
⁵ Riegel, C., *et al.*, *J. clin. Invest.*, 1947, 26, 18.
⁶ Wilkinson, A. W., *et al.*, *Lancet*, 1950, 1, 533.
⁷ Moore, F. D., *Nutr. Abstr. Rev.*, 1948, 8, 161.
⁸ Weiner, S. C., *et al.*, *Ann. Surg.*, 1949, 130, 688.
⁹ Brain, R. A. I. F., *Proc. roy. Soc. Med.*, 1954, 47, 987.
¹⁰ Moore, F. D., and Ball, M. R., *The Metabolic Response to Surgery*, 1952, Springfield, Illinois.
¹¹ Koop, C. E., *et al.*, *Ann. Surg.*, 1946, 124, 1165.
¹² Cuthbertson, D. P., *Brit. J. Surg.*, 1936, 23, 505.
¹³ Sutherland, A. B., *Proc. roy. Soc. Med.*, 1954, 47, 995.
¹⁴ Riegel, C., *et al.*, *J. clin. Invest.*, 1947, 26, 18.
¹⁵ Elman, R., *Parenteral Nutrition*, 1947, New York.
¹⁶ Rhoads, J. E., *Fed. Proc.*, 1952, 11, 659.
¹⁷ Engel, F. L., and Jaeger, C., *Amer. J. Med.*, 1954, 17, 196.
¹⁸ Russell, C. S., *et al.*, *Lancet*, 1954, 1, 902.
¹⁹ Moore, D. C., and Kowp, M., *Surg. Gynec. Obstet.*, 1945, 80, 523.
²⁰ Rice, C. O., *et al.*, *Ann. Surg.*, 1950, 131, 289.
²¹ Shafroff, B. P., *et al.*, *Surg. Gynec. Obstet.*, 1949, 89, 398.
²² — and Mulholland, J. H., *Ann. Surg.*, 1951, 133, 145.
²³ Van Itallie, T. B., *et al.*, *Arch. Intern. Med.*, 1952, 89, 353.
²⁴ Kinsell, L. W., *et al.*, *Calif. Med.*, 1954, 81, 218.

¹ *J. Laryng.*, 1954, 68, 765.
² *Catarrhus Astilvus (Hay fever)*, 1873. London.
³ *Proc. roy. Soc. Med.*, 1924, 17 (Therap. and Pharm. Sect.), 19.
⁴ *Trans. Brit. mycol. Soc.*, 1946, 29, 78.
⁵ *Ann. appl. Biol.*, 1952, 39, 257.
⁶ *Int. Arch. Allergy*, 1953, 4, 360.
⁷ *Acta allerg. (Kbh.)*, 1951, 4, 186.
⁸ *Ibid.*, 1953, 8, 168.
⁹ Swaebly, M. A., and Christensen, C. M., *J. Allergy*, 1952, 23, 370.

is the housewife who is most exposed, since it has been found⁹ that up to 1,000,000 spores of the common fungi are present per gramme of household dust.

BACTERIAL GENETICS

The field of bacterial genetics is one in which discoveries of the highest importance, both to medicine and to genetics, have been made in recent years. Interest in the genetics of bacteria was aroused by two events: the finding by O. T. Avery, C. M. MacLeod, and M. McCarty¹ in 1944 that the capsular transforming agent in the pneumococcus was composed of deoxyribonucleic acid (D.N.A.), and the discovery by J. Lederberg and E. L. Tatum² in 1946 that interchange of hereditary material had occurred in the daughter-cells from a mixed culture of different strains of *Escherichia* (*Bacterium*) *coli*.

The report in this *Journal* last week³ of the recent meeting on bacterial genetics held at the London School of Hygiene and Tropical Medicine reveals the remarkable advances made during the last decade. The hereditary mechanism of bacteria has been found to bear many resemblances to that of higher forms of life; notably in the occurrence of a particulate (as distinct from a blending) type of inheritance, associated with mutation, dominance, linkage, crossing-over, and linear linkage groups. On the other hand, bacteria show two major differences from normal Mendelian inheritance: first, in the elimination of a segment of the hereditary material from diploid cells, such as apparently occurs regularly in *E. (B.) coli*; and, secondly, in having mechanisms for the transfer of genetic material other than by close association of parent cells. These mechanisms include the phenomena of transformation—known in the pneumococcus, in *Haemophilus influenzae*, and in the meningococcus—in which the hereditary character of cells is permanently changed by treatment with D.N.A. obtained from another strain of the same species; and of transduction—known in *Salmonella*—where hereditary factors are transferred from one strain to another by means of bacteriophage. The hereditary mechanism of viruses, and in particular of bacteriophage, is closely bound up with that of the host. There is increasing evidence that the hereditary material of both bacteria and phage is composed of D.N.A. Indeed, phages behave in some respects as though they were part of a bacterium's genetic material which has come adrift from its proper place and has multiplied at the expense of the host.

There is still much to be learned about the mechanism of inheritance in bacteria. The realization that recombination of characters is apt to occur whenever a host is infected simultaneously by more than one strain of a pathogenic bacterium is of special significance in medicine. It implies that new strains of such bacteria, differing in biochemical and antigenic properties and in virulence, are apt to arise with much greater frequency

than would be possible if these bacteria were merely propagated vegetatively. For the geneticist, the opportunity provided by bacteria and viruses for studying the properties of D.N.A. is of great value in elucidating the basis of inheritance, not merely in these organisms, but also in plants and animals generally, since D.N.A. appears to be the fabric of the gene. As mentioned in last week's report,³ the separation by chromatography of D.N.A. obtained from streptomycin-resistant pneumococci into a number of fractions differing both in chemical composition and in transforming ability opens the possibility of establishing the chemical composition of a specific gene. Moreover, if a mutation such as from streptomycin-sensitivity to streptomycin-resistance comes to be understood chemically, then the control of such mutations will be a real possibility.

HISTONES AND CANCER

The nucleic acids, and especially deoxyribose nucleic acid (D.N.A.), the characteristic nucleic acid of the cell nucleus, have attracted much experimental work because of the suspicion that they carry the genetic characteristics of the cells (see preceding annotation). It is natural that some interest should be shown in the basic proteins which accompany the D.N.A. in the chromosomes. Little is known of the nature of these compounds, except perhaps the simple protamines, which occur in a limited group of fish sperm nuclei and have been extensively investigated by Felix at Frankfurt.

The rather more complex basic proteins, known as histones, which occur in the nuclei of mammalian cells have been investigated by E. Stedman and E. Stedman.⁴ In a recent communication H. J. Cruft, C. M. Mauritzen, and E. Stedman⁵ present further evidence of the physico-chemical characterization of these substances, and claim, first, that the histones are cell-specific, and, secondly, that there is a qualitative difference between the histones of cancerous and those of normal cells. The last claim, if confirmed, would be of great importance. If the first proposition is true, the second necessarily follows. However, it would not be easy to prove this, since it would be necessary first to characterize the histones of all the normal cells of the organism. Unfortunately the characterization of the histones of even the most studied tissues, such as beef thymus, leaves a lot to be desired, and it is doubtful if the present information does much more than support a suspicion of differences between the histones of different tissues of one animal.

Even the number of histones present in normal tissues is doubtful. Cruft *et al.* regard a triple electrophoretic pattern as normal, consisting of a large central peak, which they attribute to the main histone, with subsidiary peaks on each side. J. A. V. Butler and his colleagues, however, have reported in a recent paper⁶ that a histone solution which originally showed two electrophoretic

peaks gradually developed, on standing, a third intermediate peak, owing apparently to the formation of a complex of the two original components. The evidence given by Cruft *et al.* of the specificity of histone fractions derived from different tissues is also not very convincing to those who have had experience of establishing iso-electric points. The other test proposed is the occurrence of a single electrophoretic peak when histones from different tissues are dialysed together for sixty hours but a double peak when dialysed separately and mixed just before the electrophoresis is begun, but this hardly carries sufficient conviction in view of the changes which occur on prolonged dialysis in a neutral medium.⁷ The proteins isolated by Cruft *et al.* from cancerous tissue (for example, an iso-electric point at about pH 7.0 is cited in one instance) are certainly so different from normal histones that a doubt remains whether they should be regarded as histones at all. An analysis of them would be of great interest. The conclusions reached by Cruft, Mauritzen, and Stedman may well prove to be correct, but more research is needed before a critical estimate of the position can be made. An established claim to have discovered characteristic differences between normal and malignant cells would be a most notable advance, and the matter will no doubt be pursued further.

FLUORIDE IN WATER

Although some 1,000 communities in the United States have added fluoride to their water supply, the Select Committee of the House of Representatives was rightly cautious about the effects of this measure and suggested that in areas with a high fluoride level in the drinking water investigations should be made into bone development and diseases and kidney diseases. The Institute of Dental Research of the National Institute of Health and the Public Health Service undertook the study, and a team of workers has now completed a comprehensive survey in Texas.¹ The epidemiological experience of Bartlett, with the very high fluoride content of 8 p.p.m. in the water supply, was compared with that of Cameron, where the level was only 0.4 p.p.m. Both towns were similar in geographical situation and racial composition and they were mainly agricultural communities. The composition of the drinking water differed in other respects, that of Bartlett containing four times the amount of dissolved solids as that of Cameron. The largest differences between the components were in sodium and potassium, which together were 26 times greater in Bartlett than in Cameron, and chloride, which was 11 times greater.

The investigation was begun in 1943 and included only people who had been residents in the towns for the preceding fifteen years. The medical history since birth was recorded at the start of the study and the medical experience during the period 1943–53 was carefully reviewed. The number of persons concerned was 116 in Bartlett and 121 in Cameron. In both areas the males formed only one-third of the total. The age dis-

tribution of the population differed between the towns: 44.8 of the persons were over age 50 in Bartlett in 1943 compared with 24.8 in Cameron. Deaths were naturally more numerous during the ten years in Bartlett than in Cameron, there being 14 in Bartlett to 4 in Cameron. The difference between the age-corrected death rates was not statistically significant. The incidence of abnormal clinical findings was very similar in both towns. The only abnormality which had a significantly different incidence was disease of the cardiovascular system (except uncomplicated hypertension) with a percentage of 23.9% in Cameron and 12.5% in Bartlett. Bone changes were determined from radiographs taken in 1943 and 1953. The percentage abnormalities for changes in density, coarse trabeculation, hypertrophy, spurs, and osteoporosis were measured, but none of the differences were statistically significant. The only abnormal laboratory finding which was significant in both years was the differential count of neutrophils, the value in Bartlett being 21.1% in 1943 and 29.5% in 1953 compared with 8.5% and 15.9% in Cameron. Abnormalities in the white blood count were significantly larger in Bartlett in 1943—14.7% compared with 4.1% in Cameron—but not significantly larger in 1953—14.1% compared with 8.5%. The abnormality of albuminuria was significantly commoner in Cameron in 1943, being 8.3% compared with 2.6% in Bartlett; in 1953 the respective percentages were 14.1 and 6.5, and the difference was not significant. The authors conclude that apart from dental fluorosis in Bartlett and a higher rate of cardiovascular abnormalities in Cameron there were no significant differences between the findings in the two towns.

VOLUNTEERS

Two features of the experimental situation need watching when volunteers are used as subjects for medical research: first, if inferences about average healthy subjects are to be drawn from the experiments, the subjects taking part in them ought preferably to be in that category; secondly, for ethical reasons the experimenter would wish to take only those subjects whose volunteering is entirely free of any unhealthy compulsion. A small investigation recently conducted into the psychology of a group of volunteers at the Harvard Medical School is a pertinent indicator that they may be a stranger lot than they seem at first sight. Some pharmacological experiments with drugs were being carried out on 56 supposedly healthy young men, nearly all college students, aged 21 to 28. The results of Rorschach tests on them and psychological interviews are reported by Lasagna and von Felsinger.¹ Among these 56 volunteers were found 3 with psychosis (2 of them practising homosexuality), 12 with psychoneurosis (1 under treatment and 6 seeking it), 3 with psychopathic personality, 1 alcoholic, 4 practising homosexuals (in addition to the 2 psychotics), 1 with severe peptic ulcer, and 1 with severe stutter. An investigation into the reasons for volunteering (apparently not confined to the maladjusted members

⁴ Stedman, E., and Stedman, E., *Philos. Trans. B*, 1951, 235, 565.
⁵ Cruft, H. J., Mauritzen, C. M., and Stedman, E., *Nature (Lond.)*, 1954, 174, 580.

⁶ Davison, P. F., James, D. W. F., Shooter, K. V., and Butler, J. A. V., *Biochim. biophys. Acta*, 1954, 15, 415.

⁷ Butler, J. A. V., Davison, P. F., James, D. W. F., and Shooter, K. V., *ibid.*, 1954, 13, 224.

¹ Avery, O. T., *et al.*, *J. exp. Med.*, 1944, 79, 137.

² Lederberg, J., and Tatum, E. L., *Cold Spr. Harb. Symp. quant. Biol.*, 1946, 11, 113.

³ *British Medical Journal*, 1955, 1, 161.

¹ *Science*, 1954, 120, 359.

² *J. soc. Psychol.*, 1942, 16, 259.

³ *J. abnorm. soc. Psychol.*, 1952, 47, 259.

¹ *Publ. Hlth Rep. (Wash.)*, 1954, 69, 925.

of the group) showed that some took part for the monetary rewards, which are unspecified here. Some hoped to find professional help or "a drug that might prove 'the golden key' to their personality problems." Some were in search of new experiences; some sought release from personal problems. As might be expected, the subjective effects reported by some of these men when they were tested with various drugs such as pentobarbitone or mescaline bore a sufficiently strong relationship to the subject's personality to make generalization in a wider population hazardous.

Studying the volunteer response as such, Marlow found² in the course of an investigation into women's sexual behaviour that volunteering was associated with high dominance feeling and unconventional sexual conduct. Marlow and Sakoda,³ studying some of Kinsey's subjects, report that volunteer groups consistently have a higher self-esteem score than non-volunteer groups. They recommend that when volunteers are used a test for volunteer error should be made before results of the tests are published as representative of a general population. This may be seen as the corollary of a normal practice in experimental laboratories—namely, the testing and standardization of materials with which experiments are carried out—and the Harvard investigation is a useful reminder of old principles in a rather unexpected context.

TREATMENT OF ASTHMA WITH CORTISONE AND A.C.T.H.

Although spectacular results have been obtained with cortisone and corticotrophin in the treatment of severe chronic asthma, there are four important reasons for caution. The treatment is not without danger; most patients who respond satisfactorily relapse when it is discontinued, and it is wise to presume that when cortisone therapy of chronic asthma is begun it may have to be continued indefinitely; many patients gain weight so quickly that adequate dosage cannot be maintained; and some fail to respond in any way. The rising number of fatalities is disturbing. Savidge and Brockbank⁴ recently collected from published reports the details of eleven patients with severe bronchial asthma who had died under treatment: seven were having cortisone, two corticotrophin, and two both drugs. Until more is known of the mode of action of these substances they cannot be exonerated from blame. Furthermore, fatal anaphylactic reactions have been attributed to corticotrophin. The frequency with which patients relapse after treatment is well shown by recent statistics published by Kania and Schmidt,⁵ who treated 111 patients with cortisone. Eighty-five were completely relieved, 21 were much improved, and 5 were not benefited. Relief was only temporary, and symptoms usually returned two to four weeks after cortisone was withdrawn. Unpleasant and even severe side-effects are often a consequence of long-continued treatment. The most common is the

tendency to gain weight. Usually this is due to an increase in body fat, but sometimes a rapidly developing oedema is a result of the salt-conserving action of cortisone on the renal tubules. Experimentally these drugs have caused suprarenal atrophy and decalcification of bone. In spite of these serious disadvantages the use of cortisone and corticotrophin is fully justified if they can return health and happiness to severe chronic asthmatics who have resisted all other forms of treatment. Cortisone can achieve this.⁶ Corticotrophin has been more difficult to obtain in this country, but has given excellent immediate results, notably in the relief of status asthmaticus. It has the disadvantage compared with cortisone that it must be given by injection, but the longer-acting A.C.T.H. gel seems equally effective and need be given only once daily. Elsewhere in this issue Dr. J. E. G. Pearson describes the successful treatment of 8 out of 10 patients with severe status asthmaticus or prolonged and incapacitating asthma, though his series also illustrates the tendency to relapse after treatment has ceased. This was not a blind trial of the remedy, though so far as was possible the patients were prevented from knowing that they were being given A.C.T.H.

The Medical Research Council is at present conducting a trial of the use of cortisone in the treatment of chronic asthma and status asthmaticus at a number of different centres. Trials of this kind must be strictly controlled, and so far as the doctors and patients are concerned must be blind trials. No one close to the patient must know whether cortisone or an inert substance is being used, because the knowledge that a new form of treatment is being tried is likely to have a strong psychological influence on the asthmatic patient. Some patients have done astonishingly well for many months on inert preparations; and some are loud in their praise of the benefits of cortisone, although they have never had any except in their imagination. All physicians who have had experience with these drugs emphasize that it is wise to restrict them to cases of chronic asthma in which every other treatment has been tried and failed and to cases of status asthmaticus that have resisted adrenaline injections and intravenous aminophylline given four-hourly for twenty-four hours. In most cases of status asthmaticus spasm is relieved by this treatment. Long-acting adrenaline is often not nearly so effective as frequent doses of the simple solution, and intramuscular aminophylline, besides having a much less powerful action than when given intravenously, is very painful and sooner or later will lead to necrotic abscesses.

So far as this country is concerned the therapeutic value of cortisone and corticotrophin in asthma is still *sub judice*. American opinion is much less enthusiastic than it was. Gottlieb,⁷ writing from Philadelphia, begins a masterly review of the 1953 literature with these words: "Although no one gainsays the importance of cortisone and corticotrophin as additions to our armamentarium, one senses in the voluminous literature an increasing emphasis on their limitations, on adherence to stricter indications, and on their potential dangers. . . . Few fail to indicate that avoidance of allergens, hyposensitizing injections, and other therapeutic measures are essential for proper management."

² *Lancet*, 1954, 2, 893.

³ *Munch. med. Wschr.*, 1954, 96, 759.

⁴ Savidge, R. S., and Brockbank, W., *Lancet*, 1954, 2, 889.

⁵ *Ann. Allergy*, 1954, 12, 483.

EMERGENCIES IN GENERAL PRACTICE THE DIFFERENTIAL DIAGNOSIS OF COMA

BY

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Coma is a state of deep unconsciousness from which the patient cannot be roused by ordinary forms of stimulation. There is a total absence of any kind of psychologically understandable response to such stimulation as pinching the skin or vigorous shaking of the patient, but the term "semicoma" is sometimes used to describe those states of less deep unconsciousness in which there may be grimacing or withdrawal movements of a limb on the application of such stimuli.

Importance of an Orderly Approach

There are many possible causes of coma, but for practical purposes a broad distinction may be made between those cases in which coma has supervened as a late development in a patient suffering from a known disease and those in which it is an early and outstanding feature. Greater difficulties in differential diagnosis are likely to be encountered in the latter circumstances, and it is with such cases that this article is mainly concerned.

In dealing with an individual case of coma it is better to adopt a systematic but relatively simple plan of approach as opposed to one which aims at all-inclusiveness at the expense of being unwieldy and unnecessarily lengthy. A scheme based upon the following lines is therefore recommended: (1) An initial consideration of the likeliest causes in the particular patient to be examined. (2) The obtaining, wherever possible, of a history of the events immediately preceding the onset of the coma from any available source—that is, from relatives or witnesses. (3) A systematic physical examination of the patient. (4) A consideration of other less common causes if the underlying disease process is not immediately evident after careful appraisal of all the ascertainable facts.

The causes of coma can be grouped in order of importance as follows:

Cerebrovascular Catastrophes and Conditions Causing Cerebral Ischaemia.—Intracerebral and subarachnoid haemorrhage, thrombosis, embolism, hypertensive encephalopathy, terminal congestive heart failure, severe anaemia due to loss of blood or blood disease, leukaemia, Stokes-Adams syndrome.

Brain injuries, including their complications.

Metabolic Disorders and Endogenous Intoxications.—Diabetes, hyperinsulinism, renal and hepatic failure, Addison's disease.

Post-epileptic States.

Exogenous Poisons.—Barbiturates, carbon monoxide, alcohol, aspirin, arsenic, lead, alkaloids, petrol fumes, carbolic acid.

Intracranial Infections and Tumours.—Meningitis, encephalitis, intracranial abscess, primary and secondary neoplasms.

Physical Agents.—Heat hyperpyrexia, electric shock, caisson disease.

Psychiatric Disorders.—States of severe stupor in hysterical, schizophrenic, and depressive illnesses.

The History

Facts obtained by the interrogation of relatives or witnesses will often provide valuable indications concerning the likely

cause of the coma, and may well be indispensable if the patient's previous health has been regarded as good or is unknown to the practitioner.

In respect of antecedent diseases likely to be associated with the later development of coma it will be necessary to make specific inquiries, first, about such conditions as hypertension, cardiovascular and renal disease, diabetes, epilepsy, alcoholism, or drug addiction, and, secondly, with regard to abnormalities of mood or behaviour suggestive of pre-existing psychiatric or organic brain disorders. Thus a history of diabetes will immediately suggest the possibility of either hyperglycaemia or hypoglycaemia, while a history of hypertension or previous strokes will be in favour of a cerebrovascular catastrophe. On the other hand, a history of progressive loss of interest and increasing apathy associated with incontinence of urine may suggest a frontal lobe tumour; a story of recent disturbing emotional experiences in a subject who has previously exhibited hysterical symptoms will lead to suspicions of a hysterical trance state; bizarre behaviour associated with delusions or hallucinations will point to the possibility of the catatonic form of schizophrenia; while a history of increasing retardation coupled with expressions of guilt and self-recrimination or of previous similar episodes will suggest a severe depressive illness.

It must be emphasized that if the patient is truly comatose an organic cause must always be assumed; a state of severe stupor in which there is suppression of voluntary activity but not unconsciousness may be either the antecedent of an organically determined coma or a manifestation of a primary psychiatric disorder.

When coma has supervened in a person whose previous state of health is unknown or has been regarded as good, inquiry will need to be directed towards the circumstances under which it occurred. Indications of likely causes will be obtained if there is a history of recent head injury, haemorrhage, circumstances pointing to a suicidal attempt or exposure to poisonous fumes, or a recent alcoholic bout.

It is important to scrutinize all circumstantial evidence most carefully; sometimes it is seriously misleading. Thus the patient with evidence of head injury may have damaged his head through falling in a stroke, the diabetic is not immune from other disease, the hypertensive may have a cerebral tumour, and the smell of alcohol in the breath is not necessarily indicative of alcoholism. Fortunately, the physical examination will usually help to place such evidence in its correct perspective and should be systematically carried out in every case of coma.

Physical Examination

In the initial general inspection of the patient a search for signs of recent head injury is an important preliminary. Bruising or laceration of extracranial tissues may indicate that the injury is incidental, but bleeding or leakage of cerebrospinal fluid from the nose or ears and subconjunctival haemorrhage spreading forward from the back of the eye usually means a head injury severe enough to have led to a state of coma. The patient's colour should be noted (cherry-red in carbon monoxide poisoning, pale in many types of coma, but cyanotic when the coma is deep whatever its cause), and also the temperature and respiration (shallow in most forms of coma, but deep in diabetes and sometimes "hissing" in uraemia). Sweating is usually pronounced, but is strikingly absent in heat hyperpyrexia. The mouth and

tongue should be inspected for scarring (epilepsy) and pigmentation (Addison's disease), and any tell-tale odours in the breath noted. Lastly, the presence of neck rigidity should be sought and evidence of dehydration looked for.

A systematic survey of function in the various bodily systems should then be made. A brief examination of the nervous system can usually with profit be carried out first and need not as a rule comprise more than a scrutiny of the fundi with an ophthalmoscope, tests of pupillary and oculomotor functions, and a decision on the probable presence or absence of hemiplegia. The presence of the latter is established when it can be demonstrated that the limbs on one side show no movements of withdrawal when pricked, and fall more inertly than their fellows when passively raised and allowed to fall. Changes of diagnostic value that may be seen in the ocular fundi are those of renal or diabetic retinopathy, and the presence (or absence) of papilloedema may be ascertained. The significance of minor inequalities in the size of the pupils is not readily assessed, but a much enlarged pupil on one side showing little or no reaction to light is likely to be due to serious cerebral compression, while a complete unilateral third cranial nerve palsy (closed eyelids, fixed dilated pupil, and abducted eye) is sometimes to be seen in cases of subarachnoid haemorrhage. In all forms of true coma the tendon reflexes will probably be much reduced and the plantar reflexes bilaterally extensor.

In the examination of the cardiovascular system search should be made for evidence of cardiac decompensation, endocardial disease, and irregularities of rhythm, concluding with measurement of the blood pressure. The lungs should be examined for evidence of gross inflammatory or neoplastic disease and the abdomen palpated for the presence of rigidity or abnormal masses. A rectal examination will be necessary if prostatic disease is suspected in a uraemic state; and if early transfer to hospital is impracticable a specimen of urine should be obtained by catheterization and tested for the presence of albumin, sugar, and ketone bodies. Similar considerations apply to lumbar puncture, which will need to be undertaken sooner or later in all cases in which the diagnosis is not obvious; it should not, however, be performed if there is any likelihood that the patient has an intracranial space-occupying lesion.

Differential Diagnosis

The final diagnosis of the cause of the coma in any given instance will depend upon a correct interpretation and synthesis of all the ascertainable facts. In order to assist the practitioner in this task the more outstanding diagnostic features in some of the commoner conditions causing coma are given. Some of these conditions will be considered in more detail in later articles in this series.

Cerebrovascular Catastrophes and Conditions Causing Cerebral Ischaemia

Haemorrhage into brain substance occurs most commonly in late middle life, is usually fatal, and will generally be associated with severe hypertension. Hemiplegia is characteristic of intracerebral bleeding and is often associated with stertorous breathing and a slow, full, bounding pulse. The head and eyes are commonly deviated towards the side of the lesion, and retention or incontinence of urine is the rule. In intrapontine haemorrhage there is likely to be bilateral limb paralysis associated with pin-point pupils and hyperpyrexia. Spontaneous subarachnoid haemorrhage (usually due to rupture of an intracranial aneurysm) generally occurs at an earlier age; in such cases limb paralyses are far less common, but neck rigidity is usually more prominent and there may sometimes be unilateral palsy of the third cranial nerve. Papilloedema and retinal haemorrhages are seen in some cases, and blood is characteristically found in the cerebrospinal fluid; the latter may also sometimes occur in intracerebral bleeding, but in such cases the presence of hemiplegia and a more deeply comatose state are helpful diagnostic features.

When coma occurs in cases of cerebral thrombosis it is usually less profound and of more gradual onset than in

the case of intracerebral haemorrhage. Hemiplegia is often present, but hypertension is less common and there may be a history of previous strokes. An onset with sudden severe headache or vomiting is much more in favour of intracerebral haemorrhage than of thrombosis.

Coma is of uncommon occurrence in cerebral embolism. A semicomatose state may occasionally be encountered when there is occlusion of a large vessel such as the middle cerebral artery; diagnosis in such cases depends upon establishing the association of sudden unconsciousness and accompanying neurological signs (hemiplegia) with the presence of a cardiac or pulmonary lesion likely to be a source of emboli (coronary thrombosis, endocarditis, auricular fibrillation or flutter, pulmonary infarct, or suppurative).

Hypertensive encephalopathy may complicate benign or malignant hypertension, acute nephritis, and eclampsia. There is usually a subacute onset consisting of transient focal cerebral disturbances (amaurosis, aphasia, hemiplegia) followed by the development of convulsions and coma. The blood pressure is always raised, especially in malignant hypertension, when the diastolic reading is usually in the neighbourhood of 130-150 mm. Hg; papilloedema with or without the exudative changes of hypertensive retinopathy may be present in some cases, and urinary changes will be found when there is acute or chronic renal damage. The focal cerebral disturbances are much more transient than those occurring in cerebrovascular lesions, and the usually good response to treatment (venesection and lumbar puncture) may be a helpful diagnostic feature.

Brain Injuries

The patient remaining in a state of coma after the receipt of a head injury must be presumed to have sustained either a contusion of his brain or an injury complicated by intracranial bleeding. The latter is particularly likely if the patient has recovered from the immediate effects of the injury and subsequently lapses into deepening unconsciousness. This indicates increasing cerebral compression and will be associated on the side of the haemorrhage with a progressively dilating pupil which fails to react to light.

A history of relapsing impairment of consciousness ranging from drowsiness to coma suggests a chronic subdural haematoma which is usually a complication of a comparatively mild head injury, although such a history may sometimes be lacking. Males are much more commonly affected than females, and localizing signs are slight or absent until a late stage, although a dilated pupil is often found on the side of the haematoma.

Metabolic Disorders and Endogenous Intoxications

In diabetic coma the onset is gradual and follows a period of severe ketosis (dyspnoea, anorexia, nausea, vomiting, drowsiness, and diffuse abdominal pain). The patient is dehydrated and collapsed, acetone is present in the breath, and the tests for sugar and ketone bodies in the urine are strongly positive.

Coma of hypoglycaemic origin is always of rapid onset. Convulsions often occur in the early stages, and it is distinguished by the absence of both dehydration and ketonuria. Focal neurological signs (hemiplegia) may sometimes be present and sugar is occasionally found in the urine.

Coma due to renal failure is characterized by dehydration and dyspnoea associated with muscular twitching, convulsions, and albumin-laden urine of low specific gravity.

In cases of coma due to hepatic failure ("cholaemia") there is an antecedent phase consisting of malaise and jaundice followed by drowsiness, delirium, vomiting, muscular twitching, and a tendency to haemorrhage.

Post-epileptic Coma

This is only likely to be a serious problem in the presence of status epilepticus. Focal neurological signs may or may not be present, but in the absence of an antecedent history of epilepsy there will sometimes be evidence of previous tongue-biting. Both albumin and sugar may be found in the urine

and some degree of pyrexia is usual. Occasionally coma in an epileptic subject may be due to overdosage with anti-convulsant drugs.

Exogenous Poisons

Here the diagnosis will usually depend primarily upon circumstantial evidence and the exclusion of other causes of coma. Special features to be noted are the cherry-red complexion in carbon monoxide poisoning; the smell of stale alcohol in the breath in alcoholic poisoning; the association of fits, raised blood pressure, and a "lead line" in the gums in lead encephalopathy; the hyperpnoea and violet urinary ferric chloride reaction in aspirin poisoning; and the normal or subnormal temperature and pin-point pupils in opium poisoning.

Intracranial Infections and Tumours

Meningitis in its various forms can sometimes be a cause of rapidly developing coma, especially the fulminating meningococcal variety. Diagnostic difficulties may nevertheless be considerable when the temperature is subnormal and neck rigidity is inconspicuous. A purpuric rash is commonly present in meningococcal infections, while in other forms there may be a focus of infection elsewhere in the body. Usually, however, the diagnosis can be established only by lumbar puncture.

In cases of localized intracranial abscess formation coma is likely to be a late event. Headache of increasing severity and drowsiness are outstanding premonitory symptoms, mastoiditis and intrathoracic suppuration being the commonest sources of infection. Occasionally coma supervenes rapidly if the abscess ruptures into the cerebral ventricles or subarachnoid space, in which case there will be neck rigidity associated with high temperature.

Coma is also usually a late development in cases of intracranial tumour, whether it be primary or secondary in origin. Occasionally it may develop rapidly when there is cystic degeneration or haemorrhage into a tumour, but differentiation from intracerebral haemorrhage is usually impossible on clinical grounds alone.

Physical Agents

Heat hyperpyrexia is a serious condition due to failure of the heat-regulating mechanism as a result of prolonged exposure to high temperatures. It is usually fatal without adequate treatment and is characterized by progressive hyperthermia, absence of sweating, convulsions, circulatory collapse, and coma.

An individual accidentally subjected to the effects of an electric current may be rendered comatose. Diagnosis will depend upon the detection of skin burns and a consideration of the circumstances.

Mental Disorders

Severe states of stupor occurring in hysterical, schizophrenic, or depressive illnesses may sometimes give rise to diagnostic difficulties. In cases of this kind the patient is not likely to be truly unconscious, since he may show some evidence of mental activity or betray the fact that he is not entirely unaware of his surroundings. Diagnosis will depend upon the absence of physical signs and evidence of psychological disturbance in the history obtained from friends or relatives. Organic disease must be assumed to be present, however, if the patient is genuinely comatose, even if there is a history suggestive of mental disorder.

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PROFESSIONAL BOXING AND THE DOCTOR

BY

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In an editorial comment in the *British Medical Journal* of December 25, 1954 (p. 1535), the hope was expressed that the controlling body of professional boxing would listen to the advice of its medical advisers.

In order to show that the professional controlling body does, in fact, listen to its medical advisers, I propose to give a short account on the control of professional boxing, with special reference to the medical aspects of professional boxing.

Prior to 1929 the control of professional boxing in the British Isles and on the Continent was practically non-existent. Owing primarily to the efforts of the late Lord Lonsdale, the British Boxing Board of Control was formed in that year. Lord Lonsdale became the first president. The constitution of the Board is a president, two vice-presidents, and a number of stewards, all of whom have some specialist knowledge of boxing and are not in any way financially interested in boxing. The stewards serve in an honorary capacity and meet their own expenses. Should a vacancy occur, it is filled by invitation from the president and the stewards.

An account of the ups and downs of the Board of Control from 1929 to the present time, although interesting, would be out of place here, but a short account of the present organization is necessary.

Organization of the Board of Control

The Board now consists of a president, two vice-presidents, and up to 25 stewards, divided into stewards of appeal and administrative stewards, and has through its regulations complete control of all professional boxing in Great Britain and Northern Ireland, except fairground boxing booths. It has the authority to issue licences at its absolute discretion to all persons connected in any way with professional boxing (boxers, promoters, managers, referees, trainers, seconds, etc.). Without a current licence no one can officiate in any capacity at a professional boxing tournament.

The Board functions from head offices in London and is assisted by eight area councils covering the whole country and Northern Ireland. The area councils are made up of licensed members of various categories—promoters, boxers, boxers' managers, seconds, etc., elected annually by the licensed members in the area. Each area council has two representative stewards, who are elected annually by the council members, and who represent the views of their councils to the stewards at board meetings.

Before the second world war the medical arrangements were rather sketchy. A principal medical officer was appointed who was one of the administrative stewards. His main duty was to advise the Board on any medical matter which cropped up and to examine boxers where necessary on behalf of the Board.

During the second world war the control of boxing suffered, as most of the stewards were engaged in one or other of the Services. After the war, when the Board got into its stride again, it was quickly realized that a medical organization was a necessary part of the controlling body, and by 1950 such an organization was instituted as follows. An honorary area medical officer was appointed to each of the

eight areas. These medical officers, together with any medical men who happened to have been elected as representative stewards, constituted a medical subcommittee under the chairmanship of an administrative steward, who is also a medical man. Since 1951 it has been found necessary to appoint one or more deputies to the area medical officer in each area.

Since the formation of the medical subcommittee, its recommendations have been implemented without question by the Board of Control. Further, owing to the efforts of the president of the British Boxing Board of Control, the European Boxing Union was formed in 1950. This controls professional boxing throughout Europe, and is served by a medical commission elected from the principal medical officers of member countries.

The objects of the medical subcommittee are to advise the stewards on medical matters and how to make boxing freer from the isolated instances of permanent injury, particularly the results of brain injury. Some of the medical aspects of professional boxing which have been dealt with by the medical subcommittee are:

1. Medical Examinations

Every applicant for a boxer's licence is subject to a comprehensive medical examination, the results of which are reviewed by the area medical officer, who then recommends the granting or withholding of a licence. The boxer must be medically examined before and after every contest.

If a boxer has been knocked out he must be medically examined before contracting to box again. Medical officers, promoters, seconds, managers, council members, or area secretaries can insist that a boxer be medically examined at any time there is reason to think he is suffering any brain injury. Unless the boxer receives a certificate of absolute fitness from the area medical officer, his licence is suspended for a varying period or withdrawn altogether.

Only first-series—that is champion or near champion—professional boxers are allowed by the Board to box outside the British Isles, and by agreement with other members of the European Boxing Union each must be medically examined by an official medical officer and certified fit immediately before leaving for abroad. All licensed referees are examined annually before their licence is renewed, because to referee several contests during the course of an evening requires a fit man.

2. Various Recommendations Made by the Medical Subcommittee and Implemented by the Stewards

Action to be Taken by Seconds After a Knock-out.—The theory has been advanced by various observers that there are two kinds of knock-out, and experience seems to bear this out. They are adequately described by La Cava (1952), who classifies them as (1) a reflex from a hard blow on the chin, and (2) a final loss of consciousness as a result of a blow when a boxer has reached a state of collapse due to a number of blows. Managers, seconds, etc., are now instructed in words of two syllables how to treat an unconscious boxer by the first-aid methods applicable to any other case of concussion, always bearing in mind the possibility of more serious damage. Ear rubbing, strong smelling-salts, and any form of stimulation are expressly forbidden.

Haemostatics.—Formerly it was the custom for each manager or trainer to have his own particular solution to stop bleeding from a cut sustained during the course of a contest. Many of these, whilst achieving the end desired by the managers or trainers, resulted in serious tissue damage. Nowadays it is an offence for anyone to use a substance which has not been approved by the medical subcommittee. Many substances have been examined, the only one approved at present being adrenaline solution. If adrenaline solution will not control the haemorrhage, then the contest is either abandoned by the manager or stopped by the referee.

Stimulants.—No form of stimulant, either real or imaginary, is allowed by the Board, except cold water sprinkled on the body or used as a mouth wash.

Drying Out and Weight Reduction by Turkish Baths.—In the past, matches were made for a boxer at a weight which was often below that at which he was 100% fit and strong. This weight was achieved by withholding all fluids for, in some cases, up to 48 hours before the weigh-in, and by turkish baths. On the recommendation of the medical subcommittee, because of their weakening effects, these practices have been stopped and managers' licences have been withdrawn for indulging in them.

Blows to the Kidneys and Back of the Head.—The original rabbit punch, barred by the rules of boxing for many years, was a chop with the side of the hand to the back of the neck, and a similar chop was delivered over the kidney region. Either of these blows has for many years resulted in the instant disqualification of the boxer who delivered them. On the recommendation of the medical subcommittee, because of the risk of brain or kidney trauma, blows with any part of the fist to the back of the head, or to the region of the kidney, are deemed foul and referees have been instructed to see that their use is stopped.

Duration of Contests.—These have been standardized for various classes of boxers and the duration reduced to eight minutes' actual boxing for novices.

Eye Injuries.—Serious eye injuries are extremely rare. Visual standards have been fixed so as to prevent a myope being licensed, to reduce the risk of a detached retina.

Many instructions covering minor points of the medical aspects of boxing have been issued dealing with widely separate subjects such as the correct position to hold the hand within the glove, scabies or infectious skin diseases in boxing stables, and the best method of suturing cuts. The prevention of fatal accidents or permanent brain injury to boxers remains the main problem facing the medical subcommittee.

Fatal Accidents

Much has been done in this connexion. Since the war there have been five fatal accidents to professional boxers at licensed promotions. Death in all these cases, as indeed it has been in the cases reported from abroad, was due to haemorrhage from cortical veins. No case of a fractured skull has been reported. The type of injury—tearing of the cortical veins—and the history lead to the conclusion that the injury in most cases was caused not by the blow but by the boxer striking the back of his head on the ring floor, causing an abrupt deceleration of the brain mass. With this in mind, the medical committee has recommended that a special type of ring flooring developed by Cornell University, U.S.A., be obtained and tried out in this country. In the meantime, some resilient substance, such as sponge rubber, is put under the canvas of all rings.

Permanent Brain Injury

Before the days of an adequate control, an appreciable percentage of professional boxers suffered from a condition known among themselves as being "punch drunk." This condition is also met with in some steeplechase jockeys and amateur riders who have had more than a fair proportion of falls in the hunting-field or steeplechasing. The term "punchy" was often used of a boxer as an expression of contempt. Because of the stigma attaching to the name it was decided to substitute the term "chronic concussion" whenever it had to be referred to. The signs and symptoms of an established case have been frequently described by various observers. Agreement regarding the pathology, however, is not by any means unanimous. What is obvious, however, is that, as a result of a series of concussions, the brain does receive damage which, if severe, is irreversible, but which if detected in the early stages seems to clear up. In the absence of any specific treatment, it is the obvious

duty of the medical subcommittee, through the Board of Control, to prevent its occurrence, and this is being done in the following way.

All licensed referees are lectured by the area medical officer on the medical aspects of boxing, with particular reference to chronic concussion. They are instructed that they must not allow a boxer to take unnecessary punishment, and must, under no circumstances, allow a defenceless boxer to be struck. Flagrant disregard of this warning by a referee will result in his losing his licence, or being suspended for a varying period, or being degraded to a lower category of referee. During 1954, in implementing this instruction, 360 contests out of 1,973 were stopped by the referee before either a knock-out or the end of the contest had occurred. One curious result of this is that the spectators at any boxing tournament now protest vociferously if the referee in their opinion does not stop the contest soon enough.

Professional boxers have a hard system of training to follow, which, amongst other things, involves sparring. Brain injury can occur in the gymnasium as well as in the ring. All managers, trainers, promoters, and others connected with professional boxing are instructed, in the boxers' interests, to report at once any early signs of chronic concussion. The relatives and those associated with a boxer in training are the ones who notice some slight abnormality before it is detected in a normal routine examination. Obviously, area medical officers, deputy medical officers, and tournament medical officers are constantly on the lookout for any early signs of chronic concussion. Once a boxer is suspect, he is ordered to be examined by the area medical officer, and unless he is given a complete clearance his licence is withdrawn or suspended. During 1954 19 licences were withdrawn or not renewed on medical grounds. The reason for the withdrawal is explained to the boxer, and he is advised to abstain from any form of sparring in the gymnasium until given a clearance by the area medical officer.

It was thought that electroencephalography might be a means of diagnosing early chronic concussion. In this connexion the results recently published by Kaplan and Browder (1954), who spent four years studying the brain-wave patterns of 1,043 professional boxers, are disappointing, a disorganized E.E.G. showing at most that a complete physical and neurological survey is indicated.*

Conclusion

The aim of the Board is better and safer boxing. To this end they will implement any reasonable recommendation of the medical subcommittee. It is due solely to the efforts of the present president of the Board that the European Boxing Union, of which he is also the president, is in existence and that it has a medical commission. Further, again owing to his efforts, a World Boxing Union was formed consisting of a representative from the New York State Athletic Commission, one from the European Boxing Union, one from the National Boxing Association of America, and one from Great Britain and the British Empire. This World Boxing Union has, in its turn, appointed a medical advisory board.

Finally, the medical subcommittee of the British Boxing Board of Control will be grateful for any suggestion, from any medical man interested in this pre-eminently British sport, that makes for safer boxing.

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*Of the 1,043 subjects, 197 had repeated electroencephalographic examinations varying in number from 1 to 6. The interval between examinations was less than one year in 141 subjects, between one and two in 29, between two and three in 21, and between three and four in six. Forty subjects had the examination repeated within 10 minutes of losing a contest. Ringside cinematography (slow-motion and ordinary) was used to assess the type and extent of trauma to the head.

PROFESSIONAL NEGLIGENCE

LECTURE BY A QUEEN'S COUNSEL

At the City of London College on January 12 Mr. J. P. Eddy, Q.C., delivered the first of a series of Travers Memorial Lectures on "Professional Negligence." He said that the main principle he was about to put forward was that before there could be negligence there must be a duty to take care or to exercise reasonable skill. That duty might arise in one of two ways: (1) in common law (as, for example, to exercise reasonable care when driving a car), and (2) under contract, as in the relationship of doctor and patient.

Three elements had to be considered when dealing with common law liability. The first was a duty to exercise care or skill or both; the second, a breach of such duty; and the third, an actual loss to the other party as a result of such breach. The late Lord Macmillan had pointed out in a case in 1932 that the law took no cognizance of carelessness in the abstract; there must be carelessness when there was a duty to take care, and it must be proved that failure in such duty caused damage. When there was a contractual relationship negligence might be a breach of such contract by act or omission.

Responsibility of the Professional Man

A man or woman who practised a profession was bound to exercise care and skill—the skill of an ordinary competent practitioner in that profession, whether it be of accountant, banker, solicitor, or doctor. The important principle had been laid down that every person who entered a learned profession undertook to bring to its exercise a reasonable degree of care and skill. He did not undertake, if he was an attorney, that his client should win his case, or, if he was a surgeon, that he would cure his patient; nor did he undertake to use the highest degree of care and skill of which some persons in his profession might be capable, but he undertook to bring to the case a fair and reasonable competence. It followed, therefore, that where the duty to exercise care and skill existed one of two things might give rise to an action for damages for negligence: (1) that the defendant did not possess the requisite skill, or (2) that, although he possessed it, he did not exercise it in the particular case.

In some cases an action might arise out of tort at common law—that is, neglect of a duty towards persons generally; in others it might arise out of contract—that is, an agreement between the parties whereby there arose a duty to exercise a reasonable degree of care and skill; and sometimes there might be an overlapping of tort and breach of contract. But the first essential was to recognize that before there could be a liability there must exist a duty—a duty in the case of a professional man to show the average amount of competence associated with his profession. The expected degree of competence varied with the times. Two generations ago surgical operations were conducted in a manner which, by the standards of our own time, would be accounted negligent.

What Constitutes Negligence?

Mr. Eddy went on to point out that in a contract as between doctor and patient only those two people were concerned; only the partners to a contract, one or other of them, could complain if there was negligence.

A person who was himself under a duty to take care could not get rid of his responsibility by delegating the performance to someone else. He was answerable for the wrongful act of his servants or agents committed in the course of their employment. The principle of vicarious liability for the wrongful acts of others rested on the legal maxim, *Qui facit per alium facit per se* (he who does anything by another does it himself). But the wrongful act must be done in the course of employment. If a doctor employed a dispenser who, while dispensing, spilt some liquid over a patient and injured him or damaged his

clothing, the doctor was liable. If, however, the dispenser was entertaining a friend in her own room and upset some hot water over her and scalded her, the doctor was not liable. Where the servant or agent was negligent in the course of his employment, then *Respondeat superior* (let the principal be held responsible).

That principle came into its own in the case of Cassidy v. Ministry of Health (1951, 2 K.B., p. 343). He took it as good law and good sense when Lord Justice Denning (and there was no dissenting judgment) declared that where a person was himself under a duty to use care he could not get rid of his responsibility by delegating the performance of it to someone else, no matter whether the delegation be to his servant under a contract of service or to an independent contractor. The Cassidy case supported the principle that if a patient in hospital suffered injury through the negligence of some member of the staff it was unnecessary for him to pick upon any particular employee. The law applied the principle *Respondeat superior* in the case of a hospital and its staff just as it did in the relation of master and servant in any other sphere of activity, professional, industrial, or other. It mattered not that the servant did work of a skilful character for which he was specially qualified. The hospital was responsible for all those in whose charge the patient was. It had taken the law over 30 years to reach this position, owing, Lord Justice Denning had suggested, to the feeling that charitable institutions should be relieved of a liability they could not afford. But the National Health Service Act, 1946, had altered the status of hospitals, and, speaking generally, it had brought about a change in the attitude of the public towards them.

In the case of Cassidy the plaintiff entered the hospital for an operation which involved post-operative treatment. At the end of the treatment it was found that his hand had been rendered useless. It was held *Res ipsa loquitur* (the thing speaks for itself), and the onus was laid upon the hospital authorities to prove that there had been no negligence on their part or on the part of anyone for whom they were responsible. The principle *Res ipsa loquitur* had been applied in other negligence actions, in particular in an action against an anaesthetist and actions against two dentists.

The Increased Litigation Against Hospitals

Negligence, summed up Mr. Eddy in conclusion, involved a breach of the duty to exercise reasonable care and skill. Such a duty might arise out of tort—that is, it might be a duty fixed by the common law—or it might arise out of contract, and where it did so arise it was a duty existing only between the parties to the contract. But, whether it arose out of tort or out of contract, the person concerned was answerable for the acts of his servant or agent if such acts were done in the course of his employment.

It was the extended application of this principle which explained the recent remarkable increase in litigation concerning the liability of hospitals in cases of alleged professional negligence. The substantial increase in the volume of litigation against hospital authorities in recent years was strikingly illustrated by the fact that in 1948–9 the payment made by hospital authorities in England and Wales in compensation of all kinds amounted to £7,500, and in 1953 it had risen to £153,000.

Mr. Eddy promised to deal with other aspects of this question in a future lecture.

The Royal Australian Air Force is in great need of additional medical officers, and the attractive terms of service have recently been outlined in advertisements in this *Journal* (December 11, 1954, advertisement page No. 27). Doctors who join the R.A.A.F. in this country are paid from the date of embarkation and given free first-class passages to Australia for themselves and their wives and families. Provision is made for postgraduate training in R.A.A.F. and civilian hospitals in Australia.

Reports of Societies

PALLIATION IN CANCER

On January 5 at the Royal Society of Medicine the Section of Surgery, with Sir HENEAGE OGILVIE in the chair, held a discussion on palliation in cancer.

Mr. H. T. SIMMONS (Manchester), who opened the discussion, said that the treatment of cancer was becoming so complicated that he would limit his remarks to the more common types. Although treatment of operable cancer was a technical exercise that could be learned fairly easily, the treatment of inoperable cancer was more complicated and needed more judgment. Surgeons were often guilty of putting an inoperable case at the end of a long operating list, and the assessment of the real needs of the patient was often equally superficial. Clear thinking rather than skill was required. Colostomy, for example, should rarely be inflicted on patients over the age of 70 with inoperable rectal carcinoma, since they were thereby made more miserable. Heroic surgery was of doubtful value and seldom justifiable. Adrenalectomy and hypophysectomy had a place in the treatment of endocrine-dependent growths, but only half the patients got significant relief and they then became dependent on a scarce and expensive drug. These operations should not be used indiscriminately. Perhaps in the future suppression of hormones by medical means would be preferable.

Palliative Surgery

Prolongation of life should not be the only consideration in patients with inoperable growth: relief of pain and of the effects of bowel obstruction or the clearing of foul discharges was equally important. The presence of metastases should not contraindicate local treatment which would bring about relief of symptoms. But short-circuit operations which did not relieve pain and discharge probably did more harm than good. Metastases giving rise to symptoms could often be removed: in such cases radiotherapy was often disappointing. In the elderly, local excision of breast tumours often relieved the pain and removed the source of offensive discharge. Skin cancer called for palliative treatment only when the face was affected: then, deep cavities should be opened up and diathermy excision applied. If this was followed by expert prosthesis encouraging results were often obtained. In carcinoma of the oesophagus gastrostomy was inadvisable, since the accumulation of saliva and inability to swallow was the most distressing symptom. Many gastric carcinomas were inoperable when first seen, and careful pre-operative assessment would avoid many unnecessary operations. It was doubtful if palliative gastro-enterostomy was ever justified; it was better whenever possible to remove the growth. Anastomosis of the gall-bladder to the duodenum was often a satisfactory operation in patients with carcinoma of the bile passages. The help from hormonal therapy in prostatic carcinoma was remarkable; the results obtained were often better when orchidectomy was done at the same time. Similarly, before the menopause, testosterone gave good results in mammary carcinoma, but the patient often resented the masculinization which followed. After the age of 60 oestrogens were more beneficial.

A Physician's Viewpoint

Dr. C. J. GAVEY (London) enunciated some broad principles in the treatment of patients with inoperable cancer. There was need for hopefulness to the end. It was most important to relieve pain, because when pain disappeared the patient's morale improved. Popular opinion wrongly held that cancer was always painful, but patients who had recovered from cancer often remarked on the lack of pain. Assessment of the degree of pain was never easy, but it was especially difficult for young doctors and nurses who lacked experience. When pain was present analgesics should be

given continuously. Mixtures with aspirin and opium could be given every four hours; and drugs of addiction were seldom contraindicated as such. Pethidine had advantages over morphine, because it did not depress the patient so much. Methadone was valuable, but might cause trouble by suppressing the cough. Phenadoxone had a long action and was of value. Chlorpromazine was of most value when vomiting was present, but it was better to reduce the dose when vomiting ceased. R 48 often abolished pain from hepatic secondaries. Morphine was most useful in the terminal stages and should never be spared. It was, however, sometimes difficult to know when to start using morphine. It was wise not to exceed single doses of $\frac{1}{2}$ gr. (22 mg.).

The second difficult problem was that of telling the patient about his illness. Patients did not share the doctor's knowledge of disease and did not therefore appreciate how patients with cancer died. When patients persistently asked for information it was morally wrong to suppress it. Frequent visiting helped in knowing when to tell the patients about their illness. The power of self-deception might be very great, and it behoved the doctor to promote this at all times. Most patients accepted the truth if it was realized slowly. There was no place for a deliberate lie or for complete silence. The problem was more difficult with intelligent patients, to whom frankness must be shown if it was sought. Medical patients themselves were often bravest and most serene when they understood their own illness. Frequent visits to the patient were fundamental, and it was the doctor's duty to help his patients in this way. It was salutary to ask if one paid sufficient attention to prevent the patient wondering if the doctor had lost interest in his case. The nursing staff were also helped by the doctor's visit, and the task of the relatives was made more simple. Sympathy by relatives was often best shown by being practical. Of paramount importance was the employment of surgery and radiotherapy. Adrenalectomy was an operation that had come to stay, especially in those cases of breast cancer with bone secondaries and pain. Requests for further opinions by the patient must be met with sympathy even if the patient wished to venture into the fields of unorthodox therapy. In the terminal stages of the disease it was wise to see that spiritual help was available to the patient.

The Role of the Neurosurgeon

Professor NORMAN DOTT (Edinburgh) said that the neurological surgeon might assist in the palliation of cancer in four several ways: (1) When he encountered metastatic cancer of the brain while the nature of the disease was still in doubt—he made the diagnosis. (2) When called upon to assist in ameliorating the course of the known neoplasia by hypophysectomy. (3) When requested to mitigate pain in known cancer. (4) When called upon to preserve important neural functions threatened by known cancer.

He pointed out that metastatic cancer of the brain had notably increased in frequency in recent years in proportion to the increase in bronchial carcinoma. In all patients over 30 years of age, with rapidly progressive cerebral tumours, an x-ray picture of the chest and other means of search for a primary pulmonary lesion were routine procedures. Not infrequently, however, the cerebral metastasis was the first recognizable lesion in this disease. When the diagnosis was made by exploration of the cerebral lesion, or by any other means, the advice of the oncologist on the management of the neoplasia as a whole was sought.

The oncologist was usually the radiotherapist, who usually had the largest experience of neoplasia in its many sites and in its various stages of evolution. An oncological team might be desirable with the radiotherapist as its leader, and with the pathologist and endocrinologist associated and other specialists called in as required. It had become essential for "system specialists," such as the neurological surgeons, to have available the advice of an oncologist on the management of the neoplastic malady as an entity, when a metastatic manifestation of it was encountered in the brain.

In the management of cancerous neoplasia it had been found that in the parasexual tumours—those of the breast and prostate—modifications of the sex hormone state might profoundly modify the progress of the disease. Administration of oestrogens and of androgens, or their diminution by castration, adrenalectomy, or hypophysectomy had been employed. Whether hypophysectomy had special indications or advantages was not yet known. Neurological surgeons stood ready to join the oncological team as assistants if hypophysectomy proved of special value in the management of cancer.

Professor Dott thought that pain due to cancer could and should be abolished in those cases in which it constituted a clamant symptom. Pain was a sensory experience and also an emotional experience—a distress. Conscious appreciation of pain as a discriminatory sensation was a function of the cerebral cortex. Conscious appreciation of the distressful aspect of pain was a function of the diencephalon. When pain was judged to be an important factor it might be mitigated by psychological methods, by analgesics, or by surgery.

Relief of Pain by Neurosurgery

Surgery for pain took two main forms: (1) Interruption of the pain-conducting pathways, so that the pain stimuli were prevented from reaching consciousness. (2) Modification of consciousness or personality on its affective aspect by leucotomy so that the distressful element of the pain experience was lessened or abolished. Surgery for pain was justified when there was a life expectancy in excess of three months and when pain was a major factor in the patient's total distress.

Instances of satisfactory interruption of pain pathways were: trigeminal nerve interruption for cancer of the face, to which could be added interruption of the glossopharyngeal, upper vagus rootlets, and upper cervical posterior roots when the floor of the mouth and throat were involved; spinothalamic cordotomy at segmental level D2 for pain below waist level, and at C2 for pain up to arm level. For disease about the thoracic inlet one could combine a C2 cordotomy with section of the upper cervical posterior roots. The techniques of these operations were discussed. It was noted that, while eminently successful in dealing with pain, their usefulness was limited to its abolition—they did not benefit other forms of distress which were often important in the cancer patient.

Leucotomy had the advantage of mitigating all forms of distress—not only those due to pain. It did not abolish physical pain sensibility, but it abolished its distress. This relief was necessarily bought at the expense of a diminished affective depth of the whole personality, and was therefore limited to those cases in which this was considered justifiable. A somewhat similar effect was procurable by large doses of chlorpromazine. There had not yet been opportunity for prolonged trial of this remedy.

Neurological surgery was required on occasion to preserve important neural functions threatened by cancer. Cranial decompression, with or without removal of a cerebral metastatic growth, could preserve vision and relieve headache and vomiting. Spinal decompression could avert paraplegia with all its distressing accompaniments. When indicated by the early symptoms of spinal cord compression, it was an operation of urgency. It could be supplemented by stabilization of the vertebral column by the implantation of rustless steel plates, if the vertebral bones were weakened by cancerous erosion.

Thus neurological surgery could play its part in the diagnosis and treatment of cancer, and in the mitigation of pain and preservation of function, even in the "hopeless" case.

Management by the Family Doctor

Dr. G. F. ABERCROMBIE (London) spoke of the difficulty in managing inoperable cases of cancer and of the problem of what the patient should be told. It had to be realized that a stage arose when surgical treatment should cease, and the practitioner was often the best person to decide on this.

Morphine helped these patients, and it had been said that "morphine exists to be given and not merely to be withheld." The increasing nursing supervision required in the terminal phases often became impossible in the patient's home; it was the duty of hospitals to readmit their patients in this phase. Surgeons often deceived the patient in the matter of diagnosis and put the general practitioner at a disadvantage. Many patients were left in ignorance to the end, but it was doubtful if this was advisable. It was a mistake not to give patients the credit for the common sense and courage they possessed. Doctors were often afraid to tell patients about their disease.

Many fallacies about cancer needed correcting. It was remarkable that many patients with cancer died with much less distress than patients with heart failure. Patients with cancer were often more content when the diagnosis was known and the relatives were spared the unhappiness of constant deceit. Dr. Abercrombie had never regretted having told a patient about cancer. The bond between the doctor and the patient was thereby strengthened and remained firm to the end.

Discussion

In the discussion that followed, Professor C. A. WELLS (Liverpool) suggested that the problem of palliating cancer had so many aspects that no one man could be expected to be familiar with all the methods or even to be competent to select the appropriate method or combination of methods in any one case. In these circumstances the difficulty might best be met by organizing a group of workers to consider jointly or in the closest possible consultation the problems involved. Indeed, he thought it probable that this type of approach was appropriate not only to the cancer problem but to a number of other states, such, for example, as arterial hypertension, in which many voices might need to be heard before an appropriate line of treatment could be decided upon and in which subsequently there might be a need for guidance from many points of view. By an extension of the same argument it was permissible to ask whether there should not be a tendency for these and other most difficult cases to move from the periphery towards the centre of various regions of surgical organization to secure for them the best advice and treatment.

Mr. MURRAY FALCONER (London) said that although hypophysectomy for parasexual tumours was in its infancy it was an operation with a low mortality and it appeared to help more than half the patients. Metastases often disappeared, but, as the follow-up periods were still short, it was not yet possible to compare it with adrenalectomy. These encouraging results made it difficult to say that there was ever a stage when treatment should be denied because the disease had become advanced and widespread.

Many other members and visitors took part in the discussion, and it was clear that varying views were held about what to tell the patient suffering from inoperable carcinoma.

LOCAL MEDICAL SOCIETIES

Liverpool Medical Institution

Addressing the Liverpool Medical Institution on December 16, 1954, on a medical pilgrimage "from the Cape to Cairo," Professor L. S. P. DAVIDSON said there were certain diseases which were much rarer in Africans than in Europeans living in the same region. They fell roughly into two large groups: (1) the so-called psychosomatic diseases such as peptic ulceration, thyrotoxicosis, essential hypertension, and rheumatoid arthritis; (2) degenerative vascular and metabolic disorders such as atheroma (and its sequence of coronary and cerebral thrombosis, and peripheral vascular disease), cholelithiasis, and diabetes mellitus. The relative rarity of these diseases might be due either to racial or constitutional causes, or to environmental causes. But, if it were true that Africans who have adopted Western methods of eating, working, and living became as liable to these conditions as Europeans, then environmental rather than racial factors would appear to be of primary aetiological importance.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Fluoridation of Public Water Supplies

SIR,—Dr. C. G. Dobbs (*Journal*, January 8, p. 105) describes the proposal to add fluoride to the water supplies in Anglesey as undoubtedly amounting to "compulsory medical treatment with a toxic substance intended to produce a physiological change in the body, to be administered indiscriminately by medically unqualified persons." He goes on: "... no individual doctor can be discovered who claims to know much about its effects, or to be able to diagnose slow chronic fluoride poisoning if it should occur. If this is the situation the 'experiment' could do widespread damage without anyone's being the wiser."

As a member of the independent mission which investigated American experience with fluoridation and reported to the Ministry of Health, the Medical Research Council, and other interested bodies, perhaps I may be allowed to comment. The mission, in its report,¹ felt justified in drawing four main conclusions. First, there is abundant evidence, from Britain as well as America, that lifelong consumption of water containing fluorides at levels around 1 part per million results in a substantial reduction of the incidence of dental caries in children, and probably in adults also; in view of the prevalence of the disease, the shortage of dental manpower, and the absence of any other practicable preventive measure, the benefits of fluoridation (adding fluoride at a level of 1 p.p.m. to waters not naturally so endowed) are of great value. Secondly, there is no scientific evidence whatsoever that fluoridation involves any danger to health, and very considerable evidence that it is harmless. Thirdly, the amounts of fluoride added to water can be controlled very accurately. Fourthly, evidence derived from the millions of people in Britain and abroad, who use waters containing about 1 p.p.m. of fluoride, naturally present, is wholly reassuring both as to the absence of danger and as to the benefits resulting. It may be noted here that one of the earliest British reports² on dental benefits related to children evacuated during the war from a natural-fluoride area; the school dentist in the reception area was impressed by the fact that they had "remarkably good teeth—much better than those of the local children."

Dr. Dobbs uses the term "medical treatment" for a measure which does not cure dental caries but helps to prevent it. I will not indulge in what he calls "verbal quibbling," but it seems necessary to remark that, in the lay press, he has written: "The compulsory mass-medication of people via the public water-supply is the sort of thing which has not been tolerated by civilized European opinion, or practised in Europe, so far as I know, outside the concentration camp (at least until very recently)." This is the kind of highly coloured and unscientific language which is best avoided in debating the factual merits of a case. The ethics of compulsion, of course, are always good for heated argument, as is shown by the whole history of advance in public health; in the present instance, I should like to make it clear that no alternative to public water supplies as a vehicle for fluorides can at present be advocated on technical grounds or on those of safety.

It seems scarcely necessary to point out that fluorides will not be "administered indiscriminately by medically unqualified persons." The word "indiscriminately" ill describes a process which will be conducted with strict administrative, mechanical, and chemical controls, and supervision will, of course, include that of the medical officer of health. Variations in the amounts of fluoridated water ingested by individual consumers are known to be without significance for health, within the very wide range of climates in the North American continent. Variations of consumption are

almost certainly less in this country, and the question of individual intakes of fluorides has been closely examined. There is no risk that, in the unprecedented event of fluoridation causing damage to health, this will occur "without anyone's being the wiser." The arrangements in Anglesey and other areas where the water is about to be fluoridated will be subject to regular scrutiny by doctors and dentists who know the signs of fluorosis. It is not surprising that Dr. Dobbs's medical friends are a little hazy about this condition, and about fluoridation generally; fluorosis is a rarity, and all of us would have to plead incomplete acquaintance with much of the recent medical literature.

Finally, lest judgment be clouded by charges of "mass-medication" or by dark hints about undiscovered but imminent hazards to health, it is well to reflect that in fluoridation we have a public health measure which has been studied and documented with unusual care and completeness; and that we in Britain have previously hesitated unwisely—for example, in relation to diphtheria immunization.—I am, etc.,

Aberdeen.

A. M. THOMSON.

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Early Diagnosis of Spinal Tumours

SIR,—Drs. H. J. G. Bloom, H. Ellis, and W. B. Jennett (*Journal*, January 1, p. 10) have made a useful contribution to this important condition, which can often be so tragic if the diagnosis is not early. As they clearly indicate, their material is selected, all the cases being Service personnel. Thus the incidence of various tumour types is different to most published figures. They rightly state that this accounts for the absence of meningiomas in their series. But one cannot agree with them that spinal meningiomas are only twice as common in women as men—they quote Learmonth.¹ Elsberg² pointed out that nearly all spinal meningiomas occur in women, and in my series³ of 59 cases 85% were in women and over 90% were seen in patients over 35 years of age.

They give little credit to the part played by radiology in the diagnosis of spinal tumours. While they say that the plain x rays of 44% of their cases showed appearances suggestive of spinal tumour, they make no mention of the fact that a specific diagnosis can often be made. This applies particularly to neurofibromas, the most important spinal tumours (apart from meningiomas), in that removal so often effects a complete cure. In my series of 53 spinal neurofibromas, no less than 45% showed plain x-ray changes enabling a specific diagnosis to be made. The most important sign is, of course, widening of the exit foramen. Bloom, Ellis, and Jennett had 15 neurofibromas, of which 7 are listed as having plain x-ray changes (47%). This correlates well with my figures, but the important point is that a specific diagnosis of neurofibroma can so often be made. The significance of normal plain x rays in a case of spinal neurofibroma is readily appreciated by considering the anatomical conditions. If the tumour has not invaded the exit foramen and is therefore probably entirely intradural, then the plain x rays are likely to be negative, since the tumour normally produces signs of cord compression before it is large enough to splay the pedicles. The differentiation from meningioma can then only be made statistically by considering the age and sex of the patient, although a very high C.S.F. protein will favour neurofibroma.

Again, myelography gets little credit. They say, "Although myelography is by no means always necessary for the detection of a spinal tumour, it is invaluable in accurate localization, and may be the only way in which a neoplasm can be excluded in suspicious cases. . . . The myelogram may also suggest whether the neoplasm is intramedullary or extramedullary. . . ." No one will disagree with these remarks, but what an understatement. One should be able to differentiate extramedullary-intradural lesions from those which are extradural. Such differentiation often takes one

much nearer to the pathological diagnosis. Furthermore, the surgeon wants to know the relation of an intradural-extramedullary tumour to the cord—right or left, behind or in front, the last situation being the most unpleasant. Four angiomas are included in the series. How were they diagnosed? Myelography is the only certain method short of surgery or necropsy. The myelographic picture is absolutely characteristic, and should save the patient an operation which never causes improvement and sometimes initiates deterioration.—I am, etc.,

London, W.1.

J. W. D. BULL.

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- ³ *Acta radiol. (Stockh.)*, 1953, 40, 283.

Tuberculous Patients in General Hospitals

SIR,—Dr. Peter Stradling (*Journal*, December 18, 1954, p. 1483) has completely "missed the boat" about my whole letter (*Journal*, November 20, 1954, p. 1227). He overlooks the elementary principle that, generally speaking, before any campaign is carried out it is invariably preceded by intensive detailed and careful planning. He also wants to know "where is the money to build such sanatoria?" The answer is simple—from the very same sources which have unlimited supplies of money for war and the fearful destruction and devastation that accompanies it. It is amazing when it comes to the health and well-being of the nation how every obstacle is put in its way.

If Dr. J. Robertson Sinton (*Journal*, December 11, 1954, p. 1418) had read my letter carefully he would have appreciated that, because of my sincere and earnest desire that human beings should be treated like human beings and not like cattle, I want fully equipped sanatoria to be built throughout the country. Complacency and lack of enthusiasm have no place in dealing with such a serious malady. It has been proved in the Scandinavian countries that where there is adequate sanatorium accommodation and mass immunization with B.C.G. the number of tuberculosis patients has been greatly reduced. In my opinion, this is an example which Great Britain might well follow.

In answer to Dr. R. Lester Black, we must take a long-term policy in so far as the tuberculosis patient is concerned, and face up to the realization that, despite chemotherapy, etc., and provision of a couple of wards in general hospitals, the actual number of notified tuberculosis patients has in point of fact increased. In my view the dominant criterion of tuberculosis is not the death rate but the numbers of tuberculosis patients. In any case, as general practitioners know only too well, is not there a big enough waiting-list in general hospitals without taking away a further two wards?

May I conclude by saying that tuberculosis is a subject in which there has always been ample room for argument, but one fact is beyond dispute: without the tubercle bacillus there is no tuberculosis, and for medical men to have the temerity to state that the way things are at present there is no real danger of infection to the nursing staff, etc., through constant contact with tuberculosis patients is fanciful rather than factual. If I have set some of my professional colleagues thinking, then that could be the first real step in Britain's resurgence on the whole question of tuberculosis.—I am, etc.,

Glasgow, S.W.3.

ARNOLD B. COWAN.

Negative Tuberculin Test and Positive X-ray

SIR,—In 1949 all schoolchildren in Lewis were tuberculin tested and non-reactors had B.C.G. (if desired). A very high positivity rate was found. The local chest physician kindly x-rayed several hundred reactors and reported on them, and in many instances there was radiological evidence of definite intra-thoracic tuberculosis and bed rest was ordered.

A re-survey of all schoolchildren in 1954 yielded some interesting information: (1) A very considerable proportion of those showing radiological signs were now non-reactors. Had all positive reactors been x-rayed more such

evidence of reversal might have been available. Some scholars were followed from a decided positive reaction through diminishing sensitivity to negative and then B.C.G. vaccinated. (2) In a few instances (more might have been revealed if all had been x-rayed) it has been discovered that children who had had B.C.G. vaccination in 1950 had actually suffered from tuberculous lesions before vaccination. This naturally follows on point 1 if B.C.G. is administered automatically to non-reactors to tuberculin. (3) Consequent upon findings 1 and 2 it seems essential to x-ray all children—non-reactors as well as reactors—so that, in the event of a non-reactor having B.C.G. vaccination carried out and later developing intra-thoracic tuberculosis, one will be able to say whether the disease has started for the first time or is the result of a breakdown of a previous lesion. Only in this way will it be possible to evaluate B.C.G. as a preventive measure. (4) Following B.C.G. vaccination the local vaccination reaction and the subsequent allergic reaction vary from person to person. This variation has been considered as due to differences in the technique—even in the case of the same vaccination. It seems to me that an explanation of these variations might be found in points 1 and 2. For example, if a child has at some time had a primary lesion visible on x-ray and yielding a positive Mantoux, but in the course of a year or two the allergy but not the x-ray evidence disappears and B.C.G. is administered, will the local reaction and subsequent allergic reaction not be more marked than they would have been had infection never been experienced?

X-ray facilities are necessary to enable more investigation to be carried out.—I am, etc.,

Stornoway.

R. STEVENSON DOIG.

Trichomonal Vaginitis

SIR,—When Drs. S. R. M. Bushby, R. D. Catterall, and Mary Williamson (*Journal*, January 8, p. 78) found that a new drug, amido-nitrothiazole, exerted a killing power over *T. vaginalis* a hundred times greater than that of acetarsol I am sure that they believed—and naturally—that they might at last have discovered a permanent cure for this harassing disease. But, most disappointingly, they found that nitrothiazole was no more effective in preventing relapse than acetarsol. The large number of drugs which have been used for the treatment of trichomonal infestation of the vagina is evidence of a clinical defeat which is due to causes other than the failure of a specific drug. The cure of vaginitis will not arrive by the discovery of any new drug, however lethal to trichomonas.

All of the many drugs I have used, except absolute alcohol, will eradicate the organism for a few days, as judged by vaginal smear examination and usually the complete disappearance of vulval pain and pruritus. The immediate lethal power of the drugs in ordinary use is sufficient; the real problem is to prevent relapse. The causes of relapse are that the vagina has not been completely disinfested, by failure to pack the whole of the vault around the cervix with the pessaries, or that the organism hides away in the urethral and Bartholin's glands or in the vaginal epithelium. Re-infestation after treatment may also be by coitus, but most improbably due to lavatory seats, as the trichomonas dies by drying, and, though females of all ages use lavatory seats, infestation is rare in children, virgins, and after the menopause. The search for yet more lethal drugs presupposes that *T. vaginalis* is the actual cause of vaginitis, but of this there must be some doubt. For example, it is often found in a normal vaginal smear, while, on the other hand, a smear taken from a severe case may show only an occasional organism or even none at all. The intensity of the inflammatory reaction of the vaginal mucosa is by no means always related to the number of trichomonads found in the smear.

We already have all the anti-trichomonal drugs we need. The essential is the correct application of the one we choose. Self-treatment is entirely useless, for no woman can place pessaries so as to pack the fornices. They must be placed

visually through a speculum, under anaesthesia if the vulva is too tender for the passage of a speculum, and kept in place by a light pack of gauze which may be pulled out in twenty-four hours. If the present attack is a relapse the treatment should be repeated during the last days of menstruation for at least three months. Meanwhile the patient should remain celibate. Despite, however, the most careful and thorough treatment a few women will relapse at intervals, perhaps for years. Trichomonas is not the whole answer to the problem of vaginitis. It may be caused by associated bacteria or even a virus.—I am, etc.,

London, W.1.

ALECK BOURNE.

Mepacrine and Malaria in Children

SIR,—Dr. S. B. Dimson in his paper, "Congenital Malaria in England" (*Journal*, November 6, 1954, p. 1083), mentions the toxic effects of intramuscular injections of mepacrine reported by me¹ in small children in a paper published four years ago. Your readers might be interested in another, more recent case of immediate effects and serious sequelae of an intramuscular administration of mepacrine to an infant.

A well-developed European baby, 6 months of age, on suppressive quinine regimen from birth, had an onset of fever without any obvious clinical symptoms. In spite of repeatedly negative blood examinations for malaria parasites the infant was given an intramuscular injection of 50 mg. of mepacrine musonate. Within 20 minutes after the injection it stiffened, started rolling its eyes, lost consciousness, developed tonic and clonic convulsions, became deeply cyanosed, and collapsed. It was given nikethamide, artificial respiration, and was rushed to the hospital, where it received a large dose of chloral, oxygen, and cardiac stimulants. A lumbar puncture showed the cerebrospinal fluid under slightly increased pressure but otherwise normal. The temperature rose to 104° F. (40° C.). As the clonic convulsions kept reappearing the child was kept on chloral and oxygen for several days. Under this treatment and with excellent nursing the temperature slowly decreased, the convulsive status abated within a week, but occasional twitchings of arms and legs were still present and there were bouts of general muscular rigidity. The skin was yellow and mepacrine was excreted in urine for several days.

On discharge from the hospital the child showed an impairment of head control, hypotonia of the trunk and of one arm. Two months later the child received a good deal of expert attention at one of the London hospitals, where no major abnormality was found, apart from poor head control, failure to make any attempt to sit, and a feeble grasp. The cerebrospinal fluid showed a slightly raised protein content. To-day, after nearly a year, the child shows an improvement of the tone of its neck muscles, but it has a partial paralysis of one arm, shows now symptoms of spastic paraplegia of legs, and appears to have a retarded mental development.

Admittedly, cases of such severe encephalopathy due to mepacrine are uncommon, but it seems that they could be avoided by more critical intramuscular administration of this drug to infants and small children or, at any rate, by the use of chloroquine, which, apart from being an excellent antimalarial, is also much better tolerated by all age groups.—I am, etc.,

Yaba-Lagos, Nigeria.

LEONARD J. BRUCE-CHWATT.

REFERENCE

¹ *British Medical Journal*, 1950, 2, 7.

Encephalitis after Yellow Fever Vaccination

SIR,—The *Journal* of November 20, 1954, has just reached me, and I was interested to read Dr. Leonard Roodyn's letter (p. 1226) on encephalitis following yellow fever vaccination. I am prompted to write to you, as I have just had under my care an infant suffering from this condition; this is the fourth to be reported in recent weeks. A male child, aged 3 months, was vaccinated in the United Kingdom against smallpox on October 30 and against yellow fever on November 22. The parents arrived at Kano by air on November 30. On December 3 the child was admitted to hospital, as he would not take his feeds. On December 4

the rectal temperature was 103° F. (39.5° C.). He developed a Jacksonian attack involving the left limbs; this was accompanied by a left facial palsy and deviation of the eyes to the left. Direct questioning of the mother produced the story given above. The information about the yellow fever vaccination had not been given previously, as, quite naturally, the parents had not realized the significance of this point. The child did well and now appears to be normal.

From the experience of this case, and that recorded by Dr. L. G. Scott (*Journal*, November 6, 1954, p. 1108), it would appear that cases of encephalitis following yellow fever inoculation may occur when recently vaccinated children are many hundreds of miles from the centre where the inoculations were given. In this way hospitals in the United Kingdom may not be aware of the accident even if the correct diagnosis is made. Parents who travel with young children should be advised not to leave the United Kingdom for at least three weeks after receiving yellow fever vaccination in case encephalitis should follow, although this must be an infrequent complication.

With regard to the vaccination of young babies who travel from an endemic area to the United Kingdom, without stopping in a receptive area, it might be advisable to recommend that vaccination against yellow fever is withheld, as injections in these cases are given not so much to protect the individual as to prevent the spread of yellow fever in Britain, a possibility so remote that it can be ignored.—I am, etc.,

Kano, Nigeria.

E. A. BEET.

Tests of Hearing

SIR,—While agreeing with most of the remarks made by Professor A. W. G. Ewing in his statement on sweep frequency-screening tests of hearing (*Journal*, January 1, p. 41), it would appear desirable to point out that partial deafness of the severity necessitating special educational treatment should be detected before the age of 5 years if it is of congenital origin. Such deafness should be detected preferably before the age of 1 to 2 years so that the child may receive auditory training during the period of normal physiological speech development. If acquired deafness should occur, rehabilitation should start straight away, as soon as the child is well enough. It would be unfortunate if the impression were given that it is satisfactory to defer tests of hearing until the routine group tests are done at the age of 5. The search for deafness at an earlier age is long overdue. The post-natal clinic would seem an ideal place for increasing the mother's awareness of the possibility and implications of partial deafness.—I am, etc.,

London, W.1.

EDITH WHETNALL.

Medical Aspects of Amateur Boxing

SIR,—I was interested to read the article on amateur boxing by Drs. J. L. Blonstein and Edwin Clarke (*Journal*, December 25, 1954, p. 1523). As medical officer I attend weekly tournaments of one of the premier amateur boxing clubs in Glasgow. I must have attended over 200 tournaments and seen over 2,000 bouts. I disagree with the conclusion of the article in question. Far from being a useful and justifiable sport, amateur boxing is a dangerous, and often brutal, happening. Firearms, swords, daggers, razors, broken bottles, and coshes produce appalling injuries—I would say that boxing comes next on the danger list. Perhaps all-in wrestling is a "wee shade" more dangerous. Virtually, each boxer steps into the ring with the intention of injuring his opponent, especially his opponent's cranium and its contents.

Concussion produces an oedema of the brain, and this pathological condition does not clear up quickly. Though a boxer regains consciousness by the count of ten, is able to bathe, dress himself, and have a light meal, he is not recovered. I have known of a young man being off work for many months following a knock-out (by concussion). Much is made of medical control in the article. No such control exists here. Recently a boxer was knocked out on a Saturday and again on the following Monday. Boxers

here are examined before a contest only if it is an international or a championship match. The only difference between professional and amateur boxing, from my point of view, is the distance of rounds. I know of two severe eye injuries, one, at least, involving the retina. I note that the London article makes no mention of solar plexus blows, the effects of which are very distressing not only to the recipient but also to the spectators, and, not least, to the medical officer.

As a nation, are we in a position to afford this type of disability production? I admit that, after many years, "boxing" grows upon one—an innate sadistic admiration for "guts."—I am, etc.,

Newton Mearns.

JAS. C. LAURIE.

Cardiac Asthma

SIR,—Although rare, acute pulmonary oedema is probably one of the most alarming emergencies encountered in general practice. As Dr. J. G. M. Hamilton (*Journal*, January 1, p. 39) says, morphine is an effective drug for the relief of such attacks, but it is not without potential danger, particularly when administered intravenously. In a condition in which there is already extreme respiratory embarrassment, the depressant action of morphine upon the respiratory centre should be avoided if there is an alternative drug which can be used. Dr. Hamilton explains the effect of morphine by a multiplicity of actions, most of which could be achieved with alternative hypnotic and analgesic drugs. But, in fact, such other drugs are ineffective.

I believe that morphine relieves this condition by virtue of its peripheral vasodilator action. Its effect is therefore analogous to that of tolazoline¹ and other vasodilator drugs,² but these have the advantage of creating no respiratory depression. In hypertensive left ventricular failure, peripheral vasoconstriction is the precipitating factor in initiating and maintaining the attack of acute pulmonary oedema. My most recent case was a woman of 63 with a basal hypertension in the region of 220/120. She suffered an extremely severe attack of acute pulmonary oedema in the night and, when I reached her, was extremely distressed and practically unconscious. The blood pressure had risen to 285/150 and she exhibited the usual signs of intense peripheral vasoconstriction. Tolazoline hydrochloride, 25 mg., was injected intravenously, and one minute later the blood pressure had fallen to 225/100, with subsequent resolution of the attack. The use of vasodilator drugs carries with it none of the dangers of hypotensive agents, such as the methonium compounds, for the production of peripheral vasodilatation merely returns the blood pressure to its previous basal value and there is no danger of irreversible hypotension. In mitral stenosis and type II nephritis, a similar mechanism may play a part in producing attacks of acute pulmonary oedema, for I have relieved such attacks in these two conditions with vasodilator drugs and observed similar blood pressure changes. On the other hand, in myocardial infarction the use of any drug which lowers blood pressure may be an extremely hazardous procedure.

The general practitioner has a unique opportunity for studying and treating this condition. By the time the patient reaches hospital the attack may be in its later stages, and often subsiding, or the patient may be dead. In the prevention of subsequent attacks in hypertensive cases, I think more can be done than was suggested in Dr. Hamilton's article. I doubt whether general practitioners will be content to sit back and watch their patients leading a "digitalis life," with all its accoutrements of semi-invalidism, when more active measures are available. Surely it is preferable to reduce the patients' blood pressure, with consequent decrease in cardiac enlargement and prevention of further acute episodes of failure.³

It is usually possible to control most cases of hypertension with a combination of hypotensive agents, the composition of which may have to be varied from case to case. Probably the most useful combination in general practice is reserpine with hexamethonium or pentolinium by mouth. Thus in the case already quoted there were three severe episodes of acute pulmonary oedema in the first fortnight, before the blood pressure was controlled with these two drugs. In the following four months the blood pressure has been kept in the region of 150/100, a lower value than this producing postural faintness, and there have been no further attacks of left ventricular failure. It might be argued that

such treatment does not maintain a low blood pressure value and that hypertensive peaks occur as the effect of each dose wears off. Whether this is so or not, the clinical improvement in this case is striking and is associated with almost complete reversal of the cardiographic appearances of left ventricular strain and diminution in heart size on x ray. I have observed similar effects in a number of other cases of hypertension treated in like manner. I believe that it used to be said that once a patient suffered more than one attack of acute pulmonary oedema the prognosis was poor. With our present therapeutic armamentarium, there is no longer any need for such a pessimistic outlook.—I am, etc.,

Twickenham, Middx.

DAVID WHEATLEY.

REFERENCES

- ¹ Wheatley, D. (1952). *British Medical Journal*, 1, 1174.
² — (1954). *Proc. roy. Soc. Med.*, 47, 327.
³ Smirk, F. H., et al. (1954). *Lancet*, 2, 159.

SIR.—In his excellent refresher course on "Cardiac Asthma" (*Journal*, January 1, p. 39) Dr. J. G. M. Hamilton points out that rapid venesection may be usefully employed. In 1924 I published a paper¹ in which I showed that a significant hydraemia occurred in such a patient in a few hours after a venesection (300 ml.), and I have since successfully treated many cases of acute pulmonary oedema and of chronic stasis of the lungs with venesection and, of course, with morphine in the acute stage. I consider venesection (300 ml. is sufficient) as the treatment of choice in these cases. I quite agree with Dr. Hamilton on the long-term management of these cases.—I am, etc.,

Aalborg, Denmark.

CARL SCHWENSEN.

REFERENCE

- ¹ *Ugeskr. Læg.*, 1924, 86, 289.

Dyspareunia

SIR.—I was interested to read in Mr. R. Christie-Brown's letter (*Journal*, January 8, p. 106) of the existence of a clinic for the exclusive purpose of treating dyspareunia. I wonder if it is generally realized that this complaint is often due to pathological processes in the urethra—sometimes resulting in vegetations. Whatever the changes, they are readily detected by urethroscopy and are generally amenable to the appropriate treatment. I have had a number of such cases where fertility has replaced infertility.—I am, etc.,

London, W.1.

H. P. WINSBURY-WHITE.

SIR.—I was interested to read that my friend Mr. Christie Brown (*Journal*, January 8, p. 106) "has become increasingly aware of the large part which dyspareunia plays" in the causation of infertility. It is possible that he will find that a high percentage of women attending an ordinary gynaecological out-patient department also suffer from the same troublesome complaint. If he would try cauterizing the internal os uteri with a stick of silver nitrate, I think he would find that he would cure most cases of dyspareunia provoked by deep penetration of the penis and that his new clinic might prove unnecessary.

The same treatment, provided women with gross pelvic pathology were excluded, would also cure most cases of lower sacral backache, frequency and urgency of micturition, stress incontinence of urine, and lower abdominal pain, including right iliac fossa pain, for which so many normal appendices and not a few ovaries are needlessly sacrificed.—I am, etc.,

Bradford.

G. W. THEOBALD.

SIR.—I was interested in Mr. R. Christie Brown's letter (*Journal*, January 8, p. 106) drawing attention to the existence of a "dyspareunia clinic." This condition is a sadly neglected complaint and one far more common than is generally realized. I am prepared to accept that many patients seek advice for a variety of symptoms (of which infertility is one) when the basic trouble is their inability to participate in a normal married life, but surely only

introital dyspareunia is likely to be associated with infertility as cause and effect. In such cases levator spasm is sufficient to prevent penetration.

I agree that general practitioners cannot be expected to deal with these cases, but I beg to suggest that these patients can often be treated successfully in an out-patient clinic by simple instruction and the use of vaginal dilators. Only the most refractory would I refer for a psychiatrist's assistance.

These cases are a challenge to the patience and ingenuity of the non-surgical aspect of our specialty. Is there not too much tendency nowadays to split up gynaecology into various component clinics: contraception, infertility, hormone, and now dyspareunia?—I am, etc.,

Cambridge.

OSWALD LLOYD.

Changes in the Mental Health Services

SIR.—In reply to Sir David Henderson (*Journal*, January 8, p. 104), I must apologize for my injustice to Scotland (*Journal*, December 18, 1954, p. 1484). I wrote with first-hand knowledge of Edinburgh only, and made the unwarranted assumption that the conditions obtaining here were those of the Scottish mental health service as a whole. I am well aware of the existence of Jordanburn Hospital and the nursing-homes, which I visit frequently, but these establishments have nothing to offer the type of patient under discussion. If a patient is so disturbed by his illness that he refuses to accept treatment, his admission to these places cannot be effected. If he accepts the need for treatment, then he can equally well go as a voluntary patient to a mental hospital, though the nursing-homes have the merit of being without the mental hospital.

I am also aware of the existence of an observation ward at the Royal Infirmary of Edinburgh, but am equally aware of the categories of patients who may be admitted there. They are (1) disturbed patients in other wards of the Infirmary, (2) patients from corrective establishments, and (3) cases of attempted suicide. They do not admit acute psychoses from the Edinburgh area in general. These facts I have confirmed from the Superintendent's office before writing. Despite, therefore, the sympathetic attitude of the Board of Control for Scotland in 1906, the facts in Edinburgh in 1955 are that there is no alternative but to certify an acutely disturbed patient who declines to go willingly to a suitable establishment.—I am, etc.,

Edinburgh, 5.

JOHN MARSHALL.

Crying in Infants and Children

SIR.—It was with great interest that I read the article by Professor R. S. Illingworth on infant crying (*Journal*, January 8, p. 75). In a hospital for mental defectives in this town it is noticeable that genuine crying with tear formation is extremely rare among the low-grade patients. Crying is more common among the females than the males, and among the females it is much more common in the higher-grade than in the lower-grade patients.

It would be instructive to learn why crying should cease while other childish behaviour patterns, thumb sucking, rocking, and head banging remain. Perhaps there is some explanation depending upon maturation of the central nervous system.—I am, etc.,

Chipping Norton.

F. E. JAMES.

SIR.—Professor R. S. Illingworth, in his article on "Crying in Infants and Children" (*Journal*, January 8, p. 75), refers to the obscurity of the mechanism of vomiting in small children who have been crying more than a quarter to half an hour. May I mention the following observation which may throw light on this mechanism?

On reviewing some discarded chest radiographs of young children and infants, there were a few radiographs where the lung fields were almost completely obscured by an opacity continuous with the heart and mediastinal shadow. I was informed (and it is probably common knowledge to our

x-ray colleagues) that it frequently happened that in a crying young subject (and it need not be vociferous crying) such radiographs were obtained; pacification allowed unobscured radiographic views of the lung fields. If every case of crying is indeed accompanied by this hyperaemia, and if it is maintained for long periods, then it may lead to mucus exudation in unusual amount from the bronchial epithelium which would gather in the bronchial lumen. Such mucus stimulating the oropharynx leads to reflex vomiting (in severe pneumonias in children and whooping-cough, cough followed or accompanied by vomiting is a frequent occurrence). A subsidiary factor may be stimulation of the medullary vomiting centre by hypoxia of the blood in the cerebral blood vessels resulting from pulmonary-bed pooling.—I am, etc.,

Romford, Essex.

B. SKLAN.

Obstruction from Orange Pith

SIR.—May I add a further case of acute intestinal obstruction caused by swallowing an unmaasticated piece of orange (*Journal*, December 18, 1954 p. 1484)?

A man aged about 45 years was seen by me in the casualty department complaining of colicky abdominal pain and vomiting for a duration of six hours. This was on a Sunday during the football season. Examination revealed this to be an early case of small bowel obstruction. The patient had a polya type of partial gastrectomy performed at the same hospital five years previously. A provisional diagnosis of obstruction due to post-operative adhesions was made. Laparotomy revealed small bowel obstruction caused by a foreign body impacted in the lumen of the gut two feet proximal to the ileo-caecal valve. Removal of the foreign body relieved the obstruction. Examination revealed it to be an intact unmaasticated "quarter" of a fair-sized orange. On taxing the patient's memory the following day, he recalled having a similar piece of orange in his mouth at a most inopportune moment during the course of a football match on Saturday. During the excitement that followed a victorious goal the orange had disappeared from mouth and mind.

Looking back on the case, I do not believe that such a large bolus could have gone through a normal pylorus. That this is one of the lesser known hazards of gastrectomy should be borne in mind. Whether it can be classed as one of the hazards of football, I shall leave to your readers' imagination.

I wish to thank Mr. R. Cunliffe-Shaw for allowing me to mention this case.—I am, etc.,

London, S.W.1.

N. H. ANTIA.

What is Health?

SIR.—I have read with great interest the report of the Kent Paediatric Society¹ and your annotation (*Journal*, December 11, 1954, p. 1409) under the above heading. A similar study of an older age group composed of university students has been carried out over the last eight years in the University of Aberdeen, where the approach to the problem has been different in many respects, chiefly in regard to the assessment of health. Following initial trials so effort is now made in this department to assess health on a mathematical basis. I would hesitate to accept a series of physical and intellectual scores as providing accurate measurement. Some of the conditions on the Society's marking form do not seem to me to warrant degrading, and I do not think it is yet clear as to what extent intelligence and the possession of personality assist the individual to adapt harmoniously either within himself or in relation to things without, which is what fundamentally constitutes health. It may be that an intelligent, highly reactive personality does not adapt so harmoniously to environmental agents as a more placid individual.

The procedure here is as follows: Each student coming for first examination has a careful interview of about an hour's duration followed by a physical examination. On completion the individual is placed, on a purely arbitrary

assessment, into one of four categories. The first is composed of those whose all-round qualities are outstanding, the third of those who are quite obviously unfit, whilst in between is placed the largest section, constituting the average. The latter is again divided into high and low, so that the groups are labelled 1, 2a, 2b, and 3 respectively. The student's progress at University is followed up, and each receives at least one re-examination, whilst those who stay over three years receive two or more reassessments. By means of a punch file record system the factors concerned with each group can be correlated. It is realized that assessments of this nature can only be of value if carried out in respect of adequate numbers and over sufficient length of time. A ten-year survey is in progress and it is hoped to publish the results in another two years.

This method of approach obviously lacks the precision of a more exact numerical measurement, but it is felt that to attempt to apply scientific accuracy to so ill-defined a subject as health may result in a less accurate impression than a more arbitrary assessment of what we all understand and appreciate, but which we find so difficult to define and measure. In spite of any criticism which these remarks may seem to convey I would like to congratulate the Kent Paediatric Society on its very fine pioneer survey.—I am, etc.,

Aberdeen.

A. H. MACKLIN.

REFERENCE

- ¹ *A Study in the Epidemiology of Health*, published from the Health Department, 14, Brompton Road, Bexleyheath, Kent.

Sudden Death in Labour

SIR.—From the incomplete evidence submitted it would seem that the death reported by Dr. Patricia E. Campbell (*Journal*, January 8, p. 87) was probably due to massive amniotic emboli due to uterine contractions, and not to the penicillin administered over an hour before.—I am, etc.,

Oxford.

JOHN STALLWORTHY.

SIR.—I have read with interest Dr. Patricia E. Campbell's stimulating report of sudden death in labour following injection of penicillin (*Journal*, January 8, p. 87). Ascribing such a major catastrophe, however, to a penicillin injection, without any apparent proof, cannot be accepted easily, and with apologies to Dr. Campbell I feel obliged in the interests of obstetrics to criticize the diagnosis. Is it not rather untenable that hypersensitivity to penicillin should express itself in such manner and degree one hour and a quarter after injection without any prior warning or reaction? This would not be in keeping with the patterns of drug sensitivity.

The unexpected onset in normal labour of vomiting, cyanosis, and sudden death with the morbid findings of pulmonary petechiae and incoagulable blood primarily suggests a diagnosis of liquor amnii embolism and a further definitive search for evidence of extrauterine amniotic content is then warranted. It is only 14 years since Steiner and Lushbaugh¹ first brought this pathological entity to our notice, and to date there are only about 50 cases on record. It is not surprising then that many as yet are unaware of the condition. In the reported case of Dr. Campbell's it is not stated whether there was a histological search for epithelial squames in the lung and, in their absence, if any special staining was used to outrule the presence of liquor amnii fat in the pulmonary blood vessels or whether there was any rent or tear in the amnion explaining the mode of occurrence of embolism.

"Obstetric shock," one time accepted as idiopathic in nature, has more recently become clearer in its aetiology, mainly through a more comprehensive approach to morbid anatomy. In such unknown estate no doubt drug anaphylaxis is entitled to a dwelling, but in Dr. Campbell's case I feel that another housing applicant should primarily be proved less deserving.—I am, etc.,

Galway.

DONAL O'SULLIVAN.

REFERENCE

- ¹ *J. Amer. med. Ass.*, 1941, 117, 1245.

SIR,—I was interested to read the report by Dr. Patricia E. Campbell of a case of sudden death in labour following a penicillin injection (*Journal*, January 8, p. 87). There are several features about it, however, which make the diagnosis of anaphylaxis seem unsatisfactory.

These are as follows: (1) The time interval of one hour between the injection and collapse of the patient is rather long for intravenous injection of the drug—probably the cause of the majority of sudden deaths after penicillin injection—to have been responsible. (2) Reporting the use of massive doses of penicillin, McLean¹ records sudden death of three patients, and says, "As death occurred in all cases within twelve hours of the initial dose, it seems unlikely that anaphylaxis was responsible." (3) The case clinically appears to present all the features of amniotic fluid embolism described originally by Steiner and Lushbaugh,² and subsequently by Reid *et al.*,³ in the United States of America, and by Shotton and Taylor⁴ in this country, and the necropsy findings are not inconsistent with this condition. Dr. Campbell does not state whether or not the lungs were examined histologically.—I am, etc.,

Glasgow, S.1.

GORDON BRILL.

REFERENCES

- ¹ *Practitioner*, 1955, 174, 45.
- ² *J. Amer. med. Ass.*, 1941, 117, 1245.
- ³ *Amer. J. Obstet. Gynec.*, 1953, 66, 465.
- ⁴ *J. Obstet. Gynaec. Brit. Emp.*, 1949, 56, 46.

Appendectomy in Chronic Appendicitis

SIR,—In common no doubt with the majority of your readers, I have been very interested in the correspondence on appendectomy for "chronic" appendicitis which followed the publication of the paper by Messrs. I. McLennan and J. K. Watt (*Journal*, September 25, 1954, p. 736). I was particularly impressed by the letter from Professor J. Chassar Moir (*Journal*, December 11, p. 1415) in which he pointed out the fact—shown in their paper—that "chronic" appendicitis appears to be much commoner in females of menstrual age and that, in his opinion, this is usually attributable to disordered ovarian function.

I am in the process of preparing a paper which lends much support to this hypothesis. In an analysis of all cases with pain in the right iliac fossa, as the presenting symptom seen at one particular surgical out-patient clinic at a provincial teaching hospital during the course of 12 months, the following figures were obtained: females 52; males 11; total 63. Thirty-seven of the females were between 14 and 30 years of age, the majority being either in the late teens or early twenties. These girls were nearly always complaining of intermittent "stabbing" or "niggling" pain in the right iliac fossa (and frequently in the left iliac fossa if specifically asked) which usually lasted anything from a few minutes to several hours, with little or no constitutional upset and usually no abnormal physical signs at the time of examination, although deep tenderness in the right iliac fossa had often been found by their own doctors during or shortly after an attack. In 33 out of the 52 females a diagnosis of ovulation pain was made and the patient reassured. Of the remaining 19 females, of whom the majority were between 40 and 50, one had acute appendicitis and three were thought to be recovering from a recent acute attack, whilst in the remainder a variety of disorders was found, including constipation, renal, gall-bladder, and frank gynaecological disease, plus one pregnancy. Among the 11 males, 6 had a history and/or signs consistent with recent acute or recurrent appendicitis, whilst two were found to be suffering from severe constipation. A right basal lung cyst, a large para-umbilical hernia, and right myofascial lumbar strain completed the list of males. During the same 12 months, 10 females between the ages of 15 and 30 were operated on for "apoplectic" ovary (ruptured lutein cyst) and 8 treated conservatively in the beds of this unit. It is believed that this condition, particularly in a minor form, is by far the commonest cause of recurrent pain in the right iliac fossa in young women.

Appendicular colic, characterized by recurrent central abdominal pain generally lasting only a few minutes at a time and often associated with slight deep tenderness over the appendix but without local rigidity, is a much more plausible explanation for the symptoms relieved by appendectomy particularly in childhood. In such cases, the appendix is nearly always normal to the eye of the sur-

geon and to the unbiased pathologist. It may be kinked and usually contains inspissated faecal matter, but it is rarely chronically inflamed. In so far as constipation appears to be the basic cause of appendicular colic, the condition tends to cure itself in time, but this may extend over many years. For such cases, appendectomy is probably a justifiable but certainly not an essential procedure. While chronic appendicitis undoubtedly exists as a pathological entity, and probably as the sequel to acute or recurrent attacks, it is, I think, a comparative rarity, if for no better reason than the vigilance of the average G.P. in referring all suspicious cases of acute or subacute appendicitis to hospital for emergency admission. Clinically, chronic appendicitis is either silent or declares itself only during acute exacerbations. Following the resolution of an appendix abscess, the appendix is histologically chronically inflamed, yet the patient is symptom free unless there is a recurrence of acute inflammation.

My conclusions, for what they are worth, are: (1) Chronic appendicitis is relatively rare and is a sequel to acute inflammation. (2) Chronic appendicitis *per se* is symptomless. (3) Appendicular colic is common, particularly in children, and is due to inspissation of faecal matter in perhaps a kinked but not usually a chronically inflamed organ. (4) Appendicular colic can be produced only if the wall of the appendix is capable of actively contracting, and this function is inevitably inhibited by fibrosis. (5) Acute-on-chronic (or recurrent) appendicitis is characterized more by persistent pain in the right iliac fossa (lasting continuously for several hours or days) and less by initial central colic. (6) Recurrent attacks of pain localized to the right iliac fossa and lasting only short periods (minutes to perhaps an hour) are rarely due to appendicitis. (7) Recurrent niggling pain in the right iliac fossa of young women is generally due to disordered ovarian function.—I am, etc.,

London, W.C.1.

A. HENRY MILLARD.

Distribution of R.M.B.F. Christmas Gifts

SIR,—I am sure that your readers will be pleased to learn that the contributions to provide Christmas gifts for the beneficiaries of the Royal Medical Benevolent Fund amounted to £2,775. We were able to distribute £8 to each of them.

The warmth of gratitude expressed in letters of thanks would have gladdened the hearts of the contributors, and of yourself, Sir, for giving space so generously for the publication of the appeal.—I am, etc.,

WEBB-JOHNSON,

President,
Royal Medical Benevolent Fund.

London, S.W.15.

POINTS FROM LETTERS

Fixation of Blood Smears

Mr. N. V. GURJAR (Bombay) writes: I have been using successfully a 7% solution of sulphosalicylic acid as a fixative for blood smears. More than 3,000 smears of blood and marrow have been fixed by this method for a couple of seconds and then stained with different haematological stains. The results have been excellent. The cytological morphology is better as compared with alcohol fixation. Another advantage is that smears so fixed can remain (unstained) for any length of time without any fungus growth, which is a common feature of alcohol fixation. Recently I have also fixed some tissues for histological section with 10% solution of sulphosalicylic acid for 24 hours, and this has shown less shrinkage in cell cytology. This might prove a bit expensive in comparison to formol-saline or Bouin's fixative, but the advantage of getting better morphology could be a consideration particularly when dealing with small biopsies.

The Future of Surgery

Dr. E. F. BLUMBERG (London, S.W.3) writes: With reference to Sir Heneage Ogilvie's statement (*Journal*, December 18, 1954, p. 1435) that "the contributions of Germany to surgical advance in the last 50 years have been pathetic," for the years since 1933 your author is obviously correct. The first 25 years, however, produced a vast number of great names. I am including a small collection—Kocher, Trendelenburg, Lexer, Israel, Enderlen, Czerny, Bier (lumbar anaesthesia), Kehrer, Koerte, Garré, Sauerbruch.

Obituary

R. J. WILLAN, C.B.E., M.V.O., M.S., F.R.C.S.

Professor R. J. Willan, who died in London on January 12 at the age of 77, was for many years an outstanding surgeon in the north of England, and his reputation was high throughout the surgical world. Although a general surgeon, he was particularly well known for his genito-urinary work. He gave devoted service to his hospital, the Royal Victoria Infirmary, Newcastle-upon-Tyne, and to his university; he reached flag rank in the R.N.V.R. and was surgical adviser to the Ministry of Health; and he was a valued counsellor in the affairs



[Dorothy Willing]

of the Royal College of Surgeons of England and of the British Medical Association.

Robert Joseph Willan was born on January 10, 1878, the second son of John Willan, J.P., of Durham. From Durham School he went on to the University of Durham, graduating M.B., B.S., with honours, in 1906. He won the Gibb scholarship in pathology in 1904, the Charlton scholarship in the principles and practice of medicine in 1905, and the

Stephen Scott scholarship in 1908. Later, in 1920, he was awarded the Heath scholarship, which is awarded, also by Durham University, for an essay or paper based on personal investigations. He took the F.R.C.S. in 1908, and in the following year proceeded to the M.S., with first-class honours. After graduation Willan was house-surgeon and surgical registrar at the Royal Victoria Infirmary and senior house-surgeon at St. Peter's Hospital, London. In 1914 he was elected to the honorary staff of the Royal Victoria Infirmary as assistant surgeon, becoming full surgeon in 1922, and his skill, resolution, and hard work quickly gained him a wide reputation and an extensive practice. In due course he became senior honorary surgeon to the Infirmary, and then consulting surgeon when he retired in 1938, and for some time he was chairman of the honorary medical and surgical staff committee. An appointment of which he was particularly proud was that of honorary life governor of the Infirmary made soon after his retirement. He also served as honorary surgeon to the Ingham Infirmary, South Shields, to the Newcastle-upon-Tyne Dental Hospital, and to the Whickham and District Cottage Hospital. When the late Professor G. Grey Turner came south to become professor of surgery at the British Postgraduate Medical School at Hammersmith in 1935 Willan succeeded him in the chair of surgery in Durham University, a post which he filled with distinction until his retirement in 1942. He was then appointed emeritus professor. He was a past-president of the Durham University Medical Society and of the Newcastle upon Tyne and Northern Counties Medical Society.

At an early stage in his career Willan joined the Volunteers, being attached to the Durham Light Infantry. Later he transferred to the Royal Naval Volunteer

Reserve, retiring in 1933 with the rank of surgeon-captain after many years' service. During the first world war he served with the Grand Fleet and was for a time medical adviser to Prince Albert (later King George VI), and he also treated and gained the friendship of Admiral Jellicoe. He was awarded the Volunteer Decoration in 1919; and he was Honorary Surgeon to King George V from 1930 to 1933.

In the second world war he again served the Royal Navy as consultant in surgery for Scotland, with the rank of surgeon rear-admiral, and he was also surgical adviser to No. 1 Region of the Ministry of Health. He was appointed M.V.O. in 1915, O.B.E. in 1919, and C.B.E. in 1946.

From his early days in Newcastle Willan took a great interest in the work of the British Medical Association. Beginning as honorary secretary of the Newcastle-upon-Tyne Division in 1912, he was scientific secretary of the North of England Branch from 1915 to 1922, and his merits in these posts gained him the position of chairman of the Division in 1924-5 and president of the Branch in 1929-30. Much of the success of the Association's Annual Meeting held at Newcastle in 1921 was due to his organizing ability as honorary local secretary of the meeting. He served as a vice-president of the Section of Surgery at the Glasgow Meeting of the B.M.A. in 1922, was a representative to the Centenary Meeting held in London in 1932, and a member of the Council for a year (1931-2). He worked on a number of committees of the Association, and was particularly interested in the Science Committee, of which he was a member for nearly 30 years. He was chairman of its library subcommittee from 1946 until his death and was closely concerned with the move of the library to its present home in the garden-court wing of B.M.A. House.

Willan wrote a large number of articles for the various medical journals, articles chiefly concerned with subjects relating to the genito-urinary organs. All his writings were characterized by sound and practical common sense. In 1939 the seal of their approval was given to Willan by his surgical *confrères* when he was elected to the council of the Royal College of Surgeons of England, and he remained on the council for eight eventful years.

Of medium height and sturdy in build, Willan had the misfortune to lose the sight of one eye through an accident in later life, but he was never heard to complain of this infirmity. Good-natured in temperament, quiet in demeanour, rather reticent in giving his opinion, he could always be relied on to speak to the point. After his retirement from hospital and private practice he moved to London, where he regularly attended the Savoy Chapel, for he was very proud of his Membership of the Royal Victorian Order and he loved the quiet and the atmosphere of that religious oasis. After coming to London Professor Willan interested himself in medical charity. He was a member for some years of the council of Epsom College, where he was for two years chairman of the Special Committee: after that he was chairman of the Conjoint Committee for one year, but in 1954 had to decline nomination for re-election owing to the state of his health. He was also for a few years on the committee of management of the Medical Insurance Agency.

Professor Willan's wife, formerly Miss Dorothy E. Shawyer, died in 1949, after they had been married 39 years. There were one son and two daughters of the marriage.

G. McC. writes: No medical officer who has served on the permanent list of the Royal Naval Volunteer Reserve will have failed to have noted with regret the death of Robert Joseph Willan, for, although he was a surgeon and teacher of repute, it was his connexion with, and career in, the Royal Navy of which he was most ready to talk in his later years. As a very young man he joined the Royal Naval Volunteer Reserve shortly after its foundation. Serving in the years immediately prior to the first world war, he took an active part in training and preparing the Tyne Division for the part this Division was to take and for which he himself was mobilized in August, 1914. During his four and a half years of active service he wrote what became a minor classical publication entitled, *Clinical Notes for Surgeon Probationers*, which became the medical Bible for all those unqualified medical students who had medical charge of destroyers and other small ships. His place as a member of the R.N.V.R. in the Royal Navy became established when, as surgeon in the Hospital Ship *Plessey*, he was called upon to operate, in an emergency, on the Duke of York, who was later to become King George VI.

After the war he continued as a senior medical officer, attaining the maximum rank allowed in the Reserve, of surgeon captain, and in that rank holding the position of King's Honorary Surgeon. Retiring on the age limit in 1935, he kept close touch with his old Division and with Naval medical thought, and in 1939, on the outbreak of the last war, it was a great grief to him that he was considered too old to serve. Later he was re-employed as a surgeon captain (retd.), R.N.V.R., and was finally promoted to the rank of acting surgeon rear-admiral, R.N., which was a source of pride to himself and of satisfaction to those who knew him and had worked with him, and was interpreted as a tribute to the permanent Royal Naval Volunteer Reserve Medical Branch. After the war he kept up his connexion with the Tyne Division, and liked nothing better than to come North from his retirement to talk over old times with other "old salts."

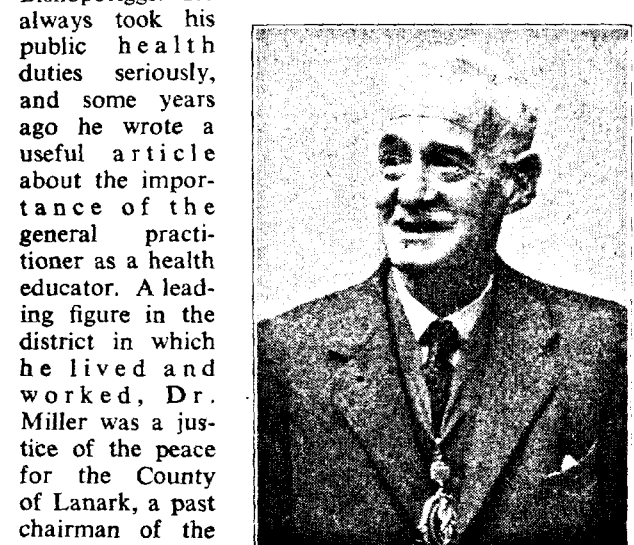
J. B. MILLER, M.D., LL.D., D.P.H.

Dr. J. B. Miller, of Bishopbriggs, whose death at home on January 14 we record with deep regret, was chairman of the Representative Body from 1946 to 1948, and one of the most popular and respected figures for many years in the central affairs of the British Medical Association. He seasoned its assemblies with his humour and wit, but behind the drollery was a keen intellect, practical wisdom, and a notable capacity for friendship. He was 77 at the time of his death.

In the Association, after filling many positions in Scotland, including the chairmanship of the Scottish Committee, and also undertaking much useful work at the London headquarters, Dr. Miller was unanimously called to the chairmanship of the Representative Body, the first Scottish practitioner to hold that office. It is an office which demands, not so much skill in the shaping of policy or the conduct of negotiations, as exceptional qualities of chairmanship—firmness, impartiality, politeness; the ability to prick a pretentious bubble, to relieve a strained situation, to rebuke the rude or restive and prod the bored or indifferent; and a detailed knowledge of the business of the meeting. Miller's personality was such that he could display all these qualities and capacities during his three years of chairmanship, among the most difficult years the Representative Body has ever passed through.

James Blakely Miller was born on April 9, 1877, at Kirkintilloch in Dunbartonshire, the son of the Rev. Andrew Miller. He was educated at Glasgow High School and at the University, where he became secretary of the Medico-Chirurgical Society. After graduating M.B., Ch.B. (with commendation) in 1898, J. B. Miller

held the post of senior assistant at Town's Hospital, Glasgow, and then settled in general practice on the Lanarkshire border, in the valley of the Clyde. Bishopbriggs—its name coming down from pre-Reformation days—is only 15 minutes by bus from Glasgow Cross, but it is the centre of the mining and agricultural community among whom Miller found his lifework. In 1909 he proceeded to the M.D., again with commendation, and he also took the D.P.H. Besides being a general practitioner he was also a medical officer of health—for his native burgh of Kirkintilloch and for Kilsyth in Stirlingshire, both of them only a short distance from Bishopbriggs. He always took his public health duties seriously, and some years ago he wrote a useful article about the importance of the general practitioner as a health educator. A leading figure in the district in which he lived and worked, Dr. Miller was a justice of the peace for the County of Lanark, a past chairman of the Bishopbriggs District Ratepayers' Association, chairman of the local Horticultural Society, a trustee of the Cadder and District Miners' and Community Welfare, and one of the oldest members of the Cadder parish church, being father of the kirk session. He was a district medical officer for the county of Lanark, medical officer to the Post Office, Admiralty surgeon and agent, and medical referee to the Department of Health. During the first world war he was medical officer in charge of the auxiliary Red Cross hospital in his own parish of Cadder. In course of time he found wider fields for his energies as chairman of the Scottish Colliery Surgeons Committee, chairman of the Lanarkshire Local Medical and Panel Committee, and member of the Central Midwives Board for Scotland. In 1951 Dr. Miller completed fifty years of practice in and around Bishopbriggs, and his friends and patients marked the occasion by making a presentation to him at a public gathering in Cadder Parish Church Hall. Last year, at the Annual Meeting of the B.M.A. in Glasgow, Dr. Miller's own university conferred on him the honorary degree of doctor of laws. Professor Stanley Alstead, presenting him for the degree, described him as "a master of this difficult art of general practice," and as "a physician who personifies those virtues which have made the Scots doctor a revered figure throughout the world."



Dr. Miller first became a representative when the British Medical Association held its Annual Meeting at Glasgow in 1922, and in 1929 he was elected a member of the Council. Then began a round of central committee work of which he took his full share, although for him every meeting entailed two nights or two days in the train. He was chairman of the Health Services Committee which preceded the Medical Planning Com-

mission, and on that Commission itself he did excellent service as chairman of the Co-ordination Committee, a task which exactly suited his abilities. He was also, at various times, a member of the Public Health Committee (for a quarter of a century), the Parliamentary Elections Committee, and an earlier General Medical Services Committee which shaped the Association's proposals for a general medical service for the nation. Again, particularly on questions of industrial practice, workmen's compensation, and national health insurance, his experience and counsel were often of service. His knowledge of both the general practice and the public health fields made him a useful member of the liaison committee which ensures co-operation between the Association and the Society of Medical Officers of Health.

In 1945 he was elected by the Representative Meeting in London as its chairman for 1946. His election took place on the very day that Mr. Attlee's Government came into power, and the three years which followed were the most strenuous in the Association's history. They saw the introduction of the National Health Service Act, the mobilization of the profession against some of its provisions, the plebiscites, the resumed negotiations, and the conditional agreement to enter the Service subject to an amending Bill. His term of office ended within a week of the measure coming into operation. During those three years seven Representative Meetings were held, four of them devoted entirely, and the other largely, to the question of the National Health Service. In a similar crisis a generation earlier, when National Insurance was introduced, there were nine meetings of the Representative Body in the course of twenty months, and the two men who filled the chair during that period, Sir Ewen Maclean and Sir Jenner Verrall, had a stormy passage. But the conflict was perhaps sharper in 1946-8. The Association was by this time twice as large, its Divisions were better organized, it was politically more alive, and the demand for leadership was more acute. As chairman of the Representative Body Miller was faced with agenda containing hundreds of motions from Divisions, many of them similar in purpose but with differences of phrase which might be important, at all events in the eyes of the Division which had sent them forward. To assign priority and to make rulings as to how far one motion might be held to cover others was both an arduous and a delicate task, calling all the time for the utmost alertness and power of analysis, the blending of authority with tolerance, and the exercise of good humour to dispel any rankling sense of injustice.

Miller's Scottish humour, which was not artificial or forced but an idiom that was natural to him, never failed him. Not once in that long period was he outwardly perturbed. If he had occasion to utter a rebuke it was done in so whimsical a way that the lesson remained but not the sting. He was always scrupulously fair. In spite of his own obvious desire to get through the tide of words to the rock of decision, he resisted importunate calls that the question be now put or that the meeting proceed to the next business if he thought the matter had not been sufficiently debated. He never failed to give the proposer of a motion the right of reply, while hinting to him either that there was nothing to reply to in the arguments against him, or else that the arguments were so overwhelming that he could not possibly have any reply to them. He once remarked that the business of the Representative Meetings was got through thanks to a core of experienced representatives who never

appeared on the platform and who had made up their minds uninfluenced by eloquence of any sort. Dr. Miller underwent a serious operation in 1948, but in a surprisingly short time he was back again at Headquarters, looking rather more frail, but with mental energies unimpaired and a wit as sharp as ever. His recreations were golf and curling, gardening and field botany, and archaeology, for which last there is plentiful material in north-west Lanarkshire. Dr. Miller married Margaret Vaughan, daughter of the Rev. I. B. A. Watt, and he is survived by his widow, one son, and two daughters. Brownswood, Bishopbriggs, was a very happy home, and Dr. Andrew Blakely Miller and Dr. Marjory Buchan Miller, both of the Glasgow medical school, helped to carry on their father's practice there.

The CHAIRMAN OF COUNCIL, Dr. E. A. Gregg, writes: With the death of "J.B." a familiar and much-loved figure passed away—one of the old guard. He was a man of inflexible principle and great integrity and held in very high regard by all of us. His common sense and realistic approach to all problems was characteristic of all his contributions to debate, whether in Council or committee. His humorous asides and interjections during his chairmanship of the Representative Meetings were a delight and often a great help at a difficult moment.

Dr. J. B. Miller found the life of a family doctor a satisfying and good one, and he had no use for moaners and grumblers. There must be a great number who found in him a friend and helper in their troubles and illnesses, whose kindly ministrations will long be remembered. All his friends rejoiced with him when his old university conferred upon him the honorary degree of LL.D. during our meeting in Glasgow. He loved to recall his early days as a student, and his speech—a special one of his—when he described the old "bone" room and many of the incidents of those days was a sheer delight to us all. We can ill afford to lose men such as "J.B." His memory and his influence on B.M.A. affairs will continue for a long time to come.

The CHAIRMAN OF THE REPRESENTATIVE BODY, Dr. I. D. Grant, writes: By the death of James Blakely Miller the West of Scotland has lost an outstanding personality. "J.B." as he was known affectionately to his innumerable friends, was essentially a B.M.A. man. During a long and happy life he had cultivated many interests and hobbies, and the demands of a busy practice were not easily satisfied. But, despite all these activities, the welfare of the B.M.A. was always his first consideration. He occupied almost every high office of the Association in Scotland, and when in 1954 his Alma Mater conferred upon him the degree of LL.D. his colleagues, even more, I think, than himself, were gratified at the honour which was given to a most erudite and greatly loved general practitioner.

As chairman of the Representative Body, even though his health was failing a little, he made the long journey to London gladly and unsparingly. He played his full part in all the committees of the Association, and his charm of manner and pawky humour quickly won him the affection as well as the regard of his colleagues in the south. I well remember the first occasion on which he took the chair. Some representatives at an early stage of a bleak and foggy morning were just a little intolerant of the rather boring speaker. "J.B." appealed to the meeting: "You might perhaps allow him to go on. We are rather anxious to fill in the time anyhow, as the Birmingham train is an hour late."

He served on the Medical Planning Commission in 1940 and was largely responsible for many of the constructive suggestions made by that body for an improved medical service, but which, unfortunately, were not implemented by the politicians who eventually introduced the National Health Service. Like so many of his generation, he did

not take kindly to nationalized medicine, and was happy to live in semi-retirement after the inception of the National Health Service.

As an after-dinner speaker he was unsurpassed, and the flights of fancy on which he embarked on these occasions will long remain a pleasing memory to those of us who were privileged to hear him speak. However, the most outstanding service he rendered to the Association was one of which he himself was quite unconscious—that was his influence over his younger colleagues and his ability to arouse in them a desire to take part in B.M.A. work. By precept and example he showed us how much one man could do in the service of his fellows. He had a genius for friendship, and I do not think he had a single enemy. We know that the salutation which awaits him is, "Well done, thou good and faithful servant."

Dr. GUY DAIN writes: A Scot with so many of the good qualities of his race, J. B. Miller was not easily provoked to speech, but when he spoke it was with both wisdom and wit. He could, and frequently did, provide the short, snappy, and completely appropriate comment in the course of a discussion, and not infrequently when in the chair of the Representative Body. His speech proposing the health of the chairman of the R.B., then Sir Henry Brackenbury, was a masterpiece of humour and sly fun. But then he was to the B.M.A. over a long spell of years a wise counsellor and leader whose advice was always the result of careful thought and balanced judgment. For those of us who for so long have been associated with him in the work at Headquarters, his cheerful friendship and always helpful advice will be a great loss.

H. W. BARBER, M.B., F.R.C.P.

British dermatology was bereft of two eminent figures on the same day, January 13—Dr. H. W. Barber, of Guy's, and Dr. W. J. O'Donovan, of the London Hospital, to whom an obituary tribute appears on the next page. Both men were born in the same year. The careers of both in their first hospital appointments were interrupted by service in the first world war. Both gained a high reputation in dermatology and made contributions to its literature. Both were in consulting practice in the Harley Street area, within a couple of hundred yards of each other. Both became presidents of the Section of Dermatology of the Royal Society of Medicine. Dr. Barber, unlike Dr. O'Donovan, confined his activities to his profession and did not enter public life, but among his dermatological colleagues he was recognized as one who spoke with authority and out of wide experience. In the Dermatological Section, which every month holds a clinical discussion on a series of cases, Dr. Barber was a constant contributor, bringing forward unusual cases of his own and commenting in his thoughtful and often provocative way on the cases of others.

Harold Wordsworth Barber, the son of a Nottingham solicitor, was born on May 13, 1886. He was educated at Repton, and from there went on with a scholarship to Clare College, Cambridge, obtaining first-class honours in the Natural Sciences Tripos in 1908. His medical training was taken at Guy's, with which hospital he was associated until the end of his life. He graduated M.B., B.Ch. Cambridge, in 1911. In the following year he obtained the Arthur Durham Travelling Scholarship of Guy's, which enabled him to study dermatology in Paris and also at Hamburg, where he learned from the celebrated dermatologist, Professor Unna. He returned to be medical registrar at Guy's from 1913 to 1915, and took the M.R.C.P. at this time. In the first world war

he joined the R.A.M.C. for service in India, Mesopotamia, German East Africa, and France. After the war he returned to his registrarship at Guy's and in 1919 was appointed physician to the skin department. From this time onwards he quickly made his reputation in the specialty he had chosen. He remained on the active staff of his hospital until 1951, when he became consultant to the department. He was also consulting dermatologist to the Royal Navy, and served at various times on the honorary staffs of the Prince of Wales and the Evelina Hospitals. A past-president of the British Association of Dermatology, he was a corresponding member of the French, German, and Vienna Dermatological Societies. He became Fellow of the Royal College of Physicians in 1922. His Lettsomian lectures to the Medical Society of London in 1929 were on the subject of "Dermatology in Relation to other Branches of Medicine" and were published in a shortened version in this *Journal*. At the Annual Meeting of the B.M.A. in 1932 Barber was president of the Section of Dermatology and Venereal Diseases. He contributed to the journal's numerous papers on dermatological and more general medical subjects, and was responsible for the section on diseases of the skin in Taylor and Poulton's *Medicine*. In 1952 he gave the Prosser White Oration.

He married Juliette Louise, daughter of Madame Veuve Champrenand, of Paris; they had no family.

We are indebted to Dr. L. FORMAN for the following appreciation: The passing of Dr. H. W. Barber will give deep sorrow to his friends, his colleagues, and to the large number of patients who were grateful for his skill and sympathetic understanding. He was one of the best known of British dermatologists at home and abroad. Visiting dermatologists to this country would always be found at some time or another in Dr. Barber's clinic at Guy's, and they had great respect and affection for him. Indeed, he was a worthy representative of the medical profession. Impressive and handsome of appearance, he kept his youthful figure and carriage to the last. He was fluent in conversation, and his intellectual quality and capacity were soon apparent.

His interests were wide, and in all of them a tenacious memory and an active interest enabled him to discourse on literature, the theatre, racing, cricket, and other sports. On all these subjects his views were original, occasionally iconoclastic, and revealed the consideration of a contemplative man on the trends and achievements of this century.

Dr. Barber began his postgraduate career as a general physician, and was a most successful medical registrar at Guy's at a time when there were only two registrars in the medical wards; all those who were in the wards at that time testify to his ability and the facility with which he could impart his knowledge. It was with this background of general medical knowledge and training that he approached dermatology, and it gave him the ability to excite the interest of students and postgraduates in the specialty. His careful and minute study of the skin lesion was integrated with his assessment of the patients' personality and medical status in a way that can rarely have been equalled. His



opinion was an excellent one, based on a wide reading in medicine, and his management of the case was a model in the art of therapy.

Dr. Barber wrote fluently and well. He anticipated and stimulated much of the work indicating the importance of disorders of metabolism, endocrine changes, psychological disorders, and chronic infection in the genesis of skin reactions. Of his numerous writings two give the measure of his comprehensive approach and grasp of the problems of medicine and well repay frequent reading. The first is the Lettsomian Lectures, already referred to, and the second, his Prosser White Oration, "What is Truth?" published in the *Transactions of the St. John's Hospital Dermatological Society* in 1953.

Those of us who were trained by Dr. Barber will be ever grateful for the experience. He could make one see and understand. His knowledge of the fundamentals of medicine and of dermatology enabled him to present every case in a manner that provoked interest and thought and a determination to enlarge one's knowledge and experience. To his juniors he was kindness itself, and took the greatest pleasure in their progress and success. He never condescended, and was eager to refer to the observations and publications for which they were responsible. Dr. Barber's contributions to medicine will not be ignored, and in our hearts he will live. To his widow we extend our deepest sympathy.

A. E. S. writes: When I first went into the wards at Guy's H. W. Barber was a medical registrar. He was a quiet, charming personality. In many rounds with him, one in particular is remembered. He talked about agnosia, alexia, etc. He said that in reading up any subject it was well to read it in as many books as possible. I have seen him on many occasions since and have been his patient. He was admired and respected by all.

W. J. O'DONOVAN, O.B.E., M.D., M.R.C.P.

The death was announced on January 13 of Dr. W. J. O'Donovan, who was for a quarter of a century physician in charge of the skin and phototherapy departments of the London Hospital and lecturer on diseases of the skin and on syphilis at the Medical College. Dr. O'Donovan was well known in many spheres—medical, political, and religious—and in all of them his ebullient personality, his wit and repartee, and his good-humoured zeal in controversy made a marked impression.

William James O'Donovan was born in Kent in 1886, but his family was from County Cork. He was a student at London University, entering the London Hospital Medical College in 1905 and qualifying in 1909. He graduated M.B., B.S. in 1911, proceeded M.D. in 1913, and took the M.R.C.P. in 1914. After qualification he held for over a year the post of pathological assistant at his hospital and at a later period he was for some time junior assistant director at the pathological institute there. During the first world war he was chief medical officer to the Ministry of Munitions, and for his services was made O.B.E. in 1920. He went on to widen his experience in general medicine and surgery and then returned to the London as first assistant in the skin and light department. In his early days as physician he had charge of the syphilis block and later of the syphilis out-patient clinic until a separate venereal diseases clinic was established under the authority of the London County Council in 1930. After a quarter of a century at first as assistant physician and then as physician he retired in 1952.

A well-known dermatologist, O'Donovan combined with his dermatology an interest in pathology, in order, as he said, to prevent himself from becoming what his

chief, J. H. Sequeira, once described as a "pimple doctor." At one time he was coroner's pathologist for London. Perhaps his most outstanding contribution to dermatology was his exposition of emotional factors in skin disease. This aspect was much neglected by physicians thirty years ago when he wrote his *Dermatological Neuroses*. A considerable textbook of his on *Diseases of the Hair* was written in a fortnight. He made contributions on a wide range of subjects, including industrial dermatitis and cancer and T.N.T. poisoning (he was a member of the Government T.N.T. Committee). For a time he assisted in the editorship of the *British Journal of Dermatology*. He was consulting physician to the skin department of Queen Mary's Hospital, Stratford, and to a number of other hospitals; consulting dermatologist to Dr. Barnardo's Homes; and lecturer at the London Institute of Dermatology, St. John's Hospital. In the second world war he served



(Elliott and Fry)

in the R.A.M.C. from 1939 to 1945, when he was released with the rank of lieutenant-colonel. He held the appointment of adviser in dermatology to the Middle East Forces in Egypt and Palestine. He was an assistant examiner in medicine in the University of London, and in 1952 he was elected a representative of the Faculty of Medicine on the standing committee of convocation of the University.

For seven years Dr. O'Donovan was honorary secretary of the Marylebone Division of the British Medical Association, for two further years its chairman, and for four years he represented it in the Representative Body. In 1933 at the Annual Meeting at Dublin he was president of the Section of Dermatology, and in 1939-41 president of that section of the Royal Society of Medicine.

During the general strike of 1926, when the electricity supply to the London Hospital was cut off, his energetic and public protest brought him with a bound into national politics, and in 1931 he was returned to Parliament as Conservative member for the Mile End division of Stepney, in which the London Hospital stands. His reversal of a 6,000 Labour majority was a tribute to his personality rather than an endorsement of his politics; he failed to hold the seat at the General Election in 1935, and was similarly unsuccessful in 1950 in opposing Dr. Edith Summerskill in West Fulham. He did not fit very well into Parliament. He was not able, as the members of the old Nationalist party were, to adapt his Irish exuberance to the constraints of Parliamentary procedure, but on the political platform, especially with an antagonistic audience, he was in his element. He occupied various positions of prominence in the Conservative Party, and was president of the University of London Conservative Association.

Dr. O'Donovan was a devout Catholic, and never hesitated to introduce Catholic doctrine into medical or political discussions. For more than 30 years he was honorary secretary of the Guild of St. Luke, SS. Cosmas and Damian. In 1951 he received from the Pope the

honour of the Knighthood of St. Gregory the Great. Just before the second world war he was appointed by the Cardinal Archbishop of Westminster the leader of Catholic Action in England.

He married Ethel K. Smith, who was a great help to him in his professional and public life, and they had one son and two daughters.

We are indebted to Dr. BRIAN RUSSELL for the following appreciation: Dr. O'Donovan succeeded Dr. Sequeira as physician to the skin department at the London Hospital in 1926 and held the post for 26 years. The esteem in which he was held was indicated by a following of 70 students and doctors on his last teaching round. He had an extensive training in general medicine and pathology before taking up dermatology, and he always maintained a practical interest in morbid anatomy, holding that the post-mortem table was as conducive to right thinking and the pursuit of truth as laboratory work at a teak bench. During the second world war he served in the Middle East, and those who trained with him at Tidworth will never forget the zest with which he applied himself to adjustment from civilian to military habits.

Dr. O'Donovan will be remembered as one of the great personalities of the medical profession during the first half of the twentieth century. He had an ebullient mind with ready wit and unfailing repartee suitable for every occasion. He was more interested in sick people with their skin affections than in hair-splitting arguments over individual spots and pimples: he believed in the importance of emotional factors in the genesis of many common dermatoses, and wrote a short monograph, *Dermatological Neuroses*, in 1927 which was the prototype of much writing on dermatology from its psychiatric aspects.

Those who were fortunate enough to attend his political meetings will never forget his oratory and ability to cope with hecklers, which soon earned him the right to sit in Westminster. Hearing him giving evidence in court made one think that he might have made just as successful a career in the legal profession as in medicine. Always cheerful in adversity, he could joke about his own illness even after the first of the three episodes which progressively struck him down. All those who have enjoyed his quips and sallies, and who have thus found the acquisition of knowledge less tedious, owe a debt of gratitude to this irrepressible and irreplaceable personality for having observed when he first came to the London Hospital the inscription over the Medical College doorway, *Amara lento tempera risu*, which may be very freely translated, "Temper the bitter things of life with a smile."

Dr. PATRICK HALL-SMITH writes: I should like to pay tribute to the late Dr. W. J. O'Donovan, with whom I was closely associated, first in the Army, and then as his senior registrar at the London Hospital. In the difficult years just after the war no young dermatologist could have served a more stimulating or considerate chief, and many besides myself owe their careers to his championship and guidance. "O'D," as he was popularly known, had a great presence and a truly sparkling personality; he was a gifted and original speaker, possessing a lively forensic skill in argument. Always an individualist, he wore a scarlet-lined cloak during his Army service, and discomfited a series of inspecting generals who imagined they were conversant with military law. Hecklers at West Fulham in the 1950 election also found the contest unequal. His learning and intellect were apparent, but those who knew him well recognized too a man of strong faith and courage. Generations of old-Londoners will recall him as an exceptional clinician and teacher, and as one who was never dull; his colleagues in dermatology mourn a unique and lovable personality whose provocative statements enlivened many a dreary meeting. He will not be forgotten, and his writings will live on as an important contribution to British dermatology.

G. V. ANREP, M.D., D.Sc., M.Sc., F.R.S.

Dr. G. V. Anrep, professor of physiology in Fouad I University, Cairo, died in Cairo on January 9, aged 63.

Gleb V. Anrep was born in St. Petersburg, the son of Basil von Anrep, who studied the action of cocaine and in 1880 suggested its use as a local anaesthetic. From the University of Dorpat he went on to study medicine in St. Petersburg. Before qualifying in medicine in 1914 he worked for a time as demonstrator of physiology in the Military Medical Academy at St. Petersburg, and he had also visited London and worked in the physiology department of University College. During the war he served as a medical officer in the Russian Army until 1917 and then returned to St. Petersburg as senior assistant in physiology at the Institute of Experimental Medicine in that city. He joined the forces of General Denikine, who fought against the Bolsheviks, and not long afterwards he had to leave Russia. Settling in London, he was first appointed assistant, then in 1923 senior assistant, and finally in 1926 reader in physiology at University College. He obtained the D.Sc. degree in physiology in 1923 and was awarded the Schäfer Prize and William Julius Mickle Fellowship two years later. He became a naturalized British citizen in 1925. Before going to Cairo as professor of physiology in 1931 he was for a time a lecturer in physiology at Cambridge, and also Cooper-Lane lecturer at Stanford University, San Francisco. He was elected F.R.S. in 1928.

Most of Anrep's studies were on the circulation, and he published numerous articles in the *Journal of Physiology*, the *Proceedings of the Royal Society*, and other journals. His Lane Medical Lectures were published in book form in 1936 under the title *Studies in Cardiovascular Regulation*. Anrep was a former pupil and collaborator of Professor Pavlov, and in 1927 he translated and edited Pavlov's book, *Conditioned Reflexes*, which had been published in Russian in the previous year. This was a most important piece of work, for it was the first time that a full account of Pavlov's researches had appeared in the English language. Apart from the ordinary difficulties of translation, Anrep had to cope with an entire new terminology. The result was remarkably successful.

G. H. G. writes: G. V. Anrep was a pupil of Pavlov and played an important part in making conditioned reflexes known outside Russia. He had paid a short visit to University College, London, before the first world war, and came back there in 1918 owing to political events in Russia. He thus came under the influence of Starling, and soon showed that he was a skilful experimenter who could make heart-lung preparations more rapidly than other people. He published a series of papers on the metabolism of the salivary glands and on the regulation of the circulation. With Starling, and with other people, he carried out elaborate experiments such as the perfusion of the head and neck by means of a heart-lung preparation, and worked out details of the reflexes controlling the circulation. He was elected F.R.S. in 1928 at the early age of 37. At about this time he added much to our knowledge of the coronary circulation and the circulation in voluntary muscles, proving that the actual contraction of the muscles caused a stoppage of the flow, and recording the reactive hyperaemia which followed even when the flow was stopped for a fraction of a second. This work is summarized in the Lane Medical Lectures which he gave at Stanford University in 1936.

In Egypt Anrep became interested in histamine, and published a series of papers with G. S. Barsoum and others

on the physiology of this substance. He was the first to show that normal urine contains not only free histamine but also inactive conjugated histamine, and that this comes from the intestine. He discovered the first histamine-releaser, tubocurarine.

He was proud of his British nationality, but this cannot have helped him when, a few years ago, his career was again interrupted by political events and he had to give up work in the laboratory. He was an energetic and enterprising person with many interests. He learned Arabic well enough for intelligent discussion of the world's affairs. He drove an old Ford car on expeditions across the desert which more cautious people regarded as foolhardy. He was an enthusiastic philatelist who had an arrangement with postmasters in Cairo which led to the discovery of what he called "the Anrep variations." He was very good company and fond of telling dramatic tales about himself; it is sad that we shall hear him no more.

Sir ARTHUR KEITH, M.D., LL.D., D.Sc.
F.R.C.S., F.R.S.

Dr. F. PARKES WEBER writes: Everyone knows of Sir Arthur Keith's enthusiasm in regard to the collection of skulls when he was conservator of the Museum of the Royal College of Surgeons, London. He was not contented with one specimen of the skulls of any particular class of natives, but preferred to have a considerable number for purposes of comparison. Shortly before the first world war a cousin of mine, who was somewhat of an amateur anthropologist, lived in a flat close to the British Museum. He possessed a small collection of skulls of the aborigines of a small island in Oceania. As he was going to be married he wished to get rid of these skulls in deference to the wish of his fiancée. He thought of presenting them to the collection of Sir Arthur Keith. The latter invited my cousin to dinner with him at a Holborn restaurant, in order to discuss the matter. After the meal Sir Arthur said to my cousin: "If you don't give me those skulls I'll have yours." This so tickled the fancy of my cousin that, if he had not already made up his mind, he decided to present the collection to the Royal College of Surgeons. Subsequently, after my cousin had returned from Salonika, where he had served during the war, I saw a good deal of him and he told me the above story.

A memorial service for the late Sir ALFRED B. HOWITT, C.V.O., M.D., will be held in the chapel of St. Thomas's Hospital, London, S.E.1, at 12.15 p.m. on Thursday, January 27.

Medico-Legal

BABY'S DEATH FROM BORON POISONING

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

On November 23, 1954, the inquest was concluded at Ealing before Mr. H. G. Broadbridge, coroner for West Middlesex, on a 3-months-old baby boy called Tony Smith, who died on September 28, 1954, from boron poisoning.

The baby had been a little sore about the buttocks and between the legs. His mother asked in a chemist's shop for a boracic powder and told the chemist what she wanted to use it for. She was sold some powder in a little cardboard drum. The powder had no smell and the child's grandmother thought that the drum was labelled "boracic acid powder."

After the powder had been used for about a week the baby seemed ill, and on September 19 he was admitted to Hillingdon Hospital suffering with severe vomiting and diarrhoea. He also had a ruptured navel. Three days later

Dr. H. V. L. Finlay, the paediatrician at Hillingdon Hospital, diagnosed poisoning by boracic acid, and the whole skin, including that inside the nose and mouth, began to peel. The boron content of the urine was found to be 28.7 mg. per 100 ml. Six days later the baby died.

In evidence Dr. Finlay said that the raw condition of the baby's napkin area on admission to hospital was ideal for the absorption of boric acid. He had never seen any harmful effects from the use of boric acid preparations, but emphasized the danger of using pure boracic acid in powder form, and thought it should not be sold indiscriminately over the counter.

Dr. Donald Teare, who made the post-mortem examination, found the boric acid content of the brain to be 13 mg. per 100 g., of the lung to be 28 mg. per 100 g., and of the kidney to be 33 mg. per 100 g., which together with the amount in the urine previously estimated was within the range in which boron poisoning occurs. Dr. Teare said that ordinary powders sold for babies usually contained 5 to 10% of boric acid, and that of the 37,000 necropsies he had made this was the first occasion on which he had found boric acid poisoning. He thought that what had happened was that the baby's mother had been sold neat boric acid as a powder.

A verdict of death by misadventure was recorded.

Vital Statistics

Influenza

A few more outbreaks of virus-B influenza had been reported up to January 17, and the increases in the weekly claims on the Ministry of Pensions and National Insurance suggest a greater prevalence among adults. In London reports of sickness indicate the probable presence of influenza, and in the environs the situation is much the same. In the northern half of the country and in Wales the disease is waning; in the southern half it is still advancing here and there, particularly in the eastern region, but progress is slow. Clinically the infection is usually mild. Laboratory reports continue to confirm most of the outbreaks as being due to virus B, but two patients in the midlands have been proved to be suffering from a virus-A infection. No spread from either has been traced.

Smallpox in France

A message from the French Ministry of Public Health and Population, dated January 8, reports the number of cases of smallpox in the Vannes area as 25, including two deaths, though a press report from Paris dated January 12 gives the number of cases as 40, including 4 deaths. The first case occurred at the beginning of December, 1954, in an unvaccinated child aged 1 year. The child's father had returned 10 days previously from military duties in Indo-China, where he had been in a hospital in which cases of smallpox were being treated.

Causes of Death in June Quarter

In England and Wales in the June quarter deaths from respiratory tuberculosis (1,657) were 9% fewer than in the corresponding period of 1953. Cancer deaths were slightly more—21,826 as compared with 21,451; but deaths from cancer of the uterus (888) were 12% below those in the second quarter of 1953. Accidental deaths rose to 3,633 (3,272 in June quarter, 1953). This was mainly accounted for by increases in accidental poisoning (243 deaths compared with 177 a year earlier), falls (1,249 compared with 969), and burns (166 compared with 146). The number of suicides (1,415) was the highest since the June quarter, 1939.

England and Wales Population

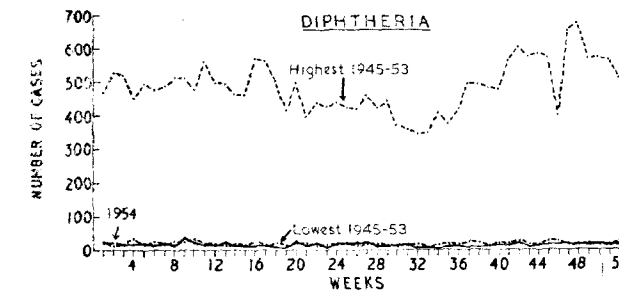
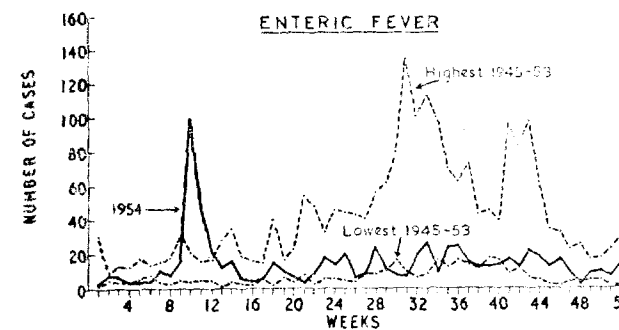
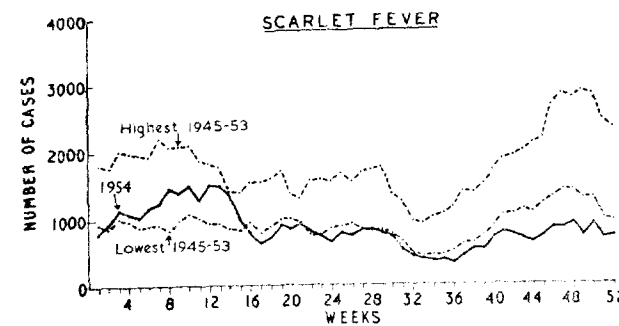
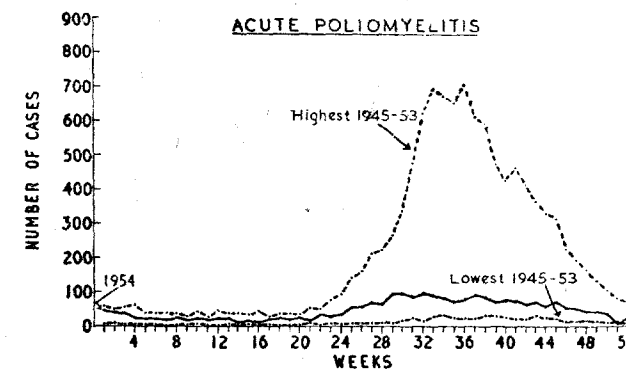
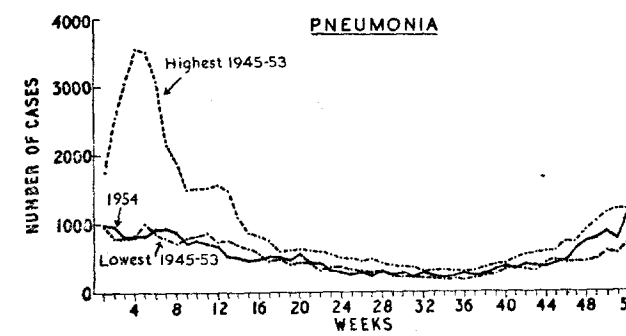
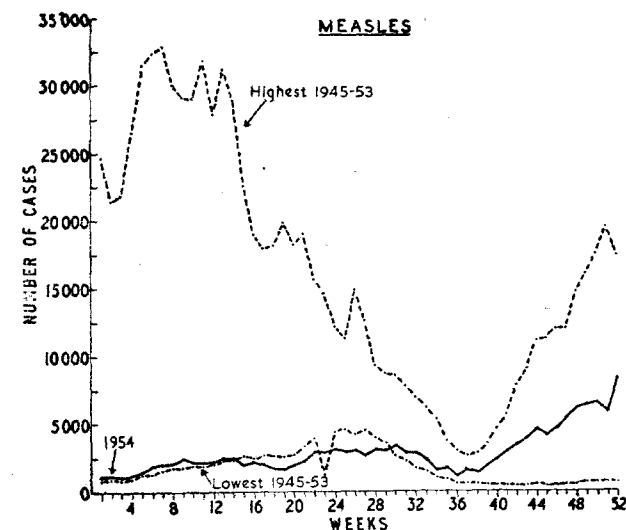
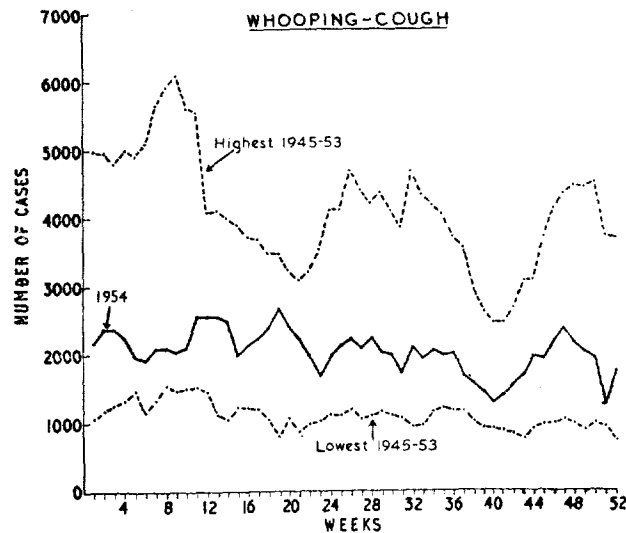
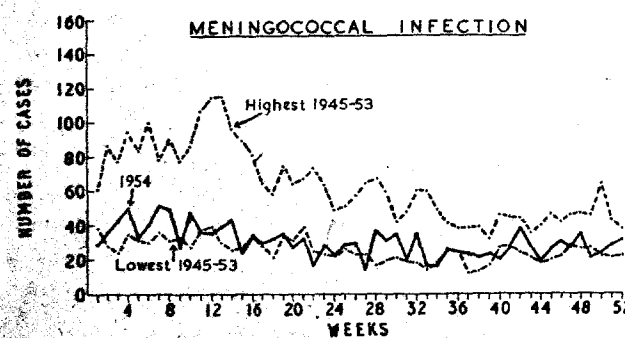
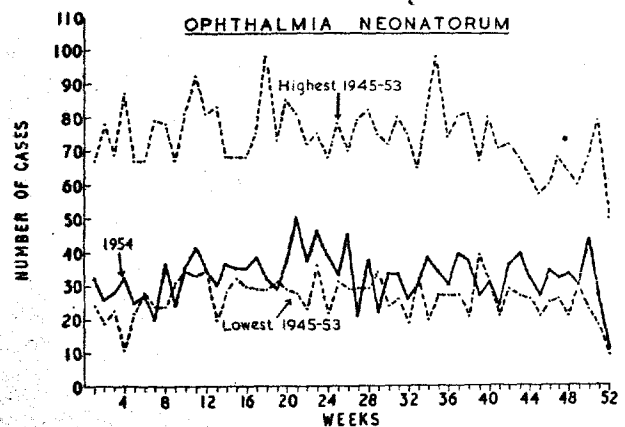
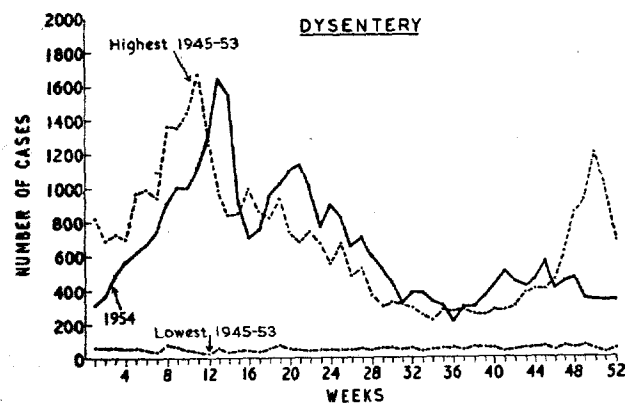
The home population of England and Wales has increased by over 500,000 since census day (April 8, 1951), according to the Registrar-General's estimates published in the Return for the September Quarter, 1954. It is given as 44,480,000 (21,492,000 males and 22,988,000 females).

Week Ending January 8

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 463, whooping-cough 1,791, diphtheria 13, measles 9,385, acute pneumonia 1,135, meningococcal infection 42, acute poliomyelitis 25, dysentery 346, paratyphoid fever 4, and typhoid fever 4.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus -----, the figures for 1954 thus ————. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

A rise occurred in the incidence of infectious diseases in England and Wales during the week ending January 1. The increases in the number of notifications included 2,480 for measles, from 5,840 to 8,320, 466 for whooping-cough, from 1,256 to 1,722, 352 for acute pneumonia, from 756 to 1,108, and 34 for scarlet fever, from 673 to 707.

The largest increases in the incidence of measles were 598 in Lancashire, from 1,912 to 2,510, 438 in London, from 550 to 988, 228 in Essex, from 341 to 569, 159 in Derbyshire, from 69 to 228, 155 in Warwickshire, from 172 to 327, 145 in Yorkshire West Riding, from 558 to 703, and 122 in Durham, from 306 to 428. The largest rises in the number of notifications of whooping-cough were 56 in Lancashire, from 127 to 183, and 50 in Durham, from 85 to 135. Only small variations were reported in the local trends of scarlet fever. 13 cases of diphtheria were notified, being 2 fewer than in the preceding week. The areas with multiple cases of diphtheria were Lancashire, Liverpool C.B. 4, Warwickshire, Birmingham C.B. 3, Surrey, Epsom and Ewell M.B. 2.

23 cases of acute poliomyelitis were notified; these were 13 more for paralytic and 1 more for non-paralytic cases than in the preceding week. The largest returns were London 5 and Middlesex 3.

340 cases of dysentery were notified—the same total as in the two preceding weeks. The chief centres of infection were London 57 (Hackney 17, St. Marylebone 11), Norfolk 57 (Norwich C.B. 41), Lancashire 56 (Oldham C.B. 14, Liverpool C.B. 13), Yorkshire West Riding 24, Warwickshire 18 (Birmingham C.B. 17), Lincolnshire 18 (Scunthorpe M.B. 18).

82 deaths were attributed to influenza in the great towns, a rise of 26. The largest totals were Manchester C.B. 8, Birmingham C.B. 7, Nottingham C.B. 6, Wolverhampton C.B. 5.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending January 1, 1955 (No. 52), and corresponding week 1953-4.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 166 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrar-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1954-5					1953-4				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Dysentery	13	1	3	0	2	23	3	3	0	0
Diphtheria	340	57	175	10	5	340	52	105	3	1
Enteric fever:										
Typhoid	4	0	0	0	0	1	0	0	0	0
Paratyphoid	11	1	2	0	0	0	0	0	0	0
Food-poisoning	131	18				127	18			0
Infective enteritis or diarrhoea under 2 years				11	8				16	27
Measles*	8,320	988	241	496	59	1,327	9	13	8	161
Meningococcal infection	31	1	13	0	1	27	2	8	3	1
Ophthalmia neonatorum	11	0	5	0		18	2	4	0	
Pneumonia†	1,108	71	200	5	2	907	58	297	13	2
Poliomyelitis, acute:										
Paralytic	21	5	3	0	2	40	2	6	1	8
Non-paralytic	2	0				13	0			
Puerperal fever‡	196	25	4	0		228	34	9	0	
Scarlet fever	707	51	134	40	16	1,111	70	166	42	32
Tuberculosis:										
Respiratory	526	59	131	26				120	30	
Non-respiratory	84	10	23	4				23	7	
Whooping-cough	1,722	108	103	33	7	2,284	84	261	66	99

DEATHS in Great Towns	1954-5					1953-4				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	1	0	0	0	0	0
Dysentery	0	0	1	0		0	0		0	
Enteric fever	1	1	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	6	0	0	0	1	16	0	0	0	0
Influenza	82	2	2	0	2	22	6	1	0	0
Measles	0	0	1	1	0	0	0	0	0	0
Meningococcal infection	0	0	1			1	1			
Pneumonia	380	40	24	16	13	332	48	27	12	6
Poliomyelitis, acute	0	0			1	3	0			0
Scarlet fever	0	0	0	0	0	0	0	0	0	0
Tuberculosis:										
Respiratory	89	16	9	0	2	124	15	14	3	9
Non-respiratory			0	0	1		4	1	1	1
Whooping-cough	4	1	0	0	0	4	0	1	0	2
Deaths 0-1 year	246	12	37	8	17	290	42	36	13	18
Deaths (excluding stillbirths)	6,745	894	681	118	168	6,767	1022	647	158	183
LIVE BIRTHS	7,337	2158	844	232	300	8,227	1222	823	229	365
STILLBIRTHS	201	42	23			201	27	20		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Medical News

Association of British Pharmaceutical Industry.—The Association of the British Pharmaceutical Industry celebrated its 25th anniversary last week by publishing a booklet describing the history and work of the association and by holding a reception which was attended by the Minister of Health, Mr. IAIN MACLEOD, and his Parliamentary Secretary, Miss PAT HORNSBY-SMITH. Mr. J. F. BOUCHER, the president of the A.B.P.I., made a short speech at the reception, introducing the Minister. Mr. MACLEOD said that when he heard that the A.B.P.I. was holding its reception in the Great Hall of B.M.A. House he thought of his own position as being rather like Daniel accepting an invitation to be chief guest in the lions' den. Referring to the resentment which some people felt about Treasury control and investigations, Mr. Macleod said that such investigations were inseparable from a national health service. An industry of the importance and with the achievements of the British pharmaceutical industry had no need to fear these investigations. He himself was very conscious of the contribution the industry made to the life and health of the nation.

Ceremony at Nuffield Orthopaedic Centre.—On January 4 portraits of Lord Nuffield and the late Mr. G. R. Girdlestone, F.R.C.S., were unveiled at the Nuffield Orthopaedic Centre, Oxford, by the Vice-Chancellor of the University, Mr. A. H. SMITH, and Professor J. TRUETA (in the absence of Lord Nuffield). Speaking at the ceremony, Sir ROBERT MCCARRISON said that, not long after qualifying, Mr. Girdlestone had injured himself in a motor-cycle accident, and after this he decided to devote his life to the care of cripples. His work extended steadily, but by 1930 the huts of the orthopaedic centre were beginning to deteriorate. Lord Nuffield had then provided money to rebuild the hospital, and it was reopened in 1933 as the Wingfield-Morris Orthopaedic Hospital. Mr. Girdlestone always had a feeling of mission in life; he had not only got the hospital going but had imprinted on it his own spirit of service, friendliness, and happiness. Professor TRUETA said that Lord Nuffield and Mr. Girdlestone had met early in their lives. Although different in temperament and ideals, between them they had been able to make the hospital what it was to-day. The portrait of Lord Nuffield, by John Whalley, was presented by Lady Nuffield. Mr. Girdlestone's portrait, painted from a photograph by Frank Eastman, was subscribed for by patients and friends.

E.B.S. at Work.—The Emergency Bed Service invites all hospital admission officers in the Greater London area to visit the service's operations room at Fielden House, 28, London Bridge Street, London, S.E.1, to study its work. An appointment should be made by telephone (HOP 7181).

Sir Allen Daley has been elected chairman of the National Association for Maternal and Child Welfare.

COMING EVENTS

Liverpool Medical Dinner.—The annual dinner for past and present medical students of Liverpool University will be held on February 3 at the Bluecoat Hall, Bluecoat Chambers, at 7.30 for 8 p.m. Mr. A. A. GEMMELL, P.R.C.O.G., will be the guest of honour. Tickets (21s.) from H. DINNICK, Medical School, Liverpool.

Hunterian Oration.—Sir CECIL WAKELEY, Bt., will deliver the Hunterian Oration at 4 p.m. on February 14 at the Royal College of Surgeons, Lincoln's Inn Fields. He will speak on "Hunter and Surgical Research."

Fourteenth International Congress of Pure and Applied Chemistry.—The congress, which covers organic chemistry, will be held in Zurich from July 21 to 27. All those wishing to participate are asked to notify the secretary-general, XIVth International Congress of Pure and Applied Chemistry, Zurich, 1, Switzerland, not later than February 15.

SOCIETIES AND LECTURES

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

Saturday, January 22
INSTITUTE OF ORTHOPAEDICS.—10 a.m., clinical demonstration by Mr. D. Trevor.

Monday, January 24
INSTITUTE OF PSYCHIATRY.—5.30 p.m., Dr. E. Stengel: Lecture-demonstration.
MEDICAL SOCIETY OF LONDON.—8.30 p.m., discussion to be introduced by Mr. D. MacG. Jackson and Dr. W. M. Levitt: Burns and their Treatment.

Tuesday, January 25
BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. Janet Vaughan: Radiation Effects on Bone.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. G. C. Wells: Lupus Erythematosus.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Dr. J. D. S. Flew: Induction of Labour.

Wednesday, January 26
BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—8 p.m., Dr. M. S. Jones: Concept of a Therapeutic Community.
HARVEIAN SOCIETY OF LONDON.—8.15 p.m., annual general meeting. Presidential Address by Dr. R. Cove-Smith: Fitness, Facts and Fallacies.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Pathology of Lupus Erythematosus.
INSTITUTE OF LARYNGOLOGY AND OTOLGY.—5.30 p.m., Professor F. C. Ormerod: Types of Deafness.
INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Dr. C. E. Dukes: Pathology of Calculous Disease.
NOTTINGHAM MEDICO-CHIRURGICAL SOCIETY.—8.30 p.m., Mr. J. H. Kellgren: Rheumatism.
SOCIETY OF CHEMICAL INDUSTRY: FOOD GROUP.—At Chemical Society, Burlington House, W., 6.30 p.m., meeting of Nutrition Panel. Mr. E. M. Learmonth, M.Sc., F.R.I.C.: Soya in the Field of Nutrition.

Thursday, January 27
BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor C. H. Gray: Chemistry of the Porphyrins.
GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.—At Glasgow University Union, 7 p.m., Debate with Royal Medical Society.
LIVERPOOL MEDICAL INSTITUTION.—8 p.m., Dr. A. S. Woodcock: Diagnosis of Gynaecological Conditions by the Examination of Smears; Dr. D. G. Miller: Diagnosis of Carcinoma of the Lung by Examination of the Sputum; Dr. J. H. Pettit: Histological Study of "Leucoplakia Vulvae."
LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of London, 8.30 p.m., Dr. Macdonald Critchley: The Body Image.
RENAL ASSOCIATION.—At the Ciba Foundation, 4.30 p.m., Mr. D. Innes Williams and Dr. R. Pugh: Renal Hypoplasias; Dr. S. W. Stanbury and Dr. M. D. Milne: Base Losing Nephritis.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Mr. H. B. Stallard: Retinoblastoma Treated by Radon Seeds and Radium Disks.
ROYAL MEDICAL SOCIETY, Edinburgh.—At Glasgow, 8 p.m., debate with Glasgow University Medico-Chirurgical Society. Motion: That the Resident is the Cinderella of the National Health Service.
ST. ANDREWS UNIVERSITY.—At Physiology Department, Medical School, Small's Wynd, Dundee, 5 p.m., Dr. J. W. Smith: Postural Mechanism of Joints.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. J. H. Paterson: neurology demonstration.
SOCIETY FOR ANALYTICAL CHEMISTRY: WESTERN SECTION.—At Bristol University, 7 p.m., Dr. E. Windle Taylor: Recent Advances in the Bacteriological Examination of Water.

Friday, January 28
●INSTITUTES OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. S. C. Gold: Lupus Erythematosus.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Mr. V. C. Thompson: Tumours of the Lung I.
INSTITUTE OF LARYNGOLOGY AND OTOLGY.—5.30 p.m., Mr. Maxwell P. Ellis: Ulcers of the Mouth and Pharynx.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—(1) 2 p.m., Mr. B. McN. Truscott: Carcinoma of the Female Breast. (2) 4 p.m., Dr. H. S. Banks: Question and Answer on Common Infectious Diseases.
●ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Dr. E. McC. McGirr: Radioactive Isotopes.
ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., Dissertation by Mr. A. A. Russell: Medicine and Atomic Warfare.
ROYAL MICROSCOPICAL SOCIETY.—At King's College, Newcastle-upon-Tyne, 6 p.m., Dr. Geoffrey Bourne, D.Phil.: The Living Cell.

Saturday, January 29
●UNITED NATIONS STUDENT ASSOCIATION.—At London School of Hygiene and Tropical Medicine, 2 to 7 p.m., conference on World Health.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS
Lawler.—On January 6, 1955, to Sylvia D. Lawler, M.D., wife of L. J. Lawler, 34, Wolsey Road, London, N., a son—Anthony John.
Sachett-Kaye.—On December 29, 1954, to Dr. Beryl (formerly White), wife of A. I. Sachett-Kaye, M.D., M.R.C.P., a son—Richard St. John Clarence.
Tucker.—On January 5, 1955, at the Rubislaw Nursing Home, Aberdeen, to Helen (formerly Rennie), wife of Dr. Hugh M. Tucker, Urquhart Villa, Lossiemouth, Morayshire, a sister for Malcolm, Gillie, and Mandy—Sally Ann Richardson.
Warren Browne.—On January 8, 1955, at King's College Hospital, London, S.E., to Muriel, M.B., Ch.B. (formerly James), wife of Dr. D. Warren Browne, of Cowes, Isle of Wight, a daughter.

DEATHS
Devitt.—On December 26, 1954, at Hermanus, Natal, South Africa, Denis Christian Devitt, M.R.C.S., L.R.C.P., F.F.A.R.C.S., formerly of Northwood, and Rustip, Middlesex, aged 48.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

How Much Sleep for Young Children?

Q.—I should like to know what is the consensus of medical opinion regarding the number of hours of sleep which a healthy, extremely active child of 3 years should have. Also, whether it is considered advisable that such a child should have a mid-day sleep or rest.

A.—Perhaps more important than the consensus of medical opinion is the individuality of the child. Many notably active children are especially so at the age mentioned, thrive satisfactorily although sleeping less than might be expected, and by the time of their fourth birthday sleep heavily in the way characteristic of the older child. Allowing that individual requirements vary considerably, a child of 3 can be said to require about 12 hours' sleep in the 24 hours. A mid-day sleep is not essential and should not be insisted upon if it results in too little sleep or in prolonged delay in going to sleep at night. On the other hand, a mid-day rest is desirable, as the relaxation will conserve the physical reserves of the very active child.

Lack of Sexual Desire at Menopause

Q.—I have a patient who is 45 years old, with five children. She is now at the menopause and has no desire for sexual intercourse. Could you advise an aphrodisiac drug which could be used with safety?

A.—Although it is natural for sex drive to weaken with advancing years, the menopause itself should not result in loss of desire unless the woman concerned expects it to do so. Many women tend to regard the change of life as the end of life so far as sex function is concerned, and it is this attitude rather than any hormone change which may cause frigidity. In fact, women with a proper outlook may continue to desire and enjoy coitus after the menopause; some even go through a phase of increased desire. In the case cited there may be other factors concerned as well—fear of pregnancy, for example, which so many women experience as they approach the menopause. But, whatever form they take, the factors are likely to be psychological rather than endocrinological.

There are no aphrodisiac drugs of real value, and, even if it would help, oestrogen therapy is not indicated because of possible undesirable side-effects. It is claimed that androgens in small doses can increase libido in women, but the evidence is not very convincing, and inert tablets sometimes have an equally good effect.

Antibiotics in Tetanus

Q.—What antibiotics are the best to use in the treatment of tetanus? How effective are they?

A.—Two possible effects of antibiotics in tetanus must be distinguished, that on the primary disease and that on complications, particularly pneumonia.

Cl. tetani is moderately sensitive to penicillin (inhibited by about 0.1 unit/ml.), and an effect on the multiplication of this organism in the body can therefore be expected. Clinical evidence of the usefulness of penicillin in modifying the course of the disease is contradictory. Buxton and Kurman¹ used it as an adjuvant to treatment with antitoxin and sedatives in two cases; Diaz-Rivera *et al.*² used it in 10 cases out of a series of 59: in each of these papers it is concluded that penicillin is of value, but the findings have no statistical significance. Altmeier³ used penicillin in 13 out of a series of 16 cases, and regarded it as of no

value; the dose used was small by present-day standards. Perhaps the main argument against the efficacy of antibiotics in tetanus is the fact that complete excision of the wound often fails to save life. If total removal of the focus of infection—often a simple procedure, since a small punctured wound is a frequent cause—is ineffective, what can be expected of chemotherapy? It has to be concluded that toxin already formed and fixed in the central nervous system can cause death despite all measures to prevent its further formation.

The prevention of pneumonia is a legitimate indication for the use of antibiotics in tetanus, and penicillin is commonly used for this purpose. There is no information on which to decide whether any of the broad-spectrum antibiotics would be more effective. This aspect of the problem differs little from that of preventing autogenous descending infections of the bronchi and lungs under other circumstances.

REFERENCES

- ¹ J. Amer. med. Ass., 1945, 127, 26.
- ² Ibid., 1948, 138, 191.
- ³ Ibid., 1946, 130, 67.

Myokymia

Q.—A man aged 43 years suffers from fibrillary movements all over the body. About nine months ago he had an attack of bacillary dysentery in South Africa, and the condition developed after that. He has been under my observation for the past five months, and the fibrillation appears spasmodically over the muscles of all four limbs, abdomen, and trunk, but no wasting has occurred. There is no loss of power, and both deep and superficial reflexes are normal. There is no pain, no loss of weight, or elevation of the temperature. What investigations are indicated? What are the treatment and prognosis?

A.—Widespread fibrillation or fasciculation in the muscles may occur without atrophy in persons who are without other symptoms, though it is sometimes associated either with an abnormal liability to muscular cramp, increased sweating, or both. This condition, known as myokymia, is quite harmless. Though the fasciculation, resembling as it does that of motor neuron disease, may at first give rise to anxiety, there is no development of weakness, atrophy, or signs of pyramidal disease. Nothing is known of the cause of this form of myokymia, but the writer has seen it in one instance follow an attack of dysentery. The myokymia may persist indefinitely, but does not as a rule trouble the patient when anxiety has been relieved. There is no treatment known to the writer which is effective.

Transfusion in Head Injuries

Q.—How should the principles of early transfusion in severe injuries be applied to the treatment of head injuries? Is not the maintenance of a good blood supply to vital centres, depressed by both local trauma and systemic shock, more important than the traditionally taught danger of increasing intracranial haemorrhage by raising the blood pressure?

A.—If a patient who has sustained a head injury has also lost a quantity of blood from a wound elsewhere and shows clinical evidence of this blood loss, it should be made good by transfusion. Should raising of the blood pressure give rise to further intracranial bleeding this must be recognized and treated, as it should be had there been no indication for blood transfusion.

On the other hand, a head injury alone, without external bleeding, would provide no indication for a blood transfusion. The state of cerebral concussion which immediately follows a head injury is recovered from rapidly and spontaneously in the great majority of cases. The pallor, low blood pressure, and shallow respiration which characterize this state are therefore not to be regarded as evidence of surgical shock. In more severe head injuries with contusion and laceration of the brain the clinical picture is not one of shock, and the pulse is slow with the blood pressure often

elevated. Though in the most severe injuries with brain-stem haemorrhages the pulse and respirations will be rapid, there is nothing to indicate transfusion in therapy. Of essential importance in cases of brain injury is the avoidance of cerebral anoxia by maintaining a clear airway. This can usually be effected by gentle suction through the mouth, but when this is inadequate tracheotomy is a life-saving measure.

Inhalation Therapy

Q.—What is the place of inhalations in modern therapy?

A.—The use of inhalations in modern therapy is very limited. Apart from the volatile anaesthetics, inhalations for nasal catarrh, and amyl and octyl nitrite, certain non-volatile substances can be thus administered. They may be in solution as adrenaline for asthma, or in fine suspension as penicillin for certain respiratory infections, although the employment of penicillin in this way is on the wane.

Although a great variety of drugs could be given by inhalation, there is no special virtue in this route apart from the rapid effect due to quick absorption. The amount absorbed cannot be controlled with any accuracy, and a danger of local irritation, as from the stramonium fumes of asthma cigarettes, must be borne in mind.

Aphthous Ulcers

Q.—A girl of 7 has for several years suffered from small painful ulcers of the mouth. Otherwise she is quite fit. She is about to start orthodontic treatment, and her dental surgeon insists that the ulcers should be dealt with before appliances are fitted. Can you suggest any investigations and treatment that may be profitably carried out? Vitamins A and B have been given and alkaline mouth-washes, with no improvement.

A.—Unfortunately the aetiology of aphthous or so-called dyspeptic ulcers still remains obscure in spite of the considerable amount of work done on the subject. They are now in fact thought to have no connexion with dyspepsia and are seen more frequently in females than in males. The ulcers are formed as a result of the breaking down of vesicles resulting from intra-epithelial oedema of the stratum granulosum of the oral mucosa.

Local antibiotics have been tried and some success has been claimed, but they are unlikely to prevent the formation of vesicles, although they may diminish the secondary infection when the vesicles break down. There is some evidence that the ulcers may be allergic in origin, and on this basis antihistaminics have been employed and success has again been reported. The formation of vesicles has also suggested the possibility of virus infection, and on this basis virus vaccines have been employed; again a small amount of success has been claimed. Vitamins A, B, and C have all had their adherents, but no sustained success has been reported. Local demulcent mouth-washes are of value, but the treatment often advocated—of painting the ulcers with a caustic—cannot be recommended, since this usually merely prolongs the healing process and does not prevent the formation of further ulcers.

NOTES AND COMMENTS

Home-made Anti-freeze.—Dr. G. W. FLEMING (Gosport, Hants) writes: Referring to the answer given to this question ("Any Questions?" December 11, 1954, p. 1434), what is wrong with industrial methylated spirit? I have used it for 40 years with complete success in a ratio of 1 to 7 parts of water. Have I just been lucky, and is not this mixture as reliable as I think it is? It is certainly cheap (3s. to 4s.) compared with other anti-freeze mixtures. It could boil off, I suppose, but I just keep my radiator topped up with 1 in 7 methylated spirit and water and have never had a freeze-up. I put an old Army blanket over my radiator at night as well, but my garage is unheated and without doors—just an open shed.

Dr. W. H. DICKINSON PRIEST (London, W.1) writes: I was more than somewhat shaken by your expert's statement that glycerin has a corrosive action, especially as I was just about to treat my car to its annual dose of one part in sixteen, as I

have done all my motoring life with nearly all my other cars. With great respect, may one inquire the basis for this statement? That it (and proprietaries) stir and scour up rusty sludge is admitted, but is not this a good thing for the next drain-out? If the proprietaries contained an anti-rust chemical, which I believe is general now in the U.S.A., one would not resent their expense so much, but so far as I know this has not reached this country yet. I am not aware of having suffered any ill effects ever from glycerin. I may add that I have asked several garage proprietors with whom I deal and they profess ignorance of the alleged corrosive action. I would be grateful for further information.

OUR EXPERT writes: The general position regarding the anti-freezes for car cooling systems can be briefly summarized as follows: There are a number of substances which, when added to the cooling water in the radiator, lower its freezing point sufficiently to prevent it from freezing in winter, without at the same time reducing the cooling capacity of the system. Unless inhibited by means of appropriate additives, however, every one of these anti-freeze solutions causes corrosion of the cooling system components, the intensity of attack depending to a large extent not only on the anti-freeze used but also on the combinations of metals found in the particular cooling system, type of car operation, etc. With ethylene glycol, methanol, and ethanol (as well as methylated spirit), which form the basis of most commercial anti-freezes, this attack is usually relatively mild, its intensity being of the order of that of ordinary water. The addition of special corrosion inhibitors greatly reduces this attack. It should perhaps be stressed at this point that such bodies as the Society of Automotive Engineers in America and the U.S. National Bureau of Standards consider the corrosive action of ordinary water in the radiator excessive for satisfactory operation of the cooling system, and recommend the use of corrosive inhibitors in cooling water in summer. With uninhibited glycol or alcohol in the radiator, it is improbable that any serious defects in the cooling system would become obvious in the first two or three years of operation, and, under favourable conditions, perhaps during the whole life of the car. The corrosive action of glycerin has been reported by the U.S. National Bureau of Standards in its Circular No. 506 of November, 1952. Also, the Swiss Society for the Study of Motor Fuels at Berne observed that the attack by glycerin, while generally low, assumed the particularly dangerous form of localized pitting of iron and solder metal. The composition of proprietary anti-freezes is not normally disclosed by the makers, but there is no doubt that most, if not all, of them do in fact contain corrosion inhibitors. In the formula recommended by the Chemical Research Laboratory, quoted in the *British Medical Journal* of December 11, 1954 (p. 1434), sodium benzoate and sodium nitrite perform this function. Finally, I should like to draw Dr. Dickinson Priest's attention to the fact that his one-in-sixteen solution of glycerin protects his cooling system against only 2 to 3° F. (1.1 to 1.7° C.) of frost. A one-in-seven solution of methylated spirit and the anti-freeze of the Chemical Research Laboratory give protection against about 7 and about 18° F. (3.9 and 10° C.) of frost respectively.

Skin Ink.—Dr. N. S. FINZI (Cobham, Surrey) writes: As the originator of the formula¹ given in reply to a question on skin ink ("Any Questions?" January 1, p. 55) I should like to add a few words of advice as to its use. It oxidizes readily and is then of no use for skin marking. To avoid this it should be made up in small quantities only, in small well-corked or stoppered bottles. In order to diminish the rate of oxidation, I use 0.2 ml. of sulphurous acid instead of the hydrochloric acid. It is not permissible to use it in radiotherapy patients in any part exposed to radiations, on account of secondary radiation from the iron: a solution of fuchsin is used for these, but it is not so permanent, if washed.

REFERENCE

¹ *British Medical Journal*, 1918, 1, 52.

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OBSERVATIONS ON THE TREATMENT OF PULMONARY TUBERCULOSIS AT THE PRESENT TIME*

BY

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[WITH SPECIAL PLATE]

In previous Mitchell Lectures the emphasis has usually been on some aspect of tuberculosis as seen through the eyes of a physician engaged in clinical practice. In selecting a subject I was aware that the late Dr. F. G. Candler talked on the diagnosis and treatment of pulmonary tuberculosis in 1940, but so much has changed in the intervening 14 years with the advent of specific antibacterial therapy and the advances thereby made possible in thoracic surgery that I felt my observations on the present state of therapy in this disease might not be out of place. I shall deal with my own clinical material and with work in this country of which I have at least some slight personal knowledge.

We all admit that preventive medicine does far more in the eradication of tuberculosis than the puny efforts of the clinician in dealing with the sick; in Scandinavia, certain provinces of Canada, and some parts of the United States it would appear that clinical tuberculosis will disappear in the near future, as smallpox and diphtheria have in Great Britain.

The mortality from respiratory tuberculosis has shown a steady decline for the past century, save for the two world wars, but the fall since 1948 has been striking. From 1931 to 1939 the average total annual death rate for England and Wales was about 25,000; from 1940 to 1944 the figure was approximately 22,000, but in 1945 it was 20,000, and by 1953 it was just under 8,000. Whether this abrupt fall is related to antibacterial therapy is for the statistician to decide. The notification of new cases remains high—in the neighbourhood of 50,000 per annum since 1947—but has dropped from about 48,000 in 1952 to 41,000 in 1953. The number of non-notified deaths from respiratory tuberculosis is still high, even though it has fallen from 3,530 in 1937 to 2,239 in 1952 and 1,751 in 1953. Papworth has shown us that in the known case simple hygiene to prevent spread of infection is highly efficacious; it is the undiagnosed positive case which is the danger.

With mass radiography and improvement in the standard of chest clinics, the type of case seen at a London chest hospital has altered appreciably of late years, but the management of the symptomless case remains a real problem. Apart from cases found by mass radiography,

*Based on the Mitchell Lecture delivered before the Royal College of Physicians, London, June 18, 1954.

pulmonary tuberculosis seems to be changing its character, and we know that over 45% of probationer nurses and first-year medical students are Mantoux-negative when they first attend hospital.

Bed Rest

In recent years one of the greatest advances has been the Medical Research Council's trials of chemotherapy, with simultaneous clinical and scientific observations on large numbers of patients with similar types of disease, using control cases, and with a panel examining results dispassionately. For this we owe much to the late Dr. Marc Daniels. In the first streptomycin trials in 1947-8 the control cases were given six months' proper bed rest, and the improvement in a proportion of these was impressive. Dr. Wallace Fox, in a personal communication, has told me that 17 of the original 52 control (acute bilateral) patients are still alive after five years; most of these were not given chemotherapy for the first two years, although many had collapse measures.

In my experience, in the newly diagnosed case the incidence of "extension" of disease during the period of a few weeks while the patient is awaiting admission to hospital is alarming. Explicit and simple instructions on the details of bed rest at home must be given to the patient. My directions are that he must have the foot of the bed raised on two bricks and use no more than two pillows; he is allowed up once a day only, for toilet purposes and to wash and shave, otherwise he must lie in bed throughout the twenty-four hours, including meal-times, save for using a chamber for emptying the bladder.

In cavitated disease, postural retention as practised extensively by Dillwyn Thomas at Sully Hospital, Glamorgan (Thompson, Savage, and Rosser, 1954), with the patient lying in a simple plaster cast and with the foot of the bed raised, at the correct inclination for six to twelve weeks, is a real advance in treatment, especially when combined with chemotherapy. Although cavities rarely close permanently, they usually decrease markedly in size and the surrounding exudative disease becomes more proliferative. Cough and sputum disappear quickly as a rule. The lung is then in a better state for further treatment and less extensive surgical measures are required.

Antibacterial Therapy

The discovery of streptomycin by Waksman and his colleagues (Schatz, Bugie, and Waksman, 1944) and the experimental work and clinical trials of Hinshaw and his co-workers (1944, 1945, 1946) have revolutionized the treatment

of pulmonary tuberculosis, not only as regards medical treatment, but by allowing more extensive surgical measures by collapse or resection with a greatly diminished risk of broncho-pleural fistula and dissemination of the disease. Another advance was the discovery that the combination of *p*-aminosalicylic acid (P.A.S.) with streptomycin materially decreased the incidence of resistant strains of bacteria to both drugs. In 1951 isonicotinic acid hydrazide (isoniazid) was discovered. This powerful, cheap, and relatively simple drug can be taken by mouth, and again the incidence of resistant organisms is diminished when it is combined with either of the other drugs.

Obviously new and possibly more efficient drugs will be produced; the clinician tends to become confused with the rapid changes taking place these days. The principle of testing under scientific control the value and dangers of new therapeutic agents is of the greatest value, and it behoves us not to discard a well-tried combination of drugs until there is good evidence that a new combination is more efficient and less toxic.

On looking back over the milestones in therapy during the past 30 years—insulin, liver extract, sulphapyridine, penicillin, and cortisone in Addisonian crisis—I still treasure the moment of doubting amazement when I saw the results of streptomycin treatment in the group of young patients with acute exudative disease who were in the Brompton Hospital during the Medical Research Council's trials from 1947 to 1953. The following is an example of such a case.

Case A.—A girl aged 18 years was admitted to the Brompton Hospital in January, 1949, with four months' history of cough, night sweats, and loss of weight. She was acutely ill with tuberculous bronchopneumonia: temperature, 103° F. (39.4° C.); pulse, 120; respirations, 30. She was given streptomycin, 1 g. daily, with P.A.S., 15 g. daily for 14 weeks. In January, 1950, a left pleuropneumectomy was performed, and she was subsequently sent to a sanatorium for six months. She is well and working four years later. (Plate, Figs. 1-3.)

When participating in the treatment of this girl I was thrilled by the vista of what might be accomplished in the future treatment of pulmonary tuberculosis. Such a prospect, coupled with the advent of lobar and segmental resection after chemotherapy, may have blinded us to the value of the older and tried forms of treatment, however. There is a tendency in some countries to accept the view that the proper treatment of pulmonary tuberculosis is a prolonged course of rest with chemotherapy followed by the resection of the remaining areas of nodular caseous disease. The rather scathing term "pimplyotomy" has been used by some clinicians who feel that the pendulum of resection has swung too far.

Thoracic surgery has had an immense influence in giving us knowledge of pathological processes in the lungs at an earlier stage than is seen at necropsy. As a class, thoracic surgeons are highly trained and very able; they handle the lungs in life and can correlate the x-ray appearances with the actual lesions found. It is therefore not surprising that the thoracic surgeon should have great influence in advising in and organizing the treatment of pulmonary tuberculosis. Perhaps it is not untimely to suggest that we physicians, in publishing the results of medical treatment, should use the same factual presentation as our surgical colleagues.

In the treatment of pulmonary tuberculosis we have three main weapons in addition to the long-established principles of rest, diet, fresh air, and graded exercise: (a) antibacterial drugs without collapse therapy; (b) collapse treatment, either medical or surgical, in which the diseased lung remains in the body and possibly acts as a stimulus to antibody formation; and (c) resection of the diseased part, which may act as a reservoir of subsequent infection. Any of these three may be used singly or in combination. We must be clear as to our aims in treatment, which are: (1) permanent healing of the lesions; (2) minimal loss of respiratory function; and (3) the attainment of these in the shortest time. The treatment of tuberculosis is long in any case, and un-

necessary months of idleness may have serious effects on morale and on domestic happiness.

Artificial Pneumothorax Therapy

I want to review our results by medical collapse measures alone, before antibacterial therapy was introduced, so as to have a base-line for the comparison of treatment to-day. The true value of artificial pneumothorax therapy is difficult to assess from the voluminous literature, because of variations in the classification of the extent of disease and an often inadequate follow-up. A paper by Foster-Carter, Myers, Goddard, Young, and Benjamin (1952) on cases in the Frimley Sanatorium furnishes some sort of yardstick. The paper covers the five-year period 1937-42 and 1,153 patients, of whom 955 had cavitated disease, and approximately 99% were followed up for at least eight years. Classification was according to the number of zones in the postero-anterior radiograph on admission: this was shown by Hartley, Wingfield, and Burrows (1935), on their experience of 2,759 cases at Frimley, to be probably the most reliable classification on which to base prognosis. It is as follows: Class I, not more than one zone involved; Class II, unilateral or bilateral disease not involving more than three zones; and Class III, four or more zones involved.

The average period of stay in the Brompton Hospital was 40 days and in Frimley Sanatorium 140 days, amounting to about seven months' institutional treatment in all. No doubt the criticism could be made that these cases are a selected group, as Frimley did not take bed-rest cases, and that Class III (advanced) cases diagnosed radiologically were not really so "advanced" as those transferred to other sanatoria where bed-rest patients were accepted. Obviously a ten-year follow-up would have been better than one of eight years. Be that as it may, the figures show a fair proportion of Class III cases. A further point is that these patients were under the control of different physicians at the Brompton Hospital, whose opinions varied widely as to the use of collapse measures, division or not of adhesions, and duration of treatment. This paper is, however, impressive in that the numbers are sufficient, with nearly 99% of cases followed up for eight years, and the results statistically significant. I am grateful to the authors for allowing me to quote from it.

Of 256 patients with cavitated disease, who had no collapse therapy at any time, 113 (44%) survived eight years; 93 (82%) of these were working and 62 were known to have a negative sputum. Of 83 patients in Classes I and II, 74% survived eight years, and of 173 in Class III, 33% were alive after that period. Thus it is clear that the extent of the original disease is of more importance than the size of the cavities. Of the 616 cases of cavitated disease reported in the much-quoted paper by Barnes and Barnes (1928), 130 were followed up for five years; of these, 79% were in Class III and 85% had large cavities; the five-year survival rate was only 10%. The Frimley figures give a less gloomy picture: of 104 Class III patients with large cavities 33% survived five years and 23% eight years.

In non-cavitated disease artificial pneumothorax treatment appears to be of little benefit. Of 130 patients treated without collapse therapy 88.9% survived eight years, although 24 (18%) required collapse therapy later. Of 62 patients treated by unilateral pneumothorax, 87% survived eight years and 35% needed further collapse. It is possible that the physician selected the less favourable cases for collapse therapy. The point I want to emphasize is the relatively good prognosis in non-cavitated disease without antibacterial therapy.

Of 457 patients with cavitated disease treated by unilateral artificial pneumothorax 316 (69%) survived eight years; 423 (93%) of these cases came into Classes II and III. An eight-year survival rate of 82% was obtained in 240 cases in Class II, and in 48% of 183 cases in Class III.

The striking finding of the Frimley investigation—in my view a most unexpected one—is the good result attained by

what I would call "contra-selective collapse." The authors define three grades of collapse resulting from artificial pneumothorax: (a) "satisfactory," with disappearance of the cavity; and (b) "adherent satisfactory," in which the cavity fails to close within one year. A further surprising fact is that extension of disease to the opposite lung occurred in 25% of the "satisfactory" group, 23% of the "adherent satisfactory" group, and only 11% of the "adherent satisfactory" group. This might be just a chance happening and is difficult to explain on other grounds.

Empyema occurred in 17% of the whole series, with 14% in the "satisfactory" group, 9% in the "adherent satisfactory" group, and 36% in the "adherent unsatisfactory" group, which again shows the danger of maintaining treatment when the cavity fails to close. The results eight years after termination of the pneumothorax show that 64% of the "satisfactory," 60% of the "adherent satisfactory," and about 28% of the "adherent unsatisfactory" group were well and working.

The deductions I draw from this important paper are as follows: (1) The grading according to zones in the radiograph gives a good indication of prognosis. (2) A satisfactory collapse in which the cavity closes gives much better results than are obtained without collapse therapy. (3) An artificial pneumothorax which fails to close a cavity in a reasonable time is dangerous. (4) The incidence of empyema is 17%, which is too high; it occurs particularly in the group with persistent cavities.

I have analysed a series of my own cases, 62 in all. So far as I am aware this includes every case admitted to the Brompton Hospital under my care in which I recommended pneumothorax treatment during the six years 1942-7 inclusive; these cases are therefore not included in the Frimley report. The series is too small to be of any statistical value, and in addition seven patients have not been traced.

The results, which are analysed in Table I, were good in 36 and bad in 11, and there were 10 deaths. I believe in attaining an anatomically perfect collapse where possible, and adhesion section was performed in 35 out of 47 cases,

TABLE I.—Results of Artificial Pneumothorax in Cases Admitted to the Brompton Hospital During 1942-7

	Non-cavitated, Sputum Negative	Class I	Class II	Class III	Total
Failed A.P.	—	—	5 (1 died)	2 (1 died)	7 (2 died)
Lost touch	—	1	5	1	7
A.P. maintained	—	1	—	—	1
Result good	7	11	11	7	36
Treatment failed	—	—	6 (5 died)	3 (3 died)	11 (8 died)
Total	7	13	27	15	62 (10 died)

Years after termination of A.P.	Good Results				
Over 4	7	6	6	5	24
3 to 4	—	2	4	1	7
1½ to 3	—	3	1	1	5
Total	7	11	11	7	36

yet empyema occurred in only 2 of the 47 patients, who were all followed up for at least eighteen months after termination of the pneumothorax. In both cases a suspended cavity was obvious and the pneumothorax should have been terminated within a few weeks. I can also endorse the observation by F. H. Young (1949) that cases under the care of one physician throughout do better than those under multiple control.

Phrenic Paralysis with Pneumoperitoneum Treatment

Banyai (1946) introduced this treatment about 1934 and is enthusiastic as to its value. Many papers on its applica-

tion have been published, but in this country at any rate it is employed chiefly as a preliminary treatment for acute exudative disease, to give some rest to the lung before more definite collapse measures are undertaken. I have used it in a limited number of (generally advanced) cases since 1942, and feel that its value, particularly when it is combined with chemotherapy, is perhaps not sufficiently appreciated. I have had no experience with pneumoperitoneum without phrenic paralysis.

As in pneumoperitoneum the pleural surfaces are not separated, the complications seen with artificial pneumothorax—such as fluid, empyema, haemothorax, and frozen lung—do not occur. Serious complications are rare—less than 5%. As with pneumothorax treatment, a certain amount of skilled supervision is required to attain the objective aimed at—relaxation and rest of the lung selected for phrenic paralysis. This entails a careful search for an accessory phrenic nerve at the time of the phrenic crush and suitable refills to keep the paralysed diaphragm high in the chest, to the level of the third rib or intercostal space in front as seen in the ordinary postero-anterior radiograph; also recrushing the nerve if the hemidiaphragm recovers too early. Careful assessment is needed at a suitable time, usually between six and nine months, to ascertain whether the aims of treatment, especially cavity closure, have been attained; if not, further treatment should be instituted. Lateral radiographs and also tomographs are necessary to decide the progress of the lesion, as pneumoperitoneum affects mainly the posterior part of the lung.

All but two of my 68 patients who have undergone this procedure at the Brompton Hospital have been followed up to date. Apart from four cases in which the pneumoperitoneum was induced by other physicians but supervised by me, the treatment has been given on my recommendation in all cases. Treatment has been abandoned for at least eighteen months, and no patients have been given chemotherapy as part of their treatment. My registrars, Dr. K. J. Gurling and Dr. W. H. Helm, have reviewed the case sheets and original radiographs with me, so as to obtain an unbiased assessment of the extent of the original disease and the results of treatment. When the original films were not available, owing to the fire at the Brompton Hospital in 1950, we have taken the radiologist's report or my own notes on the original films.

Table II gives the over-all results obtained in the 68 cases, divided into Classes I, II, and III and "lower-lobe cavities." In 32 the results were classified as "good," in 20 as "failed,"

TABLE II.—Over-all Results in 68 Cases Treated by Phrenic Paralysis and Pneumoperitoneum

Class	No. of Patients	Results of Treatment				Final State			
		Good	Failed	Non-proven	Lost	Received Other Treatment	Well and Working	Disease Progressive	Died
I	6	3	1	2	—	3	6	—	—
II	24	10	9	4	1	7	18	1	4
III	26	10	7	8	1	12	16	2	7
Lower-lobe cavities	12	9	3	—	—	3	9	—	1 (non-tb)
Total	68	32	20	14	2	25	49	5	12

and in 14 as "non-proven"; 2 have been untraced for one and a half years. With further treatment in 25, 49 of the patients are well and working and have negative sputum. Table III gives a detailed analysis of 65 cases.

The 6 cases in Class I need little comment. In Case 1 the patient, a business man, had to travel by air, and a thoracoplasty was therefore performed. In Case 4 an artificial pneumothorax was induced because the physician did not believe in pneumoperitoneum treatment. In Case 6 a

TABLE III.—Detailed Analysis of the 65 Cases Treated by Phrenic Paralysis with Pneumoperitoneum

Case No.	Age and Sex	Standard of Treatment	Duration (Years)	Result	Years After Termination	Further Treatment and Remarks	Final State
CLASS I							
1	31 M	Good	5 1/2	Non-proven	3 1/2	R. thoracoplasty	Well
2	29 M	Poor	3 1/2	Good	1	"	"
3	25 M	Good	5	"	1 1/2	"	"
4	26 M	Poor	9 1/2	Non-proven	7 1/2	R. artificial pneumothorax with fluid	"
5	20 F	Good	3 1/2	Good	1	"	"
6	44 F	Fair	4 1/2	Failed	2 1/2	L. plombage	"
CLASS II							
1	40 M	Good	1	Non-proven	9 1/2	Pneumoperitoneum added to R. artificial pneumothorax. Subsequently relapsed more than once. Working 1953	Well
2	18 M	Poor	4 1/2	Good	11	Well 10 years. ? Smouldering disease 1 year	"
3	18 M	Fair	2 1/2	"	5	"	"
4	29 M	Good	2 1/2	"	6	"	"
5	20 M	Poor	8 1/2	Non-proven	8	Extensive bilateral infiltration with R. pleural effusion	"
6	16 M	"	3 1/2	"	1	Left sanatorium when radiograph satisfactory. Did not attend chest clinic. Died suddenly	Died
7	34 M	Very poor	2 1/2	Failed	2 1/2	Died. Cavities closed temporarily. Should have had thoracoplasty	"
8	27 F	Good	3 1/2	Good	3 1/2	L. artificial pneumothorax abandoned before pneumoperitoneum started	Well
9	39 M	Poor	2	"	4	"	"
10	45 M	Good	10 1/2	"	6 1/2	"	"
11	27 F	"	4 1/2	"	2 1/2	"	"
12	22 F	"	4 1/2	"	2	"	"
13	27 F	Fair	1 1/2	Failed	4 1/2	Pneumoperitoneum abandoned for ulcerative colitis after 18 months. R. thoracoplasty	"
14	18 F	Good	4 1/2	"	5 1/2	R. thoracoplasty	"
15	20 F	"	3 1/2	"	4 1/2	Cavity bigger with pneumoperitoneum, but closed with artificial pneumothorax. Abandoned 1 1/2 years	"
16	38 F	Poor	3	Good	2 1/2	"	"
17	37 M	Good	5 1/2	Non-proven	4 1/2	Sputum positive at 5 months. Bilateral artificial pneumothorax maintained	"
18	34 F	"	1 1/2	Failed	1	Died. Cavity closed 1 year but reopened. R. thoracoplasty. Died 1 year	Died
19	21 M	Fair	1 1/2	"	3 1/2	Difficult patient: ceased treatment. Bilateral disease. Long chemotherapy	Well
20	41 M	Good	1 1/2	"	2 1/2	L. thoracoplasty. Prolonged chemotherapy. Sputum positive 2 years after	"
21	30 M	"	7 1/2	?	2	Abandoned on ship after 7 months	Lost 2 years
CLASS III, GROUP A (with Aim of Cure without other Treatment)							
1	18 F	Good	4 1/2	Good	5	"	Well
2	21 M	"	2	Failed	6	R. thoracoplasty 1948. L. artificial pneumothorax 1950-3	"
3	24 M	"	1 1/2	Non-proven	7 1/2	Bilat. artificial pneumothorax 4 years. R. upper lobectomy 1952	"
4	44 M	Fair	1 1/2	Failed	4 1/2	R. thoracoplasty 1949	"
5	19 F	Poor	3 1/2	Good	1 1/2	Chemotherapy, 42 g. Streptomycin	"
6	20 F	Good	4 1/2	Non-proven	3 1/2	L. artificial pneumothorax. Persists 1954	"
7	19 F	"	4 1/2	Good	3	L. thoracoplasty 1951. Sputum positive	"
8	26 M	Poor	6	Failed	6	R. thoracoplasty 1953. L. artificial pneumothorax maintained	Fair
CLASS III, GROUP B (with Aim of Curing One Side)							
1	46 M	Good	2	Failed	2	Died 1947. Alcoholic	Died
2	21 F	Poor	4 1/2	Good	4 1/2	R. plombage 1949	Well
3	53 M	"	4 1/2	Failed	3	Died 1949. Disliked refills. Downhill course after pneumoperitoneum stopped	Died
4	28 F	Good	1 1/2	Good	6	R. thoracoplasty 1948	Well
5	35 F	Fair	5 1/2	Failed	1 1/2	Died 1948. Gross cavitated disease. Enteritis 6 months	Died
6	22 F	Poor	4 1/2	Good	3 1/2	R. thoracoplasty 1951. Sputum negative	Well
7	27 M	Good	1 1/2	Failed	1 1/2	Died 1951. L. artificial pneumothorax plus empyema	Died
8	20 F	"	3	"	1 1/2	Deteriorating	Ill
CLASS III, GROUP C (preparatory to Surgical Treatment of Same Side)							
1	22 F	Good	8 1/2	Good	1 1/2	R. artificial pneumothorax. Empyema. Wash-outs	Well
2	30 F	Fair	1 1/2	Failed	1 1/2	L. thoracoplasty 1946. Died 1947	Died
3	28 F	Good	1 1/2	Good	6	Abandoned treatment after one year	Well
4	63 M	Fair	1 1/2	Non-proven	7 1/2	Slowly progressive	Ill
5	37 M	Very poor	1 1/2	"	—	Died. Treatment poor	Died
6	34 M	"	1 1/2	"	—	Treatment very poor	Lost 1 1/2 years? Dead
7	20 F	Fair	1 1/2	Failed	6 1/2	Cavity bigger. L. thoracoplasty 1949	Well
8	23 M	Good	1 1/2	Good	5 1/2	R. thoracoplasty 1948. Spread L. in 1953	Well
9	31 M	Poor	6 1/2	Non-proven	3	Died 1951. Disease progressive	Died
10	22 M	Good	2 1/2	Good	3	R. artificial pneumothorax. L. thoracoplasty 1951	Well
LOWER-LOBE CAVITIES							
1	45 F	Good	1 1/2	Good	5	Patient stopped refills at 6 months. Well April, 1954	Well
2	20 F	"	4 1/2	Failed	5	Cavity blocked: reopened at 4 years. Lobectomy Feb., 1949	"
3	27 F	"	4 1/2	Good	4	Also large cavity R. apex. Phrenic evulsion	"
4	15 F	Poor	5 1/2	"	2 1/2	L. artificial pneumothorax 5 1/2 years	"
5	27 M	"	8 1/2	Failed	7 1/2	Pneumoperitoneum abandoned too soon. L. extrapleural artificial pneumothorax. Mixed empyema. R. thoracoplasty 1949. Sputum positive	"
6	20 F	Good	1 1/2	Good	7	L. artificial pneumothorax failed; pneumoperitoneum added and cavity closed. R. artificial pneumothorax for cavity. Fresh disease L. upper lobe after 1 1/2 years	"
7	30 F	"	1 1/2	"	3 1/2	Haemoptysis persisted. Sputum negative. R. lower lobectomy Nov., 1948. Cavity closed. Died acute enteritis 1952	Died
8	38 M	Fair	3	Failed	4 1/2	Patient abandoned refills. Cavity reopened May, 1950, with spread to R. lower lobectomy Jan., 1951—further disease L. upper lobe. Chemotherapy	Fair
9	15 F	Good	5	Good	2 1/2	Round foci on R. cavitated. L. lower lobectomy Nov., 1951. Cavity well shut off; R. still smouldering	"
10	35 F	"	5	"	2 1/2	Lower-lobe cavity healed. Smouldering L. apex—plombage 1953	Well
11	16 M	Fair	2 1/2	"	5 1/2	"	"
12	16 F	Good	3 1/2	"	1	"	"

pleural effusion occurred before treatment, with the formation of a thick-walled apical cavity. In Class I the results were: 3 good, 2 non-proven, and 1 failed.

The 21 cases in Class II were treated with the aim of cure without further treatment. The results were: good, 9; failed, 7; non-proven, 4; and untraced, 1. The final state is more cheerful in that after treatment 17 patients are well and working, 3 have died, and the other is untraced. The remaining 3 cases of the 24 in Class II were treated in preparation for surgical treatment on the same side, and are therefore not included in Table III. The first patient had a left plombage in 1951 and is now well; the second, a diabetic girl of 27 years with extensive bilateral cavitation, has had a left extrapleural pneumothorax and a right plombage, but is going downhill. The history of the third case is as follows:

Case B.—The patient, a woman of 39 with chronic unilateral cavitated disease, developed a tuberculous bronchopneumonia following a large haemoptysis and the left lung was virtually destroyed. Streptomycin treatment had to be stopped after a fortnight owing to the development of severe toxic reactions to the drug. With a left phrenic crush and pneumoperitoneum the diaphragm was kept high and the disease controlled. Owing to the presence of disease on the right side it was necessary to wait for eighteen months before a left pneumonectomy could be performed, but during most of this time she was free of cough and sputum and doing her housework, and by the end of the period she had regained her normal weight. Unfortunately, when on holiday she was given a refill at a strange clinic, where she had a syncopal attack. This was thought to be due to an air embolism, and the refills were abandoned forthwith without any consultation. The patient died three months later with enormous cavities on both sides. Diagrams of the radiographs are shown below.

The above case illustrates the dangers of dual control, and, moreover, shows the importance, when surgical treatment

successful, the treated lung standing up to surgical collapse of the contralateral side; the other 5 were failures. In Group C, of 10 cases, 4 were classed as successful; 2 of these patients recovered without further treatment. There were 4 non-proven cases and 2 failed. Three cases required thoracoplasty. As in all of the 68 cases the pneumoperitoneum has been abandoned for eighteen months or longer there are no cases in Group D.

An example of the few cases in which a permanent pneumoperitoneum has been maintained is described below. (See Plate, Figs. 4-6.)

Case C.—A man aged 28 years with severe diabetes, Kimmelstiel-Wilson syndrome, and gross hypertension. The extent of the disease and subsequent progress are shown in the radiographs. He has never had antibacterial therapy. For some four years he has been clinically well, without cough or sputum, and is earning his living. I have refused the repeated requests of his chest physician to subject this patient to a thoracoplasty to close the cavity on the left side.

The last part of Table III shows the results in 12 patients with lower-lobe cavities, which are notoriously difficult to close; 3 of these had had unsuccessful pneumothorax therapy previously. Results were successful in 9. In Case 7 the patient died of acute enteritis four years after a lobectomy, performed because haemoptysis persisted in spite of pneumoperitoneum treatment. The resected specimen showed that the original cavity had closed and the bleeding had been caused by an area of bronchiectasis.

The patient in Case 2, a girl of 20, had a large cavity which became "blocked": she remained well and free of sputum for four years with the pneumoperitoneum, but then "spread" occurred near the cavity and a left lower lobectomy was performed. Five years later she is well and working, having had two children in this time. This case taught me that when a cavity becomes "blocked" but does not progressively decrease in size, resection should be carried out, say after a year.

In Case 5, a male aged 27, the pneumoperitoneum had been abandoned too soon, as clinical and radiological examination indicated that healing was taking place. Subsequently the patient went through a whole series of surgical operations.

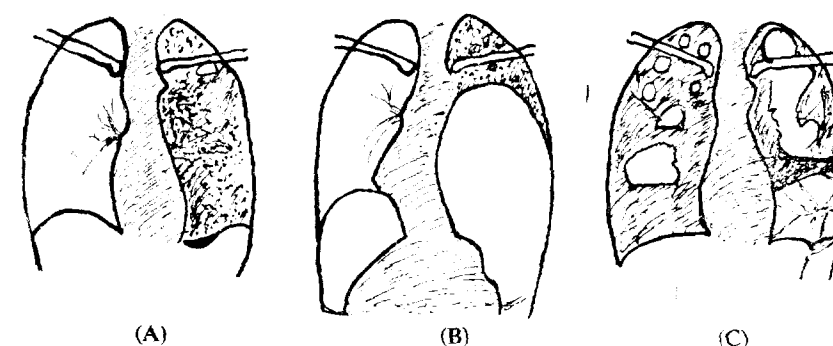
Plombage

The late Dr. F. G. Chandler (1940) has said that the thoracoplasty is "a terrific and mutilating operation, one that offends the aesthetic sense and craftsmanship of the surgeon." With the modern thoracoplasty few would now subscribe to this view, particularly as most surgeons use general rather than local anaesthesia, which was not the rule some years ago. The mortality

is now less than 5% with experienced surgeons, but the immediate post-operative pain and the common complications, such as atelectasis of the lower lobe and fluid formation, call for fortitude from the most courageous patient. The waiting period for the second stage, and occasionally the third, calls for even more courage. In my experience thoracoplasty still gives most reliable and lasting results, and patients may be seen attending for an annual check, year after year, in good health, in full work, and with minimal deformity. In spite of these good results, however, one feels at times that one is using a sledgehammer to crack a nut.

Like Chandler I had hoped that some form of plombage with a non-irritant substance would be devised, and that—although it contravenes a principle of surgery by leaving a foreign body in the tissues—something better than the old wax plomb would be found.

Wilson in 1948 showed in animals that "lucite" spheres caused little irritation or reaction in the tissues. Trent, Moody, and Hiatt in 1949 published a damning report on



Diagrams of radiographs in Case B. (a) Condition before treatment (October 20, 1950): grossly diseased cavitated left lung. (b) During treatment (May 4, 1951): left diaphragm up to level of second rib; patient without symptoms, doing full day's housework. (c) Condition on day of death (October 21, 1952), three months after treatment had been abandoned: "destroyed" left lung; gross cavitated disease in right.

has been decided upon, not to abandon the pneumoperitoneum until the patient is actually in a surgical bed.

In Class III, the advanced cases, there are 26 patients who offer a challenge to the clinician for any form of therapy. The aim in these cases was to see how many can be salvaged rather than successfully treated. With chemotherapy, of course, the outlook is better, but these patients did not have this help. I divided them into four groups, as a bald statement of success or failure does not give a fair picture of what may be done: Group A—with the aim of cure without other treatment; Group B—with the aim of curing one side preparatory to collapse or resection on the opposite side; Group C—with the aim of temporary treatment preparatory to collapse or resection on the same side; and Group D—the pneumoperitoneum is maintained indefinitely, as the condition of the patient or the extent of the disease does not allow of major surgery.

In Group A there are 8 cases: 3 were successful, 3 failed, and 2 were non-proven. After further treatment all patients are well and working. In Group B 3 of the 8 cases were

51 cases in which lucite spheres were introduced into the extrapleural space. Woods, Walker, and Schmidt (1950) in the United States, and Lucas and Cleland (1950) in this country, have reported favourably on the use of extrapleural stripping as for a Semb thoracoplasty and then introducing lucite balls (at first hollow, but now solid and sterilizable by boiling), of which they have had considerable experience.

Mr. W. P. Cleland, who has carried out the plombage in most of my cases, has kindly let me have his results to date in 186 of his own cases treated three or more years ago, starting about 1948. Of these only about 56% were good risks and some 12% were designated as "scrapheap" cases. His figures are as follows:

	No. of Cases
Good results without further treatment	104
Unsatisfactory:	30 (72%)
Persistent cavitation	8
Active disease	3
Sinuses, etc.	4
Untraced	18
Died (from unrelated causes, 8)	19
Total	186

There were 13 cases with space infection. Of these, 2 were pyogenic; one had a thoracoplasty and the other was treated by general and local chemotherapy; both patients are now well. The other 11 cases had late tuberculous infection, the majority with sterile pus; of these, 2 died from conditions unrelated to their infection, 3 had sinuses, and 6 are well.

Table IV gives details of the 27 cases for which I recommended lucite plombage. The results were good in 20 and moderate in 2, and there were 5 failures. Of the 3 deaths, one patient (Case 7) died from an anaesthetic preliminary to a pneumonectomy, one (Case 22) from epilepsy when cured of her tuberculosis, and the other (Case 23) from carcinoma of the bronchus. Complications were not serious.

It is still early, the longest period since operation being five years, to be sure that the foreign body in the chest will not give trouble, but I am hopeful. From the patient's point of view the advantages of this operation are three-

fold: (1) it is a one-stage procedure; (2) it is not followed by chest deformity; and (3) it has a relatively low complication rate with absence of post-operative shock and severe pain in the majority. From the point of view of the physician there is a fourth advantage—the patient can have the operation in a "medical" ward and so avoid the wait of six to twelve months for a surgical bed.

Resection

In some countries, particularly the United States, resection has become the accepted form of treatment after a long course of antibacterial therapy, varying from six months to two or even three years. Its use may be considered broadly under two headings: (a) *direct* therapy, in which the diseased and usually functionless portion of lung, which has previously caused symptoms, is removed, thus eliminating a reservoir of future infection; and (b) *prophylactic* therapy, by which I mean removal of parts of damaged lung not at the time causing symptoms but which are considered to be potential sources of infection at a later date. Certain discrete round foci or bronchiectatic segments of the upper lobes are examples. In regard to direct therapy, the older school argue, from previous experience of collapse therapy, that the diseased lung left in the chest acts as a stimulus to specific immunity, while the younger school have greater regard for the theory of removing "the factory." Controversy over prophylactic resection of apparently benign lesions still continues.

From my own impressions as opposed to factual data I regard bronchiectasis in the upper lobe, collapsed by disease or therapeutic procedures, as a benign condition in all but a small minority of cases, and bronchography shows that it is very common. According to Clegg (1953) discrete round foci may be of three types: (a) small areas of tuberculous pneumonia; (b) cold abscesses within the bronchi; and (c) blocked cavities.

In this country Ronald Edwards (Bickford *et al.*, 1952), of Liverpool, who published his first 200 results in 1950, and later Dillwyn Thomas (Thompson *et al.*, 1954) of Sully

TABLE IV.—Results of Extrapleural Apicolysis with Lucite Plombage

Case No.	Age and Sex	Complications	Sputum After	Result	Time After Operation (Years)	Further Treatment	Final State
CLASS I							
1	19 M	Cavity patent. Closed posture	Nil	Good	3½	3/12 postural treatment	Well
2	57 M	Small effusion	Negative	"	4	—	"
3	37 F	—	"	"	3½	—	"
4	38 M	—	"	"	2½	—	"
5	44 F	—	Positive (culture)	"	2½	—	"
6	21 M	—	?	"	1½	—	"
CLASS II							
7	28 M	—	Positive	Failure	1½	Anaesthetic death at operation for R. pneumonectomy	Dead
8	19 F	—	Negative	Good	4½	—	Well
9	32 F	Fluid: one aspiration	"	"	5	—	"
10	26 F	—	"	"	4½	—	"
11	22 M	Pyogenic empyema	"	Failure	4½	R. thoracoplasty	"
12	37 M	Fluid and atelectasis. Thrombosis arm vein	Positive	"	3½	L. upper lobectomy	Well. Sputum positive
13	40 F	Fluid: four aspirations	Nil	Good	4½	—	Well
14	29 M	Atelectasis few days	?	"	1½	—	"
15	41 F	{ Nil } bilateral	Negative	"	{ L. 1½ R. 1 }	—	"
16	21 M	Pneumothorax. Haemorrhage into space	"	"	1½	—	"
17	44 F	Fluid: two aspirations	"	"	1½	—	"
18	30 M	"	"	"	1½	—	"
19	30 F	"	"	"	1½	—	"
CLASS III							
20	27 M	Pneumothorax and atelectasis. Fluid: two aspirations	Negative	Good	5	R. artificial pneumothorax 5 years. Abandoned 1 year	Well
21	21 F	Fluid: two aspirations	Positive	"	5	Plombage repeated June, 1950	"
22	25 F	—	"	Fair	2½	R. pneumonectomy Dec., 1950	Died of epilepsy
23	40 M	Fluid: two aspirations	"	Failure	1½	—	" carcinoma
24	33 F	—	"	Fair	3	—	Well
25	35 F	Haemorrhax: one aspiration	Negative	Good	2½	—	"
26	68 M	—	Positive	Failure	1½	—	Fair. Sputum positive
27	28 M	Pneumothorax: atelectasis R.	Nil	Good	1½	—	Well

Hospital in Wales, with their assistants have performed a large series of resections, although most thoracic surgeons are undertaking a greater or less number according to their views on the pathogenesis and progress of tuberculosis of the lungs. The tendency now is that with lobectomy or resection of more than one segment of a lobe it is probably wise to prevent over-inflation and possible "reactivation" in the remaining lung by some operation to reduce the size of the hemithorax. This may be done at the time of the original resection or at a later date; in either case it adds something to a simple thoracotomy.

Mr. Edwards has kindly allowed me to quote these figures of his results. Of 1,023 patients, 20 died within three months of operation, an immediate mortality of 1.95%. In a four-year follow-up of 112 cases there are 61 pneumonectomies with 4 deaths and 4 with late exacerbations of disease: 49 lobectomies with one post-operative death and 5 exacerbations; and 2 segmental resections with 1 exacerbation. After four years 95% of the 112 patients are well and working.

By 1952 the percentage of segmental resections performed had increased to approximately 66% of all resections. Up to March, 1952, after 259 segmental resections, only one post-operative death and two empyemata had occurred.

Thompson and Savage, working with Dillwyn Thomas at Sully Hospital, report for the five-year period to June, 1953, 266 cases of resection of various types with an operative mortality of 1.88% and "apparently arrested" disease in about 97%. It is too early yet to assess final results.

For what it is worth I present my own small series of resections. By nature I am conservative, and while welcoming advances in treatment I am inclined to wait and see the results of innovations in the cases of more enterprising physicians. Of 11 pneumonectomies, mostly with "destroyed" lung, results were good in 9. There were 2 deaths, one from acute bronchitis 2½ years after, the other from epilepsy one year after; the latter has already been referred to under "Plombage." Of 21 lobectomies, results were good in 18 and poor in 2; there was one failure. Only 4 had post-operative collapse to decrease the size of the hemithorax. Of 8 segmental resections, results were good in 6 and bad in 2.

Conclusion

In this paper I have given certain figures, which I believe to be reliable, concerning artificial pneumothorax and pneumoperitoneum treatment without antibacterial therapy. Now that antibacterial therapy is available the results of surgical intervention are much better, as also are those of medical collapse. With medical collapse and chemotherapy, in my experience, many patients with minimal or moderate disease can safely return to their homes and occupations within eight to twelve months.

In the Frimley series from 1937 to 1942 quoted above the incidence of empyema was 17%—an appalling figure. If this is the true risk at the present time, then it is no wonder that artificial pneumothorax is much less used than in the past. The results in suitable cases five years after refills have been discontinued are very good, however. Of my own series of 62 patients treated with artificial pneumothorax from 1942 to 1947 it is possible, but I think unlikely, that in each of the seven untraced cases an empyema developed. Of 47 cases followed up for at least eighteen months after the pneumothorax was abandoned, only in two did empyema develop; both of these were badly selected cases in which treatment should have been abandoned forthwith.

I now teach my students that the indications for artificial pneumothorax are very limited and that the treatment should be used only in the following circumstances: (1) when the clinical duration of disease is at least four months and chemotherapy has been given for a further four weeks; (2) when cavities are less than 4 cm. in diameter; (3) when there is no clinical or radiological evidence of endobronchial

disease; and (4) when it is estimated that after the lung has healed it will fill the hemithorax without risk of over-inflation or displacement of the mediastinum. I further impress upon them that they should not hesitate to abandon an artificial pneumothorax that has been started if conditions are unfavourable.

We physicians unfortunately often deal with advanced cases quite unsuitable for pneumothorax or surgical treatment at that stage. In these cases the use of chemotherapy with postural retention for two to three months, followed by phrenic crush and pneumoperitoneum, will give an idea of future possibilities. A plombage on the worse side at the appropriate time may in some of these rather hopeless cases enable the patient to get back to a useful life within twelve to eighteen months. It is perhaps not sufficiently appreciated at the present time that pneumoperitoneum with phrenic paralysis added to antibacterial therapy has real value.

The following is a typical case (see Plate, Figs. 7-9).

Case D.—An officer in the Merchant Navy aged 27 years had been a contact of his brother and sister, both of whom had cavitated disease. In June, 1950, radiological examination showed bilateral disease with cavitation. The patient was admitted to a sanatorium, where he was given bed rest with streptomycin, 54 g., and P.A.S.; a right artificial pneumothorax was attempted and abandoned. In June, 1951, he was sent home. From December, 1951, to April, 1952, he was in the Brompton Hospital with a positive sputum. He was treated by postural retention for six weeks and then had a left phrenic crush with pneumoperitoneum; during this time he received streptomycin, 87 g., with P.A.S. He returned to a sanatorium for five months and was then readmitted to the Brompton Hospital on September 1, remaining there till November 5. His sputum was still positive on culture. Tomography revealed a small cavity at the right apex. On October 1 a right lucite plombage was performed, after which he was dyspnoeic for some days. Sputum disappeared soon after this, and he has been doing part-time work since December, 1953. Pneumoperitoneum treatment continues. The total dose of streptomycin received by this patient was 182 g.

Bacteriologists and morbid anatomists in this and other countries are investigating the finding in many resected specimens that large numbers of bacilli are present in some lesions and none in others; only a small proportion of these bacteria will grow on the artificial media now in common use, and may fail to infect or kill laboratory animals.

Dubos (1953), in his summing up of a discussion on the subject at the twelfth Conference on the Chemotherapy of Tuberculosis held in February, 1953, in the United States, comments on these facts. Bacilli are found more often in cavitated lesions than in closed necrotic foci; these bacilli may be dormant and not necessarily dead. A low-oxygen, high carbon-dioxide content is known to inhibit the growth of tubercle bacilli *in vitro*, and these are just the conditions found in closed necrotic lesions. Breakdown products of necrotic tissue such as spermine and spermidine, and enzymes such as lysozyme, also inhibit bacterial growth *in vitro*. Bacilli may, however, persist in the tissue-cells and lymph nodes of men and animals in spite of prolonged chemotherapy.

Further research is required both by laboratory workers and by clinicians who will make accurate observations on the anatomy, pathology, and bacteriology of these pulmonary lesions, follow up the patients, and publish their findings.

There is no doubt that in the right type of disease resection is a fundamental treatment which has come to stay—and rightly so. At present I am uneasy about the policy of some surgeons in removing apparently "benign" lesions on the supposition that these may break down at some future date.

When one ponders over the problem of pulmonary tuberculosis one is always brought back to the question of immunity. Why should the rat be immune and not the guinea-pig? Recently I have been studying sections of lung

taken at biopsy from patients with miliary shadows in the lungs. Some of these cases are diagnosed on all available evidence as "sarcoidosis," and others as benign chronic miliary tuberculosis; a small group seems to be "on the fence" between the two. I have a feeling that further experimental study of the syndrome called "sarcoidosis" may provide a clue to the problem of immunity in tuberculosis.

Summary

The treatment of pulmonary tuberculosis is reviewed in the light of recent advances.

The aims of treatment are: (1) permanent healing of the lesions; (2) minimal loss of respiratory function; and (3) the attainment of these in the shortest time.

In addition to the long-established principles of rest, diet, fresh air, and graded exercises there are three main therapeutic weapons: (1) antibacterial drugs without collapse therapy; (2) collapse therapy, either medical or surgical; and (3) resection of the diseased portion of lung.

The value of the various forms of treatment is assessed on the basis of results obtained by the author and by other workers in Great Britain.

The finding that large numbers of tubercle bacilli are present in some lesions and none in others is referred to, and the need for further research into this question is stressed.

Further experimental study of the syndrome called "sarcoidosis" may provide a clue to the problem of immunity in tuberculosis.

My grateful thanks are due to my registrars, Dr. J. K. Gurling and Dr. W. H. Helm, for their valuable assistance in reviewing the records of my cases; also to my secretary, Miss Hope Daniel, for her persevering efforts in following up the patients.

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In his Report for 1953, Dr. Stuart Laidlaw, Medical Officer of Health for the City of Glasgow, writes: "One can readily imagine the public outcry had diphtheria immunization been available only to the well-to-do. But it is little encouragement to those protagonists of free preventive measures that so few avail themselves of the opportunities offered. Public apathy is not restricted to diphtheria immunization alone. Only 17% take advantage of free infant vaccination, though Glasgow is a seaport town with an air terminal. Many contacts of open cases of tuberculosis decline to be x-rayed. Many parents ignore the opportunity of B.C.G. protection for children of school-leaving age. There is also the unsatisfactory response by expectant mothers to the offers of free dental treatment and supplementary vitamins despite the fact that these provide additional safeguards to themselves and the unborn child."

CURRENT THERAPY IN PULMONARY TUBERCULOSIS IN THE UNITED STATES*

BY

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[WITH SPECIAL PLATE]

The study forming the subject of this lecture was carried out under the auspices of the Committee on Non-Surgical Collapse Therapy of the American College of Chest Physicians to determine the kind of therapy advised as the initial treatment in different cases of pulmonary tuberculosis by physicians who are recognized experts in this disease. Ten representative cases were selected. They were of ordinary forms of tuberculosis that might be seen any day in such a physician's office. They differed as regards age, race, sex, and type of disease, but had no unusual or bizarre complications. All had positive sputum. They could be grouped, according to the classification of the National Tuberculosis Association, into minimal, moderately advanced, and far advanced. These patients had been known to us for a long time. It was endeavoured to make the initial problem as simple as possible. A similar study was carried out on these same ten cases in 1948.

The method of investigation was as follows. A brief case history with a single chest radiograph of each case was sent, with an accompanying questionnaire, to the one hundred physicians selected as representative of the top clinical thinking in their respective areas throughout the United States. The questions asked were: (1) Would you use bed rest alone as therapy for this type of case? (2) Would you add drug therapy? (3) Would you use collapse therapy? (4) Would you use surgery? (5) With the therapy indicated above, how long would you keep this patient on complete bed rest and in a sanatorium? In general, complete bed rest is interpreted as strict rest in bed with no bathroom privileges; the patient is not allowed out of bed at all for any reason. Modified bed rest is indicated as such.

In what follows the replies to the above questionnaire are analysed.

Drug Therapy

Drug therapy will be discussed for all of the cases together, because the same practitioners recommend practically the same dosages throughout the ten cases and most of them say they would start chemotherapy immediately. The length of time chemotherapy would be continued varied considerably, however, for the different patients.

Antimicrobial therapy is now generally accepted by the vast majority of chest physicians as part of the routine treatment of pulmonary tuberculosis, whatever the extent of the disease. Such therapy would be used as part of the basic treatment by 97%, with variation, according to the extent of the disease, only from 93% for minimal disease to 99.5% for far advanced disease. The drugs of choice were limited to streptomycin, para-aminosalicylic acid (P.A.S.), and isonicotinic acid hydrazide (isoniazid). Practically all the physicians would use combined and continuous therapy, with a marked preference for streptomycin plus P.A.S. A majority favoured the intermittent use of streptomycin in a dosage of 1 g. twice weekly, with P.A.S. by mouth to tolerance—about

*Based on the Fourth Varrier-Jones Memorial Lecture, given at Manson House, London, on May 14, 1954.

J. L. LIVINGSTONE: OBSERVATIONS ON THE TREATMENT OF PULMONARY TUBERCULOSIS AT THE PRESENT TIME



FIG. 1.—July 11, 1949.

FIG. 2.—December 29, 1949.

FIG. 3.—February 19, 1954.

FIGS. 1-3: Case A.

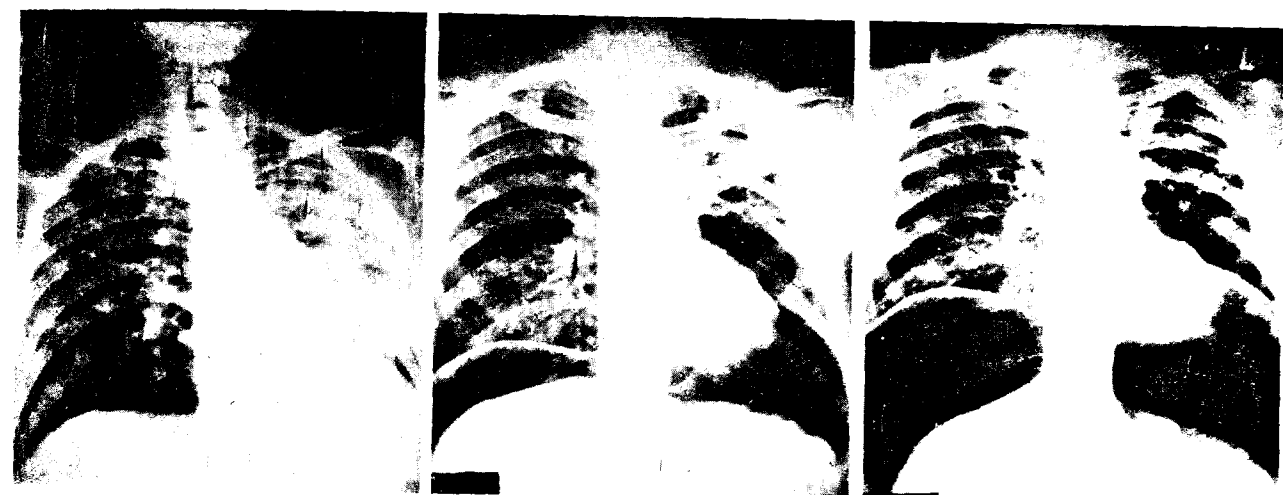


FIG. 4.—July 10, 1948.

FIG. 5.—February 12, 1952.

FIG. 6.—May 5, 1954.

FIGS. 4-6: Case C.

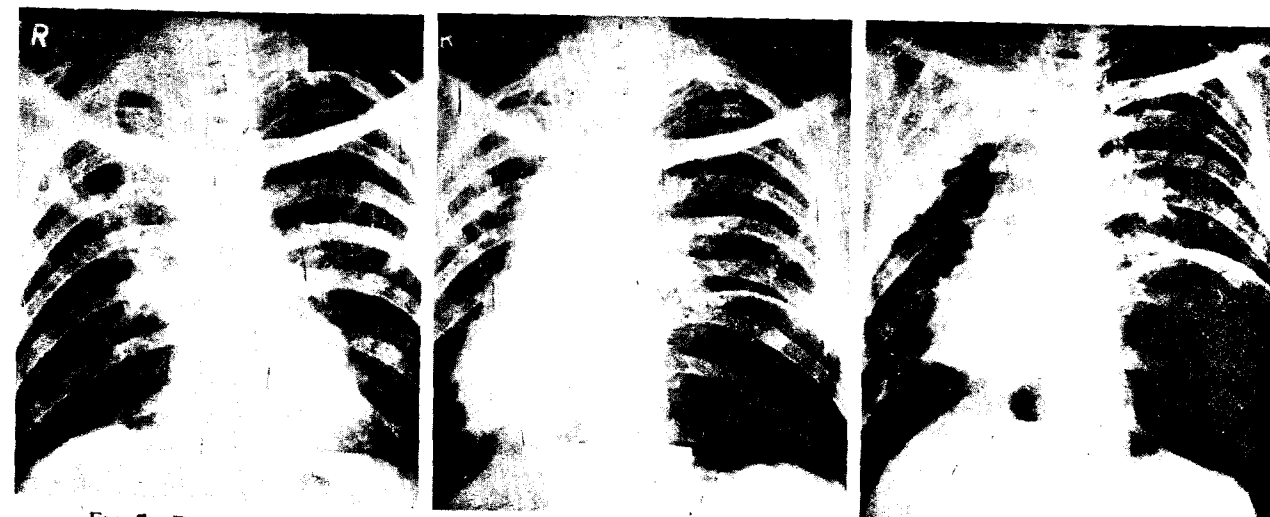


FIG. 7.—December 6, 1951.

FIG. 8.—September 29, 1952.

FIG. 9.—May 6, 1954.

FIGS. 7-9: Case D.

H. G. TRIMBLE: CURRENT THERAPY IN TUBERCULOSIS IN THE U.S.A.

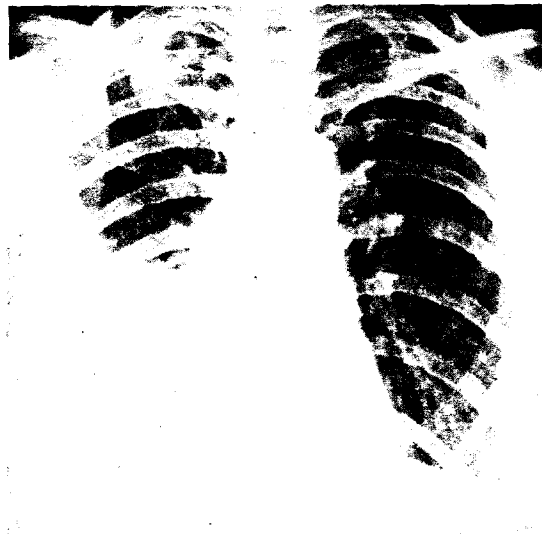


FIG. 1.—Case III: Minimal bilateral tuberculosis with right pleural effusion.

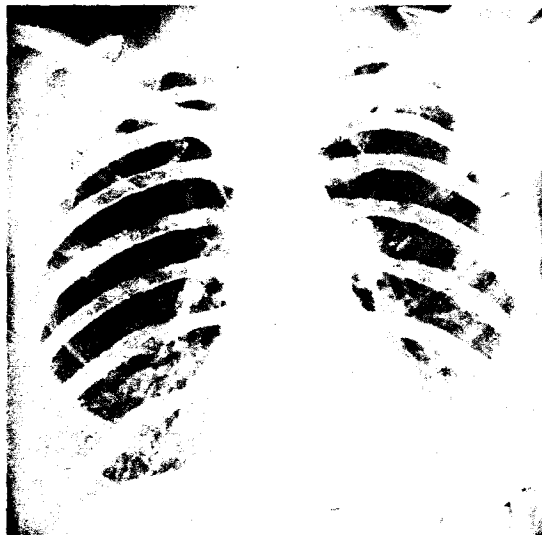


FIG. 3.—Case IX: Moderately advanced acute bilateral tuberculosis, more extensive on left.

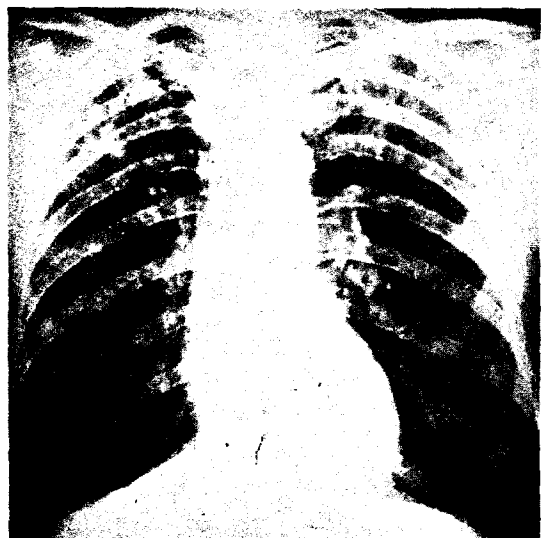


FIG. 5.—Case X: Far advanced bilateral fibrocaceous lesions with cavity on left.

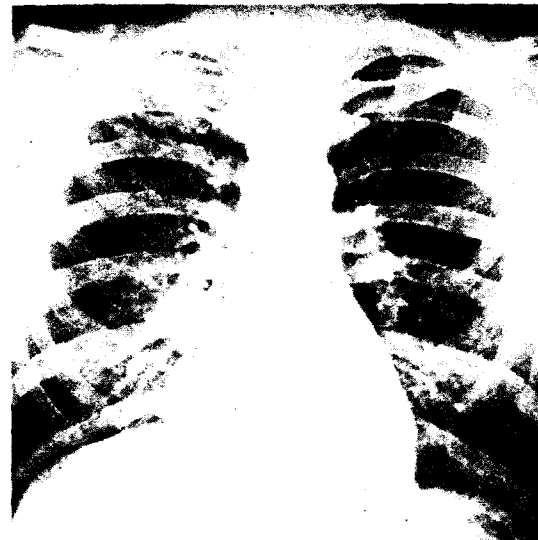


FIG. 2.—Case VIII: Moderately advanced tuberculosis with solitary 3-cm. cavity at right apex.

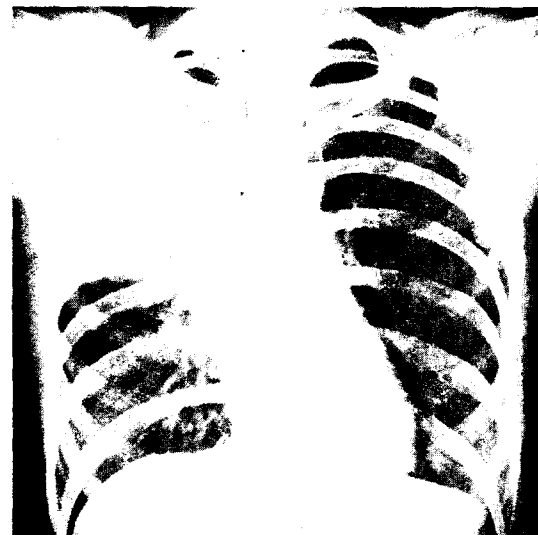


FIG. 4.—Case II: Far advanced tuberculous pneumonia.

A. CHAKRAVARTI and G. CHAKRAVARTI:
GIANT-CELL POLYPHLEBITISSection of vein showing thickened and infiltrated wall with collections of giant cells (arrowed). $\times 65$.

12 g. daily. There was less agreement about the dosage of isoniazid, which varied from 3 mg. per kg. of body weight to 10 mg. per kg. with a majority using 3 to 5 mg. per kg. In the more acute far advanced cases there was a definite leaning toward combining all three drugs.

In the United States there is a strong trend toward standardization in the use of antimicrobial therapy. This is probably greatly influenced by what is called the Annual Conference on Chemotherapy of Tuberculosis under the auspices of our Veterans Administration, which acts as a forum for the presentation of various studies on the subject.

When the views on the length of time such therapy should be continued are studied no pattern evolves. There were recommendations for courses of from one month all the way to continuous therapy for three years. In minimal and moderately advanced disease a majority thought in terms of one year or less, with a considerable number favouring less than eight months; while in far advanced disease a majority would continue giving the drugs for one to two years. However, in both instances there were many recommendations that these broad generalizations would not cover.

As a corollary to the above it is interesting to note that there are now very few who use bed rest alone in the treatment of pulmonary tuberculosis—only 1%, in fact, of the total reporting. However, when we consider the use of antimicrobial therapy plus bed rest we find that 37% of the group as a whole favoured this as the treatment of choice. This percentage was made up very largely from the answers on the treatment of minimal disease, in which nearly three-quarters of the group favoured antimicrobial therapy plus bed rest.

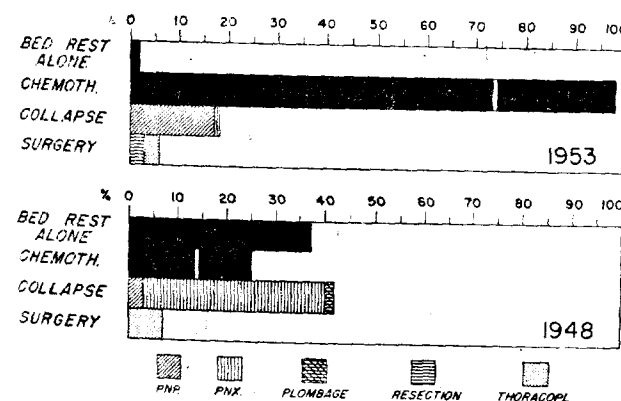
Since 1948 the use of bed rest plus drugs and without collapse therapy has tremendously increased, at the expense of collapse therapy.

Treatment Recommended in Five Sample Cases

I will not discuss each of the ten cases separately, but will use as examples one minimal, two moderately advanced, and two far advanced cases (minimal, Case III; moderately advanced, Cases VIII and IX; and far advanced, Cases II and X).

Case III: Minimal pulmonary tuberculosis, bilateral, productive, with pleural effusion on the right, in a 43-year-old white female. Chest radiograph (Plate, Fig. 1) revealed a homogeneous density in the right pleural cavity (pleural effusion) and infiltration at both apices—more marked on the right.

The graph for this case (Graph 1) shows that in 1953 practically no one would treat this pleural effusion in association with minimal bilateral tuberculosis by bed rest alone, in contrast to 37% in 1948. However, approximately three-fourths would use bed rest plus chemotherapy. As many as 98% would use chemotherapy plus other methods, with a marked decrease in the use of collapse therapy since 1948.



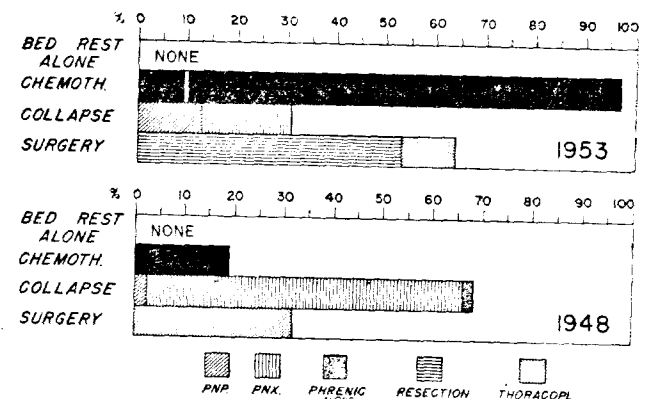
GRAPH 1.—Case III: Comparison of recommendations for treatment in 1953 with those in 1948. Chemotherapy alone with bed rest was prescribed by 74% in 1953, as against 14% in 1948 (indicated by vertical dividing line).

largely at the expense of pneumothorax, which fell from 37% to 1%. A very few would think surgery advisable for this patient.

Case VIII: Moderately advanced pulmonary tuberculosis, unilateral, with a solitary 3-cm. cavity at the right apex, in a 34-year-old white male (Plate, Fig. 2).

Most physicians would now use chemotherapy. One-third would initiate a prompt reversible collapse, about half of these using pneumoperitoneum and the other half a right pneumothorax. Two-thirds would, however, prefer surgery after the lesion had shown some stabilization by bed rest plus drugs. The large majority would expect maximum response to drug treatment and relatively stabilized lesions within three to six months. Fifty-two physicians would prefer resection and eleven a thoracoplasty.

If the treatment prescribed now is compared with that recommended in 1948 (Graph 2) it will be seen that in the case of this 34-year-old man with moderately advanced

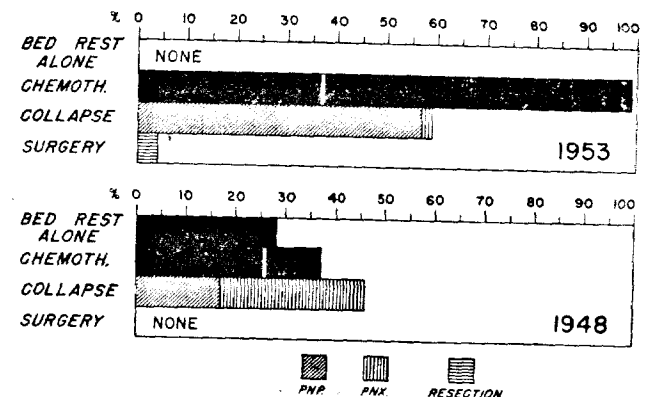


GRAPH 2.—Case VIII: Comparison of 1953 with 1948. Chemotherapy alone with bed rest prescribed by 10% in 1953 and by none in 1948.

disease and a unilateral cavity nearly all would use chemotherapy, with a definite reduction in the use of reversible collapse therapy from 68% in 1948 to 31% at the present time. It is noteworthy that there has been a marked drop in the use of pneumothorax in favour of pneumoperitoneum since 1948. It is interesting, however, that 18% would still try pneumothorax, and continue it for three to five years in most instances if the collapse promptly became adequate. But surgery was the treatment of choice for this patient.

Case IX: Moderately advanced pulmonary tuberculosis, acute, bilateral, more extensive on the left, in a 34-year-old white female. Chest radiograph (Plate, Fig. 3) revealed a soft mottled infiltration in both upper lung fields, more extensive on the left.

Practically all the physicians would use chemotherapy in this case, and six out of every ten would favour reversible



GRAPH 3.—Case IX: Comparison of 1953 with 1948. Chemotherapy alone with bed rest prescribed by 37% in 1953, as against 26% in 1948.

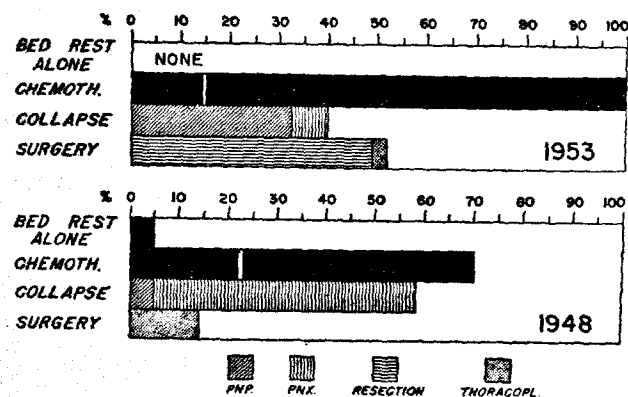
collapse, only a very few advising resection. The collapse therapy recommended was pneumoperitoneum. No one at the present time would treat this moderately advanced, acute bilateral disease in a 34-year-old woman with bed rest alone, as compared with 28% in 1948 (Graph 3). However, 37% would use only bed rest plus chemotherapy. There has been some increase since 1948 in the number who would use reversible collapse therapy, 57% favouring pneumoperitoneum, while only 2% would use pneumothorax, in contrast to the 29% who recommended pneumothorax in 1948. Four would now advise surgery as the primary procedure, advocating resection.

Case II: Far advanced tuberculous pneumonia in a 31-year-old white female. Chest radiograph (Plate, Fig. 4) showed a diffuse homogeneous density occupying the upper half of the right lung field and containing a cavity.

All the physicians would use drugs in this case, 42% prescribing streptomycin and P.A.S., 30% streptomycin, P.A.S., and isoniazid, while 28% would use a combination of any two of these drugs. Thirty-two physicians would use pneumoperitoneum and eight would try to establish a right pneumothorax. Forty-nine would expect to do a resection after a period of bed rest and drug treatment lasting from five to ten months. Three would prefer thoracoplasty.

In this far advanced case of tuberculous pneumonia in a 31-year-old woman no one would treat the patient with bed rest alone, and there was complete agreement as to the use of combined antimicrobial drug therapy. There was a tendency to use all three drugs in this case and to give streptomycin daily at the beginning. The majority would use the drugs for from twelve to twenty-four months.

The use of collapse therapy has fallen from 58% in 1948 to 40% now (Graph 4), largely at the expense of pneumothorax, with a correspondingly large increase in the use of

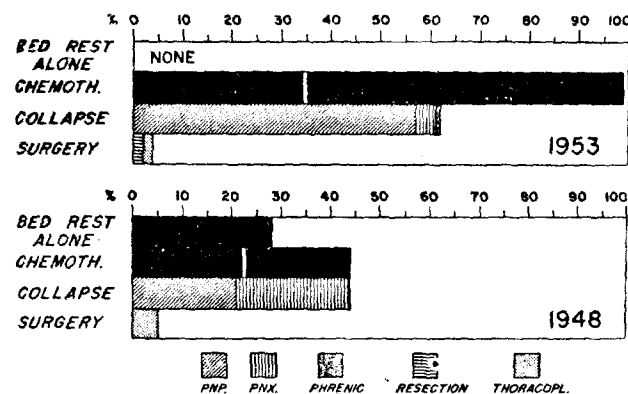


GRAPH 4.—Case II: Comparison of 1953 with 1948. Chemotherapy alone with bed rest prescribed by 15% in 1953, as against 23% in 1948.

pneumoperitoneum. Three years seemed to be the recognized time for pneumothorax to be continued. There was much disagreement as to how long to continue pneumoperitoneum, the largest group favouring five years, but substantial numbers indicated three or four years and a few suggested shorter periods. Note the definite increase in the use of resection at the expense of thoracoplasty and collapse therapy. Physicians who favoured resection tended to recommend a longer stay in a sanatorium than those who preferred collapse therapy.

Case X: Far advanced pulmonary tuberculosis, fibrocaceous lesions in the upper half of both lungs, with cavity on the left, in a 57-year-old white male. Chest radiograph (Plate, Fig. 5) showed old calcified lesions at the right apex, multiple scattered nodules, little fibrosis, but soft infiltration throughout the right lung in the upper two-thirds. In the left lung there was a soft mottling throughout the upper third, with a 1.5-cm. cavity in the first interspace.

In this case of far advanced pulmonary tuberculosis with cavitation and bilateral fibrocaceous disease in a 57-year-old man no one would now use bed rest alone, but 35% would use only bed rest plus chemotherapy. More would use rever-



GRAPH 5.—Case X: Comparison of 1953 with 1948. Chemotherapy alone with bed rest prescribed by 35% in 1953, as against 23% in 1948.

sible collapse therapy now than in 1948—almost two-thirds, compared with 44% in 1948 (Graph 5). There is a marked shift toward the use of pneumoperitoneum. All would now use chemotherapy. Very few considered this a case for surgery.

Summary of Recommendations

The recommendations for treatment can best be summarized by grouping the ten cases according to the three degrees of severity referred to earlier.

For the minimal group few would use bed rest alone. 72% would use bed rest plus chemotherapy. About 20% more would add various forms of collapse, mostly pneumoperitoneum, but a few pneumothorax. Even in the minimal cases a small percentage would recommend surgery, mostly resection.

In moderately advanced disease a very few would recommend bed rest alone. Less than 40% would use chemotherapy alone with bed rest, a larger number—60%—adding collapse or surgery. Three-fourths of those advising collapse would use pneumoperitoneum, the other one-fourth pneumothorax. Resection was recommended by 20%.

In far advanced disease no one recommended bed rest alone. A small number would use chemotherapy plus bed rest. About 80% recommended collapse therapy or surgery with chemotherapy and bed rest. Almost 60% would use pneumoperitoneum; 21% would perform resection.

Concluding Remarks

Just a personal word in closing. We have found this study very interesting. We actually treated these patients somewhat differently. Our own therapy would be complete bed rest until the sputum disappeared or became negative on examination by the concentration method. All of these patients would receive drugs, usually a combination of all three and for a period of approximately eighteen months. We use much reversible collapse therapy, with pneumoperitoneum as the method of choice and as the initial treatment in most cases. We review our results in three months, and if cavities that are not well on the way to closing are present we may then consider pneumothorax. However, all patients are examined bronchoscopically before being subjected to this procedure. Actual tracheo-bronchial disease is a contra-indication to pneumothorax, though it is not to pneumoperitoneum. We may then turn to surgical procedures. With some patients we feel from the beginning that surgery will eventually be necessary. We use bed rest plus drugs plus pneumoperitoneum as a

damping-down method for the acute exudative lesions, expecting the surgeon to remove the cavity-bearing area at a later date.

Tracheo-bronchial disease is still a problem. Many patients in whom tuberculous disease of the walls of the bronchi can be visualized through the bronchoscope are not permanently cured by drugs. If such tracheo-bronchial disease is removable, we feel that localized segmental resection is eventually indicated.

We have termed these methods a "dynamic approach" to the problem of tuberculosis. With prompt diagnosis and adequate treatment more patients with pulmonary tuberculosis are now getting well than ever could have done so previously.

Summary

The trend of treatment of pulmonary tuberculosis in the United States is discussed on the basis of a questionnaire sent in 1953 to one hundred physicians in that country. Recommendations were sought as to the treatment of ten selected cases of the disease. The replies are analysed and compared with those received in answer to a similar inquiry in 1948 concerning the same ten cases.

The investigation has shown that since 1948 the use of bed rest plus drugs and without collapse therapy has enormously increased. Collapse therapy is, however, still favoured in cases of more advanced disease, but pneumoperitoneum seems to have largely replaced pneumothorax as the procedure of choice.

A CASE OF GIANT-CELL POLYPHLEBITIS

BY

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AND

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[WITH SPECIAL PLATE]

Since 1941 attempts have been made to bring under a single heading such apparently diverse clinical conditions as polyarteritis nodosa, lupus erythematosus, scleroderma, and dermatomyositis. Banks (1941) has suggested that there is a common denominator in these diseases. Klemperer, Pollack, and Bachr (1942) proposed grouping them under the term "collagen diseases," fibrinoid degeneration of collagen having been found to form the basis of all of them. Claims have also been advanced for including in the group such diseases as rheumatic fever, Buerger's disease, and even serum sickness and the calcinosis. In spite of attempts at generalization, however, the "collagen group" of diseases remains an assortment of heterogeneous clinical varieties, and the specific conditions which should be included or excluded continue to be a matter for speculation.

Polyarteritis nodosa is predominantly a vascular collagen disease. Recognized as early as 1866 (Kussmaul and Maier), it has received widespread recognition only in recent years. Though an appreciable number of cases have been reported in the world literature, so far only three cases occurring in India are on record, the first of which was reported by one of us (Chakravarti, 1951). It must be appreciated, however, that polyarteritis nodosa has hitherto been recognized as an entity only

on the basis of the clinical findings; that it has any relationship to infection, hypersensitivity, or allergy is far from being established, and experimental attempts to arrive at its aetiology have been without success. But, unless the aetiology of such diseases as this is established beyond doubt, cases of arteritis presenting aberrant manifestations differing from the recognized clinical picture will raise problems of identification and lead to claims for the discovery of new entities. Thus a variety of arteritis with a different age incidence, vascular distribution, and prognosis was described in 1932 by Horton, Magath, and Brown. They gave it the name of "temporal arteritis." Giant cells formed the distinctive feature in its pathology, and, though it was claimed that giant-cell arteritis and polyarteritis are identical, this view was not supported by Harrison (1948).

In the light of the above considerations we describe below a case in which the clinical picture resembled in some respects that of polyarteritis nodosa, yet differed from it in a number of essential features. Clinically it was considered to be an example of polyphlebitis rather than of polyarteritis, but histological examination of the vascular lesions revealed the presence of giant cells, so long considered almost characteristic of temporal arteritis. The case would therefore appear to be of a hitherto unrecognized type of arteritis.

Case Report

A married woman aged 28 years; mother of four children, the last of which was born six years ago. No history of miscarriage. Past history of colitis, lasting three months, seven years ago. Streaks of blood in sputum during a febrile bout lasting one week three years ago. Husband's two brothers died of pulmonary tuberculosis, six and three years ago respectively.

Present Illness

The patient had suffered from a low-grade, irregular fever and malaise for the past year. One year previously slightly painful, tender spots had appeared on the medial aspects of the thighs, followed by a similar spot on the anterior aspect of the right forearm. For six months there had been persistent and gradually progressive anorexia and asthenia. A constant dull pain in the left hypochondrium, with exacerbations when the patient lay on her left side and on walking, had been noticed for the past three weeks. Since the last attack of colitis seven years ago there had been frequent bouts of diarrhoea. There were no cardiac complaints, no subjective urinary symptoms or respiratory trouble, and no signs of mental disturbance.

Clinical Examination

On examination the patient was found to be sickly, of asthenic build, pale, and anaemic. In the left eye there was phlyctenular conjunctivitis. Temperature 99° F. (37.2° C.); pulse rate 128 and respirations 32 per minute. The fingers were not clubbed. There was no enlargement of cervical or axillary lymph nodes, but the inguinal nodes showed discrete enlargement; these were neither painful nor tender. The spleen was palpable three fingerbreadths below the costal margin; it was soft and acutely tender, but there was no evidence of perisplenitis. The liver was palpable two fingerbreadths below the costal arch; it was rather soft, but peritoneal or paravertebral tenderness was absent. No abnormality was detectable in the colonic or renal area or in the lungs. There was no obvious dilatation of the heart; a harsh systolic murmur was audible all over the praecordium, with maximum intensity in the left third space, in the parasternal line, conducted well out to the posterior axillary line, but no thrill or associated diastolic murmur; the pulmonary second sound was accentuated. Blood pressure 108/64 mm. Hg.

On the medial side of the right arm, just above the elbow-joint, a thick subcutaneous tender lump containing a non-pulsatile cord-like structure could be felt. Similar non-pulsatile cord-like structures containing tender nodules were present on the front of the right forearm and the medial aspects of the thighs; these were the painful, tender spots complained of by the patient. A nodule was also present in the course of the cephalic vein on the right arm. The superficial arteries felt normal and had pulsations in them, except the left radial and brachial arteries, which could not be felt. This was probably a congenital abnormality with adequate compensation by way of collateral channels, since the nutrition of the limb was well maintained. There was no subjective or objective evidence of peripheral vascular disturbance.

Laboratory Investigations

Blood: R.B.C., 3,750,000 per c.mm.; Hb, 60%; W.B.C., 11,000 per c.mm. (polymorphs 75%, lymphocytes 18%, monocytes 2%, eosinophils 5%); E.S.R., 144 mm. in 1 hour (Westergren); coagulation time, 2 minutes; bleeding time, 3½ minutes; blood culture (repeated after two weeks), no growth; blood urea, 24 mg. per 100 ml.; Wassermann reaction negative. Urine: albumin, trace; pus cells, few; red blood cells, occasional; culture, *Alcaligenes faecalis*; no acid-fast bacilli seen by concentration method (examined thrice at intervals of two weeks). Stool: few degenerated pus cells; occasional red blood cells; no protozoa; no acid-fast bacilli seen by concentration method (examined twice at intervals of two weeks). Sputum: no acid-fast bacilli demonstrated by concentration method (examined twice at intervals of two weeks). Peripheral blood tested for "L.E. cells" found to be negative. Tuberculin test just positive with 1 in 1,000 dilution.

Special Investigations

Skiagrams of chest (taken at intervals of two months) showed no evidence of any parenchymatous lung infiltration. No evidence of calcified lymph nodes could be seen in a flat radiograph of the abdomen. Radiological examination of bones and joints distal to the affected vessel in the forearm showed no detectable abnormality. Ophthalmoscopic appearances were normal. An electrocardiogram gave evidence of sinus tachycardia with a normal sinus rhythm and normal auriculo-ventricular conduction; there was no evidence of coronary disease or of ventricular enlargement.

Histological Examination

Subcutaneous Forearm Vein.—The vein was thickened, cord-like, and thrombosed. On section the outer coat showed haemorrhage and many new, thin-walled blood vessels throughout its thickness. In some areas there was fibrinoid degeneration, patchy in distribution. Infiltration by round cells, of which the principal cells were lymphocytes together with a few plasma cells and monocytes, was of almost uniform distribution. At the junction of the outer and middle coats there were multinucleate giant cells surrounding the whole circumference like a ring. The middle coat showed interruption by granulation tissue. The muscle fibres were separated from one another by vascular connective tissue and lymphocytes. Minute patchy areas of degeneration were also seen in the middle coat. The intima was thickened by cellular connective tissue, in which a few capillaries were also seen. The lumen was greatly narrowed, but no thrombus was present, and the appearance was suggestive of organization and recanalization of a previous thrombus. (See Special Plate.)

Cephalic Vein.—A small area of thickening was felt, but the vein appeared otherwise normal. On section the outer coat showed a few areas of focal collections of lymphocytes in which could be seen a few multinucleate giant cells; there were also small areas of haemorrhage and degeneration. In the middle coat the findings were the same as in the specimen from the forearm. The inner coat was more or less normal.

Inguinal Lymph Node.—There were patchy areas of fibrinoid degeneration, but no giant cells were seen. The follicular structure was unaltered and the capsule intact.

A small arteriole from the right forearm adjacent to the affected vein also showed no abnormality.

Discussion

In arriving at a diagnosis in this case there would, in the first place, seem to be little difficulty in excluding other known forms of acute phlebitis. Thrombophlebitis migrans, for example, is of short duration and is characterized by a polymorphonuclear leucocytosis. "Tropical primary phlebitis," which was described by Fisher, Fisher, and Lendrum in 1947, runs a self-limiting course, and recurrence is uncommon. Histologically the granulation tissue interrupting the vessel wall is composed of new capillaries, polymorphs, and polyblasts, some of the last-named containing phloxinophil inclusion bodies. Again, in thromboangiitis obliterans there may be an associated phlebitis, but the disease is afebrile and characterized by arterial obstruction in the limbs; moreover, giant cells are found only in the region of organizing blood-clot. Secondly, although the family history, together with the clinical course, might suggest chronic miliary tuberculosis, absence of positive evidence of tuberculosis and the fact that the lesions were limited to the systemic veins would rule out such a possibility.

It seems certain that the case belongs to the group of vascular collagen diseases. Of these, the conditions that seem worth considering in the differential diagnosis are: (1) lupus erythematosus, (2) giant-cell arteritis, and (3) polyarteritis nodosa. (1) In acute disseminated lupus erythematosus skin lesions may be absent, but, in addition to endocarditis, involvement of serous membranes and joints is an important feature. Moreover, this is rather a visceral involvement than a surface vascular manifestation. Clinical diagnosis is dependent on the demonstration of L.E. cells. (2) Giant-cell arteritis usually affects the aged, the lesions being chiefly confined to the scalp and cranial arteries; the veins are never affected. (3) Polyarteritis nodosa is essentially a condition of primary arteritis usually affecting males. Hypertension and kidney involvement form an essential part of the clinical picture, and leucocytosis is common. Histologically, giant cells are seldom encountered.

Our case, therefore, though most closely resembling polyarteritis nodosa in the widespread distribution of the vascular lesions, has definite points of difference. Thus there was no hypertension or renal failure even twelve months after the onset of the illness; leucocytosis was absent; lesions were limited to widely scattered veins; and, finally, giant cells were present. These would appear to be grounds for regarding the case as at least a variant form of the collagen group of diseases which has not hitherto been described.

The histological slides were sent to Professor J. H. Dible, of the Department of Pathology, Postgraduate Medical School of London, for his opinion, and he makes the following comments: "I have examined the tissues and have also discussed them with Dr. Harrison. He points out that giant-cell arteritis, so far as is known, never affects veins, and, moreover, it is essentially a disease of advanced years. I don't think either the history or the histology of the lesion fits in with syphilis. . . . I have never seen tuberculosis attack veins in this way. . . . The disease which seems most worth considering is polyarteritis nodosa. The limiting of lesions to the veins and the peculiar picture of giant cells are certainly unusual, but, then, so is the whole case. I don't think this disease, either clinically or histologically, is the same as those reported by Fisher, Fisher, and Lendrum (1947)."

Summary

A case is reported of a protracted febrile illness in a young married woman in which polyphlebitis, inguinal lymphadenopathy, disproportionate tachycardia, and a high erythrocyte sedimentation rate were notable

features. The condition in many respects resembled polyarteritis nodosa, but differed from it in that the vascular lesions were limited to the veins and in the presence of giant cells.

A full account of the clinical and laboratory findings is given and the differential diagnosis discussed.

The patient is alive and is being followed up.

We are most grateful to Professor Dible for his valuable opinion on the tissue slides. Our thanks are also due to Dr. C. V. Harrison, Reader in Morbid Anatomy, University of London, for his views on giant-cell arteritis, and to Drs. S. N. De and A. Mukherjee, of the Departments of Pathology at the Sir Nalratn Sarkar Medical College and School of Tropical Medicine, Calcutta, respectively, for their help and co-operation.

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SPONTANEOUS MYXOEDEMA DEVELOPING AFTER THYROTOXICOSIS

BY

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Primary adult myxoedema most commonly occurs from idiopathic primary atrophy, but may also follow thyroidectomy, excessive radio-iodine dosage, or destructive thyroid disease such as lymphadenoid goitre (Hashimoto's thyroiditis). It is also frequently stated in textbooks that adult myxoedema may arise in patients who have previously had frank thyrotoxicosis ("burned out toxic goitre"), but it is exceedingly hard to discover records of such cases. Crotti (1938) describes one, but gives the impression that he has seen many more: he intimates that the progression from hyperthyroidism to hypothyroidism takes many years. McGavack (1951) describes the case of a patient who received only iodine treatment for his thyrotoxicosis but developed myxoedema some four years later. In view of the paucity of cases recorded, we are reporting one which was first treated for thyrotoxicosis with antithyroid drugs for 21 months; an active thyroid gland was still present at the end of this time. Twelve months later the patient was definitely myxoedematous.

Case Report

A married man aged 40 first presented in November, 1950, with an 18-months history of increasing fatigue, intolerance of hot weather, and 3 st. (19 kg.) loss of weight. He also complained of some dyspnoea on exertion and of some prominence of the eyes in the past two months. His appetite was very good. On examination at that time he was a thin, flushed, and anxious man (Fig. 1 A) with a fine tremor of the fingers, an increased peripheral circulation, and a slightly enlarged soft thyroid gland with a bruit. There was no true exophthalmos, lid retraction, or lid lag, but a definite "stare." There were no other physical signs. Investigation confirmed the diagnosis of hyperthyroidism (Fig. 2). The basal metabolic rate ranged from 140 to

160% of normal according to the Boothby standards (52 to 60 cal./square m./hr.). A radio-iodine test yielded only 10.7% excretion in 48 hours ("T" index of thyroid uptake = 105 compared with the normal of 3-13) (see Fraser *et al.*, 1953).

After a short course of an anti-thyroxine drug (butyl-4-hydroxy-3:5-diiodobenzoate) (Fraser and MacLagan, 1953), and after an episode of pyrexia which was found to be due to otitis media, the patient was discharged on methyl-thiouracil, 600 mg., and thyroid, 1 gr. (65 mg.), daily. He responded rapidly to treatment, gained weight, and remained well controlled on diminishing doses of thiouracil from January, 1951, to October, 1952. Antithyroid drug treatment was then stopped, and a radio-iodine test done a few days later showed that the gland was still active in that the 48-hour excretion was 16.7% (T=62). He was then given a short course of potassium iodide and re-tested in February, 1953, when the 48-hour radio-iodine excretion had risen to 77% (T=2.6). This was attributed to excessive ingestion of iodides as the patient appeared



Fig. 1.—Photographs taken in November, 1950 (A), and in January, 1954 (B).

	1950	1951	1952	1953	1954
	JAN.	DEC.	JAN.	SEP. OCT.	FEB. MAY.
B.M.R. %	+43 +45 +52				-27 -31 -33
Blood Cholesterol	177mg%				391mg%
48hr. ¹³¹ I Excretion	10.6 %			16.7 % 77 % 79 %	83 %
"t"	105			61.7 2.6 1.4	2.0
E.C.G.					
Weight in stone	9.9	10.12	12.3	12.9	12.11
Anti-Thyroid Drug					

Fig. 2.—Results of investigation.

euthyroid, but when the test was repeated three months later it yielded a similar result, and when he was seen again in October, 1953, he had all the features of myxoedema—full puffy facies, husky voice, and dry skin—and his weight had risen to 13 st. (82.5 kg.) (Fig. 1 B). On admission for reinvestigation it was found that his blood cholesterol had risen to 391 mg. per 100 ml., his basal metabolic rate had fallen to -28 to -33% (25-28 cal./square m./hr.), his protein-bound iodine was 2.8 µg. per 100 ml., and he had

electrocardiographic evidence of myxoedema. There was no evidence of pituitary failure: he had a normal 17-keto-steroid excretion, and a normal diuresis in response to a standard water load.

Conclusion

Our data indicate that this patient had Graves's disease in 1950; that his thyroid gland was still functioning at the end of 1952, after treatment with thiouracil; and yet that one year later he had advanced primary myxoedema, which has since responded to thyroxine. We have been unable to find a record of any other case of myxoedema developing spontaneously so soon after thyrotoxicosis.

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SEZARY'S SYNDROME

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Disturbances of the reticulo-endothelial system associated with generalized erythrodermia are well known, and form a diverse group, from which Sézary and Bouvraïn (1938) first described a distinct syndrome. This is characterized clinically by bizarre features, and pathologically by the appearance of peculiar monocytoid cells in the blood. Sézary (1949) reviewed all the four published cases (Sézary and Bouvraïn, 1938; Sézary, Horowitz, and Maschas, 1938; Baccaredda, 1939; and Sézary and Bolgert, 1942), to which Wilson and Fielding (1953) have added one more—the first reported in Britain.

The purpose of this paper is to draw attention to this syndrome by recording the clinical and pathological features of two further cases, and to discuss their relation to the reticuloses.

Case 1

The patient, a widow aged 77, previously led an active, healthy life. She had had smallpox at the age of 11 years and pneumonia at 73. Seven sons were alive and well; one premature infant was stillborn. About eight years ago she first suffered from attacks of extensive erythrodermia "just like measles," with varying degrees of exfoliation, and intense pruritus, starting in the feet and spreading over the limbs and trunk. These attacks were transient initially and were preceded by malaise. Later all her skin assumed a mottled appearance. Her palms were occasionally affected so severely that she was unable to do her housework. The mucous membranes were not affected, nor was there any history of excessive sweating, although she felt the cold intensely.

Some twelve months ago she became aware of "hot aches" and stiffness of the fingers, with distortion and looseness of the nails—so much so that she was unable to relieve the intense pruritus by "having a good scratch." Her skin also showed scattered patches of both leucodermia and brown pigmentation. Alopecia was complete apart from

occasional tufts on the scalp. Recently oedema of the legs occurred, and infected excoriations have resulted in whitelows, and superficial ulcers on the ankles and elbows.

When first seen in 1950 she showed extensive erythema, fine desquamation, telangiectasia, and superficial lymphadenopathy. Various diagnoses were then considered, including parakeratosis variegata, pityriasis rubra pilaris, poikiloderma vasculare atrophicum, and lymphosarcoma. Skin and blood examinations at that time were equivocal. The presence of atypical white cells in the blood was noted, but their significance was not realized.

Clinical examination showed an elderly woman whose bizarre appearance is well illustrated by Fig. 1. The skin

showed a generalized mottled erythrodermia with fine scaling and interspersed areas of slaty-brown pigmentation and leucodermia of varying sizes and indefinite distribution. Petechiae were maximal over the sternum and shins, the latter also showing erythema ab igne. The hair was absent apart from residual tufts on the scalp and a few remaining



FIG. 1.—Face and hands of Case 1.

hairs on the pubes. The eyelids showed chronic blepharitis and ectropion of the lower lids. The nose was shrunken and the nares were widened. The joints of the wrists and knees showed arthritic changes. There were oedema, ulnar deviation, and flexural contractures of the digits of both hands: full extension, active or passive, of the fingers of the right hand was impossible. The nails and terminal phalanges of the left hand were almost entirely absent; the thumb was normal. The changes were less marked in the right hand, although all fingers showed some degree of deformity. The lymph nodes in the axillae and groins were all enlarged, firm, rubbery, and discrete. There was one similar lymph node in the right cervical area. The mucous membranes were normal.

No significant lesion has been revealed in any other system. The spleen was not felt. The liver edge was palpable just below the costal margin. There was slight oedema of the legs. B.P. 170/80. Weight 7 st. 12 lb. (49.9 kg.). The temperature and pulse were normal. X-ray films of the skull, spine, pelvis, and chest were essentially normal. The mental condition was that of a well-adjusted euphoric elderly woman.

Case 2

The patient, a married woman aged 40, had suffered from eczema as a child. Her appendix had been removed at the

age of 17 years. In 1948 she developed a patchy eczema whilst in hospital for recurrent erysipelas of the face. She has one daughter, aged 19 years.

About four years previously she first complained of pruritus starting on the trunk, followed by erythema of the arms, thickening of the skin, and generalized scaling. This started six months after laparotomy, at which the left tube and ovary—with a benign necrotic fibroma—were removed. "Drenching" night sweats followed by rigors were frequent. They ceased six months ago, since when she has felt the cold intensely.

During 1952 superficial lymphadenopathy occurred whilst she was under treatment elsewhere for generalized exfoliation. A provisional diagnosis of lipomelanotic reticulosis was made and A.C.T.H. therapy instituted. Considerable improvement ensued, but A.C.T.H. was stopped after pigmentation and staphylococcal pyoderma supervened.

In January, 1953, she was admitted to hospital under our care with the same provisional diagnosis, the clinical features being those of intense pruritus, generalized erythrodermia,

mild desquamation, pigmentation, and superficial lymphadenopathy. She continued to develop occasional pyodermic nodules, which have healed normally, although some required drainage.

Clinical examination showed a pathetic woman, whose appearance is shown in Fig. 2.

The skin showed generalized erythrodermia, fine scaling, and "mottling," which was more confluent on the lower parts. Generalized brown pigmentation was maximal on the face and trunk. Leucodermia was absent. The arms were lichenified and there was some eczematization of the lower legs. Two right linear abdominal scars were present. At the time of writing there was one small pyodermic nodule on the right wrist. The hair was absent. The eyelids were normal, but the lower eyelashes were absent. The nose, joints, nails, and mucous membranes were normal. The lymph nodes in the neck, axillae, and groins were all enlarged, firm, rubbery, and discrete.

No significant lesion has been revealed in any other system. The spleen was not felt. The liver was palpable two fingerbreadths below the costal margin. There was slight oedema of the feet. B.P. 110/65. Weight 6 st. 5 lb. (40.4 kg.). The temperature and pulse have occasionally been slightly raised. X-ray films of the skull, spine, pelvis, and chest were normal. The mental condition was that of an anxious woman whose intellectual level is well below average.

Pathological Features

Skin.—Biopsy material from the axilla (Case 1) and from the neck (Case 2) both show similar histological appearances. The main feature is uniform infiltration of the epidermis and corium with monocytoid cells (Fig. 3). The distribution is perivascular in the corium and focal in arrangement in the epidermis. The predominant cells are distinguished by large irregular convoluted nuclei with dense chromatin and scanty feebly acidophilic cytoplasm. Allowing for structural alteration during fixation and staining,

these cells are almost identical with those in the blood. The remainder are mainly round cells. The epidermis shows marked parakeratosis, some acanthosis, vesicle formation, and prominent rete pegs. The corium is oedematous and the smaller blood vessels show endarteritis. Sweat glands are present, but hair follicles are conspicuously absent.

Lymph Nodes.—Lymph nodes from the axilla (Case 1) and from the neck (Case 2) are similar in histological appearance (Fig. 4). The capsule is intact, is thickened, and shows no infiltration. The cortex is remarkably broad, slightly lobulated, and paler than normal when stained with haematoxylin and eosin. The cortical follicles are atrophic and compressed, some still showing Flemming's centres. The pallor is due to sheets of cells with large pleomorphic nuclei, often seen in mitosis. Their scanty cytoplasm is faintly acidophilic.

Among these cells are small numbers of lymphocytes, eosinophils, and small deposits of melanin. Stained preparations reveal few reticulum fibres in the cortex. Medullary sinus catarrh is marked. The appearances are similar to those of lipomelanotic reticulosis ("dermatopathic lymphadenitis"), described by Jarrett and Kellett (1951), although nuclear mitosis and pleomorphism are more marked in the cortical cells of our cases. Jarrett and Kellett thought that the cortical cells of their cases were reticulum cells of histiocyte type. In appearance, though not in depth of staining, their nuclei resemble those of the Sézary cells in the blood of our patients. The variation in staining is probably due to differences in fixation. This view is supported by the presence of large numbers of these cells in lymph-node-puncture smears stained by Jenner-Giemsa technique.

Blood Picture.—During observation both patients have shown an unresponsive secondary normochromic anaemia, the Hb varying from 9 to 12 g. and the M.C.H.C. from 30 to 34%. No nucleated red cells were seen. The platelets appeared normal, ranging from 300,000 to 400,000 per c.mm. At times both patients have shown a slight leucocytosis which never exceeded 16,000 per c.mm., with a varying eosinophilia. The dominant feature, however, was the invariable presence of the *cellules monstres* of Sézary. At one time these abnormal cells constituted 35% of the total white-cell count; at others their numbers were so reduced that special search was necessary to detect their presence (Table I).



FIG. 3.—Skin section of Case 1 showing monocytoid infiltration. (High-power view.)

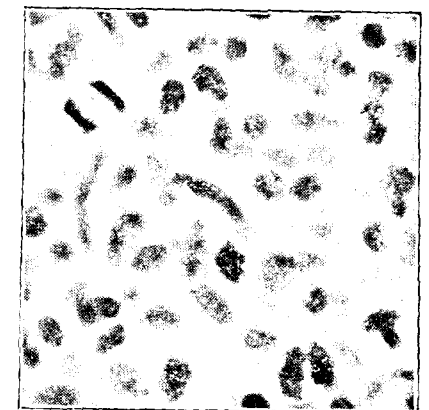


FIG. 4.—Lymph-node histology of the cortex of Case 1 showing Sézary cells in mitosis. (Oil-immersion view.)

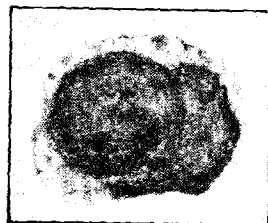
TABLE I.—Differential White Cell Counts

Date	W.B.C.	% Polys	% Lymphs	% Monos	% Eosins	% Basos	% Sézary
Case 1							
2.6.50	5,300	41	38	3	3	1	14
14.9.50	5,800	54	20	5	3	0	18
30.4.53	7,200	64	18	3	8	0	7
3.6.53	10,000	48	20	3	6	0	23
6.7.53	6,000	66	24	3	5	1	1
24.8.53	14,000	18	43	3	1	0	35
5.1.54	7,500	44	31	7	14	0	4
24.2.54	16,000	47	20	4	9	0	20
Case 2							
6.1.53	8,000	74	16	6	4	0	<1
20.11.53	10,500	70	10	10	3	1	6
7.12.53	13,000	75	16	2	2	2	3
5.1.54	14,000	75	14	1	3	0	7
24.2.54	12,800	60	13	2	16	0	9

Sézary cells in air-dried Romanovski films (Fig. 5) are approximately twice the size of normal polymorphs. They are peroxidase-negative. The scanty, feebly basophilic cytoplasm resembles that of normal monocytes and occasionally shows fine dusty granules or pseudopodia. The nucleus occupies about four-fifths of the cell and varies considerably in shape,



(a)



(b)

FIG. 5.—Peripheral blood: (a) Sézary cell in mitosis with adjacent normal polymorphs; (b) characteristic mature Sézary cell.

sometimes being round, convoluted, reniform, or bilobed. Binucleate and trinucleate forms have been seen. They simulate mature lymphocytes only in chromatin arrangement and depth of staining. Nucleoli are usually absent or indistinct. These cells were occasionally seen in mitosis in Case 1.

Sternal Marrow.—Marrow smears from both cases show no distinctive features (Table II). Sézary cells are present, but no more than would be expected by dilution with the blood.

TABLE II.—Myelograms

Cells	Case 1	Case 2
Blasts	1.0	1.0
Early normoblasts	3.0	4.0
Intermediate normoblasts	10.5	8.0
Late normoblasts	10.5	6.0
Reticulum cells	1.5	0.5
Sézary cells	1.0	3.0
Myeloblasts	0.5	2.0
Promyelocytes	1.5	3.5
Myelocytes	15.5	25.0
Metamyelocytes	20.0	22.0
Granulocytes	25.0	15.0
Lymphocytes	7.0	4.0
Monocytes	1.5	2.0
Plasma cells	0.5	3.0
Megakaryocytes	2.0	1.0

Laboratory Investigations.—The laboratory investigations are summarized in Table III. They have been repeated on several occasions, and the results have invariably been within normal limits, except the E.S.R. (Wintrobe), which is raised slightly in both patients. Hess's test for capillary wall fragility was unsatisfactory because of the state of the skin.

TABLE III.—Laboratory Investigations

Investigation	Case 1	Case 2
W.R. and Kahn test	Negative	Negative
Serum albumin	4.1 g. %	2.8 g. %
Serum globulin	2.4 g. %	2.2 g. %
Total protein	6.5 g. %	5.0 g. %
A/G ratio	0.6/1.0	1.3/1.0
Colloidal gold	0	0
Alkaline phosphatase	7 (K.A. units)	20 (K.A. units)
Serum bilirubin	0.5 mg./100 ml.	0.5 mg./100 ml.
Plasma prothrombin time	12 secs. (control 15)	15 secs. (control 15)
Whole blood-clotting time	5 mins. (L.W.)	5 mins. (L.W.)
Fasting blood sugar	62 mg./100 ml.	65 mg./100 ml.
Blood cholesterol	250 "	150 "
Blood urea	25 "	150 "
Serum Na, K, Cl	320, 20, 620 mg./100 ml.	330, 19, 610 mg.
E.S.R. (Wintrobe)	31 mm./hr.	20 mm./hr.
24-hour 17-ketosteroid excretion	4.7 mg. (920 ml.)	7.9 mg. (725 ml.)
24-hour creatinine excretion	880 mg.	850 mg.
Urine	N.A.D.	N.A.D.
B.M.R.	+1	+25

Diagnosis

The features of Sézary's syndrome are intense pruritus, generalized erythrodermia, pigmentation, and superficial lymphadenopathy, associated with the presence of unusual monocytoid cells in the blood.

In general this description might apply to many of the reticuloses, of which "lipomelanotic reticulosis," Hodgkin's disease, the leukaemias, and mycosis fungoides are of importance.

Lipomelanotic reticulosis often starts as a localized dermatosis, before generalized erythrodermia, intense pruritus, and superficial lymphadenopathy develop. Varying degrees of exfoliation, lichenification, pigmentation, excoriation, and low-grade sepsis occur. Attacks of profuse sweating are almost invariable. Eosinophilia is usually present. It may be difficult to differentiate this condition from Sézary's syndrome without careful haematological examination.

Hodgkin's disease frequently presents with lymphadenomatous masses, and less often with cutaneous manifestations. When it affects the skin pruritus may be marked, but erythrodermia is unusual. Prurigo papules or scratch marks may be the only visible signs.

The leukaemias should always be suspected. The cutaneous manifestations may take the form of intense pruritus, erythrodermia and exfoliation, although nodules and areas of infiltration occur. The hair and nails may shed. Purpura often occurs in the acute phase, the patient usually having an irregular pyrexia. Erythrodermia in the form of glazed or weeping areas may give the classical picture of "l'homme rouge." Both lymphadenopathy and hepatosplenomegaly may be present. The characteristic blood and marrow pictures indicate the diagnosis.

Mycosis fungoides is usually substantiated only when tumour formation has occurred. The earlier lesions are often red scaly patches, transient at first, eventually becoming fixed and infiltrated. Involution may occur, leaving pigmented areas, but persistence is usual. They usually precede the development of cutaneous tumours by a long interval.

Parapsoriasis embraces an ill-defined group of conditions, of which parakeratosis variegata may possibly cause confusion. Although generalized retiform hyperaemia and scaling are present, subjective sensations and lymphadenopathy are absent, and the blood picture is normal.

In cases of generalized erythrodermia with lymphadenopathy, chest x-ray and haematological examination, including marrow puncture, and biopsy of the skin and lymph nodes should be done. If doubtful, these examinations should be repeated at intervals.

Discussion

We have known of this syndrome now for two years. Despite the study of likely patients, only two cases have been seen, and the literature contains only five other confirmed cases. The condition therefore appears to be of some rarity. This is perhaps due to failure to recognize

TABLE IV.—Clinical Features of Published Cases

Feature	Sézary and Bouvraïn (1938) Case 1	Sézary Horowitz, and Maschias (1938) Case 2	Baccaredda (1939) Case 3	Sézary and Bolgert (1942) Case 4	Wilson and Fielding (1953) Case 5	Present Case 1 (1954) Case 6	Present Case 2 (1954) Case 7
Age	58	69	67	66	67	77	40
Sex	F	F	F	F	M	F	F
Duration	18 months	30 months	36 months	39 months	2 16 years	8 years	6 years
First symptom	Pruritus	Pruritus	Pruritus, 2 fissures soles and palms	Pruritus	Transient rashes, Pruritus	Pruritus	Pruritus
Erythrodermia and scaling	+	+	+	+	+	+	+
Pigmentation	+	+	+	+	+	+	+
"Mottling"	+	+	+	+	+	+	+
Purpura	+	+	+	+	+	+	+
Eruption present	Papular	Papular	?	?	+	+	+
Cutaneous infiltration	+	+	+	+	+	+	+
Oedema	+	+	+	?	+	+	+
Pyoderma	+	+	+	+	+	+	+
Sweating attacks	+	+	+	+	+	+	+
Hair	Alopecia 19 years	Alopecia	Thicker and blacker	Alopecia	Normal (sparse)	Alopecia	Alopecia
Macous membranes	Ectropion	Normal	Ectropion, Pigmented	Normal	Normal	Ectropion	Normal
Superficial lymphadenopathy	?	?	+	+	+	+	+
Hepatosplenomegaly	+	+	Terminal liver enlargement	+	+	Liver just palpable	Liver palpable
Chest	Normal	Normal	Normal	Normal	Normal	Normal	Normal
General condition	Poor	Poor	Moderate—death unexpected	Poor	Poor	Good	Moderate

the syndrome. The case reported by MacCormac and Whitby (1935) as leukaemic erythrodermia was possibly an example of this condition. Hodgkin's disease with cutaneous manifestations and circulating Reed-Sternberg cells (Simmers, 1924; Miller, 1928; Wigley, 1937; Combes and Bluetarb, 1941) has perhaps been confused with Sézary's syndrome because of the superficial similarity of Reed-Sternberg cells to the *cellules monstreuses*.

Review of the clinical features of the five published cases and the two reported here shows that this condition seems to occur mainly in elderly females (Table IV). Some patients given a history of skin trouble, such as transient rashes, occurring some time before the onset of pruritus, which was the presenting symptom in all cases. Pruritus was intense, eventually generalized, and later associated with exfoliative erythrodermia, pigmentation, purpura, and "mottling," which in one patient (Case 1) took the form of a retiform telangiectasia.

Cutaneous thickening and oedema give a strange facies, which may be accentuated by ectropion, patchy loss of hair, or even total alopecia. Other features noted include dystrophy of the nails, arthropathy, frictional eczema, excoriation, and pyoderma. In all cases superficial lymphadenopathy was marked. Chest x-ray examination revealed no evidence of mediastinal glandular enlargement.

The general condition of one of our patients (Case 1) has consistently remained good, although the local condition has varied; the other patient has been in poor health for some time. At intervals, both patients have had short courses of A.C.T.H. and cortisone with temporary improvement, but relapse has invariably occurred. At present both are improving spontaneously, and further A.C.T.H. is therefore being withheld. Pigmentation, erythrodermia, and scaling are becoming less marked, and there is associated diminution of the superficial lymph nodes. The eyebrows and eyelashes are regrowing. The mental outlook of both patients has improved.

The number of cases reported is inadequate to assess the prognosis. It is possibly significant that all except one case have been elderly. Sézary does not state the actual cause of death in his cases. In Baccaredda's case deterioration and death were unexpected, and due to pyelonephritis; Wilson and Fielding's patient died from cardiac disease. At present the general condition of our cases appears satisfactory and early death is not anticipated. Apparent clinical improvement in our cases whilst in hospital may not indicate that the condition is any the less malignant, as spontaneous remissions occur in all reticuloses.

The clinical and laboratory features of the present cases and of those reviewed by Sézary (1949) indicate that they form part of the reticuloses. Although Sézary described the condition as a "nouvelle reticulose cutanée," the cytological appearances are similar to those of the reticulum-cell reticuloses (Israëls, 1951) although affecting different structures.

One of us (R. L. T.) has had the opportunity of examining blood and marrow smears from the cases described by Israëls (1951) and classified by him as reticulum-cell reticulosis. In some of these cases the abnormal cells closely resemble the *cellules monstreuses* of Sézary. The difference between these series appears largely clinical, possibly depending on the anatomical site where the disease begins.

In general, the present classification of the reticuloses is unsatisfactory. It comprises a large group of conditions, varying from the lipid storage diseases to disturbances characterized by progressive proliferation of all or part of the reticulo-endothelial tissues. In the British literature two classifications, depending respectively on the histology (Robb-Smith, 1938) and the clinico-pathological features (Israëls, 1953) are recognized. Israëls suggests that in his classification many of the subgroups delineated by histological examination alone may be but phases in the ultimate evolution of the same disease process.

With this in view, and because of the similarity of the lymph-node histology of our cases to that of lipomelanotic reticulosis, we have reviewed the series reported by Jarrett and Kellett (1951) from this hospital in order to see if those surviving showed Sézary cells in the blood, or other evidence of malignant reticulosis. Of their 16 patients (13 men and 3 women), who were observed for 3½ years, 5 have since died, and one could not be traced. Of the remainder, one is still affected and 9 are clinically clear. Sézary cells were not found in any of these cases, nor were other manifestations of reticulosis. In no case was the certified cause of death related to the reticuloses.

Sézary provisionally classified the *cellules monstreuses* as aberrant reticulum cells originating from the reticulum tissue in the skin. This view is probably correct, although we are less certain of the site of origin, as they resemble the proliferating reticulum cells of lymph nodes—smears from which in the present cases show a high proportion of these cells. Their similarity to the proliferating cells seen in the blood and marrow of Israëls's reticulum-cell reticulosis is again emphasized.

Histologically, this appears to place Sézary's syndrome as a transitional phase between lipomelanotic reticulosis and reticulum-cell reticulosis.

The apparent benign clinical course of lipomelanotic reticulosis (Pautrier and Woring, 1937; Jarrett and Kellett, 1951) contrasts sharply with the typical fulminating course of reticulum-cell reticulosis. The review of Jarrett and Kellett's lipomelanotic series indicates that nine patients have recovered—so much so that this diagnosis would not now be entertained.

Clinically, therefore, the present cases appear to lie between these extremes, having run a chronic course for several years. Although at present showing some spontaneous remission, it is possibly significant that Case 1 has slowly deteriorated since first seen.

Wilson and Fielding (1953) were hesitant about applying the term "reticulosis" to Sézary's syndrome. They suggest that it is similar to lipomelanotic reticulosis in that it represents a non-specific response to cutaneous disturbance which "is not, at least to begin with, malignant in character." We consider that Sézary's syndrome is more than simple reactive hyperplasia. It is an early phase of malignant reticulosis primarily affecting the skin and superficial lymph nodes. Involvement of the deeper structures is probable provided death does not occur from intercurrent disease.

The ultimate aetiology of this syndrome, as of all reticuloses, remains obscure. Careful study of prolonged conditions such as this, linking reactive states to irreversible malignancy, may possibly contribute to knowledge of the latter.

Summary

Two further cases of Sézary's syndrome are described and the five previous cases reviewed.

It is thought to be a local reticulosis intermediate in phase between benign reaction and frank malignancy.

The chronicity is possibly due partly to its "pre-malignant" character and partly to the organ affected—the skin and superficial lymph nodes.

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Speaking at a graduation ceremony for medical students at St. Andrews University on January 14, Principal T. M. Knox, vice-chancellor of the University, uttered a warning against the modern tendency to divert professional men from the practice of their profession into administration. "It used to be said in scorn about teachers," he said, "that they taught only because they could not do. One might perhaps have expected an equally scornful remark about administrators." But administration now presented itself in such an attractive guise that many professional men were lured away from the exercise of their professional skill into an office chair. "I am not sure that this is a sign of health in the body politic." "In fact," Principal Knox went on, "administration is just a necessary evil, not an end in itself, but a means to the freedom and progress of professional work, and, whatever the difficulties of administration may be, it is a great deal easier than the exercise of professional skill."—*Scotsman*.

INCIDENCE OF DENTAL CARIES IN CHILDREN UNDER 5 YEARS OLD

BY

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Amongst the few surveys of the incidence of dental caries in children under 5 years old that have been published in this country are those of Knowles (1948) and Jackson (1952). Frequent reports have been made on the dental condition of children aged 5 and over, in particular the studies of Mellanby and Coumoulos (1944, 1946) and Mellanby and Mellanby (1948, 1950, and 1951).

In 1948 it was decided to carry out a series of surveys of the dental condition of the children in the city of Liverpool day nurseries. Four static surveys were completed during the period 1948–52, and the findings are presented in this paper.

The primary aim of these surveys was to determine the incidence of dental caries in children under 5 years old, before they passed into the regular care of the school dental service. A high caries attack rate would, without doubt, prejudice the chances of maintaining the dental fitness of these children by adding to the already heavy burden of dental work now being undertaken. Further, it would be possible to estimate on the basis of the results the number of dentists required to maintain a satisfactory treatment service.

As the second aim, it was desired to ascertain whether any variation in incidence of dental caries would occur over a period of years and to speculate upon possible causes of such variations. For example, a poor state of dental health might be attributed to the possibility of dietary errors during pregnancy and lactation affecting the resistance of tooth structure to caries attack. Alternatively, or in addition, post-natal dietary errors might create in the child environmental conditions in the mouth which would favour the carious process.

Children under 5 provide a useful measure of pre- and post-natal influences. The deciduous teeth begin to be mineralized *in utero* during the eighth week. The completion of the mineralization of the deciduous dentition occurs after birth, during the third year. At about 6 years of age the first permanent molar teeth erupt in a position distal to the deciduous second molar. This is followed shortly afterwards by the shedding of the deciduous incisors. Thus, by confining the investigation to children under 5 the complications of mixed (deciduous and permanent) dentitions are avoided.

Materials and Method

Liverpool Day Nurseries.—These are administered by the maternity and child welfare department under the city medical officer of health. In 1950 the number of day nurseries was increased from 13 to 15, and in 1953 it was reduced to 14. The nurseries are located in widely separated areas, which vary from the poorer districts to the more salubrious parts of the city. The number of children accommodated on a daily basis varies from 40 to 70. The eligibility of children for places in the day nurseries depends on the circumstances of the applying parent. The object is to provide daytime nursery facilities which will enable the parent to go out to work. At one time children who had been accepted could remain at the day nursery until school age, but this policy

was changed in 1951. It is now the intention that accommodation should be available for restricted periods of time until the parents can make other arrangements. The estimated annual turnover is about 15%. The nurseries open at 6.30 a.m. for the admission of children and close at approximately 6.30 p.m. after the children have been collected by the parents. At present the daily charge is three shillings.

Feeding Arrangements.—The children are given three meals at the nursery. Breakfast and tea are prepared and cooked at the individual nurseries. However, the midday meal is prepared, cooked, and then delivered in insulated containers from central kitchens by the school meal service. The vegetables are cooked at the nurseries. In addition, the children receive cod-liver oil, orange juice, and one pint (570 ml.) of milk daily. There are no between-meal snacks whilst the children are at the day nursery. The only exception is that sweets of the dolly mixture type are given after inoculations. Incidentally, many of the children arrive eating sweets, buns, or cakes, and often are given some form of confection by the parents on leaving the nursery at the end of the day. Knowles (1948) reports a similar practice in the London area nurseries. The reason for this may be the desire of the parents to establish or re-establish themselves in the affections of these very young children after long daily separations. It is known, too, that many of the children are similarly indulged at the week-ends.

Dental Standards.—All examinations were carried out by me, using mirror and probe in a good light. New Ash's Clinic No. 17 probes were used, being discarded after 15 to 20 examinations. The probe is fairly coarse, with a short taper to its point. I recorded findings on a simple chart. Caries was recorded, showing the surface(s) of the tooth involved, and graded as follows: Grade 1: cavities which would definitely admit the point of the probe; doubtful cavities were not included. Grade 2: cavities involving up to one-third of the crown of the tooth. Grade 3: cavities involving more than one-third of the crown; missing teeth due to extraction were placed in this category. Fillings were recorded as caries and scored accordingly. The condition of the gums was also recorded, and the severity of gingivitis was graded 1, 2, and 3. Co-operation was enhanced if the examinations were carried out in the presence of as many children as possible. The older children were usually examined first; the younger and doubting children usually followed without demur. Only four toddlers resisted all manner of coaxing to allow examination during the five-year period. Much of this success was due to the kind yet firm handling of the children by the matrons and their excellent staffs. A simple method was used to examine the babies. I sat facing the nurse and the baby was placed on our knees with its head towards me. This inversion of the baby proved an easy method of obtaining a view of the upper teeth.

Numbers Examined.—The number of children examined is given in Table I. In the first two examinations only those children were examined who were likely to stay a reasonable length of time. This accounts

TABLE I.—Children Examined

Age	Dec., 1948	May, 1949	June, 1951	May, 1952	Total
Under 2	33	21	151	152	357
" 3	146	136	153	197	632
" 4	117	149	134	148	548
" 5	28	52	156	136	372
Total	324	358	594	633	1,909

for the low figures in the 4–5 age groups in the 1948 and 1949 examinations. When the longer stay policy was abandoned a progressive survey was no longer possible. Thereafter all children were examined.

Results

The results of the series of four examinations are presented by age groups (Table II). The percentage of caries-free children in the series of examinations shows a similar trend for all age groups. There was a definite drop in the percentage in May, 1949, followed by a rise in June, 1951, to a higher level than in December, 1948.

The average D.E.F. (decayed, extracted, and filled) teeth per child has been calculated. The trend of caries attack is similar.

The effect of a small number of children each having a large number of decayed teeth would be to raise the overall average of D.E.F. and perhaps show a false position. This effect can be minimized by expressing the findings in terms of D.E.F. per 100 teeth. However, the trend is again similar.

The susceptibility to decay of individual teeth varies. The results of all four examinations have been pooled, and are presented by age groups (see Chart). There is a steady rise, though at different rates, in the susceptibility of all teeth with the increase in the age of the children. The pattern of the results approximates the findings of Knowles (1948). The high susceptibility of the deciduous molars, especially the second

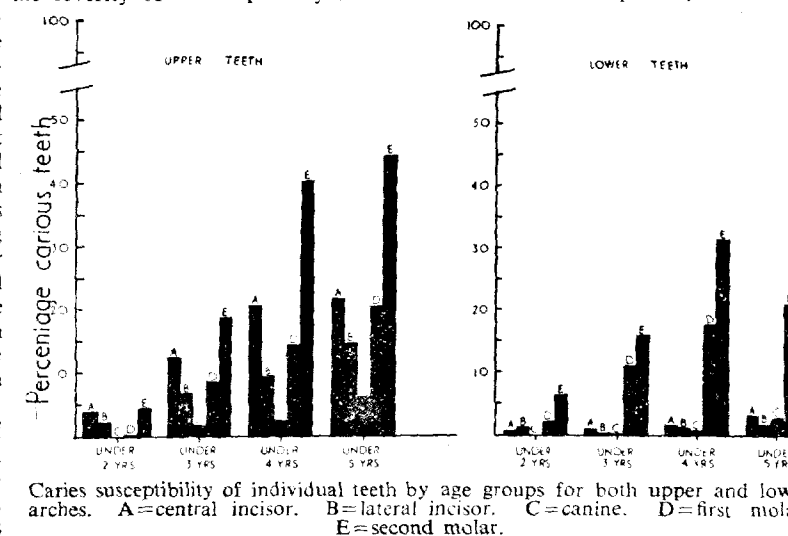


TABLE II.—Results of Four Surveys

Date Examined:	Dec., 1948				May, 1949				June, 1951				May, 1952			
Age:	-2	-3	-4	-5	-2	-3	-4	-5	-2	-3	-4	-5	-2	-3	-4	-5
Percentage caries-free children	84.8	58.9	29.0	14.8	76.2	52.5	25.8	5.9	91.5	70.2	40.1	24.0	90.6	66.8	39.0	27.9
Average D.E.F. per child	0.3	1.1	2.2	5.0	0.6	1.6	2.6	4.7	0.2	1.3	2.4	4.0	0.2	1.8	3.5	4.1
D.E.F. per 100 teeth	1.8	5.8	10.8	23.7	3.4	7.9	14.3	22.2	0.9	7.7	12.4	20.6	1.6	7.18	18.9	20.4

D.E.F.—Decayed, extracted, or filled teeth.

molars, is particularly striking when considered in terms of the length of time these teeth are exposed to the oral environment. It is generally accepted that the eruption times of the deciduous dentition are: incisors, 6-10 months; canines, 16-20 months; first molars, 12-16 months; and second molars, 20-30 months (Kronfeld, 1939). Occasionally eruption times fall outside these dates. It is possible that enamel formed at about the time of birth is less resistant to caries. Rushton (1933) has shown that the disturbance of birth causes a change in the enamel. Histological sections show a line of demarcation between the pre-natal and post-natal enamel. It is an appalling thought that 7% of the second deciduous molars are decayed before the children are 2 years old, and that, even worse, over 45% are decayed before the children reach 5 years. Comment is made below on this point.

The severity of caries was assessed in accordance with the grades referred to above. The results of the four examinations for all age groups have been pooled. Of the 876 decayed first molars, 28% were grade 1, 46% grade 2, and 26% grade 3. Of the 1,808 decayed second molars, 43.5% were grade 1, 38.5% grade 2, and 18% grade 3.

Finally, only 11 children out of the total number of 1,909 had any fillings present. The gum condition of the children was generally good, and less than 2% suffered from clinically detectable disturbances.

Discussion

The primary object of the survey, which was to ascertain the incidence of caries, has been achieved. It is reasonable to comment on these findings relative to all children, for it has not been shown that dental caries is any less prevalent at either end of the social or financial scale. The only exception is that children fully resident the year round in orphanages, institutions, and the like have a much lower incidence of decay (Hewat, 1931, 1932). These latter children constitute only a very small fraction of the child population of the United Kingdom.

It is a sad reflection that all children who enter school have, on an average, five decayed teeth each. Thus the school dental service is faced with a considerable problem.

The live-birth rate in Liverpool over the past ten years averages approximately 16,500 a year (A. B. Semple, 1953, personal communication). This provides a basis for the calculation of the number of dentists required. Thus, $16,500 \times 5$ decayed teeth = 82,500 teeth requiring treatment in the 4-5-year-old children alone. It is possible for one full-time school dentist to complete, say, 3,168 fillings a year. Assuming one simple filling per tooth, 26 dentists would be required to deal only with this 4-5-year-old age group each year. Certain factors would affect this figure, such as extractions, root fillings, multiple fillings, difficult children, refusals, attendances to private dentists, etc. Even if allowance be made for these factors, the situation is impossible. In Liverpool the establishment of dental surgeons in the school service is 24, to deal with the whole school population and such pre-school children who do attend.

No doubt much the same situation exists in the majority of other similar communities. As a result multiple extractions of the deciduous teeth have to be carried out so that time may be devoted to the preservation of the permanent teeth of the older schoolchildren. The consequence is that large numbers of children become dental cripples with impaired mastication and malocclusion of the permanent teeth due to the early loss of the deciduous teeth. The deciduous molars should be retained until 9-10 years old, when the permanent premolar teeth which follow them are due to erupt. It is little wonder that the demand for the treatment for these irregularities far outstrips the supply of trained orthodontists. Nor is it surprising that full dentures are required by adults at an early age.

The increase of dental man-power, though essential to a certain level, does not provide a satisfactory solution to this

problem. The real solution lies in more dental research into the aetiology of dental caries, and, in the meantime, the application of every known measure which may bring about a reduction in decay.

The second object of these surveys was the examination of the trend of caries attack during the five years. The result is interesting (see Table II).

It is reasonable to assume that the influential factor responsible for this trend was not of pre-natal origin affecting tooth structure during formation. A common pre-natal factor would not have caused similar variations in all the age groups at the same time. Hence it is reasonable to examine the possible local or environmental factors which might be concerned.

Diet.—There were no significant changes in the main nutritional parts of the diet during the period. Some improvement in quality was introduced during 1951. No correlation is possible.

Supplements.—The prescribed amounts and quality of the vitamin supplements were maintained. At the nurseries the daily pint of milk was given regularly. Changes in the supplying contractors precluded any basis for correlation.

Sugar and Sweets.—The variations in the ration between 1942 and 1953 were examined. This is discussed below in detail.

Oral Hygiene.—No changes in the oral hygiene routine at the nurseries were made during the period.

Extraction Rate of Flour.—No correlation.

Availability of Fruit and Vegetables.—Usual seasonal variation; comment is made below on this point.

The presence of easily fermentable carbohydrate in the mouth has for some time been thought to be an important factor, and must be considered. Stones *et al.* (1954) completed a two-year study in 1951 on the effect of administering 22 oz. (620 g.) of sugar in addition to the ration. The extra sugar was given at meal-times only. There was no significant difference in the incidence of dental caries between the children receiving the extra sugar and those in the control group. On the other hand, the recent comprehensive studies carried out at the Lund Research Station at Vipeholm Hospital in Sweden are important, for the between-meal carbohydrate has been shown to be one of the most important factors in causing dental caries (Gustafsson *et al.*, 1952).

It is tempting, therefore, to speculate regarding the effect of the United Kingdom rationing of sugar and sweets during the period of the four surveys.

The May, 1949, examination, which revealed a drop in the percentage of caries-free children, took place about two to three weeks after the derationing of sweets on April 24, 1949. It may be remembered that there was such a wave of buying that plenty soon became a famine after a few weeks, and rationing was reimposed on August 14, 1949. Thereafter the size of the ration varied until derationing on February 5, 1953. It is interesting to consider whether the quantities of sweets obtained by these children during this period were sufficient to produce changes in the oral environment which hastened the carious process.

Little is known about the rate of development of carious lesions. It is a common clinical experience to find fresh carious lesions within a three-months period after children have been made dentally fit. In this case two weeks seems a short time for the development of lesions; nevertheless, speculation is provoked. Dental surveys of large numbers of children need to be undertaken every two to three weeks over a period of at least two years. Two problems may then be solved—the rate of development of clinically detectable caries, and the possible seasonal variations in the caries attack rate.

Careful study of the former must necessarily precede that of the latter. In the United States of America the greatest incidence of caries appears to occur in the autumn and winter, and the lowest incidence in the summer and spring (Price, 1930; McBeath and Zucker, 1938; Lathrop, 1941, 1943). This finding is not in agreement with the present study, and may be due to local differences between this country and America.

The seasonal variation, if it occurs, could be due to the variations in the composition of diet such as increased consumption of sweets during the periods when there is less inclination to eat fruit and vegetables or when supplies of the latter are restricted by supply or price. If the cause of such variation could be found, a real advance would have been made in dental research.

Conclusions

Children under 5 years suffer severely from dental caries and are in need of dental care. With any foreseeable available dental man-power in the next few years, the task is too great to be dealt with on a reparative basis, so that every possible preventive measure needs to be applied.

At the present date two measures are of proved value in reducing the caries attack rate. The fluoridation of domestic water supplies in the United States is so effective that the United Kingdom Mission of the Ministry of Health (1953) has recommended the inauguration of studies in this country.

The second measure, the plain water rinse after all food and drink, is of individual application. Thus to make this measure effective the education of all those having children in their care is essential. The medical profession is in a unique position in this respect. For it is to the medical practitioner that parents, teachers, and heads of institutions turn for guidance concerning the care of very young children.

The habit of drinking plain water after eating, whatever it may be, must be established in children before the first teeth erupt. As soon as possible they must be taught to rinse and to swallow the water. Experience has shown that children learn this procedure more quickly than when expectorating the water. In any case, the former method is the more socially acceptable. Three rinses should be carried out, forcing the water between the teeth to dislodge the food debris. This routine must never be varied. It must continue throughout the school terms and holidays alike, immediately after all meals, mid-morning or afternoon snacks, sweets, chocolates, and so on. Fibrous foods, such as apples, at the end of meals enhance the procedure. When possible the rinsing should be followed by tooth-brushing, but it must always be done after the last food or drink is taken at night.

I have prepared an instructional pamphlet (United Liverpool Hospitals, 1953). It is written in the simplest terms with deliberate repetition, and is designed to introduce this procedure of preventive dentistry to the mothers of very young children. Actually, the instructions apply to children of all age groups. The method provides, short of a return to primitive diets (Price, 1939), a logical means of reducing the caries attack rate, by the removal of the carbohydrate substance which is so essential to the existence of the organisms associated with the caries process. The regime is simple and clear enough for all to understand.

Summary

The findings of four surveys, during the period 1948-52, of the incidence of dental caries in children under 5 years old are presented.

These children suffer considerably from dental caries. Children on reaching school age have an average of five decayed teeth.

The school dental service faces an impossible task in maintaining a reparative service with the present numbers.

The results show that the trend of dental caries incidence follows a similar pattern in all age groups under 5 years. There was a drop in the percentage of caries-free children in 1949 compared with 1948, 1951, and 1952. An attempt is made to speculate on the cause of this drop.

In the conclusions that are drawn two preventive measures of proved value are mentioned. The fluoridation of domestic water supplies in the United States has been of such value that the United Kingdom Mission has recommended the initiation of fluoridation studies in this country. The second measure recommended is the plain water rinsing of the mouth after eating or drinking anything whatsoever. It should be taught to children before teeth erupt. The technique is described.

The education in dental health of all those who have children under their care is a primary need, whether they be the parents, teachers, or heads of institutions. The medical practitioner is in a unique position, for it is from him that guidance is sought initially in the dental care of these young children.

I wish to express my thanks and gratitude to Professor W. M. Frazer, late medical officer of health for the City of Liverpool, and Dr. Ruby M. Bell, late assistant medical officer of health in charge of the maternity and child welfare department, who kindly gave me facilities to carry out these surveys. Also to their successors, Professor A. B. Semple and Dr. V. J. M. Stark for their continuing interest. I wish to thank the supervising matron and all the matrons and staffs of the individual day nurseries who have helped so much in carrying out the work, Mr. W. Lee for photographing the chart, and Miss I. Rayner, who carried out the tedious task of collating the data for analysis. I am indebted to the Ministry of Food, Liverpool, who kindly supplied the sugar and sweet ration figures from which some data were obtained. Finally, I express my appreciation to Professor H. H. Stones, Director of Dental Education, School of Dental Surgery, University of Liverpool, for his help and encouragement.

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The PRINCESS ROYAL unveiled a plaque at No. 10, South Street, Park Lane, London, on January 21 to commemorate the residence in a house on that site of Miss Florence Nightingale. She lived there from 1865 until her death at the age of 90 in 1910. The proposal to erect the plaque was made to the London County Council's planning committee by the Florence Nightingale Hospital, the National Council of Nurses, and the Western Heritable Investment Co., Ltd., the occupiers of the present building. The Princess Royal, who is Patroness of the Florence Nightingale Hospital, was received by Sir CULLUM WELCH, chairman of the hospital, and by Lady WELCH and Mrs. A. C. E. KIMBER, joint chairmen of the hospital's appeal committee. A link with Miss Nightingale herself was provided by the presence at the ceremony of Mrs. ALICE CRAWLEY, who as Miss Cochrane was her secretary for some years. Also present were the chairman of the board of governors, St. Thomas's Hospital, and members of the executive and appeals committees of the Florence Nightingale Hospital, representatives of the National Council of Nurses of Great Britain and Northern Ireland, and the chairman of the London County Council.

A CASE OF BILATERAL FATIGUE FRACTURE OF THE FIBULA

BY

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Fracture of a bone may result from ordinary functional activity in the absence of any obvious injury or violence. Such fractures are referred to as fatigue or stress fractures, and occur spontaneously in apparently normal bone as a consequence of the summation of stresses which singly are insufficient to produce fracture (Burrows, 1948). The incidence of this condition rose sharply during the second world war, but since then, as judged by published cases, it would appear to be an infrequent finding. By far the commonest site of this form of fracture is in one of the metatarsal bones; the tibia is involved five or six times less frequently, and the fibula forty times less frequently (Hartley, 1943). The series of 32 fatigue fractures analysed by Richmond, 1945, showed the following locations: metatarsals, 25; upper third of tibia, 5, and lower third of fibula, 2.

The case reported below is an example of fatigue fractures involving the lower third of both fibulae in a middle-aged housewife.

Case History

A married woman aged 45 was referred to one of us in a general medical clinic as a case of "arthritis of ankles." She complained of pain and swelling in both ankles. The pain had been noticed before the onset of the swelling, and had gradually become very severe—so much so that walking had become difficult. She lives in an upstairs flat and runs up and downstairs to and from a shop many times a day. The only unusual exercise undertaken recently has been that involved in using a treadle sewing-machine employing her right foot only. In addition she runs the flat for herself and her husband.

On examination there was a visible swelling $1\frac{1}{2}$ in. (3.8 cm.) above the tip of the lateral malleolus on the right side. There was a tender bony thickening at this level on both sides. Pain could be elicited at these sites by everting or rotating the calcaneus in the ankle mortise. Similar pain was produced by fully dorsiflexing the foot at the ankle-joint. Both heels showed eversion when standing. Radiographs showed fractures of both fibulae $1\frac{1}{2}$ in. (3.8 cm.) above the malleolar tips, slightly oblique in direction as seen in the antero-posterior views. The lateral views showed little of the fractures. Callus was visible on both sides (see Figs.). No osteoporosis was evident in these films or in films of the hands.

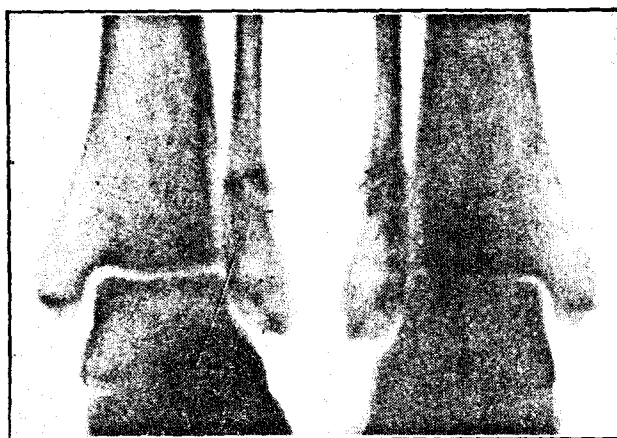
Stirrup strapping was applied to both ankles and the patient was advised to curtail her activities as much as possible. Her signs and symptoms gradually improved, and four months later her pain had almost disappeared, and only slight bony thickening was apparent clinically.

Comment

The diagnosis of fatigue fracture rests on a consideration of the clinical features and radiological findings. Pain is the usual presenting symptom, and may be of acute onset or of gradually increasing severity. There is little in the

patient's history to indicate the nature of the condition: since no record of injury or violence or of a sensation of snap is forthcoming, the possibility of fracture may well not arise.

The local signs are those of localized swelling and tenderness. Burrows (1948) has described three cases of fatigue fracture of the fibula in which tenderness was absent and five in which swelling was not evident. Oedema over the area of the dorsum of the foot may be present and local redness and increased temperature are other occasional findings. In unilateral examples limp does not appear to be a significant sign, but it was certainly a prominent feature in our case. Movement of the ankle-joint is unimpaired, but passive eversion of this articulation produces severe pain over the site of the fracture. Similar pain is produced by any movement which causes widening of the ankle mortise, such as full dorsiflexion of the foot.



Radiograph showing fracture and callus formation of both fibulae.

Watson-Jones (1952) emphasizes that radiographs may show no abnormalities until the fissure is widened by reactionary osteoporosis, or until bone is laid down beneath the periosteum. Burrows states that a fracture line may be evident in some instances only at the end of the third week, and that even then it may be recognized only with the aid of a lens; a dense band is often the earliest change in the x-ray picture, and may be the last abnormality to clear. At a later date callus appears, and may consolidate and persist for many months as a bony buttress across the concavity or "stressed" aspect of the bone.

From his review of the literature and his own personal series of cases Burrows was able to segregate two groups in which fatigue fractures of the lowest third of the fibula occur. The first group comprises young athletes, such as runners and skaters. It is not difficult to understand the mechanism of production of the fracture or fractures in such activities. The second group, to which our own case belongs, is made up of women of middle age or over who are much on their feet in the course of the day. The aetiological factors in this second group are probably several. Burrows refutes the suggestion of Hartley (1943) that osteoporosis plays any significant part in its causation.

The site of the fractures would seem to offer an explanation of the mode of production; in our case they were situated $1\frac{1}{2}$ in. (3.8 cm.) above the tip of the lateral malleolus, and a similar level was noted by Burrows. Here the bone is largely cancellous in type and the fracture line is just below the interosseus ligament. Continued eversion of the feet, particularly in overweight females, will throw a strain on the lateral aspect of the fibula. The pull of the interosseous ligament medially and the forcing of the lower portion of the fibula in an outward direction will determine a focus of stress concentration at a point immediately below the ligament. It may well be, therefore, that at this focus deformation occurs which is at first elastic, and so reversible, but which later becomes permanent. As a consequence of

the localized molecular disruption there results a gradual spread towards the centre. The analogy to fatigue fractures in metals presents itself and would repay further study. It would be interesting to note whether the characters of the fractures in both types are similar. In those of metals the fracture is comparatively smooth at its outer zones where the surfaces have been rubbed together on innumerable occasions prior to the sudden spread of the fracture transversely, this suddenly fractured zone showing relative coarseness. Difficulty remains in affording an explanation for the predominance of this group of fatigue fractures of the fibula in females.

Summary

A case of bilateral fatigue fractures of the fibula in a middle-aged woman is reported.

Point tenderness, and pain at the same site when the ankle mortise was widened by everting the heels or dorsiflexing the foot, were features of the clinical findings.

The site of the fractures was identical with that described by Burrows (1948) in women of middle age.

Treatment advised was stirrup strapping and rest.

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INTUSSUSCEPTION OF VERMIFORM APPENDIX IN ALLERGIC CHILDREN

BY

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Chronic intussusception is relatively rare in childhood and the symptoms are often ill defined, especially when the appendix is the site of intussusception. The following two cases are of interest because the presence of allergic disease caused difficulty in diagnosis. The age of the second patient makes her case additionally interesting, because this is only the second report of intussusception of the appendix in a child under 2½ years of age, the first being that of a boy aged 10 months (Forshall, 1953).

Case 1

A boy of 3 years was sent to the Royal Hospital for Sick Children because of attacks of diarrhoea with blood in the stools. A tentative diagnosis of gastro-intestinal allergy had been made because there was a history of infantile eczema.

After spontaneous delivery at term the child was breast-fed for three weeks and then put on to cow's milk, following which he developed eczema. He had bronchitis at 6 months and measles at 1 year. There was no family history of allergic diseases. The patient was well until seventeen days before admission, when he passed a small quantity of bright red blood per rectum. Two days later he had a little diarrhoea and again passed blood. Treatment with a chalk mixture was prescribed and no further bleeding occurred for ten days. Five days before admission he passed several loose stools containing a larger amount of blood; he looked pale but not ill. On the day of admission he had an attack of abdominal pain and passed more blood in the stool.

Examination on admission showed a poorly nourished child with rough dry skin. A soft systolic murmur was

heard at the apex of the heart, otherwise physical examination was negative. Blood examination revealed a moderate hypochromic anaemia.

On the day following admission he passed a dark stool, and a small, smooth, mobile mass was felt in the right iliac fossa which disappeared and reappeared at intervals during the next two days. He passed no further stools, but complained on one occasion of abdominal pain lasting for a few minutes. On the fourth day a tumour was felt extending from the right iliac fossa to the right hypochondrium, and at operation (Miss R. M. Mackay) a mass was found consisting of the caecum, into which the appendix had completely intussuscepted. There was no obvious impairment of the blood supply, but all layers were so oedematous that reduction was impossible. The caecum was opened, and the completely inverted and very swollen appendix was seen inside; the tip was just becoming gangrenous, but the rest was only congested. The appendix was removed and the caecum closed. Following blood transfusion, recovery was uneventful.

Case 2

A girl, aged 16 months at the first admission, was born spontaneously at term and was fed on dried milk. At the age of 6 weeks she developed infantile eczema, and at 6 months the introduction of egg into her diet resulted in vomiting and urticaria, which recurred whenever eggs were given. She had no other illnesses until 14 months, and there was no family history of allergy.

At 14 months she began to have attacks of abdominal pain and vomiting, lasting for a day or two at a time, and her appetite became poor. She passed normal stools between and during the attacks. On admission to Maryfield Hospital, Dundee, at 16 months of age, she was found to be a well-nourished child with extensive eczema, involving principally the shoulders, chest, and knees. No other abnormality was found and no mass was palpable in the abdomen. The haemoglobin was 11 g.%, the leucocyte count 12,000 per c.mm., and the erythrocyte sedimentation rate was 40 mm. in the first hour (Westergren). The urine was normal. There was mucus and a little red blood in the stools, culture of which showed no pathogenic organisms. The Mantoux test was positive, but x-ray examination of the chest showed only increased broncho-vascular markings.

While in the ward she was inadvertently given an egg custard and had an immediate reaction consisting of generalized urticaria, vomiting, and abdominal pain, which promptly subsided on treatment with an antihistaminic drug.

A provisional diagnosis of gastro-intestinal allergy was made, but a barium enema examination was carried out to exclude any other condition in the bowel. There was a temporary hold-up of the barium in the ascending colon, but eventually normal filling was obtained. The possibility of an intussusception which had been reduced by the enema was considered, but as the symptoms had subsided she was allowed to go home.

She had no more trouble until two months later, when she was readmitted because of further attacks of abdominal discomfort followed by the passage of blood in the stools. Apart from extensive eczema, no abnormality was found on physical examination. A second barium enema showed good filling of the colon but defective filling of the caecum. Gastro-intestinal allergy was still thought to be the most likely cause of her symptoms, and as she was thriving she was discharged from hospital.

One month later she had three more attacks of abdominal colic with blood in the stools, and this time a horizontal thickening was palpable in the upper abdomen. At laparotomy (Mr. W. G. Campbell) a basal appendicular intussusception was found which had further intussuscepted into the colon. The intussusception was easily reduced except for the part formed by the base of the appendix, and the fundus of the caecum with the appendix was removed. Microscopical examination showed diffuse post-inflammatory fibrosis in the subserosa of the appendix, while the mucosa

and submucosa of the caecum showed diffuse and heavy infiltration with eosinophil leucocytes. Post-operative progress was satisfactory, and one year later she was very well, although the eczema was still present.

Discussion

The outstanding symptom of intussusception of the appendix is intermittent abdominal pain, often accompanied by nausea and vomiting, and the stools are usually normal (McSwain, 1941). Many symptoms have been attributed to gastro-intestinal allergy, but intermittent abdominal pain and vomiting are those most commonly mentioned. Blood in the stools is often described as a feature of gastro-intestinal allergy, especially in infants, while it is usually scanty or absent in chronic intussusception (Gaymer Jones, 1924). The difficulties of proving that gastro-intestinal symptoms are allergic have been discussed by Ingelfinger, Lowell, and Franklin (1949), who concluded that absolute confirmation is virtually impossible. They considered such a diagnosis reasonable "if gastro-intestinal symptoms invariably follow contact with a normally inactive substance, and if other causes such as psychic effects and mechanical irritation are excluded." The history of sensitivity to egg of the second patient, and the vomiting and urticaria produced by its administration, favoured the diagnosis of gastro-intestinal allergy, and it seemed reasonable, in the absence of other demonstrable cause, to ascribe the abdominal pain and blood in the stools to allergy as well. Beaven (1929) reported a somewhat similar case, his patient being a girl of 3 years who had florid eczema, and who developed urticaria if she ate eggs. The child had had peri-umbilical pain for one month before laparotomy was carried out. In this child, however, an intussusception was found involving a Meckel diverticulum.

In the present Case 1 there was less justification for attributing the symptoms to allergy, but the history of eczema, the absence of abnormal signs in the abdomen, and the duration of symptoms were misleading. The initial diagnosis was not sustained after admission and the true cause became apparent when the abdominal mass was felt.

Intussusception of the appendix was first recorded in a boy aged 7 (McKidd, 1859), and the majority of cases since reported have occurred in the first decade of life (Forshall, 1953). The condition is usually chronic, the average duration of symptoms before operation being eight months in the 77 cases reviewed by McSwain (1941). Although all cases may not arise in the same way, it is thought that the condition is usually due to peristaltic contractions of the appendix, initiated by attempts to expel a foreign body or by a local thickening of the appendix itself (Fraser, 1943).

It seems possible that in the present cases increased peristalsis resulting from allergic reactions facilitated the occurrence of intussusception, although the eosinophilia in the caecal wall in the second case cannot be adduced as evidence, because the significance of such infiltration is not clearly understood. Moreover, since neither McSwain (1941) nor Fraser (1943) mentions allergy in reviewing the literature on intussusception of the appendix, it appears unlikely to be a common cause, and the association may have been fortuitous.

Summary

Two cases of chronic intussusception of the appendix in young children are reported.

The symptoms were at first attributed to allergic reactions because of a history of infantile eczema in the first child and the presence of infantile eczema and gastro-intestinal allergy in the second.

I am grateful to Professor J. L. Henderson for permission to report these cases, and to Dr. Kenneth Rhaney for the pathological report.

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SURGERY IN OCTOGENARIANS

BY

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The problems caused by lesions in aged patients which constitute either an immediate or a delayed threat to life require careful consideration if an adequate solution of them is to be found. It is recognized that the number of these patients in this country is gradually increasing, and these matters will assume greater proportions in the years to come. A study of a personal series of 34 octogenarians who underwent surgical operation demonstrates that much can be done to help these aged patients even though they are afflicted with the worst forms of malignant disease. The patients were divided into two groups: with malignant and with non-malignant lesions. Their details are set out in Tables I and II.

There were 24 patients with malignant disease; for the majority a major operation was required, and four died. The follow-up of the survivors is shown and six patients were still alive up to twenty-nine months after the operation. Three patients died of non-malignant causes 3 years, 4½ years, and 4 years 5 months later. Of those who died of cancer four lived for a minimum period of two years.

Distribution and Management of the Lesions

In 15 patients a carcinoma of the alimentary tract was present, and in 9 it was situated in the colon or rectum. One patient suddenly developed a perforation of the pelvic colon proximal to an annular constricting carcinoma. Another suffered from complete intestinal occlusion caused by carcinoma of the pelvic colon.

For an aged patient with an obstructing carcinoma of the transverse or pelvic colon Paul's operation is a satisfactory procedure, provided any involved regional lymph nodes can be removed at the same time. When the affected loop of bowel cannot be exteriorized—for example, in the lower part of the pelvic colon, or at the recto-sigmoid junction—Hartman's operation is useful. For non-obstructing lesions of the transverse or distal colon a partial colectomy with an end-to-end anastomosis is usually radical enough rather than a more extensive left hemicolectomy. When the carcinoma affects the right half of the colon a right hemicolectomy in one stage is advisable if there is no obstruction.

In one patient a large pelvic abscess complicated a carcinoma of the pelvic colon and caused severe toxæmia. A series of staged operations were performed, including drainage of the abscess, the institution of a defunctioning transverse colostomy, partial colectomy, and closure of the colostomy later. The timing of these staged operations is important, so that the patient's general condition is at its optimum when the next stage is performed. By this means many aged patients, even when seriously ill, can be brought through safely. It is worth noting that a palliative colostomy for a carcinoma of the rectum in two patients was followed by survival periods of 2½ and 3½ years. Another patient lived 4½ years after a perineal excision of the

rectum and died of another cause at the age of 87. In some aged patients the application of coagulation diathermy to an obstructing carcinoma of the rectum is a useful method of treatment; one patient lived 2 1/12 years.

TABLE I.—Octogenarians with Malignant Lesions Treated Surgically

Age of Patient	Disease	Operation	Immediate Result	Late Result
85	Carcinoma rectum	Left inguinal colostomy	Recovered	Died 2½ years later
88	"	"	"	Died 3½ years later
83	"	Left inguinal colostomy and perineal excision of rectum	"	Died 4½ years later of another cause
90	"	Diathermy to growth	"	Died 2 1/12 years later
83	Carcinoma colon, perforated. Enlarged prostate; retention of urine	Partial colectomy; later prostatectomy	"	Died 1 year after first operation
83	Carcinoma colon, complete intestinal occlusion	Partial colectomy, Paul's operation	"	Alive 2 years later
82	Carcinoma pelvic colon	Partial colectomy, Hartman's operation	Died	—
81	Carcinoma pelvic colon with pelvic abscess	Drainage of abscess, defunctioning transverse colostomy, partial colectomy, closure of colostomy	Recovered	Alive 9 months later
86	Carcinoma transverse colon	Partial colectomy	"	Alive 1 year later
81	Carcinoma caecum	Right hemicolectomy	"	Alive 9 months later
80	" stomach	Subtotal gastrectomy	"	Died 7 months later
80	"	Gastro-jejunoscopy	"	Died 8 months later
81	Carcinoma oesophagus	Partial oesophago-gastrectomy	Died 7 weeks after operation	—
80	"	"	Recovered	Died 22 mths later
81	Sarcoma breast	Irradiation and radical mastectomy	"	Died 3 months later
82	Carcinoma breast	Irradiation and mastectomy	"	Died some months later
80	"	"	"	Died 3 years later
81	Carcinoma tongue (recurrent)	Partial glossectomy	"	Alive 7 months later
89	Carcinoma floor of mouth and mandible	Partial excision of floor of mouth and mandible. Partial block dissection of neck	"	Alive 2 5/12 years later
82	Carcinoma prostate. Diabetes mellitus	Suprapubic cystostomy	Died	—
87	Carcinoma pinna	Excision	Recovered	Died 3 years later of another cause
81	Rodent ulcer of face	"	"	Lost sight of later
82	Rodent ulcer of orbit	Exenteration of orbit	"	Died 4 5/12 years later of another cause
83	Vesical calculus and carcinoma of prostate with retention of urine	Lithotripsy and transurethral resection of prostate	Died	—

TABLE II.—Octogenarians with Non-malignant Lesions Treated Surgically

Age of Patient	Disease	Operation	Immediate Result
86	Rectal prolapse	Thiersch's operation	Recovered
83	"	"	"
80	Enlarged prostate	Prostatectomy	"
84	"	"	"
80	Crohn's disease of ileum	Enterostomy	"
80	Chronic cholecystitis	Cholecystectomy	"
85	Strangulated femoral hernia	Herniotomy	"
81	Ulcerated angioma of breast	Mastectomy	"
80	Senile tuberculosis of shoulder-joint	Sequestrectomy	"
84	Necrotic ulcer of pinna	Excision of pinna	"

The re-establishment of normal micturition in aged patients who have undergone an operation for carcinoma of the pelvic colon or rectum is often a difficult problem to solve. In males this is often caused by a benign enlargement of the prostate, and surgical treatment is necessary. When the prostate is small and fibrous a transurethral resection is satisfactory, but if the gland is large and fleshy it is probably better to enucleate it, provided the patient will stand the operation. Retention of urine in females can be very troublesome, and regular catheterization is required until normal micturition is re-established. This was necessary for several weeks in the case of the patient with the pelvic abscess complicating a carcinoma of the pelvic colon.

Two patients with a carcinoma of the oesophagus underwent a partial oesophago-gastrectomy; one died in hospital seven weeks later, the other lived for twenty-two months. The problems of each patient with a carcinoma of the oesophagus must be considered carefully, and if possible normal deglutition should be restored. When radical surgical treatment is contraindicated, the insertion of a Souttar tube or a course of high-voltage x-radiation often helps. A palliative gastrostomy is an unsatisfactory procedure.

One patient with a recurrent carcinoma of the tongue had a partial glossectomy and was well seven months later; the original lesion had been treated by a partial glossectomy and block dissection of the neck seven years previously. Another patient had a large carcinoma involving the floor of the mouth, mandible, and regional lymph nodes, and complete surgical excision gave a good result; the patient was well 29 months later. In these cases no attempt is made to reconstruct the mandible, since it is better to accept the deformity rather than submit the patient to a further operation and thus prolong his stay in hospital.

Ten patients with non-malignant lesions underwent operations, and all recovered (Table II).

Rectal prolapse is frequent in aged patients, and causes much suffering. Thiersch's operation is valuable because it is simple and usually provides complete control of the prolapse. For example, the patient who was aged 86 when operated on was at the time of writing 90 and never ceased to be grateful. In some patients the silver wire breaks after a time, but it can be easily removed and a new one inserted. Prostatic obstruction is another common condition in aged patients; each must be carefully considered and the appropriate treatment carried out. Two patients underwent prostatectomy with uneventful recovery.

General Considerations Regarding Surgery in the Aged

The health of these patients varies greatly, and it is necessary to assess their biological rather than their chronological years. Some tissues age more quickly than others, and the processes of repair may be retarded considerably in certain parts of the body. Repair is, of course, slower and less complete in old than it is in young tissues, and this fact should be remembered in this branch of surgery. Degenerative changes in vital organs are frequent and cause complications after operations; the most serious and frequent are those of the cardiovascular and renal systems. As a principle it is advisable to perform the simplest operation designed to cure the particular condition causing symptoms. In aged patients nutritional defects are common owing to an inadequate dietary intake, errors in food assimilation, derangement of water and electrolyte balance, and vitamin lack. These factors combine to interfere with wound-healing, lower the resistance of tissues to infection, and generally decrease the patient's power to withstand a major surgical operation.

It is advantageous to have a clear picture of the changes often present in many organs in aged patients, and reference is made to the work of Howell and Piggot (1951) regarding the morbid anatomy of various systems of the body. Important findings included the following: considerable atheroma was present in the aorta in 68% of patients, in the coronary arteries in 36%, and in the cerebral arteries

in 25%. Changes in the heart were patchy myocardial fibrosis in 44%, old coronary infarcts in 12%, fatty myocardial changes in 12%, and brown atrophy in 20%. Amongst the changes in the respiratory system were atrophic emphysema in 64%, hypertrophic emphysema in 28%, pulmonary oedema in 68%, bronchopneumonia in 32%, pleural effusion in 12%, and chronic bronchitis in 32%. Normal kidneys were found in only 12% of patients; the pathological changes in others included coarse scarring, granular surface, narrow cortex, thickened vessels, and excess fat.

The common post-operative complications according to their frequency and potential threat to the patient's life are the following. Bronchopneumonia is frequent and serious and often diffuse, with few demonstrable chest signs. Thus cough is slight but there is fever, and radiological changes in the chest are common. Cardiac complications are frequent and include congestive heart failure, coronary occlusion, and various arrhythmias. Pulmonary oedema is a frequent accompaniment of heart complications. Peritonitis is an important complication of various intra-abdominal lesions and operations; this is not tolerated well by aged patients. Attention is called to the frequency of infections in the urinary system which may be serious, and therefore early recognition and treatment is essential. Post-operative thrombosis and embolism often occur, and fatal embolism may be an accompaniment of impairment of the heart's action. Mental disorientation is worthy of special mention; the strength of the patient's mentality to withstand a major operation must always be assessed beforehand.

Special Points Regarding Treatment

Provided intelligent management is instituted many aged patients are brought safely through major surgical operations. Obviously emergency surgery is more risky than elective surgery, and according to Carp (1951) the former carries a mortality rate about two and a quarter times greater than for the latter. An adequate time is allotted for pre-operative treatment when elective surgery is contemplated, and nutritional defects are rectified as much as possible by routine methods. Oral feeding is preferable to other routes whenever this can be done, and a high calorie diet rich in vitamins is given. Any disturbance in the water and electrolyte balance is rectified, and when parenteral fluids are necessary they are selected carefully and administered according to the patient's exact requirements, controlled by laboratory investigations. Physiotherapy is given routinely, and the importance of the correct psychological approach is mentioned because aged patients require tactful and kindly handling in an optimistic atmosphere.

During the Operation.—Attention is given to the usual details of operative technique. Exaggerated positions on the table and rapid changes in the position of the patient are avoided. Any undue exposure of tissues is eliminated and careful haemostasis is essential. The circulatory system must not be overloaded with intravenous fluids, including blood, and the amount given of the latter is assessed by measuring the blood loss during the operation.

Anaesthesia

Premedication is minimal in amount and controlled carefully, because respiratory depression is easily induced. Therefore small doses of "omnopen," $\frac{1}{4}$ to $\frac{1}{2}$ gr. (10 to 20 mg.), or pethidine, 100 mg. or less, are given; the exact dose chosen is related to the body weight, general condition, and the results of the liver- and renal-function tests. Anaesthetic induction is smooth and adequate oxygenation is essential. It is necessary to avoid deep anaesthesia and marked fluctuations in the blood pressure. For the usual abdominal operations the following is a satisfactory method. The patient is anaesthetized with intravenous thiopentone sodium and not more than 0.5 g. is given. An endotracheal tube is passed and anaesthesia is continued with pethidine, given intravenously (dose 50 mg.); this is repeated if necessary, but not more than 25 mg. is given. For abdominal

relaxation tubarine up to 15 mg. is sufficient. A clear airway must be maintained, and bronchial aspiration may be required during and after the operation.

Post-operative Care

Routine methods are employed and emphasis is placed on certain aspects. Fluid, including blood, and electrolyte requirements are assessed and provided carefully. The manifestations of potassium deficiency, acidosis, or alkalosis are recognized early in their development and treated. Oral feeding is resumed as soon as possible. For post-operative sedation barbiturates are avoided and reliance is placed upon small doses of the morphine derivatives; chloral and bromides are also useful. Physiotherapy is given routinely, and early ambulation is required unless contraindications are present.

Summary

A series of 34 octogenarians who underwent surgical operation is reported. They are divided into two categories—those with malignant and those with non-malignant lesions—and the end-results are given. Certain principles in their treatment are stressed, and it is shown that many of them can be brought safely through major surgical operations.

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Medical Memoranda

Recovery after Overdosage with Methylpentynol

Methylpentynol is now being prescribed fairly widely as a hypnotic and as a means of allaying apprehension, but there are relatively few reports of the results of overdosage. The following case report describes recovery after ingestion of approximately 10 g. of methylpentynol in the form of a proprietary elixir ("oblivon"), and this appears to be the largest recorded overdosage followed by recovery.

CASE REPORT

A woman aged 39, weight 7 st. 8 lb. (48.3 kg.), was admitted to hospital on October 29, 1954, having taken approximately 5 oz. (150 ml.) of a proprietary elixir containing 250 mg. of methylpentynol per drachm (70 mg. per ml.). There was a history of previous mental illness, necessitating admission on a voluntary basis to a mental hospital in July, 1954, for a period of ten days. Since that time the patient had been depressed at intervals and had threatened to commit suicide.

About mid-morning on October 29 she drank 5 oz. (150 ml.) of methylpentynol elixir and was admitted to hospital at 3.30 p.m. She was then deeply asleep, but responded faintly to pressure on the supraorbital nerve. Her general condition was good: respirations 20, pulse 72, blood pressure 130/80. Her pupils were normal in size and reacted briskly to light.

On the assumption that absorption was probably complete, stomach lavage was not carried out. General supportive treatment was instituted, and methylamphetamine hydrochloride, 30 mg., was given intravenously every half-hour. At 6.30 p.m. she was less deeply asleep, and half opened her eyes when spoken to. Her general condition was good: respirations 21, pulse 72. By 8.30 p.m. she was half awake and making attempts to speak. At 10 p.m. she was able to speak and to answer questions, although still drowsy. At this point the methylamphetamine hydrochloride was discontinued.

During the next day she was somewhat drowsy, but rational and capable of answering questions. By the morning of October 31 she was fully recovered and later consented to have further mental hospital treatment as a voluntary patient.

Animal experiments conducted by Margolin *et al.* (1951) showed that the dose that killed 50% of test rodents (LD₅₀) varied from 600 to 900 mg. per kg. Recoveries in adult humans have been reported after ingestion of 6.25 g. (Bourne, 1954) and 8.75 g. (Lemere, 1952), but the single fatality on record is thought to have followed the ingestion of 4.5 to 6 g. (Cares *et al.*, 1953).

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Case of Fallot's Tetralogy with Multiple Congenital Abnormalities

The past decade has shown rapid advances in the understanding of congenital heart disease. The work of Blalock and Taussig (1945), Taussig (1948), and others has resulted in major progress in the surgical treatment of the three main conditions: pulmonary stenosis, patent ductus arteriosus, and coarctation of the aorta. An increasing number of other congenital conditions associated with morbus caeruleus are coming gradually to light. Thus, Campbell and Deuchar (1953), in a series of 200 cases of morbus caeruleus, found two cases of dextrocardia with complete situs inversus, one with isolated dextrocardia, and three with laevo-cardia plus transposition of abdominal viscera.

CASE REPORT

On February 10, 1953, an Indian boy aged 8 was brought to hospital. A typical history of a "blue baby" who had survived repeated attacks of endocarditis was elicited from his father. He had always been delicate and easily got dyspnoeic on moderate exertion. He was, however, able to attend school, where he had a good record. He could not take part in any games. He suffered frequently from attacks of cough, associated with high fever, and had some difficulty in swallowing. His appetite was poor. He had also suffered from abdominal discomfort associated with constipation. His present history was that of fever, cough, and severe dyspnoea, lasting for three days.

Clinical Findings.—He was rather thin and proportionally built, but somewhat small for his age. He walked into the examination room unaided with some effort. There were cyanosis of moderate degree and marked clubbing of fingers and toes; temperature 102° F. (38.9° C.), pulse 124, respirations 36; marked dyspnoea; multiple bilateral rhonchi in lungs. Heart: forceful, visible apex beat in fifth left interspace; a loud diffuse systolic murmur was heard along the left sternal border, maximal over the third and fourth left interspace, but audible also over a wide area on the front and back of the chest. Abdomen: soft, not tender, some fullness below umbilicus; spleen and liver not palpable. Rectal examination: hard faecal masses in ampulla.

A provisional diagnosis of pulmonary stenosis, probably a Fallot's tetralogy, complicated by infective endocarditis, was made. The father of the boy refused to have him admitted. Blood cultures could not be taken during the acute phase of the illness. Treatment and subsequent investigations had to be carried out in the out-patient department.

The acute symptoms subsided after a week of massive penicillin therapy and rest, making the following investigation possible.

X-ray films of the chest revealed a boot-shaped heart of normal size; replacement of aortic knuckle and pulmonary convexity on left upper cardiac margin by a concavity; dextroposition of aorta, being visible in two distinct cones within shadow of superior vena cava; marked passive pulmonary hyperaemia.

Blood picture: Polycythaemia, with Hb 108%; erythrocytes, 6,910,000; leucocytes, 9,400 (polymorphs 48%, lymphocytes 44%, monocytes 1%, eosinophils 7%).

Barium swallow examination was done to ascertain the relationship of the oesophagus to the great vessels (see Fig.).

Diagnosis.—These clinical, radiological, and haematological findings strongly suggested a diagnosis of Fallot's tetralogy—that is, pulmonary stenosis; dextroposition of aorta with widening, dextra-septal deviation, causing aorta to override septum; high ventricular septal defect resulting in a persistent venous-arterial shunt; right ventricular hypertrophy (Boyd, 1947). According to Mercer (1950), this dextroposition of the aorta is present in 25% of all cases of Fallot's tetralogy.

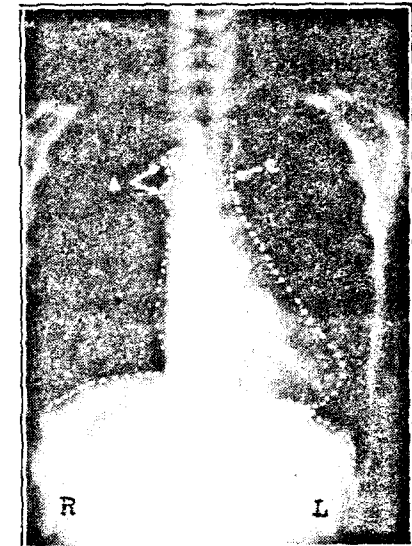
In view of the dextrocardia, a complete radiological investigation of the gastro-intestinal tract was then carried out. Barium meal examination revealed a situs partialis inversus: dextrocardia; inversion of duodenum; position of duodeno-jejunal flexure not clearly seen; terminal ileum, caecum, appendix, and colon appear again in normal position. The appendix seems to have a rather wide lumen. In the left half of the transverse colon an area of early diverticulosis was discovered, extending as far as the splenic flexure. The affected segment showed fine spastic notching on the summits of the haustral bulges, described first by Spriggs (1929) to be characteristic of early diverticulosis. Barium-filled diverticula could be seen in the same segment after partial evacuation and after complete evacuation of the barium meal. The latter, as well as a subsequent barium enema, showed a megarectum. Sigmoid and rest of colon were of normal calibre.

Lastly, congenital absence of the left twelfth rib was found as a curious skeletal abnormality.

COMMENT

The pulmonary stenosis in this case may not be very marked, as cyanosis was moderate and the degree of exercise-tolerance fair, even after several previous attacks of infective endocarditis. The abnormal findings in the gastro-intestinal tract may well explain the abdominal symptoms of this patient, bearing in mind that children with morbus caeruleus often suffer from digestive disturbances and put on weight rather slowly.

It may serve as a good example that in congenital heart disease multiple extracardiac congenital abnormalities can be expected, particularly within the thorax and abdomen.



Barium swallow examination in Fallot's tetralogy: boot-shaped cardiac silhouette with concavity (C) at left upper margin; dextroposition of aorta seen in two cones (A); upper oesophagus lying to left of great vessels, being indented markedly on right margin by aorta (B); lower oesophagus deviating to right, indicating dextrocardia.

A deliberate search for such abnormalities is advisable before operative measures, such as creation of an artificial ductus arteriosus or pulmonary valvulotomy, are considered, as it has been found (Campbell and Deuchar, 1953) that the mortality in cases with complex lesions is rather high.

I wish to thank the Director of Medical Services, Federation of Malaya, for permission to publish this case. I am also indebted to the staff of the x-ray department of the Malacca General Hospital for the radiograph, and to Dr. M. Rajathurai, of the pathology department, for the blood studies.

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Nervous Manifestations of Infectious Hepatitis

Neurological complications of infectious hepatitis are rare (Cameron, 1943). The incidence is varied—for example, 2 in 170 cases (Harries and Mitman, 1951), 3% (Lucké and Mallory, 1946), and 32 in 151 (Hardy and Feemster, 1946).

CASE 1

A girl of 6 years vomited once on January 7, 1954, but was well until the 11th, when vomiting recurred with lethargy.

She was admitted to hospital on the 12th with severe lethargy and general hypotonia. X-ray films of chest and skull were normal. The next day there was rapid deterioration. She was grey, limp, and incontinent of urine, and fluids were regurgitated through the nose. Light coma; fundi normal. She was given an intragastric drip and postural drainage with suction. In the evening there was generalized spasticity.

Laboratory Findings.—C.S.F. normal. Blood urea, 40 mg./100 ml.; blood sugar, 60 mg./100 ml.; alkali reserve, 59.5 vols. CO₂/100 vols.; W.B.C., 13,000 c.mm. (polys. 84%, lymphs. 9%, monos. 7%). Serum protein: total 7 g./100 ml. (albumin 4.4 g., globulin 2.6 g.). Serum alkaline phosphatase, 16 units; thymol turbidity, 5 units; thymol flocculation, ++. Serum did not appear jaundiced.

On January 14 there were frequent vomits of altered blood; marked dehydration; slight scleral icterus. T. 102.8° F. (39.3° C.); P. 144; R. 40. I.V. infusion started. Crystalline penicillin, ½ mega unit i.m. 6-hourly. Vitamins K and B complex. Deep coma; no paralysis; spastic limbs. Extensor plantar and absent abdominal reflexes. Second lumbar puncture still normal, but pressure 200 mm. Trace of bilirubinuria. January 15: Still intense coma; vomiting altered blood; cyanosed; noisy bubbling respiration; flaccid quadriplegia and extensor plantar response. January 16: Rational; jaundiced; liver not enlarged. January 18: Still incontinent of urine and faeces. I.V. drip discontinued. W.B.C., 23,000 per c.mm. (polys. 93%, lymphs. 4%, monos. 3%). January 23: Jaundice fading. January 29: C.N.S., normal; no icterus; liver normal size. Virus studies and leptospiral agglutination: negative. March 10: Discharged from hospital. June 8, 1954: Child physically fit, but irritable, with no sequelae. Liver function tests, including the zinc sulphate turbidity for γ -globulin (6 units), were all normal.

CASE 2

A girl of 9 years was admitted to hospital on April 5, 1953, with a week's history of vomiting, headache, and severe lethargy. Three siblings had jaundice. She was very drowsy, with slight scleral icterus; liver tender and enlarged three fingerbreadths. Temp. 96° F. (35.6° C.), later 100.4° F.

(38° C.). Dehydrated. Given adequate i.v. fluids with vitamin K i.m. Retention of urine until April 7, when she had severe lethargy and bilirubinuria. April 8: Conscious; well jaundiced, with liver enlarged. I.V. fluids discontinued.

Laboratory Findings.—Blood urea, 34 mg. per 100 ml.; W.B.C., 7,400/c.mm. (polys. 54%, lymphs. 42%, monos. 3%, basos. 1%). Alkaline phosphatase, 22.5 units; thymol turbidity, 14 units; thymol flocculation ++++. Total serum protein, 5.5 g./ml. (albumin 3.0, globulin 2.5). Some degree of liver dysfunction present.

The patient was discharged from hospital on May 29. When seen on June 8 she was symptom-free, having no nervous sequelae except slight irritability. Liver palpable one fingerbreadth. Liver function tests normal, except zinc sulphate turbidity for γ -globulin (11.6 units), the local normal range being 2.8 to 10.4 units.

PATHOLOGY AND PATHOGENESIS

Briefly, there is an acute non-specific degeneration of ganglion cells with some oedema of the brain without demyelination and, in 15% of fatal cases, a mild meningo-encephalitis (Lucké, 1944). Apart from any direct action of virus upon the central nervous system, loss of the detoxifying function of the liver may account for the nervous manifestations.

Walsh (1951, 1953) suggests that hepatic coma may be due to inability of the brain cell to combine glutamic acid with ammonia to form glutamine (Weil-Malherbe, 1950), whilst Riddell and McDermott (1954) postulate the coma in chronic liver disease as due to ammonia intoxication.

DIAGNOSIS

Nervous manifestations may take the form of encephalomyeloradiculitis, with both motor and sensory involvement (Zimmerman and Lowry, 1947). On the other hand, the signs may be encephalitic with or without motor paralysis or post-infectious sequelae. Clinically, the case may resemble uraemic or diabetic coma. Coma caused by other infections and narcotic or toxic poisoning must be considered; so must psychic states.

TREATMENT

There is no specific remedy. Davidson and his colleagues (Gabuzda *et al.*, 1952; Phillips *et al.*, 1952) note the potential danger of a high-protein diet and of ammonium-containing compounds in decompensated liver disease, but stress the therapeutic value of protein in compensated liver disease. Glutamic acid therapy in hepatic coma is not yet of proved value (Riddell and McDermott, 1954). Hypertonic glucose or double-strength plasma (i.v.) for cerebral oedema, paraldehyde for excitement, and antibiotics for secondary infection may all be helpful. Bed rest should be maintained until there is no bilirubinuria and the liver is no longer enlarged.

There are three points I would like to stress: (1) The nervous manifestations preceded the jaundice and cleared up as it became marked. (2) The course may be reversible, and recovery may occur after apparent hopelessness. (3) This infection may be the cause of some cases of idiopathic encephalitis or meningoencephalomyelitis.

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Reviews

ANY QUESTIONS?

Any Questions? A Selection of Questions and Answers published in the *British Medical Journal*. Third series. (Pp. 227 + xv. 7s. 6d.) London: British Medical Association, 1954.

The third series of *Any Questions?* is as informative and as entertaining as ever, and there seems no end to the usefulness of this feature of the *Journal*. One of the advantages or disadvantages of being a medical don is that one is so often asked at high table the sort of question the answer to which is not provided in the medicine one teaches to students, and one therefore sympathizes with the inquiries which have given rise to these books. Bizarre questions of this type in the present volume include, "Will a wig stop hair growing?" (answered by the single word, "No"), and the results of intermarriage of white and black, answered at much greater length and with the aid of a funny story. A second group of questions concerns new knowledge which has not yet reached the textbooks, as, for example, the best treatment of amoebiasis, the danger of vaccination in pregnancy, and the carpal tunnel syndrome. Then come questions which are off the normal beat of the practitioner—sanitation and hygiene, the sound-proofing of surgeries, and the prevention of scale in sterilizers. Finally, there are the marital, sexual, and psychological problems, which begin to shade into the world of Dorothy Dix. The answers are fair game for the medical sharpshooter. I should strongly disagree with the view that alcohol is not a diuretic, which is contrary to the experience of William Shakespeare (*Macbeth*, Act II, Scene III, line 27) and the experiments of Maurice B. St. auss.

This third volume is provided with a cumulative index which makes it more than ever apparent that a series of this kind gains strength by growth in size and that it will eventually become a valuable encyclopaedia of medicine.

L. J. WITTS.

BIOCHEMISTRY FOR THE CLINICIAN

Biochemical Investigations in Diagnosis and Treatment. By John D. N. Nabarro, M.D., M.R.C.P. (Pp. 299 + ix. 25s.) London: H. K. Lewis and Co., Ltd. 1954.

Dr. Nabarro has covered a wide field in these 300 pages and is to be congratulated on providing a very readable account of the subject. He has avoided all matters of technique, and has not devoted much space to the underlying biochemical mechanisms. The book, therefore, is mainly a guide to the clinician on what tests may usefully be carried out on patients with metabolic diseases and on how he should interpret the results. The author's purpose is much enhanced by the rather original index, which is in two parts: "Index of Investigations" and "Index of Conditions, Diseases, and Treatment." This will be a great help to those using the book. The actual arrangement of chapters is a compromise between the two, some being devoted mainly to diseases, and others mainly to tests or types of biochemical derangement.

The text is well written, up-to-date, and remarkably condensed. It is inevitable from its size that certain sections should appear to be rather too brief; for example, the sections on renal tubular acidosis and on hypoglycaemia could be expanded with advantage. The arrangement of references is somewhat puzzling. A few key references are found at the end of certain chapters, and in addition 91 more are given at the end of the volume, but the subject to which each of them refers is not indicated. The usual table of normal values at the end is comprehensive and valuable. This book will undoubtedly be useful to the busy clinician who wants a quick reference to possible biochemical disturbances in his patients, and equally to the laboratory worker faced with an unusual type of biochemical disturbance.

N. F. MACLAGAN.

ANAESTHESIA IN GERMANY

Die Narkose, Ein Lehr- und Handbuch. By Professor Dr. H. Killian and Professor Dr. H. Weese. (Pp. 1,003 + xxviii; illustrated. D.M. 170.) Stuttgart: Georg Thieme, 1954.

The massive, all-inclusive tome, of which this is an impressive example, is becoming increasingly rare among medical books. Few men feel able to write with authority on more than one or two facets of their work. Most are specialists even within their specialties. When teaching they must be careful not to assume either that the other man's field is easier than their own, and thus treat it superficially, or that it is specially difficult and so ignore it altogether or labour too painfully to expound it. Both these mistakes are made in this book. The title suggests that the clinical administration of anaesthesia would form the book's backbone. The authors, however, are not anaesthetists themselves, and though some (but only some) of the appropriate sections have been rightly delegated to their anaesthetic colleagues Drs. Irmer and Koss, the general balance of subject-matter does not seem correct. The sections dealing with the administration of anaesthesia are too short and the rest are too long. In a textbook of anaesthetics detailed accounts of pharmacology, pathology, physiology, and so forth are acceptable in their proper proportions and when relevant to the main subject-matter. The impression given here is that they are almost ends in themselves.

It is doubtful whether this book will help in a practical way the young anaesthetists in training in Germany. They need something more akin to our own *Essentials of General Anaesthesia* by Macintosh and Bannister. They might conceivably get the impression that a detailed theoretical knowledge of such related sciences as pharmacology, physiology, pathology, and haematology would compensate for their inability to pass a tracheal tube or to distinguish between respiratory obstruction and overdose, or for their lack of long experience in the operating theatre. Teachers and experienced anaesthetists in general, however, will regard the book differently: they will appreciate the enormous field from which the material has been collected and admire the herculean labours of compiling it. They will, if their knowledge of German is good, find this massive book valuable as a means of reference to practically everything connected with anaesthesia, even if sometimes only distantly related.

The publishers have done an expert job, and the volume is a pleasure to handle and to look at. Lavish reference lists are given at the end of each subject and an adequate index is included. A sad note is struck by an obituary notice of Professor H. Weese, one of the co-authors, who did not live to see the book in print.

W. W. MUSHIN.

THE FIRST ELIZABETH'S HEALTH

Elizabeth Tudor: The Lonely Queen. By Sir Arthur Salusbury MacNalty, K.C.B., M.A., M.D. (Oxon), F.R.C.P., F.R.C.S. (Pp. 272. 18s.) London: Christopher Johnson, 1954.

Much has been written about the fatal illnesses of monarchs, but their general health has not so often been the subject of comment. Sir Arthur MacNalty, who has made a special study of the Tudor period and two years ago published an interesting study of "Henry the Eighth, a Difficult Patient," has now turned his attention to Henry's talented daughter, Queen Elizabeth the First, and has written an account of this remarkable woman with special reference to her ailments and illnesses. The book is meant for the general reader, who will here find in small compass a readable account of this exciting period of English history. Medical readers will turn with special interest to Chapter XV, where is discussed "The Queen's Medical Case-book."

Queen Elizabeth was for the most part a strong woman, both physically and mentally, and we find it difficult to accept the view that she was hysterical. She successfully overcame such serious diseases as smallpox and nephritis, and continued hunting and dancing up to the last year, the seventieth, of her life. She appreciated the advice of her

physicians, but did not always follow it, for when on one occasion she was ill of what was thought to be food-poisoning she held another opinion of her illness: she thought it was due to the "fact that for three or four years she had found herself so well that she had disregarded all the strict discipline which her physicians formerly had been accustomed to impose upon her by purging her and drawing a lot of her blood from time to time."

In two appendices we are given a list of Elizabeth's suitors and a brief account of her physicians. We wish that space had permitted a fuller account of the latter.

This book is a definite contribution on new lines towards the understanding of a great, complex, and interesting personality, and we believe it will deservedly attract widespread attention.

ZACHARY COPE.

OPERATIVE SURGERY

Textbook of Operative Surgery. By Eric L. Farquharson, M.D., F.R.C.S. Ed., F.R.C.S. Eng. (Pp. 853+viii; illustrated. 75s.) Edinburgh and London: E. and S. Livingstone Ltd. 1954.

Books on operative surgery range from the concise one-volume textbook designed to cover the standard operations for the benefit of a student working for examinations to the large encyclopaedia in several volumes. The first seldom gives enough detail to help the practising surgeon; the second is usually a syndicated work and reflects its multiple authorship in a certain unevenness of standard.

Mr. Farquharson's book is in some ways unusual. First, though in a single volume, it is a large work containing 850 pages; secondly, the whole of it is written by himself, so that it has a uniformity of style and of outlook that makes it easy to read; and, thirdly, it is written with a particular aim and adheres to it throughout. That aim is to afford practical advice to the young general surgeon working for the first time on his own responsibility and unable to call on more expert help.

In pursuing his intention Mr. Farquharson precedes each section with a brief review of the anatomy of the part and of the principles on which operation is based, adding in some sections an account of the use of special instruments such as the cystoscope and the sigmoidoscope. He describes the important and commonly performed operations in considerable detail, with excellent and helpful illustrations, the majority of which are by Miss McLarty. The rarer procedures, or those whose value is more in doubt, he discusses less fully, but in most cases gives references indicating where detailed information can be obtained.

For the purpose for which it is intended this is a really good book, one that should find a permanent place in any surgical library. A London surgeon, even though he be a Scotsman, cannot be expected to agree with all the views of one trained in Edinburgh, but the criticisms that can be offered are of detail only, with one exception. The example of parenteral fluid administration given on page 566—9 litres in 24 hours—is dangerous and should be amended in the next edition.

Messrs. Livingstone have done their job as publishers with their usual craftsmanship.

HENEAGE OGILVIE.

ORTHOPAEDICS OF CHILDHOOD

Kinderorthopädie. By Rupprecht Bernbeck. Introduction by Professor Dr. Med. Georg Hohmann. (Pp. 234; 174 illustrations. D.M. 39.) Stuttgart: Georg Thieme. 1954.

It is inevitable that any volume embracing all the orthopaedics of childhood will be a little uneven. This volume presents the author's personal experience from the German viewpoint. After a general introduction, which is much the best portion of the book, there follow a series of special sections, the largest being devoted to clubfoot and congenital dislocation of the hip. This includes a clear description of the pathological varieties of clubfoot. The treatment is not so clearly described; for example, whereas

Kite's plasters are mentioned, there is no reference to the use of Denis Browne's splints. In contrast to these full discussions, the section on slipped femoral epiphysis is short and incomplete, and other sections, on torticollis, osteomyelitis, and the dyschondroplasias, are merely résumés.

The book is well illustrated with radiographs in series, and is worth perusal for these alone. The volume as a whole will appeal to the children's physician, and the fuller sections to the specialist. The book unfortunately evidences the isolation of German medical thought during the past 15 years, from which in other fields, such as virology, it is slowly escaping. In the literature quoted there are surprisingly few references to English and American authors (2 out of 52), and French and Italian authors are given equally scant treatment.

J. G. BONNIN.

THE VITAMINS

The Vitamins: Chemistry, Physiology, Pathology. Volumes I and II. Edited by W. H. Sebrell, jun., and Robert S. Harris. (Volume I: pp. 676+xiii; Volume II: pp. 766+xiii; illustrated. \$16.50 each vol.) New York: Academic Press Inc. 1954.

This is an encyclopaedic work on vitamins which is to appear in three volumes, the first two having already been published in the second half of 1954. The treatment is essentially biochemical, although, as the subtitle indicates, chemical, physiological, and pathological aspects are also included. It is not, and is not intended to be, a guide for the general practitioner, or even for the clinical specialist. The manifestations of vitamin deficiency and their therapy are not dealt with in any detail, since, as the authors themselves say, such information is available in other publications. For the same reason methods of vitamin assay are referred to but briefly. The approach is not historical, but rather that of a detailed systematization of existing knowledge in those fields of vitaminology that border on biochemistry. As such it is an invaluable reference work for the laboratory investigator; and the bibliography, which is unusually extensive (although sometimes too exclusively American), will prove extremely helpful.

It is not too much to say that "Sebrell and Harris" immediately becomes an indispensable work of reference for all serious research workers concerned with vitamin science.

LESLIE J. HARRIS.

CLINICAL NEUROLOGY

The Basis of Clinical Neurology. By Samuel Brock, M.D. Third edition. (Pp. 510+xii; illustrated. 54s.) London: Baillière, Tindall and Cox, Ltd. 1953.

In this detailed account of the anatomy and physiology of the nervous system Dr. Brock has been at pains to exclude material not of direct value to the clinical worker. All the same it has taken over five hundred pages, not all lightened by his excellent line diagrams, to say what seems essential. Syndromes are described, but not disease; anatomical dysfunction, and not pathology; so that the student of anatomy will find as much of interest as will the clinical worker. The way function is married to structure makes clinical syndromes easy to understand. For instance, the spinal cord is considered in seven short chapters in which, its anatomy and blood supply having been dealt with, its structure is related to movement, to sensation, and to visceral function; and then it is considered as a conducting and a segmental organ.

Some of the most interesting sections to the reviewer are in small type—which shows the author's discretion—and the arrangement of material enables the student to select with ease. He should not, however, miss the last clinical chapter, on posture, for this is a delightful essay in which the systematic integration of dull facts brings them to life. The closing chapters on the cerebrospinal fluid, radiology, and electromyography are unnecessary in a text of this sort, and do not maintain the standard of the earlier dynamic clinical sections.

DENIS WILLIAMS.

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TREATMENT OF PULMONARY TUBERCULOSIS

The introduction of effective antibacterial drugs has revolutionized the treatment of pulmonary tuberculosis. Whereas in the past the physician treating this disease has had to rely upon the natural resistance of the patient aided by bed rest and by the indirect effect of collapse therapy, he now has available methods of direct attack upon the tubercle bacillus; and the surgeon, previously restrained in the application of some of his more radical methods by the fear of complications, has now much greater freedom of action. These striking changes in the practical management of pulmonary tuberculosis have tended to distract attention from important epidemiological changes which have been occurring more gradually but which may be of greater ultimate importance. As Dr. J. L. Livingstone points out in his Mitchell Lecture, published in the opening pages of this *Journal*, preventive medicine does more to eradicate tuberculosis than the efforts of the clinician in dealing with the sick. This, like most generalizations, needs qualification. It is true without reservation in relation to underdeveloped communities where the pool of infectious cases is too great to be much diminished by the provision of treatment on any practicable scale. But in communities in which good progress has already been made in the control of the disease it seems clear that rigorous clinical measures can make a significant and perhaps decisive contribution towards the removal of the last remaining sources of infection. Dr. Livingstone's main purpose in his lecture was to give an account of his own experience in the management of pulmonary tuberculosis, with special reference to collapse therapy. The measures which he uses include artificial pneumothorax, phrenic paralysis with pneumoperitoneum, and extrafascial apicolysis with "lucite" plombage of the type described by Cleland.¹

Dr. H. C. Trimble's paper, also published in this issue (p. 250), provides an interesting companion to Dr. Livingstone's. Its approach is entirely different. It describes the analysis of the answers given by one hundred physicians in 1953 to a number of questions about the treatment they would use for ten representative cases of pulmonary tuberculosis which were presented to them in the form of brief case histories

and radiographs. The answers are compared with the answers given to the same questions about the same patients in 1948. It is perhaps a valid criticism that the method of presentation of the cases to the physicians was of necessity artificial. It is to be hoped that no physician would seriously give advice about the treatment of a patient on the basis simply of a case history and inspection of a radiograph. Nevertheless Dr. Trimble's analysis gives some indication of change in opinion. It also shows very wide variation in present-day practice. Similar differences of opinion would probably be found in the answers to corresponding questionnaires relating to the treatment of a number of other illnesses, especially those where both medical and surgical methods are in use—for instance, peptic ulcer. The most important trend among the American physicians was the greatly increased use of antibacterial treatment. In the far advanced cases every physician would use such treatment, and even in minimal infections only very few would use bed rest without antibacterial treatment. As compared with 1948, artificial pneumothorax showed a remarkable diminution in popularity, while pneumoperitoneum showed a corresponding increase. Dr. Trimble does not state how often the physicians whom he questioned would combine phrenic nerve paralysis with pneumoperitoneum. Dr. Livingstone states that he regards pneumoperitoneum as an adjunct to phrenic paralysis, and that he has never used pneumoperitoneum without phrenic paralysis. This seems to be the logical consequence of the view that collapse therapy must be selective if it is to be effective.

Among the American physicians there has been an increase in the proportion of patients for whom surgical treatment would be advised; and resection has become far more popular than thoracoplasty. Some of the recommendations for resection are surprising; for instance, a few physicians stated that they would advise resection in a case of bilateral acute pulmonary tuberculosis rather more extensive on the left side. Dr. Livingstone makes a useful distinction between resection performed as direct therapy, removing diseased and usually functionless portions of lung which have caused symptoms, and resection performed prophylactically, in which damaged lung not known to have caused symptoms is removed on the ground that it is a potential source of danger at a later date. He adds that in some countries resection after a long course of antibacterial therapy has become the accepted form of treatment. The justification for "prophylactic" resection depends upon the view that residual encapsulated caseous foci

¹ *Thorax*, 1950, 5, 248.

² American Trudeau Society, *Amer. Rev. Tuberc.*, 1953, 68, 477.

³ Goodwin, R. A., *Ann. Intern. Med.*, 1954, 41, 328.

⁴ Foster-Carter, A. F., *et al.*, *Brompton Hosp. Rep.*, 1952, 21, 1.

are dangerous; but no agreed opinion about how dangerous they are has yet been reached.²

One of the most remarkable changes which has occurred since the advent of antibacterial treatment has been the great diminution in the popularity of artificial pneumothorax. Some physicians have ceased to use this form of collapse therapy.³ Dr. Livingstone believes that there are still some indications for artificial pneumothorax, and points out that the figures derived from the Frimley follow-up of 1,153 cases, each for a minimum period of eight years, show that even before antibacterial drugs were available a pneumothorax which resulted in closure of the cavity improved the prognosis.⁴ The real drawback of artificial pneumothorax treatment was the high incidence of pleural complications. There is, however, reason to believe that the combination of antibacterial drugs with artificial pneumothorax will result in a lower incidence of such complications. No comparably extensive series of cases treated with artificial pneumothorax since the advent of antibacterial drugs has yet been studied. It is to be hoped that Dr. Livingstone and others who continue to use artificial pneumothorax in selected cases will publish their results in due course. It is difficult to believe that a method of treatment which was so widely and successfully used for so long by so many physicians can really have no useful part to play in the future.

In pulmonary tuberculosis to-day the multiplicity of possible therapeutic measures in several fundamentally different categories tends to cause confusion, and the formal assessment of all possible combinations of them is not feasible. But the disease presents such a variety of anatomical and immunological features that it would be surprising if procedures which have proved successful in the past were not found still to be useful in selected cases in combination with antibacterial treatment. In the more usual types of case the physician may hope eventually to have precise data indicating the superiority of one of the possible lines of treatment: in those not falling into a category which has been statistically investigated he will continue to have the responsibility of exercising judgment based upon experience.

HEPATIC FIBROSIS

The idea that nutritional deficiency is of great importance in the causation of liver disease springs mainly from the results of animal/experiments performed in the past 15 years.^{1,2} These experimental results seemed at first to show why human liver disease is more prevalent in Africa, Asia, and other countries where the standard of nutrition is well below that of

Western Europe and the U.S.A. The fatty liver of kwashiorkor in Uganda³ and of the "fatty liver disease in infants in the British West Indies"⁴ were strikingly similar to the fatty livers so readily produced in rats by dietary means and which so consistently caused cirrhosis if maintained for long enough. The failure, however, of methionine or choline to mobilize the fat from the livers of affected children, and the difference in the distribution of the lesions in the human liver from that in the experimental animal, suggested from the first that the direct application of the experimental results to man was altogether too simple. The recent observations of J. H. Walters and J. C. Waterlow⁵ on the incidence of hepatic disease in West African children give prominence again to these difficulties, but also help to dispel them.

The clinical material which formed the basis of this study in the Gambia consisted of four groups of children and adolescents up to 20 years of age—a control group of 15, a group of 17 patients with symptomless hepatomegaly, a group of 26 malnourished infants, and a group of 21 children with hepatomegaly associated with oedema and ascites. All cases were studied as hospital in-patients, and the investigations included one or more needle biopsies of the liver in every case. The fibrosis in these biopsy specimens was classified, in increasing order of severity, as normal, periportal quiescent, periportal active, and diffuse. The incidence and severity of the fibrosis in the children with symptomless hepatomegaly were about the same as in the control groups—namely, 50%—and almost entirely of the periportal quiescent type. Walters and Waterlow concluded from this that the hepatomegaly in these children could not be regarded as a precirrhotic state. In the group of malnourished infants, however, periportal fibrosis of an active type associated with cellular infiltration was the characteristic lesion, and present in most cases. In the patients with hepatomegaly and ascites or oedema the severest forms of fibrosis were most frequently found.

Having obtained a rough indication of the type and incidence of hepatic fibrosis in the community, the authors, in an attempt to throw light on the aetiology, directed their attention to the two outstanding environmental factors—namely, nutrition and parasitic infestation. What they reveal is both grim and startling. Owing to the inadequacy of the local

¹ György, P., and Goldblatt, H., *J. exp. Med.*, 1939, 70, 185.
² Himsworth, H. P., and Glynn, L. E., *Clin. Sci.*, 1944, 5, 93.
³ Trowell, H. C., and Muwazi, E. M. K., *Arch. Dis. Childh.*, 1945, 20, 110.
⁴ Waterlow, J. C., *Spec. Rep. Ser. med. Res. Coun. (Lond.)*, 1948, No. 263, H.M.S.O.
⁵ Walters, J. H., and Waterlow, J. C., *ibid.*, 1954, No. 285, H.M.S.O.
⁶ McGregor, I. A., and Smith, D. A., *Trans. roy. Soc. Trop. Med. Hyg.*, 1952, 46, 403.
⁷ Gillman, J., *et al.*, *S. Afr. J. med. Sci.*, 1949, 14, 21.
⁸ — and Gillman, T., *Perspectives in Human Malnutrition*, 1951, New York.

agriculture, food is never plentiful, and the daily food consumption per head of the population varies from 1,980 calories shortly after the rice harvest to 1,570 shortly before. Protein consumption, which does not exceed 50 g. per day at the best time of the year, is almost entirely of vegetable origin; cows' milk is scarcely consumed at all and fishing is despised. It is not surprising that evidence of severe malnutrition is present at all ages and especially between 6 months and 2 years, when the infant is gradually weaned from the breast and, not yet partaking of the communal food, receives supplementary feeds of sweetened vegetable paps. In addition to this "marginal state of nutrition interrupted by an annually recurring period of privation" the population is subject to an extraordinarily intense parasite infestation, malaria being outstanding. In the survey carried out by I. A. McGregor and D. A. Smith⁶ parasitaemia was found to rise from 62% in the first year of life to a peak of 97% from the third to the fifth years and then to fall steadily to about 20% in adult life. Microfilaria, trypanosomiasis, and schistosomiasis are all common, and "helminthic infestations approach malaria in frequency." Infective hepatitis is rare in the Gambia and only four cases were found in three years.

Walters and Waterlow have attempted to identify the various causes of the high incidence of fibrosis, and it is hardly surprising that they cannot incriminate one in preference to another. From their histological and chemical analyses they are apparently justified in excluding prolonged and severe fatty infiltration as a major factor. On the other hand, the consensus of informed opinion is against regarding malaria as a cause of diffuse fibrosis of the kind and severity commonly found in this investigation. The authors therefore feel compelled to fall back on a hypothesis first postulated by the Gillmans in a somewhat different context. From their work on the induction of cirrhosis by repeated injections of Trypan blue,⁷ J. Gillman and T. Gillman⁸ suggested that two factors are required, one which causes a proliferation of reticulum cells and another which stimulates these cells to form reticulin and collagen fibres. They regard a depressed level of oxidation as this necessary second stimulus. The sequence of events in the Gambian children is then viewed as follows. Severe and recurrent malarial infestation causes the reticulum-cell response of the hepatic mesenchyme. The further progression to active diffuse fibrosis then follows as the result of the depressed level of oxidation due to the impairment of parenchymal-cell function consequent upon the state of malnutrition. In other words, as a result of chronic malaria the reactivity of the hepatic connective tissue to mild damage of hepatic parenchymal

cells is greatly enhanced: a degree of parenchymal damage which is usually without effect on the connective tissue now calls forth a progressive fibrogenetic response.

That diffuse hepatic fibrosis can occur in the malnourished in the absence of severe fatty infiltration must not be adduced as evidence that fatty infiltration does not or cannot induce fibrosis in man. The evidence collected by Waterlow¹ himself in the West Indies shows that it almost certainly can. The importance of this work in the Gambia is that it emphasizes that even lesser degrees of malnutrition, themselves incapable of producing chronic liver damage, can do so in subjects whose mesenchymal reactivity has in some way been enhanced. Is it perhaps possible that the frequency of keloidal scarring in certain communities is an indication of this mesenchymal hyperactivity and should be taken as a warning of their special nutritional vulnerability?

THE HAEMOPHILIAS

Until recently haemophilia seemed to be a well-defined disease. In the eighteenth century Consbruch reported that he had been called to see a boy who had cut his thumb and bled to death within two days. A brother of this boy and several brothers of his mother's had died similarly. The sex-linked inheritance of this liability to bleed to death was thus recognized early. The bleeding tendency has been found to be due to a coagulation defect, the absence of an antihæmophilic globulin necessary for the first stage of coagulation. Normal plasma, which contains this antihæmophilic globulin, restores coagulation when either added *in vitro* or transfused *in vivo*.

The coagulation of the blood has been conveniently divided into three stages, for the first of which the antihæmophilic globulin is necessary: (1) platelets are ruptured and active thromboplastin is formed; (2) active thromboplastin produces conversion of prothrombin into thrombin; (3) thrombin causes the soluble fibrinogen to form elongated crystal-like protein fibrils, which combine into fibres by lateral association. Calcium has long been known to be necessary for the formation of thrombin, and thus there were, besides the antihæmophilic globulin, factors I-IV: fibrinogen, prothrombin, thromboplastin, and calcium. In due course patients were found whose plasma contained all these four factors but who still lacked other agents necessary for coagulation and present in normal plasma. Addition of hæmophilic blood could restore coagulation; thus the missing component could not be the antihæmophilic globulin.

¹ *British Medical Journal*, 1952, 2, 1378.
² *Proc. Soc. exp. Biol. (N.Y.)*, 1952, 79, 692.
³ Aggeler, P. M., *et al.*, *Science*, 1954, 119, 806.
⁴ Cramer, R., *et al.*, *Acta hæmat. (Basel)*, 1953, 10, 65.
⁵ Brinkhous, K. M., and Graham, J. B., *Blood*, 1954, 9, 254.
⁶ *Ibid.*, 1954, 9, 246.
⁷ Rosenthal, R. L., *et al.*, *Proc. Soc. exp. Biol. (N.Y.)*, 1953, 82, 171.
⁸ *J. Lab. clin. Med.*, 1954, 43, 860.
⁹ *Amer. J. Med.*, 1954, 17, 57.
¹⁰ *Blood*, 1954, 9, 258.

By comparing these patients' plasma with one another it became clear that there were at least two deficiencies, that of factor V (or V-VI), a labile protein which disappears on storage—hence the synonym labile factor—and of factor VII. Both are hereditary deficiencies, though they are not transmitted by the X chromosome. They are seen rarely, but the clinical importance of factor VII is that its activity is the first to be suppressed during treatment with dicoumarol and ethyl biscoumatate ("tromexan"). In the laboratory test, deficiency of factors V or VII differs from the classical haemophilia by causing a prolonged prothrombin time. The prothrombin time is also prolonged in hypoprothrombinaemia, usually due to liver disease or vitamin-K deficiency, more rarely congenital. However, when factor V or factor VII is deficient, addition of normal plasma from which prothrombin has been removed can restore the prothrombin time to normal; it will not do so if the plasma under investigation lacks prothrombin.

Among the various terms that have been attached to factor-V and factor-VII deficiency are parahaemophilia A and B, while the term haemophilia itself was reserved for the classical bleeding disorder transmitted with the X chromosome and reversed by transfusion of the anti-haemophilic globulin present in normal plasma but not in normal serum. New difficulties in nomenclature arose when it was found that there were differences among the supposedly true haemophilia patients themselves. Plasma from some haemophiles could counteract the clotting defect in others, and this effect was mutual. Thus, although the disease was clinically the same and was inherited with the X chromosome in these groups of patients, it must have been caused by different factors absent in one and present in the other. Whereas the classic antihaemophilic factor was a globulin contained in the fibrinogen fraction of the plasma, the second principle was found both in plasma and in serum. It was described in Britain by Biggs and others,¹ who named it Christmas factor, after the first patient in whom they diagnosed the new condition, and in the U.S.A. by Aggeler and his colleagues,² who called it plasma thromboplastin component (P.T.C.). The distinction between classical haemophilia and the new coagulation defect is of practical importance. While both will respond equally to treatment with normal plasma, the second will not be reversed by the therapeutic administration of purified antihaemophilic globulin. Even if normal plasma is transfused an important difference is observed. The classical antihaemophilic globulin disappears within a few days after a transfusion of 500 ml. of normal plasma, but the stability of the beta-globulin, which corrects the new condition, is such that a favourable influence on blood clotting can be observed as long as three weeks after the transfusion.³

P.T.C. deficiency and Christmas disease are almost certainly identical disorders, but few authors have as yet stated this with certainty.⁴ Some American workers have suggested that the classical haemophilia should be called haemophilia I (or A) and P.T.C. deficiency haemophilia II (or B). Others,⁵ who have named factor-V and factor-VII deficiencies haemophilioid states A and

B, want to retain for the classical condition the term haemophilia and to call the newly discovered P.T.C. deficiency haemophilioid state C. Aggeler and his group⁶ have now proposed the terms haemophilia and deuterohaemophilia, the missing coagulation factors to be called, instead of antihaemophilic globulin and P.T.C., plasma thromboplastin factors A and B (P.T.F.-A and P.T.F.-B). A third plasma thromboplastin factor has been described and was named plasma thromboplastin antecedent (P.T.A.).⁷ The new deficiency seems to be distinct from both classical haemophilia and Christmas disease. Its mode of inheritance has not yet been established, but it may not be a sex-linked disorder.

Some might argue that the term haemophilia should comprise all those disorders of coagulation in which there is a defective thromboplastin formation with a normal prothrombin time (to insist on sex linkage might exclude P.T.A. deficiency). It may after all only be a chance that the antihaemophilic globulin was discovered before the beta-globulin, which the American authors have named first P.T.C. and now P.T.F.-B, and which is almost certainly identical with the Christmas factor. Frick⁸ restudied fifty-five patients previously simply diagnosed as haemophiles and found that six were in fact cases of P.T.C. and four of P.T.A. deficiency. A similar distribution of the three deficiency states has been found in a survey of twenty-seven families carried out by Rosenthal.⁹ On the other hand, Macfarlane¹⁰ is of the opinion that variants of the term haemophilia are confusing and difficult to remember, that it would be best to avoid them, and when no established name like haemophilia is available to refer to deficiencies in terms of the missing factor—"As to the nomenclature of these factors some agreement will have to be reached, and soon, if inextricable confusion is to be avoided."

ADOPTION

Those whose responsibility it is to ensure that the adopted child is given the rights and security of a child in a normal family will find their work greatly assisted by many of the recommendations of the Hurst Committee on adoption.¹ The welfare of the child rather than the satisfaction of the adopters has been the aim of the committee, which has wisely refrained from making sweeping changes which, if interpreted into law, might set up a rigid code that would defeat its own end and increase the number of *de facto* adoptions. The committee recommends that the period of notice of placing should be increased from seven to fourteen days and also that the first six weeks of life should not be counted as part of the statutory probationary period. This, together with certain changes of procedure, would make it impossible for an adoption order to be granted before a child is 5 months old. Not everyone has agreed with the committee's insistence that a child should never be able to remember a time when he did not know the truth about his adoption, though psychological disturbance is not an unusual result of sudden or perhaps even harsh revelation to an adolescent that he or she is an adopted

child. The Standing Conference of Societies Registered for Adoption has just issued a useful leaflet for the guidance of adoptive parents entitled, "What Shall We Tell Our Adopted Child?", but if the advice given there is followed—namely, to let the child know "from the beginning" that he has been adopted—there still remains doubt, as Dr. W. J. Pinoff² has remarked, about a young child's capacity to understand the implications of the statement (however wrapped up it may be), "I am not your real mother." Dr. F. Charlotte Naish,³ who is well qualified to speak with authority on the subject, suggests that it would be as well to keep an open mind on this difficult question, while encouraging further research into the best method of telling children that they are adopted.

There is an interesting shift of emphasis in the committee's report from the health of the child to that of the adopters. The adoption of handicapped children need not be discouraged, but, on the other hand, a child should not be adopted by applicants whose good health and expectation of life are in doubt. The suggested compulsory medical examination of the prospective adopters by a doctor appointed by the court is an entirely new departure—which has the approval of the British Medical Association—but its value will be lessened if x-ray examination of the lungs is not made obligatory. The committee's desire to ensure that an adoption order is not refused for a handicapped child if the applicants have been informed and understand the implications is commendable. But unfortunately no machinery has been envisaged for simple explanation by the court doctor to the prospective adopters of any salient medical data relating to the child, and it may well be asked how the committee's view that "it is for the applicants to decide when they know the facts" is to be realized unless such facts are explained to them by a doctor.

The most controversial aspect of the report concerns third-party adoption. There has been a general dislike of this method, and the doctor acting as third party has not escaped criticism, in that his interests are often centred more on the psychological needs of the applicants or the welfare of the child's mother than on the best interests of the child himself. This has been given peculiar prominence by a quotation in the report from an unfortunately worded doctor's letter, which, although stated not to be typical of the attitude of the profession generally, has been widely publicized in the press. As the British Medical Association pointed out in the evidence submitted to the committee, the good results achieved in many cases by means of third-party adoption, as well as the impracticability of entirely abolishing direct or third-party placings, call for a realistic approach, and for the provision of safeguards to protect the child in all circumstances. The Hurst Committee's report has been framed on the basic assumption that the welfare of the child must come first. It is to be hoped that this spirit will be retained if the recommendations are embodied in formal legislation.

¹ Report of the Departmental Committee on the Adoption of Children, Cmd. 9248, 1954. H.M.S.O., London. Price 3s. net.
² *Lancet*, 1954, 2, 1285.
³ *Ibid.*, 1954, 2, 1229.

MUSCLE SPASM AND RHEUMATISM

It has sometimes been said that, since muscle spasm is partly responsible for the pain of many rheumatic conditions, antispasmodics should be administered. Physostigmine,^{1,2} curare,³ and, more recently, mephenesin,^{4,5} have all been suggested as suitable, but opinion remains divided on their value, if any, and it is perhaps worth while considering whether there is any sound theoretical basis for their use in rheumatism. It is a well-established clinical observation that in painful conditions of the spine or limb girdles there are local areas of muscle tenderness, often referred to as trigger areas, fibrositic nodules, or myalgic spots. The nature of these is sometimes a matter of diverting speculation, and the fact that local procaine injections are often followed by prolonged or even permanent relief has led to the development of the superficially attractive hypothesis that these are localized areas of muscle spasm which are of themselves responsible for the pain by setting up a vicious circle via a reflex path through the anterior horn cells. This view received some experimental support when Elliott and Kremer^{7,8} inserted needle electrodes into the muscles of patients with proved disk lesions and found evidence of spontaneous motor activity restricted to these points. While there was nothing particularly new in the recognition that muscle contraction is associated with referred pain, the emphasis had hitherto been largely on the hyperaesthesia and muscle spasm accompanying visceral lesions. This was the so-called visceromotor reflex studied by Mackenzie so long ago as 1892.⁹ Later Lewis and Kellgren^{10,11} in animals and Kellgren¹² in human volunteers observed the presence of muscle spasm and tenderness in response to painful lesions in deep somatic structures, and they concluded that this mechanism probably did not differ fundamentally from that of visceral pain mechanisms. To ascribe to muscle spasm an important part in the production of painful conditions, or at least in their perpetuation, is not, however, quite the same thing. Thus Wolff¹³ believed that some forms of headache were due to such a phenomenon, and Schlesinger and Stinchfield¹⁴ suggested that in some cases of acute lumbar disk lesion a vicious circle of pain and muscle spasm might produce a state of affairs which was something more than simple protective splinting. It has been only too easy to suggest that psychological tension leads to muscle tension, giving rise to so-called psychogenic pain. Reviewing these ideas recently Taverner¹⁵ has pointed out that, while an irritative lesion of a nerve root will give rise to spontaneous muscle activity, this is not necessarily associated with pain, and may be observed by the electromyograph in

¹ Cohen, A., Trommer, P., and Goldman, J., *J. Amer. med. Ass.*, 1946, 130, 265.

² Wramner, T., *Acta med. scand.*, 1946, 126, 241.

³ Schlesinger, E. B., and Regan, C., *Amer. J. Med.*, 1946, 1, 621.

⁴ Hermann, I. F., and Smith, R. T., *Lancet*, 1951, 71, 271.

⁵ Berger, F. M., and Schwartz, R. P., *J. Amer. med. Ass.*, 1948, 137, 772.

⁶ Schlesinger, E. B., et al., *Trans. Amer. neurol. Ass.*, 1948, 73, 94.

⁷ *Lancet*, 1944, 1, 47.

⁸ *Ibid.*, 1945, 1, 4.

⁹ *Med. Chron.*, 1892, 18, 293.

¹⁰ *Clin. Sci.*, 1939, 4, 47.

¹¹ *Ibid.*, 1939, 4, 35.

¹² *Ibid.*, 1938, 3, 175.

¹³ *Harvey Lect.*, 1943-4, 39, 39.

¹⁴ *J. Bone Jt. Surg.*, 1951, 33A, 480.

¹⁵ *Ann. rheum. Dis.*, 1954, 13, 331.

¹⁶ *Acta chir. scand.*, 1951, 160.

pain-free muscles. By contrast, in the patient with acute lumbago at rest the muscles may be completely silent. The observations of Frykholm¹ on brachial neuralgia due to nerve root compression in the cervical region are of the greatest interest and throw some new light on this problem. He was able to demonstrate at operation in this type of case that stimulation of the ventral root gives rise to deep pain associated with muscle tenderness of the so-called myalgic type, while stimulation of the dorsal root gives rise to a more peripheral pain associated with paraesthesiae—that is to say, pain of a neuritic character. Perhaps muscle spasm therefore, at least in rheumatic conditions, is no more than a result of referred pain or of ventral root irritation.

OSTEOPOROSIS AND CORTISONE

Osteoporosis—a condition caused by loss of the proteinous matrix of bone—is a common finding in Cushing's syndrome, and F. Albright¹ has produced evidence that this is due to an excess of certain adrenocortical hormones, such as hydrocortisone, which have an anti-anabolic action whereby they prevent the building up of proteins from amino-acids. In sufficient dosage over a prolonged period of time cortisone or corticotrophin induces many of the changes found in Cushing's syndrome, and workers at the Mayo Clinic² have shown that in some patients a dose of cortisone exceeding 100 mg. daily causes a negative nitrogen and calcium balance. In patients with rheumatoid arthritis this undesirable side-effect of cortisone is often counteracted by an increase of appetite, which leads to enhanced protein intake and hence a positive rather than a negative protein balance. Nevertheless it was not unexpected that in some patients prolonged administration of cortisone should lead to osteoporosis, with pain in the back and collapse of vertebral bodies, and more than a dozen such cases have now been reported.³⁻⁷ In many instances it is difficult to be certain that the condition is attributable solely to the cortisone, because osteoporosis may occur as a complication of rheumatoid arthritis, during prolonged immobilization, and particularly in postmenopausal women. In some patients the symptoms of osteoporosis and pathological fractures have developed within a few months of the start of cortisone treatment, and possibly the increased sense of well-being produced by the drug has led patients with osteoporosis which before treatment was prevented by pain and muscle spasm. Recently osteoporosis and crush fractures of the vertebrae have been reported⁷ in four male patients receiving prolonged cortisone or corticotrophin—one of them being a boy aged 9—and there can be little doubt that the treatment caused the bone changes. This hazard should be kept in mind when cortisone treatment is prolonged and particularly when large doses are given to elderly patients or postmenopausal women; physiotherapy⁸ and testosterone² may help to avert it.

¹ Harvey Lecture Series, 1943, 38, 123.
² Sprague, R. G., et al., *Arch. Intern. Med.*, 1950, 85, 199.
³ Demartini, F., et al., *J. Amer. med. Ass.*, 1952, 149, 750.
⁴ Teicher, R., and Nelson, C. T., *J. Invest. Derm.*, 1952, 19, 205.
⁵ Soffer, L. J., and Bader, R., *J. Amer. med. Ass.*, 1952, 149, 1002.
⁶ de Szé, S., et al., *Presse méd.*, 1953, 61, 819.
⁷ Curtiss, P. H., et al., *J. Amer. med. Ass.*, 1954, 156, 467.
⁸ Clark, W. S., et al., *J. clin. Invest.*, 1954, 33, 505.

TETANUS IMMUNIZATION

Every year since the war about seventy people in England and Wales have died of tetanus, and probably at least as many more have recovered from the infection. The highest death rate was in boys aged 5-14 years, and most of the deaths were of people living in rural areas, particularly in East Anglia and the south-west. Some of these deaths might have been prevented by more extensive use of prophylactic antitoxin, but the experience of Cole¹ suggests that many probably had injuries so trivial that they were not even seen by a doctor. Every year many thousand injections of tetanus antitoxin are given and are followed inevitably by a number of serum reactions; occasionally one of them is fatal. Every day doctors are faced with the difficult task of weighing the risks of horse serum against those of tetanus.

There is strong though indirect evidence for the value of active immunization against tetanus. Only twelve cases occurred in the American Army during the last war, and only six of these had received the basic course of toxoid.² The American Army used no antitoxin, but relied entirely upon booster doses of toxoid after injury. Further suggestive evidence was obtained by Ipsen,³ who showed that there has been a marked decline in tetanus morbidity in Massachusetts in children under 5 years of age, most of whom are now actively immunized, and in young adults, a high proportion of whom were actively immunized in the armed Forces. Conybeare and Logan⁴ found a similar decline since the war in the tetanus death rate of young male adults in England and Wales.

Active immunization on a scale sufficient to produce an appreciable result would hardly be practicable were it not for the development of vaccines combining tetanus toxoid with other antigens already widely used. The immunization of all infants with a single vaccine effective against diphtheria, whooping-cough, and tetanus, with later boosting doses as required, would be ideal, but it is important that in combining antigens nothing should be lost. Barr and Llewellyn-Jones showed⁵ that the result obtained with a combined prophylactic depends to an extent not fully understood on the composition of the vaccine and the state of immunity of the inoculated. However, many studies have shown that it has been possible to produce satisfactory levels of antibody against the component parts of combined vaccines, so the problem should not be insuperable. Field trials are in progress at present to confirm that the protective effect of a whooping-cough vaccine is not diminished by combining it with a diphtheria antigen. A triple vaccine incorporating tetanus toxoid would require similar trial.

We record with regret the death on January 25 of Dr. Charles Herbert Hampshire, C.M.G., secretary of the British Pharmacopoeia Commission from 1929 to 1950.

¹ *Practitioner*, 1951, 167, 247.
² Long, A. P., *Amer. J. publ. Hlth*, 1948, 38, 485.
³ *New Engl. J. Med.*, 1954, 250, 37.
⁴ *British Medical Journal*, 1951, 1, 504.
⁵ *Brit. J. exp. Path.*, 1953, 34, 12.

EMERGENCIES IN GENERAL PRACTICE

THE MANAGEMENT OF ECLAMPSIA

BY

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Although eclampsia remains one of the most serious of obstetrical complications, the Australian workers have shown that in the practice of a first-class maternity hospital a determined effort to eliminate eclampsia may be completely successful.* The measures which succeeded at the Crown Street Hospital in Sydney were administrative as well as medical. They involved arrangements for antenatal out-patient care at the very highest standard, and the reallocation of beds so as to increase antenatal accommodation at the expense of lying-in beds. The latter allowed the admission of all patients who showed evidence of pre-eclamptic toxæmia, and also many of those patients who were believed to be likely to develop pre-eclampsia, on the basis of excessive weight gain observed at their frequent antenatal examinations. The most important obstacle to the application of such methods in this country occurs in areas where maternity hospital beds are insufficient to allow an adequate number to be set aside for antenatal patients. In hospitals in more favoured areas eclampsia is already rare, while a general practitioner carrying out alert antenatal care very seldom needs to treat an eclamptic patient at home. Although successful measures for the complete prevention of pre-eclamptic toxæmia have not yet been established, the prompt treatment of early cases of toxæmia is often successful and the immediate transfer to hospital of patients showing severe pre-eclampsia is enough in itself to make convulsive eclampsia a very great rarity in domiciliary practice.

Space does not permit of elaboration of the conservative treatment of pre-eclampsia. So far as general practice is concerned the most successful measure is to increase the time spent by the patient in bed to the maximum compatible with her domestic circumstances. Restriction of sodium intake in the form of cooking salt, table salt, and sodium-containing digestive medicaments is helpful but not always easy. A nocturnal barbiturate—for example, butobarbitone 0.18 g. (3 gr.)—is often advisable. It is most important to keep very clearly in mind the indications that a case of pre-eclampsia is becoming too severe to handle in the patient's home. Of these the most important are (a) oedema which persists in the lower limbs after a complete night's rest, or oedema which significantly affects the hands or face; (b) a blood pressure at or above the level of 150/100; (c) albuminuria confirmed in a catheter specimen of urine, no matter how small the quantity of albumin may be; and (d) finally the well-known prodromal symptoms of eclampsia itself, splitting headache, blurring of vision, severe epigastric pain, and reduction in output of urine.

General Principles of Management

The general practitioner will wish to undertake domiciliary treatment of eclampsia only in most isolated communities, the number of which has been greatly reduced by the availability of good ambulance services. According to Frew the

*Hamlin, R. H. T., *Lancet*, 1952, 1, 64.

eclamptic patient appears to travel well by air if under the action of a basal narcotic such as bromethol.

There is as yet no specific treatment for eclampsia. It is universally accepted that measures to limit the number of the fits offer the best hope of saving life. Along with these measures attention is required to the prevention or prompt treatment of such complications of eclampsia as inhalational pneumonia, cardiac embarrassment, or suppression of urine.

The sedative regime associated with the name of Stroganoff has been widely employed with varying success. Morphine and chloral were the drugs originally recommended, but other and more powerful narcotics have been introduced without modifying the essential principles. Of these later drugs the most valuable appear to be sodium thiopentone and bromethol. All are potential respiratory depressants, and the balance between the effective and the toxic dose is very delicately poised.

Certain drugs which reduce the elevated blood pressure are also effective in preventing convulsions. Of these, the extract of veratrum viride (a plant of the lily family) manufactured under the proprietary name of "veratrone" has always been popular in the Cincinnati school. In this country Stern and Burnett have authoritatively recommended it.†

Whichever type of drug is selected, the general nursing management of the patient is of the greatest importance. The maintenance of a clear airway is essential. Artificial dentures should be removed as soon as possible. The mouth must be kept clear of secretion, blood, or vomitus. The use of the semiprone position, changing from one side to the other at two-hourly intervals, is probably sound, but care must be taken to swab out the dependent cheek before moving the patient. Quiet, the avoidance of bright light, and the maintenance of an even temperature help to diminish the afferent stimuli which may precipitate convulsions. The eclamptic patient should not be overheated, and there is no reason to encourage sweating by the application of a harsh blanket. The vigorous perspiration often seen during recovery from eclampsia is the result of that recovery, and not its cause.

The possibility of inhalational pneumonia is diminished by good nursing. It is important to give neither solids nor liquids by mouth during the acute phase in order to prevent their inhalation during feeding or regurgitation. Penicillin may be given prophylactically in dosage of 300,000 units eight-hourly.*

The heart is most effectively supported by ensuring that anoxia is reduced by keeping the airway completely unobstructed in the intervals between fits. If available, oxygen should be administered immediately after each convulsion and continued so long as there is the slightest trace of cyanosis. Digoxin 1.5 mg. (1/40 gr.) may be given intravenously to a patient who has not been receiving any other form of digitalis. Venesection of 500 ml. may be useful in acute pulmonary oedema, which occasionally complicates cardiac failure in eclampsia.

Obstetrical intervention is generally restricted to the terminal second stage. There is no doubt that the patient who has an eclamptic convulsion when the head is on the perineum is often treated most effectively by an immediate forceps delivery. In other circumstances the better interests

†J. *Obstet. Gynaec. Brit. Emp.*, 1954, 61, 590.

of the patient are usually served by conservatism. In hospital practice there is a place for induction of labour in antepartum eclampsia, but usually such intervention is delayed until the fits are controlled by sedatives, by which time labour has often ensued spontaneously. Caesarean section is not to be regarded as a treatment of choice in any circumstances. It is inevitably associated with a high maternal mortality in eclampsia. There are occasional cases, however, where it may seem justified to a person with very great experience of the treatment of eclampsia.

Observation of the eclamptic patient must be close and uninterrupted. Changes in skin colour, the depth of coma or degree of restlessness, the temperature, pulse and respiration, the variations in blood pressure, the volume of urinary secretion, the activity of the uterus, all require watching. Too much disturbance of the patient is to be avoided, but a four-hourly report from the midwife is a great support in controlling treatment. There is little point in being scrupulous about the foetal heart sounds during the acute phase of the disease, for the foetus is always in grave danger in eclampsia and the detection of signs of foetal distress is unlikely to influence treatment greatly. Despite the old adage, intrauterine death of the foetus does not have much influence on the maternal prognosis.

First Aid

The fit of eclampsia is essentially similar to that of epilepsy except that there is no phenomenon strictly comparable to the aura of epilepsy. After slight facial twitching a tonic phase sets in, being followed by the onset of clonic spasms. The end of the fit is usually preceded by the coincidence of a clonic inspiratory effort with relaxation of the muscles controlling the glottis. Cyanosis at once diminishes. A moment or two later the jaw muscles relax completely and the fit may be said to have passed off. Coma of variable length and depth follows. In comparison with post-epileptic coma it is relatively brief.

The primary concern of first aid is the prevention of injury during the clonic phase. Gentle restraint for the writhing body will prevent the patient rolling out of bed or knocking her limbs against walls or furniture. Little more than this is possible. The advice to force a gag, a wedge of wood, or the handle of a spoon between the teeth is sound enough in theory, but usually the clenching of the jaws is much too firm to allow this to be done without the risk of loosening teeth or causing other damage. It is some comfort to recollect that if the tongue lies between the teeth at the moment of onset of the fit, nothing can save it, while if it is internal to the opposed jaws it is in any case safe. The time for insertion of a gag or dental prop is immediately after the fit, opportunity being taken to remove any artificial dentures and to swab out the mouth and pharynx if the tongue has been bitten or if there has been any regurgitation of gastric content.

The intravenous administration of sodium thiopentone in dosage of 0.25 to 0.5 g. is very sound as a first-aid procedure. It may be expected to arrest the fit at any stage, and by its prompt administration some lives may be saved which would otherwise be lost during a single unusually severe eclamptic convulsion. Unfortunately the preparation of the injection takes a little time, so that a first convulsion may have come and gone before it can be administered. If this is the case it is prudent to put down the syringe containing the injection in some safe but accessible position, so that it will be instantly available if there be a further attack.

At one time it was customary to endeavour to control the fits by the exhibition of prodigious quantities of chloroform. There is little doubt that the liver damage of eclampsia was often fatally aggravated by this additional insult. Inhalational anaesthetics are useless during the respiratory arrest of the convulsion. Their employment immediately after the convulsion is justifiable as a first-aid measure to delay the onset of further attacks where fits are following each other in very

rapid succession and thiopentone is for any reason unavailable. Chloroform on a Schimmelbusch mask at the rate of approximately 15 drops per minute for not more than 2-3 minutes may allow time for less damaging sedatives to take effect. Ether, theoretically preferable, is too apt to produce salivation, an added embarrassment to breathing.

The immediate management of the eclamptic patient includes certain examinations. It is most useful to obtain some idea (a) whether the patient is in labour or likely soon to be in labour, (b) whether there is any abnormality likely to give rise to mechanical difficulty, and (c) whether her urinary output is satisfactory. As the necessary examinations may well precipitate a convulsion in a restless semi-conscious patient, it is well to take the opportunity to carry them out in the period of coma immediately following a seizure, especially if thiopentone or chloroform has been given. The unconsciousness is then likely to be prolonged by a few additional minutes which will allow a quick abdominal and vaginal examination and the passage of a catheter. If a self-retaining catheter is available, its use should certainly be considered. A clip can be applied to it when the bladder has been emptied, and thereafter the release of the clip at four-hourly intervals enables the urinary output to be exactly measured without further disturbance of the patient.

Further Management

When "Flying-Squad" Service Available

If such a service operates in the practitioner's area and is willing to undertake treatment of the eclamptic prior to and during her movement to hospital, then the hospital should be contacted without delay. A joint scheme of treatment can be worked out in accordance with local policy.

No Flying-Squad Available but Removal to Hospital Possible

In city practice it is enough to move the patient as quickly as possible by ambulance from her home to the hospital of choice. The practitioner should accompany his patient. It is useful to take a gag and tongue forceps, a Schimmelbusch mask, and a bottle of chloroform. Where distances are greater it is wiser to begin sedative treatment in the home and to delay moving the patient until such sedatives have had time to take effect. A very useful drug for this purpose is bromethol, of which 5.5 ml. dissolved in 220 ml. of tap water at body temperature may be administered rectally. This acts within 20 minutes and the deep narcosis which follows renders the transport of the patient fairly safe. Unfortunately, the use of bromethol in general practice is limited by the fact that it is now rarely obtainable outside maternity hospitals, its vogue as a basal anaesthetic in general surgery having expired. It is an excellent "flying-squad" medicament, but the unaided general practitioner will often need to adopt other expedients. Of these morphine with all its faults as a respiratory depressant is the most useful and generally available. Its reinforcement with some other sedative (e.g., chloral or a barbiturate) is usually practised since it may then be possible to avoid very full doses of morphine. The following scheme of dosage is advised, the hour of commencing treatment being represented by the symbol "H." All drugs are administered intramuscularly.

Hour	Drug	Dose
H	Morphine	15 mg. (½ gr.)
	Sodium phenobarbitone	0.3 g. (5 gr.)
H+1	Morphine	10 mg. (1/6 gr.)
H+2	Depart by ambulance	

The second dose of morphine should be omitted in the unlikely event of any real respiratory depression (e.g., respirations 10 per minute or less), but if so an appropriately loaded syringe should be entrusted to the ambulance nurse to use if the patient has a further seizure during transit. It must be emphasized that the delay in moving the patient is justified only if the first injection produces some degree of control of her fits. If she continues to have fits some thirty minutes after starting treatment, no time should be lost in giving the second injection of morphine and dispatching her to hospital.

Removal to Hospital Impossible

Faced with the need to treat his patient entirely at home, the single-handed practitioner cannot hope to apply treatments which may tax the resources of a fully-staffed maternity hospital. Methods involving prolonged medical supervision can hardly be selected, and it is not practical to consider such treatments as the continuous intravenous thiopentone management of O'Donel Browne. The drugs readily available to the practitioner are likely to be limited to those of sedative type, and accordingly a Stroganoff type of management is likely to be forced on him. The aim should be to keep the patient deeply narcotized for at least 24 hours, and thereafter to prolong the sedation in lesser degree for a further 24 hours. Most patients are out of danger by that time. The following dosage scheme is suggested, the hour of commencing treatment being represented by the symbol "H", all drugs are administered intramuscularly.

Hour	Drug	Dose
H	Morphine	15 mg. (½ gr.)
	Sodium phenobarbitone	0.3 g. (5 gr.)
H+1	Morphine	10 mg. (1/6 gr.)
H+4	Morphine	15 mg. (½ gr.)
H+8	Morphine	15 mg. (½ gr.)
H+12	Sodium phenobarbitone	0.3 g. (5 gr.)
H+18	Morphine	15 mg. (½ gr.)
H+24	Sodium phenobarbitone	0.3 g. (5 gr.)
H+30	Morphine	15 mg. (½ gr.)
H+36	Sodium phenobarbitone	0.3 g. (5 gr.)

The recurrence of fits despite treatment might well justify the acceleration or increase of the doses of morphine. Indications to delay the next dose include undue respiratory depression (respirations 10 or fewer per minute), persistent cyanosis, and accumulation of bubbling secretion in the trachea and bronchi—usually an indication for full dosage of atropine (i.e., 1 mg.—1/60 gr.).

In addition to sedatives, some value is attached to the parenteral injection of hypertonic solutions of glucose or magnesium sulphate. These may have some effect in reducing cerebral oedema. Glucose is believed also to favour diuresis, while magnesium sulphate may reduce blood pressure slightly and appears to potentiate the anticonvulsant action of morphine. Glucose is given intravenously in daily dosage of 1,000 ml. of 20% aqueous solution. Magnesium sulphate is usually given intramuscularly in 50% aqueous solution, in dosage of 10 ml. repeated after each convulsion up to a total daily dose of 60 ml. The side-effect of paralysis of voluntary muscle must be kept in mind, and a total dose of 20 ml. should not be exceeded without making sure that the knee-jerks are present at the time each fresh injection is given.

Other useful drugs are: (a) *Sedatives*: Chloral hydrate, oral or rectal, 3 g. (45 gr.)—4 g. (60 gr.); paraldehyde, rectal, 40 ml. (1 fl. oz.), intramuscularly, 10–20 ml. (2–4 fl. dr.). (b) *Veratrine*, intramuscularly, 0.6 ml. (10 minims)—as initial dose. Further doses, if necessary, may be started after 30 minutes. They must be controlled by blood-pressure readings at 15-minute intervals. The aim is to secure an early reduction of systolic blood pressure to less than 120. Thereafter veratrine is withheld unless the systolic pressure rises above 150 mm. Hg. For details see Stern and Burnett's paper mentioned earlier in this article.

Next article on Emergencies in General Practice.—*"Acute Lumbago and Sciatica,"* by Mr. John Charnley.

Refresher Course Books.—Copies of the first two volumes of collected articles from the Refresher Course for General Practitioners published in the *Journal* are still available at 25s. (postage 1s.) each. The first volume contains 55 articles and the second 60. Each article has been revised and brought up to date by its author.

These books may be obtained from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or through any bookseller.

INTERNATIONAL FEDERATION OF GYNAECOLOGY AND OBSTETRICS

The constitution of the International Federation of Gynaecology and Obstetrics has now been adopted by 42 countries, including Great Britain, Canada, Eire, India, New Zealand, the United States, and Russia. The Federation was founded during the International Congress on Obstetrics and Gynaecology in Geneva last year, and has the following objects:

(a) To promote the development of science and assist in scientific research work relating to all the fields pertaining to gynaecology and obstetrics, to further the attainment, by all appropriate means, of a higher level of physical and mental health of women, mothers and their children, to develop and improve the exchange of information and ideas in the field of gynaecology and obstetrics, to contribute to the research of fresh knowledge in this field, to contribute to the improvement of teaching standards in the profession, to promote international co-operation and facilitate relationships between national medical bodies of the profession.

(b) To recommend a common policy in regard to these matters on the proposal of member societies.

(c) To represent member societies whenever joint scientific action can be pursued in such matters.

(d) To foster the initiation and development of all activities aiming at the attainment of the objects of the Federation as defined under (a) above.

(e) To organize international congresses, including all countries or certain groups of countries. Circumstances permitting, each international congress shall be held successively on a different continent. Members of national societies may attend all congresses.

The executive board of the Federation is composed as follows: *president*, Professor H. de Wetteville (Switzerland); *vice-presidents*, Professor L. Gérin-Lajoie (Canada) and Professor E. Cova (Italy); *secretary*, Professor R. Keller (France); *treasurer*, Dr. F. L. Adair (U.S.A.); *members*, Professor César A. Brea (Argentina), Professor O. Rodrigues Lima (Brazil), Professor H. Martius (Germany), Dr. V. B. Green-Armytage (Great Britain), Professor B. N. Purandare (India), Professor Hideo Yagi (Japan), Professor A. Bravo (Mexico), Dr. J. Harbutt (New Zealand), Dr. Howard C. Taylor, jun. (U.S.A.), and Professor A. Belochapko (U.S.S.R.); *executive secretary*, Dr. W. Geisendorf (Switzerland).

ORDER OF ST. JOHN OF JERUSALEM

The *London Gazette* has announced the following promotions in, and appointments to, the Venerable Order of the Hospital of St. John of Jerusalem:

As Knights: Brigadier R. A. Hepple, C.B.E., M.C., M.B., and Dr. W. P. Warner, C.B.E., D.S.C. *As Commanders (Brothers)*: Surgeon Captain E. H. Lee, M.D., Brigadier K. A. Hunter, O.B.E., M.D., Lieutenant-Colonels G. N. Morris, M.B., F.R.C.S., and F. K. Mugford, M.B., Air Commodore A. A. G. Corbet, M.D., Mr. K. G. W. Saunders, O.B.E., F.R.C.S., and Drs. S. H. Keshen, A. P. Gorham, E. M. Dearn, R. A. P. Gray, and R. R. Trail, C.B.E., M.C. *As Officers (Brothers)*: Colonel G. A. Winfield, O.B.E., M.D., Lieutenant-Colonels S. Mackenzie, O.B.E., M.R.C.S., L.R.C.P., J. A. Melanson, M.B., and W. R. Everatt, T.D., M.B., Major M. J. Bett, M.D., Professor J. Galea, M.B.E., M.D., Messrs. J. S. Grant, M.D., F.R.C.S., J. A. White, M.B., F.R.C.S., V. C. J. Harris, F.R.C.S., A. L. Buchanan, M.B., F.R.C.S., R. H. Percival, F.R.C.S., and G. E. G. Peirce, M.B., F.R.C.S., and Drs. R. S. Reid, M.B.E., R. A. Dench, M.C., J. Morris, F. O'Daly, J. C. Moor, J. C. Cassaglia, G. D. E. Tullis, A. H. Penistan, E. F. Brown, E. L. Butler, M. Y. Paget, G. E. Mullins, R. Dick, R. M. B. MacKenna, H. G. Wiltshire, L. J. Haydon, T.D., H. E. Offord, J. R. Oddie, J. T. Watkins, J. H. Dixon, J. J. Kennedy, V. C. Meyer, J. McC. Caldwell, and H. E. W. Robertson. *As Associate Officers (Brothers)*: Drs. H. M. Jacobs, A. Rabinowitz, and E. B. Doany. *As Officer (Sister)*: Dr. Eily E. Gurr. *As Serving Brothers*: Surgeon Captain F. G. W. MacHattie, Surgeon Commander M. Wellman, Colonels J. E. Andrew, M.D., F.R.C.S., and E. E. Tieman, O.B.E., M.D.,

Wing Commander H. J. Bright, M.D., Squadron Leader D. O. Coons, M.D., Messrs. J. J. Coulthard, M.B., F.R.C.S., and M. H. Elliot-Smith, M.B., F.R.C.S., and Drs. O. J. Curl, K. O'L. Doherty, W. J. Boyd, T. E. Kirk, H. S. Sharpe, R. C. Wilson, P. de Bec Turtle, D. O. Dickie, J. S. Stuart, H. Leslie, L. D. M. Gavin, J. F. M. Milner, V.D., J. W. Dowzer, H. W. Taylor, R. E. Crockett, S. C. Pritchard, O.B.E., D. W. R. Richardson, V. St. C. Lucas, O. Thomas, D. T. Clark, J. W. McAllan, R. A. Lewis, A. Sandison, J. R. Martin, and R. W. Cunningham. *As Associate Serving Brothers:* Drs. A. Gordon and Kwan Kui Lun. *As Serving Sister:* Dr. Eleanor M. Whitehead.

Reports of Societies

RECENT ADVANCES IN BRAIN SURGERY

The Section of Psychiatry of the Royal Society of Medicine held a joint meeting with the Section of Neurology on January 11 to hear papers on three aspects of recent research made possible by modern brain surgery. Professor W. MAYER-GROSS, president of the psychiatry section, was in the chair, and was joined on the platform by Professor F. J. NATTRASS, president of the neurology section. The first paper was by Professor ALFRED MEYER, head of the neuropathology department at the Maudsley Hospital, on "Temporal Lobe Epilepsy and the Hippocampal Region."

Local Sclerosis in Temporal Lobe Epilepsy

The hippocampus, or Ammon's horn, was the most medial part of the temporal lobe of the cerebral hemisphere, said Professor Meyer. In 1927 Spielmeier had shown that interference with its blood supply or anoxia (as in a major epileptic fit, carbon monoxide poisoning, and similar conditions) led to its sclerosis—selective or even total neuronal loss and glial proliferation. The same year had seen the beginning of the overthrow of the traditional theory that the hippocampus is part of the "smell" brain, subserving olfactory function: it was now regarded as part of the "visceral" or limbic brain, concerned with the control of the autonomic functions of the body. In this the hippocampus formed part of a system with the uncus, the adjacent amygdaloid nucleus, the anterior uvula, the anterior cingulate region, and the thalamus and hypothalamus.

Penfield and his collaborators had recently introduced the operation of anterior temporal lobectomy for epileptics who showed no gross focal lesion, continued Professor Meyer. In their series two-thirds of all such cases showed sclerosis of a part of the temporal lobe, where in their view the lobe had at some time, probably at birth, been wedged a little way through the notch or incisura of the tentorium and its blood supply compressed. All cases with "incisural" sclerosis in the removed lobe had clinical or electroencephalographic evidence of temporal lobe epilepsy. Professor Meyer, in collaboration with Dr. Denis Hill, Mr. Murray Falconer, and Mrs. E. Beck, had been making a similar study of the tissue removed at operation for temporal lobe epilepsy. Out of 18 cases of non-focal or "incisural" epilepsy 12 showed the predicted hippocampal sclerosis, but the other 6 had very little specific abnormality in the removed lobes. Of course it was possible that in these last cases the damage lay elsewhere—perhaps in the temporal lobe on the other side, which had not been opened. Study of a comparable group of epileptics with focal lesions of different kinds (four with angiomas, two with oligodendrogliomas, and so on) which produced the well-known uncinate fits showed lesions much more frequently also in the uncus and amygdaloid nucleus and less commonly in the hippocampus. However, a sclerosis of the hippocampus could extend forwards to the uncus and into the amygdaloid nucleus, as had, in fact, been demonstrated by the speaker in four of the few biopsy specimens in which amygdaloid tissue was available. He had also seen in a necropsy on a demented child of 8, who had suffered repeatedly from status epilepticus, sclerosis of the

hippocampus (Sommer sector areas H3 to H5) as well as softening of the amygdaloid nucleus, visible to the naked eye. In a woman of 43, who began to have severe epilepsy six months after prefrontal leucotomy for chronic mania and survived for seven years, the amygdaloid nucleus in addition to the uncus and hippocampus was found sclerosed.

It was interesting that Gastaut and Magnus and their associates had found that electrical or chemical stimulation of the amygdaloid nucleus in animals was the best way to elicit a psychomotor (temporal lobe) fit experimentally. Professor Meyer pointed out that this nucleus, the uncus, and the hippocampus received blood through anterior branches of the anterior choroidal artery, whereas posterior branches of this artery supplied the globus pallidus, which in his post-mortem cases was histologically normal. He doubted whether hippocampal sclerosis occurred always at birth, as proposed by Penfield, but thought it might well be the sequel to anoxia from any cause, and particularly from the onset of severe major epileptic fits, whenever these first occurred.

Results of Cingulectomy

Dr. C. W. M. WHITTY, of the Radcliffe Infirmary, Oxford, spoke on "Cingulectomy," the removal of the anterior part of the cingulate gyrus (area 24 of Brodmann), which, as already mentioned by Professor Meyer, formed a part of the limbic brain.

Bilateral cingulectomy in monkeys produced no neurologically detectable changes but considerable emotional alteration: the animals lost their aggressiveness and became very tame. They lost all normal fear reactions, and their social behaviour with their cage-mates was different. It was thought, therefore, that the operation might be useful in the treatment of psychiatric disorders in man, and since 1944 35 human cases had been studied, the earlier operations done by the late Sir Hume Cairns, the more recent by Mr. Walpole Lewin. A limited subpial suction ablation of the cortex was made, about 4 cm. × 1 cm. × 1 cm. of tissue being removed, great care being taken to preserve branches of the anterior cerebral artery. Necropsy of five patients who later died showed that the intended area had been accurately excised in all but one. Le Beau, of Paris, had published his results on 30 cases, but the excised area was bigger.

The Oxford workers first operated on 18 chronic deteriorated mental cases, 11 of whom were schizophrenics. Aggressive outbursts and obsessional symptoms became fewer, but the relief was only temporary. They then treated 17 patients who were in hospital on account of single severe anxieties or compulsive or obsessional symptoms but whose basic personalities were well preserved. Of 7 cases in the anxiety group 4 were improved—that is, they were happier, able to go home and even work—and 2 greatly improved (all symptoms abolished). Of 10 obsessionals 7 were greatly improved and 2 improved. Improvement was not immediate, but took place gradually over a number of months. As the obsessions faded away, emotional reactions became more open and less persistent, and drive and power of concentration lessened. Follow-up after one to four years showed that patients had lost their tendency to abnormal emotional or cognitive perseveration and also some of their inhibitions. Dr. Whitty thought there was less blunting of personality than after frontal leucotomy or orbital undercutting, but he was very cautious in making any claims for cingulectomy. There seemed to be a tendency to bring out latent epilepsy, at least temporarily; though only one case had persistent fits post-operatively. During the operation electrical stimulation of the area to be excised produced variable results—stomach sensations in some, a drop in blood pressure or sweating attacks in others. Study of blood pressures, pulse rates, and response to adrenaline and mecholyl before and after operation suggested that cingulectomy produced a change in the range of response but not a change in the baseline.

Stereotactic Brain Surgery

Professor H. HASSLER, head of the neuropathology department at Freiburg University (Germany), showed a film on "A New Stereotactic Method of Brain Surgery." Different areas in the thalamic nuclei (or elsewhere in the brain) could be accurately coagulated by means of a specially introduced diathermy needle which could also be used to take electrical recordings from the area, or to stimulate it, before producing the coagulation. A rigid metal ring was fixed round the patient's skull in the plane of the auditory meatus and the root of the nose, and an aiming-bow (a metal half-ring running over the vertex and attached to the base ring) fitted to carry the needle. Air encephalograms of the patient's brain were taken to measure off various dimensions of his brain and compare them with a model brain which could be placed inside a duplicate base-ring and aiming-bow. From the model it was estimated at what angle to set the aiming-bow, and where it should carry the operation needle, and how far this should plunge in. After all this preparation the needle could be simply slid into position through a previously prepared skull defect, and a second air encephalogram would show that it had attained the desired place. This could be confirmed by the effects of electrical stimulation through the needle in the conscious patient. The film showed dramatically the results in one or two chosen cases out of the 140 so far treated, most of them for intractable pain, or for muscular rigidity, tremor, or athetosis. For example, a man with typical Parkinsonian rigidity and intention tremor of a severe degree had the needle introduced into the anterior ventral nucleus of the thalamus first on one side and, three days later, on the other. Electrical stimulation of one nucleus inhibited the rest tremor of limbs on the other side of the body. After coagulation of both nuclei the muscular rigidity was abolished, walking became very much easier, intention tremor almost vanished, but in the right arm tremor at rest persisted, though diminished. A girl with severe athetosis from a birth injury had her spontaneous uncontrollable movements very greatly reduced by coagulation of a segment of the globus pallidus.

Discussion

In the discussion Dr. M. A. PARTRIDGE paid tribute to the extraordinary accuracy of Professor Hassler's technique, and wondered whether cingulectomy would compare favourably with rostral leucotomy. Mrs. A. PETRIE said that patients with rostral leucotomy gave a very different pattern of response to her battery of personality tests from Le Beau's cingulectomy patients whom she had recently tested; the latter resembled patients on chlorpromazine. Dr. J. S. PIPPARD said his study of 240 cases of rostral leucotomy clinically showed only slight personality changes, and these were similar to the changes described by Dr. Whitty. He wondered what Mrs. Petrie's tests were measuring. Dr. STEPHEN SHERWOOD described how they had done 100 cingulotomies at Severalls Hospital, Colchester, the results of which compared favourably with classical leucotomy. He also gave details of their attempts at stereotactic brain surgery.

LOCAL MEDICAL SOCIETIES

Persian Gulf Medical Society

The third annual meeting of the society was held in Bahrain, Persian Gulf, on November 24 and 25, 1954. Over 70 delegates attended, representing governments, oil companies, and the American Mission, from countries extending from Iraq in the north to Muscat in the south of the Gulf.

The Congress was officially opened by the Ruler of Bahrain, SHEIKH SIR SULMAN BIN HAMAD AL-KHALIFAH. The guest speaker was Dr. HOEFNAGELS, of the World Health Organization, who read a paper entitled "The Position of

Tuberculosis Control as Part of a General Health Programme." It has become an established policy of the society to lay emphasis on practical problems of the Persian Gulf area, and this was well shown by the choice of papers. Dr. JOYCE OWEN, of the Kuwait Oil Company, followed Dr. HOEFNAGELS with a paper on "The Out-Patient Treatment of Tuberculosis amongst Arab Women and Children." Dr. JAMES GRANT, of the Bahrain Government, Public Health Department, read a paper on "The Susceptibility of Insects to Insecticides." Dr. WELLS THOMS, of the American Mission, who has spent most of his life in the area, read an interesting paper on his experience in dealing with leprosy in Muscat. During the second day there was a panel composed of surgeons from the various areas discussing fractures of the long bones, presided over by Dr. R. J. BIGGAR of the Bahrain Petroleum Company.

It is planned to hold the next meeting of the society at Kuwait in November, 1955.

Liverpool Medical Institution

On January 13 there was a discussion on "The Medical Education of Patient and Public." Dr. ROBERT KEMP, speaking of the medical education of the patient, emphasized the difficulties and drawbacks in providing patients with complete clinical information. However, there were a number of diseases, such as diabetes mellitus, pulmonary tuberculosis, duodenal ulcer, and epilepsy, where successful management depended almost entirely on the patient understanding his complaint. In such cases a formal educational approach to the patient was required, but the doctor had to be extremely selective both in regard to the material offered to the patient and in the type of illness in which education was undertaken. The approach to the patient differed somewhat from that of the profession itself to the general public.

Dr. I. HARVEY FLACK, editor of *Family Doctor*, said that there was a real need and a real demand for information and education on medical subjects. Ideally it should be met by the individual physician talking to the individual patient. In practice it very frequently had to be met in some other way. There were several possible methods, but one of the most important at the present time was by means of the magazine *Family Doctor*. Doctors had to be realistic and accept the fact that the public at large were not interested in health. They were interested in disease. They were interested in wonder drugs, miracle cures, and remarkable operations, not in the kind of health education that very often the profession wanted to get across to them. However, if one talked or wrote about a disease interest was attracted, and within that framework a good deal of valuable advice could be conveyed on prevention, healthy living, and the avoidance of infection. The only section of the public that was vitally interested in non-disease teaching were the young mothers, who were always anxious for information about the normal physiology of pregnancy and delivery, and about the care of infants, toddlers, and young children. There was a big field of interest here, and it was one that *Family Doctor* consistently tried to meet.

Devon and Exeter Medico-Chirurgical Society

On December 16, 1954, Dr. F. S. W. BRIMBLECOMBE spoke on some common disorders of childhood. Underfeeding was one, he said, but overfeeding very rare. If a baby failed to thrive it was wise to seek the cause in the baby rather than in the feed. Most of the causes of failure to thrive could now be recognized. Wrong feeding was one, but a rare one. Another was hiatus hernia: here the function of the cardiac sphincter was lost and the patient vomited from birth, especially when laid flat. The vomit contained mucus and sooner or later, owing to oesophageal ulceration, blood. Painful swallowing from the same cause produced anorexia, and occult bleeding might give rise to

anaemia. The diagnosis was a clinical one, for confirmation by barium x-ray examination was difficult. Feeds should be thickened and the baby sat upright. Occasional surgery was needed to free a stomach which had ridden up into the chest and become adherent.

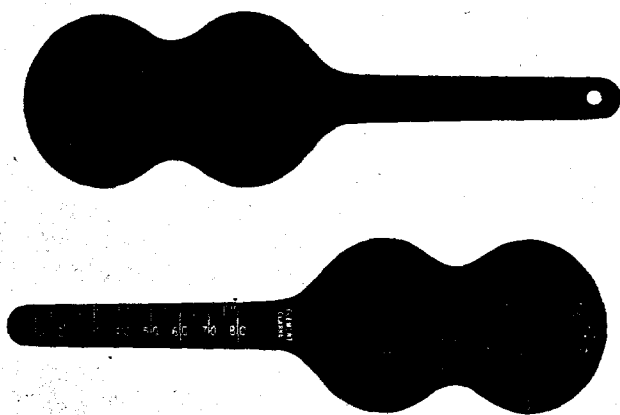
Bottle-fed babies, apparently thriving, sometimes started to vomit at the third or fourth month, became costive, and developed unexplained pyrexias. Necropsy showed calcification in the proximal renal tubules which could be demonstrated radiologically during life. In these cases there was acidemia with a urine constantly alkaline. This disorder, persistent renal acidosis, could be treated successfully with large doses of sodium bicarbonate. Another group, clinically similar, was due to hypercalcaemia of unknown origin, which was equally controllable by a calcium-free diet.

Preparations and Appliances

A HANDY OCCLUDER

Dr. G. J. ROMANES (London, W.1) writes: The use of a shield is convenient when assessing the visual acuity of each eye separately. Unless a special instrument is available the occlusion is usually carried out by covering each eye with any object to hand, such as a card or a piece of paper. This tends to give the patient an unfavourable impression. I have therefore evolved for this purpose a suitable occluder (see illustration), the features of which also enable it to fulfil several other functions.

The shape of the "head" allows it to rest comfortably on the bridge of the patient's nose, thereby occluding one eye for visual acuity assessment or for the cover test—that is, the unmasking of a latent squint. Both eyes can be covered simultaneously if desired—for example, during examination of pupil reactions. One side of the handle is



engraved with a millimetre scale enabling it to be used for interpupillary distance measurement. The end of the handle is rounded to allow it to be placed on the zygomatic bone, when a numerical idea of proptosis can be obtained from the scale. The reverse side of the handle incorporates a white spot 5 mm. in diameter, which can be used as a rough scotometry target or as a fixation point to help the patient look in a specific direction. The handle is tapered so that it can be utilized as a pointer to indicate the letters which are to be read on the test type. The whole instrument is designed so that its overall length enables it to fit into the accessory tray of a standard trial case.

I have used a similar occluder for some years now and find that it is a handy and time-saving accessory.

I should like to acknowledge the help which I have had in developing the accessory from the staff of Clement Clarke, Ltd., London, from whom the shield is now available.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Fluoridation of Public Water Supplies

SIR,—We enter with great reluctance the controversy upon this topic mentioned by your correspondent, Dr. C. G. Dobbs (*Journal*, January 8, p. 105). Our reluctance arises partly from our profound ignorance both of the effects upon the human body of the chronic ingestion of low concentrations of fluorides and of the level of intake at which retention in the body occurs in different people. But we believe our ignorance is no greater than that of other members of our profession. Since one of us (D.C.W.) has worked upon the subject for some years, and since the other (H.M.S.) has been publicly and correctly reported as being opposed to fluoridation of public water supplies before further research is done, and has been consulted by Dr. Dobbs and many others, we feel it our duty to state very briefly our views.

It is well established that the ingestion of water containing 1 p.p.m. of fluoride decreases the incidence of dental caries in children up to the age of about 8 years; the effect on adults is much less certain. It is proposed that the public water supply of four places—Anglesey, Darlington, Kilmarnock, and Watford—should be fluoridated to the level of 1 p.p.m., presumably to increase the resistance of the teeth of children to caries during the period of their calcification. This will undoubtedly benefit the teeth of the children, but we do not believe it is without risk to the adults whose teeth may not be improved.

It can be argued that, because some 14 million persons in the U.S. are drinking public water supplies fluoridated to 1 p.p.m. without any demonstrated ill-health, the practice would be without risk to health in this country. But habits differ in the two countries. The two richest dietary sources of fluorine (according to McClure¹) are sea foods, which as consumed may contain 5 to 15 p.p.m., and tea, of which the better grades contain 75 to 100 p.p.m. From these sources communities in the U.S. are likely to derive less fluorine than those in this country, and the consumption of tea may be highest among old people least able to excrete fluorides. It has been argued² that in this country adults who have arrived in West Hartlepool (with a water of natural fluoride content of 2 p.p.m.) or Maldon (5 p.p.m.) after the calcification of their permanent teeth "have drunk water containing 2–5 times the proposed concentration with no ill effect," but we have not seen the evidence for this statement. One of us (D.C.W.) took part in a study in which "severe dental fluorosis" appeared to be associated in some persons living in one village in Oxfordshire with a water supply having fluoride concentrations between 0.3 and 1.2 p.p.m. and in another village with a supply containing 0.8 p.p.m.³ One of us (H.M.S.) quoted this work in a lecture to the Women Public Health Officers' Association last July to which wide publicity has unfortunately been given.

We believe the hazard from atmospheric pollution is greater in this country than in the U.S. Outbreaks of animal fluorosis have occurred from the use in industry in increasing amounts of compounds which naturally contain compounds of fluorine, such as "marine" coals and clays and the phosphatic iron ores; and there are at least 28 industrial processes in which added compounds of fluorine are used as a flux during manufacture. Such atmospheric pollution causing animal fluorosis in the neighbourhood of Stoke-on-Trent was the subject of recent questions in Parliament.

An adult eating ordinary foods (without sea food) with four cups of tea daily and drinking 1½ litres of water containing 1 p.p.m. of fluoride would ingest about 2.2 mg. of fluoride daily. The level at which storage occurs in the body is not known: Machle, Scott, and Largent⁴ found some storage on an intake of 2.0 mg. daily, and in a more recent study Largent⁵ concluded that 1.36 mg. of fluoride daily for 45 weeks led in a healthy adult to storage of about 226 mg. during this period. In the elderly or in those with impaired renal function, storage is likely to be greater. More information is required.

Various authors, including one of us,⁶ have concluded that the toxicity of fluorides depends upon the nutriture of the person concerned; calcium nutriture has been claimed to be particularly relevant.⁸ This problem deserves further study. The United Kingdom Mission on the Fluoridation of Domestic Water Supplies⁹ believed that "in theory any fluorine compound which will ionize in aqueous solution should have the same action on teeth." We take leave to doubt this. First, a solution of stannous fluoride has a greater influence in the rat on experimental dental caries than has a solution of sodium fluoride.¹⁰ Secondly, it is not unreasonable to expect these two compounds to behave differently, at any rate in strong solution: a solution of stannous chloride, unlike a solution of sodium chloride, has a reducing power attributable to its solution containing much SnCl_3^- anions,¹¹ and stannous fluoride might ionize similarly. So even on a simple chemical point there seems to be divergence of opinion. We do not even know how fluorides act on the teeth. There appears to be no protection against caries if they are given parenterally,¹² which would indicate that the effect is one following direct application to the surface of the tooth; but incorporation in dentifrices is alleged to be useless,¹³ though others have claimed results from application to scaled and polished teeth. The effect on the oral flora deserves more attention. But we hasten to add that ignorance of how fluorides increase the resistance of the teeth of children to caries is no argument against their use.

Our argument is, in summary, that we do not consider it to be established beyond reasonable doubt that increasing the fluoride content of public water supplies to 1 p.p.m. is without risk to adults in this country. We consider that more research should first be done, which should include further studies upon storage in the body, particularly of the elderly.—We are, etc.,

H. M. SINCLAIR.
DAGMAR C. WILSON.¹

Oxford.

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Premedication of Children for Tonsillectomy

SIR,—I have read with interest the article and subsequent letters on this subject (*Journal*, December 11, 1954, p. 1397, and January 1, 1955, p. 44).

During the past five years I have tried the following combinations for guillotine tonsillectomy and adenoidectomy in children: (1) quinalbarbitone premedication followed by pure N_2O from a McKesson machine. This was associated with anoxia and occasional troublesome laryngeal spasm. (2) Syrup of chloral hydrate 5 gr. (0.32 g.) per stone (6.4 kg.) body weight for premedication followed by pure N_2O as above. No cases of laryngeal spasm and no untoward sequelae were seen, but as anoxia rather than anaesthesia formed the basis of the technique it was discontinued. (3) Premedication with atropine only followed by intravenous thiopentone 50 mg. per stone (6.4 kg.) body weight. Post-operative restlessness in the ward rendered this technique unpopular. (4) Premedication with syrup of chloral and atropine followed by ethyl chloride and ether or "neothyl." This proved too time-consuming for a long list. (5) Premedication with atropine only followed by vinyl ether, ethyl chloride, or trichlorethylene in the Oxford inhaler. Induction proved stormy and generally unpopular. (6) Premedication with atropine only followed by 50% cyclopropane in 50% oxygen and a trace of ether. As with the thiopentone series post-operative crying and

restlessness ruled this out. (7) In a recent series of 100 children whose ages ranged from 5–10 years, 50 were pre-medicated with methylpentynol (2–4 teaspoonfuls) one hour pre-operatively and 50 with syrup of chloral 5 gr. (0.32 g.) per stone (6.4 kg.) body weight one hour pre-operatively. Induction was with pure N_2O , followed by N_2O and O_2 (10%) and a trace of trichlorethylene from a McKesson machine.

The nursing staff soon requested the abandonment of methylpentynol in favour of chloral because of pre-operative apprehension and post-operative restlessness. The only point in favour of methylpentynol would appear to be its effectiveness in removing the after-taste of syrup of chloral. While the ideal premedication and anaesthetic technique for guillotine tonsillectomy in children has yet to be found, syrup of chloral correctly given, followed by nitrous oxide, oxygen, and trichlorethylene, correctly administered from a McKesson machine, is at present, I think, the nearest approach to this ideal. My thanks are due to Dr. Kothary and Sister Beal, of the E.N.T. department, for their interest and co-operation.—I am, etc.,

Hull.

W. N. ROLLASON.

Sickling and Malaria

SIR,—The *Journal* of November 13, 1954, has just arrived here and we have seen Dr. A. B. Raper's letter (p. 1162), with much of which we are in complete agreement. The problems presented by the hypothesis that there is an association between malaria and sickling are exceedingly complex and not capable of easy solution. We did not say that we had proved that sickling and malaria are not associated, but stated (*Journal*, September 11, 1954, p. 630): "There is no confirmation of the theory that there is an association of any magnitude, such as that suggested by Allison, between sickling and malaria" (*Journal*, February 6, 1954, p. 290).

The purpose of our survey among the Daruma and Kambe was to discover if very wide variations in sickling were accompanied by differences in malaria rates; we found none. Our determinations of sickling and malaria were done on the same individual. In Allison's work the samples investigated for malaria and sickling consisted of different individuals, in some instances in widely separated areas. Raper says that our numbers were small (302 Daruma and 220 Kambe), but we have since doubled them and have still found no correlation between sickling and parasite or spleen rates.

We are puzzled by Raper's reference to the mixture of adults and children that composed our sample. Since sickle-cell rates do not differ significantly between adults and children the validity of significance tests could not be affected. It is, of course, true that if there were a differential in malarial rates between sicklers and non-sicklers for children, but not for adults, a sample of children only would be more efficient for the purpose of determining associations. However, since our memorandum was published in the *Journal* we have selected a sample of children under six months and have again found no association between malaria and sickling rates. Results of this survey will be published later.

Numerous pitfalls are likely to be encountered in trying to correlate sickling and malaria, since any associations may be seriously influenced by a number of factors, such as population movements, genetic drift, and ecological changes. Any changes in gene frequencies, due to deaths from sickle-cell anaemia, would be very slow. We are, of course, aware that the survival of sickle-cell genes involves some selective advantage, but this advantage might equally well be due to either higher fertility or lower mortality.

We gather that Raper considers that the severity of malaria is less in sicklers than non-sicklers, since he found a lower parasite density in the former, and considers this to be one of the reasons for the persistence of high sickle-cell trait rates in various African tribes. At present we have very little evidence to contribute on this question of parasite density. However, in a survey that we have just completed among a very homogeneous group of Jaluo we have found no evidence that parasite density and sickling were associated. So far the numbers examined have been small and larger samples may reveal a different situation. This work is being continued.

We must emphasize again that we cannot accept any evidence of association where the homogeneity of the sample, with respect to the characteristics studied, is not proved. We have previously shown that sickle-cell trait rates vary very greatly from place to place, even within the same tribe, and this has now been confirmed by other workers. Parasite rates and densities as well as sickling vary even in quite small areas, and the chances of fortuitous associations are therefore high. Under such circumstances the assumptions necessary for tests of significance do not hold; we gave an example of this in our memorandum. Our own experience, and that of others doing medical survey work in Africa, is that such fortuitous associations are common. Our reluctance to accept the results of tests of association at their face value is particularly strong when the sample is a mixture of tribes, as was Dr. Raper's. An association between parasite density and sickling, such as postulated by Raper, can only maintain the sickling gene by ultimately causing a differential mortality. Even if parasite density can be shown to be lower in sicklers, it remains to be proved that this is associated with a lower death rate in the untreated patient.

Further, is parasite density really a measure of malarial severity in African natives? The pyrogenic density or threshold is a factor of great variability in falciparum malaria in immunes as well as non-immunes. Severe clinical symptoms may occur with densities as low as ten parasites per cubic mm., and in other cases large numbers of parasites may be present and give rise to only the slightest illness. The presence of parasites in blood and particularly their density is dependent on a number of complex and, so far, little understood factors. No single entity, such as sickling or immunity, can be regarded as paramount. The high traumatic fragility of blackwater fever red cells is one of the factors that contribute to the scarcity of parasites in this disease. Similarly, in sickle-cell trait the traumatic fragility of the parasitized red cells may result in their being destroyed at an early stage of infection and thus reduce parasite density both by direct destruction of red cells and by limiting the number of parasites that undergo schizogony; we do not, at present, know whether there is a more intense destruction of red cells in cases of malaria in sicklers than in malaria in non-sicklers. This is a question that can only be answered by careful blood studies particularly of pigment metabolism.

There may be a "negative association" between sickling and mortality from malaria, but we cannot agree that it has yet been proved. We are not altogether convinced that an association between parasite density and sickling has been demonstrated, but even if it has we cannot agree that parasite density and mortality from malaria can be equated.—We are, etc.,

HENRY FOY. G. L. TIMMS.
W. BRASS. R. A. MOORE.

Nairobi, Kenya.

Medical Education

SIR,—I was interested to read Professor L. J. Witts's review of the *Proceedings of the First World Conference on Medical Education* (*Journal*, October 9, 1954, p. 853) which has recently arrived here. As Professor Witts says, there are too many thoughts and not enough experiments in medical education. It is heartening to read of the various recent work in medical education in the United States of America.

In Queensland, we have departed from the usual system of written examinations in the final year, and have introduced oral and clinical examinations only; written examinations have been included at the end of the fifth year. This was recommended by Sir William Osler long ago. At the present time, there is an urgent need to make better provision for the requirements for entry to medical schools. All students should have a knowledge of the arts, sciences, and sociological subjects, and thereby would have a good basis for general education.

Now that arrangements for the academic training of those who are going to be specialists of one sort or another follow set lines, the undergraduate curriculum may be considered. Sir A. L. Mudaliar, who presided over the section on the "Aims and Content of the Medical Curriculum," has put the case quite well. There is need for a reduction in the amount of anatomy and physiology taught to undergraduates, and, as Sir A. L. Mudaliar said, "It would be well if the student would occasionally look into the hospital ward,

and be shown what was normal and what was abnormal. . . . Similarly with pathology, "the pathologist would walk into the wards, and tell the students exactly what he felt about pathological conditions. . . ." Years ago Lord Moynihan stressed the importance of the "pathology of the living," and quite recently Lord Horder and Sir Heneage Ogilvie have emphasized that medical students are not going to be professors of these subjects, but should be able to recognize anatomical and physiological conditions as met with in general practice.

The *Proceedings of the Conference on Medical Education* will require careful study, and, as has been said, Dr. Clegg and his colleagues have done well to produce the book so quickly. It seems to me, however, that unless arrangements can be made for universities to exchange views on their efforts to produce a better curriculum from time to time the full benefit of the work of the conference will not be realized.—I am, etc.,

Brisbane, Australia.

E. S. MEYERS.

Reading and Writing about New Diseases

SIR,—For those of us who spend a few week-end hours in trying to keep up to date in new medical discoveries about which we know nothing, it would be most helpful if a preliminary paragraph introduced us as simply as possible to the subject. For instance, I have to-day battled with articles on phenylketonuria (*Journal*, January 8, p. 57) and byssinosis (p. 65) without ever getting my ignorant feet on the ground for a good start in understanding them. I have always told myself and my juniors to kick off with a simple explanatory paragraph relating the past to the new when writing about specialized novelties. I hope you, Sir, will insist on this when your authors tend to neglect it.—I am, etc.,

London, W.1.

R. D. LAWRENCE.

Talc Pneumoconiosis

SIR,—I read with much interest the letter from Dr. David Weitzman (*Journal*, January 8, p. 104). The atomic lattice structure of talc is such as to render its inhalation in powder form unlikely to cause a true pulmonary silicosis. Nevertheless, some unsatisfied valencies may be found at the edges of the platelets in freshly powdered talc, just as they are found at the fractured ends of freshly powdered asbestos fibres, and may possibly produce similar results. For a recent discussion on the chemical surface activities of silica and the silicates your readers are referred to *Tubercle* for September, 1953.—I am, etc.,

Cork.

REFERENCE

Tubercle, 1953, 34, 246.

PATRICK HEFFERNAN.

Treatment of Papilloma of Bladder

SIR,—I have just read with very considerable interest the article by Dr. Frank Ellis and Mr. R. Oliver on the above subject (*Journal*, January 15, p. 136). I do not wish to appear in any way critical, as the treatment of papillomatosis of the bladder has always been notoriously unsatisfactory, and the case described by the authors would have otherwise come to total cystectomy, an operation which must be regarded as a last resort, for, no matter what steps are taken to minimize the subsequent disability, the patient will remain a potential invalid for life.

I feel, however, that one statement should not be allowed to pass without comment, as it may give an entirely false impression of the results of the more common treatment for vesical papilloma. This reads: "The treatment of these lesions by cysto-diathermy has for many years been the method of choice, but the results of such treatment are difficult to find. It is certain, however, that a number of patients develop incurable malignant disease after many years' cystoscopy and diathermy." During the past ten years I have been privileged to see a large number of cases of vesical papilloma treated with cysto-diathermy, and no

single case which was diagnosed clinically as a simple papilloma has later developed characteristics of malignancy. Furthermore, I have seen several cases which had the cystoscopic appearance of malignancy, but in whom radical surgery was contraindicated. Following treatment with cysto-diathermy the growths have regressed permanently, and in some instances have disappeared. Cysto-diathermy is a treatment for these lesions which has, in my humble opinion, successfully stood the test of time, and must not be hastily abandoned for a far more hazardous procedure.—I am, etc.,

Slough.

ROBIN BURKITT.

Epithelioma Due to Tar Ointment

SIR,—We are grateful to Mr. W. H. Bond (*Journal*, November 20, 1954, p. 1226) and Dr. R. E. W. Fisher (*Journal*, December 4, p. 1355) for their comments on our case report (*Journal*, November 6, p. 1089). In his letter Mr. Bond states that "with the solitary exception of the histological report all the reported features are convincingly those of molluscum sebaceum" (the italics are ours). In their original description of molluscum sebaceum MacCormac and Scarff¹ list six features of the condition. They are: (1) The lesion develops rapidly to its maximum in four to six weeks and then remains stationary. (2) In no case has more than one lesion been present. (3) The middle area of the face is the site of election. (4) The lesion is usually of firm consistency but may show central degeneration. (5) In all cases the patients were of mature age—generally over 60. (6) Both sexes were affected. In a further series reported by Beare² only seven out of seventy-six were below the age of 35; the majority were over 50. In other respects the features of Beare's cases conformed to the original description. Mr. Bond puts forward (1) the age of our patient—that is, 31; (2) the apparent absence of other pre-malignant or benign tar tumours on other parts of the body treated with tar (when there were in fact several tar mollusca also present in the treated area); and (3) the appearance of a tumour within a patch of psoriasis, as convincing evidence of molluscum sebaceum. We are quite unable to agree with this view. The short exposure to tar is unusual, but we believe that this feature was compensated for by the patient persisting in its use for a considerable period after signs of tar intolerance had appeared. Incidentally, we are not aware that tar is an aetiological factor in molluscum sebaceum.

Savaterd³ commented on MacCormac and Scarff's cases that the features were those of the well-known button epithelioma, a criticism almost the reverse of what Mr. Bond says about our case. In their reply MacCormac and Scarff⁴ emphasized one point very clearly. They said "... the appearances of the section of the growth are much more nearly matters of fact, and we confess, with all respect, that we can find nothing in those appearances which suggest epithelioma or rodent ulcer either in the slide or the photograph." We have re-examined the sections in our case. The appearances are those of a well-differentiated, keratinizing, squamous carcinoma of low-grade malignancy. There is a hyperplasia of the epithelium around the tumour—a feature not found in molluscum sebaceum.

With respect to Dr. Fisher's comments we agree that tar epithelioma can occur without the presence of other lesions and may even appear in a man who has long since given up working with tar. It was not our intention to suggest that tar acne is an essential precursor of tar epithelioma. On the other hand, it is the repeated stimulation of the skin which results in the malignant change. Other signs of such stimulation or irritation are also very often present. The late onset of epithelioma due to tar in industrial workers, often at a time when they are no longer exposed to tar, may account for tar acne being absent at that time. In passing we would remark that the failure to make a diagnosis of cancer because of the absence of tar acne does not commend the clinical acumen of the examining physician to us. Surely a cancer lesion should be diagnosed or at least suspected on its clinical appearance and not on ancillary findings.

We question whether in fact industrial workers do rub tar into their skin any more than our patient did. The latter used a very strong ointment made up in emulsifying

base, which is expressly designed to secure quick and deep penetration of the skin. This occurs particularly around the hair follicles. Anyone who has used tar ointment extensively knows that this may sometimes produce folliculitis or tar acne, and this is an indication for withdrawal of tar therapy.—We are, etc.,

J. O'D. ALEXANDER.
K. I. MACROSSON.

Glasgow, C.4.

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- ² *Brit. J. Surg.*, 1953, 41, 167.
- ³ *Brit. J. Derm. Syph.*, 1937, 49, 92.
- ⁴ *Ibid.*, 1937, 49, 208.

Kaposi's Varicelliform Eruption

SIR,—I have been prompted to protest against the title, "A Case of Kaposi's Varicelliform Eruption (Accidental Vaccinia)" reported by Dr. A. Fry (*Journal*, January 1, p. 28). The case reported undoubtedly refers to accidental infection with vaccinia, but the lesions described are those well recognized as generalized vaccinia. Dermatologists reserve the title of "Kaposi's varicelliform eruption" for the alarming eruption often associated with severe constitutional disturbance and high fever which occurs when a case of infected eczema also becomes infected with the virus of herpes simplex or vaccinia. In these cases the virus infection is usually a primary one, but it may not be, because recurrences of Kaposi's varicelliform eruption have been reported.

When a virus has been identified most dermatologists would prefer a diagnosis of eczema herpeticum or eczema vaccinatum, but the clinical picture of Kaposi's eruption, as illustrated by the above photograph, is nothing like that of accidental vaccinia. It is probable that a spreading factor such as hyaluronidase, present in infected eczema, accounts for the rapid local spread of the virus in cases of Kaposi's varicelliform eruption. Although the vaccinal cases of this disease may well be described as accidental they can readily be distinguished from vaccinia.—I am, etc.,

London, W.1.

REGINALD T. BRAIN.

A Case of Human Anthrax

SIR,—The authors Mr. M. F. Hunt and Dr. P. Cook (*Journal*, January 8, p. 87) and medical practitioner in charge of this case are to be congratulated for their early diagnosis, treatment, and subsequent investigations. It would be of interest to learn if "bone meal" was a constituent of the "animal manure," and, if not, had the inoculating insect access to this substance in a neighbour's garden. In recent years several writers¹⁻³ have stressed bone meal as a source of *B. anthracis*, as frequently the dried bones are imported from Asiatic countries where anthrax is endemic.—I am, etc.,

London, W.1.

IAN MARTIN-SCOTT.

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- ⁴ *Ibid.*, 1953, 1, 240.



Low Backache

SIR.—The methods of treating disk lesions advocated by Dr. James Cyriax (*Journal*, January 15, p. 140) are, he says, "based on logic." Logical thinking in medicine must always be followed amongst others by the question: Does it work in practice?

Cyriax suggests with all his strength that his methods do work: in one instance "immediate manipulative reduction succeeds in 99% of all cases," and "this simple manoeuvre prevents the later onset of brachial neuritis," presumably in 99% of cases. Again, referring to the dorsal spine, he says, "A protrusion irreducible by manipulation during manual traction is a rarity," and for the lumbar region his summary is, "In backache manipulative reduction, without anaesthetic, is usually successful," although there is a footnote stating that "the pain seldom returns to anything like its previous intensity." These manipulations have been carried out in Dr. Cyriax's department "with manifest success," and physiotherapists, he says, can be trained to do them, "as our experience at St. Thomas's Hospital proves."

The problem set by painful disability from disk degeneration and protrusion is very difficult and troublesome, and we would be inclined to agree with Cyriax's estimate of 20,000 to 50,000 individuals disabled from their work at any one time by these disorders.

If Cyriax really has the answer to both cause and treatment, as his article is meant to suggest, we must learn from him and train doctors and physiotherapists to carry out his methods. But can he really produce the goods? Can he prove that his rather elaborate technique, including manipulation, is more rapidly and surely successful than the established methods of exercise therapy which have always been productive of moderate success?

We must examine closely and objectively any method of treatment for any condition which claims "99% of cures," which is "usually successful," and in which "failure is a rarity." So far Dr. Cyriax has published many statements¹⁻³ but no figures. Many of the syndromes which he treats are apt to resolve spontaneously whether the patients are manipulated or not, and in two or three weeks. Gradual improvement during a series of manipulations at daily or weekly intervals cannot easily be disentangled from the probability of spontaneous cure. Will Cyriax produce rather more concrete evidence of the success of his methods so as to draw them more convincingly from the morass of palliative osteopathy? Will his colleagues at St. Thomas's Hospital or in the specialty of physical medicine support his claims for outstanding success?

Finally, expert medical opinion is at present such that a patient might argue much more successfully in a court of law that a manipulation had done harm than that recovery had been delayed by a negligent failure to manipulate at all.—We are, etc.,

W. D. COLTART.
H. OSMOND-CLARKE.

London, N.W.1.

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- ² *British Medical Journal*, 1948, 2, 251.
- ³ *Osteopathy and Manipulation*, 1949, Lockwood, London.
- ⁴ *British Medical Journal*, 1950, 2, 1434.
- ⁵ *Orthopaedic Medicine*, 1954, Cassell, London.

SIR.—All those concerned with the treatment of low backache should make themselves acquainted with the important report published by Romanus.¹ It is based on a careful study of 117 male patients. His data make it quite clear that the bone changes not only of the spine and pelvic girdle but also of more peripheral parts are the result of chronic prostatitis-veniculitis. To establish such a relationship reliable means of demonstrating the presence of prostatic infection must be employed. Certainly the examination of a single prostatic smear is inadequate. It is astonishing at first to find that a prostate which feels quite normal on rectal examination can show granulomata in the prostatic

sinuses or on the verumontanum. To me such findings are evidence of badly draining infective foci—the proof of which can often be shown by improvement in the urinary symptoms (commonly chronic frequency) and backache. In women the regular use of the urethroscope for more than 20 years on all those with disturbances of micturition has revealed to me concealed chronic inflammatory foci in the posterior urethra, often in the presence of a crystal-clear and sterile urine. Treatment of these foci in many cases will cure or improve the accompanying backache.

The appropriate treatment of cervical erosion, and chronic vaginitis, will often have the same effect. Improvement from treatment, however, is not to be expected when the lower urinary tract condition has progressed to an established *Bact. coli* infection or fibrosis of the bladder neck, and chronic changes in the upper urinary tract. The x-ray films of the pelvis and spine which the urologist so commonly examines are constantly reminding him of the presence of osteoarthritic changes in chronic urinary cases.—I am, etc.,

London, W.1.

H. P. WINSBURY-WHITE.

REFERENCE

- ¹ *Pelvo-Spondylitis Ossificans in the Male, and Genito-Urinary Infection*, 1953, Stockholm.

SIR.—Mr. John Charnley's views on low backache (*Journal*, January 15, p. 163) command respect, but it is doubtful whether they can be adopted as "facts." I find it difficult to accept some of his contentions, and trust I will be forgiven if I examine some of them from the point of view of a peripheral general surgeon who is not exempt from some responsibility for this skeletal disability.

Surely consultants employed by a National Health Service must think twice about withholding treatment unless "there is unanimity that the results . . . are worth the financial outlay." Most sensible patients approach the doctor in order to have some incommensurate symptom removed or mitigated. They are not concerned with abstract (though useful) concepts such as "significant organic causes," "scientifically sound rationale of treatment," or even "diagnosis." The doctor or his wife with backache wants the ache removed. If it is not removed the patient may, in spite of consultations, radiographs, corsets, or even "reassurance without treatment," get the idea that nothing has been done. He may even become "impossible to reassure" and finally resort to a quack who may cure him. I doubt whether, in the present state of knowledge, it is practicable to resolve pain into "organic and functional elements." As far as I am concerned persistent pain is a real thing, even when I cannot see, feel, or x-ray the aetiological lesion. A significant lesion may be physically minute. Mr. Charnley's colleague, Professor Kellgren,¹ demonstrated that the injection of 0.1 ml. of hypertonic saline into an appropriate skeletal structure could cause severe widespread segmental pain. It is easy to conceive of natural lesions so small causing persistent symptoms. The prolapsed disk is a common small yet significant lesion which escaped the attention of our profession for generations. Who can demonstrate the lesion of tennis elbow or facial neuralgia?

The history of our art is rich in examples of skeletal pains ignored by the orthodox only to be successfully treated by the unorthodox.²⁻⁷ Rational physiotherapy is more economical than irrational. Dr. L. S. Calvert (*Journal*, December 18, 1954, p. 1488) rightly drew attention to methods of physical medicine long exploited in the back street and by osteopaths, but now greatly improved and clarified in terms of orthodox medicine by Dr. Cyriax.⁸ Cyriax has described rational and refined methods of examining patients with aches and pains and has based on them a reasonable system of physical medicine⁹ of which the main ingredients are deep friction, manipulation, and traction, accurately applied to the site from which the pain is thought to emanate. *En passant* he has dealt severe blows at that honoured clinical nonentity "fibrositis." In the limited compass of his writings he has described his methods without producing evidence strong enough to compel acceptance of them, but by testing them it is easy to see that they produce benefits in many cases not amenable to traditional physiotherapy, much of which

justifies Mr. Charnley's description of "six weeks' quackery." It is conceded that there is a considerable residuum of incurables, but I share Mr. Charnley's hopes for the future.

The golden age of surgery was preoccupied with visceral disease, and most classical researches on pain, from McKenzie to Morley, were concerned with visceral pain. It is possible that many genuine pains due to obscure skeletal lesions have, in the past, been brushed aside as "not due to significant lesions" or "functional." I encounter many pains which I cannot diagnose or cure, but consider it salutary to attribute this to the limitations of my knowledge and methods. The researches of Kellgren and Lewis¹⁰ have thrown new light on the mechanisms of somatic pain, and I submit that Dr. Cyriax has significantly illuminated the clinical exploitation of this knowledge. We must test, not reject out of hand, all promising ideas. The great Paget,¹¹ in this connexion, said, "*Fas est ab hoste docere*." It is even better to learn from the successes of our less orthodox colleagues. To do so may protect the profession from some public criticism as in the case of Sir Herbert Barker.¹²—I am, etc.,

J. CLAPHAM COATES.

Hull.

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- ⁴ Bristow, W. R. (1937). *Lancet*, 1, 546.
- ⁵ Fisher, A. G. T. (1928). *Treatment by Manipulation*, Lewis, London.
- ⁶ Barker, H. A. (1926). In *Encyclopaedia Britannica*, vol. 14.
- ⁷ *The Times*, July 22, 1950. Obituary on Sir Herbert Barker.
- ⁸ *Textbook of Orthopaedic Medicine*, 1954, vol. 1, Cassell, London.
- ⁹ *Ibid.*, 1950, vol. 2, Cassell, London.
- ¹⁰ *Clin. Sci.*, 1939, 4, 47.

SIR.—Dr. James Cyriax (*Journal*, January 15, p. 140) performs a great service in pointing out in his paper the value of manipulative procedures in the treatment of low backache, but he does not disclose his diagnostic criteria for the diagnosis of spinal disk lesions.

Harris and McNab,¹ of Toronto, pointed out in 1952 that only a small percentage of the 123 patients then examined at necropsy had disk lesions and that other anatomical deformities and degenerations were probably the basis of both the patients' backache and root pain: thus we may assume that the majority of patients attending the practitioner and hospital clinics will have symptoms not related to disk derangement. Whereas a percentage of the latter will also respond favourably to competent manipulation, a large number would not only make no improvement but may indeed be made far worse by this form of treatment, especially if attempted by the inexperienced.

Prior to advocating widespread manipulative therapy in this country for all cases of backache, would a greater service not be rendered, Sir, by the clarification of the various diagnostic procedures required to make a correct diagnosis in the many sufferers from backache? In low back pain, more than in any other condition, accurate diagnosis is the only safe starting-point for successful treatment.—I am, etc.,

London, S.E.1.

P. HUME KENDALL.

REFERENCE

- ¹ *J. Bone 't Surg.*, 1954, 36B, 304.

SIR.—As a general physician often concerned, and frequently confounded, by the chronic or recurrent lumbar backache problem, I view the diametrically opposed opinions of Dr. James Cyriax (*Journal*, January 15, p. 140) and Mr. John Charnley (p. 163) with baffled and amused wonderment.

As I see it, Dr. Cyriax (the sanguine) considers the majority of chronic backache sufferers to have small posterior disk protrusions, easily cured by manipulation (delegated to the physiotherapist), while Mr. Charnley (the pessimist) considers the vast majority have either no physical disease (presumably psychoneurotics) or have a physical disease he cannot diagnose or treat, and so he reassures them. Where does the truth lie? Has Mr. Charnley previously adopted Dr. Cyriax's methods and abandoned them as ineffective, too reminiscent of osteo-

pathic practice, or as pure psychotherapy, to be classed with E.C.T.? Is the apparent success of Dr. Cyriax really due to the reduction of existing disk protrusions, is it a form of psychotherapy, or perhaps the patients, once subjected to manipulation without anaesthesia, are wise enough to keep their backaches strictly to themselves?

Quite seriously, the low backache problem remains an unsolved mystery in perhaps half the cases we see, for we are uncertain of the diagnosis, and therefore lack confidence in the treatment and management. I write this letter in the hope that the protagonists will take up the cudgels once more in the vertebral no-man's-land, and perhaps, who knows, we shall find that there is a wider common agreement than I imagine.—I am, etc.,

Warrington.

DENIS M. FREEMAN.

SIR.—I have a great admiration for Mr. John Charnley as an inventor of ingenious orthopaedic instruments, but I am considerably shaken by his conception of a "humane and sympathetic Health Service" (*Journal*, January 15, p. 163). It is, of course, apparent that Mr. Charnley has himself had neither sciatica nor lumbago, but if and when his good fortune ceases I wonder how he will react to "reassurance without treatment." I am sure that he is "an intelligent, decent, and sensible" person, but will "sympathetic explanation" be any comfort to him in his suffering? No. He will probably "hand-pick" himself into the select residue who have their spines fused.

Was it by design or chance, Sir, that in the same issue as Mr. Charnley's letter appeared Dr. Cyriax's article (p. 140)? Their mutual contradictions as regards the efficacy of physiotherapy made intriguing and amusing reading. One cannot dismiss Dr. Cyriax's results by the trite phrase "*ad lib.* physiotherapy" and one suspects that Mr. Charnley is begging a big question when he implies that "organic" backache is a matter of "collagen degeneration." It might be an idea for the British Orthopaedic Association to invite Dr. Cyriax to be a member of the panel at their next brains trust. It would certainly dispel the "dog-in-the-manger" attitude which undoubtedly exists, and might even persuade Mr. Charnley to stop bellyaching about the "backaching multitudes."—I am, etc.,

Loughton, Essex.

DONALD V. BATEMAN.

SIR.—As one who has had the opportunity of seeing Dr. James Cyriax's work and hearing the testimony of some of his patients, I feel that its value cannot be doubted, particularly in his insistence on accurate diagnosis before physiotherapy treatment is instituted and in his bringing to our notice the all-too-long-neglected forms of manipulative and traction therapy, which have reached a high standard in his hands. However, I must say that I believe equally firmly that he does his cause a great disservice in his over-simplification of the various intervertebral disk lesions and his insistence that the essence of their treatment is the reduction of the protrusion in all cases. Nothing in fact in a study of the anatomy and pathology of the intervertebral disks, particularly in relation to the effects of ageing on their physiology, lends support to this simple mechanistic theory, and a comparison of the lesion with that of a displaced meniscus of the knee-joint, as Dr. Cyriax has done,¹ is entirely misleading. I have already reviewed some of the reasons for this misrust,² and subsequent work on dissections of the cervical and lumbar regions has merely served to confirm this.

Our ignorance of the exact cause of the symptomatology associated with the various types of spinal disk lesions is profound, but I believe there are reasonable grounds for rejecting the simple organ-stop approach, that is to say, disk out giving a *vox radicularis* or *vox ligamentus* and, alternatively, disk in giving perfect comfort. The spread of this conception is making the work of orthopaedic surgeons interested particularly in this problem difficult. I mention orthopaedic surgeons in order to refute emphatically the

implication of the quotations which precede Dr. Cyriax's article (*Journal*, January 15, p. 140), and to assure him that there are many surgeons concerned with this problem who could have given a great many suggestions for coping with the vast number.

Furthermore, I feel that he is playing also into the hands of the very people whom I know he is anxious to defeat—namely, the unqualified manipulator. For, now this mechanistic concept of the prolapsed disk and its treatment has been given an aura of medical respectability, many doctors find it difficult to understand why they should not advise their patients to attend lay manipulators who are ready to claim they can reduce three or four disks at each session, whether in fact there is any reason to suppose they are displaced or not.—I am, etc.,

Wellington, Salop.

G. K. ROSE.

REFERENCES

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- ² *Lancet*, 1954, 1, 1143.

Heel Comfort

SIR,—I have lately had great success with an idea for treating painful heels in crippled or bed-ridden patients. A strip of "latex foam," 8 in. (20.4 cm.) by about 18 in. (45.7 cm.), put upside down between the sheets at the foot of the bed takes the heel or both heels in the squares, the front of which must be cut away. The depth of the squares varies from about 1 in. (2.5 cm.) to about 6 in. (15.2 cm.). I have used 2 in. (5.1 cm.), but where there is a risk of foot-drop the 6 in. (15.2 cm.) depth would help. The comfort has not only been to the heel, but one arthritic who has a pin in the neck of the femur has lost her pain in the hip and back also. She carries the cushion with her to sit on as well.—I am, etc.,

New Milton.

MARY G. H. EDWARDS.

Intramuscular Iron

SIR,—We would correct the impression given in the letter from Drs. Sheila T. Callender and Mary D. Smith (*Journal*, December 18, 1954, p. 1487) that we found the preparation of intramuscular iron to be innocuous when given intravenously. During certain observations made¹ two anaemic and two healthy subjects were given 5 ml. of the iron preparation, first intramuscularly and then, after an interval, intravenously, but "the experiment was then abandoned because the patients developed moderate reactions after intravenous injections." The intravenous use of this preparation is not without risks and in our opinion is unnecessary.

With regard to Dr. Callender's and Dr. Smith's experience of reactions in four patients after injection of the preparation, two in fact received the iron intravenously, and of the two patients given iron intramuscularly one was already known to be of allergic disposition. We found no reactions in the 40 patients treated with an experimental preparation of intramuscular iron, but since publication of our results we have found one batch of iron preparation which, when given intramuscularly to two patients, produced malaise, pyrexia, and shivering. When a further batch of "imferon" was substituted no reaction of any kind was noted in either case to the same dose given intramuscularly. It is evident that certain batches of the iron preparation contain a pyrogenic substance.

The difficulties of assessing "reactions" can be judged from the following case report: A woman aged 64 was admitted to the dermatological department, Royal Infirmary, Sheffield, for treatment of psoriasis, and while in the ward an iron-deficiency anaemia was discovered. After oral treatment with ferrous sulphate and ferrous gluconate severe diarrhoea ensued, so imferon therapy was commenced. After two intramuscular injections of 5 ml. severe diarrhoea and some pyrexia occurred. Two possibilities were considered: (a) this was an allergic response to iron, (b) some iron was being excreted in the faeces—contrary to accepted concepts of iron metabolism. A further injection of 5 ml. of the same batch of imferon caused no diarrhoea and an iron balance experiment revealed no increase of faecal iron

excretion after the injection. The diarrhoea was evidently coincidental to the intramuscular iron therapy.

Further experience is necessary to evaluate the frequency of reactions after intramuscular iron, particularly with regard to the occurrence of pyrogenic batches, and we feel that the published data indicate a useful but restricted place in therapeutics for the preparation, and the occasional occurrence of reactions should not deter from its use in selected cases.—We are, etc.,

I. McLEAN BAIRD.

D. A. PODMORE.

Sheffield, 6.

REFERENCE

- ¹ Baird, I. McL., and Podmore, D. A. (1954). *Lancet*, 2, 942.

Trichomonal Vaginitis

SIR,—I was interested in the article by Drs. S. R. M. Bushby, R. D. Catterall, and Mary Williamson (*Journal*, January 8, p. 78) reporting the results of a clinical trial of yet another drug in the treatment of trichomonal vaginitis. I am prompted to write a few brief comments based on my experience of treating a large number of cases of vaginal discharge.

Over 40% of cases complaining primarily of vaginal discharge are due to infestation with *T. vaginalis*. No age is immune; the disease has been observed in pre-puberty and after the menopause, but is more common during the reproductive years, especially in pregnancy. Clinical diagnosis in the acute phase is easy but should be confirmed by examination under the microscope; swabs are unreliable; pipette specimens examined fresh are essential. Ideally no case should be treated without demonstrating the organism; a week's supply of vaginal pessaries for "leucorrhoea," though giving temporary symptomatic relief, is a potent factor in the production of chronic cases. Acetarsol gives the highest percentage of cures, but it must be realized that to be effective the treatment should start with an initial insertion of 12 tablets and then daily insertions of one for at least 8 weeks, including during the menstrual periods. Weekly vaginal paintings with 2% gentian violet in spirit is a useful adjunct, and all marital relations should be "protected" by a condom for a minimum period of 6 months. The relapse rate with this routine is very small and a further course of treatment is usually effective.—I am, etc.,

Cambridge.

OSWALD LLOYD.

Sequelae of Erythroblastosis

SIR,—In your leading article (*Journal*, January 1, p. 35) you drew attention to the problems of kernicterus. Your suggestion that experimental kernicterus has been produced by bilirubin infusion is, however, a little misleading. Day¹ exposed cerebral tissues to x rays and then demonstrated that the infused pigment stained the damaged portions. Kuster and Krings² appear to have produced little more than a generalized yellow staining of the brain, but in Kuster's original paper³ reference is made to some staining of the basal nuclei when the serum bilirubin concentration rose to 75–100 mg. per 100 ml. In humans the characteristic pathological and clinical feature of the disease is the tendency for certain nuclear masses to be picked out and damaged, and the only experimental work which comes anywhere near achieving this state of affairs is that of Eyquem.⁴ By the injection of anti-cat red cell serum into kittens he produced an acute haemolytic anaemia with jaundice, acute neurological disturbance, and staining of the basal ganglia. Although acceptable as experimental kernicterus, this work does not give any further clue to the pathological processes in the brain; Eyquem himself concluded that a local antigen-antibody reaction was responsible and that bile-staining was secondary. The widespread incidence of kernicterus without any evidence of an antigen-antibody reaction now makes this interpretation untenable; the typical clinical and pathological changes have been reported in prematurity, in acholuric jaundice,^{5,6} and in "congenital familial non-haemolytic jaundice."⁷

There is strong circumstantial evidence pointing to bilirubin itself as the toxic agent, and a rational explanation of the high incidence of kernicterus among premature infants can be put forward when it is remembered that bilirubin levels in the blood of the newborn are inversely related to maturity⁸ and that the "blood-C.S.F. barrier" is less effective in premature than in full-term infants.⁹

Despite these clinical observations, experimental evidence is lacking. Although successful attempts have been made to demonstrate the toxic effects of "bile" in the young animal¹⁰ they cannot be accepted as incriminating bilirubin itself, as the material used was "concentrated bile" and not the pure pigment. To settle the role of pigments in the pathology of kernicterus it would seem necessary to show (1) that pure indirect-reacting bilirubin is toxic to the central nervous system and that if introduced into the cerebrospinal fluid it shows "special affinity" for the nuclear masses; and (2) that in both experimental and clinical kernicterus there are special circumstances which permit bilirubin to reach the cerebrospinal fluid in large amounts. It should not be long before evidence on these points is forthcoming.—We are, etc.,

D. C. A. BEVIS.

R. M. FORRESTER.

Urmston, near Manchester.

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- ⁷ Crigler, J. F., and Najjar, V. A. (1952). *Pediatrics*, 10, 169.
- ⁸ Billing, B. H., et al. (1954). *British Medical Journal*, 2, 1263.
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- ¹⁰ Frohlich, A., and Mirsky, I. A. (1942). *Proc. soc. exp. Biol. (N.Y.)*, 50, 25.

Changes in the Mental Health Services

SIR,—The recent correspondence on mental observation wards has shown that opinion is divided regarding whether or not their continuance in the future is desirable. Most of your correspondents have, no doubt, been arguing from their knowledge of such units in their own localities, and as there is no clear definition of what constitutes a "mental observation ward" the arguments are tending to become confused.

If by the term "mental observation ward" one is to understand a ward in a general hospital where patients on 3- and 14-day orders are admitted, for the purpose of deciding whether or not treatment in a psychiatric hospital is desirable (as voluntary, temporary, or certified patients as the case may be), or whether the patient can be discharged home, I can see no justification whatever for their existence—except possibly in the very largest centres of population where conditions are somewhat different. In any lesser centre the unit will inevitably be too small to allow of proper classification of the patients, and too small also to be administered and staffed efficiently as an economic proposition. Equally important objections are (a) that the patients requiring admission to the psychiatric hospital at the end of their "observation" will usually have to suffer a change of doctor as well as of nursing staff, and (b) that they will feel that they have failed to make the grade, and will go to the psychiatric hospital with an unnecessary feeling of shame.

On the other hand, it is generally agreed that psychiatric wards of some kind in general hospitals are desirable: such wards, however, should be for the most minor degrees of mental illness (including psychosomatic conditions) for whom admission to a psychiatric hospital might be difficult to arrange. If the Royal Commission recommends that the 3- and 14-day order procedure shall continue, the best place, in my experience, to which patients on such orders should be admitted, is the psychiatric hospital. Apart from many obvious advantages of such an arrangement, it is found in practice that the need for certification hardly ever arises,

as is seen from the following figures for a provincial psychiatric hospital for the year 1954.

Admissions			Disposal					
3-day	14-day	Total	Vol.	Temp.	Cert.	Died	Home	Other Hospital
40	106	146	107	6	8	5	15	3
								2

—I am, etc.,

Ivybridge, South Devon.

FRANCIS PILKINGTON.

Cardiac Asthma

SIR,—Congratulations to the *British Medical Journal* for once more publishing outstanding articles which are of so much benefit to general practitioners. I read with great interest the first of the new series written by Dr. J. G. M. Hamilton, of Edinburgh, on cardiac asthma (*Journal*, January 1, p. 39). This condition is not a common emergency seen in general practice, but is one of the most satisfactory to treat. The use of morphine as quoted by the distinguished author as the only treatment in severe cases cannot be overemphasized. May I describe an outstanding case which I attended five months ago to substantiate this statement?

The patient, a man aged 67, had to my knowledge suffered from aortic regurgitation and cardiac hypertrophy for the past six years, having had attacks of breathlessness and been treated with digitalis and aminophylline. I was called to see him in the early hours of the morning and found him sitting by the open door very dyspnoeic. On examination, the patient was cold, clammy, and cyanosed. Neck veins were engorged and frothy sputum exuded from his mouth. Pulse was impossible to estimate, pupils sluggish, and he could not speak. His condition was truly grave.

Owing to the obesity of the patient—18 st. (114.4 kg.)—and urgency of the condition, $\frac{1}{4}$ gr. (32 mg.) morphine was given intramuscularly. Within 25 minutes a dramatic change occurred. The cyanosis and coldness of the skin disappeared although a slight degree of breathlessness remained. Pulse was now countable too. Mental outlook was normal, and he spoke intelligently. One hour later he insisted on returning to bed, and aided by a friend walked to his bedroom.—I am, etc.,

Leicester.

ERIC LODGE.

Treatment of Bronchial Obstruction

SIR,—The reason why the odds given by Dr. J. W. Trevan in his letter (*Journal*, January 8, p. 103) cannot be used to measure our degree of belief in the relative inefficacy of calcium chloride (*Journal*, December 11, 1954, p. 1388) is that, although our patients were chosen "at random," the trial was not concluded at a predetermined point (which would again be "at random" as far as the results were concerned), but at a point determined by the results themselves. This point was then bound to be one at which a clear distinction between the drugs, or a close similarity of them, had been established. The special form of analysis used makes due allowance for this characteristic of a sequential trial, which the simple form of calculation made by Dr. Trevan does not.

It would, of course, have been perfectly possible for us to have planned our trial in such a way as to have enabled us to establish, with calculable risks, the superiority of either calcium chloride or adrenaline. Unfortunately, as it now turns out, we did not plan to test the superiority of adrenaline. It will be understood that the trial would never have been begun had not the claims made for calcium chloride suggested that it was superior to more conventional remedies.

May we hasten to add that common sense has led us to the same opinion as Dr. Trevan's, that calcium chloride is

no good? We cannot, however, use a statistical argument to reinforce this opinion, and it was therefore not claimed as a result of the sequential trial. Nevertheless, there is no conflict between common sense and statistics here; we are all accustomed to act on common-sense opinions for which statistical justification is lacking. Common sense tells us the sun will rise to-morrow; although the odds that it will do so are probably high, they cannot be worked out.—We are, etc.,

Penarth, Glam.

G. S. KILPATRICK.
P. D. OLDHAM.

Antibiotic Sensitivity Spectra

SIR,—I have read with interest the article by Dr. E. P. Silberstein (*Journal*, January 15, p. 148) on the use of antibiotic spectra in the investigation of epidemics. It is, however, unfortunate that Dr. Silberstein used both aureomycin and terramycin for his series of tests, since the sensitivity of *Staphylococcus aureus* to these two antibiotics is almost always the same. The development of resistance to one of them automatically confers resistance to the other. Dr. Silberstein's method would have greater powers of differentiation if another antibiotic were used instead of terramycin.—I am etc.,

Middlesbrough.

R. BLOWERS.

Leukaemia and Ankylosing Spondylitis

SIR,—A conference was recently convened by the Medical Research Council to consider new ways of inquiring into the causes underlying the present rise in the death rate from leukaemia. At this conference a memorandum was presented drawing attention to an apparent association between leukaemia and ankylosing spondylitis. This information was based on a rather limited number of instances, and the members of the conference considered it very desirable that further evidence should be collected on this question. The possible association of leukaemia with ankylosing spondylitis is a curious one, but it may well be one that has been noted in individual patients by some of your readers.

Dr. W. M. Court-Brown, a member of the Council's External Scientific Staff, at present working at the Department of Medicine, The Postgraduate Medical School of London, Hammersmith Hospital, London, W.12, is collecting the relevant data on this subject. He would be very grateful if any of your readers who may have witnessed the occurrence of leukaemia in a patient suffering from ankylosing spondylitis would write to him.—I am, etc.,

London, S.W.1.

H. HIMSWORTH.

POINTS FROM LETTERS

Boxing Injuries

Dr. HERBERT SIMON (London, N.3) writes: I have read the conclusions of Drs. J. L. Blonstein and E. Clarke re amateur boxing (*Journal*, December 25, 1954, p. 1523) summing up that "amateur boxing is a useful and justifiable sport." In my opinion boxing is only justified as a weapon of defence. Only six deaths due to boxing among amateurs within the last seven years have occurred, so we are told. I have watched amateur boxing in reality and in good close-up shots on television. What a spectacle watching young men hammering at each other in a more or less skilful way! The principle in boxing is to knock the other fellow out by inflicting injuries to your opponent. The "sport" is designed to win by doing the most possible physical damage to your opponent and to hurt him as severely as possible. It is a sorry tale of the commentator we have to listen to of bleeding noses, wobbly knees, eyes blinded by blood, and the lovely pay-off right on the spot of the jaw. I cannot imagine that cranium, eyes, ears, and the solar plexus are created to be intentionally exposed to punishment which might sooner or later lead to physical or mental harm.

Obituary

GEORGE HALL, C.M.G., M.D., F.R.C.P.

Dr. George Hall, consulting physician to the Royal Victoria Infirmary, Newcastle-upon-Tyne, died on January 10, aged 75.

George Hall was the only son of M. Stokoe Hall, of Bishop Auckland. From Armstrong College, where he took the Durham degree of B.Sc. in 1899, he went on to study medicine at University College, London, where he was Bucknill Scholar and where he won a gold medal and exhibition in physiology at the intermediate M.B. examination in 1901. He also won the Cluff Prize in the same year. Graduating M.B. in 1903, he continued his brilliant student career by winning the Atkinson Morley Scholarship in 1904. He proceeded M.D. in 1905, took the M.R.C.P. in 1907, and was elected F.R.C.P. in 1927.

After qualification Hall held the posts of house-physician and house-surgeon at University College Hospital, and then was junior and senior house-physician at the National Hospital, Queen Square. Returning to Newcastle to take up consultant practice he was elected assistant physician and assistant pathologist at the Royal Victoria Infirmary in 1908. He also became assistant demonstrator of bacteriology at the College of Medicine at Durham University, which he was later to serve as registrar. One of the first papers he published in this *Journal* was on the bacteriology of keratitis. Hall was a Territorial, and during the first world war he served in the R.A.M.C. with the rank of major, being appointed C.M.G. in 1916.

In the years after the war Hall quickly established a large practice as a consulting physician, especially in neurology. He became a full physician on the staff of the Royal Victoria Infirmary in 1927, and lecturer in medicine at King's College. He had previously been lecturer in medical jurisprudence and in materia medica and pharmacy. Among other appointments he held were those of honorary physician at the Ingham Infirmary, South Shields, consulting neurologist to the Home for Crippled Children at Gosforth, and visiting physician to the Ministry of Pensions Hospital, Dunstan Hill. He was also a Fellow of University College, London, a J.P. for Newcastle, and medical visitor for the Durham county magistrates. During the Annual Meeting of the B.M.A. at Glasgow in 1922 he was vice-president of the Section of Medicine; and he was chairman of the Newcastle-upon-Tyne Division of the B.M.A. in 1931-2.

Dr. Hall married Margaret, eldest daughter of Nicholas Mein, of Newcastle. They had one son and one daughter.

J. H. B. writes: I would like to pay a tribute to my old friend Dr. George Hall, who was a very lovable man. He was good-looking, modest and quiet, and a good conversationalist. He had a very kind and friendly disposition and was always ready to help anyone who came to him for advice. He was popular with colleagues, students, and nurses. He was one of the old school and most conscientious in his hospital attendances. In spite of a very busy professional life he found time to indulge in some hobbies. He was fond of music, golf, and cricket, thoroughly enjoying taking part in the annual cricket matches between the staff of the infirmary and the students. For the past few years, after the death of his wife and the departure south of his son and daughter, Dr. Hall was a rather lonely man.

He loved his friends to call in and have a chat by the fire-side. About two years ago he had a serious illness from which he never fully recovered. He will be greatly missed in Newcastle. Our sympathy goes out to his son and daughter.

H. K. WALLER, M.B., F.R.C.O.G.

After a long and distressing illness Dr. H. K. Waller died on January 13, aged 73, at the home of his adopted daughter in Wadhurst. For most of his life he was a general practitioner, but his infant welfare work at the British Hospital for Mothers and Babies, Woolwich, and elsewhere brought him well-deserved renown.

Harold Kirk Waller was born in 1881, the only son of the late Rev. Horace Waller, who was in his early days a companion of David Livingstone in some of his later journeys and after whom Waller's gazelle (*Lithocranius walleri*) was named. Horace Waller came much into contact with Sir John Kirk, British Agent at Zanzibar for many years, the adviser and helper of all the mid-Victorian East African explorers, and for this reason his son was given the name Kirk. Harold Waller was educated at Charterhouse School and at Trinity College, Cambridge; thence he went on to the medical school of University College Hospital, qualified M.R.C.S., F.R.C.P. in 1909, and graduated M.B. in 1911. He was house-physician at his own hospital and at the Shadwell Children's Hospital as well as resident medical officer at Queen Charlotte's Hospital. After service in the R.A.M.C. during the 1914-18 war he was in general practice in Chelsea, and there developed a special interest in infant feeding and infant welfare; but he always insisted that he was primarily a general practitioner, that mother and baby should be treated as a unit, and that it is the family doctor and nurse, provided they are adequately trained, who can best manage and supervise the nursing couple. In 1914 he had been appointed superintendent medical officer at St. Katharine's College, Poplar. This was a child health centre, started with funds provided by the Chapter of London, at which there were infant welfare, dental, and sunlight clinics, as well as eight to ten cots for in-patients. His appointment there continued until the inception of the National Health Service. He always had a warm affection for those who lived in the East End, and during the second world war was placed in charge of the children's ward at the Poplar Hospital, at the same time being appointed physician to the nursing staff.

Waller's association with the British Hospital for Mothers and Babies at Woolwich began in 1913 and continued until 1950. During the years since his retirement he still kept in touch with the hospital, and in the latter part of his illness, when travelling from Tunbridge Wells was a physical strain, made every effort to visit the hospital, which had become a Mecca for all those interested in the subject of lactation and the care of the newborn. He was elected an honorary F.R.C.O.G. in 1953, the second paediatrician in this country to be so honoured, and in 1951 received the Dawson Williams Prize from the British Medical Association in recognition of his original contributions to the clinical study of lactation and infant feeding.

The Chelsea Babies' Club was another institution to which Waller was devoted. He was its first medical adviser when it was started in 1927 with Lady Piercy as its chairman. Here he instituted classes for expectant mothers, instruction on infant care, breast-feeding, suitable clothing, the importance of open air, nursery planning, and so on. He was a shrewd observer and an excellent and discriminating writer. In *Clinical Studies in Lactation* (published in 1938) he described all that he had learnt about lactation—for example, the draught reflex which governs the outflow of milk from the breast, the reasons for early failure of breast-feeding and the re-establishment of lactation. His observations were made at the bedside, in the out-patient clinic, or in the patient's home without resort to esoteric laboratory procedures. His wish was that there should be two rooms at the Woolwich Hospital for "after-care" of mothers and babies. The building of this annexe with money collected from the nursing staff, doctors, and patients is almost complete—an appropriate memorial to him. He had been a widower for a few years and leaves no issue.

Sir EARDLEY HOLLAND writes: It was characteristic of Waller to head his last piece of writing with a quotation from his admired teacher, Wilfred Trotter: "The scientific world is a democracy of facts where the inhabitants are of equal standing and there is no table of precedence. Indeed, the progress of knowledge has been in great part the discovery of the importance of small things and the exaltation of the insignificant." Waller's interest in obstetrics no doubt began as R.M.O. at Queen Charlotte's, and when he went into practice in Chelsea he became in due course what would now be called a general-practitioner obstetrician. The advantage this sort of practitioner has over the obstetric consultant accoucheur is that he has the continuous care of the baby from birth onwards and the welding of the mother-baby unit. He soon became deeply interested in breast-feeding (his "last phase of the reproductive cycle"), the clinical study of which was strangely neglected, and the want of success of which, as conventionally managed, was deplorable. Even a recent survey showed that lactation failed within eight weeks of delivery in nearly one-half of nursing mothers. When Waller began practice the position can have been no better; but instead of passively accepting it he began to dedicate himself to a lifelong clinical study. In such regard did he hold baby welfare that he founded a private infant welfare centre, the Chelsea Babies' Club. His ideas soon became known to leading London midwives and welfare workers, for here was a man who seemed likely to solve one of their most hopeless problems. His work soon gathered impetus: in 1914 he became medical superintendent to the earliest public welfare clinic in London (The Royal College of St. Katharine) and physician to the Home for Mothers and Babies, Woolwich, which led on to his later appointments as paediatrician to Poplar Hospital and to the British Hospital for Mothers and Babies, Woolwich. The secrets of lactation were revealed to Waller by patient and persistent observation, through the years, of babies at the breast and by careful recording, whereby he was able to form conclusions that were convincing and to recommend simple devices that were at once adopted. Groups of devoted midwives and co-workers helped, above all at the Woolwich Hospital, which became the recognized centre of his teaching. Midwife teachers and sisters, and even young obstetricians, were sent there to learn, not only from British centres, but from many parts of the world, and he visited many centres by invitation to show his methods.

Medicine was a vocation to Waller, and from first to last he was a dedicated man. Throughout his life he inspired a feeling of affection in all who came in contact with him. Such an unusual combination of gifts—charm, gentleness, unselfishness, quick sympathy, and devotion—captured all hearts. As a doctor he was great, but he was greater still as a human being. So lived one who was content with the discovery of small things and the exaltation of the

insignificant. But was the bringing of so much happiness and comfort to so many mothers and babies such a very small and insignificant thing?

Mr. T. TWISTINGTON HIGGINS writes: Harold K. Waller was one of the outstanding doctors of my time. Pioneer in the natural feeding and welfare of infants—who can compute the debt owed to him, or yet to be incurred, by babies and their mothers? All who were fortunate to count at need upon his steadfast care and skill in their own homes can never forget this prince of family physicians. To those privileged to enjoy his friendship there will ever remain the inspiring memory of his commanding debonair figure, gentle courtesy, and infinite kindness of heart. His alert mind with its own gifts of insight, quiet humour, and modesty made him a delightful and stimulating companion, whether in a teeming noisy Poplar street, in the charm of his Chelsea house, or among the flowers and peace of his beloved country garden. At Charterhouse he had played football in distinguished company, with some whose names are now a legend—G. O. Smith, Oakley, Cobbold—and much of the boy always remained to temper the dignified distinction of the man. Harold Waller made his world a richer place for many, and those who knew him best are sadly the poorer for his passing.

Dr. DAVID MORRIS writes: Dr. Waller will be most remembered by his pioneer work on breast-feeding. But we who knew him personally know intimately the remarkable quality that lay behind his scientific contribution. Whether on ward round or in lecture-room, at consultation or in social gathering, his special ability was always to establish a warmth of human relationship. His work was much more than a mere method or technique of antenatal preparations or post-natal management of breast-feeding; it was the application of a rich experience and judgment to individual human beings. He was a remarkable example of the old school who learned and taught on the individual case rather than by statistical analysis. Typical of his mode of working was his last series of clinical observations, carried out after his retirement, on a small group of individual nursing mothers whom he visited in their homes; his accurate observations added much information to the natural history of breast-feeding. He was held in high esteem by all who knew him, exemplified in the building of the "Dr. Waller Rooms" at the British Hospital for Mothers and Babies, Woolwich, from a voluntary fund launched after his retirement.

J. D. WHITE, O.B.E., M.B., D.M.R.E.

Dr. J. D. White, director of the radiological department at the Hammersmith Hospital and senior lecturer in radiology at the Postgraduate Medical School, died in London on January 21 at the age of 59. He had suffered for years from the effects of working with radium during his early years as a radiologist.

John Duncan White graduated M.B., Ch.B. at Edinburgh University in 1917 and held the post of resident surgeon at the Royal Infirmary. During the closing stages of the first world war he was a captain in the R.A.M.C. On his return to civilian life he determined on a career in radiology, and served his early years under the guidance of his revered chief, the late Dr. Stanley Melville. In 1921 he took the D.M.R.E. of Cambridge, having held the post of clinical assistant in the x-ray department of King's College Hospital. After working for some years as assistant radiologist at St. George's Hospital and at the Brompton Hospital, and as radiologist at the Hospital of St. John and St. Elizabeth and the Hospital for Tropical Diseases, he was appointed in 1932 as radiologist at the Royal Infirmary, Edinburgh, and also as lecturer in radiology at the University.

Within two years, however, he was back in London as director of the radiological department at Hammersmith Hospital, where he had been working for over 21 years at the time of his death.

Indefatigable in the efforts he made for the good of his specialty, Dr. White served on the councils of many organizations concerned with radiology. For many years he was a member of the council of the British Institute of Radiology, being elected its president in 1934, and serving as honorary treasurer from 1939 to 1945. In 1936 he was vice-president of the Section of Radiology at the Annual Meeting of the B.M.A. in Oxford, and he was a member of the Consultants Board and of the Radiologists Group Committee of the B.M.A. for a number of years. Much of the credit for the high standard of radiography set by the Society of Radiographers must be given to him, for he had been one of its critical and constructive advisers throughout. During the last war he served again in the R.A.M.C., attaining the rank of temporary major. He was appointed O.B.E. in 1953.

Dr. JAMES F. BRAILSFORD writes: With the passing of John Duncan White another doctor joins the roll of x-ray martyrs, and British Medicine has lost one of its greatest exponents in radiology, radiologists a loyal and courageous colleague, and radiographers their best adviser and friend. White rightfully looked with disfavour on that modern appropriation of radiological services in experimental medicine which was activated merely by desire to satisfy the curiosity of the investigator—the risks to the patient being ignored. Though he taught and showed the highest standards of radiology to his students, radiographers, and radiologists, he did not consider the production of a spectacular radiograph his goal, but merely a means to help the patient. The control of a big department, in which the chief so scrupulously and intimately inspected all the work and advised with firm humanitarian principles on all of its most important investigations, may not produce universal approval, but such behaviour did endear all to him who honoured good work. His integrity, enthusiasm, and desire to render to his patients the utmost service radiology could give unfortunately resulted in severe radiation burns which necessitated several amputations. These ominous signs, though associated with much pain, were borne silently with great fortitude. He made light of his sufferings and kept his friends free from any painful reference to them, and by his quiet and courageous facing of an early death put the hall-mark on the enduring love and affection of his devoted wife, Claire, to whom we extend our deepest sympathy. Truly can it be said of him as of other x-ray martyrs:

"But in our hearts they rest
Not less revered than blest
Than those their brothers who in fighting fell,
Nor shall our children hear their names pronounced less dear
When England's roll of gallant deeds we tell."

A colleague writes: Duncan White was a most gallant fellow. No one who knew him and saw him hobbling about, overcoming his physical disabilities and doing his work day after day under circumstances which were often distasteful, would deny him this merit. Thrust into radiology in the urgent days of the 1914-18 war, with little experience and no knowledge of its perils, he sustained damage which ultimately caused his death. Knowing his inevitable end, he faced the long-drawn-out period of waiting with a courage which shamed those who occasionally visited him in those latter days. We may mutter *Ave atque vale* and feel that we have paid some tribute to a man of great heart and cool courage, but until and unless we face the same ordeal we can never evaluate the gallantry which D.W. brought to meet it.

R. J. WILLAN, C.B.E., M.V.O., M.S., F.R.C.S.

Sir GORDON GORDON-TAYLOR writes: Perhaps I may be granted a few lines to add a personal tribute to the late Professor R. J. Willan—"R.J." to his friends—whose obituary notice appeared in the columns of last week's *British Medical Journal*. I have been deeply indebted to Willan on at least two occasions: first during the earlier part of the 1939-45 war when he was consulting surgeon in the north-east region of England and I was busying myself with the collection of abdominal casualties due to air-raid attacks on Britain; and, secondly, I cannot forget the generous help which he afforded me in the preparation of the Rutherford Morison Centenary Lecture with which I was honoured in 1953. Rutherford Morison remained my hero till the very end of life, and, although I should not dare to decide whether Charles Saint, of Capetown, or Willan was Morison's "beloved disciple," the duration of "R.J.'s" friendship and loyalty was inevitably the longer. The numerous letters from Morison to Willan which the latter had preserved and which he kindly permitted me to read showed that the affection was not one-sided: it was to Willan and Hamilton Drummond, assisted by Gordon Irwin, that Morison turned for surgical help in 1923, and their surgery prolonged his life for 15 years. And I have also in my possession a copy of the pathetic letter written in 1938 by Morison, who when 85 years of age was faced with a serious surgical ordeal, dropping "the old pilot": "the old pilot" paid his last tribute to his chief a few days later in the chapel of the R.V.L., the scene of their long comradeship.

Perhaps Willan was more proud of his association with the Royal Navy than almost anything in his long life: many are the surgeons of the Royal Navy who are eternally grateful to him for appointments and surgical registrarships in the R.V.L., Newcastle. The medical department of the Admiralty was not unmindful of this loyal help to the Senior Service, and, when opportunity suddenly offered during the last world war, there was not a moment of delay, and Willan, to his unfeigned delight, donned the uniform of a surgeon rear-admiral. He may not have been one of the world's master surgeons; he may not have even been an eloquent and forceful teacher; but he had a genius for friendship, and, as he wrote of Rutherford Morison, he also overcame obstacles by sheer force of character, merit, and good temper; and to so many, as to his old chief, he will always remain "my old and loyal friend," utterly incapable of any mean or ungenerous action.

J. B. MILLER, M.D., LL.D., D.P.H.

The obituary notice of Dr. J. B. Miller was published in last week's *Journal* (p. 232).

We are indebted to Dr. JOHN LAMBIE for the following appreciation: My first contact with "J.B." was when we were students. He was always a studious chap and paid great attention to his work, but, as the fruits of that are well known and recorded, I would like to make some mention of his other interests.

His earlier interest, other than medicine, was centred in the wild flowers of Scotland, consequently botany in his first year was of great interest: he attended the excursions and collected a herbarium which was the envy of many. Later in life he became a great gardener and never was happier than when pottering in his garden and hot-house. Last year a severe storm reduced his hot-house to the ground and he lost many of his cherished plants, but his philosophy helped him through and he continued his interests in his outdoor plants and shrubs, knowing them as friends and full of knowledge of their special characteristics.

When a student he played Rugby and was a member of the medical team when the interfaculty matches took place. He enjoyed the rough and tumble, and his interest in Rugby remained all his life. He was a keen supporter of his old school F.P. team (Glasgow High School) and attended the matches faithfully on Saturday afternoons religiously wear-

ing his "old school tie." Murrayfield also engaged his attention when the internationals were on. He was also very keen on golf. Apart from playing on his own course, he was for many years a member of the Glasgow Medical Golf Club and attended steadily during that time. Curling in the Glasgow rink claimed his attention when it was possible, and he was very keen, not only for the game, but because he also met his friends. He liked company and was a member of several medical dining clubs. Not only did he enjoy his meal, but his ability as an after-dinner speaker was greatly in demand. He replied to many different toasts in his usual pawky and subtle manner, not forgetting to mix grey matter with humour and often introducing a Latin quotation. As a man he was a kindly, erudite family doctor who was not only sympathetic with his patients as regards their health but also was a great help in private problems. As such, his passing, while being a great loss to his patients and the community, will be keenly felt by his large circle of friends.

Dr. J. W. WILSON, who had been in general practice at Stirling since 1925, died in Edinburgh on December 31, 1954, at the age of 59. John Wight Wilson was born on April 4, 1895, and was educated at Glasgow University. As an undergraduate he left his medical studies in 1914 to serve with the Highland Light Infantry in the first world war, and saw active service as a combatant officer in France and Mesopotamia. He returned to Glasgow after the war, and, after graduating M.B., Ch.B. in 1922, held house appointments for the next eighteen months at the Western Infirmary and the Royal Maternity Hospital. He then spent a year as an assistant at Cumnock, Ayrshire, before moving in 1925 to Stirling, where he was successively assistant, partner, and, later, senior partner in a general practice. In 1936-7 he was president of the Stirling Branch of the British Medical Association. In 1926 he married Miss Catherine A. S. Blair, who graduated M.B., Ch.B. with him in 1922.

W. B. G. A. writes: For 30 years Dr. Wilson's work in Stirling was characterized by an integrity and a thoroughness which were based on a very lively Christian faith. In addition to the work of a large practice he made time and found the strength to give assistance to the Boys' Brigade, and, when need arose, to the Home Guard and the Army Cadet Force. In all his work, and to his family, he gave himself to the utmost, never counting the cost. His spirit lives on, and in our memory of him we have a very precious heritage. He leaves a widow, a son in the Royal Navy, and four daughters, all of whom are in work having some connexion with medicine.

Dr. G. A. WILKES, a well-known Birmingham practitioner, died at his home on January 8 at the age of 84. George Arthur Wilkes was born on July 26, 1870, and was educated at Queen's College, Birmingham, and at Leeds, qualifying M.R.C.S., L.R.C.P. in 1892. Two years later he obtained the D.P.H. of the English Royal Colleges. In 1901 his name appeared in the first list of recipients of the M.B., B.Ch. degrees granted by the newly founded Birmingham University, and he was awarded an Ingleby Scholarship and the senior medical prize. In the following year he proceeded to the M.D. He held the appointment of resident surgical dresser at Queen's Hospital, Birmingham, and was in practice at Bradford, Yorkshire, for a short time before returning to Birmingham some three years before the turn of the century. At Trinity Road, Aston, he quickly established himself as an outstandingly good doctor, and later he added to his work by becoming medical officer and public vaccinator for Aston Manor, medical officer to the Post Office and to the Birmingham Fire Brigade, and police surgeon. Becoming increasingly troubled by deafness, he retired from practice about ten years ago. He leaves a widow, a son who is also in general practice, and a daughter.

We are indebted to Dr. H. GUY DAIN for the following appreciation: With the passing of George Arthur Wilkes, Birmingham loses one of her notable and oldest doctors.

A product of the Birmingham Medical School in the days before the University had come into being, he started practice with the Conjoint qualification in 1892. Although he soon attracted a good general practice, he had the energy to take a D.P.H. and, when they became available, to work for and to take the M.B., B.Ch. degrees of Birmingham and, later, the M.D. in 1902. He took a great interest in medical affairs and in the British Medical Association, holding office as chairman of the Birmingham Central Division from 1916 to 1918. In 1923-4 he was president of the Birmingham Branch. As a member of the local medical and panel committee for many years, he became chairman in the early years of National Health Insurance. He showed the same interest in the academic side of medicine and was president of the Midland Medical Society. He was a sound clinician, and his opinions on cases, or on medico-political problems, were always well considered and showed good judgment. These opinions could be forcibly expressed. He once said that the smallest object that a person should be allowed to put in his ear was his elbow. Perhaps it is hardly necessary to say that he could hold his opinions very firmly in debate. Off duty he enjoyed, until late years, his game of golf, and a game of bridge was always an attraction. During the last war, after an operation which was followed by very dangerous conditions, he made a good recovery and came up smiling to enjoy his retirement.

Mr. L. A. KEY died suddenly at his home at Ascot on January 9 at the age of 55. Leonard Arthur Key was born at Norwich on December 15, 1899. He received his early education at the local grammar school and then served as a midshipman in the R.N.V.R. in the first world war. He went to Cambridge in 1918 and completed his medical studies at St. Thomas's Hospital, qualifying with the London conjoint diploma in 1925. Following a year's appointment as house-surgeon at the East Surrey Hospital, Redhill, he entered general practice at East Grinstead. During 1932 indifferent health, undoubtedly caused by the fact that he never spared himself in the interest of his patients, forced him to take up a less strenuous branch of medicine, and following a year with the late Sir Henry Gauvain at the Lord Mayor Treloar Orthopaedic Hospital, Alton, he developed a great interest in bone and joint tuberculosis and entered the L.C.C. health service in 1934. While in this service he became deputy medical superintendent of Queen Mary's Hospital for Children, Carshalton, and in 1947 was appointed medical superintendent of Heatherwood Orthopaedic Hospital, Ascot. During this time he wrote several papers on bone and joint tuberculosis affecting the hip and knee.

The following appreciation has been jointly written by several colleagues of Mr. Key: At Heatherwood Mr. Key's wide knowledge of medical administration, combined with a sound and broadly based judgment, enabled him to guide the development of the hospital from the treatment only of long-term bone and joint tuberculosis to its present function as a regional orthopaedic centre. The original conception was largely his own, and he worked quietly, tactfully, and unswervingly towards that end. He was a member of the regional orthopaedic committee and was able extensively to influence both policy and detail, always modestly but with clear-sighted and lucid argument. Modern advances in prevention and treatment of tuberculosis reduced his chosen field of work, and, moving with the times and in company with his hospital, he gained the F.R.C.S.Ed. in 1949, and extended his clinical activities into the general range of orthopaedic surgery. He was particularly interested in the problems arising from poliomyelitis, and many young people will walk through life more effectively for having passed through his patient hands. His approach to an orthopaedic problem combined the outlook of a research worker with that of a clinician. Careful dissection in the anatomy school, discussion with colleagues, examination of many cases, critical perusal of current literature, all led to a logically reasoned opinion

and an operation planned in detail beforehand and executed with thought and skill. He gave great encouragement to his registrars and had a way of teaching that was most discreet. No young man could work with him without thereby improving his surgery or realizing that he had a friend with his welfare at heart.

Dr. FRANK BODMAN writes: In your obituary of the late Dr. Elizabeth Casson (*Journal*, January 1, p. 48) no mention was made, among her manifold medical interests, of her membership of the Faculty of Homoeopathy. Dr. Casson joined the British Homoeopathy Society in 1927 and applied the principles of homoeopathic medicine in the medical treatment of her psychiatric patients with considerable success. As late as last summer she made a valuable contribution to a discussion at the British Homoeopathic Congress on homoeopathy and geriatrics, based on many years' clinical experience. She had been a fellow of the Faculty for some years.

Medico-Legal

DEATH FOLLOWING OBLIVON AND NEMBUTAL

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

On November 26, 1954, Frank Ronald Preston, aged 23, died after taking about 20 "nembutal" tablets and about 9 "oblivon" capsules.

The post-mortem examination was carried out on the same day by Dr. W. K. Taylor, who found gross oedema and venous congestion of the lungs. A striking feature of the abdomen was the presence of intense venous congestion, causing marked distension of the veins. Dr. Taylor gave the cause of death as acute pulmonary oedema and cardiac failure consistent with narcotic poisoning, pulmonary oedema being sometimes caused by the barbiturates.

The deceased's stomach and duodenal contents, small intestine and caecum, liver, kidneys, and spleen, together with a portion of the lung and a sample of the urine, were sent to the Metropolitan Police Laboratory, where they were examined by the director, Mr. L. C. Nickolls, F.R.I.C. He identified the presence of methylpentynol in quantity equivalent to about 9 oblivon capsules, and about 7½ gr. of a barbiturate the identity of which he could not completely confirm because of the small quantity present, but which he thought to be nembutal.

At the inquest held at Godalming on December 13, 1954, in answer to the coroner, Dr. J. M. Robertson, Mr. Nickolls said in evidence that, while the amounts of oblivon and barbiturate present were not in themselves sufficient to cause death, it had been shown that the two were synergic in action and that similar amounts together had proved fatal. Oblivon was an acetylene alcohol which it was not desirable to take together with barbiturate. The result was similar to that of alcohol and barbiturates taken together.

An open verdict was recorded, the coroner finding that there was insufficient evidence to show why or under what circumstances the oblivon and nembutal had been taken.

SURGEON SUES DOCTOR FOR FEES

Judgment by consent for £183 15s. and costs was entered for a gynaecological and obstetric surgeon in the Queen's Bench Division on January 20 when he sued a doctor for fees alleged to be owing in respect of professional services to the doctor's wife. She died on November 30, 1952, aged 53. The surgeon claimed £265 2s. 6d., which he alleged was owing in respect of professional services up to November, 1952. The husband was sued as executor of his wife's estate. The three people had first met in Berlin before coming to Britain.

The defence was that it was a medical custom for doctors not to charge each other for professional services. There

was said to be an agreement between the surgeon and the doctor's wife that the treatment should be free; and the defence claimed that the fees were excessive and that the surgical operation on the defendant's wife was performed without the defendant's authority and unskillfully. The surgeon denied these allegations.

The doctor's wife consulted the surgeon in November, 1950, and paid him £9 17s. 4d. She never paid anything for subsequent treatment, and the plaintiff did not ask for payment because he did not wish to embarrass her financially, preferring to wait until she was better placed. She was separated from her husband. The surgeon said in evidence that on November 18, 1952, the patient telephoned him, and on examining her he discovered a growth. He decided that an operation was necessary. She refused to go into hospital and said she would prefer to go into a nursing-home under his care, despite the extra expense. She refused to have a second opinion. The surgeon said that when he saw the doctor on December 3, 1952, he did not complain about the treatment nor did he say it was wrong to operate. Later the doctor told him he was surprised at the amount of the fees.

Cross-examined, the surgeon agreed that there was a wide practice among medical men not to charge each other for professional services, but it was not a binding practice. During the cross-examination the defendant received advice from his counsel, and after an adjournment the surgeon agreed to accept judgment for £183 15s. and costs against the doctor. The doctor withdrew unreservedly the allegations of negligence and want of skill, and was satisfied that plaintiff did everything that could be done.

The judge said he could well understand that the surgeon had to fight the case and bring these proceedings. He also thought the doctor had acted wisely having heard what the surgeon had to say, in recognizing that there was no foundation for the allegations.

Vital Statistics

Influenza

Influenza deaths in the 160 great towns of England and Wales increased from 102 in the preceding week to 134 in the week ending January 15. All regions showed increases except the southern, south-western, and Wales, the figures for which remained practically the same. 86.6% of the deaths were of people aged 55 and over and 70% of people aged 65 and over. There is little change in the situation. Many of the outbreaks are due to virus-B influenza, though isolated cases of virus-A infection have been reported in the midlands and Wales. On the whole the prevalence of influenza seems to be waning in many areas and spread elsewhere to be slow.

Record Low Infant Mortality

Provisional figures for England and Wales in 1954 show that the infant mortality rate for the year was the lowest ever recorded. There were 17,098 deaths of children under 1 year of age, giving a rate of 25.5 per thousand related live births. This rate compares with 26.8 in 1953, 27.6 in 1952, 29.7 in 1951, and 52.8 in 1938. Infant deaths in the December quarter numbered 4,067, giving a rate of 25.3. This also is a record figure for a fourth quarter, the previous lowest rate for that quarter being 26.2 in 1953. The total deaths numbered 501,878, giving a rate of 11.3 per thousand population, compared with rates of 11.4 in 1953 and 11.3 in 1952.

There were 16,130 stillbirths, giving a rate of 24.0 per thousand total live and stillbirths. This was higher than the rates for 1953 and 1952 of 22.5 and 22.7 respectively.—Registrar-General's *Weekly Return*, No. 2 (H.M.S.O.).

Week Ending January 15

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 465, whooping-cough 1,769, diphtheria 14, measles 7,800, acute pneumonia 1,121, acute poliomyelitis 22, dysentery 402, paratyphoid fever 2, and typhoid fever 3.

Infectious Diseases

The chief feature of the returns of the notifications of infectious diseases in England and Wales during the week ending January 8 was the large increase of 1,065 for measles, from 8,320 to 9,385. The only other variations of note were a fall of 244 for scarlet fever, from 707 to 463, and a rise of 69 for whooping-cough, from 1,722 to 1,791.

The largest rises in the incidence of measles were 331 in Lancashire, from 2,510 to 2,841, 269 in Yorkshire West Riding, from 703 to 972, 127 in Nottinghamshire, from 215 to 342, and 117 in Cheshire, from 396 to 513, and the largest fall was 54 in Warwickshire, from 327 to 273. No large fluctuations were recorded in the local trends of whooping-cough. The largest decrease in the number of notifications of scarlet fever was 36 in Yorkshire West Riding, from 75 to 39, 13 cases of diphtheria were notified, being the same number as in the preceding week.

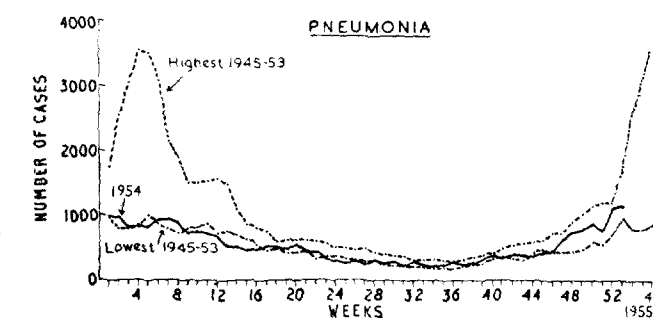
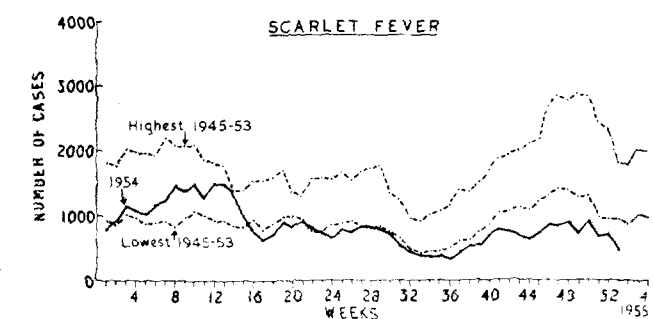
25 cases of acute poliomyelitis were notified: these were 1 more for paralytic and 1 more for non-paralytic cases than in the preceding week. The largest returns were Lancashire 6 (Liverpool C.B. 4, Manchester C.B. 2) and London 4.

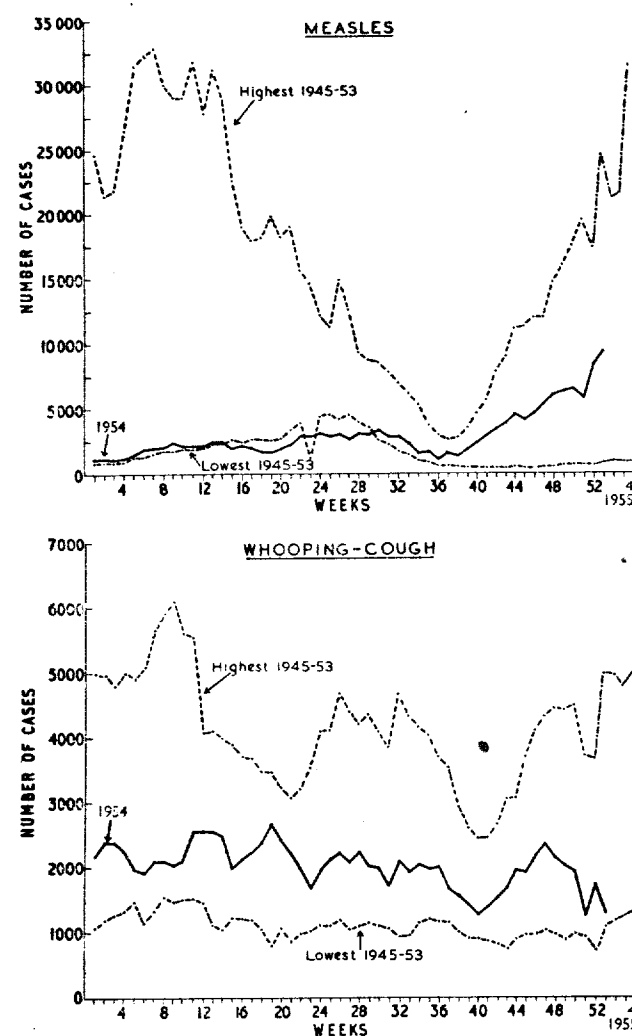
346 cases of dysentery were notified, being an increase of 6 on the total of the preceding week. The largest centres of infection were Norfolk 60 (Norwich C.B. 35), Lancashire 48 (Oldham C.B. 14), Yorkshire West Riding 43 (Sheffield C.B. 18, Leeds C.B. 11), Cheshire 32 (Marple U.D. 10), Lincolnshire 26 (Scunthorpe M.B. 24), and London 20.

102 deaths were attributed to influenza in the great towns, 20 more than in the preceding week. The largest return was 7 from Exeter C.B.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus ————, the figures for 1954 thus ————. Except for the curves showing notifications in 1954-5, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.





Infectious Diseases in 1954

The incidence of infectious diseases in England and Wales during 1954 was low, and for most of the diseases the number of notifications was the lowest in recent years. The chief exception was dysentery. The number of notifications of this disease was a record, being 15% above the previous high level of 1951. The number of notifications of typhoid and paratyphoid fever, although low, was in excess of the number in 1950 and 1953. The number of notifications of diphtheria was the lowest ever recorded, and was only 1/84 of the number in 1938. The notifications for the past five years were as follows:

England and Wales	1950	1951	1952	1953	1954
Scarlet fever	66,852	49,431	69,091	61,578	43,388
Whooping-cough	157,714	169,394	116,311	157,772	105,628
Measles	366,116	615,332	400,838	534,020	147,076
Acute poliomyelitis	8,699	3,093	4,504	5,251	2,388
Diphtheria	2,858	1,969	1,473	1,022	778
Meningococcal infections	1,745	1,956	1,687	1,783	1,569
Dysentery	18,135	29,488	15,665	19,540	33,976
Acute pneumonia	30,714	43,181	31,403	37,058	26,750
Enteric fevers	654	1,438	1,190	569	751
Great towns: Influenza deaths			996	3,381	947

Smallpox in France

Up to January 14, 44 cases of smallpox had been reported in the Vannes area, including 5 deaths (6 according to press reports).

INFECTIOUS DISEASES AND VITAL STATISTICS
Summary for British Isles for week ending January 8 (No. 1) and corresponding week 1954.

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

CASES in Countries and London	1955					1954				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	13	2	1	0		21	1	10	1	
Dysentery	346	20	192	22	8	322	75	151	1	21
Encephalitis, acute	1	0	0	0		2	0	0	0	
Enteric fever: Typhoid	4	0	0	0	1	2	0	0	2	
Paratyphoid	4	2	1	0	0	1	0	2	0	
Food-poisoning	124	37		1		141	10		0	
Infective enteritis or diarrhoea under 2 years		3		17	12				9	2
Measles*	9,385	1,004	228	434	101	1,134	13	24	24	12
Meningococcal infection	17	2	24	0	2	29	3	19	0	
Ophthalmia neonatorum	28	2	5	0		32	1	4	0	
Pneumonia†	1,135	75	330	1	1	994	51	454	11	
Poliomyelitis, acute: Paralytic	22	3	1	4	1	35	4		7	3
Non-paralytic	3	1			2	9	2			
Puerperal fevers‡	245	48	13	0		212	29	12	1	
Scarlet fever	463	47	113	41	35	792	47	198	31	
Tuberculosis: Respiratory	642	65	89	9		608	71	113	18	
Non-respiratory	107	8	19	1		92	8	11	4	
Whooping-cough	1,791	120	140	37	22	2,156	83	347	33	

DEATHS in Great Towns	1955					1954				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	0	0	0		0	0	0	0	0	0
Dysentery	1	0		0		0	0		0	
Encephalitis, acute		0			0		0			0
Enteric fever	0	0	0			0	0	0	0	
Infective enteritis or diarrhoea under 2 years	12	0	1	1	2	10	2	1	0	3
Influenza	102	7	5		1	42	2	4	0	0
Measles	0	0	0	0	0		0	0	0	0
Meningococcal infection	0	0	0				1	0		
Pneumonia	417	70	36	10	5	385	56	36	10	5
Poliomyelitis, acute	4	1			0	1	0	1		0
Scarlet fever	0	0	0	1			0	0	0	0
Tuberculosis: Respiratory	91	14	12	2	4	129	15	20	5	7
Non-respiratory		0	1	0	1		1	1	1	2
Whooping-cough	2	0	0	1	0	1	0	1	0	0
Deaths 0-1 year	240	41	38	9	15	270	26	54	11	11
Deaths (excluding stillbirths)	6,827	978	775	128	196	6,811	909	774	123	175
LIVE BIRTHS	7,645	1,087	1,043	224	319	7,821	1,115	1,198	256	451
STILLBIRTHS	219	11	31			201	20	31		

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

Medical News

Princess Louise Children's Hospital.—Medical staff of the Princess Louise (Kensington) Hospital for Children are expected to oppose a recommendation to the board of governors of St. Mary's Hospital that the Princess Louise Hospital should ultimately be converted entirely to adult use. This recommendation is made by a committee appointed by the board of governors to review the services provided by the St. Mary's Teaching Hospital Group. The committee argues that the proportion of children's to adult beds in the group is too high, especially in view of the long waiting-list for adult admissions. The adult waiting-list stands at over 1,600, while that for children was 235 at the beginning of this month, and of these 159 were E.N.T. cases. This disproportion, according to the committee, reflects the notable downward trend throughout the whole country in the demand for hospital accommodation for sick children. There is also the successful start of the experiment in the home care of seriously ill children to be taken into account. The committee suggests as a beginning the temporary conversion of two wards at Princess Louise Hospital to make room for maternity cases from St. Mary's while alterations are being made there to accommodate the new obstetric unit. Earlier the committee recommended the conversion of the Paddington Green Children's Hospital, but now think it simpler to convert the Princess Louise Hospital.

Rockefeller and Dorothy Temple Cross Fellowships.—The Medical Research Council invites applications for the following travelling research fellowships for the academic year 1955-6. Full details and application forms, which must be returned not later than March 15, are obtainable from the Council's headquarters office at 38, Old Queen Street, London, S.W.1.

Rockefeller Travelling Fellowships in Medicine.—These fellowships are intended for graduates resident in Britain with some previous research training in either clinical medicine or one of the basic medical sciences who are likely to benefit from a period of work at a centre in the United States or elsewhere abroad before taking up teaching or research positions in the United Kingdom. Maintenance allowances for fellowships in the United States are normally at the rate of \$2,700 per annum for a single fellow and \$3,900 per annum for a married fellow. Provision is also made for travelling and other approved expenses.

Dorothy Temple Cross Research Fellowships in Tuberculosis.—These fellowships are intended to provide special opportunities for study or research to suitably qualified British subjects "intending to devote themselves to the advancement by teaching or research of curative or preventive treatment of tuberculosis in all or any of its forms." Maintenance allowances are at the rate of £650 per annum for a single fellow and £900 per annum for a married fellow, subject to adjustment for fellows working at centres outside the sterling area. Provision is also made for travelling and other approved expenses.

Lady Tata Memorial Trust.—The trustees invite applications from suitably qualified investigators of any nationality for grants, scholarships, or fellowships for research on leukaemia and allied conditions in the academic year 1955-6. Candidates with programmes of research on any aspect of malignant disease which may throw incidental light on problems of leukaemia will be eligible for consideration. Full details and forms of application (to be returned before March 31) may be obtained from the secretary of the (European) Scientific Advisory Committee, Lady Tata Memorial Trust, 38, Old Queen Street, London, S.W.1.

Grants are available for research expenses or to provide scientific or technical assistants for senior workers. Scholarships (£600 per annum for whole-time research, with proportional adjustment for part-time work) are awarded for the personal remuneration of workers carrying out approved research under suitable direction. In addition one or more Lady Tata Memorial Research Fellowships (£1,000 per annum) may be awarded to workers with considerable research experience.

N.A.P.T. Scholarships.—The National Association for the Prevention of Tuberculosis offers a Hunter scholarship of £350 to enable a graduate of a British medical school who qualified between the years 1936 and 1951 inclusive to study tuberculosis abroad. The association also offers two Hunter scholarships of £150 each for medical students who have developed tuberculosis during their studies. Full details from N.A.P.T., Tavistock House North, Tavistock Square, London, W.C.1. The last date for applications is February 28.

Royal College of Surgeons.—At the council meeting on January 13 Dr. G. J. CUNNINGHAM, senior lecturer in morbid anatomy and histology at St. Bartholomew's Hospital, was appointed Sir William Collins Professor of Human and Comparative Pathology in the College. Dr. JOHN VANE was appointed senior lecturer in the department of pharmacology.

College of General Practitioners.—The Scottish Council of the College of General Practitioners was constituted at a meeting held in Edinburgh on January 13. The members of the Council are: Drs. D. PEEBLES BROWN (Kilmalcolm), MARY ESSLEMONT (Aberdeen), C. M. FLEMING (Edinburgh), W. W. FULTON (Glasgow), W. S. GARDNER (Glasgow), I. D. GRANT (Glasgow), J. M. HENDERSON (Pitlochry), G. W. IRELAND (Pathhead), LOWELL LAMONT (Edinburgh), K. A. MACKAY (Laggan), T. S. McDONALD (Glasgow), J. G. MUNRO (Beaulieu), DAVID MYLES (Forfar), R. A. B. RORIE (Dundee), C. S. SANDEMAN (Duness), RICHARD SCOTT (Edinburgh), J. A. SHEARER (Bucksburn), J. M. STALKER (Dundee), GEORGE SWAPP (Aberdeen). The office bearers appointed were: Dr. J. M. HENDERSON (Chairman), Dr. LOWELL LAMONT (Vice-chairman), Dr. RICHARD SCOTT (Honorary Secretary and Treasurer). The Scottish Office of the College is situated at Livingstone House, 39, Cowgate, Edinburgh, 1.

Refresher Courses for School Medical Officers.—In a memorandum to local education authorities (No. 489, dated January 19), the Minister of Education draws attention to the Postgraduate Medical Federation's refresher courses for general practitioners. "The Minister," says the memorandum, "is prepared to consider for grant expenditure incurred by local education authorities on enabling school medical officers to attend the refresher courses, provided that it is allowed by the district auditor at audit." Details of the courses may be obtained from the Postgraduate Medical Federation, 3, Gordon Square, London, W.C.1.

British Association of Plastic Surgeons.—At the annual general meeting in December the following officers and council were elected for 1955: President, Professor T. POMFRET KILNER (Oxford) (previously president in 1948); hon. treasurer, Mr. R. P. OSBORNE (Liverpool); hon. secretary, Mr. J. P. REIDY (London); council, Mr. J. N. BARRON (Salisbury), Mr. W. HYNES (Sheffield), Mr. P. H. JAYES (London), Mr. D. N. MATTHEWS (London) (immediate past-president), Mr. RAINSFORD MOWLEM (London), Mr. MORTIMER SHAW (Leeds), Mr. J. S. TOUGH (Glasgow), and Mr. A. B. WALLACE (editor) (Edinburgh).

Research on Cerebral Palsy.—The Nuffield Foundation has made grants totalling £17,500 to support a 5-year programme of research at Frenchay Hospital, Bristol, into the neuropathology of cerebral palsy and mental defect. The work is sponsored by the South-Western Regional Hospital Board and the Burden Mental Research Committee, as part of their programme of investigations on mental deficiency, and will be directed by Dr. R. M. NORMAN, lecturer in neuropathology at Bristol University, assisted by Dr. H. URICH. It is intended to examine the brains of those dying from cerebral palsy whose early history and clinical features have been adequately recorded, and a new laboratory is being equipped for this purpose. It is hoped that, when the new laboratory is in operation, material will be sent for detailed neuropathological examination not only from local hospitals but also from hospitals in other regions.

Hull Phonodiary.—Last year (October 2, p. 807) we gave the text of a gramophone record on cancer which was made available to the public over the Hull telephone system. A second record has now been prepared dealing mainly with the method of treatment and the aftercare of cancer patients. The first record resulted in over 5,000 telephone inquiries, at the rate of about 400 a week. This experiment in cancer education is sponsored by the Marie Curie Memorial Foundation.

Family Doctor.—The February issue tells readers how to avoid 'flu and what to do if they do get it. A new departure is headed "*Family Doctor* brings you a chance to listen in." This is selected extracts from a recent article in the *Practitioner*. The idea behind the title is that in the medical journals doctors write for each other, but sometimes they say things "that parents would like to overhear." The subject of the article is "Health and Normality in Childhood." Other articles include the career profile of a remedial gymnast, "How to tell if it is heart disease" by Professor Walter C. Alvarez, and advice on dysmenorrhoea.

COMING EVENTS

Milroy Lectures.—Dr. J. A. SMILEY will deliver the Milroy Lectures at the Royal College of Physicians, Pall Mall East, on February 8 and 10, at 5 p.m. His subject is "Personal Factors in Accident Proneness."

Fédération Internationale Pharmaceutique.—The sixteenth assembly will be held at the Senate House of London University from September 19 to 23. There will be symposia on "The Pharmacy of Blood, Blood products, and Blood Substitutes," "Recent Advances in Pharmaceutical Analysis," "Ion Exchange," and "Tests for the Sterility of Pharmaceutical Preparations." Fuller details from the secretary of the organizing committee, 17, Bloomsbury Square, London, W.C.1.

NEW ISSUES

British Journal of Ophthalmology.—The new issue (Vol. 39 No. 1) is now available. The contents include:

- OCULAR CHANGES IN ACUTE SYSTEMIC LUPUS ERYTHEMATOSUS. F. Clifton and C. H. Greer.
- SIGNIFICANCE OF CONGENITAL CYCLO-VERTICAL MOTOR DEFECTS OF THE EYES. A. Ureus-Zavalala.
- CORNEAL ULCERATION. SENSITIVITY OF BACTERIA TO ANTIBIOTICS. Tulsi Das, M. L. Sur, and M. R. Chaddah.
- DEGENERATIONS OF THE DOG RETINA. VII. CENTRAL NON-PROGRESSIVE DEGENERATION DUE TO AN ANOMALY OF THE GANGLION CELLS AND THEIR AXONS. H. B. Parry.
- EFFECTS OF COCARBOXYLASE ON THE DEVELOPMENT OF GALACTOSE CATARACT IN RATS. R. Van Heyningen, A. Pirie, and J. Blackwell.
- MULTIPLE MYELOMATOSIS WITH PROPTOSIS. A. Handoussa.
- CONGENITAL ECTODERMAL DYSPLASIA. I. D. R. Gregory.
- UNUSUAL CASE OF MYASTHENIA GRAVIS. J. Lloyd.
- INTRACULAR MAGNETIC AIR-GUN SHOT. V. P. S. Tomar.
- SIMPLIFIED NEAR POINT RULE. J. Foster.
- MEASURING STRABISMUS HOOPS. A. B. Moffat.

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

British Journal of Industrial Medicine.—The new issue (Vol. 12, No. 1) will be available in a week's time. The contents include:

- RESEARCH IN INDUSTRIAL HEALTH IN THE CHEMICAL INDUSTRY. M. W. Goldblatt.
- MANGANESE POISONING IN MOROCCAN MINERS. J. Rodier.
- DERMATOSES IN JUTE WORKERS. John Kinnear, John Rogers, and Alexander Mair.
- TALCOSSIS OF UNUSUALLY RAPID DEVELOPMENT. G. P. Alivisatos, A. E. Pontikakis, and B. Terzis.
- RESPIRATORY TRACT INJURY CAUSED BY CERTAIN ISOCYANATES USED IN PRODUCTION OF LACQUERS. Ake Swenson, Carl-Eric Holmqvist, and Karl-David Lundgren.
- DIMETHYL SULPHATE POISONING. T. R. Littler and R. B. McConnell.
- VANADIUM POISONING FROM GAS TURBINES. R. C. Browne.
- THE TOXICITY OF OZONE IN THE PRESENCE OF OXIDES OF NITROGEN. W. M. Diggle and J. C. Gage.
- THE CONSTRUCTION OF CRITICAL ORIFICES WORKING WITH PRESSURE DROPS OF LESS THAN HALF ATMOSPHERIC PRESSURE AND THEIR USE IN CONTROLLING AIRFLOW. H. A. Druehl.
- THE HEALTH HAZARDS OF THE SENIOR EXECUTIVE. A. R. Cooper.
- THE HEALTH OF THE INDUSTRIAL WORKER IN IRAQ. A. Michael Critchley.

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SOCIETIES AND LECTURES

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

Tuesday, February 1

- BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. E. F. Gale: Actions of Antibiotics on Bacteria.
- INSTITUTE OF DERMATOLOGY.—Fifth of a series of semi-permanent exhibitions from February 1 to 25, by Dr. R. T. Brain, on Vascular Naevi (Haemangiomas).
- ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., clinical meeting.
- ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Mr. A. W. Bourne: "Functional" Uterine Haemorrhage.

Wednesday, February 2

- EDINBURGH CLINICAL CLUB.—4 p.m., visit to Department of Radiotherapy, Edinburgh Royal Infirmary.
- INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Bacteriology of Skin Diseases.
- INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—6 p.m., Professor M. Arslan (Padua): Effects of Ultrasonic Waves on the Ear.
- MIDLAND MEDICAL SOCIETY.—At Birmingham Medical Institute, 154, Great Charles Street, 8.15 p.m., Mr. A. Ruscoe Clarke: Blood Loss and Blood Transfusion in Civilian Trauma.
- OXFORD UNIVERSITY MEDICAL SOCIETY.—At Radcliffe Infirmary, 8.15 p.m., Professor H. A. Krebs, F.R.S.: Role of Biochemical Concepts in Medicine.
- ST. MARYLEBONE HOSPITAL FOR PSYCHIATRY AND CHILD GUIDANCE.—5.30 p.m., Dr. Doris M. Odum: Relationship of Psychiatry to General Medicine.
- YORKSHIRE SOCIETY OF ANAESTHETISTS.—At General Infirmary at Leeds, 8.30 p.m., Dr. G. S. W. Organe: Abuse of Tracheal Intubation.

Thursday, February 3

- BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor P. B. Medawar: Tissue Transplantation Immunity.
- FACULTY OF HOMOEOPATHY.—At Royal London Homoeopathic Hospital, 5 p.m., Dr. W. Lees Templeton and Dr. C. O. Kennedy: Provinces of A.C.T.H. and Cortisone, Including Investigation of Bowel Flora; Dr. L. R. Twinn: Observations on Isoscor Treatment of Cancer.
- INSTITUTE OF PSYCHIATRY.—5 p.m., Professor H. J. Eysenck: Psychology and the Foundations of Psychiatry.
- LIVERPOOL MEDICAL INSTITUTION.—8 p.m., Dr. V. K. Summers: Syndrome of Hypothyroidism; with a note on radioactive iodine tracer studies by Dr. W. Kulke.
- NUFFIELD ORTHOPAEDIC CENTRE.—At Wingfield-Morris Orthopaedic Hospital, 8.30 p.m., Dr. E. G. L. Bywaters: Natural History of Rheumatoid Arthritis.
- ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Professor C. G. Rob: Preservation and Transplantation of Human Blood Vessels (with lantern slides).
- ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.30 p.m., Otolaryngology Lecture by Sir Gordon Gordon-Taylor: Swellings of the Neck and their Management.
- ST. ANDREWS UNIVERSITY.—At Physiology Department, Medical School, Small's Wynd, Dundee, 5 p.m., Dr. T. Anderson: Unwanted Effects of Chemotherapy.
- ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Sir Paul Mallinson: psychiatry demonstration.

Friday, February 4

- INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. P. J. Harc.
- INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Mr. V. C. Thompson: Tumours of the Lung—II.
- LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—6.30 p.m., Dr. J. A. Scott: Health.
- POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Professor R. E. Tunbridge: Clinical and Histochemical Study of some of the Disorders of Connective Tissue.
- ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Mr. J. Sloan M. Robertson: Paralysis as a Surgical Problem.
- ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., Sir James Learmonth: Some Aspects of Surgery Elsewhere.
- WHIPPS CROSS HOSPITAL MEDICAL SOCIETY.—8.30 p.m., Mr. B. Fairburn: Surgical Treatment of Cerebral Vascular Catastrophes.

Saturday, February 5

- INSTITUTE OF ORTHOPAEDICS.—February 5 and 6, week-end course for Registrars.
- MIDLAND TUBERCULOSIS SOCIETY.—At Birmingham Chest Clinic, 3 p.m., Mr. D. M. E. Thomas: Surgical Treatment of Primary Tuberculosis.

APPOINTMENTS

- LONG, M. C. W., M.B., B.S., Deputy Treasury Medical Adviser.
- MUNKO, T. A. H., M.D., F.R.C.P.Ed., D.Psych., Physician Superintendent, Royal Edinburgh Hospital for Mental and Nervous Disorders, as from November, 1954.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

- Lynn.—On January 15, 1955, to Constance, wife of Dr. C. R. Lynn, of 25, Elgin Avenue, Harold Park, Essex, a son—Jonathan.
- Weber.—On December 29, 1954, at St. Bartholomew's Hospital, London, E.C., to Rosalie, wife of Dr. G. N. Weber, a son—Jonathan Norden.

DEATHS

- Morton.—On January 3, 1955, in London, Harold James Storrs Morton, M.D., of Brinkley, Newmarket, Suffolk, formerly of Bridlington, Yorks, and St. John's Wood, London, N.W., aged 68.
- Rickard.—On October 4, 1954, at "The Firs," Simons Town, South Africa, Cecil Rodney Rickard, M.R.C.S., L.R.C.P., Surgeon Captain, R.N., retired.
- Smith.—On January 4, 1955, at St. Andrews, John Alfred Macdonald Smith, M.B., F.R.C.S.Ed., late of Kalimpong, Bengal, India.
- Stevenson.—On January 3, 1955, Charles Stanley Stevenson, M.B., Ch.B., of Felix House, Middleton St. George, Co. Durham.
- Taylor.—On January 6, 1955, at Downs Cottage, 76, Northwood Road, Tankerton, Kent, Frederic Cecil March Taylor, M.R.C.S., L.R.C.P., D.P.M., aged 55.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Vaccination in Pregnancy

Q.—Is pregnancy a contraindication to the revaccination of a woman (successfully vaccinated as an infant) who now wishes to go abroad? Is primary vaccination contra-indicated?

A.—Vaccination is often stated to be harmless to both the pregnant woman and her foetus. However, MacArthur,¹ who analysed the results of a questionnaire from the West of Scotland, concluded that vaccination during the first trimester of pregnancy increased the risk of abortion; damage to the foetus did not occur after vaccination in the later months. Notwithstanding these findings, severe vaccinia, like any other acute infection, might endanger the foetus at any stage of development. It would seem wise, therefore, not to vaccinate during pregnancy unless there is a likelihood of exposure to smallpox, or good reason to expect the development of a vaccinia or an immediate reaction rather than a typical primary "take." The decision in the present case depends on circumstances; the risks of revaccination after the third month of pregnancy are certainly not great, and postponement of vaccination till after the patient's confinement may not be feasible. Primary vaccination in pregnancy is more likely than revaccination to endanger the life of the foetus. Nevertheless, in the face of smallpox, all vaccination risks must be accepted.

REFERENCE

¹ *Lancet*, 1952, 2, 1104.

Treatment of Hypogonadism

Q.—A man of 30 with slight hypogonadism has been treated for three months with methyl testosterone, 100 mg. a day, with some success. Is there any danger in this treatment? Is further improvement likely if treatment is continued? To what extent can the improvement be expected to be maintained without further treatment?

A.—In my experience eunuchs can be maintained on a dose of only 25 mg. of methyl testosterone daily, so that a dose of 100 mg. daily for a person with slight hypogonadism seems somewhat high. A daily dose of 100 mg. is unlikely to inhibit pituitary function, but it may cause slight oedema as a result of salt and water retention; this disappears on cessation of therapy, so there is no real danger in this treatment. Improvement in hypogonadism treated with testosterone occurs over a period of six to nine months or more depending on the gravity of the condition. As therapy is merely a replacement of a deficiency, relapse can be expected if treatment is stopped.

Technique of Artificial Insemination

Q.—Could you please give me, briefly, the technique for artificial insemination?

A.—Artificial, or what is better termed therapeutic, insemination can be carried out in various ways. All of them are done at what is judged to be the ovular phase of the menstrual cycle. Intracervical insemination is the commonest technique. To perform this, the cervix is exposed with a speculum and the seminal fluid injected into the cervical canal by means of a suitable syringe and cannula. For intrauterine insemination, the cannula is passed through the internal os and about 0.25 ml. of semen injected into the uterine cavity. After the injection the woman should remain with her legs together and her pelvis slightly elevated for 10 to 30 minutes. A further alternative is to place a

cervical cap, into which the seminal fluid has been introduced, over the cervix, where it remains for 12 hours, the woman having been instructed to remove it at the end of this time.

Where, by reason of impotence or through some mechanical cause, it is impossible for the husband to ejaculate deeply within the vagina, the technique of "self-insemination" may be recommended. For this, the husband produces semen by masturbation into a clean dry glass jar at the ovular phase of the cycle. The seminal specimen is taken up into a special self-insemination syringe (designed by Dr. Joan Malleon and supplied by Messrs. Allen and Hanburys) which the wife then inserts into the vagina to its full extent. By pressing home the plunger the semen is deposited in the place where effective coitus would have left it. If necessary, a non-greasy and non-spermicidal lubricant should be applied to the outside of the syringe before it is inserted. After use, the syringe should be washed in warm soapy water and dried. Sterilization is unnecessary.

Transfusion Problems in a Small Hospital

Q.—Working in a small maternity hospital, I am required occasionally to give blood transfusions. Only group O blood (Rh positive and negative) is stocked here. Group B and group AB blood are almost impossible to obtain. Group A blood is kept at a neighbouring hospital; if this is used it often results in wastage of group O stock. The cross-matching technique is extremely primitive; patient's serum, donor cells from the bottle, and normal saline are mixed and left for 15 minutes on a slide. There is no incubator available. Will you therefore please answer the following questions? Is the risk of incompatible transfusion materially increased by the giving of group O blood to patients of other groups? Is it justifiable to use group O blood to avoid wastage in a small blood bank? Does previous childbirth or transfusion affect the issue? (It is realized that the correct Rhesus type must be used.) Is a cold saline cross-match considered adequate for non-urgent transfusion?

A.—The administration of group O blood to patients of other groups does not, as a rule, give rise to haemolytic reactions. In rare cases—for example, when half or more of the recipient's blood is replaced by group O blood—a reaction may occur; and if the donor has α or β haemolysins in his serum (as occurs after injection of concentrated antibody globulins) these lysins may destroy the recipient's cells.

The exclusive use of group O blood was probably arranged as the least dangerous procedure for a small unit with an "occasional transfusionist" in charge. It has been shown that haemolytic reactions usually result from blunders in ABO grouping by inexperienced or excited workers, or by confusion between two patients of similar name but different ABO group. If this source of error is eliminated, one is left with Rhesus antibodies and the host of irregular antibodies reacting with the antigens M, N, S, P, K, k, Fy^a and Fy^b and others, all of which antibodies are rare; apart from the common Rhesus antibody anti-D, the frequency of irregular antibodies is of the order of 1 in 3,000 recipients; the risk of such an antibody causing a haemolytic reaction is of this order, comparable with the incidence of haemolytic transfusion reactions without demonstrable cause.

Previous childbirth or transfusion makes such antibodies a little more frequent. The frequency of anti-D is, of course, greatly increased by pregnancy or Rh-incompatible transfusion, but the other antigens are weak and rarely initiate the production of antibodies; if one is concerned only with urgent transfusions it is reasonable to subject the patient to this approximately 1 in 3,000 risk of a haemolytic reaction. Even if a reaction does occur, the risk of death is only about 1 in 15, so the overall risk is about 1 in 45,000—a risk far less than that incurred by leaving an exsanguinated patient for two or three hours. Even so, many transfusions can be avoided by the free use of dextran.

There is some argument about the standard of cross-matching which should be adopted for non-urgent transfusions. The expert can use almost any method he likes with safety, but the occasional transfusionist should adopt one of the standard tube methods, since he is less likely to make mistakes with them than with any other. I would suggest a cross-match in saline at about 20° C. (room temperature) and by the Sheffield technique in albumin, at 37° C. A 37° C. incubator and a small centrifuge are essential, and no adequate blood grouping can be done without them. The recommended procedure is:

Place two tubes in each of two racks, labelling one of each pair "test," the other "control." Into each "test" place 3 drops of recipient's serum, into each "control" 3 drops of saline.

Into each tube place 3 drops of an approximately 5% suspension in saline of donor cells which have been removed from the bottle or pilot bottle with a sterile Pasteur pipette and washed once in saline. Leave one rack at room temperature; place the other in the incubator for 1½ hours. After 1½ hours remove from the incubator without shaking, and remove as much as possible of the supernatant serum and saline; replace it with 6 drops of 20% bovine albumin solution without disturbing the sedimented cells. Return to the incubator for half an hour. At the end of a further half-hour—that is, two hours from the beginning—remove samples from the tubes and examine microscopically.

If the tubes marked "test" show even a few clumps of cells, while those marked "control" show more, then the blood should be regarded as incompatible. A number of samples known to be incompatible should be tried at leisure, using smaller proportions of serum, so that the appearance of incompatibility becomes familiar.

But would it not be possible to send all non-urgent transfusions to a large local hospital or to the regional depot for cross-matching? Were I the writer of this question, I should be extremely worried by the lack of facilities, and one of my first actions would be to ask the regional transfusion director to call and advise me on the best use of the facilities which were available. It is definitely not justifiable for an "occasional transfusionist" to use a saline tile cross-match method for "non-urgent" transfusions.

Atropine and Neostigmine after Relaxants

Q.—It is customary when counteracting relaxants at the end of an operation to give intravenous atropine some minutes before intravenous neostigmine. Is there any experimental evidence to suggest that the speed of action of these two drugs is in fact different, so that they may not be given together?

A.—The practice of administering atropine some 10 minutes before neostigmine, when reversing the effects of a curare-like drug, is an attempt to avoid the coincidence of any initial bradycardia due to atropine and the bradycardia due to neostigmine. It is certain that a brief bradycardia generally precedes tachycardia when atropine is administered hypodermically. But there is some doubt whether this happens when the drug is injected intravenously. Indeed, one author¹ is emphatic that it does not. There is therefore some experimental evidence to suggest that the danger of giving atropine and neostigmine together is not a great one.

Any difference in the speed of action between atropine and neostigmine is probably not an important consideration in this connexion, since both take about five minutes to reach their maximum effect when given intravenously.^{1,2}

REFERENCES

- ¹ Hunter, A. R. (1953). *British Medical Journal*, 1, 640.
- ² Shearer, W. M. (1951). *Anaesthesia*, 1951, 6, 76.

NOTES AND COMMENTS

Fetishism.—Dr. DORIS ODLUM (London, W.9) writes: I have read with interest the answer to the question on fetishism ("Any Questions?" January 15, p. 178). In the course of the answer, however, it is stated that this appears not to occur in women, but from my own clinical knowledge I can state that in fact it does do so. One of my patients—a woman in the forties of the highest character and a teacher of English—was deeply disturbed by feelings of guilt because she had a definite orgasm whenever she

saw a pair of eye-glasses on a table or in any place where light was reflected on them. She found it a great temptation to put glasses in such a position and from time to time did in fact do so, but her most satisfactory orgasm came when the situation arose by chance. In another case a woman had strong sexual sensations whenever she touched certain types of fur, notably sealskin, moleskin, or squirrel, or when she handled certain types of velvet. In another case orgasm always resulted from the sight of a riding whip or cane, associated with masochistic fantasies. None of these cases was suffering from any kind of emotional disturbance and they were all making a good adjustment to life. I have also known of other cases where the women were happily married and were all well adjusted both to their husbands and children and to life in general. The condition is not necessarily due to any morbid tendency produced by lack of emotional satisfaction, but rather represents an alternative or supplementary form of sexual gratification. I have also had cases where some girl children as well as boys had obvious orgasms when they were sucking a blanket before going to sleep and who insisted on being allowed to suck the blanket before they would settle down at night, and a number of children of both sexes show obvious evidence of rudimentary orgasm when they smack or hug a doll or teddy bear. I have not heard of a case in which a woman has gone so far as to practise fetishism in public, and in the cases that I know of they are extremely loath to speak of it either because they feel guilty about it or because they realize that it would give rise to moral and social condemnation even though they themselves did not feel any guilt. This may be the reason why its existence has not been generally recognized.

Drugs and Fertility.—Mr. HOWARD G. HANLEY (London, W.1) writes: The answer to the question on this subject ("Any Questions?" January 8, p. 118) states, "... there seems good evidence that the sulphonamides in therapeutic doses may suppress temporarily the development of spermatozoa within the testis and so lead to impaired fertility." I have been unable to find the original reference in support of this belief, but have accumulated some evidence to show that it is untrue. I have carefully followed up 21 cases of pyospermia treated with sulphathiazole, "sulphatriad," or "gantrisin" in large and sometimes prolonged dosages, and, although one can expect the sperm motility to improve when the pus cells are cleared, in no case has the count been reduced or impaired in any way. The two cases which have been referred to me as showing reduced spermatogenesis following sulphonamide therapy both gave a clear history of a relatively severe fever (influenza with quinsy; lymphangitis) which necessitated the giving of the sulphonamides, and I suspect that it was the hyperpyrexia or the debility, not the sulphonamides, which were responsible for the temporarily impaired fertility. I also suspect that smoking has been blamed in the same unscientific manner, and whether spermatogenesis can be depressed by nicotine *per se* rather than by the various pathological disturbances attributed to excessive smoking is a debatable point. The opening sentence of the answer to the question contains the crux of the matter. "There have been few, if any (my italics) systematic studies of the effect of drugs on fertility, and consequently knowledge on this subject is scanty."

OUR EXPERT writes: Mr. Hanley's comments may well be quite justified. The first sentence of my answer to which he draws attention was indeed intended to contain the crux of the matter.

Corns Between the Toes.—Dr. C. GUY MILLMAN (Morpeth, Northumberland) writes: May a psychiatrist get down to earth and suggest that animal wool is preferable to the gauze advised in the reply to the question about corns between the toes ("Any Questions?" January 1, p. 56)?

Correction.—In the *Journal* of January 8, p. 111, it was recorded in error that the University of Oxford had granted leave of absence to Professor R. R. Macintosh for three months from January 1, the decree having been withdrawn before Congregation on November 30, 1954.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Atiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: *Britmedads, Westcent, London.* MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association, TELEPHONE: EUSTON 4499. TELEGRAMS: *Medisecra, Westcent, London.* B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 5 1955

MEDICAL SCIENCE AND PROBLEMS OF FLYING*

BY

Sir HAROLD E. WHITTINGHAM, K.C.B., K.B.E., LL.D., F.R.C.P., F.R.C.S.Ed.

Director of Medical Services, British Overseas Airways Corporation

In the development of flying, medical science has played a very important though naturally an unobtrusive part in accordance with the traditions of the profession. It has helped to solve problems in the selection and training of aircrew and of air traffic control personnel, the design of such flying equipment as oxygen systems, goggles and glasses to counteract glare, intercommunication sets to obtain good intelligibility, safety harness and other survival devices, including ejection seats and parachutes. Medical science has also contributed to the interior design of aircraft to promote and conserve efficiency of human performance, in particular pressurization, the lay-out of flight decks and gun-turrets, the shape and position of controls, the presentation of instruments to give the best grouping and siting of the most important of them, and to provide legible dials, together with suitable lighting to facilitate dark adaptation as well as map reading by night. In addition, it has aided the development of equipment to prevent blacking-out in aerobatics, of runway lighting for ease of landing and take-off, and of many other matters such as the design of aircraft seats to promote comfort and lessen fatigue, anti-air sickness remedies, and techniques for disinfecting and disinsecting aircraft.

It is impossible in the space at my disposal to deal with this vast subject, so I shall give a brief review of the part played by applied physiology to war in the air, mainly as it concerned the Royal Air Force. During the first world war the work of Flack,^{41,42} Head,⁵² Birley,¹³ and Bazett¹¹ gave us certain selection tests, which ensured that those who passed were alert in body and mind, had accurate vision, good muscle tone, quick reaction time, and a proper sense of balance. These tests did not predict the individual's aptitude to learn to fly or his suitability for high-altitude flying or aerobatics, but they aided in the assessment of general physical fitness to withstand the stress of flying.

Applied physiology in relation to efficiency in flying had only really begun when the first world war finished, and it remained dormant in this country until 1935. During the ensuing four years, tests were introduced to assess suitability for particular aircrew duties, the main ones, which were developed at the R.A.F. Central Medical Establishment, being for power of co-ordination,^{11,2} cardiovascular stability,³⁸ tolerance of rarefied atmospheres,⁷⁴ night visual capacity,^{57,66} and hearing efficiency when operating in aircraft^{29,33,35,74}; this hear-

*A special university lecture in military studies given at the University of London on May 25, 1954.

ing efficiency test was replaced later during the war by one simulating speech sounds as actually transmitted through an electrical communication system with a background noise as encountered in Service aircraft.^{36,37} The problems of glare,³⁴ ocular muscle balance,⁵⁵ and the design of flying goggles³⁶ and helmet^{30,31,32,34} were also investigated.

Early in 1939 the Secretary of State for Air, on the instigation of Air Marshal Sir Victor Richardson, then Director-General of Medical Services, formed the Flying Personnel Research Committee, under the chairmanship of Sir Edward Mellanby. As a result, research was intensified and planned to cover all current medical problems connected with Service flying. Under the aegis of this committee a certain amount of fundamental physiological research was instituted, but, subsequent to the outbreak of war eight months later, many of the researches had to be of an *ad hoc* nature. It is convenient to consider these researches in relation to the main phases of the war—namely, the phony period, the Battle of Britain, the night raids on London and the industrial cities, the retaliation by the R.A.F., the great air offensive in the West, and the air war in the Orient or the setting of the Rising Sun.

The Phony War

In the phony period from October, 1939, to Spring, 1940, the chief physiological problem which demanded attention was an adequate oxygen supply for those engaged in high-altitude reconnaissance when the main shooting was photographic. Though there was little fighting during the first eight months of the war, the Air Force was busy developing the system of photographic reconnaissance which later proved such a great factor in its success. In this work it was important to attain altitudes ever higher than the enemy, in order to escape detection or interference. This necessitated the development of an adequate oxygen system. At the outbreak of war the continuous-flow system of oxygen supply in use allowed two-thirds of the gas to go to waste, and the mask did not fit comfortably with the flying helmet, goggle, and microphone assembly. Work carried out in the laboratory by B. H. C. Matthews and staff,⁷⁵ and in the field by D. A. H. Robson (who later lost his life in an experimental flight of one of the first Boeings used in this country), led to the early development of an improved oxygen mask and an economizer, which prevented the oxygen from going to waste during expiration and was foolproof against

stoppage of the flow of the gas even if the breathing of the wearer became minimal, as during shock or unconsciousness (Fig. 1). This improvement in the oxygen supply more than doubled the operational range of aircraft from an oxygen point of view. The anoxia meter devised by E. A. G. Goldie^{48, 50} was of inestimable value in assessing the relative merits of different types of oxygen masks and revolutionized the study of anoxia, as the amount of oxygen in the blood could be estimated with this apparatus at any moment and for any length of time without puncture of an artery as was necessary hitherto (Fig. 2).

As decompression sickness occurred in some pilots engaged in reconnaissance at altitudes over 25,000 feet (7,600 metres), E. A. Carmichael,¹⁷ B. H. C. Matthews,⁷⁴

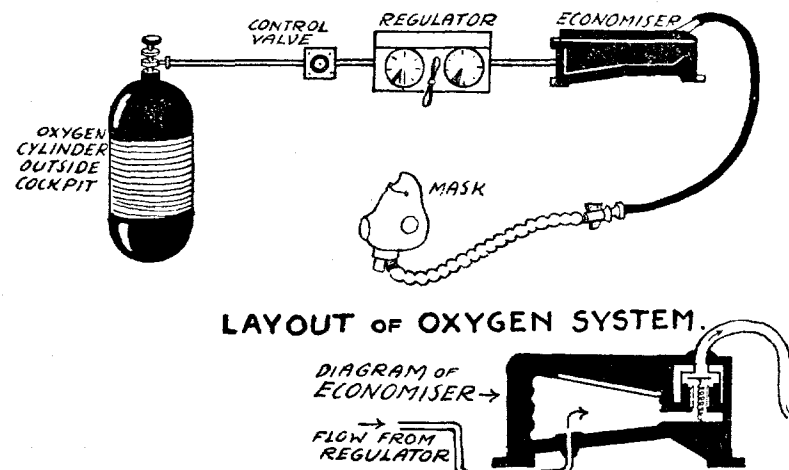


Fig. 1.—Oxygen economizer designed to prevent oxygen going to waste during expiration.



Fig. 2.—Goldie's anoxia meter. The apparatus is lightly clamped to the ear and the oxygen content of the blood is measured by means of two photoelectric cells. (Air Ministry Crown copyright.)

and I. de Burgh Daly²⁶ studied this matter and made the first appreciation of its effects. Later, the staff of the R.A.F. Physiological Laboratory at Farnborough, working in liaison with the Royal Canadian Air Force, intensified these researches and, as a result, tests were devised to select those suitable for high-altitude flying, and measures were adopted to alleviate or prevent the occurrence of decompression sickness.^{38 40 92 95 97 119} This pioneer work materially aided in Bomber Command's retaliation on the enemy, which began in 1941.

The aircraft used in these reconnaissance flights were of the single- or two-seater type, had reasonably warm cabins, and were engaged only on flights of relatively short duration, so that the effect of cold on the individual and his flying equipment was not markedly noticeable and did not call for research then.

Work done in connexion with the oxygen supply during this phony period proved of inestimable value for the Battle of Britain.

The Battle of Britain

The enemy, having failed to attain victory by force of numbers, tried to circumvent the air barrier by flying over it. The famous few had therefore to climb to equal or greater altitudes to claw the enemy out of the sky, which would not have been possible without an adequate oxygen supply.

At this time two other problems demanded immediate attention—namely, the temporary loss of vision or blacking-out which resulted from high acceleration during dog-fighting, which was then the vogue; and fatigue consequent on the large number of sorties that had to be flown without a rest.

Fortunately, in the absence of a centrifuge for the fundamental study of blacking-out, a considerable amount of research in this matter had already been carried out by W. K. Stewart and G. E. Watt^{103 106 107} at Farnborough in an aircraft specially fitted for use as a flying laboratory. In this aircraft a cine-camera was suitably mounted to take shots of pilot and passenger, so as to record their physical appearances and visual reactions under various forces of g, together with the readings of the various instruments indicating force of g, time for which applied, air speed, and altitude (Fig. 3).

In this way it was proved that abdominal belts *per se* were of no use as an anti-g device,^{98 109} but that resistance to blacking-out could be increased by $1\frac{1}{2}$ to 2 g if the rudder-bar pedals of the aircraft were raised by 6 in. (15 cm.), and the pilot assumed a crouched position, so as to lessen the amount of blood that pooled in the legs and to reduce the differences in the levels between the brain and the heart (Fig. 4). This minor modification to the aircraft was readily carried out at the airfields without interfering with the operational effort—a most important consideration at a time when every available aircraft had to be in the air or at the alert. The raising of the blacking-out threshold by $1\frac{1}{2}$ to 2 g proved adequate to prevent blacking-out with the centrifugal forces encountered in aerobatics at that period.^{99 108}

The Battle of Britain was such a critical period that little or no rest was possible for our pilots in their all-out effort. Medical aid was sought to give relief from sleeplessness and fatigue without, if possible, loss of performance.⁹ Several drugs were tried, but attention was mainly directed to the use of caffeine¹⁴ and amphetamine ("benzedrine")^{7 14 15 28 99 118 117}; the former was found to stave off fatigue for a short period without interfering with performance. The popular belief at the time was that amphetamine was the wonder

drug to banish fatigue and improve performance—in fact, some thought it would give them a mental acumen that they never possessed.

Professor F. C. Bartlett and his co-workers¹ showed that amphetamine, though it helped to banish sleep, did not im-



3A



3B

Fig. 3.—Original blacking-out experiments in a flying laboratory in Battle aircraft showing cinecamera record of effects of high g on man. (A) At 8 seconds and a force of 6.2 g: beginning of blacking-out. (B) At 18 seconds and a force of 2 g: still blacked out, but consciousness returning. Dials on left side record performance. (Air Ministry Crown copyright.)

BLACKING-OUT PROBLEM IN AIRCRAFT

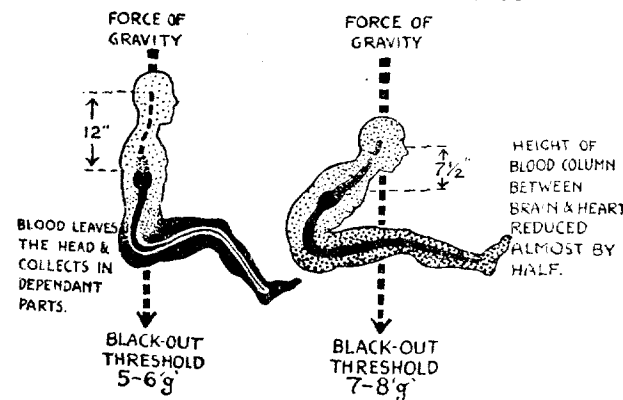


Fig. 4.—Diagrammatic representation of raising the threshold for blacking-out by adopting a crouched position with legs raised on rudder bar to lessen the pooling of blood in the dependent parts of the body.

prove performance and was mainly a stimulant and acted as a whip to the flagging horse, so that when its effect passed off the need for rest was greater than ever. There was the danger that if it were taken to lessen fatigue prior to a landing its stimulative effect, something like that of alcohol, would so warp judgment that undue risk might be taken, with dire results. The stimulative effect varied according to the type of individual, and in correct dosage the dull appeared somewhat brighter, the average was perceptibly enlivened, while the above average who was normally a "live wire" became "hay-wire" with frayed nerves. Consequently, orders were issued that no drugs were to be given to aircrew, except by the unit medical officer, and then only to individuals in accordance with their known reactions, and that as a general rule no drug should be used except to ward off sleep when the danger of that was greater than any ill effects of the drug. The importance and necessity for natural sleep, even for short periods, was stressed.¹⁰

Night Raids by the Enemy

When, in the last quarter of 1940, the enemy changed tactics from daylight bombing to terror raids at night on London and the industrial cities, anti-measures by the Air Force called for intensive research into the problems of night vision in general, and the protection against searchlight glare, to help our pilots and air gunners to detect the enemy during interception flights.^{92 99} Night-vision-capacity tests were devised to help in the selection of aircrew most suitable for night operations,^{79 85 86} and investigations were carried out to assess the effects of vitamins A and C and various drugs on night vision.^{58 66} At the same time, physiological and psychological aspects of night vision had to be considered in relation to aids for taking-off and landing in the dark. This necessitated improved methods of pre-adapting the eyes for night vision,^{21 24 25} first by wearing dark smoked glasses⁹⁰ to exclude all light, and later by the use of ruby-red glasses⁹² which permitted the user to read white standing by for taking-off.

Cockpit and cabin lighting were studied to ascertain the best type and intensity of illumination that could be used to read instruments and maps without materially interfering with dark adaptation.^{22 25 79 93 111} This led to the development of a satisfactory lighting system whereby fluorescent or red lighting^{91 94} could be used either together or separately, and so controlled that the maximum permissible luminosity could not be overstepped. At the same time, night-vision training schools were established to teach all members of aircrew how to maintain and improve their night vision and how to see or observe, including the value of oxygen in preserving night vision.^{3 4 10} Those mainly concerned in these researches were K. J. W. Craik,^{21 22 92 94} and P. C. Livingston.^{58 59 61 64 65 66} They also played an important part in the development of devices to counteract searchlight glare^{94 110} and in the lay-out of airfield lighting systems to facilitate taking-off and landing in the dark.

Retaliation

Starting in 1941, retaliation bombing by the R.A.F. became ever stronger, and for this purpose the range of flight was increased and operations were carried out at higher altitudes, partly to permit surprise attacks and partly to evade anti-aircraft fire. At the same time, bomber aircraft were provided with more guns for defence, which meant more draughts through the gun apertures. Intense cold was therefore experienced by aircrews, particularly tail-gunners. It was not practicable, owing to operational needs, to install efficient fuselage heating in the aircraft then in use; the immediate necessity was to devise clothing that would keep the aircrews reasonably warm without hampering their movements.⁹⁹ Hot-air suits were tried, but were not a success.⁷⁰ However, as a result of the combined researches of physiologists and material scientists, special flying clothing, consisting of electrically heated suits, boots, and gloves, was devised to apply warmth to those parts of the body most in

need of it; this flying clothing combined lightness and flexibility to facilitate movement, waterproofness against rain, and permeability to air to allow for dispersal of sweat.^{69 71 72}

Another ill-effect of the intense cold encountered was the freezing-up of the oxygen-mask valve under icing conditions.⁷¹ J. C. Gilson¹⁶ tackled this problem and produced an improved type of mask which did not freeze up at high altitudes and had the additional qualities of comfort, smallness, lightness, and perfect fit even during strenuous aerobatics. For these long bombing flights it was necessary to devise a light, portable oxygen set to enable aircrew to move about away from their stations at altitudes over 15,000 feet (4,600 metres), especially when loading guns or moving ammunition.⁶⁹ Before the introduction of this portable set, there were instances of crews collapsing from oxygen want when away from their normal oxygen points.²⁰ A further development of this set was the bale-out bottle to be used either fixed to the person or combined in the parachute pack to ensure an adequate oxygen supply for 10 minutes to enable aircrew to escape from aircraft and descend safely in emergency.^{69 72} These oxygen supply devices were introduced mainly as the result of researches by B. H. C. Matthews and his staff,⁷⁶ and played an important part in maintaining the efficiency and morale of aircrew on hazardous missions.

At this time, anti-submarine activities were intensified and the medical branch was asked to advise on the best visual means of detecting submarines in various waters. This involved camouflage problems and the drawing up of a scheme for teaching aircrew how to look for submarines, and the best means of scanning.⁷⁴ Coupled with this the optimum period of watch and the maximum period permissible to avoid fatigue of such a degree that further watch was useless had to be assessed.^{61 114} Another method of countering submarine and air attacks on our convoys was the use of catapult aircraft on merchantmen. These had often to operate in northern waters, and at the end of the sortie the pilots had to bale out, as they could not land their aircraft on the ships. This meant immersion, perhaps in



FIG. 5.—Original immersion suit made of fabric which allows the passage of water vapour—i.e., perspiration—but is waterproof. It was designed to keep a man's clothing dry after ditching before boarding his dinghy or being picked up. (Air Ministry Crown copyright.)

icy waters, for half an hour or more, before action was broken off and they could be rescued. It was necessary, therefore, to devise an immersion suit which would permit adequate perspiration during standby and still keep the wearer dry and warm enough to remain alive while immersed.¹¹⁶ E. A. Pask^{68 69} was mainly instrumental in the development of such a suit, the principle of which was subsequently adopted by the Royal Navy and the Allied Air Forces (Fig. 5).

Life-jackets were naturally provided for aircrew operating over the Atlantic to escort convoys, spot enemy submarines, and give defence against enemy aircraft, but it was necessary to ascertain whether these life-jackets would keep the nose and mouth of an unconscious individual above water in a rough sea. To test this, E. A. Pask⁷⁴ was anaesthetized on two occasions for several hours while immersed in water wearing various types of life-saving jackets in turn (Fig. 6). It was

found that not only the R.A.F. "Mae West" but also life-saving jackets of other Air Forces and Navies, though adequate in giving safe flotation to a fit person, could not be relied on for an unconscious individual. Following these researches, suitable modifications were made to the life-saving jackets to ensure adequate flotation for the unconscious.

These long, hazardous flights over the ocean and enemy territory were accompanied by considerable fatigue and an increased incidence in nervous breakdown. In connexion with the latter, C. P. Symonds and D. J. Williams⁶ made extensive surveys of the psychological disorders of aircrew, and their findings enabled authoritative advice to be given

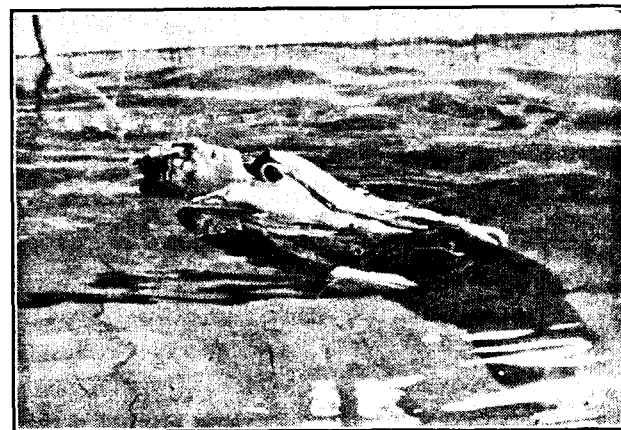


FIG. 6.—Assessing flotation properties of life-saving jackets to keep nose and mouth of unconscious individual above water. Subject was anaesthetized through leads to nose. (Air Ministry Crown copyright.)

on operational limits to conserve man-power and maintain efficiency. Researches by physiologists and psychologists into the problem of flying fatigue pointed the way to lesser this by properly designed cockpits and cabins, including seating position, instrument lay-out and dial markings,⁹ lighting to preserve dark adaptation, the best position for all controls so as to obtain the necessary reaction with the minimum of energy, sound-proofing to minimize engine noise, and air-conditioning to maintain a reasonable temperature in all climates and at all altitudes.

This work, and subsequent improvements in the aircraft and flying equipment for maintaining the maximum efficiency of aircrews, proceeded steadily and in parallel with the increasing striking power of the R.A.F. in preparation for the great offensive in the West.

The Great Air Offensive in the West

The air offensive on enemy and enemy-occupied territory was stepped up considerably in 1943, and reached crescendo in 1944 and 1945. Larger and faster bombers were used, flying at still higher altitudes, and these offensives were interspersed with low bombing attacks by much faster-flying aircraft, such as the Mosquito, followed later by the dive-bombing attacks by the very high speed rocket-carrying Typhoons. Operations were carried out both by night and by day, and pin-point bombing became the routine, especially for the "Pathfinders." The physiologists and psychologists were consulted regarding the design of the bomb-aiming apparatus, the best colours for target-markers, and the pattern of the marking.^{6 10 80}

At this time the enemy's anti-aircraft defences were considerably strengthened, and violent evasive action was often necessary to avoid the heavy flak. The enemy's night fighters were frequently concentrated to attack our raiders, so it was essential that both pilot and gunners should have the clearest vision possible to forestall the fighters' attacks. Researches by A. Luczak,⁶⁷ of the Polish Air Force, showed that a clear-vision panel was the ideal, but, failing this, plate

glass set as near the vertical as practicable was to be preferred to "perspex." Goldie¹⁹ demonstrated how markedly visibility was reduced by scratches and dirt on windscreens, and devised an apparatus for measuring the scatter of light and visual loss which resulted from using dirty perspex and other transparent screens: this gadget did much to convince aircrews of the need to maintain clean, unscratched vision panels.

To facilitate the detection and pin-pointing of targets in the dark and through cloud or mist, and to assist in homings under adverse weather conditions, various instrument aids, visual and auditory, were introduced. Physiologists and psychologists collaborated in this work, not only in the laboratory but also in the air in actual operations. The "beam approach" was a good example, as it concerned both visual and auditory aids. The pilot relied on the beam approach device in homing at night or in bad visibility by day at a time when he was likely to be tired and particularly apt to make errors. In addition to this apparatus, the pilot had at least ten instruments on his flying panel which had to be read and their meaning fitted into a whole before he could make a safe landing under blind flying conditions. It was of supreme importance, therefore, that all instruments should present their messages as simply and clearly as possible.

The beam approach consisted of a radio beam which gave two types of clue—one auditory, the other visual. Originally, these were wrongly presented, as the auditory clue did not use the morse letters that could be picked up with least error; the visual clue, consisting of a small luminous plan of the aircraft and its relation to the beam, was confusing, as the pilot had to remember to reverse the signal for right or left turn when approaching the airfield in the opposite direction to the normal. Psychological researches by R. C. Browne¹⁰ showed that the best presentation was that which necessitated the least thought, and as a result correct clues were introduced. The application of this work to the promotion of safety in flying needs no stressing.

Stratosphere Flying

Both sides were striving for the key to victory through mastery in the air, so two projects received high priority—namely, the development of the pressurized cabin and jet-propelled aircraft.

The pressurized cabin aircraft was needed for duration flights at altitudes over 38,000 feet (11,600 metres), and certain physiological aspects of pressure differentials and air-conditioning had to be solved.⁷⁷ An important point that required early clarification was the effect that sudden decompression, following holing by a missile or the blowing of a port, would have on the occupants. It was thought that such an accident would lead to so much distension of the lungs as to cause serious injury or death. R. H. Winfield,¹¹⁶ by personal experiment, demonstrated that explosive decompression at the differential pressures visualized caused no perceptible harm to a fit man provided his glottis was open.^{94 108} Experiments on animals carried out by Professor de Burgh Daly and his team at Edinburgh University gave similar results.^{26 38 39} To meet the enemy's challenge for altitude supremacy, it was necessary to develop some interim measure, and here Professor H. C. Bazett¹² and A. P. Gagge,^{11 43} of U.S.A., with their pressure-breathing waistcoat and mask, respectively, saved the situation, for this equipment so raised the intrapulmonary gas pressure as to maintain sufficient arterial oxygen saturation to enable aircrews to fly

efficiently at altitudes up to 44,000 feet (13,400 metres). This was a requirement of the high-altitude photographic reconnaissance flights, whose work was of the utmost value in deciding on targets and in assessing the result of operations.

Other physiological problems of stratosphere flying concerned ventilation, oxygen needs, visibility, and methods of escape in emergency. In connexion with escape descents by parachute from the stratosphere, physiological aid was sought as to how to guard against the intense cold (-55° C. or less), lack of oxygen, and the high forces of deceleration at the moment of opening of the parachute. Suitable clothing was designed to protect against cold. The problem of oxygen lack was studied by E. A. Pask, W. K. Stewart, and S. L. Cowan,⁶ who carried out a series of experiments in the laboratory to ascertain the length of time the average man could live at altitudes between 44,000 and 25,000 feet (13,400 and 7,600 metres) during a parachute descent, although unconscious. These volunteers were suspended in the air by means of the standard parachute harness and made to breathe nitrogen-air mixtures to simulate the atmospheric conditions from 44,000 feet (13,400 metres) downwards at the rate of descent of an open standard parachute. It was found that man could remain unconscious for 7½ minutes and yet live during such a descent without additional oxygen: the baleout bottle was therefore designed to give a 10- to 12-minute supply of oxygen to allow a sufficient margin of safety to cover the oxygen used by the energy expended in getting out of the aircraft.

Experiments in U.S.A. by R. Lovelace and M. W. Boynton by personal jumps, and by G. A. Hallenbeck,³² using large animals and dummy men fitted with accelerometers, indicated that decelerating forces up to 30 g occurred at altitudes of 35,000 to 40,000 feet (10,700 to 12,200 metres) if the parachute opened almost immediately after baling-out, and this force severely damaged the canopy and its rigging. It was therefore essential to warn all parachutists to allow the speed of fall to slow to a steady rate before pulling the ripcord, and this free-drop time had to be worked out for various altitudes. In one of these very gallant experiments Boynton lost his life. B. J. O. Winfield,¹¹⁷ who personally made many parachute jumps, added considerably to our knowledge of this art, and his observations helped in the design of parachutes and their attachments to the user, and in establishing the best stance to adopt for landing so as to minimize injuries.

Physiological Problems of High Speed

The advent of jet-propelled aircraft with speeds approaching that of sound soon raised other physiological problems,

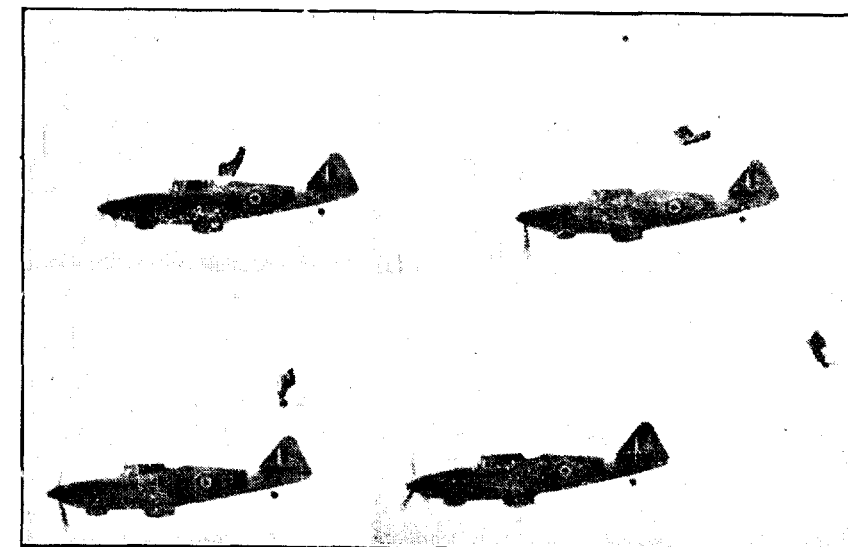


FIG. 7.—Shows the first successful ejection from aircraft in flight of a dummy man complete with seat following a 40-foot-per-second explosive charge; the airspeed was 250 m.p.h. The parachute, seen in lower photos, operated automatically after ejection. (Air Ministry Crown copyright. Photograph of official test done on October 1, 1945.)

an early and very important one being emergency escape during flight. As a result of a fatality in January, 1944, when a pilot tried to escape from a jet machine which was out of control, it was evident that the force of the slipstream of high-speed aircraft was so great that the unprotected human body could not withstand the air blast for more than a fraction of a second, else limbs were fractured or evulsed against the edge of the escape hatch, the skin of the face torn, and the lungs over-expanded. Researches done on the ground with a Martin-Baker test rig, then in fast-moving aircraft, first with dummies and later with men, showed that it was practicable to eject a pilot, complete with seat and parachute, clear of an aircraft travelling up to speeds of 500 miles (800 km.) an hour (Fig. 7). For safe ejection, however, it was necessary to devise a canopy to prevent undue flexion of the head during the upward thrust, to protect the face and lungs against blast, and to keep the oxygen mask from being torn off by the force of the slipstream.⁴⁷⁻⁵¹ In the final design, the pulling down of the protective canopy automatically activated an explosive charge under the pilot's seat only when the body of the canopy reached nipple level, and the resulting force of ejection ensured that the pilot's hands drew the hood tightly over his head.⁵¹⁻¹⁰⁵

While the war in the air was proceeding apace, important events were taking place in enemy-occupied territory from resistance groups with whom we were in touch by agents dropped by parachute and at times picked up from air. Owing to the difficulty of landing aircraft for this purpose, a technique had to be developed to pick up these agents from the ground while the aircraft was in flight. The physiological and physical problem here was how to accelerate man from rest on the ground to approximately 120 m.p.h. (190 km.p.h.) in the air within half a second. W. K. Stewart and R. H. Winfield¹⁰⁶ did most of the physiological work in connexion with this problem and took part in practising and perfecting the technique (Fig. 8).

Looking ahead to the landing in Normandy and the advance to Germany, it was expected that there would be aerial dog-fights at higher speeds than hitherto, so researches were done in Britain, Australia, Canada, and the United States to develop and perfect anti-g garments that could be rapidly donned and would be comfortable to wear even in hot weather and during long sorties. The combined efforts of these researches led to the production of a very light (3 lb.—1.4 kg.) pneumatic suit or high-waisted trousers fitted with bladders, so designed as to equalize automatically the internal pressure built up in the body fluids by the accelerating forces, thus preventing the blood from pooling in the lower part of the body (Fig. 9). By wearing such a suit the threshold for blacking-out was raised by 2 g or more, and, in addition, by ensuring good circulation of blood to the head, lessened fatigue and helped to maintain quick reaction time during

long and arduous flights.³⁷⁻¹⁰⁶ Much of the credit for this work belonged to those pioneers W. R. Franks,⁴⁴ of Canada, and F. S. Cotton,¹⁰⁷ of Australia, to S. Davidson,³⁷ a medical officer who was test pilot for these anti-g devices, to W. K. Stewart,¹⁰⁰⁻¹⁰²⁻¹⁰⁴ who acted as a guinea-pig in over 200 black-outs, and to our American Allies, particularly the Mayo team—E. J. Baldes, C. F. Code, E. H. Lambert, and E. H. Wood.¹⁰⁸ The Allied air supremacy was so overwhelming, however, that dog-fights did not occur, so these suits were not required by the R.A.F., though they were used in large quantities by the Americans, chiefly to lessen fatigue on long flights under turbulent atmospheric conditions.



FIG. 9.—Pneumatic anti-g suit. A: Shows position of abdominal, thigh, and lower leg bladders as indicated in solid black. The shaded areas are pressurized by tension of the fabric. Pressure cuts in automatically at 2 g. B: Shows how the pressure suit is worn under uniform. (Air Ministry Crown copyright.)

The Air War in the Orient

Following the surrender of Germany in May, 1945, researches in connexion with physiological problems peculiar to the Orient were intensified for the final showdown against the Japs. Special attention was paid to air-conditioning and cooling of aircraft, particularly when on the ground, to protect against the ill-effects of heat, and to the development of escape suits and equipment for survival in the jungle and in warm climates after baling out or crash-landing. The results of these researches were not adequately tested in the field, owing to the abrupt and dramatic end of hostilities in the East, as a result of atomic warfare. Nevertheless, much progress was made and sound foundations were laid for post-war research into problems of climatology, clothing, and human performance in temperature extremes.

Post-War Position

Though there was a lull in researches in connexion with aviation medicine after the first world war, it is most heartening to know that the reverse has been the case since the end of the second world war. Such researches have been intensified as regards both Service and civil aviation, and the R.A.F. Institute of Aviation Medicine at Farnborough has had a considerable increase in staff as well as extension of all its departments, which are fitted with the most up-to-date equipment capable of tackling all current and many future problems. Researches have been actively pursued into space and pace problems of the upper troposphere and the stratosphere, and of supersonic speeds, as well as into the noise and vibration associated with jet-propelled aircraft. Stratosphere investigations include the effect on man of solar and cosmic rays, mesons, and neutrons, and how to protect the body from explosive

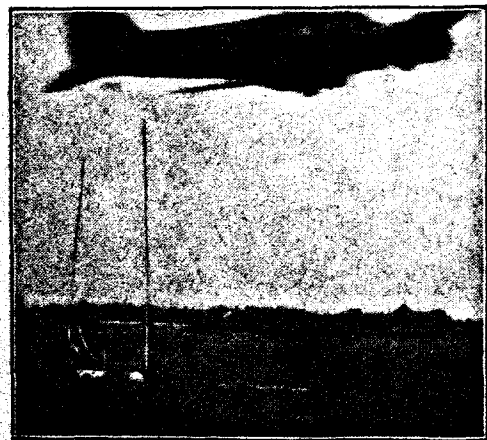
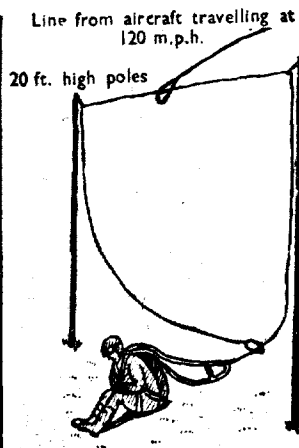


FIG. 8.—Initial experiments in pick-up from ground by aircraft in flight at 120 m.p.h. Person to be picked up is crouched facing the oncoming aircraft. Drag from trailing rope of aircraft catches nylon loop fixed between two poles. (Air Ministry Crown copyright.)



decompression should it occur in pressurized aircraft at altitudes over 60,000 feet (18,300 m.), where the blood would boil if some means of compression were not immediately forthcoming.

In addition, the terms of reference of the Flying Personnel Research Committee were extended in 1948 to cover aviation interests other than the R.A.F. and the Fleet Air Arm. The Committee's terms of reference are now to advise the Secretary of State for Air on investigations into the medical aspects of all matters affecting personnel, particularly those which might conduce to safety and efficiency in flying, including research into problems associated with the scientific selection and training of flying personnel and into measures designed to maintain their physiological and psychological efficiency. In addition, the Committee's terms of reference include the following: to advise the Board of Admiralty on these matters in relation to naval aviation; to advise the Ministry of Civil Aviation and the civil corporations on problems of flying staff and passengers of civil aircraft; and to advise the Ministry of Supply on matters in relation to human requirements in flying. The Committee also advises the War Office so far as problems of airborne troops are concerned.

APPRECIATION

This is only a sketchy survey of medical science as applied to the war in the air, but it gives some idea of the part it played in helping to win the war. Those concerned in this work deserve the highest praise for the fine results attained and for the very gallant way in which many of the researches were carried out with great risk to life. Special tribute is due to the excellent work done by physiologists under the guidance of B. H. C. Matthews at Farnborough and to practical psychologists working with Professor F. C. Bartlett at Cambridge, and to those medical officers who were also pilots (termed "flying personnel medical officers") and did liaison duties between aircrews and the laboratory, including two who gave their lives in this great endeavour—Group Captain H. W. Corner and Squadron Leader D. A. H. Robson. These results, however, could not have been attained without the whole-hearted co-operation and pooling of knowledge that existed between biological and material scientists, aircraft designers, and the executive and medical branches of the Allied Air Forces.

The Royal Air Force is greatly indebted to the foresight of Sir Edward Mellanby and Sir Victor Richardson for conceiving and initiating the formation of the Flying Personnel Research Committee, whose activities have proved so valuable in the progress of aviation medicine. Thanks are also due to the Medical Research Council for the help given in certain problems by many of their staff.

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Lady Derby opened a new centre for spastic children at Stockport on January 5. "The Heaton Moor Clinic." It will provide physiotherapy, speech therapy, and other treatment and training for 14 local spastic children.

EFFECTS OF FLYING ON PATIENTS WITH CARDIOVASCULAR DISEASE*

BY

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The enormous increase in air travel during recent years has, among other results, led to the necessity of considering its effect upon passengers suffering from organic disease. The physical standards insisted upon by Government services and by private air lines in the selection of pilots and air crews of all sorts are naturally very high. This attitude has perhaps led to the parallel conclusion that none but physically fit individuals can safely be subjected, as passengers, to the strains and stresses of this form of transport.

Whittingham, Barbour, and Macgown (1949) surveyed, from the point of view of air-fitness, most of the common medical diseases. They referred to cases of heart disease as follows: "Those suffering from angina pectoris must have the condition adequately controlled with trinitrate, and an electrocardiogram should be done to exclude infarction: such cases can be accepted if the angina is provoked only by a brisk walk of half a mile. Cases with congenital heart lesion can be accepted for low-altitude flights if there is no veno-arterial shunt as evidenced by cyanosis, or if there is no heart-block or severe hypertension resulting from coarctation of the aorta. Cases of high blood pressure are acceptable if the systolic pressure is not over 200 mm. Hg and the diastolic is less than 120, provided they have flown before and there is no pulsus alternans, cardiac asthma, gross albuminuria, or cellular casts in the urine: those who have not flown before may be upset by nervous tension."

Whittingham (1953) states: "Cardiovascular disease of marked degree is present in about three-quarters of those who are taken ill during flight. The low oxygen tension, even at altitudes between 5,000 and 8,000 ft. (1,500 and 2,400 metres), throws a serious strain on the heart. These patients should travel in a pressurized aircraft and limit their movements to the minimum; oxygen and any special drugs prescribed by their doctors should be available; and the medical department of the air line should be made aware of their condition. Patients with angina or coronary occlusion should not fly unless they have been free from symptoms for at least three, preferably six, months. Even then the altitude should be limited to 5,000 ft. (1,500 metres). A test of fitness for anginal patients is whether they can walk briskly for about half a mile (0.8 km.) without symptoms. Patients with valvular disease should not fly while the condition is acute, nor when it is chronic if there are signs of congestive failure or pronounced anaemia. Those with congenital heart disease can be accepted for flights up to 8,000 ft. (2,400 metres) altitude, in the absence of veno-arterial shunt, as evidenced by cyanosis, heart-block, or severe hypertension resulting from coarctation of the aorta. Those suffering from myocardial lesions are unacceptable if there is marked bradycardia or if they have had diphtheria within six months. Cases of high blood pressure can be accepted if there is no pulsus alternans, cardiac or renal asthma, frequent

*A paper read at the Second World Congress of Cardiology in Washington, U.S.A., on September 16, 1954.

headache, much loss of weight, gross albuminuria, cellular casts in the urine, or optic fundus change. They should be given a sedative before flight to prevent nervous tension worsening their condition, particularly if they have not flown before."

Whittingham's paper is naturally written from the point of view of the Director of Medical Services, British Overseas Airways Corporation, and quite rightly is conservative in its approach to the subject. An air line is responsible for the delivery, safe and sound, of its passengers; and from the point of view of its liability it must take stringent measures concerning the safe transportation of individuals known to be suffering from cardiovascular disease.

My own experience has for some time been that this view is ultra-conservative, especially regarding cases whose journey is really necessary. I was therefore led to collect a series of patients suffering from the more serious forms of cardiovascular disease who to my knowledge had safely flown considerable distances.

General Considerations

The chief stresses to which human beings are liable through flying are (1) oxygen lack, (2) excitement, and (3) air-sickness. The oxygen lack is compensated for in modern aeroplanes by pressurization of the aircraft. This is usually so adjusted that the pressure at the altitude flown, whatever this may be, does not surpass 8,000 ft. (2,400 metres). At 8,000 ft. the oxygen saturation of the blood passing through the lungs is about 86%. It is not until an arterial saturation of 83% or less has occurred in the arterial blood that any measurable increase in cardiac output occurs in normal resting individuals. The standard pressurization figure, therefore, is such that there should in ordinary circumstances be no added call upon the heart at the altitude flown normally by passenger aeroplanes properly pressurized. An obvious point is that the pressurization must be known to be adequate before the start of the journey. When Case 3 of the present series (myocardial infarction) was about to fly from New Delhi to London the start of the flight was delayed. Inquiry revealed that the pressurization system was out of order. The journey was put off, being made at a later date when an efficient aeroplane was available.

Certain other general facts are worth remembering. (1) Patients with organic heart disease which is properly compensated are able to increase their cardiac output for considerable periods during the day, remaining free from symptoms. (2) Women with organic heart disease who become pregnant, and who thereby develop a cardiac output of 20% or more above the average, still can remain in a reasonably comfortable physical state. (3) Patients with coronary disease have been safely investigated by reducing the oxygen content of their inspired air. Electrocardiographic changes will only result if the oxygen reduction is in the neighbourhood of 13%. These facts supply additional evidence suggesting that well-compensated cardiac patients flying in properly pressurized aircraft should not be materially influenced for the worse.

Influence of Anaemia

There is one important factor which may intrude upon the problem without being detected unless proper steps are taken in advance, and that is anaemia. It is generally accepted that anaemic patients show an increase in cardiac output. The extent of such an increase is at the moment uncertain, since the experimental methods used are all subject to criticism. The modern view would seem to be that a reduction in the oxygen saturation of an extent resulting from a measurable reduction in the haemoglobin is likely to produce some increase in cardiac output. A proper blood count, therefore, should certainly constitute an essential

preliminary to a prolonged aeroplane flight planned by a patient suffering from organic cardiovascular disease. Anaemia, if present, should be treated. The other factors of air-sickness and nervousness are readily preventable by proper remedies.

The present series consisted of 30 cases—6 with hypertension, 4 with angina of effort, 14 with myocardial infarction, and 6 with other forms of severe organic heart disease. No case in any of these four series was in the slightest extent incommenced by flying.

Hypertension

Details of these cases are given in Table I. The first case provides a good example of the fact that an individual with hypertension can fly without deterioration.

TABLE I.—Hypertension

No.	Age and Sex	Duration and Average B.P.	Heart Enlargement	E.C.G.	Remarks	Miles Flown
1	58 M	230/130 9 years	Slight	T flat I, II, QRS 0.1	Lumbar sympathectomy, 1946	More than 100,000
2	58 M	280/146 248/120 6 years	Moderate	T, I, II, VL, VS, QRS 0.11	Left hemiparesis. Lumbar sympathectomy, 1950	17,000
3	75 M	230/130 190/110 7 years	Slight	Lt. B. Br. QRS 0.13, T, I, V5	Hypertension non-progressive	More than 100,000
4	57 M	194/110 6 years	Moderate	Rt. B. Br. QRS 0.12, S-I, V5, M shaped, V1	Heart size slowly increasing during 6 years	119,000
5	56 F	220/140 5 years	Slight	Left vent. strain, E.C.G. for 10 years	"Benign" hypertension	1,600 one year ago
6	63 M	240/114 4 years	Moderate	T flat in I, V5, R tall in I, V5		7,000

Case 1.—A man of 58 concerned with aeroplane insurance has in the course of his business flown many thousands of miles every year for the last nine years. During the whole of this period his blood pressure has varied between 230/130 and 220/120. In 1946 a lumbar sympathectomy was performed. Whether or not this has influenced the good result is open to doubt. His heart has remained well compensated, but after nine years, during which time electrocardiograms showed flattening of the T waves and a QRS of not more than 0.1 second, changes of a definite left bundle-branch lesion have recently occurred.

Case 2.—A man of 58 had had a blood pressure of 280/146. Six years later it was still 248/120 when taken in the lying position. Lumbar sympathectomy was performed in 1950, and since then he has had a measurable postural hypotension. His electrocardiogram from the first showed the typical changes of left ventricular hypertrophy and left ventricular strain. He suffered a left hemiparesis nine years ago, from which he has made a good recovery. The distance flown is given as 17,000 miles, but it is considerably more than this. Exact figures are not available.

Case 3.—A man of 75 had had hypertension for seven years, the figures varying between 230/130 and 190/110. He has lost count of the number of times he has flown the Atlantic during the past ten years. He has no symptoms and his hypertension has been non-progressive.

Angina of Effort

The history of pain and tightness was typical in all four cases. It involved the upper part of the chest. It was exactly proportional to the amount of exercise taken, causing the individual to stand still. It was in all cases worse in cold weather and was accentuated by hurrying. The details are shown in Table II.

TABLE II.—Angina of Effort

No.	Age and Sex	Duration of Angina of Effort	Heart Size	B.P.	E.C.G.	Miles Flown
7	59 M	10 months	Normal	172/104	Q + I, VL, VS, R + VL, V5	50,000
8	68 M	4 years	Slight increase	132/78	S - and prolonged I, VL, V5	6,230
9	73 M	7 "	Normal	146/80	Normal	12,000
10	53 M	4 "	"	156/90	QRS abnormal and notched II, III, V3, V4	125,000

Myocardial Infarction

In the series of 14 patients with myocardial infarction 12 had suffered one infarct before flying, one had suffered two, and in one patient angina of effort had preceded the aeroplane journey by a year, the infarct occurring three months after the flight. The details are shown in Table III.

TABLE III.—Myocardial Infarct

No.	Age and Sex	Site of Myocardial Infarct	Interval between Infarct and Flight	Remarks	Distance of Flight (Miles)
11	64 M	Posterior T2, T3, TVF	9 years	Now has angina of effort, hypertension, and left ventricular strain, E.C.G. Left bundle-branch lesion also	7,000
12	72 M	Anterior	4 days		5,000
13	56 M	Antero-lateral	2 years 9 months	No hypertension, good recovery	10,000 5,000
14	51 M	Postero-lateral	4 "	Severe angina of effort 4 years	47,000 2,500
15	50 M	Antero-lateral	2 "	B.P. 160/100	1,000
16	53 M	"	5 "	Previous angina with paroxysmal tachycardia. B.P. 160/100	5,000 1,200
17	59 M	Posterior	2 months	B.P. 190/110	470
18	64 M	Antero-septal	7 months	Complete heart-block. Left bundle-branch block. Heart size 16 cm.	300 6,000 total, several journeys
19	38 M	Antero-lateral	3 years	Angina of effort since infarction	1,300
20	65 M	? Left bundle-branch lesion, E.C.G. equivocal	2 months	Angina of effort before and since attack	5,000
21	53 M	Antero-lateral	2 years 18 months	Attack slight. Second severe attack four months later	11,300 3,000
22	58 M	Posterior	—	Infarct three months after flight. Angina of effort	2,000
23	68 M	"	1 year	Flights in war conditions. Angina of effort	100,000
24	66 M	1. Posterior 2. Postero-septal	4 months	Partial heart-block after second infarct	5,100

Hypertension was present in three of these cases. Hypertension had also probably been present previously to some extent in four further cases, since the diastolic blood pressure was 100 or more in these individuals. No hypertension was present in seven of the cases.

The time interval between the occurrence of the infarct and the flight in seven cases was one year or less. In one case the interval was as short as four days; in two cases it was two months, and in one case four months. Two of the patients had flights of considerable stress, one of them (Case 13) flew 5,000 miles nine months after his attack, and 47,000 miles during the next two years, including transit of the Andes between Rio and Lima four separate times. He never suffered any inconvenience from this.

Case 23.—This patient, a man of 68, produced an even more severe test. He did nearly all of his flying during the war years from 1942 onwards. He was an expert with the Australian stock-whip, and flew from England to North

Africa, West Africa, Sudan, Iceland, and other areas under wartime conditions and in whatever aeroplane transport might be available. He entertained the troops by his skill. He always took glyceryl trinitrate tablets before his performances to prevent angina of effort. He flew considerably more than 100,000 miles before the end of the war. In 1945 his electrocardiogram (Fig. 1) showed that auricular

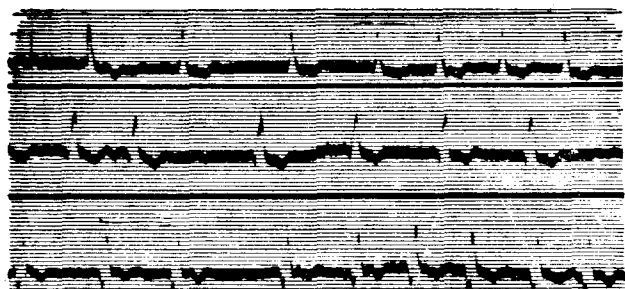


FIG. 1.—Case 23. Electrocardiogram taken after the onset of auricular fibrillation. It shows the typical Q-T changes of a posterior myocardial infarction in Leads II and III.

fibrillation had supervened. He subsequently died at the age of 72.

Case 18.—A man aged 64 had suffered from intermittent claudication for three years. Seven months before his flight he had had a severe myocardial infarct which left him with complete heart-block (Fig. 2). For personal and business

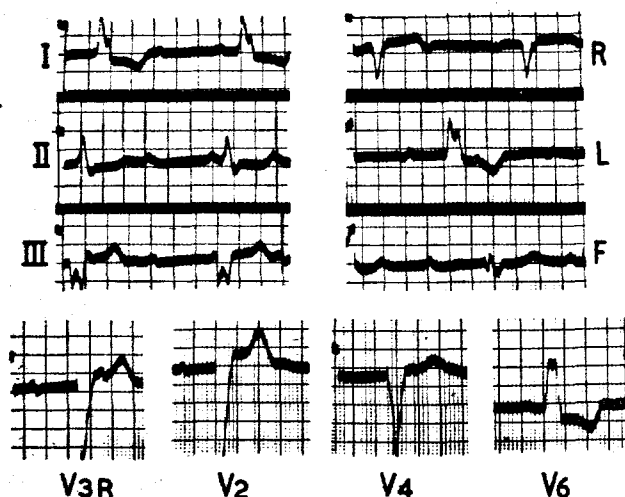


FIG. 2.—Case 18. Electrocardiogram showing changes characteristic of complete heart-block with a left bundle-branch block.

reasons he desired to make a journey to Australia, to which continent he travelled by sea. When there he flew 6,000 miles or more on personal and business errands. Radiologically his heart was much enlarged.

Only one patient (Case 24) in this series had had two infarcts. The first, a posterior lesion, occurred two years before his flight, and the second, a postero-septal lesion, four months before. The second electrocardiogram showed a transitory partial heart-block.

Case 22 illustrates a further point. This patient had suffered from angina of effort of a severe degree a year before his coronary attack. In spite of this he made two aeroplane flights of 1,000 miles, and it was not until three months later that he developed his myocardial infarct. It is reasonable to assume that at the time of his flight he was in a condition when if flying was going to induce myocardial infarction it would have done so.

Miscellaneous

The miscellaneous group (Table IV) includes the following examples: a case of auricular fibrillation, without evidence of coronary disease or of thyrotoxicosis, but asso-

TABLE IV.—Miscellaneous

No.	Age and Sex	Diagnosis	E.C.G.	B.P.	Remarks	Flew (Miles)
25	65 M	Myocardial degeneration	Auricular fibrillation	150/110	Decompensated till digitalized	7,000
26	68 M	Aortic stenosis	T, I, T, VL, T, V5	168/90	Faintness on exertion	5,140
27	35 M	Aortic regurgitation (rheumatic)	QRS=0.12 T, I, T, VL, T, V5	154/62	Large heart	3,540
28	59 M	Aortic regurgitation hypertension. W.R.-ve	QRS=0.12 T, I, T, VL, T, V5	230/102	Class II (N.Y.) failure	9,850
29	19 F	Rheumatic myocardial and mitral disease	Auricular fibrillation QRS+	122/64	Enormous heart	13,000
30	41 F	Mitral stenosis	Normal rhythm	156/94	Paroxysmal dyspnoea attacks	8,500 before valvotomy

ciated with a slightly raised diastolic blood pressure and a history of severe chronic bronchitis and bronchospasm; a case of aortic stenosis with the typical physical signs and electrocardiogram, and with the history of faintness induced by exertion; and a case of well-marked aortic regurgitation, rheumatic in origin, with a blood pressure of 164/62. This patient had been under observation from 1940 to 1953, during which time his heart had shown a progressive increase in size. In 1940 the transverse diameter was 13 cm., in 1949 13 cm., in 1950 16 cm., and in 1953 16.5 cm. He flew 3,540 miles in 1952. Case 28 is of particular interest, and Case 29 is perhaps the most interesting of all.

Case 28.—An Indian business man with hypertension and some aortic incompetence arrived in England, having travelled by sea, complaining of increasing dyspnoea and of attacks of nocturnal paroxysmal dyspnoea. The history also suggested that he had had several attacks of slight pulmonary oedema. The heart was enlarged. The electrocardiogram showed evidence of left ventricular hypertrophy, and while in England he developed congestive heart failure, for which he was taken to hospital. Although far from well, he wished at all costs to make the journey back to India, where his family lived, and to which country his friends had returned. It was decided that this could safely

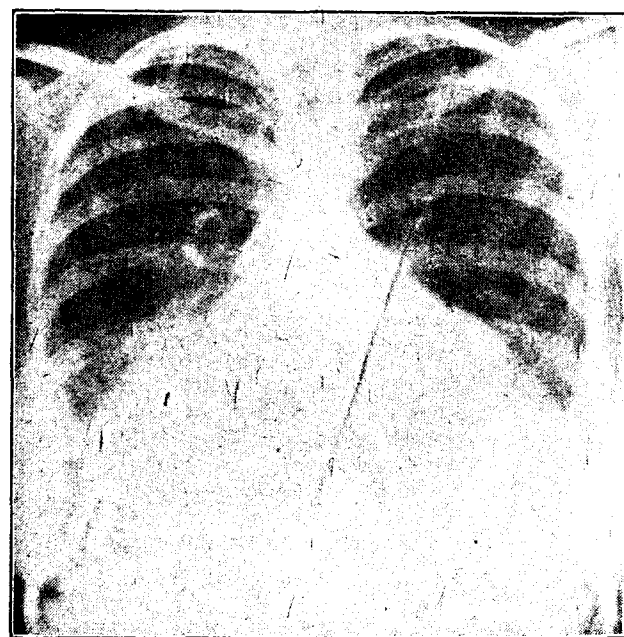


FIG. 3.—Case 29. Antero-lateral x-ray picture of chest. The heart shadow is typical of advanced rheumatic carditis with enormous dilatation of the heart as a whole.

be done by air, and he made a transit of 9,850 miles by this means. A year later, except for a little weakness, he was keeping reasonably well.

Case 29.—A girl of 19 was first seen in 1949, when she had an extensive rheumatic heart disease. The history suggested the possibility of pericarditis 18 months previously, and physical examination showed very great enlargement of the heart, auricular fibrillation, and systolic and diastolic murmurs at the apex. Broadbent's sign was positive in the interspaces behind on the left. The x-ray film (Fig. 3) showed that the heart was enormous; the transverse diameter of the chest was 23.5 cm. and that of the heart, by orthodiagraph, was 19.5 cm. In spite of the extent of organic change she has remained symptomatically remarkably well, and flew with her father from San Francisco to Australia via the Philippines without symptoms. In recent years she has flown more than 13,000 miles.

Case 30.—A woman aged 41 with mitral stenosis, normal rhythm, and pulmonary hypertension had had increasing shortness of breath with several attacks of severe paroxysmal dyspnoea before her journey from Singapore to London. She was found to have a severe degree of narrowing, the mitral orifice measuring 1.5 by 0.5 cm. at the time of operation. She has now returned to her home in the Far East.

Comment

These examples from many different varieties of cases of organic heart disease would seem to show that flying is perfectly safe when the heart is well compensated, and that it is a reasonable risk in patients whose state of compensation is not perfect, provided that the journey is necessary, or provided it is of such personal importance to the patient that he is prepared to take what can accurately be described as a very moderate risk. Generalizations as to suitability or unsuitability for flying cannot be made. Every case must be considered on its merits.

This opinion is confirmed by figures obtained from a recent survey carried out by the Medical Committee of the International Air Transport Association, which includes figures from 13 different air lines. It seems that on a five-year average one cardiac death has occurred per 1,113,000 passengers carried, and that one cardiac death has occurred per 800,000,000 passenger miles.

Conclusions

Thirty individuals, all with organic cardiovascular disease, are shown to have been able to undertake journeys by air successfully. They comprised most of the common varieties of severe organic heart diseases. In all cases the state of cardiac compensation was good at the time of flying, and in no patient did such air travel deleteriously affect the heart or the hypertension, either at the time or subsequently.

Adequate pressurization of the aeroplane must be assured in such cases. This point must be confirmed with the airport officials as an essential preliminary.

The benefit of the short air journey must be set against the disadvantage of the longer sea transit in such patients as may require to be in close contact with specialized medical care for therapeutic or other purposes, and who yet need, perhaps for personal reasons, to make a long journey.

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The establishment of the "American College of Angiology" is announced. This new organization has been formed by physicians and surgeons interested in diseases of the blood vessels. The College, whose official journal will be *Angiology*, is "dedicated to the teaching, research, and dissemination of knowledge concerned with the science and practice of angiology."

GASES ADMINISTERED IN ARTIFICIAL RESPIRATION

WITH PARTICULAR REFERENCE TO THE USE OF CARBON DIOXIDE

A Report to the Medical Research Council by its Committee* for Research on Breathing Apparatus for Protection against Dangerous Fumes and Gases

WRITTEN BY

Dr. K. W. DONALD

AND

Professor W. D. M. PATON

John Hunter suggested, in 1776, that inflation of the lungs with oxygen would be a valuable procedure in resuscitation. In 1780 Chaussier (see Hahn, 1899) administered oxygen in asphyxia of the newborn and later devised a laryngeal tube for this purpose. Early in the present century oxygen was being used increasingly in attempted resuscitation. However, in 1920, Henderson and Haggard reported that 90% oxygen and 10% carbon dioxide caused more rapid elimination of carbon monoxide in experiments on dogs. In later papers they recommended a mixture of 95% oxygen and 5% carbon dioxide for carbon monoxide poisoning, ether or alcohol intoxication, or for respiratory failure due to any cause. These workers also made a great contribution by persuading the authorities concerned that there was no efficient apparatus generally available for the administration of oxygen or other gases and that there was an urgent need for portable apparatus with properly fitting masks. Nicloux *et al.* (1925), Walton *et al.* (1926), and other workers could not confirm the great increase of carbon monoxide elimination with added carbon dioxide reported by Henderson and Haggard, and continued to support the use of pure oxygen only. Nevertheless, mixtures containing carbon dioxide were adopted almost universally for use in resuscitation.

Since this time evidence has accumulated against the use of carbon dioxide for this purpose, and recently the Medical Research Council Committee for Research on Breathing Apparatus for Protection against Dangerous Fumes and Gases recommended (unpublished memorandum) that, in first-aid practice, pure oxygen and not oxygen and carbon dioxide (carbogen) be administered to persons suffering from respiratory failure or respiratory depression and requiring manual artificial respiration. This recommendation was stated in simple terms, and it is now considered desirable that the reasons for abandoning "carbogen" should be given in greater detail. It is to be emphasized that the recommendation applies only to the resuscitation of subjects suffering from respiratory depression or failure and requiring immediate manual artificial respiration.

The urgent decision on whether artificial respiration is required may be very difficult. It is often hard to assess the degree of respiratory failure by looking at the movements of the chest or the colour of the patient.

*Members of the Committee: Professor Sir Bryan Matthews (chairman), Mr. S. H. Clarke, Mr. F. Dann, Professor E. A. Pask, Professor W. D. M. Paton, Dr. J. M. Rogan, Dr. J. S. Weinert, Mr. A. H. A. Wynn, and Dr. K. W. Donald (secretary).

* First-aid workers rightly err on the side of safety, and artificial respiration may be given to patients who are not in respiratory failure.

Causes of Respiratory Failure

The various types of respiratory failure seen by first-aid workers are as follows:

1. There are those persons who have become unable to ventilate their lungs because of drowning, asphyxiation, or strangulation and are suffering from severe oxygen lack and carbon dioxide retention.

2. There are those subjects who have been breathing an atmosphere deficient in oxygen and who have been able to increase their ventilation in response to increasing anoxaemia, thus washing out a considerable amount of carbon dioxide. However, in any dangerous atmosphere, anoxia will subsequently cause central respiratory depression, and these subjects will ultimately suffer from reduced ventilation and carbon dioxide retention.

3. There are those patients who have been able to ventilate their lungs freely with air but are rendered anoxaemic by the combination of haemoglobin with carbon monoxide, with resultant interference with oxygen transport. Animal experiments show that so long as the impaired oxygen transport has not caused respiratory depression there is little immediate danger (Schwerm *et al.*, 1948). But when respiratory failure supervenes, even the limited amount of available haemoglobin will no longer be oxygenated and very grave anoxaemia will occur. It is the first-aid treatment of such subjects requiring artificial respiration which is being considered here. The further treatment of surviving patients after first aid presents a special problem in so far as they may still have large quantities of carboxyhaemoglobin in the blood.

4. There are those persons who have been exposed to irritating gases and have developed pulmonary oedema. Cases of drowning may also have pulmonary oedema as well as water in the lungs. In such instances alveolar ventilation is grossly disturbed, and, added to this, the transfer of oxygen across the pulmonary membrane is impaired.

5. There are those subjects in whom electric shock or gaseous, volatile, or ingested poisons have caused acute central respiratory failure with consequent oxygen lack and carbon dioxide retention in an otherwise normal environment.

In all these instances there is cessation or severe depression of respiration, and urgent danger of permanent asphyxial damage to the vital centres even when the patients are returned to a normal environment. Unless artificial respiration is started very quickly they will die. (It is assumed in this discussion that irreversible circulatory failure has not occurred.) It must be emphasized here that it is *immediate* artificial respiration that is the major life-saving procedure; and that if it is efficiently carried out it will save many lives whether air or oxygen is breathed. The administration of oxygen is a most important ancillary measure, and it is useful to discuss the advantages so obtained before considering the use of carbon dioxide.

Advantages of Oxygen Therapy in Resuscitation

In general terms, the immediate danger is the death or irreparable damage of vital structures (the medullary centres, brain, and myocardium) from lack of oxygen. Even the smallest rises of oxygen tension in the lungs and body must therefore have a favourable effect in the few critical minutes during which the damage may become irreversible.

The efficient distribution of the inspired air to the alveoli may be impaired by secretions, exudates, haemorrhages, or fluid in the air passages and air spaces. Further, the abnormal air movement in and out of the lungs produced by artificial respiration appears to cause serious deficiencies of the proper distribution of inspired air to the individual alveoli; and oxygenation of blood flowing through the lungs may be subnormal even when normal or greater than normal ventilation is being induced (Gordon, Prec, *et al.*, 1951). The administration of high tensions of oxygen will go far to overcome the effects of poor gas distribution and to ensure that blood passing through the alveoli will be adequately oxygenated.

If there is oedema fluid in the alveoli or alveolar walls, then there will be considerable interference with the diffusion of oxygen from the alveoli to the venous blood flowing through the alveolar capillaries. The administration of oxygen will greatly increase the oxygen diffusion gradient, with resultant improvement in the transfer of oxygen to the blood.

Even if distribution and diffusion are not greatly impaired there will be a small but significant increase in the oxygen actually dissolved in the blood which will increase the initial oxygen diffusion gradient to the tissues. Although this effect cannot be great, it may turn the tide in favour of the survival of vital structures in the early critical moments of resuscitation. An extreme example of how small a quantity of oxygen may decide between death and survival is seen in Brucer and Swann's work (1950) on asphyxiated dogs, where 2% oxygen in nitrogen prevented the death of these dogs in the critical period following asphyxia.

In carbon monoxide poisoning, in view of the danger of anoxic brain damage even without respiratory failure, the administration of oxygen is often as urgent a necessity as artificial respiration. A further advantage of the increased tension of oxygen in the blood is that it will favour the dissociation of carboxyhaemoglobin.

The advantages of giving oxygen during resuscitation by artificial respiration are thus unqualified.

Carbon Dioxide Therapy in Resuscitation

Although carbon dioxide has been given with oxygen to subjects with respiratory failure during the last 30 years, there has been a great deal of uncritical thought concerning the use of this gas, and an attempt needs to be made to define with greater care the physiological situation involved. The main problem under consideration is whether the administration of additional carbon dioxide to persons with respiratory failure, who are being artificially ventilated, has any stimulant or other desirable effects.

The most straightforward view is that these subjects are suffering not only from profound anoxaemia but also from carbon dioxide retention; that artificial respiration is instituted to ensure normal or high oxygen tensions in the lungs and to remove both the excess carbon dioxide and that being produced by body metabolism; and that additional carbon dioxide is unnecessary because of the excess already present.

But this view has been questioned. It has been claimed that persons suffering from respiratory failure may have low body tensions of carbon dioxide and that this gas should therefore be administered to such cases. However, this has never been demonstrated under first-aid conditions, and it is clear that any subject who has remained capable of maintaining such efficient ventilation that it causes a lowering of the body pCO_2 is not in respiratory failure. Further, the postulated syndrome of respiratory failure with low levels of carbon dioxide in the living body, in which metabolism continues, implies the removal of carbon dioxide without breathing. There is, however, the remote theoretical possibility that the body metabolism and carbon dioxide production are so immediately and greatly reduced under extremely anoxaemic conditions that complete respiratory failure and abnormally low carbon dioxide levels can occur simultaneously. Reliable and precise evidence on this point is not available in the human subject, but clinical research has always shown normal oxygen uptakes and carbon dioxide production during fairly severe anoxaemia (Donald *et al.*, 1952).

Grodins *et al.* (1946) have studied this point with some care in dogs in which asphyxia was produced by tracheal obstruction or by the inhalation of nitrogen. In the former case an early respiratory acidosis was reinforced by a severe metabolic acidosis, such that, by the time the circulation failed, the arterial pCO_2 was 65 mm. Hg (control value in this series, 36 mm. Hg). In fatal nitrogen asphyxia the early respiratory alkalosis, due to hyperventilation before

respiratory failure, was overcome by a later respiratory and metabolic acidosis, so that both the arterial blood acidity and carbon dioxide tensions were above normal when circulation failed. Another important finding was that, if artificial respiration with air at the animal's control ventilatory volumes was then begun, the arterial pCO_2 and hydrogen-ion concentration continued to rise until spontaneous respiration was resumed. This effect was attributed by these workers to the oxygenation of the haemoglobin releasing carbon dioxide, to the sweeping of metabolic acid products formed during asphyxia in the now restored circulation, and to the resumption of normal aerobic carbon dioxide production. They also showed that, on resumption of spontaneous breathing, hyperventilation occurred in an attempt to lower the pCO_2 and compensate the metabolic acidosis.

Summarizing, the theoretical possibility of such severe and immediate depression of metabolism by anoxia that low carbon dioxide levels could occur with anoxic respiratory failure was not substantiated. Low carbon dioxide levels were found only during hyperventilation due to anoxia before respiratory failure had occurred. After anoxic respiratory failure there was an increase of body pCO_2 and metabolic acidosis even in those animals which had previously hyperventilated considerably. When the respiratory centre recovered, as a result of oxygenation following artificial respiration, it was then able to respond to the increased concentrations of carbon dioxide and hydrogen ions which were already present in the body.

It is not definitely stated by those who advise the use of carbon dioxide in resuscitation whether they wish to induce a rise of the body pCO_2 or not, but one must presume this to be their aim. If this is so, then, if oxygen is available, one could ensure adequate oxygenation and a rise of body pCO_2 by deliberately maintaining low ventilatory volumes; the administration of exogenous carbon dioxide would thus be unnecessary. It is well known that artificial respiration under various circumstances may fail to achieve adequate pulmonary ventilation (Gordon, Affeldt, *et al.*, 1951; Nims *et al.*, 1951), and it is certain that further carbon dioxide retention occurs in many subjects receiving artificial ventilation and breathing only air or pure oxygen.

When a subject receiving artificial ventilation is given added carbon dioxide to the oxygen being administered the following events occur. The addition of 5-7% carbon dioxide to the inspired gas without any simultaneous increase in ventilatory volumes will cause an almost immediate rise of the pCO_2 in the alveoli of the same order—that is, with 5-7% carbon dioxide = 36-50 mm. Hg (Fenn *et al.*, 1946). In those subjects who are receiving adequate ventilation to begin with, the initial alveolar pCO_2 would be about 40 mm. Hg (5.5%). Thus the alveolar pCO_2 will rise to 76-90 mm. Hg (10.6-12.6%). If the subject is not being adequately ventilated or is still suffering from gaseous acidosis, then the alveolar pCO_2 will rise to far higher figures (15-25%). The arterial pCO_2 and that in the well-circulated organs, including the central nervous system, will also rise to these levels. Evidence is presented that such tensions in the body, particularly in subjects who have suffered nearly fatal anoxaemia, so far from being beneficial, are in fact harmful.

The advocates of carbon dioxide administration may argue that the artificial ventilation should be appropriately increased to avoid an undesirable rise of carbon dioxide tension in the body. The simultaneous administration and vigorous removal of a therapeutic agent is treatment reduced to absurdity. It has been suggested that enough carbon dioxide should be given with the oxygen so that with carefully judged artificial ventilation there is a "slight" rise of pCO_2 which will act as a "respiratory tonic." Granting this was desirable, it would be most difficult to achieve even by a team of respiratory experts with all the aids of modern science, and certainly impossible in first-aid conditions.

From all these considerations it is evident that the administration of carbon dioxide under first-aid conditions to a subject in respiratory failure who is receiving artificial respir-

ation is an uncertain and uncontrolled form of therapy with grave risk of high and dangerous tensions of carbon dioxide being induced in the subject.

Possible Dangers of Overventilation

It has been argued that efficient artificial ventilation may wash out such large quantities of carbon dioxide that it causes a depression of the body pCO_2 to below normal levels (acarbica), and that carbon dioxide should be administered to counteract this. Overventilation can certainly occur with mechanical respirators of the Drinker type. It has also been reported in patients with severe poliomyelitis under treatment, but there are always several important factors contributing to these sustained high ventilatory volumes—muscular paralysis, tracheotomy with intubation, and air or oxygen given at positive pressure (Astrup *et al.*, 1954). Indeed, the assisted respiration in such cases is very similar to the "controlled" respiration used in modern anaesthesia.

However, overventilation is most unlikely to occur for any period when manual methods of artificial respiration are used under first-aid conditions on unconscious persons who have been rescued from nearly fatal asphyxia and who not only have severe carbon dioxide retention but may also have some degree of respiratory obstruction and other lung damage. Nims *et al.* (1951), who studied the very effective "push-pull" methods, strongly support this view, and emphasize that the high ventilatory volumes obtained cannot be maintained for very long periods under first-aid conditions. Further, even if overventilation occurred occasionally, there can be no doubt that such efficient washing out of carbon dioxide would be too unusual to warrant the administration of carbon dioxide to raise the body pCO_2 in all cases. Even if such instances could be diagnosed, and carbon dioxide given, then a gaseous acidosis would be rapidly induced unless the volumes being ventilated were even further increased—an improbable event under first-aid conditions.

Finally, it may be pointed out that if a patient is "acarbica" while receiving artificial ventilation the resulting lack of respiratory stimulus will have no significant effect on the volumes being artificially ventilated or on the oxygenation of the blood, and the cessation of artificial respiration for a short time will cause the alveolar and arterial pCO_2 to rise to stimulating levels. There is no evidence that a period of low body pCO_2 will cause any damage to the centre, or any other part of the body, provided that oxygenation is adequate, and, in the presence of continued metabolism, such a state of affairs can only be short-lived under first-aid conditions. It is underventilation that is the main danger in resuscitation.

Carbon Dioxide as a Respiratory Stimulant

Although it has been shown that the administration of carbon dioxide during artificial respiration is an uncontrolled and uncertain form of therapy, it is still important to consider whether an induced rise in body carbon dioxide will increase the likelihood and degree of spontaneous activity of the respiratory centre. The effect of increased levels of carbon dioxide on humans or animals in respiratory failure not being artificially ventilated must therefore be reviewed.

If a normal subject is given 5% carbon dioxide then his respiratory centre will increase its activity, with a resultant increase in ventilation that will maintain nearly normal tensions of carbon dioxide in the lungs and body. Thus, although there is an increase of activity of the centre, it is a defensive increase and there is no evidence that it improves the condition of the centre or organism. It merely avoids an undesirable gaseous acidosis. This increase of normal respiratory activity due to carbon dioxide is loosely termed "stimulation." Stimulation is a vague term which has erroneously implied, to many people, that the exhibition of carbon dioxide will cause an increase of viability or efficiency of a failed or failing respiratory centre under all

circumstances. Yet it has long been known that the depressed respiratory centre becomes less and less able to respond, or actually incapable of response, to increased tensions of carbon dioxide. Many physiologists assess the degree of depression of the centre by drugs (such as ether, chloroform, morphine, pentobarbitone, chloralose, urethane, cyclopropane, polamidone, and pethidine) by the diminution of this response (Trevan and Boock, 1921; Schmidt, 1924; Dripps, 1947; Wang and Nims, 1948; Remy, 1950). The administration of carbon dioxide to a person with respiratory depression who is not being artificially ventilated will therefore inevitably result in further carbon dioxide retention.

In experiments on the effect of these increased tensions of carbon dioxide in respiratory failure, Schmidt (1924) showed that the administration of carbon dioxide to dogs with respiratory depression due to morphine and heroin actually reduced their minute-volume in many instances. Frequently carbon dioxide inhalation was followed by permanent respiratory failure even in animals with previously adequate ventilation. Ivy *et al.* (1947) gave 5% carbon dioxide to animals with developing respiratory failure due to anoxia, and showed a progressive decrease of the response to this gas. In a number of instances, as in Schmidt's experiments, the volumes ventilated were decreased and the gas not only increased the degree of respiratory failure but also precipitated circulatory failure.

Not all these experiments are feasible or desirable in the human subject, but there is a great deal of evidence emphasizing the dangers of increased tensions of carbon dioxide in the body of humans.

Effects of High Levels of Carbon Dioxide

Anaesthetic and Narcotic Effects

Carbon dioxide was, in fact, the first gaseous anaesthetic used surgically, and Hickman performed surgical operations on animals under its influence as long ago as 1824 (see Duncum, 1947). Paul Bert (1878) subsequently confirmed that high concentrations of carbon dioxide (15% upwards) rendered normal animals unconscious, and again suggested its use as an anaesthetic during surgical procedures. Since that time many workers have described the depressant narcotic effect and the antagonism to anaesthetics produced by high concentrations of carbon dioxide in animals (Gellhorn and Heymans, 1948; Stein *et al.*, 1949; Pollock, 1949); and in man (Richardson, 1885; Brown, 1930; Seever, 1944; Dripps and Comroe, 1947). Stein *et al.* (1949) reported that 30% carbon dioxide for 30 minutes would prevent electrically induced convulsions in man. This implies, incidentally, that the administration of carbon dioxide is likely to weaken the effectiveness of any anaesthetics given during resuscitation. These reports concern the inhalations of high percentages of carbon dioxide by normal subjects, in whom even a normal response to carbon dioxide was unable to prevent severe gaseous acidosis with its attendant dangers.

Over 40 years ago Krogh and Lindhard (1913) noted that the administration of oxygen with carbon dioxide appeared to reduce the ventilatory response to the latter gas. Work during the recent war (Barlow *et al.*, 1945; Donald, 1945) showed that in the absence of efficient carbon dioxide absorption in respiratory apparatus, exercising subjects breathing oxygen could readily become anaesthetized by carbon dioxide without appreciating any preliminary respiratory stimulation, and that, in resting subjects, concentrations of 10% or more carbon dioxide in oxygen readily induce unconsciousness.

In controlled respiration, with high oxygen tensions, as used in modern anaesthesia, it has been shown that a relatively small decrease of minute-volume will cause the body pCO_2 to rise to narcotic levels (Orton, 1952; Dripps, 1952), and levels of up to 20% carbon dioxide have been recorded (Dripps, 1947; Buckley *et al.*, 1953); this may cause considerable delay in return of consciousness (cf. Scurr, 1954; Gray and Fenton, 1954). All anaesthetics and narcotics will,

if given in larger doses, finally cause medullary failure, and there is no reason to believe that carbon dioxide is an exception.

It has only recently been appreciated that carbon dioxide narcosis, far from being an academic curiosity, is not uncommon in routine clinical practice (Barach, 1948; Donald, 1949; Comroe *et al.*, 1950). If patients with very severely damaged lungs (emphysema, extensive tuberculosis, bronchiectasis) develop bronchopneumonia, severe bronchitis, or status asthmaticus, they frequently suffer extreme and fairly sudden anoxaemia—that is, arterial blood saturation of 20 to 40%. The body pCO_2 of these very ill patients rises considerably as anoxaemia develops, and this would suggest the development of some degree of anoxic central respiratory failure (Donald, 1953) with resultant depression of ventilation. In this state the respiratory centre appears to be insensitive to carbon dioxide, but still responds to some extent to anoxaemic stimuli from the sino-aortic zones. The administration of oxygen to such patients, although life-saving, does not cause an immediate return to normal respiratory behaviour, and, as the main effective stimulus to the damaged centre under these conditions is now removed, the patient ventilates even less, with the retention of increasing amounts of carbon dioxide and, frequently, resulting loss of consciousness. Removal of the oxygen under these conditions will often cause marked increase in ventilation and reduction of carbon dioxide levels with return of consciousness even though the extreme anoxaemia returns. It is to be emphasized that these very ill patients are not receiving artificial ventilation. Recently a Drinker respirator has been employed to allow improvement of oxygenation in such cases without dangerous carbon dioxide narcosis (Boutourline-Young and Whittenberger, 1951; Stone, 1953; Lovejoy, 1954).

Even very grave respiratory infections rarely cause such a severe degree of anoxaemia in previously healthy persons with hitherto normal lungs. Further, they do not have the initial respiratory acidosis and increased body base which is usually found in the patients described above. However, Engström (1954) and Christie (1954), workers of great experience in the field of poliomyelitis, state that carbon dioxide intoxication does occur in the acute phases of the disease, particularly with oxygen therapy and inadequate ventilation. Although it is still uncertain whether a similar syndrome would occur in a healthy subject who has been exposed to acute and nearly fatal anoxaemia due to drowning or asphyxiation, it would seem very likely, and animal experiments strongly support this view. Marshall and Rosenfeld (1936) caused partial respiratory failure in healthy dogs by severe anoxia and showed that the administration of oxygen appeared to remove the only remaining effective drive of spontaneous respiration and resulted in a further reduction of respiratory volumes with retention of carbon dioxide.

These clinical observations, and the experiments of Schmidt (1924), Ivy *et al.* (1947), and Marshall and Rosenfeld (1936), all suggest that a respiratory centre which is depressed either by drugs or anoxaemia, although still capable of a considerable response to the anoxaemic stimulus, may no longer respond to increased carbon dioxide or hydrogen-ion concentration, and that any attempt to increase the body carbon dioxide tension further will not only be ineffective but also dangerous. They also emphasize that efficient artificial ventilation is the keystone of resuscitation even when oxygen is being administered.

Vascular Effects

Low concentrations of carbon dioxide have, initially, a stimulant effect on the vasomotor centre with peripheral vasoconstriction. However, concentrations of 15% or greater appear to cause vasomotor depression (Nowak and Samaan, 1935; Liljestrand, 1948). There is also a direct capillary-dilating action which may well contribute to peripheral failure. Rats and guinea-pigs exposed to a cold environment fail to maintain their body temperature

normally when exposed to 3% carbon dioxide. This may be due not only to the peripheral circulatory changes but also to depression of the thermo-regulatory centres (Gellhorn, 1937). Although it is not intended to discuss this in detail here, circulatory failure is often the critical cause of death even in persons with respiratory failure (Swann, 1953), and any contributory cause of peripheral vasodilatation and fall in blood pressure must be avoided.

MacDonald and Simonson (1953) have reported considerable abnormalities of cardiac rhythm in human subjects after very brief periods (23 to 63 seconds) of acute respiratory acidosis (30% carbon dioxide). Altschule and Sulzbach (1947) describe electrocardiographic signs of reversible myocardial injury in subjects receiving 5% carbon dioxide in 95% oxygen by intratracheal tube. Under anaesthesia vagal action is said to be potentiated by hypercapnia (Campbell, 1950), with the danger that usually harmless manipulations in the respiratory tract may stop the heart. These adverse effects on the heart are highly undesirable when life is, in any case, threatened by the possible onset of irreversible cardiac failure or acute ventricular fibrillation.

Carbon dioxide administration, even in small concentrations, causes dilatation of the cerebral vessels (Wolff and Lennox, 1930; Kety and Schmidt, 1948). Further, there is a considerable rise of cerebrospinal fluid pressure—that is, up to 350 mm. of water with 10% carbon dioxide (Cobb and Fremont-Smith, 1931). A similar rise of cerebrospinal fluid pressure was demonstrated in patients who become unconscious with oxygen therapy (Davies and MacKinnon, 1949), and later was attributed (Donald, 1949) to carbon dioxide narcosis and associated cerebral vasodilatation. It has been suggested that this cerebral vasodilatation will cause a beneficial increase of blood flow to the whole cerebrospinal axis; and yet the fact that many such patients are unconscious, are hypoventilating, probably because of respiratory failure, and have a great increase of intracranial pressure, often with papilloedema, would emphasize that such high tensions of carbon dioxide in the body are, if possible, best avoided.

"Off Effect"

Even in normal subjects the sudden cessation of 5% carbon dioxide inhalation, after exposure for periods of half an hour or more, causes "shock-like" symptoms such as pallor, shivering, vomiting, and severe malaise (Alexander *et al.*, 1939). Miller *et al.* (1952) reported serious or fatal cardiac irregularities in 18 out of 19 dogs on returning to air-breathing after several hours' carbon dioxide (30 to 40%) administration; 15 of these animals died, 12 from ventricular fibrillation. Cyclopropane anaesthesia has been found, if respiration is not assisted, to cause alveolar carbon dioxide tensions of up to 20%. Abrupt withdrawal of the anaesthetic mixture, and hence also of the high levels of carbon dioxide, produces the condition originally called "cyclopropane shock" but now recognized to be caused by the removal of a severe hypercapnia. It is accompanied by a dangerous fall in blood pressure, cold clammy skin, bradycardia, and sometimes delirium (Dripps, 1947; Buckley *et al.*, 1953).

Summary and Conclusions

The value of the administration of oxygen and carbon dioxide to subjects in respiratory failure and receiving artificial respiration is reviewed. It is emphasized that without immediate artificial respiration all other measures will be useless. However, the administration of oxygen to patients receiving artificial respiration is given unqualified support.

The value of the administration of carbon dioxide under these conditions is considered in greater detail. The possibility of low levels of body pCO_2 in the presence of respiratory failure prior to resuscitation is discussed, and reasons are given why it is thought that this syndrome does not occur. If carbon dioxide is administered during

artificial respiration, then the partial pressure of carbon dioxide in the lungs and well-circulated organs will be raised to highly abnormal levels unless a considerable further increase of ventilation can be induced. Under first-aid conditions the rescue worker will never know the initial levels of carbon dioxide in the body of the subject, nor the ventilatory volumes he is producing. The administration of carbon dioxide under these conditions is therefore uncontrolled and uncontrollable, and in many cases is apt to cause a dangerous intensification of carbon dioxide accumulation and intoxication.

The question of possible overventilation and the lowering of the body pCO_2 by manual methods under first-aid conditions is considered. It is concluded that this is very unlikely to occur for any significant period, that it would not alter the prognosis, and that, even in the most improbable event of its being diagnosed by a first-aid worker, carbon dioxide therapy would be unnecessary and undesirable.

The ability of even slight-to-moderate rises of body pCO_2 to increase the viability and promote further spontaneous activity of a failed or failing respiratory centre is also questioned.

The dangers of high concentrations of carbon dioxide in the body are emphasized. These include depression of the central nervous system and respiratory centre, vasomotor depression with peripheral vasodilatation, dangerous cardiac arrhythmias, and fall in body temperature. The sudden removal of the gaseous acidosis also causes severe symptoms. Barcroft and Margaria (1931) said of even normal subjects that "the breathing of 7.5% carbon dioxide for 20 minutes produces a shock from which the system does not wholly escape for some hours or perhaps even a longer time."

For these reasons it is recommended that in first-aid practice carbon dioxide should not be administered with oxygen in the resuscitation of subjects requiring and receiving artificial respiration.

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CAN WARD ROUNDS BE A DANGER TO PATIENTS WITH MYOCARDIAL INFARCTION?

BY

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Like physical effort, emotional stress may bring on anginal pain in a patient suffering from a disease of the coronary arteries. The contributory effect of mental tension can often be shown even in cases of myocardial infarction. Besides physical rest, complete mental rest is a fundamental requirement in the treatment of myocardial infarction (Miller, 1942; Stroud, 1945; White, 1945; Scherf and Boyd, 1947; Friedberg, 1950; Levine, 1951). Physical rest is usually easy to organize: bed rest in itself guarantees it. A more difficult factor to control is mental rest. Internal mental stresses may affect the patient to such a degree that it is difficult to control them. This makes it all the more necessary that attention should be devoted to the external factors disturbing the patient's peace of mind.

Contacts in Hospital

For the in-patient, contact with others doubtless causes the strongest psychological stresses to which he is exposed. The persons with whom the patients come into contact are the patient's relations and friends, other patients, and hospital personnel.

Relations and Friends.—It is often found that the visit of a certain relative or friend to a patient with myocardial infarction does not have the desired effect of soothing him. On the contrary, one result of such a visit may be increased pain. This is an occurrence that can, of course, be avoided

if the attending physician, in serious cases, decides which visitors may be allowed to see the patient, and how often.

Other Patients.—The patient with myocardial infarction reacts differently towards his fellow-patients than towards his relations. The influence of the patient in the next bed may be soothing, that of another irritating. By choosing the patient's bed the mental stress arising in this way may be eliminated. In serious cases of myocardial infarction the practice in our clinic is often to place the patient in a single-bed room to start with.

Hospital Personnel.—Of the hospital personnel, only nurses and physicians come into close contact with cases of myocardial infarction. In selection and training of the nurses emphasis is placed upon those qualities that have a reassuring effect on the patient. It may be taken as read that credit for preserving the patient's peace of mind must go to the nurses. What is more difficult to assess is whether the attending physician may not introduce emotional stresses deleterious to the patient. Calmness of the doctor and wisely worded pronouncements by him may have a beneficial influence on the patient's worried state of mind. On the other hand the patient with myocardial infarction, knowing that his condition is dangerous, is probably anxious about the doctor's verdict. This may induce a harmful state of excitement. My personal experience has been that on several occasions, just as the ward round has advanced to the patient suffering from coronary disease, or, more often still, to the patient preceding him, he gets an attack of angina pectoris, in some cases fatal.

The present paper is an attempt to ascertain, by analysing the fatalities from sudden myocardial infarctions, whether the ward round may be a danger to such patients. No analysis of the anginal pain felt by these patients and possibly associated with the doctor's round has been included, for the simple reason that it is generally impossible to show these pains objectively.

Material

The material investigated is taken from the 373 patients with myocardial infarction treated in 1950-3 at the Third Medical Clinic of Helsinki University, and comprises those who died of acute myocardial infarction while in hospital. Where the death occurred later than six weeks after the acute myocardial infarction the case is not included. The series consists of 84 cases in which death occurred—69 male and 15 female. The average age of the male patients at the time of death was 57.4 years, and of the female patients 66.5 years. In 47 cases the diagnosis was confirmed

TABLE I.—Analysis of 84 Deaths from Acute Myocardial Infarction

Age Group	Male	Female	Lapse of Time from Onset of Infarction to the Moment of Death		
			24 Hours	7 Days	8 Days-6 Weeks
30-39	1	0	—	—	1
40-49	12	0	7	2	3
50-59	26	1	6	6	15
60-69	24	2	7	8	18
70-79	5	5	3	5	2
80+	1	0	1	—	—

at necropsy. Table I gives details of the age and sex distribution of the 84 cases and the lapse of time between the onset of infarction and death. It shows that the first 24 hours accounted for a considerable proportion of the total deaths. A probable contributing factor is that all the patients lived in the neighbourhood of the clinic; this means that serious cases were admitted to hospital more or less immediately after the attack of infarction. In hopeless cases therefore, death occurred in the hospital more often than would have been the case had the distance of transportation been longer. In addition, Table I shows that 45 of the patients died within seven days of the attack. As the first week must be regarded as a very critical period for these patients, it was thought undesirable to draw conclusions

from them even when a ward round coincided with death. Only when the patients survived for more than seven days have the cases been analysed.

Results

The 39 patients who died more than seven days (but less than six weeks) after a sudden attack of myocardial infarction included six whose death was closely associated with a ward round. Table II gives details of these six cases. As the

TABLE II

Case No.	Age and Sex	Occupation	Duration of History of Angina (years)	Interval from Onset of Myocardial Infarction to Death (days)	Necropsy
1	58 M	Intellectual worker	1	37	+
2	61 M	Manual ..	0	19	+
3	62 F	Housewife	6	41	—
4	65 M	Manual worker	0	32	—
5	67 M	Intellectual ..	1	32	—
6	68 F	..	12	9	+

factors associated with the last ward round are important in these cases detailed histories are given below.

Case 1.—A chief accountant aged 58 had had a severe attack of angina pectoris at home. Twenty-one days later, as the pain persisted, he entered hospital. Examination indicated a myocardial infarction of the posterior wall. There was no pyrexia. The E.S.R. was 36 mm. in one hour. The customary anticoagulant treatment was not given. From the beginning he was allowed to sit daily in an easy chair. Slight cardiac insufficiency disappeared with mild digitalis treatment. Emotionally he was abnormally labile. Up to the sixteenth day in the ward his condition had been satisfactory, both subjectively and objectively. That day, however, the physician-in-chief was on his round; the patient became more excited than usual, and when the round reached him he began to feel nausea, which soon developed into severe thoracic pain. In spite of the doctor's efforts, death ensued in approximately two hours (at 12.35 p.m.). **Findings at Necropsy.**—Thrombosis of right coronary artery. Thrombosis of superficial anterior descending branch and of left circumflex coronary artery, with myocardial infarction. Congestion of the lungs. Mild congestion of the liver. Mild nephrosclerosis.

Case 2.—A switchman aged 61 had had a severe anginal attack two days before admission, followed by slighter but persistent pain. Repeated E.C.G.s gave no positive indication of a fresh myocardial infarction, although signs of myonecrosis were seen. On the basis of the clinical picture, however, the diagnosis was regarded as clear. A temperature of 100.4° F. (38° C.) persisted for five days, and his E.S.R. rose to 99 mm. After the temperature had subsided slight signs of cardiac insufficiency were noted. Careful digitalis treatment was started, and bed rest and anticoagulant treatment were continued throughout his stay in hospital. The patient seemed calm but slept poorly. On the seventeenth day, as the ward doctor approached his bed, he had a severe attack of pain and died immediately (at 9.15 a.m.). **Findings at Necropsy.**—Thrombosis of left coronary artery. Myocardial infarction and cardiac hypertrophy and dilatation. Thrombosis of left ventricle. Pulmonary congestion, oedema, and emphysema. Small right-sided pleural effusion. Congestion of liver and kidneys. Some softening of the cerebral cortex on the left side. Strawberry gall-bladder.

Case 3.—A works foreman's wife aged 62 two weeks before admission to hospital had had an attack of thoracic pain which did not completely subside with nitroglycerin. An E.C.G. taken on admission showed no clear signs of a fresh myocardial infarction. However, the clinical picture was clear enough to warrant the diagnosis, and the customary treatment with anticoagulants was given. There was no rise in temperature. The E.S.R. reached its peak, 35 mm., at the beginning. Forty-one days after the assumed infarction

the patient died while the physician-in-chief was on his rounds. She had been out of bed for eight days and was impatiently awaiting her discharge from hospital. For several days she had been informed that the physician-in-chief would decide about her discharge on that very round. While he was at the bedside of the patient next to her (at 9.20 a.m.) she began to pant, and jerks were observed in the extremities. Respiration continued for a while, but heart action could not be restored. **Findings at Necropsy.**—Thrombosis of left coronary artery. Myocardial infarction. Apical aneurysm of left ventricle. Thrombosis of left iliac and femoral arteries. Pulmonary oedema.

Case 4.—A painter aged 65 had had a severe attack of thoracic pain three weeks before admission to hospital, followed by persistent distress. The E.C.G. taken in hospital showed signs of an extensive myocardial lesion. Myocardial infarction was considered to have occurred in connexion with the pain. His E.S.R. was 45 mm. in one hour. There was no rise in temperature. Seroreactions for syphilis were positive. The medical history was not indicative of syphilis. Mesaortitis was suspected. He received treatment for cardiac insufficiency, and was given penicillin. After ten days in the ward the patient suddenly fell from his bed when the ward doctor on his round reached the room (at 9.45 a.m.). Cardiac action could not be restored. **Findings at Necropsy.**—Thrombosis of right coronary artery. Cardiac hypertrophy and dilatation. Myocardial infarction. Mural thromboses in left ventricle. Pulmonary congestion, oedema, and emphysema. Congestion of the liver. Specific aortitis. Gall-stones.

Case 5.—A business man aged 67 was admitted to hospital on the day of his attack of myocardial infarction. An E.C.G. showed indications of posterior wall infarction. His temperature rose to 99.2° F. (37.3° C.), and the E.S.R. to 45 mm. in one hour. Apart from the first 24 hours he had no pain while in hospital. He was given the customary treatment with anticoagulants. Recovery seemed to proceed well. The E.S.R. dropped evenly. After four weeks it was 10 mm. in one hour. As the patient insisted, he was promised discharge after 32 days in hospital, treatment to be continued at home. He had waited for the round during which the discharge was to be decided on finally—so much so that he had had his clothes brought to the ward. Immediately after the doctor on the round had granted him permission to go home he began to dress, but collapsed and died by the side of his bed (at 11.35 a.m.). Permission for necropsy was refused.

Case 6.—A female Post Office clerk aged 68 was admitted to hospital for thoracic pain, which had started the night before in connexion with an emotional disturbance. Previously, too, anginal pain was associated almost exclusively with a feeling of resentment. An E.C.G. indicated myocardial infarction of the posterior wall. Her temperature rose in hospital to 99.5° F. (37.5° C.), and the E.S.R. to 58 mm. in one hour. Subjective complaints rapidly subsided in the ward. The customary anticoagulant treatment was given. She was psychically very labile and grew excited over trivialities. After nine days in hospital, and when the physician-in-chief was on his round in the eight-bed room in which she lay sixth, she grew restless as he reached the patient preceding her. On being asked how she felt she began to reply, but suddenly she went highly cyanotic, started to pant, and the heart ceased to function (at 9.30 a.m.). **Findings at Necropsy.**—Right coronary thrombosis. Myocardial infarction. Rupture of left ventricle. Haemopericardium. Congestion of the lungs.

Discussion

Six of the patients who had survived the first seven days but died while still in hospital before six weeks had elapsed from the acute myocardial infarction, died in connexion with the ward round. The occurrence of such a remarkable accumulation of fatalities simultaneously with the ward round cannot be ascribed to coincidence. If the 24 hours

of a day and night are divided into six-hour periods beginning from midnight, the fatalities are distributed over these periods as follows: 11, 10, 7, and 11—thus fairly evenly. In our clinic the ward round in each room takes from a half to one hour. Had the 39 fatalities not occurred during a ward round more frequently than at other hours, only 0.8 to 1.6 fatalities should have occurred during them. But these deaths totalled 5. (In Case 1 death did not occur until two hours after the round, although the fatal attack began during it.)

A closer association between these fatalities than is provided by mere coincidence is strongly suggested by the course of several individual cases. It also seems that the explanation for this phenomenon can be found in the state of excitement that may be brought on in some patients by the doctor's visit. Two deaths occurred when the patients were told that the time for their discharge, so eagerly awaited, had come (Cases 3 and 5). In two cases (Cases 1 and 6) the patient habitually got excited during the visit. Perhaps it was no coincidence that three deaths occurred in connexion with the round of the physician-in-chief, repeated only weekly or bi-weekly in each ward.

On the basis of the foregoing it is possible that there may be a serious hidden risk in ward rounds for the patient with myocardial infarction, since on these occasions he is subjected to an unusually severe emotional stress. This danger is clearly very difficult to avoid in the case of an unusually labile patient, but it is always possible to reduce it. The adoption of the following precautions may lead to improvement in this respect.

(1) To ensure that the attending doctor is aware of the risk, and takes heed of it in his attitude to the patient. According to Stroud (1945), the most important point in treatment is a sympathetic attitude on the part of the doctor towards his patient. (2) It is advisable not to emphasize excessively the importance of ward rounds to a patient with myocardial infarction. Where such emphasis is made it may not be the doctor's fault so much as owing to the attitude of the nursing staff. The patient may well have been told of the great importance of the round of the physician-in-chief, the beds may have been made with great care and speed, and other special preparations made for the expected visit. Presumably the patient's state of mind, susceptible to excitement, receives an added stimulus from this general state of bustle in the ward. This is by no means the case everywhere, but, so far as I can see, these disadvantages increase as the "formal" side of hospital life becomes more pronounced. (3) The administration of sedatives when any signs of a state of excitement are observed in a patient with myocardial infarction is naturally very important. But, obviously, the mental rest secured by this means is not the same as that resulting from a successful removal of the factor accounting for the development of mental excitement.

Summary

Six out of 39 hospital patients affected with acute myocardial infarction who died more than seven days but less than six weeks after the onset of the infarction did so during or shortly after ward rounds. This cannot be dismissed as a coincidence. Four of the ward rounds in connexion with which the deaths occurred involved, even to the casual observer, an unusually heavy mental stress to the patient. In two cases discharge from hospital, eagerly awaited by the patient, was to be decided upon at that very occasion. In another two cases the round was that of the physician-in-chief, made only once or twice a week.

The conclusion is that the ward round may sometimes constitute such a heavy strain on the patient that in cases in which this stress may be deleterious, as in myocardial infarction, it may constitute a danger. Means of reducing this risk are discussed.

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ARRESTED MENTAL DEVELOPMENT INDUCED BY LEAD-POISONING

BY

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This paper is based on the clinical history of a boy aged 7½ who, as result of lead ingestion, suffered arrested mental development and is now a mentally defective person in institutional care. The data on which his case history has been compiled are derived from the interim reports of clinicians who attended him at various stages of his long illness and his mother's account of the sequence of events and their attendant circumstances. The case is reported in part chronologically, and in part in the order in which relevant information materialized, so that the diagnostic problems which arose may be appreciated as they were presented to the physicians concerned and so that the importance of early and adequate diagnosis in such cases may be emphasized.

Case History

The patient's mother, a woman of apparently average intelligence, reported that her son was an only child. His birth weight was 6½ lb. (2.9 kg.), and both pregnancy and delivery were uncomplicated. He developed normally in infancy, sitting up at 7 months, walking at 17 months, and talking at 18 months. By the age of 2 years he had achieved sphincteric control and was repeating nursery rhymes. He was duly inoculated against diphtheria and whooping-cough and the family doctor confirms that he was a normal infant. The mother states quite definitely that the child was more than 3 years old when he had an illness, diagnosed as "food-poisoning" and associated with intestinal symptoms and an itchy rash. In the course of about six weeks the latter faded; but thereafter he developed a cough, worse at night, accompanied with almost continuous vomiting. She says that whooping-cough was prevalent at the time and the illness was so diagnosed, although the child did not "whoop."

A neurologist, consulted when the patient was aged 5, reported that the severe illness, believed to have been whooping-cough, occurred when the child was 2½; but in all other matters confirmed the mother's version of the past history. His opinion was that the severe illness may have been encephalitis, following or complicating whooping-cough, and that its sequelae were regression and an acquired aphasia (both receptive and executive). Thus the child's performance I.Q. was only 58. The mother was therefore advised to send this ineducable boy to an occupation centre while he was kept under observation at the out-patient department. He was given a course of glutamic acid.

The third medical report relates to the patient's condition when he was 5½ and under observation at another hospital. He had been referred because he was unable to talk, ignored

people, and was very fearful. The father, aged 33, was described as being emotionally immature, solitary, and like his son in his inability to form emotional relationships. It seems that incompatibility and housing difficulties caused the parents to separate by mutual consent for a period of a year in 1951-2. On examination the patient was found to be a sturdy child with incontinence of faeces but not of urine. Mentally he was withdrawn, preoccupied, and unable to talk. On the Merrill-Palmer scale his mental age was 3½ years, but full testing proved impossible. During his six weeks in hospital he was noisy at first, but later quieted down; his play activities were simple and he delighted in sand and water. He played with faeces when opportunity offered and he tended to place everything that he handled in his mouth. He did not associate with the other children, and seemed to be so sensitive to the noise they made that he sought comfort from the nurses. On January 31, 1953, he was transferred to a fever hospital with varicella. The diagnosis of his mental condition was "infantile autism." His prognosis was "poor."

The fourth medical report describes the patient's condition when he was seen at his parents' home in October, 1953 (aged 6½). His parents complained that they could not cope with the child because of his extreme restlessness, screaming fits at night, and constant overactivity indoors and out. It was noted that in his restless phases he appeared to be extraordinarily sensitive to noise and covered his ears with his hands to exclude it. As he had become unsuitable for further care at the occupation centre, the parents were at their wits' end and begged for assistance. Ultimately they agreed that the child might be admitted temporarily to a mental deficiency hospital so that they might have a rest.

Developments after Admission to the Manor Hospital

The patient was admitted (without an order) in January, 1954, for a period of seven weeks. His general condition and behaviour were as already reported, and he was found to be very constipated—however, enemata proved to be effective, and after no more than a few weeks on a liberal diet his screaming fits ceased; his general condition improved considerably and he became more co-operative, even regaining the ability to dress himself. He returned home in March, but on April 9 the health visitor reported that his restlessness and his screaming fits had recurred. He was accordingly "dealt with" under section 3 of the Mental Deficiency Act, 1913, and was "placed" at the Manor on May 28.

Clinically, the sequence of events which had attended his earlier short stay was repeated, and after a month he was transferred to the children's ward. Thereafter his condition deteriorated: from being almost hyperkinetic he became dull and languid. He refused food, and his only solace appeared to be tasting rubbish and eating paint scratched from the walls. Appropriate investigations were undertaken and the positive results were: blood Hb. 88%; R.B.C., 4,700,000 per c.mm.—the red cells were hypochromic and punctate basophilia was conspicuous. X-ray examination of the long bones revealed areas of increased opacity, most marked at the lower ends of the femur, radius, and ulna, and the upper end of the tibia.

In the light of these significant findings the mother agreed to give a more detailed account of her son's history at a clinical meeting. She confirmed the details already reported, but not until leading questions were put to her did she state that, before the boy had "food-poisoning" at the age of 3½ years, a set of very old toy lead soldiers had been resurrected for his delectation. These toys left grey dust on his hands, and it was then that he became so constipated and developed cough and vomiting. Although he was very ill there were no convulsions, coma, or paralysis. After a few weeks his physical condition improved, but he ceased to speak and became withdrawn and asocial. By the time he was 4 he had a marked craving for oil, fat, and paint, and discovered discarded (leaded) paint pots and brushes which had been used to decorate the kitchen; *pari passu*, his constipation became complicated with bleeding piles. He lost

previously acquired skills and interests, and took to hiding in cupboards and behind walls of toy bricks. Noise seemed to irritate him and he lost all affection for his parents. At this stage she sought specialist aid, but as treatment had not effected a lasting improvement she reluctantly accepted the inevitable and "placed" her son at the Manor.

Thus the diagnosis of lead-poisoning was made, and it was confirmed beyond all doubt by the further report that a 24-hour specimen of urine contained 435 µg. of lead as compared with 24 µg. in controls of the patient's age group.

Treatment and Progress

Steps were taken to free the circulation of lead. A high-calcium diet supplemented with calcium lactate, iron, and preparations of vitamins D and C was provided; within a week the colic ceased and the constipation was relieved. The child's appetite is now healthy and his complexion positively ruddy. He is more interested in his companions and attempts to join in their games. Noise no longer disturbs him and he is attracted to strangers. He welcomes his mother's visits and sometimes seems to anticipate them. He obeys simple instructions conveyed through the media of voice and gesture. His mutism persists, but he phonates when he hums and croons. He sleeps well and restless overactive behaviour is not so marked, except when he is in strange surroundings. In brief, he is a happier child, but there has been no measurable increase in his cognitive ability. Pica persists, but the casual desultory way he attempts to indulge it is in marked contrast to the drive and energy which attended it some months ago.

In an effort to determine if the patient is an indiscriminate oral experimenter or has certain predilections, a board daubed with eight different items (including fatty, salty, bitter, and sweet substances, together with leaded and non-leaded paints of similar appearance) was placed before him while discreet observation was maintained. In the course of eight minutes he tasted seven different items (he ignored one non-leaded paint) and concentrated almost entirely on just two—fat and lead paint. Three controls of the same age and grading proved to be quite uninterested in the experiment. The very tentative conclusion was reached that he is to a certain extent selective in his taste and has a partiality for fats; but, whether it is the lead or the fat (linseed oil) in the paint and whether "deprivity" or depravity is the motivating factor remains an open question.

Discussion

In the light of after-events it is tempting to speculate about the series of interim diagnoses which marked the progress of this case. Food-poisoning, pertussis, encephalitis, infantile autism, and amentia were, in that order, provisionally postulated to account for the symptomatology; but as the parents seem to have failed to appreciate the relevance of the essential causal factors—pica and lead—it is questionable whether they reported them with due emphasis when they sought advice. Moreover, as children's diets in hospital usually have high calcium and vitamin values it may be assumed that, as occurred at the Manor, once the patient had been under care for a short time the more urgent symptoms were relieved by good feeding. It may be thought that pica was the sequel to pertussis encephalitis and plumbism was its outcome; but, if this contention is correct, encephalitis must have occurred when the patient was about 2½ years old (as reported by the neurologist) and thus before the lead soldiers were "resurrected." The mother, however, insists that the child was more than 3½ years old when he had "food-poisoning" and "whooping-cough," and she is quite certain that he was playing with lead soldiers before he became ill. In the light of this and the implications of other circumstantial evidence that she has adduced, it seems reasonable to infer that the actual sequence of events was as she now describes it.

The signs, symptoms, and treatment of plumbism in children have been described so comprehensively in the literature

that further comment on them is scarcely necessary. It may be observed, however, that hyperacrusis, which so tormented this child, seems to have determined, in part at any rate, his rather hyperkinetic behaviour. Its origin must nevertheless remain a matter for speculation.

Only a score of cases of lead-poisoning in children have been reported during the present century in this country, and, of these, 10 have been described by Burrows *et al.* (1951) and Millichap *et al.* (1952) during the post-war period. They have certain features in common which indicate the need—indeed, the urgent necessity—for appropriate consideration and action by public authorities, medical practitioners, parents, and others concerned with child health.

Pica

Pica is certainly one of these features. Almost indiscriminate oral sampling is of course a characteristic developmental phenomenon in children of less than 2 years; but, if parental management is prudent and well-informed no harm is done. In some, the habit may persist until the sixth or eighth year; in others it may recur, in a more selective fashion, after it has been outgrown: in such cases it may be interpreted as failure to emerge from, or as regression to, the so-called "oral-erotic" phase. As stated by Sheldon (1951) it may be due to "chronic intestinal indigestion" with or without associated enuresis, temper tantrums, or night terrors. It may follow encephalitis, or point towards amentia; but even in low-grade aments it is met less frequently than might be expected. There is no doubt, however, that more often than not it precedes plumbism in children, and, as its serious implications are not always realized, diagnoses may be inadequate unless the relevant questions are asked.

Legislation has certainly served to protect workmen from lead-poisoning, and propaganda appears to be effective in ensuring that painted toys and nursery equipment are lead-free when they leave the factory; but, in this day and age when there is a premium on self-help in the home, the "handyman," and the "handy-woman" too, may unwittingly imperil their children's prospects of normal mental growth and general well-being through carelessly leaving lead-paint containers about the home and applying lead paint to household fittings. Lead paint is still often used on exterior wooden surfaces, and this, in point of fact, was found to be the case at the Manor; formerly it was used much more extensively, and thus may lie (unsuspected) on interior surfaces, masked by more recently applied lead-free coats. The amateur home decorator is, however, apt to believe that the best paints are leaded, and in his enthusiasm he is prone to buy them, perhaps from surplus war stocks sold cheaply in street markets, and then proceed to apply them, with more zeal than discretion, to the new baby's cot or perambulator, toys or play-pen, the kitchen walls, or the dingy recesses around the scullery sink. Millichap *et al.* (1952) listed the sources of plumbism in childhood as follows: painted woodwork, 9; nipple shields, 4; toy soldiers, 2; fumes from burning battery casings, 2; drinking-water, 1; and toilet powder, 1. Thus paint and toy soldiers account for more than half the cases reported in this country during the present century, and the patient described adds to their number.

Mental Sequelae

The grave consequences of lead-poisoning, in terms of mortality, paralysis, paresis, optic atrophy, and epilepsy, are widely recognized, but it is clear that its disastrous effects on the progress of mental development are generally underestimated. Levinson and Zeldes (1939) studied 26 Chicago cases and found that 5 of the patients had died in the acute stage; they followed up only 9 of the survivors for periods not exceeding 3½ years and graded 1 as blind, mute, and helpless, 2 as being epileptic and mentally subnormal, and no more than 3 as being normal, mentally and physically. McKhann and Vogt (1933) reviewed 89 hospital cases at Boston and found that 12 were latent and 77 showed signs of lead intoxication. Of the latter, 11 died, 45 had

"encephalitis," and 4 neuritis; 12 had permanent sequelae, half being mentally retarded. McKhann (1932) suggested that the neurological manifestations of lead-poisoning usually subside without serious consequences if the ingestion of lead is stopped and its removal from the circulation hastened by securing its deposition in the bones in an inert form. No doubt this view is correct, so far as the most urgent and dramatic symptoms are concerned: but it is unlikely that if follow-up techniques had then been practised he would have made quite so sweeping a statement—indeed, Byers and Lord (1943) have shown that, of 20 cases discharged from hospital as "cured," favourable prognoses, even in "mild" cases, were almost invariably falsified by the event. Lord's reports on the mental sequelae of plumbism are admittedly incomplete (Byers explains that after Lord's death he prepared her records for publication); nevertheless, they merit earnest consideration, because they are the only available published data on the important question of prognosis in terms of mental growth.

Lord screened the records of 71 children who had plumbism, and, having eliminated 12 with gross brain damage on discharge, found that the remaining 59 left hospital "recovered." Of these it seems that only 20 (perhaps the élite) entered the school system and became the subjects of her follow-up studies. From the reports of the medical staff in attendance on these children on their first admission to hospital and from her own inquiries, Lord concluded that they had progressed normally prior to developing plumbism. On their initial admission they were in the age range of 10 months to 7½ years (the mean age being almost 2½ years, with a standard deviation of 17.3 months), and, as regards involvement of the nervous system, 8 presented more or less conclusive signs of encephalopathy and 12 did not. When the whole group was finally reviewed, the age range was 6–15 years and their I.Q.s (mostly on the Stanford-Binet scale) were in the range of 67–109 points (with a mean of 91 and a standard deviation of 12 points).

When the size of the sample is considered, the mean I.Q. of 91 is not really exceptional; but it is highly significant that only one of these patients did passably well at school (she was the only "nipple shield" case in the group and had an I.Q. of 103—the next best was a girl with an I.Q. of 82).

The comparative progress of the encephalopathic and non-encephalopathic cases is shown in Table I.

TABLE I

	No. of Cases	Age Range		I.Q.s	
		On First Admission (Months)	On Last Test (Years)	Average	Range
Encephalopathic	8	11–55	6–12	91	69–109
Non-encephalopathic	12	10–81	6½–15	91	67–105

It may be inferred that the presence or absence of encephalopathy made no material difference to the course of mental development in this group.

As already stated, only one child did passably well at school. I.Q.s of less than 85 no doubt contributed to the failure of five others. In her analysis of the remaining 14 cases Lord made her major contribution to our knowledge of the mental sequelae of plumbism: she showed that "sensorimotor" defects and temperamental anomalies were responsible for their social and educational failure despite the fact that in many instances their I.Q. ratings were in the average range of the general population. Thus, while some were verbally facile, they could not learn to read, write, or do number work, and, when the appropriate battery of tests was applied, their "sensorimotor" disabilities were exposed in terms of their inability to deal with shape, direction, space, and projected imagery. Some also exhibited behaviour disorders which seem (from Lord's account of them) to have resembled some of the sequelae of encephalitis lethargica.

A further point of prognostic significance also emerges. The occurrence of more or less complete arrest of mental development may have typified some cases. The relevant data in terms of declining I.Q.s are given in Table II.

TABLE II

Age when First Admitted (Years)	Intermediate Follow-up Test		Final Follow-up Test	
	Age	I.Q.	Age	I.Q.
4½	5	90	12½	65
6½	6½	100	12½	82
1½	6½	102	7½	91
2½	5½	106	7	92

Lord concluded that plumbism, whether characterized by evidence of encephalopathy or not, leads, even in those cases discharged from hospital as completely recovered, to failure or impairment of the normal processes of growth and development of the cerebral cortex. Support for this conclusion is also to be found in the fact that air encephalography, as indicated by McKhann and Vogt (1933), Levinson and Zeldes (1939), and others, reveals the existence of cortical atrophy in lead-poisoning victims.

There can, indeed, be no doubt about the gravity of the aftermath of plumbism in children, and in the few instances in which adequate follow-up techniques have been applied its consequences have been, even in so-called "cured" cases, deleterious to the progress of mental growth. Hence prognoses must be guarded until the age of at least 16 years has been reached, as it is not until then that intellectual development normally approaches its peak. Moreover, as successful therapy merely diverts lead to the bones, the patient remains, during childhood and adolescence, in a precarious plight. Trifling intercurrent indispositions, missed meals, or temper tantrums may suffice to disturb the acid-base equilibrium of the circulating media and so release lead to do further brain damage.

The mental defective described in this paper is aged 7½, but his mental age is only 3 to 4 years. Whether his mental development has been arrested partially or completely, temporarily or permanently, only time will tell—moreover, regression complicates the prognostic problem. Hence, lacking data about the ultimate fate of such cases in late childhood and adolescence, we can only speculate about his future prospects.

Screening and Follow-up Procedures

According to Levinson and Zeldes (1939), correct diagnoses were made only in 10 out of 26 cases when first admitted to hospital, and then only because plumbism had been recorded in other members of the families concerned. Bearing their observations in mind and considering also the implications of the case under discussion—the diagnostic problems it presented, the long period of lead ingestion and illness; the naïveté of the parental attitudes towards pica in general and lead in particular; the fact that the patient is now a mental defective; and the tenuous theoretical foundations on which much of our knowledge of the aetiology of mental subnormality is based—it is impossible to escape making certain obvious inferences.

It must surely follow that many others are naïve, ill informed, or careless about the risks to which they expose their children; therefore the real incidence of plumbism must be far greater than hitherto envisaged. No doubt, too, an unknown number of children are now in special schools and mental-deficiency establishments handicapped in various ways because of undiagnosed plumbism. It is hoped that, in particular, those responsible for the care and training of subnormal and "maladjusted" children will consider the advisability of applying screening procedures to their charges. Past or present association of pica, constipation, and colic might serve as preliminary criteria; thereafter, fuller investigations should be carried out on those who satisfied them. Particular attention might also be given to cases with "sensorimotor" disabilities and those with symptoms suggestive of primitive schizophrenia or hyperkinetic

disease. Lay (1938) indicated that symptoms sometimes regarded as characteristic of the two last-mentioned conditions may be caused by encephalitis, and it is relevant that the patient described was thought by different observers to be the subject of encephalitis, infantile autism, and an approximation to hyperkineticism.

Summary and Conclusions

A case of arrested mental development caused by lead-poisoning has been described and its implications and those of others in the literature have been discussed with particular reference to the following considerations.

1. The diagnosis of plumbism may be delayed over long periods during which serious and possibly irreversible brain damage may be done, with resultant arrest of mental growth, the appearance of "sensorimotor" defects, and both social and educational disabilities.
2. Pica, more often than not, precedes plumbism in children, and, as its implications are not always recognized, its occurrence may not be reported with appropriate emphasis. Hence there is the possibility that lead ingestion is not considered when the presenting symptomatology suggests such conditions as food-poisoning, pertussis, infantile autism, amentia, sensorimotor defects, educational subnormality, hyperkinetic disease, and behaviour disorders.
3. The need for appropriate screening and follow-up procedures has been indicated in light of the probability that the real incidence of plumbism is much greater than hitherto envisaged.
4. It is hoped that the Ministry of Health, local authorities, medical practitioners, parents, and all concerned with child welfare will take appropriate action to safeguard children from exposure to the risks of plumbism.

We wish to thank Drs. W. W. Kay and M. K. Beattie for the pathological report, Dr. I. L. McKelvie for the radiological report, and Drs. C. I. A. D. B. Clarke, and A. M. Clarke for their very helpful advice.

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Discussing postal treatment in his latest quarterly report, Mr. H. H. BAGNALL, Birmingham's City Analyst, writes: "If a person goes to a pharmacist's shop, as many people hoping for quick and semi-miraculous cures still do, and demands a bottle of 'indigestion mixture,' he must, by the provisions of the Pharmacy and Medicines Act, be supplied with a printed list of the constituents of the medicine, and there is thus some sort of control, although admittedly not nearly enough, over such sales. The same Act, however, allows for the omission even of this simple precaution if an article is made up and supplied for the use of a particular person, being an article prescribed by reference to the needs of that person. The postal quack relies on this provision to avoid giving the composition of his remedies, for, as he sends out a typewritten chart of questions asking for answers to certain stock questions by his prospective patients, it can be said that in a sense he is prescribing for their particular needs. Is it not possible, as a slight check on these long-distance cures and as a preliminary to more thorough action, to require that all stock mixtures, powders, pills, and so on should be labelled with a list of ingredients, unless they are supplied on prescription by a properly qualified medical man?"

LEAD-POISONING IN CHILDREN

CORRELATION OF CLINICAL AND PATHOLOGICAL FINDINGS

BY

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Lead-poisoning in childhood is not a rare disease. The danger of ingestion of the metal exists from infancy, as shown by Clark (1950). Two fatal cases have been investigated at this hospital during the past year, and this paper is devoted to a description of the clinical and pathological findings. The changes in the kidney have received particular attention, as fatty vacuolation, which does not appear to have been a prominent feature in previously recorded cases, was found at both necropsies and an attempt has been made to correlate the biochemical findings in one case with the microscopical changes in the kidney.

The difficulty in making a diagnosis of lead-poisoning in infants is emphasized. Anderson (1948) points out that the central nervous system is particularly susceptible at this age, and states that after a relatively short period of ingestion of the metal the picture of encephalitis may develop in the absence of such well-recognized features as anaemia or colic. In both the cases described in this paper vague symptoms were present towards the end of the second year of life, and in neither was the diagnosis made at that time. In one case the child lived to the age of 4 years, when the presence of anaemia, constipation, abdominal colic, and punctate basophilia readily suggested the possibility of lead-poisoning, while in the other the diagnosis was made at necropsy.

The gross and microscopical pathological findings, notably the presence of intranuclear inclusions in the liver and kidneys, are described to assist in the rapid post-mortem diagnosis, and histochemical methods for detecting the presence of lead in the tissues are discussed.

Case 1

A white male child aged 4 years was first seen at the age of 2 years, when he appeared to be unsteady and tended to fall. No physical abnormality was detected at the time. He was again seen at the age of 4 years, when there was pain in the lower abdomen, pallor, and unsteadiness of six weeks' duration. Vomiting ensued and also frontal headache. The child was admitted to hospital and at this time was unconscious. The parents, when questioned, stated that, as long as they could remember, there had been a tendency to bite and chew the furniture and other articles, including toys.

Examination on admission showed a peculiar state of unconsciousness with widely staring eyes and continuous nystagmus. The skin had a grey colour, with a reddish tinge over the cheeks. There was excessive salivation, but the teeth were good and no lead line was detected. The tongue had a constant tremor, being protruded every few seconds, and there was twitching of the right cheek and the left side of the body. The blood pressure was 140/85 mm. Hg, and the pulse was rapid. Difficulty in seeing the fundi was experienced, but the veins were noted to be engorged.

The blood haemoglobin was found to be 60% (Haldane) and there was a leucocytosis with predominance of poly-

morphonuclear cells. Marked punctate basophilia was present. The urine contained a reducing substance which was identified as glucose by chromatography. A one-way chromatogram in phenol was made, taking the volume of protein free urine corresponding to 250 µg. of total nitrogen. After drying the strip and spraying with ninhydrin, excessive amino-aciduria was seen to be present. Two-way chromatograms were then run on Whatman No. 1 filter paper 18 b.

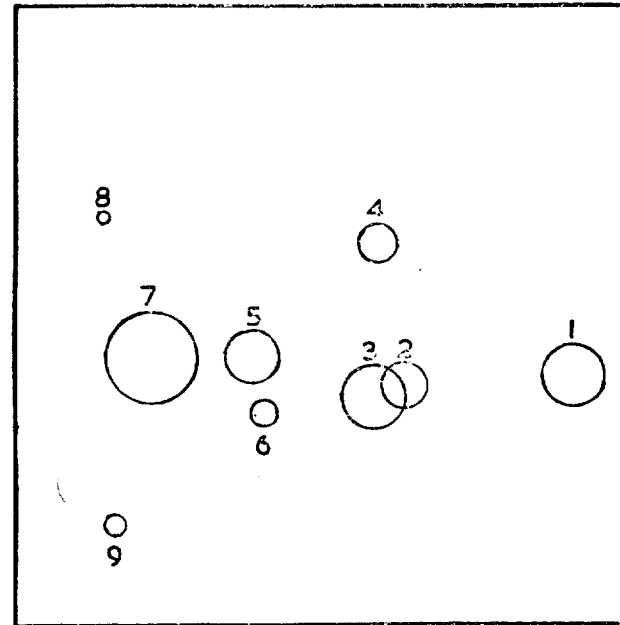


Diagram of chromatogram of urine from Case 1. The sample has been placed at the bottom right-hand corner of the paper. Phenol has been run from right to left as first solvent and tetrahydrofurfural alcohol upwards as second solvent. The convention is used of representing the strength of the ninhydrin colour reaction by means of the size of the spot, using an arbitrary scale: 1, cysteine (from cystine); 2, serine; 3, glycine; 4, taurine; 5, alanine; 6, glutamine; 7, β -amino-iso-butyric acid; 8, leucine; 9, lysine.

22 in. (46 by 56 cm.), using phenol as first solvent followed by tetrahydrofurfural alcohol as second solvent. The result is shown in the diagram. The pattern shows an excess of cystine, taurine, and especially β -amino-iso-butyric acid. The identity of the latter two was confirmed by the copper method of Crumpler and Dent (1949). Cystine and β -amino-iso-butyric acid were the strongest spots on the square.

The other biochemical findings in this case were serum sodium 315 mg. per 100 ml.; potassium 16 mg. per 100 ml.; phosphorus, 5.8 mg. per 100 ml.; chlorides, 594 mg. NaCl per 100 ml.; bicarbonate, 41 vols. CO₂%. Blood urea, 60 mg. per 100 ml.; blood sugar, 0.127% glucose.

In the small quantity of urine obtained no porphyrins were detected.

X-ray examination of the long bones showed increased density of the metaphyses. Lumbar puncture yielded a clear fluid under increased pressure with a protein of 70 mg. per 100 ml., but no cells.

Death took place shortly after admission in spite of sedatives, surgical decompression, and attempts to lower the intracranial pressure by the use of hypertonic solutions.

Post-mortem Examination

Gross Findings.—The external features were not remarkable. There were ten teeth in the upper and lower jaws in good condition. The lungs were red, fleshy, and oedematous, the right weighing 163 g. (normal 90 g.), and the left 167 g. (normal 85 g.). The liver weighed 540 g. (normal 516 g.) and had a smooth yellow-brown capsule and a greasy yellow cut surface. The right kidney weighed 66 g. (normal 58 g.), and the left kidney 71 g. (normal 56 g.).

both organs having yellow-tinged cortical regions with poorly defined markings. Examination of the bones included the ribs, vertebrae, and lower end of the left femur. In the ribs and femur a dense white band several millimetres in width was seen in the diaphyses at the bone-cartilage junction. The brain weighed 1,330 g. (normal 1,190 g.), and was moderately engorged and tense. The white matter tended to swell on incision.

Microscopical Findings.—The principal changes were noted in the liver, kidney, and bones. In the liver the peripheral portions of the lobules were relatively intact, while the remainder showed extensive fatty vacuolation. Many of the hepatic cell nuclei were swollen and had a glassy appearance with wisps of chromatin below the nuclear membranes. Inclusions filling the greater part of the nuclei or several small inclusions were sometimes seen, and it was noted that the nuclear changes were most prominent in the neighbourhood of the portal regions, where there was less vacuolation. The smaller inclusions, in particular, showed variable acid-fast properties and stained orange with Masson's trichrome stain, as has been described by Wachstein (1949b), but for their detection it was felt that haematoxylin and eosin gave the best results. There was no cellular infiltration and the Kupffer cells were not mobilized.

The changes in the kidney were seen in the convoluted tubules, where the proximal portions appeared to be damaged, and in the medullary rays and outer portions of the medulla, where the looped tubules were thought to be involved. Fine vacuolation could readily be seen in the cytoplasm of the tubular cells, this feature being most marked near the basement membrane. Stains with Sudan black showed that the vacuoles contained fat. Some of the nuclei in the looped tubules were greatly enlarged and occasional inclusions were seen in this situation, but the latter were abundant in the proximal convoluted tubules.

The bone changes were studied in the rib and femur. The cartilage columns at the growing ends of the bones were short and regular. There was, however, inadequate erosion at the bone-cartilage junction, and broad, close-packed trabeculae were present for a distance of several millimetres along the shaft. This area corresponded with the white band noted in the gross specimen, and also with the zone of increased density noted in the x-ray films. There were numerous giant cells between the trabeculae, some of which had the appearance of typical osteoclasts, while others had swollen nuclei with clumped chromatin and a vacuolated or granular cytoplasm.

Demonstration of lead in the femur was found to be most satisfactory by the sulphide method described by Timm (1936). The tissues were fixed in absolute alcohol and decalcified in 30% formic acid. Excess acid was removed by 5% sodium sulphate and then washing in water. All the solutions were saturated with hydrogen sulphide. Frozen sections were cut and treated with potassium cyanide and yellow ammonium sulphide to remove copper, silver, and tin. The deposits of lead sulphide could readily be seen with the naked eye, and under the microscope fine black-brown granules were noted in the trabeculae. These granules were most abundant in the compact region close to the cartilage, but their presence could be detected for some centimetres along the shaft. Bismuth was excluded by staining with a 4% aqueous solution of potassium iodide and a 2% acidified aqueous solution of quinine sulphate as described by Lillie (1954).

Chemical analysis, using the method of Irving and Butler (1953), showed the presence of 158 mg. of lead per kg. of fresh bone in the femur. The total lead content of the liver was 9.205 mg.

The microscopical findings in the brain consisted of evidence of oedema with swollen glial cells in the white matter and lymphocytic infiltration in the meninges. A portion of the left popliteal nerve showed no unusual feature and there were no significant changes in the remaining organs, including the pancreas and parathyroids.

Case 2

A white male child aged 1 year 10 months gave a history of vomiting, anorexia, and constipation of one month's duration. He screamed and doubled up before vomiting, and was irritable, rubbing the back of his head and pulling at his ears. The mother stated that he appeared to be frightened, and constantly called out during the night. No history suggesting the possibility of lead ingestion was obtained. On admission to hospital he was very difficult to examine. He was ataxic and there was marked pallor. The fundi showed advanced papilloedema and engorgement of the retinal veins.

The blood haemoglobin was found to be 66% (Haldane), but there was no punctate basophilia. Sugar was present in the urine, and the spinal fluid contained 8 lymphocytes per c.mm. and had a protein content of 40 mg. per 100 ml. Ventricular taps were performed, but there was a great increase of intracranial pressure and convulsions developed. Death took place in spite of all measures, including operative decompression to relieve the intracranial tension.

Post-mortem Examination

Gross Findings.—The body was that of a well-nourished white male child. There were eight teeth in the upper and lower jaws with no evidence of a lead line on the gums. The right lung weighed 105 g. (normal 83 g.) and the left 93 g. (normal 74 g.), both organs being red, haemorrhagic, and fleshy. The liver weighed 411 g. (normal 345 g.) and was pink and yellow in colour with a rather greasy cut surface. The right kidney weighed 42 g. (normal 40 g.) and the left 45 g. (normal 43 g.), both organs being pink in colour with rather faint cortical markings. Examination of the bones, including the ribs, vertebral bodies, and the lower end of the left femur, was carried out. In the long bones a white thickened band several millimetres in width was noted at the growing end of the shaft. X-ray examination of the long bones *post mortem* showed zones of increased density. The brain weighed 1,360 g. (normal 1,050 g.) and was swollen with flattened gyri. The white matter was watery and tended to bulge above the cut surface.

Microscopical Findings.—The principal changes showed a similar distribution to those noted in Case 1. They were not so obvious in the liver, where the degree of fatty vacuolation was less and the intranuclear inclusions were smaller. The nuclear changes were, however, more widespread throughout the lobule, and the inclusions, though small, were more frequently seen. In the kidney the distribution of the lesions was again confined to the cortex and outer portion of the medulla, the proximal convoluted and looped tubules being involved. In the former the fatty vacuolation was finer and less prominent and there were no inclusions, while in the latter there were abundant inclusions and giant nuclei were readily noted.

The bone changes were similar to those seen in Case 1. The band of closely packed broad trabeculae was present with numerous typical and atypical osteoclasts. The lead was demonstrated in the lower end of the left femur by the sulphide method. The deposits of lead sulphide were much finer and less profuse than those in Case 1, and with the exception of the cortex they could be detected only for a distance of less than 1 cm. along the shaft. The changes in the brain were, by contrast, more marked. There was lymphocytic and large mononuclear cellular infiltration in the meninges. Large numbers of swollen glial cells were present in the white matter, and the latter showed evidence of oedema and softening, with focal accumulations of small glial cells and lymphocytes. The nerve cells in the brain stem showed fine cytoplasmic vacuolation and their nuclei had clumped chromatin with swollen eosinophilic but not acid-fast nucleoli.

No significant changes were found in the remaining organs, including the pancreas and parathyroid. The peripheral nerves were not examined. The lead content of bone (femur) was 101 mg. per kg. of fresh bone.

Discussion

The two cases described showed symptoms at the end of the second year of life. In the first case the patient was at that time restless and unsteady, and although his urine was not examined it seems probable that the cause of the symptoms was lead-poisoning. In both cases the clinical picture suggested cerebral damage, and it is of interest that the microscopical findings in the brain were more prominent in the younger child. Anderson (1948) emphasizes that the symptoms in young children may be confined to those indicating central nervous system involvement, and in the above cases ataxia, irritability, and restlessness at night would appear to be of importance. The symptoms, however, were vague, and it is felt that reliance must be placed upon the mother's statement that there is a change in the child's behaviour.

Punctate basophilia was present in only one of the two cases and, as shown by McKhann and Vogt (1933), too much reliance should not be placed on the presence or absence of this finding in arriving at a diagnosis. Abdominal pain was a feature in both cases, as was constipation, but in Case 1 these symptoms were not found when the child was first examined.

The gross necropsy findings were not striking in the cases described in this paper. There was some increase in weight in the liver and kidneys, this feature being attributed by some authors to the toxic effect of lead on mitosis (Chiodi and Cardeza, 1949; Finner and Calvery, 1939). This toxic effect would account for the giant nuclei shown in the renal tubules in the present cases. In order to arrive at a correct diagnosis in the necropsy room, a rib should be examined by dividing the bone longitudinally, when the white band close to the cartilage can be seen. For confirmation frozen sections of the liver and kidney may reveal the presence of intranuclear inclusions.

These inclusions were first described, in the livers of 21 children dying from lead-poisoning, by Blackman (1936), who showed that they could be produced in rats by the addition of lead to the diet. Similar inclusions have been found by Pappenheimer and Maechling (1934) in the cells of the renal tubules in a patient treated with bismuth, and Olitsky and Harford (1937) have shown that they occur after the injection of aluminium and ferric compounds. Wachstein (1949a) found that the metal-inducing inclusions were acid-fast, thus differing from other types of inclusions examined. This latter property was not a marked feature in the present cases, although this could be attributed to formalin fixation. Nuclear enlargement was, however, a prominent feature in the liver and kidney, some of the nuclei having a glassy appearance and others an apparently normal structure.

Previous reports of the kidney changes in lead-poisoning have described intranuclear inclusions in the tubular cells with nuclear hypertrophy. Wachstein (1949b) has found necrosis and calcification of the cells of the cortical tubules with foci of chronic inflammation in experimental work in rats. Fatty vacuolation does not appear to have been a feature.

In both of the present cases there was damage to the cortex and outer portion of the medulla involving the proximal convoluted and looped tubules. The findings consisted of fatty vacuolation of cytoplasm and swelling of nuclei with intranuclear inclusions. There was no evidence of cellular infiltration, and the collecting tubules and vessels were not remarkable.

The pattern of the urine chromatogram in Case 1 is similar to the one described previously by Wilson *et al.* (1953), especially as regards the large excess of β -amino-iso-butyric acid, which was the strongest spot on the square in this recent case. This amino-acid was originally discovered by Crumpler *et al.* (1951), who found that 5% of normal people excrete large amounts, and as the blood level of β -amino-iso-butyric acid in these people is no higher than in the rest of the population they assume that its excretion is probably due to a defective absorption in the renal tubules.

More recently, Sandler and Pare (1954) have made a study of this amino-acid and found that an increased excretion followed starvation. In a later paper (Pare and Sandler, 1954) these authors showed that cystine and β -amino-iso-butyric acid were excreted in excess in march haemoglobinuria and suggested that these two amino-acids together with haemoglobin are reabsorbed in the same or adjacent sections of the renal tubules.

Fanconi (1951) maintained that dextrose, phosphate, and amino-acids were absorbed in the proximal renal convoluted tubule. Wilson *et al.* (1953) showed that the amino-aciduria in lead-poisoning was renal in origin, as the level of plasma amino-acids was normal. The glycosuria and amino-aciduria which are a most frequent finding in cases of lead-poisoning have been concluded to be the result of injury to the proximal convoluted tubule. In both of the present cases the proximal tubules showed marked evidence of damage, thus confirming the work of Fanconi on the physiology of the kidney.

Summary

The clinical and post-mortem findings of two cases of lead-poisoning are reported.

The possibility of this disease must be borne in mind in all children with vague cerebral symptoms or evidence of increased intracranial tension.

Post mortem it is possible to make the diagnosis by examining the cut end of a rib or by examining frozen sections of liver and kidney for intranuclear inclusions and nuclear changes.

Fanconi's theory concerning the absorption of dextrose and amino-acids in the proximal renal tubules has been confirmed.

We are indebted to Dr. A. Holzel for much helpful advice and criticism. We wish to thank Mr. F. G. Ralphs, H.M. Coroner for permission to publish these cases, also Dr. M. L. Thomson and Mr. H. Maslowski for allowing us to use the clinical records.

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The latest addition to the Medical Research Council's *Memorandum* series is called "Indices of Heat Stress" (No. 29, price 2s. net). Written by a statistician, it compares two indices used in measuring heat stress under hot and humid environmental conditions. The first, the "effective temperature," takes account of the temperature and humidity of the atmosphere, the rate of air movement, and radiation from the surroundings; the second is based on the rate of sweating. An earlier *Memorandum*, No. 17, describes the measurement of effective temperature. These memoranda will interest primarily those concerned with the well-being of workers in hot conditions. Both memoranda are published by Her Majesty's Stationery Office.

SIGNIFICANCE OF INITIAL
CONDITION OF CERVIX UTERI TO
SUBSEQUENT COURSE OF LABOUR

BY

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(From the Obstetric Hospital, University College Hospital, London)

Prolonged labour in the absence of cephalo-pelvic disproportion, where the cervix uteri fails to become fully dilated twenty-four hours or more from the onset of contractions, remains one of the great problems of obstetrics. Much research has been carried out into the causes responsible for this delay, and it was during one such departmental investigation into the problem at University College Hospital, London, that Nixon (1952) gave a preliminary report upon the correlation of the initial condition or type of the cervix and the subsequent course of labour. This investigation has been continued and 133 cases have now been studied.

It was decided to note carefully the condition of the cervix before the onset of labour at the time of surgical induction. In the great majority of cases pre-eclamptic toxæmia was the indication for induction in primigravidae at or near term with the vertex presenting. Cases of cephalo-pelvic disproportion were excluded from this study.

The diagram shows the way in which the cervix has been typed at the time of induction of labour. Types 1 and 2 represent the condition most commonly and

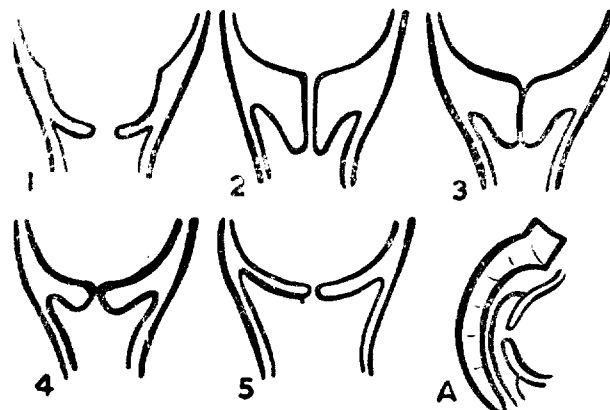


Diagram showing types of cervix uteri. 1. Soft, effacing; canal admits one finger. 2. Soft, long, and closed; whole canal admits one finger. 3. Firm, long, and closed; external os will not admit one finger. 4. Firm and short external os admits one finger; internal os rigid. 5. Cervical anomalies: pinhole os, duplication, etc. A—Sacral os, anterior sacculum occurring in any of the previous types.

types 3 and 4 the condition least commonly found. Cervical anomalies are included in type 5. It will be seen that there is an increasing hardness of the cervix as well as increasing difficulty in inserting the examining finger through the cervical canal as one passes from types 1 to 5. Other authors have noted differences in texture of the cervix. Arthur (1949) describes certain characteristics, such as hardness and tenseness, in his observations on the cervix in cases of cervical dystocia; and MacRae (1949) refers to a similar rigidity of the tissues in cervical achalasia in certain cases of primary uterine inertia. Dieckmann and McCready (1947) classify the cervix somewhat similarly by the degree of softening, effacement, and estimated amount of dilatation. Calkins (1954) also has drawn attention to the importance of the firm cervix in prolonged labour.

The diagram also depicts a special position of the cervix that has been found in types 1 to 4. This is the "sacral" position, or "sacral" os, in which there is posterior displacement of the cervix, with the external os pointing backwards towards the hollow of the sacrum in such a manner that if the presenting part is engaged in the maternal pelvis its lower part is at a deeper level in the birth canal than the external os. In order to enter the cervix the examining finger will first have to hook it down below the presenting part and thus bring the cervical canal back into its normal axis. Greenhill (1951) has described this position, and states that "the location of the cervix at term varies. . . . Most often it is in the middle of the pelvis, many times it is back in the hollow of the sacrum. . . . If it is near the sacrum and hard to reach with the finger it is pathological."

Kerr and Moir (1949) also discuss this backward displacement of the cervix in association with anterior sacculum and abnormal stretching of the anterior wall of the lower uterine segment. Presumably, the degree of posterior or sacral position depends upon the amount of stretching of the anterior uterine wall.

Present Investigation

In this study 133 cases have been observed—99 cases without and 34 cases with a sacral os. The distribution of these types of cervix is shown in Table I, where the numbers of the "ripe" cervix (types 1 and 2) and "unripe" cervix (types 3, 4, and 5) are also shown.

By typing the cervix from the condition found at the time of surgical induction and by noting the course of labour that followed, it has been possible to investigate whether any particular type of cervix, especially if combined with a sacral os, is associated with a long labour, a long latent interval prior to the onset of labour, or an increased interference rate by forceps or by caesarean section in the ultimate delivery.

Table II sets out the findings of the course of labour studied for the average time of the induction-to-delivery interval (I.D.I.), average duration of labour, and average latent interval in relation to the condition of the cervix with a sacral os. It is evident that the average latent interval before labour starts in the "ripe" types of cervix (types 1 and 2) is significantly less than in the "unripe" types of cervix (types 3, 4, and 5), confirming previous clinical observations. The average duration of labour is also less in types 1 and 2.

Dr. D. E. Barton, of the statistical department of University College, London, has kindly investigated the figures in

TABLE I.—Distribution of the 133 Cases According to Type of Cervix

Type	Cases Without Sacral Os	Cases With Sacral Os
1	66	17
2	23	14
3	4	1
4	5	2
5	1	0
Total	99	34

TABLE II.—Types of Cervix Uteri Without a Sacral Os, Showing the Subsequent Course of Labour (99 Cases)

Type of Cervix	Average I.D.I. in Hours	Average Duration of Labour in Hours	Average Latent Interval in Hours (i.e., Induction to Onset of Labour)	No. of Cases
1	19.7	10.7	9.0	66
2	27.0	16.0	11.0	23
3	71.7	22.0	49.7	4
4	53.2	21.5	31.7	5
5	One case delivered by caesarean section after being 9 hours in labour with a pin-hole os			

these tables as well as the individual figures of the cases, and has shown them to be statistically significant.

The course of labour with the various types of cervix complicated by a sacral os has also been analysed, and is shown in Table III. It will be seen that, compared with

TABLE III.—*Course of Labour in Cases of Sacral Os (34 Cases)*

Type of Cervix	Average I.D.I. in Hours	Average Duration of Labour in Hours	Average Latent Interval in Hours	No. of Cases
1	61.1	16.0	45.1	17
2	44.8	34.2	10.6	14
3	One case only.	This patient was 72 hours in labour, and was subsequently delivered by caesarean section		
4	46.0	17.0	29.0	2

Table II, the induction delivery interval is strikingly prolonged in types 1 and 2 and the average duration of labour is also increased, especially in type 2. The increased latent interval in type 1 cervix with a sacral os is also of great interest. The difference in the mean times of these cases compared with the same type of cervix without the sacral os is highly significant statistically.

Table IV compares the relative rates of forceps delivery and caesarean section in the different types of cervix and gives the figures for the total number of deliveries (1,232)

TABLE IV

Type of Cervix	Forceps Delivery	Caesarean Section	No. of Cases
Ripe cervix (types 1 and 2) . .	15 (16.8%)	4 (4.4%)	89
Unripe cervix (types 3, 4, and 5) . .	2 (20%)	3 (30%)	10
All types with sacral os . .	4 (11.7%)	6 (17.6%)	34
Total deliveries in 1951 . .	11%	5.4%	1,232

for the year 1951. The increased interference rate in the unripe types as compared with the ripe types of cervix is statistically significant, as is also the increased caesarean section rate in cases of sacral os found in all types of cervix.

Table V shows the numbers of cases in which labour lasted over 24 hours or in which labour was terminated before this time for reasons associated with delay in cervical

TABLE V.—*Course of Labour in Relation to Type of Cervix (133 Cases)*

Type	No. of Labours over 24 Hours or Terminated Earlier by Caesarean Section		No. of Cases	
	Without Sacral Os	With Sacral Os	Without Sacral Os	With Sacral Os
1	7	5	66	17
2	9	7	23	14
3	1	1	4	1
4	3	1	5	2
5	1	—	1	—

dilatation by caesarean section. The latter operation was performed in these cases for such reasons as increasing pre-eclamptic toxæmia if deterioration in the maternal condition was directly associated with a long latent interval. The sacral os is especially seen to be responsible for a higher incidence of prolonged labour and surgical intervention.

A typical example is shown by the following case, in which a high rupture of membranes was performed for a mild pre-eclamptic toxæmia near term. The cervix was found to be firm, long, and closed, and admitted a finger only with difficulty (type 2). It was also sacral in position and required hooking down digitally—a difficult procedure—before a Drew-Smythe catheter could be introduced. Eighteen ounces (510 ml.) of liquor amnii was withdrawn, but 5½ hours passed before contractions began. After a further 29½ hours caesarean section had to be performed on account of an increasing degree of toxæmia and a rising foetal heart rate.

Discussion

By a careful examination of the condition of the cervix at the time of induction of labour or, for that matter, at the spontaneous onset of labour, it should be possible to classify the cervix according to its degree of "ripeness" and so give a reasonable estimate of the likely course of labour that will follow. If there is a soft open and partially effaced or an early onset of labour and a spontaneous delivery are to be expected. If, however, the cervix is firm and difficult is experienced in inserting the finger, then a prolonged latent interval and a somewhat longer labour are likely.

If a sacral position of the cervix is found, even in the case of a type 1 cervix, a longer latent interval is to be expected, although once labour starts it may well be of average duration.

Intervention either by forceps or by caesarean section is also more likely in the unripe type of cervix, and caesarean section is more likely to be required in cases in which the sacral os is present.

As well as the risk of deterioration in cases of severe pre-eclampsia, there is an increasing risk of infection and foetal death when the membranes have been ruptured for 24 hours. In certain cases, therefore, in which the type of cervix is unfavourable and the latent interval likely to be prolonged, it may well be advisable to perform caesarean section without awaiting the onset of contractions.

In cases of sacral os in which time is not so pressing it may be possible to hook down the cervix and sweep the membranes digitally without actually rupturing them. Forty-eight hours later the cervix may be found to have become much easier to enter, and rupture of the membranes can then be more effectively performed. Faris and Kahlenberg (1954) suggest the use of a dilute oxytocin drip to soften certain cases of the hard unripe cervix. It is given during the day for two days. This may well be tried in such cases of sacral os following a digital sweep, provided the uterus is not hypertonic, although in such cases proper tographic control is advisable.

In the light of these findings, a special plea is made for a more careful assessment of the cervix uteri at the time of surgical induction than is often the case. By so doing the clinician can learn much that will help him in the subsequent care of his cases, and at the same time increase his interest in what is often, quite incorrectly, thought to be a somewhat prosaic obstetric procedure.

Summary

The cervix has been classified into five types at the time of the induction of labour in 133 cases.

The course of labour in regard to the induction delivery interval, the duration of labour, and the latent interval prior to the onset of contractions has been studied. Special reference is made to the "sacral" position of the cervix.

The relative interference rate by forceps or caesarean section in relation to the various types of cervix has been noted.

The significance of certain types of cervix in labour and their management is discussed.

I should like to pay tribute to the help and encouragement given to me by Professor W. C. W. Nixon, for the time and trouble taken by Dr. D. E. Barton in checking the statistical aspect, and to the unfailing co-operation of Sister Billing, who is in charge of the labour wards at University College Hospital, London.

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CHLOROQUINE SULPHATE IN TREATMENT OF CHRONIC DISCOID LUPUS ERYTHEMATOSUS

BY

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For some years mepacrine has been used in the treatment of chronic discoid lupus erythematosus (Prokoptchouk, 1940; Popoff and Kutinscheff, 1943; Page, 1951). From 1952 to May, 1954, a group of cases have been treated with chloroquine sulphate in this department. This drug has the advantage of being less toxic than mepacrine and does not lead to yellow discoloration of the skin.

Since the course of the disease is variable, with seasonal exacerbations, the patients were followed through the four seasons before coming to any conclusion. Routine investigations carried out included: (a) Hb, R.B.C., W.B.C. differential count, E.S.R.; (b) plasma proteins; (c) chest x-ray examination.

The following complications, as noted by Alving *et al.* (1948), were looked for: pruritus, anorexia, vertigo, tinnitus, visual disturbance, diarrhoea, malaise, urticaria. The possibility of agranulocytosis was kept constantly in mind and patients were warned to report any untoward symptoms, such as lassitude and sore throat.

Dosage.—The dosage of chloroquine sulphate used initially was 0.1 g. thrice daily by mouth (tablet, not base dose). If the clinical response was rapid the dosage was dropped to 0.1 g. twice daily.

Results

Eighteen cases have been under treatment (see Table). Ten showed clinical cure (scaling disappeared and the skin was either normal in appearance or atrophic); five improved—slight scaling remained; one (B) was subjectively improved; one (A) was unchanged; and in one (O) the condition continued to spread. No complications occurred.

The following points were noted with three of the 10 clinical cures while under treatment. Case K relapsed under treatment. The relapse occurred after the patient had stood in the sun without protection. There was also a relationship between the E.S.R. and clinical response, there being no response to treatment when the rate was raised. Case M

Results of Treatment

Case	Age	Sex	Duration when Therapy Started	Distribution	Previous Treatment	E.S.R.	Biopsy	Weeks of Treatment	Dosage	Months of Observation	Result	Comparison with Previous Therapy
A	87	F	4 months	Scalp; palate	Mepacrine	Raised	No	24	0.1 g. t.d.s. (50.4 g.)	11	Unchanged	—
B	32	M	10 years	Lip	Quinine, Bi. gold, CO ₂	Normal	"	24 16 28	0.1 g. t.d.s. (50.4 g.) No treatment 0.1 g. t.d.s. (59.2 g.)	17	Subjective improvement	Best
C	51	M	11 "	Face; ears	CO ₂ , sulphoamide, sulphapyridine, Bi, mepacrine	"	"	28	0.1 g. t.d.s. (59.2 g.)	12	Lesions cleared. Residual scarring	"
D	56	F	16 "	Face; nose	Calciferol, mepacrine	"	"	8 3 8	0.1 g. t.d.s. (16.8 g.) No treatment 0.1 g. t.d.s. (16.8 g.)	10	Lesions cleared, but relapsed on stopping chloroquine. Lesions cleared	"
E	56	F	7 "	Nose; temple	?	"	"	16 8	0.1 g. t.d.s. (33.6 g.) 0.1 g. daily (5.6 g.)	16	Skin cleared	"
F	36	M	1 year	Face; nose; lip	Calciferol	"	"	3 12 9	0.1 g. b.d. (4.2 g.) 0.1 g. t.d.s. (33.6 g.) 0.1 g. daily (6.3 g.)	11	Cleared	—
G	29	F	1 "	Face	—	"	"	16	0.1 g. t.d.s. (33.6 g.)	4	Improved	—
H	43	F	19 years	Face; ear	Gold, Bi, sulphoamide	"	"	3 28 4	0.1 g. t.d.s. (6.3 g.) No treatment; relapse following cold	12	Cleared. Relapsed. Cleared	Best
K	35	F	1 year	Face	Mepacrine, gold	Raised at first	"	12 2	0.1 g. t.d.s. (8.4 g.) 0.1 g. t.d.s. (25.2 g.) Went into sun; no treatment	12	Improved. Relapsed. Clinically clear	"
L	37	F	8 months	"	Mepacrine	Normal	"	4	0.1 g. t.d.s. (8.4 g.)	1	Improved	—
M	56	M	2 years	"	"	"	Yes	8 4	0.1 g. t.d.s. (16.8 g.) Indigestion—no treatment	10	Relapsed	"
N	54	M	2 "	"	"	"	"	8 4	0.1 g. t.d.s. (16.8 g.) 0.1 g. t.d.s. (8.4 g.) 0.1 g. b.d. (13.2 g.) 0.1 g. daily (2.8 g.)	6	Clinically clear Improved	Best "
O	32	M	1 year	"	Nil	"	No	12	0.1 g. t.d.s. (25.2 g.)	—	No change	Now on B
P	24	M	4 years	"	Mepacrine	"	Yes	3 8 4	0.1 g. t.d.s. (6.3 g.) 0.1 g. daily (5.6 g.) 0.1 g. t.d.s. (8.4 g.)	4	One small lesion appeared during course. Cleared with CO ₂	As good, but slower
Q	41	M	15 "	Face; ear	CO ₂ ; Bi	"	No	12 4	0.1 g. t.d.s. (25.2 g.) 0.1 g. b.d. (5.6 g.)	6	Scarring. No activity	Best
R	45	F	15 "	Nose	CO ₂	"	"	24	0.1 g. t.d.s. (50.4 g.)	16	Improved. Single lesion treated with CO ₂	Best
S	46	F	2 "	Face	Mepacrine, gold	"	Yes	14	0.1 g. t.d.s. (29.4 g.)	4	Improved	Best
T	64	M	19 "	Face; nose; ears	?	"	"	20	0.1 g. t.d.s. (42.0 g.)	11	Good result. Residual scarring	Best for 10 years

complained of indigestion, but, on questioning, he said he was "a martyr to attacks of indigestion." Case T found that his rheumatic pains, for which he had had many medical remedies, cleared "miraculously" while he was under treatment, but they returned as soon as the treatment was stopped.

The patients who were under observation for less than six months were asked to communicate with us should there be a relapse, but as yet we have had no response.

Two cases of subacute disseminated lupus erythematosus were also treated with chloroquine sulphate with no satisfactory clinical response.

Summary and Conclusions

Eighteen cases of chronic discoid lupus erythematosus were treated with chloroquine sulphate by mouth. The results are tabulated and discussed.

It is considered that chloroquine sulphate is as efficient a form of palliative therapy as any previously used, though not as yet the answer for the chronic disease. There is still a place for CO₂ snow treatment where there is a single discoid lesion.

I have to thank Dr. Alice Carleton, consulting dermatologist, the Radcliffe Infirmary, Oxford, for her guidance and for permission to publish this article. I am much indebted to Sister Burbridge and Dr. S. O'Reilly, of the skin department, for their help. I am also grateful to Miss Donaldson, secretary, for all her work.

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CHRISTMAS DISEASE ASSOCIATED WITH FACTOR VII DEFICIENCY CASE REPORT WITH FAMILY SURVEY

BY

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AND

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Reports of congenital deficiencies of isolated blood coagulation factors have become common. Instances of more than one such deficiency occurring simultaneously in the same individual have been much less frequently reported. Koller (1954) has drawn attention to this possibility by describing a case of combined haemophilia and Factor V deficiency. Soulier and Larrieu (1953) have reported a case of combined haemophilia and Christmas disease, the diagnosis being based on the failure of the patient's plasma to correct the clotting defect of either haemophilia or Christmas disease. To our knowledge, no association of Factor VII deficiency with Christmas disease has previously been reported. Such a combination has recently come to our notice in a family, some of whose members suffer from haemorrhagic manifestations.

Case Report

A 29-year-old man was admitted to Addenbrooke's Hospital following a road accident in April, 1954, when he received a cut over the right eye which had continued to bleed intermittently for two weeks. He had had excessive bleeding from traumatic cuts since childhood, and recurrent haemarthroses of the elbows and knees had resulted in

partial flexion deformities of these joints. In 1951, following an appendectomy, he had required 6 pints (3.4 litres) of blood, and the wound had healed by secondary intention (occasionally sutures had been sloughed out since then). In November, 1953, a dental extraction had required three weeks' hospitalization and 6 pints (3.4 litres) of blood. He had received 6 pints of blood at another hospital just before this latest admission in an attempt to control the bleeding from his forehead, with only moderate success.

General physical examination was unremarkable. Both wrists showed impairment of dorsiflexion, and there was 20 to 30 degrees limitation of extension in both knees and elbows. The cut in the forehead had been sutured, but a large subcutaneous haematoma had caused the wound edges to gape. Oozing from the wound was moderate. There was a nylon suture protruding from the appendectomy wound in the abdominal wall, surrounded by a small area of granulation tissue. X-ray examination of the knees showed loss of articular cartilage, subarticular cyst formation, and sclerosis and osteophytes of both knees, particularly on the right side. The changes were regarded as compatible with those of repeated haemarthroses.

Laboratory investigation of the urine and routine haematological examination revealed nothing abnormal. Coagulation studies are shown in Table I.

TABLE I

Test	Method	Result	Normal Values
Clotting-time	Modified Lee-White	17.5 mins.	5-10 mins.
Platelet count	Rees-Ecker	670,000/c.mm.	2-400,000/c.mm.
Oil-suspended clot retraction	Budtz-Olsen (1951)	13% in 4 hr.	20% in 4 hr.
Prothrombin consumption	Quick et al. (1949)	22.9 sec. in 1 hr.	Over 30 sec. in 1 hr.
One-stage prothrombin time	Quick	22.3 sec. (40%)	80-100%
Factor V	Stefanini (1950)	95%	90-100%
Two-stage prothrombin	Biggs and Douglas (1953a)	104%	85-100%
Factor VII	Koller et al. (1951)	44%	90-100%
Thromboplastin generation test—fully corrected by normal serum but unchanged by normal plasma	Biggs and Douglas (1953b)	27%	100%

These tests indicated a defect in thromboplastin generation compatible with the diagnosis of Christmas disease, and a prolonged one-stage prothrombin time due to a marked reduction in Factor VII. By definition, Christmas disease is characterized by a normal one-stage prothrombin time (Biggs et al., 1952), and Factor VII deficiency alone produces a defect in the thromboplastin generation test only if less than 10% of normal (Biggs and Marfaland, 1953). Thus there appeared to be two separate deficiencies present in this patient. No evidence of liver disease existed to explain the reduced Factor VII level.

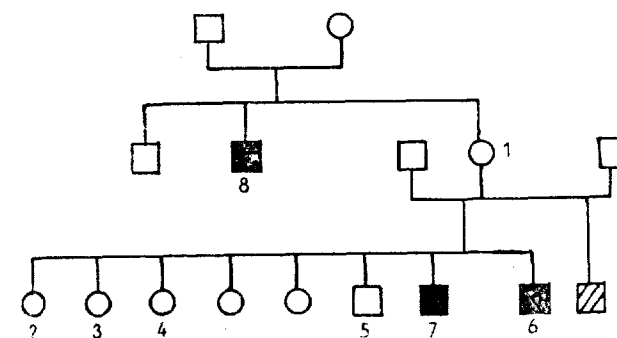
Clinical Course

He was given by intravenous drip 80 ml. of compatible 10-day-old serum, which reduced his clotting-time to 8.5 minutes, raised his prothrombin consumption to 26.2 seconds in one hour, shortened the one-stage prothrombin time to 17.2 seconds (58% of normal), and improved the clot retraction to 20% in four hours. Under cover of this treatment, the haematoma of the forehead was evacuated and resutured, and covered with a pressure bandage. At the same time the nylon suture was removed from the abdominal wound and a pressure bandage also applied. There was no excess haemorrhage as a result of these procedures. He was given a further 40 ml. of serum immediately post-operatively. His tests had returned to their pre-treatment level by 18 hours post-operatively. The sutures were removed without trouble 10 days later under cover of more serum intravenously. Traction to the right leg produced some improvement in the degree of flexion contracture. He was discharged after an uneventful convalescence.

Our use of serum, rather than plasma or whole blood, may call for brief comment here. Both Christmas factor and Factor VII are stable in stored blood, plasma, or serum for considerable periods (Biggs et al., 1952). We have found Christmas factor to be stable in stored oxalated plasma and normal serum for three weeks. Therefore, any of these fractions may be used in the treatment of Christmas disease, Factor VII deficiency, or a combination of these defects. In the course of work carried out by us on another patient with uncomplicated Christmas disease, we have found that 1 ml. of serum is approximately equivalent in therapeutic effect to 10 ml. of A.C.D.-stored plasma. Because of this finding, and because serum provided a supply of both deficient factors in this patient, it was used exclusively in this case, with good results.

Family History

The presence in this patient of a combined deficiency, apparently of a congenital nature, called for an effort to test all available members of his family. This proved only



Family tree of patient. The numbers refer to the subjects (see Table II). Male, non-bleeder; ■ Male, bleeder; ○ Female, non-bleeder; ● Female, reported bleeder, not studied.

moderately successful owing to distant residence, unwillingness on the part of some members, and death of others. The accompanying genealogical tree is based on information received from several members of the family. The patient's maternal grandmother could not be tested; his grandfather and both his father and stepfather were dead. An apparently unaffected uncle, a bleeder brother, and two sisters were not available for testing. Only males showed a bleeding diathesis. The principal clinical manifestations in all affected males were haemarthroses and subcutaneous haematomata.

In Table II are summarized the results of tests performed on the members identified in the family tree by numerals. Since these tests had to be done either in the patient's home

TABLE II.—Results of Tests in Members of Family

Subject	Bleeder	Clotting-time (min.)	Prothrombin Consumption (3 Hours)	1-Stage Prothrombin Time (sec.)	Factor VII (% of Normal)	Peak Thromboplastin Generation (% of Normal)	Correction by Plasma or Serum
1	—	8	(sec.) 48.2	65	65	98	—
2	—	9	34.9	75	75	93	—
3	—	7	64.5	72	72	80	—
4	—	8.5	93.0	100	100	80	—
5	—	8	43.3	50	50	93	—
6	+	18	24.8	45	45	12	Serum
(patient) 7	+	17	25.8	46	45	10	—
8	+	17	28.2	48	50	11	—

or two hours later on return to the laboratory, their range had to be limited, and normal controls were subjected to similar conditions.

Discussion

This investigation is reported in order to draw attention to the existence of combination forms of isolated coagulation factor deficiencies. In this family the most striking

feature seems to be that, whereas both sexes showed deficiencies of Factor VII, only some of the males had Christmas disease as well; all of the clinical "bleeders" belonged to this latter group. From these results it would appear that the critical haemorrhagic level of Factor VII is less than 40% of normal and that it was the deficiency of Christmas factor which determined the tendency to bleed. It is interesting to note that the serum of the mother (a female carrier of Christmas disease) was as effective in the correction of the abnormal thromboplastin generation tests as normal human serum, providing further evidence of the inability to demonstrate a laboratory defect in the female carrier of this disease.

Summary

A survey is made of a family, some of whose members exhibit a combination of Christmas disease and Factor VII deficiency. Pathological bleeding was confined to those showing both defects.

The advantage of serum in the clinical management of such patients is illustrated.

We wish to thank Sir Lionel Whitby for providing the facilities for this study, and Miss S. C. Tomlin for valuable technical assistance. We are indebted to Mr. D. J. Martin for referring to us the patient whose case is reported in detail.

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A CASE OF PHAEOCHROMOCYTOMA

BY

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AND

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As comparatively few cases of phaeochromocytoma are described in the literature of this country the following case is recorded. The number of cases of successful removal of the chromaffin tumour of the adrenal is smaller still, many of the reported cases having been found at necropsy (Crowther, 1951; Jellicoe, 1952; Davies, 1952; Priest, 1952). A review of the world literature up to 1949 is given by Graham (1951).

Phaeochromocytoma is probably a commoner condition than the literature would lead one to believe, and it is likely that many cases remain undiagnosed. By publishing details of these cases the condition will become better known and take its proper place in the diagnostic field. An additional reason for publication is that most new cases still present special difficulties in diagnosis and surgical treatment.

Case Record

A married woman aged 52 was admitted to hospital with sweating attacks following a respiratory infection. There were few signs in the chest, however, no pyrexia, and x-ray examination showed that her chest was normal. She then volunteered that she had suffered from these sweating

attacks for some two years. During these attacks, many of which occurred during her stay in hospital, there was no associated headache, dizziness, or definite pallor of the skin. She had no other complaints, but it is interesting to note that she had been treated at home for the past seven or eight years for high blood pressure. There was no other significant illness.

On examination she presented a normal appearance for a woman of her age, and her general condition was average. There was a sense of fullness in the right lumbar region, but no definite tumour could be felt. Manipulation of this region did not produce an attack of sweating. Her blood pressure at the time of admission was 180/110, but frequent estimations showed that it varied between 250/150 and 160/100.

Unresolved pneumonia was at first thought to be a possible diagnosis. Thyrotoxicosis was considered and the B.M.R. at this time was +39%. In view of this it is of interest that Davies's case (1952) simulated thyrotoxicosis. At this stage, however, a sweating attack was observed by one of us and the possibility of a phaeochromocytoma was considered. Special investigations were undertaken with this diagnosis in mind.

Special Investigations.—A straight renal and intravenous pyelogram showed some broadening of the lower pole of the right kidney but no other abnormality. A perirenal air insufflation followed by x-ray examination did not show any definite tumour in either kidney region, but, as is usual in our experience, the x-ray films proved difficult to interpret. A piperoxane test showed a definite response, with lowering of the blood pressure from 180/110 to 145/90. This was subsequently repeated, and the blood pressure was lowered from 170/110 to 125/80. The pharmacological tests were reviewed by Swan (1951), who described an illustrative case. In the present case the amount of adrenaline and noradrenaline excreted in the urine before and after operation was ascertained. The pre-operative specimen contained a considerably greater quantity than the post-operative. The pre-operative urine contained 1 mg. of L-noradrenaline per 24-hour output. Three days after operation it fell to the equivalent of 0.5 mg. of L-noradrenaline. Ten days after operation it had fallen to 0.25 mg. An amylobarbitone sedation test, an electrocardiogram, and an x-ray film of the skull showed no significant abnormality.

On the above evidence a diagnosis of phaeochromocytoma was confirmed, and it was thought most likely that the tumour was on the right side, although this was by no means certain. It was decided that if at operation no tumour was found on the right side, then the left side would be explored.

Operation

A right lumbar incision was used, excising the twelfth rib subperiosteally. A spherical tumour about 3 in. (7.5 cm.) in diameter was immediately found in the position of the right suprarenal gland. There was a well-marked line of cleavage between the tumour and the surrounding structures and it was freed along this line without difficulty. The pedicle was then ligated and the tumour removed. The wound was closed in layers with rubber drainage.

Technically, the removal of this tumour presented no problems, but, as is usual with these cases, the problem was to deal with fluctuations of blood pressure throughout the operation. At the beginning of the operation it was 170/90. On incision of the skin it rose to 215/140, and it continued to rise to 235/145 when the tumour was being handled.

Piperoxane, 10 ml., was given immediately before the start of the operation, and this was repeated after 10 minutes. When the blood supply to the tumour had been arrested by ligation the pressure remained unchanged for a period of 15 minutes and then fell to 135/80. It remained at this level until the end of the operation and, coincident with the postural change of the patient, dropped to 60/40. It remained at this level for over an hour, when it rose to 95/65, and continued to rise slowly thereafter. Noradren-

aline was given into the drip as soon as the vascular pedicle of the tumour was clamped, and a noradrenaline drip was continued until the next day.

Throughout the operation there was a marked degree of sweating. Oxygen was given and continued for 1½ hours after the end of the operation. Convalescence from the operation was uneventful and the blood-pressure readings were 120/80 eight days after the operation, and remained round about this figure until her discharge. The piperoxane test was repeated before her discharge and did not demonstrate the previously noted fall in blood pressure, and indeed there was a rise in blood pressure from 125/70 to 160/85.

When seen in the out-patients' department a few weeks after discharge the patient was symptom-free and her sweating attacks had been completely abolished. Her blood-pressure on this occasion was 180/110.

Although she readily agreed to the operation, one interesting personal sidelight was that she was obviously unconvinced that the operation would benefit her. It was not until some little time after the operation that she realized with pleasure that she had indeed been cured of her sweating attacks.

Pathology

The specimen was reported on as a typical chromaffinoma weighing 425 g. The cells were more pleomorphic than usual, and the cytoplasm was plentiful and slightly granular. The nuclei were often large, pale, and with many chromatin dots and an inconspicuous membrane. An estimation of the amount of adrenaline and noradrenaline in the medulla of the tumour was made. The amount of L-noradrenaline was equivalent to 0.46 mg., and the amount of L-noradrenaline was equivalent to 0.85 mg. per g. of medulla.

Summary

A case of phaeochromocytoma is described, illustrating the difficulty in diagnosis of these tumours. Some of the diagnostic investigations are described, together with some of the important points for successful surgical removal of the tumour, which was undertaken in this case.

Our thanks are due to Dr. J. D. Loughrey for the administration of the anaesthetic and the control of the blood pressure during the operation, to Dr. H. E. Vickers for the pathological reports, and to Dr. H. Wilson, of the department of pharmacology, University of Liverpool, for the pharmacological estimations on the urine and tumour.

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"In view of modern knowledge on leprosy, countries have revised their laws against lepers. The present trend in dealing with leper patients does not seem to favour compulsory segregation; this method is becoming obsolete; it has its utility as a check on the spread of disease, but it has also many drawbacks—social, ethical, and administrative—and it certainly does not seem to agree with the modern outlook. It has been ascertained that the ancient system of compulsory segregation may do more harm than good, in causing the early cases to be hidden for fear of lifelong imprisonment, until it is too late for effective treatment and they have already infected members of the household. With modern drugs and modern methods of treatment the course of the disease may be favourably altered, especially if patients seek medical advice early. Forcible segregation has been tried in many countries, but it has given poor results. In the Philippines it was adopted at a great expenditure of money, but it has not proved capable of controlling leprosy, and now the law is being reviewed and amended."—Report of the Chief Government Medical Officer, Malta.

Medical Memoranda

Bact. Coli Meningitis in Adults

Bact. coli is a rare cause of meningitis. Most of the recorded cases of meningitis due to this organism have occurred in newborn infants and young children. There have been few reports of adult cases. The rarity of the disease is confirmed by Neal (1924), Barrett *et al.* (1942), MacGregor (1943), and Fraser (1952). Ravid (1935) points out that *Bact. coli* agglutinins are absent from neonatal blood though present in the blood of adults, thus suggesting a possible explanation of the age incidence of this condition.

Previous reports of *Bact. coli* meningitis in adults and older children show that the condition has generally been associated with a septic focus, not infrequently in the genito-urinary tract, or has been a sequel of compound fractures of the skull or vertebral column.

The importance of infections by Gram-negative organisms in head wounds was stressed by Lewin (1948). Ecker (1945), Johnson (1947), and Cairns *et al.* (1947) also record cases of coliform meningitis complicating penetrating war injuries. *Bact. coli* infections have also been noted following spinal analgesia (Kremer, 1945; Evans, 1945), and a case of *Bact. coli* meningitis described by Mayers (1937) followed an intraurethral prostatic resection. Two further cases were recorded by Stallworthy (1943), both in male mental patients, in one of whom evidence of extensive suppuration in the liver and biliary tract was found at necropsy.

Previous accounts of *Bact. coli* meningitis in women show that the disease may follow the surgical induction of abortion (Theys and Gehrcke, 1923; Tesdal, 1934; Magarey *et al.*, 1935; and Crawley, 1946). We therefore thought it of interest to report two further adult cases of meningitis due to *Bact. coli*, both affecting women following induced abortion, and both successfully treated.

CASE 1

An unmarried woman aged 31 was admitted to hospital in semicomatose on October 24, 1952. Previously healthy, she became pregnant for the first time in June, 1952. During the latter half of the pregnancy vaginal douching with hot soapy water was performed twice daily with a syringe. She remained well until October 10, when she developed coryza and stayed off work. On the 16th she had an intense rigor lasting several hours, followed next day by a miscarriage. After this, slight frontal headaches and nausea were experienced until October 21, when she first noticed neck stiffness and increase in headache. The neck stiffness became severe on the 22nd, and was accompanied by tinnitus and backache. Later next day she abruptly collapsed and developed fever. From then onwards she became confused, irrational, and difficult to control, and speech was unintelligible. She had complete amnesia for the later phases of her illness.

On examination she was pale, of normal physique, stuporous, and febrile (temperature 102° F.—38.9° C.), with neck rigidity and marked trismus. The tongue was dry and furred and sordes was present. Pulse regular, rate 96; blood pressure 140/80. Heart sounds normal. Chest, N.A.D. Spleen and liver not palpable. Cranial nerves unaffected, pupils normal. Limbs flaccid. Bilateral extensor plantar responses. Tendon reflexes present and equal. Kernig's sign positive. Urine: specific gravity 1028; reaction acid; slight glycosuria.

Investigation.—A lumbar puncture was performed on admission. The C.S.F. was turbid; pressure over 300 mm.; total white cells 1,700 per c.mm. (polymorphs 80%, lymphocytes 20%); protein, 188 mg. per 100 ml.; chlorides, 680 mg. per 100 ml. *Bact. coli* was isolated in pure culture, sensitive to chlortetracycline ("aureomycin"), chloramphenicol, streptomycin, and "sulphatriad." *Bact. coli* was also isolated from blood culture and from a high vaginal swab on admission. Hb, 11 g. per 100 ml. (74%).

Treatment was started immediately with sulphatriad, 2 g., orally followed by 1 g. four-hourly. The drug was discontinued on October 31. Symptomatic improvement was prompt. The patient was rational on the 25th and the plantar responses were then flexor. Neck stiffness had disappeared by October 27, on which day the temperature fell to normal. Evening pyrexia (99° F.—37.2° C.) persisted, and was associated with vaginal discharge. *Bact. coli* was cultured from a high vaginal swab taken on November 7. The pyrexia and discharge cleared after a course of chlormphenicol, 10 g. in divided dosage, from November 11 to 14. Lumbar puncture repeated on October 31 revealed clear C.S.F.; pressure normal; cells, 56 per c.mm. (predominantly lymphocytes); protein, 67 mg. per 100 ml.; chlorides, 710 mg. per 100 ml.; sterile on culture. A final lumbar puncture on November 17 revealed normal C.S.F., and the patient was discharged well on November 26.

CASE 2

A married woman aged 34 was admitted to hospital on December 3, 1952, as an emergency following a self-induced abortion. There was a history of three previous abortions in 1947, 1949, and 1950. Three earlier pregnancies went to term.

On admission the patient was shocked and afebrile, with a pulse rate of 120. Vaginal examination revealed an enlarged uterus. The cervix was lacerated and bruised. Haemoglobin was 89%; white cells numbered 15,000 per c.mm. (polymorphs 96%). Albuminuria was present. Urine and blood cultures proved sterile. *Bact. coli* was isolated from a high vaginal swab taken on admission.

An intravenous dextran infusion was begun immediately and intramuscular penicillin was given. On December 4 her condition had deteriorated. Fever and neck rigidity developed. Lumbar puncture yielded turbid C.S.F. under pressure. Pending the result of C.S.F. culture, penicillin was given intrathecally and oral administration of chlormphenicol was started.

During the next 24 hours she rapidly became worse, and lapsed into coma. Marked neck rigidity was by now associated with bilateral proptosis, strabismus, subconjunctival haemorrhages, and blurring of the optic disks, suggesting the presence of cavernous sinus thrombosis. Splinter haemorrhages in the nail-beds were also noted. *Bact. coli* in pure growth was isolated from the C.S.F. on culture. The organisms were sensitive to chlortetracycline, chloramphenicol, streptomycin, and sulphatriad. Streptomycin was chosen for subsequent treatment and other antibiotics were discontinued. The drug was administered intramuscularly (1 g. t.d.s.) and intrathecally (100 mg. daily). Heparin, 10,000 units four-hourly, was introduced into the dextran infusion. Lumbar puncture was performed daily (December 5, 6, and 7) under thiopentone anaesthesia, 10 ml. of C.S.F. being withdrawn and replaced by streptomycin. *Bact. coli* was isolated on culture on each occasion though the turbidity of the C.S.F. had decreased, and the cell count fell from 12,360 (polymorphs 100%) to 1,215 (polymorphs 88%). Simultaneously there was progressive improvement in the general condition. On December 8 the patient regained consciousness. The proptosis and neck rigidity were less and strabismus was no longer evident. Streptomycin and the intravenous infusion were discontinued on December 8.

Pelvic examination revealed no retained products of conception, but a low-grade pyrexia was associated with a persistent offensive vaginal discharge, necessitating further treatment. Oral sulphatriad (1 g. four-hourly) was begun. A lumbar puncture on December 10 yielded faintly opalescent C.S.F. (cells 183 per c.mm., polymorphs 75%) which was sterile on culture. Sulphatriad was discontinued on December 15, when recovery was complete, the temperature normal, and the C.S.F. clear and sterile on culture.

COMMENT

Before the advent of chemotherapy, *Bact. coli* meningitis was nearly always fatal, the gross fatality rate in the series of Barrett *et al.* (1942) being 78%. Although there have

been reports of cases recovering without specific chemotherapy (Tesdal, 1934; Magarey *et al.*, 1935), the availability of antibacterial drugs has greatly altered the prognosis and improved the chance of cure. Nevertheless, *Bact. coli* meningitis remains a serious infection.

We are grateful to Dr. M. M. Deane, Dr. R. P. L. Coe, and Mr. C. W. F. Burnett for their kind permission to publish these cases.

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Acute Renal Failure After Phenylbutazone

Of the many toxic actions of phenylbutazone ("butazolidin"), its renal effects have received scant attention, although most published series include isolated instances of haematuria and proteinuria. It is not easy to ascribe oliguria or anuria to a drug the toxic side-effects of which already include diarrhoea, vomiting, and salt retention, but the clinical evidence in the following case is strongly suggestive of this complication.

CASE REPORT

A woman aged 61, who had had rheumatoid arthritis for 15 years, was admitted to hospital at 9 p.m. in a state of collapse. She complained of severe vomiting, diarrhoea, and colicky abdominal pain for twelve hours and had had nausea, anorexia, and giddiness for two weeks.

On admission she was very drowsy and distressed from nausea and vomiting. Her temperature, pulse, and respiration were all normal. Her tongue was dry and the throat red, but hydration was otherwise good. There were no abnormal signs in the chest, abdomen, or central nervous system, and the blood pressure was 175/90.

Anuria became obvious the following morning, by which time an uncharted amount of fluid had been allowed. She was still drowsy and appeared overhydrated, with basal crepitations, raised jugular venous pressure, and palpable liver edge, but no pitting oedema. The bladder was empty. A cause for anuria was sought, and on further questioning it transpired that she had passed no urine since 1 p.m. of the day before admission. Moreover, she normally passed urine frequently, usually getting up four times nightly, but had voided very little for two days. She maintained adamantly that scant micturition had preceded the vomiting, and also that it could not be accounted for entirely by a decreased fluid intake from nausea.

Past treatment for arthritis, which had failed to provide substantial benefit, included aspirin, physiotherapy, and over one hundred injections of gold, but no injections had been given for three years. Phenylbutazone, 1,200 mg. daily, was begun two years ago, the dose being reduced to 600 mg. daily after three months, and for six weeks until the time of admission she had been taking 200 mg. daily. The original effect was described as miraculous, and, whereas before taking the drug she had been crippled to a bed-and-

chair existence, only the day after starting phenylbutazone, to the intense delight of her family and herself, she was able to walk downstairs free from pain.

A diagnosis of acute renal failure related to phenylbutazone administration seemed likely, and treatment with an intragastric drip of glucose and arachis oil emulsion was instituted on the morning after admission, to be discontinued after six days, when the urinary output was satisfactory. Catheterization of the bladder on the second day yielded 12 oz. (340 ml.) of dark brown acid urine containing red cells, epithelial cells, and albumin ++; the chloride content was 2 g. per litre and the urea concentration 0.7 g.%; culture was sterile. A blood count showed a haemoglobin of 77% and total leucocytes of 22,000 per c.mm. (polymorphs 93%, lymphocytes 7%). The other investigations are summarized in the Table. Before the patient left hos-

Results of Investigations

Day in Hospital	Urine Output		Serum Levels in mEq l.				Blood Urea (mg./100 ml.)	Hb (%)
	oz.	ml.	Na	K	Cl	HCO ₃		
1	0	0	—	—	96	17	105	77
2	0	0	—	—	105	22	130	
3	12*	340*	132	5.2	101	24	100	
4	+12*	+354	126	6	101	24	100	66
5	14*	410	—	—	100	22.5	150	
6	34*	980	124	4.7	103	24	103	
7	31	880	—	—	—	—	—	66
8	54	1,534	—	—	—	—	—	
9	68	1,930	—	—	—	—	—	
10	50	1,420	124	5.5	103	24	103	66
11	83	2,357	—	—	—	—	—	
12	82	2,329	—	—	—	—	—	
13	78	2,215	—	—	—	—	—	66
14	56	1,590	—	—	—	—	—	
15	27	767	130	4.1	114	24	36	
16	49	1,392	—	—	—	—	20	

* By catheterization.

pital her urine contained albumin +, no red cells, and the reaction was neutral. On follow-up one month later she felt well and her arthritic condition had not relapsed. Frequency of micturition had returned, the urine contained no albumin, and the blood chemistry was normal.

COMMENT

Bruck *et al.* (1954) described a fatal outcome in an elderly patient in whom oliguria might have been precipitated by phenylbutazone, and histological examination of the kidneys showed degenerative changes in the tubules. They attributed oliguria to salt retention. C. Thornton (1954, personal communication) has had a similar experience in a 7-year-old child with Still's disease, who developed a rash after nine days' treatment with phenylbutazone, 200 mg. daily. Although the drug was discontinued immediately, the child became oliguric, with a blood urea of 128 mg. per 100 ml.

Evidence that phenylbutazone was the cause of acute renal failure in the patient described here can only be circumstantial. The presence of proteinuria and haematuria indicates renal damage. It might be argued that vomiting from some other cause resulted in an extrarenal uraemia, but this is unlikely because dehydration was absent, the blood pressure was not lowered, and the onset of oliguria preceded that of emesis. The alternative explanation of salt and water retention is equally unlikely in view of the normal serum sodium levels and the normal state of hydration on admission. We therefore suggest that, in addition to salt and water retention, oliguria or anuria from phenylbutazone may be due to renal damage, and that such toxicity may become manifest after small doses or prolonged administration.

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Fatal Pulmonary Embolism in a Psychiatric Patient
After a Journey by Air

Thanks to modern methods of treatment, pulmonary embolism is no longer the dreaded complication of major surgery that it used to be. Nevertheless it is still responsible for sporadic tragic fatalities, apart from major surgery, and this report concerns one such case. It is published in the hope that it will enable appropriate measures to be taken to avoid similar incidents in the future.

The climatic conditions and the comparatively poor facilities for the treatment of psychiatric illnesses are factors which make it desirable to transfer some patients by air from tropical regions to the United Kingdom as rapidly as possible. The total number of cases is not large, and the patients usually respond favourably to appropriate treatment in the cooler environment of this country. It is to such a patient that I now refer.

CASE REPORT

A woman aged 30, with no previous serious psychiatric illness, was thought to have been very anxious and worried and to have taken sedation for several weeks before the onset of acute symptoms (which occurred at night)—insomnia, confusion, hallucinosis. The day after the onset she was moved to a general hospital. Her physical condition was good, but her temperature was 99.8° F. (37.7° C.), pulse 118, and respirations 26. She was restless, agitated, garrulous, rather muddled, and confused. During the next few days symptoms strongly suggestive of manic-depressive psychosis developed. Sometimes she was very agitated and aggressive, and heavy sedation was necessary—a mixture containing 5 gr. (0.32 g.) of sodium barbitone and 1 gr. (65 mg.) of phenobarbitone as required, and occasionally "somniafine."

As her condition did not improve it was decided to transfer her to the United Kingdom by air. She travelled with a female nurse on the seventh day of her illness. Her condition then was one of hypomania.

During the flight she was very talkative and somewhat noisy. She required three doses of the above mixture, and one dose, 30 min. (1.7 ml.), of "somniafine." Despite sedation she slept very little. She took a light tea and dinner and breakfast. She travelled in a semi-recumbent position, the back of the chair being lowered fully, and her feet elevated on cushions. During the two stops on the journey she remained in the plane because of her mental condition. On the flight she went to the toilet three times, but had to be aided by the nurse and air hostess owing to her unsteadiness. On one occasion she suddenly complained of feeling cold, especially in her feet, and she collapsed. She was wrapped in blankets, and hot-water bottles were provided. Her respiration remained normal, and her colour was very good throughout the flight, apart from the attack just mentioned.

On arrival at an airport in this country she was obviously psychotic, and was sent to the nearest mental hospital. On her admission there she was still mentally rather confused and was prone to ramble incoherently. Physically she seemed well nourished and in good general health. Her pulse was regular and strong. No evidence of any thrombosis was noted. Her blood pressure was 146/100, temperature 98.8° F. (37.1° C.), pulse 80, respirations 18. During the course of the next two days her mental condition improved. The general picture favoured the diagnosis of a "manic-depressive psychosis." Her illness appeared to be reactive in origin, and I formed the opinion that the prognosis for therapy was good.

Two days after admission she complained of pain in the back all the afternoon, and at about 6 p.m., when in a wheel-chair, she suddenly became rigid, cyanosed, and stertorous in her breathing, with signs of syncope and collapse. She now complained of pain in the back and ankles. Her pulse was weak and irregular, and her general condition

poor. A tentative diagnosis of coronary infarct was made. She gradually weakened, dying next morning.

Post-mortem Report.—A well-nourished healthy woman with no physical lesions discernible other than the following: (1) all the veins of both calves were thrombosed; (2) one acute infarct at base of right lung; (3) lungs, numerous rather soft *ante mortem* clots. Cause of death: pulmonary embolism.

COMMENT

This patient, well nourished and of good physique, was examined physically before embarkation, on arrival at the airport, and on arrival at the hospital in this country. No evidence of any physical lesion was found. The blood pressure, temperature, pulse, and respirations were normal at each examination. There was no negligence, and in such a case thrombosis and embolism could not be anticipated. Many patients in much worse physical condition have made the journey without mishap. However, being wise after the event and reviewing the case in retrospect, the following points are relevant.

It is recorded that the commonest site of venous thrombosis leading to pulmonary embolism is the veins of the calves (Willis, 1950). Such thrombosis is not likely to be discerned by physical examination. The facts that might have led to thrombosis in this case are: (1) Bed treatment with possibly insufficient mobility for seven days prior to embarkation. (2) Some exhaustion due to her hypomanic excitability. (3) Sedation necessary to try to combat her excitability. (4) Prolonged immobility on the plane for reasons stated (the journey took approximately 18 hours). (5) Pressure on the calves from the mere weight of her legs against the pillows supporting them. (6) The plane was, of course, "pressurized," but even this precaution does not supply exact ground atmospheric pressure of oxygen, and in her condition this may have had some slight effect. (7) The collapse on the plane was probably due to a small infarct, and had it been possible to realize this preventive measures might have been taken to avoid further infarction (Evans, 1951).

The occurrence of the rare advent of thrombosis in a psychiatric case is no more a contraindication to the transport of such cases by air than a similar possibility is a contraindication to a major operation in surgical patients. There are certain cases in which it is essential to take the risk. Moreover, thrombosis of this type is not peculiar to air travel and might equally well occur in any other method of travel involving prolonged immobilization.

Whenever possible the following prophylactic precautions against this complication are indicated: (1) Adequate mobility prior to embarkation. (2) Ordinarily patients should not be transported by air unless they are well enough to walk by themselves and to take walking exercise at each intermediate stop. (3) The question of sedative treatment should receive very careful consideration, and wherever it is at all possible the patient should be moved to the nearest centre where E.C.T. is available, and treated there until she is well enough to make the journey with the minimum of sedation and able to walk about at intermediate stops and regularly during the journey. (4) It is obvious that if thrombosis can occur in a patient of this type, apparently in very good physical health, it must be guarded against even more in patients suffering from physical illness. (5) In all cases in which the above precautions are not practicable and in those patients having for one reason or another to remain recumbent, special prophylactic measures should be taken—for example, breathing exercises, massage, frequent changes of position, active movements of the legs, and appropriate use of heparin (Evans, 1951).

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Reviews

STREPTOCOCCAL INFECTIONS

Streptococcal Infections. Edited by Maclyn McCarty. (Pp. 218. 40s.) New York: Columbia University Press. London: Oxford University Press. 1954.

Scarlet fever is nowadays a mild disease, deaths from puerperal sepsis are rare, erysipelas has lost its terrors, and the E.N.T. surgeon is bereft of radical mastoidectomies, while rheumatic fever and acute glomerulonephritis seem also to be "on the run." Yet haemolytic streptococcal infections still contribute a sizable quota to the total morbidity among communities in temperate climates. For example, it is estimated that there are over 7,000,000 illnesses from streptococcal infections in the U.S.A. every year, and acute rheumatic fever is a sequel in approximately 3% of such cases. In Great Britain cases and outbreaks of streptococcal sore throat in child communities are an everyday occurrence, acute otitis media is not uncommon in young children, and skin and surgical infections due to the haemolytic streptococcus still plague us. A stocktaking in the form of a symposium by experts on our present-day knowledge of *Streptococcus pyogenes*, the ravages it produces, and the means for dealing with or preventing streptococcal infection is therefore opportune.

There is perhaps no pathogen which is so complex in its antigenic make-up and in the variety of substances which it secretes as *Streptococcus pyogenes*, and this aspect of the problem is fully explored in the opening chapters of this book with many stimulating indications for further studies. Particularly interesting at the present time because of its possible practical applications is Dr. L. B. Christensen's review of the streptokinase-plasminogen system, while the chapter on host factors in streptococcal infections by Dr. Dennis Watson may shed fresh light on the pathogenesis of acute rheumatic fever. On the more applied side the last four chapters provide most interesting reading. Dr. Louis Wannamaker discusses the epidemiology of streptococcal infections in the light of an extensive experience of the behaviour of streptococcal pharyngitis at a U.S. Army Training Centre in Wyoming, and concludes that direct contact plays a more important part than air-borne spread by either dust or droplet media. Dr. Floyd Denny deals with prophylaxis by such diverse procedures as tonsillectomy, active immunization, and chemoprophylaxis with sulphonamides or penicillin. The latter drug seems, in adequate doses, to be effective in curing streptococcus carriers and in preventing relapses of rheumatic fever. Dr. C. H. Rammelkamp tells the interesting story, based initially on epidemiological data, of the occurrence of acute glomerulonephritis following infection with one or two specific streptococcal types, particularly Type 12; and Dr. C. A. Stetson shows most convincingly, again from data collected at the Army Training Centre in Wyoming, that rheumatic subjects develop higher antibody titres to streptolysin than do patients with uncomplicated streptococcal infections; indeed, the attack rate for rheumatic fever bears a direct relationship to the antistreptolysin titre.

Altogether this is a most readable and stimulating collection of essays on streptococcal infections, and should have a wide appeal.

ROBERT CRUICKSHANK.

BÖHLER ON FRACTURES

Die Technik der Knochenbruchbehandlung. By Dr. Lorenz Böhler. Band II/1. (Pp. i-xi, 1133-1569; illustrated. D.M. 70; \$16.80.) Vienna and Bonn: Wilhelm Maudrich. 1954.

"The technique of handling fractures of the bones" owes more to Lorenz Böhler than to any other individual, and that his great textbook should now have passed through 13

German editions and 15 in other languages will be no surprise to those who are familiar with its contents. The present volume deals with fractures of the femur; by far the greater part is devoted to the head and neck of that bone, and the difficult problems which occur in that region are fully discussed. The author places at the disposal of other surgeons an experience to which there is no parallel, and this he succeeds in accomplishing with perfect lucidity and precision.

Full illustrations from photographs, radiographs, and diagrams give one an immediate grasp of even complex fractures and of the elaborate procedures required for their correction, but the personal interest aroused in every case which is described marks the genius of the great teacher as well as the great surgeon. Most original of all are the series of questions which are suggested for the surgeon to consider in each case he visits. As the author says, the memory of these questions would avoid many disasters, and it is perhaps consoling that after 45 years of experience he does sometimes forget some little point himself.

It is a wonderful book—a record of surgery on the highest plane, of brilliant work instinct with deep human interest. It is pleasing to know that an English edition will appear in the spring.

HENRY SOUTTAR.

PROGRESS IN ALLERGY

Progress in Allergy, IV. Edited by Paul Kallos. (Pp. 520; illustrated. Swiss francs 68.65.) Basle, New York: S. Karger Ag. 1954.

The arrangement of this fourth volume is similar to that of the previous ones. All articles are in English. Paul Kallos, the editor, gives an introductory survey of the present state of allergy, and his article is followed by eight monographs on aspects of it by authors who have been carrying out research in the actual fields they are reviewing. The first consists of 48 pages on the histology of allergy lesions by M. C. Bohrod; the second, of almost 100 pages by R. L. Mayer, covers group sensitization to compounds of quinone structure. He considers, on experimental evidence, that the allergic manifestations are caused by the metabolic formation of oxidation or reduction products, probably compounds of quinone structure, rather than that the original amines, nitro compounds, azo dyes, sulphonamides, and *p*-aminobenzoic acid derivatives represent direct active antigens.

A short review of delayed hypersensitivities by S. Raffel is followed by three articles on adrenal hormones. The first is by G. Pincus on the biosynthesis of adrenal steroids, the second by F. L. Engel on the functional relationships of the anterior pituitary and adrenal cortex, and the third by T. F. Dougherty on the mechanism of action of the adrenocortical hormones in allergy. These are essential articles in a world where these hormones are being experimented with in allergic and other diseases with varying degrees of success, but they demonstrate that we are far from being certain of the mechanisms involved. The next article is by Noelpp-Eschenhagen and Noelpp, and covers in detail their own experimental work on guinea-pig asthma and a discussion of their working hypothesis of the mechanics of normal and asthmatic breathing. The final review is by K. Maunsell on respiratory allergy to fungus spores: there is nothing really new in this contribution, but it is a very sound and practical one and should be read by all clinical allergists.

To sum up, this volume continues the high standard and excellence of the previous three volumes. The articles are authoritative and all contain first-rate bibliographies. The whole format and printing of the book are excellent, and it can be warmly welcomed as an essential part of the library of all interested in allergic diseases.

C. J. C. BRITTON.

AMOEBIASIS

Amoebiasis. By Ernest Carroll Faust, A.B., M.A., Ph.D. (Pp. 154+xi; illustrated. 34s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications Ltd. Toronto: The Ryerson Press. 1954.

In this small monograph of the American Lecture Series in Internal Medicine the well-known American parasitologist, Dr. Faust, who is a recognized authority on amoebiasis, provides an up-to-date synopsis covering the clinical and public-health aspects of this disease. The six chapters into which the book is divided deal respectively with the aetiology, epidemiology, pathology, clinical manifestations, diagnosis and treatment, and control of amoebic infections. The account is clear and precise throughout, and will serve the needs of the practising physician by providing a concise guide to the recognition and management of amoebiasis. However, the didactic approach to the subject has its drawbacks, for the author's insistence that *Entamoeba histolytica* is invariably virulent leads him to dismiss the existence of healthy carriers, with the result that in dealing with the geographical distribution of amoebiasis no distinction is made between the incidence of symptomless infections—which are in the majority everywhere—and that of clinical cases. The reader of this book will therefore form an exaggerated picture of the incidence of amoebiasis as a disease, especially in temperate regions, and particularly when he is told that "amoebiasis in the United States is as serious a public health liability as tuberculosis." Nowadays this view will hardly be acceptable in Europe, where the host-parasite relations and epidemiology of amoebic infections are beginning to be seen in correct perspective.

For the parasitological diagnosis of amoebiasis reliance is placed on the somewhat imperfect figures of *E. histolytica*, the morphology of which is not adequately described in the text. The photographs illustrating the pathological changes are, however, good. The bibliography occupies 17 pages, and there are author and subject indexes.

C. A. HOARE.

CONNECTIVE TISSUE

Connective Tissue in Health and Disease. Edited by G. Asboe-Hansen, M.D. (Pp. 321; illustrated. \$7.50; Danish kroner 50.) Copenhagen: Ejnar Munksgaard. 1954.

This is a useful symposium dealing with a rapidly developing field. There are 23 authors (14 from the United States, 5 from Denmark, and one each from Italy, Sweden, Finland, and Britain), most of whom have made major contributions to the subject. The scope and quality can best be indicated by listing the various contributions.

After an introduction by the editor, the first half, which is the better one, starts with a review of the morphological aspects by Robb Smith. He is followed by McManus on histochemistry, Meyer on mucopolysaccharides, Dorfman on the metabolism of mucopolysaccharides and hyaluronidase inhibitors, Kulonen on collagen, Bostrom on sulphate exchange, Duran Reynals on the spreading reaction, and Iversen on hormones; other articles follow on ageing (Banfield), wound healing (Howes), pathology (Altschuler and Angevine), infection (Sprunt and Cavallero), arteriosclerosis (Rinehart), and cancer (Simpson), and on cortisone, ascorbic acid, and amyloid (Teitlum).

The book ends with sections on miscellaneous clinical aspects, of which the best is Klemperer's masterly review and defence of the unfortunate term "collagen disease." Ragan's section on the clinical, aetiological, and therapeutic aspects of arthritis and the rheumatic diseases is a triumph of compression. Other sections, on traumatic, ophthalmological, and dermatological conditions, show considerable overlap: it is difficult to understand for what reader such potted descriptions of well-known diseases could be intended. The earlier chapters of this book will, however, be found invaluable to workers in this and related fields as an up-to-date and authoritative assessment of the present situation.

E. G. L. BYWATERS.

ALLEN AND HANBURY, 1715-1954

Through a City Archway: The Story of Allen and Hanbury, 1715-1954. By Desmond Chapman-Huston and Ernest C. Cripps. (Pp. 326+xv; illustrated. 25s.) London: John Murray. 1954.

Many generations of doctors have known and had dealings with the well-known firm of Allen and Hanbury, but probably very few know much of its history. It was founded in 1715 by Silvanus Bevan in an old house in Plough Court, off Lombard Street. Bevan was a Quaker and possessed the reliability and shrewd business acumen which so many of that persuasion have. From small beginnings the firm soon grew to be an important pharmaceutical centre, and had many dealings with doctors in North America both before and after the War of Independence.

William Allen joined the firm in 1792, and within a few years became the controlling personality of the growing business. Allen was a most extraordinary person. He was a devout Quaker with strong humanitarian sympathies. He was the friend of Thomas Clarkson, William Wilberforce, Robert Owen, and many more philanthropists and educational reformers; he lectured at the Royal Institution and at Guy's Hospital on natural philosophy; he was a master of many languages, studied botany and astronomy, and was elected a Fellow of the Royal Society; yet he managed to travel widely while keeping a superintending eye on the affairs of the firm. He was on friendly terms with the Czar of Russia and many crowned heads of Europe, and with the Royal Family in England. He took the lead in many philanthropic enterprises and gave generously to various charities. Yet we could not find in this account how such a comparatively small enterprise could provide him with the wherewithal to do all these things. He certainly must have been a good business man. Allen's second wife was a Hanbury, and after his death the firm was for many years controlled by members of that family. This section of the book would have been more easy to follow if a genealogical table had been inserted. Some of the Hanburys, particularly Daniel (1825-75), were very learned scientists.

The final section of the book gives an account of the modern expansion of the business and relates graphically how the Bethnal Green factory was destroyed by bombs in the second world war. We found the book interesting, but not so easy to read as it would have been if the story had been better knit together. We do not remember ever previously meeting a book with 32 appendices.

ZACHARY COPE.

Dr. F. Kauffmann's book *Enterobacteriaceae* (Copenhagen: Ejnar Munksgaard; 62s.) is still the most complete source of information on laboratory investigations leading to the classification of this family of organisms. Certain changes in classification have been made, notably of two new genera—*Cloaca*, which was known in Britain as *Bacterium cloacae*, and *Hafnia*, which includes many intermediate types of *Escherichia coli* and some paracolons. Generic rank is now given to the *Escherichia* group, which includes *E. coli* and *E. freundii*, to *Klebsiella*, which includes *K. pneumoniae* and *K. rhinoscleromatis*, to *Providencia*, and other well-known groups. The sections on *Salmonella*, *Arizona*, *Shigella*, and *Proteus* include descriptions of new serotypes. Many of the classifications used are not wholly accepted in Britain, but, being based on the work of this well-known author and his colleagues, they are worthy of most careful consideration. The author rather emphasizes the work carried out in Scandinavia. It would have been interesting to have the opinion of Dr. Kauffmann, an acknowledged expert in most branches of this field, on contemporary work carried out in other laboratories.

Treatment with Penicillin and Other Antibiotics. by J. G. BATE, with a foreword by Sir ALEXANDER FLEMING (Faber and Faber. 1954. Pp. 100, 7s. 6d.), is a simple account of chemotherapy intended mainly for nurses. It describes the properties of antibiotics and of some other drugs, including sulphonamides, and their use in the treatment of different forms of disease. In an appendix on precautions against skin reactions is reprinted the memorandum recently issued by the Ministry of Health on how to handle antibiotics without inducing skin sensitivity.

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CHLORPROMAZINE

Chlorpromazine is a substance which is a near relation chemically of promethazine ("phenegan"). It was introduced by Laborit and Huguenard¹ as a drug to prepare patients for operation, being given together with promethazine and pethidine. Chlorpromazine then was found to produce not only a condition practically equivalent to anaesthesia but also a fall in body temperature, and much interest was taken in what was called a state of "artificial hibernation," as being conducive to the avoidance of post-operative shock. Chlorpromazine ("largactil") has also been increasingly used in psychiatry, having a quietening effect on chronically agitated patients.²

The question is, What does chlorpromazine do? Its action in causing a fall of body temperature was said to depend on a block of the autonomic system, and this view has been repeated by various authors, despite the well-established evidence that the main control of body temperature is due to the tonic impulses passing down the voluntary nerves to skeletal muscle. Recently Holzbauer and Vogt³ have shown that one form of sympathetic activity which is originated centrally is not affected by chlorpromazine—namely, that which follows the administration of morphine. When morphine is given to a cat in a dose of 40 mg./kg. Vogt⁴ has shown that the noradrenaline which is present in the tissue of the hypothalamus diminishes in amount, and in addition, as Elliott⁵ found, impulses pass from the centres along the splanchnic nerves, causing a discharge of adrenaline from the adrenal medulla. Holzbauer and Vogt have observed no diminution in the central stimulant action of morphine as a result of the previous administration of chlorpromazine in such a large amount as 25 mg./kg. There was the same fall in hypothalamic noradrenaline and in the adrenaline and noradrenaline in

the adrenal medulla as occurred without chlorpromazine. As a control for this observation the previous injection of "nalorphine" completely inhibited the action of morphine. There are not many ways in which the hypothesis that chlorpromazine causes central autonomic block can be tested, and in one clear case in which the test is possible a negative answer has been given.

The same workers³ have also demolished the suggestion⁶ that chlorpromazine prevents A.C.T.H. being released after the trauma of an operation and so diminishes the effect of stress. As evidence of the release of A.C.T.H. they determined the ascorbic acid content of the adrenals of rats. The "stress" consisted in administering urethane, exposing the viscera, and handling the mesentery. The fall in ascorbic acid in the adrenal glands was the same whether chlorpromazine (10 mg./kg.) was administered or not. Furthermore, they showed not only that chlorpromazine itself caused some release of A.C.T.H. but also that it did not modify the release of A.C.T.H. by adrenaline. The view, therefore, that chlorpromazine causes either a chemical hypophysectomy⁶ or a chemical adrenalectomy⁷ thus falls to the ground.

Dasgupta and Werner⁸ have studied the effect of stimulating areas in the hypothalamus and in the medulla from which a rise of blood pressure can be elicited, and found that the pressor response was abolished by chlorpromazine provided that the observations were made in the decorticated cat. The significance of the observations seems doubtful, since they could not be repeated in cats anaesthetized with chloralose and since the chlorpromazine caused a large fall of blood pressure in the decorticated cat; such a fall might contribute to the disappearance of the pressor response. They also observed that the pressor response to clamping the carotids was abolished by chlorpromazine injected intracisternally in monkeys. This result, however, does not distinguish the action of chlorpromazine from that of a barbiturate, since that has the same effect.

So far as the important central effect of chlorpromazine is concerned, knowledge is still lacking about how it differs in its site of action from other depressant substances. Kopera and Armitage⁹ have demonstrated a peripheral action on skeletal muscle and shown that injection of the drug into the iliac artery leads to a gradual depression of the contraction of the gastrocnemius muscle of the cat in response to stimulation through the nerve or even directly; this depression develops in the course of 30–60 minutes. An action of this kind exerted even to a small extent on all the skeletal muscles would

appear to be the most likely explanation of the temperature-lowering property.

The effects of chlorpromazine are prolonged and for the most part cannot be reversed. This fact and the evidence that some patients become jaundiced owing to a toxic action on the liver^{10–13} seem the strongest reasons for caution in its use.

INTRACRANIAL GLIOMATA

A statistical analysis of the records of 298 patients with intracranial gliomata has recently been published by the Medical Research Council, and it is to the credit of the authors, Drs. John Penman and Marion C. Smith, that there is so much of interest to be found in this report.¹ Of the verified gliomata in this series, 54% were glioblastomata, 33% astrocytomata, 6% medulloblastomata, 5% oligodendrogliomata, and less than 1% ependymomata. The two most common tumours—glioblastoma multiforme and astrocytoma—were twice as common in males as in females, this sex incidence being observed in early adult life and middle age. A graph giving the numbers of cases at different ages shows peaks at 0–9 and again at 45–54 for the whole series. The curve for astrocytoma alone is similar, while those for medulloblastoma and glioblastoma have single peaks only, at the younger and older ages respectively. The left cerebral hemisphere was more often involved than the right, in the proportion 4 to 3. Two hundred and thirty of the tumours were supratentorial and 68 infratentorial—though in the first decade infratentorial tumours are four times as common as supratentorial. When allowance was made for the varying volumes of the cerebral lobes, it was found that the temporal lobe was affected almost two and a half times as often as the occipital, the frontal and parietal lobes occupying an intermediate position of frequency of involvement.

Analysing the symptoms, Penman and Smith found that at the time of admission 80% of the patients had headache, 69% papilloedema, 57% vomiting, and 43% epilepsy. But the frequency of epilepsy as an initial symptom was almost as great as that of headache and greater than that of vomiting: it was the symptom which most often preceded all others, usually in the form of multiple major fits. The value of radiological investigations emerges clearly from the report, abnormality being seen in 60% of the cases: in half, the films showed evidence of raised intracranial pressure. Pineal calcification of such density as to be readily demonstrable on antero-

posterior films was seen in only one-fifth of the adult patients, and it is noteworthy that in a third of this group there was no displacement of the pineal body in spite of the presence of a tumour. In only 4 out of 247 cases subjected to ventriculography was an abnormality not apparent.

The natural history of these tumours in general has been studied by tabulating the period of survival after the onset of illness. Of the 89 patients receiving no treatment, all had died within seven years of the onset of symptoms—over one-half within three months and almost another two-fifths within three years. In the whole series, where the age at onset of symptoms was under 15, as many as 50% of the patients survived for more than three years, whereas where the age at onset was over 15 only 25% survived for this period. The site of the tumour also affected the survival period, which diminished progressively from the cerebellar tumours, associated with the longest survival, through cerebral and brain-stem tumours to those of the corpus callosum, which were associated with the shortest period of survival. Thus the histology of the neoplasm is plainly not the only factor affecting the fate of the patient.

The figures show all too clearly that treatment favourably influenced the disease in but a minority of cases. Thus over half the patients in Penman and Smith's series were excluded from consideration in the section of the report devoted to the results of treatment, since they either received no surgical treatment or did not survive such treatment for a sufficient period to permit irradiation. Of the remaining 131 patients, nothing can be said about the value of radiotherapy alone, since it was used as a sequel to surgery. Total excision of cerebellar astrocytomata is often curative in the patients surviving operation. In tumours of the cerebral hemispheres total excision is, in the opinion of many neurosurgeons, rarely possible: but, if the neoplasm is so placed as to permit it, attempts at radical excision may prolong the patient's life more than conservative surgery would do. Of the 85 patients who were alive a year or more after admission to hospital and who had been treated by surgery or irradiation or both, in only 52 (18%) was the survival considered to be worth while.

The advances in neurosurgery of the last quarter of a century have thus brought little improvement in outlook for the patient with an intracranial glioma. It is not surprising that intrinsic tumours of the brain should carry a grave threat to life and function. Perhaps in time some satisfactory form of therapy will be developed, and until then treatment by surgery and irradiation must continue—not only because of the relief from symptoms and prolongation of life which

¹ Spec. Rep. Ser. med. Res. Coun. (Lond.), No. 284, "Intracranial Gliomata," 1954, H.M.S.O., London. Price 5s. net.

¹ Presse méd., 1951, 59, 1329.
² Elkes, J., and Elkes, C., British Medical Journal, 1954, 2, 560.
³ Brit. J. Pharmacol., 1954, 9, 402.
⁴ J. Physiol. (Lond.), 1954, 123, 451.
⁵ Ibid., 1952, 44, 374.
⁶ Aron, E., Chambon, Y., and Voisin, A., Bull. Acad. nat. Méd. (Paris), 1953, 137, 417.
⁷ Courvoisier, S., Fournel, J., Ducrot, R., Kolsky, M., and Koetschet, P., Arch. int. Pharmacodyn., 1953, 92, 305.
⁸ Brit. J. Pharmacol., 1954, 9, 389.
⁹ Ibid., 1954, 9, 392.
¹⁰ Garmany, G., May, A. R., and Folkson, A., British Medical Journal, 1954, 2, 439.
¹¹ Chesney, W. M., ibid., 1954, 2, 591.
¹² Eagles, J. Bryan, ibid., 1955, 1, 46.
¹³ Zatuchni, J., and Miller, G., New Engl. J. Med., 1954, 251, 1003.

it may provide, but also in order that other less fatal morbid swellings wrongly suspected to be gliomata may be discovered and treated.

ANTICOAGULANTS IN CORONARY DISEASE

In the past ten years anticoagulant therapy in disease of the coronary arteries has become an important feature of cardiological practice. Many physicians have now gained practical experience of it, but there has been much difficulty in determining its true value and indications. Anticoagulant therapy is laborious, uncomfortable, expensive, and potentially dangerous. It is therefore hardly surprising that it is an unpopular form of treatment which would have been abandoned with joy if it had proved of little worth. Indeed, there are some who plead with vigour that there is no justification for its use in any form of coronary arterial disease.¹ Others share the more moderate view of Schnur² that anticoagulants should be used only in severely ill, "poor risk" cases of myocardial infarction. Schnur³ has recently published his views in the form of an interesting catechism, in which he suggests that only about 10% of cases of acute myocardial infarction are likely to benefit from anticoagulant therapy. This is the group of patients who are liable to develop thromboembolic complications, and Schnur appeals for research into the methods by which such patients may be recognized.

A paper from Gilchrist and Tulloch published recently in this *Journal*⁴ gives valuable aid to readers who have been confused by the subject. These authors summarize the pathology of coronary arterial disease, include a reminder of the confusion which arises from slipshod nomenclature, and present a concise account of their experience. They reaffirm their faith in the value of anticoagulant therapy in all cases of acute myocardial infarction, except for patients who suffer from complications such as anaemia, peptic ulcer, and gross hepatic or renal disease. They add to the increasing body of evidence that such treatment reduces both the mortality and the complication rates in the first six weeks after an acute infarction, and they stress the danger of coming to a decision early in the course of treatment that any particular case is a "good risk." On the other hand Russek and Zohman⁵ consider that deterioration of the condition of a good-risk case is relatively uncommon, though they agree that such a deterioration is an indication for the immediate use of anticoagulants. These authors give their criteria for the selection of good-risk cases and record a series of 489 treated without anticoagulants with a mortality rate of 3.1%. They estimate that about 30% of all cases of acute myocardial infarction require anticoagulant therapy and stress its value in the poor-risk case. Hill⁶ expresses a widely held view that it is not justifiable to withhold anticoagulant treatment from any patient with an acute myocardial

infarct unless specific contraindications exist. Indeed, if it is true that anticoagulants are capable of preventing thrombosis in the coronary vessels, there is an excellent argument for their use in the milder case. The less the initial damage, the greater is the scope for the prevention of further infarction. More work is required to determine the effect on prognosis of anticoagulant therapy for about four weeks after an acute myocardial infarction. It might well prove difficult to justify the expense, labour, danger, and discomfort of the treatment if it should be shown that the patients are spared only to fall victim to recurrent infarcts when their treatment is withheld.

Long-term anticoagulant therapy as a preventive measure in patients who have previously had an acute infarct or are suffering from increasing angina raises interesting problems. Its value is not yet established, but there have been some encouraging reports. Nicholson *et al.*⁷ have treated 177 patients with "impending myocardial infarction" or acute coronary insufficiency. Nine (5%) suffered from myocardial infarction while under treatment and 10 out of 27 patients who stopped treatment had an "acute coronary attack" within one month, and 8 of them died.

Gilchrist and Tulloch give an excellent account of the practical difficulties and the dangers of anticoagulant therapy. It is clear that such treatment should never be instituted unless it is possible to control it with daily estimations of the prothrombin activity by a competent technician and daily examination of the patient for signs of haemorrhage, including microscopical haematuria. Opportunities for the use of anticoagulants in general practice are necessarily limited by these inescapable requirements. With the increasing, though still experimental, use of anticoagulants for long-term preventive therapy, many patients will be taking these drugs at home. In such cases it is likely that the doses will be adjusted at the out-patient clinic, but the danger of haemorrhage is always present and the general practitioner may well be consulted in such an emergency. Under these circumstances the administration of 25 to 50 mg. of vitamin K₁ is the most appropriate counter-measure in addition to the necessary local treatment. Finally it is necessary to remember that the use of anticoagulants in no way removes the need for applying all the more established and traditional methods of treatment which have proved of value in the past.

A NEW MYCOBACTERIUM

An interesting story told by F. Linell and Å. Nordén¹ begins with the occurrence of skin lesions on the elbows of children in the town of Örebro, Sweden. Large-scale inspection revealed the existence of 75 children so affected, and a few adults were found with the same condition. The site was always the same, and the lesion began as a papule which slowly enlarged and eventually ulcerated; there was some enlargement of neighbouring lymph nodes. All the patients were swimmers, and, since the histological features of the lesion resembled

those of tuberculosis, it was at first suspected that the water of the swimming-bath had been contaminated from an ulcer produced by B.C.G. vaccination. The swimming-bath was indeed the source, and the site of the lesion was due to scratching of the elbow skin against a rough cement wall when pushing off after holding a rail, but the acid-fast bacillus responsible, which was found in the water itself, was not *Myco. tuberculosis*. Several strains were cultivated both from the bath and from lesions, and their characters, which are fully described, were constant. The organism is strongly acid- and alcohol-fast, and indistinguishable from *Myco. tuberculosis* in morphology. It fails to grow on Löwenstein-Jensen medium at 37° C., a fact which apparently accounts for some delay in isolating it, the temperature for optimum growth being about 31° C.; on the other hand, growth at 37° C. was obtained on glycerol agar. Pathogenicity tests were made in eight species of animal: the organism proved to be almost non-pathogenic to the guinea-pig, which accounted for the failure of diagnostic inoculations with human material made in the early stages of the investigation. The mouse was the most susceptible mammal, and hamsters also developed progressive lesions; chickens were entirely unaffected; in frogs the organism survived and a large inoculum produced lesions; the few tests in tortoises gave results of doubtful significance. It is not clear how far temperature requirements affect pathogenicity for different species; it would be interesting to inoculate reptiles which could be maintained at about the optimum temperature for *in vitro* growth.

Not only did the characters of the organism as determined by the authors appear to indicate that it was a new species, but authorities in other countries to whom cultures were sent verified this. They included A. Q. Wells in Britain and F. Fenner in Australia, who confirmed that it is distinct from *Mycobacterium ulcerans*, another recently described acid-fast bacillus which causes skin lesions. It was accordingly and appropriately named *Mycobacterium balnei*, and the discovery by Zettergren of a second identical epidemic in the town of Västerås, Sweden, provides confirmation that infection by this organism may be acquired in swimming-baths, and thus further justifies the choice of name. The authors have proved the responsibility of the organism for the skin lesions observed by inoculating themselves with living cultures. They have also thoroughly investigated the effect of infection with *Myco. balnei* on sensitivity to tuberculin, and, with assistance from the Ministry of Agriculture Research Laboratories at Weybridge, where a P.P.D. (purified protein derivative) was prepared from their organism and cross-sensitization tests were done in guinea-pigs, have shown that *Myco. balnei* infection produces sensitivity to human tuberculin. Conversely, inoculation with B.C.G. sensitizes to tuberculin from *Myco. balnei*. Whether infection with the latter has any influence on subsequent infection with tubercle bacilli is not yet known. The fact that this trivial lesion produces tuberculin sensitivity is an additional reason for watching for the occurrence of the infection elsewhere. There is no reason for supposing that *Myco. balnei* is confined to Sweden. On the other

hand, it is unlikely to cause trouble in any swimming-bath where the water is chlorinated, since efficient chlorination put a stop to both Swedish epidemics.

VULVAR FLUORESCENCE

The human female does not plainly display by the colour of her pudendal skin the state of her ovarian function as does the female monkey. Under ultraviolet light, however, the vulva exhibits a fluorescence the variations in the colours of which are said to reflect changes in the amounts of ovarian hormones in the blood. Since Margolese¹ reported on vulval fluorescence or luminescence some six years ago, he and several other workers²⁻⁵ have added further comments on its implications in gynaecology. Most recently Morton⁶ has reviewed these earlier reports, and added his own observations based on examinations made over a period of three years. He states that there is general agreement on certain basic findings. There is no fluorescence of the vulva in childhood. About the time of puberty a brown-green background fluorescence appears and continues to be seen after castration and the menopause. During the reproductive phase this brown-green background is replaced to a varying extent and intensity by purple fluorescence. A much darker, but also variable, purple colour is seen during pregnancy, only to fade rapidly within hours or days of delivery. Morton himself found that the administration of oestrogens to women after the menopause was followed by the re-appearance of the purple colour within 48 hours, which faded again after the withdrawal of the hormone. He therefore believes that purple fluorescence is closely associated with oestrogen activity, as originally suggested by Margolese. The latter described a gradual increase in the extent and intensity of the purple fluorescence during the menstrual cycle and a fading away just before menstruation, paralleling the oestrogen levels during the cycle, but Benson³ did not find the variations sufficiently distinct to allow such a precise correlation.

Whereas the significance of purple fluorescence of the vulva seems to be generally agreed, the cause of the appearance of a bright red luminescence, a phenomenon associated with vaginal bleeding, is the subject of argument. Benson believes that this red colour is an extrinsic fluorescence largely due to surface deposition of porphyrins from decomposed red cells, which can be wiped off. Morton, however, supports those who say that there is also a true, intrinsic red fluorescence. Greenblatt⁴ suggests that at present vulval fluorescence has its most useful clinical application in differentiating hormonal from other causes of threatened abortion. He claims that if in threatened abortion the purple colour is replaced by red this is evidence of hormonal deficiency and is an indication for administering large doses of oestrogen and progesterone. He found that where a return to the purple coloration followed this

¹ Evans, W., *Proc. roy. Soc. Med.*, 1954, 47, 318.

² *Circulation (N.Y.)*, 1953, 7, 855.

³ *J. Amer. med. Ass.*, 1954, 158, 1127.

⁴ *British Medical Journal*, 1954, 2, 720.

⁵ *J. Amer. med. Ass.*, 1954, 158, 1130.

⁶ *Practitioner*, 1954, 173, 379.

⁷ *Med. Clin. N. Amer.*, 1954, 38, 399.

¹ *Acta tuberc. scand.*, Suppl. 33, 1954.

¹ *J. clin. Endocr.*, 1948, 8, 603.

² MacDonald, P. A., and Margolese, M. S., *Fertil. and Steril.*, 1950, 1, 26.

³ *Surg. Gynec. Obstet.*, 1951, 92, 14.

⁴ *Fertil. and Steril.*, 1951, 2, 467.

⁵ Benson, R. C., and Chappell, C. C., *Surg. Gynec. Obstet.*, 1952, 95, 677.

⁶ *Amer. J. Obstet. Gynec.*, 1954, 68, 334.

therapy, the pregnancy nearly always continued. However, many would consider this a case of *post hoc*, not *propter hoc*.

It remains to be seen exactly what advantages this phenomenon of vulvar fluorescence will offer the clinician. When account is taken of differences in techniques and variations in the appreciation by human eyes of colour shades and their intensity, the published reports show surprising unanimity. Morton suggests speculatively that the purple colour is due to the specific effect of a metabolite of oestrogen on certain cells or pigments in the vulval skin, and that if this is proved the knowledge so gained might help to throw some light on the mode of action of oestrogens. For the present, however, he wisely concludes that the nature of the phenomenon is still not clear and that the exact site of the fluorescent material still remains to be determined.

MALNUTRITION IN AFRICA

During recent years the group of symptoms best known as "kwashiorkor" has been recognized as one of the most important and widespread diseases of dietary origin throughout the world. Infants or young children are the victims, and the picture includes a selection of abnormalities from a long list. Thus the child fails to thrive and is weak, lethargic, and miserable. The abdomen is usually distended, and the liver enlarged and fatty. Failures in the digestive system, and particularly the pancreas, give rise to frequent, foul-smelling motions. There is invariably hypoproteinaemia and sometimes oedema. The skin may become dry and cracked, and the curly black hair of the negro may lose its normal texture and become grey or reddish. The condition is generally fatal unless careful dietary treatment is given. The fundamental cause, doubtless complicated by various forms of secondary stress, is a severe deficiency of dietary protein. Several official bodies, including the World Health Organization, have concluded that the problem of preventing kwashiorkor has passed beyond the province of the pathologist, and can be solved on a large scale only by experts in sociology and agriculture. Food adequate in protein must be provided after weaning to replace diets containing excessive amounts of cassava, plantains, or other foods which consist mainly of carbohydrates.

Two years ago an inter-African conference on malnutrition in African mothers, infants, and young children was held at the Medical Research Council's field research station at Fajara, Gambia. Professor B. S. Platt was president, and delegates from many nations attended. The proceedings of the numerous sessions, which have recently been published,¹ indicate the broad field which was covered. Thus most of the seventy communications were on kwashiorkor—its clinical features, pathology, biochemistry, and dietetics—while others discussed the related problem of the effects of malnutrition on pregnancy and lactation.

¹ *Malnutrition in African Mothers, Infants and Young Children*, 1954, London, H.M.S.O., 25s.

Reports from the Gambia, Nigeria, the Bechuanaland Protectorate, Basutoland, Uganda, and French West Africa confirmed the scattered incidence of kwashiorkor throughout Africa. H. C. Trowell and A. J. Howe demonstrated examples of the disease, and J. N. P. Davies discussed its pathology. Animal experiments bearing on the problem of dietary liver injury were described by O. Lindan, and a paper by P. R. Payne, B. S. Platt, and D. F. White got down to the practical problem of avoiding "streaking" in the paper electrophoresis of plasma proteins. Perhaps the most hope for conquering the disease, however, was raised by Professor Platt's account of experiments to prevent malnutrition in Gambian villages by improving agricultural methods and by eradicating malaria. At the same time the conference recognized that in spite of preventive measures cases of kwashiorkor would continue to occur. Information on the diagnosis and treatment of the condition should therefore be made widely available.

ACTIVITY IN PROSTATIC CANCER

"Current trends in cancer therapy are such that the early detection of adenocarcinoma of the prostate is receiving renewed interest and attention." Thus Hudson and his colleagues¹ draw attention to the merits of open perineal biopsy in the belief that other diagnostic measures are often ineffectual until the disease has become inoperable. Their observations follow a previous study² aimed at the detection (and treatment) of unsuspected prostatic cancer in the ageing male population. In this, their material was obtained mainly from the Men's Shelter, operated by the New York City Department of Welfare. One hundred cases were selected at random from 1,657 men, from whom cursory histories were taken and on whom rectal palpation of the prostate was performed. None of the patients had sought medical attention spontaneously (nor presumably examination) but each was submitted to full in-patient investigation and open perineal biopsy. Histological evidence of cancer was detected in eighteen, but showed little correspondence with the pre-operative clinical findings. Since all these growths were regarded as within the limits of operability, immediate radical perineal prostatectomy was performed. The authors claim that a wide utilization of open perineal biopsy would increase the number of prostatic carcinomas detected at an operable stage of the disease.

While such investigations might not find favour in Britain, they are directed at what has generally been regarded as a progressive and lethal condition, and consequently any effort to improve the chance of its early detection and extirpation should not be lightly discouraged. It is probable, however, from records of the high post-mortem incidence of occult prostatic cancer that many growths exhibit a low degree of malignancy, and thus the mere histological diagnosis of an unsuspected focus during life may give little indication of

¹ Hudson, P. B., et al., *Surgery*, 1954, 35, 897.

² — et al., *J. Amer. med. Ass.*, 1954, 155, 426.

³ Spence, A. W., *British Medical Journal*, 1954, 1, 1353.

⁴ Roth, R. B., et al., *J. Amer. med. Ass.*, 1954, 155, 302.

its activity. In these circumstances recourse to unrestricted radical surgery in symptom-free cases would seem indicated only if it were established that a majority of tumours pursued a course which was rapidly detrimental to the patient's well-being. No method at present exists for determining the growth potential in such silent tumours, but it is clear from the effect of oestrogen therapy in the manifest disease that activity may often be restrained merely by alteration of the hormone balance. Indeed, the ability to live in symbiosis with cancer may, in the case of the prostate, be largely determined by a natural reduction of the amount or effect of circulating male hormone.

The possibility of such a physiological decline in testicular function has also been considered in a recent contribution to this *Journal* by Spence on the "male climacteric."³ From this it would appear that some of the symptoms of the condition may be explained by lack of the anabolic action of testosterone. On this theme Roth and his colleagues⁴ draw attention to the superfluity of pharmaceutical advertisements advocating hormone preparations in geriatric practice. Since, they point out, histological evidence of prostatic cancer may be found in 20% of all men aged over 50 years of age, the potential risk of administering androgens and thus stimulating a latent growth may be considerable. Despite the prospect of bolstering up a few flagging metabolic processes for their ageing patients they are therefore disinclined to reach for the prescription pad in response to the sweeping claims sometimes made for these preparations.

UNIT NOTATION FOR AGGLUTINATING SERA

The practice of measuring the activity of drugs in terms of units, when either the complex nature of the preparation or lack of knowledge of the active principle make the use of conventional measures impracticable, is to-day accepted without question. Probably the widespread use of antibiotics in the last decade has brought familiarity in the use of this convenient measure. By enabling the same yardstick to be used in different countries the World Health Organization, continuing the work of the League of Nations, performs a valuable service. It makes possible an intelligent comparison of experience gained in different parts of the world—and indeed in different parts within one country—in the use of complex biologically active drugs for therapy and research. Some idea of the work which is continually in progress to set up and maintain the international standard preparations with their defined activities, and of the important part played by the Medical Research Council in this work, is given in a recent number of the *Bulletin of the World Health Organization*.

A new trend in international biological standardization is shown by the establishment of an international standard for anti-*Brucella-abortus* serum, described by Stableforth,¹ and the account by Felix and Bensted² of the proposed international standard for antityphoid sera. International standards for therapeutic sera have a well-established use—in fact, the first international biological standard was that for diphtheria antitoxin,

set up by Ehrlich in 1897 and later taken over by the League of Nations in 1922. These new standard antisera are, however, intended for use in serodiagnostic work, using agglutination techniques. The results obtained in agglutination tests are affected by many variable factors, such as the agglutinating suspension, and the end-point itself is quite arbitrary; so it is not surprising that the comparison of results obtained in different laboratories is difficult. The provision of standard sera of known agglutinin content will provide a means of overcoming some of these difficulties.

The traditional method of measuring agglutinin contents is by "agglutinin titre." This method is criticized independently by Stableforth,¹ Jerne,³ and Miles,⁴ and the advantages to be gained by changing to a system using units are cogently put. A lead in this direction has actually been given by assigning a unitage to the international standard for anti-*Brucella-abortus* serum, so that now the *Brucella abortus* agglutinin contents of sera from man can be reported in international units, and serum levels measured in this way in different laboratories will be directly comparable.

It might be thought that if unknown sera are all compared with the same standard, unit notation is unnecessary, and the present method of agglutinin titre would still be satisfactory. As is pointed out by Miles, however, once comparison with the standard is accepted, agglutinin titres become themselves unit measurements, but very inconvenient ones—inconvenient because they are awkward fractions and because they vary in value with the method of titration. A change to unit notation from agglutinin titres would mean that the results obtained would be more amenable to statistical examination by the biometrician. The advantage of this might appear doubtful to the busy pathologist in routine practice, since few pathologists are biometricians, and statistical examination takes time. But the methods pathologists use are based on those developed in the research field, in which there is every advantage in using measurements whose accuracy and validity can be defined.

The discovery that a well-used procedure for comparing activities is invalid may be disconcerting, but it often points the way to new facts and, of course, to more reliable methods. This is illustrated in the description of the assay of tuberculin in the sensitized guinea-pig by Long, Miles, and Perry.⁵ The old method was based on the "matching" of skin reactions in sensitized animals—which did not lend itself to statistical analysis. The measurement of activity based on the linear relationship between diameter of skin reaction and logarithm of the dose of tuberculin gives a precise assay which can easily be analysed. Experience with this method has shown clearly what was in fact already suspected, that different tuberculoproteins are heterogeneous, so that a comparison of their activities becomes very difficult. This may seem of negative value, but it does at least show when potency estimations are not to be trusted, and consequently the danger of making false conclusions is less.

¹ *Bull. Wild Hlth Org.*, 1954, 10, 927.

² *Ibid.*, 1954, 10, 919.

³ *Ibid.*, 1954, 10, 937.

⁴ *Ibid.*, 1954, 10, 941.

⁵ *Ibid.*, 1954, 10, 989.

EMERGENCIES IN GENERAL PRACTICE

ACUTE LUMBAGO AND SCIATICA

BY

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In revision or refresher courses it is customary to stick stolidly to traditional textbook ideas, but in the case of lumbago or sciatica nothing could be less helpful to the general practitioner than the standard textbooks. In the following account I make no apology for putting forward some decidedly bold and unorthodox statements in the management of an acute case of lumbago or sciatica; only by stimulating some clear thinking on this fascinating subject can theories be put to the test and progress made.

The domestic management of an acute attack of lumbago or sciatica is a confidence trick, and the confident practitioner wins the trick by imparting to the patient the feeling that he is in the hands of someone who understands what is happening inside his spine. If we try to visualize what a patient's mental image of a "slipped disk" must be, it is not very difficult to appreciate his anxiety and lack of faith during the conservative treatment of an intensely painful attack of lumbago. If in imagination a patient thinks his disk is in a state varying in degree from Fig. 1 to Fig. 2, how can he expect aspirin, hot bottles, and bed rest to "put it back again"? This,

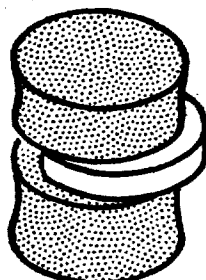


FIG. 1

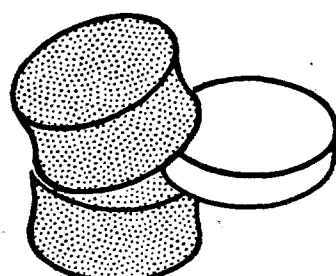


FIG. 2

of course, is the source of the whole trouble, because the true pathology is nothing like what the term "slipped disk" suggests, and it is well to remember that the medical profession never invented this term, which seems to have grown up in the popular press.

Unfortunately the teaching of the average general practitioner is at the moment inadequate to enable him to offer any other mental image to take the place of the "slipped disk." This is where time spent in describing the probable pathology of lumbago and sciatica will provide the practitioner with the ability to handle this type of case by reassurance far more successfully than by any practical hints or tips. The medical profession ought to present a united front on a basic theory and leave the argument of scientific details to their own conclaves. Can one blame the patient who is dissatisfied when diagnosed by different doctors as suffering from fibrositis, lumbago, sacro-iliac strain, lumbosacral strain, fatty herniations, sciatica, and, finally, a "slipped disk"?

It is the purpose of this account to show that in the first three or four weeks of an acute attack of lumbago a consultant can do no better for a patient than can any conscientious general practitioner, for the simple reason

that the only sensible therapeutic measures are aspirin, bed rest, and hot bottles. The trouble starts when someone suggests that the patient might have a "slipped disk." No sooner has the question been put than the patient knows instantly that the practitioner's answers are contradictory and lacking in conviction; a consultant must be sent for immediately.

The Identity of Fibrositis

It is only about ten years since most physicians were quite sceptical of the theory of disk protrusion as a common cause of sciatica, and clung to the belief that sciatica was most probably some form of neuritis or radiculitis. So far as sciatica is concerned, ten years have completely changed this attitude; but there is still fierce and heated argument if anyone suggests that the common condition of acute "fibrositis" or acute "fibromyositis" is produced by a disk lesion. Here is the crux of the matter. If one refuses to believe that acute lumbago—that is, acute "fibromyositis" of the lumbar muscles—is due to a disk lesion, then it is impossible to make sense of the clinical facts and to construct from the observed facts a story which will stand the tests of close questioning by intelligent patients. The layman accustomed to assessing evidence can make a doctor look a very sorry expert when the "slipped disk" is being discussed.

Doubtless it will be said that to demand, in the interests of unity, the acceptance of a dogma that fibrositis is due to a disk lesion is not in the spirit of science. To this I would reply that it is better for the public and more constructive for science to have some sort of working theory, which will be proved or disproved by practice, rather than to drag along in the present unhelpful chaos.

The principal evidence which connects fibrositis (acute lumbago) with a disk lesion is threefold: (1) Acute lumbago is often followed by acute sciatica with signs of compression of a nerve root. At operation a protrusion can then be demonstrated. (2) The fulminating onset of some cases of acute lumbago cannot be explained by an inflammatory theory. Onset "out of the blue," often in healthy young athletes, suggests a mechanical cause like the locking of a knee by a loose cartilage. (3) Repeated examination of muscles by the biopsy of "fibrositic nodules" has failed to reveal any histological abnormality. These so-called "nodules" are almost certainly areas of muscle spasm.

The feature of fibrositis which at first sight appears difficult to explain by disk protrusion is that acute fibrositis often appears spontaneously or follows exposure to wet or cold. Though fibrositis certainly can follow trauma it does not always do so, and even after trauma there is often a latent interval. This difficulty seems less formidable now that there is evidence to show that the nucleus pulposus can swell by the uptake of fluid and that in this process it can generate internal pressures probably high enough to cause pain.

A Theory of Disk Pathology

The following is a reconstruction of the stages of a disk lesion, and in support of it I believe there is more evidence for it than against it. I shall give the description in terms which can be used when talking to an intelligent patient:

(1) The normal disk is a hydraulic cushion consisting of a tough, but flexible, outer casing which is inflated to a considerable tension by the property of imbibing water possessed

by the soft pulpy centre (Fig. 3). A mechanism exists to govern the access of fluid to the chemical substances which form the pulpy centre, and thus the tension inside the disk is automatically adjusted to the load imposed on it by the activities of the subject.

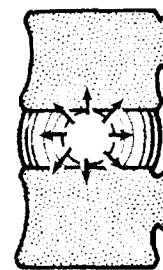
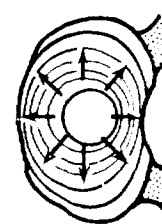


FIG. 3



(2) For reasons as yet unknown the pulpy nucleus can sometimes suddenly acquire access to more fluid than normal, and the rise of internal tension so produced is felt by the patient as a stiffness of the

back. If the condition is acute the back muscles may go into guarding spasm and a moderately severe attack of lumbago or fibrositis is produced.

(3) This episode of raised disk tension can now settle to leave a relatively normal disk. There may be a parallel to this sequence in acute glaucoma in which the raised intra-ocular pressure is easily detected but still unexplained. In other cases it is probable that when the tension episode subsides it leaves behind a molecular change in some of the mucopolysaccharides (chondroitin sulphate), which appears to be the essential water-attracting substance of the nucleus. After each new tension episode one presumes that more and more of this changed substance is left behind, and that this process of denaturing of the nucleus is the same process which occurs slowly and without acute episodes in the normal ageing process of the disk. It must be emphasized that this process, when evenly distributed through the disk, results in what is correctly termed a "degenerated" or "desiccated" disk (as distinct from a "slipped" or "protruded" disk).

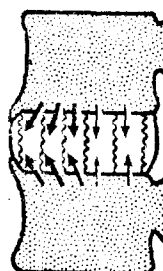
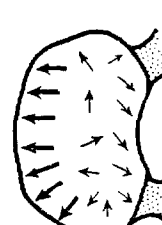


FIG. 4



I prefer to tell patients that the degenerated disk, to keep up the analogy of the hydraulic cushion, is one in which the substance of the disk has "perished" and has simply lost its original flexibility. In the later stages of degeneration the edges of the vertebral bodies above and below the "perished" disk show osteophytic lipping as a result of the localized areas of mechanical trauma to which they are exposed now that the hydraulic mechanism no longer distributes the body load evenly over the end-plates of the bony bodies (Fig. 4). The symptoms produced by this condition are those of chronic backache, not acute fibrositis.

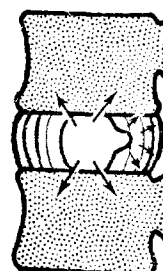
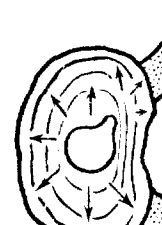


FIG. 5



(4) If in the course of an acute episode of raised internal tension (lumbago) some of the deep fibres of the annulus are ruptured and penetrated by the swollen nucleus, we now have the start of a disk herniation. The annulus is very thick, and it may take several acute pressure episodes before the nucleus works its way through the numerous layers of the annulus till it comes to lie immediately under the surface of the disk

(Fig. 5). This process of moving up to the surface is usually to one side of the midline, and in right-handed people is decidedly more common on the left than on the right. When this happens the pain referred to the muscles acquires a unilateral element, and pain and tenderness may be localized first to the region of the sacro-iliac joint, later to the fold of the buttock, and later still to the back of the thigh. This is a "referred sciatica," and is distinguished from true sciatica by the fact that there is no evidence of root compression and straight-leg raising is not seriously impaired, because there is as yet no external protrusion of the nucleus through the annulus.

(5) These leakages of the nucleus to the surface may terminate in a true disk hernia or protrusion which now for the first time will stretch a nerve root and produce true acute sciatica (Fig. 6). The pain now will pass down below the knee and into the foot, and it will be associated with a marked degree of limitation of straight-leg raising, indicating the direct stretching of the nerve root. There may or may not be signs of impaired nerve conduction.

It is to be noted that in this condition the disk has not "slipped." The disk has swelled to an abnormal volume and the excess has bulged out to form the protrusion. It will now be obvious to the patient why there is no possibility of manipulating the protruded excess back into the interior. It is here that the patient can understand the necessity for removing excessive body weight from the disk and the need to wait till the episode subsides and shrinkage of the nucleus withdraws the protrusion spontaneously. In these cases there will be no narrowing of the disk space in the radiograph.

(6) So far, the process has merely concerned the hydraulic bulging of the swollen disk, but there is almost certainly a second kind of mechanical element present. This is the production of a sequestrum of degenerated nucleus (or even possibly of degenerated annulus). Crudely speaking these sequestra are lumps of coagulated nuclear substance. Localized degeneration can produce a sequestrum lying in a track passing from the centre of the nucleus to the threatened point of penetration of the annulus (Fig. 7). This can actually be seen at necropsy. The sudden movement of such a sequestrum may be the cause of those fulminating attacks of very acute lumbago which come on, without warning, in patients who have been quite normal a few minutes before. In these cases the patient may actually feel or hear a "click" in the back at the moment of onset of the pain. The swollen disk type of lumbago described in (3) is slower in development than the sequestrum type, or, if sudden, the attack is heralded by slight discomfort present some hours or days before the main attack. The sequestrum type of lumbago is the one which has sometimes been relieved by manipulation or which sometimes clears up quite suddenly, and in this the clinical features are very similar to the recurrent locking of a knee by loose meniscus.

(7) This process of moving up to the surface is usually to one side of the midline, and in right-handed people is decidedly more common on the left than on the right. When this happens the pain referred to the muscles acquires a unilateral element, and pain and tenderness may be localized first to the region of the sacro-iliac joint, later to the fold of the buttock, and later still to the back of the thigh. This is a "referred sciatica," and is distinguished from true sciatica by the fact that there is no evidence of root compression and straight-leg raising is not seriously impaired, because there is as yet no external protrusion of the nucleus through the annulus.

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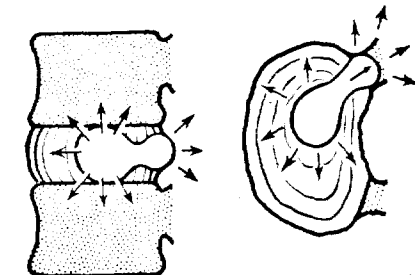


FIG. 6

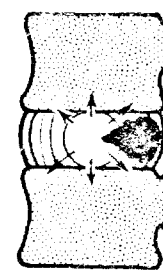
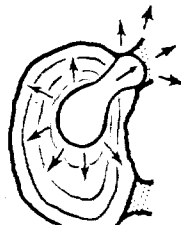
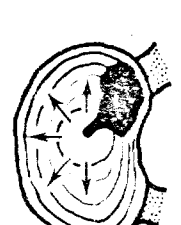


FIG. 7



(7) If the localized disk sequestrum becomes displaced so that it protrudes from the exterior of the disk (Fig. 8), the classical picture of acute sciatica is produced in exactly the same way as in (5), and it can only be distinguished from the

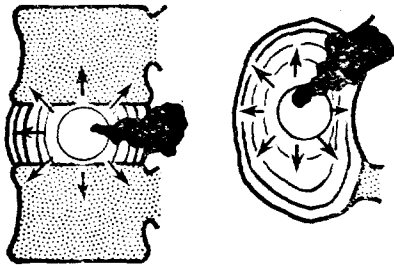


FIG. 8

the internal pressure of the disk. The sequestrum is a tough fibrous wedge which is permanently jammed between the bodies and stretching a root. In this case there may be narrowing of the intervertebral disk space in the radiograph. These are the cases which eventually have to be operated upon and which, incidentally, give the best results, because, if the sequestration of the disk is sufficiently well advanced, the removal of the protrusion leaves behind no more material to give trouble at a later date. When considering operation there is a lot to be said for not operating too early and for leaving the disk till it is fully "ripe" for picking out the sequestrum. In some very severe cases a sequestered disk can be completely extruded to lie free in the spinal canal. Sequestered disk substance can easily be recognized by the naked eye, because it has none of the pasty, semi-translucent quality of a normal disk, but has the opaque-white, shredded appearance of boiled lobster meat.

(8) Finally, to complete this account of the different types of disk disorder the true "acute back strain" must be added. This is frequently encountered in labourers lifting weights when a sudden additional load is thrown on them, as when a mate drops his end of the load. Immediate intense pain and rigidity is experienced, and severe symptoms may persist for at least three weeks before they start to clear up. There seems every reason to believe that these are ruptures of the deep layers of the annulus without actual protrusion of the nucleus. The subsequent course is indistinguishable from that of any severe fulminating lumbago.

Treatment

From these considerations of the probable pathology, certain points emerge in the handling of acute cases of lumbago or sciatica which need stating with considerable emphasis.

It is not well enough realized that the substance of the intervertebral disk is a unique tissue and that there is no reason to believe that its swelling, shrinkage, degeneration, and rupture are governed by the ordinary processes of inflammation and repair. It is a totally avascular substance, and, like the meniscus of the knee-joint, once ruptured it is probably incapable of repair. Though we customarily prescribe rest, and often fixation (by analogy with ordinary processes of inflammation), there is no proof that this shortens the period of three or four weeks which is often needed before symptoms of an acute disk episode subside. I have never been convinced that a patient who stays in bed any longer than he is forced to by the mere intensity of the pain thereby shortens the total duration of the attack. Indeed, there is evidence to suggest that movement is favoured by nature, because many patients in very severe pain cannot tolerate immobilization and prefer to be constantly changing their position, never remaining quite still for more than a few minutes at a time. Once the acute episode has truly started to regress (that is, after three weeks) it is not likely that activity will bring it back again; in this respect it is quite unlike ordinary inflammation.

Cases for Surgery or Special Treatment

The acute tension episodes, no matter how painful, or whether associated with sciatica and neurological signs, in

the majority of cases will settle merely by the passage of two, three, or four weeks. The commonest error is to underestimate the duration of acute pain—far more often than is realized an acute attack will persist for over three weeks. During this time all that can be done is to sedate, apply heat, and recommend rest.

On being called to the initial violent attack of pain an immediate hypodermic injection of morphine, $\frac{1}{4}$ gr. (16 mg.), will often be necessary. Thereafter this drug should not be needed more than once or twice and should then be reserved for the night, in order to procure sleep. It is at night that the pain, which may be tolerable during the day, seems to exhaust the patient and cause panic. Pethidine in 50-mg. tablets is useful after the first two or three nights. During the daytime two codeine compound tablets (N.F.) every two hours are usually adequate if combined with heat. Heat is best applied by relays of hot-water bottles to the affected buttock and back of thigh. If there is a localized area of extreme tenderness in the loin or buttock, it is often tempting to inject a local analgesic (20–50 ml. of 1% procaine hydrochloride), especially as the patient expects the good physician "to do something." Some transient relief sometimes follows this procedure, but, as it cannot shorten the attack, it is doubtful whether it is worth the trouble, except on psychological grounds.

If, after three to four weeks, pain and disability are still persisting the possibility becomes a probability that a solid sequestrum has been displaced and that the patient may eventually become a candidate for surgery. The initial intensity of the pain is no measure of the need for surgery; and in any case, speaking generally, in a first or second attack one would never recommend surgery until at least three months of disability had been present. In hospital the best results of disk surgery are produced by a long waiting-list. During the subacute phase, after the initial three to four weeks, a plaster jacket is perhaps the best method of encouraging a certain amount of activity while watching the progress with a view to surgery at a later date, but there is not much point in applying plaster before the expiration of the first three or four weeks. In the early acute phase bed rest, taking the load of body weight off the disk, is infinitely better than to try to fix the spine and at the same time keep the body weight on the disk.

Prophylaxis

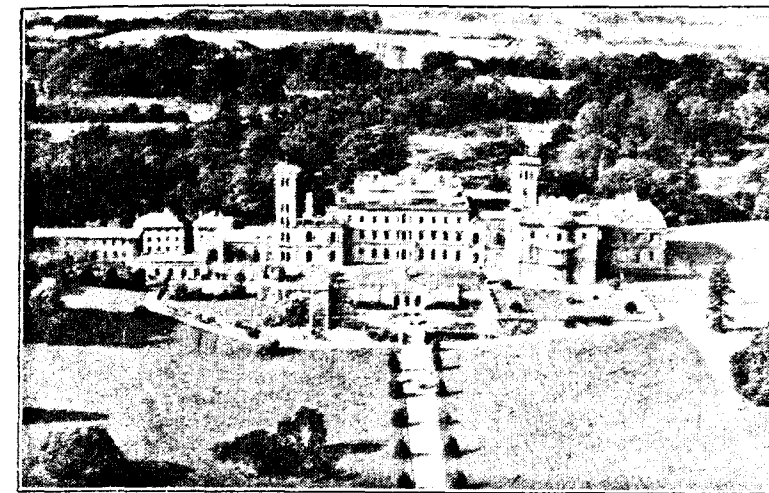
I will take the risk of saying quite categorically that there is no evidence to suggest that an attack of lumbago which has been "untreated" or "neglected" in its early stages could have been prevented from later passing into a full disk protrusion by "treatment." It is the fear of being responsible for this which causes many practitioners unnecessary worry and imposes such a strain and expense on the Health Service. With the obvious exception of attempting to lift heavy weights or to work too early in a fully bent position, I believe this opinion should be firmly and widely voiced in the popular press.

Conclusion

The importance of a cheerful and even a light-hearted approach by the physician cannot be too strongly emphasized. It is much healthier for the patient's attitude to future recurrences of back trouble, which in some measure is almost certain to occur from time to time, to try to regard lumbago as the sort of music-hall joke it used to be ten or twenty years ago. This does not mean that the practitioner need be insensitive and heartless, but that well-meaning but over-conscientious worry about "slipped disks" does not help the patient in the early stages of an acute attack.

I am indebted to the Department of Medical Illustration Manchester Royal Infirmary, for the illustrations.

Next article on Emergencies in General Practice.—"Sudden Occlusion of a Major Peripheral Artery," by Mr. C. G. Rob.



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OSBORNE HOUSE

The Jubilee of King Edward VII Convalescent Home for Officers at Osborne House, in the Isle of Wight, was celebrated this year, and it is appropriate to review the 50 years which have passed since its inauguration in 1904, and to draw attention to the facilities for convalescence which Osborne affords.

King Edward VII's gift of Osborne House to the nation was made known at his Coronation, and the *British Medical Journal* for January 30, 1904, contained an account of the opening of the convalescent home, when accommodation for 50 officers from the Royal Navy and the Army was made available. In course of time the scope was extended, and members of the Colonial Service, and then officers of the Royal Air Force and members of the Civil Service and Foreign Office, were made eligible, so that the convalescent home now serves a large group of the servants of the Crown. It may be helpful, therefore, for doctors to know the principal classes who are now eligible for admission.

Men.—(a) Serving and retired regular officers of the Royal Navy, Army, and Royal Air Force, and officers of the Commonwealth Forces serving in the United Kingdom. (b) Serving officers of the R.N.V.R., Territorial Army, and R.A.F.V.R. (c) Ex-officers—that is, officers who have ever held a temporary commission in the Forces. (d) Established and permanent unestablished members of the Civil Service. (e) Serving members of the Foreign Office and the Colonial Service.

Women.—Serving regular women officers of the Forces and women members of the Civil Service and Foreign Service.

Attention is drawn to paragraph (c) above, for it may not be generally known that any male officer who has held a commission at any time in the Forces is eligible for admission. For serving officers and those recommended by the Ministry of Pensions there is no charge; for others it is 10s. a day.

The staff comprises a nursing staff, a remedial gymnast, an occupational therapist, and a physiotherapist. The emphasis is on rehabilitation, and there is a hot pool for the treatment of rheumatic diseases, fractures, and poliomyelitis. Cases strictly confined to bed are not suitable, and no cases of incurable illness, mental illness, or tuberculosis are accepted. Convalescents are accepted in the early stage of convalescence, but must be capable of dressing and looking after themselves. Simple surgical dressings can be carried out and certain dietetic treatment arranged. The average stay is for three weeks.

A staff of London consultants visit Osborne each month to advise the House Governor, who is also the medical

superintendent. For officers serving with the Forces contact is maintained with the Naval, Military, and Air Force hospitals, and visits are paid regularly by Service consultants of the three Services.

Osborne House, as Queen Victoria's favourite residence, has a strong historical appeal, and the house and grounds are maintained as a memorial to her. The views from the house over the Solent are superb, and the setting, with its terraces and fountains, its fine trees of many varieties, and its woods and lawns, makes the convalescent home an ideal one for a quiet and peaceful convalescence. The public are admitted to the State apartments during the summer months, and in 1955 the private apartments are also to be thrown open. These apartments show in a unique setting the furnishings and bric-à-brac of the Victorian age.

There are grounds of up to 400 acres, with a private golf course and a bathing-beach; and facilities are provided for tennis, croquet, sailing, and boating. At a hostel in the grounds, about half a mile from Osborne, wives and relatives can be accommodated while officers are in residence. During the past 50 years some 18,000 convalescents have enjoyed the beautiful surroundings of the home, the excellent facilities of which should be widely known. Requests for admission should be made to the House Governor and Medical Superintendent, Osborne House, East Cowes, Isle of Wight.

NEIL CANTLIE, Lieut.-General,
House Governor.

Reports of Societies

LOCAL MEDICAL SOCIETIES

Manchester Medical Society

While showing a film on "Foot Faults related to Form and Function" to the Section of General Practice on December 20, Mr. W. SAYLE-CREER, F.R.C.S., said that they were all conscious of the muscle control of the foot from back to front and the reason why there was stability in that axis, but the lateral stability of the foot was not so well appreciated. It depended on the width and integrity of the fore-foot and was impaired by a narrow foot or incompetence of the first metatarsal segment. A strong foot could be likened to a pair of roller skates calling for minimal muscular control; a defective foot resembled an ice skate and required maximal muscular control to stop inversion or eversion. It was this overwork and consequent early fatigue of the muscles that were responsible for the symptoms of aching and tiredness.

London County Medical Society

On November 16 the society met at the Queen Victoria Hospital, East Grinstead, where Sir ARCHIBALD MCINDOE showed members round the plastic unit.

Sir Archibald and his assistants demonstrated various types of plastic repair, including those of hypospadias, cleft palate, and Dupuytren's contracture, and corneal grafting. These were carried out simultaneously in a theatre suite where the activities of all four theatres could be viewed through large glass windows from a central corridor; galleries inside the theatres also allowed a perfect view from above. Sir Archibald pointed out that the biggest bugbear of the plastic surgeon was not sepsis but the formation of a haematoma; this could completely nullify the result of his work. In that connexion modern hypotensive drugs were invaluable in securing a comparatively bloodless field.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Influenza

SIR.—Your leading article (*Journal*, January 22, p. 211) calls for comment because of its confusion between epidemiological and clinical phenomena. It is admittedly true that influenza B does not appear to cause the mortality and disruption of life occasioned by influenza A. Indeed, its periods of prevalence appear to be characterized by a succession of localized outbreaks rather than a tendency to sweep across the whole country as with influenza A. But does influenza B really cause a "less severe form of illness" as stated in your leader and as is often repeated in the newspapers? Medical officers who may have experienced recent influenza B outbreaks in school-children, the parents of children affected, and even those concerned with the occasional adult with the disease may well be inclined to question the statement.

There are, in fact, few clinical points of difference between attacks of influenza A and B, and the gravest form of illness due to synchronous virus and staphylococcal tracheo-bronchitis occurs with either virus. It might also be said that influenza A is clinically milder than influenza B because of the frequent febricula of one- and two-day fevers and of subclinical attacks with virus A. As, however, the clinical spectrum of illness either in influenza A or B is extremely wide it is fruitless to attempt to draw comparisons between the two.

In view of the frequent long lapses of six or more years between influenza B epidemics, it would indeed be surprising if the infection when it did occur was characterized by its mildness. Certainly the outbreaks in schools are often as explosive as any epidemics can be. It seems more reasonable to attribute our rather contemptuous attitude towards this infection to its lesser tendency to involve the adult and to spread rapidly. Perhaps the immunity engendered by this virus is in fact more durable than that following influenza A, or is the virus less cunningly mutable and thus more readily defeated?—I am, etc.,

Sheffield, 1.

C. H. STUART-HARRIS.

Low Backache

SIR.—It is regrettable that Dr. James Cyriax (*Journal*, January 15, p. 140) has taken the occasion of a negative answer to a silly question at a meeting of the British Orthopaedic Association to put forward again his supposition of posterior disk protrusion as "the common cause" of local and radiating pain in the neck, back, and limbs, his panacea for relief, and his suggestion that the application of the panacea should be entrusted to physiotherapists. Dr. Cyriax believes that relief of such pain is simple, the supposed protrusion of the disk being reduced by manipulation or stretching of the spine. That protrusion of a disk is a cause of local and radiating pain of spinal origin is certain. What is far from certain is that it is the common cause for such symptoms and that, when it is, manipulation and/or stretching by traction are safe and lastingly effective ways of treatment.

It may be noted that recognition of the importance of disk lesions in spinal pathology and symptomatology does not date, as Dr. Cyriax implies, from the paper by Mixter and Barr in 1934.¹ As those authors themselves acknowledge, others in Europe and U.S.A. had published articles on the subject in previous years. A monograph by Mauric in 1933² gave a full account of the large amount of knowledge accumulated by that date, including details of operations for removal of posterior disk protrusions by

Alajouanine and Petit-Datallis from 1928. It is appropriate at this time to record that it was the late Sir Arthur Keith who was the first in this country to realize the importance of the disks. It was at his suggestion that in 1926, with a B.M.A. research grant, I made a study of the disks, published in 1931.³ Later in the same year was published the Medical Research Council report by Beadle,⁴ making available in English the results of Schmorl's great post-mortem study of spines, begun in 1925, upon which our knowledge of this subject is mainly based.

It is a pity to spoil the case of a cause of symptoms by over-emphasis of its importance or of a method of treatment by claiming too much for it. To infer without proof either of their presence or disappearance that posterior disk protrusions are common at all levels of the spine, and that they can be reduced by manipulation or traction, is dangerous and savours of the practice of the unqualified practitioners of whose existence Dr. Cyriax warns us. A disk rupture can be determined with certainty by myelography or at operation; otherwise it can only be supposed to exist. Anyone who has seen this lesion at operation or necropsy will doubt whether it can be reduced, except perhaps temporarily, by manipulation or traction. Indeed, these procedures have been known to aggravate the symptoms; and there must be some danger of traction actually causing rupture of a disk, at any rate in persons over 40 years of age, in whom some kind of degeneration of the disks is usual. In Schmorl's material posterior disk protrusions were found in only a small percentage of spines, the common lesions being protrusion into the vertebral bodies and degenerative states, which indeed appear from radiographic and clinical observations to be by far the most common lesions of the disks from which symptoms may arise.

The old rule that accurate diagnosis precedes treatment should prevail with pain in the neck and back, as with other symptoms. Incomplete as our knowledge of the origin of such pain is, there should be hesitation in accepting a general cause or method of treatment or of delegating treatment to ancillaries. Nor should there be anxiety that unqualified persons practise in this field. Despite the limitations of facilities, over which they have little or no control, in the National Health Service, orthopaedic surgeons, in association with other members of the hospital staffs and the patients' doctors, are indeed coping with these cases and on the sensible lines of assessment for diagnosis of all factors, physical and psychological, and of treatment by the methods, according to these factors, of reassurance, adjustment of activities, physiotherapy, splintage or mobilization by manipulation, and occasionally by operation. Further aggrandizement of departments of physical medicine would only aggravate the problem at much increased cost to the hospitals.—I am, etc.,

Bournemouth.

N. ROSS SMITH.

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- ¹ *New Engl. J. Med.*, 1934, 211, 210.
- ² *Le Disque Intervertebral*, 1933, Masson et Cie, Paris.
- ³ *Brit. J. Surg.*, 1931, 18, 358.
- ⁴ *Spec. Rep. Ser. med. Res. Coun. (Lond.)*, No. 161, 1931.

SIR.—Dr. L. S. Calvert suggests in his letter (*Journal*, December 18, 1954, p. 1488) there are few cases of backache that cannot be cured by manipulation, and pleads for the establishment of more departments of physical medicine to treat such cases. As a gynaecologist, I have been studying for many years the problem of low backache in women, and the result of these studies is now in process of publication. Admitting that manipulation can help in many cases I do not agree that it can cure the majority of these. About 70% of all cases of low backache in women are either postural or gynaecological, or a combination of both. Treatment consists in first removing the cause, and then reassuring the patient. Instead of increasing the number of departments of physical medicine, more attention should be given to the prevention of backache.

In a memorandum in the *Journal* (January 2, 1954, p. 28) I suggested measures to prevent post-operative backache. In addition to the above, I would like to draw attention to a further group which can be prevented—namely, that of backache in connexion with childbirth. Some women date their backache to their first confinement. During the next

pregnancy the pains are usually absent, but often reappear after the next confinement. Recent research has shown that under hormonal influence the pelvic joints become movable during pregnancy and stretched during labour, which is a natural process to facilitate labour. These pelvic changes usually disappear after delivery, but in some cases a residual instability persists. If a woman gets up too early after a confinement and has to do her usual housework, these joints have no chance to consolidate, and lead to postural changes and consequent backache.

I have designed a simple girdle (made for me by F. C. Gould, 12, Wimpole Street, London, W.1) to keep these joints firmly together. This girdle consists of a band about 3 in. (7.6 cm.) wide with a small pad over the symphysis pubis, and another over the lower part of the sacrum. The girdle keeps the pelvic bones firmly together, and should be worn from the first day of getting out of bed for four to six weeks. All patients using this girdle like wearing it and appear to have no backache after the confinement.—I am, etc.,

London, W.1.

E. SCHLEYER-SAUNDERS.

SIR.—It was of interest to read the views of Dr. James Cyriax (*Journal*, January 15, p. 140) and Mr. John Charnley (p. 163) on certain aspects of back pain. On the one hand, an orthopaedic surgeon makes a plea for the accurate diagnosis of back pain and the application of rational treatment. He stresses the fact that this is only possible in a small proportion of the total number of cases and suggests further research by all concerned to shed light on the subject. On the other hand, a physical medicine specialist claims to relieve a large proportion of cases of "lumbago and fibrositis" by manipulation, the rationale for his treatment being that a displaced disk is responsible for the painful condition and that it is reduced by the manipulator's efforts. Where does the truth lie? Many orthopaedic surgeons, I think, feel that Dr. Cyriax is rather optimistic in his claims. While it is true to say that some patients suffering from back pain are relieved by manipulation, a great many are not, and indeed there are cases where manipulation can be positively dangerous, especially in the cervical region.

All concerned, however, must realize how inconclusive the administration of physiotherapy can be to patients suffering from back pain. In many cases it is simply a means of getting rid of a troublesome and sometimes an undiagnosed patient. During the recent wintry spell in the north-east of England out-patients could be seen passing through the portals of the physiotherapy department from the cold outer atmosphere. They were chilled and shivering. Half an hour later they emerged partially thawed, and prepared to face the elements on their homeward journey. How much good their treatment did can be well imagined.—I am, etc.,

Newcastle-upon-Tyne, 2.

ALAN E. BREMNER.

Pancreatitis following Pregnancy

SIR.—I have been interested in these two conditions for some time. In his interesting discussion on the association between pancreatitis and pregnancy (*Journal*, January 15, p. 124) Dr. R. A. Joske attempted to explain the aetiology of the pancreatitis in terms of an exacerbation of an underlying chronic relapsing pancreatitis. This possibility cannot be ruled out, but its importance and, indeed, its probability can only be evaluated in light of the following observations which I have made (in over 90 estimations of both amylase and lipase in 50 cases) in the course of the past year. I was stimulated to this by the observation in a jaundiced pregnant woman of an almost complete absence of serum amylase and lipase. This observation was confirmed in that patient, who, incidentally, was not suffering from obstructive jaundice apparently but from infective hepatitis. From this isolated observation we were led to the study of the levels of serum amylase and lipase in pregnancy, and we confirmed on many occasions that these

levels (especially of serum amylase) were often extremely low. Figures of below 15 units were quite frequent, the mean normal being 100 units. However, these low figures do not occur all through pregnancy but are most frequent between the 8th and 16th week. Apparently, for we have only limited observations on this point, they have fallen from the mean normal range at the beginning of pregnancy but they rise steadily in the later months, reaching the normal range at full term. On occasions figures quite definitely above the normal have been reached at term and in the puerperium, though no patient exhibited clinical evidence of pancreatitis. The curve of serum activity might be described as eccentrically concave, the point of maximal depression being early and that of maximal rise being late. The patients studied were attending the antenatal clinics of two of the Dublin maternity hospitals. Duodenal intubation was considered but decided against owing to the danger of affecting the pregnancy.

How may these observations be related to the paper of Dr. Joske? Pancreatitis following pregnancy might be due to an exaggeration of the physiological rebound of pancreatic enzyme rather than to a preceding pathological inflammation of the gland. Such a deduction assumes that the serum amylase and lipase are altogether of pancreatic origin, and that their level is an index of the activity of the gland. The former deduction is hardly correct, but the second is a moderately fair deduction, though by no means entirely true. It would hardly be pushing the argument too far, however, if we held that a steady rise in the level of serum amylase and lipase to above the normal range could be mentioned. When we sought for previous observations on the pancreas in pregnancy we found no relevant information on the histology, physiology, and biochemistry of the pancreas of the pregnant animal. The relationship also of pancreatic insufficiency (or physiological hypofunction) to a fatty liver in pregnancy is worthy of consideration. Finally, in association with Dr. A. P. Barry, master of the National Maternity Hospital, we have had hopeful results from pancreatic replacement therapy in the dyspepsias of early pregnancy. The observations referred to in the first paragraph are in course of preparation for publication. I wish to acknowledge receipt of grant for laboratory expenses from the Medical Research Council of Ireland.—I am, etc.,

Dublin.

OLIVER FITZGERALD.

SIR.—I was much interested in Dr. R. A. Joske's very complete article (*Journal*, January 15, p. 124), where he discusses six cases of post-partum pancreatitis in young women. In his summary he states that the aetiology of the pancreatitis is considered to be related to the preceding pregnancy, although the mechanism of this is unknown. In spite of the fact that he agrees with Hughes and Kernutt¹ that in his experience the relationship of biliary reflux to pancreatitis in man is thought to be slight, I would suggest that there is a considerable case for suggesting that the pancreatitis was in the main due to a rise in the abdominal pressure. I have had two cases of pancreatitis, one with gall-stones and one without, where the only factor in common was that the patients suffered badly from hay-fever and that they dreaded the incessant attacks of sneezing, as it brought on the epigastric pain.

I myself experienced nine attacks of pancreatitis. In my first operation the head of the pancreas was found to be stony hard, blocking the common duct. Six large stones were found in the gall-bladder, which was anastomosed to the stomach. A year later, because I was still having the severe pain with vomiting and slight jaundice, the surgeon operated again. He opened and cleaned the common bile duct, put a probe down through the ampulla, and inserted a drainage tube. This tube remained *in situ* for 16 weeks. I have remained well since and managed to play 52 rounds of golf last year. In the *British Medical Journal* of December 5, 1953, there was an article on pancreatitis² where the authors stated categorically: "It is our opinion that the findings of biliary calculi are coincidental, and that the

pathological changes in the gland can be explained wholly in terms of a vascular catastrophe." This has not been my personal experience.

In an article in the *British Medical Journal* of December 19, 1953, the authors¹ classified their cases of pancreatitis into three groups: (1) associated with gall-stones; (2) associated with alcoholism; and (3) due to primary infection. I would suggest that it might be better (if we must have a classification for pancreatitis) to make it as follows: (1) due to a rise in abdominal pressure from whatever cause—gall-stones, undue prolongation of the second stage in labour, continual sneezing, continual hiccups, continual coughing; (2) primary infection in the pancreas; and (3) mechanical blockage of pancreatic duct by cysts or tumour. I do not think alcoholism is a primary cause of pancreatitis. It may be that the chronic alcoholic may hiccup his merry way into a pancreatic attack, by fixing his diaphragm and sending his bile juice up the pancreatic duct, but the pain from the resultant explosion of the pancreatic and bile juices is such that he would forswear alcohol for ever and a day.—I am, etc.,

Glasgow, C.3.

A. C. GORDON ROSS.

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- ² Davies, Russell M., et al. (1953) *Ibid.*, 2, 1251.
- ³ Saint, E. G., and Weiden, S. (1953). *Ibid.*, 2, 1335.

SIR,—I was surprised that, in his discussion of post-partum pancreatitis, Dr. R. A. Joske (*Journal*, January 15, p. 124) did not mention the possibility that spasm of the sphincter of Oddi might play some part in the aetiology of this condition. Lagerlof¹ showed that such functional obstruction of the duct of Wirsung can lead to pancreatitis. It is noteworthy that four of Dr. Joske's cases showed evidence of biliary stasis which might also, of course, have followed spasm of the sphincter of Oddi.

The problem remains as to what causes the spasm in these cases. Many substances have been used to produce spasm experimentally. These include morphine,² which is not indicated in patients with pancreatitis (it does not seem to have harmed Joske's fifth case, however). Perhaps one could investigate those biochemical changes during the puerperium which might cause spasm of the sphincter of Oddi. Meanwhile, anti-spasmodic treatment, such as with atropine as in Joske's third case, or with banthine as suggested by Shingleton and Anlyan,³ seems to be indicated if this functional mechanism is of any importance in the aetiology of pancreatitis.—I am, etc.,

Oxford

A. H. W. NIAS.

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- ¹ *Acta med. scand.*, 1945, 120, 407.
- ² *J. Amer. med. Ass.*, 1951, 147, 1655.

Coarctation of the Aorta and Pregnancy

SIR,—The request by Dr. Leonard Rosenthal (*Journal*, January 1, p. 16) for further cases of coarctation of the aorta associated with pregnancy prompts the recording of the following particularly interesting one. The patient has been attending out-patients for the past 12 years, during which time she has had eight uneventful deliveries and three miscarriages.

The patient, now aged 32, was first seen 12 years ago, and was found to have a blood pressure of 185/105, so she was admitted and induced at 36 weeks. Prior to this she had had "toxaemia" in association with a breech presentation, but, despite this unfavourable combination in a primigravida (as she was then), the child had survived. Subsequent pregnancies continued to be characterized by the presence of a hypertension which ranged between 150 and 170 systolic and 90 and 110 diastolic, yet did not worsen at any stage and was never associated with oedema or albuminuria. Blood pressure readings taken on a few occasions between pregnancies were at the same level. After her last delivery (November, 1954) the medical condition was reassessed, and it was found that, although the blood pressure readings in the arms were equal, no pulses were palpable in the legs even though she is a thin woman. In addition, while she was relaxed during an anaesthetic the abdominal aorta was not palpable. The left ventricle was not enlarged clinically or radiologically. On auscultation there was a loud basal systolic murmur which could also be

heard over most of the back including along the axillary border of the right scapula. X-ray of the chest showed definite notching of the 3rd left rib and probably early notching of the 4th and 5th on the same side. Her blood pressure one month after delivery was 210/110.

This case is of particular interest in several respects. The patient has been quite symptom-free during the whole period of observation, and her hypertension has for all practical purposes remained unchanged. In addition, despite the apparently high blood pressure, not, of course, transmitted to the uterine arteries, she never had any albuminuria, and the placentas have apparently been always quite healthy. I would like to thank Professor W. Kearney for allowing me to publish this case and Dr. T. O'Keefe, radiologist, South Infirmary, Cork, for his co-operation.—I am, etc.,

Cork.

W. R. SHANAHAN.

Sterilization Methods

SIR,—The British Standards Institution has recently circulated for comment a Draft British Standard for Bed-pan and Urine Bottle Washers. In an apparatus conforming to this specification a bed-pan may be washed successively with any of three combinations of cold water, hot water, and steam for periods which are not specified. It is required that the words "This apparatus is not a sterilizer" be "permanently inscribed in bold red lettering" upon it.

For the past eighteen years many of the wards in this hospital have been fitted with bed-pan washers which automatically flush successively with cold water, hot water, and finally with steam for 30 seconds, this sequence being started simply by pushing a button. I have received so many inquiries from different sources about the performance of this apparatus and what it may be expected to do that I shall be grateful for an opportunity to answer such questions publicly. I have carried out many bacteriological tests with different models of this apparatus, always with the same results—namely, that any vegetative bacteria, however applied—for example, in the form of a dried film of faeces or pus—whether within the pan or on its rim, are invariably killed; sporogenous bacteria such as *B. subtilis*, of course, are not.

It is therefore quite correct to say that such an apparatus, even if it applies steam for an adequate time, is not a "sterilizer." But how often are bed-pans really "sterilized"? Boiling will not do it, unless some chemical is added to the water, nor will immersion in commonly used disinfectants. And is it necessary? I can imagine no circumstances in which the presence of bacterial spores in a bed-pan can be of any significance in relation to the health of the user. It is only necessary that bacteria causing intestinal or septic infections shall be destroyed, and exposure to steam will ensure this.

I write this letter with the main object of defending the apparatus devised and used in this hospital against a mistaken charge of inefficiency, and to suggest that the indications for sterilization (elimination of all forms of microbial life) and disinfection (elimination of those which in the circumstances are potentially harmful) need to be more clearly distinguished. The apparatus specified in the Draft British Standard is much inferior to ours in that automatic operation is not provided for. If this project is to go forward, I suggest that the apparatus be a simple washer, only using water. The use of steam is pointless unless for the purpose of disinfection.—I am, etc.,

London, E.C.1.

LAWRENCE P. GARROD.

SIR,—In connexion with the perspicuous leading article on this subject (*Journal*, January 15, p. 156) your reader may be interested to know something of the state of sterilizing apparatus in hospitals in a number of typical British hospitals.

During the last two years 64 dressing sterilizers (autoclaves with vacuum attachments) in 45 surgical charges were examined. Details of the defects found in design, installation, maintenance, and operation were drawn up and reported together with diagrams of the steam circuits involved. Only

5 (8%) of the instruments, and these were all of American manufacture, were found to be above reasonable criticism. The criterion was efficiency in sterilization with minimal damage to the load. Some examples of the more common or interesting faults in design or installation were as follows: lacking automatic air and condensate discharge from floor of chamber, 41 (63%); pressure in jacket sufficiently in excess of that in chamber to cause serious superheating, 11 (17%); lacking thermometer, 55 (85%); steam introduced at bottom of chamber under the perforated tray, 40 (63%); connexion between floor of chamber and main water supply of hospital, 11 (17%); connexion between chamber and underground drains (definitely no air break), 3 (4%); connexion between underground drains and main water supply of hospital via chamber, 2 (3%). In 16 hospital laboratories and pharmacies in the same area 32 hot-air ovens were examined; none had fans or turbo-blowers. Of the 26 main autoclaves (without vacuum attachment) used in the 16 units, only one withstood really searching criticism.

The report by the Central Pathology Committee of the Ministry of Health on the sterilization of hospital equipment, issued to hospitals on December 31, 1954, countenances this condition of affairs and goes even so far as to give directions concerning the operation of obsolete and demonstrably ineffective steam pressure apparatus to the total exclusion of efficient design. If perpetration of past faults sanctioned by this retrogressive report leads to criticism and thence to correction or replacement by the Ministry of inefficient sterilizing apparatus in hospitals, this official publication would, in retrospect, become justifiable.—I am, etc.,

Edinburgh.

J. H. BOWIE.

Aetiology of Kwashiorkor

SIR,—The very interesting and significant case of kwashiorkor occurring in a breast-fed infant of three months of age described by Dr. L. G. MacDougall (*Journal*, November 13, 1954, p. 1150) raises again the question of aetiology of this syndrome. The difficulty in reconciling this and other cases of kwashiorkor seen in adequately breast-fed infants^{1,2} with the common view that kwashiorkor is due to a deficiency of animal protein (or of some constituent(s) thereof) led to the introduction of another assumption—namely, that in such cases the mother's milk may be deficient in an essential factor.³ There is no evidence, however, to support this assumption.

It seems surprising that so little attention has been devoted to another concept—namely, to the possibility that it is not the absence, but rather the presence, of some factor(s) which is the cause of kwashiorkor. This concept has been suggested on the basis of experimental studies with senecio alkaloids in young rats.^{4,5} These hepatotoxic pyrrolizidine alkaloids are known to be present in certain plants of the botanical families Compositae Boraginaceae, and Leguminosae,⁶ many of which are being used as traditional herbal medicines by the African negroes and in other under-developed countries.^{7,8} Interesting examples of herbal treatment of mothers and infants have been recently published from Ibadan⁹ and from Tanganika.¹⁰ These authors, however, do not specify the exact composition of the complex concoctions used as drinks, bathing fluids, or porridge admixtures. These probably vary depending on the region, the season, and the availability of the plants. The point of great importance would be to ascertain the constituents of the particular herbal mixtures which have been used in kwashiorkor cases by the mothers during pregnancy or lactation, as well as those given to the babies.

The following points relevant in such an inquiry may be worth recalling: (1) The alkaloid content of plants varies with the season. In young plants pyrrolizidine alkaloids are present mainly in the form of N-oxides which, being more palatable, are likely to be ingested in larger quantities, and induce various degrees of poisoning. (2) The action of the alkaloids in doses not immediately toxic may manifest itself only after an induction period of several

weeks or months or even years. (3) Treatment with the alkaloids of females during pregnancy may affect the foetus *in utero*. (4) The alkaloids induce similar effects regardless of the route of their application, whether by feeding or to the skin. (5) Young animals in the course of rapid growth are more susceptible than adults to the action of these alkaloids. Gastro-intestinal disorders, pancreatic and splenic changes, stunted growth, haemorrhage, anaemia, respiratory disorders, and liver damage (necrosis, fatty infiltration, fibrosis, hyperplasia, and neoplasia) have occurred in response to appropriate treatment with the alkaloids. However, even litter mates show a great variability in response to the same treatment; while some may remain unaffected in good health, other siblings may succumb at various stages of the pathological chain of events. (6) The effects of these alkaloids manifest themselves in animals given an adequate diet, but are aggravated if superimposed on dietary protein deficiency.—I am, etc.,

Glasgow, C.3.

R. SCHOENTAL.

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Operator and Anaesthetist

SIR,—I am somewhat perturbed that the letters which have appeared in the *Journal* on this subject may be used to establish a legal precedent. Surely it is time that this subject was considered from a common-sense point of view. Ideally all dental anaesthetics should be administered by specialist anaesthetists, either with medical or dental qualifications who have had special experience in dental work. However, such men are scarce, and outside London and one or two other centres they do not exist, even if the average patient could afford the fees that such men rightly command.

It is, and has been for the last 25 years, a common practice among dental surgeons to act as operator-anaesthetist when dealing with emergency extractions. They are usually helped by well-trained chairside assistants. This practice, far from being negligent, is safer and more efficient than getting the average general medical practitioner to give the anaesthetic, and is the only economic possibility under the N.H.S. scale of fees. I have been concerned in three anaesthetic deaths. At two I was a spectator, and I arrived at the third shortly after the tragedy had occurred. In each of these cases the anaesthetic was administered by a medical practitioner—one a specialist anaesthetist.

The average medical practitioner has never been taught to give dental anaesthetics. For many years I worked in the dental department of a teaching hospital, and I can count on the fingers of one hand the occasions when medical students visited the department for instruction in dental anaesthesia. Similar conditions exist in most medical schools. It is unreasonable to assume that most medical men trained under these conditions will give efficient dental anaesthetics without special training. In domiciliary midwifery no objection is raised when a medical practitioner induces anaesthesia and then hands over to the midwife while he continues the work of delivery. This, however, is a much more dangerous procedure than that carried out by the dental operator-anaesthetist, who is working on the airway all the time and can readily observe any abnormality of respiration.

These are the facts, and apply as much to thiopentone as to nitrous oxide, provided the dentist has had experience in administering the former. There are occasions when it is safer for the dental operator-anaesthetist to give thiopentone in preference to nitrous oxide.

As to getting a certificate in every emergency case from the patient's own doctor, this is impracticable, whatever a "learned judge" may have laid down. If carried to its logical conclusion, no anaesthetics should be given in the casualty department of a

general hospital without these certificates. I do, however, feel that more careful inquiries should be made into the patients' medical histories, and if any are undergoing medical treatment every reasonable effort should be made to consult with the medical practitioner concerned.

Every anaesthetic is a serious responsibility, and I would stress that I do not consider it ideal for a dentist to act as operator-anaesthetist, but that under existing conditions it is legitimate for him to do so for short emergency procedures. For longer operations he would be wise to get one of his colleagues to work with him. If it becomes established that the operator-anaesthetist practice is abolished, many thousands of working-class patients, and their children, will be denied the advantages of general anaesthetics for tooth extractions.—I am, etc.,

St. Albans.

ERIC SCHOFIELD.

Herpes Zoster Treated with Vitamin B₁₂

SIR,—I am afraid that I cannot endorse Dr. K. E. Jolles's wholehearted enthusiasm for vitamin B₁₂ in the treatment of herpes zoster (*Journal*, January 15, p. 166). For several years I had used injections of liver extract in this condition with very variable results, some apparently benefitting and others running an apparently unrestricted course. So much so that I had abandoned it prior to the advent of B₁₂, considering that the apparently improved patients might have had less severe infections. When B₁₂ was introduced I started treating cases with increasing doses up to 100 µg. daily on three successive days, with equally variable results. For the past six months I have employed 1,000-µg. doses and am convinced that either cases vary greatly in their natural course, or that, to be of benefit, vitamin B₁₂ must be given very early in the course of the disease.

Two cases may help to illustrate.

Case 1.—Married woman. December 11, 1954, herpes zoster ophthalmicus (left) lesions present for 36 hours. "Cytamen" 1,000 µg. injected. December 13, lesions more extensive and eye almost closed. Cytamen 1,000 µg. injected. December 18, eye completely closed. More widespread lesions in scalp and forehead. Progress apparently unrestricted. Pain severe. January 1, 1955, eye open. Neuralgic pain severe. January 15, neuralgic pain still severe.

Case 2.—Married woman. October 10, 1954, complaining of pain right side of head. No lesions present. ? Herpes zoster. October 13, Cytamen 100 µg. injected. Definite herpes on forehead. Eyelid swollen but not closed. October 15, cytamen, 1,000 µg. injected. Very few lesions. Pain slightly more marked. October 18, practically settled. October 23, smarting only at times.

Almost parallel results could be quoted for herpes zoster of the body. The main difficulty in my practice is that patients do not usually attend until the lesions are well established, by which time I find great difficulty in convincing myself that vitamin B₁₂ influences the subsequent course in any degree whatsoever.—I am, etc.,

Holland-on-Sea.

JOHN C. SKELLEY.

Dyspareunia

SIR,—I should like to support the several points made by Mr. Oswald Lloyd in his letter (*Journal*, January 22, p. 228), particularly his statement that cases of introital dyspareunia can be treated successfully in a gynaecological out-patient clinic. I think it is important that when local lesions have been excluded the remaining cases, in which muscle spasm is the cause of difficulty, should be treated forthwith. To refer them to another clinic, where the process of history-taking and examination will be repeated at a later date, is likely to increase the anxiety and apprehension which underly this condition. Treatment by explanation and reassurance, aided by the use of vaginal dilators introduced by the patient herself, is almost always successful. I have recently been impressed by the value of methylpentynol ("oblivon") in doses of 500 mg. taken about 30 minutes before intercourse and repeated on four or five occasions till confidence is established.—I am, etc.,

Newton, Lincoln.

R. F. LAWRENCE.

Kaposi's Varicelliform Eruption

SIR,—Dr. Allan Bigham and Dr. Brian Russell in their letters (*Journal*, January 15, p. 167) rightly suggest that the diagnosis in the case reported by Dr. A. Fry (*Journal*, January 1, p. 28) should be one of accidental vaccinia. But it may be worth commenting on their suggestion that Kaposi's varicelliform eruption arises only on a basis of "eczema" (Dr. Bigham) or of "asthma-prurigo" (Dr. Brian Russell).

Kaposi's varicelliform eruption may appear in the presence of various pathological conditions of the epidermis, and, although a basic chronic eczema is the predominant finding, we have seen herpetic forms in association with impetigo contagiosa and with seborrhoeic eczema, and vaccinal forms in association with infectious eczematoid dermatitis and with ichthyosis. We would therefore define Kaposi's varicelliform eruption as a virus infection (herpes simplex, vaccinia and perhaps other viruses) arising in patients with a damaged skin, and would suggest that precautions against virus contamination are necessary in such subjects.—We are, etc.,

Glasgow, W.2.

A. GIRDWOOD FERGUSON.
W. A. DEWAR.

SIR,—I was very interested to read the case of accidental vaccinia in the *Journal* (January 1, p. 28). I enclose a photograph (Fig. 1) of a case I had in 1902. The lesion was on the right cheek.



FIG. 1

FIG. 2

I also send you a photograph (Fig. 2) of a case of confluent smallpox I had about the same time, which I am sure will interest you.

The patient got quite well, thanks to the skill and care of the nurses.—I am, etc.,

Newark.

ERNEST RINGROSE.

A Foreign Body in the Kidney

SIR,—The paper on "A Foreign Body in the Kidney" in your issue of January 22 (p. 205) seems to demand a world conference on the "kirbigrip." This aid to female beauty is a small smooth object, chemically harmless, without projections or points, ideally shaped to go round intestinal curves; yet of all swallowed foreign bodies it appears to be the most noxious. Why? It is significant that all cases collected by Dr. Duncan Macaulay and Mr. Thomas Moore implicate this gadget, and in all except one it was impacted in the duodenum. How many surgeons have had a similar experience?

I have been forced to remove a foreign body from the alimentary canal once only, though I have often been tempted to do so. I have seen bits of chain, lengths of wire, six-inch (15.2 cm.) nails, and open safety-pins in plenty

(and, of course, Souttar's tubes) passed through the alimentary canal without damage. My one "kirbigrip" remained for a fortnight so fixed at the duodeno-jejunal flexure that I had to remove it in order to preserve the mother's sanity.—I am, etc.,

London, W.1.

HENEAGE OGILVIE.

Lactation from Axillary Tail of Breast

SIR,—I was interested to read Dr. J. P. Roux's case report of lactation from the axillary tail of the breast (*Journal*, January 1, p. 28). I have seen a similar case also in a primigravida, but, unlike Dr. Roux's case, milk excretion continued from the axillary pore both during and between breast feeds, and for the comfort of the mother lactation was suppressed.—I am, etc.,

London, S.E.1.

M. C. JOSEPH.

SIR,—After noting the case reported by Dr. J. P. Roux (*Journal*, January 1, p. 28) I am prompted to report a similar case. It rather confirms the remark that this abnormality has been somewhat neglected by medical writers.

A 23-year-old primigravida in 1952 noticed enlargement of both axillary tails of her breasts. These protruded above the level of the brassière, and caused some embarrassment and slight discomfort, especially when she was cold. Following delivery on December 9, 1952, she had two very full breasts and an abundant supply of milk which leaked freely prior to feeds. The left axillary tail was found to have a small opening which leaked under her arm, and was a source of considerable nuisance. The baby was fed until six months, but she conceived again in April, and the breasts were never free from milk during her second pregnancy. There was, however, very little discharge of milk after feeding ceased. The right axillary tail was also enlarged but less uncomfortable and never had a separate opening. The second baby was born on January 14, 1954. The breasts did not secrete so prolifically, although satisfactory feeding was achieved for six months. The left axillary tail leaked again but to a lesser extent. Even now the axillary tails are still visible above the brassière, and the left is more conspicuous than the right.

It is interesting to note that this patient also had a rigid cervix which did not dilate beyond two fingers after 28 hours in the first stage of labour with her first confinement. This was successfully divided by Mr. F. H. Finlaison, of Windsor, whereupon the cervix immediately dilated fully. An immediate forceps delivery secured a live baby. The second pregnancy and confinement was normal in every way.—I am, etc.,

Ashford, Middlesex.

N. G. NICHOLSON.

Tuberculous Mesenteric Adenitis in Children

SIR,—I read Dr. Hugh R. E. Wallis's article on this subject (*Journal*, January 15, p. 128) with great interest, and I should like to make some observations on the treatment with calciferol. I agree that large doses of calciferol are a logical and effective means of assisting healing by calcification. The dangers of this form of therapy, however, need to be stressed. Dr. Wallis recommends a dose of 50,000 units of calciferol daily, which, I feel, requires qualification, as it is too large for small children. The dose of a potentially toxic drug should be calculated by the weight of the child. I do not agree with his observation that with a dose of this size there need be no fear of toxic symptoms.

In 1948-9 I treated a series of 25 children (aged 3-12 years) in hospital suffering from bone and joint tuberculosis with calciferol in propylene glycol. Symptoms of toxicity were carefully watched for and weekly records were kept of blood pressure, urine analysis, excess calcium secretion, monthly serum calcium and proteins, and urea clearances. At first I used a dose of approximately 2,000 units per kg. body weight daily (equivalent to 150,000 i.u. daily for an adult). Symptoms of toxicity such as loss of appetite, vomiting, and drowsiness accompanied by excess calcium in the urine were found in about half the cases in four to six weeks, and some of these showed albuminuria, depressed renal function, and raised serum calcium. I was not able to estimate the diffusible serum-calcium,

which is said to be a surer method of determining the onset of calciferol toxicity. The dose was then reduced in all patients to 1,100 units of calciferol per kg. daily. With this dose no symptoms or biochemical evidence of toxicity were discovered during two to six months of treatment.

My findings agreed with those of Anning and his associates,¹ who have made a detailed study of the toxic effects of calciferol in 200 patients. The majority of their cases were adults under treatment for skin diseases, but they also found that children were not more resistant to vitamin D unless rickets or other states of vitamin D deficiency pre-existed. They found that toxic symptoms were liable to develop if more than 1,100 i.u. per kg. of body weight was given daily. In treating a mild disease such as tuberculous mesenteric adenitis, there is, in my opinion, no justification for using larger doses.—I am, etc.,

Newcastle, Staffs.

D. C. THURSBY-PELHAM.

REFERENCE

¹ *Quart. J. Med.*, 1948, 17, 203.

Tuberculin Testing

SIR,—In the Army B.C.G. scheme it has been considered very desirable to have available a single test, simple to execute and interpret, as Professor J. Crofton and Dr. J. Maher-Loughnan have recommended (*Journal*, January 8, p. 105). It may interest your readers to learn that a comparative trial of the Mantoux and Heaf tests was carried out at the Depot and Training Establishment, Royal Army Medical Corps, by Lieutenant-Colonel R. L. Townsend and Captain R. MacDonald from July to September, 1954. A report on this trial has been prepared for publication.—I am, etc.,

London, S.W.1.

G. T. L. ARCHER.

"Rugger"

SIR,—Surely Mr. O'Connell's figures¹ as given in your leading article (*Journal*, January 15, p. 154) show that this game, a usurper of football in our public schools and universities, is more barbaric than professional boxing. The boxer's chief aim during a contest is to cause the maximum amount of severe injury to his opponent, and he reaches the highest peak of his art when he damages his opponent's brain. Although Rugger players make no claim (is it modesty?) that one of the chief objects of their game is to inflict injury, yet Mr. O'Connell's figures show that they surpass the boxer, even, in their most destructive triumphs.

This new game, which dates only from 1823, was started by a silly little boy who was ignorant of the rules of football and lacked the skill to control a round ball. If he had been suitably chastised by his house master this immature horse-play of lower school might still have been played by little boys but would not have been adopted into a game by grown men: *Vis bruta et inscientia cruenta* (usually translated B.F. and B.L.); it might still have been practised by thugs.

Rugger is injurious in ways other than physical. I have heard it whispered that there is one sure way for a young man to gain entry into the medical schools of some hospitals. Oddly enough this acceptance is not gained by showing an interest in the practice of medicine, nor by achieving some academic distinction, but by winning a place in the first XV before leaving school. I hope, Sir, that it still does not obtain in many hospitals that a "sweatband round the forehead to protect the ears" is more helpful during the curriculum and in qualifying than the cold wet towel which some students used to wear.

Despite the second paragraph of your leading article, reminiscent of "What's My Line?" and unctuously phrased to appease not so much employers as devotees of this game, Rugger is essentially a game of the public schools and the universities and, alas, of other schools with social ambitions. Who can assess the dire impetus which this schism in our national game has given to the present calamitous class war?

Finally, Sir, I suggest that it would have been more becoming in a serious and erudite journal if, in your leading

article, you had not dissimulated but had given honest and sound advice to Rugger players. You should have advised them to adopt one of two alternatives. (1) If they feel that they must continue to play this game, then let them remember that attack is the best form of defence, advise them to fit metal studs to their scrum-caps and shoulders as well as to their boots, and carry an Irish shillelagh for emergencies. (2) Abandon this misshapen ball and this puerile form of horse-play and return to our ancient, chivalrous, and noble national game—Association football.—I am, etc.,

London, S.E.7.

JOHN MONTGOMERY.

REFERENCE

1. *J. Irish med. Ass.*, 1954, 34, 20.

Tests of Hearing

SIR.—There is an undoubted need for the early diagnosis of deafness, not only because of the need for early treatment but also that provision may be made for suitable education, early training in lip-reading, and the provision of a hearing-aid. As Miss Edith Whetnall suggests (*Journal*, January 22, p. 227), the age of 5 years is too late. Professor and Mrs. Ewing have shown in their pioneer work in Manchester, and in the clinics with which they have been associated in Leicester and Birmingham, that it is possible to diagnose deafness at a year to 18 months. A considerable number of other local authorities are now taking up this suggestion, and clinics may be expected to arise in a considerable number of centres.

However, it does not appear to me that the post-natal clinic is at all a satisfactory venue in which to "increase the mother's awareness of the possibility and implications of partial deafness." The post-natal clinic is a valuable agency in which health education may be given to the mother, who is highly suggestible at this period but tends to be over-anxious about the normality of her infant. If stress is laid upon the possibility of deafness or partial deafness, a great deal of needless anxiety and distress would be caused.

The method now being adopted in Birmingham is routine screening tests of hearing at the local health authority's child welfare clinics by health visitors at the age of 9 months. By this time the mother already has a shrewd idea whether or not her child has any defect of hearing and a two-minute test causes no apprehension. Children in whom there is any suspicion of deafness are then referred to the medical officer for further testing. Such tests are simple and quick to administer and should be attempted on any child who is not beginning to speak, or does not appear to understand the spoken word, by the age of 18 months.—I am, etc.,

Stafford.

HARRY BINYSH.

Acute Thyroiditis from Potassium Iodide

SIR.—In acute iodism it is unusual to have symptoms directly connected with the thyroid gland, and so the following four cases, taken over a period of some years, may be of interest.

Case 1.—A man aged 25 complained of weakness of his wrists, and was found to be a plumber suffering from mild musculo-spiral neuritis. In addition to other treatment he was given a simple mixture containing 7½ gr. (0.5 g.) potassium iodide three times a day. Two days later he came back complaining of agonizing pain in his throat. This was found to be due to a tightly distended thyroid gland which stood out from the front of his neck in sharp relief. The swollen lobes on each side, joined by a swollen isthmus, looked like a pair of miniature swimming wings. The gland was very painful and very tense on palpation, having somewhat the feel of an over-filled rubber hot-water bottle. He said that he had been awake all night with intense pain in his throat, but no other symptoms. The iodide mixture was stopped, and in two or three days the swelling had quite gone and he had completely recovered.

Case 2.—A man aged 35 suffered from rheumatism, for which he was given potassium iodide 7½ gr. (0.5 g.) three times a day. Within 24 hours he had intense pain in his throat, and, as in the previous case, his thyroid gland stood out in marked relief. It was tense and extremely tender to touch, but normal in shape.

As before, it gave the impression of distension rather than growth of new tissue, its outline being approximately normal in size, but having an increased rotundity in a forward direction. On the potassium iodide being stopped, the condition very quickly subsided, and in three days his neck looked and felt normal. It is interesting to note that this man has a slight tendency to asthma and eczema from time to time.

Case 3.—A woman aged 70, who had rheumatism in her hand, was given a mixture containing 7½ gr. (0.5 g.) each of sodium salicylate and potassium iodide in each dose. She took the first dose of medicine after lunch, about 1 p.m., and the second dose after tea at 4.30 p.m. About 7.30 p.m. she noticed her nose was running slightly, and she began to feel unwell. At 11.30 p.m. her throat felt swollen and painful, and became progressively worse during the night. At 6 a.m. she was found to have an oedematous face with swollen eyelids, neck, and soft palate. In addition her thyroid gland was swollen, tense, and very painful, not having the soft characteristics of the other swollen tissues. The pot. iod. mixture was stopped and she was given sodium bicarbonate drinks, and phenindamine hydrogen tartrate ("theophorin"), and later mepyramine maleate ("anthisan"). In just over two days all these swellings had gone, and her throat and face felt normal.

Case 4.—A girl aged 21 had pleurisy with effusion, and was given doses of 7½ gr. (0.5 g.) potassium iodide in a mixture three times a day. She progressed satisfactorily for a fortnight, then suddenly had an acute thyroiditis, with extreme pain and tension in the gland, having similar characteristics to the previous cases. The swelling, however, was rather more than in the others, which was probably owing to the fact that she had had a mild symptomless, parenchymatous goitre for a few years. At the same time as the acute throat symptoms she developed an iodide rash all over her body. The pot. iod. was stopped, and the condition rapidly subsided in about three days.

The special features common to these four cases of (a) sudden onset without inflammation or signs of infection, (b) acute generalized tension within the capsule of the gland, causing great pain, but no distortion of normal shape, and (c) association in each case with administration of normal doses of potassium iodide, and rapid subsidence when the latter was stopped, all point to an allergic condition due to the drug.—I am, etc.,

Slough.

H. TUDOR EDMUNDS.

Treatment of Vitiligo

SIR.—Reference "Any Questions" (*Journal*, February 6, 1954, p. 346), I think the following case may be of interest.

A severe case of vitiligo in a Sikh male of 54 years came to me for treatment in April, 1953; general health and diet good; Kahn negative. A small patch of depigmentation on the left side of the face was first noticed in April, 1950. This rapidly spread over face, neck, arms, hands, and lower limbs. Disfigurement was considerable, as there was complete depigmentation of supraorbital regions, nose, ears, lateral aspects of both cheeks and neck. The patient had tried many treatments, but spread of the depigmentation continued. Treatment with "meladinine" was begun on April 8, 1953—1 tablet orally three times a day (a tablet contains 7.5 mg. ammoidine and 2.5 mg. amidine). On April 19 one local application with meladinine paint (ammoidine 7.5 mg. and amidine 2.5 mg. in 1 ml.) was made to a small area on the dorsum of the left hand. This was exposed as recommended to 10 minutes' direct sunlight. Severe erythema and vesiculation of left hand and forearm occurred and all treatment was stopped. The patient was persuaded to start oral treatment again on May 25 in the same dosage. On June 10 small scattered areas of pigment on the dorsum of left hand appeared; on July 14 many small scattered areas of pigmentation on face, ears, hands, and elsewhere. On July 16 small area flexor surface right forearm painted with meladinine. This became only slightly inflamed. Oral medication was continued, and by October pigmented areas had so enlarged and coalesced that the face was nearly uniformly its normal brown colour, and there were large areas of pigmentation of both arms and elsewhere. Medication has continued intermittently until the present date, and, although pigmentation is not completely normal, the disease is no longer an unsightly one.

This reasonable success with a single patient, I think, makes the drug worthy of further trials. The patient is most satisfied with the cosmetic improvement.—I am, etc.,

Ipoh, Malaya.

F. A. ADAM-THOMSON.

Obituary

Sir EDWARD MELLANBY, G.B.E., K.C.B., M.D.
F.R.C.P., F.R.S.

We record with regret the sudden death on January 30 of Sir Edward Mellanby at the age of 70 years. He was secretary of the Medical Research Council from 1934 to 1949, and held this highly responsible administrative post in the years of stress before, during, and after the second world war: yet he managed to continue to carry out important research himself, chiefly in his own field of nutrition. From Mellanby's early days at Cambridge each distinction gained and each office held was a stepping-stone in the upward climb of a man marked out from the beginning for high achievement. He devoted himself to science, submitting gladly to its disciplines—and understanding by science not only the acquisition but, as Herbert Spencer said, the organization of knowledge.

Edward Mellanby was born on April 8, 1884, the son of John Mellanby, of West Hartlepool. His brother, Professor John Mellanby, died in 1939, three years after succeeding Sir Charles Sherrington as Waynflete Professor of Physiology at Oxford. Another brother—the late Professor Alexander Mellanby—was Professor of Civil and Mechanical Engineering at the Royal Technical College, Glasgow. From Barnard Castle School, in County Durham, Edward Mellanby won a scholarship to Emmanuel College, Cambridge. After taking his B.A. in 1905 he spent two years, as research student of Emmanuel, at St. Thomas's Hospital, London. From 1909 to 1911 he was demonstrator in physiology at St. Thomas's; and in 1913 he became lecturer and later professor of physiology at King's College for Women, an appointment which he retained until he took up his work in Sheffield in 1920. His career at Cambridge had been highly distinguished. He took his M.A. and M.B. in 1910 and his M.D. in 1915, and his Cambridge prizes included the Walsingham Medal (1907), the Gedge Prize (1908), and the Raymond Horton-Smith Prize (1915).

His attention at an early stage in his career was attracted to experiments in nutrition. Hopkins had lately published the full reports of his vitamin experiments. Many facts had been elicited, but explanations were hard to find. In the years from 1915 to 1919 Mellanby pursued researches which resulted in the discovery—published in the *Journal of Physiology* in 1918—that some foodstuffs containing a fat-soluble substance which controlled the deposition of calcium in the bones

were effective in preventing the onset of rickets in puppies kept on certain special diets and in curing the condition both in dogs and in man. There were, however, discrepancies in the observations which were ultimately resolved by the elucidation of the separate parts played by the two fat-soluble vitamins A and D. For many years it remained a mystery why dogs even on an adequate diet developed rickets on being fed with certain cereals, but 20 years after his earlier discovery Mellanby himself, working with D. C. Harrison, showed the rickets-producing substance in the cereals to be phytic acid, which acted by forming an insoluble compound with the calcium in the food—an action which could be overcome by giving an excess of calcium or adding vitamin D to the diet. It was this discovery

which paved the way to the recent conception of "anti-vitamins." His later work in this field demonstrated how vitamin A influenced the growth and shape of bones, and how a deficiency might cause neurological disturbances due to the pressure on nerves of abnormally growing bone. Right up to the time of his death he was continuing his work on vitamin A, and with his colleagues had published a paper in this *Journal* last September describing recent research.

Much other work was carried out by Mellanby during those early years. One of his first contributions to the *Proceedings of the Royal Society* was on the metabolism of lactating women: another, to the *Quarterly Journal of Medicine*, was on diarrhoea and vomiting in children. During the first world war drunkenness was still a serious social problem, and Mellanby was asked by the Government to investigate the action of

alcohol. His observations were summarized in a Special Report of the Medical Research Council, published in 1919, entitled, "Alcohol: Its Absorption Into and Disappearance From the Blood."

In 1920 a chair of pharmacology was founded in the University of Sheffield, and Mellanby was appointed its first occupant. He held it until 1934, together with the appointment of honorary physician to the Sheffield Royal Infirmary. Here some of his most noteworthy work was done. He was recognized by this time as one of the outstanding experts in the biochemical and physiological field. His special reports for the Medical Research Council on experimental rickets appeared in 1921 and 1928 and on nutrition and disease in 1934. In 1924 he was awarded the Stewart Prize (for original medical research) of the British Medical Association. In 1929 he received the Bissett Hawkins Medal and a few years later the Moxon Medal of the Royal College of Physicians for highly important additions to practical therapeutics. In 1932 he was the recipient of the



(Barratt's Photo Press)

Cameron Prize of the University of Edinburgh, and in the same year the Royal Medal of the Royal Society was awarded him. At the Royal College of Physicians he was Oliver-Sharpey Lecturer in 1922, Croonian Lecturer in 1933, and Harveian Orator in 1938. He gave the Linacre Lecture at Cambridge in 1933 and Rede Lecture in 1939—published under the title "Recent Advances in Medical Science: A Study of Social and Economic Implications."

During this period he came into international prominence as chairman of two International Conferences for Standardization of Vitamins, one in 1931 and the other in 1934, and chairman of the International Technical Commission on Nutrition. His connexion with the Health Section of the League of Nations dated from 1930. He was the driving force behind the movement for international standardization. The atmosphere of Geneva during those years was not always stimulating, but this was not evident in the work on nutrition, thanks largely to the energy and determination of the experts who represented Britain. By common consent whatever success was achieved was due in no small measure to Mellanby's patience, assiduity, and ability to reconcile different viewpoints.

In 1934 Mellanby, who had been a member of the Medical Research Council since 1931, succeeded the late Sir Walter Fletcher as secretary of that body and *ex officio* secretary of the Committee of the Privy Council for Medical Research. At the same time he relinquished the Sheffield chair and became professor emeritus. The appointment proved to be an excellent one, for Mellanby not only had the imagination and brilliance of the successful research worker, but he had the gift of inspiring others. His office became more important as the European situation became graver, and brought a multitude of problems concerning the health and nutrition of the fighting and of the civil population in the event of war. A member of the Scientific Food Policy Committee of the War Cabinet, Mellanby exerted a strong influence in the discussions on the medical aspects of food policy, including the prevention of ill-health by dietetic measures—for instance, by the fortification of margarine with vitamins A and D and the inclusion of extra calcium in National flour. He was also chairman of the Food Rationing (Special Diets) Advisory Committee, which had the difficult task of deciding how the rations should be modified or supplemented for patients with certain diseases. In 1939 Mellanby became chairman of a standing committee appointed by the Secretary of State for Air to investigate and advise on the medical aspects of all matters concerning personnel which might affect safety and efficiency in flying; and he also took a prominent part in industrial health research. Yet another of his duties was the chairmanship of the Colonial Medical Research Committee, and it was largely due to his efforts that the organization of research in colonial territories has been put on a sound basis. He also supported the work of the British Council and was chairman of its medical panel.

Shortly after becoming secretary of the Medical Research Council he added to his labours by accepting the Fullerian professorship of physiology at the Royal Institution in succession to Sir Grafton Elliot Smith. In 1937 he became honorary physician to the King, retaining this appointment until 1941. He retired from the position of secretary of the Medical Research Council in 1949, being succeeded by Professor (now Sir Harold) Himsworth. In the year after his retire-

ment the new Institute for Medical Research, with the planning of which Mellanby had been closely concerned, was opened at Mill Hill by King George VI.

It was in this *Journal*, in 1946, that Mellanby published his observation that agenized bread is a cause of canine hysteria. Four years later he and his colleagues succeeded in isolating a crystalline toxic factor from agenized flour which caused severe epileptiform fits in ferrets. Though it has not been proved that this factor is harmful to man, the Government has decided that the agene process for "improving" flour must not be used after the end of 1955. In the Sanderson-Wells Lecture (published in the *British Medical Journal* in 1951) Mellanby gave a general warning about the chemical manipulation of food.

Sir Edward Mellanby was created K.C.B. in 1937 and G.B.E. in 1948. He had been a Fellow of the Royal Society since 1925 and of the Royal College of Physicians since 1928. Elected an Honorary Fellow of Emmanuel College, Cambridge, in 1946, he received the honorary doctorate of science of Sheffield University in 1933 on leaving that city after his 13 years' professorship; the Honorary D.Sc. of Oxford in 1939 and of Cambridge in 1947; and the Honorary LL.D. of St. Andrews, Birmingham, and Durham in 1938, and of Glasgow in 1946, and the Honorary F.R.C.S.Ed. in 1946. An honorary member of numerous foreign academies, he was also a Charles Mickle Fellow of Toronto University, a Nuffield Trustee for medical research, and a Beit Memorial Fellow. In 1935 he delivered the Halley Stewart and the Huxley Lectures, both of them dealing with the progress of science; in 1939 the Stephen Paget Memorial Lecture to the Research Defence Society; and in 1943 the Croonian Lecture to the Royal Society. From time to time he rendered useful services to the British Medical Association. He was honorary secretary of the Section of Physiology at the Annual Meeting at Cambridge in 1920, and vice-president of the same section in 1922 and again at the Centenary Meeting in 1932. From 1933 to 1937 he was a member of the Science Committee, and afterwards of the special committee which was set up to consider the policy to govern the awards of the Association's scholarships and grants.

As a lecturer and speaker Sir Edward Mellanby was plain, direct, and matter-of-fact. Those who knew him intimately were aware of a man of most charming personality, very approachable, interested in the work of others, and eager to express appreciation of the work of colleagues and subordinates when that work was well done. He was unaffected and direct in manner, and a certain boyishness of attitude was an endearing characteristic.

In his early work on nutritional problems Mellanby found a valued colleague in May Tweedy, research scholar and lecturer at Bedford College, London, and they were married in 1914. Lady Mellanby has herself carried out highly important and original work on nutritional conditions affecting the structure of the teeth: the heart-felt sympathy of her many friends and colleagues is extended to her in her loss.

Sir LANDSBOROUGH THOMSON writes: Sir Edward Mellanby was secretary of the Medical Research Council, and of the Committee of Privy Council for Medical Research, during 16 years of great activity and progress in their affairs. These years included the emergency period, 1939-45, in which the scientific resources available to the Council had to be deployed in support of the war effort. This was followed by the period of reconstruction, in which a

notable expansion of the organization was effected. Tasks of such magnitude and difficulty called for direction by a man cast in a large mould; in both of them Mellanby's achievement has had lasting results.

Mellanby's acceptance of the post involved a complete change in the pattern of his life. Hitherto he had devoted himself to his own investigations, in association with his wife and a few other chosen colleagues and personal assistants; the assumption of a wider responsibility towards the work of many others was something new, and administrative problems were frankly uncongenial. He regarded it as a duty, however, to take over the direction of an organization to which he felt indebted for his own early opportunities as a research worker; he had in fact been one of the first small band of investigators supported by the original Medical Research Committee. His aim as secretary was always to bring like help to those younger men, and women, who showed special ability for research and ideas likely to lead to real discovery. To the performance of this responsibility he brought his own intense scientific spirit, his immensely wide knowledge of medical problems, and his great intellectual grasp. Those who worked closely with him especially admired his flair for seeing what was genuine and important in any research project, or any scientific result, that came before him.

Of particular developments for which he was largely responsible, two may be singled out. One was the initiation of "personnel research" for the Defence Services—the application of physiological knowledge and methods of investigation to problems of the airman, soldier, and sailor in relation to operational conditions and the use of specialized equipment. He was himself the first chairman of the Flying Personnel Research Committee, set up by the Air Ministry at his instigation before the war; and on this model there followed two analogous committees for the other Services. The second was an arrangement with the Colonial Office for co-operation in the promotion of research in tropical medicine; and he himself became the first chairman of the jointly appointed Colonial Medical Research Committee.

By the time of his retirement Mellanby's task as an organizer had been done, and administrative shackles were beginning to chafe. It was a source of pleasure to his former official associates that he was thereafter able to return to the personal research work which he had never wholly abandoned, and—with Lady Mellanby as his colleague—to spend some happy years in the undisturbed pursuit of his own still fruitful scientific ideas.

Professor B. S. PLATT writes: Sir Edward's paramount interest was in discoveries; none of us will forget that disconcerting question with which we were often greeted, "Well, young man—what have you discovered to-day?" He prized new knowledge, and he particularly appreciated the scientific worker who had a biological sense. Inspiring as his devotion was to research, he was by no means "academic"; indeed, no one in the present century has contributed so much in so many ways in the application of medical science to human well-being. Search in support of this statement need go no further than the reports of the Medical Research Council, particularly that for the immediate post-war years (*Medical Research in War—Report of the Medical Research Council for the years 1939-45*). He played a distinguished part in international nutrition in the early 'thirties in his work with the Health Section of the League of Nations.

The main function of the Medical Research Council was in his view the promotion of "scientific investigations for the acquisition of knowledge likely to be of value for the prevention, diagnosis, and treatment of disease, and for the maintenance of health and full human efficiency" (Report of the M.R.C., 1945-8). The translation of these objectives is finely illustrated by the application of the knowledge of nutrition to the feeding of the nation in wartime. The work recorded in the report on *Medical Research in War* is alone a monument of which any man might be proud, and one with which most men would be more than con-

tent. This record is only a part of the tale, the whole of which has not yet been told; it states that, great as is the credit deserved by the various Ministries concerned in the feeding of the nation, "credit is due in no smaller measure to those research workers in nutritional science—many of them workers for the Council—who provided the solid structure of knowledge upon which a sound food policy could be based." Sir Edward himself contributed many planks to this structure.

Wise as he was in a wide field, statesmanly as he was in dealing with men and affairs, effective as he has been in the application of knowledge, it was research in nutritional science which was nearest to his heart and for which he will be long and best remembered. Before his service as secretary of the Medical Research Council, throughout his period of office, and since his retirement, his work has been productive of results with any one of which most research workers would be glad to have been associated. As I was leaving him one day last week after a visit to his laboratories, he turned to enter a room with the words, "I must go in here. Something exciting is happening—I am on to something new." Nothing would, I think, have pleased him better than to be remembered for his love of new knowledge, and he would be happy to be known for the way he gave pre-eminence to the need for "having the facts right."

In nutrition research, Sir Edward Mellanby's name will continue to be coupled with that of Lady Mellanby: theirs was a partnership in research which has benefited mankind more than most of its members will ever know.

Professor H. N. GREEN writes: For a former student, personal assistant, scientific colleague, and friend during 30 years, it is difficult immediately to express more than personal grief at Sir Edward's unexpected death. His enormous range of activities, performed with such dynamic energy, makes it difficult to focus them sharply at this stage. A biography is necessary for justice to be done, for he was a great leader in scientific medicine during those eventful years when it attained to glory. His life was dedicated to the advancement of medicine, and he never doubted how best to achieve this. He was a pioneer in bringing the scientific approach of the laboratory into the ward, and he and Sir Thomas Lewis came to be regarded as the first two great clinical scientists in the modern sense. Mellanby's method was to use the lessons learned from the patient as a source of inspiration for laboratory work. So numerous were his ideas that many will never be recorded, but those who knew him during his lively and provocative years as physician at the Sheffield Royal Infirmary will recall the controversies they engendered in the ward and staff-room. As with many great men, ideas flowed from his mind unceasingly, but he curbed them ruthlessly.

This is a purely personal tribute to a great man. Since I was perhaps more intimately aware than any but his wife of his continuous stream of scientific work, it would be an impossible task to summarize his 30 years and more of scientific discovery here. The discovery of the cause of rickets will always remain the landmark in his career, because it had such tremendous practical results on infantile morbidity and mortality; but this is only one of many discoveries with important repercussions in preventive medicine.

Sir Edward's endearing personal qualities were sometimes superficially hidden by his bold and forthright personality which made him say what he thought without apparent fear or favour. In this he really expressed his intense desire to stimulate a strong reaction in whoever was seeking his help or advice and thus to assist them in the most practical way he knew. What his listener thought about him temporarily did not matter so long as medical science was advanced or a new scientist born. Of course one had only to know Mellanby more than slightly to realize that he was warm-hearted and eager to help in medical causes. His sometimes apparent aloofness was merely an expression of a somewhat shy and mentally preoccupied nature. Actually he had a great sense of fun, being very youthful, even boyish, at

heart. Only his lifelong devotion to science, and later also to administration, prevented him from becoming not only a scientific but also a social giant.

Lady Mellanby has been a devoted wife, friend, counsellor, and scientific colleague throughout their long married life. Such a completely happy personal and scientific companionship as theirs is rare, and no one realized the debt he owed to his wife more than Sir Edward. On this theme everything remains yet to be said, and we can only now express our deepest sympathy at the breaking of such a perfect partnership.

C. H. HAMPSHIRE, C.M.G., M.B., Ph.C.

Dr. C. H. Hampshire, who died in London on January 25, was secretary of the British Pharmacopoeia Commission from 1929 to 1950. He was not only a renowned pharmacist but also skilled in a highly specialized form of editing. Probably his greatest achievement—not his achievement alone, but predominantly his—was embodied in the *Pharmacopoea Internationalis*, the first international pharmacopoeia, which came forth, after a prolonged gestation of some 14 years, in 1951.

Charles Herbert Hampshire was born at Ilkley, Yorkshire, in 1885, and educated at Ilkley Grammar School, to which he won a foundation scholarship from Ilkley National School. On leaving school he was apprenticed to a local pharmacist. When he was 20 he gained the Jacob Bell scholarship of the Pharmaceutical Society and entered the Society's school of pharmacy in London. There he showed great promise. In 1906 he obtained the bronze medals in chemistry and botany and the Martindale memorial medal, and in the following year the



(Elliott & Fry)

silver medals in chemistry, botany, and materia medica, the first certificate in practical chemistry, and the Pereira medal. Having qualified as a pharmaceutical chemist, he became demonstrator in chemistry and later lecturer in physics at the school of pharmacy. In 1914 he was appointed pharmacist to University College Hospital, a post which he held until 1929. During that time, with the permission of the hospital and to the great advantage of his future career, he became a student in medicine, obtaining the Conjoint diploma in 1925, followed in 1927 by the M.B., B.S. of London.

For 10 years he acted as honorary secretary of the British Pharmaceutical Conference (being chairman of the conference in 1933 and 1934) and as honorary joint editor of the *Yearbook of Pharmacy*. Later on he was appointed editor of the supplement of the *Yearbook*, known as the *Quarterly Journal of Pharmacy*, which later became the monthly *Journal of Pharmacy and Pharmacology* and which he continued to edit until his death. While still at University College Hospital he was invited by the General Medical Council to organize the revision of the *British Pharmacopoeia* on the lines laid down by Lord Macmillan's subcommittee of the Committee of Civil Research, and in four years the formidable task of producing an entirely new *Pharmacopoeia* was completed.

In 1929 he gave up his appointment at University College Hospital to become the first secretary of the Pharmacopoeia Commission, and two editions of the *Pharmacopoeia* (1932 and 1948) with the various *Addenda*, were carried through under his most expert supervision. Preparations for the *Pharmacopoea Internationalis* began before the last war, when the Health Organization of the League of Nations set up a technical committee of seven pharmacopoeial experts, of which Hampshire, the only British member, was chairman. It held two meetings in Geneva before war began. Then, after the war, in 1946, the World Health Organization returned to the work of setting up standards for the safety, purity, and potency of biological, pharmaceutical, and similar products in international use. Again an expert committee of seven was set up, of which again Hampshire, the only British member, was chairman, and the work of preparing an international pharmacopoeia with a unified nomenclature was completed in New York in 1950. Special mention is made in this book, quite monumental in its detail, of the work which Hampshire had undertaken as chairman. It must have called for extraordinary patience, as well as that scrupulous accuracy for which all Hampshire's work was so notable. Israel was the first State to recognize the *Pharmacopoea Internationalis* as its own official pharmacopoeia.

As anyone seeking information at his room in the General Medical Council offices had reason to know, Dr. Hampshire was not only a very approachable man but able to interpret for the benefit of the less learned the highly technical matters with which he dealt. He was the author of several papers in the journals of the Chemical Society and other bodies. His *Volumetric Analysis for Students of Pharmaceutical and General Chemistry* passed through several editions. He was examiner to the Pharmaceutical Society and to the Royal Institute of Chemistry, of which he was a Fellow. He was made a Commander of the Order of St. Michael and St. George in 1946.

Dr. Hampshire's wife died a year ago, and he is survived by his daughter.

We are indebted to Professor D. M. DUNLOP for the following appreciation. The majority of men, like motor-cars, are mass-produced: a few are hand-made. Dr. Hampshire belonged to the latter category. Perhaps he will be remembered chiefly as secretary of the British Pharmacopoeia Commission, which he served faithfully for twenty-one years until his retirement from it in 1950. He brought a variety of gifts to this work—a knowledge of chemistry; a medical qualification; a great experience of pharmacy, ripened by years of service as chief pharmacist to University College Hospital; and a love of grammatical precision, so that Browning's Grammarian was no more conversant with the enclitic *De* than was Hampshire with the intricacies of pharmaceutical and analytical punctuation and italics. He was the ideal scrupulous editor not only of the *Pharmacopoeia* but of the *Quarterly Journal of Pharmacy*, the perfect draughtsman of concise minutes, and a veritable storehouse of pharmaceutical knowledge. In fact he was for a long time the *British Pharmacopoeia* incarnate in the flesh: he had identified himself so closely with it that he had assumed many of its attributes—solid, dignified, impressive, authoritative, and rather splendid. In his latter years he was no longer just a great British pharmacist, but an international one, and walked with ease in the councils of the World Health Organization at Geneva, where he played a dominant part in the production of the *Pharmacopoea Internationalis*. In spite of his long residence in London and his cosmopolitan activities Hampshire remained uncompromisingly a Yorkshireman from the Brontë country; in

fact he might almost have stepped out of the pages of *Shirley*. Ilkley Moor always had a robust determining influence on his career. Those of us who were associated with him in the work of the Pharmacopoeia Commission, and a great many of his other associates, will remember his long and devoted service with warm gratitude and will think of his achievements with pride. Our inevitable sadness at his death must be tinged with relief that he was spared a long illness and that to within a few hours of his death he remained his erect, erudite, formidable self.

JAMES WHILLIS, M.D., M.S., F.R.C.S.

Professor James Whillis, professor of anatomy at Guy's Hospital Medical School, died in London on January 27, aged 54. He underwent an operation last May, and had to have hospital treatment again last November.

James Whillis was born at Newcastle-upon-Tyne on September 8, 1900. From Carlisle Grammar School he went on to study medicine at Durham University, where



(Lalaye)

he was Philipson Scholar. Graduating M.B., B.S. in 1922 with first-class honours, he was shortly afterwards appointed lecturer in anatomy at the College of Medicine, Newcastle-upon-Tyne. He obtained the degrees of M.S. in 1925 and M.D. (with commendation) in 1930, and was elected F.R.C.S. in 1932. As his qualifications show, Whillis was not content to remain in the dissecting-room, and he co-operated closely with the clinical teachers at the

Royal Victoria Infirmary. He was an advocate of visual methods of education, and he made a number of films for teaching purposes. At Newcastle Whillis was in command of the medical unit of the Officers Training Corps, and towards the end of the second world war he served as a major (T.A.) in the R.A.M.C.

In 1935 Whillis was appointed to the readership of anatomy tenable at Guy's Hospital, and he succeeded Professor T. B. Johnston as professor there in 1943. It was under the co-editorship of Professors Johnston and Whillis that the last three editions of *Gray's Anatomy* have been published. Whillis was also the author of a textbook, *Elementary Anatomy and Physiology*, first published in 1938, and co-author, with Professor Lucas Keene, of *Anatomy for Dental Students* (published in 1950).

For many years Professor Whillis took an active interest in the work of the Chartered Society of Physiotherapy, and he succeeded Dr. W. S. C. Copeman as chairman of the council of the Society in 1950. He was chairman of the negotiating committee which considered the recommendations of the Cope Committee on the Supply and Demand, Training and Qualifications of Physiotherapists in the National Health Service; and he played a leading part during the international congress in London which the Chartered Society organized for the World Confederation for Physical Therapy in 1953. Fortunately he was able to attend the annual congress of the Chartered Society in Harrogate last September, at the conclusion of which he retired from office.

In 1926 he married Miss Dorothy Margaret Lee, and he is survived by his widow and one son.

We are indebted to Professor W. R. SPURRELL for the following appreciation: At an early date in his medical training Whillis developed an interest in anatomy, and this led to his appointment as demonstrator of anatomy when he qualified in 1922. From that date onward the whole of his career lay within that subject, to the advancement and application of which he devoted so much time and energy. Brought up under the strong influence of Rutherford Morison and Grey Turner, his mind was always turned towards surgery, and he delighted to put his knowledge to use in that specialty.

He found himself in the period of the "changing face" of anatomy. An increasing revolt against the burden of topographical detail, a growing demand for a more dynamic outlook upon structural relationships, and the rapid development of new techniques for examining and recording were met by him in a sound and balanced fashion. In his hands there was no sudden upheaval but a steady change of emphasis. Into his department were introduced features of the anatomical "new look" with radiology, cinematography, electromyography, and modern cytology as its methods of expression. He was essentially a teacher and a great exponent of visual methods of presentation: for this reason he was put in charge of the department of medical illustration at Guy's, and this he brought to a very high pitch of perfection. In his teaching and writing the application of his subject to medicine was ever prominent: his clinical colleagues always received from him interested attention to their problems and sound constructive advice as to a solution.

He was scrupulously attentive to his administrative duties. At meetings he was sparing of speech but always constructive and to the point. He was the faithful champion of the man in a junior position, and all his subordinates worked happily under him. During the second world war he took a large share in the creation of the preclinical school at Tunbridge Wells; for this he faced all the detail, domestic and administrative, of housing, feeding, teaching, and training hundreds of students in quite unprepared surroundings. This work was very exacting, and it took its toll of his not unlimited strength.

For the last five years of his life he played a prominent part in many extra-university activities in which his anatomical and surgical knowledge was of value. Physiotherapy, speech therapy, and rehabilitation made great demands upon his time, and he was actively interested in many of the public bodies and institutions dealing with such problems. Here his balanced judgment and attention to practical detail were invaluable. He thoroughly enjoyed these outside duties, and to pay a visit with him to the rehabilitation unit of some big industrial concern was a very rewarding experience.

As a colleague Whillis was delightful, and if he had any enemies they must have been few in number. A variety of interests outside his work—golf, archaeology, and antiques—a well-informed mind, and a sense of humour made him very pleasant company. He brought to Guy's some of the robust forthrightness of his northern home, and Guy's accepted him as one of the family even as he accepted his adopted parent. He will be remembered by all, colleagues, students, and technical staff, as one who gave them a kindly ear, a helping hand, and an example of devotion to his task. Whatever he undertook he did well. Truly Guy's was fortunate in her adopted son.

F. W. J. COAKER, F.R.C.S.

Dr. F. W. J. Coaker, who died in retirement at his home at Dulverton, Somerset, on January 14, was well known in Worcestershire, having practised for many years in Bromsgrove. He was 83 years of age.

Francis William John Coaker was the son of a yeoman farmer at Kingsbridge, South Devon, and, after receiving his medical training at the London Hospital, qualified M.R.C.S., L.R.C.P. in 1893. After holding several resident appointments at the London Hospital, he obtained

the F.R.C.S. in 1896, and in the following year settled in practice at Bromsgrove, and there and in the surrounding district he was destined to perform his main life's work. In addition to conducting a large general practice he provided an outstanding example of that fast-disappearing type of doctor, the general-practitioner surgeon, who in the past dealt with the surgical needs of the people in the smaller towns and in the countryside. As surgeon to the Bromsgrove Cottage Hospital from almost the time he settled in the town he was largely responsible for the planning of the extensions to the building and the modernization of its equipment. As a result the hospital is now a most efficient unit. Dr. Coaker was able, by his skill as a surgeon and his character as a man, to inspire confidence and a real affection in his patients. These qualities were recognized by his fellow practitioners over a wide area, and they often sought and readily obtained his help and guidance.

Dr. Coaker held many public appointments. In addition to being medical officer of health for Bromsgrove Rural District Council from 1902 to 1946, he was medical officer to the guardians for many years, surgeon to the Worcestershire Mental Hospital, and a governor and later chairman of King Edward VII Sanatorium, Knightwick. In 1917 he was elected a member of the Worcestershire County Council and took an active part in the work of its committees, being one-time chairman of the health committee. Though not a fluent orator he had the gift of inspiring the confidence of his colleagues, besides possessing a wise understanding of persons and an ability to visualize the future when solutions of difficult problems had to be found. The medical profession owes him much for successfully advocating the adoption of the B.M.A. salary scale for public health medical officers in Worcestershire in the mid-twenties, before any national scale had been adopted. In an adjoining county a setback had occurred, but the wisdom and quiet patience of Dr. Coaker were largely responsible for the favourable outcome of a prolonged dispute. He was, when another councillor had failed, invited to act as arbitrator to resolve differences between two nursing associations over boundary lines. The matter was amicably settled by what is known as the "Coaker line." In the affairs of the British Medical Association Dr. Coaker also played a prominent part. He was chairman of the Bromsgrove Division in 1921-2 and of the Worcester and Bromsgrove Division in 1935-6, and president of the Worcestershire and Herefordshire Branch in 1937-8. During the second world war he was acting assistant secretary of the Worcester and Bromsgrove Division. For a number of years he served as a member of the Rural Practitioners Subcommittee of the old Insurance Acts Committee. He was a very active member of the local insurance committee over a long period, and secretary, later chairman, of the medical war emergency committee. Bromsgrove and Worcestershire will long remember the work of F. W. J. Coaker, and the fruits of his labour will always remind his successors of a great man who used his skill and wisdom to the full. —A. J. R.

D. C. M. writes: I first knew Dr. Coaker in 1925, when I went as a young general practitioner to the town of Bromsgrove. I was in an opposing practice, and I wondered what reception I should receive from the others practising there. From the first Dr. Coaker went out of his way to be generous and kind and helpful to me. He was one of the old school of general-practitioner surgeons, and his skill

and experience were of a high standard. He would always readily help me with advice in consultation and was willing to operate on my cases or to educate me in the realms of general-practitioner surgery. He was at the time the father of general practice in the town, and I shall always remember him with great affection and respect.

R. L. HORTON, M.S., F.R.C.S.

Mr. R. Lister Horton, formerly honorary surgeon to the Weymouth and District and Dorset County Hospitals, died at his home in Bournemouth on January 21, aged 65 years.

Robert Lister Horton was born at Torquay on October 22, 1889, the son of Dr. Thomas Horton. From Mill Hill School, where he was an entrance scholar, he went on to study medicine at University College, winning the Bucknill Scholarship. In later life he was elected a Fellow. After qualifying in 1912 and graduating M.B., B.S. in 1913, he held a number of resident posts at University College Hospital before taking the F.R.C.S. in 1914. During the first world war he served as a surgical specialist with the rank of major in the R.A.M.C. in France, being mentioned in dispatches for his services. Returning to University College Hospital after the war, he worked there as surgical registrar from 1919 to 1922. He was awarded the gold medal when taking the M.S. of London University in 1920. In 1922 Mr. Horton was appointed assistant surgeon to the Weymouth and District Hospital, and in a short time he had built up a flourishing surgical and general practice in and around Weymouth, where he was in partnership with Dr. H. L. Tasker and the late Dr. P. S. B. Wetherall. In due course he was appointed to the staff of the Dorset County, Bridport, Herrison, and Portwey Hospitals, and his reputation with the public and among his colleagues stood very high indeed. From 1934 to 1936 he was chairman of the West Dorset Division of the B.M.A., and for some years he was an examiner in surgery to the General Nursing Council. A man of strong character and high principles, he was a natural leader in a quiet and kindly way, and in any emergency his presence alone was enough to restore confidence. He retired from his post of consultant surgeon to the West Dorset group of hospitals only three months before his death. He married Elizabeth, daughter of John Macdonald, and he is survived by his widow and a son and a daughter, who followed her father into the medical profession.

Mr. THOMAS COLLEY writes: Mr. Horton came to Dorset in 1922, for, being married and feeling that the chance of an early staff appointment at University College Hospital was small, he had decided to join a surgical practice in the country. Thirty years ago it was not possible for a man to practise as a consultant surgeon in a semi-rural district. But Horton soon built up a reputation in general practice which was second only to that which quickly came to him as a surgeon. He had an ideal temperament, never hurried, and with a sure touch which spoke of his complete control and mastery of his subject. Additional appointments at the Dorset County Hospital, Dorchester, together with his work at the Bridport Cottage Hospital and Herrison Mental Hospital, demanded so much of his time that the second world war found him occupied almost solely in surgical work. Extra work from shortage of staff together with increasing numbers of military and civilian casualties took its toll, and finally, towards the end of the war, he was ordered a complete rest. His health never altogether recovered, and in 1945 he resigned his appointments at the Weymouth and District and the Dorset County Hospitals, though he continued to visit and work at Bridport

and at the Herrison Mental Hospital until his final retirement. He had always led a full life with outside activities, and in addition to other local appointments he was a county justice of the peace.

Horton was essentially a kindly man, and his many patients will probably remember him best for this quality. He was a genial companion, an excellent colleague, and a tower of strength in times of trouble; his memory will ever remain fresh in the thoughts of those who knew him. It is sad that he should have lived so short a time after his final retirement, but perhaps he might have wished it this way. To his widow, son, and daughter we extend our heartfelt sympathy.

His wide circle of friends in East Lancashire will have learned with deep regret of the death of Mr. A. J. McCREADIE at his home at Shipley, Yorkshire, on January 3. He was 65 years of age. Born at Alford, Aberdeenshire, on April 19, 1889, Anthony John McCreadie was educated at Aberdeen University, where he graduated M.B., Ch.B. in 1913. During the first world war he served as a captain in the R.A.M.C., attached to the Border Regiment, and was awarded the Military Cross in 1917. He held the appointments of medical officer at the military hospital for surgical cases at Alder Hey, Liverpool, where he interested himself particularly in orthopaedic work, and house-surgeon at Halifax Royal Infirmary, before settling at Nelson, Lancashire, where he took over the practice of the late Dr. Andrew Findlay, his father-in-law. He was elected F.R.C.S. in 1920. At Nelson he soon became associated with the local hospitals and served as a general and orthopaedic surgeon to the Burnley Victoria Hospital, the Reedyford Hospital, Nelson, and the Hartley Hospital, Colne, from 1927 until his retirement owing to failing health in 1950, when he was the recipient of a presentation from members of the medical, surgical, and nursing staffs of the Burnley Victoria Hospital. Although an accomplished general surgeon, his main interest lay in the field of traumatic and orthopaedic surgery, and it was fitting that in 1941 he was appointed to take charge of the newly formed fracture clinic at the Burnley Victoria Hospital. A member of the British Medical Association for thirty-five years, he was chairman of the Burnley Division in 1937-8. He was also a past president of the Nelson Rotary Club. His kindly nature, his great generosity, and his keen sense of humour will not soon be forgotten by those friends and colleagues who were privileged to know him. In spite of failing health and the loss of his wife two years ago he never lost those characteristics which endeared him to so many. To his daughter, who cared for him so faithfully during his brief retirement, and to his son, at present serving overseas as a captain in the Royal Signals, our sympathy is extended.—R. O. D.

Dr. SAMUEL EDGERLEY, for nearly 30 years medical superintendent of Menston Hospital, near Leeds, died at his home at Menston on November 16, 1954. He was 87 years of age. Samuel Edgerley was born at Old Calabar, West Africa, where both his father and his grandfather were pioneer missionaries and where both died at an early age. His father, in addition to his missionary work, was an explorer of note, and to his mother, a native of Shetland, he owed the soft intonation of voice which is a characteristic of the people of those isles. As a child Samuel Edgerley knew little of home life, for at an early age he was taken to Edinburgh and left there in the charge of a schoolmaster. After his father's death, when Samuel Edgerley was about 12 to 14 years of age, his mother settled at Portobello, near Edinburgh, and he was able to live with her. He was educated at George Watson's College and at Edinburgh University, where he graduated M.B., C.M. in 1891, having been awarded first-class honours in many subjects and honours in most of the others during his undergraduate career. He was a brilliant student with an excellent memory and with the mental approach of a mathematician to his work. He had been a member of the Watsonians Rugby

football team and never ceased to show a lively interest in the game. After graduation he went as an assistant to Dr. J. C. Balfour, a cousin of Robert Louis Stevenson, at Belford, Northumberland, and he loved to recall those early days. After holding the post of assistant medical officer at Roxburgh District Asylum, Melrose, he joined the staff of Menston Hospital as an assistant medical officer in 1897, remaining to become superintendent in 1906. He held this appointment for 27 years until he retired in 1933. A member of the Royal Medico-Psychological Association since 1895, he obtained its certificate (now diploma) in psychological medicine, and was chairman of the northern and midland division of the association from 1934 to 1936. While at Menston, in 1907, he married Dr. Catherine Mabel Blackwood, a descendant of the founder of the well-known publishing house. They had many interests in common, chief of which was membership of the Brontë Society. Catherine Edgerley was secretary of the society for 17 years and Samuel Edgerley a member of its council, and they did outstanding work in increasing its scope and interest at a time when it was becoming a society of national and even international appeal. While at Menston Dr. Samuel Edgerley's life was devoted to the welfare of his patients. One of his notable characteristics was a quiet sense of humour. He will be missed by many, but especially by those who had good cause to know his sterling qualities and who were privileged to be his friends for so many years. He had been a widower since 1946.

Dr. MARY BUCHANAN LEE, who died at her home at Sefton Park on January 6 at the age of 81, was almost the first woman to practise medicine in Liverpool, being preceded by only a few months by the late Dr. Lucy E. Cradock, who died in 1903. Dr. Lee was inspired by high ideals of voluntary service, and her life was one of devotion to her profession. She was born on May 23, 1873, and received her professional training at the Medical College for Women, Edinburgh, taking the Scottish triple qualification in 1895. She then went straight to Liverpool, where she worked first at the old Maternity Hospital in Brownlow Hill and later at the old Samaritan Hospital in Parliament Street, but only as a "postgraduate student," for at that time women were not eligible for appointment to the medical staff. Both these hospitals have since been demolished and replaced by modern buildings where men and women members of the medical staffs have equal status. Her patients came from all walks of life, but her sympathy was always for the underdog, and she did everything in her power to ease the distress of those who were ill and poor. When the National Health Service came into operation in 1948 she retired from practice, although she continued to attend to the medical needs of a few old and privileged patients.

Medical Notes in Parliament

Cleaner Air Proposals Accepted

The Government's acceptance in principle of the recommendations of the Beaver Committee on air pollution was announced by Mr. DUNCAN SANDYS, Minister of Housing and Local Government, on January 25, when Parliament reassembled after the recess.

The committee, he said, had estimated that the smoke, grit, dust, and noxious gases emitted into the air from domestic dwellings and industrial plant caused damage to property and other harmful effects to the tune of about £250m. a year. To this must be added the value of the heat wasted through excessive smoke, which was assessed by the committee at between £25m. and £50m. a year. These figures took no account of injury to health and loss of life, as, for example, the 4,000 deaths caused by smoke-laden fog in London two years ago.

The committee made a number of important proposals, the adoption of which would, in its opinion, reduce the

density of smoke in the atmosphere to an extent amounting perhaps to as much as 80% over the next 10 or 15 years.

After summarizing the main recommendations, Mr. Sandys said that these were far-reaching proposals. They involved a number of quite complex technical problems and entailed the expenditure of considerable sums of money. In addition, they raised important issues of policy, which directly affected local authorities, industry, and private individuals.

All these various questions were at present being examined by the Government in co-operation with outside interests concerned. He had already had preliminary discussions with representatives of local authorities and the Federation of British Industries. These first meetings indicated that industry would be ready to play its part in implementing this policy, and that the local authorities would be prepared to accept the additional responsibilities involved. The Secretary of State for Scotland was having similar consultations north of the border. At the same time the Minister of Fuel and Power was examining the question of increasing the availability of the smokeless fuels that would be needed.

These studies and consultations had not yet reached the stage at which he could make a detailed statement on the various aspects of this question, but the Government had decided in principle to adopt the policy recommended by the Beaver Committee.

Tuberculosis in Scotland

Mr. A. WOODBURN (Clackmannan and East Stirling, Lab.) asked the Secretary of State for Scotland whether he could report any conclusions as a result of the investigation, initiated in 1949-50, into the causes of the exceptional figures for tuberculosis in Scotland. Mr. J. STUART stated on January 25 that the expert committee which went into the question was unable to identify reasons for the exceptionally high incidence and death rates for respiratory tuberculosis in Scotland in the years immediately after the war. The Scottish position had come more into line with experience in England and elsewhere.

Training for Spastics

Mr. ERIC JOHNSON (Manchester, Blackley, Lab.) asked the Minister of Labour if he was aware of the need for a special approach to the matter of the training and subsequent placement in employment of spastics, whose need was habilitation rather than rehabilitation; and if he would set up, or co-operate with the voluntary organizations in setting up, an experimental unit for this purpose under the provisions of the Disabled Persons Employment Act, 1944. Mr. HAROLD WATKINSON, Parliamentary Secretary, replied on January 25 that he was aware that some spastics at school-leaving age or later might be able to profit from a special course of preliminary training designed to enable them to use their limbs more effectively, and he understood that the voluntary organizations concerned had in mind the establishment of centres where this kind of training could be given. One of the voluntary organizations had discussed this approach with his officers and was aware of the extent of the assistance which could be given at a later stage of training under the provisions of the Disabled Persons (Employment) Act. Mr. JOHNSON said that the existing centres catered chiefly for the very lightly handicapped spastics, and as a result of this the hard core of the problem of the employment and training of spastics was not really touched. Mr. WATKINSON answered that it was hoped, as a result of the initiative of the bodies interested, that there would be further centres. If so, they would do what they could to help.

Examination of Mrs. Christofi

Sir LESLIE PLUMMER (Deptford, Lab.) asked the Home Secretary how many of the doctors who examined Mrs. Christofi were psychiatrists, and what was the extent of their examination. Major G. LLOYD-GEORGE stated on January 27 that, of the three doctors appointed to conduct

a medical inquiry into Mrs. Christofi's mental condition, one held a diploma in psychological medicine, and the other two—a former medical superintendent of Broadmoor Institution and a former director of Prison Medical Services—had long and special experience of cases of this kind. The doctors had two prolonged interviews with the prisoner. They also interviewed the governor of the prison, the Church of England chaplain, the prison medical officers, the Greek Orthodox priest who ministered to Mrs. Christofi, and the prison officers who had charge of her.

Colonial Hospital Services

Mr. THOMAS REID (Swindon, Lab.) asked the Chancellor of the Exchequer if he would give an assurance that, in the Government's scheme of priorities, funds needed urgently for hospitals would take precedence over further gifts to dependencies, which had been allotted £530m. since the end of the first world war. Mr. R. A. BUTLER, replying on January 25, said "No," because the Government and Parliament, in deciding what funds should be allocated for the hospitals and for the Colonies, must be free to have regard to the merits of each individual case as well as to the general financial position. In the current financial year no less than £321m. had been provided for the expenses of the hospital, specialist, and ancillary services.

Preservatives in Food

Lord DOUGLAS of BARLOCH asked the Government on January 25 for what purposes mono-sodium glutamate was added to foodstuffs, and what research had been conducted relating to the effects on health of the ingestion of this chemical in small quantities for prolonged periods. Viscount WOOLTON, Chancellor of the Duchy of Lancaster, told him that the purpose was to enhance the flavour of certain kinds of food. It functioned as a condiment. It was used principally in canned soups and dry soup mixes. Glutamic acid, of which it was a salt, was a normal constituent of food proteins and had not been found to have any adverse effect on health. He was advised that there was no reason to believe that continued use of mono-sodium glutamate would have any such effect.

Lord DOUGLAS asked on January 26 in how many cases during 1954 action had been taken to prevent the sale of oranges and other citrus fruits treated with thiourea, and what had been done to prevent the importation of fruit so treated.

Earl St. ALDWYN, Parliamentary Secretary, Ministry of Agriculture, stated that court proceedings were taken in four cases and warnings were issued in a number of others. In addition, exporting countries, and food and drug authorities and the trade in this country, had been reminded that the sale of any article of food containing thiourea would be a contravention of the Public Health (Preservatives in Food) Regulations. So far as the Government was aware citrus fruit now imported was free of thiourea.

Lord DOUGLAS asked if the Government would make regulations which would ensure that purchasers of oranges and other citrus fruits would be warned when these fruits had been treated with paraffin wax.

Earl St. ALDWYN said the Government did not regard the imposition of such a requirement as desirable or necessary. They were advised that the minute amount of wax remaining on the peel after treatment was harmless. The waxing of citrus fruit was standard practice in U.S.A. and some other countries. Fruit was washed as it came from the groves to remove dirt and other extraneous matter. This washing removed much of the fruit's protective wax, and if this were not restored artificially the fruit would soften and the skin become hard and dry. He added that the quantity of mineral oil permitted in citrus fruit was limited to 0.1 of 1%. This was the same type of mineral oil as was used in the food industry for greasing baking-tins and other appliances with which food came into contact, and it was also used by most exporting countries for the surface treatment of dried fruits.

Proprietary Medicines

Mr. J. K. VAUGHAN-MORGAN (Reigate, Con.) asked the Minister of Health on January 31 what progress had been made in reducing the cost of certain proprietary medicines. Miss PAT HORNSBY-SMITH, Parliamentary Secretary, replied that discussions had been proceeding with the Association of British Pharmaceutical Industry, and the Minister was considering the position now reached. Meanwhile there had been some downward trend in the prices of preparations in those classes which were under investigation, and in addition special provisional reductions had recently been arranged with certain manufacturers in the prices of 19 of these preparations.

Doctors' Lists

The PARLIAMENTARY SECRETARY TO THE MINISTRY OF HEALTH stated on January 31 that on January 1, 1952, the average number of patients on the lists of doctors who were principals was 2,409. The corresponding figure for January, 1953, was 2,325; for July, 1953, 2,239; and for July, 1954, it was 2,210.

Disabled Inquiry.—The Committee of Inquiry on the Disabled is still engaged in hearing evidence from interested bodies, but is expected to furnish its report later in the year.

Islands Air Ambulance.—The D.H. Heron air ambulance will be able to land on the islands of North Ronaldsay, Sanday, and Stronsay, in addition to Orkney and Shetland.

Medico-Legal

DEATH FROM SALICYLATE IDIOSYNCRASY

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

At an inquest completed on January 10, 1955, Professor J. M. Webster gave evidence that the death was the result of personal idiosyncrasy to sodium salicylate.

Louis Jacobs, a corporation bus driver aged 52, was found by his physician, Dr. F. R. Gedye, on December 10, 1954, to be suffering from mild rheumatic fever with a temperature of 99° F. (37.2° C.) following a sore throat. Dr. Gedye put him on to the usual routine treatment of sodium salicylate, 20 gr. (1.3 g.), with sodium bicarbonate, 30 gr. (2 g.), to be taken every four hours. This was duly administered by Mrs. Jacobs. The patient improved and wanted to get up, but on December 20 he developed a sore throat and a temperature of 101° F. (38.3° C.). Oral penicillin tablets improved the throat, and the salicylate treatment was continued. A swab of his throat showed monilia. On the night of December 21 Dr. Gedye was sent for; he found him delirious and with a rash, and sent him into Little Bromwich Hospital.

Next morning his condition was improved, though there was still some confusion. He had an erythematous rash and was moderately dehydrated, but his temperature was 98° F. (36.7° C.) and his general condition good. A blood sample showed a salicylate content of 53 mg. per 100 ml., and he was given fluids with the object of eliminating the salicylate. He started to pass urine copiously, and as it contained 125 mg. salicylate per 100 ml. he was excreting salicylate fast and it was hoped that he would improve. Next day the salicylate in the blood had fallen to 34 mg. per 100 ml., but in the evening he suddenly collapsed and died.

Professor Webster, who carried out the post-mortem examination, found the cause of death to be acute cerebral and pulmonary oedema "due to respiratory cardiac failure." Analysis of the brain and liver showed the high content of 14 and 24 gr. (81 and 146 mg.) salicylic acid respectively. Professor Webster considered that the doses prescribed by Dr. Gedye were quite in keeping with normal medical dosage, and formed the view that this was a case of personal idiosyncrasy to sodium salicylate, causing death.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending January 15 (No. 2) and corresponding week 1954.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1955					1954				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	14	3	5	0	1	21	1	6	0	2
Dysentery ..	402	36	217	15		378	81	147	33	6
Encephalitis, acute	5	0	1	0		3	1	0	0	
Enteric fever:										
Typhoid ..	3	0	0	0	1	4	0	1	1	
Paratyphoid ..	2	0	1	0	0	4	1	0	0	
Food-poisoning ..	114	24				110	12		1	
Infective enteritis or diarrhoea under 2 years				16	7				7	10
Measles*	7,800	791	470	415	56	1,150	18	29	14	160
Meningococcal infection ..	40	3	9	0	2	36	6	13	4	
Ophthalmia neonatorum ..	23	1	9	0		26	1	3	0	
Pneumonia†	1,121	82	302	12	5	963	58	329	14	3
Poliomyelitis, acute:										
Paralytic ..	15	3		4	0	27	1		4	4
Non-paralytic ..	7	0		0	0	13	0		1	
Puerperal fever‡	244	47	8	2		250	28	11	1	1
Scarlet fever ..	465	33	115	55	24	915	36	207	44	37
Tuberculosis:										
Respiratory ..	627	69	116	29		744	90	144	30	
Non-respiratory ..	98	4	19	4		113	7	20	4	
Whooping-cough ..	1,769	156	209	37	43	2,366	97	419	75	93

DEATHS In Great Towns	1955					1954				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	2	2		0		0	0		0	
Encephalitis, acute	0			0		0			0	
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	8	0	5	0	1	10	1	4	2	1
Influenza ..	134	6	4	0		42	4	1	1	0
Measles	0	0	0	0	0	0	0	0	0	1
Meningococcal infection ..	0	0				1	1			
Pneumonia	471	65	25	10	4	432	51	30	14	9
Poliomyelitis, acute	2	1		0		6	0		0	
Scarlet fever	0	0	0	0	0	0	0	0	0	0
Tuberculosis:										
Respiratory ..	96	13	15	1	4	139	15	23	4	10
Non-respiratory ..	0	3	0	0	0	2	3	0	0	1
Whooping-cough ..	3	1	0	1	6	2	0	0	0	0
Deaths 0-1 year ..	237	23	44	9	17	272	33	27	10	23
Deaths (excluding stillbirths)	7,399	1026	795	128	213	7,079	953	754	133	221
LIVE BIRTHS ..	7,343	1100	889	202	420	7,696	1146	879	231	392
STILLBIRTHS ..	211	20	26			218	24	38		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Vital Statistics

Influenza

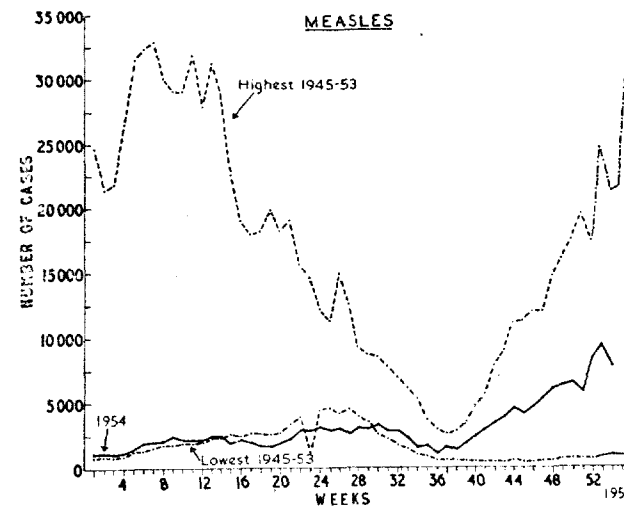
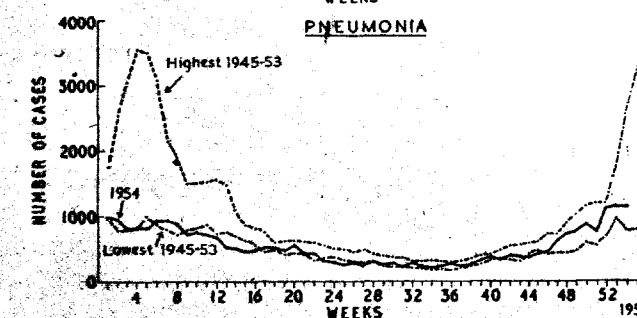
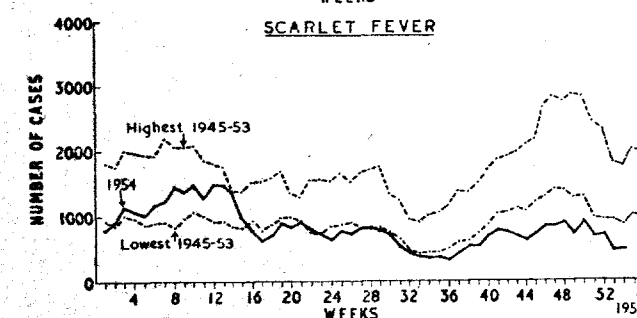
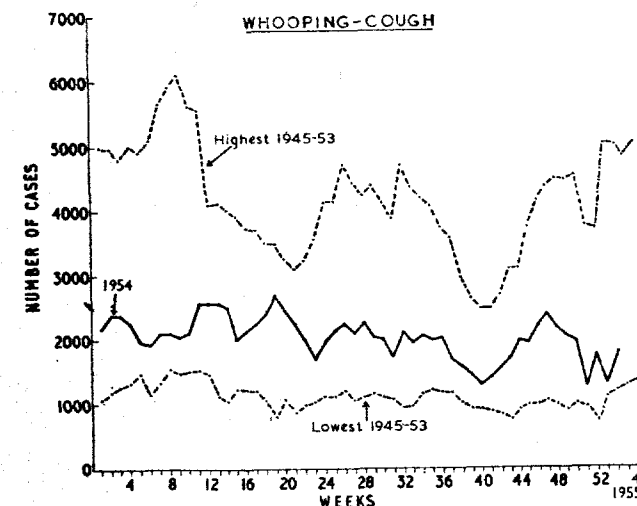
In the week ending January 22 influenza deaths increased by only 2 compared with the preceding week, from 134 to 136, in the 160 great towns of England and Wales. Small increases occurred in London and the south-east, and the eastern, midland, and north-western regions; they were offset by decreases elsewhere. The infection remains clinically mild. The World Influenza Centre reports evidence of virus-B infection in Germany, Holland, Canada, and Malaya.

Smallpox in France

Up to January 18 there had been 59 cases of smallpox, including 8 deaths, in the Morbihan Department.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus -----, the figures for 1954-5 thus ————. Except for the curves showing notifications in 1954-5, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The trend of infectious diseases in England and Wales during the week ending January 15 remained constant with the exceptions of a decrease of 1,585 for measles, from 9,385 to 7,800, and a rise of 56 for dysentery, from 346 to 402.

The largest falls in the incidence of measles were 809 in Lancashire, from 2,841 to 2,032, 213 in London, from 1,004 to 791, 179 in Yorkshire West Riding, from 972 to 793, 96 in Durham, from 503 to 407, 92 in Gloucestershire, from 253 to 161, and 80 in Essex, from 543 to 463, and the largest rises were 67 in Derbyshire, from 235 to 302, and 66 in Berkshire, from 60 to 126. The notifications of scarlet fever were 465, being 2 more than in the preceding week; variations in the local trends were only small. 1,769 cases of whooping-cough were notified, being 22 fewer than in the preceding week; the largest fluctuation was a rise of 36 in London, from 120 to 156. 14 cases of diphtheria, 1 more than in the preceding week, were notified.

22 cases of acute poliomyelitis were notified, and these were 7 fewer for paralytic and 4 more for non-paralytic cases than in the preceding week. The largest returns were 3 in London and in Worcestershire (Dudley C.B. 3).

The largest centres of dysentery were Lancashire 73 (Liverpool C.B. 15, Oldham C.B. 12), Yorkshire West Riding 47 (Sheffield C.B. 13), London 36, Glamorganshire 31 (Swansea C.B. 21), Norfolk 31 (Norwich C.B. 17), Yorkshire North Riding 21 (Middlesbrough C.B. 21), Durham 21, Staffordshire 19 (Stoke-on-Trent C.B. 15), Northumberland 17 (Newcastle-upon-Tyne C.B. 10), and Lincolnshire 16 (Scunthorpe M.B. 14).

Deaths from influenza in the great towns numbered 134, a rise of 32 on the total of the preceding week. The largest numbers of deaths registered were Birmingham C.B. 14, Manchester C.B. 6, London 6.

Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in December was 120, compared with 103 in the previous month and 116 in December, 1953.

The numbers of cases of industrial diseases in the United Kingdom reported during December, 1954, were as follows: lead poisoning 8, chronic benzene poisoning 1, aniline poisoning 2, compressed air illness 2, anthrax 1, epitheliomatous ulceration 14, chrome ulceration 14; total 42. There were no deaths.—*Ministry of Labour Gazette*, January, 1955.

Week Ending January 22

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 650, whooping-cough 2,002, diphtheria 8, measles 7,038, acute pneumonia 929, acute poliomyelitis 24, dysentery 482, paratyphoid fever 2, and typhoid fever 1.

Medical News

President Eisenhower's Health Programme.—On January 31 President EISENHOWER again asked Congress to enact the health programme which he presented last year and which Congress rejected. According to a report in *The Times* he called for "an initial authorization of \$25m. for a federal reinsurance plan which would encourage private insurance companies to offer better protection, especially against expensive illness, and to extend coverage to millions more of the population." He also asked for \$20m. for public assistance cases, and for an increase of \$3m. in the Government's annual subscription to W.H.O.

Epsom's Centenary Appeal.—Lord WEBB-JOHNSON, president of the Royal Medical Foundation of Epsom College, in commending to the public, and especially the medical profession, Epsom's centenary appeal for not less than £150,000, writes: "I beg you to give sympathetic consideration to this appeal, and to subscribe as generously as you can." The money is urgently needed in order to provide improved living quarters for boys and domestic staff, and also better catering facilities. Epsom's close links with the medical profession are well known: about a third of those who go there become doctors, and there are many special awards to help the sons of doctors in difficult circumstances (see this *Journal*, November 27, 1954, p. 1280). The Queen heads the list of donors, and Lord Webb-Johnson himself has given £1,000; other large subscriptions have already been received from the Surrey Local Medical Committee (£650), the Medical Insurance Agency (£500), and the Nottingham Local Medical Committee (£105); and besides these there are gifts of amounts of up to £100 from individual doctors. So far about £12,000 has been raised. Donations should be sent to the Appeals Secretary, Epsom College, Epsom, Surrey. On the occasion of the centenary celebrations on May 13 the QUEEN and the DUKE OF EDINBURGH will visit the College.

World Health Organization.—In Geneva the W.H.O. Executive Board has been making plans for the Eighth World Assembly which opens in Mexico City on May 10. Among the current activities of W.H.O. is the establishment of a network of regional laboratories to identify locally occurring strains of poliomyelitis and related viruses. These laboratories will be extended, and it is expected that information from them will help those concerned with making vaccines and otherwise controlling poliomyelitis. At a meeting of the Board the representative of Japan initiated a discussion on the medical aspects of atomic energy. W.H.O. is participating in the United Nations' international conference on the subject this summer, and Dr. M. G. CANDAU, director-general of W.H.O., gave the Board his views on the most urgent medical problems. He advised further study of radiation-induced diseases, the disposal of radioactive waste and the dangers of industrial nuclear reactors, the health problems of uranium miners, the means of transporting active material, and the basic problems of measuring and standardizing the activity of radioactive isotopes. Another question before the Board is a proposal from Sweden for a study of the prevention of accidents in childhood.

Royal College of Physicians.—At the quarterly comitia on January 27 in London the following were appointed or reappointed as representatives of the College on various outside bodies: Professor A. A. MONCRIEFF, Central Midwives Board; Dr. N. G. HARRIS, National Association for Mental Health; Professor S. P. BEDSON, F.R.S., Conference on the Supply of Experimental Animals; Sir WELDON DALRYMPLE-CHAMPNEYS, Bt., Health Congress of the Royal Sanitary Institute; Dr. E. W. HART, Annual Conference of the National Association for Maternity and Child Welfare. Dr. G. E. S. WARD was reappointed external examiner in medicine for the Faculty of Radiologists.

College of General Practitioners.—Research Newsletter No. 5, which is printed in full in the current issue of the *Practitioner*, describes some of the steps the College is taking to ensure that the standard of research done under its auspices is of good quality. "It will not be in the interests of the College," says the Newsletter, "if work is done in its name which is not of the highest quality." Each regional faculty is to have a research committee, and these committees are asked to keep the College's central research committee informed of all proposed faculty investigations. The College also asks those who wish to publish research work in the name of the College to submit their papers to the council beforehand. To integrate research activities, the College is planning a yearly conference of representatives from all the faculty research committees.

Chair of Psychiatry at Edinburgh.—Professor ALEXANDER KENNEDY, professor of psychological medicine at Durham, has been appointed to the chair of psychiatry at Edinburgh in succession to Sir DAVID HENDERSON. Now aged 45, Professor Kennedy graduated from St. Thomas's Hospital in 1932. He subsequently studied at the Johns Hopkins University Medical School in Baltimore, being awarded a Rockefeller travelling fellowship in neuropsychiatry. During the second world war he was adviser in psychological medicine attached to Intelligence for the Balkan and Middle East Campaigns, and later scientific adviser to the Intelligence Branch of the Control Commission for Germany. After the war he was on the staff at the Maudsley Hospital and St. Thomas's. In 1947 he was appointed to the chair of psychological medicine at Durham University. In addition to books and scientific articles on psychiatric subjects, Professor Kennedy has written radio plays (under the name of Kenneth Alexander), and been a member of the Olympic Games medical executive and president of the medical commission of the Association Internationale de Boxe Amateur.

University College of the West Indies.—On January 20, as part of its Third Inter-American Congress, the American College of Surgeons, led by its President, Dr. A. BLALOCK, paid a one-day visit to Jamaica and to the University College Hospital of the West Indies. Two scientific sessions were held and some seventy Fellows of the College attended. The visitors were entertained to a luncheon given by the Government of Jamaica at the University College, at which PRINCESS ALICE, Chancellor of the College, presided. It is believed that this is the first occasion on which the American College of Surgeons has officially attended scientific sessions in a British Colony.

Classics of Pathology.—An exhibition of "Classics in the Literature of Pathology" opened at the Wellcome Historical Medical Library, Euston Road, London, N.W.1, on February 1, when it was visited by the Section of Pathology of the Royal Society of Medicine. The exhibition, which will remain open until further notice, contains the works of 26 authors, ranging from Celsus and Galen and the Hippocratic writings at one end of the scale to Virchow, Koch, and Metchnikoff at the other.

Princess Louise Children's Hospital.—The medical staff of the Princess Louise (Kensington) Hospital for Children have told both the Governors of St. Mary's Hospital and the Press that they oppose the conversion of the hospital to adult use. The situation was summarized in last week's *Journal* (p. 299).

Sir Charles Dodds, F.R.S., director of the Courtauld Institute of Biochemistry at the Middlesex Hospital, has been appointed a member of the Advisory Council for Scientific and Industrial Research.

Dr. W. F. J. Cuthbertson, who is head of Glaxo's biochemistry research unit at Greenford, has accepted an invitation to lecture to the medical students at University College, Ibadan, during the spring term. Dr. Cuthbertson will remain in Nigeria until the middle of April.

News in Brief.—The Ministry of Health, in a letter to local authorities, has stressed the need to continue public

propaganda against venereal diseases. In 1953 and the first half of 1954 there was a rise in the incidence of both non-specific urethritis and gonorrhoea.

The Comics Campaign Council, which was established in 1953 by the National Committee for the Defence of Children and the London Federation of Parent-Teacher Associations, has started publication of a 3d. bulletin. Its object is to inform people about the campaign against horror comics. Copies may be obtained from Mr. J. Benjamin, 44, Old Gloucester Street, London, W.C.1.

The American Tobacco Industry Research Committee has increased to one million dollars its fund for research on the effects of tobacco on health.

The golden jubilee of the *Nursing Times* falls on May 6 this year. A special number will be issued to celebrate the event.

COMING EVENTS

Finlayson Lecture.—Professor A. A. MILES will lecture on "The Role of Serum Proteins in the Vascular Phenomena of Inflammation" at the Royal Faculty of Physicians and Surgeons, Glasgow, on February 9 at 5 p.m.

Television.—Dr. GREY WALTER, from the Burden Neurological Institute, Bristol, will demonstrate electro-mechanical models illustrating theories about the working of the human brain. Friday, February 11, at 8.45 p.m.

Insect Pests.—Exhibition of insect pests causing damage to the nation's food and health at the Royal Sanitary Institute, 90, Buckingham Palace Road, London, S.W.1. Open February 14 to March 12.

International Symposium in Cardiovascular Surgery.—At the Henry Ford Hospital, Detroit, March 17 to 19. Subject: "Recent Studies in Physiology, Diagnosis, and Technique." Those wishing to attend should apply to the Secretary, International Symposium on Cardiovascular Surgery, Henry Ford Hospital, Detroit, 2, Michigan.

Refresher Course in Child and Family Psychiatry.—At the Department of Child Psychiatry, Ipswich Group Hospitals, March 28 to April 1. Open to all medical practitioners. No fee. Early application to Child Psychiatry Clinic, 11, Fore Street, Ipswich.

International College of Surgeons.—Twentieth anniversary congress in Geneva, May 23 to 26. Further information from the secretariat at 6-8, rue de la Confédération, Geneva.

SOCIETIES AND LECTURES

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

Monday, February 7

INSTITUTE OF PSYCHIATRY.—5.30 p.m., Dr. E. Stengel: lecture-demonstration.
OXFORD UNIVERSITY.—At Physiology Theatre, 12 noon, Professor G. L. Brown, F.R.S.: Sympathetic Nervous System.

Tuesday, February 8

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor J. R. Squire: Correlation Between Laboratory and Clinical Findings in Hypersensitivity.
CHELSEA CLINICAL SOCIETY.—At Rembrandt Hotel, 8.30 p.m., discussion to be opened by Right Hon. Lord Justice Denning, P.C., Q.C., and Dr. R. Forbes: Increase in Medical Litigation.
OXFORD UNIVERSITY MEDICAL SOCIETY.—At Radcliffe Infirmary, 8.15 p.m., Dr. B. E. D. Cooke: Mouths and Gift-Horses.
ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Milroy Lecture by Dr. J. A. Smiley: Personal Factors in Accident Proneness.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Imperial Cancer Research Fund Lecture by Dr. E. F. Scowen: Significance of the Endocrine in Breast Cancer.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Dr. H. A. Davidson: Infertility in the Male.

Wednesday, February 9

HARVEIAN SOCIETY OF LONDON.—At St. Mary's Hospital, Paddington, W., 5.30 p.m., clinical meeting.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Allergic Vasculitis.
INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. J. G. Sandrey: Vesical Neoplasms.
NOTTINGHAM MEDICO-CHIRURGICAL SOCIETY.—8.30 p.m., Mr. H. J. Seddon: Infantile Paralysis.
ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Finlayson Lecture by Professor A. A. Miles: Role of Serum Proteins in the Vascular Phenomena of Inflammation.
ST. MARYLEBONE HOSPITAL FOR PSYCHIATRY AND CHILD GUIDANCE.—5.30 p.m., Dr. M. S. M. Fordham: Psychological Treatment in Childhood.

Thursday, February 10

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, W., 8 p.m., Dr. James Moore: Concept of Unity in Psychosomatic Medicine.
BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor C. H. Gray: Chemistry of the Porphyrins.
GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.—At Glasgow University Union, 7.30 p.m., Mr. Henry Wapshaw: Excursions in the Biliary Tract.
HUNTERIAN SOCIETY.—At Savoy Hotel, annual dinner.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Animal Parasites of the Skin.
LIVERPOOL MEDICAL INSTITUTION.—8 p.m., Dr. P. H. Whitaker and Dr. A. John Robertson: Tin Smelters' Pneumoconiosis (with colour film); Dr. E. Sherwood Jones: Scientific Investigation of Disease as Illustrated by Observations on Blood.
ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Milroy Lecture by Dr. J. A. Smiley: Personal Factors in Accident Proneness.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor P. H. Newman: Spondylolisthesis, its Cause and Effect.
ST. ANDREW'S UNIVERSITY.—At Physiology Department, Medical School, Small's Wynd, Dundee, 5 p.m., Professor W. I. C. Morris: Sudden Death in Pregnancy and Childbirth.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. D. J. Williams: neurology demonstration.

Friday, February 11

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. P. F. Borrie: Vascular Disorders.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Dr. J. Smart: Miscellaneous Cases.
INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—3.30 p.m., Mr. C. Gill-Carey: Epistaxis.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—(1) 2 p.m., Mr. J. R. Armstrong: Differential Diagnosis of Sciatic Pain. (2) 4 p.m., Dr. J. W. Todd: Healthy Living.
ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Dr. Eric G. Oastler: Cushing's Syndrome and the Adreno-genital Syndrome.
ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., dissertation by Mr. D. R. Millar: Epilepsy.

Saturday, February 12

KENT PAEDIATRIC AND CHILD HEALTH SOCIETY.—At Children's Clinic, Farnborough Hospital, 3 p.m., Dr. C. O. Carter: Eugenic Society's "Proposed Investigation into Promising Families."
SOUTH-EAST METROPOLITAN REGIONAL TUBERCULOSIS SOCIETY.—At London School of Hygiene and Tropical Medicine, 10.30 for 11 a.m., discussion, Dr. W. Hartston and Dr. J. F. Galloway: Preventive Measures in Pulmonary Tuberculosis.

APPOINTMENTS

McLAUGHLIN, G. P., M.B., Ch.B., D.P.H., D.C.H., Deputy Medical Officer of Health and School Medical Officer, Exeter.
MAYER-GROSS, W., M.D., F.R.C.P., Senior Fellow in the Department of Experimental Psychiatry, University of Birmingham, Part-time Consultant Psychiatrist, Winson Green and Uffculme Hospitals, Birmingham.
STEPHENS, L. SPENCER, M.B., Ch.B., D.P.H., D.Obst.R.C.O.G., Medical Officer of Health for Droitwich Municipal Borough, Droitwich Rural District, and Martley Rural District, and Assistant Medical Officer to Worcestershire County Council (combined appointment).

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Cummins.—On January 29, 1955, at St. Asaph Maternity Hospital, Flint, North Wales, to Eva (formerly Fisch), M.B., B.S., wife of Major George Cummins, a son.
McDougall.—On January 10, 1955, to Jean, M.B., Ch.B. (formerly Roberts), wife of Dr. Neil McDougall, 66, Egilsay Street, Glasgow, N., a sister for Sheena—Marion Cameron.
Powell.—On January 14, 1955, at the City General Hospital, Sheffield, Yorks, to Elizabeth Jean, wife of Dr. G. D. Powell, 56, Bents Drive, Sheffield, a daughter—Melinda Siân.

DEATHS

Bradbury.—On January 13, 1955, John Cecil Openshaw Bradbury, M.R.C.S., L.R.C.P., aged 81.
Coaker.—On January 14, 1955, Francis William John Coaker, F.R.C.S., of Hele House, Dulverton, Somerset, formerly of Bromsgrove, Worcestershire, aged 83.
Harris.—On January 12, 1955, at his home, Trees, Chislehurst, Kent, Herbert Harris, M.D., formerly of Rochdale, Lancs.
Jones.—On January 9, 1955, Cecil Meredith Jones, M.B., F.R.C.S., of 134, Addiscombe Road, Croydon, Surrey.
Leeming.—On January 9, 1955, at 2, The Quadrant, Bristol, Arnold Leeming, M.B., F.R.C.S.Ed.
Livingston.—On January 10, 1955, at his home, 85a, Ebury Street, London, S.W., Clement Livingston, L.M.S.S.A., aged 31.
Quin.—On December 23, 1955, at Addington Hospital, Durban, South Africa, Henry Christian Ernest Quin, L.R.C.P.&S.Ed., L.R.F.P.S., D.P.H., D.T.M.&H.
Trench.—On January 13, 1955, at San Remo Towers, Bournemouth, Hants, John Henry Trench, M.B., B.Ch., aged 76.
Walker.—On January 10, 1955, at "Highclose," St. Mary's Avenue, Carlton Grange, Bailey, Yorks, William Walter Walker, M.R.C.S., L.R.C.P., aged 80.
Westrup.—On January 13, 1955, at St. Edmund's Nursing Home, Ipswich, Suffolk, Joseph Percival Westrup, M.R.C.S., L.R.C.P., formerly of Salisbury, Wilts, aged 92.
White.—On January 6, 1955, at Sutton, Surrey, Robert George White, M.B.E., M.B., Ch.B., aged 79.
Wolters.—On January 5, 1955, the result of a car accident, Philip Benjamin Wolters, M.B., B.S., F.F.A.R.C.S.
Yule.—On January 6, 1955, at Adamson Hospital, Cupar, Fife, George Pratt Yule, M.D., F.R.C.P.Ed., of Gowan Park, Cupar.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Retrolental Fibroplasia

Q.—What is the fundamental lesion in retrolental fibroplasia, and what is the prognosis? What percentage of premature babies develop the condition if kept in an incubator?

A.—The fundamental lesion in retrolental fibroplasia is angioblastic in nature and is due to an excessive proliferation of the developing retinal vessels of the premature eye. The exuberant vasoformative tissue bursts through the internal limiting membrane of the retina and invades the vitreous. If the disease progresses, intravitreal organization results in total or partial retinal detachment; the organized tissue comes to form a fibrous membrane behind the lens, and, since the disease is bilateral, vision is lost or seriously impaired. Quite recently it has been shown by workers in Britain that high concentrations of oxygen have the peculiar property of obliterating developing retinal vessels, so that when the infant is transferred to air the retinal blood supply is grossly inadequate and an abnormal degree of vasoformation is thereby stimulated.

Prognosis depends upon whether retinal detachment develops or not, for while the early stages of the condition may regress it is generally agreed that once a marked degree of retinal detachment has occurred the disease is irreversible and no treatment is known which can modify the subsequent development.

Since it has not been the general practice in Britain to examine all premature babies ophthalmoscopically, it is not possible to give an estimate of the percentage of babies developing the condition in oxygen incubators, nor are figures yet available for the incidence of blindness from this cause. However, some idea of the extent of the problem may be obtained from American figures. Of infants weighing less than 3 lb. (1.36 kg.) at birth 50-60% treated with oxygen have early manifestations of the disease and 10-20% have permanent residual lesions. It has been estimated that approximately 650 cases of advanced retrolental fibroplasia are to be expected in the United States each year.

The importance of controlling the concentrations of oxygen in incubators can hardly be overstated, and all those responsible for the care of premature infants should be aware of the dangers of oxygen therapy. A recent report from the Johns Hopkins Hospital states that restriction of oxygen to not more than 40% led to a marked drop in incidence over a two-year period in both residual lesions and membranes, as compared with a previous period of unscrutinized high oxygen therapy. Survival rates were not adversely affected by restriction of oxygen.

Syphilis from Blood Transfusion

Q.—Is it held to be possible to contract syphilis by means of a blood transfusion? In an emergency, such as a ruptured ectopic, should a Kahn test always be done before the blood is used?

A.—The literature contains many reports of the transmission of syphilis by the transfusion of blood collected from infected donors at a stage of the disease when spirochaetes were present in the blood. The introduction of stored blood and the routine serological testing of all blood donors has undoubtedly diminished the number of these accidents. The spirochaete can survive for many hours in blood after its withdrawal from the body, but, as the work of Bloch,¹ Turner and Discker,² Kolmer,³ and Selbie⁴ showed, the spirochaete will not survive in citrated blood kept at 4°-6° C. for more than 72-96 hours. It is generally agreed that blood stored for five to six days or more at 4°-6° C.

is safe, and it is possible that blood stored for 24 hours at this temperature is safer than fresh blood in this respect.

Most would agree that, if only blood which has not been serologically tested is available for a transfusion which is deemed to be life-saving, and if the circumstances are such that the transfusion must not be delayed, it is justifiable to expose the patient to the risk of contracting syphilis from the blood transfused. In such circumstances certain precautions can be taken to protect the patient:

(a) The donor could subsequently be subjected to a clinical examination and tests for syphilis at monthly intervals for three months. Should the donor be found to be infected, vigorous anti-syphilitic treatment of the patient can then be instituted at once.

(b) Consideration might also be given to the addition to serologically untested blood of certain spirochaetocidal substances, such as penicillin, which were described in a previous answer.⁵ The literature appears to contain only reports of laboratory experiments, and the writer does not know whether these methods have been successfully used in clinical practice.

(c) Anti-syphilitic treatment of the patient could be instituted at once on the assumption that the donor was infected. Such a course of action has many obvious disadvantages, and in most instances it would have been followed unnecessarily. It is probably better to wait until the donor or the patient exhibits evidence of infection. There is one exception to this advice—the pregnant woman. In such an instance the patient should be told the circumstances which led to her exposure to the risk of contracting syphilis from the transfusion, and anti-syphilitic treatment should immediately be started.

REFERENCES

1. Bloch, O. (1941). *Bull. Johns Hopk. Hosp.*, 68, 412.
2. Turner, T. B., and Discker, T. H. (1941). *Ibid.*, 68, 269.
3. Kolmer, J. A., and Rule, A. M. (1942). *Amer. J. Syph.*, 26, 156.
4. Selbie, F. R. (1943). *Brit. J. exp. Path.*, 24, 150.
5. *British Medical Journal*, 1954, 1, 1166.

Nephritis and Pregnancy

Q.—My patient is an unmarried girl aged 18 years. Four years ago she had acute nephritis. Although apparently well, she has a persistent albuminuria. The latest report on her urine is S.G. 1010, protein ++; centrifuge deposit contains numerous epithelial cells and a few red cells; blood urea, 28 mg.; B.P. 120/75. A number of previous tests have been similar to the above. She now wishes to marry. What advice should I give her on pregnancy?

A.—This girl undoubtedly has some form of nephritis (probably Type I), and the continued presence of red blood cells in the urine suggests that the disease is not yet quiescent. She should be advised to avoid pregnancy in the immediate future. From the standpoint of age she can well afford to wait some time, and it is not impossible that the urinary picture will change for the good. Later, if the albuminuria improves and the patient's desire for pregnancy becomes urgent, full investigation, including renal function tests and retinoscopy, should be carried out before an opinion is expressed.

As a rule, pregnancy and chronic nephritis form a dangerous combination. There are a considerable and possibly fatal risk to the mother and poor prospects for the foetus, which is often lost by way of abortion, placental infarction, or immaturity. The small chance of obtaining a live child should be stressed if the patient takes the view that she would be happier to risk her life rather than forgo pregnancy, and, ordinarily, the medical attendant should advise against pregnancy so long as any evidence of nephritis is present. It should be added, however, that when this advice is not heeded it is very occasionally found that a woman with heavy albuminuria (and even a raised blood urea) tolerates pregnancy surprisingly well and produces a healthy, well-developed baby. This exceptional outcome is most likely to be seen when the nephritis is unaccompanied by hypertension, as in this case, but it would be unwise to count on it.

Hormones and the Bust

Q.—I seem to recall some time ago you published an account of hormone therapy, giving the dosage which would produce breast development in women in whom this had failed. The patient is a constitutionally thin but healthy young woman whose menstrual function appears to be fairly normal.

A.—In a question and answer published in 1948¹ it was suggested that the development of the breasts might be improved by daily local inunction with an ointment containing 2 mg. oestradiol benzoate per gramme, the treatment being continued for several months. In addition, progesterone 10 mg. intramuscularly every two days, or ethisterone 10 mg. sublingually three times a day, could be given, but only during the 10 days preceding each menstruation.

In the present case there is no reason to believe that the hormone production by the body is deficient, and the trouble, if any, may lie in refractoriness of breast tissue. There may therefore be no response to hormone therapy. Moreover, any effect hormones may have is likely to be lost when treatment is suspended. The size of the breast is determined more by deposition of fat than by the amount of glandular tissue. This patient is constitutionally thin, and this is the more likely explanation for a small bust measurement. Perhaps the best treatment would be for the patient to try to increase her weight. The question does arise, however, of how far it is possible or desirable to attempt to alter the size and shape and other constitutional characteristics of healthy individuals.

REFERENCE

¹ *British Medical Journal*, 1948, 1, 583.

Deviated Nasal Septum and Asthma

Q.—Clinically I have found that deviation of the nasal septum may be quite often associated with asthma and other pulmonary diseases. Is this relationship recognized, and, if so, what is the nature of the association?

A.—There is no special connexion between deviation of the nasal septum and asthma. Patients with asthma often have in addition allergic rhinitis, and if there is any structural abnormality of the nose they are commonly advised to have this put right. Usually this does not improve the asthma.

Precautions at Half-term

Q.—In a preparatory boarding school with an age range of 8–13 years it is customary to allow daily outings at the half-term week-end, but not travel by train and sleeping overnight at home. Will you please state how far this latter restriction is likely to be helpful in preventing infectious disease in the school?

A.—Of boys aged 13 leaving a preparatory school 75% have immunity against chickenpox and measles, even more against whooping-cough, as judged by the very few who get it later, and probably 60% against rubella and mumps. On entry at 8 years of age approximately 30% would have had chickenpox and measles, 50% whooping-cough, and 10% rubella and mumps. It is now assumed that an equal number have had subclinical rubella and mumps. Therefore in five years boys of this age group acquire two or three of these common complaints despite all reasonable precautions.

The restriction suggested is of greater theoretical value than practical, provided that sensible precautions are taken. Sleeping overnight at home, which for some reasons is frowned upon by headmasters, prevents unnecessary visits to hotels and tea-rooms, and the child's enjoyment of his home offsets any nostalgia. A medical officer of a famous public school which has long mid-term exeats once stated that in over 20 years' experience he had seen no medical harm from this. Preparatory boarding schools might well try the experiment with high hopes of success.

NOTES AND COMMENTS

Tincture of Belladonna.—Dr. G. F. B. PAGE (Exeter) writes: Your expert is undoubtedly correct in 99.9% or more cases ("Any Questions?" January 15, p. 178). But the odd case does occur where constipation, which belladonna may aggravate, may cause even small doses of the drug to become cumulative and toxic. Moreover, some people are more susceptible than others. The last case of belladonna poisoning seen by me (sent to hospital as scarlet fever) was of this nature, the symptoms being rash, dry mouth, dilated pupils, and mild confusion. The patient had been taking a mixture containing a trivial amount of the drug.

OUR EXPERT writes: Even if full allowance is made for individual variation in response and delay in absorption it is difficult to envisage toxic effects of this severity arising from small doses of belladonna. Mental confusion is the result of the central effects of atropine on the cerebral cortex and does not usually occur with doses of atropine below 5.0 mg. (1/12 gr.). This is equivalent to 16 ml. (240 minims) of tincture of belladonna or approximately a full 8-oz. bottle of medicine containing 15 minims of the tincture in each half-ounce dose.

Scarlet Fever and Nephritis.—Dr. R. E. O. WILLIAMS (London, N.W.9) writes: The recent observation that the streptococci causing throat infections complicated by acute nephritis are almost always of the serological type 12¹² throws considerable doubt on your expert's assertion ("Any Questions?" January 1, p. 55) that nephritis is in some way due to the "scarlatinal" toxin of the streptococcus, because several other types of streptococcus are found in scarlet fever cases—at least as often as type 12—and they are only very rarely associated with the development of nephritis. It is not known whether nephritis follows type 12 scarlet fever more commonly than it follows a type 12 sore throat without rash, but none of the patients reported by Wilmers *et al.*² had had scarlet fever.

REFERENCES

- ¹ Rammelkamp, C. H., jun., Weaver, R. S., and Dingle, J. H. (1952). *Trans. Ass. Amer. Phys.*, 65, 168.
² Wilmers, M. J., Cunliffe, A. C., and Williams, R. E. O. (1954). *Lancet*, 2, 17.

OUR EXPERT writes: It was not categorically stated that nephritis never follows streptococcal tonsillitis (where no rash is present). The author's very extensive experience has never included a post-tonsillitis nephritis and it must be reasonable to assume that it is much less common in such circumstances. The fact that nephritis is far less common in those patients treated with antitoxic serum gives strong support to the assumption that early neutralization of the erythrogenic factor has an important bearing on prevention of nephritis. It may be possible that a "nephritogenic" factor is also neutralized. That type 12 streptococcus has been found to have a high "nephritogenic" factor seems indeed to be amply proved. It would be interesting to evaluate serum therapy in such cases in future, even when no obvious erythema was present.

Transfusion Problems in a Small Hospital.—In the description of the cross-matching technique recommended for the "occasional transfusionist" ("Any Questions?" January 29, p. 301), the method of reading the results should have read: "If the tubes marked 'test' show even a few clumps of cells, while those marked 'control' show none, then the blood should be regarded as incompatible."

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Atiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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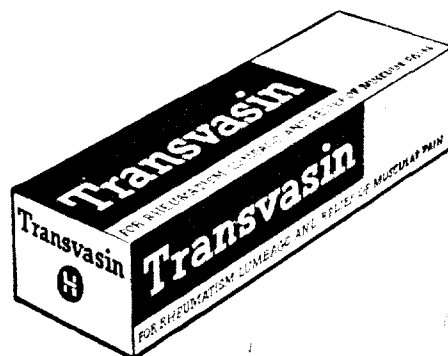
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BRITISH MEDICAL JOURNAL

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ERRORS OF DIAGNOSIS IN PAEDIATRICS*

BY

BERNARD SCHLESINGER, O.B.E., M.D., F.R.C.P.

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One of the few benefits which a physician gains from advancing years is experience through his mistakes. The account that follows is not only a personal confession, but also a review of some of the errors encountered during the course of thirty years in practice.

The subject requires some tabulating under various headings, which can be incorporated under four main aspects, all based on misconceptions or false interpretations. References are also made to overpopular diagnoses and to mistakes that are made by giving too much or, alternatively, too little significance to certain clinical features.

Disease Patterns in Adults and Childhood

Errors are sometimes made by imposing, as a kind of miniature replica, the pattern of disease of adults on to childhood. As a rule, in fact, illness in children tends to be much more acute and overwhelming, but there are some infections which have an entirely different clinical picture. Tuberculosis is a good example. Children with a chronic cough, mild pyrexia, anorexia, loss of weight, a debilitated look, and a history of sweating at nights are often thought to be tuberculous. Phthisis, which these symptoms suggest, does not occur in childhood, except in the rarest circumstances, and the diagnosis generally turns out to be an intestinal disorder once described by Eustace Smith as "mucous disease." Children with this disorder have a coated tongue, halitosis, and mucus in the stools. Sometimes threadworms are also present. Night sweats have probably raised the greatest suspicion, but this symptom is so common in childhood as almost to be physiological, if it is not the result of too much clothing and bedding, with lack of sufficient ventilation.

Otitis media in infants may progress without the usual warnings, and the drum finally ruptures after a stormy illness; earache may never have been present, or may have been difficult to establish. Vomiting and diarrhoea may have been the predominant feature, confusing the issue, and no reliance can be placed on pyrexia and leucocytosis, which may well be absent.

At this early age, also, quite advanced meningitis may occur before the right diagnosis is established. Rapid increase of intracranial pressure is largely avoided by separation of the sutures, so that the classical features of the disease do not arise until late, and various wrong conjectures are made. Bulging of the fontanelle instead

of depression, to conform with the general state of dehydration and wasting, should finally throw true light on the condition.

Misconceptions

Perhaps the most dangerous diagnosis to make in an obviously sick infant is teething. Throughout the centuries it has been the refuge for doctors who are at a loss to know what is wrong. In this way I have known erysipelas, otitis, pyelitis, meningitis, and pneumonia go unrecognized. Although a physiological process, babies can be severely disturbed during the process, but all other sources of their trouble should be excluded before "teething" is blamed. The situation is not made any easier by the fact that during this episode the child's particular weakness may be set off, such as an attack of bronchitis or "croup," an intestinal upset, or even a fit.

Reactions of the blood to simple infections in children can be misinterpreted. Twice I have seen the lymphocytosis of pertussis labelled leukaemia. No diagnosis could be more serious, as the implications are so well known to most parents, and once made it is difficult to retract what has been said. With modern methods of bone-marrow puncture such a mistake could hardly occur.

Masked Clinical Picture

The course of pneumonia has been entirely altered by modern therapy, and it is rarely now a serious disease of some duration. Nevertheless, errors in its diagnosis and the oversight of other underlying conditions can occur. It can mask pertussis, which becomes obvious only as the pulmonary complication subsides. This may have troublesome consequences from spread of the infections to others in a ward before it is recognized.

In children, asthma is usually accompanied by so much catarrh and bronchial secretion that the clinical picture may be more like pneumonia. A history of repeated attacks of this nature of surprisingly short duration, and the association of an expiratory spasm with the general dyspnoea, should put the diagnosis straight and direct the correct treatment.

When an apparently straightforward case of pneumonia fails to react rapidly to penicillin or some other suitable antibiotic, and the clearing pulmonary skiagram reveals cyst-like cavities, the mystery of the protracted course seems to be explained. Still, it is unwise to jump to the conclusion immediately that cystic disease of the lung is present, as in some cases complete disappearance of the cavities eventually occurs. The "cysts" were

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abscesses which finally healed, and this can be demonstrated only by a series of x-ray films.

Turning to alimentary disorders, coeliac and fibrocystic disease (muco-viscidosis) in infants can be completely masked by diarrhoea. Gastro-enteritis which fails to improve with standard modern therapy after a reasonable period should raise a suspicion of one or other of these two disorders. Fibrocystic disease will be associated with very evil-smelling stools and possibly some pulmonary trouble as well.

One is never on safe ground in regard to appendicitis. To miss the condition in childhood is particularly serious, as peritonitis may so easily follow. An unusual position of the appendix behind the caecum or ascending colon is a well-known trap in the diagnosis, as then no tenderness and rigidity in the right iliac fossa need be present. I find that the good family doctor has an uncanny intuition in regard to this disease, and a specialist who disregards an opinion from that quarter is indeed a foolish man. When in doubt surely it is wiser to explore.

The situation has been further complicated by all too ready administration of antibiotics in doubtful cases. This can lead to an infected appendix being brought half under control; later it may rupture and produce a pelvic abscess. Diarrhoea may then be one of the main symptoms and, with the tense and tender abdomen, suggest some other abdominal disorder such as typhoid fever.

Misinterpreted Symptoms and Signs

Mothers often say they are able to tell the difference between their babies' crying from pain or from hunger; I wonder. The fact remains that the majority of infants who are brought to the doctor with supposed "colic" are suffering from underfeeding, and the trouble is easily remedied.

The aches and pains of muscular strain and spasm in genu valgum can be mistaken for those of subacute rheumatism, but rheumatic children seldom complain only of their legs. A much more serious error is to call osteomyelitis acute rheumatism. This has happened so often that a warning is given in most textbooks.

It should not be difficult to differentiate a tic from chorea, but they are continually being confused. When analysed, no choreic movement is entirely repetitive or can ever be said to have served a useful purpose. Children with tics, on the other hand, have insight into their ailment and can be encouraged to demonstrate their habit. The correct diagnosis is of more than academic importance, as the treatment of the two conditions is diametrically opposed.

A faint should be easy to distinguish from a fit if careful inquiry is made into the circumstances immediately preceding its occurrence, the aspect of the patient during the attack, and his behaviour afterwards. Emotional breath-holding in young children with resultant cerebral anoxia is easily recognized, although mistakes have been made and something more serious suspected. The real trouble arises in deciding whether a true fit is due to epilepsy or is merely an associated symptom of some febrile complaint. There are indeed some authorities who believe that "symptomatic" fits can occur only in potential epileptics. Certainly the E.E.G. gives some assistance, but one must always be quite convinced before labelling a child an epileptic.

Vomiting by its frequency in so many disorders of childhood inevitably leads to errors in diagnosis. Some newly born infants vomit all fluid for the first few days, and are soon thought to have a congenital abnormality of the alimentary tract. Abdominal distension and peristalsis are important signs in any form of intestinal obstruction, but are not always obvious and depend on the position of the lesion. Radiological evidence of pooling of air in the upper part of the gut and its absence at a lower level is sometimes

helpful in the diagnosis, but fluid levels can be misleading. If meconium has been freely expelled and there is no bile in the vomit it is safe to wait. Passage of a rubber catheter into the stomach will exclude an oesophageal malformation. An unusual amount of mucus is often found in the vomit; this seems to be the main source of the trouble and can be remedied by gastric lavage.

Age is important. Certain diagnoses can be discounted on this alone—hypertrophic congenital pyloric stenosis, for instance, when symptoms first appear after the age of 3 months.

Vomiting and headache together are such classical features of serious intracranial disease that I hesitate to mention them. Errors are still made by the unwary, and the possibility of a brain tumour, tuberculous meningitis, or some other serious complaint must at least be considered. Migraine and cyclical vomiting should never be diagnosed until renal and cerebral disease have been excluded. With this in view the fundi are an important part of the physical examination. Lead-poisoning is rare, but should be noted as likely to give rise to a similar mistake.

There are a number of physical signs which are open to misinterpretation. An apical systolic murmur is commonly attributed to an organic lesion with little justification. It is a decision that must not be lightly taken; rheumatic carditis is usually diagnosed and the child unnecessarily condemned to a semi-invalid life. An intense murmur immediately after the first sound, with a fairly wide area of conduction, becoming louder on exercise and better heard with the child recumbent, is more likely to be due to an organic lesion. Cardiac enlargement, the presence of a thrill, and possibly a rheumatic history would be confirmatory evidence.

Paroxysmal tachycardia in infants may masquerade as an acute abdomen. Cardiac failure can rapidly appear, and the enlarged tender liver may give rise to such abdominal rigidity that it cannot be easily palpated. Vomiting may be present and the child show speedy signs of distress. Concentration on the abdomen may result in the tachycardia being overlooked. I have seen a case like this saved from surgical intervention just in time.

Another condition which may appear to be a surgical emergency is acute enterocolitis of the dysentery group with melaena, which has to be distinguished from intussusception. On the other hand, melaena is not necessarily present in all cases of intussusception, particularly when the condition is incomplete or recurring.

In the past, scurvy has also been mistaken for osteomyelitis.

It is perhaps not generally known that a transient glycosuria may occur after severe vomiting or starvation, with resulting ketosis. Further urinary tests should therefore be made, especially after the child has been given some sugar, before the possibility of diabetes mellitus is entertained. I need hardly remind you that coli bacilluria commonly gives rise to signs suggesting an acute abdominal condition, and that this urinary infection, acute appendicitis, tuberculous peritonitis, and enteric fever have all to be considered in a differential diagnosis. The physical signs of appendicitis and tuberculous peritonitis are sometimes so indistinguishable that laparotomy is the safest procedure.

Urethral valves in boys usually lead to bilateral hydronephrosis and hydroureters, which easily become infected. Sometimes congenital aplastic kidneys are present. Uræmia is the main feature, with vomiting and an intestinal upset. The enlarged ureters may be mistaken for dilated gut, and the whole clinical picture looks more like some alimentary disorder. As the condition is rare, this is all the more likely to happen.

A more common complaint is incontinence of faeces, and the child suffers from continuous soiling of his pants. Some of these cases find their way quite wrongly to child guidance clinics; others are diagnosed as Hirschsprung's disease. The rectum is found to be loaded right down to the anus, and

faeces can often be felt on abdominal palpation. The condition is really a very severe dyschezia due to bad bowel habits, sometimes originating from defaecation fears due to pain of an anal abrasion or fissure. Absence of enuresis should exclude any psychological factor.

On the other hand, a true case of Hirschsprung's disease may be overlooked in infancy when it presents all the features of lower intestinal obstruction. The most likely disorder with which it is apt to be confused in the immediate neonatal period is meconium ileus, the infantile variety of fibrocystic disease.

The only common blood disease which may lead the doctor astray is leukaemia, since it may first appear in various obscure ways—as a case of serious anaemia, agranulocytosis, purpura, generalized adenitis—or give rise to bone pains from subperiosteal deposits and be mistaken for rheumatism.

Only two neurological difficulties will be discussed. Todd's paralysis after an epileptic fit may persist for quite an appreciable time and cause anxiety in respect of some organic lesion of the central nervous system. "Otitic" or "toxic" hydrocephalus is a mysterious complaint which has quite often been confused with a brain tumour. No one could be blamed for subjecting a child to ventriculography and even more drastic measures when headache and vomiting with papilloedema are so striking. It is true there may be no localizing signs, but these are not invariably present with a centrally placed neoplasm. There seems to be no way of avoiding this mistake.

Finally, Still's disease may be puzzling when it arises with little or no arthritis, and merely with an irregular undulating fever, a rash, and a neutrophil leucocytosis. The possible diagnoses will then be legion. Alternatively, pericarditis may be present at the onset and rheumatic fever would then seem to be the correct diagnosis. It is perhaps not generally known that rheumatoid arthritis in childhood may first attack one joint alone. The fever, leucocytosis, and toxic state of the child will naturally lead to fear of a pyogenic arthritis, and the doctor in charge feels impelled to explore the joint for pus. The subject of Still's disease should not be left without referring to polyarteritis nodosa, which runs a very similar course.

Overpopular Diagnoses

Bronchiectasis is certainly diagnosed too readily. If there is a persistent productive cough, steps should always be taken to exclude a chronic sinus infection or segmental pulmonary collapse. Glandular fever is the other popular diagnosis which is consistently made on insufficient evidence. If adenitis is confined to the cervical region, tonsillar sepsis is a much more likely cause. Recently we have also been told that a glandular-like fever with eosinophilia but a negative Paul-Bunnell reaction may in fact be toxoplasmosis, an infection which is apparently commoner than we thought.

Finally, I would like to issue two warnings. One is against calling a child hysterical until all other possible causes have been excluded. Serious diseases can begin in this way. Meningitis, for instance, in children may produce most curious temperamental changes. Once I was very nearly misled in a case of subacute bacterial endocarditis. It arose in an excitable rheumatic girl of 12 years who was suddenly struck dumb on seeing her mother after an interval of three weeks. Apart from an old mitral lesion there was nothing else to discover. I was sorely tempted to consider the whole affair an hysterical outburst, but somehow refrained from this. There soon followed a right-sided hemiplegia which proved fatal, and the loss of speech was due to a small embolus in Broca's area.

It is easy to place too little significance on clinical features, but one can err in the opposite direction. Children have been confined to bed for months on end for a continued mild pyrexia—a "ninety-niner" it could be called—with no symptoms, no signs, no leucocytosis, a normal sedimentation rate, and all investigations negative. Surely the

advice here is to throw the thermometer out of the window and allow the child to get up.

So ends what I have to say. My remarks have probably been of little value. Growing children rarely profit by the mistakes of others; they have to make their own experiences. I wonder if adults are any better, even those who belong to our profession.

Congreve was indeed wise when he wrote, "Error lives ere reason can be born."

A "FOLLOW-UP" CHEST X-RAY SURVEY IN THE RHONDDA FACH

I. PULMONARY TUBERCULOSIS

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Techniques for evaluating the effect of various therapies on groups of individuals have recently been much studied and most effectively applied both in the tuberculosis and in other fields. This report attempts the more difficult task of evaluating the effect of preventive medicine on a community.

In 1950-1, as the first step in a long-term investigation of the aetiology of progressive massive fibrosis (the more serious form of coal-workers' pneumoconiosis), 89.0% of the inhabitants of the Rhondda Fach over the age of 15 were x-rayed (Cochrane *et al.*, 1952). In addition, owing to the ready co-operation of the Welsh Regional Hospital Board, we were able to offer immediate admission to hospital to all "active" cases. In this way the inhabitants of the valley may be said to have received "radical" therapy for tuberculosis.

It will be argued by some that the technique would have been more radical if B.C.G. had been given to all those whom we found to be tuberculin-negative at the time of the first survey. This was not done for two reasons: (1) we did not think the evidence in favour of B.C.G. so convincing that it would be unethical not to vaccinate the tuberculin-negative, and (2) we were particularly anxious to measure the "conversion" and "reversion" rates. Tuberculin-negative children under 5 years of age were, however, given B.C.G. if they were "contacts," while older "contacts" were similarly vaccinated if their parents so wished.

In 1953, during the second stage of the investigation, the community was again x-rayed, and we are therefore in a position to measure the changes in the death rate and prevalence rate of tuberculosis and measure the attack rate of infection.

It is, however, impossible to cover all this in detail in one report. The epidemiology of pneumoconiosis,

including a discussion of the relationship between tuberculosis and progressive massive fibrosis—the main object of the scheme—has in general been reserved for a separate publication, and further papers will deal with such subjects as the results of tuberculin-testing and the factors influencing the attack rate of tuberculosis.

General Description and Plan of Work

(1) First Survey

We were conscious that there were some errors inherent in the techniques used at the time of the first survey, so advantage was taken of the second survey to reduce them. Fortunately, however, the errors discovered were small, but they necessitated some slight modifications of the results we published in 1952. In this report, the tables and diagrams incorporate these corrections.

(2) Between the Surveys

All those who were thought to be suffering from active tuberculosis were hospitalized, with two exceptions, at the time of the first survey. As expected, it was not found possible to keep all the infectious cases in hospital. After the first few months there were nearly always 40 known infectious cases in the valley, between the two surveys, who were carefully supervised by the health visitor.

Figs. 1 and 2 show the death rates from pulmonary tuberculosis amongst the men and women in the valley between 1949 and 1953. In Fig. 2 the female death rates are compared with those for the rest of the Rhondda Urban District (population 111,389), which is also predominantly a mining area.

The rates for women show (a) that the tuberculosis mortality in the Rhondda Fach was originally higher than in the rest of the R.U.D.; (b) that at the time of the first survey there was a slight rise (this was possibly due to more accurate notification of cause of death); and (c) that after the survey the death rate fell rapidly and was actually zero in 1953. The figures are small (Table I), but encouraging so far as they go. The rates for non-miners are very similar.

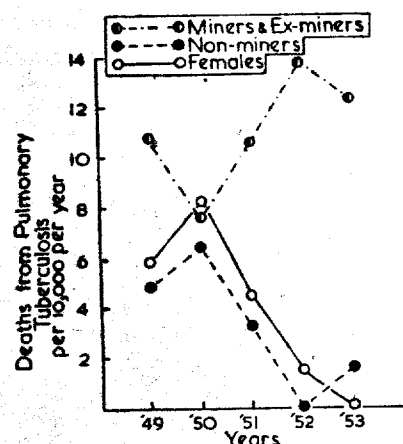


FIG. 1.—Crude tuberculosis death rates in the Rhondda Fach.

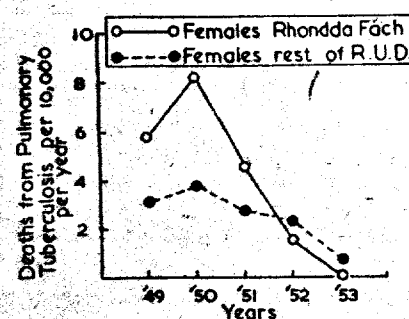


FIG. 2.—Comparison of tuberculosis death rates among females in the Rhondda Fach with those in the rest of the Rhondda Urban District.

Shortly after the survey started, another research project led to an ever-increasing proportion of miners and ex-miners in this area upon whom a post-mortem examination had been made. In 1953, more than 50% of such men who died had a post-mortem examination. This is very satisfactory from one point of view, but the increasing appearance of tuberculosis in the death certificates is al-

most certainly related to the increasing proportion of necropsies. It must be remembered that only 1% of cases of progressive massive fibrosis (P.M.F.) give a positive sputum in life (Cochrane *et al.*, 1952), while nearly 40% are positive bacteriologically at necropsy (James, 1954). It is not surprising, therefore, that the rates for miners and ex-miners have not shown the same fall as those for the females. However, it seems clear that mortality from tuberculosis among miners and ex-miners will remain a serious problem in South Wales long after it has virtually disappeared amongst the others.

(3) Second Survey

This second survey had three main objectives: (1) to reinforce the effect of the first survey in controlling tuberculous infection in the area; (2) to evaluate the effect of the first survey; and (3) to reduce the errors inherent in some of the techniques used in the first survey.

(4) General Method of Work

Our general approach was very similar to that used during the first survey, but the following changes were introduced: (a) We were, on this occasion, interested in two overlapping populations, the defined 1950-1 population (Population A), of which a nominal roll was made, and the 1953 population (Population B), which was defined by private census just before the survey started. This was found preferable to our previous use of corrected electoral rolls. (b) A records card (Fig. 3) was completed for everyone in the valley, in addition to the M.M.R. cards and P.R.U. industrial histories. They were also used for checking against the two populations, and were later coded and used as a basis for a punch-card analysis.

One point in connexion with the analysis must be stressed. The year of birth was punched in each case, but, as the time interval between the two surveys was 2 years 7 months (2.6 years), it was impossible to carry out an analysis by age at the time of each survey without either overestimating or underestimating the age at the time of the second survey in relation to that at the first survey. We have chosen, in effect, to overestimate the age (by 0.4 years) at the time of the second survey, and allowance for this must be made when interpreting some of the figures and tables.

Details of our methods of work are given in the Appendix.

Results

(1) The Defined Population

The two populations were in general defined as consisting of those of 5 years of age and over who were living in each town at the end of the survey there.

Some points, however, require greater definition. The survey did not take place at a single point in time; it lasted several months. It was therefore decided to consider the population as a composite one. The population of each town was defined as those inhabitants who were alive at the end of the survey in that particular town. The concept "inhabitant" also needed clearer definition. We were chiefly interested in these populations from the point of view of infection, so the time spent at home was the most important factor. We therefore excluded those who were in the armed Forces or who were "working away" unless they came home regularly at week-ends.

TABLE I.—Deaths from Pulmonary Tuberculosis in the Rhondda Fach, 1949-53

	Estimated Population	1949	1950	1951	1952	1953
		No. / 1,000	No. / 1,000	No. / 1,000	No. / 1,000	No. / 1,000
Females	13,464	8.5.9	11.8.2	6.4.5	2.1.5	0.0.0
Miners and ex-miners	6,513	7.10.7	5.7.7	7.10.7	9.13.8	8.12.3
Non-miners	6,207	3.4.8	4.6.4	2.3.2	0.0.0	1.1.6

FIG. 3.—The records card designed for use in the follow-up survey.

The Population B is analysed in Fig. 4. In Table II Population A is compared with Population B and also with our previous estimate. The differences between the two estimates of Population A are small (59 in the case of men and 31 in the case of women).

Lewis-Faning (1953) compared the age distribution of our survey population with that of Wales as indicated by the

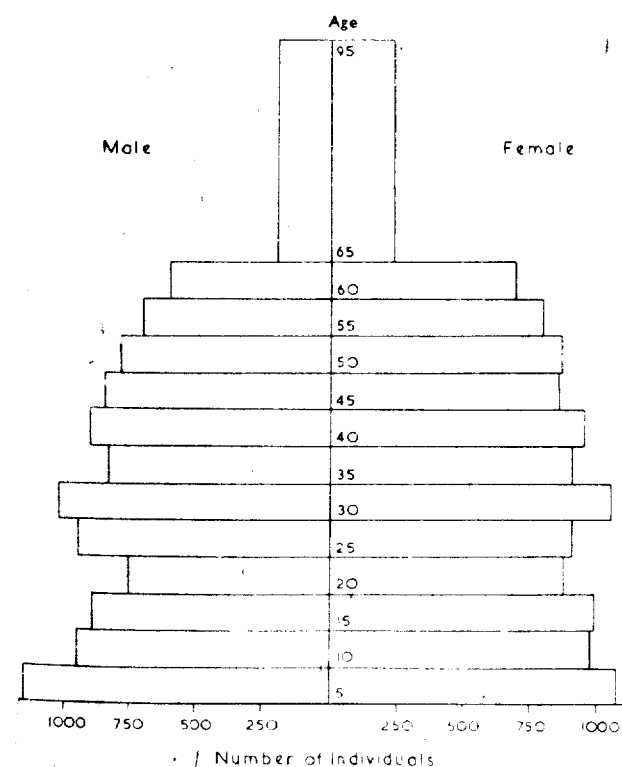


FIG. 4.—Rhondda Fach. Defined population at time of 1953 survey.

preliminary figures of the 1951 Census, and suggested that either the population of the Rhondda Fach diverged markedly from that of Wales as a whole, or we had not completely enumerated its population.

However, on re-checking our population we were not able to discover any source of error, and, indeed, subsequent publication of the 1951 Census County Report of Glamorgan (Registrar-General, 1954) showed the age distribution of the Rhondda Urban District (of which the Rhondda Fach is a part) to be very similar to that which we published.

(2) Population X-rayed

The same criteria were used as in the previous survey—that is, the population x-rayed consisted of those who were over the age of 5 at the time of the survey, and of whom a technically acceptable radiograph had been obtained by one of the teams or by anyone else within six months of the survey, provided the film was either made available to us or had been read by some recognized authority. The remainder of the population were termed "lapses." All films were read in duplicate and sputum investigations were carried out on a large scale. The 35-mm. films were read independently by two observers (T. F. J. and Dr. W. E. Miall) and the 14 by 14-in. (35 by 35-cm.) films by two pairs of observers (A. L. C. and Dr. Idris Davies, and Drs. P. J. Chapman and S. Rae).

Tables II and III summarize the percentage x-rayed in the two surveys. The differences are chiefly in the younger age groups, and are probably due to the better definition of the population on the second occasion. All prevalence rates refer to these x-rayed populations.

TABLE II.—Defined and X-rayed Populations 1950-1 and 1953

Age	Population 1950-1 as Measured Then			Population 1950-1 Corrected 1953		Population, 1953			
	%	No. X-rayed	No. in Population	No. in Population	No. X-rayed	%	No. in Population	No. X-rayed	%
Females									
5				1,000	929	92.9	1,072	1,054	98.3
10				1,005	942	93.7	977	960	98.3
15	(95.6)	(758)	(793)	972	903	92.9	990	964	97.4
20	93.0	787	847	887	807	91.0	867	824	95.0
25	94.1	994	1,056	1,041	970	93.2	906	866	95.6
30	92.5	889	961	977	903	92.4	1,047	985	94.1
35	92.2	913	990	982	903	92.0	904	833	92.1
40	91.0	810	890	896	817	91.2	952	856	89.9
45	88.5	785	888	898	779	86.7	852	767	90.0
50	87.5	770	880	885	775	87.6	867	761	87.8
55	86.8	645	743	743	631	84.9	787	684	86.9
60	78.6	503	640	654	509	77.8	690	567	82.2
65	59.2	751	1,269	1,260	750	59.5	1,430	968	67.7
Total	86.4	8,605	9,957	12,200	10,618	87.0	12,341	11,089	89.9
Total (20+)	85.6	7,847	9,164	9,223	7,844	85.0			
				9,164	7,847				
Error				59	3				

Males								
5			975	898	92.1	1,165	1,145	98.3
10			1,010	955	94.6	953	935	98.1
15	95.4	721	756	891	82.6	927	892	870
20	95.4	760	798	819	76.8	93.9	748	703
25	94.0	958	1,019	1,020	95.8	93.9	940	889
30	92.9	804	865	870	80.5	92.4	1,017	958
35	94.4	828	877	892	84.0	94.2	829	776
40	93.2	840	901	906	83.8	92.5	896	831
45	93.7	760	811	809	75.1	92.8	841	776
50	93.2	700	751	748	70.4	94.1	771	702
55	93.2	647	694	684	62.9	92.0	699	623
60	90.7	558	615	642	57.6	89.7	602	539
65	78.0	916	1,174	1,146	90.2	78.7	1,195	986
Total	91.7	8,492	9,261	11,412	10,450	91.6	11,548	10,733
Total (20+)	91.4	7,771	8,505	8,536	7,771	91.0		
				8,505	7,771			
Error				31	—			

The total age 20 and over was chosen for comparison between the two 1950-1 populations as the 15-19 age group excluded those still at school on the first occasion.

TABLE III.—Summary of Percentages X-rayed in the Two Surveys Over the Age of 5

	Population 1950-1 Corrected 1953			Population 1953		
	No.	No. X-rayed	%	No.	No. X-rayed	%
Males	11,412	10,450	91.6	11,548	10,733	92.9
Females	12,200	10,618	87.0	12,341	11,089	89.9
Total	23,612	21,068	89.2	23,889	21,822	91.3

TABLE IV.—Females. Prevalence of Tuberculosis in the Rhondda Fach, 1950-1 and 1953

Age	Survey 1950-1				Survey 1953			
	Pop. X-rayed	No. Infectious %	No. Active Including Infectious %	Quiescent and Active %	Pop. X-rayed	No. Infectious %	No. Active Including Infectious %	Quiescent and Active %
5	929	—	6 6.5	6 6.5	1,054	—	4 4.2	7 6.6
10	942	3 3.2	10 10.6	10 10.6	960	4 4.2	7 7.3	10 10.4
15	903	5 5.5	13 14.4	16 17.7	964	4 4.1	7 7.3	18 18.7
20	807	19 23.5	30 37.2	45 55.8	824	1 1.2	14 17.0	36 43.7
25	970	10 10.3	13 13.4	22 22.7	866	5 5.8	18 20.8	41 47.3
30	903	14 15.5	18 19.9	23 25.5	985	7 7.1	12 12.2	17 17.3
35	903	5 5.5	9 10.0	12 13.3	833	5 6.0	8 9.6	15 18.0
40	817	1 1.2	2 2.4	5 6.1	856	1 1.2	4 4.7	11 12.9
45	779	4 5.1	5 6.4	5 6.4	767	3 3.9	4 5.3	5 6.6
50	775	—	—	—	761	2 2.9	2 2.9	2 2.9
55	631	—	—	—	684	1 1.8	3 5.3	3 5.3
60	509	—	—	—	567	1 1.0	1 1.0	2 2.1
65	750	3 4.0	3 4.0	4 5.3	968	—	—	—
Total	10,618	64 6.0	109 10.3	150 14.1	11,089	34 3.1	77 6.9	170 15.3

Fig. 5 shows the percentage of miners, ex-miners, non-miners, and women who were x-rayed during the second survey. Although age appears to be the most important factor influencing the lapse rate, occupation and sex also appear to be important.

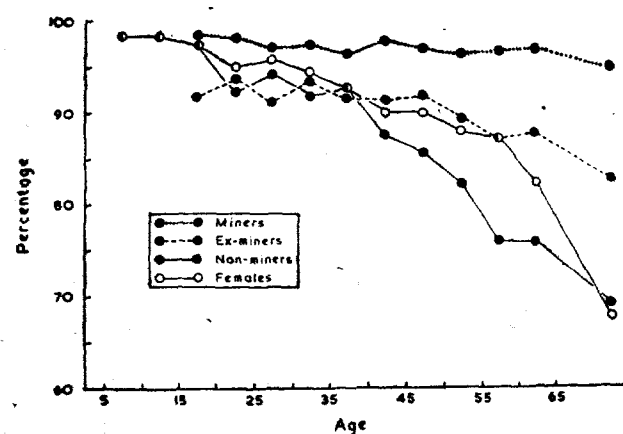


FIG. 5.—Percentage x-rayed in the second Rhondda Fach survey.

(3) Prevalence of Tuberculosis

(a) Prevalence of Tuberculous Infection.

The schoolchildren were again "Mantoux"-tested by one of us (T.F.J.); and Fig. 6 summarizes the results. The change appears satisfactory, but the results will be discussed in greater detail in a subsequent paper.

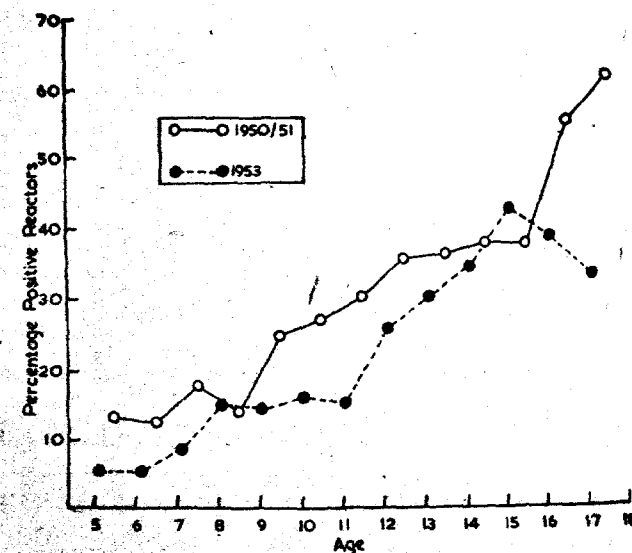


FIG. 6.—Results of tuberculin testing in the Rhondda Fach in 1950-1 and 1953. (In this figure the ages have been adjusted to correct for the error of 0.4 year.)

(b) Prevalence of Tuberculous Disease

The same standards of diagnosis were made as on the previous occasion. Fig. 7 and Table IV show the prevalence of infectious tuberculosis amongst the women at the time of the two surveys. It is clear that there has been a satisfactory fall. So far as miners are concerned, however, a similar decrease is seen only amongst the younger miners

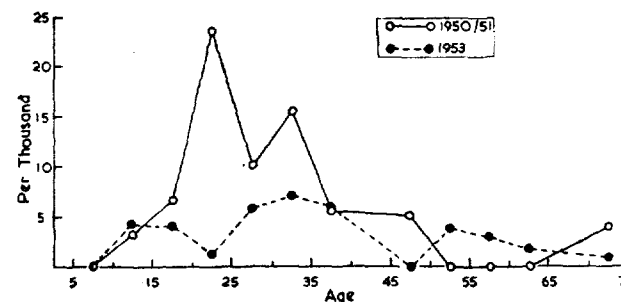


FIG. 7.—Prevalence of infectious pulmonary tuberculosis in Rhondda Fach females.

and ex-miners (Fig. 8); in the higher age groups there has been a definite increase. The results for the non-miners are somewhat difficult to interpret owing to their atypical age distribution (Fig. 9).

Those who had a positive sputum at the time of the first survey have been analysed in terms of their status at the time of the second survey (Table V). This assists us to understand some of the changes that have taken place in the prevalence of pulmonary tuberculosis. The lower mortality rate among females as shown in Fig. 1 would, of course, tend to increase rather than decrease the prevalence of infectious pulmonary tuberculosis. The cause of the fall must therefore be looked for elsewhere. The females have the highest rate of conversion from "positive" to negative sputum, and this may very well be an important factor contributing to the fall in prevalence. The highest sputum conversion rate is found among females in the younger age groups, and the lowest among cases of P.M.F., which corresponds with general clinical experience in the area. Although these overall conversion rates are relatively high, the number of cases that remained positive after treatment certainly suggests that there is still room for great clinical advances. Amongst the males with positive sputum at the time of the first survey there were 12 cases of P.M.F. It is of great interest that only one of them died during the

TABLE V.—Status in 1953 of the Infectious Cases at the Time of the 1950-1 Survey

	No. of Infectious Cases 1950-1	Status of the Same Cases in 1953			No. who Left the Area
		No. Dead	No. Sputum Negative	No. Still Sputum Positive	
Males	48	7 14.6	19 39.6	20 41.7	2
Females	64	7 10.9	41 64.1	15 23.4	1

2.6 years between the surveys. This is very different from that found by Kilpatrick *et al.* (1954), who reported that 80% of such patients were dead in 2½ years. The difference may be partly due to the cases seen by Kilpatrick being

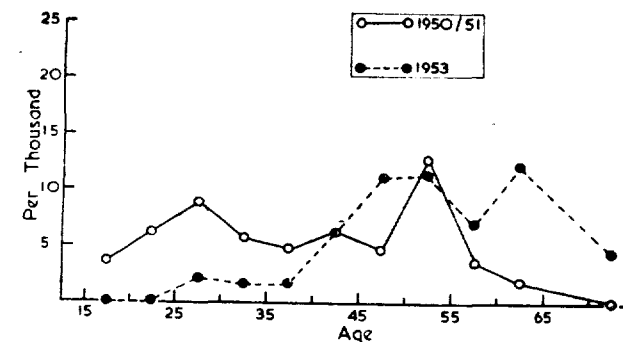


FIG. 8.—Prevalence of infectious pulmonary tuberculosis in Rhondda Fach miners and ex-miners.

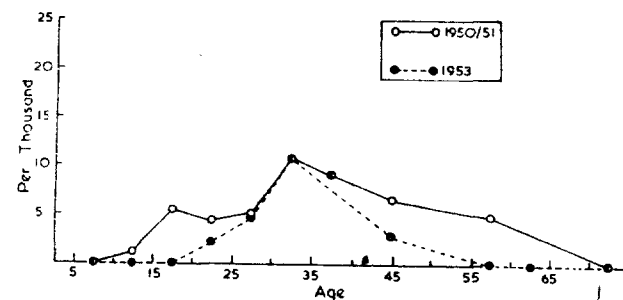


FIG. 9.—Prevalence of infectious pulmonary tuberculosis in Rhondda Fach non-mining males (owing to small numbers in higher age groups these have been combined to give a smoother curve).

selected on the basis of severity or, more probably, to the effect of antibiotics which have been used in the treatment of our cases, and which appear to prolong life without, unfortunately, causing sputum conversion.

No marked changes could be expected in the total prevalence of all types of tuberculosis, as the main way of leaving the tuberculous population is the extremely slow one of progression from the group with "active" tuberculosis to that with "quiescent" disease, and finally to the group which has "arrested" disease. The small change in total prevalence that has occurred amongst females is shown in Fig. 10. It should, however, be stressed that, although the reduction in total prevalence of all types of pulmonary tuberculosis is small, the qualitative changes within this "tuberculous" population represent a very real improvement in the tuberculosis situation in the valley. A very important factor in causing changes in prevalence is, of course, the "attack rate" of new cases, which is considered below.

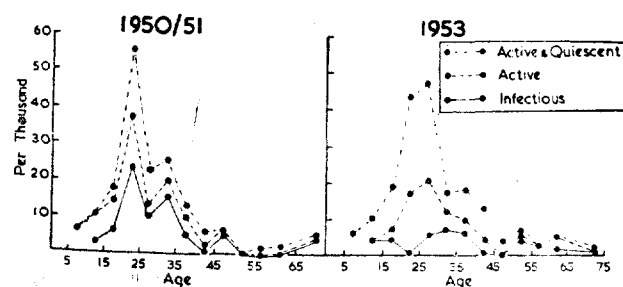


FIG. 10.—Prevalence of pulmonary tuberculosis in Rhondda Fach females.

(4) Attack Rate of Pulmonary Tuberculosis

This index measures the rate of appearance of shadows considered clinically to be tuberculous amongst those whose x-ray films were previously considered to be free of tuber-

culosis. Cases of definite simple pneumoconiosis (Categories 2 and 3) which developed early signs of progressive massive fibrosis are not included in this paper. They will be dealt with in a subsequent paper. The accuracy of such measurements depends mainly on the extent to which the original population has been followed up, and our results in this respect can conveniently be considered here.

Those who were x-rayed during the first survey fell into three groups at the time of the second survey: (1) those who had died in the interval, (2) those who had left the defined area, and (3) the survivors. The last-named could be further subdivided into those x-rayed again at the time of the second survey and those who refused.

The extent of the follow-up is shown in Table VI. It will be seen that 95% of the "surviving" men and women were x-rayed. This is shown diagrammatically in Fig. 11 for the women.

In order to calculate the attack rate on those whose x-ray films were considered normal as regards tuberculosis at the time of the first survey, those with active and quiescent

TABLE VI.—Summary Results of the "Follow-up" of Those X-rayed in 1950-1

	X-rayed 1950-1 (1)	No. Dead of (2)	No. Left of Area (3)	No. Remaining (4)	No. Re-X-rayed (5)
Females	10,618	168 1.6	650 6.1	9,800 92.3	9,315 95.1
Non-mining males	4,310	47 1.1	515 11.9	3,748 87.0	3,612 96.4
Miners and ex-miners	6,140	308 5.0	330 5.4	5,502 89.6	5,200 94.5
Total	21,068	523 2.5	1,495 7.1	19,050 90.4	18,127 95.2

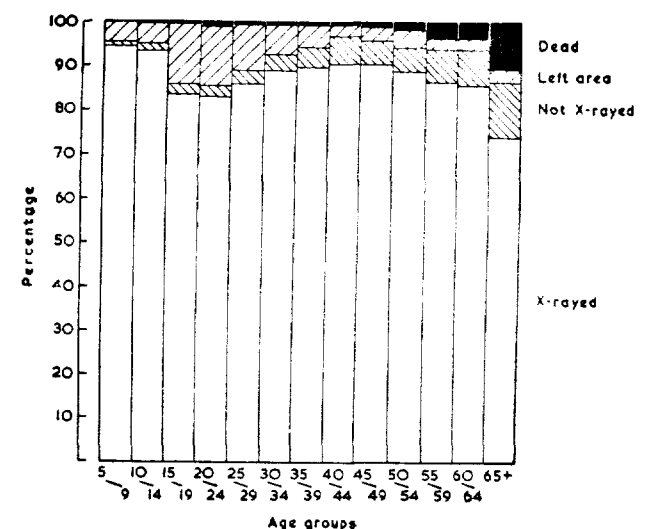


FIG. 11.—Follow-up of females x-rayed in 1951.

lesions were excluded from the population of those x-rayed in 1950-1. When pulmonary tuberculosis was diagnosed during the second survey on 35-mm. film, and the records showed that the person concerned had been x-rayed and the x-ray considered normal on the previous survey, the two films were projected simultaneously and scrutinized by three readers. The technique was time-consuming but very satisfactory.

Fig. 12 shows the radiological attack rate of tuberculosis amongst women, non-miners, and miners and ex-miners whose films were read as "normal" for pneumoconiosis and tuberculosis at the first survey.

It is proposed to devote a later paper to a discussion of the attack rate of tuberculosis and the factors influencing it. We can, however, make the following points conveniently at this stage.

(1) We have clearly not succeeded in preventing the appearance of new tuberculous lesions, and owing to the

absence of any previous direct measurement of the attack rate in that area we cannot claim to have reduced it.

(2) Our figures in general confirm the pioneer measurements of attack rate made by Springett (1951), which are still the only ones available, as shown in Table VII. Superficially, too, it would appear that our attack rates are very

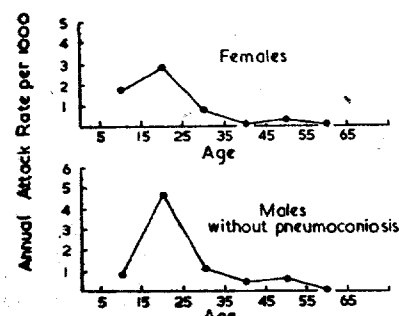


FIG. 12.—Annual radiological attack rate of tuberculosis in the Rhondda Fach.

diagnosed at clinics or hospitals (Springett, 1951), which would lead, as he points out, to his attack rates being underestimates. In addition, Springett (personal communication, 1954) did not include in his series cases of uncomplicated primary type tuberculosis or pleurisy. This again would make his figures a considerable underestimate in relation to ours, which include both types. In Table VII

TABLE VII.—Annual Radiological Attack Rates of Tuberculosis per Thousand

Source of Data	Females		Males without Pneumoconiosis	
	Age 15-24	Age 25-34	Age 15-24	Age 25-34
Rhondda Fach surveys 1950-1 and 1953	2.8	0.7	4.7	1.0
Springett (1951). London	3.5	2.0	3.0	2.0
The same Rhondda Fach data but excluding uncomplicated primary type tuberculosis, pleurisy, and those who were diagnosed between surveys on account of symptoms	0.6	0.7	0.4	1.0

a crude attempt has been made to allow for these differences by excluding from our series (a) cases of uncomplicated primary type tuberculosis and pleurisy, and (b) those who went to the clinic between the surveys on account of symptoms. Such an approach, it must be stressed, is very crude, as the factors influencing people to go to the clinic in the Rhondda Fach after the first survey were probably very different from those influencing Civil Servants in London. The comparison does, however, suggest that the attack rate in the Rhondda Fach between the surveys was less than that of Civil Servants in London in 1946-9.

(3) The way in which the appearance of new cases is confined to the younger age groups suggests the possibility of selective follow-up when a community has already been carefully surveyed. In a community where there is no progressive massive fibrosis it would be very reasonable to restrict the follow-up to those under the age of 35. The one female "new" case over this age was a diabetic. It would, of course, be necessary to have a careful follow-up of all male minimal quiescent lesions as well.

Discussion

From the point of view of epidemiology in general, our most important finding is a purely technical one. We have shown that it is technically possible to follow up a population of 25,000 people with a relatively low lapse rate. We believe this to be of considerable importance in the field of experimental preventive medicine.

As regards the epidemiology of tuberculosis, the most important finding is the confirmation of Springett's work that the radiological attack rate of tuberculosis in the two

sexes has a very similar age distribution in spite of the marked differences between the sexes in the relationship of tuberculosis mortality to age. This suggests, as Springett pointed out, that the higher tuberculosis mortality now being experienced by males in the higher age groups is mainly caused by the breakdown of lesions acquired in early adult life.

From the point of view of practical tuberculosis control, our results are less striking than we had hoped but less depressing than we had feared. There was a marked fall in tuberculosis mortality amongst women and non-miners; there was a considerable reduction in the prevalence of infectious cases, particularly among the younger people, and there was probably a reduction in the attack rate of tuberculosis.

The effects of such community surveys have recently been reviewed (Cochrane, 1954). There is no other survey with which a detailed comparison can be made. Olsen (1953) showed that the mortality rate was halved but that there was relatively little change in the notification rate after an extensive survey in Bornholm. The greater fall in mortality achieved in the Rhondda Fach is probably due to the availability of antibiotics after the first survey (the first Bornholm survey was completed in 1940). No details are given of changes in attack rate or prevalence rate, so no further comparison is possible with Bornholm. It is, however, of interest that there is nothing to suggest that a greater effect was achieved in Bornholm, where B.C.G. was given on a large scale in addition to hospital treatment. Davies (1946) and Davies *et al.* (1948) reported very much more striking results. In one instance no new cases were found during six years after x-raying a community of 367 and only one new case in the three years following a community survey of 6,000 people. The differences between their results and ours are possibly due to a very much lower initial prevalence in the communities they x-rayed, but unfortunately there is little evidence available on this point.

There are some points in relation to the results which deserve more detailed discussion:

(1) Of the 112 infectious cases known to us at the time of the first survey, all but two had had treatment and many had had surgical treatment. In 1953 14 were dead and 35 were still sputum-positive. This is a rude reminder that the therapeutic battle is only half won.

(2) If, as now seems probable, the tuberculous lesion in the male has a relatively long period of latency before cavitating and becoming infectious, the problem, as Springett pointed out, is a serious one, as the numbers are large and the period of observation long. Progressive massive fibrosis, probably pathologically and certainly administratively, presents this problem in its most serious form. These lesions are very slowly progressive over long periods of time, but may at any time become very infectious. Chemotherapy has undoubtedly improved their prognosis *qua vita*, but sputum conversion is only rarely achieved, and is even more rarely permanent. This group is undoubtedly the most serious obstacle to the elimination of tuberculosis from the valley.

(3) The speed at which the tuberculosis mortality rate fell in the valley, while the overall prevalence was scarcely altered, indicates that the mortality rate by itself is not an adequate index of prevalence. In addition, as mortality approaches zero it becomes less and less sensitive as an epidemiological index. This underlines the need for a new index. It is improbable that notification rates, however complete they are made by "intimation" or other means, and however much the inter- and intra-observer error is reduced among chest physicians, will ever be really satisfactory. In the discussion of new indices, too little attention has been paid to deciding which epidemiological index one wishes to estimate. If mortality indices are unsatisfactory, the only alternatives are attack rates, and no one would suggest it as a satisfactory routine measure.

Prevalence rates are not such a valuable measurement from the point of view of preventive medicine as attack rates, because changes in them are often rather difficult to interpret, since they vary directly with the attack rate and

inversely with the case fatality rate; but when the case fatality rate is low—as it soon will be in tuberculosis—they are much more satisfactory. They will, in any case, measure the administrative and social load on the community. Prevalence, unlike the attack rate, can, theoretically, be measured relatively accurately by x-raying a random sample of the community, and the way is thus open for obtaining a satisfactory index for various parts of the country. Whether this is a practical possibility can, of course, be decided only by actual experience.

(4) The relation between the effort put into the Rhondda Fach surveys and the results obtained should give other workers some idea of the effort required to eliminate tuberculosis from the country.

Summary

Part of the second stage of a field experiment in the Rhondda Fach to investigate the effect of reducing tuberculous infectivity upon the rate of appearance of progressive massive fibrosis in miners is described.

The valley was re-surveyed in the summer of 1953. On this occasion we succeeded in x-raying 91.3% of the new population over the age of 5, and 95% of those who had been previously x-rayed and who were still resident in the valley. The prevalence of infectious tuberculosis as compared with the figures at the time of the first survey (1950-1) shows a marked fall amongst the women and a lesser fall amongst the younger men. There has been a slight increase amongst the older miners and ex-miners.

The tuberculosis mortality for women and non-miners has fallen sharply between the two surveys. The same trend is not shown for miners and ex-miners.

In spite of ample hospital accommodation, 35 (amongst whom were 10 cases of progressive massive fibrosis) of the 112 cases which were infectious in 1951 were still infectious in 1953, and 46 new cases of tuberculosis developed in the valley between the two surveys.

APPENDIX

A. General Method of Work

As a result of our previous experience, we relied mainly on home-visiting as a means of persuading people to be x-rayed. Only one broadcast appeal was made, and there was little publicity in the Press. The actual x-raying was done between April 7 and July 31, 1953. In spite of the holidays which inevitably interfered with the survey, this was found preferable to the previous winter survey.

The staff was considerably enlarged in comparison with the previous survey. The Welsh Regional Hospital Board supplied two M.M.R. teams for most of the duration of the survey, and the Medical Research Council's P.R.U. team was assisted by two teams who were being trained for work with the National Coal Board. The x-raying was done at five main centres in the valley, at each of which there were (1) a mobile 35-mm. unit, x-raying the schoolchildren; (2) a "fixed" 35-mm. and a "fixed" 14 by 14 in. (35 by 35 cm.) unit in the centre of the town, x-raying women, non-miners, and ex-miners; and (3) a mobile 14 by 14 in. unit at the pithead x-raying miners. Slight modifications were introduced at each centre to suit local conditions. At the main centre, x-raying was continuous from 10 a.m. until 10 p.m. for women, children, ex-miners, and non-miners. On several occasions the mobile x-ray van (35-mm. film) was taken into the streets, but the results were less spectacular than expected.

We were, on this occasion, interested in two overlapping populations: (1) the "defined" population of 1950-1 (Population A), and (2) the new population of those living in the same geographical area in 1953 (Population B). For Population A, a typewritten nominal list was prepared from our previous records in street number order, including name, initials, address, and previous x-ray number for those x-rayed in the first survey. Population B was obtained by a

private census which antedated the survey by about two weeks. The technique proved highly satisfactory—much superior to our previous technique with electoral rolls.

A card was designed (Fig. 3) giving details of both surveys. These cards were completed at the three centres for everyone x-rayed, in addition to the usual M.M.R. cards and P.R.U. industrial histories. These cards were then sent from all four x-raying units to a central bureau, where they were sorted by streets and then checked first against Population B and then against Population A lists. Owing to the details available about each person, a very accurate check was possible. In the case of any doubt the person was visited. This served as a check on the accuracy of both Populations A and B. Those not marked as x-rayed on Population B were visited and, when possible, persuaded to be x-rayed. This proved a very much more difficult task than on the previous survey. This was possibly due to the lack of propaganda, but that was not our impression. Subsequently, Population A was checked against Population B, and the addresses of all those not marked as x-rayed or as refusals on the second survey were visited to discover whether the person was dead, had left the area, or whether there had been a mistake on one or other of the populations. Later, Population B was checked against Population A to discover, in the case of those members of Population B not x-rayed during the second survey, whether they were in Population A, and, if not, where they were living at the time of the previous survey. All this involved a great deal of home-visiting, but led to a great increase in accuracy in the definition of both populations.

The punching of the material on Hollerith cards and the subsequent analysis were carried out under the supervision of Mr. R. G. Carpenter, of the Pneumoconiosis Research Unit.

B. Radiographic Technique

The P.R.U. work was done under the supervision of Mr. W. G. Clarke. The P.R.U. mobile van was re-equipped with a Siemens four-valve unit with an output of 125 kV and 500 mA. The tube-cassette stand was specially designed for use in a van and ensured that the tube was always correctly centred to the film. Exposures were controlled by the "ionomat," the new automatic exposure control which incorporates an ionization chamber to measure the x-radiation reaching the film. The processing of the films in the van was done using the N.R.D. automatic processing unit. Electrical power was supplied by a mobile diesel generator of large capacity, 32 kVA. This also supplied power for the heating of the tents and a second mobile van which was used for film reading. This unit operated at the pithead.

A second unit, a Victor KX8, which had been installed in the van for the first survey, was assembled in the various halls and chapels and was used for the examination of ex-miners. Large film retakes, requested by the M.M.R. unit, were also taken on this unit. Power was supplied for this unit by a generator with the same output as that supplying the van.

M.M.R. units were installed in the same halls and staffed by the mass radiography service of the Welsh Regional Hospital Board, under the administrative direction of Mr. John H. Phillips. These units were responsible for the examination of women, children, and non-miners. The M.M.R. technique was exactly similar to that described for the first survey.

The proximity of the two units introduced the possibility of excessive scatter radiation affecting the staff. This was overcome by the use of lead screens. That this was effective was shown by checks made on dental film worn by the staff and measured by the N.P.L.

Acknowledgments.—The difficulties of making adequate acknowledgment in work which involves the active assistance of so many people increase as time passes and the personnel changes. But we wish to record our gratitude to the many members of the staff of the Welsh Regional Hospital Board and their Mass Radiography Service, the Pneumoconiosis Research Unit, the Public Health Laboratory Service, Tyntyla Hospital, Pontypridd

Chest Clinic, the National Coal Board, and the National Union of Mineworkers; and especially to the members of the two teams who gave such devoted service, and to the men, women, and children of the Rhondda Fach, without whose co-operation the scheme would have been impossible.

We express our thanks for the assistance given by the members of the Local Advisory Committee of the Rhondda Fach Scheme, and in particular to the members of its executive subcommittee. The views expressed in the paper are, however, our own and not necessarily those of the members of the Committee.

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AORTIC ANEURYSM DUE TO TUBERCULOUS LYMPHADENITIS

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The term "mycotic aneurysm" was first used by Osler in 1885 when he described a patient with multiple aneurysms of the aorta secondary to what he termed "malignant mycotic endocarditis." Since then a group of diseases have been named the mycoses, and so the word "mycotic" has been given another meaning in addition to its original one. To-day the accepted definition of a mycotic aneurysm is one due to septic infection in the wall of an artery; it is usually associated with bacterial endocarditis. The mode of formation of a mycotic aneurysm depends upon whether it is of the embolic or of the erosive type. If embolic, an infected embolus lodges in the vessel or in one of its vasa vasorum, and the inflammation, by weakening the arterial wall, causes it to give way with the formation of an aneurysm. If erosive, the inflammation spreads from the aortic valve or from a coarctation to the adjoining aorta, or, much less frequently, it comes from an extravascular source and weakens the vessel wall by spreading from the adventitia inwards.

In this paper we describe a case in which a mycotic aneurysm of the abdominal aorta developed owing to erosion of the aortic wall by tuberculosis of the pre-aortic lymph nodes.

Case Report

The patient was aged 59. Two months before admission to St. Mary's Hospital he noticed a pain in his back; this was a constant ache, worse at night, and was gradually getting more severe. He also suffered from pain in his calves and feet; this was worse when he stood up and relieved by rest in bed. He had occasional attacks of vomiting. Two weeks before admission he noticed a pulsatile swelling in his abdomen which was rapidly enlarging. He consulted Mr. A. Emlyn Williams at the Hampstead General Hospital, who considered that he had an aneurysm of the abdominal aorta and referred him to us for treatment.

He gave a past history of two bouts of pulmonary tuberculosis occurring respectively nine years and two years previously. Nine months before admission he had a cold abscess of the chest wall treated surgically at the Brompton

Hospital. One of his brothers had died of pulmonary tuberculosis and one of his daughters also suffered from this disease.

On admission the scar of the operation on the chest wall was soundly healed and x-ray examination showed no evidence of an active pulmonary lesion. He was seen by Dr. W. D. W. Brooks, who considered that the pulmonary disease was quiescent. Examination of the abdomen revealed a slightly tender mass in the epigastrium situated just above and to the left of the umbilicus; this pulsated in an expansile manner and was considered to be an aneurysm of the aorta. Apart from a mild urinary infection, no other abnormality was detectable on clinical examination. Aortography (performed by Dr. David Sutton) demonstrated an aneurysm of the abdominal aorta between the renal arteries and the aortic bifurcation (Fig. 1).



FIG. 1.—Pre-operative aortogram showing an aneurysm of the abdominal aorta.

At this stage the patient exhibited two unusual features as compared with the usual case of abdominal aortic aneurysm which we treat with a blood-vessel graft. He had an evening temperature of 100° F. (37.8° C.) and the aneurysm was unusually large clinically when compared with the size shown on the aortogram. The pyrexia was at first thought to be due to the urinary infection, but although this infection cleared with treatment the pyrexia persisted. In view of these findings and his previous medical history it was considered possible that he suffered from tuberculosis of the abdominal lymph nodes as well as an aneurysm of the aorta.

At operation a large mass of caseating tuberculous lymph nodes was found to be adherent to the anterior and lateral walls of an aortic aneurysm. At one point the aneurysm was very thin walled and about to rupture. The whole mass and the aneurysm were resected, the inferior mesenteric artery was tied, and continuity was restored by means of a prosthesis of "orlon" cloth. Orlon cloth was used in preference to an arterial homograft because the graft bed consisted in part of tuberculous tissue, and it was felt that this might spread and involve a graft.

The patient made a satisfactory recovery from the operation, and was discharged from hospital to a convalescent home one month later. There he completed a twelve-weeks course of streptomycin and P.A.S.

On examination of the specimen the resected portion of aorta was seen to have a moderate degree of atheroma; many enlarged caseating lymph nodes surrounded a saccular aneurysm. Microscopical examination demonstrated tuberculous granulation tissue with much central caseation abutting on the outer surface of the aorta, replacing the adventitia

and media in places, so that there was only thickened intima between the tuberculous tissue and the lumen of the aorta. In view of these findings we consider that this patient had a mycotic aneurysm of the abdominal aorta of the extravascular erosive type, the tuberculous disease in the lymph nodes having destroyed the adventitia and media of the aorta so that an aneurysm resulted.

Aortography performed one month after operation showed that there was good filling of the aorta, the orlon prosthesis, and the iliac arteries (Fig. 2). The patient has returned to work in his city office.



FIG. 2.—Post-operative aortogram showing the orlon cloth prosthesis in position.

Previous Reported Cases

In 1913 Haythorn reviewed the literature on tuberculosis of arteries and reported finding only one record of an aneurysm of the abdominal aorta due to erosion of the arterial wall by tuberculous granulation tissue. Since then occasional cases have been reported, and by 1933 Gellerstedt and Säfwenberg were able to collect 21 cases of aneurysm of the abdominal aorta due to erosion by tuberculous granulation tissue. The literature since 1933 contains reports of two more cases (Owens and Bass, 1944; Scott, Maxwell, and Grimes 1949), so it appears that, including our patient, only 24 cases of tuberculous mycotic aneurysm of the abdominal aorta have been recorded. Also, as the other reports were based upon material obtained at necropsy, ours is the first record of the diagnosis of this lesion with the subsequent recovery of the patient.

Summary

A case is reported of an aneurysm of the abdominal aorta due to erosion of the aortic wall by tuberculous granulation tissue from caseating abdominal lymph nodes. Treatment, which included resection of the aneurysm followed by reconstruction of the aorta with a prosthesis of orlon cloth, has enabled the patient to return to work.

Of 23 such cases previously reported in the literature, all were fatal.

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THE NUCLEIC ACID CONTENT OF BONE-MARROW CELLS IN PERNICIOUS ANAEMIA

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The understanding of disordered processes of cell development has in the past depended mainly on the observation of morphological differences between cells at various stages of their life-cycle. By modern chemical and histochemical methods it is possible to analyse, in certain of the chemical constituents of cells, changes that are probably the underlying cause of alterations in morphology. The disordered cell development that occurs in pernicious anaemia is particularly worthy of study, for the cells are easily accessible, and, furthermore, the disease process is one that can be corrected by appropriate treatment. Of the therapeutic agents that restore the bone-marrow picture to normal, the most potent is vitamin B₁₂, which appears to be closely connected with the synthesis of nucleic acids that accompanies growth (Wright *et al.*, 1948; Rose and Schweigert, 1952). In spite of the fact that, from bacterial and animal experiments, much has been learned about the biological activity of vitamin B₁₂, very little is known of its mode of action in pernicious anaemia. There is as yet no real understanding of the nature of the cellular defect that is apparently remedied by vitamin B₁₂, but it seems possible that it may be a defect in nucleic acid metabolism.

It has been demonstrated that the deep basophilia of the cytoplasm of early megaloblasts is due to the presence of ribonucleic acid (Thorell, 1947; White, 1947); it has also been shown by chemical analysis that the mean amount of ribonucleic acid phosphorus (R.N.A.P.) per cell is much greater in megaloblastic marrows than in normal marrows (Davidson *et al.*, 1951). Accumulation of ribonucleic acid in the cell cytoplasm appears, therefore, to be a specific feature of megaloblastic haemopoiesis. That abnormalities may also occur in the cellular content of deoxyribonucleic acid (D.N.A.) was suggested by La Cour (1944), who, by histological methods, demonstrated chromosomal abnormalities in both the red-cell and the white-cell series in pernicious anaemia. The mean deoxyribonucleic acid phosphorus (D.N.A.P.) per cell is, in fact, greater in megaloblastic marrows than in normal marrows (Davidson *et al.*, 1951, 1953). On the other hand, it has been shown by microspectrophotometric techniques that the D.N.A. content of individual megaloblasts is no greater than that of normoblasts of comparable nuclear size (Reisner and Korson, 1951; Marinone, 1951).

In this paper we present the results of chemical estimations of the nucleic acid content of bone-marrow cells in pernicious anaemia, and make an attempt to assess the significance of the findings, particularly with regard to the cellular content of D.N.A.P. Quantitative changes in nucleic acids during *in vitro* culture will be described elsewhere.

Experimental Work

Estimations of nucleic acids were carried out on suspensions of blood or bone marrow containing a known number of nucleated cells per cubic millimetre, thus enabling the mean amount of nucleic acid per cell to be calculated. Sternal marrow samples were taken from 18 patients suffering from classical pernicious anaemia, and the series of observations has been compared, not with normal marrows, but with observations on nine bone marrows showing normoblastic hyperplasia. Cases in the latter group were selected because the clinical and bone-marrow findings suggested that the erythroid elements of the marrow might be functioning near their maximum capacity, which would cause the marrow aspirates to contain a high proportion of "active" cells. The use of such cases was thought to afford a better comparison between megaloblastic and normoblastic haemopoiesis than the use of normal subjects, from whom marrow aspirates contain a high proportion of mature leucocytes. In addition, seven samples of normal blood were examined.

Technique

Blood samples of approximately 3 ml., obtained by venepuncture, were collected in bijou bottles containing as an anticoagulant the standard mixture of ammonium and potassium oxalate. Sternal marrow puncture was performed by the standard technique, employing a Salah sternal puncture needle and an all-glass syringe, both siliconed. When approximately 1 ml. of the blood-and-marrow mixture had been aspirated, the syringe was quickly detached from the needle and its contents were ejected into 20 ml. of normal saline in a universal container. Although anticoagulants were not used, it was found that if the mixture of marrow and saline was shaken for 20 minutes clotting did not occur. After centrifugation for five minutes, the fatty debris was taken from the top of the liquid and the supernatant fluid removed by Pasteur pipette until about 2 ml. remained. Agitation then produced an even cellular suspension, on which three independent nucleated cell counts were made.

Nucleic acids were estimated as nucleic acid phosphorus (N.A.P.) by the technique described by Davidson *et al.* (1949), in which the D.N.A.P. and R.N.A.P. fractions are separated by the method of Schmidt and Thannhauser (1945). The amount of inorganic phosphorus present in the two fractions was measured by the colorimetric method of Berenblum and Chain (1938). Readings were taken on a calibrated Unicam spectrophotometer, and by this technique satisfactory measurement was obtained of quantities of phosphorus between 0.5 and 4 μg .

Results

In Table I, II, and III are recorded the mean values of nucleic acid phosphorus per cell found in normal leucocytes, in cells from bone marrows undergoing active normoblastic hyperplasia, and in cells from the bone marrow of patients suffering from pernicious anaemia. No figures are recorded for the mean amount of R.N.A.P. per leucocyte, because difficulty was experienced in extracting all the acid-soluble phosphorus compounds from whole blood, thus making the R.N.A.P. figures unreliable.

The mean value for the cellular content of R.N.A.P. is higher in the pernicious anaemia series than in the normoblastic ($t=2.548$; $n=19$; $P<0.02$); this finding is consistent with the observations that the early megaloblasts pre-

sented in the marrow of pernicious anaemia are unusually rich in R.N.A. (White, 1947; Thorell, 1947). The distribution of the individual D.N.A.P. results in each series is depicted in the Chart, and the grand means are compared in Table IV. The lack of a significant difference between the marrow cells

TABLE II.—Mean Cellular Content of D.N.A.P. and R.N.A.P. in the Bone Marrow of Patients in whom Clinical and Bone-marrow Findings indicated the Presence of Active Blood Regeneration

Case No.	Age and Sex	Diagnosis	Hb g./ml.	R.B.C. in mlls./c.mm.	Retic. %	W.B.C. per c.mm.	D.N.A.P. $\mu\text{g.} \times 10^{-7}$ per cell	R.N.A.P. $\mu\text{g.} \times 10^{-7}$ per cell
2	18 M	Acholic jaundice	12.9	4.2	10.3	8,900	7.0	15.5
8	65 M	Paroxysmal nocturnal haemoglobinuria	6.2	1.3	11.4	9,000	6.2	—
17	23 M	Familial haemolytic anaemia	10.8	3.3	13.1	5,400	9.8	4.8
19	73 F	Cancer of bladder	7.6	2.4	—	6,050	8.8	5.4
25	61 F	Acholic jaundice	8.6	3.0	30.4	4,200	6.2	14.5
27	35 F	"	11.3	4.5	10.4	16,200	8.9	16.0
34	51 M	Acquired haemolytic anaemia	3.5	0.8	60.6	11,350	5.1	—
41	51 M	Acholic jaundice	12.9	4.2	4.4	10,050	8.6	7.3
22	48 F	Chronic haemolytic anaemia	10.1	3.5	6.2	7,600	16.0	11.3

Grand mean D.N.A.P. per cell = 8.51×10^{-7} μg . Grand mean R.N.A.P. per cell = 10.69×10^{-7} μg .

TABLE III.—Mean Cellular Content of D.N.A.P. and R.N.A.P. in the Bone-marrow of Pernicious Anaemia

Case No.	Age and Sex	Hb g./ml.	R.B.C. mlls./c.mm.	D.N.A.P. $\mu\text{g.} \times 10^{-7}$ per Cell	R.N.A.P. $\mu\text{g.} \times 10^{-7}$ per Cell
1	41 M	7.7	1.93	5.8	10.8
9	61 F	9.2	2.05	6.25	—
10	58 F	7.7	1.77	7.5	—
14	38 F	3.7	1.10	6.65	5.6
				(7.2, 6.1)	
15	65 M	5.0	1.10	5.7	28.2
				(6.7, 6.5, 4.0)	(32.8, 40.2, 11.5)
18	76 M	5.9	1.36	6.7	20.0
20	58 M	8.6	2.18	10.2	22.1
				(10.6, 8.6, 11.4)	(23.0, 17.3, 26.0)
23	54 F	7.4	1.63	10.45	20.3
				(11.2, 9.7)	(20.0, 20.6)
24	62 F	8.3	2.11	10.5	12.2
				(8.6, 11.1, 11.8)	(14.0, 11.1, 11.6)
26	44 F	6.8	1.51	13.0	27.3
				(12.1, 13.9)	(27.2, 27.5)
28	69 M	8.0	1.82	16.1	28.6
29	64 M	4.7	1.07	8.3	24.3
				(10.9, 5.7)	(25.6, 23.0)
35	67 F	7.0	1.59	6.1	11.7
36	41 M	5.3	1.40	14.6	—
38	63 F	6.8	1.41	4.5	12.7
				(5.9, 3.0)	(16.2, 9.2)
39	68 F	8.4	1.94	7.1	—
42	42 F	5.0	1.07	12.9	14.7
43	38 F	6.7	1.56	6.9	20.9
				(6.9, 7.1, 6.8)	(21.5, 19.2, 22.0)

Figures in parentheses are individual results in cases in which estimations were carried out on more than one marrow suspension from the same patient. Clearly, the wide range of nucleic acids in pernicious anaemia is due, not entirely to experimental error, but mainly to a real case-to-case difference. Grand mean D.N.A.P. per cell = 8.85×10^{-7} μg . Grand mean R.N.A.P. per cell = 18.53×10^{-7} μg .

TABLE IV.—Comparison of the Mean Nucleic Acid Phosphorus Per Cell in Blood and Bone-marrow Cells (Numbers of Cases in Parentheses)

	A	B	C
	Blood Leucocytes	Active Normoblastic Marrow	Pernicious Anaemia Marrow
D.N.A.P. as $\mu\text{g.} \times 10^{-7}$ /cell	5.89 (7)	8.51 (9)	8.85 (18)
R.N.A.P. as $\mu\text{g.} \times 10^{-7}$ /cell	—	10.69 (7)	18.53 (14)

The difference between the D.N.A.P. means in A and B is not significant ($t=2.116$, $n=14$, $P=0.053$); that between the means in A and C is of borderline significance ($t=2.258$, $n=23$, $P=0.05$). The R.N.A.P. mean of C is greater than that of B ($t=2.548$, $n=19$, $P<0.02$).

TABLE I.—Mean D.N.A.P. of Normal Blood Leucocytes

Case No.	Mean D.N.A.P. per cell in $\mu\text{g.} \times 10^{-7}$
30	5.67
31	5.37
32	5.39
37	5.70
44	6.92
45	5.90
46	6.31

Mean = 5.89×10^{-7} μg .

as compared with leucocytes is due to the relatively small numbers in two of the three series, but the present object is not to demonstrate such a difference but rather to compare the bone marrow of pernicious anaemia with that of active normoblastic hyperplasia. The results indicate that the cellular content of D.N.A.P. is quantitatively similar in these two types of bone marrow.

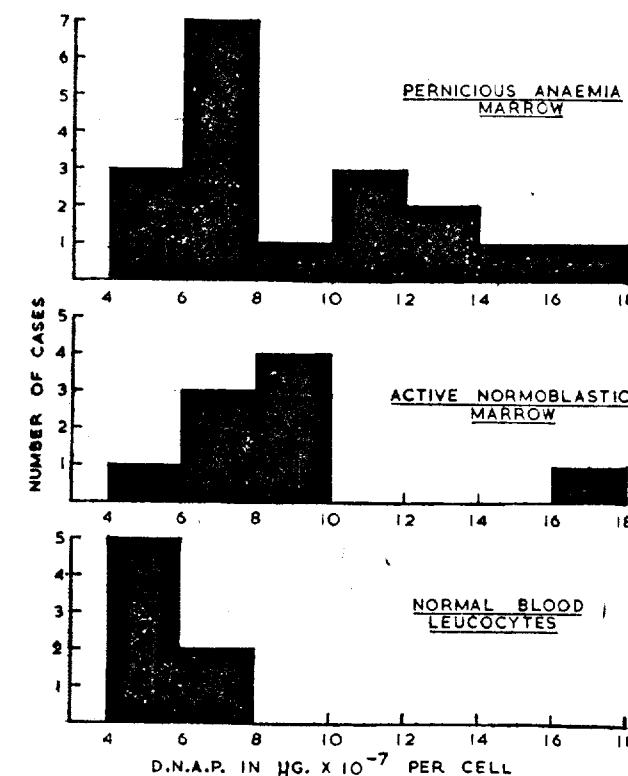


Chart showing the mean cellular content of D.N.A.P.

Discussion

Appreciation of the significance of the results depends on a knowledge of the role of D.N.A. in the life of the cell, in which it forms an essential part of nuclear chromatin (Brachet, 1933). A considerable amount of evidence points towards the idea that, in any given genus, the mean content of D.N.A. per mature diploid cell is constant, being twice that of the haploid sperm (Boivin *et al.*, 1948; Vendrely and Vendrely, 1948, 1949; Mandel *et al.*, 1950; Davidson *et al.*, 1951).

During cell proliferation, changes must of course occur, and these have, in recent years, been studied intensively by a number of workers using quantitative spectrophotometric techniques that enable the D.N.A. content of individual cells to be estimated. It has been shown that D.N.A. increases during interphase until at prophase twice as much is present as in the non-dividing cell; hence daughter nuclei have the normal complement of D.N.A. (Swift, 1950; Pasteels and Lison, 1950; Walker and Yates, 1952). Thus if the mean amount of D.N.A. per cell in a population is high it may be presumed that a high proportion of cells are of actively dividing type, or that mitotic abnormalities have occurred, resulting in polyploid cells, or that some fundamental abnormality exists in the chromosomal content of D.N.A.

The blood leucocyte is a good example of a mature non-dividing diploid cell, and the results recorded in Table I indicate that in normal subjects the mean amount of D.N.A.P. per leucocyte is remarkably constant. Moreover, as the results are in agreement with published figures for the D.N.A.P. content of other mammalian cells (Table V), they lend support to the theory of constant D.N.A. per cell.

Tables II and III demonstrate the wide variability that occurs between different bone marrows as regards the mean

TABLE V.—Mean D.N.A.P. Content of Various Mammalian Cells. D.N.A.P. as $\mu\text{g.} \times 10^{-7}$ Per Cell. (Figures Published as D.N.A. Have Been Multiplied by 0.099.)

Author	Normal Sperms	Normal Leucocytes	Other Mature Cells*	Normal Marrow	Active Normoblastic Marrow	Megaloblastic Marrow
Boivin <i>et al.</i> (1948)	3.37	—	6.43	—	—	—
Mirsky and Ris (1949)	2.79	—	6.14 to 8.37	—	—	—
Mandel <i>et al.</i> (1950)	—	6.78	—	—	—	—
Davidson <i>et al.</i> (1951)	3.14	7.04	8.3 to 10.0	8.69	—	12.7
Present	—	5.89	—	—	8.51	8.85

* Cells from liver, kidney, etc. (may include some dividing cells).

content of D.N.A.P. per cell, a finding that has also been observed by Davidson *et al.* (1951) and by Menten and Willms (1952). In a series of 31 cases showing a preponderance of erythroblasts in bone-marrow smears, the latter authors found values of D.N.A.P. per cell ranging from 4.0 to 26.3×10^{-7} μg . Included in their series were six cases of pernicious anaemia, the mean value for those being 16.0×10^{-7} μg . Values higher than the present figure of 8.81 were also found by Davidson *et al.*, who in 17 cases of megaloblastic marrows reported a mean value of 12.7×10^{-7} μg . D.N.A.P. per cell. However, the latter figure represents approximately 180% of their mean value of D.N.A.P. per leucocyte (7.04), whereas the mean of the present series represents 150% of the present leucocyte value, so that differences between the present results and those of Davidson *et al.* probably depend on technique and may not be of great significance. Other important findings of Davidson *et al.* were that the mean content of D.N.A.P. per cell in megaloblastic marrows was higher than in normal marrows, marrows from cases of leukaemia, or marrows of iron-deficiency anaemia. Those authors considered that the high values in their megaloblastic series indicated the presence of nuclear abnormality, either polyploidy or polyteny. Such a theory is in agreement with the frequent finding of abnormal mitotic figures in megaloblastic marrow smears and with the suggestion, made by La Cour (1944), that tetraploid cells are common in the bone marrow of pernicious anaemia.

The present results, although they do not in any way invalidate the theory of nuclear abnormalities, are more in favour of the alternative hypothesis that the high cellular D.N.A.P. of the pernicious anaemia marrow is due to the presence of proliferating cells. In the hyperplastic normoblastic marrows a considerable amount of cellular multiplication was going on, and the figures for the mean cellular D.N.A.P. must depend on the fact that there was a mixed population of cells, some containing the diploid quantity, others containing an excess of D.N.A.P. in preparation for mitosis. The mean content of D.N.A.P. per cell for the whole series of pernicious-anaemia marrows is similar to that of the normoblastic series, which suggests that the same factors may have operated in each case.

Thus it would appear that the high cellular content of D.N.A.P. encountered in the bone marrow in pernicious anaemia may be due, not to some specific abnormality of mitosis, but to the prevalence in the marrow of cells of proliferative type.

Summary

Chemical estimations of nucleic acids have been carried out on suspensions of blood and bone-marrow cells.

The cellular content of R.N.A.P. is higher in pernicious-anaemia marrows than in hyperactive normoblastic marrows: accumulation of R.N.A. in the cell is therefore a specific feature of megaloblastic haemopoiesis.

The cells of pernicious-anaemia marrows and those of hyperactive normoblastic marrows contain approximately the same amount of D.N.A.P., the figures in each

case being about 150% of values for blood leucocytes. This finding suggests that many of the cells of the perniciosa-anaemia marrow are of proliferative type and are engaged in building up D.N.A. in preparation for mitosis.

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CEREBROVASCULAR ACCIDENTS IN HOSPITALS FOR ACUTE CASES

BY

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Patients with intracranial vascular lesions, especially those over 70, are a serious problem to the general practitioner called upon to arrange suitable care and accommodation. Hospitals are unwilling to admit cases likely to remain as chronic hemiplegics occupying acute medical beds for long periods. Those who do get admitted are often accepted with reluctance after tedious negotiations which are irritating to both house officers and practitioners. The attitude of hospital staffs would be easier to defend if it were not based as much on traditional prejudice as on an appreciation of what actually happens to these cases after admission.

This paper reports an analysis of 239 cases admitted after cerebrovascular accidents in which the length of stay in hospital and the eventual disposal have been investigated.

Material and Methods

The in-patient records of two hospitals were examined for the two-year period 1948-9. Extracts of age, sex, length of stay, and disposal were made of all cases admitted with the diagnoses of cerebral haemorrhage, thrombosis and embolism, subarachnoid haemorrhage, hemiplegia, and coma of unknown cause. The 239 cases collected were analysed with respect to length of stay in hospital by age and sex. The duration of symptoms before admission was not studied in detail, but only three of the cases were admitted as long-standing hemiplegics and the majority were victims of recent cerebrovascular accidents.

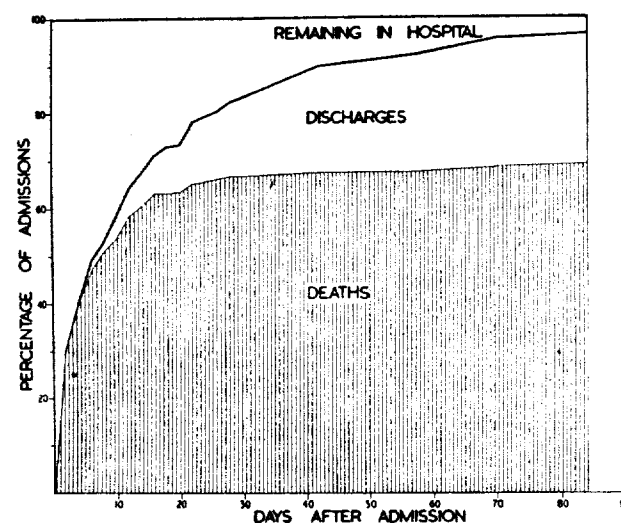
The two hospitals selected are situated in a large industrial county town in the midlands of England. Hospital A is an ex-voluntary hospital of over 600 beds with a casualty department. Hospital B is an ex-municipal hospital of 400 beds with no casualty department. Between them the two hospitals accommodate most of the acute medical admissions from a population of 600,000.

Results

Table I summarizes the patients with intracranial vascular lesions admitted to the two hospitals. Of the 239 patients 165 (69%) died in hospital and 74 (31%) were discharged. Of the discharges 61 (25.5% of admissions) were sent home, and 13 (5.4% of admissions) were transferred to other hospitals.

TABLE I.—Summary of 239 Cases with Intracranial Vascular Lesions Admitted to Hospital in 1948-9

	Hospital A			Hospital B			Total		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
Discharged home	10	17	27	12	22	34	22	39	61
Transferred	6	3	9	4	—	4	10	3	13
Died	34	55	89	27	49	76	61	104	165
Total	50	75	125	43	71	114	93	146	239



Cumulative frequency diagram showing the percentage of patients remaining in hospital, discharged, or dead after a given period of time.

The length of stay in hospital is shown in the form of a cumulative frequency diagram. Over 30% of admissions died in the first two days. By the end of 10 days 54.2% had died and 5% had been discharged, leaving 40.8% still in hospital. After six weeks 67.6% had died, 21.8% had been discharged, and 10.6% remained. Only 3.8% stayed in hospital more than 12 weeks.

Table II gives the length of stay in hospital according to age. Of those over 60 years old 10 out of 141 (7.1%) stayed in more than six weeks, compared with 14 out of 98 (14.3%) of those under 60. The difference between these percentages is not significant. The number of deaths in the higher

TABLE II.—Length of Stay in Hospital According to Age. Discharges by Death are Given in Parentheses

Week of Discharge	Age Group						
	20-29	30-39	40-49	50-59	60-69	70-79	80-89
1-2	3 (2)	3 (3)	16 (13)	35 (28)	58 (54)	40 (37)	8 (8)
3-4	—	1	7 (2)	10 (3)	8 (3)	6 (4)	2 (2)
5-6	—	—	6	2	5 (2)	4	—
7-8	—	—	1	—	1	—	—
9-10	—	1 (1)	—	3 (1)	3 (1)	—	1
11-12	—	—	—	—	3 (1)	—	—
Over 12	—	1	—	4	3	1	—
Total	3 (2)	7 (4)	31 (15)	57 (32)	79 (61)	51 (41)	11 (10)

age groups is, however, significantly greater than in the younger groups ($\chi^2=21.53$; $df=6$; $P<0.001$).

Table III shows the percentage of medical beds occupied by patients with intracranial vascular lesions. The number of beds occupied by chronic cases, those who have been in

TABLE III.—Percentage of Medical Beds Occupied by Intracranial Vascular Lesions

	Men		Women	
	Hospital A	Hospital B	Hospital A	Hospital B
All cases (Cases in hospital more than:)	1.47	2.13	3.07	4.08
2 weeks	0.51	1.26	1.53	2.62
4 "	0.26	0.73	0.93	1.87
6 "	0.18	0.45	0.59	1.26
8 "	0.14	0.29	0.37	1.01
10 "	0.10	0.17	0.27	0.77
12 "	0.06	0.14	0.17	0.59

hospital more than a given time, is also indicated. From this table can also be estimated the proportion of beds saved by transfer of cases after, say, three or four weeks to a special hemiplegic unit.

Discussion

It is surprising to find that less than 5% of patients with intracranial vascular lesions became chronic hospital patients, and these occupied only a small proportion of the total medical beds. Patients over 60, because of the high mortality in this group, were not especially liable to become chronic cases. In fact, it was the younger groups which provided the largest number of long-term cases, probably owing to their greater ability to survive grossly disabling lesions.

The most striking feature of this series was the extremely high death rate in the first few days after admission. The expectation of survival increased rapidly with the age of the lesion. Hospitals which accept early cases, particularly those with casualty departments where patients with sudden apoplexy are taken from the street, can expect a large intake, a high mortality, and a rapid turnover, with relatively few chronic survivors. Those which accept late cases will have a smaller intake, a low mortality, and a long average stay in hospital. For this reason the experience of some hospitals may differ considerably from the two which have been studied in this investigation. What the present series does show is that a generous acceptance of early cases is not necessarily followed by an accumulation of chronic hemiplegics.

There are good reasons why cerebrovascular accidents should be admitted to hospital as soon as they occur, irrespective of the age of the patient or other social factor. Rehabilitation must be started early if it is to prevent permanent disability from contractures (Rusk and Taylor, 1952). Old people must be forced to help themselves before they become reconciled to a life of bed-fast dependence. Such treatment is more effectively carried out in hospital than in the patient's own home. Denial of hospital facilities in these circumstances is likely to add to the number of helpless cases at large in the community, and in the long run actually increase the demand for their accommodation in beds for acute cases.

Summary

The hospital records of 239 cases admitted to hospital following cerebrovascular accidents have been examined.

Less than 5% remained in hospital more than three months. Patients over 70 were not especially liable to become chronic hemiplegics.

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VALUE OF SERUM IRON LEVELS IN ASSESSING EFFECT OF HAEMATINICS IN THE MACROCYTIC ANAEMIAS

BY

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The serum iron shows specific variations in different types of anaemia (Riecker, 1930; Powell, 1944; Laurell, 1947; Cartwright and Wintrobe, 1952). It is low when the cause is iron deficiency, infection, or malignancy. Higher values than normal usually occur in the macrocytic anaemias and in those due to haemolysis or hypoplasia of the bone marrow. Moore and Doan (1937) reported two cases of pernicious anaemia in which the initial high figures of serum iron fell to a low level during a remission. The following is a study of the variations of serum iron before and after treatment in the macrocytic anaemias. It was thought that a definite correlation between an early fall in serum iron and effective therapy might provide a quick and simple method of assessing the effect of a haematinic in the macrocytic anaemias.

Material and Methods

Macrocytic anaemias of all types, such as pernicious anaemia, the sprue syndrome, liver disease, and pregnancy, were studied. The patients were treated by an injection of a haematinic, usually vitamin B₁₂ or folic acid, in hospital. The response in the blood was measured by the rise in erythrocytes after 15 days (Ungley, 1949) and by the reticulocyte count.

The blood for serum iron estimation was always taken at about 10 a.m. to avoid errors due to the diurnal variation (Vahlquist, 1941; Hoyer, 1944; Hamilton *et al.*, 1950). Modern methods for serum iron determination (Laurell, 1947; Vannotti and Delachaux, 1949) are simple and accurate. A fastidious cleanliness is needed, as iron is a common contaminant; so that all-glass syringes and specimen tubes, dry sterilized and specifically cleaned, are used for taking samples of blood. The following technique, adapted by P. W. Perryman (1948, personal communication), has been used.

In a centrifuge tube is placed 4 ml. of serum, to which 1 ml. of 6 N HCl is added, mixed well, and left to stand for ten minutes. Then 3 ml. of 20% trichloroacetic acid is added, stirred with a glass rod, left for 5 minutes, and centrifuged at high speed for approximately 20 minutes. (A longer period may be necessary if particles are still present when the supernatant fluid is drawn off.) Then 4 ml. of supernatant fluid is placed in a glass-stoppered tube and approximately 50 mg. of ascorbic acid added and the solution left for 10 minutes, with occasional shaking to encourage the ascorbic acid to dissolve. Finally, 0.5 ml. of α -dipyridyl in 0.1 N HCl, or 1 ml. of 0.1% orthophenanthroline, and 0.5 ml. of concentrated ammonia solution, are added. The tubes must be agitated well immediately on adding these last two solutions. 1 ml. of doubly distilled water is added to bring the final solution to 6 ml. for the cell of the spectrophotometer (Unicam, S.P.500). The blank consists of 3 ml. of doubly distilled water, 0.5 ml. of 6 N HCl, 1.5 ml. of 20% trichloroacetic acid, then ascorbic acid, reagent, and ammonia solution as above.

Calibration curves were prepared by making known solutions of ferrous ammonium sulphate, through the range of 50 to 500 μ g. per 100 ml., and putting them through the same process as for serum. If, for other reasons, it is desirable to avoid using strong ammonia in the laboratory,

0.5 ml. of saturated sodium acetate can be used as a buffer instead; for this, the serum is incubated at 37° C. for one hour with 2 ml. of 0.3 N HCl, then 2 ml. of 20% trichloroacetic acid is added, and the solution left for one hour. Otherwise there is no change in the technique. All the glassware is washed, left in cleaning fluid (potassium dichromate 100 g., sulphuric acid conc. 800 ml., water 1,200 ml.), washed thoroughly again in running tap-water, then rinsed in distilled water. All the reagents must be chemically pure, and made in doubly distilled water.

The standard deviation of a single determination from the mean, calculated from 42 duplicate analyses, was $\pm 3.05 \mu\text{g. per 100 ml. of serum}$. Seventy-four samples were analysed from 48 normal males and 26 normal females. The mean serum iron concentration was $126.8 \mu\text{g. per 100 ml. (S.D. 30)}$, and the values ranged from 71 to 205 $\mu\text{g. per 100 ml.}$ The mean serum iron for males was $130.8 \mu\text{g. per 100 ml. (S.D. 30.8)}$; for females, $119.4 \mu\text{g. per 100 ml. (S.D. 27)}$.

Results

The serum iron was studied before and after therapy on 100 occasions. In 60 the treatment was effective, and in every case the serum iron fell to a low figure during the remission. In 40 the haematinic was ineffective and the serum iron remained within similar limits. The fall in serum iron after successful treatment is striking and abrupt (Fig. 1). It was next determined how soon this took place,

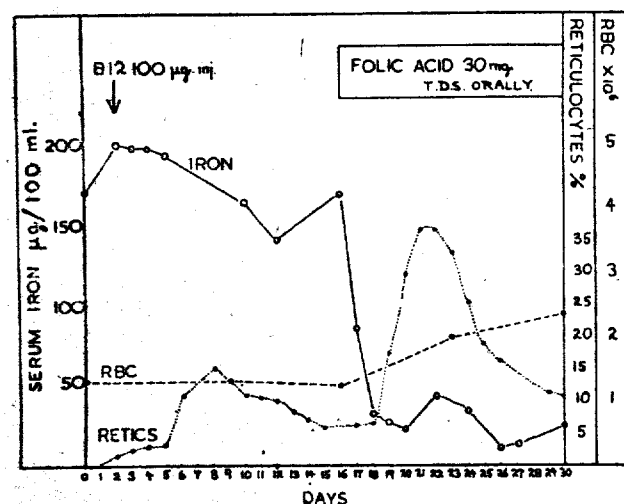


FIG. 1.—The fall in serum iron after effective treatment by folic acid in a case of megaloblastic anaemia of unknown origin.

and the earliest reliable time to estimate this change. To six patients with pernicious anaemia an injection of 100 $\mu\text{g. of vitamin B}_{12}$ was given, and readings were taken at two-hourly intervals for eight hours; a significant fall occurred in one only. However, at 24 hours a significant change was obvious in 21 out of 23 cases; in the two with little or no change a further figure at 48 hours showed the characteristic fall. It was thereafter decided to rely upon the 48-hour reading of the serum iron.

The 48-hour reading of the serum iron has been studied on 33 occasions, and the change correlated with the result of therapy in every instance except one, a case of steatorrhoea in which a submaximal reticulocyte response occurred after vitamin B₁₂ without any rise in the red blood cells. Here the fall was transient and returned to normal within the week. The maximum change was $228 \mu\text{g. per 100 ml. (from 278 to 50 } \mu\text{g. per 100 ml.)}$, and the minimum significant fall was $20 \mu\text{g. per 100 ml. (from 46 to 26 } \mu\text{g. per 100 ml.)}$; the mean was $105 \mu\text{g. per 100 ml.}$ Whatever the initial height of serum iron, the values tended to fall to about the same level (Fig. 2); they then remained at about 50–60 $\mu\text{g. per 100 ml.}$ —unaffected by the reticulocyte response—until the blood count returned to normal. Insufficient dosage of the

haematinic was shown by the serum iron rising to the previous levels. Impending iron deficiency was indicated by a fall to a lower level; values below 40 $\mu\text{g. per 100 ml.}$ were suggestive, and below 30 $\mu\text{g. per 100 ml.}$ diagnostic of this. The mean of nine cases at one week that later developed iron deficiency was $27.3 \mu\text{g. per 100 ml. (range from 11 to 39 } \mu\text{g. per 100 ml.)}$. This often preceded the signs of iron deficiency in the blood count by several weeks.

The total iron-binding capacity (Cartwright and Wintrobe, 1949) was measured on five occasions before and after successful therapy. There is no significant change unless iron deficiency develops, when the typical high figures are seen. Twelve normal controls were given injections of vitamin B₁₂ or folic acid, and no change took place in the serum iron or total iron-binding capacity.

Discussion

The 48-hours serum iron test is a reliable method of assessing the effect of haematins in the macrocytic anaemias. A fall in the serum iron is probably the earliest sign of a haematological response, for the bone-marrow reversion is not complete until 32 to 72 hours (Davidson *et al.*, 1942), and the reticulocyte response does not appear for several days. The test is useful if the level of the initial red-cell count is such (3,000,000 cells per c.mm. or more) that the reticulocyte change is slight or inconclusive, and in out-patient trials where the patient cannot attend daily for reticulocyte counts. It is helpful in severely ill patients, in whom the earliest indication of effective therapy is needed as waiting may be dangerous. It is probably unaffected by a blood transfusion being given at the same time as the haematinic. It is the first sign of impending iron deficiency. It is not necessarily suggested that this test should be used for routine clinical work, as the reticulocyte response and the rise in red cells are already sufficient. However, the study of the macrocytic anaemias and their response to various haematins is becoming a complex problem, and it may be that a simple test, with a precise and sharp end point, will be of value.

The explanation of the fall to a low level is perhaps that the rate of release of iron from the stores, possibly by enzymic action, cannot keep pace with the increased demand. It is interesting that, irrespective of the initial height, the level after successful therapy is similar in all. This figure may represent a state of physiological balance between the stores and the bone marrow. The test is an index of an increased turnover of iron in the body, and the low serum iron a measure of erythropoietic activity.

Summary

A test for assessing the effect of haematins in the macrocytic anaemias is described.

The fall in the serum iron is the first sign of effective therapy.

The level of the serum iron gives the earliest indication of impending iron deficiency.

I am grateful to our deputy biochemist, Mrs. R. M. Lainbury, for doing the serum iron estimations, and to my colleagues

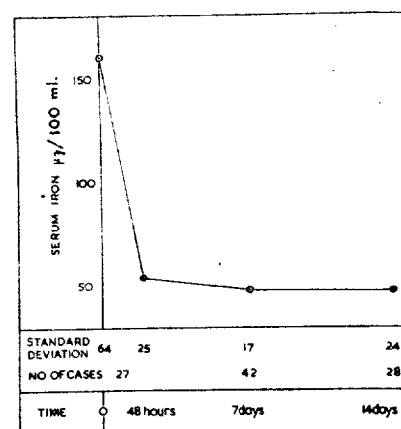


FIG. 2.—A composite graph showing the fall in serum iron following effective therapy in cases of macrocytic anaemia.

on the staff of the United Birmingham Hospitals for allowing me access to their cases. Dr. J. A. H. Waterhouse, of the department of medical statistics, also gave me helpful advice.

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IRON DEFICIENCY IN PREGNANCY

BY

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Some fall in the level of haemoglobin during pregnancy is usual. This relative anaemia is often attributed to the rise in blood volume of 18–23% (Dieckmann and Wegner, 1934; Roscoe and Donaldson, 1946; Berlin *et al.*, 1953) which occurs towards the end of pregnancy. Since the haemoglobin levels of most non-pregnant women range from 80 to 95%, levels of haemoglobin of 70–85% at the end of pregnancy have come to be accepted as normal.

The fact that throws doubt on the "physiological" nature of the anaemia of pregnancy is that the anaemia can in most cases be prevented by the administration of iron (Corrigan and Strauss, 1936; Fullerton, 1936; Wills *et al.*, 1947; Klopfer and Ventura, 1951; Scott and Govan, 1949; Benstead and Theobald, 1952; Davis and Jennison, 1954).

The present investigation does little more than confirm this finding, but it was thought that our evidence should be added to that already available both because low haemoglobin levels in pregnancy are undesirable and because there is a continuing failure to recognize that they are unnecessary.

Plan of the Present Investigation

The investigation was carried out on patients booked for domiciliary delivery and attending two local health authority antenatal clinics between January, 1951, and April, 1953. All patients presenting themselves before the end of the fourth month of pregnancy were included. The haemoglobin levels were measured by the M.R.C. neutral grey photometer, taking 100% haemoglobin to be equivalent to 14.8 g.% of haemoglobin. Haemoglobin estimations were made at the first attendance, at 28 weeks, at 38 weeks, and six weeks after delivery. These dates are approximate, and occasionally the post-natal reading was at a rather later date.

Every patient was given an iron preparation by mouth from the time of first attendance until delivery. This was given in the form of one "fersolate" tablet (containing 3 gr. (0.2 g.) of ferrous sulphate) three times a day. The preparation was changed to "ferro-redoxon" (containing 2.04 gr. (132 mg.) ferrous sulphate and 50 mg. of ascorbic acid) if the patient complained of digestive disturbances or if the haemoglobin level had not risen. This change was made in about

half the cases, and it appeared that the preparation containing ascorbic acid was better tolerated. The main difficulty in satisfactory iron therapy during pregnancy is that patients who feel well cannot be relied on to take it regularly, partly because any minor discomfort is attributed to it and partly because they see no necessity for it. We explained that taking iron regularly would make them feel "fighting fit" for their labour and also for their return to household duties after the lying-in period. In general this produced ready co-operation. At every attendance the patient was given the exact number of tablets to cover the period till she was due to come again and was asked to bring back the box with any that were left. These were counted and the number was recorded. It is clearly impossible to be certain that all the tablets not returned were consumed, but we felt that the record was as accurate as it could be, short of seeing the tablets swallowed.

The investigation included 138 patients. Of these, five could not be persuaded to persevere with iron and were excluded. In 26 instances the complete set of haemoglobin estimations was not obtained, either because the baby arrived before the calculated date, so that the 38-week reading was not made, or because the patient removed from the district or was transferred to the care of a hospital or general practitioner. Three further patients were excluded because they were given blood transfusions after post-partum haemorrhage. The 104 remaining cases are listed according to age and parity in Table I. There were no complications of pregnancy or labour in these patients apart from three forceps deliveries.

TABLE I.—Age and Parity of 104 Women who Took Iron Regularly During Pregnancy

Age	Parity					
	0	1	2	3	4	5
Under 20	3	—	—	—	—	—
20–29	14	18	11	6	1	—
30–39	1	9	12	17	6	1
40 or over	—	—	3	1	1	—
Totals	18	27	26	24	8	1

Results

A difficulty in the analysis of the results of this survey is that a few patients failed to respond to iron therapy. We have isolated as a separate group all those in whom the haemoglobin level was still below 85% at 38 weeks and have termed them "non-responders." Table II shows the distribution of haemoglobin levels before the end of the fourth

TABLE II.—Haemoglobin Levels Before the End of the Fourth Month of Pregnancy in 104 Patients who Took Iron Regularly

	Hb Levels				Total
	80% or Less	81–89%	90–99%	100% +	
Responders	15	33	33	11	92
Non-responders	4	3	5	0	12

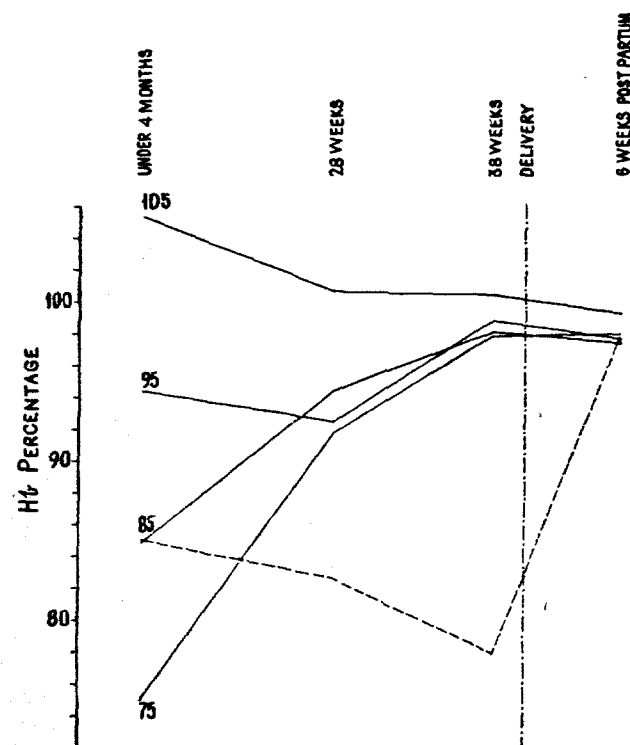
Note.—Statistical examination of the age and parity of the responders does not show any significant difference between the four groups.

month of pregnancy in both "responders" and "non-responders" and indicates that there is no systematic difference in this respect between the two groups.

The effect of iron on the haemoglobin level is illustrated in the chart, where the "responders" have been subdivided according to their initial haemoglobin. This shows that when the initial haemoglobin is below 90% the administration of iron leads to a marked rise during pregnancy. When the initial haemoglobin is above 90% there is little systematic change in the level. In all the "responding" groups the haemoglobin level is around 98% at 38 weeks and remains at much the same level for six or more weeks after delivery. The "non-responders," who show a general downward trend

in haemoglobin levels from 16 to 38 weeks, show a sharp post-partum rise to the same level as all the "responding" groups.

It is to be noted that very little effect on the form of the curves would be produced if the "non-responding" cases were included in the appropriate subclasses of "responders." In general the curves would be not more than 2% lower at 28 weeks, not more than 4% lower at 38 weeks, and unaltered post partum.



Change in mean haemoglobin level in pregnant women receiving iron. The line marked 75 gives mean values for 15 patients whose haemoglobins were initially 80% or under. That marked 85 refers to 33 patients starting between 81 and 89%. Similarly, 95 denotes the range 90-99% (33 patients) and 105 denotes initial levels from 100% upwards (11 patients). The interrupted line refers to the 12 patients classified as "non-responders."

Discussion

The results of this investigation suggest that patients whose haemoglobin levels are below 90% at the beginning of pregnancy are iron-deficient, since the level rises steeply when they are treated with iron. The patients whose haemoglobin level is over 90% at the beginning of pregnancy maintain their high level at 38 weeks when treated with iron. Thus the steady fall in haemoglobin repeatedly reported to be characteristic of pregnancy—for example, M.R.C. (1945)—does not occur if iron is administered, except in the small group of "non-responders." Moreover, the level of haemoglobin at 38 weeks is almost the same as that observed six weeks or more after delivery—again with the exception of the few "non-responders." This finding appears to dispose of the idea that a fall in haemoglobin as pregnancy proceeds is due to haemodilution and is therefore "physiological." It is possible that this process may occur in the "non-responders," in view of the sharp rise that they show in their haemoglobin level after delivery; alternatively, they may have been unable to utilize iron during pregnancy but able to do so after delivery. These 12 patients were clinically well at all stages. Full haematological investigations were carried out in six of them, but no cause for their failure to respond was found.

It has been suggested that even if the fall in haemoglobin which occurs in pregnancy is not prevented by iron therapy the patients are none the worse clinically (Samuel, 1952). It

is probable that this belief is widely held. In spite of repeated demonstrations that iron raises the haemoglobin in pregnancy, it is not administered routinely to pregnant women. It is, of course, difficult to prove that patients with haemoglobin levels above 90% are in better health than those with levels between 70 and 80%. One gains the impression that at the higher level they are more energetic and tire less easily; and there can be no doubt that they are in a better position to withstand haemorrhage or infection. Apart from the benefit to the patients, the confidence of both doctor and midwife, particularly in domiciliary practice, is greatly increased by the knowledge that the haemoglobin level is high at term.

Throughout this communication the figures quoted are averages, and averages are in some ways misleading. In this small series, 15 of the "responding" patients had initial haemoglobin levels of 80% or less. Some of these, if untreated, might have had terminal levels of 60% or less and would have been in a dangerous condition if not transfused during pregnancy. Considered on a national scale, it is probable that these dangerously low levels (sometimes but not always detected and treated by transfusion) could be avoided in the vast majority of cases by iron therapy.

It is customary to give iron to pregnant women who are "really" anaemic, the critical level at which treatment is considered necessary varying from one centre to another. When facilities for haemoglobin estimations are not readily available the presence or absence of "anaemia" is sometimes judged clinically. This is highly fallacious, as one of us (M.F.) proved some years ago by comparing the haemoglobin levels in pregnant women as judged clinically and estimated in the laboratory. Comparisons were made on 173 occasions and an error of 10% or more was observed on 87 of them. The limits of error were a clinical overestimation of 34% and an underestimation of 46%. In view of the findings in our series of patients, it would seem advisable to prescribe iron for all pregnant women and to see that it is really taken. If this is done it is doubtful whether routine haemoglobin estimations are necessary, though any patient with symptoms indicating anaemia should be fully investigated in case she is suffering from the rare macrocytic anaemia of pregnancy.

Conclusions

The administration of iron in pregnancy ensures a high level of haemoglobin at term in about 90% of cases.

It is suggested that giving iron as a routine to all pregnant women is a valuable and inexpensive preventive measure worthy of general application. The safety of domiciliary midwifery—which is questioned at times—would undoubtedly be increased by this means.

We are indebted to Dr. R. G. Macfarlane for helpful criticism to Dr. Sheila Callender for the haematological investigation of "non-responders," to Dr. R. B. Fisher for statistical advice, and to Glaxo Laboratories and Roche Products Limited for generously supplying fersolate and ferro-redoxon respectively for this trial.

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RECURRING MENTAL CONFUSION AFTER PORTO-CAVAL ANASTOMOSIS

BY

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Alterations in the level of consciousness varying from light clouding to stupor and coma have been described after the operation of porto-caval anastomosis by McDermott and Adams (1954). Their patient had been so treated because of suspected carcinoma of the head of the pancreas, and "episodic stupor" could be induced readily by feeding with various nitrogenous substances. Earlier, Gabuzda *et al.* (1952) and Philips *et al.* (1952) noted that diets rich in nitrogen reduced many of their patients with cirrhosis of the liver to a state bordering on hepatic coma, and their findings are linked with the experimental work of Baló and Korpásky (1932), who produced "meat intoxication" in dogs with Eck fistulae. The mechanism is believed by Walshe (1951) and Riddell and McDermott (1954) to involve ammonia metabolism and the utilization of glutamic acid by the brain cells.

The electroencephalographic changes in developing hepatic coma have been reviewed by Adams and Foley (1953), who believe that constant although non-specific changes occur at first. These are paroxysmal, bilateral, and synchronous theta waves at 1½-3 c/s on a background of normal frequencies; gradually, with increasing mental confusion, the slow activity becomes dominant.

The following case is reported for its clinical interest and because the confusional episodes occurred spontaneously. They could also be induced by high-protein feeding and relieved by the reverse procedure.

Case Report

A Merchant Navy officer aged 52 was first seen on March 13, 1954. There had been excessive indulgence in spirits since 1923, but, apart from intermittent epigastric pain, no illnesses occurred until 1943, when he had jaundice. He recovered after some weeks, but in 1944 contracted syphilis, for which he was treated energetically with neoarsphenamine, the blood Wassermann reaction becoming negative. In 1952 there was a small haematemesis, and in February, 1953, a more severe one with melaena.

He was admitted to the Royal Victoria Hospital, Belfast, under the care of Dr. Robert Marshall, the chief physical findings being a firm palpable enlargement of the liver and spleen. On March 27, 1953, Professor H. Rodgers did a laparotomy. A cirrhotic liver was found, and a portal phlebogram showed gross intrahepatic distortion. A porto-caval shunt operation was performed. The post-operative period was marked by a low-grade pyrexia and slight jaundice, but on discharge on April 29 he was feeling fairly fit and had no symptoms or signs apart from the firm palpable liver, two fingerbreadths below the costal margin.

From that date until his readmission a year later, he had at least five attacks of "confusion," of which he had a hazy recollection. He readily admitted that most of the details had been furnished by his wife. The attacks described had a similar pattern, but varied a little in their effects. The first symptoms included "shakiness in the hands," noted especially when eating, writing, or dressing himself, and blurring of vision. He would feel "stupid" and unable to concentrate, and was difficult to waken in the morning. The

most striking episode occurred in November, 1953. Late one evening, just before retiring, he wanted to pass water but could not find the lavatory. He wandered all over the house, and then eventually went to bed unrelieved. Some hours later he got up and renewed his search. This time his wife noticed his peculiar behaviour and showed him the way; but after relieving himself he found he did not know how to unlock the door. His wife eventually had to go outside and climb in through the window to let him out. The following morning he was awakened with difficulty and then proceeded to dress himself, but, in his own words: "I could not get my clothes on properly. They were either inside-out or upside-down." His wife watched, amazed at his performance and his persistence in trying to dress, but when she went to help him he resented interference, and nearly one and a half hours elapsed before he had his trousers on properly. In the other episodes he was noted to be querulous and unreasonable at times, and on one occasion he micturated on the floor of the sitting-room. The patient himself did not relate his attacks in any way to increased ingestion of food.

He was readmitted in March, 1954, to the neurological department, having been referred to us by Professor Rodgers. He was fully orientated and co-operative, and displayed no definite signs of impaired mental function on formal testing. The tendon reflexes were symmetrically increased, but the plantars were flexor. There was a fine rapid tremor of the outstretched hands. No other abnormal signs in the central nervous system were elicited. The blood pressure was 170/100 mm. Hg, and there was a precordial systolic murmur, but no diastolic murmur was heard. The breath at times had a peculiar odour, difficult to describe—like fresh meat or concentrated liquid extract of vitamin B. The liver was firmly enlarged to two fingerbreadths below the costal margin and was slightly tender. There was no evidence of ascites.

The results of recent chemical and radiological tests are compared in the Table with those of a year previously.

Investigations

	February and March, 1953 (Pre-operative)	May, 1954
Blood W.R.	Negative	Negative
Bromsulphthalein excretion	3% retention	17% retention
Plasma proteins	6.8 g./100 ml. A/G ratio 1.8	5.8 g./100 ml. A/G ratio 3
Thymol turbidity	4 units	1.0 unit
Serum bilirubin	0.6 mg. per 100 ml.	0.8 mg. per 100 ml.
Alkaline phosphatase	8 units K.A.	12 units K.A.
Urinary chromatogram	Slight excess in amino-aciduria of a general pattern	Slight excess in amino-aciduria of a general pattern
Blood group	AB, Rh-positive	94
Haemoglobin	56%	1.0
Colour index	1.0	6,500 cmm.
White-cell count	7,200 cmm. (normal differential)	No significant lesion
X-ray chest	Suggestion of oesophageal varices	No evidence of varices
Barium swallow	Normal	Normal
Barium meal	Normal	228 mg. per 100 ml. (normal 99-111 mg.)
Serum copper	Normal	0.230 mg. in 24 hours.
Urinary	Pressure, 90 mm. C.S.F.; cells, 1; protein, 20 mg. per 100 ml.; W.R. negative	Lag storage curve
Lumbar puncture	Some resistance to insulin	
Glucose-tolerance test		
Insulin-sensitivity test		

Methods of Investigation.—The patient was given a basic diet containing 70 g. of protein daily. Additional protein was given by mouth in the form of "casilan." Electroencephalograms were taken at regular intervals and the mental state was assessed by observing the behaviour and applying simple tests for his ability to concentrate (counting forwards and backwards), to register and recall (name and address), to calculate, and to grasp simple problems (Kohs blocks) (see Fig. 1).

On a diet containing 170 g. of protein, the E.E.G. showed excess slow activity, he was unable to concentrate well, and his performance with the Kohs blocks was impaired. Within

24 hours of giving 270 g. of protein daily, both the E.E.G. and the mental state became grossly abnormal, the behaviour corresponding to that of his condition previous to admission. Thus on one occasion he wandered around the ward looking for the bathroom, and was quite indignant when told that another patient's cubicle was not the lavatory. He was observed to have considerable difficulty in dressing himself, and he complained of blurring of vision and "shaking." The fetor of the breath was striking. The tremor of the hands became more coarse with flexion and extension movements at the wrist, giving the "flapping" appearance emphasized in most reports, and recently by Sherlock *et al.* (1954). It is of interest that it was more pronounced in the right hand. He was disorientated in place and time, and was unable to draw the points of the compass, in doing which at other times he was accurate.

Examination of the cerebrospinal fluid at this stage gave normal results, the blood-sugar values being also in the normal range. The injection intravenously of 50 ml. of 50% glucose had no effect. However, as the daily protein intake was reduced so both the mental state and the E.E.G. returned to normal. Two values of the blood ammonia were taken, using the technique described by Conway (1935), and were found to be significantly raised.

Discussion

Other possible explanations for the symptoms considered in this case were neurosyphilis and hypoglycaemia, but the blood and cerebrospinal fluid were quite normal and there was no alteration in the state of the reflexes or in the pupils. Insulin sensitivity was investigated and the effect on the blood sugar of physical exertion noted, but the results were against any association with hypoglycaemia. Further, there was the convincing manner in which the symptoms and abnormal electroencephalographic findings could be reproduced by a high-protein diet. If this is the explanation, it is somewhat surprising that such quantities of protein were necessary to produce them. The patient's wife had no doubt that he did not eat comparable amounts at home, where the same symptoms were first noted. However, when the protein intake was reduced the symptoms were reversible

within 24 to 48 hours. It is possible that at home some added factor, such as alcohol or an intercurrent infection, combined to produce symptoms with a lower intake of protein, but we could not obtain any confirmation of this suggestion.

The normal pressure and the cellular and protein content of the cerebrospinal fluid at the time when confusion was maximal are in agreement with other workers (Adams and Foley, 1953). In spite of the clinical evidence of cirrhosis, except for the bromsulphthalein excretion liver-function tests were normal, so that it is likely that the presence of the shunt itself is significant in producing the disordered metabolism as suggested by Singh *et al.* (1954). The E.E.G. abnormality also proved reversible, the slow bilaterally synchronous waves giving way to a normal alpha rhythm (Fig. 2).

We would like to emphasize that we found the E.E.G. an extremely reliable and sensitive guide in predicting mental changes. Thus the most abnormal record preceded by 12 hours the development of severe confusion. The dressing dyspraxia was interesting. Experience with this case suggests that the symptom, although often a feature of parietal lobe disease (Critchley, 1953), is without localizing value and depends to some extent on a general lowering of the level of consciousness.

Summary

The case of a man aged 52 with cirrhosis of the liver is described. Following porto-caval anastomosis for portal hypertension, several episodes of mental confusion occurred which could be reproduced by high-protein feeding. Reversible E.E.G. changes were also seen giving way to a normal alpha rhythm. A high-protein diet is contraindicated in such patients.

Acknowledgments are due to Professor H. Rodgers for giving us the opportunity of investigating this patient. We thank Dr. J. H. D. Millar for the E.E.G. reports and Miss A. Coey, senior electroencephalographer, for technical assistance. We are also grateful for the advice Mr. D. Neill, of the biochemical department, gave us in planning tests and for the copper and ammonia estimations.

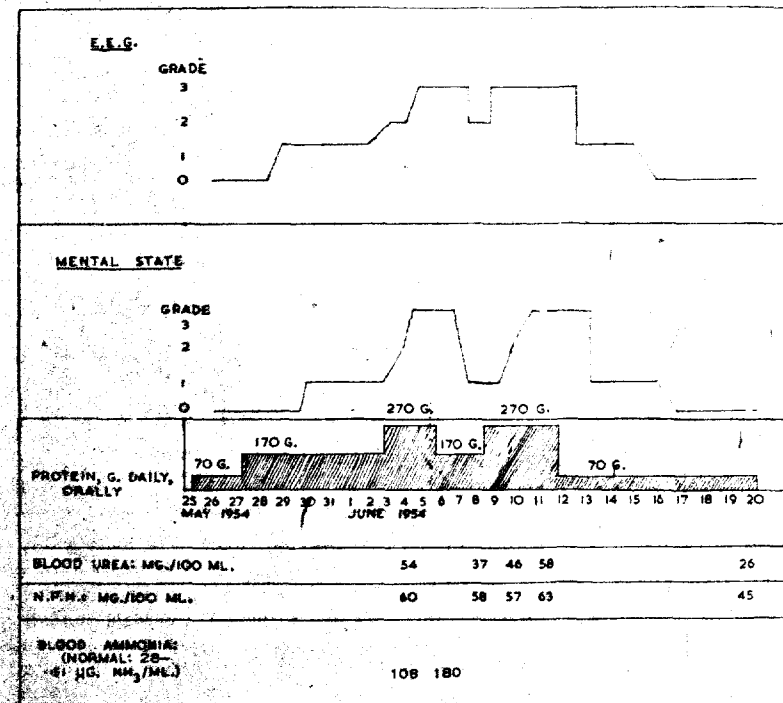


FIG. 1.

FIG. 1.—Results of investigation. Normal electroencephalographic record before increased feeding: grade 3, 3 c/s waves, main activity; grade 2, moderate excess; grade 1, slight excess, slow activity; grade 0, normal. Mental state: grade 3, disorientated, dressing dyspraxia, etc.; grade 2, tremor, blurring of vision, drowsy; grade 1, impaired concentration; grade 0, normal.

FIG. 2.—E.E.G. recordings taken, from top to bottom, on May 27, 29, and 31, and June 2, 4, 11, and 17, 1954.

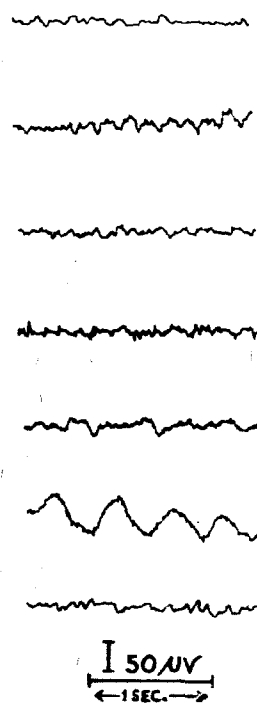


FIG. 2.

ADDENDUM

We have seen another case through the courtesy of Professor G. M. Bull in which dressing dyspraxia was a prominent feature.

Case Report.—A man aged 59 was first seen in September, 1953, with oedema of the legs, ascites, and hypertension (210/120). A continuous venous hum was heard in the epigastrium (Cruveilhier-Baumgarten syndrome). A biopsy of the liver showed multiple nodular hyperplasia. He was treated with a high-protein diet and kept well until August, 1954, when his doctor reported: "Yesterday the patient became rather confused, and attempts to dress himself were unsuccessful." He was also reported to have melaena. On admission there was jaundice, and he was apathetic and disorientated. On examination there was enlargement of the liver and spleen, and ascites, and the venous hum was very marked. With treatment by low-protein diet he made a good recovery.

An annotation in the *British Medical Journal* (1954) refers to the dual role of liver damage and the effects of a porto-caval shunt in producing mental symptoms. It seems to us, however, that a third factor, not mentioned by the annotator, is important. In the first case described, alcohol and intercurrent infection, and in the second, gastrointestinal bleeding, may have played a part in precipitating the confusional episodes. One of us (Allison, 1952) has emphasized how often anoxia, dehydration, alkalaemia, the injudicious use of drugs, and electrolytic imbalance lead to psychiatric disturbances in later life. In both our cases the possible ancillary action of some such factor cannot be excluded.

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MUSCULAR DYSTROPHY OCCURRING IN IDENTICAL TWINS

BY

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Since the second half of the nineteenth century muscular dystrophy has been recognized as a hereditary disorder (Gowers, 1879; Erb, 1891) although there has been disagreement about the way it is inherited. Much difficulty was experienced in the classification and genetics of the many varieties described. Recently further attempts were made to introduce simpler classifications, but, owing to the variability of expression of the defective gene and the similarity of the genetic types, difficulties remain.

After studying 1,228 cases from the literature and 113 case records from the National Hospital, Queen Square, Bell (1943) divided the dystrophies into three clinical groups: group A, the pseudo-hypertrophic form characterized by the enlargement of certain muscles, wasting of others, and progressive weakness in all affected muscles;

group B, cases with wasting and weakness of the affected muscles, no history of enlargement, and no affection of the facial muscles; group C, all cases in which the facial muscles were affected. She considered that there were three genetic groups—recessive, dominant, and sex-linked—and that the same gene could produce any of the three clinical types. This theory was supported by Boyes *et al.* (1950), who studied the history of an English and Canadian family in which both group A and group C occurred, the family distribution indicating a simple dominant type of inheritance.

More recently Tyler and Stephens (1950, 1951) suggested making only two groups: the childhood and the facio-scapulo-humeral groups. For the first type they preferred the term "progressive muscular dystrophy of childhood" to the more usual one of "pseudo-hypertrophic muscular dystrophy," as pseudo-hypertrophy may sometimes be absent in this group and present in the second one. This illness runs a steadily progressive downhill course, terminating fatally in adolescence or young adult life. It occurs only in males and is transmitted by females, the gene being a sex-linked recessive. The facio-scapulo-humeral type is inherited as a simple dominant affecting both sexes and half the offspring with a wide variability of expression and penetration. It starts usually in young adult life and runs a very variable course. Tyler and Stephens studied a large family in Utah founded by an affected emigrant born in 1775. In six generations there have been 1,249 descendants, of whom 159 have been affected with dystrophy of the second type. A similar classification was favoured by Ramsey and McCarroll (1952).

After studying 71 cases at Massachusetts General Hospital, Brown (1951) was unable to make a rigid classification but considered that the cases fell into three main groups: group 1, cases with pseudo-hypertrophy; group 2, cases with generalized muscular atrophy starting in the thighs; and group 3, cases with generalized muscular atrophy starting in the scapulo-humeral muscles.

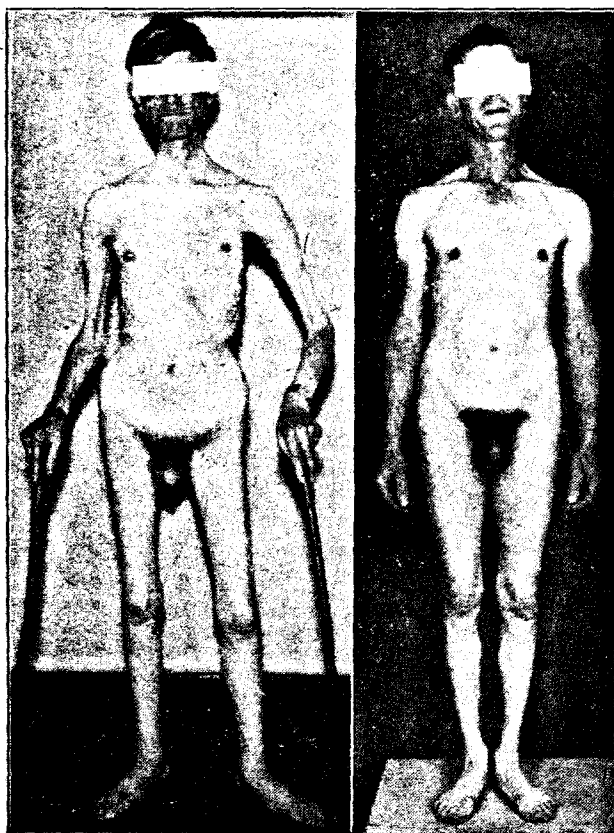
Stevenson (1953) studied all the known cases of muscular dystrophy in Northern Ireland together with their families. There were 72 cases in 51 families. He concluded that there are only two groups: (a) the pseudo-hypertrophic variety occurring in boys and transmitted as a sex-linked recessive disease. For this he suggested the clumsy but more accurate title, "Duchenne type rapidly progressive muscular dystrophy of young boys"; (b) the second group consists of all the other types which he believed to be variants of the same condition determined by single autosomal recessive gene inheritance. For this group he suggested the term "autosomal limb-girdle muscular dystrophy."

The occurrence of a disease in twins is helpful in studying its heredity. Few twins, however, have been affected with muscular dystrophy, and so far there has been no report of the variety without hypertrophy occurring in identical twins. Stephens and Tyler (1951) described male identical twins who had the pseudo-hypertrophic form. The disease ran an identical course in each, being first recognized at the age of 6 years, causing complete incapacity at 11 years, and death, within a few months of each other, at the age of 25. No other member of this family was affected. The occurrence of progressive muscular dystrophy (without hypertrophy) in a male twin but not in the corresponding female has been reported by Milhorat and Wolff (1943) and Karnosh and LaTona (1947).

The cases reported here occurred in identical twin males who had muscular dystrophy of the autosomal limb-girdle type; one was severely affected, but the other only mildly so.

Case 1

An unmarried man aged 45 was sent to hospital to obtain an invalid chair. At the age of 18 he had noticed weakness of the legs, which was worse proximally. The weakness increased gradually during the next 13 years until after an attack of influenza at the age of 31 it became much worse and affected the shoulder muscles. Progressive weakness made him retire at the age of 38 from his work as a farm labourer with some blacksmith's duties. Deterioration continued slowly until a second attack of influenza at the age of 48, when again the weakness and atrophy increased rapidly, particularly in the legs. He has had no other illnesses.



Case 1.

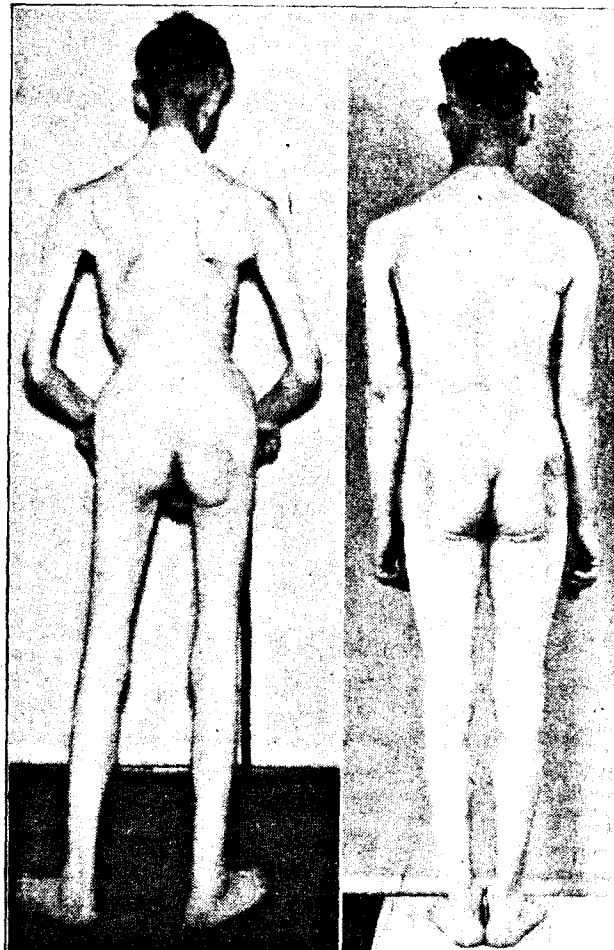
On examination there was postural oedema of the feet but no other abnormality outside the muscular system. The gait was waddling, with marked lumbar lordosis. The buccinator muscles were weak but the other facial muscles were normal. The sterno-mastoid muscles were severely affected, being very weak and wasted. There was marked wasting of the shoulder-girdle muscles with winging of the scapulae. The deltoids were moderately weak and atrophied, as were the biceps and triceps, but the muscles of the fore-arms and hands were not so severely affected. The inter-costal and spinal muscles were weakened and wasted. There was severe weakness of all the muscles acting on the hip-joint, so that he was unable to raise his legs against gravity. The severe weakness and wasting of the legs was more marked proximally. No fasciculation was visible. Tendon jerks were diminished, commensurate with the muscular weakness. Plantar responses were flexor. There was no sensory loss. He was confined to the house, being unable to walk

more than a few yards, and this only with the aid of sticks. He could not get up from a sitting position without help, and once up could stand unsupported for only a few minutes.

Case 2

The twin brother, married but without children, was not aware that he was affected. He was able to do general farm duties without difficulty.

On examination no abnormality outside the muscular system was found. There was slight hypertrophy of the right deltoid. The legs were wasted, particularly the quadriceps, sartorius, and calf muscles. No demonstrable weak-



Case 1.

Case 2.

ness was seen. No fasciculation was visible. Knee- and ankle-jerks were slightly diminished. There was no sensory loss.

The twins were not weighed at birth, but were not full-term. The younger twin (Case 1) was born ten minutes after the other, there being one afterbirth, which came after the second twin. The parents observed that the younger twin was always a little slower than the elder, but there was no other difference between them as children. They were identical physically and were mistaken for each other even until recently. No other member of the family is known to be or to have been affected.

Discussion

In the younger, more seriously affected, twin the disorder started first in the proximal muscles of the legs. It has affected the facial muscles and has not produced any

hypertrophy. Thus the case falls into Bell's group C. In the elder twin the right deltoid is larger than the left, but this may well be work hypertrophy. His legs are the parts most affected, the facial muscles not at all. Thus his disorder falls into Bell's group B. Both cases fall into Brown's group 2, Tyler and Stephens's group 2, and Stevenson's "autosomal" limb-girdle muscular dystrophy group.

The physical characteristics of the twins were carefully examined in an attempt to establish that they were identical. There was a striking physical resemblance in spite of the marked wasting of the younger twin. The colours of their hair and eyes were the same; their height differed by only $\frac{1}{2}$ in. (1.3 cm.), whilst their biparietal, fronto-occipital, and bizygomatic diameters differed by no more than $\frac{1}{4}$ in. (6 mm.).

Their main blood groups were the same: ABO: A₁; Rh: CDe/cde; MN: M. The subgroups, done by the Blood Group Reference Laboratory, were the same:

	S	P	Lu ^a	Kell	Lea	Leb	Fy ^a
Case 1	+	+	-	-	-	+	+
Case 2	+	+	-	-	-	+	+

Although the fingerprints of identical twins are not the same, the fingerprints of these twins are of interest. All the impressions of the younger twin were of the type known as "ulnar loop" with the exception of the right forefinger, which was a radial loop, whereas the impressions of the elder twin were all ulnar loops except that of the left forefinger, which was the same pattern as that of the right forefinger of the younger twin—that is, radial.

These findings, although not conclusive, support the opinion of the family that the twins are identical.

It is noteworthy that the younger twin is severely incapacitated, whereas the elder is so mildly affected that he does not realize that he has the disorder. This raises the question of whether there is some environmental factor which determines the severity of the disease.

Boyes *et al.* (1950) found that in several of their cases the onset of the disease was associated with a specific environmental stress, and that a period of unusual physical strain precipitated the onset of the disease in the muscles under stress. Thus in one case the disease started in the shoulder of a woman after working long hours as a waitress carrying trays, and later affected her legs in pregnancy.

In the present cases no such explanation could be found. Both were brought up on the same farm and have lived in the same area since, the younger twin remaining at home and the elder at the age of 17 moving to the farm of an uncle only ten miles away. Their modes of life, nutrition, and work on the two farms were similar.

The two illnesses described by the younger twin as influenza caused marked deterioration on each occasion. It is possible that these illnesses were caused by a particular strain of influenza virus or some unusual type of virus which did not affect the other twin. It is more probable, however, that they were ordinary influenzal attacks, that the other twin has had similar attacks, and that some other unidentified factor has been responsible for the marked difference between the two.

Summary

Muscular dystrophy is reported as occurring in identical male twins now aged 45; in one the disease is severe and incapacitating, but in the other it is so mild that he is unaware that he is affected. No explanation can be given for this difference.

I wish to thank Dr. A. P. Dick for permission to publish these cases and for his help in the preparation of the report; Dr. Helen Dimsdale for her criticisms; Dr. C. B. V. Walker, of the Blood Transfusion Service, Cambridge, and Dr. D. M. Parkin, of the Blood Reference Laboratory, for their opinions in the blood grouping; Mr. P. Graham for the photographs; and the superintendent of the Huntingdonshire County Constabulary for the fingerprints.

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ESSENTIAL PENTOSURIA*

BY

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Essential, or idiopathic, pentosuria is a rare condition which has been included by Garrod (1923) among the inborn errors of metabolism. Its occurrence was first described by Salkowski and Jastrowitz in 1892, but since then only about 200 cases have been recorded in the literature, and only one clinical report dealing with the condition has been published in this country—namely, that of Cammidge and Howard, which appeared in 1920 and described seven cases. The early case reports have been reviewed by Garrod (1923) and Margolis (1929a), and, more recently, Bock (1944) has summarized the features of the condition in a review of the benign meliturias. Since 1944 case reports have been added by Bloomberg *et al.* (1946), Caven (1947), and Barnes and Bloomberg (1953).

The clinical importance of pentosuria depends on the fact that it may be confused with diabetes mellitus. Nowadays, however, when chemical confirmation of a diagnosis of mild diabetes is almost a universal practice, it is more likely to be misdiagnosed as renal glycosuria.

The identification of urinary reducing substances has been greatly facilitated by the introduction of paper chromatography. In the department of clinical pathology at University College Hospital we have been applying this method to identify the reducing substance excreted in cases which appear to have a low renal threshold for glucose. In the course of 4½ years two cases of essential pentosuria have been encountered. These two cases are described here and existing knowledge of the condition is reviewed.

The following methods were used: (1) Qualitative Benedict tests (Flynn *et al.*, 1953). (2) Bial's test (Lasker, 1950). (3) Osazones (Enklewitz and Lasker, 1935a). (4) Blood sugar (Hagedorn and Jensen, 1923). (5) Urine nitrogen (micro-Kjeldahl). (6) Urine xylulose (Lasker and Enklewitz, 1933), using the factor of Greenwald (1930a) for the calculation. (7) Chromatography (Horrocks and Manning, 1949), using a 3:2:1.5 *n*-butanol-pyridine-water solvent (Hough *et al.*, 1950) as well as the 4:5:1 *n*-butanol-acetic-acid-water mixture of Partridge and Westall (1948). The paraphenylenediamine reagent of Flynn *et al.* (1953) was used for showing up the sugar spots on the paper chromatograms.

*Based on a communication read at a meeting of the British Diabetic Association on July 17, 1954.

Case 1

A married Hungarian Jewess aged 34 was admitted to University College Hospital under the care of Dr. J. F. Stokes in May, 1950, suffering from infective hepatitis. During her stay in hospital it was noted that her urine gave a yellowish-green reduction of Benedict's reagent.

History of "Glycosuria."—Sugar was first discovered in the urine in October, 1947, when the patient was in University College Hospital under Dr. F. M. R. Walshe, with poliomyelitis. So far as she was aware this was the first time her urine had been tested. She was referred to the diabetic clinic, but failed to attend. She had no symptoms suggestive of diabetes at any time apart from two boils in October, 1949. She had gained 2-3 st. (12.7-19 kg.) in weight in the last three years. Glycosuria had been noted more than once by the several doctors she had consulted in the previous year, but she was told that her blood sugar was normal and that she had renal glycosuria.

There was no family history of diabetes, though the patient recalled that one of her three siblings had once been thought to have sugar in the urine.

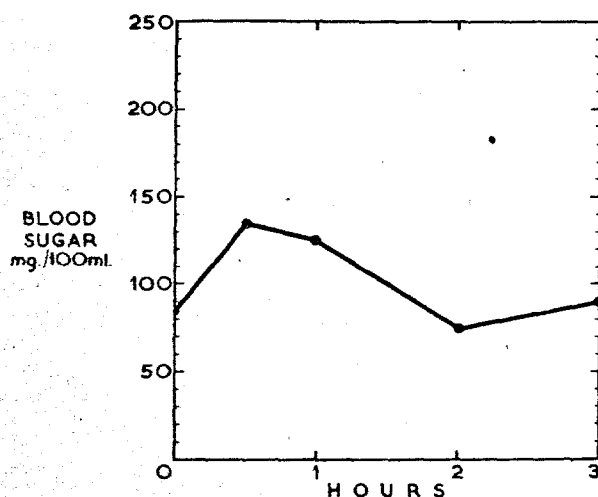


FIG. 1.—Blood-sugar curve in Case 1 after 50 g. oral glucose. G_2 =yellowish-green reduction.

Investigation of "Glycosuria"

The urine was tested repeatedly over a six-day period. Reduction of Benedict's reagent was found to occur with all specimens, regardless of the time of day; most gave a yellowish-green reduction. Rothera's test was consistently negative.

A glucose-tolerance test was performed, the result being shown in Fig. 1. This shows a normal blood-sugar curve, but sugar is present in all three specimens of urine, the concentration being the same in each.

Paper chromatography of the urine disclosed the presence of a small amount of glucose and glucuronate and a large amount of another substance which we had not previously encountered. This unknown substance moved relatively fast on the chromatogram and was recognized, by the reddish colour produced on spraying with paraphenylenediamine, as being a pentose. The R_f value of this sugar was greater than that of xylose or arabinose, however, and was nearest to that of rhamnose. Subsequently we realized that the sugar must be xylulose (also known as xyloketose), and were able to confirm this by showing that it gave the typical chemical reactions, and had an identical R_f value to that of a synthetic xylulose solution prepared from xylose according to the method of Schmidt and Treiber (1933).

Chemical studies showed that the urine gave a positive Lasker-Enklewitz test (see below), and a positive Bial test. The reducing property of the urine was destroyed by treatment with dilute hydrogen peroxide solution (Enklewitz, 1936), and by heating with strong acid (Enklewitz and Lasker, 1933), but treatment with bromide did not affect the results of reduction tests (Greenwald, 1930a). An osazone was prepared which showed the typical properties of L-xylulose (Greenwald, 1930a, 1930b; Barnes and Bloomberg, 1953). Direct examination of the urine in the polarimeter did not disclose any optical activity.

The concentration of xylulose was estimated in a random afternoon specimen of urine and was shown to be 0.5 g. per 100 ml. The concentration of other reducing substances present was 0.2 g. per 100 ml. (when expressed as xylulose).

Case 2

A German Jewess aged 55 first attended Professor M. L. Rosenheim's out-patient clinic at University College Hospital in February, 1951, having been referred by her doctor on account of hypertension. Diabetes was said to have been present for 30 years. On examination the only abnormal findings were a blood pressure of 225/130 and a bluish-green reduction of Benedict's reagent on testing the urine. No ketones were present. A diagnosis of benign essential hypertension was made.

History of "Glycosuria."—In 1919, when the patient was aged 24, her urine was tested for the first time. She had been feeling unwell immediately following her father's death, and while in Austria consulted a chemist, who found sugar and acetone in her urine. She had lost much weight, and her cousin, a doctor, diagnosed diabetes. She was put on a strict diet in a clinic at Wiesbaden, and subsequently attended there each year for 12 years. In 1920 she was said to have had a coma. In 1923 she was given two injections of insulin, with severe reactions. In 1933 she gave up going to Wiesbaden and ceased to worry about her diet, as she found she kept well without it. She returned to it, however, before visits to her doctor. In 1936 insulin was tried again and was followed by fairly typical hypoglycaemic attacks. In 1941 she was in hospital in this country on account of pyrexia of unknown origin. Routine testing of the urine revealed sugar, and she was again advised to take insulin, but refused to do so.

It is also noteworthy that she underwent appendicectomy in 1924, left radical mastectomy in 1933, hysterectomy in 1943, and a further gynaecological operation in 1946, all without complications.

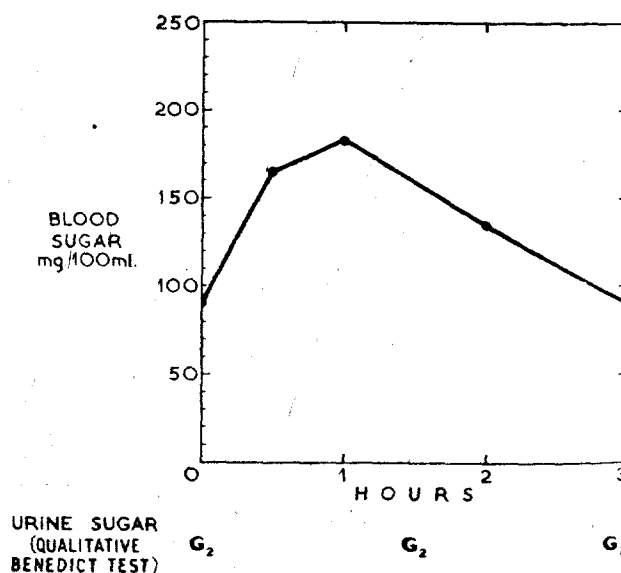


FIG. 2.—Blood-sugar curve in Case 2 after 50 g. oral glucose. G_2 =yellowish-green reduction.

The family history revealed that her father and her maternal grandfather had been known to have small amounts of sugar in the urine, but none of her five sisters was known to be so affected.

Investigation of "Glycosuria"

A glucose-tolerance test was performed, and the result is shown in Fig. 2. This shows a blood-sugar curve which is just within normal limits, but sugar is present in all three specimens of urine, the concentration being the same in all and unrelated, therefore, to the height of the blood sugar.

The urine-reducing substance was shown by paper chromatography to be a pentose and was subsequently identified.

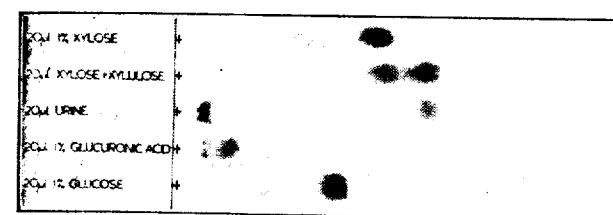


FIG. 3.—Paper chromatogram of urine sugar from Case 2 with appropriate markers.

as in Case 1, as xylulose. A chromatogram of a later specimen of this patient's urine, with appropriate markers, is reproduced in Fig. 3, and shows the presence of glucuronic acid and xylulose. The large quantity of glucuronic acid in this specimen was due to prior administration of glucurone.

Further tests, carried out in June, 1951, when the patient was admitted to the wards, showed that the condition was in every way typical of essential pentosuria. The results (Figs. 4 and 5) show: (a) that the daily excretion of xylulose is constant at about 3.5 g. a day when no drug is being given, regardless of minor changes in the diet; (b) that xylulose excretion is not affected by feeding fructose; (c) that xylulose excretion is increased by administration of glucurone and amidopyrine; (d) that xylulose excretion is not related to nitrogen output; (e) that xylulose excretion is not related to urine volume; (f) that the rate of xylulose excretion rises more rapidly after glucurone than amidopyrine; and (g) that there is a direct relationship between glucuronate and xylulose excretion.

We were also able to demonstrate xylulose in the plasma by heavily loading protein-free filtrate on to paper chroma-

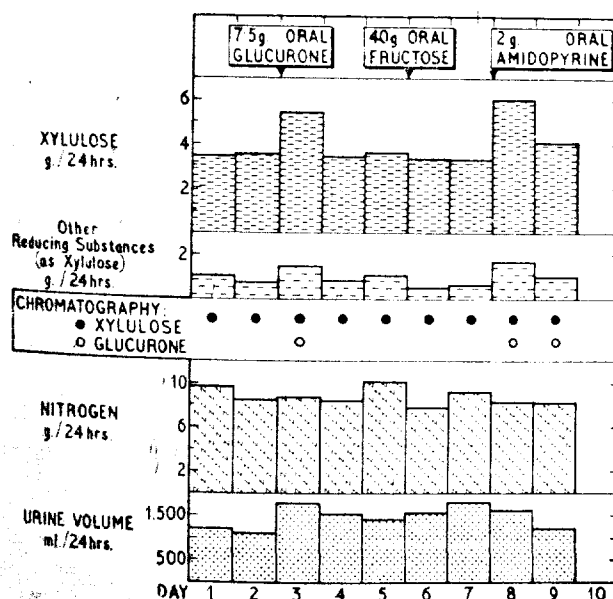


FIG. 4.—Urine findings during metabolic investigations in Case 2.

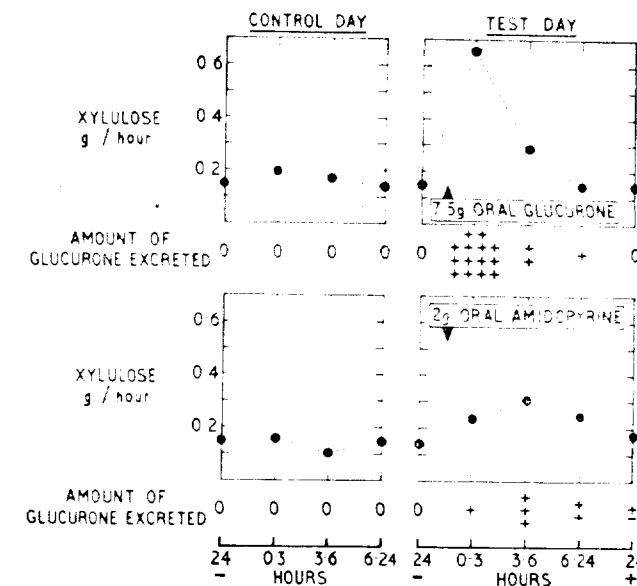


FIG. 5.—Correlation between urinary excretion of xylulose and glucuronate in Case 2. (Glucuronate excretion assessed from size and intensity of spot on chromatogram.)

tograms. It was just detectable in the fasting state, but the concentration was increased following administration of glucurone.

Urine specimens were obtained from the one relative resident in this country—a sister—and the first specimen reduced Benedict's reagent and showed xylose on chromatography. This startling finding must be attributed to fruit-eating, for subsequent specimens were sugar-free.

Discussion

Types of Pentosuria

These two cases are typical of essential pentosuria, which is characterized by the constant excretion of small amounts of L-xylulose. Other forms of pentosuria from which this condition has to be distinguished are alimentary pentosuria, in which arabinose or xylose is found in the urine after ingestion of a large amount of fruit or fruit product, and possibly also ribosuria, which has recently been claimed to accompany some cases of muscular dystrophy (Minot *et al.*, 1949; Orr and Minot, 1952).

Features of Essential Pentosuria

The incidence of essential pentosuria has been estimated from insurance records to be 1 in 50,000 (Larson *et al.*, 1937). It is found almost exclusively in people of Jewish lineage, but proved cases have been recorded in non-Jews (Barnes and Bloomberg, 1953). There is a distinct familial tendency, and the studies of Lasker *et al.* (1936) indicate that the disorder is inherited as a simple recessive. The condition has been found more often in males, but, as pointed out by Bock (1944), this may merely reflect the fact that more males than females apply for life assurance. It has been discovered at all ages, and persists throughout life. As yet no case has been proved to be present from birth.

The condition appears to be harmless to health. Margolis (1929a) noted that a high proportion of these patients suffered from headaches and were psychoneurotic; such symptoms, however, may have resulted from the patients worrying unduly about their so-called diabetes. In all cases reported by Cammidge and Howard (1920) excess urobilin and amino-acid nitrogen were found in the urine. This finding has not been confirmed by others and there was no amino-aciduria in either of the cases reported here. Excess urobilin was not found in the urine of Case 2 at any time.

The salient feature of essential pentosuria is the continuous excretion in the urine of small amounts of

L-xylulose. Usually 2-5 g. is excreted per day, the amount apparently varying with body weight (Enklewitz and Lasker, 1933); the concentration is always less than 1%. In the early literature arabinose was reported to be the sugar excreted, but later workers have agreed with Levene and La Forge (1914) that L-xylulose is the sugar present. Many cases reported as arabinosuria were in all probability cases of xylulosuria; indeed, two such cases have been proved to be so (Lasker, 1950). Wolfson *et al.* (1949) and Barnes and Bloomberg (1953) have shown by paper chromatography that pentosurics may excrete traces of xylose and other sugars in addition to xylulose.

For a given patient the amount of xylulose excreted is constant from day to day regardless of diet (Enklewitz and Lasker, 1935a). Feeding hexoses or pentoses is without effect (Cohen, 1910; Cammidge and Howard, 1920; Engle-witz and Lasker, 1933; Bloomberg *et al.*, 1946), but fasting for 24 hours has been shown to halve the excretion (Enkle-witz and Lasker, 1933). It has been claimed that the xylulose excreted paralleled the purine and protein content of the diet (Janeway, 1906; Cammidge and Howard, 1920), but Margolis (1929b) was unable to confirm this, and our results in Case 2 do not show an obvious relationship between nitrogen and xylulose excretion. Exercise and admin-istration of thyroid and insulin are without effect on xylulose excretion (Rabinowitch, 1925; Enklewitz and Lasker, 1933), but feeding glucuronic acid or drugs which are excreted as glucuronates—such as amidopyrine and codeine—results in increased excretion (Margolis, 1929a, 1929b; Lasker and Enklewitz, 1933; Enklewitz and Lasker, 1935a), as demon-strated in Case 2.

Metabolic Defect in Essential Pentosuria

Enklewitz and Lasker (1935a) seem to have established that glucuronic acid is the precursor of L-xylulose in pen-tosurics. Thus feeding them glucuronic acid or drugs excreted as glucuronates leads to increased excretion of xylulose, but feeding conjugated glucuronate is without effect. Moreover, there appears to be a direct relation between the amount of glucuronic acid administered or produced in the body and the extra amount of xylulose excreted. Our results in Case 2 seem to bear this out. It is odd that feeding drugs which are excreted as glucuronates should lead to increased xylulose excretion; presumably they stimulate the formation of more glucuronic acid than is required for their conjuga-tion.

As feeding glucuronic acid to normals does not lead to pentose excretion, the suggestion has been made that pen-tosuric patients have an abnormal enzyme system which decarboxylates glucuronic acid to yield xylulose (Everett, 1946). There is evidence, however, that L-xylulose may be a normal intermediary metabolite rather than an abnormal one. Thus L-xylulose appears to be metabolized by dogs (Greenwald, 1931; Larson *et al.*, 1939), and in a normal man, after oral administration of 5 g., none could be recovered in the urine in 24 hours (Enklewitz and Lasker, 1933). If L-xylulose is a normal metabolite in man then essential pentosuria could result from a block in the further metabolism of xylulose, for when 5 g. of L-xylulose was fed to a pentosuric an extra 0.5 g. was recoverable in the urine in the next 24 hours (Enklewitz and Lasker, 1933).

The nature of the error in essential pentosuria would appear, then, to be a partial or complete block in the meta-bolism of xylulose—one of the normal derivatives of glucuronic acid metabolism. A possible alternative explana-tion is that there is an abnormally large production of xylulose which overwhelms the mechanism that normally disposes of this sugar.

Diagnosis of Essential Pentosuria

Diagnosis depends on (a) discovering a constant meli-turia; (b) excluding diabetes by demonstration of normal glucose tolerance; and (c) identifying xylulose in the urine. Usually diagnosis is straightforward, but cases have been recorded with a coexistent diabetes (Edelman and Reiner,

1943), with diabetic symptoms (Enklewitz and Lasker, 1935b; Peterman, 1945), and where a reduction by the urine was not found in all specimens (Derivaux, 1943). In the case reported by Peterman the urine sugar was not proved to be xylulose.

Regarding tests for xylulose in the urine, that of Lasker and Enklewitz (1933) is an ideal screening test, as it can be readily performed by the clinician. It is carried out by adding 1 ml. of urine to 5 ml. of Benedict's qualitative reagent, mixing, and placing the test-tube in a water-bath at 55° C. for 10 minutes; if a water-bath is not available the mixture is left at room temperature for 3 or, preferably, 24 hours. The appearance of a yellow precipitate under these conditions is very suggestive of xylulose. Fructose, ascorbic acid, and glucose in high concentration may cause false positives, so confirmation is essential (Lasker and Enklewitz, 1933; Enklewitz, 1936; Barnes and Bloomberg, 1953).

For final identification of xylulose in the urine, paper chromatography provides the most satisfactory test, and is simpler than preparation and purification of osazones for melting-point and nitrogen determinations. With the use



FIG. 6.—Separation of sugars by one-dimensional paper chromato-graphy using 3:2:1.5 n-butanol-pyridine-water solvent.

of a butanol-pyridine-water solvent, and a spray reagent which distinguishes pentoses from hexoses, it is possible to identify all the urinary sugars on a one-dimensional chromatogram as shown in Fig. 6. It is likely that with the help of paper chromatography many more cases of essential pentosuria will be discovered.

Summary

Two unrelated cases of essential pentosuria are de-scribed; one masqueraded as diabetes mellitus, the other as renal glycosuria.

Results of metabolic investigations in one case are presented.

The features of the condition are reviewed and the nature of the metabolic defect is discussed.

The simple Lasker-Enklewitz test for detecting xylulose in the urine is described, and attention is drawn to the value of paper chromatography for final identi-fication of the sugar.

I wish to thank Professor M. L. Rosenheim and Dr. J. I. Stokes for permission to publish these cases and for helpful criticism; Mr. A. J. Cummings for valuable technical assistance; Mr. V. K. Asta for the diagrams; Mr. A. Bligh for the photo-graphs; and Dr. Ann Warrick for help with the manuscript.

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TRUE HERMAPHRODITISM

BY

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An individual who has both ovarian and testicular tissue is a true hermaphrodite. Proof of the presence of both types of gonad in the same individual is histological, as the secondary sex characters may be affected by other factors, such as overactivity of the adrenal cortex.

Adopting these criteria, an examination of the litera-ture has disclosed 59 unequivocal cases of true hermaphroditism, to which two further cases are added below. The further progress of the case originally recorded by Broster *et al.* (1938) is also noted.

Case 1

J. O., the third child of healthy parents of English extrac-tion, was first seen at the age of 16 months, having been brought for determination of the sex. No family history of any endocrine disease or congenital abnormality was forthcoming, except for talipes in the second child. The mother had suffered no illness during the pregnancy.

On examination the child appeared healthy and apparently normal except for the genitalia, which showed the following abnormalities. The phallus, about 3 cm. long, curved down-wards and had a hooded prepuce. About 3 cm. behind the phallus lay an orifice into which opened the urethra and a short recess. This recess admitted a probe for 2.5 cm. and presumably represented the lower part of the vagina. The labio-scrotal folds were rugose and contained no testes or hernial sacs.

Investigations.—Urinary 17-ketosteroids, 0.3 mg. a day (this is at the lower limit of assay, and indicates only that the 17-ketosteroid excretion was not increased). X-ray examination of the pituitary fossa showed no abnormality. The epiphysal bone age was 2-3 years—that is, about one year more than the actual age.

Operation.—Mr. L. R. Broster performed a laparotomy on July 17, 1953. A small (4 cm.) uterus was observed, from which ran two Fallopian tubes, terminating in fimbriated ends. In the usual position of the right ovary lay a structure about 2 cm. long, resembling a testis, a portion of which was removed for microscopical examination. No epididymis or other Wolffian elements could be found on either side. The adrenal glands felt normal in size and consistency. Samples of skin were taken from both sides of the abdomen for examination of the somatic nuclei by the method de-scribed by Moore *et al.* (1953). Dr. W. E. Evans reported

that the whole of the piece of tissue (8 by 3 mm.) from the right gonad consisted of immature testicular tissue, with seminiferous tubules separated by a loose, clear-celled stroma. Interstitial cells were not identified. A narrow fibrous capsule lay along one edge of the biopsy. The specimen, about 3 by 3 mm., from the left gonad consisted of a strip of young ovarian tissue beneath which was loose fibrous tissue. No ovarian "germinal" epithelium was found on the surface. Several ova were present, each sur-rounded by rather flattened cells with deeply stained nuclei, apparently derived from the ovarian stroma.

Skin Biopsies.—Professor M. L. Barr reported that a chromatin mass was present in less than 10% of epidermal nuclei. It has been observed (Moore *et al.*, 1953) that, in sections of tissue taken from a normal female, more than 80% of the nuclei seen contain a speck of chromatin on the periphery of the nucleus. In normal males such a mass is seen in less than 10% of nuclei in tissue sections. This observation is in accordance with the difference between the female sex chromosome pattern (XX) and the male pattern (XY). The nuclear picture in this case therefore conforms to the male type.

Case 2

P. F. was first seen in July, 1940, at the age of 20 months. The child had been brought up as a girl, but was already rougher and more masculine in behaviour than the elder sister, who was a normal girl. The patient was a muscular child with a deep voice and of normal intelligence. The phallus was about the normal size for a male of that age, but the urethra terminated at its base. No gonads could be felt in the scrotum, which was split, and a small uterus was palpated rectally.

Investigations.—Urinary 17-ketosteroid excretion, 0.3 mg. a day. Perineal insufflation gave no evidence of adrenal enlargement.

Operation.—Laparotomy was performed on September 1, 1940, by Mr. L. R. Broster. A small infantile uterus with fimbriated Fallopian tubes was found. Two gonads lay in the position of the ovaries. The left gonad was the size of a pea and the right gonad was slightly larger. No epididymis or vas deferens was seen on either side. Both gonads were removed for microscopical examination.

Professor H. W. C. Vines reported that the left gonad con-sisted of ovarian tissue and the right gonad of fibrotic testi-cular tissue.

The child was clearly more male than female in its behaviour, and was therefore brought up as a boy. From the age of 4 years a series of operations were performed to correct the hypospadias. Injections and local injection of testosterone from the age of 6 years have produced some increase in the size of the penis, which was, however, still smaller than normal when he was last seen in 1951 at the age of 13. He was then psychologically male, but rather shy, tending to cling to his mother.

Unfortunately, it has not proved possible to get in touch with the patient in order to obtain a sample of skin for nuclear examination.

Case 3

B. T. (Broster *et al.*, 1938) was regarded as a female at birth. At the age of 3 years, however, the child's social and legal sex was changed to male. Two years later hair began to grow on the face, legs, and pubis, and the voice cracked. When seen at the age of 9 years the child had a small penis with complete hypospadias and a split scrotum containing no testes. He was psychologically male. At laparotomy on November 30, 1936, at the age of 9, an infantile uterus with tubes was present. The gonads, which were in the position normally occupied by the ovaries, were shown by biopsy to be both ovotestes.

The patient's hypospadias was successfully repaired at the age of 14, and since then injections and implants of testo-sterone have been given to encourage penile growth.

When last seen, in January, 1954, he had the appearance of a normal adult male except for a small penis and no

testes in the scrotum. The nipples and areolae have a brown pigmentation, but there is no gynecomastia. Psychologically, he is a normal male and has been married for over a year. Intercourse has been achieved with some difficulty owing to the small size of the penis. Professor Barr has, however, reported that the nuclear picture in skin samples from both sides of the body is that of a normal female. The chromosomal determination is therefore at variance with the psychological sex.

Discussion

Diagnosis.—In many of the reported cases of true hermaphroditism the diagnosis was made incidentally during operation for other conditions such as hernia, or at post-mortem examination. The question of clinical diagnosis only arises in those patients brought for opinion because of genital malformation and consequent doubt about the sex. Such patients may be female or male pseudo-hermaphrodites or, much more rarely, true hermaphrodites. The female (adrenal) pseudo-hermaphrodite presents clinically with an enlarged clitoris and a uterus palpable on pelvic examination. There may be a history suggesting Addisonian crisis. The diagnosis is suggested by a raised urinary 17-ketosteroid level and confirmed by demonstration of enlarged adrenal glands, usually at laparotomy. The male pseudo-hermaphrodite or intersex with hypospadias and cryptorchidism will have no uterus and a normal urinary 17-ketosteroid level for his age. These two conditions may also be differentiated by examination of the epidermal nuclei, as outlined above. Most cases of true hermaphroditism have a uterus, and a phallus intermediate in size between penis and clitoris. The 17-ketosteroid level is, however, not raised. The diagnosis is made finally by laparotomy and biopsy of the gonads.

Classification.—From the published cases it appears that in true hermaphroditism either gonad may be a testis, an ovary, or ovotestis, independently of the condition found in the other gonad. The various possible combinations have been classified by Hinman (1935) as follows:

Type	One Side	Other Side	Reported Cases
Lateral	Testis	Ovary	22
Unilateral	Ovotestis	Ovary or testis	17
Bilateral	Ovotestis	Ovotestis	14
(Indeterminate)	"	Not sectioned	8

It will be seen that Cases 1 and 2 reported here are lateral hermaphrodites and Case 3 is a bilateral hermaphrodite. In the majority of lateral cases reported the adnexae on each side corresponded to the gonad on that side. In the case of Brachetto-Brian *et al.* (1943) the asymmetry involved the whole body, one half being male and the other half female. In Cases 1 and 2 above, and that reported by Davis and Scheffey (1946), however, the abnormality was restricted to the gonads, the adnexae being female on both sides.

Aetiology.—The case mentioned above in which one-half of the body was male and the other female is analogous to the condition of gynandromorphism found in lower animals, such as insects and birds. Crew (1927) has shown that gynandromorphism in insects is due to loss of sex chromatin at the time of the first division of the fertilized ovum. It is well known that anomalies are not uncommon at this stage of development, such as the complete or partial separation of the primary cells which is thought to give rise to identical or conjoined twins. Since genetic maleness appears to depend on the absence of a second X chromosome rather than on the presence of the Y chromosome, the loss of one sex chromosome during the first division of the female zygote would result in one male and one female cell. It is possible that some such mechanism may operate in man. In the higher animals, however, sex may not be absolutely predetermined by the sex chromosomes, and the genetic direction of development may be overridden by other factors, of which hormones appear to be the most important. The relative significance of genetic, hormonal, and environmental factors in producing the many different varieties of human hermaphroditism is as yet unknown.

Management.—The major problem in the management of these cases is to decide on the predominant sex. In patients first diagnosed in adult life it is usually found that the emotions are appropriate to the sex of upbringing (the "social" sex) and that removal of the inappropriate gonad and suitable hormone therapy to reinforce the remaining gonadal tissue is satisfactory. In children, however, it is difficult to predict the direction the emotions will take at puberty. This is well shown in the case reported by Lattimer *et al.* (1943) and Engle *et al.* (1946). This patient had been brought up as a girl, but was masculine in behaviour. At the age of 11 an ovotestis and an ovary were removed, leaving a third gonad, which was thought to be a testis. The patient was then regarded as a boy, but at puberty three years later a strong female trend became apparent. The remaining gonad was removed (and proved to be an ovotestis) and the social sex changed back to female.

In Case 1 above, the parents were advised to bring up the child as a boy in view of the testis being much the larger gonad and the large size of the phallus, and in spite of the presence of female adnexae. This advice was reinforced by Professor Barr's opinion on the somatic nuclei. In consequence of this decision the hypospadias will be corrected at a later date.

The third patient mentioned above is psychically a normal male, although the epidermal nuclear picture is that of a female. It must be remembered that the patient has been treated with testosterone and also emotionally conditioned to some extent by his environment. Nevertheless it would appear that considerable caution is required when assessing the results of skin biopsy in true hermaphrodites. It is of interest in this connexion that 16 cases of true hermaphroditism have been social females and 41 social males (plus 2 neonatal cases), whereas skin biopsy on five true hermaphrodites has shown four with a female nuclear picture and only one with a male picture—Case 1 described above (M. L. Barr, 1954, personal communication).

Cases in the Literature

True hermaphroditism is probably less rare than the number of case reports might suggest. Several cases—for example, Photakis (1916) and Moriarty (1944)—were discovered by chance at post-mortem examination. Young (1937) collected 20 cases from the literature, to which McIver *et al.* (1944) added 11 others and two of their own. Greene *et al.* (1952) collected 48 cases and added one, and Fischer *et al.* (1952) collected 49 cases and added one. Two cases in the latter's list were, however, rejected by Greene (Stirling (1946)—"microscopy of testis unconvincing"; and Malgras and Gricouroff (1939) as ovarian tissue was deduced indirectly and not demonstrated histologically). Excluding these two cases, we are left with a net total of 53 cases. To these must be added six further cases: Broster *et al.* (1938), Berardinelli (1952), Brewer *et al.* (1952), Baker *et al.* (1953), Delore *et al.* (1953), and Laycock and Davies (1953). With the new cases reported here, the total number of acceptable cases is therefore 61.

Summary

Two cases of true lateral hermaphroditism are reported and the further progress of a third (bilateral) case is noted.

The first case presents the clinical problem of predicting the predominant psychological sex in adult life when true hermaphroditism is diagnosed in infancy. In this case the chromosomal sex, as determined by the method of Moore *et al.* (1953), was male, which agreed with the preponderance of male gonadal tissue. On the other hand, the third case cited has grown up a psychologically normal male, but the chromosomal sex is female. This suggests that the chromosomal determination of sex is of limited value in these cases and must

be considered in conjunction with all the available clinical evidence in deciding on the sex of upbringing.

The diagnosis of true hermaphroditism rests finally on the histology of the gonads, but a tentative diagnosis may be made on clinical grounds.

Fifty-nine previous cases of true hermaphroditism have been found in the literature. This small number is probably not a true indication of the real incidence of the condition.

I am indebted to Mr. L. R. Broster for permission to publish these cases under his care, and for his encouragement and help in the preparation of this paper. I have also to thank Dr. W. E. Evans and Professor M. L. Barr for reports on the sections.

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Medical Memoranda

Hair-grips as Foreign Bodies

The accidental swallowing of metallic foreign bodies by children is of everyday occurrence. The great majority pass through the gastro-intestinal tract without incident, being voided per anum in a few days, and, considering their size and shape, it is indeed remarkable how some manage to get through in tiny children without causing harm.

I would here like to draw attention to one variety of metallic foreign body commonly swallowed by young children—the familiar hair-grip. Hair-grips do not always pass through the gastro-intestinal tract with the same ease as the many other types of foreign body; sometimes they remain in the stomach or become impacted in the second part of the duodenum. This is particularly the case in very young children.

During the past ten years I have treated seven children with swallowed hair-grips and have had to resort to operation for the removal of the grip on four occasions. The four cases which came to operation comprised two girls and one boy, all under the age of 4 years, and one girl aged 7 years. The other three, all girls, were aged 4½, 6½, and 13 years, and in these the grip was passed normally in a short space of time. Fig. 1 is a photograph of the four sizes of grip in common use, and it is the third largest size which is usually swallowed.

In children, particularly those under the age of 4 years, the grip tends to remain in the stomach, or, if it passes the

pylorus, may become impacted vertically across the second part of the duodenum. Fig. 2 is an x-ray film showing the grip in such a position.

In two of the four cases which came to operation the grip was impacted across the duodenum, one child having swallowed the grip 17 days and the other 14 days before admission. The other two failed to pass the pylorus, one having been in the stomach five days and the other ten days before operation.

It is a simple matter to remove grips from the stomach, but nothing like so easy from the second part of the duodenum. In one of my two cases the grip was coaxed back into the stomach, and in the other it was coaxed onwards into the jejunum before removal, both being difficult manoeuvres. However, I feel it is better to coax the grip

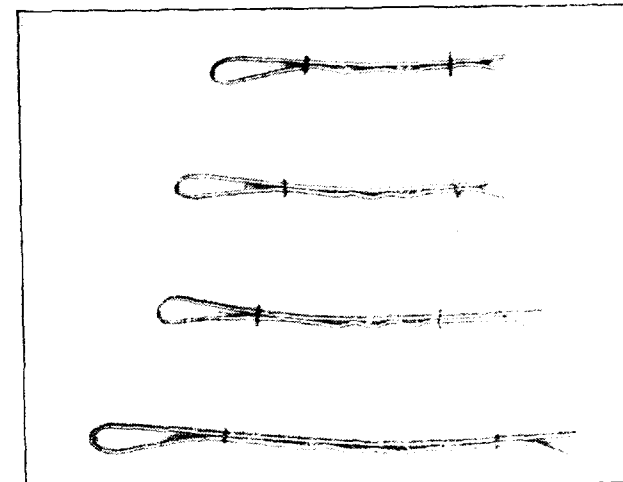


FIG. 1.—Photograph (actual size) of the four hair-grips in common use. The third largest is the one usually swallowed.



FIG. 2.—X-ray photograph of a grip impacted vertically in the second part of the duodenum in a girl aged 7 years. The gas-filled shadows of the stomach and colon can be clearly seen.

into an accessible region for removal than to open up or attempt to mobilize the second part of the duodenum in a young infant.

Prevention is better than cure, and mothers should be warned not to use grips for dressing young children's hair, but instead to employ the old-fashioned hair-slide with a large ornamental ring attached. It is the practice of the nursing staff of the children's surgical ward at the Royal Bucks Hospital, Aylesbury, to remove all hair-grips from young children on admission.

In those who have swallowed a hair-grip, treatment with a bulky diet and "normacol" is at once started, and x-ray films are taken of the whole abdomen at forty-eight-hour intervals to check progress. All stools are examined for the passage of the foreign body. In many cases emetics have been administered prior to admission to hospital in the

hope that the foreign body would be vomited, a dangerous practice when pointed or sharp objects have been swallowed. Furthermore, children who have swallowed foreign bodies should be admitted to hospital without delay so that skilled surgical treatment is at once available should the necessity arise.

The danger of delayed perforation by a hair-grip from pressure necrosis of the bowel wall will be only too apparent, especially if the grip has been impacted for any length of time.

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Effect of "Venostasin" on Serum Cholesterol Levels

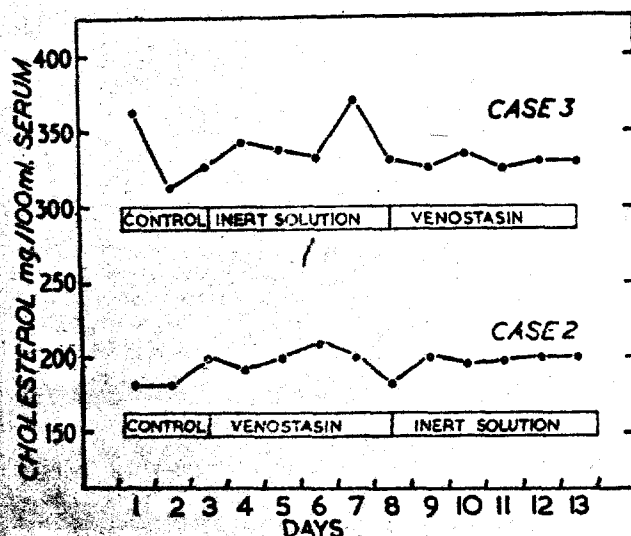
In recent years attention has been drawn to the correlation in some instances between the serum cholesterol level and the occurrence of atheroma. The subject has been reviewed in the *Annals of Internal Medicine* (1950) and more recently by Gutman (1953). In 1953 Schimert and Schwarz reported that an extract of the horse chestnut, "venostasin," caused a significant reduction in the serum cholesterol level, which fell in 25 subjects from a mean level of 204 mg. per 100 ml. to 154 mg. after five daily intravenous injections of 5 ml. They found the extract inactive when given by mouth, but no toxic effects were noted after as many as 50 daily intravenous injections of 5 ml. each. The mode of action of venostasin is unknown, but if this effect is confirmed the material might prove of value in studying factors which influence the serum cholesterol level and in treating or preventing atheroma.

METHOD

Six patients were studied by a "double-blind" technique using venostasin and an inert solution of burnt sugar indistinguishable in appearance from the venostasin. Neither the analyst nor the person giving the material knew whether the patient was receiving the horse chestnut extract or the inert solution. After a control period of three days the patients were given a daily injection of 5 ml. of one substance for five or ten days, followed by the other substance for a similar period of time. Blood was collected in the fasting state at approximately the same time each morning, and the cholesterol level estimated by a modification (MacIntyre and Ralston, 1954) of the method of Zlatkis *et al.* (1953). Throughout the period of study the patients received an ordinary ward diet.

RESULTS

The results are shown in the Table and two illustrative examples in the Figure. In all six patients venostasin had no



Failure of venostasin or a solution of burnt sugar ("inert substance") to influence the serum cholesterol level in two patients.

detectable influence on the serum cholesterol level, whether this was in the high or in the low normal range.

Effect of Venostasin and an Inert Substance on the Serum Cholesterol Level

Case No.	Diagnosis	Average Cholesterol (mg. 100 ml.)		
		Control Period	Venostasin Period	Inert Substance Period
1	Essential hypertension	193	191	193
2	Peptic ulcer	188	197	198
3	Coronary sclerosis	339	327	340
4	Essential hypertension	312	297	326
5	Coronary sclerosis	228	198	191
6	Mitral stenosis	183	201	218

We are indebted to Dr. R. I. S. Bayliss, at whose suggestion and on whose patients this investigation was carried out.

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Nitric Oxide Haemoglobin in Urine Due to Contamination

Nitric oxide haemoglobinaemia is probably incompatible with life. Banham, Haldane, and Savage (1925) described the finding of nitric oxide haemoglobin in the blood of a patient who died of pneumonia; they postulated a nitrifying organism in the blood as the agent producing the nitrification, though they did not confirm the identity of the abnormal pigment by spectroscopic examination. Barton (1954) described a fatal case of nitric oxide haemoglobinaemia due to sodium nitrite poisoning.

Nitric oxide haemoglobinuria has not been described. Below we report the identification of the pigment in urine, although the pigment was an artifact and not present in the patient.

A dark urine, which had been collected from a female patient in an open container eight hours previously, was examined in the laboratory. Nitric oxide haemoglobin was identified by spectroscopic and chemical tests (Harrison, 1947). As the patient was not desperately ill, but was suffering from stone in the urinary tract, the urine specimen was re-examined. It was found to be heavily infected with a mixed growth—one organism was a member of the *Bacillus* group. A catheter-specimen of urine was sterile. The mixed bacterial growth was cultivated in normal urine to which a little fresh blood had been added. The nitrifying action of the bacteria produced nitric oxide haemoglobin within 24 hours. The contaminated mixture was examined by a bacteriologist, but he was able to give no more detailed identification than the one here presented.

The conclusion reached was that the patient's urine originally contained blood: the haemoglobin was converted to nitric oxide haemoglobin as a result of bacterial contamination from the faeces, the container, or the air.

We wish to thank Professor Sir Charles Dodds for his interest in this case.

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Reviews

OPERATIVE GYNAECOLOGY

Textbook of Operative Gynaecology. By Wilfred Shaw, M.A., M.D., F.R.C.S., F.R.C.O.G. (Pp. 444; 382 figures. £5.) London and Edinburgh: E. and S. Livingstone, 1954.

"Si monumentum requiris, circumspice"—these words, famed in other settings, could well be found on the title-page of this book. The author, whose contributions to gynaecological pathology and practice have made him famous, was in the front rank of modern teachers of obstetrics and gynaecology. His ambition to publish a *magnum opus* on gynaecology was half realized when he was stricken by a mortal illness. His active practice ceased, but, realizing that it was now a race with time, he laboured successfully with characteristic courage to complete the text of his book. Unfortunately, he did not live to see it published, or to correlate the manuscripts and illustrations—a task which was well completed by his junior colleague, Mr. John Howkins. This posthumous publication of a first edition is a great tribute to a distinguished and courageous man.

The early influence on the author of the Viennese school of Amreich and Werner is apparent throughout the book, and the debt owed to these masters is generously acknowledged. Mr. Shaw believed that in a textbook on operative technique the illustrations must be of the highest order. New blocks were made from some of the original pictures of Karl Hajek, and others were prepared from drawings by Erich Lepier; but most of the drawings with which the book is lavishly illustrated are the work of Mr. Leslie Caswell. These illustrations are of the highest standard and are an outstanding feature of the book. The captions are not always worthy of the drawings above them; for example, on page 181 the description of Fig. 126 refers to a left-sided hydrosalpinx when bilateral disease is portrayed, with no evidence of the adhesions referred to. On page 254, Fig. 190 illustrates a large enterocele which is described as a prolapse of the posterior vaginal wall. The drawings are, however, really superb, and their reproduction leaves nothing to be desired. They form a clear and permanent record of the technique Mr. Shaw adopted and taught.

A book so magnificently produced is necessarily expensive, and the prospective buyer must ask himself if it is worth the price. The answer will depend on what contribution he expects the book to make. If he wants a permanent visual record of how various gynaecological operations can be performed the money will be well spent; but surgery consists of much more than operative technique, and in the broadest sense this book is not a surgical guide. It reminds one of the student, harassed in a viva-voce examination, who when asked what treatment he would advise for menorrhagia due to fibroids seeks doubtful refuge in the evasive statement that "you can perform a subtotal hysterectomy, or perhaps a total hysterectomy, or possibly a myomectomy," and ends with the afterthought that "radiation might be used."

This book may not have a great appeal to those who have not had the good fortune to come under the personal influence of Mr. Shaw and who believe that surgery must be learned the hard way by apprenticeship to masters of experience and skill. For those who have been his students it should be in great demand as a beautiful record of the views and practice of an outstanding teacher.

JOHN STALLWORTHY.

PHYSIOLOGY AND BIOCHEMISTRY OF THE SKIN

Physiology and Biochemistry of the Skin. By Stephen Rothman, M.D. (Pp. 741+xiii; illustrated. £7 6s. 6d.) Chicago: The University Press. London: Cambridge University Press, 1954.

To review this book adequately would require the space allotted by the *Edinburgh Review* to Macaulay; for different

reasons both editor and reviewer must plead *non possumus*. Suffice it to say that for dermatologists, and for many physiologists and biochemists, this book is of exceptional interest; nothing similar has previously been published in English. Unlike many promising ventures, there are no large gaps in the subject-matter and no amateurishness in the presentation. It is, in fact, the mature work of a senior man aided by seven collaborators, and most readers will appreciate that the subjects considered not only have been thought over in the study, the library, and the laboratory, but are presented with the assuredness and dexterity of the expert who has had frequently to lecture about and teach his subject.

A look at the table of contents is enough to reassure most prospective purchasers; a rapid glance through the pages reveals a sufficiency of diagrams, tables, and illustrations, and an adequacy of references.

Rothman has written 21 chapters; they vary in subject-matter from the mechanical properties and electrical behaviour of skin to epidermal proteins and lipid constituents. As was to be expected, he has contributed several chapters concerning sweat and a few on sebum. G. C. Wells writes about connective-tissue ground substance; Z. Felsner about collagen, reticulin, and elastin; A. L. Lorincz on pigmentation and nutrition; A. B. Lerner on enzymes; H. Pinkus on the biology of epidermal cells; and P. Flesch on the growth of hair.

If one requires facts they are here in plenty; their presentation is often brightened with interesting and valuable speculations and comments on the clinical application of the work under consideration. Further, the information is culled from international sources and is not merely an epitome of American work. In greeting this book one can be certain that it is but the first edition of a textbook which is certain to run to many editions.

R. M. B. MACKENNA.

COLLECTED PAPERS OF OTTO FENICHEL

The Collected Papers of Otto Fenichel. First Series. Collected and edited by Hanna Fenichel and David Rapaport. (Pp. 408+xiv. 35s.) London: Routledge and Kegan Paul Ltd. 1954.

Fenichel was from first to last the classical exponent of classical psycho-analysis in both its theoretical and its clinical aspects. His earlier published work, it is true, was perhaps governed a little too much by a respect for correct tradition, and, being also extremely compendious, suffered from lack of perspective and discrimination—a common failing among psycho-analysts. But these faults in presentation Fenichel gradually corrected; and he thoroughly deserved the international reputation he ultimately gained as a good clinician, a cautious theoretician, and a sound teacher.

This first volume of collected papers is arranged in chronological order and covers the years 1922-35 inclusive. It therefore gives the background of his earlier approach to psycho-analysis and its many theoretical and clinical problems. (Fenichel died in 1946.) Although the volume covers a wide range, the most important contributions to it are those dealing with the concepts of introjection and identification; infantile sexual theories and the aetiology of some perversions; the Oedipus complex and its pregenital antecedents, in particular the early sexual development of the girl; and the concept of defence against anxiety through libidization. There is also an interesting paper on Freud's theory of the "death instinct," which Fenichel did not regard as of much heuristic value.

Fenichel was not a particularly original thinker or writer, and his boldest speculations concerned the concept of "respiratory introjection": though even here the credit for the concept of "respiratory erotism" belongs to the late David Forsyth. Nevertheless he is a persuasive writer, and this collection of papers should be obligatory reading for the psycho-analytical student. Although caviare to the general psychiatrist, it could also be perused with profit by his analytically minded confreres.

EDWARD GLOVER.

HORMONE RESEARCH

Recent Progress in Hormone Research: The Proceedings of the Laurentian Hormone Conference. Edited by Gregory Pincus. Volume X. (Pp. 511; illustrated. \$9.80.) New York: Academic Press Inc. London: Academic Books Ltd. 1954.

This book records the proceedings of the tenth Laurentian Hormone Conference, which took place in September, 1953, in Quebec. The subjects discussed included hormone relationships and the nervous system, the physiology of thyroid hormones, comparative endocrinology, the chemistry of protein hormones, the relation of hormones to blood formation and destruction, and three aspects of clinical endocrinology. The discussions were, as usual, brisk, expert, and fully reported. Dr. Jack Gross and Mrs. Pitt-Rivers stated that thyroglobulin contains monoiodotyrosine and diiodotyrosine, thyroxine, and triiodothyronine. Thyroxine and triiodothyronine escape into the circulation, and then thyroxine is strongly bound to a specified protein, which is deiodinated at the target sites to enter the cells as triiodothyronine. Bernhard Zondek maintained that oestrogenic hormone is the regulator of the ovarian cycle, small continued doses initiating pituitary activity and large doses inhibiting it. By inserting a pellet of 20 mg. of oestradiol benzoate sub-mucosally into the vagina, full function culminating in pregnancy was achieved in five patients with primary amenorrhoea and in thirteen with secondary amenorrhoea. Luft talked on electrolyte and fluid metabolism and discussed the results of hypophysectomy in the treatment of cancer of the breast and prostate and in diabetic retinopathy. It is too early to assess the therapeutic results of this operation; now, one year later, Luft finds the results of hypophysectomy in prostatic cancer more hopeful than in any other neoplasm.

The interesting physiological observation has emerged that it is possible to maintain for three or four weeks, without any substitution therapy whatever, patients who have undergone complete hypophysectomy: de Bodo compared this observation with the results in hypophysectomized dogs, which, despite consequent severe adrenocortical atrophy, were still able to conserve a sodium load normally.

Amidst much work that is of primary interest to biochemists this book contains a great deal which concerns the clinician.

D. V. HUBBLE.

CLINICAL NEUROLOGY

Textbook of the Nervous System—A Foundation for Clinical Neurology. By H. Chandler Elliott, M.A., Ph.D. Second edition. Introduction by Wilder Penfield, M.D. (Pp. 437+xx; 158 illustrations, and atlas of 50 plates. 72s.) London, Philadelphia, and Montreal: J. B. Lippincott Company. 1954.

This book has as its subtitle "A Foundation for Clinical Neurology," and it is essentially a textbook of the anatomy of the central and autonomic nervous systems as treated by the author, who is associate professor of anatomy at the University of Nebraska, in his lectures to medical students.

The arrangement of the book is unusual. The first section gives an outline account of the nervous system, and this is followed by a considerably longer section in which much fuller detail is included. This method naturally leads to a certain amount of repetition. The subject-matter is well handled and there is reference to function as well as to structure, which should make the book more interesting reading for a student. There are a large number of diagrams in the two sections, but some of them are rather difficult to understand. An unusual feature is an appendix of Latin and Greek words from which neuro-anatomical terms have been derived, and this should be useful, for, as the author says, "many students enter medicine without having been subjected to any Latin, much less Greek"—a state of affairs becoming more common in this country also.

The best feature of the book is the atlas of sections of the brain; this has been considerably enlarged since the first edition. Opposite each photograph is a line diagram on which are indicated the various structures potentially visible in the section, although it is by no means easy to recognize some of the structures so labelled.

J. W. ALDREN TURNER.

CARDIAC ENERGY

Myokardstoffwechsel und Herztherapie. By Dr. Med. Fritz Pendl. (Pp. 248+xii; 52 illustrations. D.M. 29.70.) Stuttgart: Georg Thieme. 1954.

The title of this book, which may be translated "Myocardial Metabolism and Cardiac Therapy," gives a very fair idea of its aims and scope. Though the subject is a difficult one, it is likely to become more and more important. After discussing the capacity of the human heart for work and describing the structure of the muscle cell, the author gives an interesting account of the origin of the cardiac energy. The part played by adenosine triphosphoric acid is fully dealt with.

In the next section is considered the influence of potassium, calcium, and sodium on the cardiac energy. Oedema and its treatment follow. Particular attention is given to the protection of the liver from damage so far as this is possible. There is a chapter on sugar metabolism, and the action of certain vitamins is considered.

Then finally the hormones are discussed. Each chapter has a full list of references and is provided with a practical summary. The matter is difficult and the expression is not always as clear as could be wished, but the author has made a very good attempt to present this most important subject in a way useful to the clinician. The emphasis on diet is greater than is usual in this country. Throughout the object has been to base therapy on a scientific foundation so far as present knowledge allows; the author points out how the study of these matters is still in a very early stage.

TERENCE EAST.

PERIMETRY

Perimetry. By Joshua Zuckerman, B.Sc., M.D., C.M., F.A.C.S. (Pp. 391+xxiv; 156 illustrations. 80s.) London, Philadelphia, Montreal: J. B. Lippincott Company. 1954.

A new volume on perimetry inevitably invites comparison with Traquair's book, and in the present instance a greater contrast in style could hardly be imagined. The economy and simplicity of Traquair are diametrically opposed to the reiteration and elaboration of this book.

Part I opens with a brief description of the usual apparatus employed in perimetry and continues with a dictionary of all the terms in common use, including brief notes on the pathological conditions which may produce field defects and the basic anatomy of the visual fibres. In Part II the instruments and technique are described in detail and the anatomy and physiology expanded. Normal and abnormal fields are then dealt with likewise. Part III is a summary at length of Part II and is followed by a tabular review of the whole book. Almost all the material is therefore presented some three times in varying arrangements and detail. For the duller student such a scheme may be useful, but it makes irritating reading for a practising ophthalmologist.

Disentangled from the reiteration, the substance of the book constitutes a good description of methods of examining the visual fields, of the anatomy and physiology of the visual paths, and of the field defects likely to be encountered in practice. There is little new matter, and a chapter on pitfalls in perimetry, containing some ninety items, fails to emphasize that the whole test is highly subjective and that elaborate perimetry is of no avail unless the patient is reasonably intelligent and co-operative.

E. S. PERKINS.

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PREVALENCE OF DYSENTERY

Since it became notifiable thirty-five years ago dysentery has shown great changes in both incidence and severity. Notification was introduced because soldiers returning to Britain brought with them this classical companion of the martial camp, but in time the number of cases reported declined, until in 1925 (345 cases) the nadir was reached. Thereafter a slow irregular rise brought the number of cases to roughly four times that figure by 1936. An explosive rise occurred in the autumn of 1937, when there was a threefold increase, and this level was continued in the following year but fell sharply in 1939. This proved to be the first of five great waves—1937 (4,167), 1941 (6,670), 1944 (13,025), 1950 (17,286), rising steeply to 28,590 in 1951. The uncorrected notifications for 1954 total 33,976. Three of these waves are separated by deep troughs, but the years of comparatively low incidence now show many more notifications than in any year preceding the first wave. Accompanying this vast increase in the number of cases reported each year is an equally remarkable diminution in virulence. In 1925, when notifications were fewest, the case fatality rate was nearly 40%; in the last two years for which complete figures are available it was 0.2%; and in the last five years, when the apparent spread has been so great, there has been an absolute fall in the number of deaths from dysentery. Although *Shigella sonnei* undoubtedly caused human infection earlier, it was first recognized in Britain in 1926; and this is perhaps of significance because in the recent epidemic years almost all of the confirmed cases have been due to this organism. In the years when prevalence is less the proportion of Sonne infections is lower. The changes in reported incidence and case mortality of dysentery can be explained by assuming that in the early years there was a fall in the incidence of the more severe Flexner dysentery and that the increase since 1925 represents the spread of the much milder Sonne infection, superimposed on a small, fairly static number of other infections.

Sonne dysentery is essentially a disease of temperate climates. Although *Shigella sonnei* has often been

demonstrated in the Tropics, it is responsible there for only a small proportion of bacillary dysentery, and that this is not due to the milder infections being overlooked is shown by its relative infrequency in carrier surveys. That Sonne dysentery is also an infection which can spread rapidly where the standard of hygiene is relatively high we know to our cost in this country, and it differs from the majority of intestinal infections in being most common in the early months of the year. The frequency and extent of the spread of bacteriological infection in families, nurseries, and other institutions suggest that the infecting dose of *Shigella sonnei* is small. Compared with typhoid fever, in which the infecting dose is also small, the spread among contacts is much wider. Food-borne outbreaks of Sonne dysentery occur from time to time, but they are uncommon and do not account for more than a small proportion of the total cases. During an outbreak it is uncommon to discover a single common article of food, and *Shigella sonnei* has been isolated from foods much less frequently than the salmonella group of organisms, although the total Sonne infections greatly exceed the total salmonella infections. It seems preferable not to look on Sonne dysentery as a food-borne infection but to regard it as a "contagion," spreading directly from case to case with symptomless excretors and convalescent carriers playing some part. It is possible that the infection may also be passed on indirectly through infected fomites.

Most of the notified cases are in children, both of school age and under. Many outbreaks have been reported in schools, particularly in the infant classes, nursery schools, and day nurseries. Day nurseries in particular have been singled out as a possible source of infection of the general public, but there seems to be little to justify this view, since the decrease in the number of day nurseries since 1945 has not led to any fall in the reported incidence of the disease.

There seem to be real differences in the incidence of the disease both in time and in place. They are not fully accounted for by differences in diagnosis, notification policy, or laboratory facilities. In the large centres of population dysentery is probably always present. At some times it is confined to relatively small areas, not necessarily characterized by poor housing and overcrowding; at other times it spreads widely from these centres through the suburbs and into the surrounding countryside, but may miss completely many small and some large centres of population. The factors that determine whether the infection will spread widely or not are not well understood;

immunity of the population, housing conditions, social behaviour, even the weather may all play a part.

Almost all of the commoner bacteriological causes of human infectious disease have been split up in the laboratory into "types" by virtue of their different reactions to biochemical or serological tests or to different bacteriophages, and much of our precise knowledge of the way in which infections spread has been derived from a study of how the individual types spread. It has been possible to type strains of *Shigella sonnei* by a bacteriophage technique; but it has proved laborious to apply, the resulting types have not always proved stable epidemiologically, and the information gained has shown that the majority of all strains tested belong to a single type, so that we have not gained from this technique much additional insight into the way in which the organism spreads. Recent work on the distribution of sulphonamide-sensitive and resistant strains suggests that certain areas may well have their own individual infecting strains.

Sonne dysentery is not a very serious infection in man, yet it causes much discomfort and loss of working time and an appreciable number of severe and some fatal infections. The fatalities are mostly among the very young and the very old, debilitated by other conditions. It is a council of despair to recommend taking no action to prevent its spread, but we still lack sufficient knowledge to approach the problem in a practical way. To exclude all infected persons from school or work or from the society of their friends and neighbours entails more dislocation than the severity of the infection warrants. If we could recognize, as is possible to some extent in streptococcal infections, the dangerous carrier, a logical and practicable solution might perhaps be attainable, but at present all infected persons, young and old, with and without diarrhoea, have to be regarded as equally dangerous.

The widespread distribution in certain areas of strains resistant to sulphonamides suggests that chemoprophylaxis with these drugs can have but limited application, and the indiscriminate use of antibiotics cannot be recommended. Reports of outbreaks in schools provide some evidence that it is possible to control the spread of infection by excluding clinical cases and their home contacts from school, leaving the numerous symptomless excretors to continue to attend the school. Such action has the merit of being practicable. But much more experimental work is needed in schools, day nurseries, and other institutions before we learn how to control outbreaks effectively.

THE NATIONAL FORMULARY

A formulary provides a convenient collection of medical preparations for use in a community, and a national formulary reflects the prescribing habits of its country of origin. The existence of such formularies makes it unnecessary to prescribe a multiplicity of preparations with essentially the same composition and therapeutic value. The task of both prescriber and pharmacist is thereby eased and therapy is often made more efficient. The third edition of the *National Formulary—The National Formulary 1955*—is now being distributed and will be welcomed by all who have used its predecessors and have looked forward to an up-to-date version. Inevitably, however, its appearance in its present form will occasion criticism, for any volume so widely used by such a diversity of medical men is unlikely to meet with universal approbation.

Most ordinary prescribing demands can be met by the use of preparations included in the *Formulary*, which is admirably comprehensive and includes the more important effective modern therapeutic remedies. The new edition contains useful lists of those preparations which have been added to, and deleted from, the *National Formulary 1952*, and the substantial list of changes is a reflection of modern therapeutic advance with its recognition of the limited efficacy of many time-honoured remedies. It is therefore all the more surprising to find added to the formulary a number of preparations, especially mixtures, for which there is little therapeutic or pharmacological justification. They represent a concession to the extravagant lay and medical passion for a "bottle of medicine" and a reversion to the principles of Victorian and Edwardian polypharmacy. It is obligatory to prescribe only a strictly limited number of drugs—such as chloral hydrate or potassium citrate—in the form of mixtures, which are expensive compared with tablets and are a much less accurate way of prescribing medicines. It is therefore regrettable that an ammonia and senega mixture and a strychnine and iron mixture are added. The latter contains a negligible quantity of iron, but by its title may give the delusion of therapeutic efficacy. The inclusion of these formulae must represent the declared policy of the Joint Committee in the preface to include "a preparation, even if its justification on pharmacological grounds is disputed, if it is still being frequently prescribed." The committee has not always subscribed to this view; as, to quote the 1949 preface with regard to the exclusion of bismuth carbonate from antacid mixtures and powders, "The committee

realizes that these preparations are likely to be prescribed for some time to come, but it finds no evidence to show that bismuth carbonate has any advantage over, and should therefore replace, the analogous preparations which have been widely used in recent years and which are included in this formulary." This statement could be equally applied to several of the new formulae included in the 1955 edition. The new policy implies that the volume may be years behind contemporary advances in medical and therapeutic knowledge. The *National Formulary* is a potentially powerful and effective medium for the promulgation of good, sensible, and economic prescribing, and it should certainly have a more constructive function than that of slavishly following customs which may be ill-informed.

Major changes in the *British Pharmacopoeia 1953* were the substitution of English for Latin titles for monographs and drugs, and the use of the metric system for doses, imperial equivalents being quoted in brackets only where previously and traditionally used. The *National Formulary 1952* introduced English for the headings of subsections, despite the fact that in each section Latin titles were used for individual drugs. The arrangement of the sections was according to the alphabetical order of the English subsection headings, and this illogical compromise not unnaturally led to considerable confusion and irritation among users of the *Formulary*. The 1955 committee has taken what they realize will be regarded by a minority as a retrograde step, by deciding to revert to Latin for the titles of each group of preparations, and abbreviated Latin for the main title of individual preparations. This step will undoubtedly occasion some controversy. The committee has not seen fit to follow the lead of the *British Pharmacopoeia 1953*, and the *British Pharmaceutical Codex 1954*, and its refusal to follow such an authoritative lead may be a less reactionary step than some will undoubtedly think it is. The World Health Organization published in 1951 its *Pharmacopoea Internationalis*, and gave Latin names to the drugs listed in it, presumably on the highly sensible understanding that they would thus be readily recognized by users in the civilized world, and on the probable assumption that pharmacopoeias, at least in Europe, are in Latin. There is of course a practical side to this. Any national travelling or staying in a country not his own may need to have medicines prescribed by his home doctor dispensed by a foreign pharmacist: such a pharmacist should not have to cope with a vernacular prescription, or, for that matter, with a local system of weights and measures instead of the

metric system. In the *Formulary* not only are metric equivalents quoted for the older galenicals which have been traditionally prescribed in imperial measures, but imperial doses are given, quite unnecessarily, for modern preparations such as isoniazid, digoxin, and methyl thiouracil which never have been and never will be either prescribed or dispensed in such a form.

The monographs at the beginning of the book are of a high standard and have been thoroughly revised. Those on antibiotics, sulphonamides, analgesics, and hypnotics are particularly good, but it is unfortunate that phenadoxone, an ineffective analgesic not included in the *Formulary* itself, will still retain the cachet derived from its mention in the monograph. A useful new section on anthelmintics has been added, and that on expectorants deleted, an omission which reflects the contemporary opinion that they are unnecessary and ineffectual, and which was forecast by the terms of the monograph in 1952. The index is of first importance, and great improvements have been incorporated. It is now most comprehensive, with many useful cross-references, and greatly increases the value of the volume.

The *National Formulary 1955* has manifest imperfections which can be regarded as inevitable in a work with such a heterogeneous parentage, there being no fewer than eleven bodies represented among the thirty-seven members of the Joint Committee. Nevertheless it will be found to be of great value and assistance in practice and in hospital. It is a pity, however, especially from the viewpoint of the education of the younger generation of doctors and medical students, that it contains features which will undoubtedly retard the development of sensible, honest, logical, and economical prescribing habits.

ERADICATION OF TUBERCULOSIS

Until recently the steady decline of tuberculous mortality remained unexplained except as a reflection of rising standards of living or as the declining phase of a long-term epidemic which was started by the industrial revolution. During the past ten years, however, miniature mass radiography (M.M.R.) has provided a means of finding unsuspected sources of infection and the antibacterial drugs have enormously strengthened the clinician's therapeutic powers—a subject on which we have recently commented.¹ The results upon tuberculosis mortality have been dramatic. During the last six years the annual decline in mortality from

respiratory tuberculosis has averaged 15%, while the average decline for the previous ten years was a mere 1.5%. But a falling mortality from a chronic disease may be accompanied by a rising prevalence, and of this we have no satisfactory index. The annual rate of notification of new cases rose after the war, perhaps owing to mass miniature radiography, but in 1953 there was for the first time a decline in the figures despite increasing use of M.M.R. and increasing investigation of contacts,² so that it may be that morbidity as well as mortality is beginning to decline.

It is against this epidemiological background that the results (see p. 371) should be viewed of the first full deployment of medical resources against tuberculosis ever made in this country. The plan³ was simple—to x-ray the lungs of the school and adult population of a coal-mining community in the Little Rhondda Valley (The Rhondda Fach). Every case of tuberculosis was thus to be discovered, all those with a positive sputum were to be treated—the Welsh Regional Hospital Board providing special wards for this purpose. If sputum conversion could not be achieved these patients were to be kept under rigorous supervision by a health visitor to deter them from spreading their infection. The effects upon morbidity and mortality from tuberculosis were to be assessed by periodic x-ray and Mantoux surveys. The paper by Drs. A. L. Cochrane, J. Glyn Cox,⁴ and T. Francis Jarman which we publish to-day gives some preliminary results from the first of these follow-up surveys. They show first that the plan succeeded technically, since 90% of the population were examined at each survey, and 95% of those x-rayed the first time were x-rayed again two and a half years later. This is an almost unique achievement.⁴

Four indices of the effects of the surveys are reported. First, there was a steep fall in the crude mortality rate from tuberculosis among the women and non-miners, a fall that was proportionately much greater than that experienced by the neighbouring part of the Rhondda or by the rest of England and Wales. There was at the same time a rise in tuberculosis mortality among miners, but this can reasonably be attributed to changes in the accuracy of death certification, and by the fact that tuberculosis in association with advanced pneumoconiosis is resistant to treatment. Secondly, the crude results of Mantoux-testings of schoolchildren suggest that the conversion rate must have been very low between the surveys, but a detailed report on this is to follow. Thirdly, the

changes in the prevalence of tuberculosis are described. Large changes in such a chronic disease could not be expected, but, as a result of the treatment given, there was a notable decline in the prevalence of cases with a positive sputum, especially among the younger women; the decline was smaller among the men, and there was even an increase in the older men. After two and a half years 23.1% of the women and 41.7% of the men retained a positive sputum, the high rate of failure among the men being attributable largely to one quarter of the cases having advanced pneumoconiosis. These figures show that even to-day therapy cannot of itself be relied upon to control tuberculous infectivity.

The fourth and most important index was the attack rate of tuberculosis among those with normal radiographs in the first survey. At ages 15-24, it was 2.8% per annum for women and 4.7% for men, while at ages 25-34 it was 0.7% and 1.0% respectively. There was a negligible attack rate at later ages. This is the first time the attack rate of tuberculosis has ever been measured in a complete community in this country, so that it is impossible to say whether these are high or low figures; but a comparison with Springett's figures⁵ for Civil Servants in London suggests that the Rhondda rates are low. A full analysis of the factors affecting the attack rate is to be published later. Meanwhile a hint has been given⁶ that nearly all the new cases could be traced to contact with infectious cases before the latter were detected by the first survey and brought under control. If this is so, repeated surveys should undoubtedly achieve their object of reducing the attack rate to negligible levels and thus ultimately of abolishing tuberculosis from the community. One or two more surveys may be necessary, perhaps restricted to the younger age groups; and all known cases of tuberculosis (including massive fibrosis among the miners) will have to be followed to ensure that they do not become infectious.

The Rhondda Fach scheme is an example of epidemiology at its best, for the public benefits as research continues—research which is not confined only to tuberculosis and pneumoconiosis. Such diverse conditions as asthma, bronchitis, bronchiectasis, diabetes, hypertension, coronary artery disease, and rheumatism are also being investigated. Clinical research has been confined within the four walls of hospitals for too long. Pioneers such as the late Sir James Spence have led the way, and it is to be hoped that academic departments of medicine and surgery will increasingly undertake these field investigations as an essential activity. So far as tuberculosis is concerned the Rhondda survey has shown sufficient promise as a measure of preventive medicine to justify

any regional hospital board spending the necessary time and money to carry out pilot schemes of a similar nature. A clearer picture of the results which may be achieved will emerge when surveys have been carried out in areas where pneumoconiosis is not a complication.

FABRIC ARTERIAL IMPLANTS

Since 1912, when Carrel was awarded the Nobel Prize for his study of vascular transplants, there has been a steadily increasing literature on the subject which has appeared at a greatly increasing rate since the last war. Arterial replacement by means of autogenous vein grafts and arterial homografts was discussed in a recent leading article in this *Journal*.¹ The subject is again to the fore, for elsewhere in this issue Professor C. G. Rob and Mr. H. H. G. Eastcott describe the resection of an aortic aneurysm caused by tuberculous arteritis—a rare condition—with restoration of aortic continuity by an "orlon" prosthesis. It is certainly remarkable that a woven fabric identical with that used for clothing should be suitable for such a purpose. Blackemore and Voorhees² have already reported on the implantation of "vinyon N" cloth prostheses in eighteen patients, and Hufnagel³ has also recently mentioned that he is using plastic cloths of various types to bridge arterial defects.

Many attempts have been made in the past to bridge arterial gaps with inert tubes, but they have all proved unsatisfactory, usually because of thrombosis or anastomotic leakage. With a porous fabric, however, fibroblasts from the surrounding tissues migrate between the interstices of the material to form a tough fibrous tube of living tissue. The fabric thus bears the entire burden of arterial pressure in the first few weeks only. At operation blood leaks through the pores in the cloth for a few seconds. The inner surface is covered with fibrin and polymorphs within a few hours, and acquires islands of endothelial cells which coalesce within three months. Blackemore and Voorhees, before using this method clinically, found that cloth implants in dogs remained satisfactory for periods of up to three years: thrombosis or leakage occurred in only seven of the thirty animals of the series. Encouraged by this success, they have used "vinyon N" tubes in seventeen patients with aortic aneurysms and in one with a popliteal aneurysm. There was a high operative mortality (40%) due to the technical difficulties of clamping and suturing the diseased aorta adjacent to the aneurysm. These hazards are present also when homografts are used. Ten of the seventeen patients survived the operation and all have remained well: the longest period of follow-up in any patient so far is ten months.

It is too soon to assess the final results of arterial reconstruction with grafts or fabric tubes. Homologous grafts often calcify and have been known to rupture. The only justification for introducing homologous tissue or foreign material into large blood vessels is when the life of the patient or a limb is in jeopardy. At the

present time it is possible only to theorize on the relative merits of homografts and fabric tubes. Both are associated with the risk of rupture and thrombosis. As a rule the body ultimately rejects foreign material however inert it may be; the greatest use for it is as a scaffold on which living tissue can form, as in the repair of hernias with tantalum mesh. Such a process is claimed to take place around fabric tubes, so that it is immaterial if the fabric ultimately disintegrates by a process akin to metal fatigue. A word of caution is needed here, however, since collagen alone without elastic tissue can stretch. Collagenous tissue, artificially induced, not infrequently calcifies. Theoretically, then, fresh aneurysm formation and sudden rupture are still possibilities. The answer to this surgical problem should be available in ten years' time. In the meantime most surgeons will probably continue to use homografts, except when there is a special indication for a fabric implant. In the case reported by Rob and Eastcott there was a danger that an arterial homograft might become infected by the tuberculous tissue in the graft bed. In war surgery particularly fabric tubes would have the great advantage of availability and compactness: even if not a permanent solution to the problem of replacing wounded segments of major arteries they would be of great temporary value. If further laboratory and clinical experience eventually confirms that the results achieved by this method are permanently reliable, then, in the words of Brown and Hufnagel,⁴ "most of the problems relating to procurement, processing, storage, and transportation of arterial grafts will be solved."

IRON DEFICIENCY IN PREGNANCY

Blood is thicker than water, but less so in pregnancy. Varying figures are quoted, but W. L. Caton and his colleagues,¹ using radioactive isotopes, calculated that the total blood volume increased progressively in pregnancy by 45%, the peak being reached about the thirty-second week. The total number of red blood cells increased by about 40%, and the total amount of haemoglobin also rose. But a disproportionate increase of 55% in plasma volume caused haemodilution, so that the amount of haemoglobin per 100 ml. of plasma fell, producing the hydraemia or so-called physiological anaemia of pregnancy. A. S. Simpson² has recently pointed out that these factors make it difficult to interpret haemoglobin readings in pregnancy. He therefore also estimates the packed cell volume and thereby calculates the mean cell haemoglobin concentration. He contends that this concentration, which usually varies little through pregnancy, is the only reliable index of iron sufficiency, the critical level being 30.7%. Nevertheless, many clinical reports have been published over the last twenty years supporting the administration of iron to counter the usual fall

¹ *British Medical Journal*, 1955, 1, 273.

² Report of the Ministry of Health for the Year 1953, Part 2, page 96. H.M.S.O., London.

³ *British Medical Journal*, 1952, 2, 843.

⁴ Cochrane, A. L., *Brit. med. Bull.*, 1954, 10, 91.

⁵ *British Medical Journal*, 1951, 2, 144.

⁶ *Quart. J. Med.*, 1954, 23, 454.

¹ *British Medical Journal*, 1954, 2, 218.

² *Ann. Surg.*, 1954, 140, 324.

³ *J. Amer. med. Ass.*, 1955, 157, 419.

¹ Caton, W. L., et al., *Amer. J. Obstet. Gynec.*, 1951, 61, 1207.

² Simpson, A. S., *J. Obstet. Gynaec. Brit. Emp.*, 1954, 61, 807.

³ Benstead, N., and Theobald, G. W., *British Medical Journal*, 1952, 1, 407.

⁴ Davis, L. R., and Jennison, R. F., *J. Obstet. Gynaec. Brit. Emp.*, 1954, 61, 103.

⁵ Hamilton, H. G., et al., *Sth. med. J. (Bghm, Ala.)*, 1953, 46, 117.

in haemoglobin concentration in pregnancy. Among the more recent workers, for instance, N. Benstead and G. W. Theobald* and L. R. Davis and R. F. Jennison⁷ have concluded that the so-called physiological anaemia of pregnancy is an indication of iron deficiency, and that an adequate intake of iron enables the concentration of haemoglobin normally found in non-pregnant women to be maintained throughout pregnancy. For maximum effect the oral iron must be taken from at least the twenty-fourth week.

On p. 385 of this issue of the *Journal* Drs. Mary Fisher and Rosemary Biggs offer further confirmation of this view. They carried out haemoglobin estimations on 104 pregnant women at the first antenatal attendance, at the twenty-eighth and thirty-eighth weeks, and also at the sixth week after delivery. They found that when the initial haemoglobin level was below 90% the administration of oral iron caused it to rise, while where the initial reading was over 90% this treatment maintained it at a high level. Twelve women did not respond to oral iron; in such cases the addition of ascorbic acid or dilute hydrochloric acid may be effective⁸; but it is doubtful whether the addition of molybdenum oxide is helpful. If there is no response to these preparations, and the patient is not suffering from the uncommon macrocytic anaemia of pregnancy, saccharated oxide of iron may be given intravenously or intramuscularly.

Drs. Fisher and Biggs remark that the clinical assessment of anaemia is highly fallacious, and they advise that, unless haemoglobin estimations can be done as a routine, oral iron should be prescribed for all pregnant women. They appreciate the difficulty of being sure that what is prescribed is really taken, but they claim that this treatment will probably avert dangerously low levels of haemoglobin. The attainment and maintenance of a high haemoglobin level during and after pregnancy not only increases the margin of safety for mother and foetus, but it also ensures the woman a quicker recovery from childbirth and gives her more energy to resume her household duties and to enjoy her motherhood.

ADMITTING TO HOSPITAL

Many general practitioners have had the frustrating experience of trying to persuade their local hospital to admit patients with certain disorders which do not, it seems, engage the hospital's interest. Typical of these are the victims of cerebral vascular accidents, about whom Dr. P. E. Brown writes at p. 382 of this week's *Journal*. He asserts that "those who do get admitted are often accepted with reluctance after tedious negotiations which are irritating to both house officers and practitioners." It is a familiar enough story, and some family doctors might admit that they have been driven to embellish the facts slightly in order to obtain an admission which they believed to be necessary: they may remember, too, the other side of the picture when they were residents in hospitals. Teaching hospitals naturally have to select patients in the interests of research and of teaching, and this gives the "interesting

case" an advantage when it comes to admission, though cases can be interesting for other than purely academic reasons, and not least because they are the sort that make up much of general practice. But it is not only irremediable cases about which general hospitals are apt to raise difficulties. There are, too, the unfortunate bronchitics suffering winter exacerbations, the man with recurrent retention of urine, the obese old lady who unaccountably develops urinary incontinence, and the sick man from the common lodging-house, regarded with disfavour because he might be dirty and verminous. All may have a fair and urgent claim to a bed in hospital. Even old age itself is held to tell against a patient's need for admission. While discrimination is necessary in an imperfect world, the criteria that govern it deserve examination every so often lest the convenience of the hospital and its staff come to overbear the medical and social needs of the individual patients.

Some management committees, backed by medical opinion, may take the view that their first duty is to get the younger patient, the productive element in society, back to work, and that the elderly and the unemployable must take second place for hospital beds and other facilities. Economically, this is a reasonable view; by other standards it is surely hard-hearted. Anyhow, the need to care for an elderly relative in a sudden illness may keep an able-bodied man or woman away from work. Hospital staffs fear also that such patients will block the beds for a long time; if this happens, admitting house officers do not always find their seniors sympathetic. Dr. Brown's figures may not apply to all areas and in all circumstances, but they are enough to show that, for cases of cerebral vascular accident, this fear has no foundation. Energetic and early treatment of patients who have survived the first impact of a cerebral thrombosis, or of elderly people who have lately taken to their beds for one reason or another, often makes them fit to return to an independent existence. Yet if they are neglected for even a short while a serious long-stay problem may be created. But family doctors can help to ease the strain on hospital beds by careful selection of cases whose admission they seek. Brown's figures suggest the advisability, for instance, of not asking for admission of patients with cerebral vascular accidents until after the third day, if home conditions allow, when 30%—those with a hopeless prognosis—will have died whatever is done. Again, simple arteriosclerotic gangrene, a traditional reason for prompt admission, should perhaps not be regarded as so urgent a matter, for the disease in many cases progresses slowly.

Part of the solution to these problems is to set up properly constituted geriatric units with adequate medical and nursing staff, led by consultants, having their own admission wards, rehabilitation departments, and long-stay annexes, with access to the facilities of a general hospital. Such units, relieved of duties towards younger patients and patients with short illnesses, need not discriminate against the rest. General practitioners in the areas where they have been set up are relieved of many worries. The units sometimes have the additional satisfaction of counting among their successes just those cases which others have rejected.

EMERGENCIES IN GENERAL PRACTICE

SUDDEN OCCLUSION OF A MAJOR PERIPHERAL ARTERY

BY

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Sudden occlusion of an artery may be due to an injury, either open or closed, an arterial embolus, or an arterial thrombosis. Any artery in the body may be involved, but in this article only sudden occlusion of the major arteries supplying blood to the limbs is discussed.

This catastrophe does not necessarily imperil the life of the limb; in many patients the collateral circulation proves to be adequate. The popliteal artery has a particularly bad reputation and the incidence of amputation following sudden occlusion of the iliac, femoral, and axillary arteries is also high. But in the case of occlusion of other peripheral arteries gangrene is a rarity and the clinical effects often transitory, whilst slow occlusion of a vessel as large as the bifurcation of the abdominal aorta may produce surprisingly little disturbance. Eleven out of 26 of my patients with thrombosis of the aorta at this level are able to work on a medical regime of treatment, admittedly at only sedentary occupations.

Clinical Picture

A patient with sudden occlusion of a major peripheral artery calls in his doctor because the limb has become cold, pale, and perhaps numb, because agonizing pain has developed at rest, or because of the sudden onset of severe exercise pain (intermittent claudication). The severity of the symptoms varies with the rate of occlusion of the vessel, which means that they are usually more pronounced when the vessel has been blocked by an embolus than when it thromboses. There may be a previous history of intermittent claudication, a stroke, or angina pectoris, pointing to an arterial thrombosis as the reason for the new symptoms; or the patient may be suffering from auricular fibrillation or bacterial endocarditis, indicating that an embolus is the likely cause.

Pain is said to be a marked feature of an arterial embolus and usually absent when the blood flow has been interrupted by a thrombosis or an injury. This is on the whole true, but some patients develop no pain after an undoubted arterial embolus and others suffer agonizing pain from a thrombosis. Later the limb becomes numb, and, if gangrene is likely, the muscles can no longer contract and ischaemia of the nerve fibres leads to complete sensory and motor paralysis; in other patients gangrene is averted but severe rest pain develops.

The limb at first is pale and cold; in a severe case the skin looks and feels dead. Later the skin becomes cyanosed and, if gangrene is certain, a dark purple colour; usually areas of pallor are adjacent to areas of cyanosis, giving the skin a blotchy appearance. The temperature of the environment is of great importance both to the rate of onset of the various clinical signs and to the chances of recovery. If the part is kept cool, skin can withstand severe anoxia for 48 hours or more, muscle for 10 hours or so; nerve conduction ceases after about 30 minutes. Recovery from complete anoxia is much more likely after restoration of the blood flow if the part has been cooled. On the other hand, if the part has been warmed, blisters may form on the skin within 12 hours and muscle becomes gangrenous within a few hours.

The pulses are absent distal to the lesion and increased proximally. Thus a patient with a popliteal embolus will have no palpable pulsation in either the dorsalis pedis or posterior tibial arteries, but the popliteal artery will be

unduly prominent because the embolus usually rests on the bifurcation of an artery and the main vessel above appears to pulsate more forcibly than on the normal side.

Treatment

There can be few emergencies which are influenced to a greater extent by good initial medical care than sudden occlusion of the main artery to a limb. Whilst admission to hospital should be obtained if possible, the first few hours are of great importance. Incurable changes can occur during this time. Simple measures taken in the patient's own home serve to minimize the effects of such a lesion. Unfortunately there can be no doubt that many patients with sudden arterial occlusion do not receive the best treatment. In particular, heating the limb by blankets or hot-water bottles does much harm. It can be stated that a patient who receives no treatment at all is better off than one whose limb has been either heated or elevated.

Treatment is discussed under the following headings: the reduction of the metabolic needs of the part; development of the collateral circulation; anticoagulants; maintenance of the patient's general health, and the prevention of infection and deformity; and surgical operations.

Reduction of the Metabolic Needs

This is best achieved by keeping the limb cool. It should not be frozen but exposed to the air at room temperature in temperate or cool climates or cooled by a fan in the Tropics. Cooling reduces cell metabolism and less oxygen is required, so that the part has a better chance of surviving until the blood flow is restored. Rest further reduces the metabolic needs: therefore active movements of the affected limb should be avoided and if necessary a light and well-padded splint applied. Rest may also be encouraged by the relief of pain, for which purpose pethidine, 100 to 150 mg., is usually more effective than morphine, $\frac{1}{4}$ gr. (16 mg.). For those patients with minimal pain a hypnotic such as amyl-barbitone, 3 gr. (0.2 g.), is of value. A good drug for this purpose is alcohol; this often relieves the pain of sudden vascular occlusion, probably because it is an antispasmodic, and at the same time it helps the patient to sleep. One to 2 oz. (28-57 ml.) of whisky or brandy four-hourly is a satisfactory dose for these patients. It is important not to elevate the limb; the position of maximum comfort which most patients adopt in bed with the head and shoulders raised on two or three pillows and the trunk and limbs flat is also the best position for an ischaemic lower limb. Some patients obtain considerable relief when the limb is dependent; in acute vascular occlusion this may be allowed, but not for long periods.

Collateral Circulation

The development of the collateral circulation may be encouraged in a number of ways. The most efficient and at the same time the simplest measure is to establish reflex vasodilatation. To obtain this the affected part should be cooled and the rest of the body heated. With the patient in bed the method we use is to arrange the bedclothes in such a way that the affected limb is exposed to the air. The patient's other lower limb should be covered with a thick woollen sock, and both it and the trunk covered with blankets; a long-sleeved sweater and vest should be worn over the pyjama jacket and the hands in particular should be warmed; this is most easily achieved by asking the patient to wear a pair of woollen gloves, although electrically heated gloves are better if available. In the case

of sudden occlusion of a main artery to the upper limb, this limb should be cooled, and the feet, trunk, and other hand warmed.

Evidence produced by Sir Thomas Lewis and others has established that the vasodilatation produced in this way equals and possibly exceeds that of either a sympathectomy or a sympathetic nerve block. In some patients reflex vasodilatation worsens pain, but this often coincides with recovery of the circulation and is therefore a worth-while price to pay. This pain can be reduced by pethidine, 100 to 200 mg., or, if less severe, by tablets of codeine or aspirin.

It is important that splints, dressings, or the patient's posture should not constrict the region of vascular occlusion around which the collateral vessels must develop. Vasodilator drugs are of value, but in my opinion no proprietary preparation is superior to alcohol as a vasodilator in patients with sudden peripheral arterial occlusion; as already stated, this should be prescribed in liberal doses. Papaverine hydrochloride, $\frac{1}{2}$ to 1 gr. (32-65 mg.), given intra-arterially, proximal to the lesion, may help to promote vasodilatation. Tobacco, on the other hand, causes peripheral vasoconstriction, and a wise patient stops smoking after sudden occlusion of a peripheral artery.

Sympathetic block with procaine hydrochloride or phenol is no better than reflex vasodilatation in promoting the development of the collateral circulation, but if performed with phenol it does enable some patients who would otherwise be bedridden to resume a sedentary occupation. It has no place in the treatment of an acutely ischaemic limb, but a real place in the treatment of elderly and poor-risk patients and of those who need prolonged sympathetic denervation but do not want a surgical operation. The technique consists in placing the patient on his side with the vertebral column straight, the third lumbar vertebra is located and a long (12-cm.) needle inserted at this level, and at a distance of 7 cm. (2 $\frac{1}{2}$ in.) from the midline; the needle should be directed inwards and advanced until it reaches the side of the body of the vertebra, it should then be manipulated until it slides forward to lie just in front of the convex antero-lateral surface of this bone. Aspiration serves to exclude the presence of blood or cerebro-spinal fluid, and then 4 ml. of 4% procaine should be injected; if this produces a sympathetic block 10 ml. of 10% phenol in water is injected and the patient told to lie still for half an hour. This type of block produces a long-lasting sympathetic denervation.

Anticoagulants

Anticoagulants have an important place in the management of patients with sudden vascular occlusion. They help to limit the extension of the thrombus, particularly into the vessel distal to the block where the blood flow is sluggish. They should be used as a routine during the acute stage in all patients with sudden occlusion of the main artery to a limb, and for long periods afterwards in certain patients with arterial thromboses. Heparin, 15,000 units, should be given at once, preferably by intravenous injection, alternatively intramuscularly, and repeated six-hourly for 18 hours. At the same time phenylindanedione, 200 mg., by mouth, should be given and repeated twice daily in doses of 100 mg. Phenylindanedione takes about 18 hours to become effective, and so this combination of drugs produces a rapid effect which can be maintained for an indefinite period by the oral route. Control is by the prothrombin time; this should be reduced to give a prothrombin level of approximately 20% of normal in the acute phase and to about 30% or slightly more when long-term out-patient treatment is used. Most patients reach this level on a dose of 75 mg. twice daily, but some require only 50 mg., and others as much as 150 mg.

Phenylindanedione, once the dose has been stabilized, does not cause wide alterations in the prothrombin level and is therefore a relatively safe drug; once the level has become stabilized, weekly prothrombin estimations are sufficient for control. Should an overdose of heparin be given

the antidote is an intravenous injection of 10 ml. of 1% protamine sulphate, and the antidote for phenylindanedione is 20 mg. of vitamin K₁ given orally. The above dosages for heparin and phenylindanedione refer to patients without a recent surgical or other wound. Both drugs are very difficult to control in patients with a recent wound, and should only be prescribed by those with considerable experience.

General Management

The general health of the patient must be maintained by ensuring an adequate intake of food and adequate sleep. Infection, an ever-present danger in ischaemic tissues, is best prevented by dressing all breaches in the skin with a careful aseptic technique and prescribing penicillin, 1,000,000 units twice daily, at the slightest sign that an infection is becoming established. Deformities may occur, particularly if a Volkmann type of contracture develops in the ischaemic muscle; these may be minimized by putting all joints through a full range of passive movement once a day. In some patients the ischaemic muscles are too painful to permit this. In these cases a light splint helps to prevent the development of gross deformities, particularly that of foot-drop.

Operative Treatment

Surgical operations, such as embolectomy, endarterectomy, arterial repair, or an arterial graft may succeed in restoring a normal blood flow. Others—for example, sympathectomy, incisions in the deep fascia, or arterectomy—may be used to assist the development of a collateral circulation. Alternatively, operation may be resorted to because conservative treatment has failed, when an amputation is necessary either for gangrene or for intolerable rest pain.

Embolectomy is rarely needed in the upper limb; the collateral circulation here is so efficient that the pulse usually returns to the wrist within 48 hours of a brachial embolus. On the other hand, embolic obstruction of the bifurcation of the abdominal aorta is best treated by immediate operation, as are many embolic obstructions of the popliteal or common femoral arteries. A great deal depends upon the appearance of the limb; in many patients the blood flow is returning by the time the patient reaches hospital, and conservative treatment with anticoagulants and reflex vasodilatation alone is effective; however, where there are good facilities popliteal or common femoral embolectomy usually pays, for by this means a normal blood flow can be restored. Arterial repair and arterial grafting have their most important indication in those patients with sudden arterial occlusion due to an injury; of obvious importance in war, these injuries when they occur in peacetime require adequate surgical treatment. For example, I have seen in the last two years three butchers who had accidentally divided their femoral arteries with their own knives; in one an end-to-end suture was possible, and in the other two an arterial graft was necessary; all now have patent vessels with a good blood flow and palpable pulses distal to the lesion.

Sympathectomy is of great value after the acute phase has passed; before this it has a place in those patients who cannot tolerate reflex vasodilatation. The object of the operation is to increase the collateral circulation around the occluded artery; therefore, those ganglia which control the appropriate area of the patient's vascular tree should be removed. For example, removal of the second and third lumbar ganglia denervates the patient from the knee downwards, and when the first lumbar ganglion has been removed the denervated area includes the upper thigh. In addition, sympathectomy makes the skin warm and dry—a valuable contribution to the welfare of a patient with an ischaemic limb. The other two operations designed to assist the development of the collateral circulation—arterectomy and incisions in the deep fascia—have in my view little real value.

Amputation, whilst being a last resort, should not be unduly delayed in patients with rest pain. The level varies

with the level of occlusion in the arterial tree and the efficiency of the collateral circulation. With experience, many patients can receive the added benefit of a conservative operation, but in others a major above-knee amputation is required. The important thing is to obtain primary healing of the skin flaps and a stump which is useful.

Conclusion

Sudden occlusion of a major peripheral artery is an emergency the outcome of which depends to a large extent upon the initial care which the patient receives. The importance of local cooling, reflex vasodilatation, and anticoagulants has been stressed. The ideal to aim at is restoration of the blood flow to normal, but this is not often possible. The alternative is to encourage the development of an efficient collateral circulation.

Next article on Emergencies in General Practice.—“Crises in Myxoedema,” by Dr. Richard Asher.

Refresher Course Books.—Copies of the first two volumes of collected articles from the Refresher Course for General Practitioners published in the *Journal* are still available at 25s. (postage 1s.) each. The first volume contains 55 articles and the second 60. Each article has been revised and brought up to date by its author.

These books may be obtained from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or through any bookseller.

LEGAL LIABILITY OF DOCTORS

In the fourth of his series of lectures* at the City of London College on February 2, Mr. J. P. EDDY, Q.C., discussed the liability of doctors, hospitals, and dentists to actions for negligence. In recent years, he said, there had been a considerable increase in the number of actions brought against doctors and hospitals. Figures provided by the Ministry of Health showed that payments by hospital authorities in England and Wales by way of compensation of all kinds amounted in 1948-9 to £7,500, in 1950 to £23,000, in 1951 to £38,000, in 1952 to £106,000, and in 1953 to £153,000. The causes of this increase of litigation were: (1) the changed status of the hospital; (2) the payment of hospital staffs; (3) the availability of free legal aid; and (4) the decision of the Court of Appeal under which hospital authorities were responsible for the negligence of their staffs.

*Changed Status of the Hospital

Formerly many members of the community devoted much time, thought, and energy to the welfare of the hospital, which was regarded as “our” hospital. Nowadays they were not taking the same personal interest and the hospitals were regarded as State hospitals. Consultants and other members of the hospital staff were formerly not paid or were paid such a modest sum that it might be described as an honorarium. Nowadays consultants, registrars, and house officers were paid a salary; they were appointees, or indeed employees of hospital management committees or regional hospital boards or boards of governors.

Again, the legal-aid scheme had made it possible for members of the public to institute actions against doctors or hospital authorities or both. The committees charged with the duty of issuing legal-aid certificates had been doing their work well, taking reasonable care to satisfy themselves that a prima-facie case existed before issuing a certificate. Where there was an allegation of negligence against a doctor or hospital a medical report was called for. In Scotland the prospective litigant had an opportunity of being heard before a certificate was granted. Mr. Eddy did not think that that

*The first lecture was reported in the *Journal* of January 22, p. 221.

was desirable; there should be nothing in the nature of a preliminary trial, it was enough that there was a prima-facie case.

Finally, the decision of the Court of Appeal in *Cassidy v. Ministry of Health* (1951, 2 K.B. 343) had transformed the legal position in regard to liability of hospitals for negligence on the part of their medical staffs.

Duty of the Doctor

The duty owed by a doctor to his patient was laid down in 1838 in the case of *Lanphier v. Phipps*. A doctor undertook to bring to the exercise of his profession a reasonable degree of care and skill, but before the duty arose there must exist the relationship of doctor and patient. If a doctor saw a person lying injured in the street and passed him by he was not guilty of negligence, because there was no such relationship and consequently he owed no duty; but if he played the part of a good Samaritan the professional relationship was created, even though the doctor had no hope of reward. Moreover, he was liable only when he undertook the treatment of a person, not when he merely examined him at the request of someone else. A doctor incurred liability when he set out to treat a patient, but not when he expressed an opinion at the request of another person (1920, 3 K.B. 163).

In the *British Encyclopaedia of Medical Practice*, Dr. Walter Levitt, pointing out that the doctor must exercise a reasonable degree of care and skill, added:

“What is a competent degree of skill will depend on the circumstances in which the practitioner finds himself. If he practises in a remote village, away from modern sources of inspiration and knowledge, very much less will be expected of him than if he practises in a large town attached to a hospital with every possible convenience and inducement for keeping his knowledge up to date.”

The duty of warning the patient of possible danger in the treatment to be undertaken was pointed out in the judgment in *Clarke v. Adams* (1950, 94 Sol. Jo., 599). In an earlier action in 1934, in which the patient complained that a hypodermic needle had broken and been left in her tissues, the defendant claimed that the breaking was due to muscular spasm on the part of the patient, and the judge, while finding that there was no negligence, came to the conclusion that the doctor should have told the patient of the accident. The patient was awarded five guineas damages. Mr. Eddy cited other cases which turned upon the adequacy of the warning given to the patient.

Hospital Liability

In 1906, in the case of *Evans v. Liverpool Corporation* (1 K.B. 160) the plaintiff claimed damages on the ground that his son had been discharged from an infectious diseases hospital while still in an infectious condition and had communicated scarlet fever to his other children. It was held that the plaintiff was not entitled to recover, for the legal obligation of the defendants extended only to the provision of reasonably skilled and competent medical attendance. To-day beyond any question the hospital would have been held liable.

Mr. Eddy mentioned the cases of *Lindsey C.C. v. Marshall* (1937, A.C. 97) and of *Gold v. Essex C.C.* (1942, 2 K.B. 293). The latter did much to clarify the legal position. It turned upon the failure of a radiographer adequately to protect a child's face when Grenz rays were being given. Mr. Justice Tucker held that the defendants were not liable for negligence, but an appeal succeeded, and it was held that a whole-time servant of the hospital, in failing to provide adequate screening material, rendered the hospital liable.

But it was the decision of the Court of Appeal in the *Cassidy* case, already cited, which was one of the reasons for the increased litigation to-day. This was a case originally tried by Mr. Justice Streatfeild at Liverpool Assizes. The patient, suffering from a contracture, had been treated in a Liverpool hospital, and in the treatment his arm had

been kept rigid in a splint for several days. When it was released it was found that the hand was to all intents and purposes useless. The case went to the Court of Appeal, and there Lord Justice Singleton said that it was clear that there was negligence in the post-operative treatment. He also pointed out that it was not possible for the patient to say that the negligence was that of any particular individual; it might be that a number of people were at fault or that lack of system was the cause. The responsibility lay upon the hospital. Lord Justice Denning said:

"If a man goes to a doctor because he is ill no one doubts that the doctor must exercise reasonable care and skill in his treatment of him, and that is so whether the doctor is paid for his services or not. But if the doctor is unable to treat the man himself and sends him to hospital, are not the hospital authorities then under a duty of care for their treatment of him? I think they are. . . . Why should it make any difference if he does not pay them (the hospital) directly, but only indirectly through the rates which he pays to the local authority or through insurance contributions which he makes in order to get the treatment?"

Lord Justice Denning also pointed out that, since the hospitals had no ears to listen through the stethoscope and no hands to hold the surgeon's knife, they must do it by the staff which they employed, and if the staff was negligent in giving the treatment the hospitals were as liable for that negligence as was anyone else who employed others to do his duties for him. This seemed all so clear that one wondered why there should have been any doubt about it, yet for over thirty years it was the general opinion of the profession that hospital authorities were not liable for the negligence of their staff in the course of their professional duties. When a doctor or surgeon, whether consultant or not, was employed and paid not by the patient but by the hospital authorities, he was of opinion that the hospital authorities were liable for his negligence in treating the patient. It did not depend on whether the contract under which he was employed was a contract of service or a contract for services.

Mr. Eddy went on to mention the case of *Jones v. Manchester Corporation* (1952 2 Q.B. 852) in which Mr. Justice Oliver found the doctor guilty of negligence in the administration of thiopentone to a patient who had been already anaesthetized. In this case the responsibility was apportioned as to 20% on the doctor and 80% on the hospital board. In the Court of Appeal Lord Justice Denning said in this case that the hospital board had no right to indemnity or contribution from any member of its staff except in so far as the court thought it just and equitable having regard to the extent of the person's responsibility for the damage.

After reviewing some other recent cases Mr. Eddy concluded this part of his lecture by again quoting Lord Justice Denning to the effect that the term "consultant" did not denote a particular relation between a doctor and hospital; it was merely a title denoting a place in the hierarchy of the hospital staff. The consultant was a senior member of the staff, but just as much a member of the staff as a house-surgeon.

Reports of Societies

STRIPPING OPERATION FOR VARICOSE VEINS

On February 2 the Surgical Section of the Royal Society of Medicine met to hear three papers, one of them by Professor J. B. KINMONTH on his experience of the stripping operation for varicose veins.

Professor Kinmonth explained that the operation of stripping varicose veins was not new. In the second century Galen avulsed them with a hook. At the beginning of this century the procedure was rediscovered by Keller, Mayo, Babcock, and others. After the first world war the injection

of sclerosing solutions came into vogue and stripping went out of fashion, and it was not until 1947 that the operation again became popular with the work of Myers. The design of the stripper had varied. Keller in 1905 used a length of wire which turned the vein inside out, and Mayo in the following year invented an extraluminal instrument similar to a tendon stripper. Babcock in 1907 used a rigid wire with an olive head, and Myers modified this by making the wire flexible. This was the instrument in use to-day.

Professor Kinmonth said that he preferred to strip the saphenous vein from below upwards, having first carried out a standard Trendelenburg operation at the groin. He made a transverse incision at the ankle and at the knee, and the vein was removed in two lengths, using a small stripper below the knee, since it was less traumatic and less likely to damage the saphenous nerve. When necessary both legs were treated at one operation. The commonest complication was haematoma formation, and various precautions were taken to prevent this: the operation was carried out in the Trendelenburg position, and a sterile Esmarch's bandage was applied as the vein was stripped and left *in situ* until the wounds were sutured. After the operation, wool and crêpe were applied and the Trendelenburg position was maintained for some hours.

Complications

The feared complications of stripping varicose veins were thrombosis and pulmonary embolism. Accordingly Professor Kinmonth made his patients walk the day after operation, and crêpe bandages remained in place for a month. In fact the danger of pulmonary embolism was no greater than in general surgical operations as a whole, and occurred in about 0.5% of cases. In a series of 204 stripping operations at St. Thomas's Hospital there had been one case. At St. Bartholomew's Hospital there was one case in 157 operations, and at University College Hospital one case in 237 operations. None of these were fatal. Similar figures have been reported from the Mayo Clinic. In 1950 Murley had reported that in a series of general surgical operations performed at St. Bartholomew's Hospital, where special precautions were taken, there were 6 cases of pulmonary embolism in 1,289 patients, an incidence of 0.5%, and at the Mayo Clinic the figures were similar. Professor Kinmonth felt that the results of the stripping operation for varicose veins was very satisfactory, and, although statistical evidence was almost impossible to obtain because of the nature of the condition, recurrences were fewer than with other forms of treatment.

In the ensuing discussion Mr. F. B. COCKETT stated that at the vein clinic at St. Thomas's Hospital stripping had become a routine operation in the moderate and severe cases, since it gave better results than other methods and reduced the operating time. He pointed out that ablating the saphenous vein did not necessarily interfere with all the perforating veins, especially near the ankle.

Mr. J. B. OLDHAM stressed the importance of conservative treatment for varicose veins and the division of all tributaries at the sapheno-femoral junction when doing the Trendelenburg operation. He felt that, although there was no one single operation which cured varicose veins, the stripping operation was the most promising so far. Concerning the technique, he advised a vertical incision at the ankle and application of strips of adhesive felt along the course of the vein as it was removed. Mr. H. DODD stated that he operated on one leg at a time because of the danger of venous thrombosis. He noted that the operation was singularly free from discomfort. The results were good, and in consequence post-operative injections of sclerosants were rarely necessary.

Professor KINMONTH, in replying to a question from Professor C. G. ROB, said that he occasionally stripped the short saphenous vein, but that it was not often worth while. He concluded by saying that the operation of stripping varicose veins did not cure the condition, and he told the patients so.

LOCAL MEDICAL SOCIETIES MANCHESTER MEDICAL SOCIETY

At a joint meeting of the Sections of Medicine and Pathology on January 12 Professor C. H. GRAY gave an account of "Some Clinical Studies of Urinary Adrenal Steroids."

He said that although there was evidence that the physiologically important hormones secreted by the adrenal gland were hydrocortisone, corticosterone, aldosterone, and two androgens, a very much larger number of substances chemically related to these were excreted in the urine. Some might perhaps be intermediates in the synthesis of the important steroids in the adrenal gland which had leaked out in small quantities. Others, however, were metabolites of the active hormones. It was small wonder, therefore, that the earlier methods of determining adrenocortical steroid hormones in urine had been unsatisfactory, either because of lack of specificity or because they estimate some functional group common to a number of metabolites. Separation and estimation of all the adrenal metabolites in urine was necessary for a complete picture but would tax the time and energy of a mammoth institute.

Hormone Assays in Endocrine Disorders

The estimation of cortisone, hydrocortisone, and tetrahydrocortisone by paper chromatography seemed to be of value in the diagnosis of hypoadrenalism, continued Professor Gray, although these three metabolites accounted for only an extremely small fraction of endogenous or exogenously administered adrenal hormones. In both Addison's and Simmonds's diseases the excretion of these three compounds was greatly reduced, and might not be measurable in many patients with the former disease. In Simmonds's disease administration of A.C.T.H. restored the excretion to normal limits. The appearance of hydrocortisone in the urine after administration of cortisone, and of cortisone after administration of hydrocortisone, to patients with Addison's disease or after adrenalectomy showed that hydrocortisone and cortisone were freely interconvertible in the body even in the absence of the adrenals. The proportions of cortisone, hydrocortisone, and tetrahydrocortisone in the urine were approximately the same whichever hormone was administered. There was no doubt that cortisone and hydrocortisone were therapeutically equivalent, except possibly when some local action was required, as with some ophthalmological and joint conditions.

Some, but not all, cases of Cushing's disease showed an increased excretion of hydrocortisone, cortisone, and tetrahydrocortisone. When the total excretion of these three compounds was within normal limits, the excretion of either cortisone or hydrocortisone might be increased, suggesting that delayed inactivation of the active hormones might sometimes be an important factor in Cushing's disease. In other cases, however, none of these metabolites was increased, and, while it was possible that in these the adrenocortical hormones might be metabolized to a greater extent via other pathways, it was not impossible that in this disease phases of normal activity and of overactivity of the adrenal gland might alternate. Perhaps hypersensitivity of the tissues also played some part.

The excretion of cortisone, hydrocortisone, and tetrahydrocortisone was not increased during salicylate therapy, so that unless there was an alteration of the metabolism of the adrenocortical hormone from normal it seemed unlikely that salicylates produced their therapeutic effect by stimulating the pituitary-adrenal axis.

North of England Obstetrical and Gynaecological Society

At the annual general meeting in Manchester on January 21 the following officers were elected for 1955: *President*, Mr. H. J. MALKIN (Nottingham); *hon. treasurer*, Mr. C. H. WALSH (Liverpool); *hon. general secretary*, Mr. J. B. COCHRANE (Nottingham); *hon. reporting secretary*, Miss U. M. LISTER (Leeds).

Nova et Vetera

THE ILLNESS OF EDWARD THE BLACK PRINCE

Edward the Black Prince seems to have enjoyed good health up to 1366 (including his successful campaigns in France), and led an active, vigorous, and warlike life. His ill-health dates from his unfortunate expedition to Spain, undertaken to restore Don Pedro the Cruel to the throne of Castile. In 1366, when the Prince was at Valladolid waiting in vain for the promised money from King Pedro, "his army suffered so terribly from dysentery and other diseases that it is said that scarcely one Englishman out of five ever saw England again." "The army also were half-starved, and the free companions in the prince's pay ravaged the country."

The Prince contracted a severe and debilitating illness, which lasted for ten years. It was probably amoebic dysentery which merged into the chronic form, for there are contemporary references to his dysentery subsequently. Sir George McRobert informs me that amoebic dysentery still occurs in Spain as well as the bacillary forms. In 1369, when the Prince was at war with Charles V of France, Froissart states that his health was so feeble that he could not take an active part: he was swollen with dropsy and could not ride. Oedema of the legs and ascites have been noted in dysentery due to anaemia caused by intestinal haemorrhage. Alternatively, the Prince's dropsy may have been due to chronic nephritis, which sometimes complicates dysentery. A third suggestion is that it was a "hunger oedema," due to semi-starvation in Spain. The first explanation seems the most probable one.

In 1370 Charles V of France raised armies for the invasion of Aquitaine. Though ill, the Prince left his sick bed in Angoulême, gathered an army at Cognac, and sacked Limoges. A sick man, he was carried in a litter.

In January, 1371, on the advice of his physicians, he returned to England and went to his manor of Berkhamstead "ruined in health and fortune." His health improved, presumably with rest and dieting. In August, 1372, he sailed on an expedition with King Edward III, his father, to relieve Thouars, but the fleet, exposed to contrary winds for nine weeks, eventually returned without landing on the French coast.

Later, "the Prince's sickness became very heavy." He knew he was dying, was much in prayer, and did many good and charitable works. "His dysentery became very violent, and he often fainted from weakness, so that his household believed he was actually dead."

This was the result of the severe dysenteric haemorrhages and associated weakness and anaemia.

The Prince eventually died from dysentery and exhaustion in 1376, aged 46. His body was brought from the Palace of Westminster to Canterbury and buried with great state in the Cathedral.

ARTHUR S. MACNALLY.

¹ Knighton, H. In *Historiae Anglicanae Scriptores Decem*, edited by R. Trysden, col. 2629. London, 1652.

² *Chronicon Angliae*, pref. XXIX, p. 88. London, 1874.

³ Chandos, the Herald. *Le Prince Noir*, edited by F. Michel, line 4133. London, 1883.

⁴ Hunt, W. *Dictionary of National Biography*, vol. 17. 1889.

In her Annual Report for the year 1953 Dr. Catherine B. Crane, medical officer of health of the city of York, reports that attendances at the antenatal clinics, apart from midwives' clinics, were negligible, because the major part of the antenatal work in York is carried out by the patient's own doctor in domiciliary cases and by the hospital staff in cases booked for hospital confinement. "This we welcome," Dr. Crane writes, "provided adequate antenatal teaching can be given."

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Agranulocytosis

SIR,—In an annotation¹ you recommended that A.C.T.H. or cortisone should form a routine addition to the standard treatment of drug-induced agranulocytosis, though with a warning that not all cases might respond. This view was based on the reports of two cases of agranulocytosis in Canada² and U.S.A.³ respectively which, caused by sulphonamides, were successfully treated with A.C.T.H., and a case reported in the *Journal*⁴ caused by "novalgin" and treated with A.C.T.H. with recovery. Further cases of drug-induced agranulocytosis have been since reported in your *Journal*⁵ and elsewhere,⁶⁻⁹ in which A.C.T.H. was considered to have aided recovery. The use of A.C.T.H. in the treatment of agranulocytosis caused by drugs has also been referred to in a standard textbook.¹⁰

The potential danger of amidopyrine as a cause of agranulocytosis is well known, and certain related proprietary preparations—for example, novalgin—carry the same risk; for this reason the latter has been placed on Schedule 4. The case reported in the *Journal* (January 22, p. 207) by Drs. H. E. Hutchison and Hugh Conway died of an embolus five days after admission after improvement had occurred on antibiotics alone. As corticotropin and cortisone were not mentioned in their note we felt that attention should be directed to a form of therapy which is occasionally of great assistance in drug-induced agranulocytosis.—We are, etc.,

D. G. WRAITH.
F. DUDLEY HART.

London, W.1.

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- ² Caldwell, A. L., et al. (1950). *Canad. med. Ass. J.*, 62, 506.
- ³ McMillin, J. S. (1951). *Amer. J. med. Sci.*, 222, 392.
- ⁴ Hart, F. Dudley, et al. (1952). *British Medical Journal*, 1, 1273.
- ⁵ Hutt, M. S. R., and Lee, G. de J. (1953). *Ibid.*, 1, 784.
- ⁶ Aber, G. M., et al. (1954). *Ibid.*, 1, 1.
- ⁷ Stotz, K., and Hess, A. (1953). *Ther. d. Gegenw.*, 92, 361.
- ⁸ Virkkunen, M. (1952). *Arch. intern. Med.*, 90, 580.
- ⁹ Whitby, L. E. H., and Britton, C. J. C. (1953). *Disorders of the Blood*, 7th ed. London.
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Disk Lesions and Low Backache

SIR,—The paper by Dr. James Cyriax (*Journal*, January 15, p. 140) and the letter from Mr. John Charnley (p. 163) illustrate the difference of opinion—not to say confusion of thought—about these conditions, granted that there is a larger field for the use of manipulation. Dr. Cyriax is altogether too facile in regarding the great majority of patients suffering from lumbago and sciatica as subjects in some degree of disk lesion. The diagnosis of disk lesion is not as easy as all that. What does it rest on? (a) A history of injury or sudden onset (but many a case gives neither); (b) pain which on strict analysis is truly acute, with confirming clinical signs of local spasm and sciatica; (c) some element of confirmation by x-ray. With many others, I have had the misfortune to perform laminectomy at several levels in the "certain" case, only to find no evidence of disk protrusion. X-ray films often show no evidence of diminution of the intervertebral space, and, conversely, gross diminution may appear in films taken for some other condition—for example, the flat film of a barium series—with no complaint from the patient of lumbago or sciatica. It should be remembered that the intervertebral articulation comprises three elements—the disk, the spinal ligaments, and the apophyseal joints—and that any pathological condition which affects one affects all.

The late Dr. H. A. Cookson examined 22 patients at necropsy, none of whom in life gave any history of backache or sciatica;

of these, eight showed obvious disk protrusions, apparently symptomless. In operating for disk lesions, the apophyseal joints when examined consistently show pathological evidence of osteoarthritis, degeneration of hyaline cartilage, capsular thickening, and resultant narrowing of the channels through which the nerve roots emerge, especially that of the 4th lumbar. My personal view is that this condition is more frequently the source of lumbago-sciatica than minor disk protrusions.

Dr. Cyriax stresses fairly the value of manipulation and traction; Mr. Charnley recognizes the value of psychological concord with the patient, but rightly dreads the prospect of a multiplication of the physiotherapy services. May I suggest a method of treatment which effects the first and obviates the second? It is not original; it was put forward in a clinical lecture on scoliosis by that shrewd observer the late Professor Alexis Thompson, in 1909. The patient hangs from a ladder, arms fully extended, head retracted, knees bent up; in this position he hyperextends the pelvis on the lumbar spine, then swings from side to side. In the home a ladder is not normally available, but the top of a door is, and makes a good substitute. Having reached the limit of tolerance, he now lowers himself carefully to the four-foot position, and crawls round the room half a dozen times. If sciatica is present, he crawls away from the affected limb, as in Klapp's exercise, the hand and knee being approximated on the contralateral side. A firm pillow, 12 in. (30 cm.) square, is strapped to the lumbar area, and the patient instructed to repeat the routine, at least once daily. Thick gloves should be worn, and the knees protected by cotton-wool pads.

This procedure is effective in the great majority of patients, and not infrequently dramatic; it has the advantage of simplicity, it can be repeated *ad lib.* by the patient, and throws little strain on the physiotherapist or the overwrought orthopaedic surgeon. Most important, it emphasizes the principle that what the patient does for himself is worth a ton of what someone else, lay or medical, does for him. I use injections very little—when I do, I give 5 ml. of lactic acid, without procaine, paravertebrally on either side, trying to reach the root of the lumbar-transverse process at the appropriate joint. Most procaine preparations, being hydrochlorides, have a pH on the acid side.—I am, etc.,

Sunderland.

W. GRANT WAUGH.

SIR,—For many years now I have been carrying out Dr. James Cyriax's methods of diagnosing and treating low backache. This I have done in general practice. I would therefore like to give my figures for a twelve months' period, in reply to the request of Mr. W. D. Coltart and Mr. H. Osmond-Clarke in their letter (*Journal*, January 29, p. 288). I would like to add that these patients could not easily hide their recurrent backaches from me, as I was their N.H.S. doctor and they could not therefore seek advice elsewhere, as suggested by Dr. D. M. Freeman (p. 289), and very few complain that the treatment was painful.

	No.	%
Cases treated	185	
Considered suitable for manipulative reduction	133	
Relieved in one session		57
" " two sessions		194
" " three "		1
" " four "		6
" " traction		9
Referred to St. Thomas's Hospital		7
Recurrences		20
Cases considered suitable for traction	52	
Relieved in 1-5 treatments		43
" " 6-10 "		23
" " more than 10, or referred		35

I consider that these results substantiate the claims made by Dr. Cyriax. I should add that many of the treatments were given by my physiotherapist. I think it is a pity that so many of our noble profession criticize his methods, without having a working knowledge of them. Those who do watch the diagnosis being worked out, and the treatment being carried out, are usually enthusiastic.—I am, etc.,

London, W.1.

R. BARBOR.

SIR,—Mr. John Charnley (*Journal*, January 15, p. 163) defends the orthopaedic surgeon's approach towards the problem of chronic low backache. Unfortunately only a small percentage of genuine derangements of the musculo-ligamentary-skeletal structure of the lower back can be demonstrated by x-ray or any other scientific investigation. Nevertheless, they are the undoubted cause of a great deal of chronic invalidism and most of them can be cured by simple manipulation. The Cyriax traction is an aid—but I prefer to use my hands. I must confess that I sympathize with the patient who, having been sent from one specialist to another and from one x-ray department to another, says that nothing has been done for him, for nothing has in fact been done to relieve him of his backache, which is after all what he has asked for.

Simple manipulation does not require an anaesthetic, takes only a few minutes of the manipulator's time, and the question of expense does not arise, since the only equipment necessary is a couch and a pair of trained and confident hands. I still hope that we are approaching the day when the profession will at last realize the value of this type of manipulation and will accept it wholeheartedly.—I am, etc.,

London, S.W.16.

HARRIS AVERY.

SIR,—In his article on spinal disk lesions (*Journal*, January 15, p. 140) Dr. James Cyriax states that manipulation of the spine should not be in the hands of "lay manipulators." Yet that is the very thing he does by relegating this work to physiotherapists. The American osteopaths have a far superior training to the physiotherapists, and, in fact, the training of those recognized by the British Osteopathic Association compares very favourably with that given by many of the medical schools in every way. These osteopaths are recognized by the United States Government, and in many cases have to pass the same State Board Examination as the medical graduates before they can practise.

Manipulation of the spine is an extremely skilled work. It is true that anyone can be taught the necessary movements, but the application of the manipulation is the important thing, and this cannot be taught nor can it be relegated to those who have not had the thorough training that an American osteopath has had. There must be definite reasoning, ingenuity, the requisite skill, and, above all, the ability to apply the manipulation. It cannot be left to those who have not had considerable experience. There are some osteopaths who are just "joint crackers," and they are the ones who throw discredit on the true osteopaths. There are many physiotherapists who are just "skin rubbers," but that does not mean that there are not many who fill a very necessary need. American osteopaths, however, are taught manipulation from every angle, and in so many cases each manipulation must be reasoned out. There can never be any stereotyped method of manipulating a spine. The variations of restricted movement of the spinal joints are so numerous that unless the treatment is correctly applied there can be no certainty of the outcome and, what is more, the patient may be worse. This work cannot be accomplished unless one knows how and why.

What is a disk lesion in its early stage? Is not this the osteopathic lesion? Apart from this definite and simple cause, there is no other reason for what are styled disk lesions. Are they disk lesions? Has the medical profession ever improved upon the manipulations of the osteopath? It has copied them and imitated them, and claimed them as original, but there the comparison ends.—I am, etc.,

Newcastle-upon-Tyne, 2.

R. W. R. WATSON.

SIR,—I have read the correspondence on the treatment of low back pain with very great interest. From my own experience I can state that a modification of Dr. James Cyriax's method does work. The patient who is brought to an out-patient department by ambulance, in such severe pain that he cannot stand or walk, can be relieved so rapidly that he can walk to hospital next day, and return to work within a week.

This very fact raises doubts in my mind as to the diagnosis. From the consideration of the anatomy of a lumbar intervertebral disk, it is hard to believe that a herniation of the nucleus pulposus or a tear of the ligamentum annulare can be "replaced" so that they remain in position. Is it not more likely that these acute cases are really lesions of the interlaminar joints, possibly a subluxation? Weight is given to this view by the fact that the majority of these acute cases are caused by a flexion and a rotation strain. Might it not be well to reserve the diagnosis of a disk lesion for those cases with sciatic pain and/or neurological signs?—I am, etc.,

London, W.1.

A. C. ELKIN.

Tonsillectomy

SIR,—Following the article by Dr. Christine M. Rendell on the premedication of children for tonsillectomy (*Journal*, December 11, 1954, p. 1397) there has been varied and interesting correspondence. I do not propose to comment on this, but rather on a fact which has been mentioned *en passant*, and which may be of interest to posterity: the fact that guillotine tonsillectomies were still being performed in large numbers in the second half of the twentieth century—*circa* 1955.

In May, 1909, there appeared in the *Lancet* an article of extreme clarity and simplicity by George Waugh,¹ then senior surgeon to out-patients at the Hospital for Sick Children, Great Ormond Street. This paper, which dealt with "A simple operation for the complete removal of tonsils, with notes on 900 cases," was destined to revolutionize the surgical treatment of chronic tonsillitis. Of the 900 cases mentioned 143 had already had their tonsils guillotined, some of them as often as two or three times. I quote verbatim: "It is probably a common experience of all large out-patient departments—and certainly of my own at Great Ormond Street—to find a large number of patients upon whom tonsillotomy has been performed and to whom no relief either of the local or general condition for which the operation was done has resulted. From the frequency with which the operation has been repeated, sometimes as often as three times, and from the fact that the operation has been performed by many operators at other hospitals in these 143 cases, it seems right to conclude that the cause of failure lies not with the operator but with the type of operation. Even in highly skilled and experienced hands the complete removal of a tonsil by means of the guillotine is a task of such mechanical difficulty as to be, except in a few rare cases, quite impossible."

Waugh was accustomed to seeing many patients who had been subject to inadequate, inaccurate surgery. To-day, 46 years later, the same type of patient continues to attend the clinics, with huge masses of infected tonsillar remnant, and in some cases a deficiency of uvula, faucial pillars, or soft palate suggesting that these innocent anatomical structures must have been indicted and sentenced to mutilation along with the tonsils and adenoids. Guillotine apologists advance the following arguments: long waiting-lists preclude the performance of the dissection operation in every case, but this more lengthy, deliberate, and precise operation may be reserved for cases in which pre-operative findings are suggestive of adherent tonsils. In some centres the post-operative haemorrhage rate is higher in dissected than in guillotined cases: a longer anaesthetic is necessary for the dissection operation: but perhaps the most dangerous and frequently repeated platitude of all is that in the hands of experts the guillotine operation gives satisfactory results. I hasten to agree, but expert guillotinists are few.

Not one of these reasons is valid. A lengthy waiting-list cannot be said to justify any technique other than the best. Which method would the surgeon wish in the case of his own child? Of course the post-operative haemorrhage rate is higher following the removal of abnormally adherent tonsils, and if dissection is reserved for these cases any comparison of the haemorrhage rates following the two methods is bound to give rise to fallacious conclusions. As regards the length of anaesthetic, I think most of us would agree that anaesthetists have not been the least progressive of our colleagues, and the era when operation-time was reduced to a minimum, in order to curtail their activities has long since passed.

I anticipate much opposition to the view that the guillotine operation should be relegated to the historical section of every textbook, but let me make it quite clear that I am in no way critical of those revered colleagues who for many years have employed the method with diligence and success. But rather, in the words of Waugh, "The cause of failure lies not with the operator but with the type of operation."—I am, etc.,

London, W.1.

E. H. MILES FOXEN.

REFERENCE

¹ *Lancet*, 1909, 1, 1314.

Carcinogens in Cigarette Smoke

SIR,—The interesting point made by Professor R. D. Passey (*Journal*, December 18, 1954, p. 1485) referring to the prolonged exposure of the skin of the fingers of cigarette smokers to the products of the combustion of tobacco has often puzzled me. It has occurred to me that one possible explanation might be related to the relative absence of sebaceous follicles in the skin of the finger-tips (of course, this does not apply in the case of the lip or the eyebrows). The skin of young mice devoid of sebaceous follicles was shown to be resistant to the carcinogenic action of methylcholanthrene by Lacassagne and Latarjet,¹ and I have failed over a period of many years to induce any epithelial tumours in the skin of fowls with a variety of chemical carcinogens that are potent for the skin of mice. One of the peculiarities of the skin of the domestic fowl is an absence of sebaceous follicles except in the preening glands. Another and simpler explanation would be that the products of combustion of cigarette smoke are not carcinogenic for human skin.

I make these comments without prejudice in regard to the possible carcinogenic action of cigarette smoke on the epithelium of the bronchus and lung.—I am, etc.,

Glasgow, G.3.

P. R. PEACOCK.

REFERENCE

¹ *Cancer Res.*, 1946, 6, 183.

Obstruction from Orange Pith

SIR,—One of the disadvantages of being in a distant part of the Commonwealth is that the *Journal* takes so long to reach us. I have only recently received the numbers in which your correspondents discuss the dangers of orange pith (*Journal*, November 27, 1954, p. 1301, and December 18, p. 1484). I, too, have had an experience with the fruit which I think merits recording.

On March 20, 1951, I was urgently requested to see a coloured male child aged 4 years at the Coronation Hospital, Johannesburg. This child had been treated recumbent in a Jones's frame for four months for a tuberculous lesion of the 8th thoracic vertebra. He had been perfectly well until 7.30 p.m. that day, when a nurse had noticed the child was struggling for breath. The houseman was called and diagnosed acute tracheal obstruction, and, as I happened to be in the building, asked me to see the child. When seen at 7.45 p.m., the patient was semi-conscious and deeply cyanosed. Rib recession was marked and the accessory respiratory muscles were contracting forcefully. Air entry into both lungs was scarcely audible. It was presumed that a foreign body had been inhaled and an immediate bronchoscopy was performed in the ward without anaesthesia. No difficulty was experienced in introducing the instrument, but intense bronchial spasm was produced which lasted only a short while and was followed by total flaccidity, unconsciousness, and an impalpable pulse. A rapid cursory inspection of the main bronchi failed to reveal the presence of a foreign body. The bronchoscope was withdrawn into the trachea and the lungs inflated with oxygen. While we were debating whether the heart had stopped the houseman jubilantly reported the return of feeble radial pulsations. Within a few minutes the child was pink and the heart beats forceful. Trichlorethylene was then administered to the now struggling child and a more leisurely inspection of the bronchi failed to produce the expected foreign body. The bronchoscope was then slowly withdrawn, and it was noticed that the upper tracheal lumen was reduced to a slit by an extra-tracheal mass projecting from behind. As soon as the instrument was withdrawn into the larynx the obstruction recurred. Nothing had been noticed during the hasty introduction of the instrument; no bar to its advancement had been met. The bronchoscope

was again pushed beyond the obstruction and with a laryngoscope the interarytenoid fold was lifted forwards. A mass of white cotton-like material was seen to be impacted in the lower pharynx and on withdrawal was found to be a mass of orange pith. A considerable quantity was removed, which must have extended for some distance down the oesophagus. This completely relieved the tracheal obstruction. I subsequently learned that the child had eaten an orange about an hour before the tracheal obstruction was first noticed.

One wonders whether the bolus lodged in the pharynx and oesophagus had slowly increased in size by absorption of saliva and other fluids until eventually the soft trachea was sufficiently compressed to impede breathing, or whether actual difficulty had been experienced for an hour before it was eventually noted. I was assured that the child had shown no signs of restlessness after his evening meal and had certainly made no complaint.—I am, etc.,

Johannesburg.

PAUL MARCHAND.

Silver Stool Sign

SIR,—Sir Heneage Ogilvie's description (*Journal*, January 22, p. 208) of this condition in cancer of the ampulla of Vater is very important. It may be of interest to report that we have occasionally received silver stools from young children convalescing from diarrhoea. We have assumed, but without proof, that sulphonamide or other medicaments were responsible for this odd appearance.—I am, etc.,

London, N.9.

M. E. M. THOMAS.

SIR,—It was with considerable interest that I read Sir Heneage Ogilvie's medical memorandum on "Thomas's Sign, or the Silver Stool in Cancer of the Ampulla of Vater" (*Journal*, January 22, p. 208).

A 65-year-old patient was admitted to hospital in the early hours of December 25, 1954, with abdominal pain and vomiting of over 24 hours' duration. He was found to have a paralytic ileus and peripheral circulatory failure due to peritonitis. Although there was much discussion about the cause of the peritonitis, the most likely one was considered to be a perforated peptic ulcer. He was treated conservatively and never really became fit enough for laparotomy. During the course of his illness he passed quite a definite "silver stool." My wife, who happened to be the ward sister at the time, stated that she had been taught that "silver stools" were characteristic of pancreatic disease. I consulted several surgical and medical colleagues, as well as the professor of pathology, and none had met the use of the term "silver stools" in pancreatic disease, or in any other condition. On being referred to a textbook of nursing¹ I found the statement that "in some diseases of the pancreas the stools have a silvery appearance." The patient referred to above died on December 30, 1954, and necropsy revealed gross haemorrhagic pancreatitis.

In view of this case I respectfully suggest that this is not the first description of "silver stools." Also, "silver stools" are not really diagnostic of carcinoma of the ampulla of Vater and can evidently occur in other diseases of the pancreas.—I am, etc.,

Manchester, 13.

W. J. METCALFE.

REFERENCE

¹ Riddell, M. S. (1938). *Lectures to Nurses*, 7th ed. Faber and Faber, London.

SIR,—Sir Heneage Ogilvie's memorandum entitled "Thomas's Sign, or the Silver Stool in Cancer of the Ampulla of Vater" (*Journal*, January 22, p. 208) immediately attracted my attention, as I have once observed the phenomenon which he describes, but was not aware of the significance which he attributes to it.

The patient was a diabetic man aged 68 years who had been jaundiced for five weeks as a result of obstruction of his common bile duct by a large stone. He was passing clay-coloured motions at the time when he was first seen. At operation the stone was removed from the grossly dilated common duct, which was then drained with a rubber catheter. The patient's condition was very poor and he developed a profuse biliary fistula around the tube

and died of bronchopneumonia a few days after the operation. On the morning of his death the sister of the ward called my attention to a stool which the patient had just passed and which had been saved because neither she nor the staff-nurse had ever seen anything resembling it. It was a bulky well-formed stool which resembled exactly, in colour and appearance, the aluminium paint which is commonly sprayed on pipes and radiators. It was not merely grey in colour but had a definite metallic lustre. I was at a loss to explain the phenomenon but had a colour photograph of the specimen taken, and, as it was not repeated, was unable to investigate it further.

If, as Sir Heneage says, the phenomenon is due to the presence of altered blood in the pale stool of obstructive jaundice, then the origin of the bleeding in my case was no doubt the operative trauma to the common bile duct. Sir Heneage suggests the passing of silver stools may be an important sign in the diagnosis of carcinoma of the ampulla of Vater: one wonders whether it will be of much practical value. In the first place I suspect that the phenomenon must be very rare, as I cannot imagine the passage of stools, the colour of the one that I have described, escaping notice and comment by the nurses and the ward sisters. In the second place, surely the existence of unexplained obstructive jaundice is in itself an adequate reason for surgical exploration, and, as Sir Heneage has mentioned, the source of the haemorrhage which may be responsible for the silver stools is not necessarily from the obstructive lesion itself. It would be interesting to know whether others have observed the phenomenon of silver stools, and if they have I hope that they will write making their observations available.—I am, etc.,

Cardiff.

ARNOLD S. ALDIS.

Alcohol as a Diuretic

SIR,—I was shocked to detect my revered ex-teacher of clinical medicine in an error both of fact and implication. In Professor L. J. Witts's review of the third series of "Any Questions?" (*Journal*, January 29, p. 271) he invokes Shakespeare to his support in his contention that alcohol is a diuretic. He quotes a reference which I cannot verify, as my copy of *Macbeth* shows Act II to have but two scenes. If he refers to the conversation between Macduff and the porter in Scene I, then what does Shakespeare say?

Porter.—Faith, Sir, we were carousing till the second cock: and drink, Sir, is a great provoker of three things.

Macduff.—What three things does drink especially provoke?

Porter.—Marry, Sir, nose-painting, sleep, and urine.

Will he quote an authority who supports the outworn theory that excessive drinking causes a red nose? What, I wonder, did the porter at Inverness castle drink? Unless he can be shown to have ingested pure alcohol, then Professor Witts's contention is vain, for most drinks contain other ingredients—for example, oil, juniperi—which may well be specific diuretics.

All the good Will Shakespeare says is that if you drink much you pass much urine, and that can hardly be denied.—I am, etc.,

Wellesbourne, Warwick.

LAWRENCE MACKIE.

Hypodermic Injection Technique

SIR,—When, as a student at St. Thomas's, I had my first lesson in the use of the hypodermic syringe it was impressed on me that never under any circumstances should the plunger be depressed without a previous withdrawal to ensure that the needle had not entered the lumen of a dilated venule. I have withdrawn the plunger in every injection I have ever given since then, and in the course of thirty years I have withdrawn blood on at least five or six occasions. Depending on the drug or serum used, each of these half-dozen cases might have been a fatality.

I am astonished to find that no nurses I come across have been taught this elementary safety-first precaution. Surely so simple a thing should be drilled into everybody who handles this ubiquitous, but nevertheless potentially lethal, weapon.—I am, etc.,

St. Ives, Cornwall.

L. P. LOCKHART.

Dyspareunia

SIR,—Mr. G. W. Theobald (*Journal*, January 22, p. 228) suggests that Mr. R. Christie-Brown (*Journal*, January 8, p. 106) might find his new dyspareunia clinic unnecessary (for the relief of infertility) if he would try cauterizing the internal os uteri with a stick of silver nitrate, which he believes "would cure most cases of dyspareunia provoked by deep penetration of the penis." But if the infertile patient's cervical anatomy and physiology happen to be normal, what then? Might not the stick of nitrate change all this?

I would rather see the dyspareunia clinic abandoned for other reasons. I agree wholeheartedly with Mr. Oswald Lloyd (*Journal*, January 22, p. 228) that "these cases are a challenge to the patience and ingenuity of the non-surgical aspect of our specialty" and, like him, I regard as unfortunate the present tendency to hive off into component clinics various groups of gynaecological disorders. The groups selected are usually those less spectacular conditions which require time-consuming histories, investigations and/or treatments; they are, in fact, the very cases which need mature clinical judgment in their handling to bring maximum benefit to the patient. Unfortunately, such cases interfere with the tempo of the conveyor-belt system of out-patient departments, so dear to the heart of the lay administrator these days.

The herding together of similar cases into clinics may be an administrative expediency and may be justified for the purposes of research and the collecting of data, but it is good neither for the patients themselves nor those who staff them (and how often is this work delegated to juniors?). Both are apt to develop distorted ideas. In short, unless the patient derives maximum benefit from her visit to the hospital, what appears to be administrative efficiency is, in fact, the reverse.—I am, etc.,

South Shields.

TERENCE ROBINSON.

What is Health?

SIR,—I read with great interest Dr. A. H. Macklin's letter (*Journal*, January 22, p. 229) in which he set out certain constructive criticisms of the Kent Paediatric Society's report¹ and gave a few details of the 10-year survey at present being carried out in the University of Aberdeen.

In undertaking a mathematical assessment of health, the Society was well aware of the difficulties and dangers of such an approach and appreciates that the method set out in the study represents but a first step in the evolution of a generally acceptable standard. Indeed, it is hoped that not only the marking form but all the other measurements will be studied and improved upon by other workers in this field. As one reviewer has put it,² "The modern locomotive engineer may laugh at some of the original crudities of the first productions of Watts and Boulton, but without their work there could have been no Flying Scotsman." Although we are, yet, by no means convinced that health can be measured, we hope that this analogy may prove to be a sound one.

It may be that surveys based on the correlation of factors applied to individuals in special groups by methods of observation and record may yield satisfactory results; but the fact that such surveys take ten or more years reduces considerably their usefulness in field trials, where a more rapid assessment is desirable. Besides, the subjective element in such surveys is very strong and it is not always those whose "all-round qualities" appear to be outstanding who deserve to be placed in the highest category of health: the dark horse has always to be reckoned with. Neither do such methods lend themselves to standardization, which alone would permit of their universal application.

The assessment of personality or character is, perhaps, the most important (and certainly the most fallible) aspect of health assessment, for on character may depend the power of the individual to rise above physical or even intellectual disability. Health, in the absolute sense of "wholeness," can rarely, if ever, be a human attribute, and the most that we can aim at is the highest degree of well-being which can result from the individual's

endowment of physique, intelligence, and character. Any method of assessment must take into account this compensatory mechanism. How would a Franklin D. Roosevelt or a Helen Keller be placed in the Aberdeen survey, or the Kent survey for that matter? Certainly the latter could and should be modified to ensure that these would not be rejected from the category of health.

Even the "intelligent, highly reactive personality" must, somehow, come to terms with his environment by a process of mutual interaction, failing which the result can only be withdrawal, which may well be an element in psychopathology. This may be the reason why genius is so often associated with disease and must therefore be regarded as abnormal. It is, of course, not necessarily the "healthy" who contribute most to human advancement, and, indeed, the reverse may be the case; but health must not, on this account, be thought of as a state of dull, uninspired mediocrity. The stability of society may well depend on "normal," "healthy" people, and it is the aim of the infant science of "hygiology" to be able to recognize health, if possible to measure it and to discover its causes. For has not health its specific causes no less than disease? The results of the Aberdeen survey may shed much light on some of these problems.—I am, etc.,

JOHN LONDON,

Bexleyheath. Chairman, Kent Paediatric Society Research Subcommittee.

REFERENCES

- * A Study in the Epidemiology of Health, published from the Health Department, 14, Brampton Road, Bexleyheath, Kent.
* Med. Press, 1954, 232, 533.

Cortisone, A.C.T.H., and Asthma

SIR,—Your annotation on this subject (*Journal*, January 22, p. 216) deserves comment. During the last few years I have treated 28 asthmatic patients with A.C.T.H. or cortisone with a high percentage of pronounced improvements. This result does not differ from those of Dr. J. E. G. Pearson (p. 189) nor from those of the numerous authors who have reported the results of controlled and uncontrolled trials in many countries during the last five years. A few relevant details may be worth recording.

Fifteen patients were put on maintenance doses. They are still so maintained, some of them for longer than two years. There were no serious side-effects like diabetes, hypertension, or bleeding ulcer. Mooning and ankle oedema were frequent, but subsided after one or two weeks, as has been observed by others. In only two cases was it necessary to increase the maintenance dose permanently. Both were complicated by severe emphysema, and this disorder and the accompanying chronic bronchitis took their natural progressive course. In the other patients on maintenance doses (which varied from 25–150 mg./day) it was often necessary to increase the dose temporarily when the asthma became more severe after an intercurrent respiratory infection or after exposure to an allergen. In all such cases the daily dose was stepped up briskly to 150 or 200 mg. of cortisone and reduced gradually within the next 10 days until the previous maintenance dose was reached again. In all of them the asthma returned to its previous well-controlled degree of severity. Thirteen patients, who received the drug only temporarily in order to tide them over severe seasonal bouts of the disease, also returned to their previous moderate degree of chronic asthma after cortisone or A.C.T.H. had been gradually withdrawn.

In view of my own observations and those of many others, I must express disagreement with the somewhat gloomy view of your annotator, which is likely to discourage practitioners from the use of these most beneficial substances. We all know that cortisone and A.C.T.H. are only effective as long as they are given, and that they may have dangerous side-effects; so have many other drugs, including adrenaline, insulin, and chloramphenicol. We must try to avoid these dangers, but not by not using the drugs. Your annotator bases his view partly on the conclusions of Savidge and Brockbank,¹ who reported two deaths among their patients and collected nine other deaths from the literature. Their report makes it very likely that these two patients died not because they had too much but because they

had too little cortisone. It was not continued or not suitably stepped up when the asthma temporarily increased in violence. Such violent bouts frequently occur in severe chronic asthma, and we must remember that, at present, cortisone is mostly used for severe cases in whom the risk of a fatal outcome is always present. The conclusion of Savidge and Brockbank "that the cortisone cannot be exonerated" (a conclusion echoed by your annotator) therefore seems unjustified. The authors contradict their conclusion themselves, for they suggest that in future higher doses should be given in such cases of deterioration.

Your further remark that trials with such a drug "must be blind" is not a happy one either. It may be interesting to stage a blind trial of cortisone against a placebo in order to determine statistically the percentage of placebo improvements. Such a trial would not be necessary to confirm the efficiency of cortisone, because its beneficial effect has already been generally confirmed and accepted—I shall not encroach on your space by quoting the 50 or so papers which have appeared on the subject since 1950. In view of this I wonder what is meant by the phrase, "So far as this country is concerned [my italics] the therapeutic value of cortisone and corticotrophin in asthma is still *sub judice*." I feel it is going a little too far to disregard the experience of reliable authors all over the world. The therapeutic value of cortisone has been established beyond doubt. We have still to learn many things about it, but this is no reason to discourage its use.

May I add a plea that leading articles and annotations be signed in the future? Their authors ought to shoulder their responsibility in public.—I am, etc.,

London, W.C.1.

H. HERXHEIMER.

REFERENCE

- ¹ *Lancet*, 1954, 2, 889.

Human Nutrition and the Sophistication of Foods and Feeding Habits

SIR,—It is the duty of every commercial organization concerned with nutrition to ensure that their products not only conform to the relative applicable standards, but also to keep abreast of research in such a way that improvements may be introduced in any processing involved. Following Professor B. S. Platt's paper (*Journal*, January 22, p. 179), and since this department is concerned most particularly with the use of unsweetened evaporated milk in the field of infant feeding, we feel some reference to its protein value could be usefully made.

Hodson and Kreuger,¹ referring to evaporated milk samples obtained from six different areas, found a small and nutritionally insignificant loss of lysine in the heat processing of evaporated milk. They state: "When the variability of the assays is considered this is the only measurable indication of a loss of an essential amino-acid during the processing of evaporated or dried milk." More recently Hodson² reported the amino-acid content of evaporated milk on prolonged storage. In his summary of this work he stated: "Of the seventeen amino-acids studied, significant losses were found for only lysine (17%), histidine (17%), and arginine (11%) during five years' storage. During fifteen to seventeen months' storage, which is longer than the customary storage period, losses of these three amino-acids were not greater than 4% in any case."

We feel that perhaps even greater significance can be attached to the fact that the work of Hodson¹ in relation to yet further heating of the already heat-processed evaporated milk, utilizing the terminal heating method technique of preparing feeds, showed no further destruction of lysine. He stated: "Evaporated milk formulas, which were heat treated, either by low pressure method (100° C. for 15 minutes) or high pressure method (autoclaved at 110° C. for 10 minutes), showed no loss of the essential amino-acid, lysine." Further observations by Hodson refer to the darkening in colour when evaporated milk is stored for several years. He felt that because amino-acids contribute to the development of brown colour in food products, through their role in the Maillard browning reaction, a study of amino-acid loss during storage would be of interest. The study, therefore, embraced both essential and non-essential amino-acids, for which microbiological procedures had been devised. Having found the resultant loss of the seventeen amino-acids quoted above, Hodson² says: "If the amino-acids produce the brown colour in stored evaporated milk, through participation in the

Maillard reaction, then small amounts of lysine, histidine, and arginine must be very effective in producing the brown colour, inasmuch as only 2% of the total protein amino-acids would take part in the reaction during five years' storage."

In relation to curd and nitrogen storage, the investigation conducted at the Pennsylvania State College School of Agriculture by Professor Dizikes and F. J. Doan³ shows that raw and pasteurized milk have unsatisfactory curd characteristics, since after three hours of digestion more than 50% of the nitrogen was found in curds failing to pass a 4-mesh screen. At this same stage—that is, three hours and 4-mesh—breast milk gave 0.0%, unsweetened evaporated milk 0.26%, and boiled milk 10.60%.

We trust this information will show our anxiety not to rest content with our product, and that we take into account as many factors as are currently known in relation to the use of a substitute food for infants when breast feeding is not possible.—I am, etc.,

London, E.C.4.

R. H. WOODCOCK,

Manager,

Medical Department, General Milk Products Ltd.

REFERENCES

- ¹ *Arch. Biochem.*, 1946, 10, 55.
² *Industr. Engng. Chem.*, 1950, 42, 694.
³ *J. Amer. diet. Ass.*, 1949, 25, 119.
⁴ Pennsylvania State College School of Agriculture Bulletin No. 428, March 27, 1942.

Myxoedema After Thyrotoxicosis

SIR.—The case report by Drs. Russell Fraser and B. E. C. Nordin (*Journal*, January 29, p. 255) is interesting, but, although they mention Hashimoto's thyroiditis in the preamble, they do not describe the clinical state of the thyroid gland in their patient's myxoedema phase. There is some evidence that thyrotoxicosis may be present, and not uncommonly, early in Hashimoto's disease; is their case one of "struma lymphomatosa" in a male, which would be a rarity?—I am, etc.,

West Hartlepool.

R. T. COOKE.

Prophylactic Thyroid Treatment in Cancer

SIR,—We disagree with the conclusion drawn by Dr. A. A. Loeser from the results given in the first paragraph of that part of his paper subheaded "Clinical Observations" (*Journal*, December 11, 1954, p. 1381). In the following paragraph the author states: "This fact shows that a lack of thyroid hormone in the body favours tumour development."

It is not stated whether or not the seven patients with cancer development had received thyroid hormone after thyroidectomy. Therefore, considering for the moment only the remaining 93 patients, we calculate that if 100 similar samples of thyroidectomized patients were examined, 18 would be expected to show differences of the observed amount (or greater), and in the observed direction, on the basis of random sampling. The chances against such an occurrence are 4.4 to 1. Therefore the observed difference of tumour development between the group which had received thyroid hormone and that which had not has very low statistical significance. If the seven patients with cancer development are supposed not to have received thyroid hormone (which would be favourable to the conclusion drawn in the paper), and are included in the analysis, the chances are 9 to 1 against the observation being the result of chance. This result is one-half the chance which is considered by many to indicate "satisfactory significance" in a biological experiment, and falls far short of that which would permit an almost certain conclusion to be drawn.

If Dr. Loeser's conclusion is correct, it might be shown to be so statistically with greater certainty if a larger number of patients were included in the group having received thyroid hormone. We note, also, that reference is made on two occasions to cancer incidence in the "average population" for purposes of comparison, but we can find no mention of the magnitude of this incidence.—We are, etc.,

J. J. HANDLER.

D. G. WYATT.

Oxford.

Medical Aspects of Amateur Boxing

SIR,—We would like to answer some of the points raised by Dr. J. C. Laurie in his letter (*Journal*, January 22, p. 227) concerning medical aspects of amateur boxing. We cannot accept the pathological concept that concussion invariably produces oedema of the brain, and, while admitting that full recovery from a knock-out may not be instantaneous, we believe that lasting brain damage is unlikely to occur in amateur boxers if adequate medical supervision is enforced. In London a boy who is knocked out has to stay off boxing for at least a month, and all boys are examined before all contests. A bout is stopped immediately a contestant receives a cut, whereas in professional boxing the bout may be allowed to continue. A solar plexus blow does not cause unconsciousness, but a transient muscular weakness of the legs is produced and the boxer rapidly recovers, with no after-effects. We made no reference to it in our article (*Journal*, December 25, 1954, p. 1524), because it has never been a serious medical aspect of amateur boxing and is not related to the problem of head injury.

We are amazed at the conditions described by Dr. Laurie under which amateur boxing is alleged to be conducted in Scotland. If these facts are true, the sport must be in a very primitive state. We are also surprised that Dr. Laurie, who is shocked by the lack of medical control, continues to act as medical officer, thus condoning a state of affairs of which he justifiably disapproves. We can only suggest that the Scottish Amateur Boxing Association should be given the opportunity to refute these allegations.—We are, etc.,

London, W.1.

London, W.12.

J. L. BLONSTEIN.

EDWIN CLARKE.

Trichomonal Vaginitis

SIR,—We are grateful to Mr. Aleck Bourne for his letter (*Journal*, January 22, p. 226) drawing attention once again to the difficulties of treating and curing trichomonal vaginitis. We agree with many of his observations, but were particularly interested in his remarks about placing pessaries in the vaginal fornices under direct vision through a speculum. We have treated a few cases of trichomonal vaginitis by filling the vagina with a liquid preparation of amido-nitrothiazole. The patient was placed in the lithotomy position and the vaginal walls were stretched with a bivalved Cusco speculum. The fluid was injected with a Ritchie's bladder syringe and was retained in the vagina for twenty minutes. The fluid was then removed and a paste containing amido-nitrothiazole liberally applied to the vaginal walls, care being taken to see that the fornices were well filled. A plug of cotton wool was then inserted into the vagina and the patient was sent home and reported the following day for examination. It was hoped that such treatment would be effective without the necessity of relying upon the patient to insert pessaries herself. Unfortunately all five patients so treated relapsed, or were perhaps reinfected, shortly afterwards. Details of this work will be published soon in a forthcoming number of the *British Journal of Venereal Diseases*.

Our primary object in describing our work (*Journal*, January 8, p. 78) with amido-nitrothiazole was not merely to add yet another trichomonocidal drug to the large list already available, but to introduce a substance which was found to be almost as effective as acetarsol, but which was a non-arsenical and did not carry the risk of arsenical sensitization. We have found that in the long-term treatment of resistant cases or chronic relapsing cases it is useful to have an alternative drug available. Perhaps the most important conclusion to be drawn from our results and Mr. Bourne's comments upon them, as well as from most other recent work, is that the problem has been much neglected and requires more investigation if this widespread and distressing condition is to be controlled.—We are, etc.,

R. D. CATTERALL.

MARY WILLIAMSON.

London, E.1.

Tuberculous Patients in General Hospitals

SIR,—Any prospective entrant to the nursing profession who has read or heard of the recent correspondence in the *Journal* on the vexed question of tuberculous patients in general hospitals would, in my opinion, be stout-hearted indeed if her prospective entry became fact. Against this, might I submit that an intelligent girl presented with a factual and up-to-date account of tuberculosis nursing might not forgo a nursing career simply because a part of her training period was to be spent in a tuberculosis hospital, and later—who knows—she might even voluntarily join the staff of a chest hospital.

It has been well said that one of the places where one is least likely to contract tuberculosis is in a chest hospital—and this was said at a time when the incidence of "human wrecks" in tuberculosis wards was far higher than to-day. Evidence from Papworth Settlement substantiates this. The "overall infectivity" of a tuberculosis unit in a chemotherapeutic age is surely well-nigh negligible, when compared with bygone days. Even Dr. J. F. Brailsford's "unbiased layman" (*Journal*, January 15, p. 164) would probably agree with this—if he knew the facts.

The dread of tuberculosis was once well founded. But can it be that an almost superstitious fear is still infiltrating professional and lay ranks alike? Constant contemplation of the fearful in many instances promotes a *laissez faire* attitude. One is reminded of the dog on the thistle, in considerable pain but too lazy to get off. Let us have a forceful, up-to-date, and factual propaganda with regard to tuberculosis nursing, and even the fondest parent—so often the chief barrier to the prospective student nurse—would see things far less through a glass darkly. There would then perhaps be no need even to consider Dr. Brailsford's possible solution of more and more domiciliary treatment of tuberculosis, which bristles with pitfalls and difficulties, some of which, in many instances, can be quite insuperable.—I am, etc.,

Stornoway.

EWEN A. CAMERON.

SIR,—The case for and against the use of wards in general hospitals for the treatment of patients with pulmonary tuberculosis has been argued for some weeks now since you published Dr. A. B. Cowan's letter (*Journal*, November 20, 1954, p. 1227). Such a scheme may be an innovation for Glasgow; it is certainly not so for London.

But is this controversy wholly necessary? The Royal National Hospital for Diseases of the Chest, founded, equipped, and staffed for the treatment of tuberculosis by all methods, ancient and modern, medical and surgical, has been unable to find patients to fill all its beds since June, 1954; and for several weeks now has had no fewer than 70 beds unoccupied—more than a quarter of its total. (This is in no way due to shortage of staff. Only once in our history has part of one ward been closed for lack of nurses; and, *pace* Dr. J. F. Brailsford (*Journal*, January 15, p. 164), there has more than once since the war been a waiting-list for our nursing staff.) Such a situation is certainly frustrating for the staff and presumably uneconomic for the service. No doubt it will be remedied when the necessary committees have had time to give it the necessary consideration, and one may hope that one step will be the liberation of some of the wards in general hospitals in London, which are so badly needed for other purposes. I do not refer to the wards of which Dr. P. Stradling (*Journal*, December 18, 1954, p. 1483) writes—one cannot but agree with him that continuity of treatment is an overriding advantage—but there are others where the chest physician does not attend his patients; indeed, until recently it was no uncommon thing for a patient to have been in three, and even four, different London hospitals before reaching here.

Meanwhile the Regional Board has, happily, permitted the hospital to accept patients from all parts of the country, as it always had the honour of doing before July, 1948. It is very much hoped that use will be made of this opportunity. One realizes that many would not wish to come from, say, the north or

the midlands to the far south. But there will always be some who are glad to do so; others who may actually benefit by being at a distance from their daily troubles; and yet others who will gladly submit to the inconveniences in order to save delay. It would be a great pity if administrative difficulties were put in the way of patients (or their physicians) willing to go to a distance for their treatment. Transport is truly expensive; but less so than the undebited cost of needless prolongation of treatment.

It is not suggested that these 70 beds are the answer by themselves to our problems. But they can help and surely should be allowed to do so. One solution to present difficulties is to see that we have a national and not a regional health service.—I am, etc.,

Ventnor, J. of W.

E. F. LAIDLAW.

Treatment Abroad of Tuberculous Children

SIR,—A recent news item in a national daily paper¹ draws attention to treatment in Denmark of children "from industrial towns in all parts of Britain where the hospitals are overcrowded." It would be interesting to know which of our towns are concerned and why in any event treatment has to be sought outside the country. My own hospital treats tuberculous children from all over London and the home counties. We have no waiting-list and no overcrowding. On the contrary, at the present time there are many empty staffed beds waiting for patients.—I am, etc.,

Brentwood, Essex.

F. J. BENTLEY.

REFERENCE

¹ *News Chronicle*, January 20, 1955.

Fluoridation of Water Supplies

SIR,—Much has been written on the value of fluorine in the prevention of dental caries. A certain amount has also been written on the role of fluorine in the causation of dental caries. In *Hygiene*,¹ under "Dental Fluorosis": "This dystrophy of the teeth of children begins with a dark mottling of the enamel which may go on to permanent blackening or even disintegration of the dental substance... the active agent of the mischief is fluorine... one part per million of the element enables a water to start the process of destruction, which, it should be noted, is almost exclusively limited to the permanent teeth." Dr. Eugene Payne, in "Islands of Immunity,"² writes: "In some countries a number of communities are artificially fluorinating their water supplies to prevent tooth decay. In Brazil, in areas where fluorine in the water is absent, I found communities with sensationally good teeth. The incidence was lower than any reported in the fluorine-using towns. We need to investigate the reason why."

In small amounts fluorine appears to cause calcium fixation and in larger amounts calcium deprivation. Chronic fluorism may thus present as osteosclerosis, osteomalacia, and calcification of ligamentous attachments, whilst acute excess may be manifested by persistent cough, dyspnoea, sickness, constipation or obstipation, effects reminiscent of the other 'flu'. In its affinity for calcium its action recalls that of lead, and it is of interest that both substances are again associated in the production of high octane aviation fuel as hydrogen fluoride and lead tetra-ethyl. In addition to its violent chemical affinities, fluorine is highly reactive to electro-magnetic radiations, a property employed, for example, in x-radiography, television, and atomic physics. One is fascinated by the prospect of "selected" communities subsequently exhibiting fluorescence under the influence of atomic radiation. Seriously, however, it does seem a matter calling for further trials on a more limited scale, and in the meantime those of us who exhibit dental caries may find consolation in the knowledge that dental excellence is pre-eminently the attribute of the negro and the American.—I am, etc.,

Uffculme, Devon.

F. MURRAY.

REFERENCES

¹ Currie, J. R., and Mearns, A. G. (1948). *Hygiene*. Edinburgh.
² *Reader's Digest*, December, 1953.

Differential Diagnosis of Coma

SIR,—It is with regret that I must point out an omission in the otherwise excellent article by Dr. M. J. Parsonage (*Journal*, January 22, p. 217). In discussing the differential diagnosis of coma no reference is made to the possibility of this being caused by cerebral malaria. The omission emphasizes the fact that this form of malaria is commonly overlooked, and this probably in part results from defects in the teaching of medical students. In many schools students are not made sufficiently aware of the emergencies which, even in this country, may result from tropical illness.

In these days of increasing air travel it is possible for many varieties of exogenous disease to be contracted abroad but not to become manifest until the patient has returned to a temperate region and, in spite of being advised to do so, patients or their relatives when reporting illness to a doctor commonly do not tell him when they have recently been abroad. The previous movements of the patient should be ascertained by the doctor as a routine in every case in which they are not known, and when the patient has been to the Tropics the possibility of tropical illness should be considered whenever the diagnosis is in doubt.—I am, etc.,

London, N.W.1.

A. W. WOODRUFF.

SIR,—In the refresher course on the differential diagnosis of coma (*Journal*, January 22, p. 217) I was horrified to see that there was no mention of malaria.

In malarious countries, where many thousands of your readers reside, this omission will only have the effect of lowering the prestige of your excellent *Journal*, since nearly all the readers will know that the first thing one thinks about when a comatose child (especially) is brought into the dispensary is malaria, and that when this has been satisfactorily excluded it will be time to embark on Dr. Parsonage's "orderly approach."

However, in Great Britain the effect of this omission may be much more serious. In these days of easy and rapid air travel it is by no means uncommon for the first clinical evidence of malaria to appear in this country. For example, schoolchildren often spend part of their holidays with their parents in the Tropics. Not all are given prophylactic antimalarials, and, even if they were, there are certain strains of *Plasmodium falciparum* that are resistant to some of the newer antimalarials; one of these children might well develop an attack of cerebral malaria at school. In his "orderly approach" Dr. Parsonage would be well advised to include an inquiry as to the recent movements of the patient, since there is no medical emergency in which treatment is so dramatically rewarding as it may be in cerebral malaria.—I am, etc.,

London, W.1.

L. EVERARD NAPIER.

The Princess Louise Children's Hospital

SIR,—The Goodenough Committee recommended¹ that a teaching hospital should provide for paediatric teaching not more than 10% of its beds; because in the St. Mary's Hospital group the children's beds amount to 19.2%, its board of governors are considering achieving a reduction to 10% by converting to adult use the Princess Louise Children's Hospital, a small hospital which has served the children of the Royal Borough of Kensington and its neighbours since 1840.

There are at present 9,690 beds for undergraduate teaching in London, of which 9.3% (909) are beds for children. If the St. Mary's group has 19.2% of its beds devoted to children, then it is clear that some other teaching groups have much less than the 10% recommended by the Goodenough Committee: so that although the conversion of this small hospital to adult use will benefit St. Mary's to the extent of relieving its board of governors of an arithmetical problem, it will benefit no one else, and the recommendations of the Goodenough Committee in this matter as they

relate to the London teaching hospitals as a whole will be further from attainment than ever before.

The "Co-ordinating Committee" responsible for making this recommendation seeks to show that the waiting-lists of the children's department of St. Mary's Hospital reflect a fall in demand for children's beds throughout the country, and it presents figures—not fully quoted in your note (*Journal*, January 29, p. 299)—to support this view. If we examine these figures, we find that they do not in fact do so. The Committee says that the children's waiting-list has fallen from 539 in 1952 to 235 at the present time, of which 159 are ear, nose, and throat cases. What it does not disclose is that in 1952 the proportion of ear, nose, and throat cases was 435, so that the fall in the numbers on the general medical and surgical waiting-lists has been from 104 to 76, a reduction which few will regard as being significant of the trend it is sought to demonstrate. In fact, the reduction of the numbers on the children's waiting-lists reflects not a reduction in demand for the services of the hospital, but the results of a drive on the part of the staff of the ear, nose, and throat departments to reduce the tonsil and adenoid lists.

It is right that the governors of St. Mary's Hospital should show due concern over the training of their students, but it is a little unfortunate that this should seem to overshadow their concern for the welfare of their patients in this thickly populated and rather inaccessible part of London. In the statement they have issued this latter aspect of the question receives no practical consideration at all.—I am, etc.,

London, W.10.

JOHN BATE.

REFERENCE

¹ *Report of the Interdepartmental Committee on Medical Schools, 1944*. H.M.S.O., London.

Unwrapping the "Journal"

SIR,—A year ago you published a discussion on the wrapping of the *Journal*. May I, as the initiator of the correspondence (*Journal*, December 12, 1953, p. 1326) and after controlled observation and experiment, pay a tribute to the efficacy of the method advocated by Dr. G. M. Grant, of Dundee (*Journal*, December 26, 1953, p. 1432)? That is, gripping the wrapped *Journal* in the supinated left hand, so creating a trough; inserting a finger of the right hand into the trough and pushing it along. Your part in ensuring the success of this simple procedure is to see that the journal is loosely and *not tightly* rolled before postage.—I am, etc.,

Cross-in-Hand, Sussex.

H. LYNDBURST DUKE.

POINTS FROM LETTERS

Crying in Infants and Children

Dr. E. BARNES (Manchester) writes: I once was called to a perfectly good baby of 3 months. The mother complained that when she laid him down he cried; on picking him up, he cried happily. After four or five of these trials, she sent for me. I asked her to strip him, and I found in his singlet a short bristle of a tooth-brush perpendicular to the material. Removal put matters right.

Disk Lesions and Low Backache

Dr. A. LASK (London, W.13) writes: Mr. John Charnley's stimulating letter (*Journal*, January 15, p. 163) should provoke much comment. . . . I refer, of course, to his therapy of reassurance. The emotionally charged tone of his letter, obviously sincere, suggests that Mr. Charnley just does not see these patients as sick human beings (psychoneurotics) at all, but only as sound non-pathological spinal columns with bodies attached. He does not seem to recognize that there is a real problem here. What is the process by which an individual with no organic lesion comes to suffer so much discomfort or dis-ease that he continues to appeal for help in relief of his pain? What is the best method of helping these neurotics? The psychotherapist should offer the soundest opinion here. The orthopaedic surgeon has no special authority, and no justification for acting as the "final court of appeal." Let him refer these patients to the right quarter.

Obituary

J. HARDIE NEIL, C.B.E., D.S.O., F.R.A.C.S., F.A.C.S.

Mr. J. Hardie Neil, consulting aural surgeon to Auckland Hospital, New Zealand, died at Auckland on January 28 at the age of 79.

James Hardie Neil was born at Dunedin, New Zealand, on February 27, 1875. From Otago Boys High School he entered Otago University as a medical student, and, after graduating M.B., Ch.B. in 1898, held the appointment of resident surgeon at Auckland Hospital. Soon afterwards he went as a surgeon captain with the 4th New Zealand Mounted Rifles to serve in the South African War in 1900-1, being awarded the Queen's medal with four clasps. After the war he came to England and took the London Conjoint Diploma in 1902.

Returning to New Zealand, Hardie Neil was appointed ear, nose, and throat surgeon to Auckland Hospital in 1903, and he held the post for the long period of 45 years until 1948, when he was appointed consulting surgeon. For many years he was also aural surgeon to the Mater Hospital at Auckland. During the first world war he served as a lieutenant-colonel in the New Zealand Medical Corps, and was in command of No. 3 Field Ambulance with the New Zealand Rifle Brigade from 1915 to 1918. For his services he was awarded the D.S.O. and the Belgian Croix de Guerre in 1918, and was three times mentioned in dispatches. From 1924 to 1929 he was A.D.M.S. of the New Zealand Northern Command. During the last war he was deputy director of Auckland medical boards from 1940 to 1946. In 1947 he was appointed C.B.E.

A member of the British Medical Association since 1899, he was chairman of the Auckland Division in 1923-4. In 1921 he was elected the first president of the newly formed Auckland Clinical Society. He was also president of the otolaryngological section of the New Zealand Medical Conference in 1924 and of the Pan-Pacific Surgical Association in 1939. His presidency of the New Zealand League for the Hard of Hearing was no titular office, for he conducted an energetic campaign against unscrupulous salesmen and misleading advertisements of commercial hearing-aids, always with the aim of alleviating the distress of the afflicted. In recent years he had devoted much time and thought to the nomenclature of the anatomy of the bronchial tree, a subject neglected until just before the second world war. With Drs. W. Gilmour and F. J. Gwynne, Hardie Neil was the author of an authoritative article printed in this *Journal* in 1939. This paper, the result of long and painstaking work, was followed by another presenting in greater detail the results of their study. The second communication was read before the Auckland Clinical Society in 1945 and was printed in the *New Zealand Medical Journal* in the following year. He also wrote, jointly with Dr. Gilmour, an article on broncho-pulmonary segments of the lung and their terminology, which was published in the *British Medical Journal* in 1949. Other writings from his pen included a small book on *Field Ambulance Organization and Administration*, published in 1918, and *Ear, Nose, and Throat Nursing*, which ran to several editions.

Hardie Neil was elected a Foundation Fellow of the Royal Australasian College of Surgeons in 1927. He

was also a Fellow of the American College of Surgeons. He married Miss Mary E. Coates in 1904 and had two sons and four daughters.

Sir FRANCIS TREHERNE, K.C.M.G., F.R.C.S.Ed.

Major-General Sir Francis Treherne, one of the oldest members of the Army Medical Service, died at his home at Woodbridge, Suffolk, on January 30.

Francis Harper Treherne was born in 1858, the son of an audit clerk at Somerset House. He was educated at Godolphin School and received his medical training at St. Bartholomew's Hospital, qualifying in medicine in 1881. Three years later he took the F.R.C.S.Ed. and in 1887 the D.P.H. of Cambridge. He immediately adopted the Army as a career. In 1884 he was serving with the Egyptian Expeditionary Force and in the following year in the Sudan Expedition. In each case his services were recognized by mention in dispatches and by decorations. The year 1893 saw him in India, now a major in what, a few years later, became the R.A.M.C., and for five years he was surgeon to the Commander-in-Chief.

Then came the South African War, during the whole of which he served with the British forces and won campaign medals and further mention in dispatches. Later on, in 1908, he saw service on the North-west Frontier of India. In 1912 he was honorary surgeon to the Viceroy (Lord Hardinge of Penshurst), and for three years Assistant Director of Medical Services in India. When the first world war broke out in 1914 he was Deputy Director of Medical Services of the Indian Corps which formed part of the British Expeditionary Force, and during the later years of the war he served as Director of Medical Services of the Third Army. His services in France in 1914-16 received mention three times in dispatches, and afterwards he was sent to Mesopotamia and was in the actions at Kut and Djalal and at the capture of Bagdad. Later he was Deputy Director of Medical Services in the London District and inspector of hospitals in the Southern Command. His last period of service was as Inspector of Medical Services, stationed at the War Office. Appointed C.M.G. in 1915 and K.C.M.G. in 1917, he retired in 1919 with the rank of major-general and went to live at Woodbridge, in Suffolk. He married twice. One of his sons by his first marriage, Captain Claude Treherne, R.A.M.C., died of wounds in the first world war.

G. PRATT YULE, M.D., F.R.C.P.Ed.

Dr. G. Pratt Yule, formerly medical officer of health for Fife County, died in the Adamson Cottage Hospital, Cupar, on January 6. He was 81 years of age.

George Pratt Yule was born on July 30, 1873, and was educated at George Watson's College and at Edinburgh University, where he graduated M.B., C.M. in 1894. Two years later he obtained the B.Sc. in public health and in 1899 proceeded to the M.D. He became a Member of the Royal College of Physicians of Edinburgh in 1900 and was elected a Fellow in 1905.

After graduation he worked in the pathological laboratories at Larbert Institution and later at the Crichton Royal Institution, Dumfries. He was then appointed assistant to Dr. (later Sir) Leslie Mackenzie, medical officer of health, Leith. Subsequently he became resident medical officer at the Edinburgh City Fever Hospital and still later went to the Corporation Fever Hospital, Manchester. In 1900 he volunteered for service in

the South African War and was appointed second in command of the Edinburgh and East of Scotland Hospital, stationed at Norval's Point, on the Orange River. He was given this post because of his specialized knowledge of fevers, particularly typhoid fever, since typhoid fever was at that time rife among the troops. Dr. Pratt Yule remained in Africa to work in a military hospital at Bloemfontein until he was appointed health officer for the area. After a brief return to this country he was recalled by Lord Milner to serve as principal medical officer for the Orange River Colony, a post which he held until he left South Africa in 1912. The position he held was a responsible one and he carried out his duties with vigour and foresight. He assisted in the introduction of legislation covering a wide field of public health practice and medical service and thereby established for the first time in the State an organized medical service.

In 1912, soon after his return to Britain, he was appointed medical officer of health for Fife, a position he held until his retirement in 1938. He became an examiner in public health in Edinburgh University, and in Fife played a big part in the intensive work of reorganization which followed the introduction of the Local Government (Scotland) Act, 1929. He was successful in bringing into being a unified maternal, child health, and school health service. The first health visitor was appointed in Fife in 1909, and Dr. Pratt Yule, throughout his whole period of office, fostered and expanded this form of domiciliary service. He was instrumental in securing the erection of Glenlomond Sanatorium. The foresight and determination with which he utilized the increased powers devolving upon local authorities for the promotion of the public health resulted in his laying the solid foundation on which the health services of Fife stand to-day.

Dr. Pratt Yule is survived by a widow, a son, Dr. Alastair Pratt Yule, who is in practice in Cumberland, and two daughters, one of whom, Mrs. Lawrence, was appointed professor of psychology in the University of Natal in 1953.

ROBERT GRIEVE, M.D., F.R.C.S.Ed.

Mr. Robert Grieve, honorary consultant surgeon to the Hull Royal Infirmary and the Victoria Hospital for Sick Children, Hull, died suddenly at his home at Hull on December 30, 1954. He was 83 years of age and had been in active practice over a period of sixty years.

Born in London on November 22, 1871, the son of Dr. Robert Grieve, who at one time was Surgeon-General of British Guiana, Robert Grieve, junior, came of a family of Scottish lowlanders with a long medical tradition. He received his early education at Bedford, later studying medicine at Edinburgh University and graduating M.B., C.M. in 1894. Three years later he proceeded to the M.D., with commendation, and in 1900 he was elected F.R.C.S.Ed. In the same year, after having held several appointments, he became honorary assistant surgeon to the Hull Royal Infirmary. In 1918 he was elected full surgeon, a post which he held until reaching the age of retirement in 1932. During his years on the full staff he became senior surgeon, chairman of the medical committee, and a member of the board of management. On retiring from the infirmary staff he continued to serve as honorary surgeon at the Victoria Hospital for Sick Children until the inception of the National Health Service in 1948. During the second world war, although then well on in years, he never

failed to respond to the many calls on his services for the treatment of air-raid casualties and other emergencies.

Throughout a busy surgical life Robert Grieve remained in general practice, the last of a generation of general-practitioner surgeons who rendered such outstanding service to voluntary hospitals in the locality. On relinquishing surgical work he continued in his general practice and was visiting patients on the day he died. A member of the British Medical Association for 57 years, he was chairman of the East Yorkshire Division in 1928-9. He was also a member and a past-president of the Hull Medical Society, and only recently he had been elected an honorary member of the society as a mark of the affection and esteem in which he was held by his colleagues. Robert Grieve was a man of quiet and kindly disposition, which endeared him to all. He had a pawky sense of humour and a fund of medical anecdotes. A skilful and versatile surgeon, he devoted his whole life to his profession, earning the gratitude of his colleagues and countless patients. As befitted his character, he enjoyed the quieter pursuits, reading, his garden, and the company of his friends. He was a bachelor, and is survived by a brother and two sisters, to whom our sympathy is extended.—J. N. Y.

Sir EDWARD MELLANBY, G.B.E., K.C.B. M.D., F.R.C.P., F.R.S.

The obituary notice of Sir Edward Mellanby was published in last week's *Journal*. We have since received the following appreciations.

Sir ARTHUR MACNALLY writes: Edward Mellanby and I were friends for many years. When I became Chief Medical Officer of the Ministry of Health in 1935, one of my chief aims was to bring the work of the Medical Research Council into closer relation with that of the Ministry. Mellanby supported me in this endeavour. He became a member of the Minister's Medical Advisory Committee, and he and I met at least once a week to discuss problems of medical research and their practical application. He and Sir John Ledingham helped me to get diphtheria immunization more generally applied; this work has reaped a golden harvest in combating a disease so fatal to child life and especially to the schoolchild.

In the early years of the second world war we planned the Emergency Public Health Laboratory Service together, for which the Medical Research Council took practical responsibility. Its value in aiding national health during the war and subsequently cannot be overestimated. When I left Whitehall to become editor-in-chief of the official medical history of the war, Mellanby joined our editorial board, and by his nomination of Dr. F. H. K. Green and Sir Gordon Covell enabled the war work of the Medical Research Council to be adequately recorded in a volume of the *History*.

These were our official relations, but they were facilitated and made pleasant by our friendship. Sometimes we disagreed on a particular policy, but we always agreed to differ. He was ever young in mind and body. Through his endeavours in peace and war he lived to see the work of the Medical Research Council greatly extended on the foundations so ably laid by Sir Walter Fletcher. Mellanby's own work on rickets has blessed mankind. He was fortunate in his life and work, and not least in the collaboration of his distinguished wife, Lady Mellanby, to whom our sympathy goes out to-day.

Professor A. E. BARNES writes: When Mellanby became the first professor of pharmacology at Sheffield an attempt had been made to arrange facilities for him for clinical work in his own beds as a physician at the Royal Infirmary as well as laboratory work in the pharmacological department at the University. In a few months he had succeeded

in adding the field laboratory at Lodge Moor, where very careful nutritional work was done on dogs. It was a tremendous job, but he and his wife worked for all they were worth and did their famous researches on rickets, including May Mellanby's work on the nutritional problems of dentition. Although it was not until many years afterwards, I think it is true that it was there that they first met with the toxic results of agene. The final incrimination of agene as the active factor in the causation of canine hysteria was a masterpiece of criminal detection aided by their scrupulous experimental methods. His conclusions were attacked with zeal by able and well-equipped workers, only to elicit confirmation just as had been the case years before when he announced the presence of an anti-calcification factor in oatmeal.

As a teacher Mellanby was superb. He aroused the enthusiasm of his students and of his colleagues. The general practitioners of Sheffield were enlisted in the enthusiasm, and the panel committee gave a donation (from a voluntary levy) of about £2,000 to the department. He was interested in the metabolism of alcohol, especially in diabetics, at a time when the Allen pre-insulin methods were our only resort and every calorie counted. One patient who submitted himself to venepuncture in these experiments was also many months later his first insulin patient. Rarely has a physiologist had such an opportunity of repaying one of his human "guinea-pigs," for he won only by a very short head. As a member of the staff at the Royal Infirmary he was a general favourite with all ranks. He was most stimulating, not to say provoking, and one member a year or two after his departure to London said at lunch one day, "Are we not a dull crowd since Mellanby left?"

Some time ago he and Lady Mellanby went to a dinner at Sheffield held by the newly formed Medical Students' Association, and they had a great reception. In a letter he summed it up, "It was a jolly evening except for my speech." Of his work as secretary of the Medical Research Council others have written. After his retirement he again found more time for research and was very busy indeed. Tissue culture (in collaboration with Honor Fell) occupied a lot of his attention. In a recent letter he states: "Lately we have been using radioactive isotopes and making autoradiographs in the tissue culture experiments, and it has been most enlightening. These new techniques, including chromatography, have transformed the study of biological problems, and I am only sorry that I was born too soon to get my teeth into them." These were, however only a part of his activities during his "retirement." As he would have wished, he died at work, though not actually in the laboratory. On holiday he was a delightful big boy, always good company. His death ends not only a happy marriage but a long and useful partnership in the service of medical science. The heartfelt sympathy of innumerable friends will go out to Lady Mellanby.

Dr. M. N. GHOSH writes: I find no reference in your obituary notice of Sir Edward Mellanby to the significant part he played in establishing the Central Drug Research Institute at Lucknow—one of the 11 national laboratories that have been started in India since her independence. This Drug Research Institute, the primary function of which is to investigate the potentialities of the indigenous drugs of India, was formally opened in 1951 by Mr. Nehru, the prime minister, and Sir Edward Mellanby was its first director, from November, 1950, to February, 1951. During his stay in India at that time Sir Edward also presided over the eleventh session of the All-India Pharmaceutical Conference, which was held at Bangalore along with the Indian Science Congress.

C. H. HAMPSHIRE, C.M.G., M.B., Ph.C.

Dr. F. H. K. GREEN, Principal Medical Officer of the Medical Research Council, writes: I do not think that any of the obituary notices of Dr. Hampshire so far published have mentioned the important work he did during the second world war as secretary of the Medical Research Council's

Therapeutic Requirements Committee. This committee was appointed at the request of the Ministry of Health, and by arrangement with the Ministry of Agriculture and other Government departments, to advise the wartime controllers of the importation and manufacture of drugs as to which drugs were vitally necessary and must be supplied at all costs, and which were less important; it informed the medical and veterinary professions and those responsible for the formularies, indents, and quotas, as to which medicaments were scarce and must be used economically; and it dealt with the manifold and difficult problems which inevitably arise when restriction has to be practised and indicated where exceptions should be made to avoid hardship. For all these functions Dr. Hampshire's unique experience made him the ideal secretary of the committee, and he discharged the duties with tact and skill.

I personally shall always be grateful to Dr. Hampshire for the help he gave to me and to my colleague, Dr. F. Hawking, when we were editing the two editions of the Medical Research Council War Memorandum No. 10, *The Medical Use of Sulphonamides*. We frequently went to him for advice on points within his wide field of expert knowledge, and never in vain.

R. J. WILLAN, C.B.E., M.V.O., M.S., F.R.C.S.

R. A. writes: The passing of R. J. Willan is indeed a sad blow to the profession and a great sorrow to his friends and colleagues. I had the privilege of serving under him in the first world war and of knowing him more intimately since the last war. One remembers with affection and gratitude the care and the time he devoted to the guidance and the instruction of surgeon probationers. Professor Willan was a man admired alike for his great personal charm and for his distinguished professional career. He was at all times courteous and modest, yet ready and willing to advise from his superior and expert knowledge. Of upright principles, he was kindness itself, understanding and sympathetic, and would do all in his power—even when physically unfit—to help the sick. As a patient he was co-operative and courageous in his painful malady, and always grateful for anything one could do for him. Professor Willan will be sadly missed by all who knew him.

H. A. C. writes: I should like to pay my small tribute to the memory of Surgeon Rear-Admiral Willan. I first met him in 1945 when he used to visit the R.N. Hospital, Port Edgar, in his capacity as consulting surgeon to the Navy in Scotland. It was his custom to leave after lunch in his car to travel back to Newcastle; but one day he altered his routine and spent the night in the medical mess. I shall always remember that evening after dinner, how he entertained us all with his stories and kept us up to a late hour thoroughly enjoying ourselves. Although I have never seen him again since that night, I have always had a soft spot in my heart for him. He must indeed have been a very good messmate in his younger days while serving at sea in the R.N.V.R. during the first world war. I am sure that all R.N. medical officers who met him held him in high esteem and liked him, for he was indeed a very likeable man.

HENRI GOUGEROT, M.D.

Dr. Henri Gougerot, the eminent French dermatologist, died in Paris on January 15, aged 73. He was born at St. Ouen-sur-Seine on July 2, 1881, and after a medical education in Paris he qualified in 1908. Two years later he became professeur agrégé in the faculty of medicine and a hospital physician. He served in the French Army during the war of 1914-18, being awarded the Croix de Guerre. In 1928 he was appointed to the chair of clinical dermatology and syphilology at Paris University and became chief physician at the Hôpital St. Louis, posts which he held at the time of his death.

Gougerot made a number of important contributions to the literature of his subject; in 1909 he first described

hemisporosis and, with de Beurmann, gave the first complete account of sporotrichosis (de Beurmann-Gougerot disease) in 1912. He wrote also on sarcoidosis, lupus, cutaneous papillomatosis, and the prevention of venereal diseases, edited the *Archives dermato-syphigraphiques de la clinique de l'Hôpital Saint-Louis*, and was a co-editor with Darier, Sabouraud, and others of the *Nouvelle Pratique Dermatologique* (published in eight volumes in 1936). He was president of the Société de Dermatologie et Syphiligraphie in 1934, and an honorary president of the ninth international congress of dermatology and syphilology, Budapest, 1935. He also presided over a number of national organizations concerned with social hygiene.

JAMES WHILLIS, M.D., M.S., F.R.C.S.

T. P. K. writes: I crave space for a small tribute to Professor James Whillis (whose obituary was published in last week's *Journal*) from that group of consultants, registrars, and visitors who meet at Stoke Mandeville Hospital every Monday to discuss their problems of construction, reconstruction, and repair. James Whillis visited us once a month, and only illness or the pressing call of one of his other "extramural" activities was allowed to cause us the disappointment produced by a cancellation of the visit. Not everyone will know that Stoke Mandeville Hospital, Aylesbury, is roughly 40 miles north-west of London, and that Whillis lived at Seal, near Sevenoaks, some 30 miles south of the Metropolis. It was a measure of the value he placed on these visits that he was prepared to arrive at the hospital mid-morning and not leave to travel home by train via London until night, with the expectation of reaching home about midnight. These visits were to us a means of keeping us on the right lines anatomically and functionally, and to him a link with the clinical applications of his specialty, and, indeed, with clinical matters in general. Our apologies to his wife for this imposition were always considered unnecessary, because she knew how much her husband enjoyed these visits. He would watch operations until lunch and spend the whole afternoon in the clinic, where out-patients and in-patients were freely and fully discussed. To these discussions he always contributed much sage advice, and his presence was as invigorating as a breath of fresh air. If time allowed he would round off the session with a "lecturette" on some anatomical subject of our choice before we carried him off to dine with us in Aylesbury, hear one of those yarns he told so well, and reluctantly see him to his train.

Everyone who met Whillis was fascinated by his boyish (almost puckish) outlook; all who knew him developed for him a deeply affectionate regard. He had many friends and surely no enemies. We shall remember him as the man with the articulated finger bones in his pocket—always ready to demonstrate the disturbances of function so commonly seen in the burnt finger—and as that rare teacher who could make anatomy live and embryology understandable. We shall keep on remembering (and missing) him in a thousand and one ways, but most of all for his warm and loyal friendship.

The winter number of the *Army Medical Services Magazine*, published last month, includes a reproduction of a photograph of the funeral procession of the late Major (temporary Lieutenant-Colonel) W. R. W. WEST-WATSON, R.A.M.C., who lost his life in an aeroplane disaster in Alaska on February 5 last year, and was buried in the Kermit-Roosevelt cemetery in Alaska. His father was the late Dr. W. N. West-Watson, who died in 1949, and who was a tower of strength to the Bradford Division of the British Medical Association as its secretary for many years and later its chairman; he was also local general secretary of the Bradford Annual Meeting of the Association in 1924. William Ronald West West-Watson was born on April 6,

1914, and was educated at Aldenham School and at Leeds University, taking the London degrees of M.B., B.S. in 1938. After graduation he held the appointments of junior casualty officer at the General Infirmary at Leeds and house-surgeon at Bradford Royal Infirmary. In April, 1939, he received a commission as a lieutenant in the R.A.M.C. Reserve of Officers and was mobilized on the outbreak of the second world war a few months later. Promotion to captain followed in 1940, and four years later he became a Regular. During his career in the R.A.M.C. he served in Madagascar and with Paiforce, the Middle East Land Forces, the Central Mediterranean Force, and with the Army Medical Directorate as deputy assistant director-general. In 1944 he was appointed M.B.E. for gallant and distinguished services in Italy, and in the following year he was mentioned in dispatches. When he met his tragic death he was on his way to attend a United States Army exercise as medical liaison officer of the British Joint Service Liaison (Army Staff) at Washington. West-Watson was an efficient, experienced, and popular officer, and his early death is a great loss to the R.A.M.C. A memorial service was held in the chapel of Queen Alexandra Military Hospital on July 27, 1954. He is survived by a widow and two children.

Dr. G. E. TILSLEY, who died on November 11, 1954, at Sheffield, where he had been in practice since 1934, was for some years before that a medical missionary in the Belgian Congo. He was 59 years of age. George Edwin Tilsley, whose parents were Plymouth Brethren, was born on July 10, 1895, the eldest of the seven children. He began the study of medicine at Bristol University with little material support but with the firm conviction that God would provide for his needs. After the first year he supported himself and paid his way by coaching fellow students, dispensing for general practitioners, and demonstrating anatomy. He played hockey for his university and was in the team that beat Oxford before the first world war cut short his sporting career. After qualifying M.R.C.S., L.R.C.P. in 1918 he remained as casualty officer at Bristol Royal Infirmary until called up, when he was sent to Salonika. He became staff officer in hygiene to the Army of the Black Sea and so remained until demobilization, when he returned to Bristol University for a short time as lecturer in pathology. His mind, however, was already turning to the mission field, and he went to Luanza on Lake Mweru in the Belgian Congo, where he built a hospital and also one of the first leper colonies in the Congo. His nearest colleagues were at the Government Hospital at Elizabethville, some 350 miles away. At first the people were somewhat suspicious of "the new medicine," but later on, as the news of successful treatment spread, they came in increasing numbers, and it was no unusual thing for patients to travel for six weeks in order to have a consultation. To feed the patients he established a farm and employed fishermen and hunters. In the early days Dr. Tilsley suffered much from malaria. During his second furlough he obtained the D.T.M.&H. in 1930, but in 1933 he retired from the mission field and in the following year acquired a small practice at Sheffield. He steadily enlarged the practice—his aim being ever to treat the whole man and not just the immediate disease. The advice his patients sought on matters other than medicine was willingly given. His interests were many, and he contributed much to problems concerning the well-being of the people generally, particularly in regard to road safety. Both his two sons are now doctors and to them and to his widow and daughter the sympathy of his colleagues is extended.

The sudden death of Dr. D. C. DEVITT in a bathing accident at Hermanus, Natal, South Africa, on December 26, 1954, came as a shock to all who knew him. He was 48 years of age. Denys Christian de Wet (he changed his name to Devitt in 1933) was born at Cradock, Cape Province, the son of a well-known local medical practitioner, and came to England to enrol as a medical student at

St. Thomas's Hospital Medical School in 1927. After qualifying M.R.C.S., L.R.C.P. in 1932 he was in general practice at Eastcote, Middlesex, for some years, becoming also a medical officer to the Ruislip-Northwood Hospital, before deciding to specialize in anaesthesia. Later he became anaesthetist to Mount Vernon Hospital, an appointment he held for 10 years. He obtained the D.A. in 1942 and only last year he was elected a fellow of the Faculty of Anaesthetists. He served in the last war as a member of the R.A.F.V.R., attaining the rank of squadron leader, resigning his commission in 1948, the year after he returned to South Africa. In 1933 he married Christine Margaret, elder daughter of the late Dr. Charles Sampson.

We are indebted to Dr. J. C. NICHOLSON for the following appreciation: In South Africa, as senior full-time anaesthetist to the largest teaching hospital in the country—the Johannesburg Hospital—Denys Devitt played a prominent part in the development of modern anaesthesia. It was his work in that field which gained him the respect of all his colleagues; and his solid, practical approach to the most difficult problem was generally admired by all who were privileged to work with him. With his enthusiasm for progress he also displayed a shrewd conservatism, based on sound physiological principles, which was a sheet anchor to his pupils and enabled them, amid a maze of innovations, to sift the wheat from the chaff. His loss is irreplaceable, for he belonged to that rapidly disappearing group of men who are able to combine the breadth of vision and human understanding of a first-class general practitioner with the skill and judgment of the specialist. Those who were privileged to know him more intimately knew him as a kind and generous friend and as a devoted husband and father.

Dr. H. J. S. MORTON, who for the last few years had been living in retirement at Brinkley, near Newmarket, died in London on January 3 after a long illness. He was in his 70th year. Harold James Storrs Morton was born at Sheffield on January 31, 1886, the second son of the Rev. C. J. F. Morton, and was educated at Uppingham, Pembroke College, Cambridge, and the London Hospital. After gaining a second class in the Natural Sciences Tripos, he qualified by taking the conjoint diploma in 1912, graduated M.B., B.Chir. in 1916, and proceeded to his M.D. in 1919. After qualification he held a series of house appointments at the London Hospital until the outbreak of the first world war in 1914, when he took a commission in the R.A.M.C.(S.R.) and served in France till 1918. After a period as assistant medical officer at King Edward VII Sanatorium, Midhurst, he joined a practice at Bridlington, and remained there till 1935, when he moved to the St. John's Wood area of London. He retired from practice in 1947 and went to live in Brinkley, but continued to sit on medical boards till ill-health finally forced him to give up work altogether. Morton was an old international Rugby forward, having played for England in 1909 and 1910 and for Cambridge in 1908.

C. J. G. T. writes: I had the privilege of knowing Harold Morton intimately, as a fellow houseman at the London and later as a partner in practice for twelve years. Morton was a big man in every way, a typical Rucker forward in appearance, but in manner no one could have been more gentle. Quiet of voice, showing the utmost consideration for the feelings of others, self-effacing in company, the whole man rather belied his great and well-earned reputation on the football field, and this probably helped to give him the name "Tiny," by which he was known among his student friends. He possessed a droll sense of humour which delighted his associates. Morton was a very able and most conscientious doctor, who never spared himself when the interests of his patients demanded his services. He was a first-rate physician and a very capable anaesthetist. It is no exaggeration to say that he was universally beloved by his patients, and he had a perfectly wonderful way with old ladies, who simply adored him. He had no use whatever for the National Health Service Act, and gave up practice

rather than have anything to do with it. He was a man of very high ideals, who was incapable of anything underhand, and he won the respect of all with whom he came in contact. Morton had to suffer grievous misfortune and disappointments, but never allowed these to sour him. He lost his first wife with tragic suddenness while she was bathing, and he was called to the beach not knowing that she was the victim. To a man of his temperament this was even a bigger blow than it would have been to many others, especially at a time when his three sons were at the difficult age when a mother can do so much for them. It was a comfort to his friends to know that his second marriage was such a happy one. We offer our profound sympathy to his widow and three sons.

The distress caused to his family and friends by the death on January 4 at St. Andrews of Dr. J. A. MACDONALD-SMITH was deepened 18 days later by the death of his widow, Dr. Elizabeth G. Macdonald-Smith, on January 22. Born on May 21, 1872, at Belfast, the son of John Smith, plumber, of Aberdeen, and Jane Smith, of Carrickfergus, John Alfred Smith was the eldest of a family of 13 and left school at the age of 14 to work in the Post Office, where he eventually became an expert telegraphist. His heart was set on becoming a medical missionary, and at first he attended night classes and later worked at night in the telegraph office so that he could attend lectures in the morning at Queen's University, where he began his medical education. In 1896 he went to Edinburgh to continue his training, helped by the Edinburgh Medical Missionary Society, and graduated M.B., Ch.B. in 1900. In the same year he went to India to establish a medical mission station at Rajshahi, Eastern Bengal, for the Presbyterian Church of England, and, overcoming many difficulties, financial and climatic he built a hospital and a mission bungalow at Naogaon. In 1901 he married Elizabeth Greer, the youngest daughter of the Rev. K. S. Macdonald, of Duff College, Calcutta. She had been a fellow student at Edinburgh University and graduated M.B., Ch.B. with distinction a year before him. During his first furlough, while doing deputation work for the Church's foreign missions, he found time to continue his postgraduate studies and took the F.R.C.S.Ed. in 1909 before returning to India. There was an interlude in his missionary service from 1914 to 1921, when he was in general practice at Nottingham. During part of this time he was also attached to one of the military hospitals in the district. When the educational future of his family was secure, Dr. Macdonald-Smith sailed for India again, this time to serve the Church of Scotland at Kalimpong, North Bengal where he had to learn a new language and cope with new problems. He also found a new cause to fight for—the treatment and control of leprosy. In addition to his work at the Charteris Hospital he established, not without early opposition, a leper hospital and supervised its building on the hillside overlooking the Teesta valley with a magnificent view on all sides. Its reputation was quickly made and patients came, sometimes long distances, from the surrounding states of Nepal, Bhutan, and Tibet. A church was also built at the tip of the spur and is a landmark for miles on either side, a lasting memorial to his perseverance and devoted service. On his retirement in 1939 he could not immediately return to this country on account of the war, so his offer of help in South India was gratefully received to enable other missionaries to take overdue holidays. He continued working, first in Chingleput and then in Sholinghur (for the Australian Presbyterian Church) until 1944, when, with his wife, he travelled home for the last time. Their retirement was spent in the home his father had made in Bangor, Co. Down, but towards the end they had been staying with their daughter at St. Andrews. Dr. Macdonald-Smith's long life was one of dedication to the overseas work of the Church in the field of medicine. Difficulties and disappointments were many, but he met and overcame them with courage, determination, and prayer. He was a man of high principles and inflexible purpose.

softened by a saving sense of humour. His wise counsels and his example will be sadly missed by many friends all over the world. His son, Dr. K. S. Macdonald-Smith, is in practice at Nottingham.

Dr. ELIZABETH G. MACDONALD-SMITH, who had been in failing health for a long time, did not long survive her husband, Dr. J. A. Macdonald-Smith, whose obituary is printed above, for she died on January 22 in her 79th year. Born at Calcutta on June 17, 1876, the youngest daughter of the Rev. and Mrs. K. S. Macdonald, Free Church of Scotland missionaries, Elizabeth Greer Macdonald had a distinguished career at Edinburgh University and graduated M.B., Ch.B. in 1899, soon after the degree in medicine had become available to women students. She preceded her husband to the mission field, and after their marriage in 1901 she was his constant helpmate in all his medical missionary work throughout their long life together. She will be remembered also in Nottingham, where, after her husband's return to India in 1921, she remained with her children for five years and was an assistant school medical officer in the city. Those who mourn the passing of Dr. and Mrs. Macdonald-Smith will remember with gratitude their useful life of service together, and will be glad that in their death they were not divided.

Dr. WILLIAM ARNOLD, who was in practice for many years at Waltham-on-the-Wolds, near Melton Mowbray, died on January 3 in his 92nd year. William Arnold was born on May 13, 1863, and was educated at Trent College and Owens College, Manchester, qualifying in 1885 by taking both the M.R.C.S. and L.S.A. diplomas. He then held the appointment of junior house-surgeon at Ancoats Hospital, Manchester, before entering general practice at Blisworth, Northamptonshire, where he also performed the duties of medical officer to the Blisworth district of the Towcester Union. From Blisworth he moved first to Great Milton, in Oxfordshire, where he became medical officer to the Great and Little Milton districts of the Thame Union, and then to Crawley, in Sussex. About 1897 he settled in practice at Waltham-on-the-Wolds, becoming medical officer and public vaccinator for the district and medical officer to the Melton Mowbray Medical Club. In a very short time all who knew him in the hunting districts of Leicestershire came to revere and love him. He retired in 1933 at the age of 70, and, after a visit to his only son in Kenya, settled at Stratford-on-Avon to be near his married daughters. He found retirement very tedious, however, and in a few months' time was acting as locum tenens for friends, later buying another practice at Four Marks, in Hampshire, where he worked until the death of his wife in 1942. He then returned to Stratford-on-Avon to live with his youngest daughter.

Mr. ARNOLD LEEMING, who died at Bristol on January 9, was well known as a general surgeon both at Sudbury, Suffolk, and at Cheltenham. Born at Halifax, Yorkshire, in 1881, the son of an architect, Arnold Leeming was educated at the City of London School and at University College, London, before becoming a medical student at Guy's Hospital. There he was fellow dresser, under Mr. W. H. A. Jacobson, with the late Mr. E. C. Hughes, and he was house-surgeon to Mr. C. H. Golding-Bird just before the latter's retirement, Hughes being house-surgeon to Mr. (later Sir) Arbuthnot Lane at the same time. Leeming and Hughes remained warm friends for many years. After graduating M.B., B.S., with honours, in 1904, and holding a house-surgeoncy, he went to Sudbury as a locum tenens, but decided to stay there, and was for some years in partnership with Dr. H. D. King. He also became honorary medical officer to St. Leonard's Hospital, Sudbury, acquiring a high reputation for the emergency surgery he had to undertake. During the first world war he served in the R.A.M.C. as a surgical specialist at the 67th and 63rd General Hospitals in France and Salonika, attaining the rank of major. In 1922 he retired from private practice for a time, and then settled at Cheltenham with Mr. Thomas

Holmes, another Guy's man, as a general-practitioner surgeon. Obtaining the F.R.C.S.Ed. in 1924, he was elected to the honorary surgical staff of Cheltenham General Hospital and for many years was medical officer to the Cheltenham Colleges. Particularly interested in the radium treatment of cancer, he did much good work as a surgeon, and his opinion was greatly valued by his colleagues and by practitioners in the surrounding district. He had a kindly nature and was extremely conscientious in his work. In his younger days he was a good cricketer and footballer; he played cricket for Guy's and later for the Suffolk County Club. He finally retired from practice in 1945 and went to live at Tankerton, in Kent, where he became keenly interested in gardening. He married Miss Anne Lamprey, and they had three daughters and one son, who is Dr. John A. L. Leeming, a dermatologist at Durban, Natal. His brother is Dr. A. Norman Leeming, and Dr. Donald N. Leeming and Dr. Roy A. Leeming are his nephews. All are Guy's men.

Dr. CECIL MERIDYTH JONES, a well-known Croydon general practitioner and for many years a surgeon at Croydon General Hospital, died on January 9 at the age of 64. From University College, Cardiff, he went on to the Westminster Hospital, and graduated M.B., B.S., with honours in medicine, in 1912. After working as house-surgeon at the Westminster Hospital and later at the Taunton General Hospital, he joined the R.A.M.C. at the outbreak of the first world war, being wounded in 1916. In 1921 he took the F.R.C.S., and in the following year settled in practice at Croydon in partnership with Dr. C. Poulett Harris and Dr. J. H. Thompson. Soon he was elected to the surgical staff of the Croydon General Hospital, where he continued his operative work until 1948. Although in failing health for the past two years, Dr. Jones was at work in his busy practice until about six weeks before his death. He leaves a widow and one daughter.

Dr. W. F. MUNRO, the senior medical practitioner in Burnley, died suddenly at his home there on January 18, aged 74. Born on March 20, 1880, William Fraser Munro was educated at Aberdeen University, graduating M.B., Ch.B. in 1903 and proceeding M.D. in 1929. Settling in Burnley in 1906, he was in active practice there until the day of his death, a span of almost 50 years. A member of the British Medical Association for 48 years, he was honorary secretary of the Burnley Division from 1921 to 1932 and chairman in 1932-3. He was a member of the Burnley Insurance Committee from 1929, and from 1947 a member of the Burnley Executive Council, being vice-chairman of the latter body since 1952. For 30 years he was a member of the local medical committee and had been chairman for the past 10 years. In spite of his busy professional life he found time for much public service. For 15 years he was a member of the town council, being chairman of many of its committees concerned with health matters. He was also a borough magistrate for many years. During the first world war he served with great distinction in the R.A.M.C., attaining the rank of lieutenant-colonel and being awarded the Military Cross in 1917. He received the Territorial Decoration in 1923. Keenly interested in the welfare of ex-Service men, he was president of the Burnley branch of the Old Contemptibles' Association for 25 years.

C. E. B. L. writes: At a crowded memorial service held in Burnley parish church Dr. Munro was described as "one of the most outstanding characters that Burnley had known this century." As one who has known him for many years as a colleague, I should like to add my humble tribute. Above all, William Fraser Munro was a man of good will; he loved his fellow men, understood their troubles, and in his own kindly way helped to lighten their burdens. In short he was, what so few of us manage to become, an outstanding example of the family doctor. As chairman of the medical committee he acted as a cushion, not to be sat

on, but to soften the verbal blows of conflicting views. Until his death he was most active both physically and mentally, and had no difficulty in fitting into the rapidly changing face of medicine. Through it all, his kindly smile, his courteous manner, and his quiet humour remained unaltered. He was most truly a gentle man. To his widow, son, and daughter we extend our deepest sympathy.

The death took place on January 30, at the age of 81, of Brevet-Colonel A. E. HAMERTON, who had spent 28 years of his life in the medical services of the Army, and afterwards served for 18 years as pathologist to the Zoological Society of London. Albert Ernest Hamerton took his medical training at the Leeds Medical School, qualifying in 1899. After a period as resident medical officer at Leeds Public Dispensary he joined the Army in 1900. In 1904, by which time he had attained the rank of captain, he saw active service in Somaliland, in the operations against the "Mad" Mullah, and he was in the battle at Jidballa when 1,000 of the enemy were killed and the British loss in killed and wounded was 58. For his services in that action he was mentioned in dispatches and received the D.S.O. From 1908 to 1910 he was a member of the Sleeping Sickness Commission in Uganda, and no sooner had he completed that task than he was sent on a similar commission to Nyasaland, which lasted until 1913. He joined the British Expeditionary Force in France at the outbreak of the first world war, and served until 1919; here again he was mentioned in dispatches and also received the C.M.G. From 1920 to 1922 he was director of the Central Laboratory and Pasteur Institute at Bagdad. Returning to this country in 1923, he became assistant director of pathology at the War Office. He retired from the Army in 1928 and took charge of the prosectorium at the London Zoological Gardens, where he performed innumerable post-mortem examinations on many species of animals. He had always taken an interest in comparative medicine and had written various papers on such subjects as rabies in Iraq and its treatment by carbolized vaccine, and on trypanosomiasis in man and beast in Africa. He was vice-president of the Section of Comparative Medicine at the Centenary Meeting of the British Medical Association in 1932. Colonel Hamerton served on the Council of the B.M.A. and on the Naval and Military Committee from 1929 to 1932, and did some very useful work on subcommittees concerned with conditions in the R.A.M.C. He was a Fellow of the Royal Society of Medicine, the Royal Society of Tropical Medicine and Hygiene, and the Zoological Society of London, and a member of the Pathological Society of Great Britain and Ireland.

Dr. J. H. MURDOCH, principal medical officer at Wandsworth Prison, died in St. James's Hospital, Balham, on January 22 at the age of 54. He had been in poor health for some years, but carried on with his work until a few days before his death. James Hunter Murdoch, a direct descendant of William Murdoch, the inventor of gas lighting, was born at Glasgow on May 27, 1900. He received his early education at Whitehill School and then volunteered, at the age of 17, for service in the Army during the first world war. On return to civilian life he entered Glasgow University as a medical student and graduated M.B., Ch.B. in 1924. In 1925 he was appointed resident medical officer at the Glasgow District Mental Hospital, where he was one of the first to become interested in the malaria therapy of general paralysis of the insane, later publishing his observations. He joined the prison medical service in 1928 and held appointments in various prisons throughout the country, gaining an increasingly high reputation as time went on. At Broadmoor he made a special study of crime in schizophrenia, publishing a paper on the subject in the *Journal of Mental Science* in 1933. In 1949 he and three other prison medical officers submitted a memorandum to the Royal Commission on Capital Punishment. Most of his work, however, must remain unknown to the general public, but while at Wandsworth he gave valuable expert advice in many well-known

criminal cases. James Murdoch, before his illness, was a keen all-round games player. He was an enthusiastic amateur footballer and a good cricketer, golfer, and tennis player, and will be remembered by many senior prison officers for his stamina in these games. He spent many of his holidays camping and boating in Scotland. His ability extended beyond his own specialty, and he was ever ready to lend a helping hand to a local practitioner at short notice. He was an excellent companion and a sincere and reliable friend. His early death came as a great shock to all who knew him, and he is mourned not only by the prison staff but by a much wider circle of friends in Wandsworth. He is survived by a widow and daughter, who is a science graduate of St. Andrews University, and to them we offer our sincere sympathy.—T. J. L.

A memorial service for the late Dr. HAROLD K. WALLER will be held in the chapel of the British Hospital for Mothers and Babies, Samuel Street, Woolwich, S.E.18, on Thursday, February 17, at 3 p.m.

Medico-Legal

SURGEON PHYSICALLY FIT

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

On February 3 the Court of Appeal Dismissed the appeal of Mrs. Winifred Nickolls against the Ministry of Health as successors under the National Health Service Act to the liabilities of the Royal Free Hospital. Mrs. Nickolls's case was that she was operated upon for the removal of a goitre on December 1, 1944, by the late Mr. Cecil Joll, who was then suffering from carcinoma of the lung, that he and the hospital authorities knew or ought to have known that his state of health was such that he was unfit to perform the operation, and that by reason of his unfitness the result of the operation was that she now suffered from permanent bilateral laryngeal paralysis because of damage to the recurrent laryngeal nerves.

Mr. Justice Gorman had dismissed the action on July 2, 1954, because he came to the conclusion that Mr. Joll had in fact been quite fit to perform the operation.

In his judgment dismissing the appeal Lord Justice Denning¹ said that Mr. Joll was at that time the greatest surgeon in England for that type of quite simple operation, during which in some way or other both Mrs. Nickolls's laryngeal nerves had been damaged, which was a very rare thing to have happened. Mrs. Nickolls said that the cause was Mr. Joll's state of health. In June, 1944, he was diagnosed as suffering from cancer of the lung. By September he was also suffering from diabetes and was having deep x-ray therapy and insulin. In November, 1944, the cancer was found to be spreading through his body, but he went on operating until January 9, 1945, and died 16 days later. He was a brave man who carried on with his work to the last possible moment. Mrs. Nickolls said that that would have been wholly admirable but for the fact that other people's lives were in his hands.

Lord Justice Denning felt that something must have gone wrong with the operation owing to Mr. Joll's illness, resulting in the damage to Mrs. Nickolls's laryngeal nerves, but that was not negligence unless it could be said that there was negligence every time a surgeon was taken ill in the theatre. There was no question of want of skill or care by Mr. Joll. The real question was whether he was fit to undertake the operation at all, for obviously surgeons should not undertake operations unless they were fit to carry them out. The judge had found that Mr. Joll was fit to perform this operation and the Court of Appeal could not differ from him on that point.

Lord Justice Hodson delivered a concurring judgment, and Lord Justice Parker agreed.

¹ *The Times*, February 4, 1955.

OBSCENE PUBLICATIONS

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

A committee appointed on the initiative of the Society of Authors to inquire into and report on the law relating to obscenity in literature has now submitted its principal recommendations to the Home Secretary in the form of a draft Bill. This is designed to remedy what the committee considers to be anomalies and defects in the existing law relating to the common-law misdemeanour of publishing obscene libels, the powers of justices to order the destruction of obscene matter under the Obscene Publications Act, 1857, and the powers of the Commissioners of Customs and Excise to destroy indecent matter seized on import.

The committee's objection to the present common law relating to obscenity is that the test to be applied in deciding whether the matter is obscene is purely objective: in the view of the jury is the matter calculated to deprave and corrupt those whose minds are open to its influence and into whose hands it may fall? The committee observes that the intention and purpose of author and publisher are ignored, that it is no defence that the matter is of literary, artistic, or scientific merit, that expert evidence of literary, artistic, or scientific value is not admitted, that it is not clear whether a work objectionable only in isolated passages rather than in its "dominant effect" can be obscene, that they think that horror, murder, violence, and sadism are not caught by the present law, and that maximum penalties are not defined.

While the force of the committee's objections from the point of view of authors, printers, publishers, and booksellers is plain enough, others may think that an objective test is perhaps not only right but the only one susceptible of practical application if there is to be any legal restriction on obscene publications at all.

The remedies proposed by the Bill are that the intention and general character of author and publisher are to affect the matter, and the court is required to consider the "dominant effect" of the publication, whether it has in fact corrupted anyone, its literary, artistic, or scientific merit, on which expert evidence is to be admissible, and the class of persons among whom it is likely to circulate. The word "obscene" is to cover matter which, whether or not concerned with sex, "unduly exploits" horror, cruelty, or violence. The maximum penalty for an offence is to be £100 or six months' imprisonment.

The chief objections to the procedure under the Obscene Publications Act, 1857, are in addition that author, publisher, and printer have no *locus standi* to defend their work: that neither the prosecutor in attacking the work nor the magistrates in condemning it are obliged to indicate what in it they consider to be obscene, and prosecutions can be instituted, as indeed they can for the common-law misdemeanour, without the blessing of the Director of Public Prosecutions. The committee's objections to the Customs and Excise powers are that they are exercisable by the commissioners without any judicial determination by magistrates and without reference to the Director of Public Prosecutions.

The proposed remedies are that magistrates, in making destruction orders, shall take into consideration the same matters which the court is to consider in trying a case of obscene libel, that the author, publisher, printer, and distributor shall all have the right to give and call evidence, that the Customs authorities shall act only on the issue of a destruction order by a magistrate, and that all prosecutions shall be subject to the consent of the Director of Public Prosecutions.

As to medical textbooks, even in the present state of the law, magistrates and jurors are not likely to confuse them with pornography.

SLIPPERY FLOOR

Because cleaners in a ward at St. John's Hospital, London, S.W., failed to warn Mrs. Rose Hannah Slade, aged 67, of the presence of polish on the floor, Mrs. Slade, who slipped on the polish and broke her right thigh, was awarded £781

damages with costs by Mr. Justice Finnmere in the Queen's Bench Division on February 3. His lordship held that the Battersea and Putney Group Hospital Management Committee were liable because of the negligence of their servants.

On October 27, 1953, Mrs. Slade was visiting her husband, who was seriously ill in the hospital and has since died. When she was leaving the ward she saw two women standing with mops but not working. She slipped on a patch of polish that had not been rubbed in and fell. Evidence was given that, according to the hospital's accident book, 16 persons had slipped or fallen on the polished floors of wards and corridors in 14 months.

In his judgment, Mr. Justice Finnmere said he was satisfied that Mrs. Slade slipped on a part of the floor where polish had been spread and not properly finished off. Someone should have warned her of the danger, but they did not. The patch of polish, of which Mrs. Slade was not aware, was a concealed danger, he said, especially in the absence of any warning. It was more slippery than after the floor had been polished. He was satisfied there was no negligence on Mrs. Slade's part in failing to notice the small difference in the appearance of the floor. She did not know there was an unusual danger there. Was it negligent to leave that polish on the floor without giving a person warning? He thought the hospital committee were negligent through their servants, who did not act with reasonable care or give the warning required.

Awarding £750 general damages, in addition to the £31 special damages agreed, his lordship said Mrs. Slade had permanent limitation of movement of her right hip, and was incapable of doing any work that involved kneeling or stooping.

CRITERIA OF LIABILITY

The First Division of the Scottish Court of Session on February 4 ordered a new trial in an action which arose out of the breaking of a hypodermic needle. In the course of his judgment the Lord President (Lord Clyde) made some observations¹ on the establishing of negligence, and remarked that the standard seemed to be the same in England as in Scotland. He said that, to establish liability by a doctor where deviation from normal practice was alleged, three facts required to be established. First of all it must be proved that there was a usual and normal practice. Secondly, it must be proved that the defender had not adopted that practice. Thirdly (and this was of crucial importance), it must be established that the course the doctor adopted was one which no professional man of ordinary skill would have taken if he had been acting with ordinary care.

Medical Notes in Parliament

CLEARING THE AIR

Clean air legislation has attained a place in the forefront of the political picture with the undertaking given on February 4 that a Government Bill, Beaver Report "in principle," would be introduced this session. So the campaign, which began with the outcry after the deaths and damage to health caused by the great fog in December, 1952, given formal shape by the investigations conducted by Sir Hugh Beaver and his committee, and political impetus from the Bill presented by Mr. Gerald Nabarro, the Conservative M.P. for Kidderminster, has achieved its first objective.

Mr. NABARRO, moving the second reading of his Clean Air Bill, traced the ineffective efforts made to deal with smoke pollution back as far as 1257, when Queen Eleanor was reported to have moved from Nottingham because of the fumes caused by the burning of sea coal. In bringing the record up to date with an examination of the economic

¹ *Scotsman*, February 5, 1955.

losses caused by smoke pollution—estimated by the Beaver Committee at £250m. a year—he went on to quote Mr. Edward MacLellan, a surgeon, who had advised him and made the following statement: "It has been established beyond reasonable doubt that the alarming increase in the incidence of cancer of the lung is associated with the fouling of the atmosphere by smoke, exhaust fumes, and the offensive and deadly eruptions of gas works, power stations, and so on. There are more than twice as many victims of cancer of the lung in the towns as in the country, and the mortality from lung cancer among workers in the gas industry is double that of the general population."

Mr. Nabarro quoted also the Beaver Report on the medical aspects of smoke pollution. He declared that he and his supporters wanted an assurance from the Government that they would introduce a comprehensive and effective measure during the present session of Parliament.

Mr. ALFRED ROBENS (Blyth, Lab.) gave the Opposition's blessing in advance to such legislation.

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) moved the rejection of Mr. Nabarro's Bill, but only because, as a private Member's Bill, it could not go far enough and lacked the essential financial provisions. Even to assume that in ten years an 80% reduction of atmospheric pollution could be achieved meant that there was no time for delay and that no half-measures could be tolerated. Most authorities would agree that the worst pollution was sulphur dioxide, either by its own action as an isolated gas or through its synergic effects when it combined with sulphuric acid mist. He wondered whether the substitution of oil for coke in central heating plants would not inevitably mean a greater concentration of sulphur dioxide in the hearts of cities, since the 4% sulphur in oil compared with the 1½% in coke would mean more sulphur fumes in the air, unless costly preventive action was taken.

Mr. SOMERVILLE HASTINGS (Barking, Lab.) expressed his belief that the results of polluted air on health were almost entirely due to sulphur oxides and his doubt whether these would be appreciably decreased by the Bill.

Mr. DUNCAN SANDYS, Minister of Housing and Local Government, stated the Government's views, and gave the promise of their own Bill. Consultations with industry and local authorities were going ahead satisfactorily, but were not yet complete. Mr. Nabarro's text differed in many ways from the Beaver proposals, would present many difficulties, and could not of necessity contain the financial teeth to make it effective. But there was general agreement on the policy, and when its consultations were concluded the Government would frame and introduce a comprehensive measure on the general lines of the Beaver Report, which he hoped would be completed this session.

Mr. NABARRO exclaimed, "That is all we wanted," Dr. STROSS withdrew his motion for rejection, and Mr. NABARRO withdrew his Bill.

Colouring Matter in Food

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) asked the Minister of Food on January 31 what type of dye was used for the purpose of colouring some types of sugar purple, yellow, and green; and whether he would make a statement on the possible dangers to health that are involved. Dr. CHARLES HILL, Parliamentary Secretary, Ministry of Food, said that the Public Health (Preservatives in Food) Regulations forbade the use of five named coal-tar colours, but he had no reason to suppose that any one of these was being used in the coloured sugars in question. If Dr. Stross had any information to the contrary he would be glad to have it.

Mr. JOHN RANKIN (Glasgow, Tradeston, Lab.) asked the Minister of Food what steps he was taking to control the colouring materials put into foodstuffs so as to ensure that no substances deleterious to human health would be added. Dr. CHARLES HILL replied that the use of certain colouring matters including certain coal-tar colours was already prohibited. A report of the Food Standards Committee on the addition to foods of colouring matters, including coal-tar

colours, had recently been published. As was customary, it was proposed to await representations from interested parties before reaching a decision on the committee's recommendations.

Fluoridation Tests

Mr. S. P. VIAN (Willesden, West, Lab.) asked the Minister of Health whether the Anglesey water authority had yet investigated for fluorine content the urine of the area in which fluoridation was to be introduced, and the urine of the control area; how many persons participated in this investigation, and what were their ages; how far the condition of teeth of infants and older children in the areas had been ascertained; and if he would ensure that accurate and consecutive records of fluorine content of urine, and condition of teeth, were kept in the two areas. Mr. IAIN MACLEOD stated on February 3 that a pilot study of urinary excretion of fluoride in children in this country confirmed the result of work done in the United States and New Zealand, and made it clear that more exclusive studies need not be undertaken before fluoridation in Anglesey was begun. Arrangements were being made to examine the teeth of samples of children in each age group up to and including 15 years (and to some extent of adults), and consecutive records would be kept of all the most relevant facts.

Hospital Administration Report

Mr. J. K. VAUGHAN-MORGAN (Reigate, Con.) asked the Minister of Health whether he had considered the report of the committee of the Central Health Services Council on the internal administration of hospitals. Miss PAT HORNSBY-SMITH, Parliamentary Secretary, stated on January 31 that the Minister had studied the report with great interest. It contained much useful material and many valuable suggestions, most of which were addressed primarily to the hospital authorities themselves and were for them to consider in the light of their own particular circumstances.

Mr. KENNETH ROBINSON (St. Pancras, North, Lab.) asked if the Minister was prepared to make a statement on the observations of the Central Health Services Council with regard to medical superintendents of mental hospitals. Miss PAT HORNSBY-SMITH replied that the Minister did not consider it would be appropriate at the present time to introduce model standing orders for the general government of mental, and mental deficiency, hospitals defining the functions of the medical superintendent.

Paying and Non-paying Patients

The MINISTER OF HEALTH informed Mr. SOMERVILLE HASTINGS (Barking, Lab.) on February 3 that at the end of 1953 the number of beds in England and Wales designated under section 5 of the Health Service Act was 1,559 in teaching hospitals and 3,697 in other non-mental hospitals. The average daily occupancy during 1953 was—teaching hospitals: paying patients, 967.5, non-paying patients, 217; other (non-mental) hospitals: paying 1,630, non-paying, 720. Figures for 1954 were not yet available.

Scottish Surgeries

Mr. W. HAMILTON (Fife, West, Lab.) asked the Secretary of State for Scotland on February 1 what progress had been made in the talks designed to effect improvements in conditions at doctors' surgeries. Commander T. D. GALBRAITH, Under Secretary, said that it had been arranged that executive councils in Scotland would undertake a review of consulting accommodation in all areas where adequate arrangements for this purpose had not already been instituted.

Mr. HAMILTON asked for an indication of when some positive action would be taken. There were complaints about unsatisfactory conditions in surgeries, and some firm action

¹ British Medical Journal Supplement, October 2, 1954, p. 1.

was necessary. Commander GALBRAITH said he could not give any assurance. He knew what the situation was, and he hoped the executive councils would get on as quickly as possible.

Cadmium Poisoning.—The question whether, in the light of the report by a member of the staff of the Medical Research Council, cadmium poisoning should be prescribed as an industrial disease, and if so, for what occupations, is being referred to the Industrial Injuries Advisory Council.

Universities and Colleges

UNIVERSITY OF OXFORD

The title of Clinical Lecturer in the Diseases of the Ear, Nose, and Throat conferred upon Dr. R. G. Macbeth for five years from the first day of Michaelmas Term, 1954, has been changed to Clinical Lecturer in Otolaryngology.

The following degrees were conferred in Congregation on December 11:

D.M.—C. P. Silver.
B.M.—J. Billingham, A. C. Markus, B. Clarke, R. R. Charlwood, G. Harris, B. L. D. Phillips, E. J. Bovett, D. J. Reid, J. H. Baron, M. P. Joyson-Bechal, P. H. Merry, D. C. Beckingham, F. W. Wright, G. Appleby, R. B. Chalmers, G. H. Fairley, J. Gerrard, D. Guttmann, L. J. Holmes-Smith, W. H. Mitchell-Banks, A. D. Jose, V. Marks, J. C. M. Wilkinson, E. J. Wimperis, C. M. S. Coppin, J. A. Mitchell, H. R. Overy, H. R. Dingle, M. Hartog, P. T. Pickens, H. J. Liebeschuetz, R. N. P. Sutton, P. J. Mitchell, D. T. Cousins, P. R. Samsworth, D. P. Woods, R. Akroyd, T. J. D. Cochrane, Mrs. Elspeth A. Beckett, Mrs. Jean O. Hunter, Ann C. M. Wickham, Patricia J. M. Cotter, *D. H. Crill, *H. L. Freeman.

* In absence.

UNIVERSITY OF CAMBRIDGE

In Congregation on December 11, 1954, the degree of M.D. was conferred on J. J. Fleminger.

On December 20, 1954, the degree of B.Chir. was conferred on:

I. N. Godlee, P. J. Burrows, M. S. Robson, P. J. D. Kirk, C. E. Salter, E. F. D. Gawne, D. W. Atkinson, I. H. Backhouse, I. McL. Flowers, A. C. Johanson, I. V. Longfield, D. B. R. Osbourne, R. J. C. Pearson, D. J. H. Prosser, W. Atherton, L. H. Blonstein, P. D. Crockett, R. H. S. Gibbs, A. M. Parfitt, M. J. Turner, J. F. Walker, R. D. Hyde, J. Ross Russell, W. L. Cordeaux, G. C. Spackman, A. H. Labrum, J. N. Bodger, P. G. T. Bye, W. S. Ogden, J. W. Blaxill, W. R. P. Bourne, J. A. Drviden, J. Fairley, L. H. Hurrell, C. F. Ridley, R. C. Nainby-Luxmoore, T. R. Clendon, J. S. Garfield, E. Redfern, I. R. Robertson, G. E. W. Swan, S. T. G. Butterworth, D. H. Cameron, J. R. Barwell, J. S. Miller, R. Shram, Inez R. Aldous, Claudia M. B. Grisson.

On December 22, 1954, the degree of M.B. was conferred on: G. H. Hilton, J. K. Snell, J. Crook, C. M. McGregor, G. F. B. Birdwood, D. J. Buttery, R. H. Gibbon, R. J. Knight, R. C. Lawson, W. A. Williamson, S. P. Lock, H. C. Masheter, J. T. Gibbs, P. D. W. Wickenden, S. G. Bayliss, J. W. Harding, H. Jacobs, I. G. Tait, W. H. Carling, D. E. Tunbridge, J. R. Wood, Mrs. Lucy M. Rochelle.

UNIVERSITY OF LONDON

The following candidates at the Institute of Psychiatry have been approved at the examination indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN PSYCHOLOGICAL MEDICINE.—Valerie A. Cowie, I. J. MacDonald, *M. I. M. Pines. The following have passed in Part I only: G. P. S. Fernando, F. Grunberg, R. R. Mowat, I. C. L. Patch, B. P. Shah.

The degree of M.D. was awarded on December 15, 1954, to P. J. Hare.

The John Marshall Fellowship in Surgical Pathology, tenable for two years in the first instance at University College Hospital Medical School, has been awarded from October 1, 1954, to Mr. D. B. Griffiths, F.R.C.S., who will also hold the Whait Fellowship awarded by the Medical School.

The following candidates have been approved at the examinations indicated:

M.D.—Part I: H. Barkley, P. J. A. Butcher, J. A. Cheese, H. W. D. Davies, S. Dische, Yvette A. P. Franklin, Eva A. Frommer, A. A. Glynn, N. D. Gower, L. H. Harris, J. M. Hinton, N. B. Kreitman, S. Mattingly, A. R. May, Ariela Pomerance, M. E. A. Powell, A. Trueman, H. J. Wyatt, Joan F. Zilva.

M.S.—Part I: N. C. Rogers.

* Awarded a mark of distinction.

UNIVERSITY OF BRISTOL

The following candidates have been approved at the examinations indicated:

M.D.—A. G. W. Branch.
FINAL M.B., CH.B.—H. T. Apsimon, P. H. Barry, Catherine A. Clark, D. J. C. Felton, J. H. L. Griffin, M. L. Harvey, J. K. Howell, Antoinette R. Joseph, J. McC. Lalloo, Jean D. Matthews, T. N. Matthews, J. H. Orr, B. K. Palmer, B. A. Poley. In Group I completing the examination: Pamela M. Atkinson, K. G. Collins, E. C. Skeens. In Group II only: R. G. McCormick.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending January 22, (No. 3) and corresponding week 1954.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrar-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1955					1954				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	8	0	6	0	1	18	0	9	0	
Dysentery	482	65	227	22	4	490	100	178	18	2
Encephalitis, acute	4	0	1	0		4	1	1	0	
Enteric fever:										
Typhoid	1	1	0	0	0	3	0	0	1	
Paratyphoid	2	0	1	0	1	4	0	0	0	
Food-poisoning	119	10		0		148	17		0	
Infective enteritis or diarrhoea under 2 years				12	19				17	19
Measles*	7,038	656	557	557	52	1,106	12	43	31	132
Meningococcal infection	32	1	9	1	1	43	5	12	2	3
Ophthalmia neonatorum	28	0	6	0		28	0	2	0	
Pneumonia†	929	67	294	7		809	44	323	3	5
Poliomyelitis, acute:										
Paralytic	16	2		3	0	30	1		6	0
Non-paralytic	8	0			1	7	1			5
Puerperal fever‡	240	47	12	0		257	24	12	1	2
Scarlet fever	650	37	105	49	24	1,138	51	181	44	29
Tuberculosis:										
Respiratory	625	70	156	22		741	72	145	19	
Non-respiratory	75	5	21	2		92	6	20	3	
Whooping-cough	2,002	143	215	27	31	2,357	85	404	49	68

DEATHS in Great Towns	1955					1954				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	1	0		0		0	0		0	
Encephalitis, acute	0	0		0		0			0	
Enteric fever	12	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	12	2	1	0	1	6	1	1	0	0
Influenza	136	13	4	1	0	31	4	5	1	2
Measles	0	0	0	0		0	0	0	0	
Meningococcal infection	2	0				2	0			
Pneumonia	557	88	37	15	7	356	52	37	14	13
Poliomyelitis, acute	1	0			1	5	0			0
Scarlet fever	0	0	0	0		0	0	0	0	
Tuberculosis:										
Respiratory	129	15	14	4	5	123	17	13	1	5
Non-respiratory		3	1	0	0		0	3	0	2
Whooping-cough	3	1	1	0	0	2	0	1	0	0
Deaths 0-1 year	230	29	37	9	15	279	34	41	17	12
Deaths (excluding stillbirths)	8,185	1,201	876	181	206	6,568	970	734	133	189
LIVE BIRTHS	7,535	1,126	921	195	386	7,632	1,148	918	214	370
STILLBIRTHS	218	20	26			206	21	17		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Vital Statistics

Typhoid in Yorkshire

In December, 1954, and January this year an outbreak of typhoid occurred in Pickering, Yorkshire. Probably 29 people have been infected; of these, 23 are primary cases and the other 6 family or household contacts; 28 are adults. We are indebted for the following information to Dr. W. R. M. COUPER, M.O.H. of Pickering:

The date of the onset of the primary cases was between December 17 and 24. On December 13 an epidemic of what seemed to be an upper respiratory infection began in Pickering and was labelled influenza. Later the infection spread to the surrounding districts. At first children were affected; then older people had the infection in a rather more severe form. Pulmonary complications were treated with chloramphenicol. In due course some of the cases were diagnosed as typhoid fever. The clinical picture was of pyrexia, nose-bleeds, headaches, and prostration. Five patients who presented this clinical picture were sent into hospital between December 31, 1954, and January 16 last. By February 1 *Salmonella typhi* had been isolated from the faeces of one patient, and investigation of this patient and of four others showed that infection was recent.

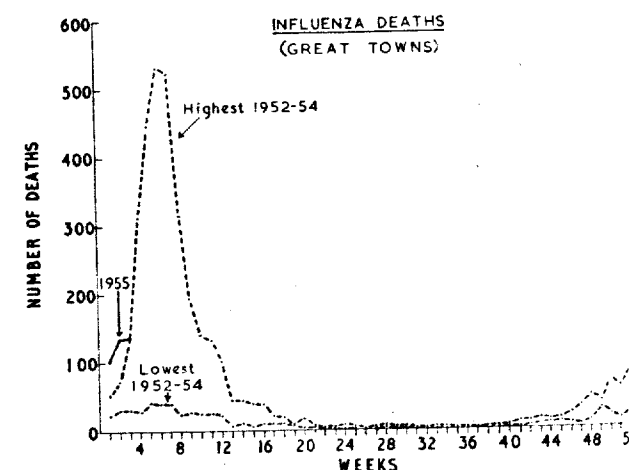
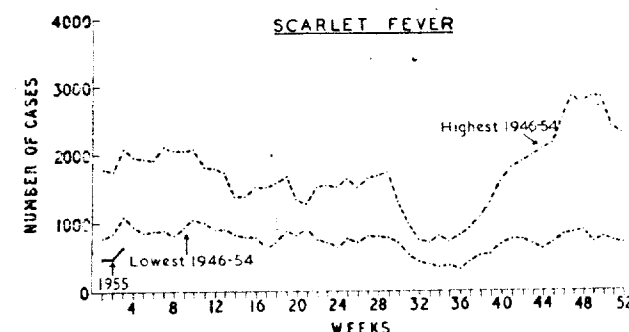
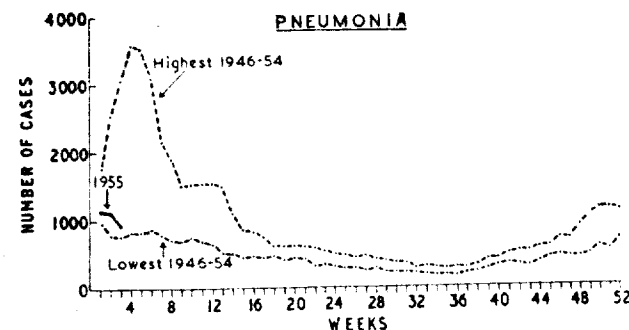
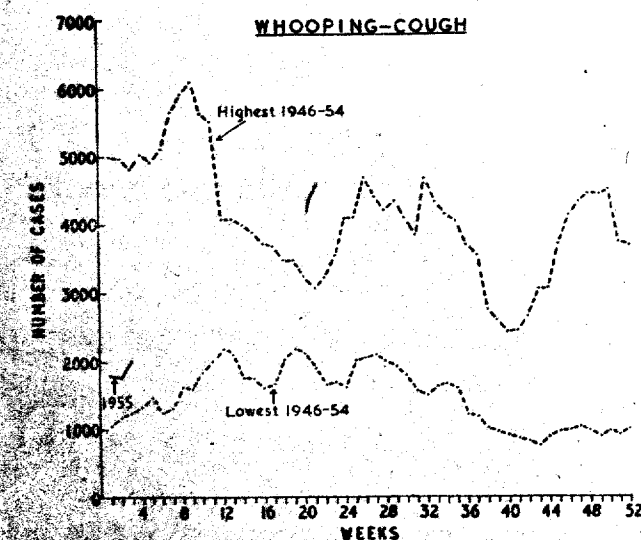
The epidemiological picture was of a localized outbreak from a single source of infection within a short period. Examination of affected and suspected persons excluded the water supply and milk as cause of the outbreak. A common food was eaten by all patients identified as primary cases, and investigations are continuing to find out how the material became contaminated.

Influenza

In the great towns of England and Wales the number of influenza deaths (123) in the week ending January 29 showed a decrease of 13 compared with the previous week. There were small increases in London and the south-east and in the north, east, and west Ridings, north midland and south-western regions, and in Wales, which were more than offset by decreases elsewhere, mainly in the north-western and midland regions. There is little change in the situation.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the nine years 1946-54 (influenza, 1952-4) are shown thus ----, the figures for 1955 thus —. Except for the curves showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The largest fluctuations in the trends of infectious disease in England and Wales during the week ending January 2 were decreases of 762 for measles, from 7,800 to 7,038, and 192 for acute pneumonia, from 1,121 to 929, and increase of 233 for whooping-cough, from 1,769 to 2,002, 185 for scarlet fever, from 465 to 650, and 80 for dysentery, from 402 to 482.

The largest falls in the number of notifications of measles were 135 in London, from 791 to 656, 122 in Lancashire, from 2,032 to 1,910, 110 in Essex, from 463 to 353, 99 in Cheshire, from 466 to 367, and 88 in Derbyshire, from 36 to 214. The largest increases in the incidence of whooping cough were 33 in Kent, from 108 to 141, and 31 in Yorkshire West Riding, from 51 to 82. A small rise in the incidence of scarlet fever occurred throughout the country, the largest was 22 in Essex, from 27 to 49. 8 cases of diphtheria were notified, being 6 fewer than in the preceding week.

24 cases of acute poliomyelitis were notified, and there were 1 more for both paralytic and non-paralytic cases than in the preceding week. The largest returns were 3 in each of the counties of Essex, Lancashire, and Gloucestershire (Bristol C.B. 2).

The largest centres of dysentery were Lancashire 103 (Liverpool C.B. 22, Manchester C.B. 18, Oldham C.B. 12), Yorkshire West Riding 80 (Leeds C.B. 55, Sheffield C.B. 13), London 65 (Southwark 18, Chelsea 11), Middlesex 28.

Medical News

Dr. E. D. Adrian, O.M., P.R.S., who was awarded a barony in the New Year Honours, becomes Baron Adrian, of Cambridge in the County of Cambridge.

New Midwives Rules.—Compulsory courses of instruction are ordered by the new midwives rules, issued as S.I. No. 120, 1955 (H.M.S.O. 1s. 3d.). Attendance at the courses is required of all practising midwives from 1958 every five years; midwives enrolled before 1938 must attend a refresher course within 12 months of giving notice to practise, unless they have attended one within five years. The rules also permit midwives to administer trichlorethylene.

New Journal.—The *Central African Journal of Medicine* makes its appearance as representative of medicine in the new Federation of Rhodesia and Nyasaland. It is a well-produced publication; its first number includes forewords by the Prime Minister of the newly formed Rhodesia and Nyasaland Federation (Sir GODFREY HUGGINS, F.R.C.S.), Sir RUSSELL BRAIN, P.R.C.P., and Dr. MORRIS, Federal Secretary of Health. Appropriately, a biographical note on David Livingstone appears, the first known medical man to practise in what is now Rhodesia and Nyasaland, and there are also papers on clinical subjects. Edited by Dr. M. GELFAND, the journal will appear six times a year at an annual subscription of £2 2s. Its editorial address is P.O. Box 2073, Salisbury, S. Rhodesia.

Dermatology Medal.—The Chesterfield Medal, with a cash prize of £25, is offered by the Institute of Dermatology for the best essay on a dermatological subject selected by the candidate. Full details from the Institute, at St. John's Hospital for Diseases of the Skin, Lisle Street, Leicester Square, London, W.C.2.

Essay on Health Visitors.—The Royal Sanitary Institute offers a prize of fifty guineas for an essay on "How the Health Visitor can help the family towards its full development." Full details from the Institute at 90, Buckingham Palace Road, London, S.W.1.

Scholarships Abroad.—Over 100 scholarships are offered to British students by 17 foreign countries for study abroad during the academic year 1955-6. The awards generally provide for free tuition and maintenance, and are tenable for periods varying from a few weeks to 12 months. The countries offering them are Austria, Belgium, Brazil, Denmark, Finland, France, Germany, Iceland, Italy, the Netherlands, Norway, Persia, Portugal, Spain, Sweden, Switzerland, and Yugoslavia. Closing dates for applications differ for each country, the earliest being March 7. Further information and application forms, for which a stamped, addressed foolscap envelope should be sent, may be obtained from the Education Division, British Council, 65, Davies Street, London, W.1.

Induced Hypotension.—The Edinburgh Postgraduate Board for Medicine will hold a fortnight's course of lectures and demonstrations on induced hypotension in anaesthesia at the Department of Anaesthesia, Royal Infirmary, Edinburgh, from March 21 to April 1 (see advertisement page 46). Applications to be sent before March 1.

D.D.T. Awards.—The Royal Commission on Awards has recommended an award of £6,000 for the manufacture of D.D.T., to be made jointly to J. R. Geigy, S.A., of Basle, and the Geigy Co. Ltd., of Manchester.

Dr. T. R. R. Mann, F.R.S., has been appointed director of the Unit of Reproductive Physiology and Biochemistry at Cambridge.

Dr. J. N. Hunt, senior lecturer at Guy's Hospital Medical School, has been appointed to the university readership in physiology tenable at that school.

Dr. P. M. Daniel has been appointed honorary consultant in neuropathology to the Army at home.

Glamorganshire 26 (Cardiff C.B. 14, Swansea C.B. 9), Norfolk 26 (Norwich C.B. 17), Northumberland 23 (Newcastle-upon-Tyne C.B. 9), and Durham 20.

The deaths from influenza in the 160 great towns numbered 136, being 2 more than in the preceding week. The largest return was 13 in Birmingham C.B.

Week Ending January 29

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 745, whooping-cough 2,237, diphtheria 23, measles 10,697, acute pneumonia 1,062, acute poliomyelitis 23, dysentery 678, paratyphoid fever 4, and typhoid fever 9.

Venereal Diseases

In England and Wales during the quarter ending September 30, 1954, 1,281 new cases of syphilis were reported as attending the clinics. Of these, 190 were classified as primary, secondary, or latent in the first year of infection, 9 cases of congenital syphilis in children aged under 1 year were reported, and 158 cases in persons over that age. New cases of gonorrhoea numbered 4,821, of chancroid 79, and of non-gonococcal urethritis (males only), 3,644.—*Monthly Bulletin of the Ministry of Health*, January, 1955.

Smallpox in France

The total number of cases so far reported in the Morbihan Department is 66, including 14 deaths. In addition, one case is reported from Rennes in the Ile-et-Vilaine Department, which adjoins Morbihan, and two cases in the town of Saint-Die, Vosges Department.

Death Rate Variations

Geographical differences in death rates are noticeable for many diseases in England and Wales. They are among the analyses of vital statistics included in the text volume of the *Statistical Review* for 1951 published this week, in which the pre-war practice is resumed of combining civil with medical statistics. In the age group 0 to 4 Greater London had the lowest general death rate and Wales the highest, while the north of England was in between. These disparities remain much the same for all age groups, though in some the south of England had slightly better statistics than Greater London. The differences by region are on the whole greater than the differences by density of population, and they are greater for males than for females. The lower death rates in Greater London and the midlands than elsewhere are thought possibly to be due to the benefits of suburban living.

Diseases of the respiratory system are well known to cause proportionately many more deaths in the north than in the south; so also do heart diseases, in particular coronary arteriosclerosis—Wales again showed a high incidence of this group of diseases.

Notifications of respiratory tuberculosis are more numerous in Wales, the north of England, and London and the south-east than in other parts of the country. The excess in Wales and the north is probably genuine; that in England and the south-east is thought to be a reflection of better diagnostic facilities. Mortality is exceptionally high on Merseyside, Tyneside, and in several midland cities. In 1951 the rate per million population was 512 in Liverpool, 463 in Sunderland, and 541 in Walsall, yet in London and the south-east it was 185, in Bath 177, and in Huddersfield 132.

A comparison of death rates from cancer of the lung with those from all forms of cancer shows that Greater London and the Merseyside cities have a higher proportion of deaths from lung cancer than other parts of England and Wales. Of the rural areas (where lung cancer is less prevalent than in cities), the south of England has the highest proportion of lung cancer deaths.

Registrar-General's Statistical Review of England and Wales for the Year 1951, Text Volume (H.M.S.O., 10s.).

COMING EVENTS

Symposium on Cardiovascular Surgery.—There will be 60 participants from 17 countries at the International Symposium in Cardiovascular Surgery to be held in Detroit from March 17 to 19. The following subjects will be discussed: Diagnosis and Treatment of Pulmonary Stenosis; International Septal Defects; Late Results of Mitral Commissurotomy; Hypothermia; and Substitutes for Arterial Segments. Sir RUSSELL BROCK will be the speaker at the dinner meeting on March 18.

International Congress on Embryology.—The editorial board of the *Journal of Embryology and Experimental Morphology* has arranged an international congress in Brussels from April 4 to 7. Details from Dr. D. R. NEWTH, Department of Zoology, University College, London.

Laboratory Animals Bureau Symposium.—The third symposium will be held at the Royal Society of Medicine, London, W.1, on May 9. The subject will be "The Breeding of Laboratory Animals." The symposium is primarily intended for medical, veterinary, and scientific graduates.

SOCIETIES AND LECTURES

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

Friday, February 11

SOCIETY OF MEDICAL OFFICERS OF HEALTH: WELSH BRANCH.—At B.M.A. House, 195, Newport Road, Cardiff, 6.30 p.m., Dr. G. Grant: Student Welfare in the U.S.A.

Monday, February 14

CHADWICK TRUST.—At Royal Institution, 5.30 p.m., Sir Hugh Beaver: Clean Air.

LONDON UNIVERSITY.—At Senate House, 5.30 p.m., special university lecture in psychology by Professor Otto Klineberg (Columbia University): Psychology and International Relations.

MEDICAL SOCIETY OF LONDON.—8.30 p.m., discussion to be introduced by Dr. W. G. Oakley and Mr. S. M. Cohen: Diabetic Gangrene.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—7.30 p.m., Dr. K. R. Capper, Ph.D., B.Pharm.: British Pharmaceutical Codex, 1954, and the National Formulary, 1955.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—4 p.m., Hunterian Oration by Sir Cecil Wakley: Hunter and Surgical Research.

UNIVERSITY COLLEGE LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, 4.45 p.m., Dr. E. E. Snell (Texas): Relationship of Structure to Catalytic Activities of Vitamin B₆.

Tuesday, February 15

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor J. N. Davidson: Nucleoproteins in Cell Structure.

LIFORD MEDICAL SOCIETY.—At King George Hospital, Ilford, 8.30 p.m., Debate: That in the opinion of this House, the National Health Service is not in the best interest of the patient or the doctor. For the motion: Dr. J. L. McCallum; seconded by Dr. R. M. Noordin. Against the motion: Dr. Bruce Cardew; seconded by Dr. Arnold Elliott.

INSTITUTE OF DENTAL SURGERY.—At Eastman Dental Hospital, 5.30 p.m., Dr. H. M. Seldin, D.D.S. (New York): Oral Lesions of Interest to Dentist and Physician.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. J. Wallace: Bullous Eruptions.

LONDON UNIVERSITY.—(1) At University College Hospital Medical School, 5 p.m., special university lecture in medicine by Professor Jan Waldenström (Lund): Clinical Investigations in Hypergammaglobinaemia. (2) At Senate House, 5.30 p.m., special university lecture in psychology by Professor Otto Klineberg (Columbia University): Uses and Limitations of the Experimental Method in Social Psychology.

OXFORD UNIVERSITY MEDICAL SOCIETY.—At Radcliffe Infirmary, 8.15 p.m., general meeting.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Professor D. M. Pryce: Gynaecological Pathology.

SOUTH-WEST LONDON MEDICAL SOCIETY.—At Bellingbroke Hospital, 8.30 p.m., Professor Alan Moncrieff: Marasmus.

Wednesday, February 16

EUGENICS SOCIETY.—At Royal Society, Burlington House, W., 5.30 p.m., Mrs. Judith Hubback, M.A.: Fertility of Educated Women.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Clefts, Vesicles, and Bullae.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. A. C. Morson: Non-Tuberculous Infections of the Renal Tract.

LONDON UNIVERSITY.—At Warburg Institute, 5.30 p.m., Dr. D. P. Walker: The "Astral Body" in Renaissance Medicine.

MIDLAND MEDICAL SOCIETY.—At Queen Elizabeth Hospital, Birmingham, 8.15 p.m., clinical meeting.

NORTH-WESTERN TUBERCULOSIS SOCIETY.—At Aintree Hospital, Liverpool, 5.30 p.m., Mr. J. Cosbie Ross: Renal Tuberculosis.

ROYAL MICROSCOPICAL SOCIETY.—5.30 p.m., Dr. E. S. Horning: Hormones in Relation to Cancer. Demonstration by Mr. G. N. Byford and Mr. A. C. G. Best: New Type of Mercury-vapour Lamp.

ST. MARLEBOROUGH HOSPITAL FOR PSYCHIATRY AND CHILD GUIDANCE.—5.30 p.m., Dr. R. D. Newton: Indications for Psychological Treatment in Early Childhood.

Thursday, February 17

BAKINGSTON PLASTIC CENTRE MEDICAL SOCIETY.—At Rookdown House (Oak Fawcett Hospital), Basingstoke, 7.30 p.m., symposium: Fractures of the Long Bones with Soft-tissue Loss. Speakers, Professor J. Trueta, Mr. J. S. Ellis, Mr. A. J. Evans, and Mr. E. W. Peet.

BRITISH INSTITUTE OF RADIOLOGY.—8 p.m., Dr. A. Robinson Thomas: Technique of Sialography; Mr. R. T. Payne: Experiences of Sialography. **BRITISH POSTGRADUATE MEDICAL FEDERATION.**—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor J. H. Gaddum, F.R.S.: Effects of Alcohol.

EDINBURGH CLINICAL CLUB.—At 7, Drumshugh Gardens, 8 p.m., Mr. John Bruce: Surgery of the Stomach and Duodenum.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Techniques in Diagnosis of Fungous Infections.

LIVERPOOL MEDICAL INSTITUTION.—8 p.m., demonstration of specimens and cases.

ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Dr. W. H. Bradley: Man and Virus.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—At 26, Portland Place, London, W., 7.30 p.m., Colonel H. W. Mulligan: Recent Investigations on Trypanosomiasis in British West Africa.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Medical School, Small's Wynd, Dundee, 5 p.m., Mr. A. Logan: Benign Ulceration of the Oesophagus.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. M. A. Partridge: psychiatry demonstration.

UNIVERSITY COLLEGE LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, 4.45 p.m., Dr. S. R. Eidsen: Respiratory Mechanisms in Bacteria.

Friday, February 18

BRITISH INSTITUTE OF RADIOLOGY.—5 p.m., meeting of medical members.

FACULTY OF RADIOLOGISTS.—At Royal College of Surgeons of England, 5 p.m., Dr. David Sutton: Thoracic Aortography by Percutaneous Trans-catheterization; Dr. Conway J. Don: Intravenous Cholangiography After Cholecystectomy.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. D. Williams.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Dr. J. Smart: Pulmonary Tuberculosis.

INSTITUTE OF NEUROLOGY.—5 p.m., Dr. G. J. Romanes: Motor Cells of the Spinal Cord.

OSLER CLUB OF LONDON.—At 11, Chandos Street, W., 7.45 p.m., meeting in honour of Leonard P. Mark (1855-1930), author of "Acromegaly: A Personal Experience." Speakers: Dr. A. W. Spence and Sir James Paterson Ross.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—(1) 2 p.m., Mr. D. M. Wallace: Natural History of Bladder Tumours. (2) 4 p.m., Professor C. H. Stuart-Harris: Virus Diseases of the Respiratory Tract.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Mr. Iain McLennan: Some Surgical Aspects of Thyroid Disease.

ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., Professor J. Chassar Moir: Confinements of Some English Queens and their Effect on History.

UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, 5.30 p.m., Professor F. Bergel: Attempts at Chemotherapy of Malignant Diseases.

Saturday, February 19

BIOCHEMICAL SOCIETY.—At London School of Hygiene and Tropical Medicine, 11 a.m., symposium: Biochemistry of Vitamin B₁₂.

APPOINTMENTS

MANCHESTER REGIONAL HOSPITAL BOARD.—F. Robinson, M.B., Ch.B., F.R.C.S., additional maximum part-time Consultant Plastic Surgeon to South Manchester Hospitals; G. Freeman, B.M., B.Ch., F.R.C.S., D.L.O., Part-time Consultant Ear, Nose, and Throat Surgeon to Lancaster and Kendal Hospitals; R. C. Woodcock, M.B., Ch.B., D.C.P., D.Path., Additional Consultant Pathologist, Bolton and District Hospitals; A. Kilpatrick, L.R.C.P.S. Ed., D.A., D.Obst.R.C.O.G., Assistant Anaesthetist, Lancaster and Kendal Hospitals; G. J. H. Hall, M.B., Ch.B., D.P.H., D.C.H., Assistant Physician (Infectious Diseases), Ladywell Hospital, Salford, and Asley Hospital, Wigan; G. H. Waddington, M.R.C.S., L.R.C.P., D.M.R.D., Assistant Radiologist, Lancaster and Kendal Hospitals; H. Fergusson, M.B., Ch.B., D.M.R.D., Assistant Radiologist, Blackburn and District Hospitals; G. H. A. Simmons, F.R.C.S., Consultant Surgeon to Crumpsall Hospital, Manchester; C. G. D. Martin, M.Ch., F.R.C.S.J., Senior Casualty Officer, Bury and Rossendale Hospitals.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Hainan.—On January 30, 1955, at University College Hospital, London, W.C., to Margaret (formerly Booth), wife of Dr. Keith Hainan, a daughter—Susan Mary.

Ringrose.—On January 23, 1955, at St. Brenda's Nursing Home, Bristol, to Doris (formerly Lemmon), M.B., B.Chir., wife of David F. Ringrose, L.D.S., of Bitton, Glos., a daughter.

Turner.—On January 31, 1955, at Burnley, Lancs., to Dr. Helen Turner, wife of Dr. Winston Turner, a daughter.

DEATHS

Acomb.—On January 21, 1955, in South Africa, John Acomb, M.B., B.S., D.L.O., of Linton, late of York, Yorks.

Allen.—On January 19, 1955, at Allendale, Coonoor, South India, Charles Harry Powell Allen, M.R.C.S., L.R.C.P., Lieutenant-Colonel, I.M.S., retired.

Aung.—On January 18, 1955, at Edinburgh, Shway Hla Aung, M.B., B.S., of Rangoon, Burma, aged 33.

Bell.—On January 29, 1955, at the Manor House, Buckden, Huntingdon, Arthur Sydney Gordon Bell, M.R.C.S., L.R.C.P., Surgeon Commander, R.N., retired.

Boone.—On January 27, 1955, at Hove, Sussex, William Brooke Boone, B.M., B.Ch., of Hillborough Terrace, Ilfracombe, Devon.

Brown.—On January 29, 1955, at the Long House, Little Strickland, near Penrith, Westmorland, Peter Otho Watkin Brown, M.B., C.M., late of Alderley Edge and Nethy Bridge, Inverness-shire, aged 88.

Burns.—On January 20, 1955, Henry Burns, O.B.E., M.B., Ch.B., Surgeon Commander, R.N., retired.

Butterworth.—On January 21, 1955, at Borth, Cardiganshire, John Butterworth, M.R.C.S., L.R.C.P., J.P., formerly of Middleton, Lancs., aged 83.

Castell.—On January 1, 1955, at his home, Finchley, London, N., Samuel Percy Castell, M.B., aged 61.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Collapse due to Adrenaline in Dental Analgesic

Q.—What is the most efficient dental local analgesic injection for a patient who is intolerant of adrenaline? The patient has twice had a serious collapse after these injections in the dentist's chair, but wants to avoid a general anaesthetic.

A.—"Cobefrin," an isomer of adrenaline, can be used as an alternative to adrenaline and is said to produce less general disturbance than the latter. Alternatively procaine can be used by itself, or better still the newer local analgesic solution "xylotox," which contains lignocaine hydrochloride in Ringer's solution. This itself produces a vasoconstrictor action and hence eliminates the need for adrenaline.

Diagnosis and Treatment of Psychosomatic Disorders

Q.—What are the positive points to look for in making a diagnosis of a psychosomatic disorder? I often see patients with vague complaints of pain, in whom every investigation is negative, and suspect that some of these pains are psychosomatic in origin. Having made such a diagnosis, what should I do then? Often a patient reacts very violently to any suggestion that he should be seen by a psychiatrist.

A.—The term psychosomatic is used in two ways: (1) To describe a disability dependent upon emotional factors (for example, anxiety) which are expressed either as a symptom without an objective organic lesion or as a physical disturbance (for example, peptic ulcer) whose existence may be verified by the usual methods. The emotional disturbance affects the soma through the autonomic system. (2) Of a disability, predominantly or wholly organic in origin, which leads to an emotional disturbance (for example, worry following the amputation of an arm).

An affirmative diagnosis of psychosomatic illness requires a careful history of the present illness, and in particular an atmosphere of emotion at the onset of the illness should be looked for. The emotion may be prolonged and figure largely in the clinical picture. The patient's description of the illness is generally overcoloured. Often, too, there will be a collection of medical reports with inconclusive diagnoses. A note should also be taken of the patient's reaction to past events such as the demands of school, work, marriage, and previous ill-health. Soon a picture of his personality will emerge. Happy and harmonious people do not develop psychosomatic complaints. The practitioner therefore should ask himself, What made this person ill? The answer will involve an assessment of the relative importance of those constitutional, environmental, and personal elements which predisposed the patient to develop the signs and symptoms he now has.

Vague complaints of pain, if persistent and without organic change, suggest a diagnosis of conversion hysteria or of an anxiety state. Presumably "every investigation" does not include a psychological investigation. Exhaustive physical examinations alone may induce an iatrogenic neurosis.

In treatment, a wise course is to affirm the reality of the illness, to state its nature as partly physical and partly emotional, and to explain that it is not due to "imagination" or "lack of will-power." Further, that for advice on treatment the help of a specialist—that is, a psychiatrist—would be desirable. Should the patient find this suggestion distasteful the physician should express regret and, without argument, he should recommend the patient to think it over.

If the patient, after reflection, still refuses the consultation it should be assumed that he has some misconceptions about psychiatrists or some shyness about the questions he fancies he might be asked. Both topics should be discussed frankly.

Treatment of Hodgkin's Disease

Q.—Would you kindly tell me if anything is known in this country about the treatment of Hodgkin's disease by a mould, actinomycin C? This substance is used, I believe, in Germany. What do you consider the best treatment for this disease?

A.—Actinomycin C, which is related to actinomycin A, was tried as a chemotherapeutic agent against human malignant disease in Germany. According to Schulte, the substance was inactive in carcinoma and in leukaemia, but had a temporarily beneficial effect in Hodgkin's disease. Most of the cases treated had concurrent radiotherapy; however, a few who were treated exclusively with actinomycin C showed a temporary reduction in the size of superficial tumours. Mediastinal masses, however, were unaffected. Recently a number of trials of actinomycin C ("sana-mycin") have been made in France. The results of these trials² showed a very limited response in a very small proportion of the cases of Hodgkin's disease. Its side-effects included stomatitis and diarrhoea.

In the author's opinion the published results with actinomycin C are inferior to those obtained with nitrogen mustard or T.E.M. (triethylene melamine). Both nitrogen mustard and T.E.M. will produce a remission of several months in most cases. Actinomycin C is said not to affect the veins on injection, as occurs with nitrogen mustard. This advantage can also be claimed for T.E.M., which is an oral preparation. The depressant effect on bone marrow is apparently less with actinomycin; this would be an advantage over both nitrogen mustard and T.E.M. if the clinical effectiveness of actinomycin was as great. This does not seem to be the case.

None of the chemotherapeutic agents so far described can yet replace radiotherapy in the treatment of the early or moderately early case of Hodgkin's disease. When radiotherapy can no longer be employed, or in the late generalized case, chemotherapy with nitrogen mustard or T.E.M. is valuable in affording one or more remissions of the disease. In the still later stages a further remission can be obtained in some cases with A.C.T.H. or cortisone.

REFERENCES

¹ Schulte, G. (1952). *Z. Krebsforsch.*, 58, 500.

² *Presse méd.*, 1954, 62, 737.

Distended Bladder in a Child

Q.—When examining the abdomen of a boy aged 4 years 7 months who was suffering from diarrhoea and vomiting, I found his bladder distended almost to the umbilicus. With small encouragement he passed a pint (570 ml.) of urine without discomfort. He has no phimosis, pin-hole meatus, or obvious cause for retention of urine. His distended bladder seemed to cause him no discomfort. Are such cases unusual? Do they require watching or active treatment?

A.—A bladder as full as this is found now and then in the course of examining children, and is of no consequence provided that, as in this case, the child is able to pass urine normally. It probably results simply from the dislike of some children of asking to go to the lavatory, or if in bed of asking for the pot, until the very last minute. No treatment is indicated.

A distended bladder may occur in chronic constipation of severe degree, but the latter is then obvious on account of the faecal lumps in the loaded colon. Bladder neck obstruction or a urethral valve will cause chronic distension of the bladder. In this case, if micturition is watched the stream is seen to be feeble and intermittent, and the bladder is not usually fully emptied.

Prolapse in Young Women

Q.—Is it worth carrying out an operative repair in young women with prolapse, or does the likelihood of further pregnancies make this a waste of time?

A.—Youth and the possibility of further childbearing do not contraindicate operative treatment for prolapse, but they may call for modifications in surgical technique. In particular, every effort should be made to avoid amputating the cervix at the time of colporrhaphy, for this may lower fertility, cause abortion, or complicate labour. Indeed, every delivery following amputation of the cervix should be carried out in hospital.

If the operation is restricted to anterior and posterior colporrhaphy, subsequent pregnancies are not likely to be complicated and the risk of a recurrence of prolapse is not very high. It is usually advisable, however, to carry out episiotomy in labour. Even if the prolapse should recur after further childbearing and require another operation, the original operation is not to be regarded as a waste of time. It is unreasonable to condemn women to endure a prolapse for many of what should be their most active years, their only consolation being that they will be made comfortable when they reach an age at which the comfort means less to them.

* * This answer is taken from the third book of *Any Questions?* Copies of the second and third books of *Any Questions?*, each containing some 200 expert answers, are available from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or through any bookseller, price 7s. 6d. a copy (postage 6d.). The third book contains a cumulative index.

Sea Travel for the Elderly

Q.—Are there any special contraindications to elderly people undertaking long voyages by liner? Are any special precautions advised?

A.—There are no special contraindications to elderly people undertaking long sea voyages provided they are in average good health.

If the voyage involves passage through tropical waters it is desirable that they should travel at a cool period of the year. May and September are both trying months in the Red Sea, and in the period June to September when the S.W. monsoon is blowing conditions are hot and humid in the Indian Ocean. Apart from this the individual should be instructed to carry out on board so far as is practicable the normal routine he has been accustomed to in his own home, from the point of view of both exercise and diet. When the weather is hot he will be well advised to cut down exercise, perhaps spend one or two days resting in bed during the hottest period of the voyage, and throughout the hot-weather period he should drink water freely and add a little salt to this water.

The passenger should be reassured by the knowledge that in case of need there is on board a competent medical staff.

Is Chlorbutol a Dangerous Preservative?

Q.—Chlorbutol is used as a preservative for some types of injection. Have any untoward effects been ascribed to it when used in this way?

A.—Chlorbutol has been used for nearly 50 years as a preservative for solutions of adrenaline and of posterior lobe extract for hypodermic injection, being present in a strength of 0.5%, and has not produced untoward effects. The preservative. The Council of Pharmacy and Chemistry of the American Medical Association recommends it as the best preservative for ophthalmic solutions, as it is non-toxic, non-irritant, and free from a tendency to produce sensitization. Chlorbutol can be used orally as a sedative and antispasmodic, for which purpose the dose is 0.3–1.2 g. general view about chlorbutol is that it is a safe and useful

It was the main constituent of Mothersills' remedy for seasickness. Toxicity does not arise with amounts less than 6 g. (90 gr.) by mouth.

REFERENCE

J. Amer. med. Ass., 1953, 152, 1631.

A Damp Cottage

Q.—A patient is worried because she has gone to live in an old cottage which in summer was dry but now shows a lot of damp patches on the walls of the ground-floor rooms. Is she running any real health risk, and, if so, of what?

A.—Tradition is in favour of this patient's fears. Science, however, has never demonstrated any direct deleterious result on a person in normal health living in a damp house. The fact that it is damp implies that the temperature inside tends to be less than that outside, owing to evaporation from the walls. The effect on the occupants will be to contract the skin capillaries, which some authorities consider may depress general immunity processes in some people, and in rheumatic subjects often to increase the pain suffered. But this can usually be counteracted by the installation of an adequate heating system.

Chickenpox, Zoster, and Poliomyelitis

Q.—Is there any evidence to suggest that an attack of chicken-pox or herpes zoster protects against poliomyelitis?

A.—No information is available on the question of whether previous exposure to varicella or zoster protects against poliomyelitis. It would seem unlikely on general grounds that such a widespread infection as chickenpox could protect against poliomyelitis without being noticed. It is certain that circulating antibody from previous infection with varicella-zoster virus is unlikely to have any protection against poliomyelitis, as the two viruses are antigenically unrelated.

NOTES AND COMMENTS

Fetishism.—OUR EXPERT writes: In your issue of January 29 (p. 302) Dr. Doris Odum comments on my reply to a question on this subject ("Any Questions?" January 15, p. 178). The female patients whom Dr. Odum considered to be suffering from fetishism were free from any kind of emotional disturbance and all were making a good adjustment to life. She adds that the condition—that is, fetishism—was not due to any morbid tendency but represented "an alternative or supplementary form of sexual gratification." She implies that any object which excites erotic feelings is a fetish. But this is not the sense in which the term is used in psychiatric literature. The true fetishist finds that coitus is impossible without the fetish object or the phantasy of it. There is no question of having the fetish as "an alternative or supplementary form of sexual gratification."

Dr. Odum implies that fetishism is common among women, but unrecognized because they do not talk of such socially unacceptable matters. This is not very convincing, for male fetishists have exactly the same reluctance and even during psychotherapy there is hesitation in mentioning the subject. One or two examples of fetishism in women have been reported in psychoanalytical literature; yet few psychoanalysts have been dogmatic about the existence of fetishism in females. Other workers with wide experience say that they have never come across an example or that it is extremely rare. The writer has made considerable inquiry in the past from psychiatrists of different schools of thought and so far has been unable to find a single authenticated instance of fetishism in women. Hence the statement that fetishism does not seem to occur in women.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: Aitology, Westcent, London. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: Britmedads, Westcent, London. MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association, TELEPHONE: EUSTON 4499. TELEGRAMS: Medisecra, Westcent, London. R.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 19 1955

VARIOUS COMBINATIONS OF ISONIAZID WITH STREPTOMYCIN OR WITH P.A.S. IN THE TREATMENT OF PULMONARY TUBERCULOSIS

SEVENTH REPORT TO THE MEDICAL RESEARCH COUNCIL BY THEIR TUBERCULOSIS CHEMOTHERAPY TRIALS COMMITTEE*

The fifth report of the Medical Research Council trial of isoniazid (isonicotinic acid hydrazide) contained a broad comparison of the effects of two combinations of drugs—streptomycin plus isoniazid compared with P.A.S. plus isoniazid—on a total of 391 patients after three months' treatment (Medical Research Council, 1953c). It was concluded that the combination P.A.S. (sodium salt) 20 g. daily plus isoniazid 200 mg. daily was of the same order of effectiveness as streptomycin 1 g. daily plus isoniazid 200 mg. daily, and as streptomycin 1 g. daily plus P.A.S. (sodium salt) 20 g. daily. There was, however, only limited information on whether the dosage of streptomycin or of P.A.S. in combination with isoniazid, could be reduced from the above levels. As a result of an increase in the total of patients to 588, it is possible in the present report to give a detailed comparison of the clinical and bacteriological effects of two dosages of streptomycin, and two dosages of P.A.S. in combination with isoniazid, after three months' treatment. These patients were admitted to the trial between September 5, 1952, and July 31, 1953, when admissions ceased. The scope of this report has been further extended by including bacteriological findings for 241 patients whose treatment was continued for six months. A list of the 51 hospitals and the names of the co-operating clinicians, bacteriologists, and pathologists are given at the end of the report. The trial was co-ordinated by the late Dr. Marc Daniels and by Dr. Wallace Fox, of the Council's Tuberculosis Research Unit; Dr. Fox and Dr. Ian Sutherland (of the Council's Statistical Research Unit) analysed the present results and prepared the report. Radiographic assessments were made by Dr. L. G. Blair. The isoniazid used throughout the trial was supplied as "nydrazid" by E. R. Squibb and Sons.

1. PLAN AND CONDUCT OF THE TRIAL

The plan and conduct of the trial are only briefly referred to here, as they have been described in detail in earlier reports (Medical Research Council, 1952, 1953a).

*Members of the Committee: Sir Geoffrey Marshall (chairman), Professor J. W. Crofton, Professor R. Cruickshank, Dr. Wallace Fox, Dr. J. E. Geddes, Professor F. R. G. Heaf, Professor A. Bradford Hill, Dr. J. V. Hurford, Dr. D. A. Mitchison, Professor W. D. M. Paton, Dr. J. G. Scadding, Dr. Norman Smith, Dr. P. D'Arcy Hart (secretary).

1. Type of Case

Certain basic requirements were laid down for all cases accepted into the trial. At the start of treatment:

- (a) Tubercle bacilli must have been demonstrated.
- (b) The tubercle bacilli, so far as was known, must not have been streptomycin-resistant or P.A.S.-resistant. (Any patient subsequently found to have had streptomycin-, P.A.S.-, or isoniazid-resistant organisms at the start of treatment has been excluded from the analysis: see Appendix.)
- (c) The patient must not have had more than 15 g. streptomycin or 300 g. P.A.S. (sodium salt) within the previous three months, and not more than 3 g. isoniazid at any time.
- (d) The patient must not have had any form of collapse therapy present on the side of the lesion requiring treatment.

Cases satisfying the above requirements were admitted to the trial in one of three main disease groups: (1) acute rapidly progressive pulmonary tuberculosis believed to be of recent origin; (2) other forms of pulmonary tuberculosis considered suitable for chemotherapy: *this group included a wide range of disease, and contained both acute and chronic cases*; (3) chronic forms of pulmonary tuberculosis expected to make only a limited response to streptomycin plus P.A.S.

2. Treatment

When a patient had been accepted for the trial, treatment was allocated by the Tuberculosis Research Unit from confidentially held prearranged lists based upon random sampling numbers.

After admission to the trial and a preliminary week of investigation, all patients were kept under observation for six months. During the first three months the prescribed treatment was followed for every patient. During the second three months patients in disease group 3 continued on the same combination of drugs. For other patients the clinician was free either to continue the original combination or to undertake any other treatment, chemotherapeutic or otherwise.

In the phase of the trial now reported, four treatments were studied concurrently—namely:

SH: Streptomycin 1 g. daily, in one intramuscular injection, plus isoniazid 200 mg. daily, in two equal doses by mouth.

S2H: Streptomycin 1 g. in one intramuscular injection, twice a week, plus isoniazid 200 mg. daily, in two equal doses by mouth.

20 PH : P.A.S. (sodium salt) 20 g. daily, in four equal doses by mouth, plus isoniazid 200 mg. daily, in two equal doses by mouth.

10 PH : P.A.S. (sodium salt) 10 g. daily, in two equal doses by mouth, plus isoniazid 200 mg. daily, in two equal doses by mouth.

In one important disease subgroup (1A—acute rapidly progressive bilateral pulmonary tuberculosis of recent origin, in patients between the ages of 15 and 30) patients were randomly allocated, for ethical reasons, only to the SH and 20 PH series. Every other patient was allocated at random to one of the four treatment series.

Prior to exclusions, 195 patients were allocated to the SH treatment, 151 to S2H, 184 to 20 PH, and 122 to 10 PH. The larger totals in the SH and 20 PH series are accounted for by the patients in subgroup 1A. The number of patients allocated to the S2H series was not intentionally larger than the number in the 10 PH series; the difference has arisen by chance as a result of the operation of random allocation within each of the 51 hospitals. Sixty-four patients (9.8%) were excluded from the analysis of the clinical results for reasons detailed in the Appendix. Of these exclusions, 29 (4.4%) were unimportant, since the patients either did not conform to the basic requirements for entry or did not complete the week of preliminary investigation. The remaining 35 (5.4%), though relevant, are few in number and so are unlikely to have seriously distorted the results. After exclusions, the numbers remaining in the clinical analysis were 182 SH, 142 S2H, 159 20 PH, and 105 10 PH

patients. The numbers in each disease group are set out in Table I. It will be noted that the numbers of group 3 patients are very small.

Since patients in subgroup 1A (acute bilateral disease in young adults) were admitted only to the SH and 20 PH treatment series, a valid comparison of the relative efficacy of all four treatments SH, S2H, 20 PH, and 10 PH can be made only after excluding the patients in this subgroup. In the first part of the tables which follow, the findings for the four treatments are presented first for all patients except those in subgroup 1A. The findings for all the SH and 20 PH patients, including those in subgroup 1A, appear in the second part of each table; the results for patients in this important subgroup may be obtained from each table by subtraction.

II. CLINICAL PROGRESS

1. Condition on Admission

The treatment received by patients before they entered the trial was investigated. Ten patients on SH (5%), 9 on S2H (6%), 6 on 20 PH (4%), and 3 on 10 PH (3%) had already received one or more courses of chemotherapy, but not within the preceding three months. Thus 95% of the patients in the present analysis were receiving their first course of chemotherapy. Most were also newly diagnosed cases.

Table II shows the condition of patients before the start of treatment as reflected by their general condition (assessment by the clinician in charge), temperature, erythrocyte sedimentation rate (E.S.R. Westergren 200 mm. reading at

TABLE I.—Number of Patients Admitted to the SH, S2H, 20 PH, and 10 PH Treatments after September 5, 1952, and not Subsequently Excluded

	Treatment				All Patients
	SH Streptomycin 1 g. Daily Plus Isoniazid 200 mg. Daily	S2H Streptomycin 1 g. Twice a Week Plus Isoniazid 200 mg. Daily	20 PH P.A.S. (Sodium) 20 g. Daily Plus Isoniazid 200 mg. Daily	10 PH P.A.S. (Sodium) 10 g. Daily Plus Isoniazid 200 mg. Daily	
Group 1: Acute rapidly progressive pulmonary tuberculosis of recent origin:					
1A. Bilateral; ages 15-30	67	—	59	—	126
1B. Bilateral; other ages	42	48	29	37	156
1C. Unilateral; all ages					
Group 2: Other forms of pulmonary tuberculosis suitable for chemotherapy	68	83	62	63	276
Group 3: Chronic forms of pulmonary tuberculosis expected to make only a limited response to chemotherapy	5	11	9	5	30
All patients (excluding subgroup 1A)	115	142	100	105	462
All patients (including subgroup 1A)	182	142	159	105	588

TABLE II.—Condition on Admission of Patients Treated with Isoniazid in Combination with Streptomycin or with P.A.S.

Treatment	Total	General Condition				Average Evening Temperature in Pre-treatment Week*				Erythrocyte Sedimentation Rate (Westergren 200 mm. Reading at 1 Hour)				Extent of Cavitation†			
		Good Fair Poor				Afebrile 99° F. or less 99-99.9° F. 100° F. or more				0-10 11-20 21-50 51 or more				Nil 1-plus 2-plus 3-plus			
		No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %
All patients (excluding subgroup 1A)	SH	115	40	35	45	30	56	49	29	18	16	12	21	28	44	38	33
	S2H	142	46	32	54	42	63	44	31	17	12	18	21	33	47	33	45
	20 PH	100	24	43	33	42	42	31	18	18	9	16	16	29	29	30	30
	10 PH	105	33	47	45	25	43	33	20	19	9	15	14	33	30	37	35
All SH and 20 PH patients (including subgroup 1A)	SH	182	51	28	73	40	75	41	49	27	34	24	27	35	55	71	39
	20 PH	159	31	19	67	42	53	33	54	34	29	23	17	34	40	58	36

* A patient was considered afebrile if every evening temperature in the pre-treatment week of investigation was below 99° F. (37.2° C.).

† Assessment on a single full-plate chest radiograph taken before treatment started. Tomograms were not taken into account.

‡ The sedimentation rate of one group 3 patient was not recorded.

one hour), and the extent of cavitation on a full-plate radiograph (as graded by the radiological assessor, who was unaware of the treatment series of any patient). It can be seen that, judging by the factors listed, the SH, S2H, 20 PH, and 10 PH patients had broadly similar distributions of severe and less severe illness; although the detailed figures are not presented in Table II, this applied to patients in disease groups 1 and 2 separately. When the patients in subgroup 1A were added the SH and 20 PH series still had very similar distributions of patients with severe and less severe illness.

2. Mortality

There were 7 deaths among the 588 patients (1.2%) during the three-month period of treatment—2 in SH patients, 3 in 20 PH patients, and 2 in 10 PH patients. Of these, 3 died within a week of starting treatment—a 20 PH and a 10 PH patient in group 1 and a 10 PH patient in group 2. Two others (both 20 PH, group 1) died within a month, the disease in each having pursued a steadily deteriorating course. One of these patients died after 21 days, the other after 30 days; for the latter, treatment was stopped 10 days before death because the patient was too ill to swallow. The remaining 2 deaths (both SH, group 1) occurred after 5 and 12 weeks. All the deaths were due to pulmonary tuberculosis except for the last patient, who died from renal failure secondary to acute nephritis, confirmed at post-mortem examination. This patient had slight clinical and radiographic deterioration at one month

and showed further clinical and radiographic deterioration at the end of two months. The nephritis was diagnosed in the third month. A specimen taken from the lung at post-mortem examination yielded a strain on culture which was sensitive both to streptomycin and to isoniazid.

3. Toxicity

There is nothing further to add to previous reports (Medical Research Council, 1952, 1953) of the absence of severe toxicity to isoniazid, in the dosage used, over a three-month period. There were also no noteworthy toxic manifestations in patients who continued to receive the drug for the whole six months. Treatment was stopped in 6 patients because of severe toxic reactions attributed to P.A.S., and in 1 patient with a severe toxic reaction attributed to streptomycin (see Appendix). Toxicity to P.A.S. must therefore be considered a disadvantage of treatment with the combination P.A.S. plus isoniazid.

4. The Comparison Between the SH, S2H, 20 PH, and 10 PH Treatments

Radiographic Changes in the First Three Months.—Table III sets out the radiographic changes at the end of three months' treatment. The assessments were made at a reading of full-plate chest radiographs by the radiologist, who was unaware of the treatment of any patient. In assessing improvement or deterioration three degrees were

TABLE III.—Changes in Radiographic Appearances in the First Three Months

Treatment	Total	Improvement			No Change	Deterioration			Death
		3-plus	2-plus	1-plus*		1-minus	2-minus	3-minus	
	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %
Subgroups 1B and 1C: Acute rapidly progressive pulmonary tuberculosis of recent origin (excluding bilateral disease, ages 15-30)									
SH	42 101	10 24	15 36	15 36	0 0	0 0	0 0	0 0	2 5
S2H	48 100	7 15	19 40	16 33	3 6	1 2	2 4	0 0	0 0
20 PH	29 99	3 10	5 17	14 48	5 17	0 0	0 0	0 0	2 7
10 PH	37 100	5 14	14 38	9 24	6 16	2 5	0 0	0 0	1 3
Group 2: Other forms of pulmonary tuberculosis suitable for chemotherapy									
SH	68 99	15 22	18 26	20 29	15 22	0 0	0 0	0 0	0 0
S2H	83 99	11 13	25 30	23 28	21 25	1 1	2 2	0 0	0 0
20 PH	62 101	11 18	14 23	25 40	11 18	1 2	0 0	0 0	0 0
10 PH	63 101	7 11	13 21	29 46	11 17	1 2	1 2	0 0	1 2
All patients (excluding subgroup 1A)									
SH	115 100	26 23	36 31	35 30	16 14	0 0	0 0	0 0	2 2
S2H	142 100	18 13	44 31	45 32	29 20	2 1	4 3	0 0	0 0
20 PH	100 100	14 14	19 19	43 43	20 20	2 2	0 0	0 0	2 2
10 PH	105 100	12 11	28 27	40 38	19 18	3 3	1 1	0 0	2 2
All SH and 20 PH patients (including subgroup 1A)									
SH	182 101	38 21	59 32	56 31	25 14	1 1	1 1	0 0	2 1
20 PH	159 100	19 12	42 26	64 40	28 18	3 2	0 0	0 0	3 2

* The assessments for one SH and one 10 PH patient were made by the clinician in charge. The radiographs were subsequently lost.

TABLE IV.—Summary of Comparisons of Isoniazid in Combination with Streptomycin or with P.A.S. at the End of Three Months' Treatment

	All Patients (Excluding Subgroup 1A)				All SH and 20 PH Patients (Including Subgroup 1A)	
	SH Streptomycin 1 g. Daily Plus Isoniazid 200 mg. Daily	S2H Streptomycin 1 g. Twice a Week Plus Isoniazid 200 mg. Daily	20 PH P.A.S. 20 g. Daily Plus Isoniazid 200 mg. Daily	10 PH P.A.S. 10 g. Daily Plus Isoniazid 200 mg. Daily	SH Streptomycin 1 g. Daily Plus Isoniazid 200 mg. Daily	20 PH P.A.S. (sodium) 20 g. Daily Plus Isoniazid 200 mg. Daily
	No. %	No. %	No. %	No. %	No. %	No. %
General condition:						
Improvement 2-plus	(115)* 29	(142) 32	(100) 34	(105) 35	(182) 35	(159) 36
Improvement 1-plus	59	58	50	57	55	51
No change	10	9	14	6	9	11
Deterioration	0	1	0	0	0	0
Death	2	0	2	2	1	2
Weight:						
Gain 14 lb. (6.4 kg.) or more	(111) 38	(139) 58	(95) 41	(102) 48	(179) 42	(152) 40
" 7-13 lb. (3.2-6.3 kg.)	36	28	28	31	35	29
" less than 7 lb., or no change	23	12	24	19	20	24
Loss	4	2	6	2	3	7
Average gain in weight (lb.)	11.3	14.8	11.3	13.9	12.4	11.2
Temperature:						
Afebrile at 3 months (febrile at start)	(57) 79	(78) 72	(56) 82	(60) 73	(105) 75	(103) 83
Sedimentation rate:						
Fall to 10 or less from 21 or more, in 3 months	(72) 38	(100) 41	(64) 48	(72) 39	(127) 35	(118) 42

* The figures in parentheses indicate the total numbers of patients upon which the percentages are based.

allowed in each—namely, 1-plus, 2-plus, and 3-plus, and 1-minus, 2-minus, and 3-minus. Of 115 SH patients, 84% improved radiographically compared with 75% of 142 S2H patients, 76% of 100 20 PH patients, and 76% of 105 10 PH patients. Two-plus and 3-plus improvement also was more frequent under the SH treatment (54%) than under the other treatments (S2H 44%, 20 PH 33%, and 10 PH 38%). The differences between this percentage for the SH treatment and those for the 20 PH and 10 PH treatments attain statistical significance—that is, at the 5% level. There were no radiographic deteriorations and 2 deaths in the SH series, 6 deteriorations and no deaths in the S2H series, 2 deteriorations and 2 deaths in the 20 PH series, and 4 deteriorations and 2 deaths in the 10 PH series.

Changes in the other Clinical Assessments.—In Table IV are set out for the four treatment series the changes in the general condition and in the weight, and the resolution of pyrexia and the lowering of the sedimentation rate in the three-month period. Apart from weight changes the responses of the patients in the four treatment series were very similar. In the SH series, 38% of patients gained 14 lb. (6.4 kg.) or more, compared with 58% for the S2H series, 41% for the 20 PH series, and 48% for the 10 PH series. The average weight gains were 11.3 lb. (5.1 kg.) for the SH and 14.8 lb. (6.7 kg.) for the S2H patients, the difference being statistically significant. This difference may be related to disturbances associated with streptomycin injections in a proportion of patients (Riches, 1954). The corresponding averages were 11.3 lb. (5.1 kg.) for the 20 PH patients, and 13.9 lb. (6.3 kg.) for the 10 PH patients, the difference again being statistically significant. This difference is likely to be a result of greater gastro-intestinal disturbance to patients receiving the higher dosage of P.A.S.

The SH treatment was thus radiographically superior to any of the other three treatments. Otherwise the differences appear to be of little importance.

5. The Comparison Between all the SH and 20 PH Treated Patients

Radiographic Changes in the First Three Months.—The percentages of patients showing radiographic improvement were 84% for the 182 SH patients and 79% for the 159 20 PH patients (Table III). The proportion of patients showing 2-plus and 3-plus radiographic improvement was higher for the SH series (53%) than for the 20 PH series (38%), a difference that is statistically highly significant—that is, at the 1% level.

TABLE V.—Presence of Tubercle Bacilli at Single Examinations made at Monthly Intervals

Disease Group	Months after Entry to Trial	Treatment	Total Patients Examined		"Positive" Direct Examination*		"Scanty Positive" Direct Examination†		Direct Examination Negative and Culture Positive or Laryngeal Swab Positive		Direct Examination and Culture Negative; or Laryngeal Swab Negative	
			No.	%	No.	%	No.	%	No.	%	No.	%
All patients (excluding subgroup 1A)	1	SH	107	101	37	35	6	6	21	20	43	40
		S2H	135	100	41	30	15	11	35	26	44	33
		20 PH	95	100	25	26	12	13	26	27	32	34
		10 PH	99	99	27	27	7	7	31	31	34	34
	2	SH	102	101	15	15	6	6	25	25	56	55
		S2H	131	101	27	21	10	8	25	19	69	53
		20 PH	95	99	19	20	5	5	24	25	47	49
		10 PH	96	100	15	16	6	6	24	25	51	53
All SH and 20 PH patients (including subgroup 1A)	1	SH	105	100	8	8	4	4	14	13	79	75
		S2H	132	100	18	14	1	1	15	11	98	74
		20 PH	92	100	11	12	3	3	11	12	67	73
		10 PH	97	99	8	8	1	1	15	15	73	75
	2	SH	171	100	58	34	11	6	48	28	54	32
		20 PH	150	100	44	29	15	10	51	34	40	27
	3	SH	163	99	30	18	12	7	41	25	80	49
		20 PH	150	99	35	23	8	5	39	26	68	45
	3	SH	166	100	18	11	5	3	30	18	113	68
		20 PH	147	100	19	13	3	2	25	17	100	68

All patients were bacteriologically positive before treatment—that is, at least one pre-treatment specimen showed bacilli on direct examination or was positive on culture.

* Even if culture-negative.

† Defined as follows: only a few clumps of acid-fast bacilli found after five minutes' search.

Changes in the other Clinical Assessments.—The changes in the general condition and in the weight, and the resolution of pyrexia and the lowering of the sedimentation rate, are set out in Table IV. There is a close similarity in the responses of patients on the two treatments.

The SH treatment is thus clearly superior to the 20 PH treatment on the radiographic assessment, but in other respects the differences are small.

III. BACTERIOLOGY DURING THE FIRST THREE MONTHS

The bacteriological findings for three months were analysed for those patients whose clinical progress has been reported above. The bacterial content of the sputum was determined after one, two, and three months of treatment, and the development of bacterial resistance after two and three months. Sensitivity to isoniazid was tested for patients under each of the four treatments, to streptomycin for SH and for S2H patients, and to P.A.S. for 20 PH and for 10 PH patients.

The procedure for taking specimens, the technique for sensitivity tests to each of the three drugs, and the definitions of resistance and sensitivity have been described in detail in previous reports (Medical Research Council, 1953a, 1953b). The examinations of bacteriological specimens and the sensitivity tests to isoniazid and to streptomycin were made in the co-operating laboratories. The P.A.S.-sensitivity tests were all made in the reference laboratory (see Acknowledgments).

The result of a bacteriological examination, or of a sensitivity test, for a given month was accepted only if it was performed on a specimen collected not more than seven days before or after the appropriate date. When more than one such result was available, the one referring to a specimen taken on or nearest to the appropriate date was selected to avoid bias. Thus in all the bacteriological tables each item represents a number of patients for each of whom a single test was selected, and not a total of all the tests performed on a smaller number of patients.

1. Exclusions

In addition to the patients already excluded from the clinical analysis, a further 5 patients (3 SH, 1 S2H, 1 10 PH) have been excluded from the bacteriological analysis. No tubercle bacilli were seen or isolated from pre-treatment specimens for any of these patients, and although there was

no doubt of the diagnosis they did not conform to the bacteriological requirements on entry to the trial. Eleven patients have already been excluded (see Appendix) because they were found to have had bacilli resistant to at least one of the drugs on entry to the trial. The bacteriological as well as the clinical analysis is thus confined to patients whose organisms were sensitive at the start of the trial to both of the drugs they were receiving.

2. Bacterial Content of Sputum

The results at one, two, and three months of the selected single examinations of the sputum for tubercle bacilli are set out in Table V. The incidence of negative cultures increased each month, and the proportions were very similar for all four treatments. At one month 40% of the SH patients, 33% of the S2H, 34% of the 20 PH, and 34% of the 10 PH patients yielded specimens negative both on direct examination and on culture. The corresponding percentages at two months were 55%, 53%, 49%, and 53%, and by three months the percentages had increased to 75%, 74%, 73%, and 75% respectively. The findings for acute disease (group 1) and for the other lesions, both acute and chronic, considered suitable for chemotherapy (group 2) were very similar, and have not been tabulated separately.

When the progress of all the SH and all the 20 PH patients was compared there was again a close similarity in the responses of the two series; 68% of 166 SH patients and 68% of 147 20 PH patients yielded specimens negative both on direct examination and on culture at three months.

3. Sensitivity Tests

Isoniazid Sensitivity.—The results of the isoniazid-sensitivity tests are set out in Table VI. Comparing the four treatments, it can be seen that at three months 2

resistant strains were obtained from 22 patients with positive cultures on SH, 12 resistant strains from 30 similar patients on S2H, none from 24 patients on 20 PH, and 2 from 25 patients on 10 PH. The results for the SH, 20 PH, and 10 PH patients were alike, and satisfactory. The figures for the S2H series were less satisfactory, since the resistant cultures at three months represented 40% of all positive cultures, compared with 9% for the SH series, 0% for the 20 PH series, and 8% for the 10 PH series. When expressed as percentages of all the patients for whom cultures were undertaken, resistant strains were isolated from 9% of 132 S2H patients compared with 2% of 105 SH patients, 0% of 92 20 PH patients, and 2% of 97 10 PH patients. At two months the results for the S2H series were already inferior to those of the other series, for 6 resistant strains were obtained from 59 positive cultures (10%), whereas no resistant strains were isolated from any of the patients on the other three treatments. The inferiority of the S2H series compared with the other three treatments at three months is statistically significant.

In the second part of Table VI are set out the results for all the SH and 20 PH patients. At three months there were 3 resistant strains among 52 positive cultures from 166 SH patients. In the 20 PH series there were no resistant strains among 44 positive cultures from 147 patients. Each treatment therefore proved effective in preventing the emergence of isoniazid-resistant organisms over a period of three months.

Streptomycin Sensitivity.—The first part of Table VII compares the results of streptomycin-sensitivity tests in the SH and S2H patients. At three months there were no resistant strains among 22 positive cultures from 105 patients in the SH series, compared with 3 resistant strains among 31 positive cultures from 132 S2H patients.

TABLE VI.—Results of Isoniazid-sensitivity Tests in SH, S2H, 20 PH, and 10 PH Patients (excluding those found to have organisms resistant to any drug on entry to trial)

Months after Entry to Trial	Treatment	Total Patients with Culture Examined (a)	Culture-Negative (No Sensitivity Test Possible)	Culture-Positive but No Sensitivity Result Available	Total Results Available (b)	Patients Culture-positive with Sensitivity Tests						Total Resistant		
						Sensitive	Doubtful	Resistant				No. (c)	(c) as % of (b)	(c) as % of (a)
								Growth on 0.2 µg. per ml.	Growth on 0.2 µg. per ml. Not on 1	Growth on 1 µg. per ml. Not on 5	Growth on 5 µg. per ml. Not on 10			
All patients (excluding subgroup 1A)	2	SH	102	57	2	43	37	5	0	0	0	0	0	0
		S2H	131	70	2	59	48	5	1	3+	1	6	10	5
		20 PH	95	52	2	41	35	0	0	0	0	0	0	0
		10 PH	96	56	0	40	39	1	0	0	0	0	0	0
All SH and 20 PH patients (including subgroup 1A)	3	SH	105	83	0	22	20	0	0	2+	0	2	(9)*	2
		S2H	132	100	2	30	14	4	6	3	0	12	40	9
		20 PH	92	67	1	24	20	4	0	0	0	0	(0)	0
		10 PH	97	71	1	25	21	2	1	0	0	2	8	2
All SH and 20 PH patients (including subgroup 1A)	2	SH	163	78	3	82	73	8	1	0	0	1	1	1
		20 PH	150	75	3	72	65	7	0	0	0	0	0	0
	3	SH	166	114	0	52	47	2	0	2+	0	1	3	6
		20 PH	147	102	1	44	40	4	0	0	0	0	0	0

* Percentages based upon fewer than 25 observations are enclosed in parentheses as an indication of the small totals.

† One of these cultures showed growth on 5 µg. per ml., but was not tested on higher concentrations.

TABLE VII.—Results of Streptomycin-sensitivity Tests in SH and S2H Patients (excluding those found to have organisms resistant to any drug on entry to trial)

Months after Entry to Trial	Treatment	Total Patients with Culture Examined (a)	Culture-Negative (No Sensitivity Test Possible)	Culture-Positive but No Sensitivity Result Available	Total Results Available (b)	Patients Culture-positive with Sensitivity Tests				Total Resistant		
						Sensitive	Moderately Resistant (Ratio 8 to 99)	Strongly Resistant (Ratio 100 or More)	No. (c)	(c) as % of (b)	(c) as % of (a)	(c) as % of (a)
All patients (excluding subgroup 1A)	2	SH	102	57	2	43	42	1	1	2	1	1
		S2H	131	70	2	59	57	2	2	3	2	2
	3	SH	105	83	0	22	22	0	0	(0)*	0	0
		S2H	132	100	1	31	28	2	3	10	2	2
All SH patients (including subgroup 1A)	2	SH	163	78	4	81	80	1	1	1	1	1
		SH	166	114	1	51	50	1	1	2	1	1

* Percentages based upon fewer than 25 observations are enclosed in parentheses as an indication of the small totals.

Full information on the ability of the SH combination to prevent the emergence of streptomycin-resistant strains is obtained when the results for the patients in subgroup 1A are included. At three months there was only 1 resistant strain among 51 cultures from a total of 166 SH patients.

P.A.S. Sensitivity.—The first part of Table VIII compares the results of P.A.S.-sensitivity tests in the 20 PH and 10 PH series. At three months 1 resistant strain was obtained from 22 positive cultures from 92 patients on 20 PH compared with 1 resistant strain from 23 positive cultures from 97 patients on 10 PH. Each combination is thus effective in preventing the emergence of bacilli resistant to P.A.S. over a three-month period.

When the results for the patients in subgroup 1A are included, there were 2 resistant strains among 75 positive cultures in the 20 PH patients at two months, and 1 resistant strain among the 40 positive cultures from 147 patients at three months.

IV. SENSITIVITY TESTS AT FOUR, FIVE, AND SIX MONTHS

During the second three months the original combination of drugs was continued for the few patients in disease group 3, and for other patients selected by the clinician. A total of 67 SH, 78 S2H, 58 20 PH, and 38 10 PH patients continued on their original drug combination, the majority doing so for the whole of the second three months. There were, however, some changes of dosage. In 29 of the 67 SH patients the dosage of streptomycin was reduced (to 1 g. three times or to 1 g. twice a week), and in 9 of the 78 S2H patients it was increased. In 3 of the 58 20 PH patients the dosage of P.A.S. was reduced, and in 2 of the 38 10 PH patients it was increased. Collapse therapy, usually a

pneumoperitoneum, was induced in the second three months for 45% of the SH patients, 33% of the S2H patients, 28% of the 20 PH patients, and 32% of the 10 PH patients.

The results of sensitivity tests for these patients have been used to study the subsequent course of the pattern of resistance which emerged for each combination of drugs in the first three months. Because the groups of patients who continued on their original combination were not drawn at random, they may not be representative samples from the four treatment series. Analyses were therefore undertaken to investigate this point. The clinical condition of the patients on admission to the trial is set out in Table IX. A comparison of this Table with Table II shows that the subgroups of S2H, 20 PH, and 10 PH patients who continued on their original drug combination had an initial distribution of severe and less severe illness which was similar to that of the groups from which they were respectively drawn. The subgroup of SH patients who continued on the combination was initially more ill than its parent group, notably in extent of cavitation; this slight disadvantage may have biased the results towards the emergence of bacterial resistance (Medical Research Council, 1948, 1952, 1954; Howlett *et al.*, 1949; Tucker, 1949; Bignall *et al.*, 1950; Lotte and Poussier, 1953).

The results of sensitivity tests at three, four, five, and six months for the four subgroups of patients are given in Tables X-XII. By comparing the three-month results for the patients who continued on the prescribed combination with the three-month results for the full series of patients in Tables VI-VIII respectively, it can be seen that the proportion of resistant strains isolated from each subgroup is similar at three months to the proportion in the parent group. As a consequence of the similarity in initial clinical

TABLE VIII.—Results of P.A.S.-sensitivity Tests in 20 PH and 10 PH Patients (excluding those found to have organisms resistant to any drug on entry to trial)

	Months after Entry to Trial	Treatment	Total Patients with Culture Examined (a)	Culture-negative (No Sensitivity Test Possible)	Culture-positive but No Sensitivity Result Available	Patients Culture-positive with Sensitivity Tests				Total Resistant		
						Total Results Available (b)	Sensitive	Moderately Resistant (Ratio 8 to 99)	Strongly Resistant (Ratio 100 or More)	No. (c)	(c) as % of (b)	(c) as % of (a)
All patients (excluding subgroup 1A)	2	20 PH	95	52	0	43	41	2	0	2	5	2
		10 PH	96	56	3	37	37	0	0	0	0	0
All 20 PH patients (including subgroup 1A)	3	20 PH	92	67	3	22	21	0	1	1	(5)*	1
		10 PH	97	71	3	23	22	1	0	1	(4)	1
	2	20 PH	150	75	0	75	73	2	0	2	3	1
	3	20 PH	147	102	5	40	39	0	1	1	3	1

* Percentages based upon fewer than 25 observations are enclosed in parentheses as an indication of the small totals.

TABLE IX.—Condition on Admission of those Patients who Continued on the Prescribed Combination of Drugs beyond Three Months

	Treatment	Total	General Condition				Average Evening Temperature in Pre-treatment Week*				Erythrocyte Sedimentation Rate (Westergren 200 mm. Reading at 1 Hour)				Extent of Cavitation†																		
			Good	Fair	Poor	Afebrile	99° F.	99-99.9° F.	100° F. or More	0-10	11-20	21-50	51 or More	Nil	1-plus	2-plus	3-plus																
			No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %	No. %															
All patients (excluding subgroup 1A)	SH	44	100	10	23	17	39	17	39	8	18	11	25	8	18	4	9	5	11	20	45	15	34	8	18	13	30	18	41	5	11		
	S2H	78	100	22	28	31	40	25	32	36	46	24	31	7	9	11	14	9	12	15	19	31	40	23	29	17	22	26	33	27	35	8	10
	20 PH	39	100	8	21	15	38	16	41	16	41	11	28	7	18	5	13	6	15	6	15	17	44	10	26	11	28	10	26	12	31	6	15
	10 PH	38‡	100	18	47	13	34	7	18	16	42	13	34	8	21	1	3	8	21	8	21	13	34	8	21	17	45	7	18	14	37	0	0
All SH and 20 PH patients (including subgroup 1A)	SH	67	100	15	22	24	36	28	42	20	30	18	27	16	24	13	19	6	9	7	10	29	43	25	37	9	13	17	25	34	51	7	10
	20 PH	58	100	10	17	23	40	25	43	18	31	19	33	11	19	10	17	7	12	6	10	26	45	19	33	14	24	13	22	19	33	12	21

* A patient was considered afebrile if every evening temperature in the pre-treatment week of investigation was below 99° F. (37.2° C.).

† Assessment on a single full-plate chest radiograph taken before treatment started. Tomograms were not taken into account.

‡ The sedimentation rate of one group 3 patient was not recorded.

condition, and the similarity in the results of sensitivity tests at three months, the analyses from four to six months have been regarded as continuations of the analyses for the first three months in the earlier tables. However, because the patients who continued on their original combination were not chosen at random at the end of the three months, the reliance which may be placed upon the conclusions for the second three months cannot be quite so firm as in the first three months.

For the patients in each series who stopped or changed chemotherapy before six months, the results are given for as long as the patient received the prescribed combination. The patients in disease subgroup 1A have been included in the Tables to increase the numbers.

Isoniazid Sensitivity.—Table X shows that at four, five, and six months very small numbers of positive cultures were obtained from patients on any of the four treatments and that only an occasional isoniazid-resistant strain was

TABLE X.—Results of Isoniazid-sensitivity Tests in Patients Treated with Streptomycin Plus Isoniazid or P.A.S. Plus Isoniazid for a Period of up to Six Months (excluding those found to have organisms resistant to any drug on entry to trial)

	Months after Entry to Trial	Total Patients with Culture Examined (a)	Culture-negative (No Sensitivity Test Possible)	Culture-positive but No Sensitivity Result Available	Total Results Available (b)	Patients Culture-positive with Sensitivity Tests						Total Resistant		
						No Growth on 0.2 µg. per ml.	Growth on 0.2 µg. per ml. Not on 1	Growth on 1 µg. per ml. Not on 5	Growth on 5 µg. per ml. Not on 10	Growth on 10 µg. per ml. Not on 50	Growth on 50 µg. per ml.	No. (c)	(c) as % of (b)	(c) as % of (a)
All patients on streptomycin 1 g. daily plus isoniazid (SH) for three months, and continuing on streptomycin plus isoniazid	3	65	46	0	19	18	0	0	0	0	1	1†	(5)*	2
	4	60	53	0	7	6	0	0	0	0	1	1†	(14)	2
	5	57	54	0	3	2	0	0	1	0	0	1†	(33)	2
All patients on streptomycin 1 g. twice weekly plus isoniazid (S2H) for three months, and continuing on streptomycin plus isoniazid	3	76	58	1	17	8	1	3	3	0	2	8‡	(47)	11
	4	70	55	0	15	6	0	2	2	0	5	9‡	(60)	13
	5	62	53	0	9	1	3	2	2	0	1	5	(56)	8
All patients on P.A.S. 20 g. daily plus isoniazid (20 PH) for three months, and continuing on P.A.S. plus isoniazid	3	56	38	1	17	15	2	0	0	0	0	0	(0)*	0
	4	49	41	1	7	6	0	1	0	0	0	1†	(14)	2
	5	46	44	0	2	1	0	0	1	0	0	1†	(50)	2
All patients on P.A.S. 10 g. daily plus isoniazid (10 PH) for three months, and continuing on P.A.S. plus isoniazid	3	36	30	0	6	5	0	1	0	0	0	1†	(17)	3
	4	33	31	0	2	1	1	0	0	0	0	0	(0)	0
	5	25	23	0	2	2	0	0	0	0	0	0	(0)	0
	6	27	25	0	2	2	0	0	0	0	0	0	(0)	0

* Percentages based upon fewer than 25 observations are enclosed in parentheses as an indication of the small totals.

† This was the first isoniazid-resistant strain to be isolated from this patient.

‡ Including 3 patients for whom this was the first isoniazid-resistant strain to be isolated.

§ Including 5 patients for whom this was the first isoniazid-resistant strain to be isolated.

TABLE XI.—Results of Streptomycin-sensitivity Tests in Patients Treated with Streptomycin Plus Isoniazid for a Period of up to Six Months (excluding those found to have organisms resistant to any drug on entry to trial)

	Months after Entry to Trial	Total Patients with Culture Examined (a)	Culture-negative (No Sensitivity Test Possible)	Culture-positive but No Sensitivity Result Available	Patients Culture-positive with Sensitivity Tests				Total Resistant		
					Total Results Available (b)	Sensitive	Moderately Resistant (Ratio 8 to 99)	Strongly Resistant (Ratio 100 or More)	No. (c)	(c) as % of (b)	(c) as % of (a)
All patients on streptomycin 1 g. daily plus isoniazid (SH) for three months, and continuing on streptomycin plus isoniazid	3	65	46	0	19	19	0	0	0	(0)*	0
	4	60	53	0	7	6	0	0	1†	(14)	2
	5	57	54	0	3	3	0	0	0	(0)	0
	6	60	58	0	2	2	0	0	0	(0)	0
All patients on streptomycin 1 g. twice weekly plus isoniazid (S2H) for three months, and continuing on streptomycin plus isoniazid	3	76	58	0	18	17	0	1	1	(6)	1
	4	70	55	1	14	13	0	1	1	(7)	1
	5	62	53	0	9	6	2	1	3‡	(33)	5
	6	64	55	0	9	6	1	2	3‡	(33)	5

* Percentages based upon fewer than 25 observations are enclosed in parentheses as an indication of the small totals.

† This was the first streptomycin-resistant strain to be isolated from this patient.

‡ Including 2 patients for whom this was the first streptomycin-resistant strain to be isolated.

TABLE XII.—Results of P.A.S.-sensitivity Tests in Patients Treated with P.A.S. Plus Isoniazid for a Period of up to Six Months (excluding those found to have organisms resistant to any drug on entry to trial)

	Months after Entry to Trial	Total Patients with Culture Examined (a)	Culture-negative (No Sensitivity Test Possible)	Culture-positive but No Sensitivity Result Available	Patients Culture-positive with Sensitivity Tests				Total Resistant		
					Total Results Available (b)	Sensitive	Moderately Resistant (Ratio 8 to 99)	Strongly Resistant (Ratio 100 or More)	No. (c)	(c) as % of (b)	(c) as % of (a)
All patients on P.A.S. 20 g. daily plus isoniazid (20 PH) for three months, and continuing on P.A.S. plus isoniazid	3	56	38	2	16	16	0	0	0	(0)*	0
	4	49	41	1	7	7	0	0	0	(0)	0
	5	46	44	1	1	1	0	0	0	(0)	0
All patients on P.A.S. 10 g. daily plus isoniazid (10 PH) for three months, and continuing on P.A.S. plus isoniazid	3	36	30	0	6	6	0	0	0	(0)	0
	4	33	31	0	2	2	0	0	0	(0)	0
	5	25	23	0	2	2	0	0	0	(0)	0
	6	27	25	0	2	2	0	0	0	(0)	0

* Percentages based upon fewer than 25 observations are enclosed in parentheses as an indication of the small totals.

isolated from the SH, 20 PH, and 10 PH patients. The experience of the S2H series was not so satisfactory; at four months 15 positive cultures were obtained from 70 patients, and 9 of these were resistant to isoniazid. At five months 5 of 9 positive cultures obtained from 62 patients were resistant, and at six months 8 of 9 positive cultures from 64 patients were resistant. It may be concluded that this further study of isoniazid sensitivity under the four treatments has yielded very few positive results for sensitivity studies, an observation which is in itself of considerable importance. But, in addition, such sensitivity results as are available confirm the unsatisfactory nature of the S2H treatment in that it fails to prevent the emergence of isoniazid-resistant organisms to the same extent as the other three combinations of drugs.

Streptomycin Sensitivity.—The results of the streptomycin sensitivity tests at three, four, five, and six months for patients in the SH and S2H series are given in Table XI. The SH patients fared very well. There was 1 streptomycin-resistant strain among 7 cultures at four months, none among 3 cultures at five months, and none among 2 cultures from 50 patients at six months. The results for the S2H patients were not quite so satisfactory. At five months 3 strains resistant to streptomycin were found among 9 positive cultures. At six months 3 streptomycin-resistant strains were again isolated from 9 positive cultures from 64 patients.

P.A.S. Sensitivity.—The results of the P.A.S.-sensitivity tests at three, four, five, and six months for patients in the 20 PH and 10 PH series are given in Table XII. Very few positive cultures were obtained after the third month in either series and none of the strains was resistant to P.A.S.

The Relationship of Resistance to Streptomycin and to Isoniazid in the S2H Series.—A further study was made of the 21 patients in the S2H series in whom resistance to streptomycin or to isoniazid emerged while the patient was receiving the combination. In 2 of these patients isoniazid and streptomycin resistance emerged simultaneously. In 1 patient streptomycin resistance alone emerged and there was no subsequent information. In the remaining 18 patients strains which were isoniazid-resistant but streptomycin-sensitive were obtained. No subsequent information was available for 8 of the patients. In the other 10 the strains were known to be sensitive to streptomycin in 3 patients one month later, in 1 patient two months later, and in 3 patients three months later; strains resistant to streptomycin emerged in 2 patients two months after, and in 1 patient three months after, the isoniazid-resistant strain.

The numbers of resistant strains with the other three treatments were too small for useful analysis.

V. ISONIAZID-SENSITIVITY TESTS IN PATIENTS WITH INITIALLY P.A.S.-RESISTANT STRAINS

Six patients, who were admitted, observed, and treated according to the requirements of the trial, were excluded from the above analysis because they were later found to have had bacilli resistant to P.A.S. on entry to the trial. Four received the 20 PH and 2 the 10 PH treatment for a period of at least three months. At two months there were 3 positive cultures, 1 of which was resistant to isoniazid. At three months 5 cultures were examined; 3 were positive and 1 of these was isoniazid-resistant. The 2 patients with isoniazid-sensitive strains at three months continued on the 20 PH treatment for two and for three more months respectively. At six months the former was culture-negative and the latter had an isoniazid-resistant strain. In all, 3 of the 6 patients yielded isoniazid-resistant strains while receiving P.A.S. plus isoniazid, at two, at three, and at six months respectively. In view of the association between the emergence of isoniazid resistance and the extent of initial cavitation (Medical Research Council, 1952, 1954; Lotte and Poussie, 1953), it is of interest to note that none of the 6 patients had extensive (3-plus) cavitation on admission to the trial. The result thus compares very unfavourably

with the total of 4 patients in whom isoniazid resistance emerged among the 264 20 PH and 10 PH patients with initially P.A.S.-sensitive organisms.

VI. DISCUSSION

In the fifth report of this trial (Medical Research Council, 1953c) a clinical and bacteriological comparison of streptomycin 1 g. daily plus isoniazid 200 mg. daily (SH) and P.A.S. (sodium salt) 20 g. daily plus isoniazid 200 mg. daily (20 PH) was presented for a period of three months. Larger groups of patients receiving these two treatments have now been studied, and it has been found that the treatments are of comparable efficacy in improving the general condition, in fostering weight gain, in resolving pyrexia, in lowering the sedimentation rate (Table IV), and in suppressing tubercle bacilli in the sputum (Table V). Both treatments are also very effective for three months in preventing the emergence of bacterial resistance to the drugs used (Tables VI-VIII). These findings confirm those in the fifth report. But it has now also been shown that the SH treatment is superior in the important radiographic assessment, 53% of the 182 patients showing substantial (2-plus or 3-plus) radiographic improvement, compared with 38% of the 159 20 PH patients, a statistically highly significant difference (Table III).

For 67 of the 182 SH patients and 58 of the 159 20 PH patients the clinician elected to continue the same drug combination beyond three months. For reasons given, the analysis of bacterial sensitivity for these patients during the second three months may be regarded as a continuation of the analysis in the first three months. At six months only 2 positive cultures, and these sensitive to both drugs, were obtained from 60 SH patients and there were no positive cultures from 47 20 PH patients. Combining the figures at four, five, and six months, a total of 12 positive cultures was isolated from the SH patients; one culture was resistant both to isoniazid and to streptomycin and another to isoniazid only; there were 2 isoniazid-resistant strains and no P.A.S.-resistant strains among the corresponding total of 9 positive cultures from 20 PH patients. Thus the bacteriological effectiveness of each combination was maintained for six months. The findings on isoniazid sensitivity for the subgroup of SH patients are particularly worthy of note, since the dosage of streptomycin in nearly half these patients was reduced at three months either to 1 g. three times or to 1 g. twice a week, and neither of the resistant strains occurred among these patients. Moreover, the SH patients who continued were in worse clinical condition on entry to the trial—particularly as regards extent of cavitation—than those in whom treatment was changed at three months.

In the phase of the trial reported here two other combinations were also studied, involving lower dosages of streptomycin or of P.A.S. These were streptomycin 1 g. twice a week plus isoniazid 200 mg. daily (S2H) and P.A.S. (sodium salt) 10 g. daily plus isoniazid 200 mg. daily (10 PH). A three-month clinical and bacteriological comparison of these two treatments, and of the SH and 20 PH patients admitted concurrently with them, is presented. For this comparison the patients in disease subgroup 1A (acute bilateral disease in young adults) have been excluded, since they were allocated only to the SH and 20 PH series. The analysis, which is based on 115 SH, 142 S2H, 100 20 PH, and 105 10 PH patients, shows that over a three-month period the four treatments were of similar efficacy, both clinically and in suppressing tubercle bacilli in the sputum, but the SH combination was radiographically superior to any of the other three treatments.

Judging from the results of bacterial sensitivity tests over a three-month period, the 10 PH treatment was of the same high order of effectiveness as the 20 PH treatment in preventing the emergence of strains resistant to either drug. There were no isoniazid-resistant strains among 24 positive cultures from 92 20 PH patients, although there were 2 among 25 cultures from 97 10 PH patients; each combination yielded 1 P.A.S.-resistant strain. (In view of the possible relevance of the dosage rhythm of P.A.S. to the

emergence of bacterial resistance to isoniazid, it should be noted that in both treatments each dose of P.A.S. consisted of 5 g. of the sodium salt.) On the other hand, at three months there were 12 isoniazid-resistant strains among 30 positive cultures from 132 S2H patients but only 2 among 22 cultures from 105 SH patients. The S2H treatment is thus much less satisfactory in preventing isoniazid resistance than any of the other three combinations, the differences being statistically significant. Moreover, streptomycin-resistant strains were found among 3 of the S2H patients and in none of the SH patients.

An analysis of sensitivity results for the 78 S2H and 38 10 PH patients who continued on their original drug combination beyond three months confirms these bacteriological trends. At four, five, and six months a total of 6 positive cultures was obtained from the 10 PH patients; none was resistant to either drug. The S2H treatment remained unsatisfactory; 9 of 15 positive cultures were isoniazid-resistant at four months, 5 of 9 at five months, and 8 of 9 at six months. There was 1 streptomycin-resistant strain at four months, 3 at five months, and 3 at six months.

There have been a number of other studies of streptomycin plus isoniazid, notably by the U.S. Public Health Service (Mount *et al.*, 1953; U.S. Public Health Service, 1953; Mount and Ferebee, 1954), by the U.S. Veterans Administration (1953, 1954), and by Pitts *et al.* (1953), in the main using streptomycin 1 g. twice a week. There is general agreement on the clinical effectiveness of the combination for periods of study of up to eight months. Bacteriologically, however, streptomycin 1 g. twice a week with daily isoniazid appears from these studies to be inadequate to prevent the emergence of resistance to isoniazid. The present trial gives the only information so far available on a comparison of daily streptomycin plus isoniazid and intermittent streptomycin plus isoniazid, in which the treatments were allocated concurrently and at random. The daily treatment is clearly superior when assessed bacteriologically for six months, and shows some radiographic superiority at three months.

Turning to the combination P.A.S. plus isoniazid, most other studies agree with the present report on its clinical value over a three-month period. Over a longer period of time there are differences of opinion. Favourable reports come from the U.S. Public Health Service (Mount and Ferebee, 1954) based on 303 patients treated for thirty-two weeks, from the U.S. Veterans Administration (1954), based on 75 patients treated for five to eight months, and from Thoren and Hinshaw (1952), based on 15 patients treated for six months. On the other hand, Ford (1953) reported initial improvement in 22 patients, "most of whom had reached the end of their therapeutic road," but the majority relapsed clinically during the second three months. However, 19 of the patients had received previous chemotherapy which included P.A.S., and no pre-treatment bacterial sensitivity tests were performed. Unfavourable reports also came from Joiner *et al.* (1954), based on 15 patients with chronic disease, but the authors state that the radiological assessments were inconclusive. It is reasonable to conclude, from the larger of these studies, that the clinical effectiveness of the combination P.A.S. plus isoniazid continues for many months.

There are also differences between the reports on bacterial sensitivity for patients on the combination P.A.S. plus isoniazid. The findings in the present study for a wide range of acute and chronic disease, in patients 95% of whom had received no previous chemotherapy and all of whom had sensitive organisms at the start of treatment, have been very satisfactory over a period of six months. They are in sharp contrast to the present findings for 6 patients with P.A.S.-resistant organisms initially, in 3 of whom isoniazid resistance subsequently emerged under treatment with P.A.S. plus isoniazid. The U.S. Veterans Administration (1954) also reported favourably on the combination for a period of five to eight months. As in the

present study, there was a lower incidence of isoniazid resistance with P.A.S. plus isoniazid than with streptomycin 1 g. twice a week plus isoniazid. Thoren and Hinshaw (1952), Ford (1953), and Joiner *et al.* (1954) gave unfavourable reports. However, neither of the first two studies presented pre-treatment sensitivity findings to P.A.S., so that it is difficult to appraise the unfavourable results of the isoniazid-sensitivity tests. Thoren and Hinshaw (1952) gave no information on the previous chemotherapy received by their cases, but 19 of the 22 patients in Ford's (1953) series had previously received chemotherapy which included P.A.S. Ten of the 15 patients treated by Joiner *et al.* (1954) had received previous chemotherapy, although all the strains were sensitive both to isoniazid and to P.A.S. at the start of the study. It may be concluded from the findings of the larger inquiries that the combination is satisfactory, both clinically and bacteriologically, for six or more months, at least in patients receiving their first course of chemotherapy.

This survey of the literature indicates the difficulty of assessing the value of a combination of drugs from studies of patients who have received previous courses of chemotherapy. Such patients are selected to some extent by virtue of failure to respond adequately to the earlier courses, and their response is thus likely to be prejudiced. Newly diagnosed cases of pulmonary tuberculosis are a much more suitable group for the study of the relative merits of chemotherapeutic combinations. First, whereas previously treated cases may have resistant organisms, there is at present a high degree of assurance that the organisms of newly diagnosed cases will be sensitive to any prescribed combination (though this must still be confirmed by sensitivity tests on pre-treatment specimens—Medical Research Council, 1953a; Thomas *et al.*, 1954). Secondly, newly diagnosed cases provide a wider variety of disease for study, ranging from minimal to far-advanced lesions, and from hyperacute to very chronic disease. Thirdly, they respond better to chemotherapy, and so will indicate the relative efficacy of different treatments more readily than cases in which chemotherapy has previously been used.

In conclusion, streptomycin 1 g. daily plus isoniazid 200 mg. daily is radiographically the most effective of the four treatments over a three-month period, though otherwise there is little to choose between them clinically. The treatment is also superior, but not greatly superior, to streptomycin 1 g. daily plus P.A.S. (sodium salt) 20 g. daily (Medical Research Council, 1953b). It thus represents the most effective combination studied at any stage of the trial.

On the other hand, treatment with streptomycin 1 g. twice a week plus isoniazid 200 mg. daily has proved less satisfactory in preventing the emergence of isoniazid-resistant organisms and, because of this, its use cannot be recommended as a primary chemotherapeutic measure. There is, however, evidence that it is bacteriologically effective as a continuation of a three-month course of daily streptomycin plus isoniazid.

The present report confirms the earlier finding (Medical Research Council, 1953c) that P.A.S. plus isoniazid is an effective combination, although it is not quite so powerful as daily streptomycin plus isoniazid. Further, there is little to choose between 20 g. and 10 g. P.A.S. (sodium salt) daily in combination with isoniazid 200 mg. daily, whether assessed clinically over a three-month period, or bacteriologically over a six-month period. Either combination of P.A.S. with isoniazid can therefore be considered a valuable form of combined chemotherapy in the treatment of pulmonary tuberculosis, and each has the great advantage that it can be administered entirely by mouth.

VII. SUMMARY

In the final stage of a clinical trial of isoniazid (isonicotinic acid hydrazide) in the treatment of pulmonary tuberculosis, 588 patients were studied in 51 hospitals: 182 were treated with streptomycin 1 g. daily plus iso-

niazid 100 mg. twice a day (SH); 142 with streptomycin 1 g. twice a week plus isoniazid 100 mg. twice a day (S2H); 159 with P.A.S., sodium salt, 5 g. four times a day plus isoniazid 100 mg. twice a day (20 PH); and 105 with P.A.S., sodium salt, 5 g. twice a day plus isoniazid 100 mg. twice a day (10 PH). When submitting a case the physician did not know which treatment the patient would receive, this being determined by random allocation. The present report analyses clinical and bacteriological results at the end of three months' treatment. Bacteriological results are also studied for 241 patients over a six-month treatment period.

The types of disease studied ranged from acute rapidly progressive disease to very chronic disease. Most of the cases were newly diagnosed; less than 5% had received previous courses of chemotherapy. All patients included in the analysis had organisms sensitive at the start of treatment to both of the drugs they were receiving.

Cases in an important subgroup (acute rapidly progressive bilateral disease of recent origin, in patients aged 15-30) were allocated only to treatment with SH (67 patients) or with 20 PH (59 patients). The report contains a comparison of the SH, S2H, 20 PH, and 10 PH treatments, excluding the patients in this subgroup, and a further comparison of the SH and 20 PH treatments, including these patients.

On admission, the four treatment series had similar distributions of patients with severe and less severe illness. At the end of three months' treatment the majority of patients had improved. In terms of general clinical condition, resolution of pyrexia, and improvement in the sedimentation rate, the differences between the four treatment series were small. The average weight gains were 11.3 lb. (5.1 kg.) for the SH, 14.8 lb. (6.7 kg.) for the S2H, 11.3 lb. (5.1 kg.) for the 20 PH, and 13.9 lb. (6.3 kg.) for the 10 PH patients.

Changes in radiographic appearances were independently assessed by a radiologist unaware of the treatment of any patient. Two-plus or three-plus improvement was seen in 54% of SH, 44% of S2H, 33% of 20 PH, and 38% of 10 PH patients. The differences between this result for the SH treatment and those for the 20 PH and 10 PH treatments attain statistical significance. There were no radiographic deteriorations and 2 deaths in the SH series, 6 deteriorations and no deaths in the S2H series, 2 deteriorations and 2 deaths in the 20 PH series, and 4 deteriorations and 2 deaths in the 10 PH series.

The proportions of patients bacteriologically negative, both on direct examination and on culture, at a single examination at three months were 75% in the SH, 74% in the S2H, 73% in the 20 PH, and 75% in the 10 PH series.

At three months bacillary resistance to isoniazid was found in 2 of 22 culture-positive SH patients, compared with 12 of 30 similar S2H patients, 0 of 24 20 PH patients, and 2 of 25 10 PH patients. Bacillary resistance to streptomycin was found at three months in 0 of 22 culture-positive SH patients and 3 of 31 S2H patients, and to P.A.S. in 1 of 22 culture-positive 20 PH patients and 1 of 23 10 PH patients.

The addition to the SH and 20 PH series of the results for the young adults with acute bilateral disease confirms both the radiographic superiority of the SH treatment and also the close similarity of the results with the SH and 20 PH treatments in other respects.

It is concluded, *judging solely from the results at three months*, that streptomycin 1 g. daily plus isoniazid 200 mg. daily is not only the most effective of the four treatments but also represents the most effective drug combination studied at any stage of the trial. Streptomycin 1 g. twice a week plus isoniazid 200 mg. daily is less satisfactory in preventing the emergence of isoniazid-resistant organisms, and its use as a primary chemotherapeutic measure cannot be recommended. P.A.S. plus isoniazid has proved itself a very effective combination of drugs, although it is not quite so powerful as daily streptomycin plus isoniazid. There is little to choose between the clinical and bacteriological efficacy of 20 g. and of 10 g. P.A.S. (sodium salt) daily plus isoniazid 200 mg. daily. Either combination of P.A.S. with isoniazid is a most valuable oral form of combined chemotherapy in the treatment of pulmonary tuberculosis.

A proportion of patients in each of the four treatment series continued on the same combination of drugs beyond three months. For reasons given the analysis of bacterial sensitivity for these patients during the second three months may be regarded as a continuation of the analysis in the first three months. The analysis, based on a total of 241 patients, confirms, for a period of six months, the adequacy of the SH, 20 PH, and 10 PH treatments, and the inadequacy of the S2H treatment, in preventing the development of bacterial resistance to isoniazid. Combining the figures at four, five, and six months, 2 of 12 positive cultures from SH patients, 2 of 9 from 20 PH patients, and 0 of 6 from 10 PH patients were found to be isoniazid-resistant. On the other hand, 9 of 15 strains from S2H patients were resistant to isoniazid at four months, 5 of 9 at five months, and 8 of 9 at six months.

A small group of patients with P.A.S.-resistant organisms on entry to the trial was not protected from the risk of development of isoniazid resistance during treatment with P.A.S. plus isoniazid.

APPENDIX

Exclusions from the Clinical Analysis

Nine patients were excluded before treatment was started:

- 2 died before the start of treatment (1 20 PH, 1 10 PH);
- 2 were too ill to be moved to hospital (1 SH, 1 S2H);
- 2 discharged themselves against medical advice (2 20 PH);
- 2 refused to go to hospital (2 SH);
- 1, although admitted, did not start treatment, because no positive sputum was obtained (SH).

Fifty-five patients were excluded after treatment had begun:

- 2 were found not to have had pulmonary tuberculosis (1 S2H, 1 20 PH);
- 4 were found to have had organisms resistant to streptomycin at the start of treatment (2 SH, 2 S2H);
- 6 were found to have had organisms resistant to P.A.S. at the start of treatment (4 20 PH, 2 10 PH);
- 1 was found to have had organisms resistant to isoniazid at the start of treatment (10 PH) (no check-test was performed in the reference laboratory);
- 7 were found to have had excessive recent chemotherapy (1 SH, 1 S2H, 4 20 PH, 1 10 PH);
- 5 were given the wrong treatment (1 SH, 2 S2H, 2 20 PH);
- 14 discharged themselves against medical advice—6 in the first, 7 in the second, and 1 in the third month (2 SH, 2 S2H, 3 20 PH, 7 10 PH);
- 2 were transferred to other hospitals in the first month for investigations of non-pulmonary complaints (1 20 PH, 1 10 PH);

- 1 was transferred to a mental hospital with a psychosis, in the second month (10 PH);
- 6 had severe toxic reactions attributed to P.A.S. (4 20 PH, 2 10 PH);
- 1 had a severe toxic reaction attributed to streptomycin (SH);
- 2 stopped treatment in the second month—one because of acute nephritis, the other because of persistent haemoptysis believed to be related to treatment (2 SH);
- 2 had a change of treatment in the first month: for one 10 PH patient streptomycin was added after eight days, and the dosage of P.A.S. was doubled, because of the serious clinical condition: for one 20 PH patient streptomycin was added after 18 days because of radiographic deterioration; this patient had 1-minus deterioration at one month, and the deterioration at three months was still classed as 1-minus;
- 2 had a change of treatment in the second month (2 20 PH): one patient had deteriorated both clinically and radiographically and the treatment was changed to SH at six weeks; at ten weeks a radiograph showed 1-plus improvement compared with the condition on admission: the other patient deteriorated radiographically and streptomycin was added at six weeks, but there was 2-minus deterioration at three months.

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RESULTS OF SURGICAL TREATMENT OF CARCINOMA OF THE LUNG*

BY

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In the treatment of cancer of the lung it is generally accepted that surgery alone offers any real hope of success. Up to the present time radiotherapy has played a part that is largely palliative, and the experiences gained by the combined use of radiotherapy and surgery are too limited to be of value. There are now large enough numbers of surgically treated cases on which a rough estimate of long-term results can be based, and in this article an analysis of personal cases operated on between the years 1940 and 1950 is made. The follow-up was carried out up to the end of 1953, which gives a five-year survival figure for cases operated on prior to 1948 and three-year survival figures for those treated in the subsequent two years.

Excision of a tumour of the lung is a practicable proposition so long as the mass can be actually removed and so long as the patient can sustain the inevitable loss of lung tissue. Pneumonectomy is regarded as the standard operation in the treatment of pulmonary cancer, though a more limited resection in the form of lobectomy can be carried out in certain circumstances. Improvements in all branches of thoracic medicine and surgery have been responsible for making lung resection a relatively safe technical procedure and in reducing the post-operative mortality and complications to reasonable limits. The lapse of time has now been long enough to permit evaluation of the results of operation.

Incidence

The steady annual ascent of the recorded death rate in relation to carcinoma of the lung is indicated by the Registrar-General's figures given in Table I. and, even allowing for a much greater awareness of the disease and for

*Based on a paper given at the Sectional Meeting of the American College of Surgeons, London, May, 1954.

improved methods of diagnosis, these give some idea of the magnitude of the problem. Stocks (1947) believes that the incidence shows a true increase during the past two or three decades, and gives the standardized death rate in males as having increased from 1.1 in 1910 to 10.6 in 1938. More recently the crude mortality rate per million living has doubled in ten years.

TABLE I.—Mortality Per Million Living (Registrar-General's Figures)

	1938	1943	1948	1953
Carcinoma bronchus	113	162	238	343
" " stomach	311	337	337	323

Figures for carcinoma of the stomach are added for comparison.

The proportion of patients suitable for surgery is depressingly small; figures have been given for an operability rate of as high as 15 to 25%, but these figures come from surgical centres where there has been a considerable measure of pre-selection, and in all probability obviously inoperable patients have been excluded. Reasons for declining operation lie in the size and position of the growth, metastasis, and in the age and general condition of the patient. The figures produced by Brian Taylor and Waterhouse (1950) showed that in over 1,500 patients not treated by surgery the average expectation of life was four months. In consequence, if surgery can produce results which allow survival beyond the average expectation of the untreated case it will have performed some service. For this reason, in analysing the figures we have classified the follow-up into deaths that occurred up to two years after operation and then considered the survivals for a period of five years.

Factors Influencing Operability

General Condition of the Patient.—The most obvious contraindication is the inability of the patient's respiratory function to withstand removal of part or whole of a lung. A rigid chest, gross emphysema, and chronic bronchitis are examples, and the presence of persistent bronchospasm is a potent factor in rendering the post-operative course hazardous. Cardiac disability, unless severe, is not such a serious hazard to surgery as might be supposed, and many patients whose hearts have been suspect have supported the operation well. Straightforward clinical observation has been found to be the most satisfactory guide in assessing cardio-respiratory function.

Age.—As measured in years age is not important (see Fig. 1); many men of 70 and over have had younger tissues than their fellows in lower age groups and have supported the operation well.

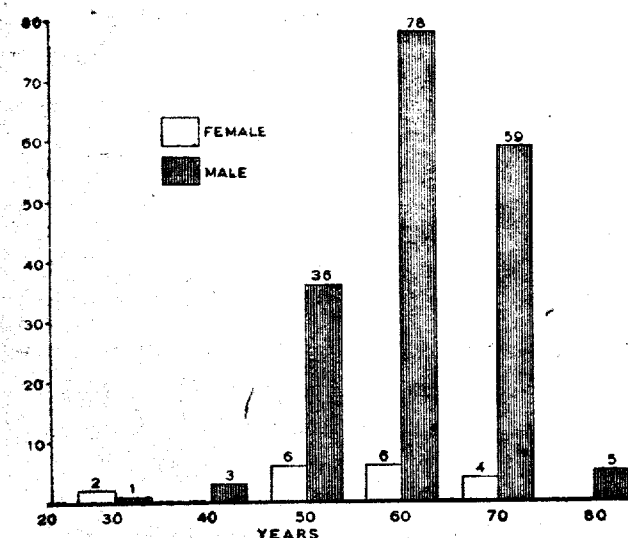


FIG. 1.—Age incidence in 200 pneumonectomies.

Site of Growth.—A mass placed in the centre of the lung field is a better immediate risk for surgery than one located close to the mediastinum. Growths at the apex are more likely to invade pleura and traverse it than those at the base, where the tumour may spread along the pleural layers for a considerable distance without invading the chest wall. When a pleural effusion is caused by spread of growth over the membrane the chances of a radical excision are small, but a clear effusion or even empyema does not necessarily preclude operation. Involvement of mediastinal structures by the growth itself or by glands is one of the most frequent causes of inoperability. Practically no case which has developed a vocal cord paralysis can be excised completely; the same applies to involvement of the phrenic nerve. Obstruction of the superior vena cava and invasion of the left auricle with the development of fibrillation are further contraindications, though a number of these cases have been explored on the faint hope that excision will prove practicable. Oesophageal obstruction resulting from pressure of enlarged glands is suggestive of inoperability, but not always. Invasion of the pericardium is often associated with a considerable amount of effusion into that sac, which, when incised, shows bulging of the tumour into the pericardium without actual penetration of that membrane. Spread of the actual growth along the pulmonary veins is well recognized, and the risk of embolism of fragments of growth as a result of manipulation have been pointed out by Aylwin (1951).

Size of Growth.—It is not always the largest growth that gives the worst prognosis. Many large breaking-down tumours have been removed successfully, with good later results. Most of these tumours have an expanding rather than an infiltrative character, and, with a well-defined oval or circular outline, may easily be mistaken for benign growths.

Type of Growth.—In the present series no case of so-called adenoma of the lung or bronchus has been included. I regard these tumours as entities requiring separate consideration. The histological character of the tumour has a considerable bearing on the surgical selection and on the prognosis. D. M. Pryce and J. B. Walter (personal communication, 1954) have investigated the cell types in two consecutive series of cases; the one was taken from necropsies and the other from operation specimens, many of which are included in the material for this article. In the necropsy series squamous-cell tumours were recognized in 20.1%, adenocarcinoma in 28.3%, oat cell in 37.1%, and polygonal in 10.7%. In the pneumonectomy or excision series squamous-cell tumours were 60.4% of the total, adenocarcinoma 15.5%, oat cell 15.9%, and polygonal 7.7%. If the necropsy series is regarded as representative of all cases of lung cancer then the operability rate for squamous-cell carcinoma is infinitely superior to that for the other cell types—a feature that is well recognized; but it is not so well appreciated that adenocarcinoma is almost as common as oat-cell tumours. In the follow-up by Pryce and Walter the end-results of operation for squamous-cell growths are superior to those of the other types. An interesting commentary on the prognosis of adenocarcinoma and oat-cell tumours is that, while it is commonly supposed that the latter give consistently bad results and that adenocarcinoma is a less sinister type, an analysis of their figures suggests that both these growths are equally unfavourable for surgery.

Regional Metastasis.—The existence of secondary deposits in the regional glands has a considerable influence on prognosis. In the first place, they may have infiltrated adjacent mediastinal structures: this is particularly the case when the subaortic group of glands have invaded the aorta or main pulmonary artery, or when glands have infiltrated the main bronchial bifurcation. Such a circumstance may well preclude operation. Secondly, there may be enlarged glands which can be removed, but in which a full surgical clearance is unlikely. In this group of cases the operation is more of a palliative than of a radical nature. In a third

group of cases the glands may be grossly enlarged, but on histological examination they are found to be of a secondary inflammatory character without metastases.

Type of Operation

The accepted operation is a dissection pneumonectomy with removal of the lung and glands *en bloc*. In the earlier cases in this series the pulmonary arteries and veins were secured individually as they emerged from the pericardium. More recently incision into the pericardium has allowed these vessels to be taken closer to the heart and has enlarged the scope of the operation and even allowed excision of part of the left auricle if necessary. In all cases the division of the bronchus was made as close to the carina as possible and the closure carried out by interrupted non-absorbable sutures. Various methods have been used from time to time to cover the bronchial stump and reduce the incidence of bronchial fistula, which has now fortunately become a less serious complication than it was in former years. Excision of the parietal pleura is carried out over the mediastinum in all cases and over areas where lung is adherent.

Lobectomy, though a less radical operation, has produced excellent results, sometimes apparently superior to pneumonectomy. The operative mortality is lower and the loss of lung function less, but the cases chosen for this operation are carefully selected and largely consist of small central tumours without gross glandular involvement.

Segmental resection is an operation that is not often performed deliberately, but is sometimes carried out under the mistaken impression that the condition is tuberculous or that the tumour is benign.

In no case was a simultaneous or post-operative thoracoplasty performed unless the presence of an empyema required some measure of chest-wall collapse. The fate of the phrenic nerve was problematical: in most cases the nerve was divided, though in some instances, particularly on the left side, it was left intact.

In discussing the results of surgery over a period of years some points in the development of thoracic surgery should be recalled. Pneumonectomy was practised successfully on occasions in the late 1930's, but it did not become a common routine or established procedure until some years later. Towards the end of the recent war the introduction of penicillin coincided with a number of improvements in technique and experience, all of which contributed to a decrease in mortality and morbidity even though more extensive operations were being undertaken. The volume of material has also increased with the greater realization of the frequency of the disease and the wider application of chest radiology, including mass radiography. In spite of many endeavours to achieve an earlier diagnosis and consequently to improve the surgical results, the average delay in 1950 between the early symptoms and operation was six months. This contrasts more favourably than the nine months which was the period of delay in 1940, but still leaves much to be desired.

Results

In an analysis of the operations performed between 1940 and 1950 a total of 689 thoracotomies were recorded and

TABLE II.—Type of Operation

	1940-8	1949-50	Total
Thoracotomy only	155	88	243
Pneumonectomy	227	137	364
Lobectomy	46	36	82

243 thoracotomies; 446 resections.

excision was undertaken on 446 occasions (Table II); this gives an approximate figure of two cases out of every three explored being operable. The "operative mortality" was taken to cover all patients who died in hospital or within

four months of operation. Of those who were submitted to resection 81 (18%) died; the figure for the period 1940-8 was 24%, but this fell in the subsequent two years to 9% (Table III, Fig. 2). There was one death in the lobectomy;

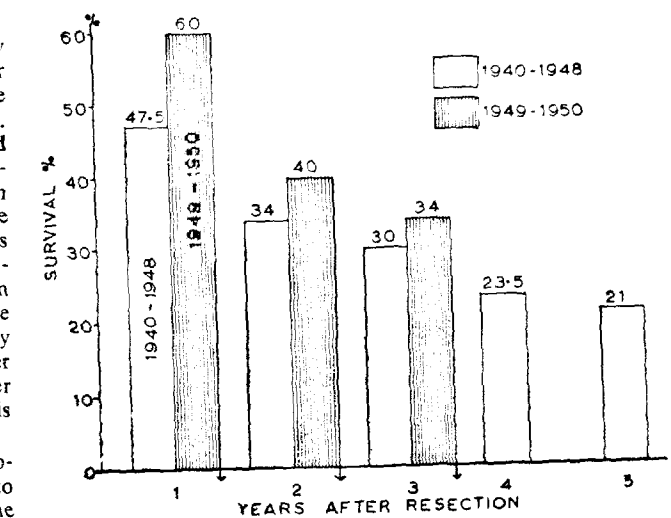


FIG. 2.—Survival rate.

TABLE III.—Results of Resection

	Resections	Deaths			Survivals			
		Following Operation	4-12 Months	1-2 Years	At End of 2 Yrs.	At End of 3 Yrs.	At End of 4 Yrs.	At End of 5 Yrs.
1940-48	273	66 (24%)	78 (28.5%)	36 (13%)	93 (34%)	81 (30%)	65 (23.5%)	57 (21%)
1949-50	173	15 (9%)	53 (31%)	35 (20%)	70 (40%)	59 (34%)	—	—

series, which consisted of 82 cases. A number of the patients included under the heading operative mortality had indeed recovered from the actual operation, but succumbed from respiratory complications or from distant metastases which were not recognized at the time of operation. In an analysis of a number of these early deaths it can be mentioned that death occurring within a week was largely caused by heart failure, pneumonitis, or respiratory insufficiency. A later complication sometimes leading to fatality, particularly in the earlier cases, was empyema consequent on a bronchial fistula.

Deaths which occurred within 4 to 12 months of the operation amounted to 131 (29%). The majority of these deaths followed early local recurrence or a distant secondary. Brain and suprarenal glands were common sites for these metastases, and there is little doubt that some of the former were caused by direct embolism of growth as a result of operative manipulation. In all, 47.5% of the patients who had the growth excised did not survive a year, and a further 16% were dead before a further two years had lapsed.

When dealing with survival figures two analyses have to be made: the period 1940-8 gives survival up to the end of five years, but the 1949-50 group can only give a three-year figure. It will be noted from Table III and Fig. 2 that the figures from this more recent group are superior to the earlier ones, largely as a result of the reduction of operative mortality; but as more advanced cases were undertaken there is a percentage increase in the deaths occurring before two years had passed. In the 1940-8 group 34% of the patients were alive at the end of two years, 30% at the end of three years, 23.5% at the end of four years, and 21% at the end of five years. At one time it was thought that if a patient survived operation without recurrence for two years his chances of long-term survival were good, but it would appear that three years must elapse

before there is any feeling of security. In the 1949-50 series 40% of the patients were alive at the end of two years and 34% at the end of three years. If these figures follow the pattern of the other group it would seem reasonable to suggest that a 25% survival at five years might be expected.

Many of those who have died are known to have died from causes other than recurrence of cancer of the lung; suicide, accident, and old age have all played some part in reducing the number of survivors. A number of those who have exceeded the five-year period are known to have lived longer than this arbitrary limit. My longest survivor is 15 years (a case not included in this analysis), and there are four who have lived 10 years, and a greater number who have passed the seven-year mark.

An analysis of any surgical results in the treatment of cancer is bound to be disappointing, and there would seem to be an impression that the results of treatment in lung cancer are so poor that surgery is not worth while. This is suggested by the number of patients who are treated conservatively or are referred for radiotherapy without being seen by a thoracic surgeon, who alone can give the best advice regarding the chances of operation in an individual case. In spite of the many disappointments there is a kernel of success and satisfaction in that at least 21% of the patients operated on survive the five-year period, and indeed in the more recent cases there is every reason to expect that this figure may be appreciably raised.

Summary

An analysis of personal cases of cancer of the lung operated on between 1940 and 1950 is made.

Of a total of 689 thoracotomies, 446 were found suitable for excision—an operability rate of about two-thirds of the cases explored.

A follow-up to the end of 1953 gave for cases operated on prior to 1948 a survival rate of 34% at the end of two years, 30% at three years, 23.5% at four years, and 21% at five years. In the 1949-50 series 40% were alive at the end of two years and 34% at three years.

It is thought that there is some satisfaction that at least 20% of these patients survived the five-year period. Moreover, the more recent cases suggest that this figure may be improved upon.

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According to the Annual Report for 1952 of the Chief Inspector of Mines, recently published, the number of persons killed in 1952 was a new low record, being 420, comparing with 487 in 1951 and an average of 583 in the previous ten years. Much of the improvement in 1952 was due to the absence of any great disasters: Deaths due to falls of ground were fewer than in the previous year's, but deaths due to haulage increased by 22 over the previous year's. "The numbers of fatalities in shafts and on the surface have shown no improvement in the last ten years or so—a state of stagnation which constitutes both a reproach and a challenge." The number of accidents required by law to be immediately reported involved 2,109 injured people, as compared with the 1951 figure of 1,942. People injured in accidents not immediately reportable but causing disablement for more than three days numbered 238,100, as compared with 234,400 in the previous year. But as more people were employed there was little change in the accident rate, which was one accident for every three employees. In the last decade fatal mining accidents have fallen by 52% and non-fatal by 25%. The safety organization of the National Coal Board continued to grow, but there were 33 vacancies in the mining inspectorate.

INTERMITTENT POSITIVE-PRESSURE RESPIRATION IN BULBO-SPINAL POLIOMYELITIS

USE OF THE RADCLIFFE RESPIRATION PUMP

BY

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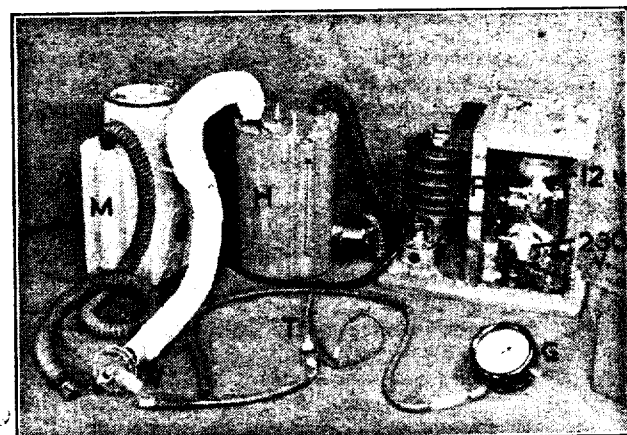
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The use of positive-pressure respirators driven either by hand or by machines has been described by Lassen (1953), Smith *et al.* (1954), and Macrae *et al.* (1954) in the treatment of bulbo-spinal poliomyelitis, where postural drainage combined with some form of tank respirator is not sufficient to prevent inhalation of secretions. Recently we have treated three such cases in the poliomyelitis unit at Nairobi, Kenya, all in male adults, and the Radcliffe respiration pump (Russell and Schuster, 1953) was used. One patient died from shock and hyperpyrexia; one died suddenly on the twenty-fifth day of illness, no cause



Recent modifications in the Radcliffe respiration pump (P), and accessories. The pump has alternative motors—one for 230 volts A.C. and the other for 12 volts D.C. The latter is very suitable for transporting patients by air or road. The gas meter (M) replaces the cumbersome spirometer. H=Humidifier. V=Expiration flutter valve. G=Gauge. T=Cuffed tracheotomy tube.

being found at necropsy; while the other was flown to Oxford, still using the Radcliffe pump, at the end of the eighth week and is making satisfactory progress.

Christie (1954) has pointed out the difficulty of clinical assessment and has emphasized the importance of being able to call on the services of the physiologist, the biochemist, the clinical pathologist, and the pharmacologist. Such assistance is generally available only at the larger medical centres, and the aim of this article is to point out to those working in more remote centres that simple clinical methods can be passably successful.

For a general description of the machine and method the reader is referred to the article by Smith *et al.* (1954). This machine has since been modified as shown in the accompanying illustration (Ritchie Russell, 1954, personal communication).

Type of Case.—Intermittent positive-pressure respiration (I.P.P.R.) through a cuffed endotracheal tube inserted into a tracheostome was reserved for those cases having respiratory embarrassment, an ineffective cough, inability to swallow, and pooling of secretions in the pharynx.

Tracheotomy

Andersen and Ibsen (1954) have described how local analgesia was abandoned as unsatisfactory in the Danish epidemic of 1952, and as this agreed with our previous experience it was decided that general anaesthesia should be used. All cases received thiopentone and succinylcholine chloride; atropine, 0.6 mg., was the only pre-medication. Small doses of thiopentone, 0.15-0.3 g., were used, but the usual dose of succinylcholine chloride, 2-3 ml. in divided doses, as the procedure took ten to fifteen minutes. In one case in which the operation was performed elsewhere and the services of an anaesthetist were not available, the dose of succinylcholine chloride was too small and disaster very nearly followed. The anaesthetist must have full immediate control of the patient, who may be in poor condition.

The steps of the procedure were as follows: (1) Aspiration of stomach with the Levine tube: this we regard as important, as regurgitation can occur without warning and a fatal outcome may result. (2) The patient's lungs were inflated with oxygen through a Waters to-and-fro unit from which the canister had been removed. (3) Thiopentone was given in a sleep dose only, followed by succinylcholine chloride, 1-1.4 ml., other syringes containing 0.5-0.7 ml. of succinylcholine chloride being available as required. In only one of our cases was there any weakness of the jaw muscles. (4) Laryngoscopy and laryngopharyngeal toilet. (5) Bronchoscopy and bronchial toilet. (6) Intubation with a plain endotracheal tube. (7) Tracheotomy, which under these circumstances can be done quietly and deliberately. Our surgical colleague commented on the difference between the ease of the operative procedure under this method and the difficulties he had experienced in previous cases under local analgesia. No window was made as suggested by Lassen (1953), and Macrae *et al.* (1954).

General Management and Treatment

Physiotherapy.—All joints were passively moved through their full range once daily. Splints were applied where necessary to prevent deformity. After about a month active exercises were instituted.

Antibiotics.—From admission, antibiotics were given in full doses, the choice depending on the sensitivity of organisms cultured on bronchial swabbing.

Other Drugs.—Phenobarbitone, 32 mg. t.d.s., and ephedrine hydrochloride, 16 mg. t.d.s., were given. Chloral, 1.3 g., was given at night. Paraldehyde intramuscularly or by mouth was used occasionally. Aspirin was used to allay the muscular pains and vitamin-B complex was given daily.

Investigations.—Blood urea estimations were done twice weekly. Bronchial swabs for culture were taken weekly. Urine chlorides were estimated daily. Total blood counts were performed at weekly intervals. Plasma proteins were estimated from time to time.

Fluid Intake and Diet.—Feeding was by means of a Levine tube. The aim was 3 litres of fluid and 2,500 calories daily. The salt intake was governed by the Fantus test for urinary chlorides and the protein intake by the blood urea.

Specific Management and Treatment

The endotracheal tube was changed every three days and deflated four-hourly. Macrae *et al.* (1954) have pointed out the danger of overinflation of the cuff. The cuff should be inflated slowly until air ceases to pass round it; this end-point can be detected by auscultation over the trachea, though sometimes it is not easy. If air enters both apices equally then the tube is not too far in. The management of the tube caused some difficulty at first, as it was not possible for an anaesthetist to be present all the time. The nursing staff quickly learned the dangers of these tubes, as attested by the fact that, during the three months in which the machines have been in continuous use, only on three occasions have emergencies arisen specifically from the cuffed tube. Twice the tube slipped into the right main bronchus, completely blocking the left; on the third occasion an old tube was used, and the very soft cuff herniated over the end of the shortened tube, giving a ball-valve effect. Air could be forced past the herniation but very little could escape. Releasing the cuff had little effect, and the herniation persisted even after the tube had been withdrawn from the trachea. This emergency almost ended in disaster, and since that time no tube has been used more than twice.

Pharyngeal, Tracheal, and Bronchial Toilet.—Suction was performed through the mouth and the endotracheal tube at regular intervals, also before and after turning, and whenever there was any evidence of pulmonary collapse or whenever the stroke of the pump seemed to be impeded. Posturing of the patient, especially into the prone position, with percussion and squeezing of the chest at the end of expiration, brought the secretions within range of the catheters. Bronchial catheters, soft rubber catheters, and Tieman catheters were used; the last-mentioned tended to cause some bleeding unless used very gently. Bronchoscopy was needed during treatment on only four occasions apart from the original surgical procedure: twice when the humidifier had been set at too low a figure and secretions had become dry and sticky; once when it had been thought that a considerable amount of secretion had run down past a deflated cuff; and once for pulmonary oedema, but bronchoscopy in this last condition seemed to do little if any good. The site of the cuff was inspected on each occasion, and appeared to be normal, except on one occasion when the left main bronchus showed a minor degree of excoriation, probably resulting from the too vigorous use of a Tieman catheter. Bi-weekly x-ray pictures were taken to check the clinical findings.

Humidification.—The apparatus described by Marshall and Spalding (1953) proved satisfactory. The temperature of the thermostat was originally set at 110° F. (43.3° C.), but was later increased to 130° F. (54.4° C.), as the sputum became too sticky at the lower figure. A fair amount of condensation occurred in the lagged tube, and care was taken to ensure that it sloped away from the Stott valve towards the humidifier.

Pressure Gauge.—It has been shown that if the pressure in the trachea does not fall to atmospheric level at the end of expiration the circulation will be affected (Courmand *et al.*, 1948; Motley *et al.*, 1948). The gauge at times needed readjusting by disconnecting it from the machine and resetting the pointer. The pressure on inspiration was not allowed to exceed 16 cm. of water. Common sites of leakage, as shown by a reduction of pressure, were round the cuff and at the Stott valve.

Increased Oxygen Percentage.—At first we tended to give extra oxygen through the side tap of the machine. This was later discontinued, as on only a few occasions was oxygen really needed and high flows upset operation of the valve. When oxygen is required it is best to lead it into a reservoir bag attached to the main intake of the inflating bellows.

Control of Respiration.—Spirometer readings of expired air are essential, as the volume delivered each minute by the machine does not all reach the lungs. The difficulty

of deciding the optimum ventilation for each patient has been stressed by many writers (Smith *et al.*, 1954; Macrae *et al.*, 1954; Astrup *et al.*, 1954). Overventilation upsets the circulation and causes alkalaemia. Underventilation causes CO₂ excess with or without anoxia. Some degree of hypertension would suggest CO₂ retention and a rise of urinary pH alkalaemia. Clinical assessment we found to be difficult. Various clinical signs have been reported as being indicative of CO₂ excess. Ibsen (1954) describes a rise in blood pressure, cold clammy skin, gagging and bucking of respiration in cases in which spontaneous respiration is present, and increased secretions in the mouth and nose—all the symptoms being relieved when respiration is increased. Case and Haldane (1941), working on conscious volunteers breathing 6% CO₂, describe hyperventilation, relatively little mental impairment, but some mental distress, slight headache, photophobia, and nausea.

The problem of CO₂ could not be investigated by elaborate methods as described by Astrup *et al.* (1954). A simple CO₂ meter of German manufacture (Dräger) was obtained from Messrs. Garthur, and was used to measure the CO₂ content of the expired air. Sampson Wright (1945) gave a figure of 4% for CO₂ in expired air. It was decided that a figure of 4% should be regarded as the maximum permitted for samples collected in a bag at the respiratory vent. As the meter gave slightly different readings from the same sample, the mean of three readings was used. There were, however, occasions when the figures seemed somewhat bizarre, and the meter readings were used only as a guide. On a few occasions attempts were made to obtain figures for air at the carina, but the figures were very variable, possibly owing to turbulence, and this method was abandoned. Routine urinary pH examinations were done as a check against hyperventilation.

The respiration pumps were used at speeds of 20 to 26 a minute, and the readings for expired air on the spirometer varied from 9 to 14 litres a minute. The higher figures were used on a heavily built man with an axillary temperature of 42.2° C. (108° F.) in whom it was exceedingly difficult to get the CO₂ readings down to 4%. These spirometer readings are higher than those recommended by other writers (Smith *et al.*, 1954; Astrup *et al.*, 1954; Macrae *et al.*, 1954), but on only one occasion was the urine alkaline.

Case 1

A European air-pilot aged 33 was admitted to the Infectious Diseases Hospital, Nairobi, on September 4, 1954. He had been flown from Mweiga, a distance of some 300 miles (480 km.). One week before admission he had suffered from epigastric pain, which continued for five days, when he developed frontal headache and aches across the shoulders and behind the knees. He had lost his appetite and had had several bouts of vomiting.

On admission he was found to have stiffness of the neck and back, horizontal nystagmus, and slight weakness of the flexors of the right hip. On the following day the nystagmus had increased and there was weakness of the left masseter and palate. He was cyanosed and no movements of the intercostals were detected. The flexors and extensors of the elbow-joints on both sides were weak. He was unable to raise his legs from the bed. The respiratory embarrassment increased, and at 1.50 p.m. he was put into a tank respirator. The next day his condition remained about the same. On September 7, 36 hours after being put into the tank respirator, he was found to be cyanosed, and the left side of the face and the left masseter were paralysed. He was unable to swallow, and secretions had collected in the hypopharynx. Both the intercostals and the diaphragm were paralysed, and all the limb muscles were paralysed to a greater or lesser degree. It was decided at this stage to institute intermittent positive-pressure respiration by means of the Radcliffe pump. The operative procedure and routine management employed have already been described.

His progress was marked by the frequent occurrence of pulmonary collapse. On one occasion this was caused by the endotracheal tube slipping down the right bronchus. On all other occasions plugs of mucus were the causative factor. These were dealt with rapidly and satisfactorily by turning, tipping, percussion, and squeezing of the chest combined with bronchial suction. The relief of collapse in these cases could only be referred to as dramatic. In almost all cases the collapse occurred in the left lung. On two occasions early on it was necessary to have recourse to bronchoscopy.

His temperature took about three weeks to settle. The first week it slowly fell from 103 to 101° F. (39.4 to 38.3° C.), the second week there were occasional spikes to 100° F. (37.8° C.), and the third week to 99° F. (37.2° C.).

On September 19 he was able to make short attempts to breathe alone, but not for more than 30 seconds at a time. On the 21st the Levine tube was removed, as ability to swallow was completely recovered. On the 22nd an attempt to replace the I.P.P. respirator by the Paul-Bragg pulsator was unsuccessful. After three hours in the pulsator the CO₂ in his expired air had risen to 6.2% and his blood pressure had increased from 135/80 to 172/105. Normally his CO₂ levels for expired air were between 2.5 and 3% and his blood pressure was about 135/80.

The usual ventilation given was 10 litres a minute, but this was increased to 12.5 litres a minute on October 11, by which time his blood-pressure level had slowly risen to 150/100. The increased ventilation caused a slow decline to the previous level.

On October 5 weaning to a Monaghan type of cuirass respirator was tried. This again was unsuccessful. After five minutes in the cuirass his blood pressure had risen to 225/105 from 130/85, his pulse had fallen from 100 to 40 and had become irregular, and the CO₂ in his expired air was 5%. Both blood pressure and pulse returned to their previous levels eight minutes after restarting I.P.P.R. Similar results were obtained on repeating the procedure, with elevation of blood pressure to 220/120, pulse 60, and CO₂ 4.2%. In an attempt to explain the mechanism of these changes, we carried out the following experiment.

The patient was inflated with pure oxygen at a slow rate (2.5 litres a minute) in order to produce CO₂ accumulation. After eight minutes the blood pressure showed a slight rise to 160/105, the pulse remained constant, and the CO₂ was 4.1%. The oxygen was then stopped and he was allowed to breathe by himself. After one and a half minutes his blood pressure had further risen to 190/115, and his pulse had fallen to 60. The Radcliffe pump was restarted and after about 10 minutes the blood pressure, pulse, and the CO₂ readings settled to 135/85, 96, and 2.5% respectively. After a rest, the patient was then allowed to breathe by himself, but this time he was given pure oxygen. After eight minutes there was a slight rise in blood pressure to 158/105, but the pulse remained constant. However, after stopping the oxygen and allowing him to breathe air, the blood pressure rose slowly during the first three minutes to 162/110, and the pulse dropped to 84. In the next three minutes the blood pressure rose rapidly to 190/115 and the pulse fell to 60. No cyanosis was observed.

We concluded that these anomalies of elevation of blood pressure and fall in pulse rate were probably due to a certain degree of anoxia. We thought it possible that he had a hypertensive vasomotor centre or carotid sinus which responded to hypertension by causing a marked slowing of the pulse rate. In an attempt to wean the patient from the Radcliffe pump, he was allowed to breathe pure oxygen on his own, and when he was evacuated to England he was able to breathe for 13 minutes at a time. By December 2 we understand that he could breathe without assistance for eight hours a day.

When he left Nairobi recovery from the cranial nerve palsies had occurred, he had a fair amount of power in all the arm and shoulder muscles, and there was movement in

all the muscles of the left leg and in the hamstrings and gastrocnemius of the right leg. The sacrospinalis showed some muscle recovery.

On October 24 he was flown to the Radcliffe Infirmary, Oxford, a distance of some 4,500 miles (7,240 km.), in a pressurized plane to the Respiration Unit directed by Dr. W. Ritchie Russell. He was accompanied by a team consisting of a physician (J. R. H.), a hospital superintendent, and a nursing sister. The machine was run from batteries by means of a dynamo to provide 240 volts. Oxygen was carried but not used. The journey of 21 hours' flying time was uneventful, apart from a collapse of the entire left lung due to secretions. The collapse was rectified by suction, posturing, and slapping. The team was met at London Airport and the patient transferred to Oxford by ambulance under the care of Dr. Crampton Smith. The latest Radcliffe respiration pump has since been modified so that it may be run from 12-volt batteries (Ritchie Russell, 1954, personal communication) (see Fig.).

Case 2

On October 15 a male Chinese electrician aged 46, working at Musoma, Tanganyika Territory, developed fever, headache, and a sore throat. On the following day the left leg became paralysed. On the 17th the right leg followed suit, and he was unable to pass urine. On the 18th he was transferred to Nairobi by plane—a distance of some 400 miles (640 km.).

On admission he had slight difficulty in swallowing; the right side of the chest moved poorly and paradoxically. Both legs were paralysed with the exception of the dorsi and plantar flexors of the right ankle-joint. His bladder was distended. At this time there was no involvement of the arms or of the diaphragm. He was nursed in the lateral positions with the foot of the bed raised. He would not tolerate the semi-prone position. The following day (October 19) he developed nystagmus, and had marked impairment of deglutition and weakness of the shoulder girdles. His respiratory rate was 40, with abdominal respirations. The intercostals on the left side were now involved. Some secretion was accumulating in the pharynx. At this time his temperature was 100° F. (37.8° C.), pulse 132, and blood pressure 115/85. A Levine tube was passed into his stomach at 2.15 p.m. This had to be done under anaesthesia (thiopentone and succinylcholine chloride). At 11 p.m. his temperature rose to 105° F. (40.6° C.), pulse 162, and respirations 38. At 1.30 a.m. he was noticed to have periodic respirations, his pulse being difficult to palpate, with blood pressure 85/70, and pulse 162. The pharyngeal secretions had increased and he became very restless. Cyanosis was not observed. The Paul-Bragg pulsator was found to be of little help, so it was decided to institute I.P.P.R. by means of the Radcliffe pump rather than the tank respirator—compare experiences quoted by Macrae *et al.* (1954).

Three hours after starting the I.P.P. respirator his blood pressure had risen to 104/80, and pulse to 158. He became very restless after recovering consciousness and was given 6 ml. of paraldehyde intramuscularly three and a half hours after the tracheotomy had been performed. He lapsed into unconsciousness after the paraldehyde, and did not recover until 15 hours later. At 10.30 a.m. on October 20 his temperature was 103.2° F. (39.6° C.), and he was given 25 mg. of chlorpromazine hydrochloride intramuscularly. In the afternoon of the same day his blood pressure fell to 60/50, and a noradrenaline drip was set up, which maintained the pressure at about 105–120 mm. Hg systolic, with occasional drops to 80. He had pulsus paradoxus, the fall in pressure during inspiration being about 10 mm. Hg. This improved when the stroke volume of the machine was reduced and the rate increased.

In the evening his temperature again rose to 105° F. (40.6° C.). The noradrenaline was stopped after nine hours, but had to be restarted as his systolic pressure fell to 45 mm. Hg. After restarting at a slower rate, his blood pressure was maintained at about 80 and gradually rose to 90, when

the drip was finally discontinued after 17 hours. At 9.30 p.m. he was given 25 mg. chlorpromazine hydrochloride intramuscularly in an attempt to reduce his temperature. Later the same day the machine was discontinued for two intervals of ten minutes as he was fighting against it. Shallow abdominal respirations were present, but in a short time the blood pressure rose to 145/100, and the CO₂ was 4.3%, so the machine was restarted.

By October 26 his temperature had gradually settled to normal and his blood pressure averaged about 115/70, pulse 100. From this day onwards he was tried for gradually increasing periods without the machine. On the 28th he developed pulmonary oedema for some 16 hours.

On November 2 he suddenly collapsed and became cyanosed, and was so for 20 minutes until medical aid was at hand. The cuff tube was at once removed, with dramatic recovery. The accident was thought to be due to a herniation in the cuff covering the opening of the endotracheal tube, producing a ball-valve effect. A bronchoscopy was performed, when a large amount of pus was found in the right bronchus. Two days later he began to bring up frothy sputum, several ounces a day, with signs of pulmonary oedema, which continued until his death.

On November 9, after breathing by himself for 16 hours, he became a little restless and the I.P.P. respirator was restarted at 10 p.m. He was given 6 ml. of paraldehyde as a sedative by mouth and 0.6 mg. of atropine subcutaneously, as he was bringing up a fair amount of frothy sputum. At 1.15 a.m. his condition was recorded as good. At 2 a.m. his pulse was said to have become thready. Medical aid was summoned, but the patient was found to be dead, with post-mortem mottling of the skin.

Pulmonary Complications.—Throughout the whole course of the illness large amounts (several ounces) of mucus were aspirated daily. Only on one occasion, however, did a pulmonary collapse occur—in the left lung. After the advent of pulmonary oedema the amount of mucus decreased considerably and was replaced by frothy pink-hued sputum. X-ray films of his chest revealed an old quiescent tuberculous lesion of the right apical region and elevation of the left diaphragm.

Mental State.—Great difficulty was experienced in communicating with this patient owing to the language difficulty. His knowledge of English was slight and of Swahili little better. He became very agitated when trying to explain his wants, and suffered from marked depressive phases. At night he used to pull out the Levine tube and pull off the bedclothes and was most irrational. We noticed with European patients that though these phases occurred they tended to be much less marked.

Investigations.—An electrocardiogram was taken on November 4, when the patient was breathing by himself and again while breathing on the machine. The following is an extract of a report which was given by Dr. A. D. Charters, consultant cardiologist to King George VI Hospital, Nairobi: "The electrocardiogram during unaided respiration shows marked clockwise rotation of the heart with low-voltage QRS in all leads, particularly in CR₁, which shows flattened T waves. Rhythm regular, rate 100. P-R interval 0.16 second. QRS 0.08 second. R-T 0.28 second. T wave inverted in VR and upright in the other leads. Comparison of tracings while in the respirator with those during unaided respiration: The voltage in the respirator is less in Leads II, CR₁, and CR₄, with smaller T waves in Leads II, CR₁, CR₄, and VL. The voltage is higher in the respirator in VR and CR₂, with a higher T wave in CR₂. P, R, and T waves are all taller in Lead III during unaided respiration."

Case 3

A male European, aged 40, weight approximately 90 kg., was admitted to Kitale Hospital, some 300 miles (480 km.) from Nairobi, on October 22, 1954, suffering from respiratory weakness. Respiration was so embarrassed that he was placed in a tank respirator on admission. He had

been ill for one week beforehand, but had carried on working, as he thought he had "flu." We were later informed that on the day previous to admission he was so ill that he could barely drag himself from his car, and his temperature had been 102.5° F. (39.2° C.).

A team consisting of a physician, a hospital superintendent, and a nursing sister flew to Kitale within a few hours. Bulbar signs had already appeared when the team reached Kitale, and the patient was cyanosed. A tracheotomy was performed and I.P.P.R. started. He was very restless and irrational during the night despite 8 ml. of paraldehyde intramuscularly. The blood pressure fell to below 100 mm. Hg systolic and sweating was profuse. One litre of 0.9% saline was given, as he was considerably dehydrated. No method of tube feeding was available. The temperature rose slowly from 102 to 105° F. (38.9 to 40.6° C.); sponging reduced it to 103.5° F. (39.7° C.).

The Radcliffe pump was hand-operated for two and a half hours during the return flight. The pilot deliberately flew at the lowest possible altitude, 9,000 to 11,000 ft. (2,700 to 3,350 m.). A foot-pump-operated sucker was used during the journey to aspirate the bronchi.

On arrival at the poliomyelitis unit at 9 a.m. on October 23, his general condition was fair and the flight did not appear in any way to have affected him adversely. He was conscious and somewhat restless, he could not swallow, and there was complete paralysis of the intercostals and diaphragm, and of the shoulder girdle and arms; but full movement was present in both legs. His pulse rate was 120, blood pressure 130/90, and temperature 102.3° F. (39.1° C.) in the axilla. Temperature readings from then on were taken every half-hour in the axilla. Chlorpromazine hydrochloride, 25 mg., was given intramuscularly. One hour later bronchoscopy was carried out under 0.3 g. of thiopentone and succinylcholine chloride (the previous evening he had needed 2 g. of thiopentone in addition to succinylcholine chloride). The tracheostoma was enlarged and a No. 10 cuffed tube inserted. His temperature fell slightly after the chlorpromazine, but rose again within an hour and continued to rise sharply to 104° F. (40° C.) that evening, his blood pressure remaining at 140/90, pulse 120. The CO₂ readings were high—just under 5%—in spite of increasing the minute volume from 11.5 litres to 12.7 litres. The CO₂ readings fell to 2.2% when the minute volume was further increased to 14 litres. A second dose of chlorpromazine, 25 mg. intramuscularly, was given, but without much effect on the temperature. A cold sponge shortly afterwards, however, reduced it to 102.6° F. (39.2° C.). No fall in blood pressure followed the chlorpromazine.

The next morning the temperature was up to 105.2° F. (40.7° C.), the blood pressure being 134/90, and his condition remained reasonable. A third dose of chlorpromazine, 25 mg. intramuscularly, was followed by a cold sponge, and the temperature fell to 101.8° F. (38.8° C.). The blood pressure dropped to 100 mm. Hg systolic, pulse 136. The temperature soon rose again, and by midday was over 105° F. (40.6° C.), CO₂ concentration being 4.5%. At this point the patient suddenly collapsed, became unconscious, and remained so until he died 36 hours later. Engström (1954) has described the appearance of circulatory symptoms occurring suddenly at high temperatures followed by rapid death. From now on, the axillary temperature readings were taken every four minutes. His lips and mucous membranes were grey; the blood pressure was 70/50, pulse 160, temperature 105.8° F. (41° C.). The oxygen flow was increased and his general condition slowly improved, the ashen-grey appearance disappearing. The temperature rose slowly to 107° F. (41.7° C.), but the blood pressure remained low, 85/50; the pulse rate was 140. Cold sponging had no effect on the temperature. The humidifier had by this time been turned off.

Lassen (1954) reported a mortality rate of 93% in cases of hyperpyrexia and temperatures of over 102° F. (38.9° C.) for five days. It was felt that a further dose of chlorpromazine was justified, and 50 mg. was added to 540 ml. of

glucose and an intravenous drip set up. The temperature fell to 103.8° F. (39.9° C.) when approximately 130 ml. had been run in, but rose again rapidly to 107° F. (41.7° C.) within an hour. The pulse was extremely poor and very rapid—170 to 200—the blood pressure being 60 mm. Hg systolic (by palpation). Covering the patient with chipped ice and allowing a fan to blow over him did not bring down the temperature. He had now been hypotensive for five hours, and we decided to give noradrenaline intravenously. As we had had a poor response with noradrenaline following chlorpromazine previously, we set up a drip of 4 ml. in 500 ml. of 5% glucose, but with little effect. Three pints (1.7 litres) of this solution was eventually run in.

By 7.30 p.m. on October 24 the axillary temperature had risen to 108° F. (42.2° C.) in spite of chipped ice and a very strong breeze from the fan; blood pressure 70 mm. Hg systolic, pulse 128, pupils pin-point. A fourth dose of chlorpromazine, 25 mg. intramuscularly, was given, and within an hour the temperature had fallen to 101° F. (38.3° C.). For the next 16 hours the temperature remained on an average at 100 to 102° F. (37.8 to 38.9° C.), rising to 105° F. (40.6° C.) on one occasion and falling to 98° F. (36.7° C.) for three short periods. During this time the skin, except in the axilla, was cold to the touch, with stagnant cyanosis, but could be made a reasonable colour by rubbing. The capillary refill test was fair. As the noradrenaline had not been effective, methylamphetamine hydrochloride, 20 mg. intravenously, was given at three-hourly to four-hourly intervals, but with no effect. The pulse could not now be felt at the wrist, and the only sign of life, apart from the apex beat, was the screwing up of the face which followed tracheal suction; this reaction to stimulation of the tracheo-bronchial reflexes persisted up to within a few minutes of death.

Towards the evening of October 25 the temperature again started to rise to 105° F. (40.6° C.), and the apex beat could be heard only with difficulty. The pupils became widely dilated and did not react to light towards midnight. An attempt to give an intra-arterial blood transfusion failed, as neither the femoral nor the subclavian artery could be palpated. In a further unsuccessful effort to insert an intra-arterial needle 8 ml. of noradrenaline was added to 540 ml. of 5% glucose and the drip run in fairly quickly for a few minutes. The pulse became palpable, the blood pressure rose to 80/60, and the pupils became half-dilated and reacted to light. The drip was then slowed, but the circulation finally collapsed completely and the patient died within 20 minutes. Necropsy showed the usual changes of poliomyelitis in the cord, medulla, and pons.

Discussion

To date there are reports of five cases of bulbo-spinal poliomyelitis occurring in England (Smith *et al.*, 1954; Macrae *et al.*, 1954), and these three more in Kenya which have been treated with I.P.P.R. Of these eight patients five have died. In the English series one died of the effects of inhalation of vomit (Smith *et al.*, 1954) and two from pulmonary infection (Macrae *et al.*, 1954). In our series the cause of death in Case 2 was unknown, though during the course of his illness he developed the following complications: (a) hyperpyrexia as defined by Lassen—mortality rate 91% (Lassen, 1954); (b) shock—mortality rate 67% (Lassen, 1954); (c) pulmonary oedema—mortality rate 93% (Lassen, 1954). He survived the first two complications, and it would appear from the post-mortem findings that pulmonary oedema was not the direct cause of his death. Case 3 developed hyperpyrexia—axillary temperature, 108° F. (42.2° C.)—and shock, both carrying a high mortality rate as mentioned above.

Shock.—The causes of shock in bulbo-spinal poliomyelitis are: (a) anoxia; (b) CO₂ retention; (c) virus invasion of the brain; (d) interference with venous filling of the heart; (e) central damage due to hyperpyrexia (Christie, 1954; Engström, 1954). Engström points out that high pressures and long inspiratory phases interfere with cardiac output,

and that hyperpyrexia above 105.8° F. (41° C.) is followed by rapid circulatory failure. In Case 2 a fall in systolic pressure of 10 mm. Hg occurred during the inspiratory phase of the machine, indicating interference with the venous return to the heart (Lewis, 1942); this was supported by the electrocardiographic changes. There was no evidence of anoxia or of CO₂ retention, though central damage remained a possibility. It was noted, however, that there was an improvement in the blood pressure and a decrease in the inspiratory fall in pressure on increasing the rate of the machine, so decreasing the time of the inspiratory phase. The pressure recorded on the machine during inspiration remained constant at 16 cm. of water. In Case 3 the shock was presumably due to damage to the vasomotor centre by hyperpyrexia and direct damage by the virus.

Mental State.—All cases showed some degree of mental distress. In Case 1 the patient, who was most co-operative, tended to be very emotional and would burst into tears for no apparent reason. At the beginning of treatment he wanted to pull out the endotracheal tube. He became very intolerant of pain and had marked depressive phases, which were most noticeable about the third week, from which time he became more cheerful. In Case 2 the added difficulty of communication exaggerated the mental symptoms. At all times the patient was restless and agitated, and tended to fight the machine with his remaining respiratory muscles. He slept poorly, and at night, especially latterly, he became very irrational and was always pulling out the Levine tube and pulling off the bedclothes. After the second week he became very depressed and wanted to pull out the endotracheal tube. Case 3 tended to be restless and irrational at night. In none of these cases were the mental changes due to the accumulation of CO₂ or to anoxia. In Case 1 reassurance helped considerably; this has been stressed by Daley and Miller (1952).

Pulmonary Oedema.—This appeared rapidly in Case 2 on three occasions. We are unable to suggest the exact mechanism. Anoxia and CO₂ accumulation did not appear to be relevant. This patient was, however, exceedingly apprehensive and agitated, and had been breathing on his own for considerable periods. The serum proteins were low (total 5.3 g.%), but the oedema persisted even when the total proteins had risen to 6.5 g.%. Treatment with atropine, 0.9 mg. twice daily, aminophylline, 0.5 g. twice daily intramuscularly, oxygen, bronchial suction, and anaesthetizing the bronchi with cocaine were disappointing. The pulmonary oedema on two occasions disappeared suddenly; once for no apparent reason and once 20 minutes after 0.9 mg. of atropine had been given.

Chlorpromazine.—This was tried on two of these cases because of its supposed pharmacological actions of (a) protection against shock (Laborit and Huguenard, 1953); (b) potentiation of sedatives (restlessness was a prominent feature of these cases); (c) reduction of temperature and of the oxygen requirements (Laborit and Huguenard, 1951); and (d) depression of respiratory reflexes. Its use in asthma has been reported by Robinson and Zuck (1954). Bronchial suction was frequent, and it was thought that this action would be particularly useful in view of the occurrence of widespread rhonchi in all cases. Chlorpromazine did not seem to have any appreciable effect on the temperature unless ice and a breeze from a fan were used in addition. These two measures in conjunction did bring down the temperature, but the reduction was inconsistent and no definite conclusions could be drawn. Shackman *et al.* (1954), using promethazine as part of a "lytic cocktail," have shown that unless cooling measures are added no fall in temperature occurs in non-pyrexial patients under anaesthesia. The anti-noradrenaline action of this drug was shown, as has been described by Foster *et al.* (1954). In the two cases in which noradrenaline was used to combat the hypotension, large doses were needed and in higher concentrations than are generally recommended. Higher concentrations were used, as we feared that the circulation might be overloaded by larger amounts of 5% glucose.

Transport.—We experienced no particular problems in the transport of these cases by air, using the Radcliffe respiration pump. A sucker of some kind is essential. Oxygen cylinders were carried, but were not needed in pressurized planes. The team consisted of a physician, a hospital superintendent, and a nursing sister.

Staff.—It was soon realized that a specially trained team of doctors and nurses was essential. Ideally, a doctor should be in attendance throughout the day. In particular we would emphasize that the nursing is arduous and that, as this is a new technique, every detail must be carefully explained to every member of the team. The members should not be changed if this can possibly be avoided. It is unfair to expect a nurse, new to this type of work, to be able to learn the details "as she goes along." An error of judgment may be fatal, and a call for help must be answered promptly.

It is obvious that this treatment can be carried out only in properly equipped centres, and no one should be tempted to undertake these measures unless the following minimum personnel are readily available: a physician, an anaesthetist, and nine nursing staff. Even with these requirements medical personnel must be prepared for a day's work of 16 hours over long periods.

Conclusions

(1) Even with the advance of I.P.P. respiration in the treatment of bulbo-spinal poliomyelitis the mortality remains high when complications enter the picture.

(2) It is important to have a specially trained team of nurses and doctors, and constant supervision for 24 hours a day.

(3) It is necessary for an anaesthetist to be a member of the team used for the transport of acute cases.

(4) General anaesthesia is advisable for tracheotomy.

(5) We would emphasize the difficulty of treating the various complications—shock, hyperpyrexia, and pulmonary oedema—and of ascertaining the exact aetiological factors involved.

Summary

The treatment of three cases of bulbo-spinal poliomyelitis with the Radcliffe respiration pump is described. All cases showed inadequate respiration combined with inability to swallow, ineffective cough, and pooling of secretions.

Experience of these Kenya cases has shown that even acutely ill patients may be flown safely over long distances with this apparatus.

The importance of maintaining a clear airway in the lower respiratory tract coupled with the inflation of air at the correct pressure, humidification, and temperature, and in adequate volume, is stressed. A simple bedside method of measuring the CO₂ content of expired air is suggested, coupled with pH estimations of the urine to detect hyperventilation.

The different features of each of the three cases emphasized the difficulties in the management of this condition. An adequately trained team of doctors and nurses is essential. These patients cannot be left unattended at any time, as critical emergencies may occur without warning.

"Shock," hyperpyrexia, and pulmonary oedema occurred in the two fatal cases. Chlorpromazine and noradrenaline were used to combat "shock" and hyperpyrexia.

Abnormalities of the mental state were prominent in all cases but responded well to reassurance when this was possible.

We wish to thank the matron and the nursing staff of King George VI Hospital and the Infectious Diseases Hospital, Nairobi.

for the long hours of arduous duty given willingly and without complaint. We also acknowledge the invaluable help given to us by Mr. F. Owen, hospital superintendent, the Infectious Diseases Hospital, Nairobi, and Mr. Austen, Government Electrical Engineer. We are indebted to the United States Air Force for their prompt answer to a call for assistance. A cuirass respirator and a technician were flown out to us from Tripoli. We have to thank the Director of Medical Services, Kenya Colony, for his help and permission to publish this article. The Radcliffe pumps were manufactured by H. G. East and Co., Longworth Road, Oxford.

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CLINICAL USES OF INTRAVENOUS HYDROCORTISONE

BY

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Cortisone therapy is now an important part of day-to-day therapeutics. Whatever the argument may be for its use in rheumatoid arthritis, ulcerative colitis, and asthma, there is little difference of opinion when it comes to adrenal insufficiency; for in Addison's disease, Simmonds's disease, and in the adrenalectomized subject it is the most useful drug now available. In acute adrenal insufficiency, however, oral cortisone may not be enough; though the drug is rapidly absorbed from the intestinal tract when taken by mouth, in adrenal crisis a vomiting and dehydrated patient may need rapidly effective parenteral therapy. It is to meet this need that intravenous hydrocortisone has been produced, for the ordinary issue of cortisone or hydrocortisone acetate for oral, intramuscular, or intra-articular use cannot be given intravenously.

The use of intravenous hydrocortisone may be considered in the following conditions:

1. **Addisonian crisis.**—The dehydrated, vomiting, critically ill patient with Addison's disease may be unable to tolerate oral cortisone, and intramuscular injections may be too slow in action to help him. An intravenous drip of 10–20 mg. hydrocortisone per hour for some six to eight hours will usually effect marked improvement and allow the institution of oral or intramuscular cortisone therapy. This dosage can be increased, if response is unsatisfactory, to 30–40 mg. per hour or even higher.

2. **The adrenalectomized patient,** usually in the face of infection or some other form of stress, may become ill, weak,

and hypotensive. Such patients may not show the usual signs of adrenal insufficiency, but appear merely to go downhill rapidly and alarmingly. Nausea is frequent and vomiting commonly occurs. The use of intravenous hydrocortisone may be life-saving, and if in doubt the general rule should be to treat as for a probable adrenal failure.

3. **The cortisone-treated patient with intact adrenal glands,** whether he be a sufferer from rheumatoid arthritis, asthma, or any other condition, may, in the face of infection or any other form of acute stress, experience symptoms of partial adrenal insufficiency. One common form of stress is major operative surgery. A surgical operation may precipitate adrenal failure in a gland suppressed by weeks or months of cortisone therapy, and, if there is no time for 24–48 hours' full pre-operative cortisone treatment, intramuscular cortisone may be augmented by intravenous hydrocortisone. It is well recognized that after stopping cortisone therapy, if such treatment has lasted more than a few days, the adrenal glands may be unable to react normally to operative stress for some weeks or months subsequently. In such patients it is wise to "cover" the operation two days before and a week afterwards by full cortisone therapy. Intravenous hydrocortisone may in these instances also play a part if such "cortisone cover" has been neglected or the dosage insufficient.

4. **The Waterhouse-Friderichsen syndrome.**

5. **Simmonds's disease.**—In the face of stress these patients may develop signs of acute adrenal insufficiency. Allott and Simmons (1951) report a case of Sheehan's syndrome which responded only to cortisone. In such cases intravenous hydrocortisone should be considered. Such cases are rare, however, compared with the hypoglycaemic episodes which are common in this condition and which respond usually satisfactorily to intravenous glucose.

6. **The above list of indications is not to be regarded as exclusive.** Black and Harken (1954), for instance, discussing "the safe conduct of a patient through cardiac surgery," state that in a few cases intractable hypotension after operation appeared to be due to adrenal failure. The patient, alert and orientated despite the absence of a detectable blood pressure, responded to intravenous hydrocortisone though not to intramuscular cortisone or corticotrophin (A.C.T.H.). In severe status asthmaticus, acute disseminated lupus erythematosus, or overwhelming allergic reactions, the use of intravenous hydrocortisone could legitimately be considered.

The following cases are instructive.

Case 1

The patient was a woman aged 47. Bilateral total adrenalectomy was performed by Sir Stanford Cade for metastatic malignant disease secondary to carcinoma of the breast. The immediate post-operative progress was uneventful, no noradrenaline infusion being required. On the seventh post-operative day her condition deteriorated rapidly, swelling and induration became apparent at the medial end of the left incision, and her temperature rose to 104° F. (40° C.), her pulse to 150 a minute. She became drowsy, almost comatose, and her blood pressure unrecordable. As her condition was critical, intravenous hydrocortisone was started that night and 100 mg. was given over a period of six hours. After some two hours her blood pressure rose and her general condition improved dramatically; by morning her temperature had dropped to 99° F. (37.2° C.) and her pulse to 110. Oral cortisone, 25 mg. six-hourly, was given for the next six days and then gradually reduced to the usual maintenance dose of 50 mg. a day. There were no marked changes in serum electrolytes, sodium and chlorides being normal or just below normal throughout.

Comment.—In this case a wound infection rapidly precipitated a degree of adrenal insufficiency which seemed

likely to prove fatal. The improvement was sufficiently rapid and dramatic to make it probable that the hydrocortisone given was responsible for that improvement.

Case 2

This patient was a woman aged 44. Total bilateral adrenalectomy was performed by Sir Stanford Cade in April, 1954, for advanced metastatic disease secondary to carcinoma of the breast. Before operation she had been subject to occasional mild attacks of nausea and vomiting. In May, one month after discharge from hospital, she was readmitted, vomiting and ill; B.P. 85/75. Serum electrolytes were within normal limits. Only slight improvement occurred on L-noradrenaline and hydrocortisone (100 mg.) infusions, and it was felt that her gradual improvement was natural and essentially uninfluenced by therapy. Her next vomiting bout occurred in July; again it was felt that improvement was unrelated to L-noradrenaline given, but it was noted that the marked tachycardia settled only when the cortisone daily dosage was increased to 112.5 mg. by mouth.

In late November, 1954, she caught a severe cold and vomiting restarted. She became critically ill, pulse 140-150 a minute; the blood pressure dropped and became unrecordable. She became rapidly very weak and felt "numb." Her reflexes were normal. Hydrocortisone hemisuccinate, 50 mg., was given rapidly intravenously, followed by intravenous saline infusion. Within an hour she was distinctly better, blood pressure being 95/70. A further 50 mg. of hydrocortisone hemisuccinate was given intravenously three hours after the first injection, saline infusions were continued, and her daily dose of cortisone was increased to 200 mg. intramuscularly. Next morning she was much improved, the blood pressure was 120/90, and vomiting had stopped. Plasma chlorides and serum sodium, which were just below normal (93 and 131 mEq per litre respectively) on admission, dropped to 75 and 110 mEq as her condition deteriorated, then rose to 97 and 121 mEq two days after starting treatment.

Comment.—An upper respiratory infection apparently precipitated an attack of vomiting, a symptom to which this patient was predisposed. Her rapid deterioration seems to have been due partly to adrenal insufficiency and partly to dehydration and electrolyte upset. Intravenous hydrocortisone, abundant saline infusions, and an increase in the daily dose of cortisone appeared responsible for the improvement, which started soon after 50 mg. of hydrocortisone had been given intravenously and before more than a very small amount of saline had been infused. In this case it seems likely that in the previous episode hydrocortisone dosage had been inadequate.

Case 3

This patient, a woman aged 56, had had adrenalectomy performed by Sir Stanford Cade, the left side on March 16, 1954, the right on March 30. In the early morning of April 25 she suddenly collapsed and the blood pressure became unrecordable on the sphygmomanometer. She was sweating and the skin was cold; she was not cyanosed. For the previous three days her condition had been deteriorating and she had had nausea and vomiting, with some hypotension. Blood chemistry had been normal. The cause of this collapse was uncertain, and she was given 100 mg. of hydrocortisone by intravenous infusion over a period of six hours, purely empirically. She improved to some extent, but a greater improvement followed an intravenous infusion of noradrenaline subsequently. On May 2 her general condition had greatly improved.

Comment.—In this case hydrocortisone appeared to be less effective than the noradrenaline subsequently infused, though it may have initiated the improvement in the patient's condition. Many conditions apart from cortisone

insufficiency may cause sudden deterioration in these critically ill malignant cases—dehydration, electrolyte imbalance, and spread of the malignant process. Any infection, however trivial, may upset their somewhat precarious balance.

Discussion

Rukes, Orr, and Forsham (1954) have reported the use of intravenous infusion of the free alcohol of hydrocortisone at rates up to 50 mg. an hour in over 50 instances without untoward effect, though they note that epileptic seizures can be precipitated in susceptible patients. Thorn and his associates (1953) have shown that considerable sodium retention occurs in the normal subject during intravenous continuous infusion of 12 mg. an hour in saline. Over the short periods needed for the treatment of adrenal crisis, sodium retention and oedema are not a very real danger, however, and the use of 5% glucose in water will minimize this hazard. Rukes *et al.* advise that saline should be used only when an increase of blood volume is required, as in shock. They regard the use of intravenous hydrocortisone as justified in "selected cases of shock which are not relieved by transfusion or vasopressors."

Intravenous hydrocortisone is rapidly eliminated from the body; after its use oral or intramuscular cortisone must be given in full dosage. It is common practice to give a large intramuscular injection of cortisone acetate at the same time as the intravenous infusion is started so that it may gradually take effect when the infusion is discontinued. The patient should be very closely watched for some hours after the intravenous infusion has been stopped.

During the treatment of any condition in medicine or surgery with large doses of cortisone a close watch is always kept for signs of infection, and antibiotic therapy instituted as required. This applies particularly to adrenalectomized patients with metastatic malignant disease who are in such a frail condition that episodes such as post-operative infection are often poorly tolerated. If there is any possibility of cortisone deficiency playing a part resort is had to the use of intravenous hydrocortisone. We have not, to date, needed to use intravenous infusions of this drug over the operative period; we regard it as our main stand-by when any symptoms occur which might be construed as being the result of acute cortisone insufficiency after operation. The adrenalectomized patient may respond atypically to wound or chest infection, becoming hypotensive and ill, not responding satisfactorily to antibiotics, and going rapidly downhill. Cases such as Case 1 above should, I feel, be given intravenous hydrocortisone. Although only some may be helped, it is unlikely that the rest, seriously ill patients with advanced malignant disease, will be harmed by this treatment, which in some cases appears to be life-saving.

Summary

Intravenous hydrocortisone is a most useful weapon in the treatment of acute adrenal insufficiency; it marks a real advance in therapeutics. Its use is discussed in a number of different conditions. It should be always available when total adrenalectomy is performed and throughout the early post-operative period.

My thanks are due to Sir Stanford Cade for permission to publish details of his cases, and to Messrs. Merck & Co., Rahway, New Jersey, for supplies of hydrocortisone (free alcohol) and for hydrocortisone infusion concentrate for intravenous use. Case 2 was treated with hydrocortisone hemisuccinate kindly supplied by the Roussel Laboratories.

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TREATMENT OF PROGRESSIVE MYOCLONIC EPILEPSY WITH MEPHENESIN*

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During an investigation of the effect of mephenesin on certain cerebral dysrhythmias it was found that the drug abolished myoclonus in two cases of progressive myoclonic epilepsy, and it has since proved possible to control this hitherto intractable symptom of the disease by using very heavy dosage of mephenesin.

The disease was first clearly described by Unverricht (1891). The patients have occasional attacks of grand mal, but their major disability is myoclonus, in the production of which there is a strong reflex element (Dawson, 1947). The disease progresses until they exist in "status myoclonicus" and die of exhaustion and inanition within four to five years of the onset. Often there are signs of a cerebellar disturbance (Ramsay-Hunt, 1921), and cerebellar changes are found at necropsy (Hodskins and Yakovlev, 1929).

Early in the course of the disease the myoclonus may respond to the usual anticonvulsants, but it soon becomes resistant to and uncontrollable by drugs without producing incapacitating cerebral depression. Bradshaw (1954) reported that myoclonus may be partially suppressed by phenacemide ("phenurone"), but this is the only drug that has appeared to offer any relief, and the relief afforded was apparently not striking.

Case 1

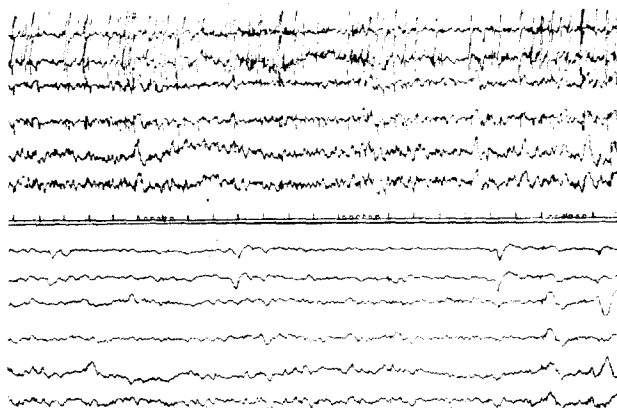
A girl aged 16 was admitted to St. Thomas's Hospital in March, 1952. She had previously been a patient at the National Hospital, Queen Square, under the care of Dr. S. P. Meadows. She had suffered from grand mal for eight years and myoclonus for seven years. She had been helpless for four years, could not feed herself or leave her bed, and her speech was slow and jerky. Many days were passed in status myoclonicus. Phenobarbitone, phemitone, phenytoin sodium, bromides, troxidone, and phenylmethylbarbituric acid ("rutonol") had been tried and a combination of phenobarbitone and phenytoin found to be the most helpful in preventing grand mal and perhaps slightly reducing the myoclonus.

The patient, during a period when severe facial and general myoclonus was constant, was placed on a couch and an electroencephalographic record was taken for 30 minutes (see Fig.). This showed many cortical spikes and high-voltage slow waves; there was also a moderate amount of muscle artifact in the frontal leads. An intravenous infusion of 1% mephenesin in normal saline was begun, and within 50 seconds the cortical spikes and muscle artifact had disappeared and the record had become dominated by high-

voltage slow waves. Myoclonus ceased. In 35 minutes 1.75 g. mephenesin had been given. The patient felt a little sleepy during the latter part of the infusion. The E.E.G. began to revert and myoclonus began to return 20 minutes after the infusion ended. The experiment was repeated seven days later, when the patient had been deprived of anti-convulsants for three days. The results were similar except that epileptic activity in the E.E.G. was not totally abolished.

Oral treatment with mephenesin was started and the myoclonus was well controlled. She was deprived of mephenesin on four occasions, and each time she relapsed dramatically but was readily controlled again, first by an elixir containing 2 g. of mephenesin per oz. (30 ml.) in about 30% alcohol, and later by a suspension of mephenesin carbamate.

The patient left hospital in May, 1952, taking 1 gr. (65 mg.) of phenobarbitone thrice daily and 1 oz. (30 ml.) of mephenesin elixir four times a day. She was now well enough to dress herself partially, to feed herself, write, knit, and walk with assistance. Reflex myoclonus still occurred but was



Case 1. Top: typical section of E.E.G. before treatment
Bottom: E.E.G. three minutes after start of infusion of 1%
mephenesin intravenously.

infrequent, whereas previously it had prevented every voluntary act. During the following 18 months she had five minor and two major grand mal seizures.

In November, 1953, she developed an acute attack of vomiting, and, probably correctly attributing this to the mephenesin, she stopped taking it and within 24 hours relapsed completely and became speechless and helpless. She was readmitted to hospital five days later in status myoclonicus and having had a grand mal attack on each day of relapse. She had six major fits during her first 12 hours in hospital. She had been vomiting her phenobarbitone also. Paraldehyde, 5 ml. intramuscularly, failed to control the myoclonus, so she was given 2 g. of mephenesin intravenously as a 1% solution in normal saline in 20 minutes. Within five minutes of the start of the infusion the myoclonus ceased. She relapsed an hour later and the mephenesin was repeated with the same result. Four hours later she relapsed yet again and was given 8 ml. of paraldehyde intramuscularly and 0.75 g. of mephenesin carbamate by mouth; she then slept. She went home 16 days later, taking 1.25 g. of mephenesin carbamate four times a day and 1 gr. (65 mg.) of phenobarbitone three times a day. She was then better than she had ever been. She has since been liable to attacks of "gastritis," which are attributed to the mephenesin carbamate. She is now taking about 15 g. of mephenesin carbamate a day either as 20% suspension or as tablets.

Case 2

A woman aged 29 was admitted to St. Thomas's Hospital in January, 1954. Facial myoclonus had begun five months previously and had spread, so that for three months she had been confined to bed and unable to feed herself. Occasional grand mal attacks occurred from this time. She had two

*A summary of this paper was read and a film demonstrating the first two patients shown at a joint meeting of the Swiss Neurological Association and the Association of British Neurologists at Interlaken in June, 1954.

periods of remission; the first, lasting one week, occurred when she was given 1 gr. (65 mg.) of phenobarbitone and 1½ gr. (98 mg.) of phenytoin thrice daily; the second, of 10 days, followed an attack of grand mal. Grand mal attacks were always followed by remissions, which became shorter and shorter until there was only a few minutes' quiescence before the myoclonus recommenced and gradually increased in violence until another major fit occurred hours later.

An electroencephalographic record in January, 1954, when she had had no anticonvulsant drugs for three days, showed random spikes in association with slow wave activity. A second record when taking phenobarbitone showed much low-voltage fast activity with random spikes. The spike activity was greatly reduced after an intravenous infusion of 1.5 g. of mephenesin.

Oral treatment was begun, and 15 minutes after 3 g. of mephenesin as elixir both the spontaneous and the reflex myoclonus ceased. She became practically normal, but relapsed in three hours and was readily controlled again by 3 g. of mephenesin. This sequence of events was repeated many times. A control elixir containing no mephenesin was substituted and proved ineffective. She was then allowed to take 3 g. of mephenesin as elixir whenever she felt the myoclonus returning, and in a few days she was taking 27 g. a day. She was mildly drunk on this dose, as the elixir contains about 30% alcohol. It was therefore decided to try mephenesin carbamate in the hope that a lower dose could be used, since it is more potent than mephenesin when tested on animals (Berger, 1952). This was given as a suspension and contained only 1% alcohol.

On the first day she took 9 g. of mephenesin and 12 g. of carbamate, on the second day 24 g. of carbamate; on the third day she relapsed, returned to taking the elixir on demand, and became drunk again. The myoclonus of the throat was the first to return after each dose and so she had to swallow the elixir in sips. This resulted in anaesthetization of the throat (mephenesin is a local anaesthetic), and inhalation of the drug and of food. The resulting lung infection was treated with penicillin, and a stomach tube was passed for medication and feeding. When she recovered mephenesin was given partly as the elixir, for rapid action, and partly as crushed tablets, so that her alcohol consumption was reduced, although the tablets seemed rather less effective. A few days after this regime began she had increased her daily total to 48.5 g. of mephenesin, but it soon fell to an average of 30 g. a day, 10 g. as the elixir and 20 g. as tablets.

She left hospital in February, 1954, on a regime of mephenesin, phenobarbitone (33 mg. t.d.s.), and primidone (250 mg. b.d.). The latter drug alone had not prevented relapses of myoclonus. She could walk, dress, and feed herself, but had a slight irregular tremor of both hands which made her writing illegible. A month later she reported that she had had no grand mal since leaving hospital. She had been doing her shopping and housework, but was still unable to write clearly and feared to carry saucepans lest she should drop them. She had been taking 2 g. of mephenesin as elixir on waking, when the myoclonus was fairly severe. The elixir controlled the myoclonus sufficiently to enable her to swallow 3.5 g. in tablets 30 minutes later. She had been taking 3.5 g. in tablets once or twice between meals with 2 g. as elixir at meal times. Her daily requirements had varied, being about 30 g. total—8–10 g. as elixir and 20–22 g. as tablets. During April and May she reported that she had had no myoclonus and that she was reducing her mephenesin dosage.

The common side-effects of mephenesin—dizziness, drowsiness, and vomiting—are less severe if the drug is taken after food, and in this case are not troublesome.

Other Cases

After it had become clear that the drug was effective in these two cases Dr. E. Arnold Carmichael, of the National Hospital, very kindly allowed us to give intravenous infusions to three of his cases.

Case 3.—This patient, a young woman aged 21, had never been normal. From the age of 4 irregular jerking movements of all four limbs had been noted. The condition progressed until myoclonus was constantly present, and for the past eight years she had been confined to her bed totally incapacitated by the myoclonus. Mephenesin, 1.5 g., was given intravenously in 15 minutes. There was a complete abolition of the myoclonus as in the previous cases and of a similar duration. She has since been treated with oral mephenesin, which appears to be effective, but the correct dose has not yet been determined, as she has great difficulty in tolerating the drug, although it was clear that it was enabling her to get on to her legs.

Case 4.—A woman aged 41 had suffered from myoclonus for three years. She had been confined to her bed for one year and had been for the most part totally disabled, but there was a marked periodicity in her condition. Mephenesin, 2 g., was given intravenously in 20 minutes, and this had a less dramatic effect than in the other cases. The myoclonus did not disappear completely, but the movements were sufficiently reduced to enable her to sit up and get off the bed on to her legs. This had previously been impossible. Oral mephenesin has since produced enough relief to allow her to walk and to sit up in an armchair. The duration of its effect is short and, unfortunately, when the effect wears off the myoclonus is more violent than it was before treatment was begun.

Case 5.—A youth aged 19 had suffered from attacks of grand mal and myoclonus, causing ataxia for six years. Although never able to work, he was much less incapacitated than the previous patients and was able to care for himself and to walk, although unsteadily. As the myoclonus was mild the effect of intravenous mephenesin was not marked. He has, however, started to take the drug orally and he appears to be slightly improved.

Cases 3, 4, and 5 have been treated for a few weeks only, and it is too early to assess their response.

Mephenesin

Mephenesin was introduced by Berger and Bradley in 1946, when they showed that its principal action is depression of the spinal cord. It was later shown by Berger (1947), Henneman *et al.* (1949), and Kaada (1950) that the site of action is probably on the spinal cord internuncial neurones. Polysynaptic neural circuits are easily depressed and monosynaptic circuits withstand large doses. Henneman *et al.* (1949) also found that mephenesin decreases or abolishes facilitation and inhibition, reaching anterior horn cells from all levels of the central nervous system, and that the electrical activity of the bulbar reticular substance is reduced. Reversible paralysis sparing respiration can easily be produced in animals by large doses, and it is not due to a peripheral effect. A neuromuscular blocking action can be demonstrated only by toxic doses (Berger, 1947), and there is no record of this effect having been achieved in man.

That the drug has actions high in the central nervous system of man may be inferred from the slight drowsiness and invariable nystagmus which follow the intravenous infusion of the pure drug in saline, and also from the observation that spike-and-wave activity in the E.E.G. in cases of petit mal can be reduced (Gammon and Churchill, 1949). We have confirmed this in some cases, but have found others which were resistant to the drug given intravenously. The highest concentration of mephenesin following intravenous injection is in the brain (dogs) (Morrison *et al.*, 1948). However, there is at present no evidence of the site of action above the brain stem, and the mechanism of the beneficial effect in myoclonic epilepsy remains obscure. It has been observed (Hunter and Waterfall, 1948) that mephenesin can subdue status epilepticus.

Mephenesin has a poor reputation in this country, largely owing to its failure to produce good relaxation in surgical anaesthesia and to the occurrence of haemolysis when given intravenously as a 10% solution. It has also proved to be

relatively unsuccessful in the treatment of spastic paralysis, for which condition it was particularly indicated on theoretical grounds. Its failure is due chiefly to the difficulty in getting enough of the drug into the patient without causing gastric or cerebral side-effects and to its brief action: intravenous administration in adequate dosage usually gives complete or almost complete relaxation of the most severe spasticity without any concurrent loss of power, although the effect by this route is too brief to be therapeutically useful.

In the treatment of myoclonic epilepsy we have found it necessary to give up to 48.5 g. of mephenesin a day, and, although this is exceptional, doses of that order should be fairly easily achieved, for short periods at least, if attention is given to the timing of the doses. Where possible they should be given on a full stomach, some as alcoholic elixir and some as tablets, although the latter are absorbed less readily and possibly less completely than the elixir.

In a series of 27 spastic patients one of us found that the maximum tolerated dose of the elixir alone varied between 6 and 18 g. of mephenesin a day; these were high doses at the time (1951), and it is now clear that they can be greatly exceeded in some patients and are safe for a period of months at least.

When mephenesin is given intravenously it should be as a 1% solution in saline. At this strength significant haemolysis does not occur and haemoglobinuria has never been reported. The risk of this complication increases as the solution strength rises, but is probably not serious until 4% has been reached. For solutions of over 1.5% it is necessary to use alcohol or propylene glycol to aid solution. The drug is metabolized very rapidly, and the clinical effects of a single intravenous injection may last as little as 30 minutes, or an oral dose only 60 to 90 minutes.

Mephenesin is also a local anaesthetic, and if a patient cannot swallow easily and sips the elixir this may lead to anaesthetization of the throat and inhalation of the drug (Case 2 above and Newhouse *et al.*, 1950).

Summary

It has hitherto been impossible to control the myoclonus of progressive myoclonic epilepsy with drugs.

Five cases are reported, in four of which helpless patients were restored to activity temporarily by intravenous mephenesin; one less severe case was helped by oral mephenesin.

Owing to the very large doses necessary, various side-effects occurred; these were largely overcome.

The mechanism of the action of mephenesin in this disease remains unknown.

We wish to thank Dr. S. P. Meadows for permission to treat Case 1; Dr. M. J. McCormack for referring Case 2 to one of us; and Dr. E. Arnold Carmichael for permission to treat Cases 3-5. We also wish to thank Dr. J. St. C. Elkington for his help and encouragement in carrying out this work; Dr. J. T. Hutchinson for the E.E.G. reports; Messrs. E. R. Squibb and Son, who supplied the mephenesin carbamate; and British Drug Houses, who supplied the control elixir.

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SPONTANEOUS REGRESSION OF A MALIGNANT MELANOMA

BY

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Cutaneous malignant melanoma has a characteristically unpredictable behaviour, and a melanoma which has already metastasized may undergo spontaneous regression (Willis, 1953).

Bennett (1899) described two such cases. The first was in a woman aged 52 who had a malignant melanoma of the foot treated by local excision, followed by Syme's amputation for a local recurrence. She then developed widespread skin and glandular metastases, and the prognosis was regarded as hopeless. Six months later there was no evidence of malignancy. His second case showed spontaneous disappearance of glandular metastases and skin nodules following removal of the primary tumour, a malignant melanoma of the foot.

Gould (1906) saw a man aged 35 who developed widespread skin recurrences following excision of a malignant melanoma on the chest. The liver was enlarged, there were glandular metastases, and melanogen was present in the urine. He was treated with turpentine and sulphur pills, with considerable local and general improvement and disappearance of the skin deposits lasting for five months, though during this time the melanogenuria persisted. Renewed activity then occurred and he died eight months later. Mathews (1915) saw a man aged 45 who had a malignant melanoma over the scapula, with enlarged axillary glands and a fullness above the corresponding clavicle. After incomplete surgery, when the primary tumour and the axillary glands were removed, he remained well for two years and the supraclavicular swelling disappeared.

The histogenesis of intraocular melanoma is unsettled; amongst other hypotheses Willis (1953) suggests that they are of epithelial origin, arising from split-off epithelial cells analogous to the naevus cells of the skin, and that there is a general similarity between the intraocular and cutaneous melanomas. Ocular melanoma behaves slightly differently from the cutaneous type in producing frequent though long-delayed metastases, and in not usually disseminating so widely throughout the body. If, however, Willis's hypothesis is acceptable, then it is reasonable to expect metastases from a malignant melanoma of the choroid to exhibit the same anomalous behaviour as if the primary tumour were in the skin.

Case Report

The patient, a man aged 60, had the right eye excised at Moorfields Eye Hospital on February 21, 1951. The pathological report on the specimen was as follows: "Arising from the choroid in the superonasal quadrant of the eye is a large lightly pigmented mixed-celled malignant melanoma. Many blood sinuses are present in the growth and the reticulin content is light. There is some infiltration of the adjacent deep scleral lamellae, but in the sections examined there is no evidence of extraocular extension. The retina overlying the melanoma has been invaded and there is a retinal detachment on both sides of the growth. Microscopically this is a malignant melanoma of the choroid."

The patient was first seen at Addenbrooke's Hospital on February 26, 1953, when there was no clinical evidence of recurrence and the liver was not palpable. An x-ray film of the chest showed multiple small opacities at the base of the left lung, and examination of the urine at the same time showed melanogens to be present, and he was accordingly regarded as having pulmonary metastases. The presence of melanogens in this urine was shown by the ferric chloride in hydrochloric acid test, and by Thormählen's nitroprusside reaction (Harrison, 1947). No treatment was given.

Re-examination on July 8 showed disappearance of the pulmonary metastases and no melanogens in the urine. Since then repeated clinical and radiological examinations have shown no evidence of recurrence, and melanogens have not been present in the urine.

Discussion

Melanogen, the colourless chromogen of melanin, is excreted in the urine when there are extensive secondary deposits of malignant melanoma. Urine containing melanogen reduces sodium nitroprusside to ferric ferrocyanide (Thormählen's reaction) and reduces ferric chloride to ferrous chloride. Haden and Orr (1924) and Peters (1923) describe cases with apparent melanogenuria with no malignant melanoma in the body, but it seems doubtful if melanogen was really present in the urine in these cases. von Jaksch (1905) claims that a positive Thormählen reaction may be obtained in urine free from melanogen and has seen it in children suffering from chronic constipation; he says an abundance of melanogen occurs in the urine of wasted patients. Harrison (1947) states that he has tested many pathological urines and has never obtained a positive Thormählen reaction except in melanogenuria, and he concludes that if both the ferric chloride test and the nitroprusside reaction are positive it is safe to diagnose melanogenuria. In the case reported here it is considered that, as the choroidal tumour removed was a proved malignant melanoma, the pulmonary opacities were metastases and responsible for the presence of melanogens in the urine.

Spontaneous disappearance of a malignant tumour is a rare phenomenon of considerable interest, and several theories regarding the aetiology have been put forward. Rohdenburgh and Bullock (1918) collected 302 cases in which temporary or permanent regression of a malignant growth occurred. In this series the greatest number of spontaneous regressions followed incomplete surgical removal of the tumour or acute infections with prolonged pyrexia such as erysipelas, and a smaller number were associated with a profound upset of the patients' metabolism such as the menopause. He considered it probable that these conditions act by depressing the proliferative energy of the malignant cell until the defensive forces of the body are able to accomplish its final destruction. Ewing (1940) says the only explanation of many cases of spontaneous cure of highly malignant tumours is a local or general immunity. It is recognized that necrosis, probably starting because the tumour outgrows its blood supply, is a prominent feature of choroidal melanoma, and out of 106 tumours described by Samuels (1934) 24 were completely necrotic. Reese (1951) saw spontaneous necrosis occur in a malignant melanoma of the iris.

In the case reported here there was no obvious cause for the regression of the metastases such as an acute infection. As necrosis can bring about regression and apparent cure of the primary choroidal tumour, it is thought probable that this is the cause in this case rather than the other theories discussed.

Summary

A case of spontaneous regression of pulmonary metastases from a malignant melanoma of the choroid is described. Several theories concerning the aetiology are discussed, necrosis due to the tumour outgrowing its blood supply being considered the most probable.

I am grateful to Professor J. S. Mitchell for permission to publish details of this case and for his help, to Dr. N. R. Lawrie for assistance with the biochemical details, and to Dr. N. Ashton for supplying me with the pathology report.

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THERAPY IN EXPERIMENTAL HEPATIC FAILURE

BY

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It is difficult to assess the effect of any drug in the treatment of acute hepatic failure in man. A few patients will recover spontaneously, and any method of treatment used will then be given credit for the successful outcome. No satisfactory therapeutic trial comparing similar groups of treated and untreated cases has ever been carried out, and the difficulties in the way of such a trial are formidable, for the condition is uncommon and may be due to a variety of causes.

A controlled trial of the efficacy of some of the measures advocated for the treatment of acute hepatic failure in man has therefore been carried out on rats in which the syndrome has been reproduced experimentally.

Methods

It has been shown that the injection of 0.02 to 0.04 ml. of carbon tetrachloride into the mesenteric vein of the rat will reproduce many of the clinical and pathological features of the syndrome of acute liver failure seen in man (Reynell, 1953). A large proportion of the rats so treated will die within 48 hours. The procedure was designed to produce severe hepatic necrosis without damaging other tissues. Adult male rats of the Wistar strain (200-400 g. body weight) and free of Bartonella infection were used in these experiments.

Experiment I: Vitamin Supplements by Mouth.—Thirty-four rats reared on stock diet were each given 10 g. of a synthetic diet daily for two days before the injection of carbon tetrachloride into the mesenteric vein. The diet was made up as follows: cornstarch, 71 parts; casein, 26 parts; and salt mixture, 3 parts. During the three days after operation each rat was offered 5 g. a day of the same diet, although even this reduced amount was not always consumed. Half the rats were given the following vitamin supplement, which was mixed with the diet: 2 mg. of nicotinic acid, 1 mg. of thiamine, 1 mg. of riboflavin, 1.5 mg. of tocopherol, and 30 mg. of choline chloride per rat daily. This supplement resembles the parenteral vitamin mixture advocated by Latner (1950) for the treatment of hepatic failure.

Experiment II: Large Doses of Parenteral Liver Extract.—Of 24 rats fed on stock diet and subjected to the injection of carbon tetrachloride into the mesenteric vein, 12 were given 0.25 ml. of commercial liver extract daily by subcutaneous injection for two days after operation.

Experiment III: Sodium Gluconate.—Of 28 rats fed on stock diet and subjected to the injection of carbon tetrachloride into the mesenteric vein, half were given 50 mg. of the monosodium salt of glutamic acid eight-hourly by subcutaneous injection for 48 hours after operation.

Experiment IV: Cortisone.—Of 40 rats fed on stock diet and subjected to injection of carbon tetrachloride into the mesenteric vein, 20 were given 2 mg. of cortisone per 100 g. body weight twice a day by intramuscular injection for two days after operation.

Results of Treatment

Treatment	Treated Animals		Controls	
	Surviving	Dead	Surviving	Dead
Vitamin supplements ..	10	7	11	6
Liver extract ..	5	7	4	8
Sodium glutamate ..	4	10	5	9
Cortisone ..	6	14	7	13

Results

In none of these experiments was there any significant difference between the mortality of the treated rats and that of the controls (see Table). Vitamin supplements by mouth, large doses of liver extract parenterally, sodium glutamate, and cortisone all separately failed to improve the chances of survival of rats with experimentally induced hepatic failure.

Discussion

Polyvitamin therapy (Latner, 1950), large doses of liver extract (Snell and Butt, 1941), glutamic acid (Walshe, 1953), and cortisone (Ducci and Katz, 1952) have all been advocated for widely differing reasons in the treatment of hepatic failure. Though these measures may sometimes be followed by symptomatic improvement, claims that they increase the patient's chances of survival should be examined critically. Although there are possible dangers in applying the results of animal experiment to man, no adequately controlled human therapeutic trial has been done, and one is obliged to draw conclusions from human observations which are relevant but inconclusive and from animal experiments which are conclusive but of uncertain relevance.

The clinician faced with a patient suffering from acute liver failure has to deal with a liver which is already severely damaged, and treatment is probably effective only in so far as it will protect the organism against the effects of liver damage until regeneration can occur. Since the metabolic effects of liver injury are so extensive, it is unlikely that any single chemical substance will do this completely, and, as in acute renal failure, the object of treatment must be to maintain chemical homeostasis until spontaneous recovery occurs. There is a need for more fundamental knowledge of the biochemistry of liver failure in order to plan rational therapy.

Summary

Acute hepatic failure has been produced in rats by the injection of small quantities of carbon tetrachloride into the mesenteric vein.

Vitamin supplements, large doses of liver extract, sodium glutamate, and cortisone all failed to reduce mortality in this type of experimental liver failure.

I am grateful to Miss Shirley Thomas for technical assistance and to Professor L. J. Witts, in whose department this work was done.

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SURGICAL EMPHYSEMA AS A COMPLICATION OF ANAESTHESIA

BY

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Surgical emphysema is that condition in which gas is present in the tissues. This gas may be air or, during anaesthesia, any of the gases used in induction. The first case of surgical emphysema occurring as a complication of anaesthesia was reported by Woolsey in 1912. Thereafter sporadic reports of cases have been published.

Two factors are concerned in the aetiology: (a) the presence of gas under pressure, and (b) some form of trauma permitting entry into the tissues. During anaesthesia, trauma may be produced on any portion of the surface lining of the respiratory tract, including the nose and pharynx, and is usually due to instrumentation (Barrett and Thomas, 1944; Gordon, 1950). Laceration of the mucosa permits gases in the lumen of the respiratory tract to gain access to the submucosal connective tissue and to spread from there.

Gas under pressure in the lumen of the respiratory tract may itself produce the trauma and spread in the connective tissue. Normally the weakest point of the respiratory tract is the alveolar wall, and raised pressure will cause trauma here. In man, a case has been reported in which an intrabronchial pressure of only 12 mm. Hg caused emphysema (Heidrick *et al.*, 1940; Marcotte *et al.*, 1940), and a pressure above 80 mm. Hg will almost always rupture the alveolar walls and their contained vessels, causing air embolism (Haldane and Priestley, 1935). This excess pressure may be exerted by the anaesthetist with his machinery easily enough nowadays, when controlled respiration is so commonplace. Tuffier (1906) showed that a pressure of 6 mm. Hg was enough to maintain distension of the lungs, and 15 mm. Hg has been advocated as the maximum pressure that should be employed in controlled respiration (Thornton *et al.*, 1944). The patient may himself raise the intrabronchial pressure, as by coughing or straining (Hamman, 1945).

The mechanism involved is (Macklin, 1937): The alveolar wall ruptures and gas passes perivascularly along the vessels to the hilum and mediastinum, producing mediastinal emphysema, which becomes the focal point for the further spread of the gas. The gases may (a) spread with the large vessels up to the neck and present as subcutaneous emphysema, (b) spread with the vessels down into the retroperitoneum, or (c) rupture the mediastinal pleura, thus producing pneumothorax. The important point is that pneumothorax does not result directly from rupture of the alveolus.

Clinical signs and symptoms depend on the site and the amount of gas present. Mediastinal emphysema (Hamman, 1945) causes obstruction to the return of blood to the heart and thus lowers the cardiac output, showing clinically as dyspnoea, cyanosis, engorged veins, obliteration of the cardiac dullness, and crackling sounds

on auscultation of the heart. These signs of mediastinal emphysema are generally not marked, the gases usually spreading with comparative ease and presenting as subcutaneous emphysema, with or without pneumothorax. With mediastinal emphysema an associated pneumothorax is present in one-third of the cases.

Case Report

A boy aged 8 years was admitted to hospital for enucleation of an eye. Pre-operative examination revealed a plump child, weight 58 lb. (26 kg.), height 3 ft. 9 in. (114 cm.), nose blocked, pigeon chest, emphysematous vesicular breathing. Premedication consisted of chloral, 8 gr. (0.5 g.), at 9.25 a.m., and atropine, 1/100 gr. (0.65 mg.), at 10.15 a.m.

At 11 a.m. 200 mg. of thiopentone sodium as 2½% solution, followed immediately by 20 mg. of succinylcholine chloride ("scoline"), was given intravenously. After the usual fibrillations of the muscles, a size 8 "portex" endotracheal tube was passed easily through the mouth into the trachea under direct vision, using a Macintosh laryngoscope. The endotracheal tube was connected to a Boyle machine, and inflation of the lungs with oxygen was begun pending the return of spontaneous respiration.

As the bag was compressed, the sudden rapid appearance of subcutaneous emphysema of the face and neck was noticed. The Boyle machine was immediately disconnected from the endotracheal tube, the laryngoscope was inserted, and the tube was removed from the larynx and immediately replaced. The patient was still apnoeic as a result of the succinylcholine chloride, so the tube was reconnected to the Boyle machine and very gentle rhythmic compression of the oxygen-filled reservoir bag was restarted. The subcutaneous emphysema had spread superiorly up to the eyebrows and inferiorly on the anterior abdominal wall down into the scrotum. At this time the pulse could not be palpated, but it rapidly returned to full volume in less than two minutes at a rate of about 150 beats a minute. The mucous membranes were pink throughout, except for a period of about one minute following the appearance of the subcutaneous emphysema, when they were cyanosed. Spontaneous respiration began again in about five minutes.

In view of the patient's condition the operation was cancelled and he was returned to the ward with the endotracheal tube *in situ*. At about 11.15 a.m. he started to object to the presence of the endotracheal tube, but was restrained from removing it, and amethocaine 2% solution was sprayed down and round the tube. Portable x-ray examination of the chest revealed a bilateral pneumothorax, retroperitoneal gas, and subcutaneous emphysema. Bilateral puncture of both pleural cavities was performed with needles attached to tubes leading under water. Gas bubbled out rapidly and x-ray examination showed re-expansion of both lungs. The patient was then sedated with paraldehyde, and three and a half hours after the onset of the surgical emphysema the endotracheal tube was removed. Penicillin, 500,000 units, and streptomycin, 0.5 g., were given twice daily as a prophylactic against the possible development of mediastinitis, and the patient made an uneventful recovery, the subcutaneous emphysema being almost entirely reabsorbed by the following day.

Comment

The cause in this case appears to be the institution of positive pressure, leading to the sequence of events described by Macklin: rupture of the alveoli and perivascular tracking of the oxygen to the mediastinum, with extension from there to the neck to present as subcutaneous emphysema, and rupture of the mediastinal pleura to give bilateral pneumothorax with collapse of the lungs.

Trauma to the tracheal mucous membrane, as has been described by others (Barrett and Thomas, 1944; Gordon, 1950), seems to be unlikely, in view of the ease with which the endotracheal tube was passed.

Summary

The causes, mode of production, and treatment of surgical emphysema as a complication of anaesthesia are discussed, and a new case is reported.

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Medical Memoranda

Winged Scapula Caused by a Solitary Exostosis

Solitary exostoses of the scapula of sufficient size to cause symptoms occur very rarely. Du Mortier and Halpert (1934), who reported two cases, could find only 18 further cases in the literature covering the previous 100 years; Mouchet, who showed one case to the Société d'Anatomie de Paris in December, 1927, had personal knowledge of two further cases (quoted by Pouzet and Labry, 1929). Five other isolated cases have since been reported (Pouzet and Labry, 1929; Hartmann, 1930; Lunardi, 1934; Taylor and Schaffer, 1937; Leffmann, 1947). In a survey of the causes of "snapping scapula" collected by Milch and Burman (1933), subscapular exostosis was mentioned, these authors citing the case described by McWilliams (1914), which is included in the series of Du Mortier and Halpert.

In 15 of the cases in the series of Du Mortier and Halpert the exostosis grew from the subscapular surface, thus causing winging of the scapula or interference with shoulder movement. Of the remaining five cases, four were inadequately described by the original writers, and in one instance (Heurtaux, 1886) the exostosis arose from the spine of the scapula. In the five further cases now collected from the literature, the situation of the exostosis was at the medial angle or the vertebral border of the scapula, except in one, in which it was attached to the axillary border (Taylor and Schaffer, 1937). There appears to be no sexual predominance, 14 being male and 12 being female.

In all but four cases symptoms occurred before the age of 20, and in the remainder it is likely that the condition had existed for some years before advice was sought. Because of its rarity it was thought worth while reporting a case of subscapular exostosis with some unusual features.

CASE REPORT

A bus driver aged 23 attended the out-patient clinic complaining of aching pain in the left shoulder and limitation of shoulder movement.

On examination an extensive deep-brown pigmented naevus was found to be situated over the left shoulder and a pronounced winged scapula which could not be passively corrected. The deformity had apparently been present for about 10 years, recently becoming more noticeable. The arm could be abducted to 160 degrees, this being accompanied by a creaking sensation over the scapula. Palpation deep to the vertebral border of the scapula revealed a large bony mass. X-ray examination showed this to be an exostosis growing from the subscapular fossa and impinging on the uppermost three ribs, which bore slight indentations at the points of contact. At operation the exostosis was approached by a longitudinal incision over the vertebral border of the scapula. The exostosis was easily excised and was found to be pear-shaped, 3½ in. (9 cm.) in length

by 2 in. (5 cm.) at its greatest width. It was attached by its narrower extremity to the costal aspect of the vertebral border. The wider end bore rounded facets indicating the points of contact with the ribs.

The pathological report stated that the specimen consisted of normal compact and cancellous bone, covered by a layer of hyaline cartilage at its wider end, and without any evidence of haemopoiesis or malignancy.

The post-operative recovery was uneventful, a full range of painless movement, together with disappearance of the "winging" of the scapula, being obtained in eight weeks.

COMMENT

In only two cases of the present collected series of 26 instances of exostosis of the scapula were the exostoses found to be present at a site other than the medial angle or vertebral border. Du Mortier and Halpert (1934) believed the exostosis to grow from an accessory centre of ossification, but Lunardi (1934) thought it to be due to an overgrowth of the epiphysis of the vertebral border.

Treatment consisted in excision of the exostosis as close to the scapula as possible, and sometimes a portion of the scapula may need to be resected with it. The results of operation appear to be uniformly good, and even in cases in which winging has been present for many years, as in the case here described, correction of the deformity and return of full function is the rule.

I wish to thank Mr. G. Hyman, under whose care this case was admitted and who performed the operation, for permission to publish and for encouragement and advice; and Dr. R. A. Garson, assistant pathologist to the Halifax Group of Hospitals, for his examination of the specimen.

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Topical Analgesia for the Urethra

Topical analgesia for urethral instrumentation has been practised for many years, during which time cocaine and a large number of synthetic derivatives have been tried with varying results. All of these drugs have a small but undeniable mortality risk from toxic absorption. The blame for this must be attributed to the operator who, with complacent disregard for the risks, instils the drug into the urethra. Although cocaine has fallen into disrepute for nerve blocks or infiltration techniques, it still retains an important place as a topical agent, and if due regard is paid to the maximum dose it is as safe and efficient as its synthetic rivals.

Only too frequently are local analgesic drugs used with unwarranted abandon; and since, in efforts to produce perfect analgesia, the solution is instilled too liberally, accidents still occur. Recently a preparation, "xylocaine gel" containing xylocaine (lignocaine hydrochloride) 2% w/v, has appeared on the market, supplied in 15-ml. tubes for urethral application. The total quantity of xylocaine in any one pack amounts to 300 mg., and, just as it is impossible to empty a tube of toothpaste completely, so also will the amount of xylocaine which can be administered be appreciably less than the total dose available. With such a packing, some protection is offered against overdosage.

The efficiency of 2% xylocaine solution in providing good topical analgesia for the urethra has been attested by many workers. In a series of more than 800 cases Persky and Davis (1953) limited their dose to 10 ml. and reported good results with only one doubtful toxic reaction, while Haines and Grabstald (1949) observed no untoward effects in 250 cases. The results obtained with xylocaine gel

appear to have been equally good (Romanus, 1951; Nesbitt and Baum, 1952).

I have now administered xylocaine gel to 150 patients, ranging in age from 16 to 84 years, for a variety of per-urethral instrumentations with good results and no toxic reactions.

TECHNIQUE

Males.—The bakelite nozzle (supplied in each package and sterilizable by boiling) is screwed on the end of the tube of gel and a small amount is squeezed beyond the tip to lubricate the nozzle. The penis is cleaned in the usual fashion and the nozzle inserted into the meatus. The contents of the tube are then expressed gently into the urethra. As the nozzle is removed, the penis is compressed with a penile clamp or rubber band to prevent leakage. The gel is massaged gently into the posterior urethra and 10 to 15 minutes are allowed to elapse before proceeding with the operation.

Females.—A throat swab with enough wool to cover the terminal 1 to 1½ in. (2.5 to 3.8 cm.) is dipped in xylocaine gel which has been expressed into a dish. The genitals are cleaned, and the prepared swab is inserted into the urethra and kept there for 10 minutes.

RESULTS

The methods described have been used on 100 males and 50 females for cystoscopy, retrograde pyelography, passage of sounds, and a few cases of simple cystodiathermy.

Males.—In the male group the directions given must be followed with care. In most cases good surface analgesia was provided, but this in itself does not suffice where a narrow urethra has to be stretched, causing sensations of deep pressure. A stricture, an enlarged prostate, and a contracted urogenital diaphragm all provide obstructions to the passage of an instrument, and are therefore causes of discomfort. When the urethra is essentially normal a good result can be expected. The result was satisfactory in 89 out of 100 cases.

Females.—Commonly no analgesia is used for cystoscopy in the female, but there is no doubt that discomfort is caused by the passage of a rigid instrument whose position is constantly changing. Most of the females in this series had previously been catheterized in the ward; the majority volunteered that cystoscopy with xylocaine gel was no more unpleasant than the simpler ward procedure carried out without analgesia. The result was satisfactory in 48 cases and unsatisfactory in 2; one of the latter had a large neoplasm encroaching on the internal meatus, and the other was a nervous girl of 16, for whom any form of local analgesia would have been unsuitable.

The method is not recommended as a general rule for cystodiathermy, as the pain from this is not abolished by topical analgesia of the urethra. However, where it has been necessary merely to fulgurate one or two seedling papillomata on the fundus of the bladder, many patients have found the procedure quite tolerable.

The advantages of topical analgesia for urethral instrumentation include the simplicity of the method, the lack of general disturbance to the patient, and the retention of consciousness, which allows a supervising nurse to be dispensed with, as, for example, when retrograde catheterization is being carried out in the x-ray department.

Toxic Reactions.—Although no toxic reactions were seen in this series a second type of reaction was encountered in a man who complained of nausea and faintness when the gel was injected too rapidly, causing localized distension of the urethra. This reaction, although not dangerous, may cause considerable distress to the patient.

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Reviews

ANNUAL SURVEYS OF MEDICINE

Advances in Internal Medicine. Edited by William Dock, M.D., and I. Snapper, M.D. Volume VI, 1954. (Pp. 375; illustrated. 75s.) Chicago: Year Book Publishers Inc. London: Interscience Publishers Ltd. 1954.

Les Entretiens de Bichat, 1954. Chirurgie et Spécialités, sous la direction de M. J. Chabrier *et al.* (Pp. 442. No price.) Médecine, sous la direction de MM. les Professeurs Guy Laroche et L. Justin-Besançon *et al.* (Pp. 502. No price.) Thérapeutique, sous la direction de MM. les Professeurs Guy Laroche et L. Justin-Besançon *et al.* (Pp. 188; illustrated. No price.) Paris: Expansion Scientifique Française. 1954.

Symposia and annual reviews have recently been described as having become a literary incubus in their own right. *Advances in Internal Medicine* is the third annual survey of medicine which we have reviewed in the last few weeks; nevertheless, it is not a newcomer, this being the sixth volume, and it has previously been reviewed favourably in these columns. Each of the annual volumes contains nine or ten articles of about 10,000 to 15,000 words on subjects of topical interest. The subjects included in the present volume are uropepsin, glucagon—the hyperglycaemic hormone of the pancreas—the Papanicolaou technique of cancer diagnosis, spatial vectorcardiography, the L.E. cell phenomenon, biopsy studies of the liver and kidney, thrombotic thrombocytopenic purpura, porphyria, diaphragmatic hernia, and the determination of insulin in blood. The authors are expert and well chosen; for example, Hargraves writes on the L.E. cell phenomenon. The book is well produced, and this sixth volume will consolidate the position of the series as a valuable help to the physician wishing to keep up to date in the theory and practice of medicine and to the student working for the higher medical examinations.

The Bichat Postgraduate Lectures are a series of annual publications which are widely used and much esteemed in the French-speaking world. They form the basis of a postgraduate course which is given in the amphitheatre of the Salpêtrière in Paris. Not all the lectures are actually spoken, though the text is available for discussion. They are about 2,000 words in length, and there are some 80 lectures each on medicine and on surgery and the specialties, and some 50 lectures on therapeutics. About them all it can be said, as the preface itself says of the lectures on therapeutics, that they have at the same time an up-to-date character and a practical tendency. The series gives a splendid picture of the renaissance and vitality of French medicine since the war; and, although the language difficulty will prevent these volumes from having a wide public in this country, they can nevertheless be strongly recommended, if only for skimming, to our medical and surgical travelling clubs, and to our British teachers and consultants in general, nourished as they are almost exclusively on Anglo-American literature. I should certainly like to have them on my own shelves for preparing clinical lectures and case demonstrations.

L. J. WITTS.

ANTIBIOTIC THERAPY

Principles and Practice of Antibiotic Therapy. By Henry Welch, with 16 collaborators. Specially edited by Felix Marti-Ibanez. (Pp. 699+xix. \$12.) New York: Medical Encyclopedia, Inc. 1954.

This book is a successor to *Antibiotic Therapy* by Henry Welch and Charles N. Lewis, which was somewhat critically reviewed in these columns (June 21, 1952, p. 1339); it has been much improved. The more superfluous accounts of clinical features and general treatment of diseases have been omitted, as have the unsatisfactory diagrams indicating variations in bacterial sensitivity: these are replaced by extensive tables containing much important and positive information. But the chief change has been made by deputing the clinical chapters to leading authorities in special fields. It is invidious to mention only a few names, but to say that Finland writes on staphylococcal infections, Hinshaw on tuberculosis, and Woodward and Smadel on

virus and rickettsial diseases will show their quality. Multiple authorship has one disadvantage: it may entail inconsistency. Thus in Chapter XXIV carbomycin is given as the first choice for treating certain infections, whereas in Chapter XXV it is dismissed as inferior to other antibiotics. The time before dental extraction for beginning penicillin administration to prevent bacterial endocarditis is stated as two days on page 661, as one day on page 318, and as 30 to 60 minutes on page 664; there are strong reasons, which have been ventilated in this *Journal* (for example, March 31, 1951, p. 656), for choosing the shortest of these intervals.

The book is well up-to-date, including, for example, a full account of tetracycline. Both for the extensive information about the pharmacology and biological activity of individual antibiotics in the earlier chapters, and for the accounts which follow of their clinical use in almost every condition in which they are applicable, this work will be of great use both to clinicians and to laboratory workers.

L. P. GARROD.

THE CAUSES OF CRIME

Who are the Guilty?: A Study of Education and Crime. By David Abrahamsen, M.D. (Pp. 340. 13s. 6d.) London: Victor Gollancz Ltd. 1954.

The Roots of Crime. Edited by the late Sir Norwood East, M.D., F.R.C.P. With a foreword by the Rt. Hon. Sir David Maxwell Fyfe, G.C.V.O., Q.C., M.P. (Pp. 181+ix. 30s.) London: Butterworth and Co. Ltd. 1954.

"Masturbation in a boy," writes Dr. Abrahamsen, "is like playing for sexual excitement. . . . When a man starts gambling, that also begins as a sort of play. Another similarity is that in many forms of gambling as well as in masturbation the person uses his hands." The question Dr. Abrahamsen asks in his title is a pertinent one; and the implied answer—that, in so far as we do not make efforts to guard children against the effects of unsatisfactory home life and other defects of the society in which we live, we are all among the guilty—will awaken sympathy. But he does not advance his argument by a consistent looseness of thinking, of which an example has been given above.

The British symposium edited by Sir Norwood East has the advantage over the American *cri de cœur* that the authors have tried to come to grips with the problem at a realistic level. To offset the exaggerated claims, both for treatment and for prophylaxis, which are made by some psychotherapists Dr. Curran quotes the results of an American experiment. The names of 650 boys between 6 and 10 who were notified as likely to become delinquent were matched in 325 pairs by a number of characteristics, including age, intelligence, and educational, ethnic, and social background. By a toss of a coin one member of each pair was sent for psychotherapy—anything from "big brother" guidance to formal psychoanalysis—while the other was watched as a control. The boys were followed up for an average of 50 months. Out of the treatment group 96 appeared in court for 264 offences; out of the control group 92 for 218 offences. When faced with these results the therapists insisted that the relationships established had their value in themselves, irrespective of their possible effect on the boys' behaviour.

Mr. F. J. Powell, in his chapter on "The Magistrate and the Psychiatrist," estimates that mental abnormality entered into the causation of only 11% of all cases tried at the Clerkenwell Court during a complete year (1951). This may well be an underestimate, as if psychiatric abnormality is unsuspected it will not be looked for. Nevertheless the figures lend support to the view that in most cases of the commoner crimes, such as larceny, psychological explanations will be found in ordinary rather than psychopathic mental processes. We can be sure that the contribution which psychiatry can make to the elucidation of the causes of crime is important, but is most unlikely to be decisive.

In his introductory chapter Sir Norwood East points out that the peak age for crime in both sexes is 13–14; the risk of criminality rapidly diminishes with age. With "finger-

printable" offences, 81% of those without and 59% of those with proved previous offences had not returned to prison 14 years later. Sir Norwood concludes that "prison treatment can justly claim a considerable degree of success"; but this is a *non sequitur*. It can safely be claimed for "prison treatment" that while it is going on it substantially reduces the risk of crime; but, curiously enough, there appears to be no evidence at all, in a scientific sense, that imprisonment is any more successful than psychotherapy.

ELIOT SLATER.

CONGESTIVE HEART FAILURE

A Primer of Congestive Heart Failure. By George E. Burch, M.D., F.A.C.P. (Pp. 126+xi; illustrated. 30s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1954.

This book of 126 pages has four chapters. The first is devoted to a review of the mechanisms of heart failure, while the remaining three are concerned with its treatment. Although primarily intended for medical students, young graduates, and general practitioners, there is little description of the clinical features and varieties of congestive heart failure. The current theories of the mechanisms of heart failure are clearly presented in the first chapter. Fact and theory are separated, and experimental work is appraised in its relationship to the findings in man. The emphasis is on the heart and circulation as a double pump system, and the effects of forward and backward failure are described; but Dr. Burch points out that they are an inadequate explanation of the clinical syndrome.

Advice on management and therapeutics is detailed and sound, though not always applicable to conditions in Great Britain. Home treatment is considered to be at least equal to a hospital regimen. The dangers of hyponatraemia and other toxic effects of administering mercurial diuretics appear to be slightly overemphasized. Most physicians are more impressed by their extraordinary safety. The third chapter, on digitalis, contains a useful table describing the various preparations of this and related drugs. The many diagrams are clear and there is a reasonable bibliography at the end of each chapter. The crisp opening sentence of this book—"Congestive heart failure constitutes one of the enigmas of medicine to-day"—is supported by seven references and characterizes the form and substance of the book. It is one to be confidently recommended to those for whom it is written.

WALLACE BRIGDEN.

CLINICAL BIOCHEMISTRY

The Biochemistry of Clinical Medicine. By William S. Hoffman, Ph.D., M.D. (Pp. 681+xx; illustrated. 90s.) Chicago: Year Book Publishers Inc. London: Interscience Publishers Ltd. 1954.

This is an ambitious book, as it aims at dealing with some of the essential aspects of biochemistry as well as with the pathological, biochemical, and therapeutic aspects of most diseases of biochemical interest. The difficulty of compressing all this within some 650 pages is obvious, but the author has very largely succeeded in his efforts, and he is to be congratulated on producing a useful and readable book. This is perhaps the nearest approach in recent years to the well-known *Quantitative Clinical Chemistry* by Van Slyke and Peters, though it differs from the earlier work in omitting all technical details.

The volume opens with a discussion of proteins, carbohydrates, and fats, and proceeds to a consideration of diseased states arranged mainly on an anatomical basis. Chapters are included on such subjects as nucleic acids, biological antagonists, and isotopes. References are not so numerous as might be expected, but a useful list is given at the end of each chapter. Relatively more space is devoted to endocrine disturbances than to some other subjects. Sections on the liver, kidney, and electrolytes are also excellent. On the other hand idiopathic steatorrhea is hardly mentioned and is not given as a cause of osteomalacia. There is a lack of reference to recent work on the 17-keto-steroid excretion in gout, and the modern dietary treatment

of uraemia is not discussed. Nevertheless this book can be strongly recommended both to the clinician and to the chemical pathologist as a valuable work of reference and a stimulating account of this special field.

N. F. MACLAGAN.

SURGICAL HANDBOOK FOR STUDENTS AND NURSES

Demonstrations of Operative Surgery: A Manual for General Practitioners, Medical Students and Nurses. By Hamilton Bailey, F.R.C.S., F.A.C.S., F.I.C.S., F.R.S.Ed. Second edition. (Pp. 387; illustrated. 24s.) Edinburgh and London: E. and S. Livingstone Ltd. 1954.

This is indeed a remarkable book and will appeal to a wide circle of readers. Written originally for the benefit of the nursing staff, it has grown into a manual in which the medical student, the theatre sister, the general practitioner, and indeed all those who wish to know how operations should be carried out will find all that they require. To describe an operation accurately and yet to avoid the elaborate detail with which the surgeon himself must be familiar is no easy task, but here it has been accomplished with complete success.

The first chapters deal with the minute care of instruments and the complicated appliances which the modern nurse is expected to maintain. There follow a series of short but accurate descriptions covering practically every operation in the most modern fields of surgery, including even mitral valvotomy. The descriptions are so clear and so admirably illustrated that no one could fail to appreciate the steps of each operation or the reasons for the precautions which are so carefully explained. Many an experienced surgeon will be only too glad to refresh his memory in the case of some unusual situation with which he has to deal.

The illustrations are most aptly chosen and well produced and add greatly to the value and clarity of each article. Hamilton Bailey is to be congratulated on a brilliant achievement in co-ordinating the contributions of some thirty authors, all of them acknowledged leaders in surgery, in a volume for which so many will be grateful.

HENRY SOUTTAR.

PARKINSONISM

Parkinsonism and its Treatment. Edited by Lewis J. Doshay, M.D., M.A., Ph.D. (Pp. 152; illustrated. 24s.) London, Philadelphia, and Montreal: J. B. Lippincott Company. 1954.

In recent years increasing interest has been taken in Parkinsonism, and this short book adequately covers various aspects of the subject. The outstanding chapters are those by Professor Wolf on the pathology of the various types of Parkinsonism and by Professor Denny-Brown on the aetiology of the condition. In this latter chapter the suggestion is made that idiopathic Parkinson's disease may basically be due to a disorder of metabolism, and Denny-Brown cites evidence indicating that it may be a "limited form of cumulative metabolic neuronal lipoidosis." The description of the clinical aspects by Dr. Doshay is excellent, but it is disturbing to find adiadochokinesis mentioned as an important sign of the condition. If this cumbersome word is to be used at all, it should surely be applied to incoordination of rapid movements such as occurs in cerebellar disease, and not to the slow, but not incoordinate, type of movement seen in Parkinsonism.

Over one-third of the book deals with treatment; there is a useful chapter on the drugs, including the newer synthetic chemicals, which are valuable in improving symptoms, and this is embellished by a coloured plate showing the various tablets and capsules. A considerable number of surgical procedures have been used in an effort to reduce rigidity and tremor, and these are reviewed by Dr. Schlesinger; his conclusion is that no surgical treatment "has approached the status of a standard clinical procedure."

This book is easy reading and should be helpful to all who look after patients suffering from this common disorder.

J. W. ALDREN TURNER.

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COMBINED CHEMOTHERAPY IN TUBERCULOSIS

Of all the drugs recently found to be effective in the treatment of tuberculosis, isonicotinic acid hydrazide (isoniazid) stands in a class by itself. While not the "wonder drug" that some hoped it might prove to be, three years' experience has fully confirmed the original American reports that it has a remarkable effect *in vitro* and *in vivo* against the tubercle bacillus.¹⁻³ It was therefore disappointing when early reports on isoniazid showed that both in the laboratory and in the treatment of patients (especially with pulmonary tuberculosis) tubercle bacilli developed resistance to the drug even more quickly than to streptomycin,^{3,4} and the indiscriminate use of isoniazid alone in the treatment of tuberculosis was generally condemned.⁴⁻⁶

This condemnation has not been universal. Isoniazid alone has been given with success to many patients with miliary and meningeal tuberculosis.^{7,8} Even for pulmonary tuberculosis W. McDermott and his colleagues⁹ have claimed that isoniazid alone, over a period of one year, was "in the same general class as the multiple drug regimens," and tubercle bacilli could be cultured from the sputum of only 11 out of 32 patients treated for that length of time. There was no great deterioration in clinical condition even in those patients whose sputum still contained tubercle bacilli, often highly resistant to isoniazid. Now many strains of isoniazid-resistant tubercle bacilli isolated both in the laboratory and from patients have been shown to be relatively avirulent, at all events to certain experimental animals,¹⁰⁻¹³ and McDermott and his colleagues, while recognizing

the great value of combined therapy, suggest that in at least some cases of pulmonary tuberculosis the administration of isoniazid alone may not be so disastrous as was at one time feared. Even so, in some patients bacteriological relapse, with the re-appearance in the sputum of isoniazid-resistant tubercle bacilli, is associated with serious clinical relapse¹; such organisms may perhaps be of reduced virulence in the sense of initiating new lesions in certain experimental animals, but they seem to be capable of causing serious harm to the patients in whose lungs they are growing, and these people may be a danger to contacts.

Many reports have shown that excellent results can be obtained by suitable combinations of isoniazid with P.A.S. or streptomycin.^{6,14,15,16} The latest report of the Medical Research Council, published in the opening pages of the *Journal* this week, gives further information about the effectiveness of certain of these combinations. Four methods of treatment were compared in 588 patients. All received 200 mg. of isoniazid daily; 182 of them received in addition streptomycin, 1 g. daily (SH), 142 streptomycin 1 g. twice weekly (S2H), 159 P.A.S. 20 g. daily (20 PH), and 105 P.A.S. 10 g. daily (10 PH). "Judging solely from the results at three months," the report concludes that "streptomycin 1 g. daily plus isoniazid 200 mg. daily is not only the most effective of the four treatments, but also represents the most effective drug combination studied at any stage of the trial." Streptomycin 1 g. twice weekly plus isoniazid 200 mg. daily was less effective in preventing drug resistance; isoniazid plus P.A.S. in either of the doses used was effective, though not quite so good as daily streptomycin plus isoniazid. It is not always realized, though it is explicitly stated, that full clinical and laboratory information was available for only three months of treatment, and therefore these Medical Research Council reports, although they contain valuable information about the response to three months' treatment, cannot be expected to tell us what happens with longer courses of chemotherapy. It is true that in 241 patients bacteriological results are available for courses of treatment lasting for six months, and these confirmed the adequacy of the SH, 20 PH, and 10 PH treatments, and the inadequacy of the S2H treatment in preventing bacterial resistance to isoniazid. But it is unfortunate that clinical information is not available for periods of treatment longer than three months, since it is precisely in the period between three and six months that differences between different treatments may reveal themselves, at least in some forms of pulmonary tuberculosis. Such information is urgently needed for the combination isoniazid plus

¹ Fox, H. H. 12th International Congress Pure and Applied Chemistry, Sept. 9-13, 1951. *Chem. Engng News*, Sept. 24, 1951, 3964.

² Gramberg, E., and Schnitzer, R. J., *Quart. Bull. Sea View Hosp.*, 1952, 13, 3.

³ Robitzek, E. H., et al., *ibid.*, 1952, 13, 27.

⁴ Knox, R., et al., *British Medical Journal*, 1952, 1, 1081.

⁵ Grace, E. J., et al., *J. Amer. med. Ass.*, 1952, 149, 1241.

⁶ Joiner, C. L., et al., *Lancet*, 1952, 2, 843.

⁷ Clark, C. M., et al., *Amer. Rev. Tuberc.*, 1952, 66, 391.

⁸ Anderson, T., et al., *Lancet*, 1953, 2, 691.

⁹ Deutschle, K., Ormond, Louise, Elmendorf, D., Jr., Muschenheim, C., and McDermott, W., *Amer. Rev. Tuberc.*, 1954, 70, 228.

¹⁰ Barnett, M., et al., *Brit. J. exp. Path.*, 1953, 34, 568.

¹¹ Steenken, W., Jr., and Wolinsky, E., *Amer. Rev. Tuberc.*, 1953, 68, 548.

¹² Middlebrook, G., and Cohn, M. L., *Science*, 1953, 118, 297.

¹³ Morse, W. C., et al., *Amer. Rev. Tuberc.*, 1954, 69, 464.

¹⁴ Mount, F. W., et al., *ibid.*, 1953, 68, 264.

¹⁵ Medical Research Council, *British Medical Journal*, 1953, 1, 521.

¹⁶ Joiner, C. L., et al., *Lancet*, 1953, 2, 152.

¹⁷ — *ibid.*, 1954, 2, 663.

¹⁸ Mackaness, G. B., and Smith, N., *Amer. Rev. Tuberc.*, 1952, 66, 125.

¹⁹ Stewart, Sheila M., et al., *British Medical Journal*, 1954, 2, 1508.

P.A.S. There is no doubt that this method of treatment is effective over short periods, and the Medical Research Council's report shows that drug resistance is greatly delayed by the use of isoniazid plus P.A.S. for six months. But, as the report points out, its clinical value over periods longer than six months is in doubt. Much of the disagreement can perhaps be explained by differences in the type of case studied by different groups of workers. In some studies, for example, isoniazid alone, isoniazid plus streptomycin, and isoniazid plus P.A.S. have appeared to be about equally effective. Yet in advanced fibrocaceous disease isoniazid plus streptomycin is clearly better than isoniazid alone. Isoniazid plus P.A.S. may be between these two regimens in the benefit it gives.

The best combination of these three drugs remains uncertain. It is possible that changes in treatment may be more effective than any one combination. C. L. Joiner *et al.*¹⁷ obtained satisfactory results with isoniazid, streptomycin, and P.A.S. in rotation, each pair of drugs being used for one month at a time. Whether in the end this will be more or less effective in delaying drug resistance is not known. The use of all three drugs together has the disadvantage that resistance might develop to all of them. The importance of continuing the search for new drugs is plain. Two which show promise are terramycin (oxytetracycline) and pyrazinamide. Terramycin by itself has some activity against the tubercle bacillus, and it is interesting to note that G. B. Mackaness and N. Smith¹⁸ found that, like isoniazid, terramycin was effective in killing tubercle bacilli inside macrophages as well as in the test-tube. There is little information about its effect *in vitro* in combination with other drugs. But several workers have claimed that in the treatment of chronic pulmonary tuberculosis excellent results could be obtained by combining streptomycin with terramycin. More recently Sheila Stewart, F. W. A. Turnbull, and J. W. Crofton in this *Journal*¹⁹ have attempted to assess the value of terramycin together with isoniazid in the treatment of chronic fibrocaceous tuberculosis. Thirty-three patients were treated. All received isoniazid (100 mg. twice daily) and terramycin in daily doses of 1 g. (10 patients), 2 g. (13 patients), or 5 g. (10 patients). The progress of these patients was compared with the progress of 17 patients who received isoniazid alone (100 mg. twice daily). The authors conclude that terramycin in the lower doses has little to offer, even in conjunction with isoniazid, but that in a dose of 5 g. daily it does seem to delay the onset of isoniazid resistance. Resistance to terramycin was not observed in any of the groups. The authors themselves suggest that these results are not impressive, but that terramycin may

have some place in combination with isoniazid when other drugs for any reason cannot be given. Some recent American reports suggest that pyrazinamide is more promising. McDermott and his colleagues⁹ go so far as to say that pyrazinamide with isoniazid "provides probably the most effective therapy known." Pyrazinamide is a drug of considerable interest. Chemically it resembles nicotinamide, but has a pyrazine instead of a pyridine ring. Like nicotinamide, it is not very active in the test-tube against tubercle bacilli except in special conditions, but showed promise in experimental animals. When first used in man it was found to be too toxic for prolonged administration in effective dosage, but if the recent American reports are confirmed its combination with isoniazid is an important step forward.

One of the real problems in this field is the nature of the disease, whose progress or relapse is difficult to test reliably. A given course of treatment may produce disturbingly different results in different groups of patients, even though every care has been taken by one group of investigators to make them as comparable as possible. It is therefore not surprising that results obtained by different groups of workers are sometimes even more conflicting. When several good methods of treatment are available, it is not easy to devise tests which will clearly indicate the best of them. Here it is well to remember how quickly the chemotherapy of tuberculosis has advanced. Only a few years ago tuberculous meningitis was a disease with a 100% mortality, and no drug could be relied upon to influence the course of any form of tuberculosis. To-day the drug control of tuberculosis is established and is already greatly reducing the mortality and the infectiousness of the disease.

GRANTS FOR NEW HOSPITALS

The Minister of Health's statement last week on a new building programme for hospitals in England and Wales, together with the Secretary of State's similar statement for Scottish hospitals, will have brought a feeling of relief to all responsible for the working of the hospitals. The programme will not be started until the financial year after next, and the sums of money to be made available will be small in relation to the needs; but at last a start will be made on the physical expansion of the hospitals made necessary by the growth of their services since 1948.

The new programme, which is divided into two parts, will not replace the existing capital works programmes of hospital boards. These, under which a certain amount of expansion and renovation have already taken place, and nurses' homes been provided, will go forward as planned. In the current financial

year, £12m. has been voted for the capital expenditure of hospitals in Great Britain, and, according to the statements made last week, much the same sums will be available in 1956-7 and 1957-8. What the main part of the new programme will do is to inaugurate the building of entirely new hospitals for the first time since before the war. Parliament will be asked to vote a sum of £7½m. for England and Wales in 1956-7 and £10m. in 1957-8 to enable major building projects to be undertaken.

Compared with expenditure in the decade before the war, when a vast amount of hospital building was carried out from voluntary funds and by public authorities, these sums, as Mr. Macleod pointed out, are not large. On the other hand, much of the building by the voluntary system in the 'thirties took the shape of small hospitals, scattered haphazardly over the country according to the wishes of the benefactors, local enterprise, and local wealth. In the public system, similarly, energetic local authorities were busy putting up new hospitals or converting their old public assistance institutions. But here, too, though such relatively well-off public authorities as London and Middlesex carried out some big hospital schemes, some of the poorer authorities were impeded by lack of funds. Now that all hospital expenditure is met from central funds, there should be a much better chance of the new building taking place where it is most needed and of the money available being put to better use. Certainly the list of projects given by Mr. Macleod that will be included in the first year's programme looks as if absence or shortage of existing accommodation in relation to population has been the main criterion in deciding priority. Thus a new town like Harlow and a greatly to be expanded old town like Swindon are to have new general hospitals. West Cornwall and West Cumberland, at present without adequate general hospitals, are to have them. The present shortage of mental hospital accommodation in the Midlands is reflected in the new mental hospital to be built at Wolverhampton, and four regions are to have major extensions to their mental deficiency hospitals. The rebuilding of Charing Cross Hospital at Harrow, possibly to start in 1957-8, had been decided on long ago; it is an obvious advantage to disperse some of the teaching hospital facilities of Central London to areas of growing population outside.

In other cases, however, the reason for priority seems less clear, at least to those not privileged to know what guides a regional board in coming to a decision. Four hospitals were mentioned by Mr. Macleod as being allowed to start building new out-patient departments in 1956-7. Their need for them is not disputed. But what the staffs of other hospitals whose need is apparently no less great would like to

know is why their hospitals' claims have again been postponed. Publication of the reasons for postponement might help to allay the customary suspicion that priority is given to those who make most fuss.

The second smaller part of the new programme is a special allocation of money to be used for plant replacement and "redeployment," whatever that may prove to be. For this purpose Parliament will be asked to vote £2m. in 1956-7 and £4m. in 1957-8. The replacement of antiquated plant in boiler rooms and laundries has long been recognized as a means of economizing in maintenance expenditure, and the new financial provision is intended to give a fillip to schemes of this sort, which can already—subject to Ministerial approval—be carried out under the Boards' ordinary capital programmes.

Nevertheless, such economies as are obtained in this way must be small in relation to the hospitals' total maintenance expenditure. This is bound to be increased when the new hospitals are ready to be staffed and used. Here, too, a point arises. Will the additional staff be forthcoming? Mr. Macleod seemed to have no qualms about this on being questioned, because, he said, hospital staffs had been steadily increasing since 1948, and it would be easier to attract staff to new hospitals. Nevertheless, there is a danger, particularly in the mental hospitals and mental deficiency institutions, which are already short of nurses, that the new hospitals will not recruit additional staff but merely attract staff away from the old.

The new schemes are only a foretaste of what needs to be done. But at least a beginning is to be made, and at last hospital boards have been given a long-term period for planning—and, moreover, a definite undertaking that, subject to Parliament's approval, the necessary funds will be forthcoming.

RESULTS OF TREATING CANCER OF THE LUNG

Carcinoma of the bronchus is a disease with a bad prognosis: often no treatment is possible, and in other cases only temporary palliation can be hoped for. But when radical surgery is possible a substantial hope of a long survival can be offered; and in the majority of cases life is prolonged. The benefits of surgery, disappointing though it often is, are greater than is generally believed. Elsewhere in this issue Mr. T. Holmes Sellors reviews the results of surgery in the cases he has himself treated. Between 1940 and 1950 he undertook 689 thoracotomies, and found excision possible in 446. Of 273 resections performed between 1940 and 1948, 24% of the patients died within four months of operation, but 34% survived

two years, and 21% five years. Of 173 resections performed in 1949 and 1950, 9% of the patients died within four months of operation, and 40% survived two years, and 34% three years. Results of surgery are thus better than they used to be and are still improving. In 1946 Tudor Edwards¹ published his personal results in the first number of *Thorax*: of 1,016 patients seen with bronchial carcinoma, 173 were operated on and excision carried out on 70. Operative mortality was 17%; 27% of the patients survived two years, and 7% five years. Another recent series, published in 1954 by Boyd and his colleagues² from Boston, Mass., gave results comparable to those of Holmes Sellors: resection was done in 104 cases out of 403 seen, with 8% operative mortality and 32% surviving for five years. Gibbon³ reported a five-year survival rate of 26%; and Ochsner⁴ found resection possible in 442 cases out of 1,365, with an operative mortality of 19% and a five-year survival rate of 34%. In considering survival rates, it must be remembered that most of these patients are in late middle or old age and that the onset of other diseases would in any event be tending to raise the mortality rate in such a group. Nevertheless many of those surviving for five years eventually die from recurrence or metastases of the original growth.

Taylor and Waterhouse,⁵ reporting on 1,592 cases of carcinoma of lung, found an average survival of only four months from the time of diagnosis in patients not treated by resection. Boyd and his colleagues² also reported that patients treated only medically survived four months; and Lea⁶ found the average duration of life to be six and a half months from the first symptom. The range of variation in the time of survival of untreated patients is wide, and occasionally, as with all cancers, patients survive several years. A case of spontaneous regression has even been reported,⁷ but the natural course of the disease is almost always extremely short. Cure is always hoped for, though it cannot be confidently predicted even after several years' survival, but the patient who has had a resection has more than a 50% chance of surviving for a year, and so of trebling his life expectation.

Radiotherapy, which is mainly used as a palliative, also prolongs life. As Smithers⁸ has pointed out, the patients who would most benefit from radical radiotherapy are also suitable for surgery and so usually treated by resection. Brooks and his colleagues⁹ found that 129 patients given a radical course of radio-

therapy survived for an average period of 10 months, and that 176 given palliative therapy lived, on average, for five and a half months. The temporary palliation of symptoms achieved by the lesser course, which, unlike radical therapy, can usually be given without causing radiation sickness, is most valuable, particularly for the relief of haemoptysis, superior vena caval obstruction, or the pain of secondary bone deposits (but not of direct bone invasion).

The advice of a surgeon should be sought whenever extension of the growth beyond the thorax has not been proved. Operation will occasionally be contraindicated by the patient's general condition (especially if respiratory function is reduced by previous disease), but more often by invasion of glands or mediastinal structures—the heart or superior vena cava, the recurrent laryngeal or phrenic nerves, or the proximal great vessels. Holmes Sellors confirms the general belief that the histological type of the carcinoma influences the operability and prognosis, squamous-celled growths being more readily and more successfully treated than adenocarcinoma or oat-celled carcinoma. The same tumour, however, may contain areas of different cellular types. Unfortunately operability cannot always be determined before exploration, and a large number of useless thoracotomies must inevitably be done if as many patients as possible are to be given the benefit of a resection. A radical operation nearly always entails a pneumonectomy, since it is usually essential to remove the main bronchus. Sometimes in peripheral growths without glandular involvement a lobectomy is enough, and in other patients with poor respiratory function it must be accepted as a palliative.

ARTIFICIAL RESPIRATION AND CARBON DIOXIDE

When a healthy man breathes air or oxygen mixed with 5% of carbon dioxide his breathing markedly deepens and quickens. This incontrovertible observation led to the emergency use of carbon dioxide in attempts to stimulate breathing when it had stopped. Haggard and Henderson¹ in 1921 advocated, for many respiratory emergencies, the use of 5% carbon dioxide with oxygen in conjunction with artificial respiration. Since then cylinders containing this mixture of gases have been widely used. There are few forms of treatment about which it is harder to obtain direct clinical evidence, for in these emergencies those present must strive urgently for the patient's life and critical observation is almost impossible. Yet it has been suspected for some time that to give carbon dioxide to a patient who needs and is receiving artificial respiration is not only irrational but may be harmful.

When a healthy man breathes 5% of carbon dioxide the breath-regulating mechanism responds and ventilation of the lungs increases greatly, with the result that the pressure of carbon dioxide in the arterial blood increases only very slightly. This is not so when the patient has been exposed to narcotics or deprived of oxygen, for then the breath-regulating mechanism is damaged and depressed and the earliest of its functions to be impaired is the ability to respond to increasing concentrations of carbon dioxide. Thus by the time that artificial respiration becomes necessary the tension of carbon dioxide in the alveoli and arterial blood will already be abnormally high and the pH of the arterial blood may be abnormally low. If 5% of carbon dioxide is given to a patient in real need of artificial respiration breathing will not be stimulated. Ventilation of the lungs will continue to depend upon the artificial respiration, and in emergency conditions this is unlikely much to exceed normal resting levels. In consequence the alveolar carbon dioxide concentration will rise to 15% or 20%, and at this level carbon dioxide is poisonous. Such concentrations of carbon dioxide depress respiration, cause coma, and damage the cardiovascular system.

The hazard and confusion which can be caused by high alveolar concentrations of carbon dioxide have now been recognized in respiratory disease² and after anaesthetic procedures which seriously interfere with breathing.³ Failure of commencement of spontaneous respiration after the administration of a muscle relaxant may be due to this cause if artificial respiration has been inadequate during the operation. In a recent issue of the *Journal* we published a report⁴ to the Medical Research Council by its Committee for Research on Breathing Apparatus on the subject of gases to be administered in artificial respiration. The authors of the report, Dr. K. W. Donald and Professor W. D. M. Paton, have marshalled the evidence in favour of the committee's conclusion that "carbon dioxide should not be administered with oxygen in the resuscitation of subjects requiring and receiving artificial respiration." It is recommended that oxygen should be given, when possible. Much of the evidence is experimental, but in this field experiment can often closely mimic practice. The evidence and argument are impressive, and no other conclusion seems reasonable.

THE FUGITIVE CATHETER

A polyethylene catheter has been found a practical alternative to the cannula in giving intravenous fluids. It is particularly useful when a hypertonic solution is to be given intravenously, such as hypertonic glucose in the treatment of anuria. The fluid can be delivered directly into the superior vena cava by advancing the tip of the catheter to this point; whereas if a cannula in a peripheral vein is used thrombosis in the vessel will probably ensue as a result of hypertonicity of the fluid. The polyethylene catheter has, however, one serious disadvantage—it is difficult to anchor securely to the skin. This is usually overcome by having a sufficient length of catheter both outside and inside the vein, so that small changes in position of the catheter do not

matter. Turner and Sommers¹ now report a serious mishap to a patient with myocardial infarction being treated with intravenous fluids: a 22-cm. length of polyethylene catheter which had been tied into the right median antecubital vein and strapped to the skin escaped from the vein and passed into the right auricle. At necropsy two days later, in addition to extensive myocardial infarction resulting from recent coronary occlusion, the polyethylene catheter was found lying in the right atrium and superior vena cava, with its tip resting against the tricuspid valve ring. A mural thrombosis overlying an area of myocardial necrosis was found on the anterior wall of the right atrium at the level reached by the end of the catheter. The catheter itself was surrounded by a thin layer of antemortem blood clot and the entire right side of the heart was filled with clot also. A similar layer of blood clot sheathing the entire length of the catheter has occasionally been found at necropsy on patients who have died from anuria after treatment for several days by hypertonic glucose through a polyethylene catheter in the superior vena cava. Hence intravenous therapy by this method should not be continued longer than is absolutely necessary. The endocardial lesion in the case reported by Turner and Sommers was probably caused by atrial contraction against the tip of the catheter. No direct parallel can be drawn with cardiac catheterization, since in this procedure the tip of the catheter is only in the same position in the heart for a matter of minutes, as opposed to 48 hours in the case reported. Goodwin,² however, reporting a fatality after cardiac catheterization, found a small area of subendocardial necrosis lying beneath an endocardial thrombus in the outflow tract of the right ventricle, and he stressed the need for caution and gentleness when performing cardiac catheterization. The necropsy findings in Turner and Sommers's case lend further weight to his warning.

POST-TRAUMATIC PERSONALITY CHANGES

Interest in the personality changes following frontal lobe injury in man has grown progressively since Phineas Gage received his head injury from a crowbar just over one hundred years ago, and was converted from a popular hard-working man into a "childish kind of crook."³ The increase in the number of patients with head injury, due to the two world wars and to automobile accidents, and the steady growth of neurosurgery have enlarged the clinical experience of neurologists and psychiatrists. It was, however, the results of animal experiments which led to the introduction of prefrontal leucotomy, by which those character changes caused by frontal lobe injury might be expected to balance certain symptoms—in particular, emotional tension and pre-occupation—occurring in patients with mental disorder.

Various groups of patients have been studied in order to determine the fundamental disturbances resulting from frontal lobe injury, and each of these groups has its advantages and disadvantages as research material. In 1937 Jefferson⁴ commented on some of the mental changes observed in eight patients operated on for

¹ Jefferson, G., *British Medical Journal*, 1937, 2, 199.

² *Acta psychiat. neurol. scand.*, 1939, Suppl. 20.

³ *Prefrontal Leucotomy*, 1950, Oxford.

⁴ *J. Neurol. Neurosurg. Psychiat.*, 1954, 17, 14.

¹ *Thorax*, 1946, 1, 1.

² *J. thorac. Surg.*, 1954, 28, 392.

³ *Ibid.*, 1954, 28, 408.

⁴ *Ibid.*, 1954, 28, 408.

⁵ *Thorax*, 1950, 5, 257.

⁶ *Ibid.*, 1952, 7, 305.

⁷ Blades, B., and McCorkle, R. G., *J. thorac. Surg.*, 1954, 27, 415.

⁸ *British Medical Journal*, 1953, 1, 1235.

⁹ *Thorax*, 1951, 6, 1.

¹ *J. Amer. med. Ass.*, 1921, 77, 1065.

² Donald, K. W., *Lancet*, 1953, 1, 495.

³ Scurr, C. F., *British Medical Journal*, 1954, 1, 565.

⁴ *Ibid.*, 1955, 1, 313.

¹ *New Engl. J. Med.*, 1954, 251, 744.

² *Brit. Heart J.*, 1953, 15, 330.

frontal lobe tumours. Rylander⁴ also recorded his findings in patients who had had a frontal lobectomy for tumour or abscess, and found fairly consistent changes in spite of the variations in amount of tissue excised and the possibility that in some patients the tumour had not been completely removed. There were mental changes in almost all of his 32 patients with frontal lobe ablation, an alteration in mood and a decrease in social tact being prominent. Partridge,⁵ in his outstanding contribution to knowledge about prefrontal leucotomy, recognized the difficulty of separating the effects of the mental illness and the effects of the operation. He therefore paid special attention to the group of patients who had recovered from an affective illness, and found some character change in all except one. The most remarkable changes were diminution in activity, a decrease in the tendency to worry, and a more permanent lack of restraint in behaviour—often “the freer post-operative expression of some subdued hostility which the patient has formerly held in check.”

The group of patients with frontal lobe damage due to penetrating wounds presents certain advantages for the study of personality changes, in that it comprises for the most part people who were previously in good health and in whom the lesion is static. Jarvie⁶ has recently made a close study of the changes after wounds of the frontal lobes in six patients. He compared their personality before and after injury and found that they had a much less firm control of their behaviour in its social aspects, and that this might appear independently of intellectual or other changes and was often quite apparent to the patient. Further, antisocial tendencies present before injury which had required a continuing conscious inhibition found a more ready expression after injury. He used the term “disinhibition” to describe this change, and pointed out that this mechanism gives an explanation of why such personality changes are seen only in certain patients, and why they involve different aspects of the personality in different people. Similar intensive studies of small groups of patients—particularly the study of personality, with its rich variation from person to person—are likely to throw more light on frontal lobe dysfunction and psychological mechanisms.

ROCKEFELLER INTERNATIONALISM

It is usual for the president of the Rockefeller Foundation to preface the annual report with a review intended to inform the public on broad lines of the Foundation's activities and interests. In the annual report just to hand, for 1953, the president, Mr. Dean Rusk, has had to devote half his space to a rebuttal—unnecessary as this must appear to many non-American observers—of charges against the Foundation and other philanthropic bodies made by a Congressional committee. The committee has been investigating tax-exempt institutions, and opportunity has been taken to make charges of “subversion” and the promotion of “left” ideas inimical to the American social system and government. The report of the committee had not been published when the president wrote his review, but he was aware of its likely tenor and made in advance a dignified defence. The activity under suspicion seems to

be that the Foundation has promoted internationalism, but what else, asks the president in effect, could it do? The attack upon medical and allied problems must cross national boundaries. Moreover, the general body of knowledge, scientific and other, is an international heritage, depending on the labours of scientists and scholars in many schools, in many laboratories, in many countries.

It is refreshing to turn from this political murkiness to what the Foundation achieved in 1953. In work of such variety it is difficult to take any short measurement except the financial one. The benefactions amounted to not far short of fifteen million dollars, which at the rate of exchange prevailing is between five million and six million pounds. This was divided for the most part between the four provinces of the Foundation—medical and public health projects, science and agriculture, social sciences, and the humanities. The medical interests of the Foundation in 1953 lay mainly in three directions. The first was the improvement of medical education by support given to medical faculties and teaching institutions in twelve countries. The second was a virus research programme, including intensive research on viruses whose attack upon man up to now has not been severe but may become so with changes in the genetic and environmental situation. The third was medical care, including a survey of general practice in an area of the United States with a view to throwing light upon the training of doctors for work in rural communities. There is no clear dividing line between medical and social science, and the Foundation is supporting investigations into the relationship between physiological and psychological factors and social behaviour. Grants were made in the expectation that the biochemist, the physiologist, the neurologist, the endocrinologist, the geneticist, and their colleagues in closely related fields can throw more light on human conduct. The Institute of Psychiatry of the University of London and similar departments at Cardiff and Birmingham were included as recipients.

In 1953 the Rockefeller benefactions assisted eleven British universities and numerous other institutions in this country. Out of the 321 persons holding the Foundation fellowships—163 of them in medicine and public health—19 were from Great Britain and 50 more from other countries in the British Commonwealth. A total of one million dollars was made available for fellowship activities during 1953. These fellowships, for postgraduate study, are awarded to outstanding men and women who show promise of making important contributions in their various fields. Eighty years ago, long before the Foundation was established, Charles W. Eliot, the famous president of Harvard, declared that in England and the United States “the method of doing public work by means of endowments managed by private corporations has been domesticated for several centuries; and these are the only two nations which have succeeded on a great scale in combining liberty with stability in free institutions.” It is to be hoped that no “barbaric indictment,” to quote the words of one of the dissenting members of the Congressional committee, will result in inhibiting the work of the Rockefeller Foundation or restricting its international adventures.

EMERGENCIES IN GENERAL PRACTICE

CRISES IN MYXOEDEMA

BY

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Myxoedema is a chronic rather than an acute disease, and therefore rarely presents with a crisis. It only does so when the disease has progressed to a very advanced stage, or if an acute complication develops.

I shall start by describing how to recognize the disease, for whatever the crisis the clinical picture of myxoedema is the same. The most important thing is to keep the possibility of the diagnosis in mind, for once the diagnosis has been thought of it is usually not difficult to establish it with the appropriate questions and observations.

Signs

I put signs first because appearance, voice, or demeanour often initiate the idea of the diagnosis before the history does.

Face.—The most helpful sign is the appearance of the face. This is hard to describe but easy to recognize once a case of myxoedema has been encountered, because affected people resemble each other as closely as if they were near relations. The patient is usually a woman, but the condition can occur in men. In advanced cases the features look bloated and the normal contours of the face are smoothed away just as the wrinkles of a balloon disappear when it is blown up. Oedema collects in the lips, broadening them, and around the eyes, narrowing the palpebral fissures and forming little bags of flesh beneath them. The colour is yellowish and waxy with a contrasting burgundy-coloured flush over the cheeks; in addition, the hair is dry and scanty, with a receding hair margin that leaves a wide forehead and, in some cases, partial baldness. The eyebrows are sparse and sometimes the lashes too. The classical loss of hair over the outer third of the eyebrows is an unreliable sign because so many normal people show this deficiency.

Neck.—Feeling for the absence of thyroid tissue is not clinically rewarding—besides, myxoedema can occur with a goitre; but the presence of a thyroidectomy scar is a helpful confirmatory sign when present.

Speech.—The essential characteristics of the speech are that it is low, it is slow, it shows nasal obstruction, and has a thick indistinct quality. In a gross case the words are punctuated by peculiar grunting, snorting sounds, and sound like a bad gramophone record (running down) of a drowsy, slightly intoxicated person with a bad cold and a quinsy. In less severe cases a husky thickness is all that is observed.

Oedema.—The myxomatous infiltration gives the body tissues a spongy, swollen feel somewhat resembling ordinary fluid oedema, but not pitting on pressure. This can be best felt on the front of the upper chest, where the sensation on pressure reminds one of rubber sponge. The textbook supraclavicular pads are not at all constantly present. In the legs the myxomatous oedema may be blended with true oedema due to heart failure.

Heart.—Though bradycardia is the textbook finding, it is unusual to get a pulse rate below 70. The heart is usually somewhat enlarged, but the frequent presence of pericardial effusion makes it seem larger. It is unlikely that the size of the heart or the presence of pericardial fluid will be detected clinically, because of the thickened integument of the chest wall.

Skin.—This looks coarse and feels cold, dry, and scaly; in a gross case the observer feels as if he were touching a lizard.

Mentality.—The patient with myxoedema thinks, speaks, and moves slowly. She may sleep much of the day and night, dropping off unintentionally whenever she sits in a chair. Her memory is faulty and she is too drowsy to pay much attention to anything. Psychotic symptoms may occur (see below) even when the myxoedema is not gross.

Symptoms

The history may give little help in making the diagnosis, though it greatly helps in confirming it once suspected. The symptoms are admitted to rather than complained of, and are discovered only when the right questions are asked. Often relatives notice the changes more than the patient because the illness itself smothers self-criticism. The following symptoms are common: general tiredness and sleepiness, gain in weight, vague pains in the limbs, poor memory, constipation, deafness, falling out of hair, dryness of the skin, and a feeling of perpetual cold. The myxomatous blocking of the air passages makes the patient complain of a chronic cold, and during sleep snoring may be unusually loud. The puffiness of the face and the change in the quality of the voice may be noticed by relatives. The drowsiness may be so great that the patient drops off to sleep at all hours of the day. The feeling of coldness may be so striking that a patient with myxoedema may use an inordinate number of blankets and hot-water bottles even in summer; the position in bed is often characteristic for the same reason—the bedclothes pulled up high, with only the top of the head visible, in an effort to get warm (Fig. 1).



FIG. 1.—The “snug” sign. A case of gross myxoedema showing the typical position in bed.

Diagnosis

Essentially myxoedema is a diagnosis made by clinical observation rather than by investigations; it is unlikely in a crisis that the practitioner would need more than the blood cholesterol level (and perhaps the basal metabolic rate and a photograph if easily available). For the sake of completeness here is a fuller list of investigations that may be helpful in supporting the diagnosis in doubtful cases.

Photographic Test.—Take a photograph of the face before and after six weeks' thyroid treatment. The change in appearance is usually sufficient to leave no doubt of the diagnosis (see Figs. 2 and 3). One patient, for instance, was not recognized by her grocer, with whom she had dealt for years, because her appearance had so greatly changed with treatment.

Blood Cholesterol.—The normal value is usually between 100 and 200 mg. per 100 ml. In nearly all cases of myxoedema there is a rise in this value to between 300 and 400 mg., or even higher. However, a normal value does not exclude the diagnosis.

Basal Metabolic Rate.—Classically the basal metabolic rate is lower than minus 30 to 40% by the time symptoms appear. The basal metabolic rate is a difficult thing to estimate accurately both because myxoedematous patients are often uncooperative and because the test demands special conditions, faultless apparatus, and repeated estimations by a very experienced observer. For these reasons a misleading figure is sometimes obtained, but this should not exclude a diagnosis made on clinical grounds.

Electrocardiogram.—The dry skin makes good records hard to get. The record sometimes shows bradycardia and usually reveals a low voltage of the QRS complex with flattening or inversion of the T wave. After treatment the electrocardiogram becomes normal.

Chest Radiography.—This reveals an apparently enlarged heart, but aspiration will show that much of the enlargement is due to pericardial effusion. With thyroid treatment the enlarged cardiac shadow returns to normal.

Iodine Excretion.—The urinary excretion of radioactive iodine is followed for 48 hours after a dose of 10 mc. of I^{131} with



FIG. 2

FIG. 3

Fig. 2.—A case of myxoedema admitted with an acute psychosis, before treatment. Fig. 3.—Same patient as in Fig. 2 after six weeks' treatment. (The loss of facial hair after treatment was only an indirect effect of the administration of thyroid. The improvement in the patient's social consciousness led to the use of a razor.)

10 mg. of potassium iodide. When hypothyroidism is present the values in the 24-48-hour period are abnormally high because the thyroid gland is less greedy for iodine than normally, but in myxoedema caused by antithyroid drugs the avidity of the thyroid for iodine is increased unless the antithyroid drug is still being given.

Temperature Chart.—There may be a low temperature, ranging between 96 and 97° F. (35.6-36.1° C.). A chart of this kind may help in suggesting the diagnosis, but the inconstancy of low temperature in myxoedema makes it of little value as a diagnostic test.

Blood Count.—Anaemia is usually found. In the blood count alone there is nothing diagnostic, for any of three types of anaemia may be shown: (1) a true macrocytic pernicious anaemia responding to liver in the usual fashion; (2) true hypochromic iron-deficiency anaemia responding to iron; and (3) a normochromic anaemia which responds neither to liver nor to iron but improves very slowly with thyroid.

Other Tests.—Among other tests the urinary ketosteroid excretion may be lowered, the protein-bound blood iodine diminished, the cerebrospinal fluid protein increased, the blood carotene raised, and the response of the blood sugar to intravenous insulin delayed. These tests are not essential for diagnosis.

What the Patient Says

Usually, despite all the diagnostic tests, the most convincing confirmation of the diagnosis lies in the spontaneous remarks of the patient or her relatives after treatment. For example: "My husband says I look ten years younger";

"I feel different, I speak different, and I am like what I used to be." A barmaid said to me, "I usen't to know how many light ales the boss had ordered and my customers used to say, 'What's come over you, Lyd? You're like an old frog,' but now they say, 'You're back to your usual self, Lyd.'" This same barmaid told how before treatment she found she had lost her power of repartee which she found so necessary in dealing with jovial regulars, and it was the return of this gift which pleased her more than anything.

Crises

1. Advanced Myxoedema

Any patient with advanced myxoedema is liable to die suddenly in the first few weeks of treatment before normal metabolism has been restored. The exact cause of death is not usually clear. The diagnosis of advanced myxoedema is easy if the patient is seen for the first time, but when a patient has been known for years the advanced condition may develop so slowly that a practitioner long acquainted with the patient can fail to notice it; the clinical newcomer has an advantage.

Before describing treatment, it must be underlined that in this (and the other crises of myxoedema) the ideal treatment is to prevent the condition ever reaching so gross a stage by diagnosing and treating myxoedema earlier.

The patient should be kept warm with plenty of bedclothes and hot-water bottles, because she is liable to develop hypothermia and go into an irreversible coma. Because of the liability to sudden collapse the patient should be moved as little as possible. People with gross myxoedema lie huddled in a torpid hibernating condition, and they should be allowed to stay thus without bothering them with much washing, visiting, or investigations. Thyroid should be started with a dose of $\frac{1}{2}$ gr. (32 mg.) twice daily for ten days and then be increased to $\frac{1}{2}$ gr. three times daily for the next week. After that the dose can be increased slowly to that level which maintains clinical improvement without overdose. This dose usually lies between 2 and 3 gr. (0.13 and 0.2 g.) a day. The clinical improvement and the blood cholesterol level help to assess the dose. Palpitations, anginal pain, diarrhoea, and undue loss of weight are indications that the dose is too large. Thyroxine has recently come on the market and can be used instead of thyroid. It has the theoretical advantages of a pure substance—certainty in action and constancy of dosage, 0.1 mg. corresponding roughly to 1 gr. (65 mg.) of ordinary thyroid; however, thyroid tablets in practice seem so efficient and certain that their general use continues.

The complications of myxoedema which can lead to crises are: myxoedema coma, acute psychosis, heart failure, intestinal obstruction, anaemia, gall-stones, and relapse.

2. Coma

This condition occurs only in fairly gross myxoedema and is often fatal. V. K. Summers reported five cases, all of them fatal. The coma may develop within a few hours, or deepen gradually for two days. The cause of the coma is uncertain, most cases have a very low temperature and the condition occurs more often in winter, so hypothermia may play a part.

It is hard to be dogmatic about treatment, because the coma is so often irreversible and treatment ineffective. Of the two cases I have seen that recovered, one came round from her coma in a few hours before thyroid had been given and thereafter progressed on $\frac{1}{2}$ gr. (16 mg.) of thyroid

twice a day, whereas the other case (which Dr. C. G. Barnes, of Hillingdon Hospital, kindly invited me to see) made a good recovery after being given 10 gr. (0.65 g.) of thyroid on the first day. Probably all that can be done is to treat the patient as already described for severe myxoedema, but if she is too deeply comatose to swallow, thyroxine sodium, 0.05 mg., can be injected subcutaneously instead of giving thyroid $\frac{1}{2}$ gr. (32 mg.) by mouth.

3. Acute Psychosis

Quite commonly an acute psychosis may result in the patient being first diagnosed as a mental case and dealt with under the Lunacy Acts. A. J. Cronin gave a vivid account of this complication in his book *The Citadel*, and it was clearly described in 1888 by the Clinical Society of London. I reported 14 cases in 1949 and have encountered eight more since. Almost any type of psychosis may occur, and the diagnosis is made on the myxoedematous appearance of the patient and not on the kind of mental symptoms. The commonest variety of psychosis is general confusion and disorientation, with persecutory delusions and hallucinations.

As there is a prospect of mental recovery within one or two weeks, the patient need not be transferred to a mental hospital if she can be managed at home or in a mental observation ward. Thyroid can be started at $\frac{1}{2}$ gr. (32 mg.) twice a day, or, if the myxoedema is not very severe, at 1 gr. (65 mg.) twice a day. Amylobarbitone, 3 gr. (0.2 g.), or paraldehyde, 2 dr. (7 ml.), may be needed at night to allay restlessness. Within a week or two the psychotic symptoms may have cleared almost completely, though if the condition has been long established mental improvement may be incomplete.

4. Heart Failure

Heart disease can occur in myxoedema because the heart is enlarged by myxoedematous infiltration of the heart muscle and because there is quite often a pericardial effusion. In addition, there may be coronary atheroma because of the high blood cholesterol. The clinical picture is that of myxoedema with the addition of dyspnoea, venous distension of neck veins, and pitting oedema.

If the myxoedema is gross it is probable that the heart failure will respond to thyroid; this should be given as already described in the treatment of gross myxoedema. In addition, digitalis should be given, 3 gr. (0.2 g.) three times during the first day, 2 gr. (0.13 g.) three times during the next day, then 1 gr. (65 mg.) three times a day for a week. If there is a pericardial effusion it should not be aspirated as it will absorb with thyroid treatment. Patients with myxoedema sleep well, so no sedative may be needed. If necessary, phenobarbitone, 1 gr. (65 mg.), can be given at night; morphine should not be given, as it may produce stupor.

5. Intestinal Obstruction

Subacute intestinal obstruction can occur as a complication of myxoedema owing to the constipation which is part of the disease and also to the myxomatous infiltration of the gut wall. One of my patients (the woman shown in Fig. 1) came in as a surgical emergency with subacute intestinal obstruction, and three other such cases have been seen at the Central Middlesex Hospital. The condition clears up with thyroid treatment. Naturally it is important to see that the obstruction is not caused by some unrelated condition such as strangulated hernia or carcinoma of the colon.

Thyroid is given as described already and a saline enema of 1 pint (570 ml.). Digital evacuation of the rectum is necessary if there are very hard scybala there.

6. Anaemia

It is unlikely that anaemia will be severe enough to be labelled as a crisis, but it may by its presence add to the critical condition of the patient.

Thyroid should be given whatever the type of anaemia if myxoedema is present. Other treatments depend on the

kind of anaemia. If there is iron deficiency the blood picture is that of hypochromic microcytic anaemia, and iron should be given by mouth as ferrous sulphate tablets, 6 gr. (0.4 g.) three times a day. If the blood picture shows true pernicious anaemia with macrocytosis and megaloblasts in the peripheral blood the case should be treated with vitamin B₁₂, 200 μ g. by intramuscular injection monthly. Before initiating treatment with vitamin B₁₂ it is advisable to confirm the diagnosis of pernicious anaemia by a sternal puncture and by reticulocyte counts, which should rise to a peak on the sixth day after treatment. Transfusion should not be given for the anaemia of myxoedema, because of the liability to heart failure.

7. Gall-stones

The incidence of gall-stones is increased in myxoedematous people, so the crises of gall-stones—that is, cholecystitis and gall-stone colic—may complicate the picture of myxoedema. The treatment of gall-stones is not a matter for this article, but the associated myxoedema should be treated in the usual way.

8. Relapse

It is, unfortunately, common for people with myxoedema to stop taking their thyroid and relapse into a condition of advanced myxoedema complicated by any of the crises which have just been outlined. The reason is that patients feel so well after a few months' treatment that they think there cannot still be any need to continue it. Once a patient stops taking thyroid the mental slowing prevents her noticing her own deterioration. It is important, therefore, to explain most carefully to the patient and her relatives that the illness requires treatment indefinitely, because, unlike most illnesses, it is caused not by something wrong being present, but by something right being absent.

(Fig. 1 is reproduced by permission of *Medicine Illustrated*.)

Next article on Emergencies in General Practice.—"Fits," by Dr. Denis Williams.

THE B.P.C. AND THE NATIONAL FORMULARY

A PHARMACEUTICAL SOCIETY LECTURE

The publication of the *National Formulary*, 1955, which was the subject of a leading article in our last issue (p. 402), a few weeks after that of the *British Pharmaceutical Codex*, 1954, has been arranged so that both compilations can be accepted for National Health Service purposes on the same date. In a lecture delivered by Dr. K. R. CAPPER, Ph.D., B.Pharm., a member of the Codex Revision Committee, at the Pharmaceutical Society of Great Britain on February 14, an interesting account was given of the work which lay behind both these publications.

Dr. CAPPER reminded his audience that to a large extent the *Codex* was produced by pharmacists for pharmacists, although many doctors served on the revision committee, and many doctors consulted the *Codex* for information, especially on the newer drugs. On the other hand, the *National Formulary* was a joint production by doctors and pharmacists, and was in fact a prescribers' handbook, easy to use in the crowded surgery hours of the general practitioner and in the dispensary of a retail pharmacy.

English or Latin Titles

The *Codex*, following the lead of the *British Pharmacopoeia*, had used English for the main titles of its monographs, whereas the *National Formulary* had reverted to an arrangement based on Latin titles and abbreviations of Latin names. Dr. Capper explained that this was the result of differently constituted committees dealing with similar

but not identical problems. Latin was officially discarded for medico-pharmaceutical purposes when the first *British Pharmacopoeia* used English instead of Latin for everything except titles. Latinized titles had some value because some of them, although by no means all, were identical with those used in other countries, but many of the traditional drugs to which these titles applied had fallen into disuse, and the newer drugs had never had such titles. The antibiotics, the antihistamines, the newer hypnotics, and narcotics, and the sulphonamides and other drugs were known only by their English names, and thus the advantage of retaining Latin titles for the older drugs became less than the disadvantage of coining Latinized names, which would never be used, for the newer ones. Many of the monographs in the *Codex* referred to *British Pharmacopoeia* substances some of which had not been given Latin titles in the *Pharmacopoeia* itself.

In the *National Formulary* the arrangement had reverted to that used in the 1949 edition. The Joint Formulary Committee, said Dr. Capper, bowed to the resolutions of many important medical and pharmaceutical bodies. The Committee was not backing Latin in the *Formulary*, but it was recognizing "that by far the greater number of prescriptions are written in a type of shorthand which is often an abbreviated Latin, but sometimes could equally well be abbreviated English. It is these abbreviations to which practitioners and pharmacists are really attached—the abbreviations which appear on prescriptions, on the shop rounds in dispensaries, and, with some irrelevance, on the little drawers behind the counter."

Some 400 formulae had been deleted from the formulary section of the *Codex*; over 900 had disappeared from current editions within a few years. The omissions consisted mainly of preparations of vegetable drugs, and of pills, effervescent granules, and other types of preparation which had largely fallen into disuse. To look through the formulary section of the *Codex* of 1934 was to realize the great changes which had occurred in the nature of pharmaceuticals in two decades. Of the 86 new formulae included in the new edition many were identical with or similar to those which had been deleted from the recent *British Pharmacopoeia*.

New Monographs in the "National Formulary"

In the *National Formulary* 45 new monographs had replaced 62 deleted from the 1949 edition. The reaction of the medical press to some of the additions, said Dr. Capper, deserved special consideration. This concerned in particular certain mixtures deleted from previous editions which had been reinstated either because frequency-of-prescribing surveys had shown that they were still often prescribed or because there had been strong requests from medical practitioners for their inclusion. The Committee had, in fact, reinstated only a few of very many formulae from old formularies that were still prescribed—in two counties alone there had been 96 mixtures and 67 other preparations in this category—and only when the evidence that these preparations were greatly in demand was indisputable. Dr. Capper welcomed what the *British Medical Journal* had said about the new *National Formulary*. "It may stimulate a discussion which will help the Joint Formulary Committee and eventually the pharmacists who have to use the book it produces."

Another criticism of the *Formulary* was that it contained no equivalents for certain popular proprietaries composed of freely available drugs. It could hardly be expected that the Committee would include these formulae if it did not consider them therapeutically sound. "In any case," said Dr. Capper, "it is a much better procedure if the medical men on the Committee decide how they want the drug presented for use, in tablet, injection, mixture, or linctus, and let the pharmacists develop a suitable formula. Such a formula may or may not resemble a proprietary medicine; if it does, it can be taken as an indication that great minds think alike." The idea that a patient would have no

confidence in what his doctor prescribed unless it resembled some well-known proprietary medicine seemed to be based on a completely unreal conception of the doctor-patient relationship.

The lecturer concluded by remarking on the immense amount of work put in by the members of the revising committees. The Codex Revision Committee had 16 members, and its subcommittees a membership of nearly one hundred.

JOHN HUNTER AND SURGICAL RESEARCH SIR CECIL WAKELEY'S ORATION

The Hunterian Oration was delivered before a large assembly at the Royal College of Surgeons on February 14 by Sir CECIL WAKELEY, whose theme was "Hunter and Surgical Research." He described Hunter as a pioneer in experimental surgery and the first to establish an experimental research station. This was at Earl's Court, then largely open country, where in 1763 he purchased 3½ acres of land, which had increased to 52 acres by the time of his death 30 years later. The orator read an impressive list of staff who came to be employed on the estate. Many species of animals were maintained, and Hunter's study overlooked a lion's den and a pond where he kept fish and frogs, eels and river mussels. How cheerful he was in this research environment was shown by a letter to his brother-in-law in 1775 in which he said, "My business is very nearly what I want because it very nearly gives me what I want," and added that he was "one of the happiest men alive." For a great part of his life Hunter seemed to be in some financial embarrassment, and, although when his estate was sold it realized over £10,000, yet after payment of debts and redemption of mortgages the amount at the disposal of his family was only a little over £1,000.

Some of the early experiments at Earl's Court were designed to prove what the surgeon could accomplish by grafting. Hunter believed that life in all animals was of the same nature however far apart zoologically they might be. It was natural to dwell on Hunter's successes, but perhaps an equal amount of instruction was gained from his failures. He was disappointed, for example, in his temperature experiments. He had the idea that life might be almost indefinitely preserved by refrigeration. The experiment failed, and yet freezing had now long been used in minor surgery and more recently in major surgery. Hunter, by the way, regarded 99° F. (37.2° C.) as the normal temperature of man. Readers of Hunter's lectures were inclined to smile at his explanation of how and why a useless piece of bone was absorbed, but the subject was still obscure, and it was necessary to postulate a susceptibility to some form of stimulation as yet unexplored. He studied the growth of antlers in deer, and came to the conclusion that in the animal body there was something which gave a new supply of blood to an actively growing part. One of his successful experiments followed an accident to himself in 1767, when he ruptured his tendo Achillis. This led to several experiments which laid the foundation of the modern practice of tenotomy. In 1785 he performed the operation of tying the femoral artery for the treatment of popliteal aneurysm.

After speaking of some of Hunter's pupils and how they had carried their master's teaching and methods to other schools and countries, Sir Cecil Wakeley said that were Hunter alive to-day his first concern would be the fate of his museum, which he desired to be preserved intact, not sold piecemeal. The Royal College had reason to be very grateful to the faithful guardians of the museum throughout the years, especially, in recent times, to Sir Arthur Keith and Professor Wood Jones, also to that great benefactor Sir Buckston Browne, who had made possible the research station at Downe, in Kent, an establishment after Hunter's own heart. Two priceless possessions Hunter would wish them to preserve, said the orator in conclusion, were his museum and his ideal of research.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Whither Natural Childbirth?

SIR.—Certain trends in maternity work are taking shape rapidly, and I would like to ventilate some of the problems before it is too late. The country is coming to demand for its expectant mothers elaborate explanation and instruction, with classes to increase the suppleness of the pelvic joints, to teach relaxation, and to rehearse for labour. There is a tendency to-day to introduce all these as a national policy as if benefit therefrom were an established fact, whereas I believe there are many who are uncertain of the wisdom of such a course. Has the matter been carefully enough thought out, discussed, and tested, or are we in danger of being rushed into its precipitate acceptance? Does childbearing require special training to be natural? To any other generation such a suggestion might seem absurd. Yet it is on just such a supposition that vast sums of public money are being expended to-day.

A baby does not have to be trained to defaecate, yet rehearsals for the second stage of labour are being taught all over the country.¹ In a normal labour the natural impulse to strain comes into action irresistibly when the head presses on the pelvic floor. The mother, without giving any elaborate thought to it, expels the foetus using the same mechanism as she has used day by day all her life for evacuation of the bowel. In both processes faulty timing, straining too soon, too hard, or for too long at a stretch, can impede progress. Surely, then, preconceived ideas about bearing down and practice beforehand will make it more difficult and not easier to achieve truly spontaneous evacuation. Cases where the second stage is not capable of being completely spontaneous are relatively few, provided patience is practised by those in attendance (a feat beyond the capacity of many doctors and midwives even to-day). Where teaching is required it can be given quite satisfactorily when the need arises—this would seem preferable to sacrificing the chances of an easy natural birth for the majority by training them antenatally just in case they should be in the minority group.

The first stage is not so easy to rationalize. It calls for considerable fortitude and endurance in many and varies enormously from person to person, and even from confinement to confinement in the same person. Any idea or ideal which can serve as a charm or banner during this ordeal may be given the credit by the patient for helping her win through. It is resignation as much as relaxation that is required, although the two may well go together. Practice beforehand may help some, but given implicit confidence in the attendant and the correct atmosphere of calm and reassurance, aided perhaps by sedation at the appropriate time, resignation and relaxation come naturally to a considerable proportion of mothers. This number includes many who are exceedingly tense personalities normally. Should we then be teaching relaxation as a necessary but difficult accomplishment which must be learned beforehand if a gruelling and painful labour is to be avoided? Is there not a danger that a fear of failure may be instilled in the mind of some mothers?

Does special training in fact increase the incidence of natural childbirth? Statistics can be misleading, but even more misleading are impressions on such a variable factor as morale. Many authoritative statements have been made²⁻⁶ pointing out that statistically⁷ no significant difference has been proved as between trained and untrained mothers in relation to length of labour, instrumental deliveries, or lacerations. Despite such strong backing this evidence still seems to require wider publicity. Only morale is then left. It hardly seems worthy of the mothers to-day and to-morrow that these very extravagant aids purely for their morale should be deemed necessary. Rather is it not a censure on those who look after them and whose duty it is to win their confidence?

There is, too, the possibility that the usual antenatal classes may in some cases actually do physical harm. The hazards of

instability of the pelvic girdle are of far-reaching importance and it may be that they are not receiving sufficient attention to-day. The widespread and time-honoured idea that increased mobility of the pelvic joints is so desirable is open to doubt.⁸

Another problem should be discussed. It is becoming customary to go into considerable detail in classes about the processes of pregnancy and labour and to illustrate them by pictures and diagrams. Is this intimate knowledge really necessary for an atmosphere of resignation and confidence in the first stage and for doing as nature dictates in the second? Knowledge when first acquired is seldom in perspective, but that is the quality of knowledge with which our mothers are in danger of being armed for their first confinement. It is unlikely that anyone without a previous background could obtain a balanced grasp of midwifery in a few months, still less should we expect a pregnant woman, who is already in a biased position, to keep a sense of proportion.

What training then, if any, is desirable for childbirth? There is one argument for antenatal classes which merits its full measure of praise. This is the opportunity to train women in good posture and muscle control. Although important, it may be questioned whether the antenatal period is the best time to introduce these problems. If we as a nation were more physique- and posture-minded, and if the physical education given in schools, and even better in evening classes in adolescence, were more enthusiastically supported, it would not be necessary to begin the teaching in pregnancy. The extra postural precautions necessary as the result of increased weight and altered centre of gravity could then be taught without special classes and post-natal rehabilitation would be more readily achieved. It might even be argued, as Nixon⁹ has already suggested, that the training required for childbirth is mainly the training which is desirable for life in general.

I am not writing to put forward any new theory; many authorities, as I have tried to show, have indicated somewhat similar lines of thought. Nor do I wish to underestimate the valuable pioneer work which has been done to wean women away from demanding painless labour, however artificial. I am writing because I believe more general and open discussion might be wise at this juncture.—I am, etc.,

Hove, 3.

CONSTANCE L. BEYNON.

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Thinking Differently

SIR.—As many others must have done, I read with interest and delight in its literary style, scholarship, and clinical brilliance Sir Charles Symonds's Harveian Oration (*Journal*, January 15, p. 119). I felt as I finished the peroration, with its earnest exhortation to research, that under such leadership the future of medicine could not be as gloomy as that which Sir Heneage Ogilvie depicted for surgery in an address you published a few weeks previously (*Journal*, December 18, 1954, p. 1435).

But, as I thought about it, his suggestion that the State should now in the names of research pay physicians to sit and think started an ugly train of thought. Is this privilege to be extended to all consultants or only some? The context excluded the possibility that it was to be given to hard-pressed young registrars, the class most likely to produce new ideas were they able, like consultants, to shed their overload of routine work.

Most particularly in neuropsychiatry, the field in which Sir Charles so well earned his knighthood, the need, it seems to me, is not for more thinking or training along established lines but for new thinking. If we want new thinking without each man having to rediscover everything for himself teachers must give young men opportunity and encouragement, not only to dot the "i's" and cross the

"t's" of their own work, but to think differently from them, to make mistakes and try again, for "error is opinion in the making" (Bacon). Such a policy is inconsistent with a State service, and I venture to suggest that Sir Heneage's interpretation of the trend of the times is the correct one, and that as a historian Sir Charles is too long-sighted. If he plans further historical research he might consider the factors that led to the decline of the spiritual influence of the Established Church when good committee work and adroitly turned platitudes became the passport to rich benefices. More simply let him try and imagine Hughlings Jackson or any of his successors, whose original research still carries neurology, allowing attendance in committees to interfere with their work, or doing their thinking by the paid session.

I conclude regretfully that the effect of the oration is to adorn rather than advance the art of medicine, and would remind anyone to whom the proposal seemed attractive that it was written long ago that man cannot serve God and Mammon—in the same session.—I am, etc.,

Sistrans, Austria.

J. F. TUTHILL.

Surgery in Octogenarians

SIR,—In his article on surgery in octogenarians (*Journal*, January 29, p. 266), under the heading of "Anaesthesia," Mr. Ronald W. Raven mentions that respiratory depression is easily induced. Every anaesthetist will agree with this. I feel certain, however, that there are many who will consider that the doses of respiratory depressant drugs that he then recommends are surprisingly large.

In my experience with these old people the dose of "omnopen" for premedication should never exceed $\frac{1}{2}$ gr. (10 mg.) or pethidine 50 mg., and usually it is better to give atropine only. Sodium thiopentone may be used for induction, but should be given very slowly in a 2.5% solution with a maximum dose of 0.25 g. The intravenous injection of 50 mg. of pethidine following omnopen or pethidine premedication and thiopentone induction suggested by Mr. Raven will induce severe respiratory depression, at least in my hands. It is safer to give single doses of 10 mg. of pethidine in dilute solution and to assess the effect of each for 10 minutes before giving subsequent similar amounts. I appreciate that details of anaesthetic technique cannot be given in an article of this nature, but consider that inexperienced anaesthetists may have been misled by the dosage recommended.—I am, etc.,

London, E.C.1.

ROBERT I. W. BALLANTINE.

Recurrent Abdominal Pain

SIR,—The recent correspondence on the subject of chronic appendicitis and the résumé by Mr. A. Henry Millard (*Journal*, January 22, p. 230) failed to consider a particularly frequent cause of recurrent abdominal pain in the young. I refer to non-specific mesenteric adenitis. As reported elsewhere,¹ I have seen more than 100 cases of this syndrome in one year in hospital practice. Due to the recurrent nature of the symptoms, the usual diagnosis before admission to hospital was that of chronic appendicitis. Awareness of the frequency of mesenteric adenitis, however, and of its presenting features, enables a clinical diagnosis to be made in almost every case. Particularly important in this connexion is a deliberate attempt (bimanual pressure if necessary) to palpate the firm, bean-sized nodes through the abdominal wall.

Further, there does appear to be a significant relationship between mesenteric adenitis and appendicular disease. Gross abnormality of the appendix was a feature of 19% of 588 cases culled from the literature. Therefore, without inserting a finger towards the mesenteric root, the surgeon cannot be satisfied that an abnormal-looking appendix (unless it be acutely inflamed) is the source of the patient's symptoms. It is worthy of note that of 700 cases of mesenteric adenitis in the literature 84% had no recurrence of symptoms after laparotomy.

Dr. H. R. E. Wallis (*Journal*, January 15, p. 128) has illustrated the importance of tuberculous mesenteric adenitis as a cause of recurrent abdominal pain. It must be borne in mind, however, that the non-tuberculous form is many times more common. The radiologist must be the arbiter in distinguishing between the two. With regard to laparotomy findings, Heusser² and Freeman³ have shown that if the glands are not typically tuberculous to the eye or finger they are not tuberculous in origin. The plea raised by Aird,⁴ Apley,⁵ and others for a wider recognition of the non-specific mesenteric adenitis syndrome must again be reiterated.—I am, etc.,

Cork, Eire.

M. J. T. FITZGERALD.

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SIR,—It is not often that a general practitioner actually sees the cause of recurrent abdominal pain, and this case might therefore be of interest.

The patient concerned first consulted me when she had right-sided abdominal pain for ten days, with nausea but no vomiting. On examination she was slightly tender in the right iliac fossa; her temperature was normal. I diagnosed a subsiding appendicitis and treated it accordingly. The pain became very much less and so did the tenderness, but I made an appointment for her to see a surgeon at the local hospital. One month after the first onset of pain she again complained of acute abdominal pain, this time more central, again with nausea but no vomiting, and no disturbance of the bowels. Her temperature again was normal, but this time she was admitted to the local hospital as a possible acute appendicitis. Again the pains subsided, and she was discharged after two days, but asked to return for a barium enema at the hospital. After the enema she came to see me and reported that two days before the enema she had felt something sharp when defaecating and on investigation had found a piece of glass, which she showed me. It was a jagged piece of clear glass about $\frac{1}{2}$ in. (12.7 mm.) long by $\frac{1}{4}$ in. (6.4 mm.) wide, such as might have come from a milk bottle or glass jar.

It is now five weeks since she passed the glass per rectum, and she has remained completely pain-free. The barium enema showed nothing abnormal. It seems probable therefore that the glass was indeed the cause of the pain, and the patient was rather fortunate in the outcome of the incident.—I am, etc.,

Purley, Surrey.

MAUREEN B. ADAMS

Obstruction from Orange Pith

SIR,—I have read with interest the cases reported by Mr. D. H. Sandell (*Journal*, December 18, 1954, p. 1484) and by Mr. N. H. Antia (*Journal*, January 22, p. 229), but do not agree that a bolus consisting of an unmasticated "quarter" of an orange could not pass through a normal pylorus. In 1941, while acting as Emergency Medical Service surgeon at St. Mary's Hospital, Highgate, a woman aged 50 was admitted suffering from obvious acute intestinal obstruction. She gave a history of similar (though milder) attacks over the previous 20 years. She was admitted during a night of almost continuous air raids, but her condition was so serious that it was decided to operate at once in the small emergency theatre. On opening the abdomen I found a stony hard mass in the lumen of the small intestine about 15 in. (38.1 cm.) from the ileo-caecal valve. The gut proximal to the obstruction was engorged and dilated. The intestine was opened and the mass removed. It was found to be a "quarter" of an orange fibrosed in the centre and covered with a dense layer of calcification. The patient made an uninterrupted recovery, and, on being told the findings, volunteered that she knew she had swallowed a large lump of orange when in her "teens." Subsequently she has had no recurrence of the colicky attacks she had suffered from previously. It would appear likely that the foreign body had been present longer than in the previous cases recounted.—I am, etc.,

London, W.1.

G. M. SANDES.

Bleeding from Tumours of the Small Bowel

SIR,—The interesting paper by Mr. T. A. Ogilvie and Mr. H. M. Shaw (*Journal*, January 15, p. 142) indicates clearly the various clinical manifestations of these tumours. May I emphasize more particularly one aspect of their presentation—that is, the occurrence of severe melaena? Two illustrative cases are as follows.

(1) A woman aged 38 had a right nephro-ureterectomy for tuberculous infection of the kidney in 1941. In 1949 she had a partial gastrectomy carried out for attacks of melaena due to duodenal ulcer. At the time of operation there was no evidence of a small bowel neoplasm. Her subsequent convalescence was uneventful until 1951, when she complained of attacks of central abdominal pain. In 1952 she was admitted as an emergency, having had a severe melaena stool, the first noted since the time of operation on the stomach in 1949. At the time of her admission her Hb was 8.2 g./100 ml. A barium meal and follow-through showed a high partial gastrectomy with some tenderness over the stoma, but no obvious ulcer. She had a further severe melaena and after massive blood transfusion the abdomen was explored. There was some thickening around the stoma but no obvious ulcer, and a vagotomy was carried out. Further exploration of the abdomen, however, revealed a mass in the terminal ileum with adjacent enlarged glands in the mesentery. The affected ileum and mesentery were resected and bowel continuity restored. Subsequent convalescence was uneventful, and the pathological report stated that the tumour was an ulcerated argentaffinoma with secondary deposits in the regional nodes of the mesentery. The particular point of emphasis is that the operation became a matter of urgency owing to the severity of the melaena while she was being investigated as an in-patient.

(2) A man aged 67; this patient complained of attacks of faintness and discomfort after food, associated with flatulence, for two to three years prior to admission. He was admitted with severe melaena as an emergency. There was no abdominal tenderness. There were no physical findings on examination of the abdomen, although his obesity rendered palpation difficult. His blood pressure was 160/65. It was considered that he had had a peptic ulcer with a recent exacerbation of inflammation, leading to melaena. He bled again soon after admission and operation was advised. At operation a pedunculated growth in the lumen of the gut about 3 in. (7.6 cm.) distal to the duodeno-jejunal flexure was palpated. Resection of the gut with end-to-end anastomosis was carried out. Convalescence was tardy owing to diarrhoea and some wound dehiscence. Pathological report on the tumour was that it was a simple fibroma.

It is not infrequent that prior to operation, and even afterwards, the final diagnosis of the cause of bleeding in the management of cases of severe melaena may be in doubt. As more cases of severe haematemesis and melaena are treated by immediate surgery, in the absence of obvious peptic ulceration or portal obstruction, the possibility of a neoplasm of the small bowel as being the cause of symptoms should be borne in mind.—I am, etc.,

St. Albans.

P. STRINGER.

"Rugger"

SIR,—Dr. J. Montgomery (*Journal*, February 5, p. 353) betrays a lack of appreciation which, in the twentieth century, is astonishing. Rugby football may cause occasional physical injury, but it differs strikingly from "Association" in that it never causes psychological trauma. Soccer is the supreme example of perpetual frustration. A player no sooner gets the ball than someone takes it away from him. The deprived person has no redress except to bump into his adversary (called "barging," I believe). Furthermore, 20 men have frequently to stand in impotent fury whilst one or other of two specially favoured players (called "goalies") handle the ball just as much as they like. If you want the ball in Rugger you go and get it, whilst in soccer you have to await its arrival in your part of the field.

But there are up-to-date reasons for thinking that Rugger actually confers psychotherapeutic benefits. There is a school of thought which believes it to be intensely beneficial for tired human beings to assume a healthy foetal position from time to time. I attribute my tranquillity of mind largely to the frequency with which, as a front row

forward, I assumed the vertex position, properly immersed in fluid medium, whenever the scrum collapsed on top of me on the Rugger pitch of a school famous for its mud (and its Rugger). At the most, soccer players never get beyond a few moments in the transverse lie—one that any psychologist would admit to be bad.

Let Dr. Montgomery should reply that the I.Q. of Rugger players is too low for the infliction of psychological trauma. I would add that when they play other games like cricket they have been found to develop depression and schizoid and paranoid tendencies in approximately similar proportions.—I am, etc.,

London, N.W.8.

J. C. HAWKSLEY.

SIR,—I am surprised that Dr. John Montgomery (*Journal*, February 5, p. 353) appears to take it for granted that more physical injury is produced by Rugby football than by Association football. Perhaps he can produce figures for this statement. I am also uncertain of the significance of the adjective "chivalrous" in relation to the more ancient game. Does he suggest that Rugger is not chivalrous, or does he really expect us to believe that all soccer players are inspired by a nobility of character unknown in other games?

I have always given extra credit in examinations to any student who has shown proficiency in some non-academic university activity, whether it be in games (especially "rough" games) or in such activities as debating, acting, or playing musical instruments. I am sure all sane teachers do the same by one method or the other. What kind of people does Dr. Montgomery desire to have as practitioners of medicine—a pack of lily-livered knights out of a Burne-Jones painting? Finally, I would be interested in Dr. Montgomery's reactions to Irish hurley, which perhaps as much as any other game trains the eye and muscles to act in perfect co-ordination. Many a good surgeon owes his skill to playing such games as much as to reading textbooks or listening to lectures. As for Rugby being responsible for the class war, let us introduce it to the Russians.

Would they tremble in the Kremlin,
Would they shudder on the Don,
Would the homeland break asunder,
Comrades rise in wrath and wonder,
If Russia took to Rugger
And won the triple crown?

(England having dropped out in order to return to her ancient, chivalrous, and noble national game.)—I am, etc.,

Belfast.

JAMES SCOTT.

SIR,—Dr. J. Montgomery writes (*Journal*, February 5, p. 353), no doubt, with his tongue in his cheek, and we are grateful for the entertainment value of his letter. But after the laughter has subsided we must pause to consider whether too much emphasis is being placed on the dangers accompanying activities which most of us have believed to be both health-giving and character-forming. And in any case, according to statisticians, two of the most dangerous occupations available at present are (1) crossing the road, and (2) staying at home. What can we do to be really safe?—I am, etc.,

Birmingham, 14.

P. R. KEMP.

SIR,—I sincerely trust that Dr. John Montgomery (*Journal*, February 5, p. 353) is edentulous in case his tongue should remain in the position it surely occupied in his cheek when he wrote under the above heading. Otherwise, had he the misfortune to meet one of these sadistic monsters of Rugger players he might suffer one of the injuries mentioned in Mr. O'Connell's article, referred to in your leading article (*Journal*, January 15, p. 154).—I am, etc.,

London, S.W.1.

J. C. DOWSE.

* * We understand that, teeth apart, Dr. Montgomery's tongue was partially displaced.—Ed., *B.M.J.*

Influenza

SIR.—I would like to support the views of Professor C. H. Stuart-Harris (*Journal*, February 5, p. 348) that there are in reality few, if any, clinical differences between the A and the B types of influenza. I say this from experience in general practice of three epidemics in 1950 (A), 1953 (A), and the recent 1955 B epidemic. The total number of cases is almost 650. It was quite impossible to detect any clinical differences in the symptoms and signs in these three epidemics; the only epidemiological difference was the fact that the maximal incidence in the one B epidemic was in children under 10 and in the two A epidemics it was in the young and middle-aged adults. In further support of the lack of difference between the two types an examination of the incidence and types of chest complications shows little difference.

Incidence and Nature of Chest Complications in Three Influenza Epidemics

	1950 A	1953 A	1955 B
No. of cases	233	264	150
Chest complications	43 (20%)	29 (12%)	15 (10%)
Acute bronchitis	6 (3%)	12 (5%)	4 (3%)
Pneumonia with clinical consolidation	4 (2%)	4 (2%)	4 (3%)
Pneumonia with no clinical consolidation	33 (15%)	13 (5%)	7 (5%)

These numbers are necessarily few, as they emanate from one single general practice and care must be taken not to draw any false conclusions, but there do not seem to be any real marked differences in the liability of the lungs to be affected in the two types of flu.—I am, etc.,

Beckenham, Kent.

JOHN FRY.

Subacute Oedematous Nephritis Treated with Malaria

SIR.—In her report of a case of subacute oedematous nephritis successfully treated with malaria (*Journal*, December 11, 1954, p. 1398) Dr. Ruth Porter states: "The explanation for the effectiveness of various infections, such as measles and malaria, in improving the course of oedematous nephritis remains obscure."

In my original report¹ I stated that the effect of acute febrile infection might be due to stimulation of the active defence phase of the general adaptation syndrome in which—among other observed effects—there occurs a greatly increased production of A.C.T.H. Support for this explanation is given by the findings of McCall and Singer,² who showed that there is a correlation between the level of corticoid excretion in the urine and the diuretic response to A.C.T.H. Children in whom the urinary corticoid levels failed to show a marked increase with A.C.T.H. did not discharge their oedema, while those patients whose excretions were high at some time during therapy underwent complete diuresis. They also observed that in nephrotic children who contracted severe infection the urinary corticoid excretion was within the same range as that reached by nephrotic patients who were receiving treatment with A.C.T.H. and who subsequently cleared their oedema. The corticoid excretion observed in minor infection was comparable with that obtained in patients receiving A.C.T.H., but whose subsequent diuretic response was unsatisfactory. The above-mentioned workers felt that their findings might explain why spontaneous loss of oedema is a frequent outcome of severe infection in nephrotics, whereas diuresis rarely results from a mild or moderate degree of infection.

The patient whose case I reported in 1952 has maintained a normal renal function since his treatment with malaria in 1949, and in two other cases, similarly treated, normal renal function has been restored, apart from a slight but transient albuminuria occurring in the course of acute infections.—I am, etc.,

Lancaster.

E. A. J. BYRNE.

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- ¹ *Lancet*, 1952, 1, 844.
- ² *J. clin. Endocr.*, 1953, 13, 1157.

Kaposi's Varicelliform Eruption

SIR.—Drs. A. Girdwood Fergusson and W. A. Dewar (*Journal*, February 5, p. 352) are correct in asserting that Kaposi's varicelliform eruption occurs on skin damaged by conditions other than eczema. Dr. G. I. Barrow's paper (*Journal*, February 27, 1954, p. 482), to which I drew attention in my letter (*Journal*, January 15, p. 167), deals with this point in some detail. I must confess, however, that I am not very impressed by the other basic conditions quoted by my Glaswegian colleagues—impetigo, seborrhoeic eczema, infectious eczematoid dermatitis, and ichthyosis. Eczema occurs in two of the four conditions mentioned, and it is well known that the ichthyotic easily ecematizes (see Dr. Barrow's Case 3). I would suggest that it is as rare for Kaposi's varicelliform eruption to occur on basic pathological conditions other than eczema as it is for the Scot to recross the Tweed through failure to make a living amongst the English.—I am, etc.,

Bradford, 8.

ALLAN BIGHAM.

Agranulocytosis

SIR.—The interesting case of agranulocytosis recorded by Drs. H. E. Hutchison and Hugh Conway (*Journal*, January 22, p. 207) raises some interesting features. Many years ago, when amidopyrine was used very effectively in ameliorating the attack of measles, agranulocytosis was not recorded, but in these cases it was used only for four or five days. Accordingly, 50 adult volunteers were given 10 gr. (0.65 g.) of amidopyrine three times a day after meals for seven days, and the leucocyte count made every day. At the end of this time all were well and none showed any reduction in the count either then or subsequently. This suggested that, as has been pointed out by others, the majority of cases arise after marrow poisons have been taken for some time, and often in quite small doses.

With regard to the immediate treatment, in addition to penicillin the transfusion of fresh blood is of great value for obvious reasons, and this may have to be repeated in a few days' time.—I am, etc.,

Bristol, 8.

FREDERICK SUTTON.

The New Insulins

SIR.—The articles by Drs. J. M. Stowers and J. D. N. Nabarro (*Journal*, January 8, p. 68) and Dr. K. J. Gurling *et al.* (p. 71) represent an admirably full and critical survey of the clinical action of the insulin zinc suspensions. They show these preparations in perspective and allow an assessment of their value. The fact impresses itself that insulin zinc suspension is by no means the ideal insulin it was hoped to be. However, Drs. Stowers and Nabarro, having reviewed and compared the features of soluble insulin, protamine zinc insulin, globin insulin, and isophane insulin, in their summary maintain that insulin zinc suspension has definite advantages over the other preparations.

Their conclusions do not appear to me to be justified where they concern isophane insulin. This preparation, introduced in the U.S.A. about 1948, and in Britain late in 1953, has oddly enough received hardly any publicity in this country, probably owing to the simultaneous introduction of I.Z.S. Having used isophane (with the kind encouragement of Drs. D. E. Meredith and G. H. T. Lloyd) since November, 1953, and in more than 60 diabetics, I find it easily the most satisfactory one-shot-a-day insulin available and fully deserving its established popularity in the U.S.A. It has all the advantages claimed for G.I., I.Z.S., and S.I.-P.Z.I. mixtures, and practically none of their drawbacks. Direct comparison in some half-dozen patients who responded poorly to I.Z.S. showed smooth and rapid stabilization on isophane in the majority, generally on a lower dose.

Drs. Stowers and Nabarro allege two disadvantages of isophane: (1) early morning hyperglycaemia in some cases—I have not encountered this in any significant degree; and

(2) local sensitivity reactions in some cases. I recall two patients with mild rashes; these were transient and did not necessitate any modification of treatment. Moreover (as mentioned by Gurling *et al.*), I.Z.S. is not free from local reactions. More could be said in favour of isophane insulin, but your space is valuable and the only valid proof is, after all, practical trial. I feel sure that anyone who uses this preparation will rapidly become conscious, as I have, of handling the most smoothly effective insulin available at the present time.—I am, etc.,

Rhyd.

E. B. KRAUS.

Princess Louise Children's Hospital

SIR.—I note with dismay your announcement (*Journal*, January 29, p. 299) that proposals are being made to convert the Princess Louise Kensington Hospital for Children for adult use. I had the pleasure of working there at the time when the fate of Paddington Green Children's Hospital was in the balance. The outcry against that proposal was sufficiently vehement to achieve results, and I hope history can be repeated.

The practice of judging the work of children's hospitals by the size of their waiting-lists is widespread and cannot be too strongly condemned. Have the authorities not yet realized that children do not get waiting-list diseases? Do they not appreciate that, generally speaking, they are either acutely ill or not ill at all? If the paediatric beds in the country were decimated, the waiting-lists for them would scarcely increase.

The only fair criteria by which to judge the work of a children's hospital is by bed occupancy, and even then allowances must be made for seasonal variations in demand and closures due to infectious diseases which do not occur in adult wards. A visit to the less fortunate paediatric wards and hospitals, especially at this time of year, will often reveal children being discharged home prematurely and extra cots being put up in odd corners to accommodate acute cases. But there is still no waiting-list.—I am, etc.,

Leeds, 7.

R. W. SMITHELLS.

Disk Lesions and Low Backache

SIR.—The admirable clinical and pathological picture of the disk syndrome described by Mr. John Charnley (*Journal*, February 5, p. 344) is not, I think, so unorthodox as he would suggest. It certainly agrees very closely with my own teaching. But, though we are now getting a much clearer idea of what happens during the course of this condition, we are still in the dark as to why it happens.

An important point that he brings out is that all derangements of an intervertebral disk are primarily pathological in nature and can only occur after the tissues of the disk have become softened as a result of degenerative changes. We know that degenerative changes in the intervertebral disk are part of the normal ageing process. A generation ago, when "lumbago" and "sciatica" were almost the prerogatives of middle age, the clinical picture was a reasonable one—of an intervertebral disk in which degenerative changes were present finally giving way under stress. Now, however, an increasing proportion of cases seen are in the third decade or even younger. To explain such cases one must postulate the presence of some abnormal pathological process, and this is borne out by the soft "pulpy" condition of the tissues that is usually noted if operation is carried out in young people. The infective theory has now been discarded, and it is generally considered to be most likely that the cause is a metabolic one, and that it may possibly be incited by nutritional defects. But, since we are told that the nation as a whole has never been better fed than during the last 15 years, how can we explain the changing incidence of these conditions on any such basis?

Professor B. S. Platt's masterly article (*Journal*, January 22, p. 179) seems to pierce the gloom with the first real shaft of daylight. I use the word "gloom" thinking of the

sense of frustration that we all feel in treating an endless succession of symptoms without any real understanding of their cause, and hence no means of dealing with it. As an orthopaedic surgeon I believe that the investigations he describes will prove to be more important for the advancement of knowledge in my own subject than any other work now being carried out, and I would commend their study to all those who have to deal with these and allied conditions.

Incidentally, the publication of his paper at the moment provides a happy example of that most important function of your columns—namely, to help parallel lines of thought to meet.—I am, etc.,

London, S.E.1.

T. T. STAMM.

SIR.—Mr. J. Charnley does a great service by his paper on acute lumbago and sciatica (*Journal*, February 5, p. 344), which I have read with great interest. His theory of the mechanism of pain suggests to me two lines of treatment which have been advocated by Dr. Cyriax for some years—namely, spinal traction and manipulation. In paragraphs (4) and (5) under the heading "A Theory of Disk Pathology," the figures 5 and 6 would seem to be crying out to have their arrows illustrating centrifugal force reversed to a centripetal force by spinal traction. Who knows, this reversal might cut short the "tension episode." In paragraph (7) Mr. Charnley states that manipulation sometimes relieves the sequestrum type of lumbago. Although no mention is made of dural pain, could not a ruptured fragment of the annulus which is pressing on the dura be moved to a position of more comfort by manipulation? The time-honoured Kernig's sign and neck rigidity demonstrate that the dura is not insensitive to pain when pressure and tension are applied to it.

The protagonists in this correspondence seem to have resolved themselves into two camps (with some waverers): those who have tried Dr. Cyriax's methods and those who have not. I feel confident that Mr. Charnley's article will bring recruits to the Cyriax technique, for at the moment Mr. Charnley has nothing to offer but rest, morphine, and surgery. I make these comments with the plea that the prejudices which have surrounded manipulations of the spine for so long be cast aside, and that all those who have to deal with backache and allied conditions will not disregard the evidence¹⁻³ which so plainly points the way to easing the suffering of many.

Lastly, I wish to apologize to Mr. Charnley (*Journal*, January 15, p. 163) if my previous letter (*Journal*, December 18, 1954, p. 1488) suggested to him that orthopaedic surgeons were failing in their responsibility or that they were tending towards a dog-in-the-manger attitude. This suggestion, of course, was not intended.—I am, etc.,

Brough, Yorks.

LEONARD S. CALVERT.

REFERENCES

- ¹ Cyriax, J., *Textbook of Orthopaedic Medicine*, 1954, London.
- ² Barbor, R., *Lancet*, 1954, 1, 437.
- ³ Cyriax, J., *British Medical Journal*, 1955, 1, 140.

SIR.—I would like to back up the letters of Dr. Leonard S. Calvert (*Journal*, December 18, 1954, p. 1488) and Dr. David B. Ramsay (*Journal*, January 8, p. 105) concerning the treatment of backache, acute and chronic, due to disk lesions together with sciatica as on the lines of the Dr. Cyriax technique. I myself would not go so far as to say that every case of lumbago is caused by a disk prolapse. I visualize that many patients in middle life who get sudden backache are suffering from sudden cracking or fissure of a desiccated disk with accompanying oedema or local haemorrhage. These are the cases which get well after a week or so of resting in bed, but which are cured quickly if treatment is carried out on manipulative lines as advocated by Dr. James Cyriax (*Journal*, January 15, p. 140). Before a diagnosis of a prolapse of a lumbar intervertebral disk lesion is made there must be a history of sudden pain and click while in the act of spinal flexion and compression, followed

by inability to stand erect. Lumbago is not a disease entity but a symptom and a sign of protective painful muscle spasm of the erector spinae protecting a spinal joint.

Before the derangement—be it a prolapse, a displacement, oedema, or adhesions about the damaged disk—can be manipulated or loosened, the guarding muscle spasm must be temporarily abolished so as to give the manipulator a better chance of localizing his manoeuvres to the affected intervertebral joint. For a year or more, in a hospital physiotherapy department of which I have charge, I have been giving all acute lumbago and sciatica cases having spasm of the back muscles—the erector spinae being seen as tight cords on forward flexion—mephenesin ("myan-esin"), 11 0.5-g. tablets a day for three days. While under the effects of this drug the patient attends the physiotherapy department daily and is given 15 minutes of infra-red and gentle massage to the back muscles; then, with the patient lying on his back, rotation of the lumbar spine is carried out by the patient and the physiotherapist fully flexing and adducting each hip across the abdomen five times, so that the patient's pelvis and lumbar spine are tilted backwards and rotated first to one side and then to the other (Cyriax manoeuvre). The hip in turn is then fully flexed by the patient grasping the knee, and, on a word from the assistant, who grasps the ankle, the leg is forcibly pulled out straight, thus jerking the leg, hip, pelvis, and lumbar spine. Doing this on the unaffected leg in sciatica is not painful, but the jerk is quite painful when the leg with the sciatic pain is pulled. This longitudinal jerking is repeated three times on each leg. Other manipulation manoeuvres are described by Dr. Cyriax in his book,¹ but we have found that, if a patient is going to respond to manipulation therapy, these two manoeuvres produce rapid improvement. A bad "lumbago" of a week's duration responds within a few days—often better after six treatments. A sciatica of a week or so's duration responds so that the sciatica is practically gone after a week except for residual tingling (evidence of root oedema), which may, however, persist for up to a month. If a case fails to respond after a fortnight, manipulative therapy is stopped and a plaster cast applied for two weeks. If this fails to relieve the sciatica, rest in bed with weight traction on the affected sciatic leg for ten days usually cures.

Laminectomy is a rarity now. With a fairly large annual turnover of backache and sciatica cases in several hospitals, I perform one or two laminectomies a year. Statistics showing control cases treated by manipulative, other physiotherapy methods, or rest in bed are difficult to produce until we can further define and be certain of the pathological conditions which we are treating—e.g., muscle sprain; disk lesion, fissure, or prolapse; osteoarthritis; sacro-iliac strain; or even fibrositis.—I am, etc.,

London, S.E.1.

G. O. TIPPETT.

SIR.—Having read the recent mass of correspondence from many experts on lumbago, I feel it is time some general-practitioner sense was cast on the problem of disk lesions.

I do not think that any general practitioner would deny that a cold draught can produce "fibrositis," but I would defy any orthopaedic specialist or physical medicine expert to state that a cold wind can prolapse a disk. As I see it, the pain which I still refer to as "fibrositis" is an end-product of prolonged constant tension of skeletal muscle and may well be a fatigue phenomenon. This can obviously be produced in a variety of ways, the most important being: (1) overworking (usually for about a month); (2) an underlying lesion which requires protection by immobility—for example, bone and disk lesions; (3) nervous tension; (4) stimuli from the skin (cold draughts, wettings, etc.). These can obviously operate singly or in any combination. In my experience it usually takes two to cause trouble.

It seems that the majority of cases of lumbar ache which occur in my practice get better in about a week, and seem to get some relief from heat, gentle massage, and aspirin. These do not seem to recur very easily unless the stress recurs. Those which do not so respond I presume to have an underlying lesion and usually refer to hospital, where they are nearly all diagnosed and confidently treated as disk lesions by the orthopaedic specialist. If an orthopaedic specialist were therefore to assess fibrositis on the basis of cases which I refer to him, he would undoubtedly

form the opinion that over 90% of cases are due to prolapsed disks. I am sure that the consultant here concerned realizes that he is seeing a highly selected group.—I am, etc.,

*Workington.

R. N. R. GRANT.

Tuberculous Patients in General Hospitals

SIR.—Dr. J. F. Brailsford (*Journal*, January 15, p. 164) strongly recommends that patients suffering from pulmonary tuberculosis be expelled from general hospitals in order to protect the nurses from infection. He suggests that the ideal place for the patient is his own home. I wonder if he has seriously thought how this could be carried out?

A man needing absolute rest for many weeks must present a very difficult problem in the home. How could he really rest and relax if he saw his wife becoming worn out looking after him, family, and house? How can Dr. Brailsford's conscience allow a tuberculous patient to be removed from adult nurses for their protection and yet be put into the home where, as like as not, there may be young children? The chances of their being able to receive the same full care and protection must be far less than the nurses'. How can the busy general practitioner possibly have time to cope with the numerous investigations and treatment that a tuberculous patient needs?

I can answer Dr. Brailsford from personal experience that no matter how capable and efficient the general practitioner is, no matter how good home conditions are, the patient cannot receive the same feeling of assurance and optimism that hospital and sanatorium give him, and I know that where I was fortunate enough to be treated the charming and capable nurses were looked after with great care. Finally, I would agree with Dr. A. B. Cowan (*Journal*, November 20, 1954, p. 1227) that the real answer to the problem is to "declare an all-out war against tuberculosis," but until that time comes the general hospital must still play its part.—I am, etc.,

Watton-on-Thames.

P. B. SCHOFIELD.

Sudden Death in Labour

SIR.—Dr. Patricia E. Campbell (*Journal*, January 8, p. 87) reported sudden death following an injection of procaine penicillin. This tragedy was ascribed to anaphylactic shock. While this may have been the cause, I think that it is more likely to have been due to the accidental injection of the substance into a vein.

Elsewhere a report was published¹ of the effect of deliberate intravenous injection of procaine penicillin into the saphenous vein of cats, and a whole range of symptoms from a transitory disturbance up to death were obtained, depending upon the amount of the drug injected in relation to the weight of a cat. The median lethal dose was found to be 100,000 units per kilogram of body weight and this finding was remarkably constant. Procaine penicillin is a suspension with particles ranging in size from 5 μ to 70 μ which appear to cause multiple small emboli in the pulmonary capillaries. Further intramuscular injections of procaine penicillin following severe but not lethal intravenous injections did not cause any systemic disturbance in the animal. This appeared to rule out the possibility of anaphylactic phenomena.—I am, etc.,

Consett, Co. Durham.

R. C. BELL.

REFERENCE

- ¹ Bell, R. C., *Lancet*, 1954, 2, 62.

Scurvy

SIR.—May I add yet a further case of scurvy to the one described by Dr. S. E. Levin (*Journal*, January 1, p. 46), but this time in a boy of 7 years? This must be an extremely rare occurrence nowadays, and the diagnosis was particularly surprising, as the lad was otherwise well nourished.

The boy was seen by me late one evening as an emergency, complaining of bilateral painful paralysed legs which had been

swollen all day. Actually there had been some aching behind the knees for nearly a week, but the puffiness had come up suddenly and the child could not bear to have his legs touched, and claimed that he could not walk. The legs were oedematous from just above the knees down to the ankles, and were tender to touch. Scattered petechiae were present around the lower third of the shins; temperature 99.4° F. (37.4° C.); pulse 96. The reflexes were normal. He was neither anaemic nor undernourished and there were no other abnormal physical signs. On questioning the parents, it appeared that he had had no fresh fruit for four months apart from an occasional apple; he had always refused to eat green vegetables and practically never drank fresh milk. X-rays of the legs were negative—even after a month. But the results of the ascorbic acid absorption test (dichlorophenol indophenol dye method) were confirmatory.

Ascorbic Acid Absorption Test, 300 mg. Intramuscularly

	Urine Concentration (mg./ml.)		
	Initial	After 2 Hours	After 5 Hours
Onset of illness	0.030	0.020	0.025
One month later	0.125	0.195	0.123

Clinically he improved on bed rest, tab. ascorbic acid 100 mg. daily, and orange juice *ad lib.*, but the absorption test after one month suggests that he is not fully saturated with vitamin C.

I wish to thank Dr. B. W. Powell, consultant paediatrician at the North Cambridgeshire Hospital, for his advice and for arranging the investigations.—I am, etc.,

Wisbech.

PETER CAVE.

Tests of Hearing

SIR.—The title of the statement about hearing tests to which Dr. Edith Whetnall refers (*Journal*, January 22, p. 227), and which you published for the Medical Research Council (*Journal*, January 1, p. 41), was "The Sweep-frequency Method of Making Screening Tests of the Hearing of Schoolchildren." The council did not ask me to draft a comprehensive statement on the ascertainment of defective hearing in childhood. The sweep-frequency method was recommended, in my statement and with the council's authority, for use by school medical officers in detecting defects of hearing among children which have escaped ascertainment during their pre-school life or have occurred without having been otherwise ascertained after their admission to school.

With financial support from the Medical Research Council, a clinic in which special provision is made for testing hearing in infancy and early childhood was established by the University of Manchester in the Department of Education of the Deaf in 1934. This research unit appears to have been the first of its kind, and the procedures that my wife and I have evolved for testing the hearing of children aged 3 months to 5 years have been reported in the *Journal of Laryngology and Otology*¹ and in our books.²⁻⁴ As Dr. H. Binysh says (*Journal*, February 5, p. 354), these procedures are being used in local authority clinics. Further study of deafness in childhood, in which senior members of the staffs of the Department of Otolaryngology and Education of the Deaf in this university are taking part, is at present in progress.—I am, etc.,

Manchester, 13.

A. W. G. EWING.

REFERENCES

- ¹ *J. Laryng.*, 1944, 59, 317.
- ² *Opportunity and the Deaf Child*, 1947, chapters 2 and 3. University of London Press.
- ³ *Speech and the Deaf Child*, 1954, chapter 4. Manchester University Press.
- ⁴ *Aphasia in Children*, 1930, chapter 3. Oxford University Press.

Foreign Body in Kidney

SIR.—The cases described in your issue of January 22 (p. 205) by Dr. Duncan Macaulay and Mr. Thomas Moore remind me of the case of a child, aged 2, who demonstrated that "kirbigrips" can perforate other areas of the intestine than the duodenum.

Two years ago she was referred to the orthopaedic surgeon here because she was limping and had pain in the right knee and was unable to straighten the right hip. On

examination the knee movements were full but there was incomplete extension of the hip-joint, and a routine x-ray of the hip-joint showed a kirbigrip lying obliquely in the right iliac fossa with its blunt end about the middle of the iliac bone and the double end 1 in. (2.5 cm.) above and to the left of the umbilicus. Operation disclosed that it was lying in the ileum with the lower end passing through the ileocaecal valve and piercing the posterior wall of the caecum, forming an abscess in the ilio-psoas muscle. It was removed at operation in one piece with some little difficulty, as it had become so soft and eroded, but the child made a normal recovery after draining pus for some ten days or so. Post-operative leg movements were full and painless.

The feature of interest in this case was that the kirbigrip was so long relative to the size of the child that it is surprising that it was able to pass round the duodenal curve and did not present as a perforated duodenum with penetration of the kidney as described by Dr. Macaulay and Mr. Moore. Owing to the parents being immigrants with practically no English, no history could be obtained of the time when the pin had been swallowed, but its condition suggested that it had been present for a considerable time.—I am, etc.,

Rochdale.

A. M. McMASTER.

Eclampsia

SIR.—Marked interest in the subject of eclampsia has lately been shown in the correspondence in this *Journal* and by the refresher course article by Professor W. I. C. Morris (*Journal*, January 29, p. 279). It might be more profitable from the clinical point of view to establish the source of the toxin rather than to discuss conflicting hypotheses which have been forced into the Procrustean frame of endocrinology.

Having been interested for some 30 years in the origin of the toxins of eclampsia, I have tried to arrive at conclusions by taking into account a number of different observations which have been established independently. Among these, the absence of eclampsia among primitive tribes suggests that the toxin originates in environmental factors. Of these factors, the nutritional seem to be of prime importance. This is suggested by the long-established observations concerning on the one hand the relationship between eclampsia and the excess consumption of rich foods, and, on the other hand, the disappearance of eclampsia during the starvation period in Central Europe between 1916 and 1922. In my own practice I have not yet seen any case of eclampsia among subjects who were under strict dietary control during pregnancy. I have, however, noted in cases of eclampsia referred to me that invariably there has been some gross dietary error. It would seem that the detoxicating mechanism which may be adequate in non-pregnant women is not able to cope with excessive demands during pregnancy.

I have always advised low intake of overheated fats and salt. On the positive side, I have recommended liberal helpings of raw fruit, salads, and vegetables (roughage and vitamins), with proteins supplied by milk and lean meat.¹

It is likely, however, that the subject of eclampsia has been significantly advanced by the observations of Grauert.² This author noticed many years ago that, on opening the skull during necropsy of eclampsia cases, a typical smell of prussic acid (HCN) became noticeable. Following up this observation Grauert developed the view that endogenous cyanides may be involved in the aetiology of eclampsia.

In the normal course of metabolism of the foetus, cyanocompounds are produced in the breakdown of purine-rings. These compounds are normally innocuous, because they react with the sulphur of the HS-group of cystein to yield thio-compounds, a process which also takes place with the HCN formed in the intestines in the course of digestion. In the normal organism we find the innocuous potassium ferricyanide, which originates by combination of ferrous cyanide and ferrous cyanurate with potassium cyanide. This complex formation, neutralizing the liberated HCN, is

missing in the eclamptic condition. In the urine, serum, and saliva of the eclamptic patient thiocyanic acid—a product produced by the detoxication of HCN—is significantly raised. For instance, in the 24-hour urine it amounts to 0.15 to 0.35 g. (normally 0.03 to 0.05 g.), as precise qualitative and quantitative analyses have incontestably proved. For the rough clinical test the deep red colour obtained on the addition of diluted ferric chloride to the urine or saliva, which flow amply from the mouth during a fit, is sufficient.

The conversion of cyanide into thiocyanide—the actual detoxication—can be successfully brought about with the help of thiosulphate and/or cobaltinitrate. The specific action of the HCN is annulled by the nascent sulphur which combines with the cyanide radical when sodium thiosulphate is administered intravenously. Thus the noxious element of eclampsia is neutralized. In the pre-eclamptic, a few intravenous injections of 5 ml. of a 2½% sodium thiosulphate solution suffice. In severe cases, intravenous injection of 2 ml. of a 50% sodium thiosulphate solution in 10 ml. of a 20% dextrose solution are administered one to three times daily. The fits stop gradually or at once. There are no side-effects. In mild cases, one injection every second day is sufficient. Of 34 cases, including some seemingly moribund women, where this method was used, 32 were cured, followed by successful termination of the pregnancy.

The claims made by Grauert are so definite that the method deserves to be subjected to tests in this country.—I am, etc.,

London, W.1.

ALBERT W. BAUER.

REFERENCES

- ¹ *Diet in Gynaecology and Obstetrics*, 1934, Urban and Schwarzenberg, Vienna.
² *Münch. med. Wschr.*, 1954, 96, 719.

Tetanus Immunization

SIR.—In your annotation "Tetanus Immunization" (*Journal*, January 29, p. 278) you mention the difficult task of weighing the risks of horse serum against those of tetanus. Surely the risk of serum reactions would be greatly diminished by the routine subsequent active immunization of all patients who have received tetanus antitoxin. They would then just be given a booster dose of tetanus toxoid if prophylactic measures were required on a subsequent occasion (reactions following the injection even of tetanus toxoid do, however, rarely occur).

I do not know how many casualty departments pursue such a policy, which presents certain administrative difficulties, but it is a policy which we have in mind for the rather injury-prone population of a colony for mental defectives. It is to be hoped that the triple vaccine (whooping cough, diphtheria, tetanus) will prove its value and become more widely used. In the meantime, following the recommendation of Mr. T. C. J. O'Connell, referred to in your leading article (*Journal*, January 15, p. 154), football players might be added to the list of groups carrying a special risk of tetanus and thus being worthy of active immunization.—I am, etc.,

St. Albans.

M. P. NELSON.

Operator and Anaesthetist

SIR.—I think Dr. E. Schofield (*Journal*, February 5, p. 351) is either very unfortunate or else he grossly overstates his case. He says that competent dental anaesthetists "outside London and one or two other centres . . . do not exist."

I admit that the art and technique of dental anaesthesia in the chair is not an easy one to acquire, but it has a fascination of its own and it has attracted the attention of some of the most active minds among anaesthetists. The literature on the subject is copious and there must be few places in Great Britain where there is not someone who has not given thought, attended demonstrations, and acquired some proficiency in the art of dental anaesthesia.

The remuneration under the N.H.S. is inadequate, but many dental surgeons do their best to mitigate this by grouping their gas cases at a time convenient to the anaes-

thetist of their choice. By such co-operation I feel sure Dr. Schofield could avoid the added risk and heavy responsibility that he incurs in acting as both anaesthetist and operator in the majority of his cases.—I am, etc.,

Hove, 2.

REX BINNING.

SIR.—Dr. Eric Schofield has some very useful points to make in his letter (*Journal*, February 5, p. 351) on the subject of dental anaesthesia. There is, however, one part of his letter which I feel cannot pass without comment.

As a final-year student I feel qualified to write on current instruction in at least one big London teaching hospital. Dr. Schofield will, I am sure, be glad to know that there at any rate all medical students get special instruction in dental anaesthetics during their three-month appointment on anaesthetics in general. The instruction includes lectures and clinical work consisting of the giving of between 15 and 20 dental anaesthetics. Incidentally, they are also instructed in local dental analgesia and the extraction of teeth—including practical experience of both.—I am, etc.,

London, W.14.

J. ZORAB.

A Case of Pheochromocytoma

SIR.—The pre-operative localization of a pheochromocytoma is important in determining its surgical approach. In the patient described by Mr. R. A. C. Owen and Dr. G. H. Murray (*Journal*, February 5, p. 331) x-ray examination after perirenal air insufflation failed to show a tumour which at operation was found to be 3 in. (7.6 cm.) in diameter. As they imply, perirenal insufflation often fails to achieve its object, and in addition it carries a very definite risk of an air embolism.

Retroperitoneal (presacral) pneumography is a much more satisfactory alternative, its advantage being that both kidneys and suprarenal regions can be visualized with a high degree of certainty, and it is free from the risk of air embolism.¹ The procedure as described by Blackwood² was used in a case previously reported by my colleagues and myself.³ No difficulty was experienced, and the result was entirely satisfactory, since not only was the tumour accurately localized but the contralateral suprarenal was seen to be normal in size and contour. For the pre-operative localization of a pheochromocytoma retroperitoneal pneumography is, in contrast to perirenal air insufflation, a safe and a more reliable investigation.—I am, etc.,

Nuneaton.

A. C. KENDALL.

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- ¹ Ruiz Rivas, M., *Amer. J. Roentgenol.*, 1950, 64, 723.
² *Brit. J. Surg.*, 1951, 39, 111.
³ Israelski, M., *et al.*, *Arch. Dis. Childh.*, 1954, 29, 18.

Chloroquine Sulphate in Chronic Discoid Lupus Erythematosus

SIR.—We read with interest the article by Dr. H. J. Lewis (*Journal*, February 5, p. 329) on chloroquine sulphate in the treatment of chronic discoid lupus erythematosus. His results agree with our own published a year ago.¹ Since the publication of these, further trial with chloroquine sulphate has confirmed our opinion that it is the drug of choice in early cases of chronic lupus erythematosus.

We also note with interest his findings regarding the erythrocyte sedimentation rate (E.S.R.) during treatment. One of us² used this test in a series of 85 cases of chronic lupus erythematosus and found that as the disease improved the E.S.R. gradually decreased. It was shown that special attention should be paid to cases in which an E.S.R. of 10 mm. or over remained after apparently successful treatment, as these cases were most prone to relapse.—We are, etc.,

Glasgow, C.4.

G. HARVEY.
T. COCHRANE.

REFERENCES

- ¹ *J. Invest. Derm.*, 1954, 22, 89.
² *Cochrane, T.*, *Arch. Derm. Syph.*, 1951, 63, 323.

Obituary

G. E. MALCOMSON, M.D., M.R.C.P.

The sudden death in the street of Lieutenant-Colonel G. E. Malcomson, on January 24 came as a shock to his many friends, the more so as he was just about to go to Switzerland for his annual ski-ing holiday. He was 76 years of age.

Greer Edmund Malcomson, who was born at Belfast on September 30, 1878, came from a well-known Ulster family, and was educated at Owens College, Manchester, subsequently completing his medical training at Guy's Hospital. He graduated M.B. in 1902 and proceeded to the M.D. two years later. After holding house appointments at Guy's he joined the Indian Medical Service in 1906 and was posted to the 114th Mahrattas, serving on the North-west Frontier. Later he was attached to the 26th Punjab in Hong Kong, where he left the Service in 1913 on being appointed the first professor of physiology in the then New University.

On the outbreak of the first world war Malcomson asked to be relieved of his post, and in 1915 he re-entered the I.M.S. to serve in Mesopotamia until 1917. In 1919 he returned to India as superintendent of the Military Hospital, Karachi, but in 1921 he transferred to the civil side of the I.M.S. and became first physician to the Government of Madras and subsequently professor of medicine, with beds in the Government General Hospital. Here he gained a considerable reputation as a singularly astute diagnostician, and his services as a consultant were much sought. On study leave in 1927 he took his M.R.C.P.

When retirement was forced upon him in 1930 he found himself, like so many, at a loose end. The typical club life of a retired Army officer irked him badly, and in answer to an advertisement he began work at King's College, London, where he worked very full time with assiduous care checking the 7,000 references of McDowall's *Control of the Circulation of the Blood*, on the title-page of which his name appears. Later he assisted in research. His wealth of knowledge, his loyalty, his cheerfulness, and his patient hard work were a great example and made him beloved by all. From 1939 wartime conditions again found him engrossed in multifarious and voluntary duties, and in recognition of his work in the radium department he became a life governor of the Royal Free Hospital. During the last 10 years he continued to see a few old patients (some even came from India to see him), and he read voraciously. Always abstemious in his habits, he prided himself on his physical fitness, and continued to ski until quite recently. All who knew him will cherish his memory and regret his passing.

We are indebted to Lieutenant-General Sir ERNEST BRADFIELD for the following appreciation: Before Lieutenant-Colonel Malcomson became professor of medicine at Madras College he succeeded Colonel Donovan as professor of physiology there. In this appointment he maintained the high standard which his predecessor had built up in a department of preclinical teaching which could bear comparison with any in England. Malcomson was a quiet, unassuming officer, a first-class clinician, and a good teacher. He was popular with the students and had a large practice among both Europeans and Indians in Madras, where his devotion to his profession and to his patients was much appreciated. At one time he suffered from a detached

retina, and spent many anxious weeks of uncertainty, but seemed to recover completely. Until this eye trouble he hunted regularly with the Madras Hounds, and enjoyed the snipe shooting which was a feature of the cold-weather season in Madras. Since his retirement he maintained his interest in his profession by assisting in the writings of others, but published nothing himself. He had a small practice consisting of old patients, for whose benefit he never spared himself. His wife, a former Guy's sister, survives him.

F. BOLTON CARTER, M.D., M.S., F.R.C.S.

Mr. F. Bolton Carter, honorary consulting surgeon to Leicester Royal Infirmary, died on February 5, nine days before his 82nd birthday.

Felix Bolton Carter was born at Gravesend, Kent, on February 14, 1873, and received his medical training at University College Hospital, London. He qualified M.R.C.S., L.R.C.P. in 1895, but, with his mind set on a surgical career, he determined to widen his experience as well as to acquire higher qualifications. As the first step in this direction he took the London M.D. in 1897, and this was followed by the F.R.C.S. in 1899, the London B.S. (with first-class honours) in 1901, and the M.S. degree in 1902. For a time he worked as a ship surgeon, and his other early appointments included those of senior obstetric assistant at University College Hospital and senior house-surgeon at Halifax Royal Infirmary. He began his long association with the Leicester Royal Infirmary as a house-surgeon in 1901, retiring from the active staff 31 years later. When the British Medical Association held its Annual Meeting at Leicester in 1905 he held office as honorary local general secretary jointly with the late Dr. Astley V. Clarke, who died in 1945. To Bolton Carter and Clarke much of the success of the meeting—the only Annual Meeting of the B.M.A. to be held at Leicester—was due.

We are indebted to Mr. J. C. BARRETT for the following appreciation:

Mr. F. Bolton Carter came to the Leicester Royal Infirmary as house-surgeon in 1901 after a very distinguished academic career. He was appointed to the consulting staff in 1906 and was the first consulting surgeon as such, his predecessors having been general practitioners at one time or another, including his very well known senior colleague, the late Colonel C. J. Bond. Carter's brusque manner, decisiveness, and speed in operating are well remembered, and also his intense loyalty to his house-surgeons when medical matters were in dispute. He was essentially a general surgeon, for at this time there were no special departments at the Royal Infirmary other than the ear, nose, and throat and ophthalmological departments. He served with the R.A.M.C. in the first world war, principally at the 5th Northern General Hospital, which was situated in the buildings which are now the home of Leicester University College. He became senior surgeon of the Royal Infirmary in 1930 and was chairman of the medical staff committee until his retirement in 1932. From this time he was a regular attendant at the meetings of the board of governors until the inception of the National Health Service in 1948. Carter was a keen golfer and an equally keen bridge player all his life and was captain of the Leicestershire Golf Club from 1911–13 and president in 1914. Our sympathy goes out to his widow, three daughters, and son, who is now first assistant in the surgical unit at University College Hospital.

Dr. MURDO MACLEAN died suddenly on December 25, 1954, four years after his retirement from general practice and 48 years after graduating M.B., Ch.B. at Edinburgh University, and with his death there has passed one of the old

school of family doctors. He was 75 years of age. The second son of the late Mr. K. A. Maclean, headmaster of Tarradale Public School, Muir of Ord, he was himself originally destined for the teaching profession. After taking the M.A. in 1899 he turned to medicine and graduated M.B., Ch.B. in 1906. He then came to England as a resident at the Sunderland Royal Infirmary, and after a period as an assistant he settled in general practice in the mining town of Ashington, Northumberland, where he remained until within three years of his death. A member of the British Medical Association for 46 years, Dr. Maclean was chairman of the Morpeth Division in 1924-5 and again in 1938-9, and he was elected a vice-president of the North of England Branch in 1936. Having been a member of the Northumberland Panel Committee, he later served on the Northumberland Executive Council. During the first world war he held a temporary commission in the R.A.M.C.

H. S. B. and W. M. write: Fond as he was of the place of his adoption and of the people whom he served so faithfully for 40 years, Murdo Maclean never ceased to be a Highlander, making regular visits to Inverness, where one of his family still resides. His gentle voice with the soft Highland accent, coming strangely to English ears from so large a man, his never-failing interest in people and their doings, his strong conviction of the supernatural, all distinguished him as a Highland Scot. Though he played his part in administrative affairs it could not be said that he was a keen medical politician, but he could be relied upon to express a well-considered opinion on any important subject under discussion. He will, however, be better remembered by his friends and by his patients as a skilful and conscientious doctor, quiet, gentle, dignified, sympathetic to those in trouble, ready to enjoy a joke with the merry, upright in his dealings, and most generous to his friends. To a generation glibly talking of doctor-patient relationship and busying itself with form-filling or improved pay and working conditions, Murdo Maclean presented an example of the true ideal which is founded on the vocation to the service of the sick. It can indeed be said of him that he will continue to live in the memory of his friends in all stations of life. His wife died in 1952, but he is survived by his daughter, Dr. Mary Maclean, to whom we extend our sympathy.

The news of the accidental death from an electric shock of Miss GRACE LUKOSE on December 26, 1954, at the early age of 36 came as a great blow to her many friends, who believed that she was destined for a surgical career of exceptional distinction in her native country of India. Grace Mary Lukose was born in India on April 21, 1918, the daughter of Dr. Mary Poonen-Lukose, surgeon-general to the Government of Travancore. After graduating B.Sc. at Madras University, she followed in her mother's footsteps and entered as a medical student at the London School of Medicine for Women, where she graduated M.B., B.S. in 1946. She showed a special bent for surgery, and after returning to India and working at the Lady Hardinge Medical College, New Delhi, for two years she came back to England in 1949 to study for the F.R.C.S., which she obtained in 1951. Not long afterwards she was appointed assistant professor of surgery at the Lady Hardinge Medical College. She had recently been ill, and it was in Travancore that she was killed.

Dr. KATHLEEN M. LANE writes: Singularly free from any self-consciousness, Grace Lukose quickly made friends and entered into every aspect of university life. It was during the years of her second visit to England, when she resided at Canterbury Hall, that many of us came to recognize her unique qualities and to catch some of the gaiety of her infectious laughter. No one could be more jealous than she was for the position and dignity of medical women, nor more loyal than she to her friends and to the institutions to which she gave her affection.

The warden of Canterbury Hall writes: It is difficult to write of Grace Lukose without seeming to exaggerate her

lovely qualities, but the concern with which the news of her death was received by those who had known her in England showed the deep impression that her rich, vital personality had made on all who came into contact with her. We went to her with joys and troubles, and with her invigorating common sense and fine understanding, springing from her own inner serene faith, she was able to give us what we needed. Sincere, forthright, courageous, she spoke her mind or took action in the cause of truth or right wherever she felt it necessary. In her there was no sense of any difference between East and West: in her were the best qualities of each. Yet there was never undue seriousness: nobody could ripple into laughter and nonsense more easily than Grace. I was privileged to live for a while at her home in Travancore in 1952 and also to see her in Delhi, and I know how well loved she was in her own country and what a great future there seemed to be for her work in India.

Dr. G. R. F. STILWELL died at Beckenham Hospital on January 22 at the age of 87. George Robert Fabris Stilwell was born at Beckenham on August 30, 1867, the son of Dr. R. R. Stilwell, who was in practice there from 1857 until his death thirty years later, and the grandson of Dr. George Stilwell, of Epsom. G. R. F. Stilwell was educated at Epsom College and St. Thomas's Hospital, qualifying in 1891 and graduating M.B. London two years later. After holding house appointments at his teaching hospital and spending a year at sea as a ship surgeon, he entered general practice at Beckenham, where he was to remain in active practice for more than sixty years. He soon began what was to be a lifelong association with Beckenham Hospital, being made honorary medical officer to the hospital in 1900 and honorary consulting medical officer in 1911. He was early a member (later chairman) of the committee of management, and in 1934 he was made vice-president of the hospital. He was chairman of the medical staff committee for a number of years, and played a major part in planning the rebuilding and extension of the hospital during the 1930's. One of its wards was named after him in 1951. He was also chairman of the Beckenham and Penge Joint Maternity Home Committee which built for these two co-operating local authorities the hospital that is now the Beckenham Maternity Hospital. Dr. Stilwell was an active member of the British Medical Association, being chairman of the Bromley Division in 1924-5 and again in 1938-9. He was also president of the Kent Branch in 1930-1 and from 1943 to 1947. During the first world war he held the rank of captain in the R.A.M.C. and was in charge of a war hospital established in the district. In addition he was chairman of the local medical war committee, and for his wartime services was appointed O.B.E. in 1919. During the second world war he was again the mainstay, as chairman and secretary combined, of the local medical war committee, and this in spite of the fact that his own practice duties were considerably increased by the absence of his son on service. Dr. Stilwell was for many years chairman of the Kent local medical and panel committee. In this busy life he still found time to play a full part in the social life of the town. He helped to organize the Beckenham tennis tournaments, now one of the most important of the pre-Wimbledon fixtures, and he was a life-long member of the cricket club and a keen golfer. Horticulture and bell-ringing were among other hobbies which he followed and inspired others to follow. His was a full life, active to the end. He will be greatly missed and long remembered for all he achieved in extending the facilities for medical practice in Beckenham. He married Miss Edith Perks, and she survives him, together with a son and two daughters. The son, Dr. G. Denison Stilwell, joined, and now succeeds, his father in the family practice.—A. T. R.

The death of Dr. A. R. RENDLE on January 22 at his home at Godalming, Surrey, has severed a long connexion between his family, for some generations established at

Plymouth, and the medical profession. He was in his 84th year. Born at Saxmundham, Suffolk, on June 19, 1871, Arthur Russel Rendle was the fourth son of Dr. C. B. Rendle and the grandson of Dr. Edmund Rendle; his uncle was Dr. E. M. R. Rendle; his cousin, Dr. C. E. R. Rendle; and his elder brother, Dr. A. C. Rendle. An entrance scholarship took A. R. Rendle from Marlborough College to St. George's Hospital for his medical training, and he qualified M.R.C.S., L.R.C.P. in 1893. After holding the post of assistant surgical registrar at St. George's and a similar appointment at Leicester he went into general practice at Devonport, where, being keenly interested in the volunteer movement, he became surgeon-captain in the 2nd (Prince of Wales's) Volunteer Battalion of the Devonshire Regiment. He was also surgeon to out-patients at the Royal Albert Hospital. In 1902 he moved to the City of London to become a medical examiner for insurance companies, but in 1906 he gave up this work to join the Colonial Medical Service. Employed in Southern Nigeria, he gained much varied surgical experience, but he remained in Africa for only a few years. He took the Brussels M.D. in 1908, and in the following year re-entered general practice at Chichester. During the first world war he served as a captain in the R.A.M.C. in Malta, India, Mesopotamia, and Russia, where he was in command of the military hospital at Petschenga. While there he improvised out of a tobacco tin a practical form of ear speculum and mirror, which he described in the *British Medical Journal* in 1918. After the war he was in practice at Folkestone and Blackpool before he finally settled, in 1924, at Godalming, where he practised until 1946. In conjunction with a busy practice he held several medical appointments in the town, including those of examining surgeon under the Factory Acts and Admiralty surgeon and agent. He was also medical officer to St. George's Hill Military Hospital at Weybridge, and surgeon to Walton-on-Thames Cottage Hospital. One of the general practitioners of a more gracious age, Dr. Rendle had a whimsical sense of humour, and his scrupulous attention to the needs of his patients, coupled with unostentatious benevolence and a punctilious regard to the niceties of professional etiquette, contributed to his popularity with patients and colleagues. All his long life he enjoyed foreign travel and visiting the art galleries in Europe. As a young man he was a keen Rugby footballer and rifle shot, and in later life he enjoyed his game of bridge. He married his cousin, Miss Enid E. Cardew, the younger daughter of the Rev. F. C. Cardew, in 1897, and she survives him, together with the two sons and two daughters of the marriage.

Colonel GEORGE A. MOORE died on January 29 at the Princess Beatrice Hospital, Kensington, aged 85. George Abraham Moore was born in Dublin on March 24, 1869, the fourth son of Dr. William Moore, physician in ordinary to Queen Victoria and Edward VII in Ireland. His brother, the late Sir William Moore, was the Lord Chief Justice of Northern Ireland. Educated at Charterhouse School and at Trinity College, Dublin, he graduated M.B., B.Ch., B.A.O. in 1891 and proceeded M.D. seven years later. Immediately after qualification he entered the Army Medical Services. He served on the North-west Frontier of India and in the Tirah campaign of 1897, obtaining the medal with two clasps. Then he served throughout the South African war of 1899-1902, being decorated with the Queen's Medal and four clasps and the King's Medal and two clasps. When the first world war broke out he was allotted the task of organizing the ambulance train service for the B.E.F. As the authorities had not envisaged such luxuries as ambulance trains, this meant hasty improvisation with rolling stock begged or borrowed wherever it could be found—chiefly by conversion of the French vans with the familiar inscription, "Hommes 40, Chevaux 10." The result was a service which for some months was far below a proper standard—but better than nothing at all.

In the collection of rolling stock there is little doubt that some of his subordinates did not hesitate at what the Army called "scrounging." To this the French authorities objected strongly, and just as new and properly designed coaches, built in England, began to appear, Moore, who had done wonders with the slender resources at his disposal, was transferred to command No. 1 Base Hospital at Etretat, and later on became an A.D.M.S. That the Army valued his services was shown by his appointment as C.M.G. in 1916 and D.S.O. in 1918. In 1921 he retired with the rank of colonel, and started in general practice in Kensington, where he worked until his death. He took a special interest in ear, nose, and throat work. Moore was a remarkably handsome man with a splendid soldierly bearing, very good manners and address, and typical Irish *bonhomie*. He soon made many friends among his professional colleagues in London. He married in 1899 Helena Catherine Georgina, daughter of the late Deputy Surgeon-General G. Whitla; she died in 1946, leaving three sons and a daughter.

Dr. A. G. JAMES, of Castleford, Yorkshire, died in Pontefract General Infirmary on January 30, within a few days of his 58th birthday. Alan Gilbert James was born in Leeds on February 3, 1897. In the first world war he served as a combatant and was wounded. Rather later in life than usual he became a medical student at Leeds University, where he graduated M.B., Ch.B. in 1932. Having held resident appointments at the General Infirmary at Leeds and the Leeds Public Dispensary, he settled in general practice at Castleford in 1934, in partnership with his twin brother, Dr. E. James, who died six years ago. At the time of his death he was honorary secretary of the Wakefield, Pontefract, and Castleford Division of the B.M.A., an office he had held since 1947.

T.G. writes: The sudden and unexpected passing of Dr. Alan G. James was a shock to all his friends and colleagues. For twenty years his genial personality had endeared him to a wide circle. In addition to the work of a strenuous industrial practice, his activities, among other things, included membership of the local hospital management committee and medical committee of the West Riding of Yorkshire, as well as the council of the Association of Police Surgeons of Great Britain. He was a very efficient honorary secretary of his B.M.A. Division, and will not easily be replaced. The deep sympathy of all who knew him is extended to his widow and two children.

Dr. BERNARD MYERS writes: All old friends of Mr. J. HARDIE NEIL—whose obituary was printed in last week's *Journal*—will deeply regret his passing. During the first world war he held the reputation in the field of being an efficient and able officer for whom no trouble was ever too much, even in the great stress of work on the Somme: he was esteemed by officers and men alike. In the intervals between the fighting Hardie Neil went to much trouble to organize entertainments for the troops, which they greatly appreciated. I was A.D.M.S. to the 1st N.Z.E.F. at the time and aware of his fine qualities as a man, a surgeon, and a good fellow. After Neil's return to Auckland, New Zealand, he did some fine work on the anatomy of the lung and gave unstinted services to the New Zealand League for the Hard of Hearing. He will be sadly missed by his many friends.

Dr. R. J. C. HUTCHINSON died suddenly at his home at Wiveliscombe, Somerset, on January 25 at the age of 42. Ralph John Charles Hutchinson was born on March 30, 1912, and qualified by taking the L.M.S.S.A. in 1945. After qualification an appointment at Willesden General Hospital was followed by short periods of practice in various parts of the South of England, until finally he settled at Wiveliscombe, near Taunton, towards the end of 1949.

R.S.H. writes: The sudden loss of John Hutchinson deprives the West Country of one of its most able general practitioners and a man of sterling quality. Not only was

he most fully versed in the techniques of his profession, but he had "the root of the matter in him." Each case was an individual problem to be considered in all aspects, and his notes—in that crabbed and difficult hand—were complete in all essentials. To be consulted by John was both an honour and a test. He was loved and trusted by his patients—and with justice. Their interests were his, and he brought a critical but most charitable and fearless mind to bear upon their problems. Life was not always easy for him, but he met it with gallantry and fortitude. His spirit will live on in the loving memory of his friends. We are the richer for having known him: the poorer for his passing.

Medico-Legal

DAMAGES FOR LOSS OF WIFE

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

On February 9 in the Queen's Bench Division of the High Court Mr. Justice Devlin gave judgment¹ for £2,650 damages for the loss of his wife and dancing partner to Mr. Robert William Burgess. Mrs. Burgess had died in January, 1953, as the result of an injection of what was admitted to be an accidentally lethal dose of adrenaline by Miss Emily Catherine Lewis, F.R.C.S., at the Florence Nightingale Hospital. The issue before the court was not liability but damages.

Mr. Burgess had started dancing with the deceased in 1942 when he was 25, and after considerable success as amateurs they turned professional in 1948. By January, 1953, when Mrs. Burgess died, the couple were nearly at the peak of their professional success. Mr. Burgess had found his wife's skill as a dancing partner substantially irreplaceable and was losing professionally as a result of her death some £500 to £750 per year.

Mr. Justice Devlin assessed Mrs. Burgess's value as a dancing partner in terms of gross income at £2,500, her value as a wife at £1,000, and the loss to Mr. Burgess of her contribution out of their joint income to their joint living expenses at £1,000. The value of her contribution to the support of her mother and daughter was assessed at £300 and £350 respectively.

Mr. Justice Devlin held that the damage suffered by Mr. Burgess for the loss of his wife as a dancing partner was not recoverable under the Fatal Accidents Act. To recover, it had to be shown that the benefit which the plaintiff had enjoyed arose out of the relationship. In this case the relationship of husband and wife was incidental to and superimposed upon their business partnership, and, if the claim under this head was allowed, logically any partner whose prospects were affected by the death of a partner, whatever their relationship, ought to be allowed to recover. The husband, however, was entitled to recover for the loss of the wife's contributions to their joint income. No doubt a century ago husbands paid all the expenses and a wife's earnings were treated as pin money, but that conception did not fit in with the way Mr. and Mrs. Burgess's life had been conducted. Both earned and contributed equally, and Mrs. Burgess was in the same position as if she had kept her money separately and then handed it over.

Where a husband and wife had a joint income and lived together and shared expenses and so had expenses which were less than if they had lived separately, each conferred on the other a benefit arising out of their relationship of husband and wife and its loss was therefore recoverable under the Fatal Accidents Acts.

The Medical Protection Society instructed Messrs. Le Brasseur and Oakley, solicitors, to act for Miss Lewis.

¹ *The Times*, February 10, 1955.

Medical Notes in Parliament

HOSPITAL BUILDING PLANS ANNOUNCED

The MINISTER OF HEALTH told Parliament on February 9 of the Government's plans for increasing the rate of hospital building in England and Wales. In sum they represent estimated Exchequer expenditure in 1956-7 of some £13m. and in the following year of £18m.—an increase on current expenditure in the first period of about 50% and in 1957-8 of 100%.

Mr. IAIN MACLEOD stated that it was proposed to expand the building programme in two ways, first by the starting of a number of new major building projects, including new hospitals, and, secondly, by a special allocation of money for a plant replacement and redeployment programme. It was not thought that any significant increase in capital expenditure on major schemes could be achieved in the 1955-6 programme, which remains unaltered.

It was proposed in 1956-7 and 1957-8 to start major new building projects to a total value of £7½m. and £10m. respectively. For the plant replacement and redeployment programme £2m. would be available in the first of these years and £4m. in the second. Quite apart from these amounts, there would be £9m. available in 1956-7 and £10m. in 1957-8 for capital expenditure on other works. The Minister said that these figures covered only work financed from Exchequer funds. He hoped that a fair amount of hospital building work would be financed from other sources during this period, but he could not give an estimate of what this figure might be.

The Minister explained that full discussion with the hospital boards would be necessary before all the projects could be settled. The boards concerned had already been asked to bring to completion the planning of a first batch of major projects, to a total value of some £7m., and these would almost certainly be among those started. They included new general hospitals, or the first stages thereof, for Welwyn, West Cumberland, West Cornwall, Harlow, and Swindon; the development of the Glangwili Hospital, Carmarthen; a new mental hospital near Wolverhampton; major extensions at mental deficiency hospitals in the Newcastle, Sheffield, and Liverpool regions, and in Wales; new out-patient departments at the Royal Victoria Infirmary, Newcastle, the Leeds General Infirmary, the Lewisham, and North Middlesex Hospitals; a new block at St. James's Hospital, Balham, and major extensions to the Peterborough Memorial Hospital. Considerable expenditure was also likely to be needed during the period for making good structural defects at the Manchester Royal Infirmary.

Examples of the type of project he had in mind to start within the next few years were the new Cardiff teaching hospital, the rebuilding of Charing Cross Hospital at Harrow, a new ward block at Guy's Hospital, new general hospitals at Slough, Boston (Lincolnshire), Coventry, and Sheffield, and new mental hospitals in Lancashire and Yorkshire, but he could not at present say which of these would be started in 1956-7 and 1957-8. He added that the Government believed that these outline proposals represented what could reasonably be achieved over this period, and they represented also the first programme of new hospital building in this country since before the war.

New Allocations

The cheers with which this announcement was welcomed were followed by a string of questions seeking to amplify points in it. In his answers to these Mr. MACLEOD made it clear that the new programmes were distinct from the normal capital allocations to regional boards, which would be maintained and in the second year increased by £1m. The teaching hospital at Cardiff retained its first priority in England and Wales for a completely new teaching hospital. But it was an enormous project, nowhere near ready

yet—the architectural competition had not taken place—and it would therefore be the wildest guess to say when it would be started. Whether the new Charing Cross Hospital, to be built on the site already obtained at Northwick Park, Harrow, would get into the 1957-8 programme was uncertain, but it stood a very good chance. He was not unduly worried about the staffing side of the new building and extensions. With all the difficulties, there had been a steady increase since 1948 in the numbers of staff, and it would be easier to attract staff to good new hospitals than to old ones.

Scottish Hospitals

A corresponding increase in the rate of hospital building in Scotland was announced by Commander T. D. GALBRAITH, Under Secretary, Scottish Office. He said the total provision would be increased from the present level of £1.9m. this year and next to £2.2m. in 1956-7 and £2.5m. in 1957-8. Of the extra funds thus made available £50,000 in the first year and £150,000 in the second would be used to supplement the programme of plant renewal, on which £800,000 would be spent in the three years 1955-8. The balance would be used to increase the number of major building schemes, and he expected it would be possible to put in hand schemes to a total value of £3m. during these three years.

In 1955-6 a start would be made on a new maternity hospital at Bellshill, Lanarkshire, a new surgical block at Kirkcaldy, and the reconstruction of a mental hospital in Dundee. Details of the subsequent programme had still to be settled in consultation with the regional boards, but among the projects to be considered were extensions to mental deficiency institutions in Banff and in the Glasgow area, a new treatment unit at Glasgow Western Infirmary, reconstruction of the Edinburgh Royal Mental Hospital, and improvement of hospital facilities in Shetland. Detailed planning work would also be put in hand for other schemes to start in 1958-9 and succeeding years, including the provision of a completely new teaching hospital in Dundee.

M'NAGHTEN RULES DEBATED

The House of Commons, having at long last on February 10 debated the report of the Royal Commission on Capital Punishment, decided that the death penalty must remain. It did so by a majority of 31 votes, rejecting by 245 to 214 on a free vote the only alternative before it—the proposal, moved by a Labour Member and seconded by a Conservative, that for an experimental period of five years convicted murderers should be sentenced to life imprisonment.

The arguments pro and con have been widely canvassed since the issue arose in the debates on the Criminal Justice Bill in 1948, and little new was added by those who spoke on this occasion. Some, but not many, had changed their opinions. Among these were the Home Secretary, Major G. Lloyd-George, and his Labour predecessor, Mr. Chuter Ede, who introduced a touch of personal drama by the admission that in the case of Evans, found guilty of the murder of his infant daughter but not tried on the second charge of murdering his wife, he had made a mistake and sent to the gallows a man who was not guilty as charged.

Major LLOYD-GEORGE, stating the Government's provisional views on the major recommendations of the commission, accepted the minority view that there were strong objections to raising from 18 to 21 the age below which the death sentence might not be imposed; and rejected as unworkable the proposal that juries should be given discretion to decide whether there were extenuating circumstances to justify substituting life imprisonment for the death sentence.

The third main recommendation related to the criterion of criminal responsibility when a defence of insanity was raised. The majority of the commission, he recalled, took the view that the present criterion in the M'Naghten Rules was so defective in the light of modern medical knowledge that it ought to be changed, and that the best course would

be not to frame a new criterion but to dispense with any criterion and leave it to the jury to decide whether, at the time of the act, the accused was suffering from any disease of the mind or mental deficiency to such a degree that he ought not to be held responsible. Three members of the commission dissociated themselves from this recommendation on the ground that, while the Rules were in some respects inadequate, a formula had the advantage of limiting the arbitrary element and promoting uniformity, but to have no formula would leave the decision to the uncertain variation of ethical standards and emotional reaction which might influence the minds of the jury. These members set out their own formula in the commission's report. The Government's view was that in England some formula was essential. They recognized that the M'Naghten Rules were open to criticism (although the commission recognized that their theoretical defects led to little hardship or injustice in practice); they were impressed by the difficulty of framing a satisfactory amendment on the Rules and the wide differences of opinion, and they took the view that no advantage would be gained by disturbing the present position and that it was better to leave matters as they were.

Defect of Will

Mr. BASIL NIELD (City of Chester, Con.), Recorder of Salford, said the fundamental and perplexing problem was what must be proved to establish insanity which would amount to a defence. The M'Naghten Rules said that there should be shown to be a disease of the mind—which was clearly right—but that, having established a disease of the mind, the defence must continue so as to prove a "defect of reason" of the sort described. It was around these words that controversy had raged. Might there not be not merely a defect of reason but a defect of will which should constitute a defence? He had always doubted the rightness of the decision that an uncontrollable impulse was not a defence. If there was a disease of the mind which rendered a man incapable of resisting an impulse, he could not in logic see why that was not a defence. The principal argument against any alteration of the M'Naghten Rules seemed to be: they have worked well for a long time; they have been liberally interpreted, and indeed stretched by the jury if circumstances appeared to require it. He could not support the proposal that the Rules should be abrogated and the question left to the jury to say whether they found insanity or no. A formula should be devised so that the jury might have an objective standard by which to decide, and he inclined to the other proposal that the Rules should be extended to add that insanity was proved if disease of the mind rendered the accused incapable of preventing himself from committing the offence.

Irresistible Impulse

Dr. REGINALD BENNETT (Gosport and Fareham, Con.), who said he had been in practice as a psychiatrist examining offenders on remand—although not on capital charges—said it must be faced that the M'Naghten Rules were dangerous and misleading and only approximately did the job for which they were intended. He used as an illustration of how misleading they could be the case of a man suffering from a depressive psychosis. But no substitute formula could be found. The concept of the irresistible impulse (which was suggested by the B.M.A. in para. 264) immediately raised the point of the irresistible impulse and was not the best way to evaluate the less obvious forms of derangement. The idea of the principle of irresistible impulse was a good one, but it would entangle a jury in a welter of hypothetical motivations and provide a happy hunting-ground for insincere pleas of irresistibility. It was too subjective a test. Juries were not qualified to split hairs on psychiatric issues, but they were qualified to judge sanity and to recognize conduct within normal limits, and could be expected to see the prisoner objectively. He suggested, as a modification of the M'Naghten Rules, that if the answers to the first two existing questions—whether the man knew

Vital Statistics

Influenza

In the great towns of England and Wales the number of reported influenza deaths was 106 in the week ending February 5, a decrease compared with the preceding week of 17. Most of these deaths were of people aged 65 and over. Decreases were reported in all regions except the north-western, midlands, and London and south-eastern. There is still no sign of any spread of virus-A infection.

Smallpox in France

Up to February 9 the number of cases reported in the Vannes area of the Morbihan Department was 67, including 15 deaths. 52 of the cases are among hospital patients. The last cases were notified on January 31. Over 2 million persons have been vaccinated in Morbihan and the four adjacent Departments. No additional cases have been reported from the Vosges Department since the two cases notified last week.

Smallpox in Belgium

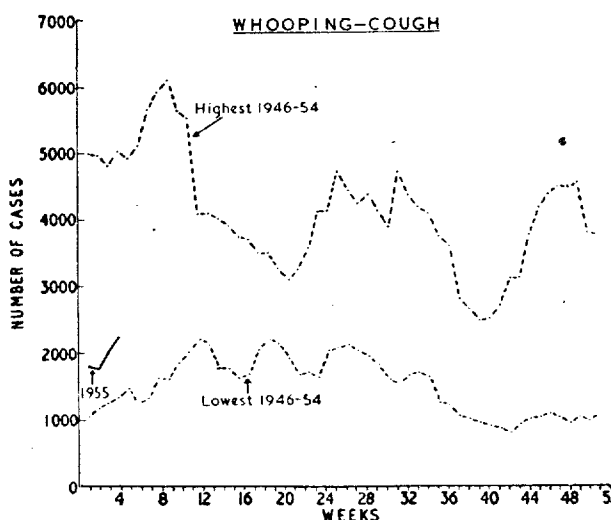
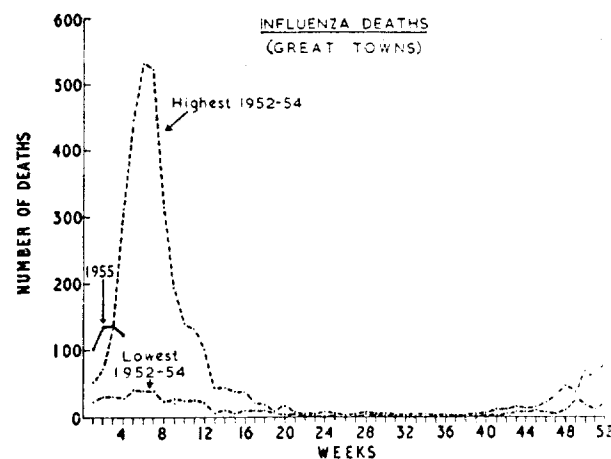
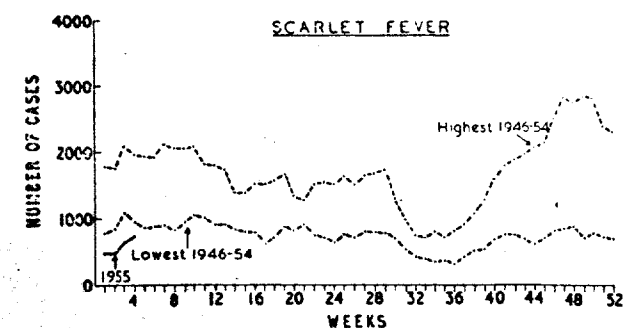
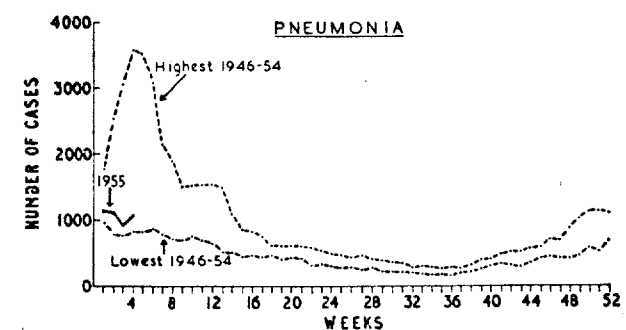
Up to February 10 two confirmed cases of smallpox have been notified at Spa (on January 31 and February 2).

Week Ending February 5

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 791, whooping-cough 2,213, diphtheria 16, measles 12,729, acute pneumonia 1,157, acute poliomyelitis 13, dysentery 979, paratyphoid fever 7, and typhoid fever 8.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the nine years 1946-54 (influenza, 1952-4) are shown thus - - - - -, the figures for 1955 thus ———. Except for the curves showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The incidence of infectious diseases rose in England and Wales during the week ending January 29. The largest increases in the number of notifications were 3,659 for measles, from 7,038 to 10,697, 235 for whooping-cough, from 2,002 to 2,237, 196 for dysentery, from 482 to 678, 133 for acute pneumonia, from 929 to 1,062, and 95 for scarlet fever, from 650 to 745.

The largest increases in the number of notifications of measles were 656 in Yorkshire West Riding, from 808 to 1,464, 481 in London, from 656 to 1,137, 477 in Lancashire, from 1,910 to 2,387, 292 in Derbyshire, from 214 to 506, 240 in Cheshire, from 367 to 607, 187 in Essex, from 353 to 540, 150 in Nottinghamshire, from 319 to 469, 147 in Gloucestershire, from 120 to 267, 138 in Surrey, from 138 to 276, 105 in Warwickshire, from 267 to 372, and 104 in Lincolnshire, from 128 to 232. The largest fluctuations in the trends of whooping-cough were rises of 36 in Lancashire, from 181 to 217, and 31 in Essex, from 52 to 83, and a fall of 42 in Kent, from 141 to 99. The largest rises in the incidence of scarlet fever were 22 in London, from 37 to 59, and 22 in Yorkshire West Riding, from 55 to 77. 23 cases of diphtheria were notified, an increase of 15 on the total for the preceding week. Multiple cases of diphtheria were notified in Yorkshire East Riding (Kingston-upon-Hull C.B. 6), Cheshire (Birkenhead C.B. 3), Devonshire (Plymouth C.B. 2), and Lancashire (Whiston R.D. 2). 5 of the 9 cases of typhoid fever were notified in London (Islington 4, Hampstead 1).

23 cases of acute poliomyelitis were notified, and these were 1 fewer for non-paralytic and the same for paralytic cases as in the preceding week. The largest returns were Essex 5 (Braintree R.D. 5) and Yorkshire West Riding 4.

The increase in dysentery was mainly contributed by Lancashire, where 121 more cases were notified than in the preceding week. The largest centres of infection were Lancashire 224 (Oldham C.B. 51, Manchester C.B. 31, Royton U.D. 21, Liverpool C.B. 17, Blackpool C.B. 16, Stretford M.B. 14, Morecambe and Heysham M.B. 10), London 74 (Southwark 12, Chelsea 11), Yorkshire West Riding 54 (Sheffield C.B. 18, Leeds C.B. 14), Norfolk 44 (Norwich C.B. 20, Blofield and Flegg R.D. 18), Durham 37 (Whickham U.D. 9), Lincolnshire 28 (Scunthorpe M.B. 26), Leicestershire 23 (Leicester C.B. 20), Glamorganshire 23 (Cardiff C.B. 19), Northumberland 22 (Newcastle-upon-Tyne C.B. 14), Middlesex 21 (Edmonton M.B. 13), and Berkshire 20 (Easthampstead R.D. 20).

Medical News

Hunterian Society.—Dr. W. S. C. COPEMAN presided over the annual dinner of the Hunterian Society on February 10, when the health of the society was proposed by the Lord Chancellor, Viscount KILMUIR, who said that Hunter was still a figure that enthralled us "over the arches of the years." He recalled that it was in 1819 that the society took its present name three weeks after a meeting in a City tavern called the King's Head. After Dr. COPEMAN had replied Dr. W. GORDON SEARS proposed the toast, "The Lord Mayor and Corporation of the City of London." Sir SEYMOUR HOWARD responded. Professor A. E. RICHARDSON, the President of the Royal Academy, replied to the toast of "The Guests," proposed by Sir ARTHUR PORRITT.

Hunterian Festival Dinner.—On February 14, for the first time, the Hunterian Festival Dinner at the Royal College of Surgeons was attended by Fellows and Members of the College as well as by the College council and their guests. For the first time also the dinner was held in the Great Hall of the College, where some hours earlier the Hunterian Orator, Sir CECIL WAKELEY, had delivered his oration (see p. 474). The large and distinguished company included two of the visiting Commonwealth Prime Ministers and two Ministers of the Crown. After the President of the College, Sir HARRY PLATT, had proposed the Loyal Toasts and "The Memory of John Hunter," which was honoured in silence, Lord ADRIAN, O.M., P.R.S., proposed the health of the College. He foresaw a time when to match the advances of an electronic age the objectives of surgery would have to change. The College might find itself organizing a great replacement service for worn-out organs of every kind. The surgeon would be found sitting at his desk surrounded by punch-cards and electronic devices. But, reassuring his audience, Lord Adrian predicted with equal confidence that there would still be patients and they would still continue to be grateful. Replying, the President of the College spoke on the meaning to surgeons of the Hunterian tradition. It was not true that after 150 years John Hunter was a mere shadow and the Hunterian tradition something of a mystique. Hunter had lived a life of insatiable curiosity and experiment—"an empiricist in a splendid age of reason." "British surgery," said Sir Harry Platt, adapting a phrase of Whitehead about current philosophy, "consists of a series of footnotes to John Hunter." Since Moynihan's day the College had returned to experimental surgery in the Hunterian tradition, and the future of the College lay in its ability to maintain its leadership in ideas. Professor LAMBERT ROGERS then proposed the health of the many guests, who included the Prime Minister of New Zealand (Mr. S. G. HOLLAND), the Prime Minister of the Federation of Rhodesia and Nyasaland (Sir GODFREY HUGGINS, a Fellow of the College by examination), the Minister of Health (Mr. IAIN MACLEOD), Lord WAVERLEY, and the High Commissioners for Australia, India, New Zealand, and Rhodesia and Nyasaland. Lord WOOLTON, Chancellor of the Duchy of Lancaster, replied. The evening concluded

with the proposal of the health of "The Hunterian Orator," coupled with the name of Lady WAKELEY, by Mr. JULIAN TAYLOR, and a brief reply by Sir CECIL WAKELEY.

World Health Organization.—The W.H.O. Executive Board has had to be content with recommending acceptance by the Eighth World Health Assembly of a budget for 1956 of a little over 9.6 million dollars. Although this is a small increase on this year's figure, it will not maintain the Organization's programme at so high a level, and the Board is dissatisfied with the position. Reflecting its anxiety about current methods of malaria control, the Board passed the following resolution among its other business: "In view of the fact that certain types of malaria-carrying mosquito are already showing resistance to insecticides, all threatened countries should be urged to plan total malaria eradication before it is too late." Another decision is to call, with the United Nations Food and Agriculture Organization, a conference of experts on food additives. The Board declares as the reason for this conference "the potential health danger from the increasing number of chemical substances added to various foodstuffs." Other activities of the Board were described in our issue of February 5 (p. 365).

Edinburgh Mental Health Week.—In Edinburgh February 6-12 was designated a Mental Health Week, with the objects of interesting the public in mental health and sickness and of recruiting nurses to the mental hospitals of the region. The Ministry of Labour and the regional hospital board were initiators and co-ordinators of the recruiting campaign. publicity was handled by the Scottish Information Office, and the staffs of the hospitals concerned were responsible for the detailed planning and performance of its main features of public interest. Many statutory bodies and voluntary organizations assisted. The two principal events were a cinema show, where an address was given by a psychiatrist, laymen's questions were answered by a medical team, and films were shown (including "The Troubled Mind"); and an exhibition, entitled "Mental Nursing To-day," which ran for four days in a large shop in the centre of the city. Over 7,000 people visited the exhibition in its first three days.

Hospital of St. John and St. Elizabeth.—On February 9 Cardinal GRIFFIN, Archbishop of Westminster, opened a new 18-bedded children's ward at the Hospital of St. John and St. Elizabeth, St. John's Wood, London. The ward cost £27,000.

Royal College of Surgeons.—At the Council meeting on February 10 Honorary Fellowships were awarded to Dr. LOYAL DAVIS (Chicago), Mr. WILLIAM DOOLIN (Dublin), Professor ROBERT JAMES (Toronto), and Professor PAUL SANTY (Lyons). Professor A. B. MACGREGOR (Birmingham) was appointed Charles Tomes Lecturer for 1955, and Dr. N. M. CASS lecturer in physiology. The annual meeting of Fellows and Members will be held this year in Manchester on December 10, when there will also be clinical demonstrations and a scientific discussion.

Tuberculosis Grant.—The Scottish Branch of the National Association for the Prevention of Tuberculosis offers a grant of £250 for postgraduate study abroad to a doctor working in Scotland. Details from 65, Castle Street, Edinburgh, 2, not later than April 1.

The Duke of Edinburgh has accepted an invitation to become the first Honorary Fellow of the Pharmaceutical Society of Great Britain.

Cortisone for Acute Leukaemia.—On a recommendation from the Medical Research Council, the Ministry of Health will supply to hospitals cortisone and A.C.T.H. for the treatment of acute leukaemia.

Mental Health Research.—£3,300 has been raised by a B.B.C. appeal for the Mental Health Research Fund.

Music Therapy.—The renowned violinist, FRITZ KREISLER, and his wife have given \$500 (£180) to the Music Service in Hospitals, which is an organization established to encourage and provide musical therapy in British hospitals.

Medical Orchestra.—The London Medical (and Dental) Orchestra, conductor Dr. H. Ucko, will welcome more players. Details from Dr. E. V. SLAUGHTER, 6, Oxford Court, London, W.3. The next concert will be a performance of Haydn's Passion, "The Seven Last Words," on Good Friday.

Sir Earle Page has been elected the first Chancellor of the recently established University of New England, New South Wales.

Dr. J. L. Blonstein has been appointed to the Medical Commission of the Association Internationale de Boxe Amateur.

Journal Index.—The half-yearly indexes to Volume II of the *Journal* and the *Supplement* for 1954 are now being sent to members who receive them regularly and to subscribers. Members who have not previously asked for the indexes can obtain copies, post free, on application to the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

COMING EVENTS

Doncaster Dinner.—The Doncaster Medical Society will hold a dinner and dance at the Danum Hotel on February 24 at 7 for 7.30. Tickets (£1.11s. 6d.) from Dr. P. J. SHIELDS, Roxboro' House, Carcroft, Doncaster.

Brompton Hospital Association.—Fourth dinner at the Waldorf Hotel, Aldwych, London, W.C.2, on April 15. Dr. G. E. BEAUMONT will preside. Inquiries to hon. secretary, Brompton Hospital, London, S.W.3.

Joseph Clover Lecture.—Professor W. W. MUSHIN will lecture on "Measurement in Anaesthesia" at the Royal College of Surgeons, Lincoln's Inn Fields, on March 23, at 5 p.m.

Daiby Memorial Lecture.—Mr. TERENCE CAWTHORNE will lecture on "Otosclerosis" at the Royal Society of Medicine on March 3 at 8.30 p.m.

National League of Hospital Friends.—Annual meeting and conference at Caxton Hall, Westminster, on March 9. The theme of the conference will be, "Leagues of Hospital Friends in Special Spheres" (The Aged and Chronic Sick; The Mentally Sick). Details from the secretary at 23, Knightsbridge, London, S.W.1.

Boat Race.—Messrs. Vitamins Limited have available a number of tickets for doctors who may wish to view the Oxford and Cambridge Boat Race on March 26 from the Bemax premises. Early application should be made to Dept. B.R.1, Vitamins Limited, 23, Upper Mall, London, W.6.

SOCIETIES AND LECTURES

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

Sunday, February 20

GREY TURNER SURGICAL CLUB.—At Postgraduate Medical School of London, from February 20 to 23 inclusive, meeting.

Monday, February 21

HUNTERIAN SOCIETY.—At Mansion House, 8.30 p.m., Hunterian Oration by Mr. Lionel E. C. Norbury: Some Aspects of Life in the Time of John Hunter.

INSTITUTE OF PSYCHIATRY.—5.30 p.m., Dr. E. Stengel: lecture-demonstration.

Tuesday, February 22

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor A. C. Frazer: Fat Metabolism.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. E. J. Moynahan: Carcinogenesis.

LONDON UNIVERSITY.—At Anatomy Theatre, University College, 1.15 p.m., Dr. R. P. Kelvin: Missing the Point in Psychology.

MIDDLESEX COUNTY MEDICAL SOCIETY.—At Edgware General Hospital 3 p.m., Dr. F. E. Camps: Brute Force and Murderous Ignorance.

Members of the Harrow Division, B.M.A., are invited.

OXFORD UNIVERSITY MEDICAL SOCIETY.—At Radcliffe Infirmary, 8.15 p.m., Sir Cecil Wakeley: Surgery Through the Ages.

ROYAL STATISTICAL SOCIETY: STUDY CIRCLE ON MEDICAL STATISTICS.—At Westminster Medical School, 6 p.m., Dr. A. L. Cochrane: Medical Field Surveys.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Professor H. C. McLaren: Carcinoma of the Uterine Body.

SURREY INTER-HOSPITAL PSYCHIATRIC ASSOCIATION.—At Long Grove Hospital, Epsom, Surrey, 6 p.m., clinical meeting. Papers by Dr. A. Gillie: A Safe Technique in Modified E.C.T.; Dr. A. B. Monro: A Concept of Mental Health Derived from Recent Research.

Wednesday, February 23

BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—At Child Guidance Clinic, 29, George Road, Five Ways, 5 p.m., clinical meeting. BRITISH PSYCHOLOGICAL SOCIETY: MEDICAL SECTION.—At Royal Society of Medicine, 8.30 p.m., Dr. R. A. J. Asher: Talk, Tact, and Treatment. INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Squamous Cell Epithelioma.

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—5.30 p.m., Professor F. C. Ormerod: Hoarseness.

INSTITUTE OF ORTHOPAEDICS.—6 p.m., Dr. C. H. Lack and Dr. H. A. Sissons: Clinical Pathological Conference.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Dr. S. B. Osborn: Radiotherapy in Urology.

NOTTINGHAM MEDICO-CHIRURGICAL SOCIETY.—8.30 p.m., Dr. T. F. Fox: Medicine in Russia.

ST. MARYLEBONE HOSPITAL FOR PSYCHIATRY AND CHILD GUIDANCE.—5.30 p.m., Dr. C. C. Edwards: Functional or Organic? Differential Diagnosis.

THURSDAY, FEBRUARY 24

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. R. A. Kekwick: Plasma Proteins.

GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.—At Glasgow University Union, 7.30 p.m., B.M.A. Lecture by Dr. W. N. Pickles: Epidemiology in Country Practice.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Mr. H. S. Williams: Physical Principles of Radiation Therapy.

LIVERPOOL MEDICAL INSTITUTION.—At Walton Hospital, Liverpool, 3 p.m., afternoon clinical demonstration.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of London, 8.30 p.m., pictorial survey: Ocular Manifestations of General Disease; short film: Myasthenia Gravis. Speaker, Mr. Joseph Mintea.

NUFFIELD ORTHOPAEDIC CENTRE.—At Wingfield-Morris Orthopaedic Hospital, 8.30 p.m., Mr. J. C. Scott: Results of Conservative Treatment of Fractures of the Femoral Shaft.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Arnold Demonstration by Dr. F. Stansfield: Growth and Development of Bone.

ROYAL EYE HOSPITAL.—5.30 p.m., Dr. T. H. Whittington: Some Aspects of Refraction Work: (1) Normal Vision. Headache and Asthenopia.

ROYAL MEDICAL SOCIETY, Edinburgh.—At Charlotte Rooms, 8 p.m. to 1.30 a.m., annual ball.

ROYAL SOCIETY.—4.30 p.m., Dr. Wilson Smith, F.R.S., Dr. G. Belyavskiy, and Dr. F. W. Sheffield: Host Tissue Component of Influenza Viruses.

Dr. H. Halliday: Absorption of Antibodies from Immune Sera by the Gut of the Young Rat.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Medical School, Small's Wynd, Dundee, 5 p.m., Dr. D. P. Cuthbertson: Work of the Rowett Research Institute.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. J. H. Paterson: neurology demonstration.

UNIVERSITY COLLEGE LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, 4.45 p.m., Dr. S. R. Elden: Respiratory Mechanisms in Bacteria.

FRIDAY, FEBRUARY 25

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. R. T. Brain: Precancerous and Epitheliomata.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Dr. J. Smart: Pulmonary Tuberculosis.

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—3.30 p.m., Mr. J. C. Hogg: Dysphagia.

●LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—6.30 p.m., Dr. J. H. Sheldon: Old Age.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.—At 11, Chandos Street, London, W., 7.30 p.m., Dr. A. E. Wilkinson: Use of T.P.I. as a Verification Test in Suspected Latent Syphilis; Dr. P. J. L. Sequeira: Studies on the Reproducibility and Specificity of T.P.I.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—(1) 2 p.m., Mr. D. Lamb Stevenson: Some Illustrations of General Surgical Principles. (2) 4 p.m., Dr. J. J. R. Duthie: Systemic Manifestations of Rheumatoid Disease.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—3.30 p.m., Mr. Ian Fraser: Problems of Tumours of the Small Intestine.

●ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Professor Stanley Alstead: Therapeutics: Tropical Diseases.

ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., Dr. A. G. MacGregor: Atomic Medicine.

ROYAL SANITARY INSTITUTE.—At Town Hall, Rhyd, 10.30 a.m., Dr. B. Rhyddwen: Whither Public Health? Afternoon, Mr. E. L. Lloyd Jones: Food Poisoning—Why?

SATURDAY, FEBRUARY 26

CAMBRIDGE UNIVERSITY MEDICAL SCHOOL.—10.30 a.m., Symposium: Infectious Diseases.

MEDICAL ASSOCIATION FOR THE PREVENTION OF WAR.—At 45 Russell Square, London, W.C.1, 8 p.m., Professor Taitai (Osaka University): Medical Aspects of the Atomic Disaster in Japan (illustrated).

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Ambrose.—On February 9, 1955, in London, to Sheila, wife of Dr. Gordon Ambrose, a son.

Feldman.—On February 4, 1955, to Nora, wife of Dr. A. Feldman, of 70, Petersfield Avenue, Harold Hill, Essex, a son—Mark Rosslyn.

Hamilton.—On Christmas Eve, 1954, at the Toronto Western Hospital, to Rosemary, M.B., B.S., wife of Thomas R. Hamilton, M.B., B.S., a son.

Price.—On February 8, 1955, in Calcutta to Kathleen (formerly Shaddick), wife of John Price, F.R.C.S., a daughter—Jane Elen.

DEATHS

France.—On January 16, 1955, Robert Scouler France, M.B., Ch.B., late of Merthyr Tydfil, Glam.

Geddie.—On January 25, 1955, in hospital, Colin More Geddie, M.B., Ch.B., of 59, Preston New Road, Blackburn, Lancs, aged 71.

Gimson.—On January 29, 1955, at Witham, Essex, Edward Carwardine Gimson, D.S.O., M.B., Ch.B., aged 77.

Hill.—On January 19, 1955, at the London Hospital, London, E., Nelson Wood Hill, F.R.C.S.Ed., aged 75.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Tin Poisoning

Q.—What are the signs and symptoms of tin poisoning? What records are there of poisoning by tin from the consumption of tinned foods?

A.—It is pretty generally agreed that tin and its simple compounds have little or no toxicity. As Von Oettingen¹ states, acute tin poisoning is very rare, but it has been reported from the ingestion of acid-canned herrings containing about 156 mg. of tin. The toxic symptoms started after a latent period of 5 or 6 hours and were characterized by severe colic, meteorism, oppression in the chest, and later by a metallic taste and constipation. In a few instances the continued absorption of small quantities of tin was followed by abdominal pain, nausea, constipation, and loss of weight. Some patients complained of sore throat and chilliness, mild fever, myalgias, and arthralgia, and some showed a moderate anaemia. The symptoms cleared up when no more tin was ingested. The elimination of tin from the body may be helped by the administration of sodium iodide.

Fairhall² states that tin is one of the least toxic of the common metals when ingested in the form of its salts. Relatively large quantities can be dissolved from acid materials preserved in tin cans without conferring any taste or flavour to food materials and without producing toxic symptoms. In an investigation made by Schwartz and Clarke,³ of the U.S. Department of Agriculture, four individuals were fed on canned pumpkin for five days, during which time they ingested as much as 2.75 grammes of tin. The quantity of tin absorbed was small and no adverse effects were noted. The intravenous injection of stannic and stannous salts in animals shows that the organs tolerate relatively high concentrations of tin and that the injected tin is rapidly excreted. The inhalation of tin oxide dust and fume over a long period produces marked radiological changes in the lungs simulating silicosis. The condition is known as stannosis and no symptoms have been noted as a result of it. It is comparable with the siderosis of welders and other workers inhaling iron oxide.

The subject of tin as a poison was reviewed recently in the *Journal*⁴ and attention was drawn to the toxic properties of organic salts of tin such as di-ethyl tin diiodide combined with linoleic acid or vitamin F. It is clear that such salts are much more toxic than the inorganic ones.

The Metallic Contamination Subcommittee of the Foods Standard Committee has set up a new limit of tin in canned foods of 250 parts per million, whereas the one recommended in 1908 was 286 p.p.m. It is pointed out that this limit has generally been regarded as satisfactory and that there was practically no evidence of cases of poisoning attributable to excessive tin content in tinned foods. Even so it was thought desirable to lower the limit until more decisive information is available on the subject of the toxicity of tin.

REFERENCES

- ¹ *Poisoning*, 1952, p. 491. W. Heinemann Medical Books, London.
- ² *Industrial Toxicology*, 1949, p. 177. Williams and Wilkins, Baltimore.
- ³ *J. Pharmacol.*, 1927, 31, 224.
- ⁴ *British Medical Journal*, 1954, 2, 693.

Testosterone and Growth

Q.—I was shown a press cutting by a patient in which it was reported that an adult male had grown by three inches (7.6 cm.) after a prolonged course of testosterone had been given by mouth. Is there any scientific basis for this claim?

A.—Testosterone undoubtedly has growth-promoting properties and is responsible for the marked growth spurt

seen in boys at the time of puberty. (Girls have a less marked growth spurt at puberty.) However, as part of its action on growing bone, testosterone also brings about epiphyseal fusion, which leads to cessation of growth, so that only a limited growth increment can result from its administration. Testosterone given to an adult though hypogonadal male whose epiphyses have not yet fused will usually produce a definite increase in stature. But clearly no growth can be produced by testosterone, or by anything else, once epiphyseal fusion has taken place. Presumably, therefore, the "adult male" referred to in the question must have been hypogonadal when treatment was begun.

Morphine for Patients with Coronary Thrombosis

Q.—One commonly provides the patient suffering from coronary thrombosis with trinitroglycerin tablets for use in the event of pain; occasionally one wishes to give them some form of morphine so that they may use it themselves in case of a severe attack. What preparation of morphine is recommended as being best for this purpose, and what dose should be given?

A.—Suppositories containing 15 mg. ($\frac{1}{2}$ gr.) morphine would appear to be the most suitable and safe preparation for this purpose.

The Fish Tape-worm

Q.—Could you kindly tell me whether there is any danger of infection by fish tape-worm from eating raw pickled herrings? Which species of fish are concerned in the transference of these worms to human beings?

A.—There is no danger of human infection with the fish tape-worm from eating raw pickled herrings. The infective larval stages (plerocercoids) of this parasite (*Dipyllobothrium latum*) occur in Europe only in fresh-water fish, such as perch, pike, salmon, miller's thumb, trout, grayling, etc. Other kinds of fresh-water fish are involved in Africa, Japan, North America, and Canada.

Desensitization to Penicillin

Q.—I should be grateful if you could give me details of the best method of attempting desensitization to penicillin in a nurse who develops an allergic rash on the face and hands after giving the drug by injection, although every care is taken in injection technique. If success is achieved, how long would the benefit be expected to last?

A.—The method of desensitization to penicillin which it is recommended to adopt is the one used by Crofton.¹ Crofton described in detail desensitization to streptomycin with daily intramuscular injections starting with 10 mg. and gradually increasing to 1 g. The whole treatment in Crofton's cases took from one to three months, and it seems likely that the same methods are applicable to penicillin. Severe reactions may be encountered, but may be minimized if points mentioned by Crofton are carefully studied.

REFERENCE

- ¹ *British Medical Journal*, 1953, 2, 1014.

Periodical Lactation at Menstruation

Q.—A patient of mine aged 42 years had her only child 14 years ago. Seven years ago and on two occasions during the last year she has lactated at a time corresponding to her periods. What are the possible causes and what treatment, if any, should be given?

A.—Women who have borne and suckled children can often express a small amount of "milk" from the nipples for many years afterwards. The breasts are normally affected to some extent by the hormone cycle of the ovary, and during the premenstrual phase are usually slightly larger, more vascular, and tender, if not painful. The amount of discomfort varies from one individual to another, and from time to time in the same individual.

The occurrence of such symptoms might cause a woman to examine her breasts more closely and to attempt expression and thus reveal some secretion which would not otherwise have been noticed. This sort of explanation of the finding of secretion about the time of a period is tentatively suggested. It assumes that the amount of secretion is small. If, however, there is a free supply of milk such as would warrant the term galactorrhoea, and which occurs in the absence of manipulation of the breast, the explanation might not be acceptable. Galactorrhoea sometimes occurs as a sign of a corpus luteum retention cyst or of a disturbance of pituitary function (including tumour formation). The latter is not likely in this case, because the phenomenon has been intermittent over the course of years. A temporary disturbance of the ovarian cycle is more probable.

If no evidence of pituitary or ovarian disease can be found, the occurrences should be regarded as being of no importance and as not requiring any treatment other than advice to avoid interfering with the breasts.

Refractive Changes in Diabetics

Q.—It has been stated that the presence of diabetes should be considered in adults requiring frequent changes of glasses, since a tendency to myopia is associated with a high blood sugar level, and hypermetropia may be observed concomitant with a low concentration of sugar. Why is this? Is it due to a varying concentration of glucose in the fluid media of the eye?

A.—It has long been known that refractive changes occur in diabetics in whom the sugar content of the blood varies rapidly; the tendency is for myopia to develop with a high sugar level in the blood, hypermetropia with its sudden decrease. The actual mechanism determining these changes is unknown, but it is not due to a varying concentration of glucose in the fluid media of the eye. The evidence is fairly conclusive that the changes in refraction are associated with alterations in the lens, possibly due to osmotic effects; but it is not clear how these act.

Sterilization of Rug Made by Tuberculous Patient

Q.—I have a patient with pulmonary tuberculosis who has a positive sputum. As a hobby he has started making wool rugs. The first one is completed and I should be grateful if you would let me know how this can be sterilized without damaging it.

A.—It is probable that hanging the rug out in the fresh air and sunshine for four days in succession would render it quite harmless. For maximum safety, however, exposure to steam at a pressure of 5 lb. per square inch (0.35 kg. per square cm.) for 30 minutes is advised. The local chest clinic will probably have an arrangement with a hospital or the local authority for getting this done.

Laburnum and Other Poisonous Plants

Q.—What is the active poison in laburnum seeds? The seeds when eaten cause vomiting, diarrhoea, drowsiness, and collapse. Can you advise a suitable reference to poisonous plants and shrubs, which includes antidotes?

A.—The poisonous principle of *Cytisus laburnum* is the alkaloid cytisine, $C_{15}H_{15}ON_2$. Some years ago Laidlaw¹ reviewed recorded cases of poisoning and produced evidence for the responsibility of cytisine, emphasizing the narcotic-irritant action and similarity to nicotine. As with most poisonous plants, treatment is directed to elimination of the poison rather than to application of an antidote, and he states: "The treatment of laburnum poisoning in man resolves itself into removal of the poison by emetics or stomach-tube and the treatment of symptoms as they arise. Radziwillowicz has shown that cytisine is readily excreted in the urine; diuretics, therefore, seem to be indicated. In a number of cases hot baths seem to have been beneficial." Later investigations have added little or nothing to this work; no therapeutic application of cytisine has been made.

The best small book on poisonous plants in Europe, including all important species occurring in Britain, their pharmacology, and treatment of cases of poisoning, is by O. Gessner,² but it is unfortunately in German. In English there is a popular work of some age by the Rev. Professor G. Henslow³ which has no up-to-date successor. Much information, but only incidentally referring to human poisoning, is to be found in the books by H. C. Long,⁴ the first of which has detailed references.

REFERENCES

- ¹ *Proc. roy. Soc. Med., Therap. and Pharm. Sect.*, 1912, 5, 10.
- ² *Die Gift- und Arzneipflanzen von Mitteleuropa*, 1931, Heidelberg.
- ³ *Poisonous Plants in Field and Garden*, 1901, London, S.P.C.K.
- ⁴ *Plants Poisonous to Livestock*, 1924, Cambridge University Press.
- ⁵ *Poisonous Plants on the Farm*, Ministry of Agriculture and Fisheries Bulletin No. 75, 1938, London, H.M.S.O.

Supernumerary Kidneys

Q.—In a recent post-mortem examination a small accessory kidney was seen on the left side. I would like to know the approximate frequency of this finding, and I would be grateful for a reference to any recent review on the subject.

A.—Supernumerary or accessory kidneys are very rare. The reported cases have been collected and reviewed by H. E. Carlson.¹ He traced records of 51 cases, of which 4 were diagnosed pre-operatively and 32 came as a surprise to a surgeon when operating. Supernumerary kidneys are generally smaller than their companion kidney. Their function is always greatly reduced and they are generally found below the normally located and functioning kidney. The ureters are generally bifid, but complete duplication is not infrequent and ectopic ureteral orifices are not uncommon. Carlson points out that there is wide variation in the pathological findings in both the supernumerary and non-supernumerary kidneys, and he summarizes these in the tables which accompany the article referred to above.

REFERENCE

- ¹ *J. Urol.*, 1950, 64, 224.

Incidence of Hydronephrosis in Prostatic Obstruction

Q.—What proportion of cases of prostatic enlargement with symptoms have hydronephrosis or hydroureter? Is there any difference in incidence on the two sides?

A.—Figures given by Kretschmer and Squire¹ showed that in the period 1933–7 44% of their patients with prostatic obstruction had hydronephrosis or hydroureter, and in the period 1945–7 33%. They claimed that the incidence was diminishing with earlier treatment. There was only a small difference, at the most 1%, in the incidence on the two sides in their cases; unilateral hydroureter is, however, sometimes seen and can be related to unilateral prostatic enlargement in a few instances. As a rule dilatation of the ureter precedes dilatation of the pelvis and calyces.

REFERENCE

- ¹ *J. Urol.*, 1948, 60, 1.

Corrections

We regret that in the *Journal* of February 5 (p. 362) Mr. Eric Johnson, M.P., was recorded in our Parliamentary report as being a member of the Labour Party instead of the Conservative Party.

The tuberculosis attack rates were wrongly quoted as per 100 instead of as per 1,000 in the penultimate paragraph of the leading article in last week's *Journal* (p. 403) commenting on the Rhondda Fach survey.

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 26 1955

FACTORS INFLUENCING ADRENOCORTICAL ACTIVITY IN HEALTH AND DISEASE*

BY

R. I. S. BAYLISS, M.D., M.R.C.P.

Assistant Physician, Westminster Hospital

The heightened interest in the adrenal cortex and its secretory products over the last few years is largely due to two factors—the belief by some workers that several diseases of unknown aetiology, such as rheumatoid arthritis, are caused by an imbalance in the various hormones secreted by the adrenal gland, and the advent of pure adrenal steroids and corticotrophin (A.C.T.H.) in sufficient amounts for use in clinical medicine. There can be no doubt that these agents are of considerable value in the treatment of certain diseases, particularly in the control of status asthmaticus and rheumatoid arthritis, and also in testing adrenocortical function so that the diagnosis of certain endocrine diseases can be more accurate and founded on a truly scientific basis. The proper use of these agents requires some knowledge of the mechanism by which they and other factors influence adrenocortical function.

The many different hormones secreted by the cells of the suprarenal cortex can be classified under five main headings according to their chief physiological actions. These five categories comprise glucocorticoids, androgenic steroids, mineralocorticosteroids, oestrogenic steroids, and progestational steroids: very little is known about the last two groups, and they are not discussed further. These subdivisions are somewhat arbitrary, because the actions of these hormones often overlap. For example, glucocorticoids, which include such compounds as hydrocortisone (also known as cortisol and compound F) and corticosterone (Albright calls them the "S" or sugar hormones because of their influence on carbohydrate metabolism), not only affect protein, carbohydrate, and fat metabolism but influence salt and water metabolism as well. There is evidence, however, for a specific mineralocorticoid which controls salt and water metabolism—namely, aldosterone, a hormone recently isolated by Simpson *et al.* (1954). Little is yet known about its role in health and disease, although there is enough evidence to indicate that the factors which control its secretion are different from those which promote the formation of hydrocortisone (Simpson and Tait, personal communication; Prunty *et al.*, 1954). Androgenic steroids, which Albright has called the "N" or nitrogen-retaining hormones because of their ability to promote anabolism of protein in addition to their action on the secondary sexual mani-

festations, also appear to be controlled to some extent by different factors from those concerned with the formation of glucocorticoids and aldosterone. Thus in considering the factors which influence adrenocortical activity in health and disease it is necessary to define which particular adrenal function is under discussion. This report is concerned chiefly with the secretion of glucocorticoids: our knowledge is far from complete, and in a rapidly developing field of research this is inevitably in the nature of an interim report on work in progress in several different centres.

INDICES OF ADRENOCORTICAL ACTIVITY

Glucocorticoid Secretion

Research into the secretion of corticosteroids has been beset with difficulties largely owing to lack of satisfactory methods. In the past much valuable information has been obtained from animal experiments in which assessment of adrenocortical activity has been based on such indirect indices as the degree of ascorbic acid or cholesterol depletion in the adrenal glands—changes which have been accepted as evidence of increased secretion of corticosteroids. However, the significance of these changes is still uncertain, and in endocrinology, perhaps more than in any other subject, it is unwise to translate from animal experiments to man. In man, too, indirect indices of adrenocortical activity have been used. Some of these, such as the fall in eosinophils, have proved under certain circumstances to be misleading. The significance of these eosinophil changes is discussed later.

More direct assessment of adrenocortical function is obtained by measuring the concentration of corticosteroids in the blood and in the urine. In principle the technique of estimating plasma corticosteroids is simple. A sample of 15 ml. of plasma is extracted with chloroform. The extract is dried and then purified by column chromatography. The steroids are estimated by a colour reaction with phenylhydrazine in sulphuric acid which is specific for C-17 dihydroxy-ketones (Porter and Silber, 1950; Nelson and Samuels, 1952; Bayliss and Steinbeck, 1953). By working up large volumes of fresh plasma it has been found that the bulk of the material measured is hydrocortisone (Nelson and Samuels, 1952), although some of the colour is produced by metabolites such as tetrahydrocortisone (Bayliss and Steinbeck, 1953; unpublished observations). The identification of the compounds present has been made by paper chromatography, eluting the steroids off the

*A lecture given to the Postgraduate Medical School and the Institute of the British Postgraduate Medical Federation as part of the course on "The Scientific Basis of Medicine." Delivered at the London School of Hygiene and Tropical Medicine on November 25, 1954.

paper and then recording the characteristic absorption spectra they give when reacted with concentrated sulphuric acid (Zaffaroni, 1950, 1953).

There are certain shortcomings in using the plasma concentration of 17-hydroxycorticosteroids as an index of adrenocortical activity. First, the method does not measure corticosterone, which is a normal, but probably not a major, constituent of adrenocortical secretion. The second, and in this context the more important, shortcoming is that the concentration of 17-hydroxycorticosteroids in the plasma may not necessarily be an index of adrenal activity. The level in the plasma is

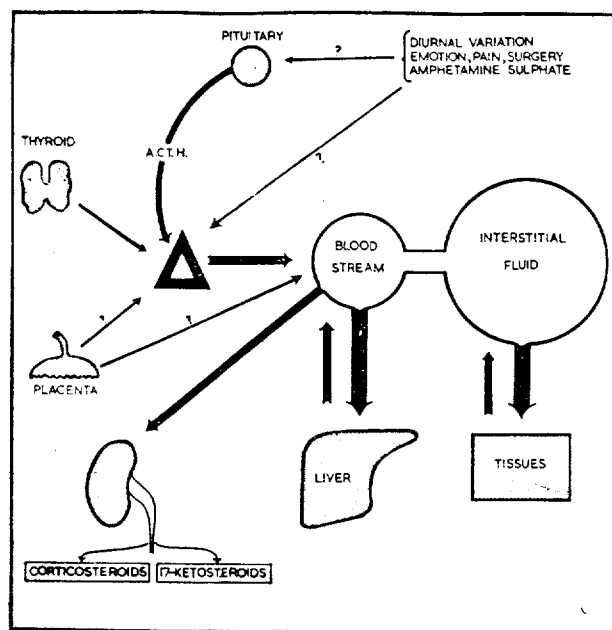


Diagram to illustrate some of the factors which influence the plasma level of 17-hydroxycorticosteroids.

the resultant of several factors (see Diagram)—the quantity being secreted by the adrenal glands, the quantity being metabolized and utilized in the tissues, and the quantity being excreted in the faeces and urine.

Secretion

Steroids secreted by the adrenal cortex pass into the blood stream and thence into the extracellular fluid. Paper chromatographic analysis of fluid removed from the pleural space or peritoneal cavity has shown the presence of hydrocortisone and also, in some specimens, very small amounts of tetrahydrocortisone (Cope and Hurlock, 1953, 1954). The 17-hydroxycorticosteroid content of pleural and ascitic fluid is of the same order as that found in blood samples, and this suggests that adrenocortical hormones diffuse readily from the vascular into the interstitial fluid compartments (Bayliss and Steinbeck, unpublished observations).

Utilization

Adrenocortical steroids are metabolized in the tissues and particularly in the liver. In the dog there is a considerable steroid gradient across the liver, and after giving cortisone by mouth the steroid concentration is much higher in the portal venous blood than in blood from the hepatic vein (Bayliss *et al.*, 1954b). In man a dose of 50 mg. of cortisone by mouth causes a rapid increase in the plasma steroid level, but the hormone disappears quickly from the blood stream and the plasma level returns to normal in four to six hours (Bayliss and Steinbeck, 1955).

Little is known of the metabolism of corticosteroids in peripheral tissues. Nelson *et al.* (1951) failed to find a significant arteriovenous difference across the limbs. This is perhaps not surprising, since Louchart and Jailer (1952) found that little disappeared when cortisone was incubated with slices of muscle or brain, but that large losses occurred in the presence of liver, kidney, or spleen slices. On the other hand, when hydrocortisone or cortisone is injected into a knee-joint the steroid is rapidly metabolized, and if some of the joint fluid is withdrawn half an hour later the hormone has been converted into other compounds (Wilson *et al.*, 1953).

It is possible that certain substances may interfere with the metabolism of cortisone or hydrocortisone. It was first observed in Holland that patients taking large amounts of liquorice were liable to develop oedema and hypertension (Borst, 1950). It was suggested that glycyrrhetic acid, believed to be the active ingredient of the liquorice, exerted an effect similar to that of adrenocortical hormones, and that this might be the unwitting reason why salt-depleted miners in certain French coalfields sucked sticks of liquorice at the end of their day's work, just as British miners may add extra salt to their beer. When glycyrrhetic acid was given to Addisonian patients conflicting results were obtained. Some patients showed clinical improvement and maintained their salt balance (Groen *et al.*, 1951; Card *et al.*, 1953); others did not (Borst *et al.*, 1953). It was observed that when an Addisonian patient was given cortisone a smaller dose combined with glycyrrhetic acid produced the same therapeutic effect as a larger dose given alone. This suggests that liquorice may act by blocking the enzyme systems which metabolize corticosteroids. If in an Addisonian patient there is some residual adrenal function and small amounts of steroid are being secreted, glycyrrhetic acid causes clinical improvement by preventing enzymic breakdown of the adrenal steroids; if, on the other hand, adrenal atrophy is complete and no steroids are being secreted, glycyrrhetic acid has no effect. Proof of this hypothesis has not yet been obtained.

Urinary Excretion

Although studies with C^{14} -labelled cortisone have shown that eventually about 80% of the radioactivity is eliminated in the urine, much of this material is probably no longer steroidal, because only 5 to 10% of a 50-mg. dose of cortisone is recovered in the urine as corticosteroids and an even smaller amount as neutral 17-ketosteroids. The quantitative estimation of urinary corticosteroids has proved difficult, because the hormones and their metabolites are excreted partly as free compounds and partly as conjugates. The difficulty has been to hydrolyse the conjugated compounds. The method evolved by Norymberski *et al.* (1953) circumvents this difficulty and is likely to prove a most valuable tool in the study of adrenocortical function. The method of Reddy *et al.* (1952) is also promising: it has the great merit of simplicity, but its accuracy has still to be proved. By estimating the 17-hydroxycorticosteroid concentration in plasma and urine the renal clearance of corticosteroids has been measured in the same way as the clearance of urea or creatinine is measured. About 1 ml. or less of plasma is cleared of 17-hydroxycorticosteroids per minute. Since data from studying the steroid concentration in ascitic and pleural fluid indicate that these hormones are diffusible, the low clearance must be due to active reabsorption in the tubular lumen, which is the method used for conserving substances important to the body economy.

These, then, are some of the factors which may influence the concentration of 17-hydroxycorticosteroids in the plasma.

In normal healthy subjects the plasma steroid level ranges from 3 to 17 μ g. per 100 ml., with a mean of 9 μ g. per 100 ml. It is necessary to point out, however, that isolated single determinations may be misleading, because there is evidence, discussed below, that emotional factors

may influence plasma steroid concentration and high values may occur in normal people during an emotional disturbance.

Androgenic Steroid Secretion

The urinary excretion of neutral 17-ketosteroids is generally accepted as an index of androgenic steroid formation in the body. The daily output in the adult male is on the average some 5 mg. higher than in the female—this amount being contributed by androgens of testicular origin. Unfortunately, hydrocortisone and cortisone are in part excreted as 17-ketosteroids, and the total excretion of 17-ketosteroids—derived from both corticosteroids and androgenic steroids and probably other precursors as well—is an imperfect index of androgenic hormone formation. By more complicated chromatographic techniques it is possible to separate 17-ketosteroids into several constituent fractions and determine how much of the total has been derived from corticosteroids and how much from androgenic hormones and other precursors (Dingemans *et al.*, 1952; Kellie, 1953; Lakshmanan, 1954).

FACTORS INFLUENCING CORTICOSTEROID SECRETION

Corticotrophin

The pituitary trophic hormone A.C.T.H. is the principal factor directly regulating the secretion of corticosteroids (Sayers and Sayers, 1948; Sayers, 1950; Long, 1952). Whether corticotrophin is a protein or a polypeptide, and whether it is one hormone or several, is still undecided (Astwood *et al.*, 1952; Stack-Dunne, 1953; Forsham, 1955), nor is the mechanism by which it increases corticosteroid secretion fully understood. Perfusion studies of ox adrenal glands, carried out at the Worcester Foundation over a number of years, indicate that its action is to accelerate the early stages in the biosynthesis of hydrocortisone and corticosterone from cholesterol and acetate precursors (Pincus, 1954).

The degree of increased adrenocortical activity produced by A.C.T.H. is dependent upon two factors—the amount of hormone administered (Bayliss and Steinbeck, 1954a) and the length of time the stimulating action of the hormone is applied (Renold *et al.*, 1952).

If solutions of A.C.T.H. are infused over a constant time, the degree of adrenocortical stimulation produced is directly related to the dose given. Over a 6-hour period as little as 0.25 unit an hour will cause a significant increase in adrenal activity. If this response is plotted against the logarithm of the dose a straight-line relationship is obtained. The slope of the line is rather flat, so that with increasing doses above 2 units an hour there is little further elevation of the plasma steroid concentration, and for practical purposes it can be assumed that 2 units an hour over a six-hour period will cause maximum adrenal stimulation.

The degree of adrenocortical response to a constant dose of A.C.T.H. is directly proportional to the duration of A.C.T.H. administration (Renold *et al.*, 1952). If a single dose of 20 units is injected intravenously the response of the adrenal cortex is often short-lived and evanescent. In contrast the same amount of hormone dissolved in saline and infused over a six- or eight-hour period causes a profound increase in adrenocortical secretion. These differences are due to the rapid destruction of A.C.T.H. in the body (Sayers *et al.*, 1949; Greenspan *et al.*, 1950; Reiss *et al.*, 1951; Pincus *et al.*, 1952). If A.C.T.H. is dissolved in saline and injected intramuscularly it causes a relatively brief increase in plasma 17-hydroxycorticosteroid concentration lasting about four hours. If the same dose is given intramuscularly in a gelatin menstruum, combined with a zinc precipitant or an oxycellulose adsorbant, a more prolonged effect is observed, the vehicle allowing a gradual release of the A.C.T.H. and preventing its destruction at the site of injection (Bayliss and Steinbeck, 1954a; Oudsten

et al., 1954; Greene and Vaughan-Morgan, 1954; Ferri-man *et al.*, 1954; Gemzell and Franksson, 1953).

The degree of adrenal stimulation obtained from intramuscular A.C.T.H. in saline or a gelatin menstruum is too variable from one patient to another and in the same patient at different times to allow a quantitative assessment of adrenocortical response. In our hands consistent results are observed only when the material is given by intravenous infusion (Bayliss and Steinbeck, 1954a). This has an important clinical application: the testing of adrenocortical function by giving intramuscular A.C.T.H. is meaningful only if a positive response is obtained. If the response is negative no conclusions can be drawn and the trophic hormone should be infused intravenously.

Deficiency of A.C.T.H. secretion due to pituitary destruction leads to adrenocortical atrophy and low plasma 17-hydroxycorticosteroid levels. The degree of adrenal atrophy is related to the degree of A.C.T.H. deficiency and this in turn to the degree of pituitary destruction. When pituitary destruction is total, or nearly so, the plasma level of 17-hydroxycorticosteroids may fall to zero, and such values are found in patients with gonadal, thyroid, and adrenal failure who require substitution therapy to remain alive. In others in whom the degree of pituitary destruction is less complete and the clinical features indicate only gonadal failure the plasma steroid levels are within the normal range.

Responsiveness of the Adrenal Gland

The amount of steroid secreted by the adrenal cortex depends not only on the degree of stimulation provided by A.C.T.H. but also on the responsiveness of the gland itself. In normal subjects a continuous infusion of A.C.T.H. calls forth a rapid response, which can be detected in the peripheral blood within 15 to 30 minutes of starting the infusion. After reaching a maximum in about an hour, the plasma steroid level remains relatively constant during the remainder of a six- or eight-hour infusion. When the infusion is stopped the increased adrenocortical activity ceases, and within two to three hours the plasma steroid level has returned towards the pre-infusion level. In normal subjects the level attained six to eight hours after starting an A.C.T.H. infusion at the rate of 2 units an hour is usually of the order of 25–35 μ g. per 100 ml.—that is, 15 μ g. or more above the pre-infusion level. As would be expected, repeated daily infusions cause progressively higher levels, and this suggests that the anatomical hypertrophy of the gland found after repeated infusions is associated with increased functional capacity and heightened steroidogenesis.

Some idea of the total steroid output from adrenal glands receiving maximum stimulation with A.C.T.H. is given by some studies made by Thorn *et al.* (1953). They observed the changes in urinary corticosteroid excretion, eosinophils, electrolyte, and blood glucose concentrations during a four-hour infusion of 3 units of A.C.T.H. an hour and found that quantitatively similar effects were produced in the same subject by infusing 12 mg. of hydrocortisone an hour. From this it may be tentatively inferred that under maximum stimulation the adrenal glands secrete the equivalent of about 300 mg. of compound F per 24 hours.

Addison's Disease

Decreased responsiveness of the adrenal cortex to A.C.T.H. is seen characteristically and diagnostically in Addison's disease. None of the patients we have studied has shown a significant increase in the plasma level after A.C.T.H. infusion. Even those who appear to have some slight residual adrenal function, as evidenced by their symptomatic independence of substitution hormone therapy and by the low but not negligible plasma steroid levels, show no response, and in them the steroid level may actually fall during the infusion, owing perhaps to utilization of the small amount of circulating hormone during

the stress of the procedure. Normal subjects infused with saline alone show little variation in their plasma steroid level, and if during this time there is increased steroid utilization a constant level is maintained by increased A.C.T.H. secretion and increased corticosteroid output. It is tempting to believe that in Addisonian patients with low normal plasma steroid levels, the few remaining adrenocortical cells are responding to their uttermost to large amounts of endogenously produced A.C.T.H. and no further response is possible to exogenous A.C.T.H.

Hypopituitarism

In patients with hypopituitarism the responsiveness of the adrenal glands is often less than in normal subjects, and there is evidence that the degree of responsiveness is related to the duration of the adrenal atrophy. Thus a patient, who was known to have had hypopituitarism for many years following implantation of radon seeds into the sella turcica, and then surgical extirpation of the remaining hypophyseal tissue, showed a rise from 0 μ g. per 100 ml. to only 6 μ g. after a six-hour infusion of A.C.T.H., whereas in a patient who had only recently been hypophysectomized the level rose from zero to 36 μ g.; this large increment may indicate, as occurs in animals, that shortly after hypophysectomy the target gland has a heightened response to its trophic hormone.

Adrenogenital Syndrome

In Addison's disease the activity of the adrenal cortex is impaired in all its functions and the formation of glucocorticoids, mineralocorticoids, and androgens is much reduced or absent. In contrast the adrenal glands of patients with virilization due to congenital adrenal hyperplasia have a more isolated defect which is limited to the biosynthesis of glucocorticoids, and in rare instances the mineralocorticoids as well. In most of these patients the circulating level of 17-hydroxycorticosteroids is abnormally low and there is little or no increase following stimulation with A.C.T.H., whereas the formation of androgens, as indicated by the urinary excretion of 17-ketosteroids, is increased and raised even further after A.C.T.H. (Kelley *et al.*, 1952; Bayliss *et al.*, 1954a; Bongiovanni *et al.*, 1954).

This condition provides information concerning the mechanism by which pituitary-adrenocortical activity is regulated. The secretion of A.C.T.H. is controlled by the plasma level of circulating glucocorticoids, and if the steroid concentration falls the pituitary secretes more A.C.T.H., thereby stimulating the adrenal cortex to maintain the plasma steroid concentration. Conversely, if the steroid level in the blood rises the activity of the pituitary is depressed and less A.C.T.H. is elaborated. In congenital adrenal hyperplasia it appears that because the biosynthesis of glucocorticoids is defective (probably through lack of a particular enzyme system) and the plasma concentration is low, the pituitary responds by secreting increased amounts of A.C.T.H. The adrenal glands are unable to secrete more glucocorticoids and respond to the A.C.T.H. by hypertrophying and elaborating large amounts of androgens which are responsible for the virilization of the patient and for the increased urinary excretion of 17-ketosteroids (Bartter *et al.*, 1951; Wilkins *et al.*, 1952; Jailer *et al.*, 1952).

The validity of this concept has been confirmed by the observation that if cortisone or hydrocortisone is given to such patients the activity of the pituitary is suppressed, less A.C.T.H. is elaborated, and the adrenal glands no longer secrete such large amounts of androgens (Wilkins *et al.*, 1951, 1952; Gardner and Migeon, 1952; Bayliss *et al.*, 1954a; Jailer *et al.*, 1954). Thus these patients are treated by the administration of cortisone in sufficient amounts to suppress pituitary activity and to reduce the urinary excretion of 17-ketosteroids to normal limits.

Cushing's Syndrome

In contrast to the conditions discussed above, in all of which the formation of glucocorticoids is reduced, Cushing's

syndrome is characterized by abnormally high plasma steroid levels, whether the condition is associated with an adenoma of the adrenal cortex, bilateral adrenal hyperplasia, or a carcinoma. If the condition is due to bilateral adrenal hyperplasia an infusion of A.C.T.H. raises the already high steroid level even higher. This finding suggests a possible explanation for the underlying disorder in Cushing's syndrome of this type. Since the plasma level of corticosteroids is abnormally high, it seems probable that the primary defect lies in the pituitary gland itself, which is insensitive to the normal inhibitory influences of large amounts of circulating steroids. It is as though the "thermostatic" mechanism is set at too high a level and pituitary activity is not shut off until abnormally high plasma steroid levels are attained. Proof of this belief must await a reliable method for estimating the A.C.T.H. content of the blood, but it is significant that when hydrocortisone is infused into such patients there is a reduction in the urinary excretion of 17-ketosteroids, suggesting that the exogenously administered hormone raises the plasma level high enough to suppress pituitary activity. This response is not seen if the condition is due to an adrenal adenoma or carcinoma, and so may be of clinical value in determining the pathology of the disease before surgical exploration (Jailer *et al.*, 1954).

Myxoedema

The hormone secreted by the thyroid gland influences the metabolic rate of all tissues, and it might be anticipated that in severe myxoedema the activity of the adrenal cortex would be impaired and the rate of steroidogenesis retarded. However, in many patients with myxoedema the plasma steroid level is within the normal range, although, of course, in the myxoedematous state utilization may be decreased, and the rate of steroidogenesis correspondingly reduced. In a few patients abnormally low levels have been encountered, and these have risen to normal after substitution therapy with thyroid extract or L-thyroxine. In one patient with hypopituitarism characterized by severe secondary myxoedema, the plasma steroid level rose from 1 μ g. per 100 ml. to 6 μ g. when replacement therapy was given with thyroxine only.

In addition to A.C.T.H. and the state of the adrenal cortex, other factors influence adrenocortical activity. Most of these are still incompletely understood, and it is uncertain whether they exert their effect by direct action on the adrenal cortex, or by way of the hypothalamus and anterior pituitary, or by increasing tissue "utilization" of corticosteroids. Their importance lies in the fact that their influence is difficult to control and they may operate, unknown to the investigator, during physiological studies.

Diurnal Variation

Healthy adults show a diurnal variation in adrenocortical activity. It has been known for many years that the urinary excretion of 17-ketosteroids varies throughout the day (Pincus and Hoagland, 1943), and Thorn (1954) has reported that the urinary excretion of 17-hydroxycorticosteroids also varies over a 24-hour period. Similarly, the plasma steroid level varies: lowest values are found at night, around midnight, and the highest levels occur at about 6 a.m. (Tyler *et al.*, 1954; Bayliss, 1955). This variation persists whether the subject is up and about his daily work or whether he is confined to bed and receiving a constant amount of food every two hours. It is not related to the diurnal variation that occurs in the urinary excretion of water, sodium, and other electrolytes. What controls this diurnal change in activity remains unknown, and many obvious investigations need to be carried out: Is this rhythm reversed in night workers? Does it occur in blind people? What effect on it has a lesion of the hypothalamus? Is it disturbed in patients with psychiatric disorders or with Cushing's syndrome?

Emotional Factors

Emotional factors may influence adrenocortical activity in certain subjects. We first observed this phenomenon in 1952, and have since confirmed that in certain patients anxiety, frustration, and fear may cause a significant increase in the plasma 17-hydroxycorticosteroid concentration. Repeated venepunctures, although not more painful than usual, may activate the adrenal cortex by calling forth an emotional response. In certain subjects, delivering a lecture to a critical audience has a similar effect. It is because of these influences that it is difficult to define normal plasma steroid levels. A blood sample taken at random from an out-patient on his first attendance may give an erroneously high value because the patient may be suffering anxiety and tension at the time. Usually the levels induced by an emotional upset do not exceed 20 μ g. per 100 ml. and are not therefore likely to cause confusion in the differential diagnosis of Cushing's syndrome, but in some instances higher levels are observed. In interpreting the results of physiological studies due allowance must be made for these emotionally prompted rises in plasma corticosteroids, and it is necessary to make repeated observations and to use adequate controls to be certain that the responses observed are due to the change in the specific experimental conditions being studied and not to an emotional upset.

Adrenaline

It is not yet known how emotional disturbances influence the plasma steroid level, but release of adrenaline is a possible intermediate mechanism. It has been thought for some time that, because adrenaline causes a fall in circulating eosinophils, directly or indirectly it stimulates the adrenal glands to secrete increased amounts of corticosteroids (Recant *et al.*, 1950). In normal but not in adrenalectomized subjects A.C.T.H. causes a fall in the number of eosinophils (Thorn *et al.*, 1948; Forsham *et al.*, 1948), and, since hydrocortisone or cortisone also causes a fall in eosinophils, it has rightly been assumed that the eosinopenia after A.C.T.H. indicates increased secretion of corticosteroids and a rise in the plasma concentration of adrenocortical hormones. It has been found, however, that adrenaline may cause an eosinopenia in patients who have had both adrenal glands removed (Kark and Muehrcke, 1952), and direct measurement of the steroid concentration in the plasma, and the steroid excretion in the urine after a single injection or a prolonged infusion of adrenaline in normal subjects, has failed to show any increase in adrenocortical activity (Sandberg *et al.*, 1953; Thorn *et al.*, 1953).

We were impressed that following A.C.T.H. the fall in eosinophils is greatest two to three hours after the maximum plasma steroid concentration has been obtained; and that following adrenaline the fall in eosinophils is greatest two hours after the injection. Hence it seemed that any increase in plasma steroids should be looked for within the first few minutes of giving the adrenaline. Despite taking multiple samples at this time, Hunter *et al.* (1955) have failed to detect any consistent increase in plasma steroids, and on the present evidence we must conclude that adrenaline does not cause a detectable increase in adrenocortical activity and is not responsible for the increased plasma steroid levels found in emotional disturbances. It must also be concluded that, although an eosinopenia after administration of A.C.T.H. is a valid index of increased adrenocortical activity, this is not necessarily so under other circumstances.

D-Amphetamine Sulphate

Amphetamine sulphate has many of the pharmacological properties of adrenaline, but a more prolonged action. In 1952 a patient with panhypopituitarism due to a large chromophobe adenoma which was also causing attacks of diencephalic epilepsy was found to have plasma corticosteroid levels above normal—22 μ g. per 100 ml. This

surprising result was obtained at a time when the patient was receiving amphetamine sulphate for his diencephalic epilepsy. When the amphetamine was stopped the plasma steroid level fell to the anticipated low value of 3 μ g. per 100 ml. Subsequently Thorn (1954) has noted that some patients have increased urinary excretion of 17-hydroxycorticosteroids following "benzedrine," and we have found similar changes in the plasma steroid levels.

Stress

Selye (1946) has suggested that a wide variety of factors, such as infections, intoxications, trauma, nervous strain, heat, cold, muscular fatigue, and x-irradiation induce a state of general systemic stress which is associated with increased adrenocortical activity. Whether or not these many different factors do indeed cause increased cortical secretion remains to be proved. Thorn *et al.* (1953) have not observed an increase in the urinary excretion of 17-hydroxycorticosteroids after physical exertion, exposure to cold, anoxia, or mental exertion involving the use of an Air Force pursuit meter; but these results cannot yet be accepted with complete confidence because of the analytical method used. Increased steroid excretion was noted in members of the Harvard boat-race crew, but since the cox and the coach showed a similar response the increased adrenocortical activity seemed more attributable to emotional factors than to the physical exertion *per se*. The plasma steroid level shows no consistent change in patients receiving whole-body x-irradiation sufficient to cause radiation sickness.

Surgical operations do increase the urinary excretion of corticosteroids (Cope *et al.*, 1951; Thorn *et al.*, 1953) and raise plasma steroid levels (Franksson *et al.*, 1954), and increased adrenocortical activity is commonly observed in any painful condition. For example, an elderly patient with severe cephalgia due to temporal and occipital arteritis had consistently high values of 26 μ g. per 100 ml., which returned to normal levels when the pain subsided, although the disease continued to be active. Patients with a myocardial infarct may show high levels. One admitted soon after the onset had a level of 50 μ g. per 100 ml., which rose to 82 μ g. per 100 ml. when she seemed on the point of dying. With recovery the plasma steroid level returned to a normal value of 9 μ g. In several patients studied in the terminal stages of their illness very high steroid levels have been observed. This is not necessarily associated with urea retention and therefore is not attributable to failure of renal excretion. These findings may not, however, represent increased adrenocortical secretion; they may indicate failure of tissue utilization or impaired hepatic metabolism.

Salicylates

It has been suggested that salicylates exert their beneficial action in rheumatic affections by increasing adrenocortical activity (Hetzel and Hine, 1951; van Cauwenberge and Heughebaert, 1951; van Cauwenberge and Betz, 1952). However, in ordinary therapeutic dosage salicylates do not cause a significant or constant increase in the plasma level of 17-hydroxycorticosteroids despite symptomatic relief and mild manifestations of salicylism (Bayliss and Steinbeck, 1954b), although poisoning with salicylates has been reported to increase the level (Done *et al.*, 1954).

Pregnancy

As judged by the urinary excretion of corticosteroids, there is evidence that the activity of the adrenal cortex is increased during pregnancy (Venning, 1946; Tobian, 1949; Cope *et al.*, 1951), and the plasma steroid level is also raised (Gemzell, 1953). Blood samples taken from 30 women at monthly intervals throughout pregnancy show a progressive increase in 17-hydroxycorticosteroids, the mean value for the group rising from 10 to 13 μ g. per 100 ml. during the third and fourth months to 24 μ g. during the last month. The concentration in blood taken from the umbilical cord

at the time of delivery was of the same order—27 μ g. per 100 ml. During the post-partum period the level in the mothers' blood fell, the mean concentration for the group returning to normal by the eighth post-partum day. The levels in individual patients varied considerably from the mean values. About 45% showed a marked increase, with maximum levels exceeding 29 μ g. per 100 ml.; another 45% had more moderate increases, with maximum values of more than 21 μ g.; and in 10% the level did not exceed 20 μ g. per 100 ml. (Bayliss *et al.*, 1955).

One important question which remains unanswered is the origin of this steroidal material. Does it arise in the mother or in the foetus? Since in newborn infants the urinary excretion of 17-ketosteroids, glyconic corticosteroids, and reducing steroids, and the plasma level of 17-hydroxycorticosteroids are all low (Talbot *et al.*, 1943; Venning *et al.*, 1949; Day, 1948; Klein *et al.*, 1954) whereas the level of plasma 17-hydroxycorticosteroids remains high in the maternal circulation for a week after delivery, it seems probable that the site of origin is in the mother. Here three possible sites need consideration—the adrenal glands, which have an increased weight during pregnancy; the placenta, which is known to form other steroids such as progesterone; and the ovaries. Blood samples taken during caesarean section from a uterine vein or a maternal placental sinus and from a peripheral vein have not shown a significant difference in 17-hydroxycorticosteroid concentration, and if the steroidal material were elaborated mainly in the placenta it would be expected that after delivery the concentration in the mother would fall more rapidly than it does. However, observations made in Addisonian patients who have become pregnant suggest that adrenocortical-like hormones are formed in the placenta (Samuels *et al.*, 1943; Knowlton *et al.*, 1949; Jailer and Knowlton, 1950). There is also evidence that an A.C.T.H.-like hormone is formed in the placenta (Jailer and Knowlton, 1950; Opsahl and Long, 1951; Tarantino, 1951; Cohen and Kleinberg, 1952). Thus it may well be that in pregnancy increased amounts of adrenocortical steroids are formed both in the maternal adrenals and to a lesser extent in the placenta.

Two years ago Professor Long (1952) wrote: "I am of the opinion that the greatest obstacle to our understanding lies in the inadequacy of the methods at present employed for the detection of an increased secretory rate from either the anterior pituitary or adrenal cortex." Although some progress has been made, we are still lacking satisfactory methods, and the secretion of many hormones by the adrenal cortex makes a study of its activity complicated and often laborious. I have dealt with only glucocorticoid secretion and with only some of the factors which influence this particular activity, but enough has been said to indicate the changes that occur through the seven stages of man from the high levels in pregnancy, the low levels in the newborn infant, to again the high levels that may be found at the time of death.

Summary

The adrenal cortex elaborates a large number of different hormones which to some degree overlap in their physiological effects. Current investigations are chiefly concerned with 17-hydroxycorticosteroids (such as cortisone and hydrocortisone), androgenic steroids (as reflected in the urinary excretion of 17-ketosteroids), and in the compound which is probably responsible for the control of salt and water metabolism (aldosterone).

In the work reviewed here adrenocortical activity has been assessed by studying the plasma concentration of 17-hydroxycorticosteroids. The plasma level is influenced by the amount of material secreted by the adrenal glands (which is mainly controlled by the release of A.C.T.H. from the pituitary gland), by the "utilization" of the liberated steroids in the tissues (particularly in the liver), and by the rate of urinary excretion.

The plasma level of 17-hydroxycorticosteroids is the same in both sexes. It shows a diurnal variation, and increased values are found in pregnancy, Cushing's syndrome, certain emotional disturbances, following surgical operations, in painful conditions, and at the time of death. No consistent increase in adrenal activity has been observed after administration of adrenaline, salicylates, or deep x-irradiation in ordinary therapeutic dosage. Amphetamine sulphate increases the plasma steroid level in some subjects. The relationship between the adrenal response and the dose of A.C.T.H. and the duration of its administration is discussed.

Low plasma adrenal steroid values are found in Addison's disease (and there is evidence that in these patients adrenocortical failure may be complete or only partial), in patients with extensive pituitary destruction, in congenital adrenal hyperplasia associated with virilism, and in some patients with myxoedema.

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ENDOCRINE TREATMENT IN PSYCHIATRY*

BY

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Endocrine therapy has a definite but restricted place in psychiatric practice; in some conditions its use is accepted, in others presumptive. With a few possible exceptions, such as cretinism, there are no psychiatric disorders in which an endocrine disturbance or deficiency has been proved to be an exclusive or major factor in causation. In contrast to the many papers published on research in the endocrinology of psychiatric illness in recent years, there are few about endocrine therapy and fewer that carry conviction.

Since the ductless glands are essential to adaptation and the preservation of physical and emotional stability, and can be disturbed by psychological upset, it is reasonable that psychiatrists should have looked to the field of endocrine treatment.

Although physiological disturbances and abnormalities of body constitution can be seen in any selection of chronic psychotics, the usual symptomatology of endocrine illnesses is rare in psychiatric disorders. Laboratory methods for investigating ductless gland function which have been evolved up to the present are probably not sufficiently precise or reliable to indicate and guide therapy in the absence of clinical signs of endocrine disease, and are not yet convenient for routine use. Thus endocrine treatment is still empirical, and the attempts to make it rational by laboratory methods have not yet been successful.

*From a Maudsley Bequest Lecture given in London on April 5, 1954.

Endocrine preparations may be used because of their physiological and pharmacological effect or as replacement; probably to some extent both aspects enter into successful therapy. It is improbable that lack of one hormone is responsible for any psychiatric disorder, and a replacement therapy is unlikely to be found.

An endocrine disturbance is only one factor in an illness which can be regarded as a reaction between physical and psychological components; but it may be responsible for great difficulties in adjustment. Endocrine therapy aims at improving this factor, so contributing to the total therapeutic effort by benefiting the adaptive or reactive capacity of the patient. It must be preceded by careful psychiatric assessment and investigation, and accompanied by adequate psychotherapy.

Endocrinology in psychiatry can conveniently be considered from the following aspects: (1) conditions encountered in psychiatric practice for which therapy is no longer experimental; (2) psychiatric aspects of endocrine disorders; and (3) experimental endocrine treatment of the psychoses and psychoneuroses.

Conditions Encountered

The Menopause

The features of menopausal depression, irritability, or neurosis need only be mentioned briefly here. There are few women who do not experience psychological changes during the months or years in which ovarian function is failing. The degree to which a woman is disturbed seems to depend upon her capacity for emotional adjustment, general stability, and reaction to ill-health. Many women who suffer most at the menopause report that they have usually experienced mood swings and physical discomfort at some part of the menstrual cycle. It is not correct to assume that a certain kind of personality suffers at the menopause, or is immune; but unbalanced and especially aggressive females often become unreasonable almost to the point of psychosis both at the menstrual cycle and at the menopause. A gradual menopause produces more discomfort than an abrupt cessation. Vasomotor disturbances and hot flushes correspond closely with mood swings. It is believed that these are due to a dysbalance in the relationship between pituitary-stimulating hormones and the peripheral ovarian hormones that are now failing, which has been suggested by high prolactin excretion.

Treatment with synthetic or natural oestrones (stilboestrol, dienoestrol, or oestrone), or, in severe cases, oestrogen by injection, in sufficient quantity to control hot flushes, is all that is required for the somatic disturbances, and makes psychotherapy easier. Stilboestrol is toxic to about 20% of women, especially the older; the dose is about 0.1 mg. daily. The usual dose of oestrone is from 0.2 to 1 mg. daily. A severe menopausal disturbance sometimes occurs years after artificial menopause by radium, or after hysterectomy if the ovaries remain; this is to be treated on the same lines as the normal menopause and is mentioned for this reason. Convulsive therapy—so effective in involutional melancholia—often aggravates menopausal depression and is contraindicated in the presence of hot flushes, because of its stimulating effect on anterior pituitary lobe function.

Involutional Melancholia

Unlike the menopausal reaction, this is a true psychotic depression, with ideas of guilt or of incurable illness, much agitation, and a marked tendency to suicide. It rarely follows a gradual menopause with vasomotor disturbances, and it usually occurs a year or more after sudden cessation of menses. The pre-psychotic personality is conscientious and inflexible, in contrast to the lability of the menopausal reaction. There is often an appearance of rapid physical ageing, and in some cases there seems to be an anterior pituitary insufficiency, which may be benefited by treatment

with A.C.T.H. But, normally, E.C.T. is the treatment of choice. Experience suggests that oestrones are ineffective, or even contraindicated, as they may suppress anterior pituitary activity.

Pre-menstrual Tension

This term indicates a state of mental and physical tension occurring towards the latter half of the menstrual cycle and prominent about a week before menstruation. The current view is that it is due to water retention produced by abnormal elevation of the oestradiol/progesterone ratio (Rees, 1953; Malleon, 1953).

The diagnosis is made on the occurrence of irritability, emotionalism (even unreasonable aggression), mental discomfort, lack of concentration, coupled with physical discomfort, such as a sense of being blown out, a gain in weight, discomfort in the fit of clothes—due presumably to localized adiposity or water retention. There are occasionally attacks of migraine, or of epilepsy in epileptic subjects.

The usual treatment is ammonium nitrate or ammonium chloride in coated tablets, 0.5 to 1 g. thrice daily for 10 to 12 days before the onset of menses. If this is unsuccessful, progesterone injections, 25 mg. twice daily, or ethisterone tablets, 5 to 20 mg. orally, daily or twice daily. Methyltestosterone, 10 mg. daily, is said to be effective, but may cause virilization.

Assuming that the condition is due to endocrine dysbalance, normal regulation may be established in a few months, when treatment can be discontinued.

Abnormal Libido

Impotence.—This is the inability to perform or complete the sexual act in a male. It may be caused by conditions such as hypogonadism and intersexuality; but usually the external genitalia are normal and the impotence is of psychological origin. This is rarely benefited by endocrine therapy, except where it accompanies the male climacteric or depression, or where it is intermittent and has not existed for long. In long-standing cases of psychological impotence, the interest has been displaced from the sexual object to anxiety whether the act can be performed, causing extinction of the sexual stimulus. Where impotence has occurred in a setting of exhaustion or business worries and has not been prolonged, and where there has not been much controversy between husband and wife, testosterone may improve the sense of well-being, increase libido, and, by making one or two performances possible, improve self-confidence so that anxiety disappears. It is best administered by injection—25 mg. of testosterone propionate three times weekly for a month; oral administration of methyltestosterone is insufficient. Treatment should be discontinued after a fortnight if there has been no response. The patient should not be led to believe it will produce a cure, lest it should not be successful. Intensive psychotherapy is essential. It is unwise to attempt treatment with testosterone in long-standing cases, because of the worsening effects produced by disappointment, as it will certainly fail.

Frigidity.—The diagnosis of frigidity is obviously difficult to make, and the term is a relative one. However, loss of sexual desire or enjoyment is not uncommonly complained of by married women, especially after childbirth; and it has been claimed that treatment with small doses of either oestrone or testosterone improves the appreciation of physical sexual stimuli and will therefore reduce temporary frigidity. Testosterone may cause virilization, and for this reason some authors prefer oestrone. Inunction of external genitalia with oestrone or testosterone cream has been advocated. True frigidity of long standing—that is, inability to experience or elaborate psychically sexual stimuli—is a rare condition, and probably cannot be improved by hormones.

Homosexuality and Excessive Sexuality.—The direction of homosexual or heterosexual drives cannot be altered with sex hormones; but the force of sexual drive in males can be reduced by treatment with female sex hormones. There are a number of papers on the subject, and all the

authors are in general agreement about the indications and the rationale. Treatment with female sex hormones reduces the production of gonadotrophic hormones, producing a secondary effect on testicular function and secretion. The reduction of sex drive is comparable to that achieved by surgical castration, although some authors claim that endocrine treatment is more effective (Hamilton, 1943). Stilboestrol is the usual preparation, administered in increasing doses until the nipples become pigmented and the breasts sore; an alternative is ethynol oestradiol, 0.5 or 1 mg. daily. Eventually almost complete testicular atrophy will be produced, but not necessarily a total suppression of the abnormal sex drives. It is interesting that notice has been taken of this treatment at the recent trial of an extreme and persistent homosexual offender, in whom abnormal behaviour had continued in spite of the production of almost complete atrophy of the testes by stilboestrol. The judge took into consideration that the offender had therefore done everything possible that medical treatment could offer, although in his case it had not been completely successful. Persistent homosexual offenders should therefore be encouraged to persevere with this treatment, although in some cases a satisfactory control of sexual behaviour may not necessarily be achieved.

Male Climacteric

The gradual diminution in the production of male sex hormones in middle and later age is held to be responsible for loss of physical and mental powers and libido. The male climacteric as an entity has been well discussed by Spence (1954). The diagnosis of male climacteric reaction cannot often be made with confidence, because arteriosclerosis or other systemic diseases complicate the picture and there is no dramatic event like the cessation of menses to indicate endocrine change. Moodiness, irritability, tearfulness, inability to concentrate, paraesthesiae, and sometimes hot flushes, suggest the diagnosis. Treatment is with testosterone by injection, 25 mg. daily or thrice weekly until there is improvement, methyltestosterone 5 to 10 mg. three times a day being given as continuation therapy for a year or more. There is usually improvement in mental and physical activity, sexual performance, and altered sense of well-being. Better peripheral circulation and flushing of the face are favourable early signs.

Cretinism

A causal association between thyroid deficiency and failure of intellectual and physical development, known as cretinism, was observed early in the history of modern medicine. Some authors make a distinction between juvenile myxoedema and cretinism. The cretin suffers from athyreosis from intrauterine life or early infancy (Means, 1948). The clinical picture is well known, but the results of treatment are less certain, for good results cannot be obtained in infantile myxoedema unless the brain is free from congenital abnormality.

At one time it was believed that only early and cautious treatment was likely to be successful. Surveys by Lewis *et al.* (1937), and by Topper (1951), who gives a good bibliography, indicated that promptness and continuity of thyroid treatment did not altogether decide whether a child remained backward or not. Topper pointed out that, according to electroencephalographic studies, cerebral defect explains much of the mental deficiency of the treated cretin, and that when such a defect is present in infancy no amount of thyroid can improve the brain. In her large series, 39% remained defective in spite of treatment.

Treatment should be pushed to the point of tolerance, which can be found by trial and error. The small doses usually recommended in cretinism are based on requirements necessary for alteration of hair and skin, and do not produce acceleration of growth and intellectual development. While tolerance is being determined the patient should be kept in hospital. Means and Lerman (1935) pointed out that with a constant daily dose the maximum

effect is not produced for about three weeks, and it is not safe to increase the dose oftener than every three to four weeks. Toxic symptoms are rapid pulse, a small rise in temperature initial loss of weight, increased nervousness, and frequent bowel movements; and some authors believe that these occur at the limit of safety and can be tolerated for a while. Dangerous symptoms due to excessive dosage are extreme restlessness, twitching, diarrhoea, vomiting, continued loss of weight, very rapid pulse, high fever, and syncope. As much as 4 gr. (260 mg.) daily is given at 21 months without adverse effect, but average doses are: 6 to 18 months, $\frac{1}{2}$ to $2\frac{1}{2}$ gr. (30 to 160 mg.); 1 $\frac{1}{2}$ to 8 years, 1 to 2 gr. (65 to 130 mg.); 8 to adolescence, $1\frac{1}{2}$ to 3 gr. (100 to 200 mg.). It is worth noting that the dose tolerated is not proportionate to the age and weight, for a young cretin can tolerate as much as a 12-year-old child with hypothyroidism (Brown, 1951).

Psychiatric Disturbances in Endocrine Disorders

Although psychological disturbances are a feature of many endocrine disorders they rarely amount to recognized psychiatric syndromes. Classical psychoses are uncommon even in thyrotoxicosis. Treatment of some endocrine conditions may precipitate a psychotic episode.

Thyrotoxicosis often follows an acute emotional upset, and it has been contended that it occurs usually in frustrated and emotionally dependent individuals who wish to take care of others. Ham *et al.* (1951) have agreed with some others that symptoms of thyrotoxicosis can be understood as the patient's response to early experiences and that although the experiences differ in detail they fall into a pattern characteristic of the disease. In all the patients they studied there were extreme feelings of insecurity in early life, a strong sense of responsibility, but a tendency to suffer in silence; this is in some contrast to the anxious patient, who has no such tendency. From the psychosomatic point of view, some cases of thyrotoxicosis may be an end-result of an endocrine disturbance operating through emotional pathways. Thyroidectomy may be followed by a degree of myxoedema, producing the usual sluggishness. Where there has been a coexisting anxiety state, or the diagnosis should have been an anxiety neurosis and not thyrotoxicosis, sometimes the thyroid requirements of body and brain are not met. The patient will be less able to cope with the anxiety situation than before operation, and the picture will then be continuing anxiety with agitation or even restless delirium. Treatment with thyroid hormone is indicated.

Myxoedema usually produces apathy and sluggishness. The administration of thyroid hormone may activate a paranoid psychosis, as if, by increasing metabolism, an uneasy psychological balance had been disturbed. Withdrawal of thyroid is not necessarily followed by an improvement in the psychiatric state, and cases of chronic paranoid psychosis arising in this way are occasionally seen. Caution is necessary in treating myxoedema in patients of paranoid constitution. Myxoedema may be associated with confusion and depression, especially in later life (Asher, 1949). A picture of organic brain change, with clouding of consciousness, delirium, or agitation, may be due to myxoedema or its cardiac complications (Calvert *et al.*, 1954). In such states of hyperactivity myxoedema may be overlooked unless remembered. Many of these patients improve with thyroid hormone; but care is needed, for an increased metabolism in the aged or in organic brain disorder may produce accentuation of confusion, delirium, and death.

Addison's Disease.—In adrenal hypofunction the capacity for adaptation is reduced. Cleghorn (1953) has compared the psychological changes in Addison's disease with myxoedema, and agrees with Engel and Margolin (1942) that the psychiatric symptoms of apathy, negativism, depression, and irritability occur in more than 50% of cases; he also quotes Stoll (1953), who reported similar disturbances in 35% in the pre-Addisonian state and 66% in the developed con-

dition; according to Stoll, they all improved remarkably under treatment with cortisone.

Adrenogenital Syndrome.—Virilism in females due to adrenocortical hyperplasia or cortical tumours has been the subject of much study. Broster *et al.* (1938) and others have shown that in extreme cases a combination of aggressiveness and paranoid thinking are to be expected. It has been claimed that after operation a more normal adrenal function is accompanied by reduction in psychopathic elements. These are extreme conditions, and operation seems to be very seldom indicated. Nevertheless, this work suggests that further research in the relationship between hypercortical adrenalism and aggressive paranoid behaviour might be worth while.

Experimental Endocrine Treatment

Endocrine treatment in the psychoses is still in the experimental stage, since up to the present no conclusive evidence has been produced about its rationale and value. In spite of the views expressed by some workers there is nothing to suggest that a new system of psychiatric diagnosis or classification can be derived from endocrine investigations, and classical concepts cannot be disregarded nor can laboratory methods replace clinical observation.

Most analytic methods so far evolved lack precision, and it is not certain what are the range and the significance of normal values in non-psychotic individuals, how much variation within the range normally occurs, and how the values are affected by age, sex, physical illness, diet, and state of nutrition.

Therapy directed on the basis of figures alone is notoriously unsatisfactory in general medicine, and is even more open to error in psychiatry. In a series of 150 recent and chronic psychotics, with some psychoneurotics, treated on laboratory indications at the Bristol Mental Hospitals, only 12 showed a significant improvement considered to be due to the hormone therapy. Psychiatric recovery or deterioration does not necessarily correspond with laboratory findings.

Nevertheless, in spite of the limitations of the methods, and the impossibility of defining scientifically the dimensions of psychiatric illnesses and degrees of improvement or deterioration, there is a good deal of evidence to justify research in the field of experimental endocrinology, with a hope of eventual therapy in some conditions.

Gjessing (1938) has shown that in the rare condition called periodic catatonia, alterations in nitrogen balance coincided with the catatonic episodes, and the attacks could be terminated or aborted by treatment with thyroxine and dried thyroid to discharge nitrogen stored. The value of Gjessing's treatment has been confirmed by other workers.

Many psychotics, especially schizophrenics, do not react normally to hormones. It has been shown that schizophrenics are, or soon become, insensitive to thyroid; and insulin resistance in schizophrenia is well known. The same seems to be true for cortisone and A.C.T.H.: neither depressives nor schizophrenics usually exhibit the euphoria and emotional changes described in normals. Hench *et al.* (1950) and others believed that the familiar euphoria was not due to relief of pain, but a positive factor accompanied by increased mental function. Some workers have assumed that psychological changes were most marked where there was some evidence of previous mental illness or psychological maladjustment; this is certainly not the case. Lewis and Fleminger (1954) have shown that of 12 patients with a history of recent mental illness who had been treated with cortisone or A.C.T.H. none developed a severe mental illness. In the Bristol Mental Hospitals, A.C.T.H. has been used extensively, and reactions comparable to those described in normals have never been seen. This suggests that in some psychiatric disorders the ductless gland system is abnormal; it may be insensitive or react in an abnormal way, or metabolic processes may destroy or neutralize the action of hormones.

A great amount of research in the endocrinology of schizophrenia, especially of the adrenal cortex, has been carried out at various centres. Evidence of failure to preserve adequate endocrine equilibrium and of abnormal adrenal responsiveness has been advanced, but the treatment of schizophrenia with A.C.T.H. on the assumption of evidence of lack of adrenal stimulation, attempted by Glaser and Hoch (1951), by the Worcester group (Hope *et al.*, 1952), by Kobbernagel *et al.* (1953) in Scandinavia, and at the Bristol Mental Hospitals and elsewhere, has been practically unsuccessful.

Cortisone has been used, on the whole without much success, but Cohn *et al.* (1953) have reported that 6 out of 21 chronic patients who had been ill for about six years were discharged from hospital. Their patients were treated with between 300 and 800 mg. daily for four weeks. Toxic effects were observed in four at least, with oedema, retention of urine, and renal colic. It is possible that those who improved did so because of the destructive action of cortisone on the hypothalamus.

Castor *et al.* (1951) have shown that A.C.T.H. in rats produced degeneration of the paraventricular nuclei of the thalamus; cortisone did the same, but it also produced changes in the thalamic and hypothalamic nerve cells. These areas are usually affected by prefrontal leucotomy, and it is probable that Cohn's success was due not to the physiological but to the destructive effect of the cortisone.

Treatment with thyroid has been recommended in various conditions. Danziger and Kindwall (1953) have reported success in a number of cases of schizophrenia in which failure to remain in remission after other forms of treatment, or periodic fluctuations, seem to be common features. Their material may include cases of Gjessing's type. It is therefore worth while administering thyroid to the point of toxicity empirically in relapsing schizophrenia after E.C.T. and insulin-coma therapy have been unsuccessful. Thyroid is valuable in reducing apathy in schizophrenics after insulin coma (Mayer-Gross *et al.*, 1954).

Yet the role of the thyroid in psychiatric illness is still quite uncertain. Reiss (1954), using a radioactive technique, has reported that the thyroid activity was within the limits he regarded as normal in about 70% of psychiatric admissions. In a selected series of 450 cases, after treatment by various methods, including hormones, E.C.T. and insulin coma, the thyroid activity was reported as "normal" in 72%. This suggests that the thyroid state is of consequence in only a very small percentage of psychiatric cases, if at all, irrespective of whether the thyroid activity is regarded as causally related to the illness or indirectly as an indicator of the state of the endocrine equilibrium.

In manic-depressive psychosis A.C.T.H. has been used as an alternative to E.C.T., on the assumption that E.C.T. exercises its favourable effect by the mobilization of anterior pituitary hormones. But, although in a very few cases remissions have been seen after a single dose of 25 mg. of A.C.T.H., this hormone is practically valueless in depression and without effect in mania, as Cleghorn *et al.* (1950) and the Worcester group have reported.

Sands (1954) recommends dehydroisoandrosterone ("diandron") for young inadequate psychopaths with timidity, physical immaturity, little energy, and perhaps homosexuality; to combat the residual disabilities after insulin coma therapy in schizophrenia; in stammering, on a basis of inadequacy; and to assist psychotherapy in some cases of neurosis. Strauss *et al.* (1952) originally gave three criteria: abnormal 17-ketosteroid excretion, a mild or slowly deteriorating mental illness, and the appearance of physical immaturity. They regarded the normal ketosteroids as 6 to 21 mg. per 24 hours, and the beta fraction 5 to 15%. Diandron is contraindicated where there is evidence of aggressive traits. Dosage is 5 to 30 mg. orally. Overdosage is suggested by undue irritability and over-activity.

Summary

There is a place for endocrine treatment in psychiatry, and the psychiatrist is often confronted with complications of the menses, the menopause, disturbance of libido, homosexuality, male climacteric, and cretinism. Treatments for these are reviewed.

In the field of the psychoses there is some evidence of endocrine disturbances, the exact nature of which is not yet clear. Random cures of psychotic conditions are always to be expected, but they contribute little to the understanding of the physiology of mental disorders.

Assuming that functional derangements of endocrine balance occur spontaneously and are responsible for psychotic illnesses, spontaneous remissions are to be expected, which must make one extremely cautious in attributing recovery to a particular therapy. It is probable that there is a time lag between alteration in physiological state and the appearance of mental change, which would make a reliable correlation of physiological and clinical observations difficult.

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"For doctors in Nyasaland the mango season means a plague of 'mango fractures.' Every year about this time the hospitals, especially in Zomba, the capital, are crowded with piccininnies with broken limbs, plaster-of-paris hall-marks of an over-ambitious pursuit of the delectable fruit. Recently in Zomba there were eight small African boys with fractured legs—all victims of the mango craze, and all very sorry for themselves. But the little devils will never learn so long as their elders fail to set a good example of careful climbing and cautious picking: in a village not far from Zomba two Africans, grandfathers both, broke their arms when falling from mango trees, which often reach a height of sixty and seventy feet. Mangoes, incidentally, which were probably introduced into the Protectorate by Arab slave traders, are the most widely cultivated tropical fruit. They say Buddha often rested in the shade of mango trees. He would be unwise to take the risk in Nyasaland."—*Manchester Guardian*.

SPONTANEOUS AND INDUCED WATER INTOXICATION IN TWO CASES OF HYPOPITUITARISM

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It has been known for many years that patients with adrenocortical failure, whether this be primary or secondary to anterior hypopituitarism, are unable to excrete ingested water at the normal rate (Rowntree and Snell, 1931; Robinson *et al.*, 1941; Levy *et al.*, 1946). Less recognized is the possibility that patients with hypopituitarism may retain water in excess of electrolytes while on ordinary diets and without apparent forcing of their fluid intake. Such water retention* would lead to dilution of body fluids (hypotonicity) and, finally, to symptoms of water intoxication. Whittaker and Whitehead (1954) have described the case of a patient with hypopituitarism whose death they attributed to spontaneous water intoxication. The present report describes two such cases in which a similar, though reversible, abnormality was observed.

Apart from its spontaneous occurrence, water intoxication is occasionally precipitated by water-diuresis tests in patients with hypopituitarism. Pickford and Watt (1950) have reported this complication, which also occurred in both of our patients.

In primary water retention the plasma sodium concentration falls, although the total body sodium may not be reduced. The plasma sodium concentration may also be low in severe sodium depletion, a finding which, by itself, is often regarded as evidence of depletion of this ion. It is important, therefore, to distinguish between these two hyponatraemic states, since they differ in cause, metabolic effects, and treatment (Wynn and Rob, 1954).

Briefly, sodium depletion leads to loss of body water and haemoconcentration. The patient loses weight, looks haggard, and shows loss of tissue turgor. The circulation is impaired, the blood urea rises, the plasma potassium may be raised, and there is usually a metabolic acidosis. If the kidneys behave normally there is little fall in plasma sodium concentration until loss of this ion is more than 300–500 mEq (McCance, 1936), because water is at first excreted to maintain a normal osmotic pressure of the body fluids.

With primary water retention there is no dehydration but the reverse. The body weight exceeds normal, and the circulation does not fail unless hypotonicity is extreme. The plasma sodium concentration is always

*Unfortunately the term "water retention" is used in two senses in clinical medicine. Most commonly it is used to imply isotonic retention of both water and sodium, a condition which finally results in pitting oedema. The second sense, used in this report, means that water is retained alone or in excess of electrolytes. Since about two-thirds of this water is located in the cells (Wynn and Rob, 1954) the result is not pitting (extracellular) oedema but intracellular overhydration and dilution of body fluids.

low; acidosis and urea retention may be absent, and the plasma potassium concentration may be normal or low. The symptoms of water intoxication are not unlike those of sodium depletion, but with certain differences (Wynn and Rob, 1954). Gross hypotonicity causes weakness or great prostration, lethargy, anorexia, vomiting, mental disturbances, and, finally, convulsions and coma, which may prove fatal.

The following two cases of hypopituitarism illustrate the occurrence of water intoxication, both spontaneously and after a water-excretion test.

Case 1

M. W., a woman aged 53, had suffered from anterior hypopituitarism since 1941, when her pituitary gland was removed for mild acromegaly. In May, 1953, she came into St. Mary's Hospital for investigation, having had no specific treatment for her condition. She had had amenorrhoea since the operation and had long complained of weakness, tiredness, and difficulty in keeping warm; her incapacity was such that she had hardly left her bed for many years. On examination there were slight skeletal signs of acromegaly. She was thin, pale, and expressionless. Her speech was slow, monotonous, and slurred. There was loss of eyebrows and of axillary and pubic hair. The thyroid gland was not palpable. There were no abnormal cardiovascular, urinary, or neurological findings, and the blood pressure was 130/70. There were no signs of dehydration, and her weight was 52.3 kg.

The following investigations were made: urinalysis negative; Hb, 12.6 g.%; plasma sodium 116, potassium 4.1, chloride 83, and total CO₂ 26.2 mEq per litre; plasma non-protein nitrogen, 20 mg. per 100 ml. (Table I).

TABLE I.—Case 1: Blood and Plasma Chemistry, Blood Pressure, and Weight

Day	Hb. (g.%)	Haematocrit	Na (mEq/l.)	K (mEq/l.)	Cl (mEq/l.)	Total CO ₂ (mEq/l.)	N.P.N. (mg./100 ml.)	Protein (g./100 ml.)	B.P. (mm. Hg)	Weight	
										kg.	lb.
—14*	12.6	—	116	4.1	83.0	26.2	20	—	130/70	52.3	115.2
1	10.5	—	125	4.2	88.5	28.0	20	6.2	130/70	52.3	115.2
2	10.6	35.5	125	4.1	88.0	27.2	20	6.5	140/85	52.3	115.2
3	11.4	36.5	132	4.7	95.0	26.4	21	7.1	135/80	50.2	110.5
5	11.5	36.5	136	4.3	97.0	27.8	22	7.3	138/85	50.2	110.5
9	11.2	35.5	136	3.7	94.0	28.1	26	7.5	130/75	50.6	111.3
21	12.4	40.5	122	3.6	85.0	25.7	20	8.0	116/75	50.8	111.8
22	12.8	40.0	130	3.7	93.5	25.1	24	8.0	117/77	49.2	108.3
23	12.2	39.5	136	3.9	96.0	27.6	24	7.3	118/70	49.1	108.0

* Day —14 was soon after admission to hospital. The metabolic balance study began 2 weeks later (Day 1). Cortisone (100 mg. daily) was given on day 2 to day 9, and again on day 21 and subsequently.

TABLE II.—Endocrine Function in Cases 1 and 2

Tests of Endocrine Function	Case 1	Case 2
Gonadotrophic:		
Urinary F.S.H. excretion (m.u./24 hrs.)	—	<4
Adrenal cortex:		
Urinary 17-ketosteroids (mg./24 hrs.)	1.5 1.3	0.7 1.2
Urinary 17-hydroxycorticoids	Trace only*	Trace only†
Plasma 17-hydroxycorticoids‡ (µg./100 ml.)	1	0
Water diuresis: % dose excreted in 3 hrs.:		
(a) without cortisone (normal=70% excretion of 20 ml. water/kg. in 3 hrs.)	9.5	6; 8.5; 12
(b) with cortisone	69	80; 66
Fasting blood sugar (mg./100 ml.)	89	60; 61; 64
Insulin tolerance (0.1 unit/kg.)	Hypoglycaemic—unresponsive	Hypoglycaemic—unresponsive
E.C.G. voltage	Low	Low
Thyroid:		
B.M.R. (% normal)	—	—48
I ¹³¹ neck uptake at 48 hrs. (% dose) (lower limit of normal=25%)	0	5.1
Urinary excretion 0–48 hrs. (% dose) (normal range=35–70%)	82.7	73.3
"T" factor (normal range=3–14)	1.8	1.4
Plasma cholesterol (mg./100 ml.)	207	389

* By courtesy of Dr. C. H. Gray.

† By courtesy of Dr. C. L. Cope.

‡ By courtesy of Dr. R. I. S. Bayliss.

Tests of endocrine function, showing adrenal and thyroid failure, are summarized in Table II. A water diuresis test of adrenal function, performed in ignorance of the low plasma sodium concentration, caused severe symptoms of water intoxication, including great prostration, nausea, vomiting, mental confusion, and a fall of blood pressure to 80/50. Only 9.5% of the litre of water given was excreted in three hours.

Experimental Observations

Methods.—Fourteen days after the episode of water intoxication described above a metabolic balance study was carried out. The patient was put on a diet containing about 50 mEq of sodium a day. Duplicate diets were bulked for three days and analysed for sodium, potassium, chloride, and nitrogen. Aliquots of three-day stool and 24-hour urine

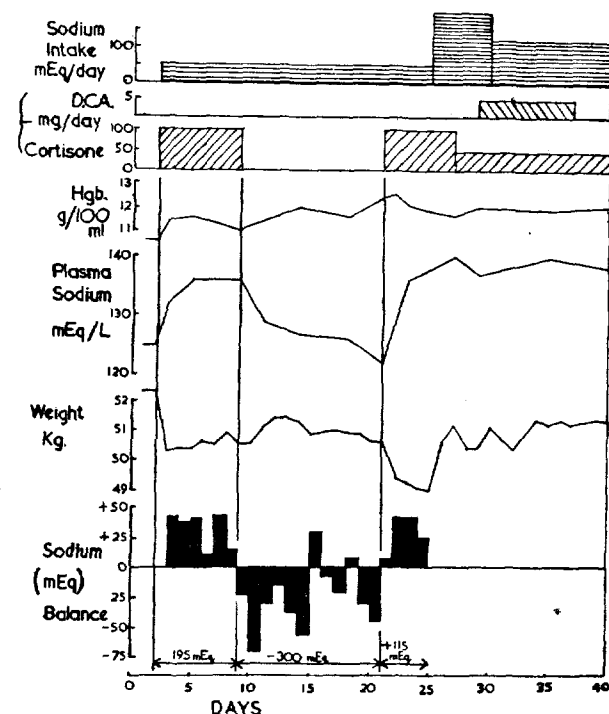


FIG. 1.—Metabolic balance data in relation to cortisone therapy in Case 1.

collections were also analysed. The patient was weighed daily before breakfast, after emptying the bladder, and when possible after defaecation, on scales sensitive to 30 g. (1 oz). After 24 hours on this diet, body weight and plasma electrolyte concentrations having stayed constant, she was given 100 mg. of cortisone a day by mouth, in four divided doses, for one week; cortisone was then discontinued. After a 12-day interval with no treatment the cortisone therapy was repeated.

Results (Fig. 1, Table I).—Twenty-four hours after starting cortisone the following changes were observed. The body weight had fallen by 2.05 kg. (4.5 lb.) owing to a large water diuresis (4,200 ml. of urine in 24 hours, which contained a total of 48 mEq of sodium and 74 mEq of potassium). The balance of water and electrolytes was: water -2 litres; sodium ± 0 ; potassium -30 mEq. The plasma sodium had risen from 125 to 132, and chloride from 88 to 95 mEq per litre.[†]

During the next 48 hours there was no further change in body weight, and the plasma sodium rose to 136 mEq per

[†]On simple osmotic theory, the expected and the observed rises in plasma sodium were close. Thus, assuming the total body water initially to be 65% of body weight—that is, 34 litres—then the final sodium should have been approximately $\frac{34 \times 125}{32} = 133$ mEq per litre.

litre. At this point—that is, 72 hours after starting cortisone—the cumulative balances were: water -2 litres; sodium +80 mEq; potassium ± 0 . The serum protein and Hb concentrations had risen slightly, suggesting haemoconcentration. The patient felt very much better whilst on cortisone; there was an increase in muscle power and animation, and her facial colour improved.

During the seven-day period of cortisone treatment 195 mEq of sodium was retained and 38 mEq of potassium lost, and during the latter half of this period the gain in weight was 0.4 kg. (0.9 lb.).

On stopping cortisone for 12 days the plasma sodium fell from 136 to 122 mEq per litre. There was a negative sodium balance of 300 mEq. However, instead of the expected fall in body weight, there was a small rise (0.2 kg., Table I). Thus, the usual renal regulation of osmotic pressure did not occur and water was retained in excess of electrolytes, resulting in severe hypotonicity. The patient's previous symptoms of weakness and lethargy returned.

On repeating the cortisone treatment (100 mg. a day) there was a prompt water diuresis, loss of weight (1.7 kg.), and a rise in plasma sodium concentration from 122 to 136 mEq per litre during the first two days (Fig. 1), during which time only 55 mEq of sodium and 45 mEq of potassium were retained. Clinical improvement was immediate.

These data suggest that the low plasma sodium concentrations present on each occasion before cortisone treatment were due mainly to spontaneous water retention. They also

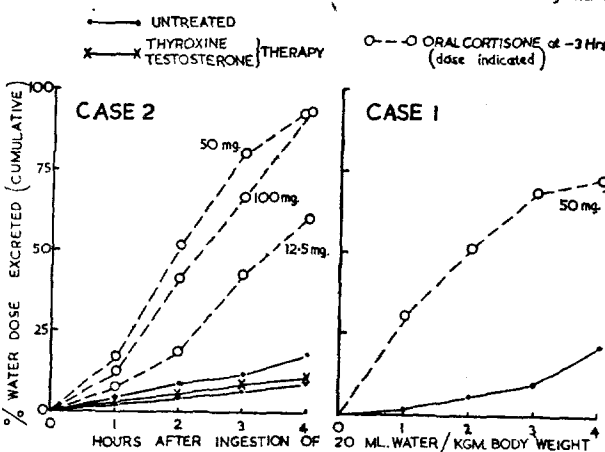


FIG. 2.—Effect of cortisone on water diuresis in Cases 1 and 2.

show that cortisone acutely corrected the sodium dilution. Further tests showed that cortisone acutely restored the ability to excrete a water load rapidly (Fig. 2). Since clinical improvement followed restoration of a normal plasma sodium concentration, it is possible that the symptoms were attributable, partly at any rate, to hypotonicity.

During six weeks of treatment with cortisone (50 mg. a day), later supplemented by D.C.A. (2.5 mg. a day), and a sodium intake of 125-200 mEq a day, the highest weight recorded was 51.5 kg. (113.3 lb.). This was less than the patient's initial weight (52.3 kg.), which further supports the interpretation that there was originally excessive water retention.

Case 2†

J.B., a housewife aged 53, was admitted to Hammer-smith Hospital in January, 1953, with an initial diagnosis of myxoedema. However, at 40 she had had a severe post-partum haemorrhage which had needed blood transfusion and which was followed by complete failure of lactation. The menopause at 51 was followed by the onset of myxoedema, which had become gross by the time of her admission.

[†]This case has already been described briefly in relation to her episodes of hypopituitary coma (Caughy and Garrod, 1954).

Her behaviour, voice, and appearance were those of classical myxoedema, with superadded features of hypopituitarism. In addition to loss of eyebrows and partial baldness of the scalp, there was total loss of axillary and pubic hair and absence of cutaneous pigment. There were no abnormal findings in the cardiovascular, urinary, or neurological systems, and the blood pressure was 140/90.

The following investigations were made: urinalysis, negative; Hb, 11.4 g.%. Tests of endocrine function showing gonadotrophic, adrenal, and thyroid failure are summarized in Table II.

Clinical Observations

The patient gained 3 kg. (6.6 lb.) in weight during her first three days in hospital. Two days later she became nauseated and stuporous after a water diuresis test, and the blood

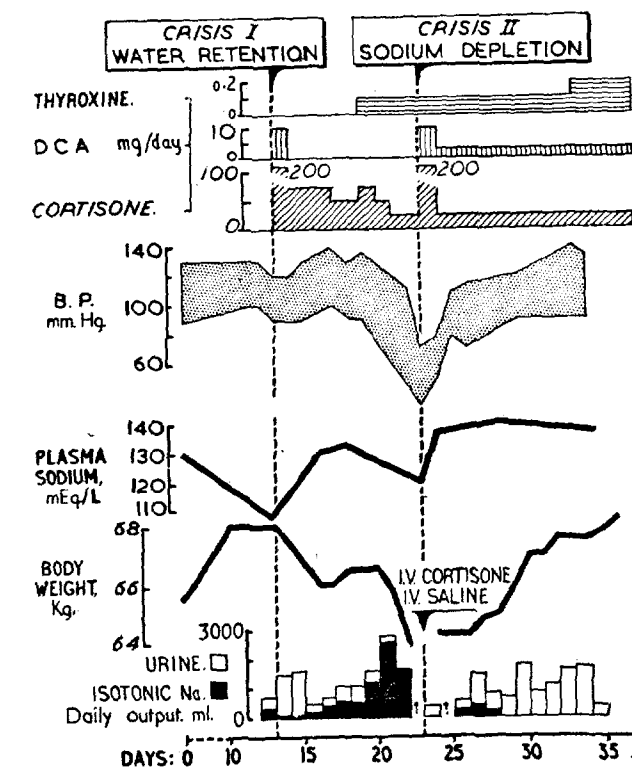


FIG. 3.—Metabolic changes in relation to therapy in Case 2.

pressure fell to 100/70. She had excreted only 9% of the water dose of 1,320 ml. during four hours, and had remained oliguric during the next 24 hours. The plasma sodium was 116 and the chloride 85 mEq per litre, and blood urea was 21 mg. per 100 ml. She was then given 100 mg. of cortisone by mouth, 5 mg. of D.C.A. by intramuscular injection, and an infusion of 600 ml. of 5% glucose in 0.3% saline. Within 24 hours of starting treatment she passed large volumes of urine, lost 1.9 kg. (4.2 lb.) in weight, and regained full consciousness. Later she was discharged on thyroxine and a testosterone implant.

In November, 1953, she was readmitted in relapse, having omitted to take any treatment for five months. The blood urea was 16 mg. per 100 ml., plasma cholesterol 389 mg. per 100 ml., and B.M.R. -36% (Robertson and Read). Her subsequent course is charted in Fig. 3. By the 13th day in hospital, while on a normal diet and without specific treatment, she had gained 2.5 kg. (5.5 lb.) in weight. The plasma sodium had fallen from 130 to the very low level of 107 mEq per litre, and potassium from 5.7 to 4.2 mEq per litre. On the 12th day she was nauseated, and during the 13th day she became irritable, then drowsy and stuporous, with a blood pressure of 120/90. She was given 200 mg. of cortisone by mouth in divided doses and one 10-mg. injection of D.C.A., followed by 75 mg. of cortisone a day for three

days. During the first two days on cortisone she passed 3.1 litres of urine containing only a trace of sodium, and by the third day she had lost 2 kg. (4.4 lb.) in weight and the plasma sodium had risen to 130 mEq per litre. Full consciousness returned within 24 hours of starting treatment with cortisone. The loss of weight, due to excretion of water without sodium, accompanied by a rise in plasma sodium of 23 mEq, suggests that the hypotonicity was due mainly to water retention.

While still on cortisone, an episode of true sodium depletion occurred, the signs of which differed from those just described. Seven days after starting cortisone therapy the patient became aggressive and mentally confused and began to pass large amounts of sodium in her urine (784 mEq in three days). The body weight fell by a further 2.5 kg. (5.5 lb.) in two days. The exact negative sodium balance was not known, but probably exceeded 500 mEq. On the 10th day of cortisone therapy she needed forcible restraint, and four hours after an injection of paraldehyde (10 ml.) became comatose and pulseless. Her appearance was that of severe dehydration. The systolic blood pressure fell to less than 70 mm. Hg. and at one time could not be measured. The plasma sodium had fallen only to 117 mEq per litre, as compared with 107 mEq during the previous episode of water retention when the circulation was relatively normal. This classic crisis of sodium depletion and dehydration was successfully treated with saline infusion, D.C.A., and intravenous cortisone.

Subsequently, tests showed that normal water diuresis could be restored within three hours by intravenous or oral cortisone, but not by prolonged treatment with testosterone (300-mg. implant) and thyroxine (0.3 mg. a day) (Fig. 2).

Discussion

Both of these patients retained water in excess of electrolytes while on ordinary ward diets. This was shown by a large gain in weight accompanied by a profound fall in plasma sodium concentration—to 116 mEq per litre in Case 1, and to 107 mEq per litre in Case 2. In both patients the water retention was corrected by cortisone, which caused a large water diuresis. The plasma sodium concentration rose towards normal, although there was little change in total body sodium. The stupor which accompanied the hypotonicity in Case 2, and the symptoms of weakness and prostration in Case 1, were relieved when the excess of water was excreted.

Following a water-excretion test, and superimposed on the chronic water retention, there were acute symptoms of water intoxication, including nausea, vomiting, severe prostration, mental confusion, and, in Case 1, a sharp fall of blood pressure. These untoward effects probably occurred because hypotonicity was already significant in both patients when the test was carried out. This interpretation is supported by the fact that later, when the plasma sodium concentration was normal, there were no symptoms from water-excretion tests, although retention of the water dose was roughly the same as before.

Despite much investigation, the cause of the failure of water diuresis in hypo-adrenal states is still uncertain (Lewis, 1953). Cortisone corrects this failure, whereas deoxycortone acetate, testosterone, and thyroid extract are largely ineffective (Slessor, 1951; Garrod and Burston, 1952). Since cortisone also prevents chronic over-retention of water in hypopituitarism, it is likely that the failure of water homeostasis is mainly conditioned by inadequate secretion of 17-hydroxycorticosteroids.

In hypopituitarism it would appear that adrenocortical secretion of steroids may fail in a selective manner. Thus, androgen secretion, measured by 17-ketosteroid output (in the female), fails early; and 17-hydroxycorticosteroid secretion (cortisone and hydrocortisone), as measured in the blood (R. I. S. Bayliss and A. W. Steinbeck, 1954, personal communication) and urine (Cope *et al.*, 1951) is usually very low. Yet mineralo-corticoid secretion, now believed to be

aldosterone (Simpson *et al.*, 1953), which may not be dependent on pituitary control, seems to be adequate for the patient's normal needs; because severe sodium depletion, such as occurs regularly in untreated Addison's disease, is an unusual feature of adrenal failure secondary to hypopituitarism, unless it is provoked by infections, gastroenteritis, or surgical stresses (Peters *et al.*, 1954; Caughey and Garrod, 1954). This conclusion is supported by the results of Luetscher and Axelrad (1954), who found normal amounts of aldosterone in the urine of two cases of severe hypopituitarism, although this steroid was absent in the urine of patients with primary adrenal insufficiency. It is not surprising, therefore, that pure water retention without significant sodium depletion can occur in hypopituitarism. That it may not be uncommon is suggested by reports of very low plasma sodium concentrations, without evidence of dehydration or crisis, in patients with this condition—for example Bartter *et al.* (1950), Waterhouse *et al.* (1952), Peters *et al.* (1954), and Aber *et al.* (1954)—a state of affairs which has usually been attributed to sodium depletion.

As though to protect themselves from water retention, and because of their lowered metabolism, which reduces the solute load to the kidneys, patients with advanced hypopituitarism usually drink very little, and their urinary volumes are correspondingly small (Case 1 was exceptional in that her urine output, when not on cortisone, was around 1.5 litres a day). Admission to hospital may present a definite hazard to such patients because of a tendency to force the fluid intake, especially when urine output is low. This should be avoided by special instructions to the nursing staff.

Daily weighing of the patient is the simplest way to detect large changes in water balance. A gain in weight accompanied by a fall in plasma sodium concentration suggests primary water retention. It should be stressed that dangerous hypotonicity can exist without clinical signs, and that peripheral oedema is not a manifestation of primary water retention (although the two conditions may occur together).

Once the danger of forcing fluids in hypopituitary patients is recognized, it follows that water-excretion tests are unwise when plasma sodium estimations show that significant hypotonicity already exists. If the plasma sodium exceeds 130 mEq per litre the diluting effect of a litre or so of water is unlikely to cause untoward symptoms. Since cortisone acts rapidly to cause water excretion in adrenal failure, it should be available for use whenever water-excretion tests are performed in these patients.

Conclusions and Summary

An abnormality of water balance is described in two patients with anterior hypopituitarism. Although their intake of fluids was not forced, they retained water in excess of electrolytes, causing dilution of the body fluids and symptoms of water intoxication. The diagnosis was suggested by a gain in weight and a very low plasma sodium concentration. When cortisone was given there was a prompt water diuresis and the plasma sodium concentration rose to normal, though there was little change in the total body sodium. Water retention may not be very rare in anterior hypopituitarism, although it appears to have been reported as such in only one other case (Whittaker and Whitehead, 1954).

In addition to chronic water retention, acute symptoms of water intoxication, including nausea, vomiting, extreme prostration, mental confusion, and stupor, were precipitated by water-excretion tests of adrenal function. This untoward effect of the test probably occurred because there was already excessive dilution of body fluids which was not recognized when the tests were performed. To avoid this complication, a water-excretion test should not be carried out until the plasma

sodium concentration is known. If symptoms due to water retention occur in patients with hypo-adrenal function, cortisone should be given, whereupon the excess water will be excreted rapidly.

We wish to thank Professor G. W. Pickering and Dr. Russell Fraser for allowing us to study cases under their care.

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RESULTS OF PARTIAL GASTRECTOMY IN TREATMENT OF PEPTIC ULCER

BY

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Partial gastrectomy has now gained general acceptance as the operation of choice in the treatment of gastric ulcer, and although it is widely used in the treatment of duodenal ulcer its results therein are not so universally acclaimed. Because of its wide usage, much information has accumulated about the effects of the operation, particular attention being focused on the various disturbing after-effects produced.

This investigation was begun in an attempt to assess the value of the operation, and to determine whether partial gastrectomy was capable of relieving the patient of his ulcer symptoms, freeing him from irksome dietary rules, and restoring him to a satisfactory economic life.

Method of Follow-up

This survey is based on a personal follow-up of cases of peptic ulcer submitted to gastrectomy of the Polya type in one surgical unit in the years 1940 to 1951 inclusive. Of 481 patients surviving partial gastrectomy, both elective and emergency, 23 were found to have died of intercurrent disease. Of the remaining 458, 415 (90.6%) were traced and interviewed. Of these, 379 were interviewed personally by one of us with the aid of an agreed schedule of questions, and the results were graded jointly. Information regarding 36 patients who lived too far away to travel was obtained through the courtesy of their own practitioners. Because mild post-gastrectomy symptoms are common in the immediate post-operative period and usually improve or disappear

during the succeeding six months, no patient was interviewed until at least a year after operation.

An overall assessment of the success, or otherwise, of partial gastrectomy was made by classifying the results into three categories: "good," when a good or excellent result had been obtained; "satisfactory," when the patient was substantially improved in comparison with his pre-operative state; and "poor," when no marked improvement had occurred or the patient's condition was worse than before operation. Each patient was asked for an opinion regarding the success of the operation, and the observer made a separate estimate based on all aspects of the patient's health. No result was adjudged to be "poor" on account of anaemia alone, as this is in most cases correctable by the administration of iron. Seven patients who developed tuberculosis were regarded as "poor" results on the assumption of a close relationship between this disease and gastrectomy.

Clinical Assessment

The results are presented in Table I, and the number of patients satisfied with their post-operative state is seen to be very impressive. Only 16 patients out of 415 considered

TABLE I.—Clinical Assessment

Result	Patient's Opinion	Observer's Assessment
Good	338 (81.4%)	266 (64.1%)
Satisfactory	61 (14.7%)	99 (23.9%)
Poor	16 (3.9%)	50 (12.0%)

that they had obtained no benefit from partial gastrectomy. The stricter criteria of success adopted by the observers produce a different picture, and 50 (12%) were considered to have had a "poor" result from operation.

On analysis there was found to be no significant correlation between the clinical result and such factors as the age of the patient, the duration of ulcer symptoms, and the site of ulcer; nor did variations in operative technique influence the outcome, as there was no significant difference in result between 276 antecolic and 131 retrocolic anastomoses.

In comparing the sexes (Table II) it was found that the number classified as "poor" was essentially the same, but fewer of the women were regarded as having a "good" result, a number of otherwise excellent results being classified as "satisfactory" owing to anaemia.

TABLE II.—Result in Relation to Sex of Patient

Sex	No. of Patients	Result as Assessed by Observer		
		Good	Satisfactory	Poor
Male	355	231 (65.1%)	81 (22.8%)	43 (12.1%)
Female	60	35 (58.3%)	18 (30.0%)	7 (11.7%)

Operative Mortality

With increasing experience of the operation and better pre- and post-operative management (Illingworth, 1953) it was found that the mortality rate of the operation gradually improved throughout the years of the series, and it is now 3.3% (214 cases, 1951-2).

Of all the factors investigated which might influence the mortality rate, the age of the patient was found to be the most important. Over 50 years of age the rate rose steeply and cardiac and respiratory causes of death contributed largely to the higher mortality in the older patients. The duration of ulcer history, the sex of the patient, and the type of operation performed did not affect the mortality rate to a marked extent.

Tuberculosis after Partial Gastrectomy

It is suspected that there is an increased liability to pulmonary tuberculosis after partial gastrectomy. Attention was focused on this possibility by Pulvertaft (1952), who

found that of 23 deaths subsequent to operation 8 were due to tuberculosis. The occurrence of such deaths had previously been noted without comment by other authors (Bruusgaard, 1946; Ransom, 1947), but none found such a high incidence as did Pulvertaft.

In the present series there have been 8 deaths due to pulmonary tuberculosis in a total of 23 intercurrent deaths. In addition, 8 patients still alive were found to have had pulmonary tuberculosis, and in 6 of these the lesion was still active. Thus in 481 patients surviving operation, 16 (3.3%) are known to have developed active tuberculosis.

Such a figure would appear to be definite evidence of an increased liability to tuberculosis in patients who have undergone partial gastrectomy. It is therefore suggested that the presence of active tuberculosis in an ulcer patient should be accepted as an absolute contraindication to partial gastrectomy, and the presence of a latent lesion should give rise to serious consideration of the advisability of this operation. Since 1952 a pre-operative chest film has been taken routinely in this unit, and this would appear to be a wise precaution.

The reason for the increased liability to tuberculosis is not known, but Pulvertaft's suggestion that it is "related to the recognized loss of weight following gastrectomy" seems very reasonable. There is little doubt that the nutrition of many of these patients is inadequate, and this could be the determining factor in the development of tuberculosis.

Anaemia after Partial Gastrectomy

It is generally accepted that macrocytic anaemia with a megaloblastic bone marrow is very rare after partial gastrectomy, though more common after total gastrectomy. Only one case of atypical macrocytic anaemia occurred in this series, and we hesitate to label it as a verified case. Iron-deficiency anaemia, on the other hand, is far from uncommon and is generally thought to be due to the inadequate absorption of food iron after partial gastrectomy.

In this investigation the haemoglobin level, as measured by the Sahli method, was ascertained at each interview, and cases with values below 70% had a full haematological examination carried out. The results are plotted separately

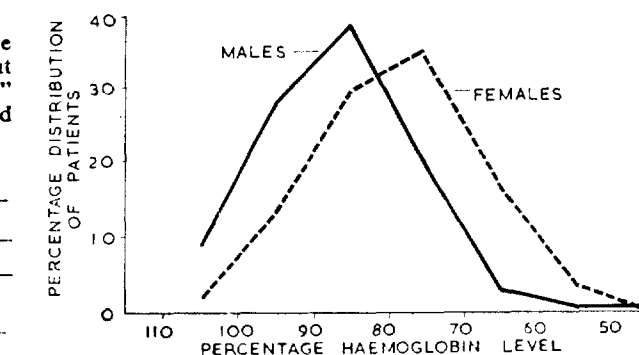


FIG. 1.—Haemoglobin levels. (Sahli: standard 14 g. per 100 ml.)

for males and females in Fig. 1. It will be seen that the haemoglobin level is subnormal in the majority of patients, especially females. The values for men tend to be situated in the range 80-95%, and for women 70-90%.

It is suggested that diminished iron absorption after partial gastrectomy produces, in general, a haemoglobin level lower than that of normal individuals. In some cases symptoms of tiredness or shortness of breath are produced, especially in women in whom the additional factor of menstruation is involved. The administration of iron by mouth is usually curative, and those who do not respond adequately can be controlled by periodic injections of intravenous iron.

Loss of Weight after Partial Gastrectomy

The occurrence of loss of weight after partial gastrectomy is accepted by most authorities (Everson, 1952; Pulvertaft, 1952), the degree of such loss depending on the standards adopted. In this survey, in each patient the post-operative

weight at the time of interview has been compared with his normal weight in health. The findings are presented in Table III and in Fig. 2, the change in weight being indicated according to the formula

$$\frac{\text{Present weight} - \text{Normal pre-illness weight}}{\text{Normal pre-illness weight}} \times 100.$$

TABLE III.—Change in Weight

Change in Weight	Males	Females
+5% or more	27 (8.6%)	4 (7.8%)
-5% to +4%	114 (36.2%)	14 (27.5%)
-6% to -10%	81 (25.7%)	8 (15.7%)
-11% to -15%	56 (17.8%)	14 (27.5%)
-16% to -20%	30 (9.5%)	6 (11.8%)
-20% or more	7 (2.2%)	5 (9.8%)

The change in weight was calculated by expressing the present weight as a percentage of the normal pre-illness weight and thereafter noting the percentage gain or loss.

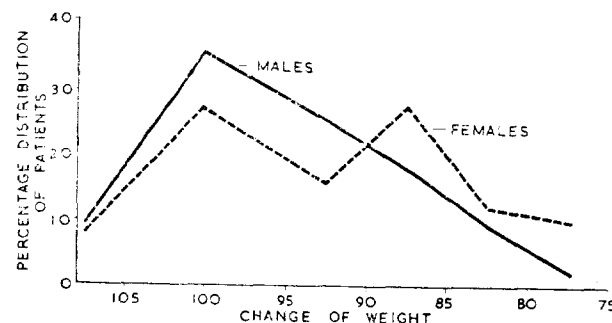


FIG. 2.—Weight change after partial gastrectomy

$$\frac{\text{Present weight} - \text{Normal pre-illness weight}}{\text{Normal pre-illness weight}} \times 100$$

If it is accepted that a 5% loss of weight is within the limits of normality, 44.8% of males and 35.3% of females regained their pre-illness weight. This compares with Pulvertaft's figures of 53.9% for males and 37.2% for females. A substantial degree of weight loss (more than 10%) is noted in 29.5% of men and 49.1% of women. Such figures leave no doubt that loss of weight after partial gastrectomy is a real entity, and many patients are seriously disturbed by it.

Recurrent Ulceration

The frequency of recurrent ulceration after partial gastrectomy would appear to depend on the level of gastric resection (Visick, 1948). In this unit resection is performed above the lowest of the vasa brevia, and the gastric remnant is a tubular pouch about 2 in. (5 cm.) wide and 6 in. (15 cm.) long. With such a resection, acid secretion has been found to be negligible or absent, and, accordingly, the risk of recurrent ulcer is slight. In this series, recurrent ulcer was proved in only 4 out of 438 partial gastrectomies. Two of these were demonstrated by gastroscopy; one patient died from a gastro-jejuno-colic fistula and the fourth from recurrent haematemesis. Ulcer has been suspected on clinical grounds in another seven patients, but a full investigation, including laparotomy in two, has proved negative. In none of these patients has the pain responded to ulcer therapy, and it is thought that the symptoms are not due to ulcer.

This gives an ascertained recurrence rate of 0.9%. This accords with Visick's (1948) experience of measured radical gastrectomy (an even more extensive resection), when he noted no recurrence in 200 patients. If a less extensive resection is preferred in view of the probable lesser operative risk and the lower incidence of post-gastrectomy symptoms (Pulvertaft, 1952), a higher recurrent ulcer rate must be accepted—for example, 3.7% (Visick, 1948).

Post-Gastrectomy Symptoms

Estimates of the incidence of these symptoms vary enormously with different observers up to the high figure of 75% (Muir, 1949). Symptoms do occur in many patients

soon after operation but tend to diminish or disappear within the first six months, and in some cases are acknowledged only after careful inquiry. As our patients were not interviewed until at least a year had elapsed since operation, it was thought that a reasonable estimate of the incidence of symptoms was possible.

The following classification into four categories was adopted: (a) no symptoms; (b) fullness only—that is, a sensation of epigastric fullness induced by meals of small quantity (two small courses or less) without other symptoms; (c) "dumping"—mild or severe; and (d) bilious vomiting—mild or severe. Frequent overlap was found between the latter two categories.

Our estimate of the frequency of these symptoms is presented in Table IV. Severe symptoms were found to occur in 48 (11.8%), and consisted of severe dumping or severe

TABLE IV.—Post-gastrectomy Symptoms in 408 Patients

Symptoms	Males	Females	Total
Nil	184	26	210
Fullness only	57	10	67
• Dumping { Severe	17	4	21
Mild	40	6	46
• Bilious vomiting { Severe	26	4	30
Mild	32	9	41

* Overlap between these two categories was relatively common.

bilious vomiting or both. Milder symptoms were more common but on the whole relatively unimportant. From a study of the results of other authors (Butt *et al.*, 1948; Visick, 1948; Capper and Butler, 1951; Goligher and Riley, 1952) it would seem reasonable to assume that the incidence of severe symptoms is in the region of 5 to 10%. Unfortunately, it often proves difficult to relieve this minority of their symptoms, and, although a variety of medical and surgical remedies have been tried, the results on the whole are disappointing.

Hypoglycaemia and Vitamin Deficiencies

Hypoglycaemia is generally accepted as the cause of late symptoms two to three hours after a meal. Both the incidence and the resultant disability were found to be of minor importance in this series.

Vitamin-C deficiency was seen in one of our cases, and vitamin-B deficiency occurred in 17 patients, mainly in the form of cheilosis and glossitis. No gross deficiencies were noted such as were recorded by Wells and Welbourn (1951), and response to treatment was satisfactory.

Economic Results of Partial Gastrectomy

After discharge from hospital, usually 10 days after operation, patients are encouraged to return to their original work as soon as they are reasonably capable of so doing. Those performing heavy manual labour naturally tend to restart after a longer period and sometimes have to change to a lighter occupation. It is highly desirable that patients should resume work as soon as possible, both for economic and for psychological reasons.

From Table V it is seen that convalescence need not be unduly prolonged, as 84.3% were able to resume full work within six months. Only 3% of patients have failed to

TABLE V.—Time of Return to Work after Operation: 395 Patients

Time of Return after Operation	No. of Patients
1 month	38 (9.6%)
2 months	109 (27.6%)
3 months	100 (25.3%)
4-6 "	86 (21.8%)
7-9 "	20 (5.1%)
10-12 "	13 (3.3%)
Over 12 months	17 (4.3%)
No return to work	12 (3.0%)

return to work at any time since operation, though a larger number (7.3%) were not working at the time of the survey for various reasons—for example, unemployment, intercurrent illness, etc.

If partial gastrectomy is to be regarded as a satisfactory operation, patients must not only return to work within a reasonable period but be able to retain their jobs in competition with other workers. That they are eminently capable of remaining in employment is shown by Table VI, in which

TABLE VI.—Loss of Working Time (Male Workers)

Time Lost	Year Before Operation	Year Before Follow-up	
		All Workers	Heavy Workers
Nil	21.6%	79.9%	84.0%
1 month	16.6%	6.1%	6.4%
2 months	13.4%	4.3%	5.3%
3 "	15.3%	1.8%	—
4-5 "	21.3%	1.8%	1.1%
7-9 "	7.3%	2.4%	3.2%
10-11 "	4.5%	4.3%	—

the amount of work lost in the year prior to interview is recorded. Little or no work had been lost by 79.9%, and, indeed, many of these had never lost even a day since their return to work. In fairness, it must be admitted that some with post-gastrectomy symptoms were fortunate that they were able to take things easily after meals.

To illustrate the improvement in economic status after operation, a comparison is made of the loss of work before and after operation (Table VI). The comparison is impressive and indicates the economic value to the patient of a satisfactory partial gastrectomy. So satisfied with these results are the patients that the annoyance of mild symptoms is usually ignored.

The ability of heavy manual workers to perform their original job was next investigated. Various occupations were classed as "heavy" (involving heavy manual labour or requiring physical exertion beyond that of the average worker) or "light" (sedentary work or work requiring relatively little physical effort), and the class of work to which each patient returned was noted. As is seen in Table VII,

TABLE VII.—Return to Work after Operation: 134 Heavy Workers: 261 Light Workers

	Heavy Workers	Light Workers
Return to original or equivalent work	97 (72.4%)	220 (84.2%)
" " lighter work	30 (22.4%)	19 (7.3%)
Unemployed (labour market, other health reasons, etc.)	6 (4.5%)	14 (5.4%)
Unemployed (due to post-gastrectomy symptoms)	1 (0.7%)	8 (3.1%)

72.4% of heavy workers returned to their former occupation or to one involving equivalent or, in some cases, even heavier duties. Not only do the majority of heavy workers return to their former occupation, but they lose surprisingly little work after they have restarted (Table VI). From this evidence it is seen that the majority of heavy workers can be restored to a satisfactory economic life by partial gastrectomy.

Discussion

The satisfaction expressed by the large majority of patients with the results of partial gastrectomy underlines its value, and the low percentage of dissatisfied patients (3.9%) is reassuring. Unfortunately, those patients frequently do not respond to treatment, and this gives grounds for disquiet when considering the results as a whole. A large number (29.4%) are troubled by mild or severe post-gastrectomy symptoms, but they usually feel that these are tolerable by comparison with the disabling pain of ulcer.

The attraction which gastro-enterostomy still holds for the surgeon lies in the lower mortality of the operation and the rarity of symptoms of "dumping," bilious vomiting, loss of weight, and anaemia, but the price paid in recurrent ulceration is high. In spite of this, gastro-enterostomy still has a place in the treatment of duodenal ulcer. Because women are more liable to anaemia and weight loss after partial gastrectomy, and the severity, though not the inci-

dence, of stomal ulcer symptoms after gastro-enterostomy is less in women than in men (Clark, 1951), it is possible that the latter operation is to be preferred in females. Furthermore, in both sexes over 50 years of age the risk of stomal ulcer after simple anastomosis is less than average (Clark, 1951), and, as the mortality of partial gastrectomy rises so definitely with age, the simpler operation would appear to be preferable in older people.

In the largest group of duodenal ulcer patients—namely, adult males between 20 and 50 years of age—the risk of recurrent ulceration is such that it is considered that an extensive partial gastrectomy is desirable. In view of the evidence presented in this investigation, the results to be expected are good.

Even in those who do well, however, it is felt that something is lacking. Nutrition is substandard. In the majority the intake of food is limited to a less than average size of meal, and in some there is deficient absorption of fats with the occurrence of borderline fat absorption or actual steatorrhea. The extent of the deficiency in the individual patient is indicated by the degree of weight loss, which is substantial in nearly 50% of cases. The absorption defect is also evident in the case of iron and vitamin B. In most cases absorption of these is sufficient to meet normal requirements, but in some a clinical deficiency results.

From the evidence of deficient absorption of proteins and fat (Wollaege *et al.*, 1946), the tendency to loss of weight, the frequent presence of a subnormal haemoglobin level (Fig. 1), and the relatively frequent occurrence of vitamin deficiencies, it seems to us that a state not of malnutrition but of subnormal or substandard nutrition exists in a considerable number of cases after partial gastrectomy. This seems likely to be the precipitating factor in the development of tuberculosis or the reactivation of a quiescent lesion.

Summary

An assessment of the value of partial gastrectomy in the treatment of peptic ulcer is presented, based on a personal follow-up of cases operated on between 1940 and 1951. Particular attention was paid to the effect of the operation on the patient's working capacity, and the incidence of pulmonary tuberculosis, recurrent ulceration, loss of weight, anaemia, and post-gastrectomy symptoms was investigated.

Our thanks are due to Professor C. F. W. Illingworth for giving us access to the records of all these cases in which partial gastrectomy was performed in his unit in the Western Infirmary, Glasgow, and also for his advice and encouragement throughout this investigation. We are grateful to Miss Murray, the secretary of the Peptic Ulcer Clinic, for valuable clerical assistance.

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The Second Panhellenic Congress of Hygiene was held in Athens from December 5 to 11, 1954, under the honorary chairmanship of the Minister of Social Welfare, Dr. CHRISTOS S. SOLOMONIDES. Among the 500 who attended were members of the Academy of Athens, the University of Athens, the Athens School of Hygiene, the Panhellenic Medical Association, and the Athens Medical Association, together with representatives of public health, social welfare, and engineering.

TREATMENT OF HAEMORRHAGE FROM PEPTIC ULCER BY CONTINUOUS INTRAGASTRIC MILK DRIP

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"Where is the man who can live without dining?"

—EDWARD BULWER-LYTTON (*Owen Meredith*).

During the last century haemorrhage from peptic ulcer was treated by rest, starvation, and opium. The patient, anxious and weakened from blood loss, lay flat, enduring starvation and dehydration, ice being applied to his abdomen and parched lips. In a widespread belief that the giving of blood restarted haemorrhage, transfusion was withheld and enfeeblement prolonged.

Literature

Early in the present century, Lenhartz (1904) advised feeding with milk and raw eggs from the first day. However, many hospitals in this country continued to employ initial starvation until Meulengracht (1934) introduced a further plea for early generous feeding. "It seems doubtful," he wrote, "whether it be particularly expedient to pick out for weakening dietetic measures the very point of time when a patient has lost a considerable amount of blood and is rather poorly." The 'thirties saw other important therapeutic advances: Marriott and Kekwick (1935) demonstrated the importance of adequate transfusion; Finsterer (1933) made, and Gordon-Taylor (1935) successfully defended, the case for early operation in patients with established ulceration and severe haemorrhage, pointing to lower mortalities if the gastrectomy was performed in the first 48 hours. Those tempted to question whether this advice is applicable now the patient has adequate food and transfusion during the first two days should note that Tanner (1951) has proposed, and is at present employing, a return to the Finsterer regime. Recent authors, such as Ogilvie *et al.* (1952), have stressed the importance of medico-surgical team-work in the management of bleeding ulcers.

With what appeared to be steady therapeutic advances in the first half of this century one would have expected a comparable decline in mortality. However, there was a rise during the first quarter of the century. The factors which caused this and led to subsequent confusion were stated by Avery Jones (1947) in the Goulstonian Lectures. Those wishing to learn the pitfalls of drawing conclusions from published mortalities are referred to these lectures.

Briefly, from 1902 to 1907 published ulcer mortalities were 7% or under. Some of these low figures gave a false impression of the mortality in the country as a whole as they came from teaching hospitals having a smaller proportion of indigent and elderly patients. Some series excluded cases transferred to surgical wards or did not take into account the overall hospital results. Omissions of deaths from causes related to the management of the haemorrhage were also common. Nevertheless, making

allowances for these factors, Avery Jones was able to show that there was still a lower mortality due to the greater prevalence of acute ulcers in young women at this time, whereas after 1920 there were many more chronic ulcers in males over 40.

Between 1920 and 1932 relatively high mortalities were published. In 1927 Bulmer reported a mortality of 10.7% and in 1932 one of 13.5%. More reports came in from municipal hospitals which had poorer and older patients, among whom there was a greater proportion of gastric ulcer and a greater expectation of death from peptic ulcer haemorrhage. Of Avery Jones's patients, 33% were over 60, whereas former voluntary hospital series might have had only 10% of patients above this age. Mass hospital surveys might show even higher figures, and Chiesman (1932) reported a mortality of 25%. Comparable figures did not come from other parts of the world, and in Denmark, Meulengracht (1939), using generous feeding, showed only 1% mortality. However, only 30% of these patients showed radiological confirmation of ulcer.

Between 1935 and 1953 the mortality fell once more, and Avery Jones's (1947) figure of 8% may now be taken as a standard. These years reflected the improvement following adequate transfusion (Marriott and Kekwick, 1935), generous feeding (Meulengracht, 1939), and planned surgery (Finsterer, 1936; Gordon-Taylor, 1937).

Treatment by Continuous Intra-gastric Milk Drip

Impressed by the ulcer patient's rapid recovery from pain on a continuous intra-gastric milk drip, we looked for further improvement in feeding methods for bleeding peptic ulcer by combining the continuous intra-gastric milk drip employed by Winkelstein (1933) with early generous feeding as recommended by Meulengracht, the former being given as soon as the patient had settled in hospital and had received his morphine, the latter as soon as he wanted it, usually the morning of the second day. It was argued that such a regime would give adequate fluid replacement, complete nourishment, relieve the patient's shock, and reassure him. Furthermore, the continuous buffering action of the milk would bring early relief from pain, set the stage for early healing, and prevent pepsin from dissolving blood clot in the vessel mouth and ulcer base. The high morale and freedom from exhaustion and prostration in these patients has encouraged us to continue with this regime, although there is statistically little difference in its results from the one, previously adopted, of one-hourly milk feeds on the first day followed by a liberal diet on the second. It should be pointed out that the earlier group were fed generously and must not be regarded as a control group treated by restricted feeding. Both groups of patients received adequate transfusion.

Technique

The apparatus was simple, consisting of a Ryle stomach tube, a glass connexion, two lengths of rubber tubing, a drip chamber from a transfusion set, and a flask to hold the milk (see Fig. 1). The siphoning bottles used by Woldman (1936) for the continuous aluminium hydroxide drip were not employed. The mechanism of the drip was explained to the patient in simple terms: "This neutralizes the acid in your stomach and allows healing to go on during the night." The Ryle tube was passed nasally to the second mark or until gastric juice was obtained, when it was withdrawn slightly and strapped to the side of the face. It was considered an advantage to have the tip of the tube high in the stomach in order to "bathe" the ulcer area, while avoiding direct trauma from the tube. The American authors used a Levin tube or a collapsible tube made of latex (Woldman, 1937). The Ryle tube did not block easily,

and when the drip stopped it could often be restarted by milking the tube. The tube would be changed at varying times determined by discomfort or blocking, usually 48 hours; sometimes it was used for as long as seven days without replacement.

Initially milk was contained in blood transfusion bottles, but later vacoliter flasks were used instead, these having to be changed less often. The smaller bottles were still employed during the hot summer months. Five or six pints (2.8 or 3.4 litres) of milk was run in during 24 hours. The

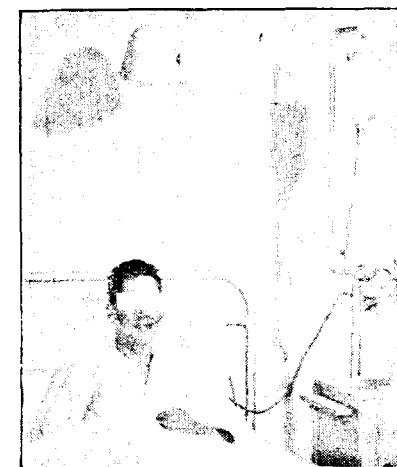


FIG. 1.—Simple gravity feed with vacoliter bottle and Ryle tube.

patient received a generous bland diet at four-hourly intervals while the drip was still running, and thus the total intake was in the region of 3,700 calories. This high-calorie feeding would be difficult to procure without employing continuous intra-gastric milk throughout the night.

The milk was usually unadulterated; on rare occasions aluminium hydroxide gel was added if there was some persistent

pain unrelieved by the milk drip. In the earlier cases with recurrent bleeding, viper venom was added to the drip, but as it did not appear to influence the tendency to recurrences this practice was later discontinued. We have no experience of the addition of thrombin. Winkelstein's (1933) method of adding sodium bicarbonate was rejected, as continuous buffering was considered to be more important than rapid neutralization, and it was thought wiser to avoid the danger of alkalosis. The milk drip was preferred to the aluminium hydroxide drip employed by Woldman (1936), as the value of early nourishment with generous supply of calories, protein, and electrolyte was felt to outweigh the dangers of promoting peristalsis.

Nature of Series

The patients comprising this series have all been admitted to one of two of a small group of regional hospitals as emergencies with haematemesis or melaena due to peptic ulceration. They constitute the entire admissions of such cases in the group during the period between the summer of 1950 and the winter of 1953-4. In assessing the mortality no exclusions have been made for related deaths or the late complications of surgery. The proportion of peptic ulcer patients among the overall cases of haematemesis of the group is shown in Table I. The sex incidence, ulcer site, and mortality are shown in Table II.

TABLE I.—Total Emergency Cases of Haematemesis or Melaena During Same Period

Peptic ulcer	153
Carcinoma of stomach	8
Cirrhosis of liver	6
Oesophageal varices	1
Telangiectasis	1
Haemophilia	1
Uraemia	1

As the majority of patients were treated by the continuous intra-gastric milk drip after the summer of 1951, and the accuracy of the diagnostic indexing could not be ensured before the summer of 1950, the control group is a much smaller one.

Table III shows the distribution of the age groups and compares the mortalities with those of Cullinan and Price (1932) and Avery Jones (1943).

TABLE II.—Sex Incidence, Site, and Mortality

	Conventional Therapy and Early Feeding			Milk Drip			
	M	F	Total	Deaths	M	F	Total
Duodenal ulcer	17	7	24	1	51	15	66
Gastric ulcer	5	3	8	2	10	2	12
Gastric and duodenal ulcer	1	—	1	—	—	—	—
Acute lesion	7	11	18	1*	12	6	18
Stomal ulcer	2	—	2	—	—	—	—
Oesophageal ulcer	—	—	—	—	1	—	1
Total	32	21	53	4 (7.5%)	76	24	100

* Acute gastric erosion. † Acute gastric ulceration.

TABLE III

Age	Cullinan and Price (1932) (Haematemesis Only). Restricted Fluid Intake. Occasional Small Transfusions		Avery Jones* (Haematemesis Only). Generous Feeding—Witts's Regime. Adequate Drip Transfusion		Present series, 1951-3 (Haematemesis and Melaena). Continuous Milk Drip. Generous Feeding. Adequate Drip Transfusion	
	No.	Deaths	No.	Deaths	No.	Deaths
10-19	1	0	0	0	2	0
20-29	12	0	4	1	10	0
30-39	15	3	13	0	16	0
40-49	29	6	28	0	23	0
50-59	37	6	40	2	20	1
60-69	11	4	31	6	19	4
70-79	0	0	7	1	8	2
80+	0	0	3	0	0	0
Total	105	19	126	10	100	7

* Avery Jones excluded melaena alone from his figures for better comparison with Cullinan and Price's series. Our numbers are no larger enough to make this worth while. Of our patients 27% were over the age of 60 and 47% over the age of 50. There were no deaths below the age of 52 and only one below the age of 60.

Analysis of Deaths.—In Table IV summaries of the seven fatal cases in the 100 drip-treated patients are given. In two cases death was directly due to haemorrhage. In two it was due to conditions associated with the management of the haemorrhage, and in three to later complications of surgery.

TABLE IV.—Analysis of Deaths

Age and Sex	Type of Ulcer	Operation	Day of Opn.	Cause of Death	Day of Death	Comments
M 52	G.U.	None		Haemorrhage	3rd	Sudden collapse. Necropsy: ruptured aneurysm of splenic artery in base of ulcer
M 67	D.U.	"		"	2nd	Necropsy: chronic nephritis, prostatic hypertrophy, hypertensive heart disease, duodenal ulcer
F 62	Acute G.U.	"		Pulmonary oedema	1st	Necropsy: aortic stenosis, acute pulmonary oedema, acute gastric ulcer
M 71	D.U.	Gastrectomy. Further opn.	1st 4th	Haemorrhage Duodenal fistula and peritonitis	5th	Haemostasis not secured at first operation
M 70	D.U.	Gastrectomy	2nd	"	24th	"
M 63	D.U.	"	14th	"	23rd	"
F 60	D.U.	"	6th	"	12th	"

Duration of Bleeding.—Fig. 2 is an assessment of the presence of occult blood in the stools (estimated in the laboratory by the benzidine test and in the ward by Gregerson's modification of it). A larger proportion in the continuous milk-drip group than the control group stopped bleeding between the 5th and 10th day, whereas the peak in the conventionally treated group was between

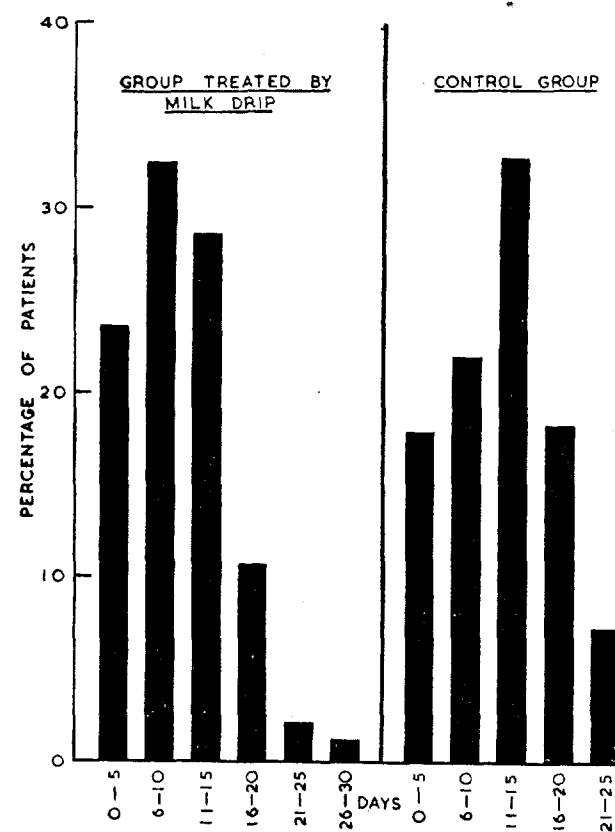


FIG. 2.—Showing duration of occult blood in stool.

the 10th and the 15th day. Turnbull and Sagi (1939) and Meulengracht (1934) have claimed earlier cessation of bleeding in groups of patients treated by initial feeding.

Recurrences.—At first sight the drip-treated group, though twice the size of the conventional one, gave rise to only six more recurrent bleedings. This figure is unconvincing when allowance is made for eight of the recurrences in the conventional group having occurred in one patient. If this patient is excluded one is unable to demonstrate a reduction in the number of recurrent bleeds in hospital as a result of drip treatment. Nevertheless it can be stated that to have more than two recurrences was exceptional in these 100 patients. The one with four recurrences had a deep penetrating posterior gastric ulcer, and his operation was deferred because of auricular fibrillation and congestive heart failure. Despite these handicaps he survived on medical treatment. The patient with eight recurrences in the conventionally treated group was bleeding from multiple gastric erosions, and died.

TABLE V.—*Recurrent Haemorrhages in Hospital*

	No. Treated	No. of Recurrences						Total
		1	2	3	4	5	6	
Conventionally treated	53	6	2	1	1	1	1	9 (21)
Drip treated	100	8	6	1	1	1	1	16 (27)

Patients' Views on Treatment

Few patients objected to the technique. Those who had had previous treatment of haemorrhage preferred the milk drip, particularly if the former treatment included a few days of restricted diet. They looked and felt confident and reassured on their second day. Confidence was often enhanced by seeing others in the same ward undergoing the same type of therapy. Some complained of mild nasal irritation and soreness of the throat, not severe enough to warrant discontinuation of treatment. By the end of the

first week this complaint became more frequent, and at this time it was usual to discontinue the drip but to maintain it at night for a further week. If there had been recurrent bleeding or if occult blood persisted in the stools the drips were continued for longer periods.

Patients could tolerate the drip for periods of six weeks. A few, asked to write down their impressions, even referred to a soothing effect of the steady flow. One man and one woman objected initially: the woman had objected to other forms of therapy; the man was old and querulous at 71 years. Two other women would not have the tube replaced after the fourth or fifth day. One of these had three recurrent bleeds but could not be induced to change her mind.

Views of Medical Attendants on Treatment

The doctors and nursing staff were impressed by the apparent well-being, reassurance, and confidence of the 84 patients out of the 100 who did not bleed again or who were not moribund on admission. The patients were propped up on the second day, taking generous meals in addition to the milk drip, looking and feeling comfortable. Sweating and anxiety were the exception, pulse and blood pressure had usually been restored. Their condition was in notable contrast to that of patients treated by initial starvation, and a further improvement on the state of those treated by early feeding without continuous milk drip. The 16 who bled again were more distressed, as the rejection of their tube with a bloody vomitus, sometimes repeated, would impair confidence. Nevertheless eight of these resumed their drip and progressed steadily to recovery. Some of the patients' minor discomforts might have been relieved by the use of the latex tube, advocated by Woldman (1936). It is unfortunate that the treatment is difficult to establish in elderly people with early recurrent haematemesis, as the danger lies with this group.

In only one patient, a man with an aneurysm of the splenic artery in the base of a large gastric ulcer, who died suddenly with massive bleeding, may the use of the tube have aggravated the haemorrhage.

Conclusions

The results are given of the treatment of 153 ulcer patients admitted to hospital as emergency cases for haematemesis or melaena. Of these, 100 were treated with a continuous intragastric milk drip given from the time of admission, and 53 were treated as a control group by one-hourly milk feeds and early generous step-up regimes. The drip-treated group received purées from the first or second day. Both groups were adequately transfused. The therapy does not prevent the occasion for surgery with continued bleeding in old people, nor has it so far produced a fall in the mortality of this group.

There was a tendency to diminished duration of bleeding in the drip-treated group. More than two recurrent bleedings in hospital were very uncommon in this group, but the numbers of recurrences under treatment do not differ significantly in the two groups.

The drip-treated group displayed earlier reassurance, confidence, and freedom from shock than the control.

Continuous milk-drip therapy for peptic ulcer haemorrhage can be carried out in hospital for periods of two or more weeks without inconvenience to the patient.

It can be affirmed that this is a safe treatment comparable in results to one-hourly feeding and transfusion regimes.

We would like to express our thanks to Dr. C. N. Armstrong for permission to include in the present series patients admitted under his care at the Queen Elizabeth Hospital, Gateshead.

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STANDARDS OF FITNESS AMONG DRIVERS OF COMMERCIAL VEHICLES

A SOCIO-MEDICAL INVESTIGATION BASED ON WARTIME RECORDS OF CIVILIAN MEDICAL BOARDS

BY

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A recent lecture by the senior medical officer of the London Transport Executive describes in detail the steps taken to ensure that the drivers of London's motor-buses are healthy when recruited and maintain a satisfactory standard of fitness throughout their period of service (Norman, 1954). This leads one to consider what comparable steps are taken with reference to other professional drivers. So far as public service vehicles are concerned, the precautions taken seem to be adequate. The licensing authority, before granting permission to drive a bus or a coach, requires the applicant to have a general medical examination (including tests of vision) and to pass a special driving test. Many of the larger bus companies, including London Transport, conduct their own medical examinations and have even higher standards of vision and health than the statutory licensing authorities.

In contrast, no medical test is required of drivers of commercial vehicles, and inquiries into their fitness to drive are both limited and ill-defined. Whatever the type of vehicle may be—and it may be anything from a three-wheel van to a five-ton lorry—the applicant for a licence has merely to answer four questions regarding the state of his health and declare the answers to be true. The four questions (which appear on all driving licence forms) are well known:

1. Do you suffer from epilepsy or from sudden attacks of disabling giddiness or faintness?
2. Can you read at a distance of 25 yards in good daylight (with glasses if worn) a motor-car number plate containing six letters and figures?
3. Are you without either hand or foot or are you suffering from any defect in movement, control, or muscular power of either arm or leg?
4. Are you suffering from any other disease, mental or physical, or disability which would be likely to cause the driving by you of a motor-car to be a source of danger to the public?

Question 2 is checked by the examiners who conduct the official driving tests. They would presumably also notice so gross a defect as absence of a limb. Otherwise

*In receipt of a grant from the Medical Research Council.

the physical competence of an applicant for a driving licence depends on his truthfulness, his knowledge of his own health, and the construction he puts on the phrase "likely . . . to be a source of danger." Medical men frequently experience difficulty in convincing patients that they are no longer fit to drive, and know that (if they choose) even persons who are obviously a danger to the public can ignore their advice.

At a meeting of the Royal Society of Medicine a doctor stated that one of his elderly patients "who drove a high-powered car at reckless speed" was extremely annoyed at the advice that he should give up driving after he had had three blackouts in one year and had been found to have developed petit mal (Crosby, 1953). On another occasion, a neurologist deplored the number of epileptic and paralytic patients who drive cars, and added, "The patient in every case considers himself entirely fit to drive" (Campbell, 1952).

Present Investigation

To amplify the evidence of these isolated instances the civilian medical board records of 1,276 men who earned their living as drivers of road vehicles were scrutinized. The records, which were compiled during the years 1941-4, were drawn from three areas† and referred to 761 lorry drivers, 406 drivers of vans or other light commercial vehicles, 31 drivers of public service vehicles, and a miscellaneous group of 78 chauffeurs, drivers of ambulances, and A.A. men.

TABLE I.—*Professional Drivers of Road Vehicles*

Reasons for Rejections	Lorries	Vans	P.S.V.	Other	Total
Eyes:					
High myopia	3	4		1	8
Pathological defects	2				2
Ears:					
Defective hearing	5	2			7
Pathological conditions	6				6
C.N.S.					
Epilepsy + unconsciousness	3	1		1	5
Neurological conditions		2			2
Mental defectiveness	4				4
Mental instability	3	3			6
Skeletal:					
Upper limbs	3	3		1	7
Lower limbs	12	9	2	4	27
Other skeletal defects	3	2		1	6
Cardiovascular:					
Heart disease	11	4		1	16
Hypertension	2	2		3	7
Varicose veins	7	2			9
Lungs:					
Tuberculosis	5	10	1		16
Chronic chest conditions	6	5			11
Abdominal:					
Peptic ulcer	10	9		1	20
Hernia	7		1	1	9
Other		1			1
General:					
Diabetes	2			1	3
Other endocrine disorders		2			2
Skin conditions	2				2
Other	5	1		1	7
All disabilities	101	62	4	16	183
No. of men examined	761	406	31	78	1,276
Rejection rate	13%	15%	13%	20%	14%

Of these 1,276 men, 28% were under 20 years of age, 43% were between 20 and 34, and 28% were between 35 and 45. At the end of the medical examination each man was graded according to his general standard of fitness. Briefly these grades were: (1) fit for all forms of military service; (2) minor or remediable defects; (3) fit for light duties only; and (4) not fit for any form of military service. In practice men in Grades 1 and 2 were called up for national service, and men in Grades 3 and 4 were rejected. Ninety-nine of the professional drivers were placed in Medical Grade 4 and 83 in Medical Grade 3, making a total rejection rate of 14%. The main reason for down-grading was identified in every case, and the results are summarized in Table I.

†Essex, 577; Leicester, 273; Northampton, 426.

Needless to say, the records of the men who were rejected did not specifically state that the examinees were not fit to drive. It is apparent, however, from what was discovered at the civilian medical board examination that the four questions on the standard driving licence form had, either intentionally or from lack of medical knowledge, been incorrectly answered by several men. Thus question 1 (epilepsy) should have disqualified 5 of the group, a further 49 were either unaware that they had defective eyesight or had chosen to hide the fact, and 34 had failed to state that they were suffering from defects of "movement, control, or muscular power" (provided, that is to say, none of the men were holders of "cripple" licences).

The fourth question on the driving licence form is extremely difficult for anyone to answer correctly. For, besides assuming a lively social conscience on the part of every applicant, it demands much more medical knowledge than most people possess. Even members of the medical profession are not unanimous about which diseases should be described as "likely to cause the driving of a car to be a source of danger to the public." Dr. Norman, for instance, considers that any condition that may cause either momentary attacks of unconsciousness or giddiness, or increased liability to fatigue, is potentially dangerous. If this is the standard of health expected for all professional drivers of road vehicles, then none of the national service recruits should have been holding a driving licence. For, whatever the nature of their complaints, the fact that they had (in the middle of a war) been found unfit to serve in the armed Forces was a sure indication that they at least suffered from "increased liability to fatigue."

If, however, a lower standard of health is acceptable then an arbitrary selection of the diseases which apply to the fourth question would have to be made. If, for instance, it is considered that only pathological conditions of the eyes, deafness, mental defectiveness, and instability, neurological disorders, diabetes, and cardiovascular diseases (other than varicose veins) are "likely . . . to be a source of danger to the public," then only 53 of the 172 men who were rejected need have answered the fourth question in the affirmative. Even so, the total number of drivers who fell below the (presumed) standard of fitness for holders of ordinary driving licences would be 143, or one in eleven of the total group.

Vision (Table II)

Included in the civilian medical board examination was a vision test, based on the well-known Snellen type, and performed, if necessary, with or without spectacles. An

TABLE II.—Visual Standards Among 1,276 Professional Drivers

Below Standard Required for	Lorry	Van	P.S.V.	Other	Total
P.S.V. licence*	31	15	—	3	49†
L.T.B. (re-employment)‡	66	28	1	4	99
L.T.B. (initial employment)‡	103	63	4	8	178
	13.5%	15.5%	16.1%	19.3%	14.0%

* That is, Snellen type 6/12: 6/36, or ability to read a motor-car plate at 25 yards.

† Including 8 men with severe myopia (6/60 both eyes) and 22 who were blind in one eye.

‡ The corresponding figures include men who would have failed the easier tests.

ophthalmologist's report was obtained in all cases of eye disease and for all men whose corrected vision failed to reach either 6/12:6/12 or 6/6:6/36 Snellen type. Some of the drivers with defective vision did not wear spectacles and others were not fully corrected by the spectacles they were wearing. Thus there were three men with 6/60:6/60 who had no spectacles, four who had 6/60:6/36 after correction, and four whose good eye could not be improved beyond 6/24. The overall rate for standards below the one regarded as safe for driving was 3.8%.

The standards of vision required by the London Transport Board at their initial and re-employment examinations are respectively 6/9:6/12 (without spectacles) and 6/9:6/36

(with spectacles). This means that 178, or 14%, of the men examined by the civilian medical boards would not have obtained employment as a London bus driver and 99, or 8%, would, in spite of being experienced drivers, have been transferred to other jobs.

Types of Vehicles.—The all-causes rejection rate was highest for the miscellaneous group and lowest for the drivers of public service vehicles, but the difference between these men and the group of lorry drivers was marginal. Failure to reach the licensing authority visual standard was roughly the same for lorry drivers, van drivers, and men in the miscellaneous group, but there were no drivers of public service vehicles with vision below 6/12:6/36.

Accidents Due to Commercial Vehicles.—For the two years 1948 and 1949 the Registrar-General has analysed 7,999 deaths on the road by victim and vehicle involved (Registrar-General, 1950, 1951). From this analysis it appears that the number of pedestrians and pedal-cyclists killed in road accidents was 5,541 (see Table III). Of these,

TABLE III.—Analysis of 7,999 Deaths on the Road by Victim and by Vehicle Involved

Vehicles involved, other than that carrying Victim	Victim was:							Total of First 3 Col.
	On Foot	On Pedal Cycle	On Motor-Cycle	In Private Car	In Bus	In Motor Goods Vehicle	In Other Type of Vehicle	
Goods transport vehicle*	1,568	471	375					(2,414)
Bus, tram or train	702	167	72					(941)
Private car	1,190	394	245					(1,829)
Motor-cycle	247	35	42	326	19	137	125	(324)
Pedal-cycle	164	37	24					(225)
Coaches and taxis	129	29	16					(174)
Other vehicles	63	13	27					(103)
No other vehicle	—	332	477	179	142	247		(809)
Total	4,063	1,478	1,278	505	161	384	125	(6,819)

* In 1954 there were 945,127 licences issued for goods transport vehicles.

2,039 were knocked down by goods transport vehicles, 809 by buses or trams, and 158 by coaches or taxis. Thus, in more than half of the pedestrian and pedal-cyclists' deaths, the mechanically propelled vehicle was in charge of a professional driver.

Discussion

Compared with men in other occupations, the percentage of physically defective drivers is slightly below average (Stewart, Webb, and Hewitt, 1955). But, considered in relation to the number of licences issued annually to goods transport vehicles (just under one million in 1954), it suggests that there are—not counting private-car owners—a formidable number of potentially dangerous drivers on the roads. It is possible that some of the men who were examined by the civilian medical boards had applied for, and been given, the special licences issued to physically defective people. There may also have been a number of cases where driving experience outweighed other deficiencies, for opinion varies on how much different defects affect a man's competence as a driver. Nevertheless, the fact remains that the final decision in this matter rests not on an unbiased assessment of fitness, but with the man who is applying for a licence. Whether or not he passes as fit depends entirely on his veracity, his self-knowledge, and his ability to answer certain difficult medical questions. In these circumstances there is nothing to prevent a man with a serious defect (or vision that has deteriorated to danger levels since he first passed his driving test) from driving a heavy lorry to the public danger. Civilian medical board records support the view that this source of public danger actually exists.

Viewed from the angle of road safety, we cannot afford to be complacent about the fact that the percentage of physically defective men who earn their living as drivers is not exceptionally great. There should be no such men.

Those interested in reducing the appalling number of deaths on the road might do well to press for a radical revision of the present system of granting driving licences to professional drivers.

Summary

Civilian medical board records of 1,276 professional drivers were examined for causes of rejection from military service. Physical defects and impairment of vision found were considered in relation to the declaration of physical fitness made on the application form for a driving licence.

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HYDROCORTISONE OINTMENT IN THE ECZEMAS

BY

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Cortisone has been used with dramatic effect in diseases of the skin. Unfortunately, the side-effects of cortisone therapy are hazardous and limit its use in dermatological practice to potentially fatal illnesses such as pemphigus, disseminated lupus erythematosus, and exfoliative dermatitis. The local application of cortisone has little or no anti-inflammatory effect on the skin, though it has been of value as an ophthalmic application, being readily absorbed through the conjunctiva.

Hydrocortisone has been found to exert anti-inflammatory effects when applied to the skin as well as when administered systemically. No systemic effects have been reported in the hundreds of patients who have used hydrocortisone ointment, and Smith (1953) found no significant change in the circulating eosinophil count when ointment containing 150 mg. of hydrocortisone was applied to normal or diseased skin.

Literature

Sufficient reports on the use of hydrocortisone ointment have been published for some assessment of the type of case in which it is of most value. With one exception (Goldman and Preston, 1953) the accounts have been enthusiastic.

There is general agreement that the ointment is of no value in psoriasis, lichen planus, pemphigus vulgaris, generalized exfoliative dermatitis, and alopecia areata. Evidence of the response of chronic discoid lupus erythematosus is conflicting; Sidi and Bourgeois-Gavardin (1953) report improvement or healing in seven cases, while Sulzberger *et al.* (1953) found only slight improvement in one of five cases, and other observers have observed the same lack of response.

The effect of hydrocortisone ointment in atopic eczema has been extensively studied (Sulzberger and Witten, 1952; Sulzberger *et al.*, 1953; Robinson, 1953; Sidi and Bourgeois-Gavardin, 1953; Malkinson and Wells, 1954; Witten *et al.*, 1954), and the results have shown a remarkable uniformity, about two-thirds of the cases responding in each series. McCarrison (1954), in a series of 104 cases, obtained even

better results and records a good response in each case. Most observers found that response was apparent within a week and that benefit was sometimes visible within 24 to 48 hours from the beginning of treatment.

Several series were controlled by the use of the "symmetrical paired comparison" method, and it was noted that some improvement often occurred on the side of the body on which the inert ointment was used. Also in cases using hydrocortisone on one area only, improvement was observed in remote areas. Systemic absorption or contamination with hydrocortisone has been suggested as the cause, but a more likely explanation is the "sympathetic" improvement which is also seen with other forms of local treatment.

McCarrison found that 60% of cases of atopic eczema maintained improvement on stopping treatment, but others (Robinson, 1953; Malkinson and Wells, 1954) have observed a relapse in most cases, or even an exacerbation.

The treatment has been found most effective in eczema or dermatitis affecting the eyelids, pinnae, and ano-genital regions (Sidi and Bourgeois-Gavardin, 1953; Alexander and Manheim, 1953; Malkinson and Wells, 1954), probably because of improved absorption from these areas. Acute contact dermatitis, lichen simplex, nummular eczema, and seborrhoeic dermatitis are also reported as responding to hydrocortisone ointment. Sidi and Bourgeois-Gavardin (1953) warn against the danger of secondary infection in acute contact dermatitis; they also state that the antipruritic effect is slight in cases in which much lichenification is present.

The American work has been criticized on the grounds that the patients were selected private patients who knew they were having some special remedy applied. In the present series the patients were hospital patients who were aware that they were receiving a special remedy, and the control cases were, of necessity, under a similar impression. Those patients were selected whose diagnosis was firmly established and in whom the areas affected were not too extensive.

Method

A series of 105 cases of various types of eczema and dermatitis were treated with an ointment containing 1% hydrocortisone acetate; in a few of the more resistant cases 24% hydrocortisone was used. The base consisted of anhydrous lanolin, petrolatum, and mineral oil ("cortef" ointment).

A further 23 cases of eczema were used as controls, at the beginning of the trial alternate patients being issued with the ointment base in a similar packing and given the same instructions.

Patients were instructed to use a thin smear of the ointment twice daily, to avoid soap and water on the affected areas, and to use liquid paraffin or olive oil for cleaning.

Results

Nummular Eczema.—This was separated from other endogenous forms of eczema on account of its distinctive pattern. Of the 25 cases treated, 18 had had previous treatment with x rays and tar preparations without healing. Ten healed completely, most within one week, 11 improved but did not heal, three showed no response, and one became worse under treatment. Five cases which had healed or improved relapsed within seven to ten days of stopping treatment. Three of the 10 controls showed some improvement, and the remaining seven became worse.

Eczema.—This group contained an assortment of cases of eczema which were considered to be endogenous and which affected various areas of the body. Of the 24 patients treated, 17 had had previous treatments without healing. Eight healed completely, eight improved, three showed no response, and five became worse; one of the last-named appeared to be aggravated by the ointment. Of the six controls, one healed, two remained static, and three became worse. Half of those not responding to treatment had

eczema of the hands which involved the palmar surface, and it seems probable that lack of penetration of the thickened horny layer may have contributed to failure. In another of the failures, infection, which was present when treatment began, spread rapidly. Of the cases which improved, four relapsed within seven to ten days of stopping treatment.

Atopic Eczema.—This group comprised 30 patients varying in age from 1 year to 50 years. Twenty-five were old patients, the majority of whom had been difficult to control with the usual treatments. Three patients were treated during admission to hospital. Nine healed completely, 13 improved, six showed no response, and two became worse. Of the four controls, three showed no response and one became worse. Most of the cases which responded to treatment showed maximum improvement within a week. The more lichenified and chronic the eczema the less effective was the treatment, and in these resistant cases 2½% hydrocortisone ointment did not seem to be more effective than the 1% ointment.

Lichen Simplex.—Of the 10 patients treated, nine had very long-standing lesions which had resisted the usual occlusive and x-ray therapies. Three healed completely after three to four weeks of treatment, and have remained healed. Three improved and gained relief from itching, but despite the use of 2½% ointment their lichenified patches remained, to be scratched again when treatment ceased. Four showed no response to 2½% ointment. Of the three controls, two became worse and one remained static.

Contact Dermatitis.—Six new cases of acute and weeping contact dermatitis were treated. All were due to medications. One did not respond. Improvement in the others was dramatic, the lesions drying and subsiding almost completely within two to three days.

Pruritus Ani.—Ten cases of pruritus ani were treated; six of them had resisted various therapies, including x rays. Four healed and remained symptom-free, four improved but did not lose all their irritation, and two derived no benefit. No controls were included in this series, and it is recognized that a fairly high proportion of these cases derive benefit from any new treatment. Nevertheless, knowing the chronic cases which admitted improvement, one is impressed with the therapeutic effect.

Comment

Improvement or complete healing was observed in 76% of the 105 treated cases and in 17% of the 23 controls. Deterioration occurred in only 7.5% of the treated cases and in 56% of the controls. It is evident that the psychological effect of the "new treatment" (packed in impressively small 5-g. tubes) was slight. Although there was an overall high rate of improvement certain conditions improved more readily than others.

Those which improved most rapidly were cases with a raw weeping skin lesion which allowed rapid absorption of the hydrocortisone. Acute contact dermatitis responded dramatically and almost healed in two or three days. Two of the treated patients presented with an acute weeping dermatitis of the face a few days before they were due to go for their summer holiday. With the usual bland applications recovery might have taken 10 to 14 days. In three days after application of hydrocortisone the rash was almost healed in each case and these patients did not miss their holiday.

A high proportion of cases of nummular eczema healed completely in a week; and here, too, the more acute and weeping the eczema the better the response. Relapse followed cessation of treatment in some cases, but application of a minute amount of ointment every day, or even every second to third day, was sufficient to prevent recurrence. In some cases healing was not complete, but hydrocortisone was useful in rapidly controlling exudation and rendering the eruption suitable for applications of tar pastes.

Patients suffering from an acute skin eruption may be prepared to endure messy applications with the prospect of recovery in sight, but the atopic eczema subject spends a lifetime fighting unpleasant attacks of eczema with almost equally unpleasant remedies. The freedom from sting, stain, and stench (as Sulzberger puts it) makes hydrocortisone a welcome treatment for the "atopic." Unfortunately the results are variable and unpredictable. Some cases healed completely in less than a week and derived complete relief from itching. Others improved more than with any other local application. Healing or improvement occurred in two-thirds of the cases treated. Those which did not respond well had very lichenified eczema that was not easily penetrated by the ointment. Patients in whom excoriations were more marked than eczema did not respond well, possibly because their scratching had become a habit. In some of the milder cases the patients still complained of itching, though the skin had apparently returned to normal; this may explain the continuation of scratching. Infection tended to be spread by the ointment, and should be regarded as a contraindication until it has been controlled by appropriate antibiotic therapy. The types of eczema outlined can easily be recognized and hydrocortisone avoided in these cases, but there remained in this series a few cases which were not improved by the ointment, though clinically indistinguishable from cases in which it worked like a charm.

Most cases of atopic eczema relapsed when treatment was stopped. It has been suggested that 2½% hydrocortisone ointment may be useful for controlling the eczema and that 1% can be used for maintenance therapy. In this series it was found that cases either responded to 1% ointment or not at all. Maintenance therapy is possible, but may prove expensive when large areas are affected. Once the rash was controlled the patient could revert to the usual tar applications with every hope of maintaining improvement; only when treatment was stopped completely was there a severe relapse. It seems likely that hydrocortisone may prove most useful as something on which the atopic eczema subject can rely to control the exacerbations to which he is so prone. The very knowledge that he has this weapon available will probably make its use less often necessary.

In other cases of localized areas of eczema the results depended largely on the site and nature of the eruption, raw and exuding areas responding well to treatment and lichenified chronic cases deriving little benefit. Eczema of the hands which involved the palmar surface responded poorly, presumably because of lack of penetration of hydrocortisone through the thickened horny layer.

Similarly, lack of penetration probably explains the poor results in lichen simplex. The 2½% ointment was used on all cases, and treatment was maintained for three to eight weeks, but only 30% of the cases healed.

In pruritus ani the degree of improvement depended on the extent and nature of the perianal dermatitis. Those patients with an active eroded and excoriated eruption experienced rapid relief, which in several chronic cases proved lasting. Those with much lichenification derived some relief from itching but did not heal. Persistent cases with intractable itching but with little or no abnormality of the skin did not respond to hydrocortisone therapy, presumably because the site of origin of their irritation was in the head rather than the seat.

From these results it is evident that hydrocortisone is not the complete answer to the treatment of eczema and dermatitis. It is, however, a potent weapon whose value can be compared to that of x-ray therapy, provided that it is used with the same circumspection.

Summary

A series of 105 cases of eczema and dermatitis were treated with 1% and 2½% hydrocortisone ointment. A further 23 cases were treated as controls with an inert ointment. Improvement or healing occurred in 76% of the treated cases and in 17% of controls.

Response appeared to depend on the ease of absorption of hydrocortisone, eroded and exuding eczema and dermatitis healing rapidly, while lichenified eczema showed little improvement.

Good results were obtained in acute contact dermatitis, nummular eczema, atopic eczema, and perianal dermatitis. Lichen simplex, lichenified atopic eczema, and lichenified cases of ano-genital pruritus responded poorly. Infection was spread by the ointment unless controlled before its use.

Relapse occurred in many chronic cases on stopping treatment, and could be prevented by using the ointment less frequently as maintenance therapy or by reverting to the use of tar applications.

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A SEARCH FOR ABNORMAL HAEMOGLOBINS IN SOME SOUTHERN SUDANESE PEOPLES

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Sickle-cell Tests

Nilotic peoples are found in two main areas—the southern Nilotes in Uganda and round the eastern shores of Lake Victoria, the northern Nilotes in the Southern Sudan. During the course of investigations among the northern Nilotes of Upper Nile Province, Sudan, the blood of a large number of individuals was examined for sickling. Some specimens were sent to laboratories for testing; in London, where positive specimens from West Africa could be used as controls, 344 specimens were tested, 83 by one of us (H.L.) and 261 by Dr. J. N. M. Chalmers, of St. George's Hospital; in Khartoum 215 were examined by Professor Dean Smith of the Kitchener School of Medicine.

These specimens were obtained from unrelated adult individuals; details of the sampling methods employed are given elsewhere (Roberts, Ikin, and Mourant, 1955). In the field, testing was largely restricted to specimens from children, 10 adults and 170 children of all ages being examined by D.F.R.; these children constituted the major part of the child population of one Dinka and two Shilluk villages, and the individuals from each village were therefore not all unrelated. As regards technique, in London and in the field, 2% solutions of potassium

metabisulphite were used, freshly made up on each occasion with distilled water; in Khartoum, each specimen was carefully enclosed bubble-free under a cover-slip ringed with petroleum jelly, and examined after 24, 48, and 72 hours.

Altogether specimens from 739 individuals were examined, representing the different indigenous peoples as follows:

People	Adults	Children
Northern Dinka	217	103
Shilluk	204	67
Nuer	100	
Mabaan	34	
Dinka/Shilluk/Nuer-hybrids	14	

Since in no individual of this large sample was the sickle-cell trait observed, it is concluded that the absence of the trait is a characteristic typical of the northern Nilotic peoples. This finding is similar to that of Foy *et al.* (1954).

Examination by Electrophoresis

Seventy-five specimens were further examined by paper electrophoresis according to the procedure described by Lehmann and Smith (1954). Of these, 64 specimens were from northern Dinka individuals, 4 were from Mabaan, 3 were from Dinka/Nuer hybrids, and 4 from Dinka/Shilluk hybrids.

All blood specimens contained nothing but normal adult haemoglobin. No haemoglobin S (or D), C, E, or G was found. The results of this survey are in striking contrast to those obtained in the Gold Coast (Edington and Lehmann, 1954a, 1954b), where out of 211 West Africans examined 41 were found to possess haemoglobin S, 29 haemoglobin C, and 1 haemoglobin G. On the other hand, in Tanganyika (Dar es Salaam) 100 out-patients of mixed tribal origin but mainly Bantu were recently examined by us through the kindness of Dr. Mackey; although 12 individuals with a haemoglobin showing the electrophoretic properties of S were noted, no haemoglobin C or any of the other known variants was found.

Discussion

In several recent publications the view has been advanced that the sickle-cell gene provides an example of balanced polymorphism in man. Neel (1953) discussed the possibility that the balance was attained through increased fertility on the part of the heterozygote. Allison's (1954a, 1954b, 1954c) experiment in Kampala, and his examination of the geographical distribution of the sickle-cell trait in East Africa, with high and low frequencies respectively confined to endemic and non-endemic malarious areas, provide some evidence, implementing that of Brain (1952), Mackey and Vivarelli (1952, 1954), and others, that possession of the trait confers selective advantage in malarious regions. He postulates a condition of balanced polymorphism, selection acting against the sickling homozygote through sickle-cell anaemia, against the non-sickling homozygote through malarial susceptibility, the heterozygote, however, being at an advantage over both homozygotes through the protection afforded by the sickle-cell trait against malaria, especially subtertian.

The role of malarial endemicity in determining sickle-cell frequency once the gene is introduced, however, should not be exaggerated. Many tribal areas are not sufficiently local in extent to be assigned to a single category of endemicity: the range of flight of the mosquito may admittedly be greater than the limit of several hundred yards generally quoted; but it is essentially local, and many "hyper-endemic" tribal territories must consist of intensely malarious and less malarious districts. Hence differences in selection pressure will occur within the territory, and if mating tends to be to any extent local differences in gene frequency will result. The actual value found for any sample will depend on a combination of social and ecological factors, the mating system of the people, the

length of time their economy requires individuals to spend in malarious areas, and the intensity of malarial infection in those areas. From these considerations it would seem that Allison's (1954b) attempt at a geographical analysis by means of a simple table is not sufficiently detailed to be convincing. Nor should the degree of selection pressure be overestimated. If, as is generally recognized (Taliaferro, 1949), malarial immunity is of two types, innate and acquired, then presumably the hypothetical immunity given by the sickle-cell trait falls into the former category. Is the non-sickling homozygote in endemic areas not protected to some extent by acquired immunity? Too little attention has been given to established work on malarial immunity during recent developments in this field.

Undoubtedly the functional approach to the problem of the sickle-cell trait represents a stimulating advance on the purely descriptive. The unequivocal establishment of this first example in man of balanced polymorphism would represent a considerable advance in anthropological theory. Hence the importance of clarifying the several points weighing against outright acceptance of the hypothesis in its present form.

As Edington (1953, 1954) and Lehmann (1954) have pointed out, the assumption that the simple homozygous theory of the inheritance of sickle-cell anaemia is correct remains difficult to accept completely. There are other factors to be considered; for example, those relating to the proportions of different haemoglobins such as are noted above, of which little is yet known. Certainly in areas where haemoglobin C exists, sickle-cell crises must occur in individuals heterozygous for S and C; and malarial infection, since it may precipitate such crises, may thereby adversely affect the proportion of heterozygotes. Some advantage of the non-sickling homozygote over sickling individuals could indeed be postulated to explain the several studies noted by Neel (1950), in which the sickle-cell frequency appeared to diminish with age, though other explanations can be advanced.

The assumption that malarial susceptibility is proportional to malarial mortality is not necessarily correct. As regards the demographic situation, Christophers (1949) concluded that in indigenous tropical populations "no obviously greater infant and child mortality rate accrues under hyperendemic conditions [of malaria] than is generally normal apart from malaria."

Neither Moore *et al.* (1954), in two samples, nor Edington (1954) in two samples, have been able to confirm any association between parasite rate and sickling such as is claimed by Allison (1954a) on a barely significant test of data relating to Baganda children; nor does either of Beet's (1946, 1947) investigations show any significant association; when the aggregate of the seven sets of data published by these authors is considered no significant relationship emerges. It should be pointed out that the χ^2 values given by Allison (1954a), if calculated by recognized procedures, are all incorrect; using Fisher's method with Yates's correction for continuity, χ^2 values of 1.64, 3.64, and 4.05, each with one degree of freedom, should replace those of 19.3, 4.1, and 5.1 calculated by Allison. In Raper's (1954) recent sample of 1,675 children, among those in the second year of life there was a significantly lower malarial rate in sicklers, but at no other age nor in the whole series was this association shown. It appears, then, that sickling has no effect on parasite rate in adults, though it may have an effect during a very limited period in early infancy. It is thus difficult to accept without further confirmation Allison's results on Luo adults, where in only 2 out of 15 adult sicklers, but in 14 out of 15 adult non-sicklers, malaria parasites were observed after repeated artificial inoculation. On each of the above points the evidence is unfortunately limited.

The findings reported here concerning the northern Nilotes, however, are not equivocal. Among the Shilluk, Dinka, and Nuer, by reason of their ways of life and the nature of their habitats, malaria is endemic. The Shilluk are a riverain people; they make more use of the rivers for

purposes of communication than do the Dinka: most of their villages are within a few hundred yards of the river, and a number are actually at the waterside. Most Dinka and Nuer spend the dry season by the rivers, and the wet season, when swamps abound, in inland villages. Malaria incidence would be expected to be at its lowest for the Dinka in the early dry season when the swamps inland have dried but immediately before the depletion of water in their wells, waterholes, and "hafirs" (waterholes of human construction) necessitates the movement of cattle and humans to the rivers. In a Dinka inland village, during the week before the move to the riverside cattle camp, out of a total village population estimated at 350, 11 individuals (3.1%) were seen to be suffering from a fever seemingly malaria, which responded to treatment with mepacrine; from only one of these individuals, unfortunately, could blood smears be obtained, in which instance M.T. rings were observed.

In the absence of published data concerning malaria in these peoples, the opinions of two authorities are quoted. Professor P. C. C. Garnham, of the London School of Hygiene and Tropical Medicine, states (personal communication) that "there is no doubt that the malaria incidence is very high in the Southern Sudan near Malakal." Dr. G. J. Clark, Province Medical Inspector, Malakal, states (personal communication) that new cases attending the out-patient department of Malakal Hospital for the year 1953-4 included 2,605 malarial cases, some 2% of the total, though many more were diagnosed as malaria which were either not proved or were probably relapses; that the majority of proved cases were *P. falciparum*, there being 2,488 positive M.T. slides; that malaria is endemic in the Malakal region; and that its incidence is reckoned to be greater than in the Nile region of Equatoria Province (where considerable frequencies of the sickle-cell trait occur).

Hospital figures are of course not representative of these primitive populations, since only a small proportion of individuals ever reach hospital; malarial cases are adequately treated at the outlying dispensaries, whereas more serious cases are sent to hospital; yet in the majority of many villages visited during the present investigation clinical malaria appeared to be the most frequent complaint. Thus all the evidence points to a high malarial endemicity in the region. This group of northern Nilotes, then, provides one exception to Allison's statement that "the world distribution of the trait is also in accordance with the view presented"—namely, the relationship of the sickle-cell trait to malarial endemicity. There are other exceptions. The sickle-cell trait is absent from aborigines of Malaya despite the high malarial incidence (Polunin, 1953); and the trait is virtually absent in the Union of South Africa. Budtz-Olsen and Burgers (1955) have tabulated surveys of nearly 6,000 Africans from that area, and have pointed out that at least in Zululand malaria has been present for generations.

Anthropological Interpretations

The differences noted here between West Africans and Nilotes in frequency of abnormal haemoglobins other than S suggest that further investigations may yield information of considerable anthropological interest. Haemoglobin E, for example, first found in a child of an Asian father (Itano *et al.*, 1954), has also been found in Siamese (Chernoff *et al.*, 1954) and in the Veddas of Ceylon (Graffe *et al.*, 1954), but not in the limited number of Africans so far examined.

As regards S haemoglobin, the present unresolved state of the hypothesis of marked association between sickling and malaria necessitates dual attempts at anthropological interpretation of the sickle-cell findings of the present survey.

If the hypothesis of balanced polymorphism associated with malaria is correct, then with this observed incidence of malaria the sickle-cell trait ought to be present among the northern Nilotes. To explain its absence, two suggestions may be offered. There may be insufficient malarial

mortality of the non-sickling homozygote in these peoples to raise the frequency of the gene if introduced—that is, there may be other genetic factors besides sickling which protect against death through malaria. Alternatively, the gene may never have been introduced (by mutation or intermarriage with individuals from populations possessing the sickle-cell) among the northern Nilotes. Had they received it, then selection would have increased its frequency to that at which equilibrium occurred, its diffusion among these peoples being broadened by their mating systems: the increase in gene frequency would have been rapid at first, since its introduction would presumably be in the heterozygous condition, matings between heterozygotes would occur much more rarely than between heterozygote and non-sickling homozygote, and the sickling homozygote would therefore in the initial stages very rarely be produced; loss of the gene in appreciable quantities would only occur after its frequency had reached such a level that heterozygotes were mating.

The finding by Foy *et al.* (1954) of the sickle-cell trait in one or two individuals among the southernmost groups of the northern Nilotes suggests that the gene is only now beginning to enter this region from the south. Certainly such Shilluk as migrated to their present territory from the south could not have brought the gene and subsequently lost it. Nor could the southward-moving Lwo groups, who according to Crazzolar's reconstruction of traditions subsequently became the peoples known to-day as the central and southern Nilotes, have taken the gene with them when they diverged from the northern Nilotic peoples. Since the southern Nilotes now possess the trait in appreciable frequencies (Lehmann and Raper, 1949; Foy *et al.*, 1954; Allison, 1954b), they must have received it at a date later than that at which they diverged from the northern groups.

If, on the other hand, the postulated selective advantage under malarial conditions of the sickle-cell trait should prove to be more apparent than real, then the presence of the trait among the southern Nilotes would seem to be due to hybridization with peoples of high sickling frequency in the areas to which they wandered. On this hypothesis, the alternative explanation for the difference in sickling between northern and southern Nilotic groups—that a northward-moving Shilluk group possessing the gene interbred with non-sickling groups in their new territory, with subsequent dilution of the gene frequency—seems less feasible, since in this instance the gene would be expected to occur at low frequency among the northern Nilotes, which the data do not show.

The above discussion shows clearly the increase in anthropological interest that may accompany increased knowledge of a particular gene. Whatever the explanation, the sickle-cell trait to-day is a physical criterion distinguishing between the northern and southern Nilotic groups, being absent in the former and present at medium frequency in the latter. Some degree of genetic divergence is thereby implied—less if the trait is selectively advantageous, greater if it is not.

Summary

No abnormal haemoglobin was discovered by paper electrophoresis of 75 blood specimens from northern Nilotes of the Southern Sudan. In 739 specimens examined no sickling was found. These findings suggest that the association between malaria and sickling is more complex than might at first appear; their anthropological significance is discussed.

We acknowledge the practical assistance given by Dr. J. N. M. Chalmers and Professor D. Smith in the examination of the specimens; the help and interest of Professor P. C. C. Garnham and Dr. G. J. Clarke; and, in Khartoum, the technical assistance of Miss K. Dobbins and Mr. L. B. Greenhalgh through the courtesy of Professor H. V. Morgan.

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A SURVEY FOR HAEMOGLOBINS C AND D IN UGANDA

BY

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The sickle-cell trait and sickle-cell anaemia, which have long been known, are associated with an abnormal shape of the red cell at reduced oxygen tensions. In 1949, Pauling *et al.* demonstrated that the potentiality for sickling is associated with a variety of haemoglobin which differs from the normal in its electrophoretic mobility.

This sickle-cell haemoglobin was at first called haemoglobin B (the normal being haemoglobin A), but it is now generally known as haemoglobin S. In the sickle-cell trait haemoglobin S usually forms from 25 to 45% of the total haemoglobin, and in sickle-cell anaemia from 85 to 100%. The former state is regarded as characterizing persons who are heterozygous for the sickle-cell gene, and the latter those who are homozygous (Neel, 1951).

Incidence

During the course of family studies of cases of haemolytic anaemia associated with sickling, Itano and Neel (1950) found a further abnormal haemoglobin, since designated haemoglobin C. This differs in electrophoretic mobility from both haemoglobins A and S. It is not associated with anaemia in the heterozygous C/A combination. The C/S combination, however, produces a haemolytic anaemia which is in many ways similar to sickle-cell anaemia though milder in degree (Kaplan *et al.*, 1953).

The incidence of haemoglobin C in the negro population of Detroit was estimated by Lawrence *et al.* (1952) to be about 0.3%; Smith and Conley (1953) found an incidence of 1.8% in 500 unselected negroes in Baltimore, while Edington and Lehmann (1954) found it to be as high as 12% in Gold Coast Africans. A further abnormal haemoglobin has been described by Itano (1953) which has the same mobility as haemoglobin S but differs in its solubility and in that it does not cause sickling. Like haemoglobin C this haemoglobin, now known as D, will cause a haemolytic

anaemia when in combination with S. Its incidence in American negroes is not known, but it must be much rarer than C. Apart from the studies of Edington and Lehmann on haemoglobin C in persons from the Gold Coast, haemoglobins C and D have so far been described only as occurring in American negroes. The combination of the single gene for sickling and the single gene for thalassaemia can also produce a haemolytic anaemia (Powell *et al.*, 1950). Thus, of all the cases of a haemolytic anaemia with sickling that are seen in America, most are true sickle-cell anaemia, but a proportion are due to the combination of the sickling gene with some other inherited abnormality of haemoglobin synthesis.

Thalassaemia, which is readily recognizable, is not known to occur in the Africans of tropical Africa, and hence it is unlikely that there are in Uganda any cases of anaemia due to the combination of the sickle-cell gene and the thalassaemia gene. It, however, appeared possible that some of the cases of apparent sickle-cell anaemia were due to the coexistence of haemoglobin S with C or D. In order to determine this, it seemed easiest to examine only non-sickling bloods—in other words, to screen the population for possible haemoglobins C and D in combination with A rather than S and to preserve any of these bloods showing a double haemoglobin for identification elsewhere.

Method

Bloods sent in to the laboratory for routine Khan tests were used. A sickling test was done, using a 24-hour *Bact. coli* culture and reading the unsealed preparation in two hours. All sicklers were discarded except one out of each batch, which was used as a control. As much serum as possible was drawn from the clot and discarded, and, after shaking, a drop of concentrated red cell suspension was withdrawn. To this was added a drop of 0.5% saponin in watery solution to cause lysis. Paper strip electrophoresis was performed in the Shandon apparatus with the apex height adjusted to 4½ in. (11.4 cm.) instead of the standard 7½ in. (19 cm.). A barbituric acid/sodium barbitone buffer of pH 8.6 and ionic strength 0.06 was used, and, with eight strips of Whatman No. 3, each 1½ in. (3.8 cm.) wide, electrophoresis was allowed to proceed at a voltage of 90–110, giving a current of 1.5–2 mA, for 12 to 18 hours. A sickling control was included in each run. The position of the haemoglobin could readily be seen without further staining provided the solutions were concentrated enough. If there was any doubt a washed and cleared preparation was made from the original clot and the procedure repeated.

Results

Of 500 bloods examined, 250 were male and 250 female. They were almost entirely adults. The tribal composition is not accurately known but is largely Bantu, of which the majority are Baganda. There were probably some 40 to 50 Nilotics. No case was found with a double haemoglobin, and all the haemoglobins migrated with the same speed as normal adult haemoglobin.

Conclusion

In a series of 500 non-sickling bloods examined in Kampala no example of haemoglobins C or D has been found. Since, on the other hand, there is known to be a considerable amount of haemoglobin C in West Africa, it is probable that this area is the source of the genes for haemoglobin C found in American negroes. This is, in any case, the most likely source, since the slaves largely came from this area. Most, if not all, of the haemolytic anaemias in Uganda, in which sickling appears to play a part, may therefore prove to be true cases of homozygosity for the sickling gene. There remains, however, the possibility that other/modifying haemoglobins exist here which could be distinguished by properties other than electrophoretic mobility at alkaline pH.

I am indebted to the Director of Medical Services, Uganda, for permission to publish.

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Medical Memoranda

Death from Hexamethonium Ileus

In view of the increasing use of ganglion-blocking drugs in the treatment of patients with severe hypertension, this report of an avoidable death caused by one of these drugs may be of interest.

CASE RECORD

A carpenter, aged 54, was admitted to another hospital in April, 1953, in congestive cardiac failure, due to hypertension. He was discharged, improved by orthodox treatment, after three weeks.

In August, 1953, he was admitted to this hospital in a further attack of congestive cardiac failure with a blood pressure of 250/180 mm. Hg. He had now developed bilateral papilloedema with retinal haemorrhages and exudates. In view of the severe retinopathy it was decided to begin treatment with hexamethonium bromide in addition to full doses of digitalis and mersalyl.

On discharge, five weeks later, he was giving himself 280 mg. of hexamethonium subcutaneously three times daily. His blood pressure was fluctuating between 180/110 and 140/95 mm. Hg, whilst the papilloedema was beginning to regress.

At follow-up his dose was reduced to 200 mg. thrice daily, and he was advised to take 7½ mg. of neostigmine orally for his alimentary dysfunction. He took this dose for three days, when both eructation and diarrhoea ceased. However, on the fourth day he became obstructed and began to vomit, and on the fifth day he developed colicky abdominal pain. He continued to inject full doses of hexamethonium in spite of having been told to reduce the dosage if the diarrhoea or constipation should become severe. Only on the sixth day did he permit his wife to arrange for urgent readmission to hospital. He was found to be very dehydrated, with a thready, regular pulse and a blood pressure of 110/90 mm. Hg. The abdomen was greatly distended, particularly over the upper quadrants. There was some lower abdominal tenderness and guarding, and almost complete absence of bowel sounds. A radiograph of the abdomen showed gaseous distension of the small gut with fluid levels. Small amounts of gas and faeces were present as far as the hepatic flexure.

Ileus due to hexamethonium was provisionally diagnosed, and treatment was started with gastric suction and intravenous glucose-saline. A total of four pints of black fluid was aspirated from the stomach within the next four hours, during which time the patient's condition improved greatly. Further improvement seemed to justify continuation of conservative treatment, but 16 hours after admission the pulse rate rose to 120 a minute over the space of an hour, and his condition gravely deteriorated. Immediate operation was decided upon, as it was now thought likely that a perforation had taken place. The patient died before he could be got to the theatre.

Post-mortem examination within 3½ hours of death showed that operative intervention would have been valueless. The stomach and 5 to 6 ft. (1.5 to 1.8 metres) of small intestine were dilated and filled with foul faecal fluid. No perforation was found, but throughout the small intestine there were areas showing thinning of the bowel wall

with fibrinous reaction on the serosal surface. These areas ruptured on the slightest handling. The other findings were those expected in a case of malignant hypertension.

COMMENT

Bowel disturbances ranging from constipation with or without diarrhoea to complete ileus are not uncommon during the early stages of effective treatment with ganglion-blocking drugs. Most patients on treatment report occasional bouts of constipation, often accompanied by diarrhoea, though these attacks tend to become less frequent as time passes. During these episodes the urinary output falls. As hexamethonium compounds are not destroyed to any extent in the body, but are almost wholly excreted in the urine (Zaimis, 1950), oliguria leads to the building up of a dangerous concentration of the drug in the body, unless the dosage is cut down. This in turn can lead to further bowel atony, progressing to ileus, unless the situation is recognized and all drug treatment is withheld. This state of affairs may not be very obvious from clinical examination, as blood concentrations of the drug beyond a certain point do not necessarily produce a progressive fall of blood pressure. The ileus thus produced can lead to loss of bowel viability with consequent peritonitis.

In the ganglion-blocking drugs we have a powerful weapon which is life-saving in suitable cases. Their use does, however, require close and careful supervision. The patient should be warned to cut down or omit his injections when constipation becomes too obstinate, or when fever, vomiting, sweating, or diarrhoea threatens his urinary output. He should always consult his doctor when in doubt or in difficulties.

My thanks are due to Mr. P. F. Jones for sharing in the management of this case, and to Dr. R. A. J. Asher for permission to publish.

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Carbuncle of the Kidney

Perinephric abscess is not uncommon as a complication of a transient bacteraemia, but a carbuncle of the kidney occurs only infrequently. Brady was able to review only 88 recorded cases up to 1932, and the condition is apt to be overlooked in considering the differential diagnosis of a possible perinephric abscess. For this reason the following case, in which the diagnosis was made with some certainty before operation, is presented in detail.

CASE HISTORY

A man aged 28 attended the out-patient department complaining of pain in the right loin and of anorexia, both of seven days' duration. The pain was continuous, of gradual onset, did not radiate, and was felt posteriorly below the last rib. There was no nausea or vomiting, micturition was entirely normal, and there were no symptoms referable to the other systems. He could remember no pustule or other possible septic focus in the previous two months.

The temperature was 100.2° F. (37.9° C.) and the pulse rate 86. In the right loin a smooth tender swelling was palpated bimanually, which moved slightly with respiration and appeared to be the lower pole of the kidney. There was no muscular rigidity, and no other abnormal physical signs were elicited. The urine was normal to chemical and microscopical examination. The patient was admitted and penicillin therapy was begun.

Investigations.—Urine: culture sterile after 24 hours. Blood: Hb, 75%; R.B.C., 4,000,000; W.B.C., 18,500 (polymorphs, 85%); urea, 34 mg. per 100 ml. X-ray report: "The outline of the upper two-thirds of the right kidney is normal, but the lower pole cannot be identified. The edge of the right psoas shadow is not seen. Slight lumbar scoliosis to the left. Normal left kidney and psoas shadows."

Intravenous pyelogram: normal appearance of calices and pelvis on both sides. Cystoscopy: bladder normal in all respects. Retrograde pyelogram normal.

On these findings a confident diagnosis of carbuncle of the lower pole of the right kidney was made.

Operation.—The right kidney was exposed by the lumbar route on the second day after admission. There was oedema of the perinephric tissues, but no evidence of suppuration. The lower pole of the kidney was enlarged and fluctuant, but the surface appeared normal. A needle was inserted and thick yellow pus aspirated. The abscess was opened along the needle track, a finger swept round to break down any septa, and a drainage tube inserted around which the wound was closed. Some 5 fl. oz. (140 ml.) of pus was evacuated.

Culture of the pus secured at operation yielded a growth of *Staph. aureus* sensitive to penicillin. The temperature fell by lysis and was normal on the third post-operative day. Penicillin was discontinued the following day. The drainage tube was shortened on the 10th day and removed on the 13th. When the patient was discharged on the 20th day the wound was soundly healed and an intravenous pyelogram report stated: "Normal pelvis and calices, but the lower pole of the right kidney appears larger than normal. The psoas shadow is seen on both sides."

The patient has been seen at the follow-up clinic and has remained well.

COMMENT

The diagnosis of renal carbuncle is of importance in that, whereas observation of a perinephric abscess does relatively little harm, delay in treating a carbuncle damages more of an irreplaceable tissue at a time when the other kidney may also be infected. The demand for surgery is therefore urgent for two reasons—to drain the abscess in order to limit destruction of the kidney tissue and to secure pus for sensitivity tests.

The clinical features are admirably portrayed by this case, but whether the kidney is palpable depends first on the normal position of the kidney in the individual patient, and, secondly, on the site and size of the carbuncle. The degree of perinephritis determines movement on respiration. The findings in this case suggest that fixity occurs late, as this quite large carbuncle was still mobile on the ninth day of symptoms.

One would expect the outline of the enlarged kidney to show on an x-ray film of the abdomen, and Thomson-Walker (1948) gives this as a radiological sign of carbuncle, but in the above case it remained undefined until after operation, and clearly it and the psoas shadow were obscured by the perirenal oedema. A pyelogram may show the nearest calix to be deformed by the mass.

Fleming (1950) recommends treatment with penicillin only, but he stipulates that it must be continued for from three to four weeks and that a normal temperature and feeling of well-being are insufficient indications to stop treatment. He suggests that the drug may be stopped when the pyelogram returns to normal, but in the above case it was never abnormal. Even in this chemotherapeutic age the old adage, "Where there is pus, let it out," remains as true as when it was coined, for thereby toxæmia is relieved and resolution accelerated. Excessive fibrosis is known to occur as a result of delayed drainage of a pyogenic abscess treated with antibiotics (Stammers, 1953), and I have seen several breasts destroyed and a "frozen" hand from this cause. Antibiotics aid but do not replace the surgeon. If a carbuncle is suspected the kidney should be explored without undue delay, any abscess drained, and the pus submitted for sensitivity tests to indicate the most suitable antibiotic should one be required. Only rarely should nephrectomy, freely advocated in earlier writings, be necessary.

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Reviews

AMPUTATIONS

Amputations. By Leon Gillis, M.B.E., M.B., B.Ch., M.Ch.Orth., D.L.O., F.R.C.S. Foreword by Sir Harry Platt. (Pp. 423+x; illustrated. 84s.) London: William Heinemann Ltd. 1954.

This is the first comprehensive book on amputations published in this country. It contains a great deal of information on all aspects of a small but not unimportant branch of surgery. It should be useful to those who treat traumatic conditions, to orthopaedic surgeons, and to those who fit prostheses; but it is not intended for the student who is required to learn the elements of the subject. The author's experience has been unique, and he has made full use of the teaching of those who started and developed the principles of modern amputation and the "service for amputees." The book is the outcome of years of work dealing with the amputees still alive from the First World War, with a large number of those from the last war, and an increasing number of civilians who have lost limbs.

It appears that Mr. Gillis realizes that this very specialized subject makes dull reading, and in order to induce surgeons to read the book and not merely use it as a work of reference he has illustrated it profusely and placed apt quotations, classical or modern, at the head of each chapter. The routine procedures and technique employed at Roehampton are described simply and clearly, and the index enables the reader to discover quickly what he wants, but he may have to refer to several chapters to get the information he requires.

The general instructions and information regarding the use of a tourniquet are helpful. The reader will find details of every type of amputation carried out to-day, and will be interested to find that Lisfranc, Hey, Chopart, and Pirogoff are still with us. There is particularly useful information on affections of and operations on stumps, on painful stumps, and on phantom limbs. The chapter on kineplastic procedures, including the Krukenberg operation, does not condemn them, but is written from only a limited personal experience. The management of children's amputations and prostheses is lucid and should be most helpful. The subject of amputation for vascular disease, including diabetes, is dealt with in rather too narrow a way to be of value.

This book has been written with authoritative knowledge and is to be followed by a sequel—*Artificial Limbs*. The production is of high standard which would not suffer from the exclusion of a number of illustrations.

ST. J. D. BUXTON.

SCIENTIFIC BIBLIOGRAPHY

Scientific Books, Libraries and Collectors: A Study of Bibliography and the Book Trade in Relation to Science. By John L. Thornton, A.L.A., and R. I. J. Tully, F.L.A. (Pp. 288+x. 24s.) London: The Library Association. 1954.

The authors succinctly sum up this book in their preface as follows: "The professional historian of science will find little new in these pages, but the student of the subject, and the scientist searching for 'bibliographical gaps,' will find between two covers an accumulated wealth of material on the bibliography of science." Even so, the scope of this book is too wide. In 12 chapters the authors have surveyed scientific literature before the invention of printing, scientific incunabula, scientific books from the sixteenth to the nineteenth century, the rise of scientific societies, the growth of scientific periodical literature, scientific bibliographies and bibliographers, private scientific libraries, scientific publishing and book-selling, and scientific libraries of to-day. With so extensive a field to cover, a book of this size had been better planned as an introduction to the subject of scientific bibliography, which could be read with profit by one embarking on the

study for the first time. Instead, it is overweighted with erudition. It is too learned for the beginner, and, as the authors admit, is not adequate enough for the scientific historian, who will find many gaps in the chronology.

Some points of interest are the following: Dr. John Dee (p. 51) was an empiric, not "a medical man," as stated. He is believed to have had the degree of LL.D. of Cambridge University. Paracelsus (p. 53), so often regarded as a charlatan, receives his meed of recognition. The bibliographical study of Robert Boyle (pp. 71-4), based upon the writings of Geoffrey Keynes and John F. Fulton, is well done. Notable physicians in other branches of science were Claude Perrault (p. 83), who made contributions to comparative anatomy and then became a distinguished architect, and Martin Lister (p. 91), the founder of British conchology. Perrault's brother, Charles, achieved fame as a poet and a teller of fairy-tales. Scientific botany is the offspring of physicians, and Linnaeus had a medical degree. William Prout (pp. 142, 143) is mentioned as a British chemist. He was also a physician and a pioneer in biochemistry. So, too, was J. W. Thudichum, who is not mentioned, neither is E. B. Bancroft's *Philosophy of Permanent Colours*. Francis Buckland (p. 161) is cited, but not his father, Dean Buckland, so eminent as geologist and palaeontologist.

It is the duty of a reviewer to point out defects as well as merits. At the same time this book has many merits, much knowledge on every page, an excellent bibliography, and a full index. It should find a place in every large scientific and medical library.

ARTHUR S. MACNALT.

TEXTBOOK OF ANATOMY

Anatomy: Regional and Applied. By R. J. Last, M.B., B.S., F.R.C.S. (Pp. 665+xii; 309 illustrations, many in colour. 55s.) London: J. and A. Churchill, Ltd. 1954.

During the last few years there have been several new books on human anatomy, and Professor Last's is the latest addition. It might be thought that there is no room for another book on anatomy, but this is not the case; there is always a place for a new book on this subject provided that it is a good one. And this is certainly the case with this book, for Professor Last has approached his subject from a new angle. He has placed emphasis on general principles to illustrate why structures are arranged in a definite manner. The practical and applied sides of anatomy have been stressed. Professor Last has the great advantage over the majority of anatomists in that he practised general surgery for over 20 years, and therefore is in a position to apply this practical background to his book.

It is certainly encouraging to find such a wealth of new and original illustrations in it, many of them from the author's own pen.

The arrangement of the volume, designed to meet the requirements of those reading for an examination in anatomy, is sensible and practical, for both the undergraduate and the postgraduate like to study the body region by region. The book can be read in the museum or in the quiet of the home, and the author intends it to be read with the appropriate bones and the dissected part or museum specimen at hand for constant reference. Miss Jessie Dobson has written a series of biographical notes on famous anatomists of the past—a very useful addition to a work which is bound to prove popular.

Cecil Wakeley.

JUNG'S PSYCHOTHERAPY

The Practice of Psychotherapy: Essays on the Psychology of the Transference and Other Subjects. By C. G. Jung. Translated by R. F. C. Hull. (Pp. 377+xii; 14 illustrations. 30s.) London: Routledge and Kegan Paul. 1954.

Analytical Psychology is by no means a neatly systematized discipline resting on a few simple ideas and capable of application in treatment by means of a settled technique. This volume will be of special value to those who are interested in the clinical application of Jung's ideas, for particular attention is paid here to this aspect of his work. Part I

contains all of his papers on psychotherapy, and Part II his latest exposition of the transference situation. With one exception (the chapter on the principles of psychotherapy) the general papers have already appeared in English. Two of the papers were written in English by Professor Jung; the remainder have been excellently translated. Repetition is unavoidable in an assembly of eleven papers on therapy; but this is probably an advantage, as the reader will be able to see the development of Jung's ideas through the years.

Almost the whole of Part II is devoted to the only English translation of *Die Psychologie der Übertragung* ("The Psychology of the Transference"), which appeared as a separate publication in 1946; its inclusion here alongside the papers on psychotherapy is a sound plan and provides a fairly comprehensive picture of Jungian treatment. Analysis—as all agree—involves a reciprocal relation between patient and therapist, but this is hardly considered in some forms of psychotherapy, and in others it is given the central place. Jung's understanding of the transference makes it clear that the therapist is *in* the treatment and shares it with the patient.

Alchemical symbolism is extensively used in describing transference phenomena. This will strike some readers as rather odd, and they may wonder what link there can be between alchemy and present-day psychotherapy. They will find that Jung's study of alchemy is essentially practical and throws a clear light upon the transference situation in psychotherapy. Every psychiatrist using psychotherapy will find this chapter on transference worthy of his attention. The material does not make easy reading and it is not intended for the beginner. There is an excellent index and an impressive bibliography.

E. A. BENNET.

DUST HAZARDS

Dust is Dangerous. By C. N. Davies, D.Sc. Foreword by Sir George Barnett. (Pp. 116+xvii; illustrated. 21s.) London: Faber and Faber, Ltd. 1954.

In this book Dr. Davies has presented an outline of the medical and technical problems of dust diseases. He reviews the dust hazards of industrial workers, the methods and problems of dust assessment, and preventive measures. There are also chapters on radioactive dusts and on house and non-industrial dusts. These diverse and complicated problems are covered in 105 pages, so that the author has been forced to use a rather telegraphic style which often leads to some obscurity; but there are excellent illustrations and a good bibliography to lead the interested reader to sources of fuller information.

The book is presumably intended to awaken interest and to act as an introduction to the subject for those concerned with the practice of industrial hygiene but who have no expert knowledge of the subject. For them a glossary of technical terms would have been helpful, and perhaps a little more guidance as to the border-line between established practice and recent untried developments. Thus, illustrations are given of three dust-sampling devices which have not yet been accepted for general use, while the account of established instruments is rather cursory. In the clinical and pathological sections there are a number of minor errors and oversimplifications to which the medical reader may take objection, but on the whole the book is accurate and informative and should provide a useful stimulus to many people who do not realize how serious and complicated are the medical and technical problems of diseases caused by dust.

C. M. FLETCHER.

WARTIME PSYCHIATRY

Wartime Psychiatry: A Compendium of the International Literature. Edited by Nolan D. C. Lewis, M.D., and Bernice Engle, A.B., M.A. (Pp. 952. 46s.) New York: Oxford University Press. 1954.

The editors claim that "the material in this book attempts a general survey of all the important psychiatric aspects of the problems of selection, administration, combat, demobilization, and rehabilitation of members of the armed forces.

When possible, articles have also been included that bear on the application of new methods and knowledge to the field of civilian psychiatric practice."

In fact, no general survey, summary, or sifting of the vast literature has been attempted, for the volume consists of abstracts, varying in length, of individual books and papers. The selection of what should be included is in keeping with a most hospitable democracy. The abstracts are roughly grouped under 14 different general headings, sometimes for no very obvious reason. For example, the 17th abstract in the first section, "Administration," is:

"*Psychiatric Voice Recordings in the Military Service*

" (Albert A. Rosner, *War Med.*, 6:38-41 (July) 1944)

The author describes use of psychiatric voice recordings to supplement the printed word by the spoken word with its accompanying revelation of personality, feeling, character. The disks of one patient can later be cut as wished and transcribed to a single disk, but 10-20 per cent loss of clarity must be anticipated.

The author presents 4 cases; case 1 is that of a psychotic soldier with dementia precox, paranoid type, which illustrates fantasy formation as a symptom."

The volume may possess some value as a work of reference, but the index refers only to the names of authors; it is therefore impossible to look up any subject or article unless the name of the author is known. Much labour by stenographers must have gone into this compilation. The printing is clear and the binding good.

DESMOND CURRAN.

HOSPITAL PLANNING

Hospital Planning Requirements. By Guy Aldis, A.R.I.B.A., A.A.Dipl. With a foreword by Professor H. W. C. Vines, James B. Ewen, M.D., D.P.H., and the late Lionel G. Pearson, F.R.I.B.A. (Pp. 257; illustrated. 85s.) London: Sir Isaac Pitman and Sons, Ltd. 1954.

The author in this excellent work displays considerable genius, including that part which consists in a capacity for taking infinite pains. His study of the complex problem of hospital planning shows much evidence of prolonged and careful inquiry and observation, constructive thought, and perfected description, both verbal and diagrammatic. Indeed, he deals with clinical departments and their ancillary departments so ably that it is to be hoped he will not delay long in presenting his suggested similar work on non-clinical hospital departments, such as the kitchens and engineering services.

Each section has a general pattern of text and numerous diagrams. The latter illustrate the functional circulation within the department under discussion and give examples of typical layouts, indicating clearly the author's preference. With so many diagrams the text can be commendably brief, but it contains a wealth of material; it gives explanatory notes and a schedule of the accommodation required in each department. This is therefore a book to be studied carefully, section by section, then retained as a reference-book for frequent use. It is not one to be borrowed for a single rapid reading. Whenever a new hospital department is being planned—and, just as important, whenever an existing department is to be adapted or extended—the team concerned (architect, doctor, nurse, and hospital administrator) will be well advised to digest the appropriate section of this book, and, having produced their plan, to re-examine it in detail against the functional circulation and the schedule of accommodation described by Mr. Aldis.

The production of the book is excellent, the print being good and the diagrams models of clarity. Mr. Aldis is to be congratulated on having made such good use of the opportunity for research on hospital planning afforded by his position as a Regional Architect in the National Health Service. His book fills an important gap in the literature of hospital planning and is worthy to be a standard textbook. A copy should be made available in the reference library of every hospital management committee and of all doctors and nurses closely associated with hospital planning.

W. G. PATTERSON.

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EXPERIMENTS ON HUMAN BEINGS

The question asked in Parliament last week whether an experiment on patients recently described in this *Journal* was ethical is but another example of a fairly widespread anxiety. At a meeting of medical editors in Rome last September, under the auspices of the World Medical Association, Dr. W. A. R. Thomson,¹ joint editor of the *Practitioner*, and Dr. G. C. Heringa, editor of the Netherlands journal *Medisch Contact*, read papers on the responsibility of editors in publishing the results of experiments on human beings, the nature of which might be abhorrent to the ethical conscience. The W.M.A. General Assembly passed a resolution on the ethics of human experimentation, and in his address to a large gathering of W.M.A. delegates the Pope lent the weight of his high authority to a series of pronouncements on this form of medical responsibility. The Pope recognized that Medicine could not do without human experiments: "Que la recherche et la pratique médicale ne puissent se passer de toute expérimentation sur l'homme vivant, on le comprend sans peine,"² to give his actual words. The conditions under which such experiments can be justified—are ethical—are not necessarily easy to determine. What to the doctor may be a seemingly harmless procedure may to the onlooker in Parliament or to the Press be something to be challenged in the name of ethics or morality. But doctors themselves have been the first to examine the ethical problems of human experimentation, feeling, perhaps, more than ever conscious of their responsibilities in this after learning of the black record of certain German doctors in the last war.

"Clinical investigators," W. B. Bean³ has said, "rarely meditate upon the wide cleavage which separates clinician from investigator in their split personality." The physician caring for the sick person joins forces with him in the closest of all alliances against a common enemy—the affliction that has laid the patient low. In the face of an intractable disease for which there is no specific remedy the physician—and still more the surgeon—may offer the patient a

drastic remedy which may fail to do good or may do actual harm. Each such intervention by the doctor is an experiment. The first appendicectomy was an experiment, as were the first lobectomy, the first removal of a cerebral tumour, the first administration of penicillin. Both patient and physician in the face of disease or disablement feel a strong urge to intervene actively, and in the days when therapeutics was only barely rational the bleeding bowl, the cupping instruments, and the enema syringe were always at hand for use and misuse. A mediaeval physician proposing to put bleeding to a controlled trial in the treatment of a given disease would have been looked on as beyond the pale. But a simple trial might have saved thousands from being bled to death. The modern clinician must be clear in his own mind what he is doing when taking part in a trial of a new drug in treatment or a new vaccine in prevention of infection, both presumed to have the possibility of being effective or they would not be on trial. If a large-scale trial of, say, pertussis vaccine or a poliomyelitis vaccine is undertaken, with comparable groups of children serving as controls to those receiving the prophylactic, in what scale of ethics is one to weigh the increased morbidity and mortality subsequently found in the control group—a large enough difference being found to justify widespread inoculation of later generations of children against these diseases? Of course every safeguard is introduced. Parents and schoolteachers are informed with the greatest scrupulousness of the nature of the experiment, of its object, of the risks entailed; and the investigation is then conducted on a voluntary basis. But however careful and conscientious the explanation—unfortunately often described as propaganda—there is a limit to the layman's understanding of it. Probably what finally tips the balance in most cases is trust and faith in the doctor, in the wonders of modern medicine. Yet without such controlled trials it is difficult, if not impossible, to prove the prophylactic value of a vaccine or the superiority of a new variant over an old one. The history of B.C.G. shows what confusion may prevail for more than a quarter of a century in the absence of proof—the proof that only an experiment can provide. In therapeutic trials it is interesting to note that only strict limitation of supplies of the drug made it possible for controlled trials of streptomycin in the treatment of tuberculosis to be conducted in this country: in this instance necessity was the mother of ethics; indeed, it would have been unethical not to have controlled the trial that was made. No one can doubt the great benefit conferred on tuberculous persons the world over as a result. Much heartaching

disappointment would be avoided if no new drug were made generally available except after previous carefully conducted clinical trials, except after, in other words, the essential test of human experimentation. The story of cortisone is a warning.

The stronger the influence of the laboratory in Medicine, the more tempting it is for the investigator to look upon his patients or the patients of his colleagues as "experimental material," as cases of this, that, or the other disorder, rather than as sick and anxious human beings longing to be relieved of distress of mind and body. To some extent such detachment of viewpoint is essential if the doctor is to do his best for the patient, by looking on him with complete objectivity. But modern instruments and techniques make it easy for the medical man to satisfy his scientific curiosity by subjecting patients to procedures not essential to the relief of the condition for which they are being investigated or treated. When these procedures are simple and free from risk, then surely there is everything to be said for them when knowledge is added to. The main requirement is full explanation to patient or parent before permission is obtained. And some would distinguish sharply between experiments on the sick and experiments on the healthy. In the former an experiment may lessen the consequences of disease. A doctor voluntarily contracting a tropical disease to discover some link in the chain of causation is one thing; to subject a lay person—even a volunteer—to a similar experience is another, especially if the lay person is in a subordinate position.

What safeguards should the medical profession erect to protect the public and to preserve its traditional *mores*? The first, and the oldest, and the most obvious imperative lies in the nature of the doctor's first task—to care for the sick person, the man or woman in pain or distress, to submit himself to the rigorous demands of the doctor-patient relationship, to do nothing to his patient that he would not do or have done to his own family. Mr. B. Shimkin⁴ considers that the clearest rules for guidance were those laid down at the Nuremberg trials. The first of these is here given in full:

"The voluntary consent of the human subject is absolutely essential. This means that the person involved should have legal capacity to give consent; should be so situated as to be able to exercise free power of choice, without the intervention of any element of force, fraud, deceit, duress, overreaching, or other ulterior form of constraint or coercion; and should have sufficient knowledge and comprehension of the elements of the subject matter involved as to enable him to make an understanding and enlightened decision. This latter element requires that before the acceptance of an affirmative decision by the experimental subject there should be made known to him the nature, duration, and purpose of the experi-

ment; the method and means by which it is to be conducted; all inconveniences and hazards reasonably to be expected; and the effects upon his health or person which may possibly come from his participation in the experiment.

"The duty and responsibility for ascertaining the quality of the consent rests upon each individual who initiates, directs, or engages in the experiment. It is a personal duty and responsibility which may not be delegated to another with impunity."

Some hold that editors of scientific journals have a prime responsibility in this matter in being able to reject articles recording the results of allegedly unethical experiments. But it might be argued that an editor should publish papers which contribute to knowledge and should not act as a censor of morals. It might with more force be argued that it is only by publication that undesirable methods of investigation are brought to light and exposed to public criticism. Whatever may turn out to be the best methods of discouraging and preventing undesirable experiments on human beings, it is heartening to note that medical men all over the world are alert to the dangers; and it is deeply satisfying to record that human experimentation has contributed immeasurably to the health and well-being of countless millions. The continued progress of Medicine will depend upon its continued use under wise and humane guidance.

ADRENAL CORTEX

The review by Dr. R. I. S. Bayliss of recent advances in our knowledge of adrenocortical function, which appears in our opening pages this week, may be welcome to those many medical men who are apt to be somewhat daunted by the intricate chemistry and terminology of the subject. The adrenal cortex secretes five groups of substances, all of which are related in chemical structure to cholesterol. This sterol is widely distributed throughout the body, and from it all the adrenocortical hormones, regardless of their function, are thought to be derived. Two groups of hormones have been most widely investigated, chiefly because their absence is most dramatically marked by the inability of the deprived animal to go on living. These are, first, the hormones whose primary effects are on carbohydrate, nitrogen, and fat metabolism, and, secondly, the most recently isolated steroid aldosterone; this exerts its most powerful effect on sodium, potassium, and water metabolism. The functional distinction between the two is not clear-cut, since the steroids concerned with carbohydrates, commonly known as corticosteroids, exert some effect on sodium, potassium, and water conservation, while aldosterone to some extent corrects the tendency to hypoglycaemia from which patients with decreased or

¹ *Med. J. Aust.*, 1954, 2, 953.² *L'Osservatore Romano*, October 2, 1954.³ *J. Lab. clin. Med.*, 1952, 38, 3.⁴ *Science*, 1953, 117, 205.

absent adrenocortical function suffer. So far little is known of how aldosterone is secreted, or of how it produces its effects, and most research has been concerned with the secretion of the carbohydrate-active compounds, of which cortisone and hydrocortisone are important examples.

The secretory activity of the adrenal cortex is under the control of the corticotrophic hormone (A.C.T.H.) of the pituitary. This substance is not itself a steroid, but is either a protein or a polypeptide, and there is some disagreement whether it is one hormone or several. It exerts its effect on the adrenal cortex by causing increased synthesis of cortical hormones from cholesterol and acetate, the intermediate chemical keystone of the whole process probably being the hormone progesterone. Since there are at present no reliable methods by which the A.C.T.H. concentration in body fluids may be estimated, little is known about the levels which are necessary to ensure adequate adrenocortical secretion for coping with the vicissitudes of everyday healthy life. When A.C.T.H. is not secreted because of hypopituitarism, the suprarenals atrophy and secretion of corticoids is minimal. When a patient is given A.C.T.H., corticoid secretion increases, as shown by increased corticoid levels in the blood, by increased excretion of corticoids in the urine, and by the effects of the corticoids themselves on the level of circulating eosinophils, lymphocytes, and blood-sugar concentrations. The amount of stimulus exerted by administered A.C.T.H. depends on the dose of A.C.T.H. given and on the time over which a constant dosage can be maintained without intermission. A single dose of A.C.T.H., which must be given parenterally, produces a transient enhancement of adrenocortical secretion; laboratory evidence of this may be missed in the commonly used Thorn test of adrenocortical function. Therefore negative results to this test, as usually done, should be confirmed by a stimulus of longer duration. This can be provided by intramuscular injection of A.C.T.H. mixed in a gel, or preferably by intravenous infusion.

The level of corticosteroids in the blood probably controls the release of A.C.T.H., while corticosteroids are secreted into the blood in response to stimulation of the adrenal cortex by A.C.T.H. In healthy subjects the mean plasma corticosteroid concentration averages 9 μ g. per 100 ml., ranging from 3 to 17 μ g. per 100 ml. The method estimates chiefly hydrocortisone (compound F). Its value as a method of assessing adrenocortical function is limited by the same considerations which apply to all estimations of blood concentrations—namely, that the blood level of any substance is a resultant of the rate at which the substance is discharged into the blood and the rate at

which it is removed by metabolism or excretion. Corticosteroids are excreted in the urine and probably in the faeces. They may be estimated in urine, in which they are excreted partly metabolized to 17-ketosteroids and other steroids and partly unchanged as water-soluble conjugates with glucuronic and sulphuric acids. Unfortunately there are not yet any satisfactory routine methods for determining specific corticosteroids in the urine. This is because of the difficulty of hydrolysing the conjugated excretion product without altering the chemical structure of the hormone beyond recognition. It is known that 5–10% of an administered dose of cortisone is excreted in the urine as cortisone, and a very small amount appears as 17-ketosteroids. The fate of corticosteroids in the tissues is obscure. They diffuse freely throughout the extracellular fluid and are metabolized by synovial tissue, kidney, spleen, and liver. In the liver they may undergo chemical reduction and conjugation with acid radicles, and are partly excreted in the bile. The renal clearance of corticosteroids is low, and they are probably actively reabsorbed in the renal tubules.

While the pathogenesis of Addison's disease and hypopituitarism are obvious enough, it is clear that in such a complex system there is plenty of room for disorders of steroid production, consumption, and excretion, and these may be reflected in clinical syndromes whose aetiology is at present only dimly understood, if at all. Much remains to be done in this field of research.

ENDOCRINES IN PSYCHIATRY

A lucid and compendious account of endocrine treatment in psychiatry is given by Dr. R. E. Hemphill at p. 501 of the *Journal* this week. The story is, admittedly, a somewhat disappointing one. Almost everywhere in psychiatry the endocrine balance seems to play some part—in the psychoses, in many forms of neurotic reaction, and in personality and constitution; and yet the points at which the endocrinologist can effectively enter into treatment are few and far between. Dr. Hemphill has himself drawn attention to some of the reasons why this is so; there are also others. However, things are not quite so bad as they seem at first. When some form of psychiatric disorder proves to have a physical cause, diagnosis and treatment are taken from the hands of the psychiatrist and reserved for the physician. It is not so long since dysmenorrhoea was regarded mainly as a neurotic disturbance; either no treatment was given or it was a case for psychotherapy. More is now known about the physical basis—for instance, that the pain may be

related to ovulation. If ovulation is suppressed, as it may be by giving oestrogen early in the menstrual cycle, the pain may disappear. Superficially the cycle appears to be the same, though its hormonal balance is now different. The treatment, which might once have been regarded as a successful application of endocrinology to psychiatry, would not now be thought of as having anything to do with psychiatry at all. The same position has been reached with the premenstrual tension state, and, to a large extent, with the emotional instabilities of the menopause. Such endocrine disorders as Graves's disease, myxoedema, Addison's disease, and Cushing's disease, despite their important psychiatric aspects, rarely come the way of the psychiatrist and are treated with some success by physicians without recourse to the psychiatrist. This has the disadvantage that the psychiatrist never sees this kind of clinical material, though it would be of great educational value to him. The cases that the endocrinologist refers to the psychiatrist, like the cases passing in the opposite direction, are those with atypical features, in which on each side the clinician feels at a loss. Here are the unsolved problems involving both specialties, which neither side can tackle alone.

Early studies of glandular disorders gave an altogether false impression of their aetiology, suggesting that every such illness should fall into the simple pattern of diabetes, in which the replacement of a single hormone is effective treatment. In the endocrinopathies this is a most unusual state of affairs. Generally it is the balance of a number of internal secretions which is at fault, and there is no simple replacement that can be carried out. In treating the premenstrual tension state, for example, administration of ethisterone in the latter half of the cycle is only moderately successful, and sometimes does not avail. At this time the oestrogen level is at its maximum, and the progesterone level should be rising to compensate for it. The imbalance may arise through deficient corpus luteum formation and inadequate absorption of progesterone; in that case the administration of a progesterone compound may give benefit. But the imbalance may also arise through an excessive production of oestrogen; then the giving of oestrogen in the first half of the cycle, influencing the production of follicle-stimulating hormone (F.S.H.) by the pituitary and suppressing the formation of a corpus luteum, will so alter the cycle as a whole that the same therapeutic end is attained by what would seem to be physiologically contrary means.

The administration of a single endocrine preparation often fails to restore normal balance; furthermore, it cannot be given without repercussions.

Supplying an extra amount of one internal secretion not only alters the level of that one compound but also affects the level of many others, and the prolonged administration of any one endocrine substance will probably depress the function of the gland that makes it. While no general rule can be formulated, it is safer when the pathology is not clearly understood to give balanced complexes rather than single gland products, and to give treatment intermittently—in short courses with rests between. There are yet other dangers of inexpert treatment, many still not fully known. It seems rather doubtful whether there is such a condition as a male climacteric—that is, a revolution rather than an evolution of hormonal balance—but the diagnosis is sometimes made, and hormones are sometimes given for it. But the risk is by no means negligible that the administration of androgens may start up a prostatic carcinoma. Even when the nature of the disease is known and the treatment is uncontroversial, caution is often necessary. Deaths from myxoedema have been reported (for example, in cases in which adrenal function was depressed) caused by the administration of thyroid extract in a dose too high for the patient, though moderate by ordinary standards.

The future of endocrine treatment in psychiatry is encouraging enough. More research is still needed, though not crude experiments matching degrees of mental improvement in treated and control series of patients whose hormonal balance is entirely unknown, for these can give only misleading results. And it is to be hoped that official bodies responsible for the distribution of scarce preparations, such as cortisone, will be more sensitive to psychiatric claims.

NUMBERS OF DOCTORS

The news that a Government committee has been set up to consider the intake of students into the medical schools is welcome. As reported in our Parliamentary news (p. 546), the Minister of Health and the Secretary of State for Scotland have appointed Mr. Henry Willink, Q.C., as chairman; the ten other members of the committee comprise seven medical men and three laymen. Their combined experience of medical affairs, both clinical and administrative, will provide a firm foundation for their debates. Not quite so much can be said for their terms of reference. They read as follows:

"To estimate, on a long-term basis and with due regard to all relevant considerations, the number of medical practitioners likely to be engaged in all branches of the profession in the future, and the consequential intake of medical students required."

Though the total number of doctors practising at some future time may be estimated fairly accurately, provided

certain common-sense assumptions are made, the distribution of those doctors between the branches of the profession may well change unexpectedly in response to the development of medical science and its clinical applications. No good purpose is served by trying to work out, on the basis of the existing distribution, the numbers required to fill complex hierarchies in the hospital or public health branches. Moreover, the distribution between even the main branches of the profession has changed, and continues to change, in accordance with the needs of efficient medical practice. Flexibility of response is apt to be lost sight of in a State service, and it is to be hoped the committee will so interpret their terms of reference as not to impair it. The ambiguity in these instructions about what the size of intake is to be a consequence of, and what requirements it ought to meet, is presumably intentional. No doubt the committee will treat them as a starting-point rather than a boundary.

It was two years ago that the Council of the B.M.A. accepted a suggestion made by the chairman of the General Medical Services Committee that the G.M.S. Committee should look into these questions of supply and demand, and last year the Council asked the Minister "to set up a working party to review the whole problem."¹ Since then nothing has happened to make it any less urgent. As we pointed out last year,² there were in 1953 about 900 persons in England and Wales to one doctor and rather under 600 in Scotland. These figures, still the latest obtainable, are derived from the numbers of doctors shown in the *Medical Directory* as living in these countries. Some may be retired, and others who are practising do not have their names listed, but these are only trivial sources of error. The corresponding figure for Ireland is 730 persons per doctor, though, since Northern Ireland and the Republic are not treated separately, the figures are difficult to interpret. In 1900 England and Wales had 1,410 persons to every doctor and Scotland 1,300. From about 1930, when England and Wales had 1,250 persons per doctor, the proportion steadily fell to the 1953 figure of 900. In Scotland as far back as 1920 there were only about 1,000 persons to every doctor; during the 'thirties there were about 800, in 1953 there were about 570. Meanwhile students have been pressing at the gates for admission to medical schools in considerably greater numbers than are finally admitted, and as a result of their exertions the average annual increase of names on the *Medical Register* has been more than 1,000 for at least the last 20 years. In 1934 there were 57,496 names, in 1953, 83,090; this is an increase of 25,594, or 45%. Evidently, therefore, one of the most "relevant considerations" before the new committee will be the swiftly growing body of registered medical practitioners, for when the present new intake emerge from the chrysalis in 1960 their names will be added to a *Register* whose list will then have increased by five or six thousand. The committee may well feel some urgency about its work.

¹ *British Medical Journal Supplement*, March 27, 1954, p. 86.
² *British Medical Journal*, 1954, 2, 53.

TOPICAL HYDROCORTISONE

Cortisone and corticotrophin have been available for long enough now to give a fairly clear impression of their value in the treatment of skin diseases. They are used in two principal types of case: the severe but self-limiting disorder in which steroids will cut short an attack and tide the patient over until natural remission sets in; and those long-term cases which are otherwise fatal or severely disabling and for which no alternative treatment gives much benefit. In the former type of case the patient is often treated for only a few days at a time, and the well-known complications of treatment with these substances scarcely have time to develop. But when treatment is prolonged over many weeks and months a formidable list of complications may appear, some of them well-nigh unavoidable. It is therefore of particular interest to determine what benefit may be expected from the local application of steroids.

It was early discovered that cortisone and A.C.T.H. are almost, if not completely, without effect when applied to the surface of the skin, but that hydrocortisone (compound F) exerts a profound influence on certain eruptions. It is evidently absorbed through the skin, particularly if the corneous layer of the skin is damaged by disease; but the experiments of C. C. Smith¹ failed to demonstrate any eosinophil response to the application of relatively large amounts to the intact skin surface. Similarly, the application of hydrocortisone to the skin over periods of many weeks is not followed by any signs of systemic absorption. The precise mechanism and level of action of topical hydrocortisone therefore remain unknown.

Although the therapeutic effects of systemic cortisone and local hydrocortisone are not quite the same, they correspond fairly closely, and in many disorders local application is preferable in that the risk of the complications and side-effects of its systemic administration is avoided. Moreover, local application of hydrocortisone appears to be surprisingly free from irritation. In all those cases where irritant action has been recorded, it appears to have been due to the base, usually carbowax, in which it was incorporated; true epidermal sensitivity to hydrocortisone has not been demonstrated. Dr. R. Church, whose results are reported on another page, used a base of lanolin, soft paraffin, and mineral oil, and does not record any irritation from this.

M. B. Sulzburger² has listed those disorders in which hydrocortisone appears to be beneficial. Most belong to the eczema group, whether of the so-called constitutional type or the type of case due to contact sensitivity. Atopic eczema, both the infantile and the flexural, otitis externa, and pruritus ani are also likely to respond. Dr. Church confines his account mainly to those disorders which have already been shown to improve with this kind of treatment, and his results, successful in about three-quarters of the cases, are comparable to those of other authors. It is notable that most of these diseases

¹ Smith, C. C., *Arch. Derm. Syph. (Chicago)*, 1953, 68, 50.
² Sulzburger, M. B., in *Modern Trends in Dermatology*, 2nd series, Editor, R. M. B. MacKenna, 1954, London.
³ — and Baer, R. L., Editors, *Year Book of Dermatology*, 1953-4, Chicago.

are of unknown, or only partly understood, causation, and that they run an unpredictable course with spontaneous exacerbations and remissions. To measure the benefit conferred by any new treatment is thus a matter of the greatest difficulty, and the final assessment of hydrocortisone ointment will not be made for some years. However, even when allowance is made for natural optimism, it seems likely that M. B. Sulzburger and R. L. Baer³ will be proved right when they surmise that it bids fair to being one of the most important advances ever made in local treatment of the skin. The disorders which will or will not respond to hydrocortisone ointment are now fairly clearly defined. Suitable vehicles and bases in which to incorporate the active substance have yet to be decided, as have the mode and frequency of application required in different cases. The combination of hydrocortisone with antibiotics and other drugs has already been considered, but so far hardly studied: combinations of local treatment with systemic steroid therapy also need investigation.

TREATMENT OF BACTERIAL ENDOCARDITIS

Since the conclusion of the Medical Research Council study of the penicillin treatment of subacute bacterial endocarditis, the findings of which were reported by Cates and Christie,⁴ it has been left to individual effort to pursue this subject. Possibly the lessons learned in that study are still being applied, but there is almost no means of knowing how successful their application is proving, or whether any improvement in the method of treatment has had an adequate trial. It would be interesting in particular to know whether, and if so in what circumstances, the disease can safely be treated by less frequent injections of a slowly absorbed penicillin preparation, a modification which would be welcomed by patients who have to endure a course lasting six weeks. The results obtained with procaine penicillin by Roston and Stollerman⁵ in six patients, and by Volini, Hoffman, and Hughes⁶ in sixteen appear to have been very satisfactory and fully warrant more extended trial.

Not only the method of treatment but the grounds of the decision to institute it are matters of importance, and on the second of these subjects Newman, Torres, and Guck⁷ have decided and somewhat controversial views. Their material consisted of 52 cases, all men, admitted to the Veterans' Administration Hospital, Bronx, N.Y., between 1946 and 1953. Only 12 of these were diagnosed before admission, and apparently 8 died undiagnosed. Blood cultures were made in 48, of which only 32 were positive: in "some" cases daily cultures were made for 15 to 20 days, and in none was a positive culture obtained after the fourth when the first four had been negative. On this basis these authors propose the following policy. It depends on the presence or absence of signs of the disease, classified as "major" (these, apart from a positive blood culture, are heart

murmur, fever, and anaemia), and "minor" (palpable spleen, petechiae, clubbing, microscopical haematuria, arterial emboli, and Osler's nodes). If a patient with a cardiac or vascular lesion predisposing to infection has one or more of these signs inexplicable in another way, he should have four blood cultures on successive days and then be submitted to a full course of treatment without awaiting the results of these cultures. The authors say earlier that if a murmur associated with one other major or two minor signs had been accepted as diagnostic, 47 of their cases could have been diagnosed. This policy is well expressed in their dictum: "We must have a very high index of suspicion for this disease even if it means treating some patients unnecessarily."

This series of patients is not altogether satisfactory for several reasons: at least three and possibly five were infected by organisms which place them outside the category of a "subacute" endocarditis, no sensitivity tests were reported, and treatment in some of the early cases was inadequate. Even "adequate" treatment is defined as a certain dose given for "at least two weeks," which in most people's estimation is much too short a period. Nevertheless, some other conclusions, even though based on small numbers, are interesting. Of 39 adequately treated patients 27 recovered, of whom one-third each died of sequelae, are alive but disabled, and alive and symptom-free. The duration of the disease, if not exceeding six months, did not appear to affect the amenability of the infection to treatment, nor did the presence of congestive heart failure, which actually preceded the onset of the infection in five patients, and was the first sign of it in eight. On the other hand, the mortality in such patients is much higher. Positive blood cultures were obtained in three afebrile patients. Provided the infection could be cured, recovery from renal damage was possible. Previous inadequate antibiotic therapy did not affect either the chances of obtaining a positive blood culture or the outcome of subsequent treatment. Two of the more heterodox of these conclusions—namely, that neither the duration of the disease nor the existence of heart failure appears to affect the results of treatment—are also reached by Bunn and Cook⁸ from a study of 48 patients, of whom 33 recovered. These authors are insistent that the dose of penicillin must be adjusted to the sensitivity of the infecting organism. Inadequate dosage was a probable cause of failure in 4 of their patients; in 6 others rupture or perforation of an aortic valve cusp was the immediate cause of death. It is emphasized that the outlook when the lesion is aortic is far less favourable than in involvement of the mitral valve or of congenital defects. Analyses such as these, even though some of the conclusions rest on a slender basis, provide helpful information, and those in a position to report on such a series should be encouraged to do so, particularly if it illustrates the effects of any newer method of treatment.

We record with regret the death on February 21 of Sir Henry Wade, the eminent urological surgeon, who was on the staff of the Edinburgh Royal Infirmary for nearly thirty years before his retirement in 1939.

⁴ *Quart. J. Med.*, 1951, 20, 93.
⁵ *Amer. Practit. (Philad.)*, 1949, 4, 102.
⁶ *Cuore e Circol.*, 1949, 33, 12.
⁷ *Amer. J. Med.*, 1954, 16, 535.
⁸ *Ann. intern. Med.*, 1954, 41, 487.

EMERGENCIES IN GENERAL PRACTICE

"FITS"

BY

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By the time he gets to the house the doctor will find that the fit itself is over and that the patient is either recovering or is in post-epileptic coma or in a restless confused state. It is best then to do as little as possible, for restraint or restriction will cause an increase in restlessness or aggression; the sleeping patient is best undisturbed.

If this is the first fit the question to be answered is whether it was an epileptic convulsion, an hysterical attack, apoplexy, a subarachnoid haemorrhage, or even an unsuspected head injury with subsequent coma. A witness's account will usually establish the characteristic train of events in a convulsion—sudden tonic spasm occurring without cause, followed by gradually decreasing clonus with tongue-biting and cyanosis, and then coma with flaccidity, incontinence, and stertorous breathing. If there is doubt about the nature of the attack, it is best not to hurry into action because time and the recovery of the patient will in most circumstances make the diagnosis clear. He will recover from post-epileptic coma in a few minutes or a few hours with no sequel other than a headache, a badly bitten tongue, and incidental soreness and bruising. The family will probably need more treatment than the patient, and the advice given should be very conservative. It is best to tell relatives that a fit itself does the patient little harm, barring accidents, that it is an explosive affair affecting the whole body, and that like any other explosion there is nothing that can be done until it is over. Then the thing to do is to repair the damage and try to prevent a recurrence.

When a patient falls in a fit he should be left where he lies, furniture and obstructions being removed from the area of movement to prevent injury. There is no need to loosen clothes or to try to modify his activity in any way. In the early tonic phase the mouth opens and there is plenty of time to remove dentures and to rest something against the upper premolar teeth to prevent subsequent tongue damage: a bit of stick or a screw of stuff will do, or the patient's diary, a pencil, a handkerchief, or the corner of his coat collar. Once the clonic phase is over the patient can be laid somewhere comfortable and allowed to recover without interruption. At this stage a brief examination of the nervous system may show weakness of one limb after the others have recovered, or a unilateral extensor plantar response, which may provide a valuable clue concerning the cause, which will completely disappear and be lost in a few minutes.

After recovery from the fit—perhaps the next day—the reasons for the attack must be considered. There are immediate precipitants and remote causes. The more potent the immediate causes, the less serious are the remote ones likely to be. A normal person may have a solitary fit after excessive beer-drinking, through sheer hydration, and some will complicate pneumonia with a convulsion. Others will have a solitary fit during a period of prolonged emotional and physical strain. When immediate causes have been considered, the more remote ones will be looked for—sugar or albumin in the urine, raised blood pressure, an enlarged liver, or a history of recent ill-health will suggest a host of general medical conditions which may give rise to convulsions. The local cerebral causes, revealed by signs of local dysfunction or the symptoms of raised intracranial pressure, will then be excluded. Every adult who has had a solitary fit without known cause should be fully examined by the

physician, have his urine tested, and then be referred for an electroencephalogram, radiology of the chest, blood Wassermann reaction, and radiology of the skull in that order of importance.

No person who has had one solitary convulsion should be given anticonvulsants—he may never have another fit. Unless there are special circumstances, it is more reasonable to allow a period of time to elapse, to withhold treatment until investigations have been completed, and, other diseases having been excluded, to begin treatment if two more fits occur. Three attacks may give some indication of the natural periodicity without treatment, which will help in the assessment and consequent management of the case.

A Convulsion in a Child

A convulsion occurring in childhood has much less serious significance than in later life, as regards both prognosis and causation; for the younger the infant, the more readily do transient bodily changes induce a fit. There is no difference between a teething convulsion and any other sort of fit; it is simply that the tendency to convulsions with similar causes is progressively diminished with maturation of the nervous system. As in the adult, the more closely the convulsion can be related to an immediate cause, the less intensive need be the search for remote causes; in infancy, pertussis, pneumonia, measles, chicken-pox, or teething, in that order of frequency, may be the whole and sole cause of a convulsion. Do not treat these symptomatic convulsions, but begin to consider the matter to be serious if a fit is repeated more than once, whatever the cause; if there are several convulsions in one illness; or if there is a single fit without an adequate recognized cause. If any of these circumstances obtain, the time has probably come to begin anticonvulsant therapy.

Focal Attacks

So far generalized convulsions only have been mentioned, but the same management may be adopted for the focal epileptic attack. Here, however, the immediate event is less dramatic and exacting, but a searching investigation of the patient for evidences of a local cause should be made. At this stage the physician will generally find negative results of his initial investigations, and it is rather worrying to know how far to pursue them. As neurological investigations carried out in hospital, including as they do carotid arteriography and air encephalography, are both complex and distressing, it is often wise merely to re-examine the patient and to have an electroencephalogram done at infrequent intervals—perhaps every other month.

Status Epilepticus

Status epilepticus is the most deadly complication of epilepsy and sometimes is the first event in the illness. It is said to occur when a patient has more than two fits without recovering consciousness, and at that stage it must be treated as a grave emergency. It is too late to save his life if you wait until the patient begins to look as if he may die, because death usually occurs through acute myocardial failure, which rapidly progresses if fits continue after its onset. Consequently a patient in status epilepticus, if possible, should be sent to hospital after initial treatment. Intramuscular sodium phenobarbitone, 5 gr. (0.32 g.), is most often given first, but an intramuscular injection of sterile paraldehyde, 5 or 10 ml., repeated in an hour if the fits continue, is more effective. It is best to err in giving

EDUCATING THE PUBLIC IN MENTAL HEALTH

The education of the general public in mental health was the theme of discussion at the final session of the quarterly meeting of the Royal Medico-Psychological Association held in London on February 17. Dr. NOEL G. HARRIS, the president of the association, was in the chair.

Miss P. HORNSBY-SMITH, M.P., Parliamentary Secretary to the Ministry of Health, who opened the discussion, said that it was generally agreed that there were few fields of medicine which had made more dramatic advances in the last 20 years than mental health. Indeed, there was now such a "new look" in mental health that it was no longer just a case of care and custody but of care and treatment, and in many cases cure. That fact was not generally appreciated. The workings of the mind, particularly the sick mind, were a very difficult subject for the man in the street to understand. There was still need to obliterate from popular speech such phrases as "padded cell," "put away," and "put in an asylum."

Why Bother?

Why bother about educating the public? So far as Parliament was concerned, vast sums of money could not be spent on mental health and priority could not be given to it unless people generally recognized the size of the problem and fully understood the need. The incidence of mental illness could not be kept down unless people were better informed and encouraged to come forward for treatment at an early stage. There must be a general realization that nursing the sick mind was just as important a service as nursing the sick body. The spread of knowledge of the principles of mental health would pay very handsome dividends. That had already been shown in the field of physical health, and the public now had to be persuaded that in safeguarding their physical health an essential concomitant was the safeguarding of their mental health.

Miss Hornsby-Smith added that she was well aware that the whole tendency to express scientific matters in colloquial terms was abhorrent to the average professional man, but if mental specialists were going to take the public with them they must give reasons understandable by the common man. And it was far better, if colloquial terms had to be used, that this should be done by those who were fully qualified than by the less skilled who might make a botch of it. She appealed therefore to mental health specialists to study the value and the best method of educating the public in their specialty. Mental specialists could not say too often or make too well known the fact that seven out of every ten who entered mental hospitals did so as voluntary patients and that the average stay of those discharged was just over two months. Recognition of such facts would help to build up in the mind of the public a better-informed picture of the service provided to-day.

Some of the Dangers

Dr. R. R. BOMFORD (The London Hospital) said that all doctors suffered to a considerable extent because they were expected to work magic: when their magic was successful they were irrationally praised, and when it was unsuccessful they were equally abused. He believed the mantle of the magician was now falling on mental specialists. Whilst there was a great deal of unconscious rejection of psychiatric theories for indefinite reasons, there was also a danger of people accepting psychiatry in an unreasonable fashion.

Dr. W. S. MACLAY (Board of Control) suggested that the many aspects of mental health needed to be more closely defined if there was ever to be a satisfactory assessment of the value of the effort and money expended on it. It was much easier for people to have sympathy with the aims of the mental hygienist than for the hygienist to be scientific.

Mr. FRANCOIS LAFITTE thought it would be helpful if all newspapers employed a competent medical correspondent.

a large rather than a small amount. If the patient is in a hospital where an anaesthetic apparatus for positive-pressure respiration is available, intravenous thiopentone or amyl-barbitone sodium, both given very slowly until the movements stop, are highly effective. The injection should cease when clonic movements cease, to be repeated later if necessary, for, as the patient is already in deep coma, it is impossible to judge the depth of anaesthetic coma, and respiratory and cardiac action may cease. It used to be said that a half of all patients in status epilepticus die, but death should now be thought to be due to delay in instituting parenteral treatment.

When the actual clonic movements of the limbs of a patient who is in status epilepticus cease, post-epileptic coma may continue for many hours, and confusion for days, but if the patient's general condition is good there is now no need for immediate concern. During the coma any feeding should be by a Ryle tube, in small amounts, to prevent the possibility of aspiration pneumonia. Intravenous infusion of glucose-saline should not be needed, and in any case fluids should be given sparingly, as hydration of the patient may well precipitate further fits. Sometimes after freedom from convulsions for some hours they will repeatedly recur; then it is wise to put up a slow intravenous saline drip with thiopentone and to inject into the tube from time to time, but in those circumstances a whole team made up of physician, anaesthetist, and nurses is needed. A patient should remain in bed several days after status epilepticus has been controlled, even if there are no complications, both for recovery and for repeated examination.

Recurrent Fits

When more than two fits have happened, and investigation has failed to show a cause requiring specific treatment, continued anticonvulsant treatment will be needed, but before beginning this the physician should face the fact that he is implying that medical treatment must continue for at least three years after the last attack. This is a consequently serious step requiring much consideration; I think some doctors are far too apt to "put him on phenobarb." to ease domestic tension as much as anything else, when it would be more logical, effective, and economical to give the relatives phenobarbitone for a few days instead.

Although this paper is dealing with emergencies, it is logical to consider the treatment of repeated convulsions. For the major fit phenobarbitone remains the anticonvulsant of choice—it is so often effective, and its side-effects are usually so trivial. I generally begin in an adult with $\frac{1}{2}$ gr. (32 mg.) twice a day, increasing to thrice a day if necessary. Children tolerate phenobarbitone well, and as a rule they are given too small a dose in attempting to control convulsions; a suitable dose is $\frac{1}{2}$ to $\frac{1}{4}$ gr. (16 to 32 mg.) twice a day. The timing of the dose should depend on the usual time of occurrence of the fits—a large dose in the evening if they are mainly nocturnal, but on rising if they are diurnal. Similarly, menstrual or pre-menstrual convulsions can be treated with much larger doses in the week before the period than at other times.

The hydantoins (tab. phenytoin sod., $\frac{1}{4}$ gr.—0.1 g.), in a variety of proprietary forms, should next be used, preferably with phenobarbitone, and they may be combined in a ratio of phenytoin 2 to phenobarbitone 1 in the same capsule. If toxic effects arise with one of the hydantoins, two different kinds may be given together in smaller doses to obviate them. If fits are not controlled, I then use primidone up to four or five tablets in the day, mainly because this substance is particularly effective for pure major convulsions without evidence of organic brain disease. Since focal attacks and petit mal cannot be regarded as emergencies, I may be excused from including their treatment in this short review.

Next article on Emergencies in General Practice.—"Attempted Suicide," by Dr. I. R. C. Batchelor.

Reports of Societies

TEACHING OF DERMATOLOGY

The teaching of dermatology for general practice was one of the subjects discussed at a joint meeting of the Sections of General Practice and Dermatology at the Royal Society of Medicine on February 16.

Dr. BERNARD PECK, speaking first, presented a strong case for improving undergraduate training in dermatology. Five to eleven per cent. of consultations were for skin disorders. In his own practice in Plymouth he had noted some seasonal variation, but on the average dermatological conditions accounted for 8.8% of all diagnoses. Reports on prescribing showed that some 12% of prescriptions were for skin preparations, and since this figure presumably included only local applications the actual percentage of prescriptions for the relief of skin conditions must be considerably higher. Of all patients referred for consultant opinions to a general hospital in Plymouth, 4.7% were referred to the dermatological department.

In most areas the opportunities of gaining knowledge of dermatology as a postgraduate were poor: and in any event Dr. Peck thought that it was not easy to acquire new knowledge after qualifying. A circular letter had been sent to the 27 medical schools in Great Britain. The 26 replies indicated a wide variation in the time allocated to dermatology in the undergraduate course. At some schools the same number of hours were devoted to dermatology as to radiotherapy and to thoracic surgery. Most schools allowed about 20 hours for out-patient demonstrations, and in only one were the patients for these specially selected. With very few exceptions most qualifying examinations did not regularly contain questions on dermatology, and, although an occasional skin condition might be included in the clinical examination, the knowledge required from candidates was likely to be superficial, since there were no dermatologists among the examiners.

In summing up, Dr. Peck suggested that an undergraduate training which ignored almost entirely one-tenth of the graduate's future work was unrealistic. He did not advocate any increase in the length of the present training, but felt that further time might be devoted to dermatology at the expense of the technical aspects of operative surgery and of other subjects which were not of such value to the future general practitioner. Moreover, apart from its direct importance to the practitioner, dermatology offered an excellent field for training in accurate observation and in the correlation of clinical and pathological findings.

Examination Questions

Dr. R. T. BRAIN, opening the discussion, said that dermatologists had long felt that the specialty had not received sufficient recognition in the medical curriculum. Dr. J. E. M. WIGLEY said that the fundamental problem was the lack of dermatological questions in qualifying examinations. Most students had perforce to concentrate on passing examinations, and until they knew that they would be examined in dermatology they would tend to be disinterested in the subject. There should always be a dermatologist on the board of examiners.

Dr. W. B. ADAM was critical of the postgraduate teaching in dermatology which he had received, and Dr. W. P. HEDGECOCK suggested that special training might be given during the period of trainee-assistantship. After several other speakers had taken part in the discussion Dr. C. H. WHITTLE pointed out that as a result of the shortage of registrars more appointments for general practitioners as clinical assistants in dermatology would probably become available. But Dr. M. FEIWEL thought that a practitioner derived much more benefit from sitting with a dermatologist

in his clinics for some weeks than from acting as a clinical assistant seeing the old patients. Dr. G. B. DOWLING, from his experience of the postgraduate teaching of general practitioners, disagreed with Dr. Peck's implication that a general practitioner would not acquire much knowledge of dermatology from practical experience. He had found that many had gained a very sound knowledge of the subject. Dr. G. M. KERR, while agreeing that dermatology was inadequately taught, did not believe that this subject should be singled out for special consideration. The entire medical curriculum needed revision, because the general practitioner was taught very little about many other conditions which he frequently encountered in practice, including diseases of ear, nose, and throat, and of the eyes.

Nova et Vetera

AN EARLY X-RAY PICTURE

Last August Dr. Cochrane Shanks told in the *Journal's* correspondence columns¹ the story of an early x-ray picture taken in March, 1896, by a 16-year-old boy, W. E. DAVIES. The boy was spending the Easter holidays in Hanover and had with him a quarter-plate camera. One of the local entertainments was a hall with side-shows, automatic machines, and the like, and among them was an automatic x-ray machine which, in return for a pfennig in the slot, showed up the bones of the hand or any other opaque object inserted through an aperture by the customer. On top of the machine was an eye-piece to look through. The boy, interested, as well he might be, in this novelty, and with a commendable scientific curiosity, visited the showplace armed with a sensitive quarter plate in light-tight box in which he had also placed some small metal objects. This he inserted into the apparatus, and, with the aid of the appropriate coins, gave it an exposure to the x rays of about one minute. The result (reproduced with Dr. Shanks's letter) was probably the first amateur x-ray photograph.

Dr. J. F. Brailsford² questioned the accuracy of the story. He pointed out that, though Roentgen made his discovery on November 8, 1895, he did not announce it publicly until December of that year. According to Glasser,³ Edison, in May, 1896, was among the first publicly to demonstrate the fluoroscopic characters of x rays. It was remarkable, therefore, Dr. Brailsford thought, that the "show business" should be able to adopt this new scientific discovery so early as March, 1896. Reports of diagnostic skiagraphs first began to appear in the *British Medical Journal* in June, 1896, and in the issue for June 6 (p. 1412) it was announced that "a Roentgen laboratory has been established in the Glasgow Royal Infirmary."

The correspondence ceased after Dr. Brailsford's contribution, but the matter has not rested there. A Hanoverian reader of the *Journal* wrote to the editor of the *Hannoversche Allgemeine Zeitung*, who published the story and the doubts cast on it, and appealed to local memory. The response was immediate: the editor was able to publish the evidence of some 26 replies from senior inhabitants of Hanover who championed the accuracy of the boy photographer's story. One, Herr K., said that while he was in the fifth or sixth form at school he went to the exhibition, which contained the apparatus referred to. He was not certain whether it was in 1896 or 1897, but was in no doubt about the place where the exhibition was held. It was in a house in Georgstrasse, which is now the Basse Bank. Herr K. F. also could not quite fix the date, but added something to the story. "At the same time," he wrote, "there was also a Lilliputian married couple to be seen. The man was wearing Hussar uniform and had a big moustache and pointed beard, which we were allowed to pull to prove its genuineness." Herr K. M. wrote that he was an employee of the German Automaton-

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Renal Biopsy

SIR.—Your leading article on renal biopsy (*Journal*, December 18, 1954, p. 1468) seems to us to imply that our technique of percutaneous biopsy of the kidney in the prone position is a simple matter which can be done by anybody. This is not so. We believe that indiscriminate use of the technique by untrained people will certainly lead to accidents. We feel that for the present the operation should be done only by those physicians or surgeons who are going to use the technique frequently as part of a programme for the study of patients with renal or related diseases.

Since our report¹ in May of last year we have done a further 150 biopsies, making in all a total of just under 200 biopsies to date. We have encountered no serious complications with our technique and have extracted adequate tissue for histological diagnosis in over 95% of our attempts at biopsy. The dangers of renal biopsy are retroperitoneal haemorrhage, severe laceration of the kidney, renal infarct, anuria, and spread of infection. We have been fortunate in that our only complications so far have been transitory renal colic in three patients, mild loin pain in six, and a sharp haemorrhage into the bladder in an old gentleman with severe calcific atherosclerosis.

In order to secure the safety of the patient, particular pains have been taken in the selection of patients, and meticulous attention has been given to their pre- and post-operative care. At present our contraindications for doing a biopsy are: an uncooperative patient, individuals with a bleeding tendency, patients with one kidney, and patients with oliguria whose non-protein nitrogen is above 100 mg. per 100 ml. of blood and rising. We do not advise a biopsy on patients who have severe calcific atherosclerosis, a perinephric abscess, hydro- or pyonephrosis, renal neoplasm, or large cysts. Although Cazal² has done a few biopsies on patients with renal neoplasm, we believe that the danger of spreading neoplastic cells along the needle track is too likely to warrant biopsy.

The hazards of kidney biopsy have been overcome by accurate localization of the kidney with intravenous pyelograms and the exploring needle, by the thin Franklin Vim-Silverman needle, which secures a small core of renal tissue without aspiration, and by the use of the sandbag in the prone position, which ensures post-biopsy haemostasis. Biopsy of the kidney is more accurate than any other method in making an exact diagnosis. There is no need to labour this point, but it must be obvious that, as time goes on, biopsy of the kidney will become more and more valuable as new therapeutic measures are found to combat each of the many disease processes which involve the kidney. We find that renal biopsy is a more accurate method than culture of the urine or blood in determining exactly the type of organisms which are responsible for infection within the kidney, and we have been using it to select patients with nephrotic syndrome for therapy with steroids. Besides its clinical value in diagnosis, prognosis, and therapy, it is a most valuable tool for studying the natural history of diseases of the kidney.

We have already trained a number of British physicians to do biopsies of the kidney in the prone position, and we look forward, as you do, to reports on its usefulness.—I am, etc.,

ROBERT M. KARK.

Chicago, 12, U.S.A.

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Company, Stollwerk and Co., of Cologne, in 1900-5 at the house in Georgstrasse. He says that there were automatic chocolate machines, automatic music machines, electric pianos, weighing machines, the x-ray apparatus, automatic peasant bands, and a peepshow of the Frenchman Lumière. In the cellar of the house a cinematograph apparatus functioned from time to time. Although Herr K. M. could not confirm the year 1896, Herr B. S. produced the answer to the key question. He could say for certain that he had seen the x-ray apparatus in 1896 because he was married that year, and he had gone to the showplace with his new brother-in-law.

Further confirmation of the date 1896 came from a 78-year-old reader, Herr K. K., who became a soldier in 1897 and was quite definite that he went to the automaton show the year before. Dr. B. reported that in 1896 he already owned an x-ray apparatus in his practice, purchased through the firm of Nicolai, Leinstrasse, from Reiniger, Gebhard, and Schall. Herr O. R. also reported that a doctor in Gehrden owned an x-ray apparatus in 1896.

It seems, therefore, that Hanover and the show business were right up to date in March, 1896.

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FLUORIDATION OF DOMESTIC WATER SUPPLIES

The Board of Faculty of Dental Surgery of the Royal College of Surgeons of England was asked some time ago by the Minister of Health to consider the question of the fluoridation of domestic water supplies. The following report was therefore drawn up, and last week it was accepted and approved by the Board of Faculty of Dental Surgery and by the council of the Royal College of Surgeons. The Board is satisfied that the incidence of dental caries is much less among children and adults who have spent the whole of their pre-natal and post-natal life in areas where the drinking water naturally contains fluoride at a level of one part per million or more than among those in areas where the water is practically free from fluoride.

In 1945 the fluoridation of domestic water supplies for reducing the incidence of dental caries was started in certain selected communities in the United States of America and in one in Canada. Eight of these communities in which fluoridation was started from 1945-48 have been used as study centres. The results obtained each year have been compared with the base-line data, and in some centres, as an additional control, dental examinations have been undertaken in adjoining and comparable communities.

The evidence to date shows a reduction in dental caries incidence of 40% to 50% in children of the youngest age groups, which is comparable to what is observed in areas where the water has naturally a fluoride content of one part per million or more. In the older age groups the teeth have not been subjected to fluoridation during all their formative period, and the reduction is not as yet so marked. There is nothing to suggest that a water naturally containing fluoride has properties different from those to which fluoride has been added.

In a temperate climate, with a population of adequate nutritional standard, fluoride at a concentration of 1-1.5 parts per million as fluorine in the water produces an occasional white fleck on the enamel, but this cannot be detected without expert dental examination, and is found in only about 10% of children. The appearance of the teeth is excellent.

There is no scientific evidence of toxicity or of harmful effects in districts with the water supply fluoridated at this level.

The Board considers that there is very strong evidence in support of fluoridation, and welcomes the proposal that this procedure should be adopted in the first place in some selected districts that can be used as study centres.

Misuse of Penicillin

SIR.—The spectacular effect of penicillin in the treatment of certain severe acute infections, and recently increased availability, have led to the use of this drug on a large scale in comparatively mild respiratory infections. It is sometimes forgotten that penicillin does not suit some individuals, and it is likely that we shall see a variety of patients who are complaining of symptoms which could be referred to the treatment which they have undergone.

In recent years, in particular during the present winter, I have seen a number of adult patients who complain of asthma which they date from a minor respiratory infection, usually labelled a "chill" or "bronchitis." The common factor in these cases appears to be that all have received penicillin, usually by injection, but sometimes by inhalation. Skin tests in several of these cases have demonstrated sensitivity to penicillin, and in other cases I have found a positive skin reaction to the Bencard group of moulds. There seems little doubt that penicillin may provoke an onset of asthmatic symptoms in patients who are sensitive to it, and the treatment of the sequel may be much more troublesome than the treatment of the initial complaint.

It would seem, therefore, that care should be exercised in the selection of patients who are regarded as being suitable for penicillin treatment. It is my impression that the milder infections respond quite well to the methods of treatment which were used before penicillin was discovered.—I am, etc.,

London, W.1.

JAMES MAXWELL.

Chlorpromazine

SIR.—Clinical investigators are entirely dependent on the laboratory work of our colleagues the pharmacologists. It is disconcerting when two sets of workers apparently meet in head-on collision (*Journal*, February 5, p. 338). The experiments of Holzbauer and Vogt¹ in Edinburgh and the Frenchmen Aron, Chambon, and Voisin² are not, however, comparable. The French workers performed a neat and simple series of experiments; they removed one suprarenal from unmedicated rats and estimated the ascorbic acid content. This was the control, and also constituted the stress. An hour later the other suprarenal was removed, and the fall in ascorbic acid noted. In another series of rats, chlorpromazine was given at varying times before the first operation, and the two operations repeated as before. The fall in the ascorbic acid content of the second suprarenal was found to be considerably less in the animals that had chlorpromazine. From these results they reasonably concluded that the drug modified the normal effect of trauma on the suprarenal ascorbic acid content. They were careful not to claim that the drug caused a chemical hypophysectomy.

In Edinburgh the animals were medicated with urethane. A laparotomy was performed. An hour and a half later the animals were killed while still anaesthetized and the ascorbic acid content of both suprarenals estimated. In another series of animals they were given chlorpromazine prior to the experiment. This made little difference to the fall in the ascorbic acid content of the suprarenals. This experiment shows that, in rats given urethane, trauma causes a fall in the ascorbic acid content. Chlorpromazine added to the urethane does not modify the fall to any greater extent than does urethane itself.

We must be careful not to apply results found in rats at dosage of 10 mg. per kg. to those obtained in man at a dosage of less than 1 mg. per kg.

Pronouncements about this drug show laudable *ex cathedra* negativism, but the details of the experiments on which the findings are based should be more widely known.—I am, etc.,

London, N.W.1.

ANGUS SMITH.

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- ² *Bull. Acad. nat. Méd. (Paris)*, 1953, 137, 417.

SIR.—Your recommendation of caution in the use of chlorpromazine should certainly receive careful consideration by all those who have found this drug useful and employed it extensively. For three or four months I have been giving it to patients suffering from dermatoses in which the mental aspect was deemed to be of importance, and I would estimate the incidence of jaundice at no more than two cases in about one hundred.

The first patient phoned my clinic one day to report that he had developed shivering attacks eight days after being put on 25 mg. of the drug three times a day. On the following day he noticed dark urine. I subsequently confirmed from his family doctor that he was suffering from jaundice. The second case developed after 24 days on an identical dose. The patient developed vomiting followed on the next day by dark urine. As he was feeling so much better generally since taking the drug, he continued taking it until seen three days later, when he showed marked clinical jaundice.—I am, etc.,

London, W.1.

W. G. TILLMAN.

Lead-poisoning

SIR.—The papers by Drs. J. W. G. Gibb and J. F. MacMahon and by Dr. H. B. Marsden and Miss V. K. Wilson (*Journal*, February 5, pp. 320 and 324) rightly emphasize the disastrous consequences of lead-poisoning and the difficulty of early diagnosis. Even when lead-poisoning is suspected, it is often not easy to obtain confirmation, particularly in those mild cases whose prospects for successful treatment should be brightest. Isolated examinations of the blood for stippled cells or of the urine for albumin and sugar may be negative, radiological changes may be inconclusive, and lead assays in blood or urine are impracticable as a screening test. In these circumstances, the qualitative test for urinary coproporphyrin is valuable. This consists in adding 5 drops glacial acetic acid, 3–4 drops of hydrogen peroxide, and 1–2 ml. ether to 5 ml. of urine in a test-tube; after 10 minutes the tube is inspected in a "Wood's light." If excess of coproporphyrin is present, there is reddish-pink fluorescence of the ether layer. The test is a simple one requiring little time; it is generally positive in active lead-poisoning and sometimes may be the only readily demonstrable sign. Coproporphyrinuria of course occurs in certain other conditions, but none of these is likely to be mistaken for lead-poisoning.

As Drs. Gibb and MacMahon remark, children who have recovered from acute lead-poisoning remain during childhood and adolescence (because of skeletal storage of lead) in a precarious plight. However, since the introduction by Bessman *et al.*¹ in 1952 of treatment with the chelating agent calcium disodium ethylenediamine tetraacetate (calcium disodium versenate) it is no longer correct to say that "successful therapy merely diverts lead to the bones." There is much evidence that, in addition to relieving the symptoms of acute plumbism, calcium disodium versenate therapy increases the total excretion of lead from the body, and in fact leads to removal of lead from the bones.—I am, etc.,

London, W.2.

H. MCC. GILES.

REFERENCE

- ¹ *Med. Ann. Distr. Columbia*, 1952, 21, 312.

Silver Stool Sign

SIR.—I was greatly interested by Sir Heneage Ogilvie's memorandum (*Journal*, January 22, p. 209) concerning the silver stool sign, and by the correspondence which has followed it. Twice during the past six months I have been shown silver stools. On one occasion the stool was well formed and had a distinctly metallic sheen. The production of such a stool was an isolated occurrence in a patient who had had a myocardial infarction and was being treated with phenylindandione.

The other and much more remarkable event was the production of an "aluminium paint stool," which I think must have been exactly similar to that described by Dr. Arnold S. Aldis (*Journal*, February 12, p. 414). The bright silver

appearance of the exterior of this stool was only slightly less marked throughout its substance.

The patient concerned, a man aged 58, had been admitted to hospital five days previously, complaining of severe substernal pain since the preceding day. He gave a history of anginal pain for three months, and fifteen months before he had been admitted to the same ward because of a severe melaena. Radiological examination following this episode showed no evidence of gastric or duodenal ulceration. The more recent event was diagnosed as a myocardial infarction and this was confirmed by E.C.G. Anticoagulant treatment was started with ethyl biscoumacetate. On the same day as he produced the silver stool, the prothrombin time was 8.8 times normal and the prothrombin index was 11. Anticoagulant treatment was stopped, and by this time he had received a total of 3.6 g. tromexan. On the seventh day after admission his condition suddenly deteriorated and he died. No more silver stools had been passed. Post-mortem examination confirmed the presence of a large postero-septal myocardial infarct which was thought to be about three weeks old. Because of his history of melaena the gastro-intestinal tract was carefully examined. There was no evidence of past or recent haemorrhage or ulceration, nor was there any macroscopic evidence of neoplasm. The pancreas appeared normal, as did the other viscera.

If a silver stool is evidence of altered blood in the gastro-intestinal tract, then I feel that the production of silver stools by two patients, both of whom were being treated with anticoagulant drugs, may well be significant, and such an occurrence should be regarded as an indication for increased caution in the handling of these drugs. I should be most interested to know whether others have noted a similar association.—I am, etc.,

Carshalton.

JOHN WEEKS.

S.T.H. and Tuberculosis

SIR.—In his lecture on "The Role of the Host in the Chemotherapy of Tuberculosis," reproduced some time ago in the *Journal* (October 2, 1954, p. 767), and which I read otherwise with much interest, Dr. P. D'Arcy Hart mentions our work in the following terms: "... We have been unable to antagonize the protuberous effect [of cortisone] by any structurally similar steroid; and although Lemonde *et al.* have claimed to have done this with somatotropic hormone (S.T.H.) in rats, and even to suppress experimental tuberculosis in mice with this hormone, we have failed to produce either effect in mice."

I feel that the author exaggerates a little. It is true that we have found, in repeated experiments, that the somatotropic hormone (S.T.H.) prevents the extension of tuberculous infection, catabolism, and death in cortisone-treated rats, but we never claimed to suppress tuberculosis in mice with S.T.H. What we saw is the following: (1) In mice affected with a stable, chronic form of tuberculous infection, S.T.H. decreased the number and extent of pulmonary lesions, as well as the number of bacilli in the lesions.^{1,2} (2) With a rapidly evolving disease—whether this was achieved by inoculating a larger amount or a more virulent type of bacilli or by treating the animals with A.C.T.H.—and in spite of the fact that we repeated the experiments several times under various conditions, we never succeeded in obtaining any prolongation of survival, even though the lesions and the number of bacilli were generally reduced.²

May I add that a group of investigators, working with the guinea-pig, have reported recently some results which are in accord with ours—i.e., that S.T.H. diminished the extent of tuberculous lesions³ and potentiated the action of isoniazid.⁴—I am, etc.,

Montreal, Canada.

PAUL LEMONDE.

REFERENCES

- ¹ Lemonde, P., *et al.*, *Ann. Endocr. (Paris)*, 1952, 13, 897.
- ² — and Panisset, M., *Amer. Rev. Tuberc.*, 1955, 71, In press.
- ³ Lucherini, T., *et al.*, *Policlinico. Sez. med.*, 1953, 60, 358.
- ⁴ Besta, B., *et al.*, *Annali Ist. "Carlo Forlanini"*, 1954, 14, 171.

Tuberculous Mesenteric Adenitis

SIR.—I was much interested in the account given by Dr. H. R. E. Wallis of tuberculous mesenteric adenitis in children (*Journal*, January 15, p. 128), because of the enormous contrast between past years and now. Referring to Colt and

Clark,¹ who dealt chiefly with adult cases, we described some surgical aspects of tuberculous disease of the abdominal lymphatic glands. There is an excellent, brief, comprehensive, and easily accessible abstract of the relevant parts of the latter paper in the *British Medical Journal*.² G. N. Clark is not now in England and cannot join with me in this letter.

In those days the condition of the udders of the cattle on the farms was bad. Tuberculin-tested herds were supposed to yield milk that was free of tubercle; indeed one herd has never been known to show infection since then, but two fatal cases of tuberculous meningitis were admitted to the Sick Children's Hospital on the day that one of our patients came under our care. This patient, aged 5 years, had been looked after at home and fed on boiled milk until put on certified milk. Acute peritonitis very soon followed with temperatures of 101°–103° F. (38.3–39.4° C.) daily for 13 weeks, and marked ascites. Now, after 20 years of married life and with no detectable disability, the patient remains sterile. On two occasions doctors have suspected appendicitis, but, as will be shown presently, operation has been avoided.

At that time there was prejudice and fear amongst the farmers that they would lose on compensation and on their established reputations in the markets. Once these items had been adjusted there was a great improvement, but it was not sufficiently rapid to appear in our articles. I believe that a good co-operative drive at that time would have eradicated the disease in about two years. Why after all this long time the disease has not been completely eradicated is difficult to understand, but Dr. Wallis's article shows that it has not. Importation of cattle may be a factor.

Our articles were as complete and comprehensive as could be attained at the time. They dealt with 239 consecutive cases admitted into a general adult surgical ward, many of them—in fact most—as abdominal emergencies. 207 of the cases were traced and 118 patients were seen and examined. In 38 caseous cases the patients were operated on. In the later calcified cases, as well as in the caseous, the presence of acetone in quantity in the breath (which does not seem to have been noticed by previous observers) was so common that this alone was sufficient and safe to enable urgent operation to be avoided. Hyperaesthesia and increased tonus of the muscles in the right iliac fossa, though more diffuse and less intense than in appendicitis, were not so certain in their indications. Lockwood's sign always proved invaluable, and on one occasion it was possible to actually demonstrate its mechanism on the exposed viscera, which I do not think Lockwood actually did.

Now that the State pays for radiological investigations and facilities have also improved, it would be a great help in coming to a decision to be able to observe, by serial x-ray examination, the rate of calcification of glands and whether there is any difference in the rate of deposition of calcium when either milk is fed or any of the other more modern preparations. Judging by our observations it is impossible to be sure of the facts by ordinary clinical methods, palpation and so on, but with careful adjustment of tests with x-ray tubes it should be possible to obtain comparable pictures of the amount of calcium present. Some of the aluminium alloys should match up the degree of opacity. In former days no two tubes could ever be made to give comparable results on the same day, and even the penetration of one tube varied with its temperature. The difference in fuzziness of the dendrons is important as well as the gross density of calcification.

If this letter has re-established a link with our articles, which were comprehensive, and gave a chronological approach to the subject by the references, it will be of some satisfaction, because it will help to demonstrate the great advance in the factors of the state of the public health which have come about in the last 15 years. For details the papers themselves should be consulted.—I am, etc.,

London, W.1.

G. H. COLT.

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- ¹ *Lancet*, 1937, 1, 125.
- ² *Surg. Gynec. Obstet.*, 1937, 65, 771.
- ³ *British Medical Journal*, 1938, 1, Epitome 38.

Treatment of Pulmonary Tuberculosis

SIR.—Artificial pneumothorax began to lose popularity as its complications became widely appreciated and as surgical alternatives multiplied. Dr. J. L. Livingstone (*Journal*, January 29, p. 243) considers that it still has a limited place in the treatment of tuberculosis, especially since chemotherapy is likely to reduce the complication rate; and you, Sir, in a leading article of the same date (p. 273), find it difficult to believe that it "can really have no useful part to play in the future."

I myself do not think that there is any place for artificial pneumothorax treatment to-day, and hardly any for pneumoperitoneum. The disadvantage of having to attend a doctor every week or two for air refills is one of which little was made when alternative methods were few. Yet it is in fact so considerable that, even if no risk whatever were involved, the physician should seek other methods wherever practicable. No one would deny that artificial pneumothorax has had good results as well as bad, but other methods are making it redundant. Current developments in the use of chemotherapy appear to be giving as good results, or better, in every respect, and it is my view that all forms of pneumatic treatment should now be abandoned as not having merit enough, compared with prolonged chemotherapy, to set against their obvious disadvantages. Only if some unforeseen snag is discovered in the use of chemotherapy for long periods should we consider reopening the refill clinics.—I am, etc.,

Malvern.

T. W. LLOYD.

Treatment Abroad of Tuberculous Children

SIR.—This association is having considerable success with sending British tuberculous children for treatment at Vordingborg Sanatorium, Denmark. In the last three years some 235 children have been sent across, with exceedingly good results. At the present moment 47 patients are under treatment at Vordingborg.

It is true, as Dr. F. J. Bentley says (*Journal*, February 12, p. 418), that there is less need for treatment abroad than there was a few years ago, but we find that from Clydeside, Merseyside, and Northern Ireland there are still children whom the chest physicians wish to send. This Anglo-Danish scheme is free of cost to the parents or our Health Service. Children are kept at Vordingborg at the expense of Anglo-Danish sympathizers. The whole scheme owes its origin to the success which Denmark has had in eradicating childhood tuberculosis, and which has set free beds in the sanatoria. The psychological benefit to these children of a stay abroad during the impressionable years of life is certainly not the least important part of the scheme.—I am, etc.,

HARLEY WILLIAMS,

Secretary-General, The National Association for the Prevention of Tuberculosis.

Paraffin Stoves

SIR.—In these days of expensive fuels there is an increasing tendency to use paraffin-burning stoves in sickrooms and living-rooms of domestic dwellings. It appears that this method of heating is not without danger. A few days ago I was called to see a man and his wife of 40 years of age who had retired to bed in excellent health the night before and had been found by neighbours at 11 a.m. the following day in very bad shape. When I arrived at the house the woman was still in bed and comatose. The husband had managed to crawl downstairs in answer to repeated and persistent ringing of the doorbell. He was very weak and drowsy and complained of headache. In the bedroom was a small paraffin stove of modern design which had been allowed to burn throughout the night. The bedroom door had been tightly closed, also the window, and the only ventilation was by means of the chimney. Fortunately the stove had run out of paraffin, otherwise a tragedy might have resulted. The stove had used up oxygen and had given out carbon monoxide.

It appears that the general public is largely unaware that any harm can result from an oil stove burning in a confined space. I suggest that a word of warning by the doctor finding one in a sickroom might not be out of place and might help to prevent serious and even tragic results.—I am, etc.,

Blackburn.

F. C. REIDY.

Fluoridation of Public Water Supplies

SIR.—Dr. A. M. Thomson's letter (*Journal*, January 22, p. 224) provides an excellent example of the methods by which fluoridation has been promoted—namely, by sweeping assertions of knowledge in matters in which more cautious, or perhaps more humble, people admit their ignorance, supplemented by attempts to discredit opponents by a display of contemptuous language. It would have saved much trouble if the mission to the U.S.A., of which Dr. Thomson was a member, had presented both sides of the question fairly instead of behaving as a team of advocates for the proponent side. According to the report¹ of this mission (p. 11) the case against fluoridation was given full prominence while they were in the U.S.A. at the hearings before the Delaney Committee.² This committee, in fact, examined eighteen scientific witnesses, of whom seven were critical of fluoridation. Nevertheless, there is no evidence in the mission's report that they had visited or consulted any of these scientists; and, although a few words of the Delaney report are quoted and some criticisms of fluoridation are mentioned with a view to refutation, it is quite clear that the opposition case has been seen only through the eyes of its opponents. This bias is even clearer in Dr. Thomson's letter; and when it comes to the *ex cathedra* statements of public health officials there is no attempt to present the opposition case to the public, which is why persons such as myself have had to take a hand in the matter.

I cannot see what Dr. Thomson gains by jibbing at a plain accurate description of what he advocates. If "medical treatment" is limited to "cure" and excludes "prevention," the "medical" profession can have no status in the matter. If dosing everybody with something required only by children is not "indiscriminate," what is? Or does he hold that the scientific "discrimination" exercised in putting the fluorides in the right reservoir is sufficient? And I fail to see why this medical Big-Brotherism, with its insistence on invading every home and everybody through the water tap, should be regarded as "scientific," and an objection to it as "unscientific," except, of course, for propaganda purposes. Nice as it is to find the *North Wales Chronicle* so carefully read in Aberdeen, I think he was unwise to drag into this discussion from its pages a reference, quite correct in its context, to "civilized European opinion" and to the precedents for medical tampering with the human body without consent. The ten standards laid down at the Nuremberg trials on August 9, 1947, for persons who initiate or engage in medical research on, or treatment of, human beings, start with this statement: "*The voluntary consent of the human subject is absolutely essential*," and I have yet to learn that the British medical profession regards itself as exempt from this standard of conduct. In France, I am informed, the Dental Convention in Paris has recently rejected fluoridation as contrary to human rights, local governments have no power to order it, and the Institut Pasteur and the Ministre de Santé Publique have not approved it.

If it is true, as Dr. Thomson clearly implies, that the medical profession, which is not without experience with dangerous drugs, can yet find no safe way of administering fluoride, under normal conditions of consent, only to those who may be expected to benefit, I cannot see how the public can be expected to consent to the putting of this substance in the general water supply. The statement that "variations in the amounts of fluoridated water ingested by individual consumers are known to be without significance for health" would be sufficiently staggering if the word "fluoridated" were omitted. With the bottom limit for "chronic low grade poisoning" officially placed as low as

2 mg. daily, as compared with 1 to 1.5 mg. of fluoride daily for "preventive dentistry," it makes no sense to me.

Finally, I come to the actual evidence upon which the proponents of fluoridation base their astonishing claims to knowledge of its harmlessness to individuals. The evidence is almost entirely statistical, and, considered as such, unconvincing to the point of absurdity. The Bartlett-Cameron comparison reviewed in your annotation "Fluoride in Water" (*Journal*, January 22, p. 215) seems to be, to date, the most careful long-term investigation into the effects of fluorides upon health, other than dental decay. But here we find, not the "evidence from millions of people" mentioned by Dr. Thomson, but a comparison of two populations of about 120, of an age-distribution so different that 14 deaths in one is not significantly different from 4 deaths in the other. Just to make it funnier, the younger population turns out to have nearly twice the incidence of cardiovascular disease found in the older, and, to round it off, the water of the "control" town has more than the average amount of fluoride in it (0.4 p.p.m.). Certainly it is quite true to say that this comparison has produced no evidence of damage due to fluoride at 8 p.p.m., but such a statement is completely misleading unless accompanied by an estimate of the number of people in Bartlett who would have had to suffer death or observable damage through ingesting fluoride in order to produce a significant result. It seems obvious, even on the limited data available, that, with samples of this size and variability of this order, the disaster to health in Bartlett would have had to have been catastrophic to have reached statistical significance. So far as I know, no one has entertained the idea that fluoride at such low concentrations could produce damage of that kind, so that the "evidence" is entirely irrelevant to the question of the possible hazards of fluoridation. The mortality statistics for 22 Illinois cities, published in the British mission's report¹ (p. 62) are equally unconvincing. The only thing demonstrated is the irrelevance of the statistical approach to this matter.—I am, etc.,

Bangor.

C. G. DOBBS.

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- ¹ *The Fluoridation of Domestic Water Supplies in North America*. Report of the United Kingdom Mission, 1953, p. 11. H.M.S.O., London.
- ² *Chemicals in Food and Cosmetics*. Hearings Before the House Select Committee to Investigate the Use of Chemicals in Foods and Cosmetics, Eighty-second Congress, Second Session, 1952, part 3.
- ³ *The Problem of Providing Optimum Fluoride Intake for Prevention of Dental Caries*, 1953, a report of the Committee on Dental Health of the Food and Nutrition Board, publication 294, Division of Biology and Agriculture, National Research Council.

Slippery Floors in Hospitals

SIR.—May I draw attention to a subject which receives very little? I refer to the large number of minor and major accidents which occur to the staff and patients of hospitals, many instances of which I can quote, including fractures of limb bones, due to slippery floors. Most hospitals have some system of recording such accidents because of possible litigation, and when injury is caused this process is usually carried out, but many more accidents causing damage to hospital property, mainly crockery, glassware, and thermometers, due to nursing and domestic staff slipping in wards or ward annexes, probably go unreported. When post-operative patients, the infirm and aged, and those recovering from limb fractures are being encouraged to get on their feet, there is in most of them a natural loss of confidence resulting in muscular incoordination, and a slippery floor is the worst possible surface on which to try their first hesitating steps; not only are their feet liable to slip but also their walking-sticks or crutches, with resulting falls. The lethal effect of fractured neck of the femur in the aged is of course well known.

A tendency to slip depends on several factors, which briefly are those associated with the person, such as some locomotor disability and also the material composing the soles and heels of his footwear, and factors relating to the composition, texture, and polish of the floor. The problem is a difficult one, because some shoe surfaces will slip on

some flooring materials and not on others, but in my view much of the trouble is caused by the excessive and un-intelligent use of floor waxes and polishes, so as to produce the shining appearance beloved by administrative nursing staff. Polish which is claimed to have a non-slip quality is, I believe, available, but the accepted view seems to be that if it is non-slip it cannot polish. I suggest that this is a problem of some importance which deserves the attention of hospital architects and administrators. Slippery floors in hospitals are a serious hazard to patients and staff and they should no longer be tolerated.—I am, etc.,

London, N.W.9.

W. E. SNELL.

Ward Rounds and Myocardial Infarction

SIR.—I was much interested in Dr. Klaus A. J. Järvinen's article (*Journal*, February 5, p. 318). The importance of his findings on the unfavourable response of patients with acute myocardial infarction to the hazards of hospital routine can hardly be exaggerated. The emotional stress causing a fatal issue in six of his patients is perhaps too narrowly defined as the result of the visiting physician's ward round, many other factors—partly mentioned by the author—connected with the daily hospital experience of such patients combining in the production of an anxiety state so dangerous for those affected with coronary artery disease.

But does not the logical conclusion present itself that such a patient is best treated in his own home whenever circumstances permit? In an extensive cardiological practice, before I came to this country, I had made it a rule to treat all my patients with acute coronary occlusion in their home, in surroundings best suited for safeguarding mental rest, and had no cause to regret this procedure. Only so is it possible to disguise the diagnosis in spite of the difficulty of persuading the patient to keep his six weeks' absolute rest. Though often enough, owing to socio-economic conditions, I had to dispense with the expert help of a day and night nurse and had to entrust the care of the patient to a reliable member of the family, the results were satisfactory and the mortality rate among my patients was considerably low. The small inconvenience of taking my portable electrocardiograph to the patient and of performing simple laboratory tests like E.S.R. and urine examinations at the bedside was highly compensated for by the beneficial effect of allowing the patient to remain in his familiar surroundings.

It must, of course, be admitted that modern anticoagulant treatment may make it difficult for the practitioner to decide in favour of this management, but I am certain that many general practitioners will agree with me that, provided all available facilities are used (and the home help service should be mentioned in the first place), home treatment can be assured with benefit to the patient in the majority of cases. As a mere onlooker I feel hardly entitled to comment on the value of anticoagulant therapy in coronary artery disease, a treatment unknown in the 'thirties, but do the results so far obtained really justify the frequent unavoidable risks of interfering with the patient's most-needed rest? Four patients of the six cases reported in Dr. Järvinen's paper had died in spite of anticoagulant treatment.—I am, etc.,

Leicester.

LEO HAHN.

Treatment of Phenylketonuria

SIR.—We have read with great interest the important paper, "Treatment of Phenylketonuria with a Diet Low in Phenylalanine," by Dr. L. I. Woolf, Dr. Ruth Griffiths, and Professor Alan Moncrieff (*Journal*, January 8, p. 57). The psychological findings provoked a great deal of discussion here, during which we felt that certain aspects should have been taken into consideration before placing too much reliance upon the apparent improvement in intellectual level in the three cases involved in the investigation. It is known that mentally defective children are subject to fluctuations on their test scores, and any extra attention on the part of

the investigators might easily have produced some improvement. A control group in this case would have been very desirable. The prediction of educability based on pre-school tests, to which Dr. Griffiths's valuable test belongs, is not highly reliable, because of their nature. Allowance should be made for practice effect on the same test and also for improvement in adjustment to the test situation with repeated testing. We look forward with much interest to further findings.—We are, etc.,

Ipswich.

J. G. HOWELLS.
W. PAWLICK.

Disk Lesions and Low Backache

SIR.—When reading the paper by Dr. James Cyriax (*Journal*, January 15, p. 140) I felt certain it would provoke a lively correspondence; this has proved to be the case. While thoroughly agreeing with Dr. Cyriax that manipulation or traction is often successful in the treatment of acute and chronic back conditions, I think it should be recognized that such treatment, even in the most expert of hands, sometimes makes the patient worse.

Being quite unable to accept the contention of Dr. Cyriax that practically every case of low back or sciatic pain is caused by a disk lesion, I was delighted to read the letters of Mr. W. Grant Waugh and Dr. A. C. Elkin (*Journal*, February 12, pp. 412 and 413), pointing out the importance of the apophyseal joints as a source of low back and sciatic pain, for I have long held similar views.¹ The fact that one can so often give the patient relief by a single manipulation, in my opinion, makes it exceedingly unlikely that a disk protrusion could be the cause of the symptoms. The nucleus is contained within the annulus under very considerable pressure, and, although it is easy to visualize lumbar traction reducing the protrusion, it is difficult to understand why the protrusion should not recur as soon as traction is released. If anyone doubts the importance of the posterior joints as a source of low back or sciatic pain I would suggest they read the papers by Putti,² Kraft and Levinthal,³ and Harris and MacNab.⁴

We should beware of "omnibus" diagnosis and treatment. Mr. Grant Waugh rightly points out that the intervertebral articulation comprises three elements—the disk, the spinal ligaments, and the apophyseal joints—and that any pathological condition which affects one affects all. Therefore if we must have an "omnibus" diagnosis let it be "intervertebral derangement."

As for treatment, each and every case should be considered on its merits. Many cases recover with rest alone, while others do equally well with physiotherapy. Though manipulation or traction often provides a short cut to recovery, there are exceptions, and for these cases the plaster jacket still remains the most effectual remedy. Furthermore, if one had succeeded in reducing a disk protrusion by traction, it would appear rational to follow up with a plaster jacket to enable repair to take place and prevent recurrence. Fortunately Nature is very wonderful, and many patients recover "in spite of" rather than "because of" what we do for them.—I am, etc.,

London, W.1.

E. J. CRISP.

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SIR.—Mr. John Charnley's admirable article on this subject (*Journal*, February 5, p. 344) imparts a constructively sane approach towards this condition. As a G.P. surgeon I can testify to the cost and burden borne by the hospital and general-practitioner services since the British public began to take lumbago and sciatica seriously. Shortly after the war I worked for two years as a clinical assistant in the orthopaedic department of my old teaching hospital. Drove of patients with varying degrees of backache clogged the department. One of the two consultants, who was contemporary with me as a student, asked me: "As a G.P., what did you do with all these cases before the war?"

My reply was: "Before the war these cases did not exist. Severe sciatica was relatively rare, while lumbago, though common enough, was not regarded seriously either by doctor or patient, and they soon got well."

It must be agreed that we had no satisfactory explanation for these conditions, or for "fibrositis," "neuritis," etc. Now that we have a logical explanation, I cannot agree too much with Mr. Charnley's recommendation that a robust attitude by both doctor and patient towards this tiresome condition will do much to reduce invalidism and waste of time and money in the Health Service. Dr. James Cyriax has, without doubt, hit on a line of therapy which works in a large number of cases. One cannot, however, help retaining some scepticism with regard to the claims for so many instant cures, on a purely physical basis. Successful psychotherapy *does* produce instant cure in all the faithful, and one wonders whether indeed many of Dr. Cyriax's cases lie in this category. "Laying on" of healing hands. . . ?

It is to me certain that many "backache" cases are psychologically inadequate and conform to a psychosomatic type easily recognized in general practice. Mr. Charnley mentions fluid retention in the nucleus pulposus as the cause of increased tension, and associates glaucoma in the comment. Glaucoma is undoubtedly psychosomatic in many cases. May it be that further research into the biochemistry and endocrinology of localized fluid retention will shortly provide that link between mind and body which will present both practitioner and patient with a satisfactory explanation for these and allied states?—I am, etc.,

Reigate

L. DULAKE.

SIR.—Although a personal admirer of Mr. John Charnley's attitude to chronic backache (*Journal*, January 15, p. 163), I find it very hard to be convinced over his explanation of acute lumbago on a disk basis. To me the fulminating onset does seem quite easily explicable on an inflammatory basis, since the pain is not due to ordinary inflammatory tension but to a sudden cramp in the affected muscle. Anyone who has ever had acute lumbago will never forget the tightening up of the muscles in the excruciatingly painful spasms. These painful cramps occur in other conditions where muscles are irritated, which we all know of and where no disk lesion is in question, such as in cold (ranging from cold sheets to cold water—where it can cause drowning) and in anoxic states. One would like to know how Mr. Charnley would explain on a disk basis the exactly analogous condition of stiff neck, where the intensely painful spasm is on the side that was exposed to the draught. Unless he can explain this, it is hard for one to be convinced over the acute lumbago. Needless to say, I am not referring to the syndrome of an acute disk lesion, which is often accompanied by trauma, and where the pain shoots down the leg and is a longer time going away, and still less to chronic backache. I am merely referring to the ordinary attack of acute lumbago that disappears completely.—I am, etc.,

Alverstoke, Hants.

T. L. CLEAVE.

SIR.—As a general practitioner the question of backache has always been of great interest to me, and the recent articles and letters in the *Journal* have prompted me to tell of another line of approach that I have taken.

I have found that a good number of patients trace their backache to some previous injury or sprain. As so many people can explain almost everything from a boil on the nose to a carcinoma of the breast by a blow they once received, I determined to follow up a number of cases of minor injury to the back and see whether the patients returned complaining of backache. In some six years I have managed to collect 60, mostly young, people who have had minor sprains and injuries to their backs. Each case was carefully examined and charted on a diagram—the greater the tenderness the bigger the spot on the diagram.

I divided them into three groups: (1) 24 Cases: Treated with rest, heat, aspirin, and some massage. Allowed to return to work when they felt they "could make it." No further instructions given to them. Of these, 20 returned within weeks or months complaining of backache, and 18 had their chief tenderness localized to the area of previous tenderness as marked on the diagram—especially in the "big spots." (2) 26 Cases: Treated in same way as (1) but told about my chart and asked to return if backache returned. Of these, 18 returned—all with pain in the marked areas. (3) 10 Cases: These were made to rest till all signs of pain had gone—given more prolonged massage. Told to return at slightest suggestion of pain. Only one returned.

It seems, therefore, that a case can be made out for not "neglecting" minor injuries to the back as a means of preventing some cases of backache.—I am, etc.,

London, W.7.

A. M. LASNICK.

Hyperpyrexia and Anaesthesia

SIR.—Dr. R. Cecil Brown (*Journal*, December 25, 1954, p. 1526) has given an interesting account of hyperpyrexia and convulsions occurring in a patient anaesthetized with thiopentone, nitrous oxide, and trichlorethylene. It is well known that carbon dioxide can produce cerebral congestion and convulsions. The high metabolic rate associated with hyperpyrexia and a convulsion would result in increased carbon dioxide production, and it would be interesting to know how much was given, and for how long, in the treatment of the laryngeal stridor.—I am, etc.,

Newcastle-upon-Tyne, 4.

J. D. WHITBY.

The National Formulary, 1955

SIR.—There will be widespread agreement with your leading article (*Journal*, February 12, p. 402) on the new edition of the *National Formulary*, but to say that the committee's decision to revert to Latin for group and individual titles "will undoubtedly occasion some controversy" is indeed an understatement. It is quite incredible that the 1955 committee should reverse in its tracks. Instead of, as outlined in the preface, completing the change-over to "a more rational grouping and transition to the use of English in prescribing, in conformity with modern trends," it has decided that because the 1952 compromise was "unwelcome to the majority of those who use the *Formulary*" therefore the next rational step is to retreat to Latin instead of to advance logically to the adoption of English throughout the *Formulary*.

This reversion to a traditional although outmoded pharmaceutical convention involves the ridiculous pseudo-Latinization of approved names of drugs; cyanocobalamin injection is a sufficient mouthful without the absurdity of injectio cyanocobalamini being substituted for it. Furthermore, it is completely unreal to attempt to justify the step by pleading that the Latinization of drugs makes them thereby more easily understood internationally. A prescription written for inj. insulin, protaminat. c. zinc, is no more easily interpreted in Chile or China than protamine zinc insulin injection. The argument that a national *Formulary*—which is in daily use in town and country, general practice and hospitals, throughout the United Kingdom—must be in Latin because the *Pharmacopoea Internationalis* is in Latin is as absurd as to maintain that the key and explanations at the foot of Ordnance Survey maps should be in Latin because many foreign tourists visit this country. In any case, the national equivalent to the *Pharmacopoea Internationalis* is not the *National Formulary* 1955, but the *British Pharmacopoeia* 1953—which has adopted English usage. It would be amusing to discover how many, or rather how few, prescriptions are in fact written in this country and subsequently presented to foreign pharmacists. No, Sir, neither by this nor any other hackneyed argument, such as the necessity to conceal the contents of a prescription from a patient, can this reactionary, retrograde, and misguided decision be justified. There is no place in modern medicine for such rigid adherence to pharmaceutical tradi-

tion, and few, if any, medical schools throughout the country train students to prescribe in Latin. Many doctors will therefore welcome the proposed edition of a companion volume to the *Formulary* in which English is to be used throughout, and the formulae grouped according to their pharmacological classification. Such a formulary will meet with more general acceptance, and would be the appropriate guide for young doctors starting practice uninfluenced by previous contact with the archaic mystique of Latin prescriptions.—I am, etc.,

Edinburgh, 3.

ALASTAIR G. MACGREGOR.

SIR.—Your leading article (*Journal*, February 12, p. 402) on the above publication surely reflects the views of the majority of practitioners. It is inevitable that a book of this nature will not meet with the approval of all its readers in every respect. Difference of opinion is understandable, but inconsistency is not. The declared policy of the Joint Committee is to include "a preparation even if its justification on pharmacological grounds is disputed, if it is still being frequently prescribed." Why, then, is bismuth carbonate not included among the remedies for dyspepsia? Much has already been written concerning the relative merits of antacid preparations, and one must accept that difference of opinion exists. In 1949 the Committee suggested analogous preparations were as good as bismuth carbonate: they did not categorically deny it to be of value. The question as to whether bismuth carbonate is frequently prescribed cannot be a matter for conjecture when the overall consumption of bismuth carbonate in this country is increasing.

There is every indication that bismuth carbonate is frequently prescribed, and this warrants its inclusion in the *National Formulary*. If there is some other reason for its exclusion, then the Joint Committee should make it perfectly clear, for their present attitude is inexplicable and lacking in logic. Those who have found bismuth carbonate of value will no doubt be disappointed at its exclusion; those who do not prescribe the preparation must surely agree that its exclusion is inconsistent and the reason for it obscure.—I am, etc.,

London, W.1.

PETER R. BATESON.

SIR.—Space forbids the detailed criticism of your leading article on the new *National Formulary* (*Journal*, February 12, p. 402) which I—and no doubt others—would like to make. I will therefore only say about "bottles of medicine" that they allow a much more flexible control of dosage than do tablets, and that the modern tendency to tablets involves tablets of an ever-increasing multiplicity of sizes and combinations which is becoming an overpowering burden to the prescriber and an added expense to the State.

To suggest that the *N.F.* is "slavishly following customs which may be ill-informed" because it reinserts the ammonia and senega mixture is, I submit, prejudice rather than therapeutics. Unfortunately pharmacology is largely based on normal animals and defines an expectorant as a substance that increases the bronchial secretion. This is difficult to determine and few substances seem to do it. But the physician is concerned with inflamed surfaces, and is not worried too much about the amount of secretion but whether or not his mixture eases the patient; and at least three generations of doctors and patients have experienced the striking relief that this mixture will give in the early stages of a hard cough. This stage may seldom be seen in hospital—and anyhow few pharmacologists nowadays would be willing to try the mixture—but in general practice we do see such cases and also the relief afforded. Incidentally, the omission of the monograph on expectorants does not "reflect the contemporary opinion that they are unnecessary and ineffectual" but was due to quite other causes.

Academic pharmacologists may well criticize some other features, but they should remember that the *Formulary* is not a textbook: and they might even welcome its apparent vagaries if they remembered the danger which both practical and academic medicine run of being cribbed, cabined, and

confined in a national health service which is potentially authoritarian. There is a strong feeling among practitioners that the *Formulary* is in some way an attempt to direct their prescribing, and it is essential to demonstrate that it is, and indeed only can be, merely a help, if the increasing drift to proprietary preparations is to be arrested. Actually your leading article suggests that the writer's mind is not far removed from a dictator's in his concluding remarks on "the development of sensible, honest, logical, and economical prescribing habits," for his first two epithets unconsciously (I hope) ascribe mental perversity and moral obliquity to those who do not agree with him. We do not expect this attitude in the *British Medical Journal*.

I think that those who remember the story of the ergot alkaloids will agree that "contemporary opinion" may be at fault and G.P. experience not quite negligible. At least the compilers tried to hold the scales even. The final result inevitably represents the pressures as well as "the dispensing habits of its country of origin," but I hope it also reflects the whole-hearted efforts of us all to make it as worthy and helpful a volume as we could. I should like to say what a privilege and honour I felt it to be one of the B.M.A. representatives on the revision committee, and what a pleasure and education I found it to work with so many people with whom I often disagreed but from whom I also learned so much. I trust that the doctors of the country will give the *Formulary* a more cordial welcome than your leading article, and, above all, that, in spite of its many shortcomings, they will use as much of it as they can and find the value of some formulae which they have not used hitherto.—I am, etc.,

Winsford, Cheshire.

W. N. LEAK.

Laryngeal Paralysis Following Thyroidectomy

SIR.—The recent medico-legal case of complete laryngeal paralysis following thyroidectomy (*Journal*, February 12, p. 426) should stress the essential pre-operative examination which is often neglected—namely, laryngoscopy. This simple procedure would prevent irreparable damage.

It is not uncommon in cases of thyrotoxicosis for a symptomless unilateral abductor laryngeal paralysis to be present. It only requires damage to the other side to make the paralysis complete. A preliminary laryngoscopy and an awareness of a unilateral paralysis would allow for an alternative treatment to be adopted.—I am, etc.,

London, E.11.

C. J. SCOTT.

Fatal Pulmonary Embolism in Psychiatric Patient

SIR.—I was interested to see the memorandum on pulmonary embolism in a psychiatric patient by Dr. Donald Blair (*Journal*, February 5, p. 335), as it immediately reminded me of a similar case which recently came under my care.

The patient was a woman of some 40 years, suffering from severe endogenous depression of sudden onset. After being kept in bed for a few days on fairly heavy sedation, and while awaiting air evacuation to the U.K., she was commenced on a course of unmodified E.C.T. A few hours after the second session she complained of pleuritic pain in the left side of her chest, and over the next few days developed a haemorrhagic pleural effusion associated with persistent blood-staining of the sputum and a low-grade pyrexia. Following aspiration the remaining fluid absorbed quite quickly and her chest x-ray revealed no evidence of rib fracture. There was at no time any evidence of phlebothrombosis in the legs, and her heart was normal.

I concluded at the time that her pulmonary infarct was probably caused by a pulmonary arteriolar thrombosis consequent upon the period of anoxia and disturbed pulmonary blood flow at the time of her E.C.T. As Dr. Blair points out, small segments of calf-vein thrombosis can be notoriously difficult to detect clinically, and it may well be that her infarct too was embolic in origin. Certainly the immobility in bed of some of these heavily sedated patients combined perhaps with some degree of dehydration, in the absence of energetic tube-feeding, must predispose to venous thrombosis in the legs. I would be interested to learn of

any similar cases to the one described above, particularly with regard to whether the incident followed E.C.T. or not.—I am, etc.,

Luton.

P. G. JACKSON.

Premedication of Children for Tonsillectomy

SIR.—In his letter (*Journal*, January 29, p. 285) Dr. W. N. Rollason describes a variety of premedications and anaesthetic techniques for this operation. I am surprised he found method (4) (chloral, atropine, ethyl chloride, and ether) too time-consuming. Using atropine only, followed by nitrous oxide, oxygen, and ethyl chloride administered from the Y-piece attachment to the Boyle's machine as already described,^{1,2} about 10 cases can be done in an hour.

While "a trace of trichlorethylene" is a valuable adjunct to nitrous oxide in operations *not requiring relaxation*, it would appear to be unsuitable here on account of its inability to relax the jaw and the pillars of the fauces (as is essential for a clean guillotine tonsillectomy) without producing tachypnoea in the child.^{3,4} Perhaps the secret lies in the phrase "correctly administered from a McKesson machine."—I am, etc.,

Aberdeen.

JAMES B. STIRLING.

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Toxicity of D.A.D.P.S.

SIR.—Since the reports of Esteves and Brandao in 1950¹ and of Cornbleet in 1951,² di-amino-diphenyl sulphone (D.A.D.P.S.) has been widely used for the control of dermatitis herpetiformis, and it is generally agreed that toxic symptoms are infrequent and mild. The following brief case history suggests, however, that occasionally severe and rapidly developing toxic effects may occur, with the small doses usually employed.

A rather frail woman, aged 68, developed blisters in the mouth. Several months later there were grouped irritable papules on the forearms, with occasional small blisters. Biopsy showed a sub-epidermal blister containing polymorphs with an inflammatory cell infiltrate in the underlying corium. No other physical abnormality was found. She was given D.A.D.P.S. 50 mg. daily. When seen one week later she complained that the tablets had made her feel ill, with nausea and some vomiting. For two days she had become yellow, with dark urine and light-coloured stools. She had only taken the tablets for four days. On examination she was not jaundiced and there were no abnormal physical signs apart from the blisters. Hb, 65%; R.B.C., 3,000,000; C.I., 1; M.C.D., 7.9; W.B.C., 5,000; neutrophils, 67%; eosinophils, 9%; basophils, 2%; leucocytes, 20%; monocytes, 2%; total plasma protein, 4.5 g. per 100 ml.; albumin, 3.8 g. per 100 ml.; globulin, 0.7 g. per 100 ml.; serum bilirubin, 0.4 mg. per 100 ml. One week later these tests showed: Hb, 75%; R.B.C., 3,800,000; reticulocytes, 1/100 red cells; W.B.C., 6,000; polymorphs, 56%; leucocytes, 34%; plasma protein, 5.7 g. per 100 ml.; albumin, 4.4 g. per 100 ml.; globulin, 1.3 g. per 100 ml. Eight weeks previous to this episode the blood count was: Hb, 95%; M.C.D., 7.3; W.B.C., 5,000; polymorphs, 60%; leucocytes, 34%; eosinophils, 3%; monocytes, 2%; basophils 1%.

It seems probable that in this case D.A.D.P.S. in a dose of 50 mg. daily for four days produced a rapidly developing anaemia and also hepatitis. The evidence is not, of course, conclusive, but strongly suggests this. Haemolytic anaemia is a well-known complication of sulphone therapy, but usually develops gradually in the first weeks of treatment. Allergic hepatitis and exfoliative dermatitis are described occurring during the first nine weeks of treatment.³ Previous sensitization with D.A.D.P.S. or sulphonamides might result in the onset of allergic hepatitis or aplastic anaemia at the beginning of D.A.D.P.S. treatment, but as far as is known she had never been given these drugs.—I am, etc.,

London, W.2.

R. G. HOWELL.

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Dyspareunia Clinic

SIR.—We were glad to see Mr. R. Christie Brown's reference (*Journal*, January 8, p. 106) to a new clinic which is to deal with dyspareunia cases. Up to the present University College Hospital is, we believe, the only teaching hospital to provide special sessions for work of this sort. Cases of introital spasm, leading to dyspareunia or to total unconsummation, are common and can be tedious to treat. Invariably the patients are anxious, and their resulting sexual maladjustments and infertility require time for suitable management and advice. At such sessions the methods used are mainly those of persuasion, whereby the patient is shown how to insert graduated dilators and how to ensure, by alterations of posture, the optimum relaxation of the levator spasm. Such tuition should, as correspondents have pointed out, be given in a normal out-patients session, provided there is leisure and opportunity for weekly return visits. But surely this could be true only of non-teaching hospitals? It would hardly be possible for a nervous woman to spend several minutes learning to insert vaginal dilators in front of a group of students. In practice, therefore, the case must be passed on to a house-surgeon, a delegation that, as another correspondent observes (*Journal*, February 12, p. 415), is a most unsuitable arrangement.

At University College Hospital the cases received are inter-departmental, being referred from the sub-fertility, gynaecological, and obstetric clinics. There are seldom less than one or two new cases at the weekly session, and generally three or four old ones. One student only is accepted for tuition at a time, and privacy from nursing staff, and so on, is assured. Patients who reach this clinic have frequently drifted on from other hospitals where no such facilities have existed. Some of them have delayed renewing their efforts until it is already too late for childbearing or until their marriages are breaking up. We therefore welcome this new clinic under the auspices of the Family Planning Association, and we believe that some hospitals and general practitioners will be glad of its services. We understand that patients are attended by a consulting gynaecological surgeon with special experience of psychoneurotic disorders.—We are, etc.,

London, W.C.1.

W. C. W. NIXON.

JOAN MALLESON.

POINTS FROM LETTERS

Negative Tuberculin Test and Positive X-ray

Dr. R. CHAKRAVERTY (Yeovil) writes: The observations of Dr. R. Stevenson Doig (*Journal*, January 22, p. 225) are very interesting, warranting careful study. . . . His suggestion that an individual who had an infection and then lost sensitivity (allergy) later, and yet showed x-ray evidence of a lesion following the infection, would react more markedly to B.C.G. vaccination than a totally non-infected one is a very problematical one and cannot be so dogmatically answered. Schwabaker and Wilson (*J. Path. Bact.*, 1938, 46, 535) and Wells and Brook (*Brit. J. exp. Path.*, 1940, 21, 104) experimentally reproduced this condition and found that the return of hypersensitivity (allergy) was not accelerated, but on the contrary markedly delayed and suppressed. It would be very interesting to know further investigation results.

Gelatin-walled Suppositories

Dr. R. F. MILLER (London, W.1) writes: It has always seemed strange to me why manufacturers do not make gelatin-walled capsules containing glycerin, rather than the solid and almost insoluble product which goes under the name of glyc. suppos. B.P. The latter can be retained for as long as 10 minutes or more without any obvious reduction in size or appreciable action on the lower bowel. A thin-walled capsule on the other hand would dissolve in no time, scattering its contents as effectively as a glycerin syringe. I have asked several chemists if such a suppository is available, and they say no. It would be particularly useful with babies, where a quick action is desirable before they can "push it out." It need not be made with a soft or semi-soft wall. Indeed, a rigid capsule, like the oral variety, would probably lend itself to easier self-insertion.

Obituary

Sir CHARLES J. MARTIN, C.M.G., D.Sc., LL.D.
D.C.L., M.B., F.R.C.P., F.R.S.

A long career in medical research and medical education, spent on two continents and reaching high distinction in both, is closed with the death on February 15 of Sir Charles Martin. He was 89 years of age.

For more than a quarter of a century Martin was director of the Lister Institute of Preventive Medicine in London, but before he took up that appointment he had already, in his twenties and thirties, built up a reputation in Australia, where his name is still acclaimed after half a century as one of the founders of Australian medical research. When in 1952 the Jubilee of the Australian Commonwealth was celebrated, Mr. R. G. Menzies, the Prime Minister, sent Martin, then 86 years of age, a letter extending the greetings and good wishes of the medical research workers throughout the Commonwealth and announcing that the National Health and Medical Research Council of Australia had created



(Press Portrait Bureau)

two Fellowships in medical science named after him, to be awarded periodically to young Australians in order to give them overseas experience. The same Council addressed to him a memorial letter signed by all its members which said, "Your work and teaching in Australian institutions laid a solid foundation of research in this country and your example and encouragement stimulated its progress through its formative years. Your inspiration still permeates its whole fabric, and you are remembered by Australian workers as one of their most distinguished masters."

Charles James Martin was born in London in 1866 and was privately educated before entering St. Thomas's Hospital, where he won a scholarship in his second year. Later he was exhibitioner, gold medallist and university scholar in physiology, demonstrator in biology and physiology, and lecturer in comparative anatomy at King's College. He also studied at the University of Leipzig, where he was the devoted pupil of Karl Ludwig, the famous German physiologist. He had among his friends at that time two great physiologists, William Bayliss, who was at University College, and Ernest Starling, who was at Guy's, both of them born in the same year as Martin himself. He qualified in medicine in 1889, graduating M.B. in the following year, and in 1891 he went out to Sydney as successor to Almoth Wright, who had been demonstrator of physiology at the University. He remained in that post until 1887, when he became lecturer in physiology at the University of Melbourne, being appointed professor four years later.

The period was a formative one, both in Martin's career and in Australian medicine. Not only did he help to lay the foundation of Australian medical research, but he had great influence on medical education in the

Commonwealth. As professor of physiology at Melbourne he worked in company with that fine group of teachers, Halford the anatomist, Lambert the physicist, Baldwin Spencer the anthropologist, and others. Martin was a man who had not only great skill in medical research but that intuition which makes all the difference between pedestrian accomplishment and genius. He had also the gift, invaluable in those early pioneer days in Australia, of making laboratory equipment out of all sorts of odd materials. Even in his old age he described his chief recreation as "tinkering." Moreover he had the gift of stimulating research workers, a faculty which came into full play in later years when he was director of the Lister Institute.

Many medical men who received their training in Australia and afterwards rose to eminence in medicine in Great Britain—men like Sir Thomas Dunhill, Sir Howard Florey, Sir Hamilton Fairley, Professor G. R. Cameron, the late Sir Hugh Cairns, and others—were either Martin's pupils or the product of the system of medical education in the Commonwealth which he was active in helping to form. Indeed, from one point of view Australia regarded the position with some dismay. Here she was training at her new universities men whose talents found fulfilment in the mother country. Martin had been heard to declare that the quality of the medical students he met on the other side of the world was higher than at home: he found intellectual adventure more congenial to them and the experimental method of approach more natural.

In 1903, when he was 37 years of age, Martin returned to London to take charge of the Lister Institute of Preventive Medicine. This Institute, of which Lister himself was one of the founders in 1891, was modelled on the Pasteur Institute in Paris, and from year to year it has carried out mostly long-term researches in various fields. Among the problems of medical research which owed much to Martin's stimulus and interest were plague, caisson disease, infantile diarrhoea, the chemistry and metabolism of fat, adrenaline, fermentation, calcification of bone, and the role of vitamins in nutrition. In problems of nutrition and also of immunology he still continued to take an active interest in spite of the claims made upon him as director of the Institute and also as professor of experimental pathology in the University of London—a post to which he was appointed in 1912. From 1904 to 1907 he acted as chairman of the War Office committee on anti-typhoid inoculation; later he was a member of the advisory committee for the investigation of plague in India. This committee, whose work extended over eight years, was appointed jointly by the India Office, the Royal Society, and the Lister Institute. Martin himself went to India on behalf of the committee to organize the investigation.

During all this time his contacts with Australia continued, especially through the constant flow of Australian graduates to the Lister Institute. He had himself two further experiences of Australia. One of these was in the first world war, when he served, with the rank of lieutenant-colonel, in the Australian Army Medical Corps. He was at Gallipoli, where he organized laboratory services and resolved difficulties which had arisen in the field of amoebic and bacillary dysentery and the different typhoid fevers. He served also in Egypt, Palestine, and France, and in his service in France he superintended laboratories in Rouen. He was twice mentioned in dispatches and received the C.M.G. in 1919. In the 'thirties, immediately after his retirement

from the Lister Institute, he visited Australia at the request of the Australian Government to assist in some problems closely connected with its health and economy, including work on myxomatosis in rabbits. From 1931 to 1933 he was chief of the Division of Animal Nutrition of the Australian Council for Scientific and Industrial Research, and during the same period Adelaide—his third Australian university—welcomed him with open arms to its research institute as professor of biochemistry and general physiology.

Sir Charles Martin, who was elected F.R.S. in 1901, received the Royal Medal of the Royal Society in 1923, and was appointed a member of the Medical Research Council in 1926. He was a Doctor of Science of London and Melbourne and held honorary doctorates of the universities of Sheffield, Edinburgh, Durham, and Trinity College, Dublin, and the honorary M.A. of Cambridge. He was knighted in 1927. Over the course of years he gave valuable advice and help to the B.M.A. At the Annual Meeting in 1908 he was president of the Section of Pathology, and two years later he was president of the Section of Bacteriology. He was first elected to Council in 1904 and served off and on until 1916. After the first world war he was a member of several committees, including the Science, Arrangements, and Postgraduate Committees.

Sir Charles Martin married Edythe, daughter of Alfred Cross, of Hastings, and had one daughter. His wife died in March, 1954, at the age of 94, after 63 years of happy married life.

We are indebted to Sir ALAN DRURY for the following appreciation: Although I had known Sir Charles Martin as a scientist for many years, it was when I came to direct the institute he had created and to learn its intimate history that I realized what a rare personality he had. The development of the Lister Institute during his directorship, both in the quality of its science and in the men it produced, was remarkable, and was due entirely to his inspiring and enthusiastic leadership.

Martin was essentially the man of the laboratory. Within the laboratory he was supremely competent, and he found his happiness in making the "bits and pieces" for his or other workers' experiments and in carrying out the experiment himself. He had an intense and wide curiosity, an uncanny knack of appreciating the essence of a problem and the lines upon which its solution might be possible. Widely read and with an excellent memory, he was able to help many colleagues, and he could give completely of himself, because self-advancement did not appeal to him. A severe critic, he demanded high standards of performance and would not tolerate slipshod work.

Whimsical in word and manner, humble and straightforward, there was no one who would hesitate to seek his help and advice. It is easy to see why he was so successful a director and why he was so beloved. Living to a great age, he kept his scientific curiosity to the end. He followed the careers of those he had trained and helped and kept abreast of the literature. He seemed able even to regard the disabilities of his advancing years as scientific problems, so that when he spoke of them one felt he was still within the laboratory. There was nothing he enjoyed more than the visits of his colleagues. One can only hope that he appreciated that they came, not from a sense of duty, but because they wanted to hear his comments upon their activities, which they knew would still be valuable, and to meet again a man who was so unique and endearing.

Dr. LESLIE J. HARRIS writes: May I be permitted to add my tribute to the many that will be paid to the memory of Sir Charles Martin? It was in his capacity as chairman, from 1935 to 1946, of the committee of the Dunn Nutritional Laboratory that I had the privilege of getting

to know him well, and so of coming to respect, to admire, and to love him. Intellectually, what stood out most was his astonishing width of interest and knowledge, in the most varied fields of medical research. Equally at home in many specialized departments of pathology, physiology, bacteriology, or biochemistry, he had the gift of seeing right into the heart of a problem; and, knowing as he did how the present knowledge had been won, he quickly sensed what gaps still remained to be filled in. He was interested in knowledge for its own sake, and, unlike some lesser men, judged a research finding on its merits alone, not by its authorship. In consequence he was able to recognize talent and originality where others might miss seeing it, and, as a result, had the satisfaction of fostering young and sometimes precarious, research careers—leading in one instance at least to a later Nobel Laureateship. He was never one of those prone to put his own name on the title of the papers of his assistants and students published from his institute. On the contrary, it was an open secret that during the years that he was director of the Lister Institute much of the now classical work appearing under other names was really suggested, inspired, and directed—sometimes even down to the smallest technical details—by "Sir Charles," who took a pride in being a competent technician and handyman.

His scientific integrity was marked by a robust sense of right and wrong and fair dealing, combined with practical common sense. He was prepared, in no uncertain voice when occasion demanded, to stand up against established authority, when he knew that authority to be in the wrong; and his courageous determination more than once won the day. To his junior colleagues and to his friends he could at times be blunt and outspoken to a degree, but his direct speech never caused resentment, and it was in fact appreciated because one recognized the kindly heart behind it, and one was warmed by the friendly, welcoming smile always lurking below. Although in his own tastes simple to a degree, he could prove himself a man of the world in dealing with officialdom. He himself had the gift of handling men, and of dealing effectively with committees and organizations: indeed, one of his maxims was that people who failed to rub shoulders with their contemporaries had not succeeded in learning one of the elementary "techniques" of their trade. Another of his maxims was that it is useless to appeal to reason where a person's emotions have become involved. Up to the end Sir Charles retained both his charm and his penetrating intellectual faculty; and it was an experience to hear him, at the end of the ninth decade of his life, giving his stimulating comments on some future scientific developments which he foreshadowed after reading a paper that had just appeared in the current issue of a scientific journal.

PHILIP TURNER, M.S., F.R.C.S.

Mr. Philip Turner, consulting surgeon to Guy's Hospital, died on February 16 at St. Mary Abbots Hospital. He was 81 years of age.

Philip Turner was born in Kensington on December 27, 1873. Before studying medicine he graduated B.Sc., with honours in zoology, at University College, London. He then went on to Guy's Hospital, qualifying in 1897. Two years later he took the M.B., and in 1901 he became F.R.C.S. and proceeded to the degree of M.S. At Guy's he won the Treasurer's gold medal in clinical surgery, and his early appointments there included those of medical registrar from 1902 to 1903, and demonstrator in anatomy from 1903 to 1908. Meanwhile he had obtained the appointment of assistant surgeon at the Belgrave Hospital for Children, but he relinquished this in 1908 on his election to the staff at Guy's as assistant surgeon and demonstrator of operative surgery. For several years he was in charge of the ear department. Mr. Turner was not one to seek the limelight, but his excellent qualities earned for him a

solid and enduring reputation as a general surgeon, and among other hospitals to which he was attached were the Eltham and Hornsey Cottage Hospitals and the Surrey Dispensary. He had retired from the active staff of Guy's before the second world war, but in 1940 he joined the E.M.S., and for ten years thereafter worked as a surgeon at Joyce Green Hospital, Dartford, where his vitality and keenness will be long remembered.

He wrote numerous articles on surgical subjects for the medical journals, and several books. In 1908 he had two books published on the subject of osteology, *The Pocket Osteology* and *Aids to Osteology*, and he described some of his own contributions to operative surgery in *Inguinal Hernia, the Imperfectly Descended Testicle, and Varicocele* (1919). With Mr. R. P. Rowlands he edited *The Operations of Surgery*, and he contributed to Latham and English's *System of Treatment* and Choyce's *System of Surgery*. In 1908 he married Miss Helen B. Lambert, who was formerly a sister at Guy's and during the first world war matron of the Central Red Cross Workrooms at the Royal Academy. She died in 1932.

We are indebted to Sir HENRAGE OGILVIE for the following appreciation: Philip Turner will be remembered with affection by all who have passed through Guy's in the last 50 years. To the world of medicine as a whole he was a little-known figure, for he was quiet and shy in his manner, dressed formally, entertained little, and made surgery and his hospital his life. With R. P. Rowlands he edited the several editions of Jacobson's *Operations of Surgery*, and was largely responsible, after Rowlands's death, for the eighth edition. He himself wrote on hernia and scrotal conditions, and described the operation of trans-scrotal fixation of the undescended testis that bears his name and that remains the best method to-day.

As an operator he was scrupulous rather than spectacular. Whatever he did he did gently and bloodlessly, displaying a craftsman's hands and an anatomist's knowledge of topography. At a time when operating by the clock was fashionable and dramatic surgery was more admired than it is to-day, he taught to many generations the value of careful technique.

When I first knew him he was assistant surgeon to Sir Alfred Fripp, and his gentle, almost apologetic manner stood in marked contrast to the masterful personality and easy address of "The Baron." He grew in stature year by year as his sterling worth came to be appreciated by successive generations. Having retired from the staff when at the height of his powers, he was called back into harness at the outbreak of the second world war and given the post of chief surgeon at a large E.M.S. hospital in the Guy's sector. He entered into this assignment with a boyish enthusiasm, and in his new duties developed a new personality, a power of leadership, and social gifts that had hitherto lain dormant. I saw him last when he took the chair at the Guy's Biennial Dinner in October, 1954. It was moving to see the universal affection in which "Philip" was held, and the pride with which he looked round that great gathering of Guy's men, most of whom had been his pupils.

The death took place on February 19, within nine days of his 81st birthday, of Dr. EDGAR F. CYRIAX, manipulative surgeon and physiotherapist, apostle of physical fitness, and one of the earliest and most ardent exponents in this country of Swedish gymnastics. Edgar Ferdinand Cyriax was born in London and educated at University College School and University College, afterwards taking his medical training in Edinburgh, where he graduated in 1898, proceeding to the Edinburgh M.D. in 1901. He was attracted to the Swedish methods and became a graduate of the Central Gymnastic Institute of Stockholm. One of his earliest monographs, published in 1903, was on the elements of the manipulative treatment practised there by the director, Henrik Kellgren.

whose daughter, herself a medical woman, Dr. Cyriax married. During the first world war he was visiting physician to the Swedish War Hospital, and afterwards, from 1919, visiting physician to the British Hospital for Functional Mental and Nervous Disorders, Camden Town. Until his retirement only a short time ago he continued in private consulting practice, describing himself as a specialist in mechano-therapeutics. During his lifetime he wrote a number of papers on subjects connected with physical medicine: one, entitled "Minor Displacements of the Vertebrae and Ilii," was published in the *Practitioner* in 1916, and another, about the differences between blood-pressure readings in the two arms, in the *Quarterly Journal of Medicine*. Dr. Cyriax achieved a great reputation in the field of sport. He was the grand old man of Rugby fives, a game which he had learned at University College School 70 years ago, and which he continued to play well into his old age. He did much to popularize the game in public schools. His prowess in physical achievement became something of a legend. He disdained the car—"You just sit there and go flabby"—and cycled between his Welbeck Street surgery and his Hampstead home. Similarly he preferred the staircase to the lift. He hardly ever wore hat, overcoat, or gloves even in winter, and he boasted of his cold bath every morning. He was a Knight of the Royal Swedish Order of Vasa (First Class) and a member of the French and Belgian Societies of Physiotherapy, and he had been a member of the British Medical Association for more than 50 years. Dr. Cyriax is survived by his widow and by his son, Dr. James Cyriax, and his daughter, Dr. A. V. K. Cyriax.

A memorial service for the late Sir EDWARD MELLANBY will be held at St. Martin-in-the-Fields at 11.30 a.m. on Thursday, March 17.

Medico-Legal

VACCINATION CLAIM WON

On February 14 Dr. Brian Quinn, of Mytholmroyd, near Halifax, successfully claimed for £62 15s. against Halifax Corporation Health Department in respect of 251 vaccinations and the compiling of records while house-physician at St. John's Hospital, Halifax, during 1953. The judge granted a stay of execution for 14 days in case of an appeal.

Dr. Quinn's case was that in March, 1953, there was a smallpox scare in the Halifax area and many vaccinations were carried out. The corporation paid a total of £445 to general practitioners who did vaccinations and submitted records, but it had declined to pay any hospital doctors who did the same work. Dr. Quinn contended there was no possible distinction between hospital doctors and general practitioners who carried out vaccination work. Questions of fact which arose were: Did the local authority in fact make arrangements with Dr. Quinn through the medium of the senior medical officer, and was there a request expressed or implied that a record should be completed and submitted to the local authority?

In March, 1953, there were two suspected cases of smallpox—one at Halifax General Hospital and another at St. John's Hospital. Conferences were held between the hospital authorities and the medical officer of health for Halifax, and at all these conferences the M.O.H. or his assistant was present. Ultimately instructions were given by the acting M.O.H. to the senior medical officer at St. John's Hospital that vaccinations should be carried out on anyone likely to have come in contact with a suspected smallpox case. Dr. Quinn was told to get on with the work, vaccine was supplied free of charge, and record cards were sent.

Dr. Quinn said that he did not regard it as part of his job at the hospital to vaccinate patients and send in record cards.

Mr. R. W. Ranson, group secretary, Halifax Hospitals Management Committee, expressed the view that if any fees were paid they should be retained by the doctor.

The Corporation contended that neither it nor its agents made arrangements with Dr. Quinn. Any action should have been brought by Dr. Quinn's employers, as the arrangements were made with his superior on behalf of the hospital management committee. Vaccination of contacts was one of the incidental duties a doctor might have to do in the course of his ordinary work in the hospital.

Judge Myles Archibald said he found there was the clearest intention by the health department that these doctors should be invited to do the work. He did not think a hospital was the sort of place where one would normally expect this sort of work to be done. It was not part of Dr. Quinn's duty to carry out vaccinations in this sense or to fill in record cards.

The Medical Defence Union instructed Messrs. Hempsons, solicitors, to act for Dr. Quinn.

Medical Notes in Parliament

ETHICS OF CLINICAL INVESTIGATIONS

The conduct of clinical trials in hospitals, and the right of the patient to be informed and to give or withhold his consent, were discussed in the House of Commons on February 16. It was raised by Mr. STEPHEN SWINGLER (Newcastle-under-Lyme, Lab.), and arose out of trials conducted at Bristol Maternity Hospital and reported in the *British Medical Journal*, December 11, 1954, p. 1392.

Mr. Swingler said that, while the community should give to medical scientists and doctors the best possible facilities and conditions for research, medical scientists and doctors should be extremely careful not to use their privileged position to treat human beings as laboratory specimens. He put forward two principles: medical experiments on patients should not be conducted unless there was a chance of patients benefiting; and clinical experiments in hospitals should not be conducted unless the consent of the patients had been freely given, in the knowledge of the nature of the experiments. The doctor should explain to a patient that experimental treatment was necessary, the nature of the experiment, the risks involved, and the benefits that might be obtained or the injury that might result.

In the Bristol case, he said, penicillin was administered to newly born babies for the purely scientific purpose of observing their reaction to penicillin and to establish the properties of the preparations. The penicillin was not required by the babies, and there was no question of its having any beneficial effect on the babies. It had been established by the Minister of Health on inquiry that the consent of the parents was not sought. In his opinion, even if consent had been given, the experiment was ethically dubious. In the opinion of those who conducted this experiment, and of the Minister, there was no possibility of harm being done. But in the same issue of the *Journal* in which the experiment was reported there was a report of a speech by a distinguished doctor to a meeting of the Royal Society of Medicine about the uses and abuses of antibiotics, in which he was reported to have said that a doctor should think twice before prescribing the first-ever dose of penicillin to any patient.

A search of the medical press over the past two or three years had shown him at least half a dozen reported cases of clinical experiments on children in hospitals, not designed to benefit the children in any way, but said to have been carried out merely to test the reaction to certain drugs. That was treating children as guinea-pigs. The Minister had said that judgment could be left to the clinician in charge, but he (Mr. Swingler) would point out that some clinicians allowed their enthusiasm for science to override all moral objections. He would have thought that it was the responsibility of the Minister of Health, in conjunction with the

Ethical Committee of the B.M.A. and the Medical Research Council, to lay down some guiding principles. He urged the Minister to consult with his advisers and with these organizations, to see if some directive or code could be sent to hospitals to prevent and prohibit experiments, especially on children, which were for purely scientific purposes and not designed in any way for the promotion of health. In this way some ethical guidance might be given which would act as a necessary and desirable curb on the enthusiasm for enlarging scientific knowledge.

Major W. J. ANSTRUTHER-GRAY (Berwick and East Lothian, Con.) was concerned that all consideration of the parents appeared to have been overlooked. He quoted extracts from the *Journal* report, and said that he had no doubt the experiment was quite harmless. There was a note at the foot of the article in which a lot of people were thanked. But the parents were not only not thanked, they were not even consulted.

Future to Benefit

Mr. IAIN MACLEOD, Minister of Health, said it was admitted that the consent of the parents should have been asked for. The people responsible, who were of the greatest authority and competence, regretted very much—as he did—that that was not done. What the House was discussing was whether such experiments were proper, and whether any action should be taken by the Minister in these matters. He disagreed with Mr. Swingler's proposition that it would be wrong and unethical for any clinical investigation to be carried out which would not immediately benefit the person concerned. If it was to add to future knowledge he did not see how that could be so. The reward to those who tried to catch the common cold at the Salisbury research unit was not that they would derive direct benefit themselves, but that the general pool of knowledge might be increased and others helped in the future. The answer to Mr. Swingler, therefore, was that babies yet unborn might benefit from this continued thrusting forward to new frontiers.

There were two propositions with which he thought most of the House would agree. First, there was bound to be clinical investigation and experiment. If that were not so, knowledge of surgery and medicine would not have changed over the centuries. Second, only the clinician in charge could say what was right and proper and what safeguards were needed in the action he took. Mr. Swingler had asked, in questions on February 14, that before further clinical experiments on children were undertaken the nature of such experiments should be reported to the Ministry of Health so that the medical staff of the Ministry could ensure that there were adequate safeguards against harmful effects; and also that the Minister should issue a directive to hospital management committees on the ethical principles involved. That was in his (Mr. Macleod's) view a wrong conception of the duty of the Minister of Health. He thought it would be wholly improper for him to try to lay down what ethical and medical principles should govern the conduct of professional men in the work they undertook at hospitals.

In this instance there was undertaken an experiment which all those concerned, who were of the highest capability, were quite certain was completely harmless. If a small child of his, or a child of any age, was in hospital, and he was told by people of the standing, for example, of professor of medicine and child health at the university concerned, "We are interested to know the effects of a perfectly safe clinical investigation; it may very well be that we can learn from what is done, and as a result can drive still lower the infant mortality rate," he would be more than ready to give his consent.

The common sense of the matter was that where a clinician intended to undertake an investigation which was so novel as to amount to an experiment he would be wise to seek consent from the patient or parent for what was proposed. But he was absolutely convinced that it would be quite wrong for a Minister of Health to issue directives

on a matter that was essentially one of medical ethics to those concerned. He was sure it was best to leave the matter to the profession, and not to have a lay Minister interfering in a matter that was very precious to those professionally concerned.

Some Guidance Needed

Mr. SWINGLER said he appreciated why the Minister should resist the idea that he should himself go into this matter and issue a directive. But in view of the complexity of the situation, did he not think it was the duty and responsibility of the heads of the medical profession to give some ethical guidance? As it had been brought to his attention that there were cases where, for example, consent had not been obtained, and where experiments were being conducted which had nothing to do with actual treatment, would he not use his good offices to ask the heads of the medical profession to give some guidance on that?

Mr. MACLEOD said that was a very different matter and one with which he was in some sympathy. If he had the slightest reason to believe that the position was not fully understood, then he would informally—and it could only be informally in a matter like this—draw the attention of those responsible to what had been said. The Medical Research Council sent out a confidential memorandum rather on those lines. If he had any reason to believe that the position was not completely clear, and that it was desirable for these things to be drawn to the attention of those responsible, then of course he would not object at all to what he might call an informal notification from himself. Of one thing he was clear: no directive must come from the Ministry of Health on a matter of this delicacy.

The discussion was part of the debate on a Supplementary Estimate for the National Health Service, which was agreed to.

HEALTH SERVICE COSTS

The supplementary estimate of £4,848,000 for the Health Service (*Supplement*, February 19, p. 56) was presented to the House of Commons on February 16 by Miss PAT HORNSBY-SMITH, the Parliamentary Secretary. She pointed out that in spite of the stricter basis on which the main estimates had been prepared, in accordance with the recommendations of the Public Accounts Committee, the net additional amount asked for was only slightly over 1% of the original sum. For a service which covered nearly 3,000 hospitals, 20,000 doctors, 10,000 dentists, 8,000 ophthalmic medical practitioners and opticians, and 15,000 chemists and suppliers of appliances the smallness of the margin was very creditable. The total sum asked for was made up of various increases which amounted to £8,562,000, reduced to the net figure by savings.

The increase for hospital maintenance accounted for £2,608,000, which included increases in pay totalling £1,200,000, additional to the £1,000,000 in the original estimates; increases in costs which accounted for £900,000; and £500,000 to meet expenditure which it had been estimated would be met by running down costs. Last year there was an increase of 8,000 in the daily average of occupied beds, of 125,000 in the number of new out-patients, and of 270,000 in casualty attendances. An additional £2,133,000 for the pharmaceutical services was due mainly to an increase in the average cost per prescription and in the number dispensed, and to a wider use of the newer and often more expensive drugs and preparations. Doctors were continually being kept cost-conscious in various ways, most recently through the introduction of arrangements by which a doctor could compare the cost of his own prescribing with that of his colleagues. Discussions between the Ministry and the manufacturers on price investigations had resulted in a number of reductions, and prescription had been kept reasonably stable over the past three years in spite of the almost continuous introduction of new drugs. The average cost in 1952-3 and in

1953-4 was 4s. 1d., and this year was expected to be about 4s. 2d., and the increase in the number was expected to be about 4,500,000. The bad summer last year produced a higher incidence of prescriptions than was normal, and the July figure was the highest on record for that month.

The estimated increase in expenditure on the supplementary ophthalmic and general dental services was also due to increased demand.

Pharmaceutical Costs Debated

Mr. H. A. MARQUAND (Middlesbrough, East, Lab.) commented that the largest proportionate increases were in the services provided by the executive councils—pharmaceutical, dental, and ophthalmic—on which charges to the public had been imposed. As there had been no epidemics since last May it looked as if the charges were less of a deterrent than they had been. A fortunate aspect of the increases for dental and ophthalmic treatment was that there was no suggestion of any increase in cost. The pharmaceutical service, however, showed an increase in both demand and cost, and that deserved more scrutiny. Why was the cost still going up?

Mr. IAIN MACLEOD, Minister of Health, stated that since the Estimates were prepared it had been decided to make the two most expensive drugs, aureomycin and terramycin, freely prescribable. The fact that they could now be prescribed on Form E.C.10 would be a major factor in the increased amount for which the House was being asked.

Sir HUGH LINSTEAD (Putney, Con.) said that the increased cost of the pharmaceutical service was basically due to the fact that medicine was advancing very rapidly, and that new and inevitably more expensive drugs were replacing the traditional and cheaper drugs. These generally reached the market in the form of proprietary medicines, and there was a heavy development and research bill attached to them. In 1950 18% of prescriptions were proprietary; in 1953 the proportion was 27% and in 1954 29%.

Of the report of the working party into hospital pharmaceutical services of which he was chairman, he said there were substantial economies still to be secured in costs, but they would be secured only in so far as the chief pharmacist in each hospital was a person of substantial scientific knowledge, whose advice was listened to by the consultants and medical staff.

Mr. MACLEOD, answering the debate, said that the inevitable concentration on what was wrong in Parliamentary debates and questions did not give an accurate picture of what was happening in this great service. It was worth remembering that since 1948 the number of beds available, the number staffed, and the number occupied, and the number of out-patients, had all gone up every year. There was a very great deal of progress against which the difficulties must be looked at. The general investigation into the secondary manufacture and compounding of drugs had been completed, and they had stated a preliminary view that there was no evidence to show that excessive profits were being made. On basic drugs they were still considering the accountants' report.

There had been a general downward tendency in price of proprietary preparations, and he had no reason to suppose that the investigations were the only, if indeed they were the main, reason for the reductions. Although there were preparations unworthy of being sold under the Health Service, the industry had made a wonderful advance in recent years. It had an export trade of great importance, and research was absolutely vital to it.

Vaccine Tests on Children

Mr. JOHN RANKIN (Glasgow, Tradeston, Lab.) asked the Secretary of State for Scotland if he was aware that 600 children belonging to the Orphan Homes of Scotland, Bridge of Weir, Renfrewshire, had been used for the purpose of research into a new antituberculosis vaccine; that this experiment had been going on for the last three years; that

now, as a result, a number of the children were suffering from a chronic skin infection; and if he would make a statement on the matter. Commander T. D. GALBRAITH, the Under Secretary, replied on February 15 that in the course of vaccinating these children against tuberculosis it was arranged in the spring of 1951 between the Department of Health and the county council, with the consent and co-operation of the management, to use B.C.G. vaccine for some of the children and an alternative vaccine—the "vole" vaccine—for others. Earlier studies had suggested that vole vaccine was likely to give as good protection with less local reaction, but late skin reactions on the site of the vaccination had been noted in 20 of 280 children who received this vaccine. He was assured that these reactions had been slight and were all clearing up, while the general health of the children had been entirely unaffected.

Medical Man-power Inquiry

The MINISTER OF HEALTH announced on February 21 the composition and terms of reference of the committee to investigate future needs in medical man-power.

The chairman is to be Mr. HENRY WILLINK, Q.C., Vice-Chancellor of Cambridge, and a former Minister of Health, and the members are:

Dr. J. T. Baldwin, Sir Harold Boldero, Sir John Charles, Sir Henry Cohen, Sir Andrew Davidson, Dr. A. B. Davies, Mr. J. P. Dodds, Sir Geoffrey Jefferson, F.R.S., Mr. L. G. K. Starke, Mr. A. B. Taylor, D.Litt.

The terms of reference are:

To estimate, on a long-term basis and with due regard to all relevant considerations, the number of medical practitioners likely to be engaged in all branches of the profession in the future, and the consequential intake of medical students required.

Mr. P. V. Muston, of the Ministry of Health, will be the secretary to the committee.

Mr. Henry Willink (chairman), aged 60, is Master of Magdalen College, Cambridge, and Vice-Chancellor of Cambridge University. He was Minister of Health in the Coalition Government, 1943-5, and chairman of the Royal Commission on Betting, 1949.

Dr. J. T. Baldwin is a general medical practitioner in Midlothian, a member of the Scottish Health Services Council, and a member of the General Medical Services Committee of the B.M.A.

Sir Harold Boldero, aged 65, is a registrar of the Royal College of Physicians and was dean of Middlesex Hospital Medical School. He holds the position of examiner in medicine at the Universities of Oxford, Cambridge, and Birmingham. He is also a member of the North-west Metropolitan Regional Hospital Board.

Sir John Charles, aged 61, has been Chief Medical Officer at the Ministry of Health since 1950. After being medical officer of health at Newcastle during 1932-44, he was appointed a deputy chief medical officer at the Ministry of Health in 1944.

Sir Henry Cohen, aged 55, is professor of medicine at the University of Liverpool. He is also vice-chairman of the Central Health Services Council, and chairman of its Standing Medical Advisory Committee. He has been chairman of several special committees, including those on general practice and the prescribing of proprietary preparations. He is a member of the United Liverpool Teaching Hospitals and Liverpool Regional Hospital Board.

Sir Andrew Davidson, aged 62, was Chief Medical Officer to the Department of Health for Scotland during 1941-54. He is chairman of the Advisory Committee on Medical Research in Scotland and a member of the General Medical Council.

Dr. A. B. Davies is a general medical practitioner in Walsall who has had experience in industrial medicine, and is a member of the General Medical Services Committee of the B.M.A.

Mr. J. P. Dodds, aged 42, is Under Secretary, Health Services Remuneration and Staffing Division, at the Ministry of Health.

Sir Geoffrey Jefferson, F.R.S., aged 68, is emeritus professor of neurosurgery, Manchester University, and consultant adviser in neurosurgery to the Ministry of Health. He is a member of the Medical Research Council and chairman of the Clinical Research Board.

Mr. L. G. K. Starke is a principal actuary in the Government Actuary's Department.

Mr. A. B. Taylor, aged 50, is an assistant secretary in the Health Services Division, Department of Health for Scotland.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending February 5 (No. 5) and corresponding week 1954.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1955					1954				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria	16	1	8	0		19	2	9	0	
Dysentery	979	61	287	8	6	624	99	199	0	6
Encephalitis, acute	2	0	1	0		3	1	0	0	
Enteric fever:										
Typhoid	8	0	3	0	1	0	0	0	0	
Paratyphoid	7	0	6	0	1	4	0	1	0	
Food-poisoning	137	19		0		88	19		0	
Infective enteritis or diarrhoea under 2 years										
Measles*	12,729	1295	399	608	136	1,487	19	30	20	240
Meningococcal infection	43	5	17	2	2	33	4	13	0	2
Ophthalmia neonatorum	39	0	7	0		25	0	3	0	
Pneumonia†	1,157	108	380	58	2	826	37	249	10	2
Poliomyelitis, acute:										
Paralytic	9	0	1	0		17	2	3	0	1
Non-paralytic	4	0				4	1			
Puerperal fever	240	41	14	2		235	33	7	0	
Scarlet fever	791	59	111	62	20	1,015	41	187	36	20
Tuberculosis:										
Respiratory	751	82	137	21		825	103	141	23	
Non-respiratory	109	13	11	3		111	6	20	4	
Whooping-cough	2,213	162	214	79	31	1,984	45	328	46	54

DEATHS In Great Towns	1955					1954				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	0	0	0	0	0	0	0	0	0	0
Encephalitis, acute	0	0	0	0	0	0	0	0	0	0
Enteric fever	1	0	0	0	0	0	0	0	0	0
Infective enteritis or diarrhoea under 2 years	13	0	3	0	0	10	0	2	1	1
Influenza	106	14	6	3	0	41	3	1	0	3
Measles	0	1	0	0	0	0	0	0	0	0
Meningococcal infection	1	1	0	0	0	2	0	0	0	0
Pneumonia	449	81	43	22	11	382	48	27	16	14
Poliomyelitis, acute	3	1	0	0	0	2	0	0	0	0
Scarlet fever	0	0	0	0	0	0	0	0	0	0
Tuberculosis:										
Respiratory	108	20	11	4	7	120	15	27	1	2
Non-respiratory	0	0	6	1	1	3	3	0	0	1
Whooping-cough	2	0	0	0	0	2	0	0	0	0
Deaths 0-1 year	273	28	32	11	14	304	36	41	9	20
Deaths (excluding stillbirths)	7,127	1,105	724	166	204	7,142	1,018	791	149	219
LIVE BIRTHS	7,807	1,122	990	221	414	7,399	1,052	946	229	315
STILLBIRTHS	198	26	31			202	34	21		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Vital Statistics

Influenza

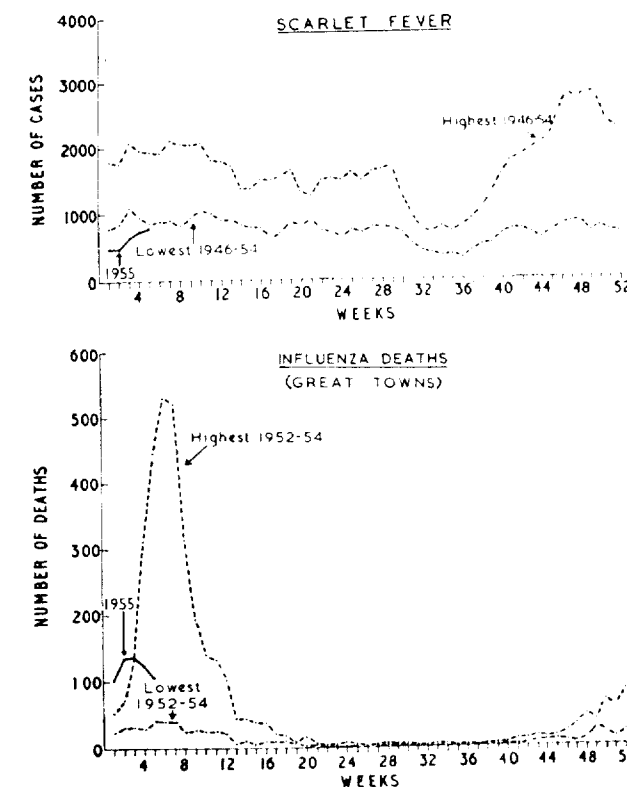
The 84 deaths from influenza in the great towns of England and Wales reported in the week ending February 12 showed a decrease of 22 from the preceding week's figures. This is the third successive week in which the total has fallen. 71 of these 84 deaths were of people aged 55 or over. The outbreak of virus-B influenza is evidently continuing to wane, and there is no evidence that any outbreaks of virus-A influenza are developing.

Typhoid in Yorkshire

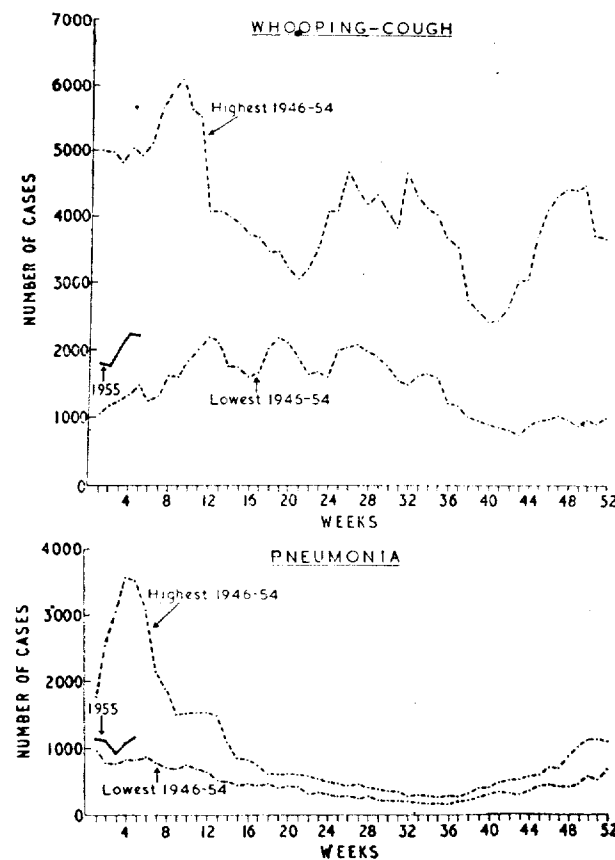
The cause of the typhoid outbreak at Pickering, in Yorkshire (*Journal*, February 12, page 430), is reported to be contaminated tinned tongue. It was all sold on one day, December 11, 1954. On December 13 an epidemic of an apparently upper respiratory infection, labelled influenza, started in Pickering after (not before, as we previously reported) a similar condition had affected people in surrounding districts. Chloramphenicol was administered to those patients suspected of pulmonary complications, and most of the primary cases subsequently diagnosed as typhoid received a course. The clinical picture was an unusual one—pyrexia, nose-bleeds, headache, and prostration.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the nine years 1946-54 (influenza, 1952-4) are shown thus -----, the figures for 1955 thus ———. Except for the curves showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



¹ *Yorkshire Post*, February 17, 1955.



Infectious Diseases

The rises in the number of notifications of infectious diseases in England and Wales during the week ending February 5 included 2,032 for measles, from 10,697 to 12,729, 301 for dysentery, from 678 to 979, 95 for acute pneumonia from 1,062 to 1,157, and 46 for scarlet fever, from 745 to 791.

The largest increases in the local incidence of measles were 389 in Yorkshire West Riding from 1,464 to 1,853, 280 in Kent, from 286 to 566, 204 in Warwickshire, from 372 to 576, 198 in Nottinghamshire, from 469 to 667, 158 in London, from 1,137 to 1,295, 122 in Durham, from 443 to 565, 104 in Surrey, from 276 to 380, and 101 in Northumberland, from 190 to 291. Only small variations occurred in the local trends of scarlet fever. 2,213 cases of whooping-cough, 24 fewer than in the preceding week, were notified. The largest variation was a rise of 38 in Kent, from 99 to 137. 16 cases of diphtheria were notified, being 7 fewer than in the preceding week. Multiple notifications of diphtheria came from Birmingham C.B. 3, Kingston-upon-Hull C.B. 2, and Liverpool C.B. 2. 13 cases of acute poliomyelitis were notified during the week, and these were 7 fewer for paralytic and 3 fewer for non-paralytic cases than in the preceding week. No multiple cases were reported.

The incidence of dysentery was the largest for 34 weeks. The chief centres of infection were Lancashire 368 (Oldham C.B. 86, Stretford M.B. 61, Blackpool C.B. 59, Manchester C.B. 30, Liverpool C.B. 27, Royton U.D. 15, Chadderton U.D. 14, Huyton-with-Roby U.D. 11), Suffolk 103 (Woodbridge U.D. 78, Blyth R.D. 17), Yorkshire West Riding 67 (Leeds C.B. 26, Rotherham C.B. 17), London 61 (Southwark 23), Norfolk 60 (Norwich C.B. 28, Blofield and Flegg R.D. 15, Forehoe and Henstead R.D. 10), Durham 42 (Lanchester R.D. 23), Glamorganshire 33 (Swansea C.B. 10), Warwickshire 30 (Birmingham C.B. 23), Leicestershire 29 (Leicester C.B. 23), Lincolnshire 28 (Scunthorpe M.B. 27), Yorkshire North Riding 23 (Middlesbrough C.B. 16), and Northumberland 20 (Newcastle-upon-Tyne C.B. 16).

Week Ending February 12

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 746, whooping-cough 2,065, diphtheria 14, measles 18,363, acute pneumonia 1,156, acute poliomyelitis 16, dysentery 1,110, paratyphoid fever 4, and typhoid fever 1.

Medical News

Duke of Edinburgh.—The Royal College of Surgeons of Edinburgh is to confer its Honorary Fellowship on the Duke of Edinburgh on June 20 as part of the College's 450th anniversary celebrations. The last member of the Royal Family to receive the Hon.F.R.C.S.Ed. was the Duke of Cumberland, the younger son of George II. On his return from his victory over the Young Pretender at Culloden Moor in 1746, he was made an honorary freeman of each of the City Crafts of Edinburgh, in gratitude for having come to that part of the kingdom "to maintain, protect, and defend our valuable Constitution of Church and State, most unjustly and unreasonably attacked by the present rebellion."

Sir Godfrey Huggins, C.H., F.R.C.S.—The Queen has approved the conferment of a Viscounty on Sir GODFREY HUGGINS, Prime Minister of the Federation of Rhodesia and Nyasaland. On February 18, the day the honour was announced, Sir Godfrey broke the Commonwealth record for service as a Prime Minister. He first attained this high office in 1933 as Prime Minister of Southern Rhodesia, a position he held unbroken for 20 years, until in 1953 he became Prime Minister of the newly created Federation of Rhodesia and Nyasaland. The previous record was made by the late Mr. Mackenzie King, who was Prime Minister of Canada for 7,828 days in three separate periods. The son of a doctor, Sir Godfrey Huggins qualified from St. Thomas's Hospital in 1906, and after holding appointments there he became house-physician and ultimately medical superintendent at the Hospital for Sick Children, Great Ormond Street. In 1908 he took his F.R.C.S., but a serious illness three years later compelled him to go abroad. For ten years he was a general practitioner in Salisbury, Southern Rhodesia, but in 1921 he became a consulting surgeon. In the same year he made his first entry into Southern Rhodesian politics. Only last week Sir Godfrey Huggins was in London attending the meeting of Commonwealth Prime Ministers, and while here he found time to go to the Hunterian Festival Dinner at the Royal College of Surgeons (*Journal*, February 19, p. 491). On the day of Sir Godfrey's return to Africa Sir Winston Churchill sent him this message: "I and my colleagues in the United Kingdom wish to send you our warm congratulations and good wishes for the future on your achievement in surpassing all records for the longest tenure of office of a British Prime Minister."

National Spastics Society.—The Lord Mayor of London, Alderman SEYMOUR HOWARD, presided at a dinner held at the Mansion House on February 15, when Mrs. CLEMENT ATTLEE and Mr. TED LEATHER, M.P., spoke in aid of the five-year medical research programme of the National Spastics Society. It is hoped that £45,000 will be subscribed to finance this research, which is only one of several projects which the society has in hand, including the setting



[Barratt's Photo Press]

up of special schools and local treatment centres for spastic children and adults. Dr. P. E. POLANI, the society's research director, speaking at the dinner, said that the main task of research in this field was to find out the causes of cerebral palsy, but investigations would also be made to assist diagnosis and to assess the potentialities of the handicapped child and the results of treatment.

Royal College of Surgeons in Ireland.—The annual Charter Day dinner was held in the College on February 12, when over two hundred Fellows and guests attended, among them members of the Surgical Travellers' Club. The toast of "The Guests" was proposed by the vice-president, Mr. A. B. CLERY, and was replied to in most felicitous terms by Professor ERIC ASHBY, vice-chancellor of the Queen's University, Belfast, and Sir STANFORD CADE. The toast of "The College" was proposed by Sir HENRAGE OGILVIE, and to this the president, Mr. IAN FRASER, replied.

Liquid Paraffin and Cancer.—One of the studies mentioned in the current annual report of the London School of Hygiene and Tropical Medicine is an analysis of data on the use of purgatives by patients with cancer of the gastro-intestinal tract and by patients with other diseases. These data were collected during the investigations into the aetiology of lung cancer which were published in the *British Medical Journal* (1950, 2, 739; 1952, 2, 1271). "The results," says the annual report, "suggest that the use of liquid paraffin may be associated with the development of a small proportion of the cases of cancer of the stomach and of the large bowel."

Dermatology and the G.P.—The reality of the demand from general practitioners for courses in dermatology (see page 534) is attested by figures published last week in the *Cambridge University Reporter* of the attendances at clinical symposia arranged for them at the Cambridge Medical School. Of the eleven symposia, that on dermatology was easily the most popular, 61 practitioners attending it. Next in popularity were those on paediatrics (53), disorders of blood (45), cardiovascular diseases (43), and obstetrics and gynaecology (42). At the bottom of the list were orthopaedics (18) and E.N.T. diseases (12).

French Government Exchange Scholarships.—Under the terms of a reciprocal arrangement with the Centre National de la Recherche Scientifique, the Medical Research Council invites applications from British workers in medical science (excluding clinical medicine) for two scholarships, valued at between 50,000 and 70,000 francs a month and tenable at research institutions in France during the academic year 1955-6. Further details and forms of application from the secretary, Medical Research Council, 38, Old Queen Street, London, S.W.1, with whom applications must be lodged by March 31.

Travelling Fellowships in Ophthalmology and Otology.—The Medical Research Council invites applications for Travelling Fellowships in ophthalmology and otology for the academic year 1955-6 for which special provision has been made by the Alexander Pigott Wernher Memorial Trustees. The Fellowships are intended for medical graduates who are likely to profit by a period of work at a centre abroad before taking up positions for higher teaching and research. The rate of payment is £650 per annum for a single Fellow or £900 per annum for a married Fellow, with allowances for travelling and other approved expenses. Further details and forms of application from the secretary, Medical Research Council, 38, Old Queen Street, London, S.W.1, with whom applications must be lodged by March 31.

Committee on Trial-case Lenses.—The Minister of Health has appointed a committee, under the chairmanship of Sir STEWART DUKE-ELDER, "to review standards for trial-case lenses and the method of measuring lens powers." Among the eight members are two other medical men, Mr. J. E. AYUB, F.R.C.S., and Mr. F. W. LAW, F.R.C.S.

Journal on Viruses.—The forthcoming publication of a new journal, *Virology*, is announced by the Academic Press, New York. The aim of this journal will be to publish papers on the biological, biochemical, and biophysical aspects of the subject, with emphasis on the comparative approach. The new journal will fill an obvious gap in the literature. *Virology* will be edited by Dr. G. K. HIRST, of the Public Health Research Institute, New York, 9, and Dr. C. H. ANDREWS, F.R.S., of the National Institute for Medical Research, London. It will be one of the associate editors. Volume 1, 1955, will comprise five issues, the first of which will appear in April. Annual subscription is \$9.00, and the British agents are Academic Books Ltd., 129, Queensway, London, W.2.

Aircraft Seats.—Under new Air Navigation Regulations all new civil airliners imported into Australia after January 1, 1957, must have their passenger seats facing the rear of the aircraft. The Australian Director-General of Civil Aviation, Air Marshal Sir RICHARD WILLIAMS, is quoted as saying that such seats give three times the protection of forward-facing seats.

Lawrence Poole Prize.—The Edinburgh branch of the Infantile Paralysis Fellowship has given £1,020 to Edinburgh University for the founding of an annual, biennial, or triennial prize for work on the prevention of poliomyelitis or the treatment or rehabilitation of those suffering from it.

William Hyde Award.—Dr. ROGER BANNISTER has been chosen for this year's William Hyde Award by the Research Board for the Correlation of Medical Science and Physical Education. The award, valued at £300, was instituted by the Nuffield Provincial Hospitals Trust in memory of its first manager.

Lord Adrian, P.R.S., will receive the honorary degree of Doctor of Science of Hull University on July 19.

COMING EVENTS

British Council Courses on Anaesthesia and Plastic Surgery.—Courses for overseas specialists: "Anaesthesia," London, February 27-March 12; "Plastic Surgery," East Grinstead and London, April 17-30. Details from director, Courses Department, British Council, 65, Davies Street, London, W.1 (Tel.: Grosvenor 8011).

Radio.—"Crime Comics and the American Way of Life." Twenty-minute talk on the Third Programme by Irving Sarnoff, Ph.D., senior psychologist, Student Health Service, Michigan University, on Thursday, March 3, at 8.55 p.m.

Otology Lecture.—The first James Yearsley lecture, commemorating the founder of the Metropolitan Ear, Nose, and Throat Hospital, will be delivered by Mr. TERENCE CAWTHORNE at 5.30 p.m. on March 4 at Rushcliffe House, St. Mary Abbots Hospital, Marloes Road, Kensington, W.8. His subject will be "The surgery of the ear in the prevention and treatment of intracranial complications of chronic suppurative otitis media." The lecture will be open to the medical profession without fee.

Alcohol Symposium.—The Nutrition Society will hold a symposium on "Alcohol and its Nutritional Significance," at St. Mary's Hospital Medical School, on March 12. Details from Dr. R. J. L. ALLEN, c/o Monkhouse and Glasscock, Ltd., Snowfields, London, S.E.1.

All-India Obstetric and Gynaecological Congress.—The eighth congress will be held in Bombay from March 24 to 26. Further details from hon. secretaries, Purandare Griha, Chowpaty Sea Face, Bombay, 7.

A.N.Z.A.S., the Australian and New Zealand Association for the Advancement of Science, will hold its thirty-first meeting in Melbourne on August 17-24. Visitors from overseas will be welcome. Details from Professor J. R. A. McMILLAN, Science House, 157, Gloucester Street, Sydney, Australia.

NEW ISSUES

Journal of Clinical Pathology.—The new issue (Vol. 8, No. 1) will be available next week. The contents include:

VISCERO-CUTANEOUS COLLAGENOSIS. Walter Pagel and C. S. Treip.
INTERSTITIAL PLASMACELLULAR PNEUMONIA DUE TO PNEUMOCYSTIS CARINII. H. S. Baar.
THE CELLS OF NORMAL HUMAN URINE. Philip Rofe.
A CASE OF CRYPTOCOCCAL MENINGITIS. D. C. Caldwell and S. S. Raphael.
NEEDLE NECROPSY. Richard Terry.
THE SPLEEN AND BLOOD EOSINOPHILIA. Simon Seviit.
THE USE OF A NEW CETRIMIDE PRODUCT IN A SELECTIVE MEDIUM FOR PSEUDOMONAS PYOCYANEA. E. J. L. Lowbury and A. G. Collins.
THE OCCURRENCE OF PASTURELLA SEPTICA (SYN. MULTOCIDA) IN BRONCHITIS. J. A. Cawson and J. M. Talbot.
THE FATE OF S. TYPHI IN BLOOD CLOT IN RELATION TO THE PROBLEM OF ISOLATION. Kenneth C. Watson.
EFFECT OF CHLORAMPHENICOL ON THE ISOLATION OF S. TYPHI FROM THE BLOOD STREAM. Kenneth C. Watson.
OPTICIN IN THE IDENTIFICATION OF STR. PNEUMONIAE. Eric F. Bowens and Leonard R. Jeffries.
THE ESTIMATION OF EVANS BLUE IN PLASMA. G. A. Bedwell, J. Paterson, and J. Swale.
THE EFFECT OF DIET UPON THE RESPONSE TO ORAL ANTICOAGULANTS. H. Paylor Wright and M. Hayden.
BLOOD COPPER AND ITS RELATIONSHIP TO THE GLOBULINS. J. N. Cumings, H. J. Goodwin, and C. J. Earl.
ISOLATION AND EXAMINATION OF URINARY METABOLITES CONTAINING AN AROMATIC SYSTEM. C. E. Dalgleish.
A SIMPLIFIED METHOD OF INVESTIGATING STEATORRHOEA. Dorothy Woodman and W. B. Yeoman.
A METHOD FOR THE DETERMINATION OF GLUTAMINE IN CEREBROSPINAL FLUID AND THE RESULTS IN HEPATIC COMA. T. P. Whitehead and S. R. F. Whitaker.
TECHNICAL METHOD: A SIMPLE METHOD FOR THE ESTIMATION OF PEPSIN IN GASTRIC JUICE. A. Wynn Williams.

Issued quarterly: annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

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

Friday, February 25

CAMBRIDGE MEDICAL SOCIETY.—At Addenbrooke's Hospital, 3 p.m., Miss M. Moore White: Infertility.

Monday, February 28

LEEDS UNIVERSITY.—At Littlewood Hall, General Infirmary at Leeds, 4 p.m., talk and demonstration by Sir Howard Florey, F.R.S.: Cinematographic Illustration of Some of the Phenomena of Inflammation.
MEDICAL SOCIETY OF LONDON.—8.30 p.m., discussion to be introduced by Mr. D. J. Browne and Mr. N. L. Eckhoff: Common Congenital Deformities.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, 4.45 p.m., Dr. Joseph Needham, F.R.S.: New Light on Physico-chemical Aspects of Morphogenesis.

Tuesday, March 1

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. C. Hodges: Superficial X-ray Therapy.
OXFORD UNIVERSITY MEDICAL SOCIETY.—At Clarendon Laboratory, 8.15 p.m., Professor J. Rotblat, D.Sc., Ph.D.: Nuclear Physics and Medicine.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Mr. John Beattie: Abnormalities of Bladder Function.
WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., neurological demonstration by Dr. J. N. Milnes.

Wednesday, March 2

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: *Trichophyton rubrum* Infection.
INSTITUTE OF LARYNGOLOGY AND OTOLGY.—6 p.m., Dr. H. Engrström (Stockholm): Anatomy of the Cochlea by the Electron Microscope.
INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. A. W. Badenoch: Haematuria.
LIVERPOOL MEDICAL INSTITUTION.—At Manchester University, 4.30 p.m., joint meeting with Manchester Medical Society, Professor A. W. Downie: Virus of Chickenpox and Herpes Zoster; Dr. C. A. Clarke: Some Methods of Investigating Inherited Factors in Disease.
MIDLAND MEDICAL SOCIETY.—At Birmingham Medical Institute, 154, Great Charles Street, 8.15 p.m., Dr. J. F. Brailsford: Lesions of the Inter-vertebral Disks.
ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE: EDINBURGH BRANCH.—At West Medical Theatre, Royal Infirmary, Edinburgh, 5 p.m., Dr. J. R. Innes: Defects in the Present-day Treatment of Leprosy.
ST. MARYLEBONE HOSPITAL FOR PSYCHIATRY AND CHILD GUIDANCE.—5.30 p.m., Dr. E. H. Larkin: Selection of Patients for Physical Treatment (with demonstration of treatment).

Thursday, March 3

●MOTHERS' CLINIC, 108, Whitfield Street, London, W.—2.30 p.m., Dr. Marie Stopes, D.Sc.: lecture and demonstration (on living models) on contraceptive technique.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.30 p.m., Otolaryngology Lecture by Mr. A. J. Gardham: Evolution of Major Surgery in the Mouth and Pharynx from the time of Trotter to the Present Day.
ROYAL EYE HOSPITAL.—5.30 p.m., Dr. T. H. Whittington: Some Aspects of Refraction Work: (2) The Reduced Eye and Retinoscopy.
ST. ANDREWS UNIVERSITY.—At Physiology Department, Medical School, Small's Wynd, Dundee, 5 p.m., Dr. F. G. Spear: Use and Misuse of Radiation.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. D. Curran: psychiatry demonstration.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.—4.30 p.m., demonstration and discussion of clinical cases.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, 4.45 p.m., Dr. S. R. Elsdon: Respiratory Mechanisms in Bacteria.

Friday, March 4

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. P. D. Samman: Lichen Planus.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Dr. J. Smart: Lung Abscess.
LONDON UNIVERSITY.—At King's College, 5 p.m., Professor Jerome Hall: Mental Disease and Criminal Responsibility.
●LONDON UNIVERSITY.—At Queen Elizabeth College, 5.30 p.m., Professor J. A. C. Knox: Exercise and the Heart Rate.
METROPOLITAN EAR, NOSE, AND THROAT HOSPITAL.—At Rushcliffe House, St. Mary Abbeys Hospital, 5.30 p.m., Inaugural Address by Mr. T. E. Cawthorne: Surgery of the Ear in the Prevention and Treatment of Intracranial Complications of Chronic Suppurative Otitis Media.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. R. W. Raven: Malignant Melanoma.
●ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Mr. Matthew White: Thoracic Surgery in Children.
ROYAL INSTITUTION OF GREAT BRITAIN.—9 p.m., Sir Frederic Bartlett, F.R.S.: Thinking—An Experimental Approach.
ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., Dissertation by Mr. A. McSmith: Some Aspects of General Practice.
ROYAL SANITARY INSTITUTE.—At Guildhall, Kingston-upon-Hull, 10 a.m., Mr. T. H. Jones, M.I.C.E.: Water Supply of Kingston-upon-Hull—Past, Present, and Future; Dr. W. Ferguson: Epidemiological Approach to Health Education.
WHIPPS CROSS HOSPITAL MEDICAL SOCIETY.—8.30 p.m., clinical meeting.

Saturday, March 5

INSTITUTE OF LARYNGOLOGY AND OTOLGY.—12 noon, Dr. H. Engrström (Stockholm): Anatomy of the Vestibule by the Electron Microscope.
MIDLAND TUBERCULOSIS SOCIETY.—At Birmingham Chest Clinic, 3 p.m., Dr. A. L. Cochrane: Epidemiology of Tuberculosis in the Rhondda Pools.

APPOINTMENTS

GREER, C. H., M.B., B.S., Pathologist, Victoria Eye and Ear Hospital, Melbourne, Australia.
INSTITUTE OF OPHTHALMOLOGY.—P. B. Schofield, M.R.C.S., L.R.C.P., Assistant Pathologist; C. M. H. Pedler, M.B., B.S., Junior Pathologist.
NORTH-EAST METROPOLITAN REGIONAL HOSPITAL.—Alexander Russell, M.D., M.R.C.P., D.P.H., D.C.H., Part-time Consultant Physician in Paediatric Endocrinology, Queen Elizabeth Hospital for Children; E. W. Emery, M.B., Ch.B., F.F.R., D.M.R.(T), Full- or Maximum Part-time Consultant Radiotherapist, North Middlesex Hospital and Annexes; K. A. D. Turk, M.D., Full-time Consultant Pathologist, Chelmsford Group of Hospitals; C. G. Nairn, M.B., Ch.B., F.R.C.S.(Ed.), M.R.C.O.G., Part-time Consultant Obstetrician and Gynaecologist, Prince of Wales's and Bearded Memorial Hospitals; G. D. W. McKendrick, B.M., B.Ch., M.R.C.P., Part-time Consultant Physician in Infectious Diseases, St. Ann's General Hospital; A. S. Clark, M.B., B.S., D.P.M., Part-time Consultant Psychiatrist, Edmonton Child Guidance Clinic; J. H. P. Johnson, M.B., M.R.C.P., Full-time Consultant Chest Physician, Tottenham Chest Clinic; W. J. Jenkins, M.D., Full-time Consultant Pathologist and Medical Director, Brentwood Blood Transfusion Centre; J. P. S. Whitehead, M.R.C.S., L.R.C.P., Full-time Consultant Pathologist, Tilbury and South-east Essex Group of Hospitals.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Thomson.—On February 9, 1955, to Nancy S. M. Thomson (formerly Milne), M.B., Ch.B., wife of Thomas Nairn Thomson, B.Sc.(Econ.), B.Com., Ivybank, Blairgowrie, Perthshire, a son.

MARRIAGES

Phillips—Carp.—On February 22, 1955, at Toorak Synagogue, Melbourne, Australia, Leo Phillips, M.B., Ch.B., M.R.C.P., D.C.H., of Auckland, New Zealand, to Anne Carp, of Melbourne.

DEATHS

Johnston.—On January 28, 1955, at Old Court, Wellington, Somerset, Henry Stapleton Johnston, L.R.C.P.&S.I. & L.M., aged 71.
Low.—On January 24, 1955, in London, John Bruce Low, M.B., Ch.B., D.P.H., of 18, Causton Road, Highgate, London, N.
McIver.—On January 13, 1955, William John McIver, M.B., B.Ch., D.P.H. of The Demesne, Wistaston, Nantwich, Cheshire, aged 74.
Marsden.—On January 25, 1955, in London, Norman Spencer Marsden, M.B., Ch.B., Surgeon Commander, R.N.
Mayne.—On January 22, 1955, at "Caradon," Teignmouth, Devon, William Boxer Mayne, M.R.C.S., L.R.C.P.
Meehan.—On January 22, 1955, at "Maryfield," Duns, Berwickshire, Felix Patrick Meehan, M.M., M.B., Ch.B.
Moore.—On January 21, 1955, at 8, Groveley Road, Bournemouth, Hants, Edward James Fleetwood Moore, M.D.
Newton.—On January 27, 1955, at a nursing-home, Arthur Charles Dunca Newton, M.R.C.S., L.R.C.P.
North.—On January 15, 1955, at Axmansford Cottage, Ramsdell, Hants, Thomas North, M.D., F.R.C.S.I., late of New Southgate, London, N., aged 87.
Pooley.—On January 17, 1955, at Hill Rise, Dalton-in-Furness, Lancs, Edward Burdett Pooley, L.R.C.P.(Ed.), L.R.C.S.I. & L.M., aged 91.
Sheehan.—On January 25, 1955, at Norwich, Norfolk, William Joseph Sheehan, M.B., B.Ch.
Stalker.—On January 16, 1955, Alice Stalker, M.B., Ch.B., D.P.H., of Southport, Lancs.
Thompson.—On January 15, 1955, William Alexander Thompson, M.B., Ch.B., of 37, Derby Lane, Stoneycroft, Liverpool, Lancs, aged 33.
Walker.—On January 27, 1955, William Watson Walker, M.R.C.S., L.R.C.P., of 2, Chevening Road, London, N.W., aged 84.
White.—On January 21, 1955, at 187, Queen's Gate, London, S.W., John Duncan White, O.B.E., M.B., Ch.B., D.M.R.E.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Antibiotics and Buccal Ulceration

Q.—What place have antibiotics in the treatment of stomatitis and buccal ulceration? If indicated, how should they be administered?

A.—The answer, as to so many such questions, is that treatment depends on the cause. Antibiotics are worse than useless in *Candida* (Monilia) infection, and may indeed produce it. Penicillin is a specific for Vincent's infection. If there is some underlying condition (agranulocytosis or other blood disease and perhaps others less serious and less easily identified) antibacterial treatment of any kind, since it does not deal with the ultimate cause, may be unsuccessful. If the condition appears to be primary and not due to any resistant species such as *Candida albicans*, penicillin may be tried: none of the newer antibiotics has any special advantage for this purpose. When given in large doses parenterally (not less than 500,000 units daily of sodium penicillin; procaine penicillin does not produce sufficiently high blood levels) penicillin is excreted in the saliva, and this is perhaps the best way of giving it. Alternatively penicillin pastilles made with gelatin may be continuously sucked or penicillin chewing-gum used. Penicillin tablets (saccharose base) are unsatisfactory for prolonged use, and can in fact themselves produce a stomatitis.

Crepe Rubber Soles

Q.—There is a current opinion among orthopaedic staff that the wearing of crepe rubber soles causes pains in the feet. Are there any facts ascertained concerning rubber footwear and the welfare of the feet?

A.—It is a prevalent belief that crepe rubber soles are not suitable for children's feet. In fact, there seems to have been no investigation of this question at all. Certainly there can be no harmful effect on normal feet. In feet that are grossly abnormal there might be some complaint of pain, though I do not believe any harm would come from wearing such shoes. The reason that pain might occur is that a crepe sole does not give any rigid support to the foot. However, it is uncommon for children with foot abnormalities to complain of anything but minor pain. In short, I would say that crepe soles are quite suitable for shoes worn by children.

Alopecia Totalis

Q.—A patient of mine, a man aged 43, has had total alopecia since childhood. He lost all his hair at the age of about 10; no illness is known to have been the cause of it. His hair then grew again and disappeared again each year until he was about 18 years old, since when he has been without hair on head or body. Every spring a few downy hairs appear on his face and scalp, but by mid-summer they have gone again. He is a reticent type of person, sensitive about his baldness. He wears a wig, but can you suggest any treatment for his condition?

A.—Reports from the United States indicate that alopecia totalis may recover completely after systemic treatment with cortisone or A.C.T.H. It seems, however, that the baldness is likely to return very quickly once treatment is stopped, but perhaps this is not always so. The local application of cortisone and A.C.T.H. to the skin seems to be of no effect, but it may be hoped that hydrocortisone may prove successful in treating this condition. As yet, supplies of hydrocortisone in this country are not sufficient for the treatment

of alopecia totalis, and its value is still uncertain. In any case, it is doubtful whether the disorder merits the hazards and expense of systemic steroid therapy. However, no other treatment is likely to be successful.

Obliteration of Tattoo Marks

Q.—I have recently been consulted by a patient who is anxious to have some tattoo marks removed from his arm. They consist of three small initials, and have only been there for a few weeks. Is it possible to bleach them in any way or to lessen the intensity of the pigment? Apparently he is prepared to put up with a considerable amount of inconvenience.

A.—The removal of tattoo marks, except by surgical excision and closure of the wound by a skin-graft or by suture, is not very satisfactory.

The only other method which has been seriously attempted is to use a tattooing machine to drive an escharotic, such as tannic acid, into the skin over the tattoo mark. This causes necrosis of the skin and healing by scar tissue. It therefore leaves an outline of the previous tattoo mark as a scar. It does, however, achieve the removal of the coloured dyes.

Anaemia in Pregnancy

Q.—I should be grateful for information on the treatment of the pregnant woman whose routine haemoglobin estimation at a local authority antenatal clinic is about 60% to 80%.

A.—Although it has recently been disputed, the general view is that the physiological hydraemia of pregnancy results in an apparent anaemia and that a haemoglobin reading of 80% (11.0 g. per 100 ml.) or more is normal for the latter part of pregnancy. If anaemia is present, and if it is the result of an iron deficiency, treatment should be by modification of the diet and, if need be, by the oral administration of iron in the form of ferrous sulphate, ferrous carbonate, ferrous gluconate, iron and ammonium citrate, or proprietary preparations of colloidal iron. While it is true that one or other of these preparations may cause constipation or diarrhoea in certain women, this can only be determined by giving each a trial.

Failure of hypochromic anaemia to respond to oral iron therapy is sometimes explained by achlorhydria, which is not uncommon during pregnancy, so hydrochloric acid may be administered in addition to iron. If this fails, there is a clear indication for reference of the patient from a district antenatal clinic to the nearest hospital where full investigation can be carried out to establish the type of anaemia present, and where further treatment can be arranged or advised according to the findings.

Oversexed Women

Q.—Is there any reliable medical treatment—for example, hormones or sedatives—to lessen the sexual urge in women?

A.—It is worth trying the effect of ethisterone, 5 mg. three times a day. This is an expensive remedy, but it has been known to have the desired effect. Alternatively, small doses of bromide or phenobarbitone thrice daily are effective in some women, as is shown by the fact that some epileptic females cannot reach orgasm as long as they continue with sedation. Sensible advice about behaviour, masturbation, and the avoidance of alcohol would doubtless also help. With regard to masturbation, many children are brought up to believe that any self-relief is an unforgivable sin, and the punishment for it will be diseases of the sexual organs or damage to childbearing capacities. In fact, there seems no reason to consider masturbation as anything but normal in the celibate adult. Of Kinsey's figures from about 5,000 males 96% had masturbated and some 62% of his series of women. There seems to be no valid reason for fearing that a habit will become established: in normal people masturbation is only resorted to in the absence of more satisfactory outlets: certainly for many relief obtained in this

way would seem preferable to making a whole-time effort to repress desire as some young people have to do. A little kindly reassurance from the doctor may bring great relief along these lines. Admittedly the question is a complex one, but such advice would probably be given by most present-day psychiatrists.

Dental Anaesthesia for Children

Q.—*I am often asked by our local dentists to administer a domiciliary anaesthetic to children (3 years and upwards) for the extraction of a varying number of teeth, from two to a total clearance. It is seldom that one can avoid an open fire, especially in winter. What is the best anaesthetic agent to use? On a recent refresher course for general practitioners which I attended hands were raised in horror at the mere suggestion of chloroform, but no alternative (except ethyl chloride and ether) could be suggested. What is your expert's advice?*

A.—The choice of dental anaesthetic for infants and young children varies from single-dose ethyl chloride or divinyl ether for the simplest extraction, to endotracheal anaesthesia with nitrous oxide and oxygen with an adjuvant for the longest operations. The latter would be quite unsuitable in domiciliary practice. Nasal nitrous oxide and oxygen alone is a difficult anaesthetic to give to the very young without some premedication, and on the whole is not advised for the occasional anaesthetist. Ether, ethyl chloride, and divinyl ether are all inflammable and explosive, particularly so in the presence of oxygen or nitrous oxide. They should not be administered in the presence of an open fire. Chloroform is inadmissible because of its special pharmacological dangers, now too well documented to need repetition and out of all proportion to the nature of this operation.

The practical outcome is that unless the anaesthetic can be administered in a room without an open fire or for that matter any other source of ignition, it should not be administered at all. A larger question is whether dental extractions under general anaesthesia should be performed in a patient's home. If the reasons for doing so seem sufficient, any fire should be extinguished and any source of ignition removed from the room before the anaesthetic is administered. Quite apart from the explosion risk, the difficulty of avoiding and treating the by no means rare anaesthetic hazards of overdose, inhalation of vomit, and respiratory obstruction in a private house is very great. The death of a child in these circumstances would be difficult to excuse merely on grounds of expediency.

Paradichlorobenzene

Q.—*A patient sleeps in a room with little ventilation and with wardrobes and drawers so generously treated with paradichlorobenzene that the atmosphere seems constantly charged with it. Is this dangerous, or might it account for vague symptoms otherwise reasonably attributable to advancing years, or for a mild irritating cough?*

A.—Paradichlorobenzene is not usually considered to be a particularly toxic substance, though it is a narcotic and a liver poison. Inhalation of vapour is said to lead to headache, dizziness, and vomiting in sensitive people. I have been able to find only one reference in the literature to occupational poisoning among those handling the material. Wallgren¹ has recently reported poisoning in eight workers producing it. The symptoms were loss of appetite and weight and irritation of the eyes and throat. There were also increased reflexes, fine finger tremors, and some degree of methaemoglobinemia. More serious, however, is a single report² of two women both excessively exposed at home who developed cataract after an attack of jaundice a year previously. The significance of these observations might be questioned in view of the widespread use of paradichlorobenzene, but in any case a reduction of the hazard should be relatively easy to achieve.

REFERENCES

- ¹ Zbl. ArbMed. ArbSchutz., 1953, 3, 14.
- ² Berliner, M. L., Arch. Ophthal., 1939, 22, 1023.

Magnesium

Q.—*What is known about the magnesium requirements of man? Does deficiency or excess of this element lead to any ill-effects and, if so, what?*

A.—The usual dietary intake of magnesium is 0.2 to 0.6 g. (15–50 mEq) daily. The minimal requirement of magnesium in man is not known with any accuracy. In animals, deprivation of magnesium has been shown to cause tetany associated with low serum levels of magnesium. In man, the absence of a normal diet during prolonged parenteral feeding has been shown to lead to low serum levels of magnesium; the tremor in delirium tremens has been attributed to magnesium deficiency induced by anorexia, and low values of serum magnesium have been associated with it. Although magnesium is present in a considerable amount in cells, the effects of a cellular deficiency of magnesium in man are not known. High serum levels of magnesium can lead to stupor and coma. Magnesium in the diet could scarcely be adequate to produce this effect, but the giving of magnesium salts to patients with renal failure may elevate the serum level and so accentuate drowsiness.

NOTES AND COMMENTS

Lepers in Revolt.—Dr. M. G. CORCOS (Trinidad, B.W.I.) writes: "In your number of January 15, on p. 175, under 'Medical News' appears the paragraph headed 'Lepers in Revolt,' in which you correctly quote newspaper reports concerning myself. The incident did in fact occur, and has been followed by a considerable amount of publicity in both the world press and in the local press, most of it unfortunately highly favourable to me. I would be very grateful, therefore, if in fairness to me you could see your way to publishing the following disclaimer:

"Subsequently to January 7, 1955, a number of articles, letters, and reports have been appearing in the lay press, some purporting to give my views and practices in the treatment of leprosy patients and in leprosy control, and some including statements by patients and other persons lauding me, my views, and my actions. Please note that none of the articles, letters, and reports purporting to give my views and practices has been or will be published with my written, spoken, or implied consent. Many of the views and practices are not necessarily my own, and are in any case held and practised by a large number of medical practitioners, nurses, and medical auxiliaries throughout the world, as well as by various bodies interested in leprosy and leprosy control, including the World Health Organization. The laudatory statements, articles, letters, and reports by patients and others have been, and will be, in no way solicited by me, and have been, and will be, published without my written, spoken, or implied consent."

Burns from Petroleum Bitumen and Paraffin Wax.—Arising from the reply to the question on the treatment of pitch and tar burns ("Any Questions?" November 27, 1954, p. 1306), it has been asked whether the same treatment would be applicable to burns from petroleum bitumen and paraffin wax. OUR EXPERT replies that the treatment described is equally suitable for these types of burn.

Technique of Artificial Insemination.—Dr. JOAN MALLESON (London, N.W.1) writes: There is a slight error in the reference to the use of the insemination syringe ("Any Questions?" January 29, p. 301). Any apparatus such as this, dealing with sperms, should be washed in plain water and dried in air. A sediment of soap is most detrimental to sperm life. The syringe and glass vessel also need warming, in the axilla, to blood heat, for cold glass is a shock to spermatozoa. Full details of the use of the syringe have been published.¹

REFERENCE

- ¹ Practitioner, 1952, 169, 161.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Atiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: *Britmedads, Westcent, London.* MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association, TELEPHONE: EUSTON 4499. TELEGRAMS: *Medisecra, Westcent, London.* B.M.A. SCOTTISH OFFICE: 7, Drumshough Gardens, Edinburgh.

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TREATMENT OF ACUTE RHEUMATIC FEVER IN CHILDREN

A Co-operative Clinical Trial of A.C.T.H., Cortisone, and Aspirin

A JOINT REPORT* BY

THE RHEUMATIC FEVER WORKING PARTY OF THE MEDICAL RESEARCH COUNCIL OF GREAT BRITAIN
AND

THE SUBCOMMITTEE OF PRINCIPAL INVESTIGATORS OF THE AMERICAN COUNCIL ON RHEUMATIC FEVER AND CONGENITAL HEART DISEASE, AMERICAN HEART ASSOCIATION

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Statistical consultation and services were provided by Miss MARJORIE T. BELLOW, chief statistician of the American Heart Association, and Dr. JOHN KNOWELDEN, London School of Hygiene and Tropical Medicine. Mr. FELIX MOORE, chief, Biometrics Research Branch, National Heart Institute, served as statistical consultant. Dr. A. St. J. DIXON, Taplow, served as co-ordinating registrar for the British centres. Mrs. RUTH E. RUTSTEIN was co-ordinator for the centres in the United States.

Starting in 1949, encouraging reports of A.C.T.H.[†] and cortisone in the treatment of acute rheumatic fever aroused hope that a more effective therapy had at last become available. Conclusions of the early and uncontrolled studies were, however, somewhat contradictory, in that some investigators reported that the hormones altered the course of acute rheumatic fever while others suggested that they merely suppressed its clinical manifestations (see bibliographies in Thorn *et al.* (1950) and Massell (1954)). At that time no data were available concerning the prevention of rheumatic heart disease by these agents, a question which could be answered only by a long follow-up study.

By early 1950 it became evident to both the Council on Rheumatic Fever and Congenital Heart Disease of the American Heart Association and the Medical Research Council of Great Britain that there was need for a controlled study of the efficacy of these hormones in comparison with the previously accepted therapy. It was also clear that no single research centre could provide, in a short period of time, enough cases to give a definitive answer. It was therefore proposed that a group of research centres should collaborate. The co-operative clinical trials of the streptomycin treatment of tuberculosis in Great Britain under the Medical Research Council and similar studies in the United States under

the Veterans Administration pointed the way. Planning funds were soon made available.

There were several advantages in the establishment of a co-operative study on an international basis. It was possible that the general availability of A.C.T.H. and cortisone in the United States might seriously interfere with a strictly controlled clinical trial. Large numbers of cases would be collected rapidly. Much-needed information on the natural history of the disease in two different parts of the world would be made available.

The Committee on Criteria and Standards of the Council on Rheumatic Fever and Congenital Heart Disease, together with a group of American and Canadian rheumatic fever research workers, set up a subcommittee of principal investigators for American planning. It also established liaison with the Working Party on Rheumatic Fever of the Medical Research Council of Great Britain. Joint planning of the United Kingdom-United States Co-operative Rheumatic Fever Study was begun and the design of the study completed in a six months' period.

The trial was designed to compare the therapeutic effects of the hormones, A.C.T.H. and cortisone, with the usual treatment of rheumatic fever at the time—namely, aspirin—all patients to be treated in hospital on bed rest and protected against beta-haemolytic streptococcal

*This report is being published simultaneously in the *British Medical Journal* in the United Kingdom and in *Circulation* in the United States.

†Throughout this paper A.C.T.H. will be used to indicate corticotropin, N.N.R.

infection. Within the limitations imposed by the design of the study, answers were sought to two questions:

(1) What is the relative effectiveness of each of these hormones and of aspirin in altering the course of the acute disease or in suppressing its clinical manifestations?

(2) What is the relative effectiveness of these three agents in preventing rheumatic heart disease?

Information was also collected on the side-effects of the two hormones and of aspirin.

The design created and agreed upon by the principal investigators in both countries, in co-operation with the co-ordinating staff and statistical consultants, provided for diagnostic criteria, random allocation of patients to treatment groups, a uniform six-weeks therapeutic regimen, and a fixed time-pattern for observation and follow-up. It prescribed the type and frequency of clinical and laboratory observations during hospital stay and follow-up period and required reporting on specially prepared forms (see Appendix) to the co-ordinating centres in London and New York City.

This report compares the effects of the three drugs—A.C.T.H., cortisone, and aspirin—on the acute course of rheumatic fever, in children under the age of 16, through 13 weeks from the start of treatment, and on the persistence and development of rheumatic heart disease through one year.* Subsequent reports will include a similar analysis of adult patients and, after longer follow-up, of the relative effectiveness of the three drugs in the prevention of rheumatic heart disease. These extensive data should also provide much information on the natural history of the disease.

Diagnostic Criteria for Admission of a Patient to the Study

To ensure, so far as possible, that in all centres patients admitted to the trial were unquestionable cases of rheumatic fever, and of no other illness, it was necessary to specify precise diagnostic criteria. Since there are no specific diagnostic clinical symptoms or signs or laboratory tests, such criteria must be arbitrary. The criteria had to be broad enough not to exclude many genuine early cases, and yet sufficiently rigid that there should be, among competent clinicians, no reasonable doubt regarding the diagnosis.

The diagnostic criteria were based on those of T. Duckett Jones (1944), modified for the purposes of this study with his advice and assistance.† They divide the manifestations of rheumatic fever into two groups, major and minor. There were five major and five minor manifestations, defined as follows.

Major Manifestations

- (1) **CARDITIS**, as shown by any one of the following: (a) the development of an organic apical systolic murmur or an aortic diastolic murmur under acceptable observation‡; (b) a change of heart size of more than 15% on standard x-ray film by any standard method of measurement; (c) pericarditis revealed by

a definite friction rub or by pericardial effusion; (d) congestive failure, in a patient under 25 years and in the absence of other causes, and shown by one or more of the following: (1) dyspnoea, (2) orthopnoea, (3) enlargement of the liver, (4) basal pulmonary rales, (5) increased jugular venous pressure, or (6) oedema.

In the assessment of carditis as a criterion for entry to the trial, it was assumed in patients with no known pre-existing rheumatic heart disease or history of an attack of acute rheumatic fever, that previous to the current illness the patient's heart was of normal size and that there were no rheumatic murmurs. In other patients, observations of changes in heart size and murmurs were used in determining carditis, and recorded.

- (2) **POLYARTHRITIS**, as shown by pain and either limitation of active motion or tenderness, in two or more joints.
(3) **CHOREA**, with movements of at least moderate severity.
(4) **SUBCUTANEOUS NODULES**.
(5) **ERYTHEMA MARGINATUM** (OF ANNULARE).

Minor Manifestations

- (1) **FEVER**, defined as any temperature above 99.3° F. (37.4° C.) by mouth or 100.3° F. (38° C.) rectally, occurring at least twice in one period of 24 hours, or above 100.3° F. (38° C.) by mouth or 101.3° F. (38.5° C.) rectally, observed on any one occasion.
(2) **ELEVATED SEDIMENTATION RATE**, defined as 15 mm./hr. or above (Wintrobe (1935), corrected by the Whitty and Hines chart to a haematocrit of 45%).
(3) **EVIDENCE OF PREVIOUS STREPTOCOCCAL INFECTION**, as shown by a culture in which beta-haemolytic streptococcus predominated, or by an antistreptolysin O titre of 200 units or greater, or by a reliable history of sore throat with fever preceding the onset of illness by an interval of one week to one month.
(4) **AN INCREASED P-R INTERVAL**, defined as a value at least 0.04 sec. beyond those given in the Ashman and Hull (1947) tables for ages under 16.
(5) **A RELIABLE HISTORY OF RHEUMATIC FEVER**, as defined in these criteria or EVIDENCE OF PRE-EXISTING RHEUMATIC HEART DISEASE—namely, an apical organic systolic murmur, an apical diastolic or a basal diastolic murmur.

These criteria having been specified, it was ruled that to be admitted to the study the patient must (a) at some time during the illness which brought him to the centre have exhibited at least two major manifestations or one major and two minor manifestations, and (b) on the first day of the allotted therapy show evidence of any one major manifestation or of any two of the three following minor manifestations—fever, elevated sedimentation rate, increased P-R interval.

It was arbitrarily decided that an interval of at least three months with no rheumatic activity must have preceded the present illness to justify its being called a new attack. With any shorter interval of time between the present and a previous illness, the present illness was held to be an exacerbation of symptoms of the previous attack and not a new attack. In such instances, the date of onset was referred back to the beginning of the illness.§

Patients who had had previous hormone therapy were excluded from the trial (a single test dose previously administered was not regarded as therapy). If a patient was receiving salicylate therapy, that treatment was discontinued upon admission to the hospital, before the patient was considered for inclusion. If such a patient subsequently satisfied the criteria he was eligible and admitted in the ordinary way.

§“Onset” was defined as the date of the first observation of any major manifestation or any minor manifestation that appeared to be related in a continuous time sequence to the development of any major manifestation.

Treatment Plan

Dosage Schedules

The dosage schedules of A.C.T.H., cortisone, and aspirin were based (in 1950) on published studies, modified by reports from investigators to Armour Laboratories and Merck and Company. From such information, a dosage was selected to be effective for a period of administration short enough to indicate whether the acute attack had been differentially shortened by any one of the three drugs. Provision was made for decreasing the dosage if toxic manifestations appeared and for “tapering off” so that cessation of therapy would not be abrupt.

While the same hormone dosage was used for all patients, the dosage schedule of aspirin was calculated on the basis of body weight. Cortisone and A.C.T.H. were administered intramuscularly, while aspirin was given by mouth.

The dosage schedules were:

A.C.T.H.*—All cases U.K. and eight cases U.S.†: a total daily dosage of 80 U.S.P. units for the first four days, 60 units for the next three days, 40 units for the second and third weeks, 30 units for the fourth and fifth weeks, and 20 units for the sixth week, administered every six hours.

All but eight cases U.S.: a total daily dosage of 120 U.S.P. units for the first four days, 100 units for the next three days, 80 units for the second week, 60 units for the third week, 40 units for the fourth and fifth weeks, 20 units for the sixth week, administered every six hours.

The A.C.T.H. dosage in the U.S. was increased early in the study, because with the relatively poor methods available for lot standardization and the lack of dramatic response in the first few cases treated, it was held possible that optimum dosage was not being administered. In regard to the question of “adequacy” of hormone dosage, it is of interest that practically all cases receiving A.C.T.H. or cortisone had side-effects; the details of which are presented later.

Cortisone.‡—A total daily dosage of 300 mg. for the first day, 200 mg. for the next four days, 100 mg. for the remainder of the first three weeks, 75 mg. for the fourth and fifth weeks, 50 mg. for the sixth week.

In the few cases where the hormone dosage was reduced because of undesirable side-effects, the percentage stepwise reduction in dosage thereafter remained unchanged.

Aspirin (acetylsalicylic acid, U.S.P. or B.P., 0.3 g. (5 gr.) tablets).—A total daily dosage of 60 mg. (1 gr.) per lb. of body weight (140 mg. per kg.) or 10 g. (150 gr.) total dosage, whichever was less, for the first two days; 40 mg. (½ gr.) per lb. (100 mg. per kg.), or 10 g. (150 gr.), whichever was less, for the next five days; 30 mg. (½ gr.) per lb. (70 mg. per kg.) for the remainder of the six weeks. Administered every four hours for 48 hours, every six hours thereafter. Aspirin was administered without bicarbonate of soda.

Patients unable to tolerate aspirin in the scheduled dosage received the largest amounts that they could tolerate as determined by the investigator. This occurred mainly in the older patients where the body-weight dosage produced side-effects. Conversely, because of the weight-dosage formula, small children did not receive aspirin up to the limit of tolerance.§

*A.C.T.H., donated by Armour Laboratories, was in three lots of water-soluble material standardized on both animals and human beings. All the U.K. cases were treated with one lot (K-50601R), while most of the U.S. cases received a second lot (J-24109R), although a few were treated with a third lot (L-56702). The U.S.P. unit is expressed as a milligram equivalent of A.C.T.H. lot number LA-1A.

†One Canadian centre took part in the trial, but for easy reference the term “U.S.” is used to include all North American centres.

‡Cortisone, donated by Merck and Company, was the regular commercial preparation for intramuscular use—namely, the acetate of 17-hydroxy-11-dehydrocorticosterone, suspended in a vehicle consisting of sodium carboxymethyl cellulose, Tween 80, and 1.5% benzyl alcohol in isotonic saline.

§Salicylate blood levels determined in two U.S. centres showed a positive correlation with body weight; lower blood levels found in one U.K. centre revealed no such relationship.

During the three-weeks observation period following the six-weeks course of therapy, none of these drugs was administered unless the investigator believed that the patient's condition was so poor as to endanger life or the polyarthritides so painful that it could not otherwise be controlled. In such cases, re-treatment was given for a period of four weeks, using the same drug and dosage as in the first four weeks of initial therapy; it was followed by a three-weeks observation period as before.

If re-treatment was necessary at any time during the three months following the original course of therapy, then the above four-weeks re-treatment scheme was followed. No patient was re-treated unless he demonstrated rheumatic activity sufficient to have brought him into the study initially.

If after three months without activity the patient developed a new attack of rheumatic fever, he was treated as in the original course—that is, for six weeks on the same drug and dosage, followed by a three-weeks period of observation.

Auxiliary Therapy

Sodium and Potassium Intake.—To minimize salt retention in hormone-treated patients, and to maintain comparability among the three treatment groups, the dietary intake of sodium was restricted to less than 2 g. per day for all patients for at least four weeks. All patients received added potassium chloride by mouth daily, 2 g. for those weighing less than 60 lb. (27.2 kg.) and 3 g. for those 60 lb. (27.2 kg.) or more, except that those few who developed oliguria due to congestive failure received no added potassium. Serum potassium levels were estimated weekly.

Streptococcal Prophylaxis.—Every effort was made through streptococcal prophylaxis to prevent recurrent attacks of rheumatic fever which would introduce an additional variable in the study. All patients, upon admission to the study and on the fourth, seventh, and tenth days of treatment, received procaine penicillin G in aluminium monostearate intramuscularly, 300,000 units for those weighing less than 60 lb. (27.2 kg.), 600,000 units for those 60 lb. (27.2 kg.) or more.¶ On the 14th day after admission to the study, and continuously thereafter, sulphadiazine was administered in a dose of ½ g. per day to those weighing less than 60 lb. (27.2 kg.) and 1 g. per day to those weighing 60 lb. (27.2 kg.) or more. (In a few patients, oral penicillin in a dose of 100,000 units twice a day was substituted when sensitivity to sulphadiazine developed.) Sera were drawn for determination of antistreptolysin-O titres (Massell and Miller's unpublished technique modified from Hodge and Swift, 1933) at weeks 0, 5, 9, and 13, and at each follow-up examination, to detect intercurrent streptococcal infection.

In addition to this routine, throat cultures were made on all patients on admission to hospital, and thereafter whenever there was indication of a throat infection. Those with positive cultures received penicillin therapy, as prescribed by the investigator.

Other Therapy.—All but a few patients were kept at bed rest for the nine weeks of therapy and observation. In a few cases of chorea, sedatives were necessary. No anti-rheumatic drugs other than those allocated for the study were given. Therapy necessary for any complicating illness was recorded.

Allocation of Patients to Treatment

Patients on admission to the study were divided into two age groups, 0 to 15 years and 16 and over, and into three groups according to the length of time in each case between the date of onset of the attack and the date at which therapy began. The three duration-from-onset groups were (1) 14 days or less; (2) 15 to 42 days; (3) 43 days and over.

For each of these three duration groups, within each age group, and separately for each treatment centre, the three treatments, A.C.T.H., cortisone, and aspirin, were listed in

¶At the House of the Good Samaritan (Boston) a variable dosage schedule was used.

*The one year follow-up data represent observations made at a calendar year from the end of the nine-weeks period of treatment and observation (61 weeks from the start of therapy).

†These modified criteria are not necessarily applicable for general use by the practising physician, particularly in questionable cases where continued observation of patients may be necessary for definitive diagnosis.

‡The development of an apical mid-diastolic murmur was also used for the diagnosis of carditis in U.K. centres, but there was only one case in which the diagnosis of carditis rested solely on this murmur, and this case was eligible under other criteria.

TABLE 1.—Details of 15 Cases Admitted to the Study in Which the Treatment and Observation Schedule was not Followed, with Reference to Their Inclusion or Exclusion From the Analysis.

Treatment Group	Treatment Stopped (5 Cases)	Treatment Changed (5 Cases)	Re-treatment (4 Cases)	Treatment Incomplete (1 Case)
A.C.T.H. (4 cases)	(1) U.S. gastric haemorrhage 6th day. Excluded (2) U.S. renal haemorrhage 21st day. Included (3) U.S. toxicity ¹ 27th day. Included (4) U.K. toxicity ² 32nd day. Included			
Cortisone (3 cases)			(11) U.S. re-treated 48th day. Included (12) U.S. re-treated 50th day. Included (13) U.S. re-treated 45th day. Included (14) U.S. re-treated 58th day. Included	(15) U.S. patient left hospital 12th day. ³ Excluded
Aspirin (8 cases)	(5) U.S. discharged from hospital 41st day. ⁴ Included	(6) U.S. in failure. Changed to A.C.T.H. 8th day. Excluded (7) U.S. carditis and failure. Changed to A.C.T.H. 28th day. Included under aspirin (8) U.S. carditis. Changed to A.C.T.H. 28th day. Included under aspirin (9) U.S. carditis. Changed to cortisone 50th day. Included under aspirin (10) U.K. pericarditis and failure. Changed to cortisone 51st day. Included under aspirin		

¹ Unusually rapid weight gain and enlargement of liver not responding to mercurial diuretics. ² Too rapid development of moonface. ³ Family moved to another city. ⁴ Child was an unmanageable behaviour problem.

random order for as many patients as were likely to be admitted, using random sampling numbers and keeping the numbers of patients on the three treatments approximately equal in each centre. The co-ordinating centre in each country issued serially numbered and sealed envelopes to the treatment centres. Thus, on admission of a patient of given age and specified duration-from-onset group, the investigator at the treatment centre had merely to open the next available envelope for that particular group to find a statement of the treatment to be applied. He was therefore unable to predict the treatment for his next case. The allocation was both "blind" and random.*

The admission report on the patient, and the assignment envelope, were then sent to the co-ordinating centre. If for any special reason the investigator decided in advance that a patient fulfilling the criteria should not be admitted to the study, no envelope was opened. In every such case, however, an admission report was required, together with an explanation as to why the patient had not been admitted. Six such cases were reported in the U.S.; none in the U.K.†

The Study Sample

In all, 505 children under 16 years of age were admitted to the study—242 in the U.K. between March 2, 1951, and October 6, 1952, and 263 in the U.S. between January 15, 1951, and June 15, 1952. Four of these cases were subsequently excluded when their illness proved to be a disease other than rheumatic fever. These were a case on cortisone (U.K.) of Henoch-Schönlein purpura, a case on aspirin

*In a few centres, for varying durations of time, the investigators wished to withhold some patients for other studies. In these instances a predetermined proportion of the envelopes contained, as an instruction, "free case." Such exclusions, therefore, were also "blind" and randomly determined, and could not bias the group brought into the study.

†These six cases were: one, with schizoid personality, considered unsuitable for the trial; one, excluded because his private physician insisted upon cortisone therapy; and four severe cases excluded in one centre under provision of the protocol—namely, "If in the opinion of the principal investigator, the patient is severely ill to the point where his life is in danger, that patient may be removed from any group and given therapy at the discretion of the investigator." These four cases were treated with A.C.T.H. as follows: (1) a 12-year-old boy in a sixth attack with acute carditis, mitral insufficiency, and congestive failure made a smooth recovery without residual heart disease; (2) a 9-year-old girl in a second attack with residual heart disease, mitral insufficiency, and congestive failure made a gradual but unremarkable recovery; (3) a 12-year-old girl in a second attack, with residual heart disease, acute carditis, mitral insufficiency, and congestive failure, made, after a stormy course, a slow recovery with persistence of chronic heart disease with increasing cardiac enlargement; and (4) a 9-year-old boy in a first attack with mitral insufficiency, pericarditis, and congestive failure, died after seven days of treatment.

(U.K.) of tuberculous meningitis, a case on A.C.T.H. (U.S.) of lupus erythematosus disseminatus, and a case on A.C.T.H. (U.S.) of salmonella infection. In another case on A.C.T.H. (U.S.) there was x-ray evidence of tuberculous infection superimposed upon the rheumatic fever, and hormone treatment was therefore withheld. These five exclusions present no problem.

In the remaining 500 patients (240 U.K., 260 U.S.) there was only the small number of 15, or 3%, in whom the prescribed treatment and observation schedule was not fully carried out (2 U.K., 13 U.S.). Table 1 shows their nature and the action taken with regard to them. Only three (Cases 1, 6, and 15) have been wholly excluded from the statistical analysis of the trial, since their treatment with the allotted drug was very brief (6, 8, and 12 days). All other cases had been treated for three weeks or longer. Three of them (Cases 2, 3, and 4) fall within the original provision for a reduction of dosage when essential, and four (Cases 11, 12, 13, and 14) within the provisions for re-treatment in active cases. Such patients, together with one (Case 5) that left the hospital after the six weeks of therapy, can be included under the allotted therapy without any difficulty.

There remain four aspirin cases in which, on account of the severity of the illness, the investigator administered hormone treatment. In two (Cases 7 and 8) a change to A.C.T.H. was made during the treatment period (on the 28th day); in two, treatment with cortisone was instituted during the observation period (on the 50th and 51st days), after completion of the aspirin treatment. It was thought better to continue these cases in the aspirin group in spite of the change of treatment, since the exclusion of these four cases from the analysis at these points of time would make the picture of the aspirin group somewhat too favourable, since severely ill cases were being artificially removed from it.

Altogether, it is clear that these three exclusions, four changes of the allotted treatment, and eight variations of the treatment schedule can have had no appreciable effect upon the results of the trial.

Two U.S. and four U.K. patients died during the first year and are included in the analysis.

Taken as a whole, the 497 cases under age 16 show the following features. There were, altogether, 14 cases (3%) aged 3 or 4 years, 200 (40%) aged 5 to 9 years, and 283 (57%) aged 10 to 15 years. In just over one-half (255) the allotted therapy was begun within 14 days of the onset of the attack, and a more detailed analysis shows that 149, or 60%, of these "early" cases were treated within one week of onset. In nearly two-thirds (327 cases) there was neither history of a previous attack of rheumatic fever nor evidence of pre-existing rheumatic heart disease. Only 128,

or approximately one-quarter, of the 497 cases were in fact definitely diagnosed as having pre-existing rheumatic heart disease at the start of therapy. Mitral stenosis as shown by an apical pre-systolic murmur was reported in only 16 cases. In general, therefore, the group contained a large proportion of cases still in the early stages of the disease.

Comparability of Treatment Groups at Start of Therapy

The method of allocation ensured that in each treatment group there was approximately the same number of cases with regard to the duration from onset of attack to start of therapy. Thus, there were on A.C.T.H., cortisone, and aspirin, respectively, 86, 85, and 84 "early" cases (0 to 14 days); 47, 45, and 46 "medium" cases (15 to 42 days); and 29, 37, and 38 "late" cases (43 days or more) (Table 2).

TABLE 2.—Comparison of Treatment Groups at Start of Therapy: Duration of Illness from Onset, Sex, Mean Age, and Mean Weight

Treatment Group	Total Cases	Duration from Onset			Sex		Mean Age (Years)	Mean Weight (lb.)
		0-14 Days	15-42 Days	43+ Days	M	F		
U.K.:								
A.C.T.H.	80	39	27	14	40	40	10.0	66.0
Cortisone	80	38	25	17	34	46	9.9	63.6
Aspirin	80	32	27	21	40	40	9.6	64.4
Total	240	109	79	52	114	126	9.8	64.7
U.S.:								
A.C.T.H.	82	47	20	15	51	31	9.9	71.4
Cortisone	87	47	20	20	45	42	10.1	71.7
Aspirin	88	52	19	17	49	39	10.2	73.6
Total	257	146	59	52	145	112	10.1	72.2
U.K. and U.S.:								
A.C.T.H.	162	86	47	29	91	71	10.0	68.8
Cortisone	167	85	45	37	79	88	10.0	67.9
Aspirin	168	84	46	38	89	79	9.9	69.2
Total	497	255	138	104	259	238	10.0	68.6

The average age and mean body weight in the three treatment groups were almost identical, and the sex distribution was reasonably alike. In general, it is clear that the balance produced by the design of the study permits amalgamation of the duration-from-onset groups and of the data for the two countries.

Clinical features of the three treatment groups at the start of therapy are compared in Table 3. With regard to the first item, temperature, it should be noted that oral temperatures were taken in the U.K. (except at one centre) and rectal temperatures in the U.S. (except at one centre). An arbitrary correction of each oral reading was made by the addition of 1° F., and the tabulations are of the maximum "rectal temperature" recorded on each day. As the distribution of patients in each centre was evenly divided among the three treatment groups, the comparison between treatments should not be biased, even though the arbitrary temperature correction may be imperfect. It will be seen that at the start of therapy there was a larger proportion of U.S. cases (57.6%) with a rectal temperature of 100.4° F. (38° C.) or above than of U.K. cases (45.4%). This difference may be real, but it is possible that the addition of 1° F. to the oral temperature may not make the latter entirely equivalent to the rectal temperatures taken in the U.S.

The proportion of cases initially febrile (those with a temperature of 100.4° F. or greater) among the three treatment groups is dependent upon whether comparison is made on the first day of treatment or on the day before treatment was begun. On the first day of treatment there was a smaller proportion of cases febrile in the aspirin group (40.5%) than in the cortisone (61.1%) or the A.C.T.H. (53.7%) group. These differences were in part due to the more immediate antipyretic effect of aspirin in comparison with A.C.T.H. and the slowly absorbed intramuscular cortisone. This is borne out by the proportions of cases febrile

on the day before therapy was started in the A.C.T.H. (61.7%), cortisone (58.1%), and aspirin (53.0%) groups.

The pulse during sleep and the erythrocyte sedimentation rates reveal no material difference (Table 3). Their mean values also showed no real differences, the average pulse during sleep being 93, 93, and 90, and the average E.S.R. 46.7, 46.2, and 45.1, for the A.C.T.H., cortisone, and aspirin groups respectively.

Within each country, the treatment groups do not differ appreciably in their incidence of joint involvement, subcutaneous nodules, and erythema marginatum, but there appears to be some difference in these respects between the two countries. The proportion of cases showing these signs (Table 3) were: joint involvement U.K. 36.7%, U.S. 49.4%; subcutaneous nodules U.K. 21.7%, U.S. 7.4%; erythema marginatum U.K. 7.9%, U.S. 3.9%. The last difference might well be due to chance, but the first two (joint involvement and subcutaneous nodules) are statistically significant ($P < 0.05$). On the other hand, subdivision of these cases into early, medium, or late (Tables 10 and 15) suggests that there is no real difference between the two countries in the incidence of joint involvement. Nodules were observed more frequently in the U.K. at each stage, and particularly in the late cases.

TABLE 3.—Comparison of Treatment Groups at Start of Therapy: Percentage with Specified Symptoms

		Treatment Group			Total
		A.C.T.H.	Cortisone	Aspirin	
Number of cases					
	U.K.	80	80	80	240
	U.S.	82	87	88	257
	U.K. and U.S.	162	167	168	497
Temperature 100.4° F. (38° C.) or more (rectal)					
	U.K.	47.5	51.2	37.5	45.4
	U.S.	59.8	70.1	43.2	57.6
	U.K. and U.S.	53.7	61.1	40.5	51.7
Pulse during sleep 100 or more per minute					
	U.K.	41.8	33.3	34.6	36.6
	U.S.	29.2	36.0	26.1	30.6
	U.K. and U.S.	35.8	34.6	30.8	33.7
E.S.R. 20 mm. hr. or more					
	U.K.	87.5	86.2	88.8	87.5
	U.S.	96.3	93.8	94.1	94.7
	U.K. and U.S.	91.9	90.0	91.5	91.2
Joint involvement					
	U.K.	33.8	36.2	40.0	36.7
	U.S.	43.9	56.3	47.7	49.4
	U.K. and U.S.	38.9	46.7	44.0	43.3
Subcutaneous nodules					
	U.K.	22.5	23.8	18.8	21.7
	U.S.	9.8	6.9	5.7	7.4
	U.K. and U.S.	16.0	15.0	11.9	14.3
Chorea					
	U.K.	8.8	13.8	22.5	15.0
	U.S.	2.4	9.2	9.1	7.0
	U.K. and U.S.	5.6	11.4	15.5	10.9
Erythema marginatum					
	U.K.	10.0	8.8	5.0	7.9
	U.S.	4.9	4.6	2.3	3.9
	U.K. and U.S.	7.4	6.6	3.6	5.8
Pre-existing rheumatic heart disease					
	U.K.	31.2	32.5	31.2	31.7
	U.S.	28.0	14.9	18.2	20.2
	U.K. and U.S.	29.6	23.4	24.4	25.8
Pericarditis					
	U.K.	10.0	16.2	5.0	10.4
	U.S.	6.1	3.4	5.7	5.1
	U.K. and U.S.	8.0	9.6	5.4	7.6
Congestive failure					
	U.K.	12.5	10.0	3.8	8.8
	U.S.	15.9	8.0	8.0	10.5
	U.K. and U.S.	14.2	9.0	6.0	9.7
Cardiothoracic ratio of 0.55 or more					
	U.K.	21.5	26.0	13.3	20.3
	U.S.	22.5	11.8	10.5	14.7
	U.K. and U.S.	22.0	18.5	11.8	17.4
Arrhythmia: conduction time of 0.18 sec. or more					
	U.K.	32.5	30.1	24.4	28.9
	U.S.	34.2	38.3	32.1	34.9
	U.K. and U.S.	33.3	34.4	28.3	32.6
No organic murmur					
	U.K.	20.0	13.8	17.5	17.1
	U.S.	26.8	33.3	36.4	32.3
	U.K. and U.S.	23.5	24.0	27.4	24.9
Apical systolic murmur					
	U.K.	75.0	77.5	73.8	75.4
	U.S.	69.5	64.4	59.1	64.2
	U.K. and U.S.	72.2	70.7	66.1	69.6
Apical mid-diastolic murmur					
	U.K.	48.8	46.2	45.0	46.7
	U.S.	34.1	23.0	25.0	27.2
	U.K. and U.S.	41.4	34.1	34.5	36.6
Basal diastolic murmur					
	U.K.	38.8	35.0	33.8	35.8
	U.S.	12.2	12.6	11.4	12.1
	U.K. and U.S.	25.3	23.4	22.0	23.6
Apical presystolic murmur					
	U.K.	5.0	2.5	1.3	2.9
	U.S.	4.9	3.4	2.3	3.5
	U.K. and U.S.	4.9	3.0	1.8	3.2

Returning to Table 3, chorea was recorded more frequently in the U.K.; in both countries chance factors brought fewer cases into the A.C.T.H. group and more into the aspirin. Thus in the total group of 162 on A.C.T.H., 167 on cortisone, and 168 on aspirin there were 9, 19, and 26 cases with chorea as a presenting symptom. Severe cases, however, numbered only four, two, and five.

For a general picture of the status of the heart at start of therapy, the 497 cases have been divided (Table 4) into groups depending on the presence or absence of pre-existing rheumatic heart disease and carditis (as defined in the diagnostic criteria). Groups A and B contain all the cases without evidence of pre-existing heart disease at the time of admission. Group A includes: (1) cases with no carditis; (2) cases with murmurs of questionable significance (doubtful carditis); (3) cases with no, or doubtful, carditis but with a prolonged P-R interval. Group B includes cases with definite carditis at the start of therapy. Within both these groups, the number of cases with a definite previous history of rheumatic fever was negligible. Group C contains all those with definite or doubtful pre-existing rheumatic heart disease, whether or not carditis was also present. Both groups B and C are further subdivided into (1) cases with and (2) cases without pericarditis and/or failure at start of therapy.

Table 4 shows that the cases analysed in this way have in general fallen equally into the three treatment groups. The main departure lies in a somewhat lower number of cases on A.C.T.H. in group B (no pre-existing heart disease, carditis present at start of treatment). In the less important C group, in which the course of the disease is difficult to analyse because of pre-existing rheumatic heart disease,

TABLE 4.—Condition of the Heart at Start of Therapy, by Duration from Onset. U.K. and U.S., all Cases

Cardiac Group and Treatment Group	Total	Duration from Onset		
		0-14 Days	15-42 Days	43+ Days
Cardiac Group A—no or questionable carditis,* no pre-existing heart disease:				
A.C.T.H.	40	30	6	4
Cortisone	39	29	6	4
Aspirin	38	26	10	2
Total Group A	117	85	22	10
Cardiac Group B—carditis present; no pre-existing heart disease:				
A.C.T.H.	74	34	29	11
Cortisone	89	38	29	22
Aspirin	89	44	24	21
Total Group B	252	116	82	54
Cardiac Group C—with definite or questionable pre-existing heart disease:				
A.C.T.H.	48	22	12	14
Cortisone	39	18	10	11
Aspirin	41	14	12	15
Total Group C	128	54	34	40
Cases with failure and/or pericarditis included in Cardiac Group B:				
A.C.T.H.	13	4	6	3
Cortisone	14	3	7	4
Aspirin	10	7	—	3
Total	37	14	13	10
Cases with failure and/or pericarditis included in Cardiac Group C:				
A.C.T.H.	14	5	4	5
Cortisone	10	5	3	2
Aspirin	7	3	—	4
Total	31	13	7	11

* Questionable carditis includes 8 A.C.T.H., 6 cortisone, and 7 aspirin cases with a grade P murmur and 13 A.C.T.H., 12 cortisone, and 10 aspirin cases with a prolonged P-R interval and either no murmur or grade P murmur. (For definition of grade P murmur, see footnote to section on Murmurs.)

there is some predominance of cases with pericarditis and/or failure in the A.C.T.H. group.

Returning to the incidence of the individual signs of involvement of the heart at start of therapy, Table 3 shows, for A.C.T.H., cortisone, and aspirin respectively, no appreciable differences for apical systolic murmurs (72.2%, 70.7%, and 66.1%), basal diastolic murmurs (25.3%, 23.4%, and 22.0%), and the proportion of cases with atrio-ventricular conduction time of 0.18 sec. or more (33.3%, 34.4%, and 28.3%). The proportions with a cardio-thoracic ratio of 0.55 or more were not equal, there being a smaller proportion in the aspirin group (22.0%, 18.5%, and 11.8%), but, as will be seen in the section on heart size (Table 20), this is largely due to the unequal distribution of cases with pre-existing heart disease (Group C). There was also a somewhat larger number of cases in failure at the start of therapy in the A.C.T.H. group, compared with the cortisone and aspirin groups (14.2%, 9.0%, and 6.0%).

Between the two countries, the individual signs of cardiac involvement were equally reported except for basal diastolic murmurs. These were more often reported in the U.K. (35.8%) than in the U.S. (12.1%), but this difference came from one U.K. centre only. Ninety-three of the 240 U.K. cases came from this centre, where the incidence of basal diastolic murmurs was 73.1%. In the remainder of the U.K. centres the incidence was 12.2%.

In short, these comparisons show that in many respects the three treatment groups were very similar—namely, in the duration-from-onset, age, sex, body weight, temperature, pulse during sleep, erythrocyte sedimentation rate, frequency of polyarthritides, subcutaneous nodules, erythema marginatum, and in the P-R interval. There are, however, a few differences. The group on aspirin included an undue proportion with chorea as a presenting symptom, although the few severe cases of chorea fell fairly equally in the three treatment groups. The A.C.T.H. group contained a larger proportion of cases with pericarditis and/or failure (particularly in the U.S.), and the aspirin group contained rather fewer (particularly in the U.K.). These differences are not large, but must be borne in mind in the study of the response of the illness to the different treatments.

Results

The course of rheumatic fever was followed in each case after admission to the study during the six-weeks period of treatment, three-weeks period of observation, at monthly intervals for six months following the end of the observation period, and at two-months intervals until the end of the first year (quarterly thereafter). This report includes an analysis of each symptom, sign, and laboratory test considered as evidence of active rheumatic fever or of rheumatic heart disease through a period of one year following the end of the observation period.

Each manifestation is considered at specified points of time and discussed individually. The methods of analysis include: comparison of averages; the proportion with a change greater than an arbitrary maximum amount; the proportion with a manifestation present or absent; the number, or percentage, above or below an arbitrary limit of normal. (With this last method of analysis, a constant number or percentage over a period of time does not indicate that the same cases continue abnormal but that of all the cases at risk the number abnormal remains the same.) In general, when several such indices yielded the same results, the simplest is reported; when two methods yielded differing results, both are reported. When a difference between treatment groups in one of these measurements is significant the probability value is reported; otherwise differences in results between treatments are not significant.

Temperature

Temperatures were measured four times a day throughout the nine-weeks period of treatment and observation. The maximum reading for each day is used in this analysis,

and cases are considered febrile if that reading (rectal) was 100.4° F. (38° C.) or above. The three groups were comparable on the day before treatment (Chart I). Following start of treatment, the proportion of febrile cases decreased rapidly in all three groups, although it was most rapid on the first day in the aspirin group (Chart I, Table 5). During the latter part of the first week the proportion febrile in the A.C.T.H. group was lower than that of the other two groups, but at the end of the week all three groups were in the same range, the aspirin group lagging slightly behind. In the main this lag in the aspirin group persisted throughout the six-weeks period of treatment, and was more prominent among the cases febrile than among those afebrile at start of treatment.

At the end of the sixth week of treatment there was a rise in the proportion of febrile cases in the A.C.T.H.

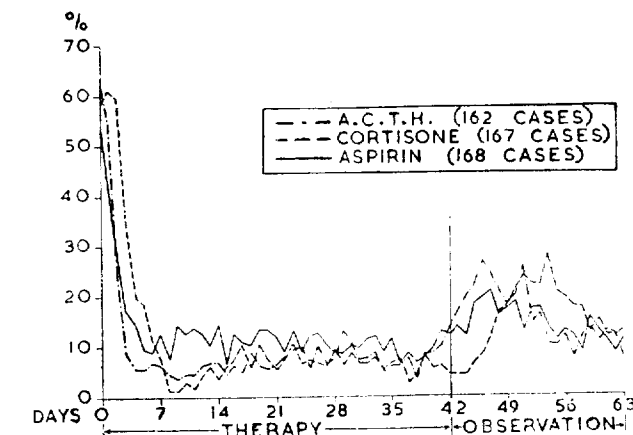


CHART I.—Temperature. Percentage of cases on each day with a rectal temperature of 100.4° F. (38° C.) or above

TABLE 5.—Temperature: Percentage of Cases with a Rectal Temperature of 100.4° F. (38° C.) or Above at Specified Times.* U.K. and U.S., all Cases

Treatment Group	No. of Cases	Start of Therapy	Week of Therapy						Week of Observation		
			1	2	3	4	5	6	7	8	9
All Cases											
A.C.T.H.	162	53.7	5.8	6.0	6.6	8.9	5.8	13.4	19.3	9.7	9.6
Cortisone	167	61.1	6.8	5.2	6.8	7.0	6.4	4.8	18.2	19.1	12.2
Aspirin	168	40.5	9.7	10.3	11.3	9.1	8.9	12.8	17.0	11.9	9.5
Febrile Cases at Start of Treatment											
A.C.T.H.	87	100.0	5.8	7.7	6.9	10.0	6.5	14.1	21.8	9.6	6.7
Cortisone	102	100.0	6.5	6.2	7.0	7.6	5.6	4.3	20.6	20.9	12.0
Aspirin	68	100.0	12.7	15.7	16.7	14.3	8.3	13.7	20.2	13.6	12.5
Afebrile Cases at Start of Treatment											
A.C.T.H.	75	0.0	5.8	4.0	6.2	7.6	4.9	12.5	16.4	9.9	12.9
Cortisone	65	0.0	7.3	3.6	6.7	6.2	7.7	5.6	14.5	16.4	12.5
Aspirin	100	0.0	7.7	6.7	7.7	5.7	9.4	12.1	14.9	10.7	7.4

* To reduce irregularities, the values given for the end of the weeks are based upon all the observations made on three days centred at the end of the week—i.e., 6, 7, and 8 for week 1; 13, 14, and 15 for week 2; and so on up to days 62 and 63 for week 9.

TABLE 6.—Temperature: Distribution at End of Ninth Week. U.K. and U.S., all Cases

Rectal Temperature	No. with given Temperature at the End of the Ninth Week		
	A.C.T.H.	Cortisone	Aspirin
97.4° F. (36.3° C.)	3	4	5
98.4° F. (36.9° C.)	33	47	41
99.4° F. (37.4° C.)	104	92	101
100.4° F. (38.0° C.)	18	18	12
101.4° F. (38.6° C.)	1	1	1
Not stated	3	5	8
Total	162	167	168

group, persisting into the eighth week and then slowly decreasing. A similar rise occurred in the cortisone group, beginning in the seventh week, reaching a peak in the eighth, and decreasing slowly during the ninth week. The aspirin group showed a smaller rise with its peak in the seventh week, and decreasing during the eighth and ninth weeks. At the end of the ninth week all three groups had about the same proportion of febrile and afebrile cases (Table 6).

Pulse Rate During Sleep

The pulse rate was taken during sleep, between the hours of 12 midnight and 5 a.m. At start of treatment (Table 7), 31% to 36% of the patients in each group had a pulse rate of 100 per minute or more (tachycardia), while less than 5% had a rate of less than 60 per minute (bradycardia).

TABLE 7.—Pulse Rate During Sleep: Percentage of Cases with Bradycardia (under 60) and Tachycardia (100 and over) at Specified Times.* U.K. and U.S., all Cases

Treatment Group	No. of Cases	Start of Therapy	Week of Therapy						Week of Observation		
			1	2	3	4	5	6	7	8	9
Percentage with Bradycardia											
A.C.T.H.	162	4.6	14.7	10.9	7.4	6.1	3.8	2.5	0.0	0.6	0.7
Cortisone	167	2.0	18.3	24.7	13.7	12.0	8.3	6.9	2.0	0.4	0.3
Aspirin	168	4.1	4.8	10.0	9.3	7.1	4.3	1.6	3.8	1.5	4.3
Percentage with Tachycardia											
A.C.T.H.	162	35.8	13.9	10.7	9.6	13.9	12.7	13.3	24.6	21.4	21.3
Cortisone	167	34.6	10.1	6.5	7.2	7.5	6.3	5.9	13.2	22.7	20.1
Aspirin	168	30.6	10.1	7.9	6.9	7.3	5.3	6.8	10.7	8.8	6.7

* See footnote to Table 5.

Following start of treatment there was a slight rise in the proportion with tachycardia among the cortisone cases during the first two days. Apart from this, the proportion decreased at approximately the same rate in all three groups, reaching the same level in cortisone and aspirin at the end of the first week, the A.C.T.H. group having a slightly higher figure. These relative proportions remained unchanged throughout the treatment period. When therapy

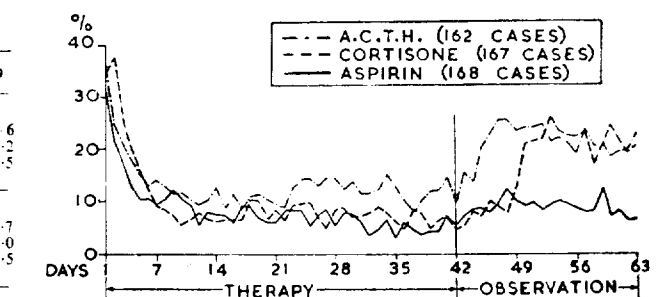


CHART II.—Tachycardia. Percentage of cases on each day with a pulse rate of 100 or more.

was stopped there was a sharp rise in the A.C.T.H. group and a slower rise to the same level in the cortisone group. At the end of the observation period one-fifth of the cases in both groups still had tachycardia. On the other hand, the proportion with tachycardia in the aspirin group remained almost unchanged when treatment ended and throughout the observation period (Table 7 and Chart II).

Detailed analysis showed that in all treatment groups there was the same rapid fall in the proportion with tachycardia among the cases of short duration (0-14 days), while in those of longer duration (15+ days) it fell more slowly. Thus, starting from the same level of 30% to 40% with tachycardia, there was a fall at the end of the first week to only 1% to 8% among the cases of short duration, in comparison with 13% to 22% among those of longer duration. This latter group lagged behind until the fourth or fifth week.

TABLE 8.—Erythrocyte Sedimentation Rate: Percentage of Cases with a Rate of 20 mm./hour or higher (uncorrected) at Specified Times,* U.K. and U.S., all Cases.

Treatment Group	No. of Cases	Start of Therapy	Week of Therapy						Week of Observation			Follow-up	
			1	2	3	4	5	6	7	8	9	13 Wks.	1 Year
A.C.T.H.	162	91.9	64.3	28.1	17.1	20.3	22.8	20.6	47.2	43.0	32.2	11.6	10.3
Cortisone	167	90.0	87.3	46.1	38.8	28.2	23.0	19.1	24.8	44.1	41.8	16.1	12.8
Aspirin	168	91.5	79.0	66.7	49.4	39.6	32.9	22.0	24.8	23.6	21.4	13.5	12.8

* The observations were not always made on the final day of the week, but were in most cases made at weekly intervals. A margin of ± 3 days was allowed in deriving weekly values.

The proportion with bradycardia increased sharply after the start of treatment in both hormone groups, reaching 14.7% in the A.C.T.H. group at the end of the first week and almost 25% in the cortisone group at the end of the

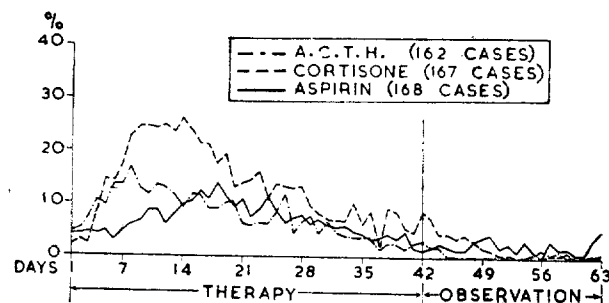


CHART III.—Bradycardia. Percentage of cases on each day with a pulse rate of 60 or less.

second week. From this point the proportion with bradycardia decreased to approximately the starting level by the end of the treatment period. In contrast, bradycardia occurred later in the aspirin group, reaching a peak of a little over 10% in the second to third weeks, and declining thereafter (Table 7 and Chart III).

Erythrocyte Sedimentation Rate

The erythrocyte sedimentation rate was measured by the Wintrobe method (uncorrected)† at the start of treatment, weekly throughout the treatment and observation period, and at each follow-up examination. Its course was followed by tabulation of the proportion of cases with a rate of 20 mm. per hour at specified times.

At the start of treatment, approximately 90% of the cases in each treatment group had an elevated sedimentation rate. This proportion decreased rapidly in the hormone groups, with the A.C.T.H. group showing the sharpest drop, levelling off at the third week, in contrast to the cortisone group, which reached roughly this same level about the fifth week (Chart IV, Table 8). The proportion of those with an elevated rate in the aspirin group lagged distinctly behind that of both hormone groups, not reaching the same level until the last week of treatment. When treatment was stopped, however, there was a sharp rise in the proportion with a raised rate in the A.C.T.H. group, and a slower rise to the same level in the cortisone group, while there was no change in the aspirin group. By the 13th week the proportion in all three groups had reached the same low level of 12-16%. The very similar distribution of values at this point is shown in Table 9; at one year the proportions were relatively unchanged from the 13th-week figures. Separate analysis showed that these trends were the same for all three duration-from-onset groups.

† A corrected sedimentation rate of 15 mm./hr. or above was established as a minor diagnostic criterion for admission to the study, and was so used. In analysing the course of the disease for the first 13 weeks, an uncorrected rate of 20 mm./hr. or above was used, because (1) the centrifuges used in the haematocrit determinations were not standardized, with resulting variations from centre to centre, and (2) analysis of uncorrected and corrected readings for each of the drugs showed the same trends, and it seemed undesirable to introduce an unnecessary variable.

To summarize, during treatment the proportion with an elevated sedimentation rate decreased much more rapidly in the hormone groups than in the aspirin group, but it increased sharply, though temporarily, in both hormone

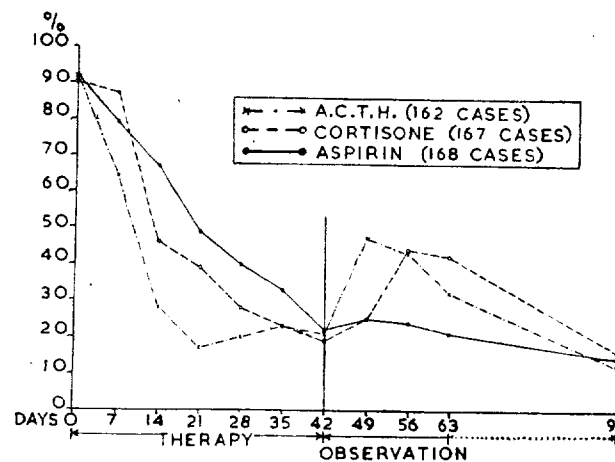


CHART IV.—Erythrocyte sedimentation rate. Percentage of cases with a rate of 20 mm./hr. or above (uncorrected Wintrobe).

groups after treatment was stopped, in contrast to a negligible change in the aspirin group. It finally reached the same low level in all three groups at 13 weeks, and this equal level was maintained at one year.

TABLE 9.—Erythrocyte Sedimentation Rate: Distribution at 13 Weeks. U.K. and U.S., all Cases

Erythrocyte Sedimentation Rate (mm./hr. Uncorrected)	No. with Given Rate at 13 Weeks		
	A.C.T.H.	Cortisone	Aspirin
0-19	137	130	134
20-29	13	20	14
30-39	2	4	3
40-49	3	1	2
50-59	—	—	2
Not stated	7	12	13
Total	162	167	168

Joint Involvement‡

At start of therapy there was a greater proportion of cases with joint involvement in the U.S. centres (49.4%) than in the U.K. (36.7%), the difference occurring entirely among the early cases (Table 10). In both countries the percentages were about the same in each treatment group.

In each treatment group, cases with joint involvement on admission rapidly lost this symptom. Thus on the third day of therapy joint involvement was still present in 28.6% of A.C.T.H., 56.4% of cortisone, and 36.5% of aspirin cases

‡ Polyarthritides as a major manifestation for diagnosis of rheumatic fever was defined as "pain and either limitation of active motion, or tenderness in two or more joints." For following the course of this manifestation after start of treatment, a system of grading was adopted in which the lowest grade was defined as joint pain without objective joint findings. Since this lowest grade is less than that required for the definition of polyarthritides, the course of the manifestation is referred to as "joint involvement."

TABLE 10.—Joint Involvement: Comparison of U.K. and U.S. Cases at Start of Therapy

Duration from Onset at Start of Therapy (in Days)	U.K.			U.S.		
	Total Cases	With Joint Involvement		Total Cases	With Joint Involvement	
		No.	%		No.	%
0-14	109	57	52.3	146	101	69.2
15-42	79	20	25.3	59	13	22.0
43+	52	11	21.2	52	13	25.0
Total	240	88	36.7	257	127	49.4

By the eighth day it remained in less than 10% in each treatment group. Throughout the rest of the treatment period joint involvement was present in none of the cortisone cases, in only a rare case in the A.C.T.H. group, and in a few cases in the aspirin group (Table 11). After treatment was stopped there was an insignificant increase of cases with joint involvement in the A.C.T.H. group, and these had disappeared by the 13th week; in the cortisone group there was an immediate rise to 10.3%, followed by complete disappearance at the ninth week and one recurrence at the 13th week; in the aspirin group two cases con-

TABLE 11.—Cases with Joint Involvement at Start of Therapy: Number and Percentage with Joint Involvement at Specified Times. U.K. and U.S., all Cases

Time from Start of Therapy	A.C.T.H.		Cortisone		Aspirin	
	No. of Cases	%	No. of Cases	%	No. of Cases	%
1 day	63	100.0	78	100.0	74	100.0
2 days	41	65.1	59	75.6	52	70.3
3	18	28.6	44	56.4	27	36.5
4	12	19.0	27	34.6	11	14.9
5	7	7.9	17	21.8	9	12.2
6	5	11.1	13	16.7	9	12.2
7	5	7.9	8	10.3	9	12.2
8	4	6.3	6	7.7	6	8.1
15	1	1.6	—	0.0	6	8.1
22	2	3.2	—	0.0	5	6.8
29	1	1.6	—	0.0	6	8.1
36	2	3.2	—	0.0	2	2.7
43	2	3.2	—	0.0	4	5.4
50	3	4.8	8	10.3	6	8.1
57	2	3.2	7	9.0	5	6.8
63	1	1.6	—	0.0	2	2.7
13th week	—	0.0	1	1.3	2	2.7

TABLE 12.—Cases without Joint Involvement at Start of Therapy: Development of Joint Involvement During Specified Intervals. U.K. and U.S., all Cases

Treatment Group	No. of Cases Without Joint Involvement at Start of Therapy	No. Developing Joint Involvement		
		1-42 Days	43-63 Days	At 13 Weeks
A.C.T.H.	99	4	5	—
Cortisone	89	5	4	—
Aspirin	94	—	4	—

tinued up to the 13th week. Among cases in which joint involvement disappeared it later reappeared in only a few cases (A.C.T.H. 5, cortisone 15, and aspirin 8).

Among cases without joint involvement at start of therapy (Table 12), a few developed it during the 13-weeks period (A.C.T.H. 9, cortisone 9, aspirin 4). In five A.C.T.H., four cortisone, and the four aspirin cases the joint involvement appeared for the first time after the end of treatment.

There is little to choose between the three drugs in their effect on joint involvement, apart from some delay in response to cortisone administered intramuscularly.

Chorea

At the start of therapy there was a larger proportion of cases with chorea in the aspirin group than in either of the hormone groups. Chorea seemed to persist longer in the aspirin than in the hormone groups, but this difference is not significant (Table 13). The persistence of this symptom

was strikingly more pronounced in the U.K. than in the U.S. cases, since at 13 weeks nearly all were in U.K. centres (the A.C.T.H. case, one of three cortisone, and eight of nine aspirin cases).

Among the cases without chorea at the start of therapy, a few in all three treatment groups developed this symptom at some time during the 13-weeks period (Table 14).

The persistence of chorea, as well as its appearance for the first time, was not significantly different between the treatment groups.

TABLE 13.—Cases with Chorea at Start of Therapy: Subsequent Course. U.K. and U.S., all Cases

Treatment Group	No. of Cases with Chorea at Start of Therapy	No. with Chorea at		
		End of Therapy (Week 6)	End of Observation (Week 9)	Follow-up (13 Weeks)
A.C.T.H.	9	1	—	1
Cortisone	19	2	1	3
Aspirin	26	9	5	9

TABLE 14.—Cases without Chorea at Start of Therapy: Development of Chorea During Specified Time Intervals. U.K. and U.S., all Cases

Treatment Group	No. of Cases Without Chorea at Start of Therapy	No. Developing Chorea		
		1-42 Days	43-63 Days	At 13 Weeks
A.C.T.H.	153	3	—	—
Cortisone	148	3	—	2
Aspirin	142	4	—	1

Subcutaneous Nodules

At the start of therapy there was a significantly larger proportion of cases with subcutaneous nodules in the U.K. (21.7%) than in the U.S. (7.4%), most of the difference occurring in the group of late cases (Table 15). Among the

TABLE 15.—Nodules: Comparison of U.K. and U.S. Cases at Start of Therapy

Duration from Onset at Start of Therapy (in Days)	U.K.			U.S.		
	Total Cases	With Nodules		Total Cases	With Nodules	
		No.	%		No.	%
0-14	109	6	5.5	146	2	1.4
15-42	79	14	17.7	59	7	11.9
43+	52	32	61.5	52	10	19.2
Total	240	52	21.7	257	19	7.4

three treatment groups in the two countries, however, such cases were fairly evenly distributed except for slightly fewer in the aspirin group.

In most of the early and medium-duration cases (0-42 days) receiving A.C.T.H. or cortisone, subcutaneous nodules had disappeared by the end of treatment (Table 16). In the aspirin group, although the number with nodules was fairly small, the nodules tended to persist to the end of the sixth week. This tendency was even more apparent among the chronic cases (43+ days), although the rate of disappearance in these cases was perhaps lower with all three drugs. These differences in response came from the U.K. cases, since at the end of six weeks only two, and at 13 weeks only one, with nodules still remaining were U.S. cases.

New subcutaneous nodules developed in some cases during the treatment period in all treatment groups, and particularly among cases with nodules at the start of therapy (Tables 16 and 17). During the treatment period there was a slightly greater tendency for cases in the aspirin group to develop new nodules than among those in the hormone groups. Of the 36 cases in all treatment groups in which new nodules developed during therapy, 25 were U.K. cases.

Thus it may be concluded that new nodules appeared on all treatments and that nodules persisted longer in the aspirin- than in the A.C.T.H.- and cortisone-treated cases,

TABLE 16.—Cases with Nodules at Start of Therapy: Subsequent Course. U.K. and U.S., all Cases

Treatment Group and Duration from Onset	No. with Nodules at Start of Therapy	No. with Nodules Persisting to:		
		End of Therapy (Week 6)	End of Observation (Week 9)	Follow-up (13 Weeks)
0-42 days:				
A.C.T.H. ...	13	4	1	—
Cortisone ...	12	4	2	1
Aspirin ...	4	3	2	1
43 days +:				
A.C.T.H. ...	13	6	4	3
Cortisone ...	13	7	4	1
Aspirin ...	16	12	12	10
		No. in which Fresh Nodules Appeared:		
		1-42 Days	43-63 Days	At 13th Week
All duration groups:				
A.C.T.H. ...	26	5	2	1
Cortisone ...	25	3	—	—
Aspirin ...	20	9	2	1

TABLE 17.—Cases without Nodules at Start of Therapy: Development of Nodules During Specified Time Intervals. U.K. and U.S., all Cases

Treatment Group	No. of Cases Without Nodules at Start of Therapy	No. Developing Nodules		
		1-42 Days	43-63 Days	At 13 Weeks
A.C.T.H. ...	136	7	—	1
Cortisone ...	142	2	—	—
Aspirin ...	148	10	1	1

Erythema Marginatum

At the start of therapy there were 29 cases with erythema marginatum (A.C.T.H. 12, cortisone 11, aspirin 6). The proportion with new episodes developing during treatment and observation was similar for all treatment groups (Table 18). At 13 weeks, erythema marginatum had persisted in two A.C.T.H. cases and one aspirin case.

Among the cases without erythema marginatum at start of treatment, the number developing episodes for the first time during treatment or observation was also similar for all treatment groups (A.C.T.H. 10, cortisone 15, and aspirin 11). Among these cases only one remained at 13 weeks—a cortisone case which first manifested erythema marginatum during the observation period. In addition there was one aspirin case in which erythema marginatum appeared for the first time at the 13th week (Table 19).

Thus the rate of appearance or disappearance of episodes of erythema marginatum seemed to be unrelated to therapy.

TABLE 18.—Cases with Erythema Marginatum at Start of Therapy: New Episodes of Erythema Marginatum. U.K. and U.S., all Cases

Treatment Group	No. of Cases with Erythema Marginatum at Start of Therapy	New Episodes Developing		
		1-42 Days	43-63 Days	At 13 Weeks
A.C.T.H. ...	12	5	1	—
Cortisone ...	11	2	2	—
Aspirin ...	6	2	1	—

TABLE 19.—Cases without Erythema Marginatum at Start of Therapy: Development of Erythema Marginatum During Specified Time Intervals. U.K. and U.S., all Cases

Treatment Group	No. of Cases without Erythema Marginatum at Start of Therapy	No. Developing Erythema Marginatum		
		1-42 Days	43-63 Days	At 13 Weeks
A.C.T.H. ...	150	9	1	—
Cortisone ...	156	10	5	—
Aspirin ...	162	9	1	1

Heart Size

Variations in heart size were analysed by three methods:

1. The proportion in each treatment group with a cardiothoracic ratio of 0.55 or more; this method described extreme grades of cardiac enlargement.

2. The frequency of change in transverse cardiac diameter of 0.6 cm. or more, between 0-3, and 3-6, and 6-9 weeks and 0-1 year; this method, although starting from an abnormal base line, was more sensitive than method 1 to temporary changes of a lesser degree.

3. The proportion of cases with a cardiothoracic ratio of 0.50 or more; this method yielded no additional information and will not be further discussed.

In Cardiac Group A the proportion with a cardiothoracic ratio of 0.55 or more in any treatment group at any time was insignificant (Table 20). In Cardiac Group B (exclud-

TABLE 20.—Cardiothoracic Ratio: Percentage of Cases in Cardiac Groups with T.D./I.D. Ratio of 0.55 or More at Specified Times. U.K. and U.S., all Cases*

Cardiac Group and Treatment Group	No. of Cases	Start of Therapy	Week 3	End of Therapy Week 6	End of Observation Week 9	Follow-up One Year
Cardiac Group A: No or questionable carditis, no pre-existing heart disease:						
A.C.T.H. ...	40	2.6	0.0	0.0	2.7	2.9
Cortisone ...	39	2.7	2.9	0.0	0.0	0.0
Aspirin ...	38	0.0	0.0	0.0	0.0	0.0
Cardiac Group B†: Carditis present, no pre-existing heart disease:						
A.C.T.H. ...	61	5.0	8.3	12.1	8.6	10.2
Cortisone ...	75	10.7	7.1	10.3	8.4	6.0
Aspirin ...	79	9.2	13.9	6.4	7.8	5.8
Cardiac Group C†: With definite or questionable pre-existing heart disease:						
A.C.T.H. ...	34	27.3	30.3	28.1	29.0	13.8
Cortisone ...	29	29.6	28.6	31.0	37.0	17.4
Aspirin ...	34	15.2	15.2	15.2	9.4	16.0
Congestive failure and/or pericarditis:						
A.C.T.H. ...	27	81.5	66.7	68.0	64.0	47.8
Cortisone ...	24	56.5	50.0	52.2	31.8	19.0
Aspirin ...	17	43.8	58.8	41.2	31.2	27.3
All groups:						
A.C.T.H. ...	162	22.0	20.8	21.6	20.5	15.6
Cortisone ...	167	18.5	16.1	17.9	14.8	8.5
Aspirin ...	168	11.8	15.7	10.2	8.9	8.0

* At the specified times there were sometimes one or two observations missing. The percentages are based upon the numbers available.

† Excluding cases with failure and/or pericarditis at start of therapy.

ing those with failure or pericarditis or both) the approximately equal distribution among the three treatment groups persists throughout. In Cardiac Group C (excluding those with failure or pericarditis or both) there was a smaller proportion of cases initially in the aspirin group with extreme grades of cardiac enlargement. This inequality persists at three, six, and nine weeks, but disappears at one year. In the group of cases with failure or pericarditis or both, the relative inequality persists throughout.

Using the more sensitive index of change in heart size of 0.6 cm. or more, a larger proportion showed an increase over the 0-9 weeks period in each hormone compared with the aspirin group. This difference appeared early, since analysis of the 0-3 and 3-6 weeks intervals showed the same result, but at one year it had disappeared (Chart V). In contrast, the proportion showing a decrease in heart size was similar for all treatment groups. Cardiac groups A, B, and C all showed this difference between each of the hormones and aspirin early in treatment and the same equality at the end of one year. Among cases with failure and/or pericarditis (in which the proportion of enlarged hearts was

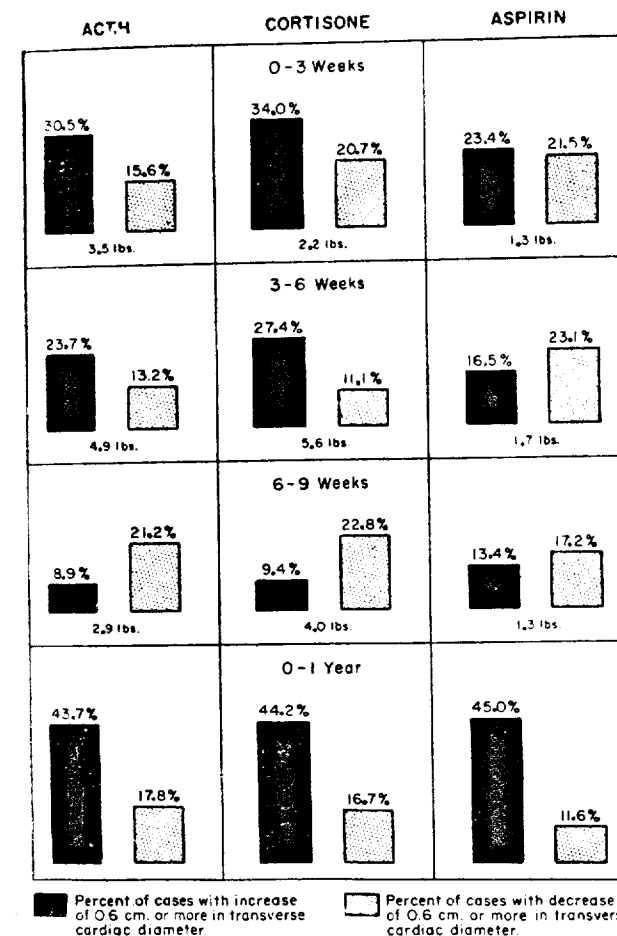


CHART V.—Changes in heart size and average weight gain in specified time intervals.

high at start of therapy), approximately one-third showed an early decrease regardless of therapy, and few (16%) showed an increase during treatment.

Considering gains in body weight, increases in heart size were more frequent in each hormone group than in the aspirin group during 0-3 and 3-6 weeks, but not during 6-9 weeks. In each period, however, both hormone groups had an average weight gain two to three times as great as the aspirin group; in other words, there was no clear relationship between weight gain and increase in heart size.

In summary, when heart size is measured by the proportion with a cardiothoracic ratio of 0.55 or more, the cardiac subgroups and the total cases reveal no differences between treatments. Using the more sensitive index of change in heart size of 0.6 cm. or more, there is a tendency for cases treated with A.C.T.H. or cortisone to show a temporary increase in heart size.

Atrioventricular Conduction Time

The course of the atrioventricular conduction time* (measured by the P-R interval in the electrocardiogram) was analysed, using:

1. The percentage with a P-R interval of 0.18 sec. or longer.
2. The percentage with a P-R interval of 0.16 sec. or longer.
3. The average P-R interval.

*The diagnostic criteria for admission of patients to the study defined normal P-R intervals as corrected for age and heart rate according to the Ashman-Hull tables. These corrections were not used in evaluating the course of the disease because the P-R intervals were unduly influenced by marked pulse rate changes, and because recent unpublished studies of the P-R interval in normal children by the Child Research Council of Denver question the corrections proposed by Ashman and Hull.

4. The percentage with an increase or decrease in the P-R interval of 0.03 sec. or more during the interval of 0-3, 0-6, 6-9, and 0-9 weeks.

The four methods led to the same conclusions, and only the percentages with a P-R interval of 0.18 second or longer are presented here.

The proportions of cases with a P-R interval of 0.18 second or longer are distributed fairly equally at start of therapy in each of the treatment and each of the cardiac groups (Chart VI, Table 21). They decreased initially more

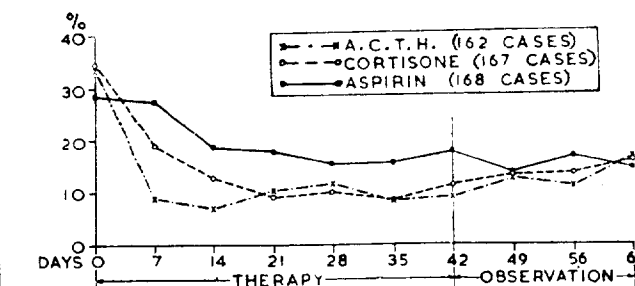


CHART VI.—Atrioventricular conduction time. Percentage of cases with P-R interval of 0.18 second or more.

TABLE 21.—Atrioventricular Conduction Time: Percentage of Cases in Cardiac Groups with P-R Interval of 0.18 sec. or Above at Specified Times. U.K. and U.S., all Cases*

Cardiac Group and Treatment Group	No. of Cases	Start of Therapy	Week 3	End of Therapy Week 6	End of Observation Week 9	Follow-up One Year
Cardiac Group A: No or questionable carditis, no pre-existing heart disease:						
A.C.T.H. ...	40	36.8	5.3	5.7	7.1	6.5
Cortisone ...	39	40.5	8.1	11.1	13.6	18.5
Aspirin ...	38	30.6	13.3	15.2	20.0	0.0
Cardiac Group B†: Carditis present, no pre-existing heart disease:						
A.C.T.H. ...	74	28.2	6.1	6.0	14.3	14.1
Cortisone ...	89	29.3	7.3	11.4	12.7	22.3
Aspirin ...	89	25.6	14.5	13.8	10.0	12.5
Cardiac Group C†: With definite or questionable pre-existing heart disease:						
A.C.T.H. ...	48	38.3	20.5	15.9	25.6	30.8
Cortisone ...	39	40.0	13.9	10.8	24.2	11.1
Aspirin ...	41	32.4	28.2	27.5	29.0	25.9
All groups:						
A.C.T.H. ...	162	33.3	10.1	8.9	16.4	17.4
Cortisone ...	167	34.4	9.0	11.2	15.9	19.2
Aspirin ...	168	28.3	17.8	17.6	14.4	12.5

* See footnote to Table 20.

† Includes cases with failure and/or pericarditis at start of therapy.

rapidly among those receiving A.C.T.H. or cortisone than among those receiving aspirin, with the A.C.T.H. group showing a very rapid fall at the end of the first week from 33.3% to 8.7%, and in the second week to 6.9%. At the third week the A.C.T.H. and cortisone groups were at the same level, with the aspirin group clearly lagging behind. This difference was maintained to the end of the treatment period, after which, at 9 weeks and at one year, all three groups were in the same range (13% to 19%). This decrease during treatment in the hormone-treated cases occurred in all cardiac groups, but was less marked in cardiac group C.

The hormones appear to decrease the P-R interval to values below those at 9 weeks and at one year. The values at these later times might well be expected to be closer to normal than those recorded during the acute illness. It may be questioned, therefore, whether the early decrease in P-R intervals is an effect of the hormones on the disease or merely a direct effect on the atrioventricular conduction time.

TABLE 23.—*Cardiac Group B* (with carditis, no pre-existing heart disease): Apical Systolic Murmurs, Grades at Start of Therapy and at Specified Times. U.K. and U.S., all Cases*

Grade at Start of Therapy and Treatment Group	Total Cases	Grade at end of Therapy (Week 6)				Grade at end of Observation (Week 9)				Grade at Follow-up (13 Weeks)					Grade at Follow-up (One Year)				
		0	1	2	3	0	1	2	3	0	1	2	3	Not Known	0	1	2	3	Not Known
Grade 0: A.C.T.H. ... Cortisone ... Aspirin ...	5 8 12	4 8 10	— — 2	1 — —	— — —	4 8 11	— — 1	1 — —	— — —	4 7 11	— — —	1 — —	— — —	— 1 1	5 7 11	— — —	— — —	— — —	— 1 1
Grade 1: A.C.T.H. ... Cortisone ... Aspirin ...	14 27 18	10 19 4	2 7 10	1 1 4	1 — —	11 14 6	2 11 8	— 1 4	1 1 —	11 20 7	2 5 7	— 1 3	— 2 —	— — 1	12 17 10	1 7 5	1 3 3	— — —	— — —
Grade 2: A.C.T.H. ... Cortisone ... Aspirin ...	35 36 49	9 8 5	9 14 17	15 14 24	2 — 3	7 11 12	11 12 13	15 13 19	2 — 5	6 12 10	11 13 14	14 10 18	3 1 5	1 — 2	10 19 24	9 7 9	10 7 9	3 2 6	3* 1 1†
Grade 3: A.C.T.H. ... Cortisone ... Aspirin ...	20 16 10	1 1 —	3 — 2	9 6 3	7 9 5	1 — 1	2 1 1	8 6 4	9 9 4	3 — 1	1 3 2	8 3 4	8 9 3	— 1 —	4 2 2	3 2 1	6 2 5	7 9 1	— 1 1
Grade not Stated: Cortisone ...	2	1	—	—	1	1	—	1	—	1	—	1	—	—	1	—	—	1	—

*Includes cases with failure and/or pericarditis at start of therapy. †Includes one death.

Apical Systolic and Basal Diastolic Murmurs†

The development and course of significant heart murmurs are among the most important aspects of rheumatic fever. They are analysed during the acute attack (0–13 weeks) and at one year, according to the status of the heart at the start of treatment—that is, Cardiac Group A, those without pre-existing heart disease or carditis; Cardiac Group B, those with carditis and without pre-existing heart disease; and Cardiac Group C, those with pre-existing heart disease.

Cardiac Group A

Each treatment group included approximately the same number of cases without carditis or pre-existing heart disease. None of these had an apical systolic or basal diastolic murmur on admission to the study. During the nine-weeks period of treatment and observation it was unusual for either of these murmurs to appear, and at 13 weeks few cases had either an apical systolic or a basal diastolic murmur or both, regardless of the type of therapy (Table 22). At 13 weeks,

TABLE 22.—*Cardiac Group A (no Carditis, no Pre-existing Heart Disease): Murmurs Present at Specified Times. U.K. and U.S., all Cases*

	Total Cases	No. with Murmurs at			
		End of Therapy (Week 6)	End of Observation (Week 9)	Follow-up (13 Weeks)	Follow-up One Year
A.C.T.H. ...	40	3	5	5	5
Cortisone ...	39	2	1	3	4
Aspirin ...	38	3	2	2	5

among 40 A.C.T.H. cases there were five with apical systolic murmurs; among 39 cortisone cases there was one with an apical systolic murmur, one with a basal diastolic murmur, and one with both; and among the 38 aspirin cases there were two with apical systolic murmurs. At one year apical systolic murmurs were still few: five A.C.T.H., four cortisone, and five aspirin. One of the cortisone cases also had a basal diastolic murmur. In other words, if a case of rheumatic fever meeting the criteria for admission to this

†In this study the following grades were adopted for reporting apical systolic murmurs: Grade 0—No murmur, or a murmur considered to be "functional" on the basis of its apparent origin at the pulmonary area or along the left sternal border. Grade 1—Murmur apparently localized to the apical area, but so faint as not to be transmitted to or toward the axilla. Grade 2—Soft apical systolic murmur transmitted to or toward the axilla. Grade 3—Louder similar murmur. Grade 4—Very loud similar murmur, usually transmitted to the back. In the analysis of the data, the "P" murmurs were included under Grade 0.

study had no apical systolic or basal diastolic murmur at that time the chance of developing either murmur during the acute attack or at one year was only approximately 1 in 8 regardless of treatment.

Cardiac Group B

Among the cases with carditis without pre-existing heart disease, the distribution of apical systolic murmurs by grade was not the same in the three treatment groups at start of therapy; there were relatively more Grade 0 and Grade 2 murmurs among the aspirin, Grade 1 among the cortisone, and Grade 3 among the A.C.T.H. cases. For this reason, analysis of the group as a whole becomes complicated and each grade is analysed separately.

The Group B cases without an apical systolic murmur at start of therapy (included in Group B on account of other murmurs, increase in heart size, failure or pericarditis) behaved much like the cases without carditis (Group A). It was unusual for them to develop an apical systolic murmur during the first 13 weeks following the start of treatment or at one year, regardless of the treatment employed (Table 23).

In Group B cases, Grade 1 apical systolic murmurs at start of treatment appeared to respond differently during the acute attack in hormone-treated cases compared with the aspirin-treated cases. In the majority of the cases treated with A.C.T.H. or cortisone the Grade 1 murmur disappeared by the end of six weeks of treatment. There was a slight increase in their frequency among the cortisone cases at nine weeks, but otherwise there was no appreciable change at the 9th and 13th weeks. By contrast, in only 4 of 18 aspirin cases did the Grade 1 apical systolic murmur disappear at six weeks and in only seven by the 13th week. There were relatively few Grade 1 murmurs that increased to Grade 2 or 3 during the 13-weeks period in any of the treatment groups. At one year following the end of the observation period, the differences between the three treatment groups were no longer significant (Table 23).

Grade 2 apical systolic murmurs in cases with carditis (Group B) presented a somewhat different pattern. These murmurs disappeared in slightly more cortisone than A.C.T.H. or aspirin cases. Thus by the end of 13 weeks they had disappeared in about one-sixth of the A.C.T.H., one-fifth of the aspirin, and one-third of the cortisone cases. Considering murmurs which decreased as well as those which disappeared, the differences among the treatment groups are not so great. At the end of 13 weeks in one-half of the A.C.T.H. and aspirin cases the Grade 2 murmur had diminished or had disappeared, in comparison with five-sevenths of the cortisone cases. With the number of cases studied, none of these differences reached the 5% level of

significance. By the end of one year, only minor differences remained. Thus in the Group B cases there were no striking differences in the effect of A.C.T.H., cortisone, or aspirin on Grade 2 apical systolic murmurs during the acute attack or at one year.

Grade 3 apical systolic murmurs in cases with carditis did not disappear, except in a few instances, during the 13-weeks period or at one year, regardless of the type of treatment (Table 23). Some of these loud murmurs became less intense, particularly in the aspirin group, but this difference again was not significant.

Summarizing, the apical systolic murmurs in Group B cases responded in relatively the same way to the three forms of treatment, except when the apical systolic murmur was of minimum intensity (Grade 1). In these cases a larger proportion of such murmurs disappeared during therapy with A.C.T.H. and cortisone than with aspirin, but there was little difference between treatment groups at the end of one year.

In 11 centres, basal diastolic murmurs in cardiac Group B cases were recorded in 20 of 201 (10%), while in one U.K. centre they were present in 41 cases (80%), absent in 8, and undetermined in 2. Two separate analyses are therefore presented.

In the 11 centres, basal diastolic murmurs were present at the start of therapy in 7 of 58 A.C.T.H., 8 of 70 cortisone, and 5 of 73 aspirin cases (Table 24). At 6, 9, 13 weeks, and one year the disappearance of these murmurs or their appearance in cases originally without them was approximately the same for all treatment groups.

In the one U.K. centre, of eight cases initially without basal diastolic murmurs one developed a transient murmur. In 41 cases where the murmur was initially present it had disappeared by nine weeks more frequently from the A.C.T.H. (14 of 15) than from the cortisone (6 of 13) and aspirin groups (4 of 13). The difference was still present at one year (13 of 15 A.C.T.H., 4 of 12 cortisone, and 5 of 12 aspirin).

TABLE 24.—*Cardiac Group B* (with carditis, no pre-existing heart disease): Basal Diastolic Murmurs at Start of Therapy and at Specified Times. U.K. and U.S. Cases†*

Status at Start of Therapy and Treatment Groups	Total Cases	End of Therapy (Week 6)		End of Observation (Week 9)		Follow-up (13 Weeks)			Follow-up (One Year)		
		Absent	Present	Absent	Present	Absent	Present	Not Known	Absent	Present	Not Known
No Murmur at Start:											
A.C.T.H. ...	51	48	3	49	2	48	2	1	48	1	2‡
Cortisone ...	62	60	2	60	2	59	2	1	58	3	1
Aspirin ...	68	63	5	64	4	63	2	3	62	4	2‡
Murmur Present at Start:											
A.C.T.H. ...	7	1	6	1	6	2	5	—	1	5	1
Cortisone ...	8	3	5	3	5	5	3	—	2	5	1
Aspirin ...	5	2	3	2	3	2	3	—	2	3	—

*Includes cases with failure and/or pericarditis at start of therapy.

†Includes 201 cases in 11 of the 12 centres where basal diastolic murmurs were present at start of therapy in 10% of cases, and excludes 51 cases in one centre where basal diastolic murmurs were present in 41 cases (80%), absent in 8, and undetermined in 2 because of a loud pericardial friction rub.

‡Includes one death.

TABLE 25.—*Cardiac Group C‡ (with definite or questionable pre-existing heart disease): Apical Systolic Murmurs, Grades at Start of Therapy and at Specified Times. U.K. and U.S., all Cases*

Grade at Start of Therapy and Treatment Group	Total Cases	Grade at End of Therapy (Week 6)				Grade at End of Observation (Week 9)				Grade at Follow-up (13 Weeks)					Grade at Follow-up (One Year)				
		0	1	2	3	0	1	2	3	0	1	2	3	Not Known	0	1	2	3	Not Known
Grade 0 at Start: A.C.T.H. ... Cortisone ... Aspirin ...	— — 7	— — 5	— — 1	— — 1	— — —	— — 4	— — 2	— — 1	— — —	— — 4	— — 1	— — —	— — —	— — 2	— — 6	— — 1	— — —	— — —	— — —
Grades 1 & 2 at Start: A.C.T.H. ... Cortisone ... Aspirin ...	— 32 23 23	— 5 4 1	— 8 8 2	— 16 11 1	— 3 — —	— 7 5 2	— 6 8 5	— 15 10 15	— 4 — —	— 8 5 2	— 3 5 3	— 15 10 15	— 5 — 3	— 1 — —	— 7 6 6	— 9 7 13	— 12 9 —	— 4 1 —	— — — III
Grade 3 at Start: A.C.T.H. ... Cortisone ... Aspirin ...	— 16 16 11	— 1 — —	— — — —	— — — —	— 14 10 7	— — — —	— 1 — —	— 4 — —	— 11 — —	— — — —	— — — —	— 13 10 6	— — — —	— — — —	— 1 — —	— — — —	— 3 5 5	— 11 8 4	— 1 — —

‡Includes cases with failure and/or pericarditis at start of therapy. IIIIncludes one death.

TABLE 26.—Cardiac Group C* (with definite or questionable pre-existing heart disease): Basal Diastolic Murmurs at Start of Therapy and at Specified Times. U.K. and U.S. Cases†

Status at Start of Therapy and Treatment Group	Total Cases	End of Therapy (Week 6)		End of Observation (Week 9)		Follow-up (13 Weeks)			Follow-up (One Year)		
		Absent	Present	Absent	Present	Absent	Present	Not Known	Absent	Present	Not Known
No Murmur at Start:											
A.C.T.H. ...	29	26	3	27	2	26	3	—	24	5	—
Cortisone ...	20	18	2	18	2	18	2	—	18	2	—
Aspirin ...	21	20	1	19	2	17	2	2	16	3	2‡
Murmur Present at Start:											
A.C.T.H. ...	9	1	8	3	6	2	7	—	2	6	1
Cortisone ...	12	1	11	1	11	1	11	1‡	1	10	1‡
Aspirin ...	8	1	7	1	7	1	7	—	2	6	—

* Includes cases with failure and/or pericarditis at start of therapy.

† Includes 99 cases in 11 of the 12 centres where basal diastolic murmurs were present at start of therapy in 29% of cases, and excludes 29 cases in one centre where basal diastolic murmurs were present in 93% of cases.

‡ Includes one death.

terms—namely, mid-diastolic murmur, third heart sound, and gallop rhythm—were recorded inconsistently from centre to centre and from observer to observer of the same case in the same centre. Further, in acute rheumatic carditis this murmur is rarely heard in the absence of an organic apical systolic murmur, which was consistently recorded. The U.S. investigators therefore agreed that the mid-diastolic murmur in the U.S. cases should not be analysed.

In the U.K. no such murmur developed during the year in Group A cases. In Group B, where the murmur was initially absent it appeared in only a few cases, equally in all treatment groups. Where it was initially present it persisted up to the 13th week to a greater extent in the aspirin group (9 of 17 cases) compared with A.C.T.H. (3 of 19) and cortisone (5 of 18). At one year, however, there was little difference between the three groups (1 of 17 A.C.T.H., 3 of 18 cortisone, and 3 of 16 aspirin). In Group C cases, where the murmur was initially absent it appeared in a few cases in all treatment groups by the end of one year. Where the murmur was initially present it persisted in all treatment groups at the ninth week (13 of 20 A.C.T.H., 12 of 19 cortisone, and 15 of 19 aspirin), becoming slightly less at one year (9, 10, 9 cases, respectively).

Presystolic Murmurs

Apical presystolic murmurs were not included in this analysis, as they result from slowly progressive scarring of the mitral valve and are not evidence of acute carditis. In this study they were present in only 16 of 497 cases (3.2%) on admission, and they appeared for the first time in very few (12 additional cases during the following 13 weeks).

Summary of Murmurs

Summarizing the effects of treatment on murmurs during the acute attack and at the end of the first year, the following conclusions appear justified:

1. The development of an apical systolic murmur among those without such murmurs at start of therapy, regardless of the presence or absence of carditis, was infrequent and was not related to the treatment.
2. The disappearance of softer apical systolic murmurs was more rapid among those receiving A.C.T.H. or cortisone than among those receiving aspirin, but at the end of one year the treatment groups did not differ significantly. Similar results were found for the apical mid-diastolic murmur for the U.K. centres only.
3. The disappearance or diminution of loud apical systolic murmurs rarely occurred, regardless of therapy.
4. The appearance or disappearance of basal diastolic murmurs occurred in a relatively small proportion of cases, and in 11 of 12 centres was not related to therapy.
5. At the end of one year there was no evidence that the treatment groups differed in the frequency with which murmurs had appeared or disappeared.

§ In the one U.K. centre where an abnormally high proportion of basal diastolic murmurs was heard at entry, they disappeared more frequently in the A.C.T.H. group.

Seriously Ill Cases

Cases here described as seriously ill are those with congestive failure, pericarditis, or both, present on admission or occurring during the 13-weeks period of treatment and follow-up, and those cases terminated by death during the one-year period of this report.

Congestive Failure and/or Pericarditis

At the start of treatment, 23 of 162 A.C.T.H., 15 of 167 cortisone, and 10 of 168 aspirin cases had congestive failure (Table 27). Among these cases, failure disappeared

TABLE 27.—Congestive Failure: U.K. and U.S., all Cases

Interval from Start of Therapy in Days	Cases with Failure at Start of Therapy			Cases without Failure at Start of Therapy		
	No. with Failure Present on First Day of Interval			No. Developing Failure for First Time During Interval		
	A.C.T.H.	Cortisone	Aspirin	A.C.T.H.	Cortisone	Aspirin
1-7	23	15	10	4	3	2
8-14	18	12	9	—	1	5
15-21	13	10	5	2	1	—
22-28	9	4	3	—	—	—
29-35	6	4	3	1	1	1
36-42	5	4	3	—	—	—
43-49	5	3	1	—	—	—
50-56	3	3	1	—	—	1
57-63	4 (1)	1	1	—	1 (died)	—
64th day	2	1	1	—	—	—
13th week	3 (2)	1	1	—	—	1

N.B.—Figures in parentheses indicate number of cases on given day in which failure had reappeared after previous disappearance.

at about the same rate, regardless of therapy. In all but one case in each treatment group failure disappeared by the 13th week. After initial disappearance it reappeared in only three cases, all in the A.C.T.H. group.

Among the cases without congestive failure at the start of therapy, 7 of 139 A.C.T.H., 7 of 152 cortisone, and 10 of 158 aspirin cases developed failure during the 13-weeks period (Table 27). In 21 of these (7 A.C.T.H., 6 cortisone, and 8 aspirin), failure appeared during the treatment period but disappeared in all but five cases during the observation period. One of these, a cortisone case, had a fatal outcome during the observation period, and four (two A.C.T.H., two aspirin) had persistent failure at the ninth week. In three cases (one A.C.T.H., two aspirin) failure was present at the 13th week. In one of these aspirin cases treatment had been changed to A.C.T.H. on the 28th and continued to the 70th day.

Thus among the cases with or without failure at the start of therapy there were no marked differences among the treatment groups in the behaviour of congestive failure.

Pericarditis was present at the start of therapy in 13 of 162 A.C.T.H., 16 of 167 cortisone, and 9 of 168 aspirin cases, and disappeared at approximately the same rate regardless of therapy (Table 28). In only four of these (two cortisone and two aspirin) did the symptom reappear following its disappearance.

Among the cases without pericarditis at the start of therapy (Table 28), there were 3 of 149 A.C.T.H., 3 of 151 cortisone, and 5 of 159 aspirin cases which developed pericarditis for

TABLE 28.—Pericarditis: U.K. and U.S., all Cases

Interval from Start of Therapy in Days	Cases with Pericarditis at Start of Therapy			Cases without Pericarditis at Start of Therapy		
	No. with Pericarditis Present on First Day of Interval			No. Developing Pericarditis for First Time During Interval		
	A.C.T.H.	Cortisone	Aspirin	A.C.T.H.	Cortisone	Aspirin
1-7	13	16	9	1	1	1
8-14	8	8	7	2	—	2
15-21	3	6	3	—	—	—
22-28	2	5	3 (1)	—	—	—
29-35	1	3	3 (1)	—	—	1
36-42	1	2	1	—	1	—
43-49	1	2	1	—	—	1
50-56	1	—	1	—	1	—
57-63	—	1 (1)	1	—	—	—
64th day	—	1 (1)	1 (1)	—	—	—
13th week	—	—	—	—	—	—

N.B.—Figures in parentheses indicate number of cases on given days in which pericarditis had reappeared after previous disappearance.

the first time during the 13-weeks period. In nine of these (three A.C.T.H., two cortisone, and four aspirin) pericarditis appeared during the treatment period. In all 11 cases it was of short duration, persisting in no case until the ninth week, and never reappearing after disappearance.

Thus among cases with or without pericarditis at start of therapy it appeared and disappeared regardless of treatment.

Deaths

Among the 497 cases, 6 deaths occurred during the one year of follow-up. Their case histories were as follows:

Case 1.—A 12-year-old girl was admitted to a U.K. centre in her first attack, with fever, carditis with apical systolic murmur and gallop rhythm, erythema marginatum, and elevated sedimentation rate. She was treated with A.C.T.H. on the 24th day of her disease, with symptomatic improvement but with progressive carditis. A basal diastolic murmur, noted intermittently during the first week of treatment, later was constantly present, becoming associated with a basal systolic murmur. In the fourth week an apical mid-diastolic murmur was heard and nodules appeared, rapidly increasing in number. The acute disease was obviously not controlled by A.C.T.H. No additional symptoms appeared during the three-weeks observation period. The patient was kept in bed thereafter throughout her slow but progressive downhill course, death occurring five months after the beginning of treatment and one day following her removal from the hospital against advice.

Case 2.—A 7-year-old boy with a four-days history of precordial, pleural, and joint pains was admitted to his local hospital, where his sedimentation rate was found to be elevated and a diagnosis of rheumatic fever was made. He was treated with penicillin, sulphonamides, and 60 gr. (4 g.) of aspirin and 30 gr. (2 g.) of sodium bicarbonate a day for 12 days without improvement. During this period he is said to have developed "a murmur" of gradually increasing loudness. He became dyspnoeic and was transferred to a U.S. centre. On admission he was extremely ill, with fever, orthopnoea, dyspnoea, cyanosis, muffled heart sounds, apical systolic murmur, gallop rhythm, and tachycardia (146/min.). Bronchial breathing and rales were heard over both lung fields. A diagnosis of rheumatic pancarditis with mitral valvular disease and congestive heart failure was made and rheumatic pneumonia suspected. The patient was treated with digitalis and mercaptopurine ("thiomerin"), and admitted to the study in the cortisone group. He died 20 hours after admission, having received 300 mg. of cortisone. Necropsy revealed a large flabby heart with verrucae on the mitral valve and left auricular wall.

Case 3.—A 13-year-old girl with a previous history of rheumatic fever and rheumatic heart disease with mitral insufficiency was admitted to a U.S. centre on the fifth day of a recurrent attack, following an upper respiratory infection with sore throat of three weeks' duration. She was moderately ill with fever, polyarthritides, elevated sedimentation rate, and probable carditis. She was treated with cortisone for six weeks with a fairly satisfactory response, although the evidence of underlying rheumatic heart disease was unchanged. Two weeks following end of treatment, she suddenly, for the first time, went into congestive failure associated with raised temperature and erythrocyte sedimentation rate. Re-treatment with cortisone was begun immediately, but she became rapidly worse and died one day later, on the 57th day after admission to the study. Necropsy revealed a greatly hypertrophied heart with obliteration of the pericardial cavity and chronic mitral disease without stenosis, bilateral pleural effusions, diffuse pulmonary oedema, and ascites. Microscopic examination showed evidence of diffuse active pancarditis.

Case 4.—A 9-year-old boy was admitted to a U.K. centre with a history of three weeks of polyarthritides with two weeks of rash. He was found to have fever, erythema marginatum, an enlarged heart, and a loud apical systolic murmur. He was admitted to the study and aspirin therapy begun. After slight improvement his temperature rose again, the heart shadow became enlarged, and a basal diastolic murmur was heard intermittently. At the end of nine weeks he was still considered to be seriously ill, and was transferred to another hospital, where he developed increasing congestive failure, which later stabilized and then gradually improved. Four months after start of treatment, while still hospitalized, he became febrile and a group A beta-haemolytic streptococcus was isolated from his throat. He was treated with penicillin but remained febrile for 12 days, after which his temperature returned to normal but signs of congestive failure progressively increased. He died one month after this relapse, five months after start of treatment. Necropsy revealed rheumatic endocarditis, myocarditis, cardiac dilatation, a bicuspid aortic valve (? congenital), and chronic venous congestion of lungs, liver, and spleen.

Case 5.—A 12-year-old boy was admitted to a U.K. centre in his second attack with pre-existing rheumatic heart disease with mitral stenosis. Rheumatic fever had continued without intermission for four months, manifesting itself by nodules, arthritis, erythema marginatum, precordial pain, and fever. Physical findings during that period were enlarged heart, apical systolic, mid-diastolic, pre-systolic, and basal diastolic murmurs, enlarged liver, pulmonary congestion, elevated sedimentation rate, and prolonged P-R interval. The patient was admitted in the aspirin group and received symptomatic benefit; relapse followed at the end of treatment. Four additional courses of aspirin were given, the patient responding in the same way each time. He was then placed on a cortisone schedule but showed no improvement, dying in the fifth week of this treatment, in congestive failure, eight months after admission to the study. Necropsy revealed rheumatic heart disease with enlarged heart, mitral stenosis, acute mitral and tricuspid endocarditis, Aschoff bodies and fibroid changes in the myocardium, congestive failure with pulmonary oedema, and cardiac cirrhosis of liver.

Case 6.—A 6-year-old boy was admitted to a U.K. centre, severely ill in the seventh week of his first (?) attack. He showed evidence of carditis with apical systolic and mid-diastolic murmurs and the signs of congestive failure. One subcutaneous nodule was noted on the right elbow. The temperature was normal and the erythrocyte sedimentation rate elevated. Because of intractable vomiting, the digitalis and aspirin were temporarily stopped late in the first week, with immediate improvement. At the beginning of the second week small doses of aspirin—20 gr. (1.3 g.) per day—were given for three days and then omitted because of lack of improvement from therapy. The patient gradually improved without treatment, but congestive failure persisted. During the fifth and sixth weeks, amidopyrine—7½ gr. (0.5 g.) per day—was given without effect on the patient's gradual improvement, which continued until the ninth week. Digitalis was then stopped and the patient discharged to a convalescent home.

The patient continued in moderate congestive failure, leading a bed-and-chair existence. Five months later he developed an upper respiratory infection, treated with sulphadiazine and penicillin. Tachycardia (145 per minute) and a pericardial friction rub developed. A six-weeks course of A.C.T.H. was given, with disappearance of acute symptoms, congestive failure continuing. The patient had a rapid increase in weight, marked moonface, and moderate hypertension, all of which gradually disappeared.

Ten months after admission to the study the patient developed another upper respiratory infection, treated with sulphonamide drugs and penicillin. He then went rapidly downhill and was transferred back to the centre, where he died in severe congestive failure after one week's treatment with A.C.T.H., digitalis, and diuretics.

Necropsy showed hypertrophy and rheumatic pneumonia, congestive failure with mitral stenosis, cardiac dilatation, acute and chronic lesions of mitral, aortic, and tricuspid valves, fibrinous pericarditis, and numerous Aschoff bodies.

In summary, there were no appreciable differences in the course of seriously ill cases, since the behaviour of congestive failure, pericarditis, or both, appeared to be similar in the treatment groups, and there were only six deaths (one on A.C.T.H., two on cortisone, and three on aspirin).

Re-treatments

Apart from the six patients who died, there were some in each treatment group who, during the one-year period, were re-treated for persisting or recurring manifestations. Thus,

re-treatment was given to 10 of the 161 A.C.T.H. patients surviving to one year. None of these re-treatments were given during the three-weeks observation period. One case was treated for chorea, and one had two courses of re-treatment. In all except the case with chorea, the symptoms demanding re-treatment were moderately severe.

Re-treatment was given to 8 of the 165 cortisone cases surviving the one year, one of which was re-treated during the observation period. All were moderately severe cases except one, having only erythema marginatum and fever. None was re-treated for chorea. One case required two re-treatments.

Re-treatment was given to 19 of 165 aspirin cases surviving to one year. Four were re-treated during the observation period, two receiving aspirin and the other two receiving cortisone. Thirteen of the 19 cases were moderately severe; of the remaining 6, 5 were re-treated for recurrent chorea and 1 for a mild illness consisting of elevated temperature and sedimentation rate.

When the cases given re-treatment are analysed according to duration of disease at start of therapy, it is seen that the differences among the three treatment groups are due entirely to the chronically ill cases. Thus in the 0-14-day group there were six A.C.T.H., four cortisone, and six aspirin cases to which re-treatment was administered. In the 15-42-day group the cases were two, one, and four, respectively; in the group of those ill 43 days or more they were two, three, and nine—a preponderance of aspirin cases in this chronically ill group.

Excluding the cases re-treated for chorea, the number of cases remains the same in the 0-14-day group, becomes one on each treatment in the 15-42-day group, and two A.C.T.H., three cortisone, and seven aspirin in the 43+-day group.

In summary, re-treatment was given to a greater proportion of cases in the aspirin than in the A.C.T.H. and cortisone groups; but this difference occurred only among the chronic cases, and was slightly affected by the larger number of cases initially admitted with chorea to the aspirin group.

Side-effects of Treatment

In both countries, practically all the A.C.T.H. and cortisone cases showed one, or a combination, of the following side-effects of therapy: moonface, hirsutism, acne, or striae. There were only 10.5% of the A.C.T.H. and 4.8% of the cortisone cases with none of these side-effects by the end of the ninth week (Table 29). These effects were recorded less frequently in the U.K. than in the U.S. cases, being absent in 15.0% of the U.K. and 6.1% of the U.S. A.C.T.H. cases, and in 10.0% of the U.K. and none of the U.S. cortisone cases.

TABLE 29.—Side-effects of Therapy in A.C.T.H. and Cortisone Cases: U.K. and U.S., all Cases

Side-effect	Percentage of Cases Showing Side-effect					
	A.C.T.H.			Cortisone		
	U.K.	U.S.	Total	U.K.	U.S.	Total
Moonface	77.5	90.2	84.0	80.0	96.6	88.6
Hirsutism	15.0	19.5	17.3	13.8	16.1	15.0
Acne	26.2	63.4	45.1	8.8	17.2	13.2
Striae	12.5	12.2	12.3	18.8	12.6	15.6
None	15.0	6.1	10.5	10.0	0.0	4.8
Total No. of cases	80	82	162	80	87	167

There were no appreciable differences between the A.C.T.H. and cortisone cases in frequency of moonface, hirsutism, or striae, but acne appeared much more often among the A.C.T.H. cases. With the exception of striae, each side-effect was recorded more frequently among the U.S. than among the U.K. cases. Although these side-effects appeared almost equally in the hormone groups, those severe enough, in the opinion of the investigator, to require stopping treatment occurred only among the A.C.T.H. cases (Table 1).

In addition to the side-effects of hormone treatment already noted, many others were reported, but, not being specifically requested, they were not uniformly recorded. These included cases of hypertension, mental symptoms, convulsions, renal haemorrhage, water and salt retention, glycosuria, infections, hepatomegaly, febrile reactions, pigmentation, increased fat deposition, and unusual increase in appetite.*

Relatively few aspirin cases developed side-effects, and these all appeared in the first week of therapy in both countries while the dosage was relatively high. In the U.K., among 80 cases there were four with tinnitus or deafness, seven with nausea, and one with hyperventilation. Comparable figures in the 88 U.S. cases were 9, 19, and 5. The few side-effects and the maintenance of the dosage schedule of aspirin without interruption, except in a rare case, suggests that these cases did not receive the maximum tolerated dosage.

In summary, very few patients in the hormone groups did not exhibit one or more side-effects. Further, there was little difference between U.S. and U.K. cases on differing schedules of A.C.T.H. or between those on A.C.T.H. and those on cortisone in either country (Table 29). In other words, the dosages of both hormones were large enough to produce a recognizable side-effect in nearly all cases.

Discussion and Conclusions

The object of the present co-operative study, set up in 1950, was to measure the relative effects of A.C.T.H., cortisone, and aspirin when given uniformly in all centres according to defined schedules. These schedules (dosages, periods of administration, and auxiliary therapy) were based mainly upon existent knowledge regarding apparent efficacy and toxicity. They had also to be practicable, not only in the length of time that patients could be kept in hospital during the trial itself, but to allow their subsequent application in medical practice if they proved to have value. It is obvious that innumerable other studies could be designed employing larger (or smaller) dosages, longer (or shorter) periods of treatment, or individualized dosage schedules which would need to be based on predetermined criteria for changes in dosage. It cannot be maintained that such other schedules are either more or less effective than those used here without adequate controlled study.

Evaluation of treatment of such a complex and not wholly understood disease as rheumatic fever poses a large number of problems. Acute rheumatic fever may be considered a specific type of generalized inflammatory reaction, but no means are available for measuring this quantitatively. Since it is impossible to correlate the observed manifestations with the severity of the pathological process, it must be accepted that the available data may represent only approximate indices of the severity of the disease. Furthermore, since many of the clinical evaluations are subjective, their interpretation must take into account observer error and acuity. For example, although there is general agreement on the importance of apical mid-diastolic murmurs as an index of carditis, inconsistencies in reporting them and difficulties in distinguishing them from a third heart sound or gallop rhythm gave this index uncertain value in this study. In general, such difficulties were reduced by the large number of patients in each treatment group and by the equal allocation of the three drugs within each study centre.

Other difficulties encountered in the evaluation of certain data were the lack of normal standards and the absence of normal values to serve as base lines at start of therapy. Moreover, variables which have been analysed separately may be interdependent. An example of these difficulties is interpretation of the changes in P-R intervals with changing pulse rates and heart size.

*With an initial average body weight of a little less than 70 lb. (32 kg.) in each treatment group, patients on A.C.T.H. and cortisone gained by the end of the ninth week an average of 11.3 and 11.8 lb. (5.13 and 5.35 kg.), whereas those on aspirin gained an average of 4.3 lb. (1.95 kg.).

In addition to grouping by duration of disease, various types of classification of patients were made. The most useful was based on the presence or absence of cardiac involvement on admission to the study. Owing, however, to the random allocation of patients to treatment and the consequent balance of characteristics, such additional groupings had roughly equal numbers in the three treatment groups. Each manifestation was analysed in several ways, and that method chosen for presentation which gave the clearest picture.

It should be noted that nowhere in this report have analyses of combinations of measurements and clinical signs been presented. Since in clinical practice the patient is assessed as a whole, attempts were made to integrate the separate manifestations in individual patients. These attempts were unsuccessful in providing new information, but, observing each case over the entire 6-9-weeks observation period, the proportion without any manifestation of rheumatic fever was found to be greater in the aspirin than in either of the hormone groups. This difference was observed whether or not a murmur at this time (6-9 weeks) was considered to be a manifestation. Thus, including a murmur as a manifestation, there were, with no manifestations at all, 11 cases on A.C.T.H., 11 on cortisone, and 25 on aspirin. This difference, however, is almost entirely due to the smaller proportion with an elevated erythrocyte sedimentation rate and/or raised pulse rate among the cases in the aspirin group. Adding the cases with only these signs to the group showing no manifestations, the numbers of the latter become 34 on A.C.T.H., 32 on cortisone, and 34 on aspirin. If the presence of a murmur at this time (6-9 weeks) is not regarded as a manifestation, the numbers with no manifestations during the whole 6-9-weeks period were 31 on A.C.T.H., 26 on cortisone, and 53 on aspirin. Adding to these the cases with only an elevated erythrocyte sedimentation rate and/or raised pulse rate, the figures become 71 on A.C.T.H., 62 on cortisone, and 72 on aspirin.

In attempting to assess the relative efficacy of A.C.T.H., cortisone, and aspirin in altering the acute disease or suppressing its manifestations, the following conclusions appear permissible.

1. During the acute illness and the first year of follow-up very few deaths occurred—one in the A.C.T.H., two in the cortisone, and three in the aspirin group. Re-treatments were given to some cases in all three groups, but apart from a slight excess in the late-treated cases on aspirin, there was no marked difference in the groups.

2. The temperature and pulse rate during sleep returned to normal during treatment in the great majority of cases in all treatment groups, but there was a greater tendency in the groups treated with the hormones for the rates to become elevated in the 6-9-weeks observation period.

3. The erythrocyte sedimentation rate decreased more rapidly during treatment in the hormone-treated groups, but was elevated more frequently in the 6-9-weeks observation period. There were no differences between the treatment groups at the 13th week.

4. The behaviour of joint involvement, chorea, and erythema marginatum was essentially the same in the three treatment groups. Nodules, however, disappeared more rapidly in the patients treated with A.C.T.H. and cortisone, although new nodules appeared in some patients during treatment in all three groups.

5. The analysis of the effects of the drugs on carditis, while undoubtedly most important, is especially difficult, and the conclusions the least clear. The following, however, seem justified:

(a) There appeared to be no relationship between the treatment given and the behaviour of congestive failure and pericarditis.

(b) There was more frequently an increase in heart size as measured by a change of 0.6 cm. or more in each of the hormone groups as compared with the aspirin group. This may be related to a possible increase in blood volume or, in some cases, to abdominal distension. It was not related consistently to weight gain, since heart size increased frequently in the 0-3-weeks period

of treatment and much less frequently in the observation period (6-9 weeks) although the average weight gain during these two periods was very similar. At the one-year follow-up examination there was no appreciable difference between the three groups.

(c) The appearance for the first time of apical systolic murmurs was infrequent in all three treatment groups and unrelated to therapy. No consistent difference in the behaviour of murmurs present at the start of treatment was noted except that the soft apical systolic murmurs disappeared more rapidly in hormone-treated groups. At the end of one year, however, no significant difference remained. The differences in the treatment groups with respect to apical mid-diastolic murmurs in the U.K. and basal diastolic murmurs at one U.K. centre have been discussed.

(d) The P-R intervals decreased more frequently and more rapidly in the hormone groups than in the aspirin group. This difference between the groups lessened during the observation period and was absent at nine weeks and one year. Since the values at these later times might be closer to normal than those recorded during acute illness, it may be questioned whether the early decrease is an effect of the hormones on the disease or merely a direct effect on atrioventricular conduction time.

(e) At one year the proportion with residual cardiac damage was similar in the three treatment groups. A final determination of cardiac status must await results of a prolonged follow-up.

It is apparent that this study presents no evidence that rheumatic fever in children can be uniformly terminated by any of the three agents. There is evidence that hormone treatment results in more prompt control of certain acute manifestations, but this more rapid disappearance is balanced by a greater tendency for them to reappear for a limited period of time at the end of treatment. Treatment with the hormones also leads to the more rapid disappearance of nodules and of soft apical systolic murmurs. At the end of one year, however, it is clear that there was no significant difference between the treatment groups in the status of the heart.

Summary

Six centres in the United Kingdom, five in the United States, and one in Canada have collaborated in a trial of the relative merits of A.C.T.H., cortisone, and aspirin in the treatment of acute rheumatic fever and the prevention of rheumatic heart disease. The present report relates to children under the age of 16 and compares the effects of the three drugs on the acute course of the disease and on the persistence and development of rheumatic heart disease through one subsequent year.

The records of 497 patients are presented (240 U.K. and 257 U.S., including the Canadian centre in the latter). Each case met specified diagnostic criteria on admission to the trial and was allocated at random to treatment with one of the three drugs. Each treatment was given for six weeks according to a defined schedule, and detailed observations were continued for a further three weeks. Follow-up examinations were made at specified times after these nine weeks, and the present report extends to the examination made one year later—that is, 61 weeks from the start of treatment.

The study was designed to ensure a balance of cases in the three treatment groups for each centre, for the duration of illness at start of treatment, and for the time of year when cases were admitted. Random allocation of cases within this balanced design was relied upon to secure a reasonably equal distribution of cases according to age, sex, and severity and frequency of manifestations of disease. This design permits many comparisons of the total groups on each treatment.

In 51% of the patients, treatment was begun within 14 days of the onset of the attack; in nearly two-thirds there was no history of a previous attack or evidence of pre-existing rheumatic heart disease. The treatments were therefore tested on patients of whom a large proportion were still in the early stages of the disease and had no established heart disease.

The three randomly constructed groups on A.C.T.H. (162 cases), cortisone (167 cases), and aspirin (168 cases) were notably alike in most respects at the start of the trial. The results of the treatments were measured in relation to separate manifestations of the disease—namely, temperature, pulse rate during sleep, erythrocyte sedimentation rate, joint involvement, chorea, erythema marginatum, nodules, and such aspects of the status of the heart as heart size, atrioventricular conduction time, murmurs, and, in particular, those indicative of serious illness, congestive failure, and pericarditis.

There was no evidence that any of the three agents resulted in uniform termination of the disease, and on all treatments some patients developed fresh manifestations during treatment. Treatment with either of the hormones resulted in more prompt control of certain acute manifestations, but this more rapid disappearance was balanced by a greater tendency for the acute manifestations to reappear for a limited period upon cessation of treatment. Treatment with the hormones also led to more rapid disappearance of nodules and soft apical systolic murmurs. At the end of one year there was no significant difference between the three treatment groups in the status of the heart. During the period of treatment, observation, and one year of follow-up there

were only six deaths among the 497 cases, under the age of 16, admitted to this study.

The National Heart Institute of the United States Public Health Service supported the study with grants to the co-ordinating centre and to the co-operating centres in the United States and by a travel grant to the Medical Research Council of Great Britain. The Medical Research Council provided support for the six centres and for a co-ordinating registrar in the United Kingdom. The centre in Toronto received a grant from the Canadian Arthritis and Rheumatism Society. In the United States, the costs of the medical care of its patients were met by each co-operating centre, and in Great Britain by the National Health Service. The American Heart Association provided office space for the American Co-ordinating Centre and a grant for statistical services.

This co-operative clinical trial was first proposed by Dr. John R. Mote, then assistant general manager of the Armour Laboratories. For the planning of the study, funds were provided by Armour Laboratories and Merck and Company, and space and services by the Helen Hay Whitney Foundation.

Grateful acknowledgment is made to the resident and technical staffs at the co-operating centres, without whose devoted efforts the collection of these data would have been impossible.

In the planning and conduct of this trial much is owed to the wise advice and guidance of the late Dr. T. Duckett Jones and the late Sir James Spence.

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APPENDIX

ADMISSION REPORT

Form 1

1. Hosp. No.	2. Study No.
3. Study centre	4. Date adm. to centre
6. Name of patient	5. Date study therapy began
	7. Age
	8. Sex
	9. Race

(Please put a X in each relevant "box".)

MAJOR CRITERIA	Has condition been present in this attack	Date first observed in this attack	Is condition present at start of therapy	Used as criterion for admission to study
11. Active Carditis	Yes ☐ No ☐		Yes ☐ No ☐	Yes ☐ No ☐
a. Development of or change in murmurs	Yes ☐ No ☐		Yes ☐ No ☐	
b. Increase in heart size	Yes ☐ No ☐		Yes ☐ No ☐	
c. Pericarditis	Yes ☐ No ☐		Yes ☐ No ☐	
d. Congestive failure	Yes ☐ No ☐		Yes ☐ No ☐	
(1) Dyspnoea	Yes ☐ No ☐		Yes ☐ No ☐	
(2) Orthopnoea	Yes ☐ No ☐		Yes ☐ No ☐	
(3) Liver enlargement	Yes ☐ No ☐		Yes ☐ No ☐	
(4) Râles	Yes ☐ No ☐		Yes ☐ No ☐	
(5) Jugular venous pressure	Yes ☐ No ☐		Yes ☐ No ☐	
(6) Oedema	Yes ☐ No ☐		Yes ☐ No ☐	
12. Polyarthritides (two or more joints)	Yes ☐ No ☐		Yes ☐ No ☐	Yes ☐ No ☐
13. Chorea (definite)	Yes ☐ No ☐		Yes ☐ No ☐	Yes ☐ No ☐
14. Nodules	Yes ☐ No ☐		Yes ☐ No ☐	Yes ☐ No ☐
15. Erythema marginatum	Yes ☐ No ☐		Yes ☐ No ☐	Yes ☐ No ☐
MINOR CRITERIA			Max. measurement in present attack	
16. Fever	Yes ☐ No ☐		Yes ☐ No ☐	Yes ☐ No ☐
17. Elevated ESR (15 mm./hr. or over, corrected Wintrobe)	Yes ☐ No ☐		Yes ☐ No ☐	Yes ☐ No ☐
18. Previous strep. infection	Yes ☐ No ☐			Yes ☐ No ☐
a. Culture				
b. ASO titre				
c. Sore throat with fever	Yes ☐ No ☐			
19. Increased P-R interval (see criteria)	Yes ☐ No ☐			
20. Previous history of rheumatic fever or rheumatic heart disease:				
a. Total No. of attacks including present attack		Reliability of history	Good ☐ Questionable ☐ Poor ☐	Yes ☐ No ☐
b. Date 1st attack	Manifestations			
c. Date 2nd attack	Manifestations			
d. Date 3rd attack	Manifestations			
e. Residual heart damage from these or any unrecorded attacks:				
(1) History of				
(2) Present findings				
21. Previous Therapy:	Date begun	Total amt. given	Date stopped	
ACTH (any attack)				
Cortisone (any attack)				
Salicylates (this attack)				
22. General description of progress, course, and severity of attack up to time of entry of trial:				
23. Present cardiac diagnosis—Anat. Physiol.				
24. Date of onset (present attack)				
25. Study group (put X in box below):				
Duration from Onset	Age			
0-14 days	Under 16 yrs.	16 yrs. and over		
15-42 "				
43 days and over				
26. Therapy group—ACTH ☐ Cort. ☐ Salic. ☐				
Excluded from study ☐ "Out" ☐				
(If case was excluded from study, explain fully on back of form.)				
27. Investigator (sign.)				
28. Date reported to centre				

PROGRESS REPORT

Form 2

1. Hosp. No.	2. Study No.	3. Study centre	PROGRESS NOTES		
4. Date adm. to centre	5. Date study therapy began	6. Name of patient	7. Age	8. Sex	9. Race
10. a. Date (month and day)	D				
b. Days from onset	D				
c. Day of therapy	D				
11. Temp. (max. for day)	D				
12. Sleeping pulse	D				
13. Weight	D				
14. Blood pressure	DW				
15. Gallon rhythm	0 or + DW				
16. Arrhythmias	0 or + DW				
17. Murmurs	DW				
a. Apical organic systolic (0-3)					
b. Apical mid-diastolic (0-3)					
c. Basal diastolic (0-3)					
d. Apical presystolic (0-3)					
18. Precordial pain	0 or + DW				
19. Pericardial a. Rub	0 or + DW				
b. Effusion	0 or + W				
20. Failure	0-3 DW				
a. Orthopnoea	0 or +				
b. Dyspnoea	0 or +				
c. Liver enlargement (cm.)					
d. Oedema	0 or +				
e. Rales	0 or +				
f. Jugular venous pressure (cm.)					
21. a. TD-ID (mm. mm.)	W				
b. Contour	0 or +				
22. PR/Vent rate	W				
23.					
24.					
25. Joints	0-3 DW				
26. Nodules	0 or number DW				
27. Erythema marg.	0 or + DW				
28. Chorea	0-3 DW				
29.					
30.					
31. ASO titre	M				
32. ESR (uncorrected)	W				
33. Haematocrit	W				
34. Eosinophils	Date				
35. pH	W				
36. CO ₂ (meq.)	W				
37. K (meq.)	W				
38. Urine sugar	0-3 W				
39.					
40.					
41. A.C.S. 24 hr. dosage	D				
No. doses day	D				
42. XCl (gm. p. d.)	D				
43. Digitalis (specify)	Date				
44.					
45.					
46. Chemotherapy	Ant. Date				
47. Toxic symptoms	0 or + D				
48. Complications	Date				
49. General condition	Improved ☐ unchanged ☐ worse ☐				

D daily; DW daily for days 1-7 and 42-56, otherwise weekly; W weekly; M monthly.

SIDE-EFFECTS OF THERAPY

Date special therapy began

Date special therapy ended

ACTH	
CORTISONE	
ACETYSALICYLIC ACID	

Symptom	Date of first appearance	Date of disappearance	Describe severity
1. Moonface			
2. Abnormal fat deposition			
3. Hirsutism			
4. Acne			
5. Striae			
6. Amenorrhoea			
7. Mental changes (specify)			
a.			
b.			
c.			
d.			
8. Weakness			
9. Pigmentation			
10. Other (specify)			
a.			
b.			
c.			
d.			
11. Salicylism (specify)			
a.			
b.			
c.			
d.			

FOLLOW-UP REPORT

Form 3

1. Hosp. No.	2. Study No.	3. Study centre	FOLLOW-UP NOTES		
4. Date adm. to centre	5. Date study therapy began	6. Name of patient	7. Age	8. Sex	
9. Race			Date of Follow-up	Notes	Observer
10. Date (month and day)					
11. Fever a. Temperature	0 or +				
12. Sleeping pulse (if I.P.)					
13. a. Weight					
14. b. Height (inches)					
15. Blood pressure	0 or +				
16. Gallop rhythm	0 or +				
17. Arrhythmia	0 or +				
18. Murmurs					
19. a. Apical organic systolic	0-3				
20. b. Apical mid-diastolic	0-3				
21. c. Basal diastolic	0-3				
22. d. Apical presystolic	0-3				
23. e. Basal systolic	0-3				
24. Precordial pain					
25. a. At follow-up exam.	0 or +				
26. b. History	0 or +				
27. Pericardial a. Rub	0 or +				
28. b. Effusion	0 or +				
29. Failure	0-3				
30. a. Orthopnoea	0 or +				
31. b. Dyspnoea	0 or +				
32. c. Liver enlargement	(cm.)				
33. d. Oedema	0 or +				
34. e. Rales	0 or +				
35. f. Jugular venous pressure	(cm.)				
36. g. TD/ID	(mm./mm.)				
37. a. Contour	0 or +				
38. PR/Vent rate					
39. Joints	0-3				
40. Nodules	0 or number				
41. Erythema marg.	0 or +				
42. Chorea					
43. ASO titre					
44. ESR (uncorrected)					
45. Haematocrit					
46. Upper respiratory infection	0 or +				
47. Days in bed	0 or number				
48. Rheumatic activity	O C R or N				
49. Cardiac diagnosis					
50. a. Anatomical					
51. b. Physiological					
52. c. Functional capacity					
53. Digitalis therapy	(gr. day)				
54. Other therapy	0 or +				
55. Chemoprophylaxis	G P or O				
56. Urine sulphonamide	0 or +				
57. Toxicity	0 or +				
58. Examiner					

A-V BLOCK AND CARDIAC OUTPUT

BY

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The Starling heart-lung preparation provides a means of determining the effect of varying degrees of A-V block and of auricular fibrillation on the output of blood from the brachio-cephalic artery of the dog. We therefore describe observations we have made in which we have produced A-V block by driving the auricles electrically at increasing rates, and also observations in which we have produced auricular fibrillation by infusing acetylcholine at a uniform rate into the blood entering the superior vena cava and applying electrical stimuli in conjunction. A description of the effects of infusing acetylcholine in this way has been given in another paper (Burn, Vaughan Williams, and Walker, 1955).

Methods

The methods employed were the same as those already described. When the heart-lung preparation of the dog

was set up, leads to a Cossor electrocardiograph (model 1314) were attached to the right and left forelegs and the left hindleg. Electrodes which did not pierce the tissue were applied to the tip of the right auricle, and stimuli of 1 mA strength and of 0.9 msec. duration were applied at varying rates. In experiments on fibrillation acetylcholine was infused from a burette at known rates. The output was measured by deviating the blood before it entered the venous reservoir through a T-piece into a cylinder for a period of 15 sec.

Results

Output at Varying Rates of Stimulation

Stimuli were applied to the auricle at a rate about 20 per minute faster than the spontaneous rate. The application continued for about one minute, during which the output was measured and a record of the E.C.G. was taken. Higher rates of stimulation were then tried in succession, the range of stimuli being usually from 160 to 560 per min. During

application of the lower rates of stimulation the ventricular rate was the same as the auricular, until a rate was reached at which some of the auricular contractions were not followed by a ventricular contraction. This change is illustrated in Fig. 1, which shows that above the rate of 296

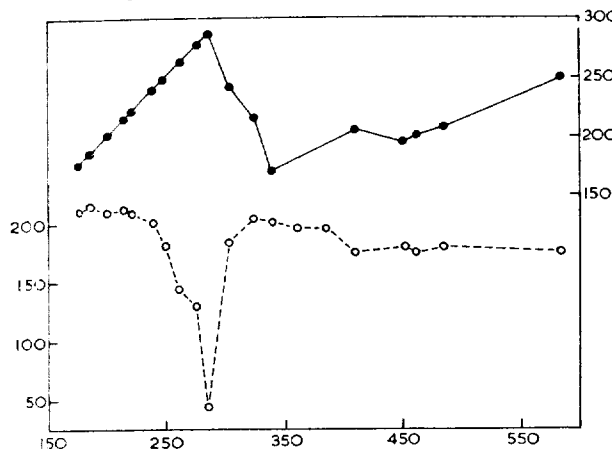


FIG. 1.—Heart-lung preparation. Abscissa: number of stimuli per minute applied to tip of right auricle. Ordinate: upper graph shows the ventricular rate; lower graph shows the output of blood in ml. per 15 seconds.

per min. further increases in the auricular rate caused a continuing fall in the ventricular rate until the latter became half the former. At this point there was a 2:1 block. As the auricular rate rose still further the ventricular rate followed at half the rate, and often the 2:1 block was unchanged up to the maximum rate of stimulation applied. In some experiments the block increased to 3:1 and in occasional experiments to 4:1; in Fig. 1 the block increased to 5:2 above the rate of 410 per min.

The changes in output are illustrated in Fig. 1. As the rate of stimulation increased the output remained stationary or fell slightly. With a further rise in rate the output fell steeply and continued to fall, sometimes even to zero, so long as the A/V relation was still 1:1. But when the rate was reached at which some auricular contractions were not followed by ventricular contractions, the output rose suddenly and returned to near its initial value. The sudden rise in output seemed to be due to the greater filling of the ventricles during the pause created by those impulses which were not transmitted to the ventricles. This explanation is supported by the relation between the ventricular rate and the output when stimulation was faster than 350 per min. (see Fig. 1). As the rate of stimulation rose to 585 per min. the ventricular rate slowly rose to 250 per min., at which point the output had gradually fallen to 175 ml per 15 sec. But when the ventricular rate reached 250 per min. before block began, the output was also 175 ml. per 15 sec.

TABLE I.—Restoration of Output by A-V Block. Figures are Output in ml./15 sec.

Experiment	Before Stimulation	At Maximum Rate for V=A	When Restored by A-V Block	Degree of Block
1	164	68	150	3:2
2	170	118	152	3:2
3	154	72	136	2:1
4	168	54	174	4:3
5	154	112	150	3:2
6	170	74	146	2:1
7	170	110	146	2:1
8	180	5	178	3:2
9	168	30	178	3:2
10	182	20	172	3:2
11	174	10	166	3:2
12	186	5	180	3:2
13	196	0	172	3:2
14	212	44	204	3:2
15	194	0	141	4:3
16	170	5	160	3:2
17	182	138	176	3:2
18	176	0	146	4:3
19	200	66	170	3:2
20	190	128	168	3:2

In Table I the output changes which were observed in 20 experiments are recorded. The second column gives the output per 15 sec. before stimulation. The third column gives the output during the highest rate of stimulation at which the ventricles followed every contraction of the auricles. In all experiments the output was much reduced at this point; in Experiment 17 the reduction was only to 75% of the initial output, but in Experiments 13, 15, and 18 the reduction was to zero. The fourth column gives the output in the presence of A-V block, when it was restored to a figure similar to the initial output and occasionally greater than this. The fifth column gives the degree of block corresponding to the restored output. When the figure for the low output in the third column was expressed as a percentage of the initial output in the second column the mean value was found to be 29%. Similarly, when the figure for the restored output in the fourth column was expressed as a percentage of the initial output the mean value was found to be 92%. These results show that the spontaneous development of A-V block enabled the output to be maintained at high rates of stimulation.

Greater Output with 3:2 Block

When the ventricular rate fell below the auricular rate the output usually reached its greatest value when the block was 3:2. As the block became 2:1 the output fell. Figures for 11 consecutive experiments are given in Table II, which

TABLE II.—Showing the Greater Output with 3:2 Block than with 2:1 Block

Experiment	Block 3:2		Block 2:1	
	Ventricular Rate	Output (ml. 15 sec.)	Ventricular Rate	Output (ml. 15 sec.)
21	187	150	177	114
22	228	170	188	170
23	216	156	190	90
24	278	166	240	116
25	205	160	162	150
26	190	170	155	170
27	210	160	167	136
28	153	144	124	90
29	192	130	150	104
30	175	124	140	80
31	198	156	155	150

demonstrates this fall in output associated with the change from 3:2 to 2:1 block in 9 out of the 11 experiments. The ventricular rate corresponding to each output is also given. The fall in output with the fall in the ventricular rate as the block increased from 3:2 to 2:1 suggested that there was an optimal ventricular rate below which, or above which, the output fell. This optimal rate seemed to be about 200, but obviously it varied. Thus in Experiment 24 the output fell with the increase in block although the ventricular rate was still as high as 240 per min., and in Experiment 26 the output did not fall with the increase in block although the increase reduced the ventricular rate to 155 per min.

Despite the fact that the 2:1 block, when first reached, reduced the output, it enabled the output to be maintained when rates of stimulation were higher. For example, in Experiment 21, when the block was 3:2 the ventricular rate of 187 produced an output of 150 ml. per 15 sec. With a block of 2:1 a ventricular rate of 187 would correspond to a stimulation rate of 375 per min., at which the output should also be 150 ml. per 15 sec. Actually the output was recorded as 148 ml. per 15 sec. when the stimulation was 392 per min.

Output and Fibrillation

In some of the experiments described in the previous paper, in which acetylcholine was infused at a constant rate, with the result that when stimulation was applied auricular fibrillation occurred, we obtained evidence that fibrillation helped to maintain output, probably because of the accompanying block. An example is given in Fig. 2. In the first part of this experiment the right auricle was stimulated at increasing rates and a relation between the ventricular rate and output

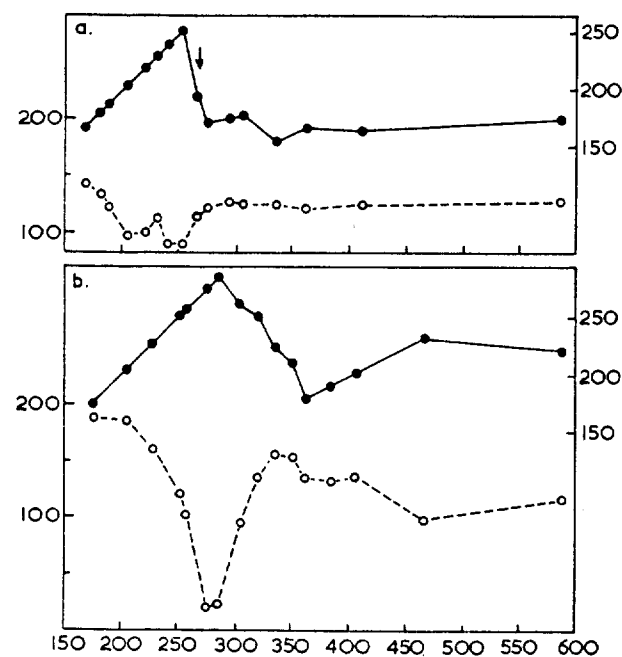


FIG. 2.—Records as in Fig. 1. (a) Stimulation during the infusion of acetylcholine at the rate of 200 µg./min. Auricular fibrillation began at the arrow, and the output rose in consequence. The ventricular rate and the output remained steady during stimulation up to 580 per minute. When the infusion of acetylcholine was stopped, normal rhythm returned. (b) Stimulation without acetylcholine infusion then led to a large fall in output, which was, however, restored when block began.

was recorded very like that seen in Fig. 1 and closely resembling that obtained later in this preparation, which is shown in Fig. 2b. In Fig. 2a acetylcholine was infused at the rate of 200 µg. per min., and when stimulation was as fast as 266 per min. the auricles began to fibrillate, and continued to fibrillate as stimulation was progressively increased to 650 per min. When stimulation was stopped the fibrillation continued, but when the acetylcholine infusion was stopped the fibrillation stopped. Before the auricle fibrillated the ventricular rate rose in step with the auricular rate up to 252 per min., and, as Fig. 2a shows, the output fell from an initial figure of 142 ml. per 15 sec. to 91 ml. With the onset of fibrillation the ventricular rate fell to 176 per min. and the output rose to 126 ml. per 15 sec. Throughout the rest of the period in which stimulation was applied at an increasing rate the ventricular rate and the output remained more or less constant. What seemed noteworthy was that when fibrillation occurred the output did not fall to zero as in the first part of the experiment. When the fibrillation stopped after discontinuing the infusion of acetylcholine the stimulation was repeated once more. The relation of ventricular rate to output is shown in Fig. 2b. It was very much the same as in the first part of the experiment, the output falling to 20 ml. per 15 sec. at a ventricular rate of 286 per min.

Discussion

The experiments which have been described have been carried out in the heart-lung preparation in which the output of blood into the systemic circulation can be measured directly. The changes in output which occurred when the tip of the right auricle was stimulated at increasing rates have been studied and the effect of A-V block in maintaining the output has been demonstrated. As the rate of stimulation rose the output fell at an increasing rate until the moment at which block began. As soon as this occurred the output promptly rose even when only 1 in 6 or more of the auricular beats was not transmitted to the ventricles. As the rate of stimulation increased, the degree of block (the proportion of non-transmitted beats) increased, and with it the output also, until the block became 3:2. When the block

increased further to 2:1 the output fell slightly. Up to rates of stimulation of 500-600 per min. the output was then well maintained.

That a too-rapid ventricular rate results in a fall in output has been recognized by all workers. The occurrence of A-V block has been much studied, but for the most part it has been spoken of as though it represented an impairment of function, and almost nowhere has it been recognized as an essential mechanism for the maintenance of output when the stimuli reaching the auricles are too numerous. Block occurs spontaneously when the auricles are driven electrically in the heart-lung preparation. Once it has begun it is proportional in its degree to the rate of stimulation up to the point at which it is 2:1. When the block has reached this point it permits the output to be maintained even when the rate of stimulation approaches 500 per min. Thus block can be regarded as a protective mechanism to maintain the output.

There is in addition a little evidence that under certain circumstances auricular fibrillation may serve to protect the organism from the fall in cardiac output which would otherwise occur. When stimulation during the infusion of acetylcholine led to auricular fibrillation, and presumably to a high degree of A-V block, a fall in the ventricular rate occurred together with a rise in output. The ventricular rate then remained independent of the rate at which stimuli were applied to the auricle. The preservation of a reasonable output in this condition would, of course, depend on the ventricular rate being neither too fast nor too slow. It is of interest to note that three effects of acetylcholine released by vagal stimulation—namely, slowing of the pacemaker, depression of A-V conduction, and an increased tendency to auricular fibrillation—are all directed towards the same end—an optimal ventricular rate.

Summary

A study has been made of the effect of increasing rates of electrical stimulation on the ventricular rate and on the output of blood in the heart-lung preparation.

As the rate of stimulation increased, the ventricular rate also increased and the output fell. In some preparations the output fell to zero.

Block then began, some auricular beats not being transmitted to the ventricles. The output then rose promptly.

With increasing rates of stimulation the block progressively increased until it became 2:1, at which point it stayed, rarely becoming more than this at rates up to 550 per min. Throughout the period after the block began the output was well maintained.

Block thus acts as a mechanism whereby the ventricular rate is controlled and the cardiac output maintained; it is not necessarily a sign of impairment of cardiac function.

In experiments in which acetylcholine was infused stimulation led to auricular fibrillation. The onset of fibrillation caused a rise in output.

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Radio-isotopes are now being widely used in industry as measuring and detecting devices; for instance, a radioactive source on one outside wall of a foundry furnace and a counter on the opposite side measure accurately the height of the molten metal in the furnace. This method is also used to measure the contents of other types of containers. Again, a block in a pipe can be accurately found by moving a container holding radioactive material along one side of the pipe at the same time as a Geiger counter is moved along the opposite side.

ACQUIRED TOXOPLASMOSIS WITH A REPORT OF A CASE OF LABORATORY INFECTION

BY

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One of us (S.C.M.) recently became infected with *Toxoplasma gondii* when working in the laboratory. Brief mention was made of this in a recent publication on acquired toxoplasmosis (Skipper *et al.*, 1954) in which two cases of the glandular variety of the disease and one other possible case resembling typhus fever were described. The laboratory infection is now reported because it furnishes yet another example of mild adenopathy, with little constitutional disturbance, due to the toxoplasma.

Case Report

On August 31, 1953, S.C.M., for purposes of animal passage, set out to fill a sterile syringe with mouse peritoneal exudate rich in the Rh strain of toxoplasma. As the needle became blocked he removed it, set it aside point uppermost, and fitted a fresh one. Shortly afterwards he pricked his left third finger on the upturned needle. Realizing what he had done, he tried, unsuccessfully, to make the puncture bleed and applied tincture of iodine.

Nine days later (September 9) he felt shivery and tired, suffered from headache, and discovered an enlarged painful gland in the left axilla. On September 12 his temperature was 102° F. (38.9° C.) and the following day he had a rigor. In spite of a 48-hour course of penicillin, prescribed by his family doctor, his fever continued and ranged between 100 and 103.8° F. (37.8 and 39.9° C.). When examined on September 16 he was sweating and looked ill. The skin of his finger was red where it had been pricked, and two enlarged, tender, discrete glands, each the size of a walnut, were present in the left axilla. Some smaller tender glands were felt in the posterior triangles of the neck. The edge of the liver could be felt, but it was not tender. The blood count showed: Hb, 100%; red cells, 4,900,000 per c.mm.; colour index, 1; platelets, 165,000 per c.mm.; white cells, 11,000 per c.mm. (polymorphs 50%, eosinophils 2%, lymphocytes 26%, monocytes 14%, band cells 8%). Many of the lymphocytes were abnormal, resembling Downey cells types I and II. A Paul-Bunnell test was negative, as were agglutination tests for salmonella and brucella antibodies. A blood culture remained sterile.

On September 16 he was given 2 g. of sulphadimidine, followed by 1 g. six-hourly for five days, at the end of which period his temperature was normal. By September 26 the cervical adenitis had disappeared. On September 30 the total white count was 5,000 per c.mm. (polymorphs 36%, eosinophils 5%, lymphocytes 48%, monocytes 8%, band cells 2%). A few atypical lymphocytes were still present. Further Paul-Bunnell tests (on September 28 and October 23) were negative. By October 5 he felt well and had returned to work, but the enlargement of the axillary glands persisted in a minor degree until January, 1954. On May 5 full clinical examination was negative and x-ray films of the chest and an E.C.G. were normal. A final blood count (May 7) showed: Hb, 120%; red cells, 5,700,000; colour

index, 1.05; white cells, 13,000 per c.mm. (polymorphs 78%, lymphocytes, 16%, monocytes 4%, band cells 2%). No abnormal lymphocytes were seen.

Investigations for Toxoplasmosis.—Previously, S.C.M.'s serum had repeatedly given negative results in the dye and complement-fixation tests for toxoplasmosis. Indeed, it was so free of antibody that it had been regularly used as activator in dye tests, and only four days before the accident it had been satisfactorily employed as a negative control in the rabbit skin neutralization test. Subsequent changes in titre are shown in the Table.

Changes in Titre

Date	Dye Test (Sabin and Feldman, 1948) (Beverley and Beattie, 1952)	Complement- fixation Test (Sabin, 1949)
16.9.53	1:80	Nil
27.9.53	1:200	"
9.10.53	1:600	"
21.10.53	1:1,560	1:16
27.10.53	1:3,200	1:16
16.11.53	1:4,200	1:16
8.12.53	1:2,400	1:4
8.1.54	1:1,150	1:16
5.2.54	1:1,600	1:2
12.3.54	1:2,000	1:16

On September 16 inoculation of heparinized blood into six mice, both intraperitoneally and intracerebrally, produced no illness in the animals, and two blind passages of pooled viscera, at intervals of two months, were negative. The toxoplasmin skin test (Frenkel, 1948), which was purposely postponed until February 9, 1954, was strongly positive.

Cases Already Reported

We have been able to find a total of six recorded cases of toxoplasmosis in laboratory workers (Ström, 1951; Sabin *et al.*, 1952; Sexton *et al.*, 1953; Giroud *et al.*, 1953; Franceschetti and Bamatter, 1953). It would seem that Ström's two cases were also briefly reported by Magnusson (1951).

Ström's first case was that of a woman aged 22 who, after working for only 19 days in the laboratory, developed painful adenitis of the neck with fever. She had been employed pipetting toxoplasma exudates, and it was thought infection had been by the mouth. On the third day of her illness she developed conjunctivitis, and on the fourth day a maculo-papular rash on the trunk, which disappeared in two weeks and was followed by desquamation on the hands and feet. Meanwhile the adenopathy had spread to the axillae and groins, and early in her illness the cerebrospinal fluid showed an increase in protein and in mononuclear cells (up to 12 per c.mm.) lasting for three weeks. Three weeks after the onset of the illness transient inversion of the T waves and other slighter changes in the electrocardiograph appeared and she complained of mild anginal symptoms and breathlessness. By this time her temperature was practically normal, but some weeks later severe headaches and attacks reminiscent of petit mal began, these being ascribed to meningo-encephalitis. She gradually improved but still suffered from headaches and from mild angina after six months. The duration of the lymphadenopathy was six to seven weeks. Attempts to demonstrate toxoplasms in an excised lymph node were not successful, and inoculation of mice with cerebrospinal fluid produced no illness. The dye test, at first negative, reached a titre of 1:4,000 three weeks after the onset of the illness.

Ström's second case occurred in a 22-year-old woman who pricked a finger of her left hand with a needle infected with toxoplasma material. Three days later an enlarged gland appeared in the left axilla. Her illness was very mild, and only slight enlargement of the lymph nodes in the neck, axillae, and groins was noted. A blood count was normal except for a relative lymphocytosis of 54%. The dye test was negative two weeks after infection, but gave a titre of 1:2,000 after two months.

Sexton *et al.* (1953) reported a fatal laboratory infection in a 47-year-old woman. She admitted no accident in the laboratory. After a period of four months' vague ill-health, she developed an acute febrile illness and became irrational. On the third day an extensive maculo-papular eruption, which spared the palms, soles, and scalp, appeared. There was no adenopathy. A blood count showed a leucopenia of 2,350 cells per c.mm., but later the white cells rose to 7,850 per c.mm. Moist sounds were present at the base of the right lung and there was rigidity of the limbs and to a less extent of the neck. On the seventh day of her illness convulsions began and she became deeply comatose. The cerebrospinal fluid, previously normal, was now xanthochromic (protein 55 mg. per 100 ml., sugar 48 mg. per 100 ml., culture sterile). Treatment, which included sulphonamides, antibiotics, and, because of low plasma electrolytes, deoxycortone, was unavailing, and she died on the ninth day. The dye test, which was negative before her illness, rose to a titre of 1:256 on the eighth day and the organism was recovered from mice inoculated with whole blood and cerebrospinal fluid taken before death, and with brain, spleen, and liver emulsion obtained at necropsy. Parasites were also seen in the patient's heart muscle, which showed widespread focal myocarditis. There was extensive gelatinous oedema of the lungs with cellular proliferation in the alveoli and in the interstitial tissue.

Giroud *et al.* (1953) briefly describe, in a laboratory technician, a febrile illness accompanied by conjunctivitis, headache, and, on the sixth day, by a facial maculo-papular rash. The complement-fixation test was positive to a titre of 1:32, but a complement-fixation test for Q fever was also positive (1:40).

Sabin *et al.* (1952) mentioned that one of their number was bitten by a toxoplasma-infected rabbit. No fever or other symptoms resulted, but the dye test became positive after 16 days and reached the high titre of 1:16,000 after 30 days, while complement-fixing antibodies appeared later.

Finally, Franceschetti and Bamatter (1953) quote the case of a girl (mentioned to them by Jaeger) whose eye was splashed while manipulating a suspension of toxoplasma. She was said to have developed "relapsing meningo-encephalitis."

Discussion

Skipper *et al.* (1954) point out that acquired toxoplasmosis usually occurs in latent form, no apparent illness resulting. In describing active acquired toxoplasmosis they draw attention to its two main types. In the first, the disease runs a benign course with mild fever and adenopathy, closely simulating glandular fever. In the second, the illness is acute and sometimes fatal. In addition to adenopathy, there are protean manifestations, particularly a maculo-papular rash, pneumonia, myocardial involvement, and infection of the nervous system with the production of meningo-encephalitis. The laboratory infections here described admirably illustrate the different forms the disease may take. Skipper *et al.* (1954) draw particular attention to the glandular variety of acquired toxoplasmosis and state that the disease should be suspected in cases of lymphadenopathy of uncertain aetiology when the Paul-Bunnell test is negative. More recently, Cathie (1954a) has carried out the dye test and complement-fixation test on the sera from 20 children and young adults in whom glandular fever was suspected on clinical grounds and in whom the Paul-Bunnell test was negative. In seven cases the dye test was positive, to titres varying from 1:32 to 1:512, and in six of these the complement-fixation test was positive to a titre of from 1:16 to 1:64.

It is well known that women who bear toxoplasmic infants are latently infected and very rarely show evidence of the disease. It is therefore of interest that Farquhar and Turner (1949) published the case of a woman who during the twenty-sixth week of pregnancy suffered a short influenza-like illness accompanied by enlargement of the cervical, axillary, and inguinal glands and who subsequently bore a toxoplasmic child. In the light of recent knowledge it

seems likely that the adenopathy was a clinical manifestation of active toxoplasmosis occurring during pregnancy.

The diagnostic value of the dye test and of the complement-fixation test is well shown in the case of S. C. M. Although some authorities have expressed doubt about the specificity of the dye test, so far as we are aware high titres such as we obtained in this serum have not been encountered in any other disease. Of particular importance is the rise and fall in the titre, as was emphasized by Sabin *et al.* (1952). As stated, we were unable to recover the organism from the blood by animal inoculation; we did not feel justified in excising a lymph node. Case reports show that direct demonstration of the toxoplasma in sections of affected organs and the transmission of the disease to animals by inoculation of blood, cerebrospinal fluid, or tissue emulsion is by no means always successful. Positive results are more likely to be obtained with severely ill patients. Skipper *et al.* (1954) were unsuccessful with lymph-node tissue, heparinized bone marrow, and citrated blood taken from one of their cases. Cathie (1954b), however, has reported the successful recovery of the organism by animal passage, using saliva and blood taken from a 5-year-old boy suffering from the glandular variety of the disease.

Little is yet known about the source of the infection in acquired toxoplasmosis. Although it has long been realized that the toxoplasma infests many species of animals, including domestic, direct transmission of the disease from animal to human, except, of course, in laboratory infections, has never been conclusively demonstrated. Similarly, transmission from human to human is known to occur only in the case of a woman who bears a toxoplasmic infant. Cathie (1954b) makes the interesting suggestion that one form of transmission may well be by direct contact spread through the saliva.

A large number of compounds have been tried, without success, in the treatment of experimental toxoplasmosis in animals (Eyles, 1953). So far, none of these drugs has been used in the treatment of human infections on a scale large enough to warrant drawing any conclusions. S. C. M. was treated for two days with penicillin without any effect on his pyrexia; it was not possible to ascertain whether there was a response to sulphadimidine.

Summary

A case of toxoplasmosis resulting from a finger-prick sustained in the laboratory is described. After an incubation of nine days a mild illness characterized by fever and lymphadenopathy resulted. The diagnosis was made by means of the dye test, which rose to a high titre (maximum 1:4,200), but the organism could not be recovered by animal passage.

Other published cases of laboratory toxoplasma infection collected from the literature are described. The clinical features of these cases vary, but closely resemble those of the spontaneously acquired disease. One case terminated fatally.

We are indebted to Professor C. P. Beattie for his helpful criticism and advice. This work has been assisted by a grant from the M.R.C. to one of us (J. K. A. B.).

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ANTICHOLINESTERASES AND MUSCLE RELAXANTS

BY

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The muscle relaxants commonly used in anaesthesia achieve their action either by competing with acetylcholine at the motor end-plate—for example, gallamine and tubocurarine—or by persistently depolarizing the motor end-plate and rendering it inexcitable to acetylcholine—for example, succinylcholine and decamethonium iodide (Paton, 1953). Normal neuromuscular transmission is dependent upon the liberation of acetylcholine, which transmits the stimulus to the muscle and is thereafter immediately neutralized by the enzyme cholinesterase, which is normally present in excess. If neutralization does not take place the accumulation of acetylcholine permanently depolarizes the motor end-plate, so preventing the passage of further impulses, and produces a paralysis (Feldberg, 1951). The competitive blocking agents gallamine and tubocurarine antagonize the action of acetylcholine, whereas succinylcholine acts in the same way as an accumulation of acetylcholine, and its hydrolysis is similarly dependent upon the presence of cholinesterase, though at a slower rate (Bovet *et al.*, 1951). Decamethonium iodide, although also achieving its effect by depolarization, is not dependent upon the presence of cholinesterase for its removal (Paton and Zaimis, 1949).

The amount of cholinesterase in the body may alter the duration of action of some relaxants, and it would therefore seem that when using these drugs in cases in which the blood cholinesterase has been lowered by previous exposure to anticholinesterase substances—for example, certain insecticides—varying modifications of dosage might be needed. To determine whether in fact such modifications were necessary a comparison has been made of the periods of respiratory paralysis following intravenous injection of comparable dosages of tubocurarine, gallamine, decamethonium iodide, and succinylcholine in Rhesus monkeys before and after they received a standard dose of a known anticholinesterase. The chosen compound was sarin (*iso*-propyl-methyl-phosphono-fluoridate), which was given subcutaneously in a dose of two-thirds of the LD₅₀ (the LD₅₀ being the dose which is lethal to 50% of monkeys of the same species in a given series). This dosage was sufficient to cause marked symptoms of miosis, salivation, respiratory distress, and muscular fibrillation.

Technique

Rhesus monkeys of approximately 4 kg. were anaesthetized with thiopentone, 0.1 g. intravenously, and intratracheal intubation was performed with a close-fitting polythene cannula, through which the animal was ventilated at a rate of 18 a minute and a stroke volume of 50 ml. by means of a standard respiratory pump. A pneumograph was attached to the chest and a continuous record of respiratory movement obtained. The relaxant under investigation was then injected, after which 1 ml. of blood was withdrawn for plasma cholinesterase estimation. At five-minute intervals the respiration pump was disconnected for 30 seconds to

ascertain whether spontaneous respiration had returned. The time of respiratory paralysis in all experiments was taken as the time from the injection of the relaxant to the re-establishment of effective natural respiration—that is, a rate and an amplitude of respiration which would lead to recovery without further application of the pump. At the end of each experiment a second 1-ml. sample of blood was withdrawn for plasma cholinesterase estimation.

The relaxants were investigated in pairs—namely, tubocurarine and decamethonium iodide, gallamine and succinylcholine—on two groups of 10 monkeys as follows:

1st week	..	Gallamine	} 5 monkeys
2nd "	..	Succinylcholine	
Monkeys then	given	sarin	
3rd week	..	Gallamine	
4th "	..	Succinylcholine	} 5 monkeys
1st week	..	Succinylcholine	
2nd "	..	Gallamine	
Monkeys then	given	sarin	
3rd week	..	Succinylcholine	}
4th "	..	Gallamine	

Similarly, a further 10 monkeys were used for the remaining pair of relaxants.

The dosages of relaxants used were as follows: tubocurarine, 1 mg./kg.; gallamine, 4 mg./kg.; decamethonium iodide, 0.75 mg./kg.; succinylcholine, 60 mg./kg. These dosages were selected, after preliminary investigations, to give 30 to 90 minutes' respiratory paralysis.

Immediately after the completion of each experiment the plasma cholinesterase estimations were carried out by Ammon's modification of Warburg's manometric method (Ammon, 1933).

Results

The results showed that there was no influence of one relaxant upon another in any experiment, and the four agents could therefore be considered independently. As

Table of Results

Monkey	Period of Respiratory Paralysis before Exposure (min.)	Days after Exposure	Period of Respiratory Paralysis after Exposure (min.)	Change (min.)
<i>Tubocurarine</i>				
1	85	2	70	-15
2	115	3	75	-40
3	75	4	40	-35
4	90	4	65	-25
5	85	4	55	-30
6	75	7	100	+25
7	65	7	75	+10
8	85	8	70	-15
9	85	8	75	-10
10	75	10	70	-5
<i>Decamethonium Iodide*</i>				
11	30	3	25	-5
12	35	3	35	0
13	15	3	10	-5
14	30	4	40	+10
15	30	4	25	-5
<i>Gallamine</i>				
16	95	2	80	-15
17	85	3	75	-10
18	100	4	65	-35
19	110	5	95	-15
20	95	6	75	-20
21	75	10	75	0
22	105	12	90	-15
23	110	13	90	-20
24	105	13	90	-15
25	80	14	85	+5
<i>Succinylcholine</i>				
26	55	2	70	+15
27	35	3	55	+20
28	40	4	55	+15
29	35	5	55	+20
30	35	7	65	+30
31	35	7	55	+10
32	50	11	55	+5
33	35	11	35	0
34	35	12	35	0
35	30	13	30	0

* In this group, there being no significant changes in respiratory paralysis after sarin within 4 days of exposure, it was unnecessary to expose further animals.

can be seen from the Table, with tubocurarine and gallamine there was a significant decrease in the period of respiratory paralysis after sarin, whereas with succinylcholine there was a significant increase. This effect of sarin was temporary, the period of respiratory paralysis in general showing less change with a longer period of delay. Sarin had no appreciable effect on the respiratory paralysis following decamethonium iodide.

Cholinesterase Estimations.—The results obtained from the plasma cholinesterase estimations were so anomalous that no attempt was made to correlate them with the periods of respiratory paralysis. There was a wide variation between individual monkeys in their clinical response, as well as in the degree of blood cholinesterase reduction produced by sarin.

Discussion

The results of this investigation are in accordance with current theories of neuromuscular block (Paton, 1953). Tubocurarine and gallamine achieve their action by inhibiting acetylcholine at the neuromuscular junction, and this effect is antagonized by sarin. The duration of the block with succinylcholine is governed by the speed with which the drug is hydrolysed in the blood and at the end-plate; sarin, by preventing hydrolysis, prolongs the action. Since decamethonium iodide acts not by preventing the action of acetylcholine but by mimicking it, and is not destroyed by cholinesterase, anticholinesterases have no effect. The experiments showed that these changes were more marked when the relaxant was given soon after exposure to the anticholinesterase and diminished with the passage of time, presumably owing to the gradual regeneration of cholinesterase to effective physiological levels.

It is interesting to note the large dose of succinylcholine needed to produce respiratory paralysis in the monkey, approximately ten times the dose for man. There was much less species difference in the dosages of the other three drugs.

Conclusions

With the exception of decamethonium iodide, the duration of action of the relaxants commonly used in anaesthesia appears to be modified temporarily by the effects of anticholinesterase intoxication. With the extended use of these substances as insecticides the possibility of inadvertent poisoning must be considered (Barnes and Davies, 1951) if a relaxant has to be used. This may be of particular importance to Service medical officers and others who may be called upon, in the event of war, to anaesthetize casualties who have been exposed to sarin.

Summary

A description is given of a series of simple experiments designed to determine the effect of intoxication with sarin on the duration of muscular relaxation produced by tubocurarine, gallamine, succinylcholine, and decamethonium iodide.

The duration of the respiratory paralysis induced by tubocurarine and gallamine is decreased, that produced by succinylcholine is increased, and the effect of decamethonium iodide is unchanged following sarin.

The clinical implications of these results are discussed.

We are indebted to the Chief Scientist, Ministry of Supply, for permission to publish this article.

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FAMILIAL HYDRONEPHROSIS

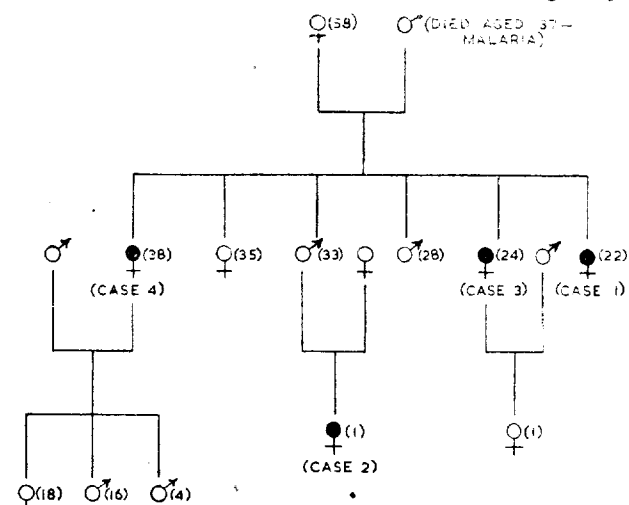
BY

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The coincidence of more than one case of hydronephrosis in a family is rare enough to attract attention. The incidence of non-calculous hydronephrosis in the family here reported is remarkable, and in view of its bearing on the aetiology of non-calculous hydronephrosis in general this occurrence is worthy of record.

Details of Family.—The constitution of the family is shown in the accompanying diagram. All the members of the family other than the four patients here described are apparently healthy and no other congenital abnormalities are known. There was no consanguinity.



Genealogical tree of family, showing distribution of cases. Ages at time of writing in parentheses.

Case 1

An unmarried girl of 19 was first seen in April, 1951. Her only complaint was of embarrassment occasioned by a generalized and gradually progressive abdominal swelling, which she had first noticed three years previously. The rate of enlargement had been noticeably greater in the preceding three months. She had no other complaints, and, in particular, there was no history of pain or disturbance of micturition. There had been no previous illnesses.

Examination revealed abdominal enlargement almost to the size of a full-term pregnancy, and on palpation this appeared to be due to a cystic swelling, localized mainly in the lower abdomen and extending up over the whole of the right side of the abdomen.

Straight x-ray examination showed a complete absence of gas and bowel shadows in the right half of the abdomen, and the liver, renal, and psoas outlines were not visible. All the bowel shadows were displaced to the left, apparently by a large fluid-containing cyst which was thought to be probably ovarian.

Laparotomy on May 3 revealed the tumour to be a massive right-sided hydronephrosis which contained 11 pints (6.2 litres) of fluid. Practically nothing was left of the normal renal tissue. The tumour was removed. The ureter was not dilated. No cause for the hydronephrosis was discovered. Post-operative progress was satisfactory and the patient was discharged from hospital two weeks later, since when she has remained well.

Case 2

A female infant was delivered normally at full term in February, 1953. Her birth weight was 5 lb. 2 oz. (2.3 kg.).

At birth she was noted to have a rather protuberant abdomen which contrasted markedly with the otherwise wasted appearance of the limbs, chest, and face. She was breast-fed from birth, but sucked poorly and initially vomited after her feeds, though after about three weeks this ceased. The abdominal distension increased, and appeared to be due to an ill-defined mass, dull to percussion, on the left side of the abdomen. By the end of the sixth week the infant's general condition was somewhat improved and she was feeding better, but the abdominal enlargement was still progressing. A pyelogram at this time revealed complete absence of excretion from the left kidney.

On May 1 the abdomen was explored through a left paramedian incision and the swelling was found to be due to a large left-sided hydronephrosis. The pelvis and calices were grossly dilated and the renal tissue was reduced to a mere shell. There was a well-marked uretero-pelvic junction and the ureter was not dilated. No cause for the hydronephrosis was found. Nephrectomy was performed.

The wound healed satisfactorily but the infant did not "pick up." Two weeks later she started vomiting, and gastric peristalsis was visible. This settled completely after a short course of "eumydrin," and her subsequent convalescence was uneventful, with a satisfactory weight gain. She was allowed home on June 18, since when, apart from two attacks of bronchitis, she has been well. She is, at the time of writing, a perfectly normal healthy-looking baby aged 1 year.

Case 3

This patient, a married woman of 23, was first seen in August, 1953, almost exactly a year after the delivery of a first child. She had been perfectly well during the pregnancy. Her presenting complaint was of a dull ache in the right loin which had started two weeks previously. In the preceding week she had felt generally ill, with occasional nausea and vomiting, had complained of headaches, and had sweated profusely. Micturition was frequent and somewhat painful, and she had to rise two or three times at night to pass water. There had been no previous illnesses.

Examination revealed a healthy-looking but febrile woman with herpes labialis. There was a tender cystic mass in the right flank which was thought clinically to be a hydronephrosis. The urine contained albumin and a deposit which microscopy confirmed as pus. Bacteriological examination produced a pure culture of *Bact. coli*. The infection settled quickly with alkalis and sulphonamides by mouth, and she was admitted to hospital one week later for further investigation.

At operation on September 18 the right kidney was removed through a right lumbar incision. It consisted of a thin shell of kidney tissue round a grossly distended pelvis. A large leash of blood vessels was observed at the uretero-pelvic junction. Post-operatively, recovery was uninterrupted and she has been perfectly well since.

Case 4

A married woman of 37, the mother of three children, aged 17, 15, and 3, was first seen in June, 1953. During her last pregnancy she had suffered from pre-eclampsia, but the obstetric history was otherwise normal. There had been no other illness. On June 26 she had noted a sudden onset of pain in the right loin during the afternoon. This was associated with vomiting. She felt generally unwell and had to go to bed. When first seen later that day she complained also of headache, pain on micturition, frequency, and sweats. There was marked right-sided renal tenderness but no palpable mass. The urine showed numerous pus cells in an uncentrifuged specimen. The blood pressure was 150/90. She had a course of alkalis and sulphonamides by mouth, and after a week felt perfectly well, was afebrile, and was again up and about. There was then no albumin or microscopical abnormality in the urine. She refused further investigation.

On September 11 she was again seen with a recurrence of pain in the right loin of one week's duration, less severe

but more persistent than that experienced previously. There were no febrile symptoms on this occasion and no disturbance of micturition. A cystic mass, clinically a hydronephrosis, was now palpable in the right flank. The urine showed a trace of albumin, a deposit of pus, and a growth of *Bact. coli* on culture.

Intravenous pyelography two weeks later revealed a somewhat enlarged right renal outline. Both kidneys excreted the dye. There was very well marked caliceal hydronephrosis on the right, but the pelvis and ureter contained no visible dye.

On October 16 a right lumbar nephrectomy was performed. There was gross caliceal and pelvic hydronephrosis. The ureter was of normal dimensions. The post-operative course was satisfactory and she was discharged from hospital three weeks later. Since then she has remained well.

Discussion

The occurrence of four cases of non-calculous hydronephrosis in two generations of one family would appear to rule out coincidence as an explanation. All the patients were females. In one generation three out of four sisters were affected. I have not been able to examine the other, apparently healthy, members of this family to see if any present a symptomless hydronephrosis, but obviously such a possibility exists, since the cases here reported came under observation only because of the large size of the tumour or because of the accident of infection. Thus in Case 1 the hydronephrotic sac had reached enormous proportions, containing 11 pints (6.2 litres) of fluid; in Case 2 abdominal enlargement due to the hydronephrosis was already present at birth; and Cases 3 and 4 presented with the signs and symptoms of a urinary infection.

In speaking of the aetiology of hydronephrosis Winsbury-White (1951) states: "Heredity can claim some cases." A search of the literature, however, reveals few reported cases of familial hydronephrosis. Blackwood (1896) quotes Virchow as having described the case of a woman who gave birth to three premature children, each with hydronephrosis. The cases in the family reported by Mackay (1944) differ from those here described in that they were associated with megaloureter. The history in this family was remarkable. Of seven siblings, five had congenital kidney lesions, three having megaloureters (in one bilateral) and two having congenital sarcomata of the kidney. The paternal grandfather had had a calculous pyonephrosis and may therefore have had a congenital hydronephrosis. Aaron and Robbins (1948) reported the cases of two brothers, aged 12 and 16, with hydronephrosis. In both "aberrant lower pole vessels were definitely established as the cause of hydronephrosis."

The pathogenesis of the hydronephrosis in the cases reported here is obscure. In only two is there any suggestion of a definite cause—in Case 3, which presented following pregnancy and in which aberrant vessels were reported at operation, and in Case 4, in which the patient had had three pregnancies, the last three years previously. There was no history of pyelitis of pregnancy in either of these women. Unless the remarkable familial incidence is ascribed to coincidence alone, the underlying causal factor must be presumed to have been the same in each case. Neither the aberrant vessels, present in one case only, nor pregnancy, which had occurred in only two, could therefore be of primary aetiological significance. This supports the belief of Winsbury-White (1925) that the vascular factor is of merely secondary significance in the aetiology of hydronephrosis. He contends that obstruction of the ureter by a blood vessel occurs simply as an additional factor when the renal pelvis, dilating from some other cause, reaches a sufficient degree of distension, though it may add a very severe mechanical obstruction to the primary cause of the dilatation, whatever that happens to be.

If we disregard, then, the aberrant vessels reported at operation in Case 3, we are left with the problem of the cause of the hydronephrosis in all four cases. In each the

ureter was apparently normal; the pelvis and calices alone were dilated; the uretero-pelvic junction was well marked; and yet no cause of ureteric obstruction was found.

Jewett (1940), after careful study, showed that normally there is no absolute uretero-pelvic junction, the pelvis blending into the ureter in a funnel-shaped prolongation. He believed that when such a junction exists, as it did in the cases described here, stenosis should be considered, particularly if there is pyelectasis. The fact that he considered this stenosis often congenital, since there were no acquired factors to explain it, would make such a mechanism an exceedingly attractive explanation for the present series of familial cases. However, no evidence of stenosis was found. *Faute de mieux*, we must therefore fall back on such a conception as inadequacy of the ureter as an efficient urinary duct which has been posited as a causal factor in hydronephrosis; or we must postulate a functional defect in the neuromuscular mechanism of the renal pelvis, as the familial and inherited primary aetiological factor, though there is no positive evidence for either supposition. Consideration of the familial nature of these cases does, however, serve to show that, contrary to general opinion, a pelvic and caliceal hydronephrosis of this type can occur as a congenital condition without evidence of ureteric obstruction.

Summary

Four cases of non-calculous hydronephrosis occurring in two generations of a family are described. The literature is reviewed. The aetiology of the condition is discussed.

I am indebted to Mr. R. J. Rutherford, who was responsible for the surgical care of Case 1; to Mr. M. C. Pinkerton, who was similarly responsible for Cases 2, 3, and 4; and to Dr. C. H. Kitchen, who carried out the radiological examinations.

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UNUSUAL CASE OF JUVENILE G.P.I.

BY

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AND

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Juvenile general paralysis is commonly thought to manifest itself as a gradual dementing process similar to that seen in the adult disease, but with the differences in symptomatic conduct and behaviour disorder that the onset in childhood or the school years would produce. Thus intellectual deterioration may appear as a failure to ascend the normal educational ladder or as an unexpected loss of already acquired learning. Grandiose delusions, which are uncommon, may take the form of claiming ownership of vast stores of sweets or toys. Reduced social standards, such as minor dishonesty or lack of personal cleanliness and tidiness, often presenting symptoms in adults, are likely to be less readily noticed in the juvenile age group. This is the picture given in the standard textbooks of neurology and psychiatry, though Ford (1949) and others mention a maniacal reaction as an occasional presenting symptom.

The following case is worth recording because juvenile G.P.I. is now an uncommon disease and because the

method of presentation was unusual. The sudden development of a hemiplegia drew attention to the disease, and shortly thereafter the patient developed an acute mania.

Case History

A National Service man, aged 19, was admitted to Wheatley Military Hospital in July, 1953. On the previous day, while picking peas on leave at home, he had suddenly "collapsed" in a semicomatose state, from which he could be roused only by repeated shouted requests. He was able to obey simple commands, but his answers to questions were incoherent and unintelligible. On examination he proved to have a right hemiparesis with dysphasia and right homonymous hemianopsia. There were some continuous clonic movements of the right face and hand resembling epilepsy partialis continua. The pupils were large, irregular, and did not react to light. The optic fundi were normal, as were other bodily systems. The blood pressure was 140/90. The urine was free from albumin and sugar. Lumbar puncture revealed a clear fluid under normal pressure, with a protein of 70 mg. per 100 ml., and 25 white cells per c.mm. (90% lymphocytes, 10% polymorphs). His electroencephalogram showed high-voltage delta activity in both hemispheres but focusing on the left mid-parietal electrode.

During the next 48 hours his comatose condition gave place to an acute mania. He would laugh and talk continually, and as he was still dysphasic a stream of jargon, often shouted at the top of his voice, resulted. Despite his hemiparesis he made continual attempts to get out of bed, and would keep on neither bedclothes nor pyjamas. He would try to attack anyone approaching him, and when restrained in bed made continual restless movements of his non-paretic limbs. He was incontinent of urine and faeces, and had to be tube-fed. In view of a possible left frontal abscess or tumour, a carotid angiogram was done, but this showed no convincing abnormality. By this time, some five days after admission, a strongly positive W.R. in the blood and C.S.F. had been returned, and the Lange gold curve was 455555321. The diagnosis of juvenile G.P.I. was thus suggested, and he was given penicillin, and in view of a possible gummatous process this was combined with potassium iodide. During three weeks he had 22 mega units of penicillin and 30 gr. (2 g.) of potassium iodide three times a day. On the mental side the response was dramatic. Within a week his acute mania had subsided and he would remain in bed and feed himself. He was continent of faeces, though he still occasionally wet himself.

Four weeks later he was up and helping with ward duties, though still rather emotionally labile. His neurological condition had also improved. The involuntary movements lessened gradually and ceased after some seven days, the hemianopsia and hemiparesis also cleared, though pyramidal signs—increased tendon-jerks and an extensor plantar response—remained. Some dysphasia also persisted, and there was slight proprioceptive sensory loss in the right arm and leg. The pupils remained large and irregular. There were no other signs of congenital syphilis. His electroencephalogram became more normal, with an 11 c.p.s. alpha rhythm in the right hemisphere, and some low-voltage theta activity from the anterior leads on the left. He proved to be entirely right-handed. Three months after the onset of his illness he was well enough to return home and was invalided from the Army.

As his serology remained positive he was treated with two further courses of 20 mega units of penicillin at the Queen Elizabeth Hospital, Birmingham. In March, 1954, his C.S.F. showed a protein of 42 mg. per 100 ml., with 1 lymphocyte per c.mm., Lange 3211000000, and a positive W.R. He was still emotionally labile, had occasional dysphasia and also evidence of left parietal lobe dysfunction, such as visual and tactile inattention to the right half of the body and a disinclination to use these limbs. However, he was leading a normal social life at home and was hoping to restart work in his previous trade.

Subsequent inquiries revealed that the patient had been to an ordinary school, and, although considered backward, had attended a junior technical college for a year, leaving at the age of 15. He had been employed as a factory hand and later as a storeman before his national service. On entering the Army at the age of 18, he had been regarded as rather dull and mentally immature, but no physical abnormalities were found. Three months before the illness here reported he had "collapsed" during a battle course done as part of his Army training, and a weakness of the right hand had been noted in examination. This had cleared in a few days, and he had been returned to duty but excused further battle courses.

His father, mother, and only sister each proved to have a positive W.R.

Discussion

The rarity of juvenile G.P.I. was emphasized by Worster-Drought (1940). This case also showed several uncommon features. The clinical onset was abrupt, and, although some degree of dementia may have been present for a time before the acute breakdown, it was not sufficient to prevent his wage-earning employment or his acceptance for national service. The presentation with focal neurological signs is unusual. However, such a syndrome in G.P.I. was recognized by Lissauer and Storch (1901), and these cases are sometimes referred to as "Lissauer's paralysis." Lissauer himself explained them as being due to an intense localized atrophy of a group of convolutions, but of the same pathogenesis as the more diffuse cerebral atrophy of G.P.I. More recently, however, Stewart (1933), in reviewing the pathology of juvenile cases, could find little to differentiate histologically between ordinary G.P.I. and Lissauer's type, as localized atrophy with status spongiosus occurred in both. In our case the abrupt onset of hemiparesis, the focal clonic movements, the localized electroencephalographic abnormality, and the rapid improvement with potassium iodide and penicillin, with slight residual focal signs, all suggest that a meningovascular process with gumma formation may have been present in addition to the G.P.I.; and, indeed, this may be the explanation for other cases of "Lissauer's paralysis."

A predominantly manic psychiatric picture is also unusual, though recorded in this condition. This patient's initial response to penicillin was very striking. His subsequent improvement has continued, though more slowly, and it can certainly be said that already, during the course of a year since the diagnosis was made, progress has been much better than with older remedies such as malaria, arsenic, and bismuth. Worster-Drought (1951) has used a combination of penicillin and malaria in treating 10 cases of juvenile G.P.I., with improvement in all cases. However, it is still a matter of debate whether such a combination has any advantages over penicillin alone, used, as in the acquired form of G.P.I., in large and repeated doses until the serology shows a definite response. Either way, treatment should be continued until such a response does occur.

We should like to thank Professor P. C. Cloake for the follow-up notes of the case, and the Director-General, Army Medical Services, for permission to publish.

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Spastic and other disabled children in hospitals and special schools are finding the use of magnetic letters both entertaining and instructive. Clinging to the surface of special blackboards, which can be held in any position, these letters are particularly helpful in the education of children who have to lie on their backs.

ANAPHYLACTIC SHOCK AS A COMPLICATION OF INSULIN COMA THERAPY

BY

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AND

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Changes in insulin sensitivity are fairly common during insulin coma therapy and are shown by changes in the time and depth of coma, usually in the direction of increased sensitivity, requiring reduction of the original coma-producing dose. Insulin hypersensitivity (or allergy) is far less common and actual anaphylactic shock is extremely rare.

Case Report

A 40-year-old male paranoid schizophrenic was admitted to hospital on October 15, 1953. He had been in hospital in 1950 (when he had a three-weeks course of modified insulin) and in 1952. There was no personal or family history of allergy. He was in satisfactory physical health, and routine blood investigations were normal. After preliminary electroplexy, modified by relaxants, he began deep insulin therapy on October 22. This was administered by the routine technique modified by the use of intravenous insulin. Daily injections of insulin were given for six days a week, at first intramuscularly, beginning with 10 units, then 20 units, then increasing daily by 20 units, changing to intravenous injection at 60 units. Various brands of soluble insulin of 20 units per ml. strength were used in the treatment unit, but only one batch was in use at any particular time.

November 1 was a rest day, and on the 2nd an intravenous injection of 160 units of soluble insulin was given at the usual slow speed at 7.50 a.m. This was the tenth treatment, and the dose was the same as that administered on October 31, when only sweating had resulted, with termination of the hypoglycaemia by oral glucose at 10.30 a.m. No untoward reactions had previously been noted. On this occasion, however, five minutes after injection coughing and retching occurred. The manifestation of anaphylaxis was immediately suspected, and during the preparation of an adrenaline injection severe bronchospasm occurred with startling rapidity and severity, and the patient became pallid and cold. Intravenous adrenaline tartrate, 2 ml. of 1 in 1,000 solution, was given, and general treatment for shock was begun. Bronchospasm and vasomotor collapse remained very pronounced, and consecutive intravenous injections of 60 ml. of 33% dextrose solution and 2 ml. of nikethamide were given, accompanied by continuous insufflation of oxygen (later changed to oxygen with 5% carbon dioxide). Slow intermittent intravenous injection of adrenaline was maintained, and between 8 and 8.35 a.m. 8 ml. of 1 in 1,000 solution was administered. The case proceeded as follows.

At 8.40 a.m. he was given atropine sulphate, 0.6 mg. (1/100 gr.), and aminophylline, 0.5 g., intramuscularly and 33% dextrose, 60 ml., intravenously. He was now sufficiently recovered to ingest chlorcyclizine hydrochloride tablets ("histamin"), 100 mg., crushed in a little glucose solution. 9.5 a.m.: Blood sugar, 143 mg. per 100 ml. 9.10 a.m.: I.V. 33% dextrose 60 ml., and normal saline 40 ml. 9.30 a.m.: B.P. 114/76; pulse rate, 130 a minute. 10.5 a.m.: B.P. 94/62; I.M. nikethamide 2 ml., and I.V. injection aminophylline 0.25 g.; general condition unchanged. 11 a.m.: B.P. 80/50; pulse rate, 80 a minute; blood sugar, 43 mg. per 100 ml. 11.15 a.m.: Patient suddenly became very collapsed, with dyspnoea and very weak pulse volume; I.V.

nikethamide 2 ml., I.V. 33½% dextrose 60 ml., and I.M. aminophylline 0.5 g. administered, with rapid improvement. 11.30 a.m.: B.P. 84/60; pulse rate, 90 a minute. 12 noon: Renewed collapse, with dyspnoea, weak pulse, and cold extremities; I.V. adrenaline 2 ml., I.M. methylamphetamine hydrochloride 10 mg., and I.V. 33½% dextrose 110 ml. were injected, with consequent improvement. 2 p.m.: B.P. 114/76; blood sugar, 212 mg. per 100 ml.; I.V. 33½% dextrose 60 ml., and I.M. methylamphetamine hydrochloride 10 mg. At 2.10 p.m. the urine contained 2% sugar. The patient was now taking frequent sips of fluids and was maintaining his general condition. 4 p.m.: Blood sugar, 132 mg. per 100 ml.; B.P. 88/58, but general condition fairly good. Conversation was rambling at times, probably due to methylamphetamine abreaction.

The systolic blood pressure remained consistently below 100 mm. despite the general improvement. Another intramuscular injection of methylamphetamine produced further abreaction, and this drug was then discontinued to avert possible exhaustion. Intramuscular nikethamide, 2 ml., was continued two-hourly throughout the night and then four-hourly; chlorcyclizine hydrochloride tablets, 100 mg., were also given four-hourly from the next morning (November 3), when the patient's improvement was well maintained, although his conversation was noted to be rambling.

On November 4 he was still rambling and confused, although accessible mentally. Nikethamide and chlorcyclizine were discontinued, and paraldehyde, 2 fl. dr. (7 ml.), was prescribed as a nocturnal sedative. Next day he was more rational and quite normal physically. Clinical psychological examination on November 14 showed no significant mental change resulting from the anaphylaxis.

Follow-up Allergy Studies

An intradermal technique was adopted, using 0.01 ml. of test solution injected from a tuberculin syringe with a fine needle. The batch of insulin in use at the time of the anaphylactic incident ("AB" insulin, 20 units per ml.) gave a strong positive reaction. Similarly strong positive skin reactions were given by all other types of insulin tested, both unmodified (Novo insulin 20-unit solution, and Boots insulin 20-unit solution) and modified (Wellcome P.Z.I. 40-unit solution, Boots I.Z.S. 40-unit solution, and Boots I.Z.S. (amorphous) 40-unit solution). Control solutions used were normal saline and 0.3% cresol (since this latter was the preservative added to the original insulin solution): these gave consistently negative results, as also did Bencard intradermal solutions of pig, beef, and mutton proteins.

At the beginning of December passive transfer of sensitivity was attempted, using four healthy non-allergic subjects: three gave positive reactions and one gave a slight positive reaction. Sensitized skin areas were prepared by the injection of 0.1 ml. of the patient's serum.

In January, 1954, when his intradermal response to soluble insulin was still strongly positive, experiments with antihistamines were carried out, and it was found that oral dosage (chlorcyclizine hydrochloride tablets, 100 mg., an hour before the injection) diminished the reaction considerably; but this remained positive, whereas coincident injection with the insulin solution, using 0.01 ml. of a 2.5% solution of mepyramine maleate (0.25 mg. of salt) with 0.01 ml. of soluble insulin (0.2 unit) achieved almost complete neutralization.

In April, intradermal testing revealed the continued presence of a strongly positive allergic reaction to insulin. It is proposed to keep this patient under observation, so that the expected waning of his allergic state may be detected by repeated tests for skin allergy and circulating skin-sensitizing antibodies (reagents).

Discussion

The occurrence of a true anaphylactic reaction was confirmed by the presence of an incubation period, the positive

intradermal tests, and the detection of circulating antibodies. These features are absent in the so-called anaphylactoid response to intravenous injections (Sollmann, 1942).

Earlier literature on the allergenic properties of insulin has been well summarized by Harten and Walzer (1940) and by Yasuna (1941). The above case is an unusually severe example of the generalized reaction regarded as occurring in about 1 in 1,000 insulin users, although Ulrich *et al.* (1939) suggested that insulin allergy was relatively more frequent in the non-diabetic patient. Harten and Walzer criticized the paucity of skin-test recording in these cases and pointed out that even less often was the possible presence of circulating reagins investigated, although neither of these reactions necessarily parallels the presence or severity of clinical symptoms.

Of particular interest in the described case was the presence of the "latent period" prior to the anaphylactic incident that occurred 11 days after the first injection of the insulin course—which was itself begun two and half years after a previous course. The increased frequency of allergy (particularly generalized) when insulin therapy had been interrupted and the resemblance of the "latent period" to the incubation period of serum sickness were emphasized in the reviews by Tuft (1928), Harten and Walzer, and others. A further feature was the occurrence of the episode immediately following an insulin-free "rest day"; this can be compared with the cases of Hinko *et al.* (1941) and of Sherman *et al.* (1941). Non-diabetics are far more likely to suffer interruptions of insulin administration, and this may account for their reported greater liability to allergic reactions.

Allergy studies in the above case confirmed the activity of a specific antigen. Despite the improved purification of insulin, some authorities maintain that its apparent allergenic properties are due to minute amounts of contaminating protein material, or even to an alteration of insulin in the isolation process, rendering it a "foreign protein" (Waters and Best, 1941).

Jorpes (1949) claimed that repeated recrystallization of insulin reduced the incidence of allergic reactions, and suggested that these were usually, if not always, due to impurities.

The antihistamine experiments demonstrated the efficacy of these drugs in neutralizing insulin allergic effects: this has been confirmed by therapeutic experience, sometimes combined with desensitization, spontaneous or induced (Hunter and Hill, 1947; Leavitt and Gastineau, 1947; Armstrong and Lloyd, 1954). In the treatment of the above case an oral antihistamine was used, but it may be that early administration of an injectable compound, unfortunately not available at the time, might have shortened the emergency period.

We wish to thank Dr. J. S. McGregor, medical superintendent, Saxondale Hospital, for permission to publish this paper; Mr. D. C. Hubbard, F.I.M.L.T., for technical assistance; and the nursing staff for their invaluable co-operation.

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ESTIMATION OF ISONICOTINIC ACID HYDRAZIDE IN BLOOD SERUM AND CEREBROSPINAL FLUID

BY

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Cuthbertson and his colleagues (1954) described a method of estimating isonicotinic acid hydrazide (I.N.H., isoniazid) in blood plasma and urine that marked a considerable advance on previous methods. Their method, however, requires about 10 ml. of blood and is rather elaborate for routine purposes. Our interest in the subject has been confined to blood and cerebrospinal fluid (C.S.F.), for which it has been possible to shorten the procedure in a manner that may be of interest to others.

Method for Serum and C.S.F.

Reagents.—Acetic acid, 0.05N. Phosphate buffer pH 6.5: 3 vol. M/5 Na₂HPO₄ and 7 vol. M/5 KH₂PO₄. Picryl chloride solution: 35 mg. (B.D.H.) in 10 ml. ethanol. Acetic acid, 5N. *n*-Butanol.

Protein Precipitation (in test-tube, 16 by 125 mm.).

Serum.—To 1.25 ml. of serum add 7.5 ml. of water and 1.25 ml. of 0.05N acetic acid.

C.S.F.—To 1.25 ml. of C.S.F. add 7.75 ml. of water and 1 ml. of 0.05N acetic acid. (When other amounts of serum or C.S.F. are used the above proportions of 0.05N acetic acid are strictly adhered to, and the volume is always made to 10 ml.) The tubes are immersed in a bath of boiling water for about three minutes to coagulate the protein. They are then centrifuged.

Colour Reaction.—To a test-tube (16 by 125 mm.) add 8 ml. of the supernatant fluid (≡ 1 ml. of serum or C.S.F.), 2 ml. of buffer, and 0.25 ml. of picryl chloride solution. Heat the tube in a bath of boiling water for 20 minutes. Cool. Add 0.4 ml. of 5N acetic acid and 3 ml. of *n*-butanol, and shake vigorously for one minute. Spin, and remove the clear butanol layer into small tubes containing 2 drops of ethanol to prevent clouding. Transfer to a glass cuvette with 1-cm. light path and note the optical density at wavelength 500 mμ.

Calibration Curve.—This was constructed from a series of readings made from solutions containing 8 ml. of water, 2 ml. of buffer, and 0.25 ml. of picryl chloride solution, and containing 0, 0.5, 1, 2.5, 5, and 10 μg. of I.N.H. Such solutions were heated as described above and the optical density of the butanol extracts was measured. When no I.N.H. was present there was a reading of about 0.01 optical density. When this was subtracted from all readings a strictly linear curve in the above range was found such that the observed optical density × 34.5 = μg. I.N.H.

It may be noted here that the optical density from controls containing no I.N.H. increases rapidly with light of wavelength less than about 480 mμ, whilst at great wavelengths the optical density from the reaction product of I.N.H. and picryl chloride decreases rapidly. At 500 mμ the blank value is almost negligible and the sacrifice in sensitivity is not more than about 20%.

Serum and C.S.F.—Controls.—Under the above conditions it has been found that sera from patients who have not received I.N.H. commonly give values, expressed as I.N.H., of 1 to 2 μg. per ml., and corresponding C.S.F.s about half such values. Such blank values are somewhat reduced but not eliminated by the extraction procedure of Cuthbertson *et al.*, so that control observations are always necessary for accurate estimation. However, as the

amount of serum or C.S.F. required is now moderate, proper control determinations are practicable with sample volumes ordinarily obtainable in hospital wards.

Recovery of I.N.H. Added to Serum.—The amount of I.N.H. recoverable from serum by the present method of analysis may be seen from the observations shown in the Table. With C.S.F., recovery values are rather better.

Recovery of I.N.H. Added to Serum

I.N.H. added, μg. ml. serum	0	0.4	0.8	1.2	1.6	2.0
I.N.H. recovered, % ..	Range of blanks: 1.41–2.07 μg. as I.N.H. ml.	89	87	85	82	84
Range of recovery values, %		86–95	83–95	78–92	69–88	77–90

To seven sera, in six lots each, I.N.H. was added in the amounts noted. In each case 1.25 ml. of the serum was deproteinized as described and the equivalent of 1 ml. filtrate was treated as further described for the colour reaction. The range of blank values is inserted to indicate the necessity for control determinations.

Tungstic acid may be used, as described by Cuthbertson *et al.*, for deproteinization, but the above method gives more consistent results, is simpler, and indeed yields better filtrates with C.S.F.

Summary

A simplified method suitable for routine estimation of isonicotinic acid hydrazide in blood serum and cerebrospinal fluid is described.

I should like to express my appreciation to Dr. S. W. A. Kuper (Brompton Hospital, London) for details of the method of Cuthbertson *et al.* before publication; to Dr. F. D. Stott for designing the photoelectric colorimeter; and to Mr. G. J. Bowser for technical assistance.

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Medical Memoranda

Delay in Passage of a Ryle Tube Ingested Accidentally

Many papers in the medical literature have dealt with ingested foreign bodies and complications therefrom, but, so far as can be determined, none has mentioned a Ryle stomach tube as the foreign body. Furthermore, none has described arrest occurring at the duodeno-jejunal flexure. For these two reasons the following case is worth recording.

CASE REPORT

On February 16, 1953, a youth aged 16 suffering from a left pleural effusion had a Ryle tube passed to obtain a specimen of his gastric washings for examination for tubercle bacilli. During the procedure he swallowed the tube accidentally. A strong saline emetic given immediately failed to return the tube by mouth, but it was thought that it would pass through the alimentary canal without incident.

The following day a radiograph of the abdomen showed the tube high in the abdominal cavity, probably in the stomach. Seven days later, as the tube had not passed, a second radiograph was taken and this showed that its position had not materially altered. In an attempt to locate it a barium meal was given nine days after the tube had been swallowed, and the radiograph revealed part of it emerging from the barium-filled pylorus and occupying the curve of the duodenum. Following this, regular screening demonstrated the metal weight in the end of the tube to maintain a fairly constant position on the left of the vertebral column, at the level of the third lumbar transverse process, corresponding to the position of the duodeno-jejunal flexure.

Sixteen days after the ingestion of the tube a second barium meal was given, and a lateral radiograph showed the metal weight still lying posteriorly to the stomach, at the

level of the third lumbar vertebra. On the thirty-sixth day a third barium examination revealed the metal marker in roughly the same position, and it was thought highly probable that arrest had occurred at the duodeno-jejunal junction.

On the forty-third day it was decided that, as no progress had been made, the boy should have an exploratory laparotomy with a view to removal of the tube. Shortly before the date arranged for operation, on the fifty-third day, the boy was screened again, and this time the metal weight was clearly seen lying in the pelvis. Digital examination of the rectum confirmed the presence of the tube, which was hooked by the finger and withdrawn.

COMMENT

The interesting point in this case is the unusually long time (53 days) the tube remained in the alimentary canal; yet, despite this, the patient suffered no ill effects of any kind.

It seems probable from the radiological findings that the point of arrest was the duodeno-jejunal flexure, which must surely be unusual. Furthermore, after a delay there, known to have lasted 34 days and which was probably longer, the tube became dislodged and passed without further trouble.

It is reasonable to conclude, therefore, in dealing with cases of this kind, that, provided there are no symptoms, a delay of six to eight weeks is warranted before surgical removal is considered, and that, in addition, a failure of the tube to advance in the alimentary canal for as long as three to four weeks does not preclude the possibility of a natural passage.

I thank Dr. A. J. Moon for permission to publish this case.

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Occupational Calcium Necrosis of the Skin

Necrosis of the skin due to calcium chloride solution appears to be a rarity in that only two cases have so far been published. Oppenheim (1935) described its occurrence in an ice-cream maker who accidentally allowed the concentrated solution of calcium chloride used as a freezing bath to come into contact with his skin. Heppleston (1946) described it in an operator using a 40% solution of calcium chloride as a dust-laying spray in a South Wales coal-mine. The following case, in a maker of anti-freeze solution, serves to confirm the existence of calcium chloride necrosis and to stress the need for protecting the skin from this substance.

CASE REPORT

A 29-year-old Turkish labourer was employed in making a 40% solution of calcium chloride. This was marketed as

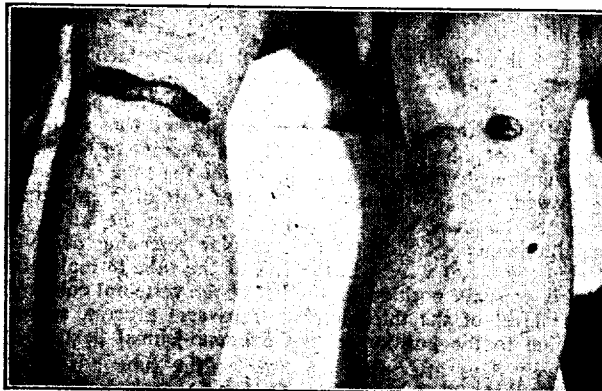


FIG. 1.—Necrosis of friction areas on the legs due to calcium chloride solution.

an anti-freeze agent to add to water used for mixing mortar and concrete in cold weather. The manufacturing arrangements were primitive, and one day he splashed his trousers with the solution, but did not change them or wash his legs. That night he noticed considerable pain in the parts of his legs where the tops of his gum-boots had rubbed.

The next morning he reported to the industrial clinic and his legs appeared as in Fig. 1. On each was a thick black eschar surrounded by a thin border of inflammation. The appearance was similar to that of the coagulum produced by the old tannic acid treatment of burns. The eschar was obviously necrotic skin involving the full skin thickness.

With conservative treatment the coagulum began to separate along the edges on the 19th day, and was half separated on the 30th day. Healing was not complete until the 90th day.

A biopsy (Fig. 2) showed coagulative necrosis of the epidermis and underlying dermis. The latter was crowded with nuclear fragments and there was slight proliferation of fixed tissue cells in the surviving connective tissue. Von Kossa's reaction showed obvious impregnation with calcium.



FIG. 2.—Lesion of right leg, showing necrosis and calcium impregnation. Haematoxylin and eosin, Von Kossa.

COMMENT

The microscopical appearances in Heppleston's case were similar, except that in the less severe lesions there was necrosis and calcium impregnation of the dermis only. As in this case, severe lesions were present on those parts of the legs where friction from the tops of the gum-boots had occurred. Healing was prolonged, and it is for this reason that it is so important to protect the skin from calcium chloride solutions.

The cause of the lesions is probably the alkalinity of the solution combined with its necrosing effect. In the present case the pH of the solution was 9.4, and it was found by titration to have an alkalinity equivalent to N/50 NaOH. Calcium is a well-known necrosing agent, as shown by the dire results of its accidental injection subcutaneously or intramuscularly. The alkalinity would soften the horny layer of the skin so that penetration and subsequent necrosis could occur.

I would like to thank Dr. L. E. Glynn for kindly preparing and reporting on the section in this case.

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Slough Industrial Health Service.

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Reviews

KWASHIORKOR

Kwashiorkor. By H. C. Trowell, O.B.E., M.D., F.R.C.P., J. N. P. Davies, M.D., and R. F. A. Dean, Ph.D., M.R.C.P. (Pp. 308+xii; illustrated. 50s.) London: Edward Arnold (Publishers) Ltd. 1954.

A great deal of research has been done on kwashiorkor since the appearance in 1931 of Cicely Williams's classic description of the disease. Introduction of the liver biopsy technique and of new biochemical methods has given impetus to this work, and Dr. Trowell and his co-authors are able to quote over 600 references to it. When a disease of hitherto unknown causation becomes the object of much interest it is to be expected that many differing opinions will emerge, and in this respect kwashiorkor has proved no exception. There is, therefore, a need for a book, not only to draw together the widely dispersed literature on the disease, but also to mediate between varying opinions concerning it. Dr. Trowell and his associates at Mulago have been in the forefront of those carrying out research on kwashiorkor; none are more qualified to write on the subject, and they have well accomplished the task of preparing this book. It is readable, and the narrative proceeds easily from the history of the disease to the clinical features, diagnosis, pathological anatomy, biochemical findings, treatment, and prevention. There follows a discussion on protein malnutrition in adults and on the pathological and physiological implications of it and of kwashiorkor in children. There are many good photographs and diagrams.

Throughout the work the authors have put forward their own findings and views with modesty, and, though seldom leaving the reader in doubt as to their opinions, they have been careful to quote opposed views. Few will, however, disagree with their conclusion that the main features of the disease are caused by defects of protein metabolism. The use of the term "kwashiorkor" may be criticized, but this has been used advisedly. In different parts of the world innumerable terms are used for the same disease, some, such as "infantile pellagra," being sources of considerable confusion. There is need for a single generally understood term, and at present this should not imply too precise a knowledge of aetiology. There is much to be said for the term "kwashiorkor" by which the disease is known to the Ga tribe of the Gold Coast, among whom Dr. Cicely Williams carried out her original researches.

The medical world is indebted to Dr. Trowell and his associates for much of what is known about kwashiorkor. The debt is now greatly increased, for in writing this book they have performed yet another valuable service.

A. W. WOODRUFF.

RADIOISOTOPES IN MEDICINE

Radioisotope Conference, 1954. Proceedings of the Second Conference, Oxford, 19-23 July. Volume I. Medical and Physiological Applications. Edited by J. E. Johnston, assisted by R. A. Faires and R. J. Millett. (Pp. 418+xi; illustrated. 65s.) London: Butterworth's Scientific Publications. 1954.

Two important conferences have been held at Oxford on the uses of radioactive isotopes, each having been organized by the Atomic Energy Research Establishment, Harwell. The first took place in 1951, and its report, published in 1953, included about 70 papers on medical and biological radioisotope techniques (*Journal*, October 3, 1953, p. 766). The second conference met in July, 1954, and the present report is perhaps of even more value, both to those working with these methods and to anyone wishing to assess their scope or progress. Fewer communications were presented than in 1951, but they are in many cases fuller and more developed than those made at the earlier conference, though they still have the refreshing character of describing work actively in progress.

This volume gives all of the 46 medical and physiological papers presented in 1954, and the discussion following each. Fully half of these papers concern human investigation or therapy with some fifteen different radioactive elements, and the report as a whole forms a most useful source of information as to progress in new methods of investigation.

The value of this book is considerably increased by the impressively short time that elapsed between the conference in July and publication of its proceedings in November, and both the publishers and those who undertook this work at Harwell are to be congratulated and thanked for this addition to the outstanding success of the conference itself.

E. ERIC POCHIN.

CHEMISTRY OF METABOLISM

Chemical Pathways of Metabolism. Edited by David M. Greenberg. Volume II. (Pp. 383+vi. \$9.50.) New York: Academic Press Inc. 1954.

This is the second volume of the work, the first volume of which was reviewed in these columns on October 30 of last year (p. 1035). The survey of existing knowledge of the metabolism of major constituents in living organisms continues with "Nitrogen Metabolism of Amino Acids" (P. P. Cohen); "Carbon Metabolism of Amino Acids" (D. M. Greenberg); "Synthetic Processes Involving Amino Acids" (D. M. Greenberg); "Metabolism of Sulphur-containing Compounds" (D. M. Greenberg); "Enzymatic Syntheses of Peptide Bonds" (H. Borsook, with an Addendum by D. M. Greenberg); "Purines and Pyrimidines" (M. P. Schulman); "Nucleotides and Nucleosides" (L. A. Heppel); and "Metabolism of Haem and Chlorophyll" (S. Granick). Thus the review proposed is completed in this volume.

The mechanism whereby protein is synthesized in living systems remains mysterious, and perusal of the relevant chapters in the volume under review leads one to no definite conclusion. The interpretation of results in which isotopically labelled amino-acids are incorporated into tissue substance is often uncertain, and the caution advisable in the assessment of the significance of results of this sort is critically discussed. One can say that the elucidation of the mechanism of protein synthesis is the most important outstanding problem in the field of intermediary metabolism; it is one that must have relevance to the nature and control of both normal and neoplastic growth.

Some overlap was unavoidable among the chapters of the present volume, but this is not such as to inflate the book unduly. The two volumes together provide an authoritative and lucid account of the present knowledge of intermediary metabolism and can be confidently recommended to those who wish to bring their knowledge of a complex field reasonably up to date.

F. G. YOUNG.

ACTINOMYCETES AND THEIR ANTIBIOTICS

Guide to the Classification and Identification of the Actinomycetes and their Antibiotics. By Selman A. Waksman and Hubert A. Lechevalier. (Pp. 246+x. 38s. 6d.) London: Baillière, Tindall and Cox. 1953.

In this useful reference volume the discoverer of streptomycin and one of his colleagues first classify the Actinomycetes and describe each species. The genus occupying most space is naturally *Streptomyces*, since it is from within this that most antibiotics since penicillin have come; 147 species are described, many of them first studied by the author himself long before the antibiotic era, and others discovered recently as antibiotic producers in the course of large-scale soil surveys. The descriptions are intended to enable workers to decide whether any newly isolated species is in fact new, and they will be helpful for this purpose, though not always conclusive.

The second part of the book is about the antibiotics formed by this class of micro-organism, which the authors divide into twelve groups. Four of these are of clinical interest on account of their antibacterial activity, and

others because of their activity against fungi, protozoa, and viruses; the remainder are of academic rather than clinical significance. It is stated that substances with anti-neoplastic properties may come to assume greater importance. There follow a key to the identification of these antibiotics and a description of each in alphabetical order, stating its source, method of extraction, chemical and physical properties, biological activity, toxicity, and uses if any. Mycologists and anyone engaged in the present search for antibiotic-forming organisms will find this book a valuable source of information.

L. P. GARROD.

CHROMATOGRAPHY

Chromatography. British Medical Bulletin, Volume 10, No. 3, (Pp. 161-252; illustrated. 15s.) London: British Council. 1954.

The distinguished contributors who have written the separate chapters to this volume make an almost unique contribution to the literature on chromatography. The introduction by Dr. A. J. P. Martin is followed by a valuable account of the general principles by Dr. R. J. P. Williams. The gas-liquid chromatography is dealt with by Drs. James and Martin, and the application to paper is covered by Dr. Consden. The remaining chapters deal with applications of the method to special problems. Those of most interest to medical readers deal with amino-acids (A. C. Chibnall), peptides (P. N. Campbell and T. S. Work), porphyrins (J. E. Falk), thyroid hormones (J. Gross), antibiotics and vitamins (T. S. G. Jones), steroids and sterols (I. E. Bush), proteins (R. R. Porter), separation of amino-acids and peptides (S. M. Partridge), and amino-acid metabolism (C. E. Dent and J. M. Walshe).

The general standard is so high that it is somewhat invidious to select any particular article. The references are well chosen and in many cases cover the literature up to the year of publication. Although most articles are confined to technical methods, some interesting new data on amino-acid metabolism are included in the last article in the book. Altogether this most useful volume has appeared at a particularly appropriate time, and all those working in the field will be grateful to the writers for their informative summaries of work on their special subjects.

N. F. MACLAGAN.

MEDICAL LIBRARIANSHIP

Proceedings of the First International Congress on Medical Librarianship. Edited by F. N. L. Poynter. *Libri*, Volume 3, 1954. (Pp. 451; illustrated. Danish kroner 50.) Copenhagen: Ejnar Munksgaard. 1954.

The professional librarian is of comparatively recent origin. "At the first national meeting of librarians in America in 1853 some 70 of the 82 gentlemen present were university professors or clergymen; while three or four were lawyers and an equal number physicians." The full-time professional medical librarian is of still more recent origin, yet their number has increased rapidly. The medical group of librarians was the first to hold an international congress, which took place in London in July, 1953. This volume contains the 61 addresses delivered at the congress and the discussions which took place upon them, well edited by Mr. F. N. L. Poynter.

Among the papers are several dealing with the function and education of the medical librarian and with systems of classification and centralization; there are also an account of medical libraries all over the world and some historical papers. Here we have a mine of information which will be constantly referred to by all interested in medical books. In the account of London medical libraries we missed any reference to that of the Medical Society of London. Among such an array of papers it is difficult to mention many, but we particularly liked the short account given by Lieutenant-Colonel Frank B. Rogers of the growth of the wonderful Armed Forces Library at Washington; the erudite article

by Mr. K. W. Humphreys on the medical books of the mediaeval friars; the description of the Trew Library at Erlangen; and Dr. Bett's witty comments on the writing of papers by medical men. We quote from the last-mentioned: "Do remember that it is possible for a medical man to be a pillar of his profession and at the same time be utterly ignorant of the meaning of so hackneyed a term as *ibidem*."

Mr. W. B. McDaniel pays a nice compliment to doctors and to medical librarians when, in commenting on the statement made by two medical historians that medical librarians as a class were very helpful and companionable, he adds: "I confess that I have often felt we were peculiarly delightful people, for librarians. If it be true that we are, the explanation is a simple one. We serve the sons and daughters of Aesculapius—a most delightful and inspiring lot." We leave it at that.

ZACHARY COPE.

MEDICAL SHORT STORIES

Medicine in its Human Setting: Being Clinical Stories for Students, Nurses, and Practitioners. By A. E. Clark-Kennedy, M.D., F.R.C.P. Illustrations by Sylvia Treadgold, M.S.I.A. (Pp. 276; illustrated. 13s. 6d.) London: Faber and Faber, Ltd. 1954.

When Dr. Conan Doyle published *Round the Red Lamp*, a collection of medical short stories, in 1894, he was criticized for describing features of medical life which were better relegated to the lecture-room, the ward round, or the textbook. The subject was painful; then why treat it at all? To this he replied that it was the province of the novelist to describe painful things as well as cheerful ones. The course of time has changed all that, and to-day a book of medical short stories needs no apology. Authors like Treves, Francis Brett Young, A. J. Cronin, and Somerset Maugham have made use of their medical knowledge in fiction, and non-medical writers have done the same. Who can forget the masterly picture of locomotor ataxia in Kipling's story "Love o' Women," or the harrowing account of cancer in Arnold Bennett's *Riceyman Steps*?

In this book Dr. Clark-Kennedy, whose writings on the history and philosophy of medicine stimulate thought and practice, has written 22 short stories on various aspects of disease. His aims are to lighten the heavy burden of medical reading; to correct the bad habit of thinking of diseases as if they had a real existence apart from the men, women, and children who suffer from them; and to impress the lesson that the real object of medicine is not the application of science to a diseased body but the relief of human suffering. The purpose is excellent; the task is a little difficult to fulfil. Sometimes the human side of the story is over-weighted by technical detail; sometimes the picture is too sombre. I liked best the story of the eccentric behaviour of Mr. Swindlethorpe, the managing director who had G.P.I. It has a happy ending, for he responded to intensive treatment with penicillin.

Medical readers will appreciate this excursion of a distinguished physician into the realms of fiction. Miss Treadgold's illustrations are apt and amusing.

ARTHUR S. MACNULTY.

Until now Canada has had no medical directory of its own, its physicians and surgeons having been listed in the unwieldy *American Medical Directory*, which last appeared five years ago. Now the first *Canadian Medical Directory* has appeared, appropriately enough a few months before the joint meeting of the British and Canadian Medical Associations, and it will be particularly useful to those concerned with that meeting. The directory has three divisions—an alphabetical listing of doctors; a geographical listing by province and town; and a section containing general information on medical societies, departments of health, universities, journals, etc. The arrangement owes something to our own *Medical Directory*, although entries are not so informative. The *Canadian Medical Directory* is issued by Current Publications Ltd., 9, Duke Street, Toronto, 2, Canada, and costs \$7.

BRITISH MEDICAL JOURNAL

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ACUTE RHEUMATIC FEVER IN CHILDREN

Of unique historical interest, the article in our opening pages this week is a report of the first international clinical trial to be carried out. The study was sponsored by the Rheumatic Fever Working Party of the Medical Research Council of Britain and the Subcommittee of Principal Investigators of the American Council on Rheumatic Fever and Congenital Heart Disease, American Heart Association. It was designed to test the relative efficacy of A.C.T.H., cortisone, and aspirin in the treatment of acute rheumatic fever, with reference not only to the relief of acute symptoms but to the prevention of cardiac damage.

Nearly six years have passed since Hench and his colleagues¹ reported their observations on three adolescent patients, suffering with acute rheumatic fever, to whom they administered adrenal cortical hormone. Compound E (Kendall) acetate was given by intramuscular injection, the dose being 200 mg. daily for several days, and then 100 mg. daily for a few days more. The immediate results were gratifying, and the paper is well worthy of study not only for its historical interest but also as a model of careful clinical observation and scientific wisdom. Many subsequent reports, such as that of E. N. Chamberlain, J. D. Hay, and D. M. Freeman,² have borne witness to the efficacy of adrenal hormone during the acute stage of rheumatic infection. But is it a better treatment than salicylates, and does it possess the additional advantage of preventing progressive and permanent cardiac damage?

In all, 505 children aged under 16 were admitted to the study (242 in the United Kingdom and 263 in the U.S.A. and Canada); 5 were subsequently excluded. The remaining 500 were allocated by random sampling methods to the three treatment groups, subdivided according to lapse of time between onset of symptoms and beginning of treatment. The results of treating 497 patients were finally analysed. Diagnostic criteria and details of treatment should be consulted in the

report, and the reader will be impressed by the great care taken to enable reliable conclusions to be drawn. Treatment was given during a six-weeks period, and at the same time the dietary intake of sodium was restricted to less than 2 g. per day for all patients, to minimize salt retention in hormone-treated patients and to maintain comparability among the three treatment groups.

Attempts were made to prevent recurrent attacks of rheumatic fever by giving penicillin during the first two weeks of treatment, and sulphadiazine from the fourteenth day onwards. Follow-up data (with special reference to rheumatic heart disease) were obtained at intervals during the succeeding year. The investigation continues, and a final determination of each child's cardiac state will be awaited with interest. But several important conclusions emerge from the results to date. There is no evidence that rheumatic fever in childhood can invariably be terminated by any of the three treatments used; hormone therapy controls the acute manifestations more quickly than does aspirin, but there is a greater tendency for them to reappear for a short time at the end of treatment; and at the end of one year there was nothing to choose between the three groups in respect of cardiac state. This last conclusion is disappointing, though there is still the possibility that a longer survey of these patients may show some advantage to lie with the hormone-treated group. But it seems unlikely that this treatment will be shown to have any spectacular effect in protecting the heart, and the challenge of rheumatic carditis must still be met mainly by preventive measures.

In the Harveian Oration given to the Royal College of Physicians in 1945 Sir John Parkinson³ estimated that about 16,000 people were dying annually of rheumatic heart disease, and that at least 200,000 people between the ages of 18 and 41 were at that time suffering from heart disease, mostly rheumatic. It is well known that the incidence of rheumatic infection has been waning for some years, but we should not assume that this decline will necessarily continue, and some districts have recently reported a local increase. At present about 4,000 to 5,000 new cases occur annually in England and Wales in the age-group 5 to 14 years, and to this figure must be added the frequent cases of relapse—an increasing threat to the heart. Unfortunately, from the point of view of effective prophylaxis, mystery still surrounds the essential nature of rheumatic infection. Both genetic and infective factors have to be considered,⁴ and many workers, including Bruce Perry⁵ and Ryle⁶ have emphasized the significance of social conditions in the child's environment. Family income,

¹ Hench, P. S., et al., *Proc. Mayo Clin.*, 1949, 24, 277.

² Chamberlain, E. N., et al., *British Medical Journal*, 1952, 1, 1145.

³ Parkinson, J., *Lancet*, 1945, 2, 657.

⁴ Bradley, W. H., *Proc. roy. Soc. Med.*, 1950, 43, 979.

⁵ Perry, C. B., *Bristol Med.-chir. J.*, 1944, 61, 1.

⁶ Ryle, J. A., *J. roy. Sanit. Inst.*, 1946, 66, 277.

⁷ Courrier, 1954, 4, 357.

⁸ Perry, C. B., and Gillespie, W. A., *British Medical Journal*, 1954, 2, 729.

⁹ Stollerman, G. H., *Amer. J. Med.*, 1954, 17, 757.

¹⁰ Catanzaro, F. J., et al., *ibid.*, 1954, 17, 749.

nutritional standards, overcrowding, and ventilation all seem to bear a relationship to the prevalence of rheumatic infection, and when a single factor is sought that might be common to these possible influences the most likely conclusion is that it lies in infection (especially of the nose and throat) with group A β -haemolytic streptococci.

Claims have been made that the incidence of rheumatic infection can be lessened by effective treatment of these streptococcal infections during the acute phase, both in the primary attack and in relapses, and by sterilizing the upper respiratory passages of carriers. Sulphonamides were at first used, but sometimes they caused toxic symptoms, and the micro-organism developed resistance. Penicillin was found to be free of these disadvantages and has been administered, apparently with success, by mouth and by injection. The prophylactic dose of penicillin, when given by mouth, is 200,000 units three times daily on an empty stomach.⁷ But this treatment must be given over a long period, and the patient's forgetfulness may result in intermittent dosage. Bruce Perry and W. A. Gillespie⁸ have shown that a monthly injection of benzathine penicillin gives a prophylactic blood level and eliminates group A haemolytic streptococci from the throat. G. H. Stollerman⁹ and F. J. Catanzaro *et al.*¹⁰ seem to be in general agreement, and they stress the importance of effective penicillin treatment of the primary pharyngeal infection within ten days of its onset.

Acute rheumatic infection in childhood is still a dangerous menace demanding the continued attention of paediatricians, public health officers, and laboratory workers.

OPERATIVE TREATMENT OF AORTIC ANEURYSMS

It is now agreed that surgical treatment should be considered when the diagnosis of aneurysm of the aorta is made. The prognosis is grave and medical treatment ineffective.¹ The palliative manoeuvre of wiring—to induce a clot formation within the aneurysm—by passing into the lumen a length of wire, either as a continuous coil or as a Colt's wisp,² is often effective in relieving pain and may retard the enlargement of the aneurysm and improve the prognosis: it can only be done for saccular aneurysms with a well-formed neck, where thrombosis will not involve the main aortic blood stream. Wiring has been practised for many years, but never extensively. A small number of radical operations have now been carried out both for saccular aneurysms and for fusiform aneurysms not involving the proximal aortic arch

above the origin of the left common carotid artery. Saccular aneurysms can be excised and the aorta repaired if a clamp can be placed tangentially across the neck without occluding the aortic lumen, so as to allow lateral suture. Fusiform aneurysms can usually be treated only by grafting, a preserved homograft being used to bridge the gap left after excision.

Aortic grafting was first done for cases of coarctation where the segment which had to be resected was too long to allow direct end-to-end suture.³ In coarctation an extensive collateral circulation develops in response to the congenital obstruction of the aorta: clamping the aorta during the operation has little effect on the blood flow to the lower part of the body, and ischaemic effects are very unusual. These operations showed that grafting a large artery was practicable and helped to establish the principles described in a recent leading article in this *Journal*.⁴ Thrombosis and rupture of an anastomosis or of the graft are uncommon complications after operative treatment of a coarctation, and it now appears that this will also hold good for grafts applied after excision of aneurysms which may be of a traumatic, arteriosclerotic, or syphilitic origin. For lesions of the lower abdominal aorta, beyond the origin of the renal arteries, the necessary temporary interruption of the aortic blood stream does not usually lead to circulatory disorders. Clamping the aorta above this level for more than a short time leads to irreversible ischaemic effects on various tissues. The most susceptible organ is the spinal cord and its cauda equina, and the kidneys come next. An interruption of blood flow for ten minutes may lead to permanent paraplegia. The exact danger period is not at present accurately known: it depends on age, being considerably longer in children, and on the degree of general arterial disease present. It probably usually lies between fifteen and forty-five minutes. A grafting operation entails clamping the aorta at two levels, above and below the aneurysm. After it has been excised two anastomoses must be made between aorta and the two ends of the graft, which may well take a considerably longer time than can be tolerated.

There are two ways in which the dangers of ischaemia can be avoided. First, a by-pass can be arranged so as to allow the aortic flow to continue throughout the operation. This adds considerably to the technical difficulties, but perhaps with increasing experience a satisfactory method will be devised. Alternatively the oxygen demands of the tissues

¹ Borrie, J., and Griffin, S. G., *Thorax*, 1950, 5, 293.

² *Quart. J. Med.*, 1927, 20, 331.

³ Gross, R. E., *et al.*, *Surg. Gynec. Obstet.*, 1949, 88, 689.

⁴ *British Medical Journal*, 1954, 2, 218.

⁵ Churchill-Davidson, H. C., McMillan, I. K. R., Melrose, D. G., and Lynn, R. B., *Lancet*, 1953, 2, 1011.

⁶ *Surgery*, 1954, 36, 33.

⁷ *J. Amer. med. Ass.*, 1954, 155, 1398.

beyond the level of aortic occlusion can be reduced by lowering the body temperature. It has been shown experimentally that as the temperature falls oxygen consumption is progressively reduced, being about one-third the normal at 27° C.⁵: the cells can obtain enough oxygen for their basal needs without any arterial blood flow for at least a proportionately increased period. Hypothermia thus considerably prolongs the period for which ischaemia can be tolerated, and it allows the thoracic aorta to be clamped for long enough to carry out the necessary operation without haste.

The theoretical advantages of hypothermia in avoiding ischaemic complications after clamping the aorta have been confirmed by experiments carried out on dogs and reported by De Bakey and his colleagues⁶ from Texas. They clamped the aorta at various levels. Many of the animals died in both the control group operated on at normal temperatures and in the group of hypothermic animals. But of the control animals which survived 65% had paraplegia, whereas none of the surviving animals in the hypothermic group had this complication. De Bakey and Cooley⁷ have also recently reported a successful resection and grafting operation for a traumatic aneurysm of the distal aortic arch in a man aged 31. At a first operation a saccular aneurysm was excised and lateral suture performed. An accompanying fusiform aneurysm then increased in size and caused symptoms necessitating a second operation. This was done under hypothermia, the temperature being reduced to about 27° C. by surface cooling with a refrigerating blanket. The aorta was clamped for one hour, while a 9-cm. defect left after excision of the aneurysm was replaced by a homograft preserved in tyrode solution. The patient made an uneventful recovery, after evacuation of a haemothorax, and at no time were there any symptoms of spinal-cord damage.

SEPTIC INJURIES IN INDUSTRY

Most of the injuries requiring treatment in the factory surgery are small lacerations and puncture wounds, and the majority of them affect the hands. These common cuts usually heal uneventfully and do not cause any great inconvenience to the worker, nor do they result in loss of working time. But a few of them become septic, and these are apt to give more trouble. As a cause of losing three or more days' working time, sepsis accounts for about 7% of notifiable factory accidents,¹ though the conditions of notification make it likely that the real figure is rather more than this. Since the war there seems to have been a decline both in the total numbers of septic injuries and in the

proportion which they bear to total notifiable accidents. This decrease has been found in all types of industry, though some—particularly those concerned with metal working—continue to have a much higher incidence than the rest.

The recent study by Wilkes² gives further evidence of the continuing social cost of these septic injuries. Among 151 patients with infections of the hands, the usual amount of time lost was from two to four weeks, and the net loss of earnings for each man averaged about £3 10s. a week. The actual cost to the community must be several times this figure: apart from the further expenses of sickness and injury benefit with no productive return there are the costs of medical treatment, and there are further losses, though difficult to estimate, due to disturbance of team work.

The cases of sepsis as they come to the surgery divide themselves into two groups: those septic when first seen and those which become septic under treatment. The first group includes the majority of finger-pulp infections and paronychias, and because of the peculiarities of the local anatomy they present special problems of treatment and prevention. The causative organisms are most often penicillin-sensitive staphylococci. It might have been expected that penicillin-resistant forms would by now be common, but the findings of Harrison *et al.*³ and Robins⁴ suggest that they are not. Though more recent bacteriological studies are not available, it seems likely that such infections which arise away from hospitals and the common use of penicillin are caused by organisms which are still penicillin-sensitive. A combination of careful surgery and systemic penicillin has almost certainly contributed to the reduction of lost time due to sepsis, and complications such as tendon-sheath infections with their resulting disabilities are now increasingly rare.

If patients with these septic lesions are questioned, a history of some injury can often be elicited. Commonly mentioned are knocks against pieces of metal, splinters, or the edges of hand tools. Many of the patients frequently have such minor injuries in the course of their work, and it is difficult to attribute with certainty the septic condition to any particular one. Radiography of metal workers' fingers will often show the presence of many other splinters of "swarf" in the tissues than the one which is believed to be the cause of the sepsis. Of the patients

¹ Ministry of Labour and National Service, *Annual Report of the Chief Inspector of Factories for the year 1952, 1954*, H.M.S.O., London.

² *Brit. J. industr. Med.*, 1954, 11, 269.

³ *Lancet*, 1949, 1, 425.

⁴ *J. Bone Jt Surg.*, 1952, 34-B, 567.

⁵ *Brit. J. industr. Med.*, 1945, 2, 217.

⁶ *Spec. Rep. Ser. med. Res. Coun. (Lond.)*, No. 266, 1949.

⁷ Gissane, W., *et al.*, *Brit. J. industr. Med.*, 1944, 1, 90.

⁸ Bull, J. P., *et al.*, *Lancet*, 1948, 2, 213.

⁹ Schilling, R. S. F., *et al.*, *ibid.*, 1950, 1, 293.

with septic lesions studied by Wilkes at the Newcastle Hand Clinic, 30% had no memory of any injury, and it is possible that in some cases organisms enter the tissues through minor cracks or even the normal sweat and sebaceous glands. The suggestive evidence presented in this study that a "run down" state of health commonly preceded the sepsis would fit in with this implication of reduced resistance to infection. Some of the patients have septic lesions such as boils elsewhere on the body which might be the source of heavy contamination of the skin with *Staph. aureus*, though about 20% of normal people having no such lesion carry these organisms on their skin. In these circumstances the prevention of all cases of sepsis is probably not attainable. In some factories earlier and better treatment of minor injuries would doubtless be an improvement, but in those with good facilities a stage is soon reached when it is not feasible for every minor wound to be treated. Williams and Capel⁵ found that about 7% of engineering workers injured themselves every day, and Wilkes quotes a workman: "If I reported everything I might just as well sit in the accident room all day." Two general lines of preventive action seem promising: improvement in methods of working, so that swarf and sharp edges are kept away from the workers' hands; and good washing facilities and changes of clothing should reduce the load of infection of the skin and hence the proportion of injuries becoming septic.

The second clinical type of sepsis, that occurring during treatment of an open wound, may also be due to staphylococci, but the more severe examples are streptococcal. The development of sepsis in such wounds is relatively rare, but the fact that it occurs at all means that current methods of treatment could be improved. These infections may occur at the time of dressing, and the studies reviewed by Williams and Miles⁶ give a clear lead to better techniques. A carefully planned routine of treatment incorporating a no-touch technique is necessary, and this is made easier if the lay-out of the dressing station is appropriately designed.⁷ Infection occurring between treatment times may sometimes be due to interference by the patient, but it must sometimes be attributed to the present lack of a really satisfactory surgical dressing which will stand the hazards of normal industrial work. Such a dressing needs to be bacteria-proof; it should be permeable to water vapour so as to avoid sogginess of the skin; it should be resistant to water, oil, and common industrial solvents; and it must remain in place when in contact with these materials during the patient's work. Attempts at such a dressing have already been made,^{8,9} but further development on these lines is needed.

CHILBLAINS

Damp cold is the most troublesome kind of cold weather for those who are susceptible to perniosis or erythema pernio, commonly known as chilblains. Lewis¹ found that the vascular responses of these people were normal if their limbs started by being warm, but if they were cold (as they usually are) there was evidence of abnormally high vascular tone and an increased readiness to develop arteriolar spasm. Together with this spasm of arterioles a dilatation of other blood vessels can be seen, leading eventually to histological appearance of chronic inflammation, fat necrosis, and obliterative endarteritis. Why damp but not dry cold should be to blame is not clear, but the geographical distribution of chilblains, as quoted by Mitchell Heggs,² leaves little doubt of it. Our climate must be accountable for the high incidence in Britain. Adolescents suffer most, particularly young women whose legs are poorly protected; fresh cases are rare after the age of 40. So-called erythrocyanosis crurum, dermatitis hiemalis, and nodular vasculitis are conditions which affect mainly the same group and appear to have the same aetiology: it is doubtful, therefore, if anything is gained by preserving their separate dermatological identities. R. B. Lynn³ suggests that all these manifestations of one pathological process should take the simple name "chilblains." There are many who will be less ready to agree that erythema induratum (Bazin's disease) is not, after all, of tuberculous origin but attributable like the rest to cold.

Lynn emphasizes the distinction between acute and chronic chilblains. Acute chilblains, even if they develop vesicles which rupture, usually clear up in a few days whatever treatment is applied, provided that exposure to cold is not repeated. Susceptibility to acute chilblains often seems to diminish as the patient grows older. A seasonal nuisance, they can usually be avoided if a good diet and sufficient exercise are taken, and above all if the victim consents to be sensibly clothed and shod. But neglect of these rules later in life, or prolonged and repeated exposures to cold from the first in people who are exceptionally prone to chilblains, may lead to changes which persist. Such chronic chilblains, using the term to include all the various clinical appearances, must be regarded as a further stage in the disorder—the pathological changes having become irreversible. Limbs which have been affected by neurological diseases like anterior poliomyelitis are particularly susceptible, which suggests that there may be several predisposing factors in the development of chronic chilblains. Tuberculosis does not seem to be one of these, save in so far as it may affect the general resistance. The sufferers are often young or middle-aged women with stout limbs and thick ankles. Commonly there is symmetrical involvement of the limbs, especially in the lower third of the legs, but sometimes the condition extends to the knees and thighs. Persistent blotchy, reddish-purple discolorations progress to large, swollen, raised lesions which even the coming

¹ *British Medical Journal*, 1941, 2, 837.

² Mitchell Heggs, G. B., in *Modern Practice in Dermatology*, 1950, London

³ *Surg. Gynec. Obstet.*, 1954, 99, 720.

of warm weather will not disperse. Later still the raised nodular lesions ulcerate. The ulcers may heal slowly to form permanently pigmented scars, but are liable to break down finally and coalesce to become large, indolent, open lesions.

In the treatment of chilblains calcium, vitamins, and ultraviolet light have had, and still have, their adherents as general measures. Local applications in great variety have been tried, including emollients, antipruritics, and counter-irritants; but their very number testifies to their slight effectiveness, and the main attack on chilblains should not be local. The basic disorder is arteriolar spasm, and it is rational to use nicotinic acid or tolazoline to offset it. Sympathectomy was suggested almost twenty years ago. This also is a rational form of treatment, though some may think it too drastic. Yet in their chronic form chilblains may cause pain, distress, and disfigurement severe enough to warrant drastic steps. Lynn reports that there has been no recurrence of ulceration on 40 limbs (of 25 patients) after lumbar sympathectomy. But the crux of the matter is prevention. Women may have to choose between the disfigurement of chronic chilblains and the less permanent embarrassment of wearing wool.

"SLUM SICKNESS"

An attempt has recently been made in Glasgow to discover the extent to which the removal of families from slums to new houses has had a beneficial effect on their health, and on social behaviour as measured by juvenile crime.⁴ For this purpose the circumstances of 388 families living in old slum property were studied, together with those of 718 families who had formerly lived in old slum houses but had been rehoused for periods ranging from ten to twenty-seven years. It was hoped at the outset of the survey to superimpose the pictures thus obtained of these two sets of families and study the contrasts, but it unfortunately proved impossible to do so, mainly because the families which had been rehoused were much older than those in the slums. Nevertheless, some interesting facts emerged, which deserve further consideration.

In the first place the comparative youth of the slum families is interesting, because it shows that the slum community which was investigated was the creation of the housing shortage; young people were unable, it seems, to find any accommodation other than in the slums to live in during the early stages of their married life. Poverty (except in the case of old people) could be disregarded as an influence driving them there, for more of the wage earners in the slums than formerly are hard-working, often skilled or semi-skilled operatives in regular employment. Indeed, the proportion of parents classified as in good health was higher in the slums than in the new houses, the reason no doubt being the differences in age between the two groups. In other respects few contrasts were found between the slum families and those which had been rehoused. The feeding habits of the rehoused families, for instance, showed

no improvement on those of the slum population, and deaths of children varied little between the two groups. Delinquency among the boys who were members of rehoused families, again, was "very similar" to that experienced among young people still living in slums. As previous researches had indicated, it was found to be "much in excess" of that which prevailed even among boys who had left school at the earliest permitted age. This may demonstrate that the social consequences of slum life are more harmful to young people than its physical effects.

The conclusion drawn by the authors from this argument is, they think, abundantly clear: "many slum families require a great deal of help and encouragement to make the transition from the slums to a new life," for the evidence "shows again that the eradication of slum sickness does not come with the mere erection of new houses." There is therefore obviously room for a more intensive study of the forms which this "help and encouragement" takes, in order to discover which of them is the most effective; this would require a general survey of the impact of all the social services, from health visiting to housing management, on the members of rehoused families.

One reassuring point emerges from the investigation. The work carried out by Dr. McGonigle in Stockton-on-Tees in 1933 demonstrated that the effect of moving slum dwellers to new houses might have harmful consequences, so far as their health was concerned, because increased rents might leave them with less to spend on food. In Glasgow, however, it was found that the redistribution of purchasing power has freed the rehoused families from economic pressures of this kind. On the contrary, there was an evident need "for the provision of more new houses, particularly to permit removal from the perils of a slum environment of young families at present driven to live there though they could well afford to pay a reasonable rent and would willingly do so."

FLAVOURED MILK

Milk to which various "fruity" flavours have been added is now being sold in increasing quantities. The flavours are mainly synthetic, but concentrated flavouring essences prepared from natural fruit are also being used on a small scale. Promotion of milk sales is the obvious purpose of these flavours; and "Drink More Milk" is a slogan which the medical profession can fully support provided there is no risk to the health of the consumer. As the law stands, however, flavoured milk escapes the provisions in the Food and Drugs (Milk, Dairies and Artificial Cream) Act, 1950, which limit the sale of milk "in specified areas" (mainly the large urban areas) to tuberculin-tested, pasteurized, and sterilized milk. This is a loophole in public health legislation that might well be closed. Fortunately the milk industry itself is aware of the risk, to which attention has already been drawn by the chief chemist¹ of the Milk Marketing Board and by the general secretary² of the National Dairymen's Association. Both strongly recommend that

¹ Ferguson, T., and Pettigrew, Mary, "A Study of 388 Families Living in Old Slum Houses" and "A Study of 718 Families Rehoused for Upwards of Ten Years," *Glasg. med. J.*, August, 1954, 38, 169.

² Provan, A. L., *Milk Industry*, January, 1955, p. 37.

³ O'Neill, P., *ibid.*, January, 1955, p. 41.

milk should be heat-treated after addition of the syrup which carries the concentrated flavours. This authoritative advice should certainly be heeded by dairymen, whether the law is amended or not. The nutritive value of flavoured milk should not differ appreciably from that of ordinary milk, but some mothers may see in these flavoured milks, especially if they have an orange flavour, a convenient means of giving their babies at one and the same time its proper feeds of milk and of vitamin C. Such notions should be dispelled.

CARRIER STATE IN VIRAL HEPATITIS

Experience with viral hepatitis in the second world war led to the differentiation of two closely related forms of the disease—infectious and serum hepatitis—but the lack of a practicable experimental approach has prevented the exact relationship between the two forms from being determined.¹ Reviewing the present state of knowledge on viral hepatitis, a W.H.O. committee² drew attention to some of the pressing problems needing clarification, of which the duration of the carrier state in both types was an important item. Recently three reports of preliminary findings on this aspect have appeared, based on the inoculation of human volunteers under carefully controlled conditions.³⁻⁵

In infectious hepatitis the virus (IH or virus A) is present in the blood for a short time before and during the acute phase of the disease and for longer periods in the gastro-intestinal tract.² The normal duration of faecal excretion is probably short, but the existence of faecal carriers has been considered a probable explanation of the smouldering endemic infection encountered in institutions.⁶ Investigations carried out by Stokes and his colleagues³ on two young children from an orphanage where hepatitis had been endemic for a number of years⁴ established that both had chronic active hepatitis without jaundice and both were faecal carriers of virus A, in one case for six months and in the other for fifteen months after the initial illness.

In serum hepatitis the virus (SH or virus B) has been demonstrated unequivocally only in the blood, in which it may persist for long periods. Just how long in the average case is not known, but three apparently healthy donors also investigated by Stokes and his colleagues³ were found to have virus B in their blood for at least 5½, 3, and 1½ years respectively. One donor appeared to be a true "silent carrier" for at least three years, in that she was symptomless and liver-function tests were within normal limits. This patient's newborn infant developed jaundice at the age of 2 months and succumbed to it. Virus B was recovered from the blood of mother and child by inoculation of human volunteers. Transplacental infection and the existence of silent carriers may help to explain some of the epidemiological aspects of virus B infection.

As both viruses are present in the blood, hepatitis can result from parenteral inoculation with either virus A or virus B if blood is collected during the viraemic phase, though it more often follows the longer incubation usually associated with virus B. In two further reports^{4,5} on viral hepatitis in blood donors it appears that 28–42% may have been due to virus A if the criterion of distinction is the length of the incubation period. Differentiation on this basis is clearly difficult but is of some practical significance, as there is more chance of type A viral hepatitis being controlled with gamma globulin.

None of the donors referred to in these reports gave a history of jaundice; a few admitted to vague non-specific illnesses, and more showed abnormal results in liver-function tests. These findings are worth bearing in mind in selecting blood donors⁷ and emphasize the need for a laboratory test for the detection of healthy carriers of either virus.

ANAESTHESIA AND THE COMMON COLD

Medicine is plagued by myth and mumpsimus,¹ the extent of which was only barely indicated in J. R. Forbes's stimulating and entertaining paper.² Now George Ellis³ suggests that perhaps he might have included as an example of mumpsimus the belief that anaesthesia is contraindicated in the presence of the common cold. However, even Ellis would agree it would probably be going too far to say there is no foundation whatever for the belief that anaesthesia is better avoided in these circumstances. The hundred years or so of world-wide experience of anaesthesia has shown that an anaesthetic may well exacerbate an upper respiratory infection and that more serious chest complications may follow. Nevertheless, Ellis points out, there is little worthwhile factual evidence on this matter. No one will disagree with him that if the operation is urgent then the common cold can be ignored; equally so, that an operation which is necessary for a patient's livelihood or peace of mind should not be postponed. He carefully points out, however, that "it is all too likely that the patient will acquire a nasty hacking cough and that therefore abdominal operations, including those for hernia, should be postponed." Operations on the respiratory tract itself and those inside the chest are better not performed. But Ellis does maintain that a whole host of operations of less gravity, and outside these regions, could be carried out with little increased risk in the presence of a common cold. In view of the current bed shortage and long waiting-lists, Ellis's opinions deserve the closest consideration. They may well be treated with a little reserve and should not be construed into meaning that the presence of a common cold indicates an anaesthetic. This refreshing paper is a worthy addition to the literature on mumpsimus in medicine.

¹ Mumpsimus: a traditional custom, obstinately adhered to however unreasonable it may be.—O.E.D.

² Forbes, J. R., *Lancet*, 1946, 2, 293.

³ Ellis, G., *Anaesthesia*, 1955, 10, 78.

EMERGENCIES IN GENERAL PRACTICE

ATTEMPTED SUICIDE

BY

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A patient's suicidal attempt commonly takes both his relatives and his doctor by surprise. In this emergency the doctor's first duty is to conserve the patient's life, by administering whatever first aid is necessary for the injuries sustained, and by arranging without delay for the patient's further physical and psychological care and treatment. This duty takes precedence, of course, over any detailed investigation of the causes and circumstances of the attempt. Where possible, immediate admission to the mental observation ward of a general hospital is the ideal arrangement. Even if the individual has not sustained serious hurt and the situation appears less urgent to his relatives, it is usually advisable to insist that he goes into hospital. The most skilled medical and surgical care is available there for the treatment of injuries; also a breathing space is obtained, during which the situation may be calmly assessed by everyone concerned. The patient should always be kept under observation for at least a few days. He must be safeguarded from further self-injury, his relaxation and sleep must be ensured by sedatives, a detailed assessment of his mental and physical state must be made, the relatives interviewed, and both the individual and the social aspects of the situation fully considered. Usually a proper decision about his future can be taken within two weeks.

All this calls for such a specialized investigation that the help of a psychiatrist should be enlisted as soon as possible, whether or not the patient has been admitted to a general hospital. Where the practitioner is unsupported by a general hospital or psychiatric advice, he will have to rely more on his first estimation of the seriousness of the attempt (see below) in deciding whether or not to arrange prompt admission to a mental hospital. Mental hospital admission is most often required for those suffering from depressive, schizophrenic and paranoid psychoses, and more often for those past middle age than for younger individuals. It is necessary for most of those aged 60 years or over. If the individual's progress cannot be adequately watched and safeguarded at home, mental hospital or other in-patient care is essential. Admission to a mental hospital should not, however, be made the rule: of those who are admitted initially for a short period to a general hospital, about one-half may be discharged home reasonably safely. Those who go to a mental hospital will usually do so as voluntary patients. Psychiatric out-patient treatment is required for many others.

To discharge from observation an individual who has attempted suicide, just as soon as he is physically fit, is malpractice. Sometimes the patient is asked first to promise that he will not attempt suicide again. This promise, if given, is usually valueless. It may reassure the doctor but it does nothing to safeguard the patient, who can no more control his self-destructive impulses than the sufferer from an acute appendicitis his pain.

How Serious was the Attempt?

The determination behind a suicidal attempt may be very difficult to measure and cannot be judged by any one criterion. It is not profitable to draw a sharp distinction between real suicidal attempts and suicidal gestures. It is better to err on the safe side, which is to consider a gesture a real attempt and to treat it as such. After middle life suicidal gestures are uncommon; in old age they are exceptional.

If the individual has injured himself seriously, or has jumped from a height, or has attempted to hang or drown or shoot himself, there can be little doubt that he intended to take his life. The more bizarre the method used, the more likely is it that the individual is seriously mentally ill. Those who have chosen a solitary place, and those who have used more than one method, are likely to have been in earnest.

That the attempt was feeble in execution does not, however, necessarily mean that the intention was feeble. If the individual has not taken a gross overdose of drugs, or has attempted gassing with the windows open, or has made only a few superficial cuts on his wrists or throat, it is sometimes immediately concluded that he was not serious. But a psychotic patient may make a poor attempt: his agitation or retardation may cloud his judgment and render his hands impotent.

It is of great importance to find out if the individual who has made the attempt has recently appeared nervously ill. If he has not appeared to be ill, especially if he is of chronically unstable temperament, and if the act has been an obvious response to some quarrel or frustration and is described by the actor as done on the spur of the moment, then one may usually conclude that the immediate danger has passed, particularly if the actor himself has become calm again. But there are exceptions here too: the young schizophrenic, hardly recognized to be unwell, may act with great impulsiveness.

Unfortunately one cannot accept at its face value the patient's own estimation of his act, but one must correlate his statement with the rest of the evidence. Not infrequently a suicidal individual denies his suicidal intentions after the act, out of fear of police action or the reproaches of relatives, or to get another opportunity to complete the act. On the other hand, an admission of suicidal intent is usually to be believed. A farewell letter is usually of serious import, and its contents may throw light on the motives which prompted the attempt. Inquiry should always be made whether or not the individual left any communication, since such letters are often suppressed or quickly destroyed by relatives.

The most difficult cases to assess are often those in which the suicidal attempt has been made at home and the method has been barbiturate poisoning. The individual may assert that all he wanted was a long sleep. This statement should not be readily accepted. Some suicidal individuals will deny vehemently that suicide was their intention. The story may be given that the drugs were at the bedside, that the patient took two perhaps, then two more, and when drowsy more still. Such an accident, leading to prolonged and deep unconsciousness, is rare. The story, which relatives are only too glad to accept, is usually a cloak for a suicidal attempt.

¹ MacCallum, F. O., *Brit. med. Bull.*, 1953, 9, 221.

² Expert Committee on Hepatitis, *Wld Hlth Org. techn. Rep. Ser.*, No. 62, 1953, Geneva.

³ Stokes, J., et al., *J. Amer. med. Ass.*, 1954, 154, 1059.

⁴ Neefe, J. R., et al., *ibid.*, 1954, 154, 1066.

⁵ Murray, R., et al., *ibid.*, 1954, 154, 1072.

⁶ Coppa, R. B., et al., *Arch. intern. Med.*, 1952, 89, 6.

⁷ Trumbull, M. L., *Amer. J. clin. Path.*, 1954, 24, 254.

Attempts made when the individual is under the influence of alcohol are also difficult to assess. While it is true that certain suicidal attempts are made under the influence of alcohol which would not have been made in a state of sobriety, alcohol may release a serious suicidal trend; it may also interfere with its consummation. It may be very difficult in these cases to know how prolonged was the oblivion sought. Perhaps two-thirds of such attempts are to be judged serious.

That the attempt was dramatic does not necessarily mean that it was not serious. A serious attempt may be dressed up for and executed publicly. The sufferer from a depressive psychosis may wish to demonstrate to others the extent of his wickedness and his self-punishment: while the aggressive psychopath, venting a murderous spite upon himself, may at the same time court a posthumous publicity by which relatives will suffer.

More men than women commit suicide, and men more often use active and violent methods. These generalizations, though true, hardly help one with the individual case.

Could it Have Been Prevented?

After such a distressing emergency has arisen, one is prompted to ask, could it have been foreseen and forestalled? While it is perhaps doubtful if the really determined individual can often be deviated from his intention, it must be admitted that preventable suicides do occur. They occur because either the doctor or the relatives or both feel sure that, knowing the patient to have been a decent and trustworthy person, a suicidal attempt was not to be expected. But suicide is no respecter of persons.

Almost any nervous or mental illness, at any age, may lead to a suicidal attempt. Suicide is thought of particularly in relation to depressive psychoses, but it is a mistake to consider it as limited to them. It may be a symptom of any psychosis where there is emotional disturbance. It cannot be ruled out in neurotic reactions. It may be the panic response to a sudden crisis of disablement or bereavement, for example, or to a threat of loss of liberty or reputation, or to the self-discovery of homosexual trends. It is the typically exaggerated response to frustration of that large group of temperamentally unstable people which includes the psychopaths and a certain number of epileptics and mental defectives.

The emphasis must be on the early diagnosis of nervous and mental instability, and on treatment and protection at the earliest possible stage. If the risk of suicide is thought of, it is much more likely to be recognized. To appreciate, even approximately, the degree of risk one must get to know the patient well, must give him time to speak freely about his problems, and must exercise great delicacy in questioning when trying to sense the dangers of his situation. At a single interview it is usually possible to give the depressed patient a feeling of confidence that he is understood; and if he has admitted to despondency he may then be asked if he has had any morbid thoughts or at any time felt discouraged or even hopeless about his future or the outcome of his illness. He must be gently assisted, never forced, to reveal further his emotional state. Any disclosure of suicidal thoughts should be taken seriously. When a patient has spoken of suicidal thoughts it is advisable always to reassure him that these are usual symptoms of a depressive illness, that they are not evidence of sinfulness, and that they will disappear as the illness lifts.

On physical examination scars on the neck and across the fronts of the wrists, which might indicate a previous suicidal attempt, should be noted. There are other features of the patient's history and symptomatology which will point to a particular need for vigilance.

Warning Signs

One still often hears it said that those who talk of suicide to other people do not commit it. This is a false and dangerous belief. At least one-third of those who attempt

suicide have threatened suicide. Such threats should therefore never be ignored but should be evaluated carefully in the setting of the type of abnormal reaction and all the individual circumstances. Suicidal threats are not only warnings often of an impending attempt, but cries for help.

If a history of a suicidal attempt in a previous illness is obtained it increases the risk in the present illness. In the case of the manic-depressive, the fact that previous depressions have not been associated with a suicidal attempt may give one a feeling of greater security about the risk in the present illness, but it does not exclude this risk. Neither does one suicidal attempt in a depressive illness eliminate the possibility of further attempts in that illness.

A family history of suicide is significant, and there may be a family mode of committing suicide. A living person may come to identify himself with someone who is dead. If he becomes depressed he may wish to rejoin that person; and if he says so, this is usually to be construed as a suicidal threat. If the individual identified with has himself committed suicide, the risk of a duplicate suicide is materially increased.

There is some evidence also that the history of a "broken home" in childhood is correlated with an increased suicidal risk.

Depression and insomnia are the usual symptomatic precursors of a suicidal attempt. All depressions carry a suicidal risk, whether they have clear precipitants—for example, bereavement, financial ruin—or come out of the blue. The risk is often greatest in the early stages of the illness, and again in convalescence. This unexpected and almost paradoxical risk in convalescence is often forgotten. Depressions associated with retardation are less dangerous than tense, agitated depressions. Any individual past middle-life, who presents a picture of persistent anxiety and who has not previously had neurotic symptoms, should be suspected of suffering from an early involutional melancholia and precautions against suicide should be taken without delay. Particularly dangerous are those who blame themselves, who express feelings of intense shame and guilt and failure, and who say that their continued existence would be burdensome for those they love. The obviously very depressed individual who denies having had thoughts of suicide should on principle be disbelieved; he may be determined to be unhindered. Those who say that they are too cowardly to carry out the act may do it successfully.

Insomnia, Fear, and Loneliness

In general the greater the concern about insomnia, the greater the suicidal risk. The patient may assert that he is certain that lack of sleep is doing irreparable damage to his brain. Though he may sleep for some hours, he may declare that he has not slept at all; if one just dismisses the statement as untrue, one will miss its significance as a danger signal. The psychotically depressed individual often awakens at an early hour of the morning, and is most ill then. A suicidal attempt is often prefaced by a sleepless night.

Severe hypochondriasis in a depressive setting is also a significant complaint, particularly if it is focused on a single organ or part of the body and is accompanied by a phobia of disabling or fatal disease—for example, tuberculosis, heart disease, cancer. The fear of insanity is very common, often associated with intense feelings of tension and head pains, so that the patient feels that something is about to snap in his head. Venerophobia also, accompanied by depression and agitation, must be viewed very seriously. The individual's feelings of great guilt and contamination may urge him to attempt suicide even before the result of a blood test becomes available. Perhaps the most potent fear of all is the dread of the unknown.

Of all the reality fears which may precipitate serious suicidal attempts, the prospect of entering a mental hospital is one of the most noteworthy. The period during which arrangements are being made for a depressed patient to

enter a mental hospital, if the patient has got to know what is planned, is a period of real danger, during which he must not be left unattended.

In a depression, fears of losing control and of hurting or killing others, and actual attacks upon others, particularly if this behaviour is foreign to the person's usual disposition, are serious warning signs. This aggression may at any time be turned by the individual against himself. If the depressed individual goes unexpectedly on a journey, or wanders away with mind clouded (a fugue), he is suicidal.

Feelings of loneliness and of being unwanted are common harbingers of suicidal attempts, particularly in older people.

While none of these several symptoms is found exclusively in the suicidal patient, the presence of any of them will indicate the need for extra caution, and their concentration is always ominous.

Next article on Emergencies in General Practice.—"Obstructed Labour," by Mr. J. Peel.

Refresher Course Books.—Copies of the first two volumes of collected articles from the Refresher Course for General Practitioners published in the *Journal* are still available at 25s. (postage 1s.) each. The first volume contains 55 articles and the second 60. Each article has been revised and brought up to date by its author.

These books may be obtained from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or through any bookseller.

MUSIC IN MEDICINE

Galen advised playing music to cure snake bite, Pythagoras thought music good for depression, and more recently a dentist claimed that he needed less gas for his anaesthesia if he played Debussy's "Clair de Lune" or "The Moonlight Sonata" on the gramophone at the same time. These were a few of the examples quoted by Mr. FRANK HOWES, music critic of *The Times*, in the third Cantor Lecture given to the Royal Society of Arts on February 21. Mr. Howes is a member of the council for music in mental hospitals, which for the past ten years has tried to make systematic provision of music for psychiatric in-patients, and has sponsored investigations, particularly by the late Dr. Mitchell at Warlingham Park Hospital, into the therapeutic value of music. In one experiment soothing music was played to disturbed patients at bedtime, instead of giving them sedatives, but the only result was a fight. In another, when the last two movements of Vaughan Williams's *F* minor symphony were played to a group of neurotic patients, the effect was to bring into the open their hostility to psychiatrists, which was freely expressed.

Dr. Cunningham Dax at Netherne Hospital had played music to patients and then made them paint their response. Their pictures showed either elation (after Mahler's adagietto) or depression—after Mendelssohn's "Midsummer Night's Dream." Thirteen out of seventeen pictures were of violence, robbery, murder, and a Chopin nocturne provoked a suicide. Bach and Mozart were probably tranquillizing. But the hope of a musical pharmacopoeia was dashed by the inconstancy of the effects. Results were so often unexpected, or varied with the individual. With some, music provoked an emotional explosion and release which was beneficial; in a few others, epilepsy; and yet others remained indifferent to it. But there are different types of listener, susceptible of classification like other personality attributes. We all listen in various ways, but predominantly in one way characteristic of us. A simple classification, went on Mr. Howes, was Vernon Lea's, into Sicilians (those susceptible to the sheer power of sound, sensuous euphony), dionysiacs (those who respond to the emotion), and apollonians (the intellectual-technical approach). Only the

second group was likely to be therapeutically approachable. Mr. Howes's own estimate of music in hospital was modest and commonsensical. An American authority, Dr. S. Licht, in his *Music in Medicine* (1946) thought the music played should be bad music, an endless succession of old-time favourites, but Mr. Howes believed that in-patients were a cross-section of the public with the same musical tastes, and needed something not too long or complicated, but not too well known either. Music for them could be a part of occupational therapy and an entertainment. It might make some temporarily less introspective, in a few it might awaken a new and lasting interest, but above all it was a communal activity, and brought solitary people into contact with their fellows. Those who played had in addition the satisfaction of exercising a skill and of creating something. Beyond that it was difficult to say. Plato in his *Republic* laid great stress on music as an element of education, because rhythm and euphony entered into the inner recesses of the soul and made a man a well-ordered person—an idea which was very foreign to us to-day. We were more accustomed to the thought that music speeded industrial production, or human performance, and Mr. Howes quoted an odd experiment from 1911, when 46 mile-long bicycle races were ridden, 23 to music and 23 in silence. The average speed of the control group was 17.9 m.p.h., and that of the musically stimulated 19.6. To sum up in a sentence, music is certainly hygienic, even if not therapeutic.

Reports of Societies

DEFECTS IN MODERN TREATMENT OF LEPROSY

The introduction of the sulphones for the treatment of leprosy a few years ago aroused world-wide interest and great hopes for the eventual eradication of the disease. But to-day opinion, if no less hopeful, is certainly becoming more critical. Speaking on March 2 before the Edinburgh Branch of the Royal Society of Tropical Medicine, the director of the newly established East African Leprosy Research Centre, Dr. JAMES ROSS INNES, roundly declared: "The modern treatment of leprosy based on the sulphone group of drugs is unsatisfactory." He realized, he said, that many would think this statement outrageous, when they recalled the few lepers who ever came within sight of cure during the chaulmoogra era; but it was high time leprologists expressed their dissatisfactions as a preparation for further advance.

Limitations of the Sulphones

Broadly speaking, the sulphones brought clinical arrest and bacterial negativity to a high percentage (70 to 80) of active cases of leprosy, the relapse rate was low, and relapses were easily reversed. Dosage was moderate, drug reactions were infrequent, and the annual cost was low. Useful adjunct drugs were also available, such as isoniazid, thiosemicarbazone, A.C.T.H. and cortisone, streptomycin, chlorpromazine, and vitamin B₁₂. Drug resistance to the sulphones proper was practically unknown. In fact the whole therapeutic picture seemed rosy. "We ought to be able to 'plug away' with the sulphones and clear leprosy from the face of the earth." But, said Dr. Innes, after experience of the sulphones on a large scale it was by no means certain that this would be so.

For one thing, it took far too long to achieve bacterial cure in lepromatous cases. A failure rate with the sulphones of 20 to 25% in various countries indicated their inadequacy. Instead of achieving bacterial negativity in six months to a year, which would be a useful period in controlling the spread of the disease and a fair one to expect, they took three to five years or more. It was true that when widely and carefully applied in an endemic country the sulphones achieved great things, but their slowness and imperfection

of action suggested that it might prove very hard to eradicate the hard core of endemic infection. "Leprosy patients soon discern that the drug has power and wait as patiently as they can for the final happy result, but few escape periods of doubt and despair as month succeeds month. In some of them, hope dies, and this reacts unfavourably on their prospect of ultimate cure." What is wanted, said Dr. Innes, is a dynamic bacteriostatic or bactericidal drug, or combination of drugs, stronger than the sulphones, both for the sake of the leper himself and for the sake of the community.

Other Weaknesses

Quite apart from the sulphones, there were other serious weaknesses in the attack. The criteria of cure were still too vague. Laboratory checks were few and limited. Clinicians could not tell how many resting bacilli, or viable granules or debris of bacilli, might lie low in the tissue planes. In the last resort, if biopsies detected nothing, they had to fall back on long periods of observing their patients. Then, there was no way of modifying the resistance of the patient with leprosy. They badly needed an agent that would stimulate direct resistance to the infection. The lepromin test did not do this; it indicated only the degree of resistance already present. Nor was there any evidence that B.C.G. inoculation raised the resistance of the leper to his disease, although some had suggested that it might be a valuable prophylactic.

Perhaps also, in the understandable enthusiasm for the sulphones, the use of hydnocarpus oil had been abandoned too readily. Local intradermal injections were still useful in resistant tuberculoid and indeterminate lesions. The trouble with hydnocarpus oil was that the dose was large and the injections took such a time.

Tuberculosis and Leprosy

Finally, Dr. Innes indicated the tardy co-operation between tuberculosis and leprosy workers in countries where both diseases were rife. There were many points of similarity between the two diseases. "In leprosy therapy the only sound policy at present is to investigate drugs which have an action in human tuberculosis or on the human tubercle bacillus." Likewise, tuberculosis workers could gain from the trial of drugs in leprosy. Closer co-operation was long overdue, and great benefit to both sides would result from it. In East Africa, for instance, with almost a quarter of a million cases of leprosy and probably an equivalent number of cases of tuberculosis, co-operation should be at all levels—in control, therapy, follow-up, and research.

LOCAL MEDICAL SOCIETIES

Manchester Medical Society

During a discussion on January 24 on "Recent Advances in Obstetrics and Gynaecology," Dr. R. NEWTON, a clinical lecturer in the subject at Manchester University, told the Section of General Practice that he questioned the usefulness of many of the investigations undertaken in cases of infertility. Nevertheless, he went on, there was a useful by-product of these investigations—the discovery of many early cases of tuberculous endometritis and salpingitis. Reports on their treatment with streptomycin and P.A.S. were more hopeful.

Basingstoke Plastic Centre Medical Society

On February 17 the Society held a symposium on "Fractures of the Long Bones with Soft Tissue Loss," the speakers being Professor J. TRUETA, Mr. J. S. ELLIS, Mr. A. J. EVANS, and Mr. E. W. PEET. In the healing of fractures, said Professor Trueta, the periosteal vessels were most important. Stripping of the soft tissues away from the periosteum reduced the blood supply at the fracture site and delayed union. His own work had convinced him of the importance of early skin repair in long-bone fractures. This view was shared by Mr. Ellis, who said that good results had been

obtained when simultaneous skin and bone replacement was carried out within a week or two of injury. Mr. Peet discussed the technique of skin repair in these cases, and Mr. Evans reviewed a series of 39 cases treated at Rooksdown House between 1940 and 1945. This series showed a strong preference for the cross-leg flap, and included nine successful examples of simultaneous skin and bone replacement.

Liverpool Medical Institution

"Tin-smelters' pneumoconiosis" was the subject of a paper read to the Institution by Dr. P. H. WHITAKER and Dr. A. JOHN ROBERTSON on February 10. During a field survey 120 cases of pneumoconiosis were found at a tin-smelting works. A film was shown illustrating the main sources of dust formation and the smelting process. Dr. Whitaker then demonstrated some typical chest radiographs from the men and Dr. Robertson presented some preliminary clinical, environmental, and experimental studies in support of the view that the condition is a benign pneumoconiosis due to tin oxide.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Adrenalectomy for Breast Cancer

SIR,—I have read with considerable interest your leading article entitled "Adrenalectomy for Breast Cancer" (*Journal*, January 1, p. 33). I should like to comment on the endocrine types of breast cancer—namely, ovary-dependent, adrenal-dependent, and hormone-independent.

My colleagues and I have discussed this subject previously,¹ classifying breast cancer into two types—namely, oestrogen-dependent and non-oestrogen-dependent. Our studies demonstrated that approximately 50% of pre-menopausal women with metastatic breast cancer have an oestrogen-dependent type of tumour, as shown by the fact that oophorectomy results in cessation of growth and regression of the tumours, subsequent administration of oestrogen to the patient produces reactivation of the tumour growth, and on withdrawal of the oestrogen the tumours again regress. In the other 50% of cases oophorectomy produces no benefit, and oestrogen fails to stimulate tumour growth.

We have also presented evidence which suggests that adrenalectomy produces its benefit by removal of another source of oestrogen. Thus pre-menopausal women who have obtained a remission from oophorectomy may obtain a second remission from adrenalectomy; whereas those who fail to benefit from castration invariably fail to benefit from adrenalectomy also. This information provides the only practical means of selecting patients for adrenalectomy. In post-menopausal women combined oophorectomy and adrenalectomy will benefit about 50% of patients and is the treatment of choice, since oophorectomy rarely produces a remission.

The leading article also raised the question as to whether human mammary cancer may be dependent upon pituitary hormones for its growth. We have presented preliminary observations which indicate that some tumours are probably growth-hormone-dependent.² Thus, hypophysectomy has produced remissions in patients whose disease had relapsed after oophorectomy and adrenalectomy. In one of these patients administration of a beef pituitary growth hormone preparation caused acceleration of the tumour growth, which subsided when the growth hormone was withdrawn.

Hypophysectomy for the treatment of metastatic mammary cancer in man is being pursued with the hope

of attaining a higher percentage of response and longer-lasting remissions.³ It is already apparent, however, that in some patients the disease is unaltered by ablation of all three endocrine organs.—I am, etc.,

New York.

O. H. PEARSON.

REFERENCES

- ¹ *J. Amer. med. Ass.*, 1954, **154**, 234.
- ² *J. clin. Invest.*, 1954, **33**, 956.
- ³ *J. clin. Endocr.*, 1954, **14**, 786.

Advertising by Post

SIR,—The bombardment of advertising material aimed at general practitioners by every morning's post has recently increased to a full-scale barrage. If anyone were seriously to attempt to read all this verbiage, it might take two or three hours every day to get through it, but in practice 90% of it goes unopened into the waste-paper basket. Ultimately the public has to pay for this appalling waste, and in the interests of manufacturing firms and doctors alike it seems to me very desirable to try and do something about this. However, most doctors find it necessary to use a certain number of proprietary preparations, and information about new products is necessary and often very interesting and instructive.

I have suggested to representatives of many different firms that a card should be prepared for every product with certain necessary information only recorded on it such as indications, composition, dosage, contraindications, and price, and that the size of these cards should be standardized by all firms so that they can be easily filed for reference in a simple box. At present the number of pamphlets is so excessive, and they are so different in shape and size, that filing is impracticable. This suggestion has been well received by most representatives, although many expressed the view that it was too much to expect that all firms would agree on this. But the advantages of such a scheme would seem to be so great that in my opinion it would be well worth while for the manufacturing firms to consider it. And if only a few firms started with my suggestion, the rest might soon find it advisable to follow suit.

If in addition the manufacturing firms could come to some agreement between themselves to limit the advertising pamphlets about any particular product to a certain number per year, I believe that this would also be of great benefit to all concerned, and some doctors might even read them.—I am, etc.,

Sandwich, Kent.

A. K. JONES.

Trichomonal Vaginitis

SIR,—I have been very much interested in the correspondence opened by Mr. Aleck Bourne (*Journal*, January 22, p. 226) on the problem of the resistant and relapsing case of trichomonal vaginitis. Mr. Bourne emphasized that the trichomonas may be found as an inhabitant of the healthy vagina and may be almost entirely absent in a clinically severe case of recurrence of the disease, yet other correspondents have said little about these underlying causes and predisposing factors which surely are the most important aspect of the problem.

I suggest that in addition to the frequent association of secondary bacterial infections and monilia (and possibly virus infections), which require their own appropriate treatment before the condition can be cleared, and the by no means rare allergic manifestations in sensitive individuals, one or more of the following factors may play a part: (1) An endocrine factor—indicated by the tendency to relapse in the post-menstrual phase. At this time cyclical ovarian activity is at its lowest ebb, the vaginal epithelium is inactive, leucocytes are few, and the secretion less acid, and the trichomonas is encouraged (it is my clinical impression that the woman with highly active ovarian function rarely suffers from vaginitis). (2) A neuromuscular factor: a woman with an irritating vaginal discharge tends to hold the vaginal introitus closed, which may become so much of a habit that a state of vaginal spasm is induced, and this may well retard recovery by retaining secretion and

squeezing organisms into the many available hiding-places. (3) A urinary factor: a gaping introitus and lax vaginal wall lead to constant soiling with drops of urine after micturition, and this admixture, if highly acid or alkaline, may so alter the pH of the vaginal secretion that conditions are favourable for the trichomonas to flourish. The importance of the urinary factor is seen in the vulvo-vaginitis of diabetics, which, although admittedly more often due to a monilia and secondary bacterial infection than to trichomonal vaginitis, may resist all treatment until the urine is kept more strictly sugar-free—or is it that the lowered blood sugar affects the glycogen content of the vaginal mucosa? (4) Certain contraceptives: women who have had an attack of trichomonal vaginitis are not able to use with impunity some of the contraceptives which are entirely innocuous to others.

Knowledge of the means of increasing the powers of resistance of the vaginal mucosa to the trichomonas seems a more effective method of attack than either the production of stronger or the use of larger dosage of anti-trichomonal drugs.—I am, etc.,

Hove, 3.

MARGARET NEAL-EDWARDS.

Subscapular Swellings

SIR,—On January 4, 1955, a young housewife presented with bilateral subscapular swellings. These had been insidious in onset and quite painless. The patient's attention was drawn to them by her husband, who remarked that she was becoming round shouldered.

She had been doing extra housework of recent weeks, but had also acquired a rather boisterous dog that she exercised daily on a lead. The patient had had a chronic cough over the past two to three years.

Four and a half ounces (128 ml.) of heavily blood-stained fluid was withdrawn from the right side at the first attendance and 3½ oz. (92 ml.) on January 31. A proof puncture only was made on the left side, where the quantity of fluid has gradually increased over the past four weeks. It has been suggested that (1) there was bilateral tearing of rhomboid major, (2) tearing of latissimus dorsi, (3) friction between subscapularis on the deep aspect of the scapulae, the serratus anterior, and the chest wall, and (4) that it is an inflammation of unusual bursae.

I should like to thank Professor Lockhart and Dr. Fyfe, of Aberdeen University anatomy department, for their interest, and Mr. Wilsher, of Chesterfield, for the photography.—I am, etc.,

Chesterfield.

KENNETH E. McIVER.

Cancer and Tobacco

SIR,—I enjoyed your leading article entitled "Carcinogens in Cigarettes" (*Journal*, November 20, 1954, p. 1213), but wish to suggest that perhaps there has been too much emphasis upon the need for combustion to produce carcinogenic agents from cigarettes. There is good clinical evidence from India, Ceylon, the United States, and other countries that the habitual use of chewing tobacco alone or with additives is associated with the development of tumours at the "quid-site."

The apparent association of cancer and the use of tobacco, whether burned, unburned, and with or without additives,



paper, insecticides, etc., would suggest that the carcinogenic property is an inherent one. If lung cancer is caused by heavy cigarette-smoking, it is probably the result of a quantitatively higher exposure of a susceptible tissue by the carcinogenic agent; one would expect the larynx also to have a higher incidence of tumours. Tobacco chewers, in contrast, should be expected to have a high incidence of oral cancers, hypopharynx, and oesophagus. Pipe and cigar smokers apparently swallow more tobacco products than they inhale, and therefore would be expected to fall into this group.—I am, etc.,

Buffalo, 3, N.Y.

GEORGE E. MOORE.

Cardiac Asthma

SIR,—I read with great interest Dr. J. G. M. Hamilton's article on "Cardiac Asthma" in the "Emergencies in General Practice" series (*Journal*, January 1, p. 39), and would like to make one addition to his suggestions for immediate treatment. Instead of morphine, I now use only pethidine—usually intramuscularly but if necessary intravenously—or sometimes half dose by one route and half by the other. The dose is normally 100 mg., and the results are as dramatic as one would wish, no oxygen or any other medicament—e.g., aminophylline intravenously—being required in the majority of instances.

I was introduced to this drug as a cure for asthma by Dr. A. H. Walker, the house-physician at the Lowestoft and North Suffolk Hospital, in 1952, when I sent in a small girl of 6 years with a severe attack of "adrenaline-fast" bronchial asthma, and he injected pethidine, 50 mg. (I think that was the dose), and cured the attack in 20 minutes. Following this example I have used it in a few cases of bronchial asthma where adrenaline has failed, and in all cases of cardiac asthma, which have been fairly numerous in my practice, as one patient alone suffered one attack every two or three weeks until he died about 12 months ago.

I should be interested to learn of other observations concerning pethidine in the treatment of asthma. Its use in these cases may be well known, but my belief is that it is not.—I am, etc.,

Lowestoft.

T. S. NICOL.

Changes in the Mental Health Services

SIR,—I would like to make a comment on your recent correspondence over the importance of observation wards in the mental health service.

In regard to the observation ward, I too, like one of your correspondents, Dr. I. S. Kreeger (*Journal*, January 8, p. 104), have spent a similar period in the same observation ward (that now attached to a teaching hospital) and also a period in another observation ward, between them dealing with a very large proportion of London's mentally sick. It seems to me that all three correspondents are right: Sir David Henderson (p. 104) in pointing out the Scottish method of dealing with those problems by admitting them directly to general hospital; Dr. I. B. S. Lewis (*Journal*, December 4, 1954, p. 1354) by suggesting that observation wards should be abolished; and Dr. Kreeger by pointing out how valuable and important the work of observation wards is. A recent article in the *Lancet* by Dr. J. F. Stokes *et al.*¹ has shown, on figures from the same observation ward as Dr. Kreeger and myself have worked in, the very high proportion of physically sick patients admitted to the observation ward with apparent mental disorder.

All these distinguished contributions surely point to the abolition of the observation ward as such, as Dr. Lewis suggests, and to the establishment of properly equipped psychiatric wards within the general, and particularly the teaching, hospital—as Sir David Henderson points out is now the method in Scotland. This would mean that, as Dr. Kreeger rightly asserts, the valuable and important work now done in observation wards will be carried on side by side with other medical and surgical specialties and given its rightful due—of which it is still deprived by many within

the medical profession. It would mean that social, psychiatric, medical, and medico-legal problems at present kept inside the observation wards would be properly ventilated, explored, and, very much more important, taught to students, instead of being relegated to a minor, unimportant role in a full curriculum; and taught with appropriate case material at the bedside in the most reputable clinical fashion. It would help to underline the complex interrelation between the psyche and the soma in all disease, whether mental or physical. It would also mean that the nursing of such cases could be shared by nurses fully trained in both aspects of nursing and teaching programmes integrated to this end. It might also help the enormous difficulties of attracting suitable men and women into the nursing of the mentally disturbed, instead of maintaining an increasingly unreal isolation. Within this framework more cases could be dealt with by treatment on the spot, later discharge, out-patient support, and follow-up than is now possible. The burden could be more effectively lightened on the mental hospitals, as well as establishing closer relation between the mental hospitals and the general hospitals, and the difficulties surrounding certification and mental disease more easily circumvented in the lay mind.—I am, etc.,

London, N.W.1.

M. J. ROSENTHALL.

REFERENCE

¹ *Lancet*, 1954, 2, 862.

Grants for New Hospitals

SIR,—Your leading article "Grants for New Hospitals" (*Journal*, February 15, p. 466) is timely in two respects; first, in stating that the reason for priority of some projects is not clear, and, secondly, in indicating the possible danger of attracting staff away from old hospitals to new ones.

The situation in the North-west Metropolitan Region is of some interest. Certain of the urban hospitals are unable to meet their commitments fully or efficiently. It is however stated that there is no question of adding to their beds while beds stand empty elsewhere. The hospitals in question are, however, struggling to deal with their work under most difficult conditions. Additional accommodation in such hospitals would cost but a fraction of the capital outlay on some of the proposed new hospitals. A hospital of 150 beds is planned for the Welwyn Garden City and Hatfield area (an ultimate bed total of more than 400 was mentioned by an official of the Regional Board in a press interview). At the present time the hospital work of the Welwyn Garden City and Hatfield area goes mainly to St. Albans, Hertford, and Barnet. The hospital at St. Albans consists of three separate units, with inadequate x-ray and theatre facilities, as well as many other difficulties. Despite these handicaps, this hospital and others drawing patients from the Welwyn Garden City and Hatfield area still have unused reserves. What justification can there be for planning a further hospital which may exceed in size any of those already draining this area? Much of the increase in population has already occurred, and even at its peak will result in about a 25% increase of the total population. To say this is not to deny the need for improved hospital facilities in the area concerned, but merely to question the scope and detail of the present plans.

You, Sir, press for the publication of reasons for various decisions, and I am sure this will receive wide support. One might also put in a plea for prior consultation with those who provide the service. So far as I am aware, the medical advisory committee of the group to which I have referred (representing hospital staff, general practitioners, and medical officers of health of the area) have not been consulted about details of the proposed Welwyn Garden City and Hatfield Hospital. It is hard to see how the Ministry can get a true idea of the medical requirements of such an area without consulting the professional people on the spot.

If I have referred to one particular area, it is only because of my personal knowledge of it. I have, however, no wish to imply that the conditions there are necessarily any less satisfactory than elsewhere, nor do I wish to attribute

responsibility for that state of affairs. Speaking as a doctor and a taxpayer, I am by no means satisfied that the best, or even the second best, will be done with the available resources.—I am, etc.,

Radlett, Herts.

R. S. MURLEY.

Alcohol as a Diuretic

SIR,—Dr. Lawrence Mackie's copy of *Macbeth* "shows Act II to have but two scenes" (*Journal*, February 12, p. 415), and he implies that Professor L. J. Witts must have given the wrong reference when he wrote of the dialogue between Macduff and the porter (*Journal*, January 29, p. 271). In the First Folio (1623) Act II consisted of four scenes. It was Nicholas Rowe (1709) who reduced this Act to two scenes. Evidently Dr. Mackie's *Macbeth* follows Rowe's arrangement. A modern example of this is the Shakespeare published by Collins about 30 years ago: the name of the editor is unknown, but the book can be identified from the fact that it includes an exhilarating introduction from the pen of St. John Ervine dated June, 1923. Happily, Collins's new edition, prepared by the eminent Shakespearean scholar Peter Alexander, reverts to the arrangement given in the First Folio.

"What, I wonder, did the porter at Inverness castle drink?" asks Dr. Mackie. I gather that he is not offering a prize for the correct answer. As a former citizen of Inverness, I feel entitled to suggest that "carousing until the second cock" means only one thing, no matter whether we consider it by the standards of the twentieth century or by those of King Duncan's time. Revelry amounting to "carousing" was almost certainly sustained by liberal indulgence in an alcoholic beverage of some kind. It is probable that the porter had been drinking whisky or other spirituous liquor. "Distilling was practised in England as early as the eleventh century, but was confined to the monasteries, the produce being used as a medicine. . . . In Scotland during the fourteenth century whisky had already displaced much of the imported Continental spirit. . . . By the middle of the sixteenth century a large trade was established, and house or cottage stills were found in all parts" (*Chambers's Encyclopaedia*, 1904). It is unnecessary for Dr. Mackie to insist that the porter "be shown to have ingested pure alcohol." No self-respecting Scotsman would thus abuse his stomach; nor would he waste "pure alcohol"—a preparation rarely seen, even in the laboratory of the analytical chemist. The product of the pot-still distillery contains 80% of pure alcohol when 50% over proof; the patent-still yields a spirit containing about 95% alcohol.

It has long been held that the presence of alcohol in the blood produces diuresis independently of the water and ethereal substances which are imbibed with most alcoholic beverages. As a therapeutic measure, the action is perhaps unimportant; and in any case alcoholic beverages would rank among the most expensive preparations for producing a flow of urine. On the other hand, if it does occur, the diuretic action of alcohol must be a matter of some interest to physiologists and pharmacologists. We may be sure that academic niceties about higher esters and the like had no place in the mind of the porter at Inverness castle. He had evidently been impressed by what might be called the over-all effects of alcoholic beverages taken late at night; perhaps he had evolved a crude test of diuretic potency by simply noting the number of times he had to rise during the night to empty his bladder.

Dr. Mackie is evidently not convinced that excessive drinking causes a red nose. Whatever may be the importance of alcohol in the pathogenesis of redness of the nose, it is certain that this disfigurement is by no means rare among those of temperate habits, and florid cases have been observed even among strict abstainers. Nevertheless, a flushed face is one of the early signs of an alcoholic orgy, and over a period of years the face of the inveterate drinker often becomes both congested and coarse. I do not suggest that the action of alcohol is selective in the sense that the skin of the nose is particularly liable to be affected, but

in the presence of other diseases such as acne rosacea alcohol may intensify redness of the nose to an alarming degree. It is probable that Bardolph was a victim of this distressing combination of disabilities—rosacea and alcoholism. When Fluellen was describing him to King Henry V he said: " . . . his face is all hubbuckles, and welks, and nobbs, and flames o' fire; and his lips blows at his nose, and it is like a coal of fire, sometimes plue and sometimes red; but his nose is executed and his fire's out" (*Henry V*, Act 3, Scene 6, line 101). The aetiology of this condition is suggested by a conversation that takes place before the Boar's Head tavern (Act 2, Scene 3, line 40) *à propos* some of the foibles of the late Sir John Falstaff.

Boy.—Do you not remember 'a saw a flea stick upon Bardolph's nose, and 'a said it was a black soul burning in hell?

Bardolph.—Well, the fuel is gone that maintained that fire: that's all the riches I got in his service.

Doubtless the fuel was sherris-sack—so eloquently eulogized by Falstaff in his soliloquy on wine (*Henry IV*, Part II, Act 4, Scene 3):

. . . A good sherris-sack hath a twofold operation in it. It ascends me into the brain; dries me there all the foolish and dull and crudy vapours which environ it. . . . The second property of your excellent sherris is the warming of the blood. . . . It illumineth the face, which as a beacon, gives warning to all the rest of this little kingdom, man, to arm. . . .

—I am, etc.,

Glasgow, W.2.

STANLEY ALSTEAD.

Prevalence of Dysentery

SIR,—It is satisfactory to see that you gave your leading article (*Journal*, February 12, p. 401) to this important disease, but I think you are mistaken in attributing its lessened severity amongst the young and healthy to the higher proportions of Sonne as opposed to Flexner infections. Experience over the last dozen years is that both types of dysentery have been much milder, and the diarrhoea has been as a rule of moderate intensity, with blood and mucus, prostration, and high temperature only exceptionally. The reason for this change is unknown, but perhaps the constitution of the organisms has been altered and virulence diminished as a result of widespread sulphonamide therapy.

This decrease in virulence, however, carries a new danger, for it has led the public to treat the disease with complacency. Bacteriological tests of the stools are often omitted, so that carriers abound, and, as your leader showed, the disease is assuming serious endemic proportions. Complacency is unjustified, since, although the mortality amongst healthy adults may be trivial, it is not so in the invalid aged; moreover, the disease is still severe and frequently fatal in infants.—I am, etc.,

Warwick.

E. S. STERN.

Chlorpromazine

SIR,—In your leading article on chlorpromazine (*Journal*, February 5, p. 338) you state that the main control of body temperature is due to tonic impulses passing down the voluntary nerves to skeletal muscles, and later you ascribe the hypothermic properties of chlorpromazine to a peripheral neuromuscular depression. Recent work has suggested that under normal conditions skeletal muscle activity plays a negligible part in the maintenance of body temperature, the main centres of heat production being the liver and the brain.^{1,2} The shivering mechanism comes into operation when active cooling of the body is carried to such a degree that the normal heat conservation mechanisms can no longer maintain body temperature. Neuro-muscular blocking agents may be used as adjuvants in the production of hypothermia by surface cooling, when they prevent reactive shivering, but are useless as the primary agents to induce hypothermia.

If chlorpromazine produced hypothermia by neuro-muscular block one might expect even the surface of the

limbs to be cooler than the rest of the body, whereas the mild fall in body temperature induced by clinical doses of chlorpromazine is characterized by the warm state of the extremities.³ It would appear likely that in the hypothermia induced by chlorpromazine a defect in heat conservation is more important than any derangement of heat production.—I am, etc.,

London, W.C.2.

C. M. CONWAY.

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- ¹ Grayson, J., *British Medical Journal*, 1951, 2, 1379.
- ² Birnie, J. H., and Grayson, J., *J. Physiol.*, 1952, 116, 189.
- ³ Dobkin, A. B., et al., *Anaesthesia*, 1954, 9, 157.

Hair-grips as Foreign Bodies

SIR.—Mr. Ralph H. Gardiner's memorandum (*Journal*, February 12, p. 397) serves a very useful purpose in drawing attention to the special dangers of the swallowed hair-grip. It requires operative removal much more commonly than any other swallowed foreign body. I feel that Mr. Gardiner was too impatient when he operated on his patients after the hair-grips had been in the stomach for only 5 and 10 days. Foreign bodies don't usually do any harm there, and I have seen hair-grips pass the pylorus and manipulate the alimentary canal successfully after lying in the stomach for three weeks.

When a grip gets arrested in the bend of the duodenum it may erode the bowel wall, and operation is indicated. The sequelae to erosion, however, are not as dramatic as might be inferred from Mr. Gardiner's article. Of the four grips which I have removed and which were lying partially or completely outside the bowel wall, none had caused more than localized peritonitis and the clinical features were mild abdominal pain and local tenderness. One hair-grip was removed from a deep abscess in the abdominal wall. No faecal fistula developed.

I cannot agree with his treatment of bulky diet and "normacol." The most important objective of treatment is to prevent intestinal spasm. This is best achieved by giving the child the diet it is used to. For this reason it would seem wise not to admit these children to hospital, once it is ascertained that the object has entered the stomach, but to supervise them carefully as out-patients.—I am, etc.,

Manchester, 3.

H. M. GOLDBERG.

Agranulocytosis

SIR.—Drs. D. G. Wraith and F. Dudley Hart in their letter (*Journal*, February 12, p. 412) advocate the use of cortisone and A.C.T.H. in the treatment of drug-induced agranulocytosis, and cite a number of cases which recovered following the exhibition of these drugs. Cases have also been described by Kirkeby¹ and Peyman² which responded to A.C.T.H. and cortisone, although the latter considered the marrow was probably recovering before the drug was given.

There have, however, been a number of cases recently³⁻⁵ which recovered on antibiotics alone without the use of A.C.T.H. and cortisone, and one¹⁰ who probably would have recovered, as well as some cases¹¹⁻¹³ who did not respond or died after the use of these drugs. In an annotation¹⁴ you say: "In agranulocytosis the drugs [that is, A.C.T.H. and cortisone] have given far less benefit, a favourable response being a rare and unpredicted event." The use of these drugs is also not without risk especially in the presence of an established infection—a common enough event in agranulocytosis. In a further annotation¹⁵ you state: "It is now fairly well established that all the common bacterial infections are enhanced [by the use of these drugs], including those with spirochaetes and tubercle bacillus"; and Page¹⁶ states: "Little emphasis has been laid on the practical results of the well-known disseminating qualities of these drugs in occult infections."

Two cases of drug-induced agranulocytosis have been treated in this hospital in the past eighteen months. One was a woman who had had sulphonamides, chloramphenicol, and a compound of amidopyrine and a barbiturate, and who had on admission a white cell count of 600 per cubic mm.,

with no polymorphs present. She was treated by antibiotics initially, but A.C.T.H. was started on the fourth day. No polymorphs appeared in the peripheral blood until a few hours before her death on the tenth day. The second case was a woman who had had phenobarbitone for six weeks, and was admitted because she had a generalized maculopapular rash and sore throat. Her white cell count was 170 per cubic mm. with no polymorphs. She was given penicillin, and on the fourth day after admission her temperature settled and polymorphs reappeared in the peripheral blood. She is now quite normal.

Hutt and Lee¹⁷ suggest not giving A.C.T.H. and cortisone for at least seven days, because the marrow frequently recovers in this time. It is possible that our first case would have recovered without the use of A.C.T.H. and that she died of a septicaemia induced by this drug. Post-mortem examination confirmed that death was due to a generalized infection, with meningitis and bronchopneumonia.

There is therefore need for considerable caution in the use of A.C.T.H. or cortisone in treating agranulocytosis: and it would seem desirable that a properly controlled trial of these drugs in agranulocytosis should be made. The Medical Research Council trials have so far been quite inadequate, as in the first report¹⁸ no case of agranulocytosis was included and in the second¹⁹ only two. Aber and others²⁰ quote only three cases in their report, and Whitby and Britton²¹ quote only Hart's case.²² We also do not know how many cases have been treated unsuccessfully by A.C.T.H. and not reported. I suggest that the case for A.C.T.H. or cortisone in drug-induced agranulocytosis is not proven.

I am grateful to Dr. R. G. M. Longridge for permission to include the clinical notes of these patients.—I am, etc.,

Salisbury.

J. R. H. PINKERTON.

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- ¹ *Lancet*, 1954, 2, 580.
- ² *Ibid.*, 1954, 2, 656.
- ³ Steel, S. J., et al., *British Medical Journal*, 1954, 1, 795.
- ⁴ Patuck, D., *ibid.*, 1954, 1, 919.
- ⁵ Morgana, A. A., *ibid.*, 1954, 2, 28.
- ⁶ Jarvis, D. J. A., *Lancet*, 1952, 2, 830.
- ⁷ Ferguson, A., *ibid.*, 1952, 2, 1179.
- ⁸ Varadi, S., et al., *ibid.*, 1953, 1, 145.
- ⁹ Harrison, A. R., *ibid.*, 1954, 1, 396.
- ¹⁰ Hutchison, H. E., et al., *British Medical Journal*, 1955, 1, 207.
- ¹¹ Fuld, H., *ibid.*, 1952, 2, 1133.
- ¹² M.R.C. Report, *ibid.*, 1953, 2, 1400.
- ¹³ Aber, G. M., et al., *ibid.*, 1954, 1, 1.
- ¹⁴ *Ibid.*, 1954, 1, 32.
- ¹⁵ *Ibid.*, 1954, 1, 381.
- ¹⁶ *Ibid.*, 1954, 2, 1334.
- ¹⁷ *Ibid.*, 1953, 1, 784.
- ¹⁸ *Ibid.*, 1952, 1, 1261.
- ¹⁹ *Disorders of the Blood*, 1953, 7th ed. London.
- ²⁰ *British Medical Journal*, 1952, 1, 1273.

Silver Stool Sign

SIR.—Mr. Arnold S. Aldis in the interesting case he reported exhibiting silver stool (*Journal*, February 12, p. 414) suggests it would be interesting to hear if others had observed this phenomenon.

In south China and Hong Kong I have on several occasions observed silver stools in patients suffering from tropical sprue. All were advanced cases of this disease and all were undergoing treatment with large doses of calcium lactate by mouth and twice-daily doses of parathyroid gland, gr. 1/10 (6.5 mg.), as this was said to regulate the amount of calcium absorbed into the system. Sprue cases do not exhibit blood in the stools, unless there is some superimposed cause to account for the blood, but of course there is little or no bile and usually an excess of fat in sprue stools.

It was suggested that the action of the fat on the calcium, aided by the parathyroid gland, and with no bile pigment to obscure the reaction, gave rise to the silver stool, so aptly described by Mr. Aldis as just like aluminium paint. In these sprue cases there was no question of cancer of the ampulla of Vater or cancer at any other site, but silver stool was regarded as a serious and often fatal complication in tropical sprue.—I am, etc.,

Belfast.

J. H. MONTGOMERY.

The New Insulins

SIR.—Dr. E. B. Kraus writes (*Journal*, February 19, p. 478) about the virtues of isophane insulin (N.P.H.), produced originally by Hagedorn in Denmark and widely used in the U.S.A. since 1948. He says that it has received little publicity in Britain; but that does not mean that it has not been studied by some of us on our own patients and its effects observed on travelling Americans. My opinion was, and is, that, containing very little protamine, its action as a one-dose preparation is not much more prolonged than globin insulin. It works well, as do other slightly retarded insulins, on the milder insulin case but will not carry through for 24 hours in the average severe case needing some 40 to 60 units a day. It is therefore not lack of trial and knowledge that has led to silence in the British medical press.—I am, etc.,

London, W.1.

R. D. LAWRENCE.

Princess Louise Children's Hospital

SIR.—Dr. R. W. Smithells (*Journal*, February 19, p. 479) recalls the "Battle of Paddington Green" in writing of the threat to convert the Princess Louise Hospital for Children to adult use. It was in 1949 that the Sporborg Subcommittee recommended the Board of Governors of St. Mary's Hospital to close Paddington Green Hospital as a children's unit. And it was outraged public opinion, which was prepared to chain itself, its prams, and its babies to the railings of St. Mary's, which finally made the board abandon the proposal.

In their latest report the Sporborg Subcommittee say: "Members of the Board may well be surprised that whilst in their earlier proposals . . . the Subcommittee recommended the conversion of Paddington Green Hospital to adult use, they now put forward a similar recommendation in respect of Princess Louise Hospital." And well they may be surprised. For the same arguments against such a conversion apply now as then, and the same solution exists—namely, that if St. Mary's do not need so many cots for teaching paediatrics to their students they should allow one of their two children's hospitals to be transferred to a less favourably placed teaching hospital.—I am, etc.,

London, W.1.

MICHAEL HARMER.

Tonsillectomy

SIR.—I congratulate Mr. E. H. Miles Foxen on his protest (*Journal*, February 12, p. 413) against the extraordinary inefficiency of the present removal of tonsils and adenoids in this country as a whole. The rate of failure appears to be about 20%; and the amount of damage to patients and discredit to the profession caused by this misuse of an excellent operation is immense. He is right in emphasizing that the true principles of tonsillectomy were laid down by George Waugh,¹ since in many clinics the term "dissection" is applied to the use of a snare, after a preliminary loosening of the upper pole.

May I suggest that, in addition to applying to this operation the standards of surgery aimed at in other branches, we might also teach the true anatomy of the region concerned? Some twenty-odd years ago I put forward my views on this.² If I am wrong, they should be controverted: if I am right, a considerable number of children have quite unnecessarily bled to death in the interval from the paratonsillar vein. I may say that no surgeon or anatomist would discuss these views for many years, with the exception of George Waugh himself, who came to agree with me completely.

Some of the points I made are now getting into the anatomy books, but no anatomist has dared to recite the old description of the six arteries of supply and the venous plexus and then announce, "*Nous avons changé tout cela.*" The change is being made gradually, so as not to arouse the dawn of doubt among those who have been taught to recite the anatomy of the books as unquestionable dogma.

Of course, the trouble is that anatomists do not get specimens of the developing human body to study and demonstrate; can anyone refer me to a really good preparation showing the adenoids or the tonsils *in situ*? Such specimens of the adenoids would demonstrate that the most popular sizes of curettes are too wide to be used on many children without scarring up the openings of the Eustachian tubes, with results only too familiar to those interested in hearing.—I am, etc.,

London, W.1.

DENIS BROWNE.

REFERENCES

- ¹ *Lancet*, 1909, 1, 1314.
- ² *J. Anat.*, 1928, 63, 82.

SIR.—The expression of any views on tonsillectomy is always followed by considerable controversy. This fact alone would suggest that consistently good results are not being achieved in all centres. Mr. E. H. Miles Foxen (*Journal*, February 12, p. 413) has no doubt started a prolonged controversy on guillotine tonsillectomy by quoting and supporting George Waugh's¹ statement that "the cause of failure lies not with the operator but with the type of operation."

May I suggest that the key to it all is anaesthesia? If an inexperienced surgeon is only allowed two minutes' operating time, during some of which time the patient is probably moving, he should be forgiven if the uvula or anything else is extracted rather than the tonsil. But if, on the other hand, as in most other surgical operations, he is allowed good operative conditions without a time limit he can remove the tonsil carefully with a guillotine and then examine the surgical field. Should there be a remnant, and this can happen to the most experienced guillotinist, it can be dissected then and there so that complete removal can be ensured in every case. This technique would appear to combine all the advantages of the old method with all the advantages of the new one. If the cases can be successfully treated at a rate of ten or more per hour I can see no reason to reduce the rate to four or less per hour. The end-result should be the same in either case.

One anaesthetic technique which allows this is N₂O→O₂→ether—relaxant if required—with intubation orally or nasally according to the surgeon's wishes. After a gag has been inserted the ether should be turned off and only N₂O and O₂ given. This ensures that the patient will be in a light plane of anaesthesia at the end of the operation regardless of time. Another technique which has been used successfully in Portsmouth on many cases has been designed for an experienced guillotinist. A single injection of thiopentone is given in the anaesthetic room; nothing else is given afterwards. This allows some two to three minutes for surgery and examination. Should tags remain the child is given a relaxant and intubated. This technique is not suitable for a slow surgeon or for one who often leaves remnants.

May I, as one who has seen much harm result from the guillotine, suggest that, properly used, it can still play a major role in good modern surgery. While anaesthetists can provide the operative conditions, this is of no avail should we have a generation of surgeons who have never seen it used and are quite determined that they never shall.—I am, etc.,

Southsea.

H. B. C. SANDIFORD.

REFERENCE

- ¹ *Lancet*, 1909, 1, 1314.

SIR.—Mr. E. H. Miles Foxen (*Journal*, February 12, p. 413) must not be disappointed in his expectation of opposition to his wish to relegate the guillotine operation to the historical section of every textbook. Alas, this wish will never be granted by calling what is indeed the truth a dangerous platitude. The guillotine operation, carried out properly, is a sound procedure.

Trained in a Scottish medical school I saw many cases post-operatively whose tonsils had been removed by the

guillotine method. Later, while a registrar in the ear, nose, and throat department of a London hospital, I saw many cases post-operatively whose tonsils had been removed by the dissection method. I can assure Mr. Miles Foxen that it is not just the guillotine method which is responsible for tonsillar remnants and damage to the faucial pillars, soft palate, etc.

Obviously, with either the guillotine or dissection method, there will be initial failures in the training period of any surgeon. If the failures proceed, then either the operator has not been taught correctly or is inept. To reverse Mr. Miles Foxen's quotation, surely "the cause of failure lies not with the operation, but with the type of operator."—I am, etc.,

Carlisle.

J. C. CAMPBELL.

A Case of Phaeochromocytoma

SIR,—In reply to Dr. A. C. Kendall's letter (*Journal*, February 19, p. 482), I would like to state that the perirenal insufflation (*Journal*, February 5, p. 331) was undertaken by the presacral route as described by Blackwood.¹ I have no personal experience of undertaking this procedure by any other route, and I would agree that the presacral route should be used for preference. It would appear that Dr. Kendall has been more fortunate than myself in the results that he has obtained.—I am, etc.,

Liverpool, 1.

R. A. C. OWEN.

REFERENCE

¹ *Brit. J. Surg.*, 1951, 39, 111.

Natural Childbirth

SIR,—Dr. Constance Lang Beynon (*Journal*, February 19, p. 475) entertains a series of fears about natural childbirth and expresses an urgent desire to "ventilate some of the problems before it is too late." With all due respect to an inquiring mind, her letter persuades me that she has neither read, practised, nor closely observed the subject of her anxieties. It may be that, like many of our senior colleagues, she is more occupied with obstetric abnormalities and gynaecological cases. One cannot help feeling she has not often attended natural births, for had she done so it is unlikely she would have expressed fears lest all women might be given an opportunity of similar experience.

This obstetric programme provides the most humane consideration and treatment of mothers and their babies. All of us know that the care of women and the conduct of labour, particularly in many hospitals, leaves much to be desired. This problem must be faced frankly so that we can concentrate on making childbirth a healthier and happier event. Surely we owe this to those who place their confidence in us. It cannot be overlooked that the rapid spread of this teaching across the civilized world has been due, almost entirely, to the women themselves. Had there been no justification for their enthusiasm, it would have died out long ago. If responsible medical men, who conscientiously studied and employed its procedures, had proved it to be harmful it could not have survived their denunciation.

Innovations which imply change of orthodoxy usually meet with professional prejudice or apathy, and this case has not been an exception. In spite of all, natural childbirth has survived 30 years of careful thought, discussion, and trial, and the demand for it steadily increases. Men cannot have babies, but there is no shame in sacrificing their academic "stance and circumpomp" in the cause of kindly and compassionate unselfishness for women who bear babies. Dr. Beynon must not be afraid lest mothers receive a service that can do no harm, but will bring to the majority of them happiness, health, and a fund of family affection.

I agree with Dr. Beynon that "more general and open discussion might be wise at this juncture," but I go further. The time is ripe for a full inquiry into the care of pregnant and parturient women, which should be made by medical and lay investigators who are competent and unbiased. I

urged those responsible for our obstetric standards to do this eight years ago. The suggestion had interesting repercussions, but there was no inquiry. Childbirth is a much wider subject than obstetrics, for true motherhood is the cornerstone of domestic and social stability.—I am, etc.,

Petersfield, Hants.

GRANTLY DICK READ.

Comparison of Vole and B.C.G. Vaccination

SIR,—As there has been considerable publicity in the daily press following the publication of our paper (*Journal*, January 15, p. 133) one or two explanations are called for.

B.C.G. and vole vaccination of the children in the orphan homes and those of our staff was introduced as a protective measure. Eleven cases of tuberculosis had been notified in the 10 years previous to vaccination, and these did not include any case occurring after the children had left the homes, and there has been a number of such tragic sufferers. No case has occurred since this vaccination was undertaken 3½ years ago. In our report we reviewed the state at the end of two years, and since then many of the arms showing a persistent lupoid reaction have responded well to treatment; the two most severe are now healed. In no case has any child complained of pain or discomfort, and there was no systemic upset. The general health of the children has never been better. The opportunity was taken to compare two tried and established forms of vaccination. The persistent vole reactions were unexpected and it was our duty to record this. Nevertheless, we still consider vole vaccination to have certain advantages over B.C.G.

For the most part the article was fairly and accurately reported, but it is most regrettable that a section of the Press has misrepresented facts which may cause public opinion to be unfairly influenced against a voluntary institution whose first concern has always been the health and welfare of the children. The way in which this publicity has been used brings much discredit to those responsible. They have done a great disservice to the children and those sincerely interested in their problems who give such devoted care as house mothers and fathers. It must be made quite clear that the management acted on medical advice in the best interest of the children. There was a similar outburst when diphtheria immunization was first introduced. Finally, any measure which may prove of help in the eradication of tuberculosis should surely be welcomed.—We are, etc.,

HUGH W. O. FREW.

J. ROMANES DAVIDSON.

J. T. W. REID.

Paisley.

Fluoridation of Public Water Supplies

SIR,—To fluoridate or not—that is the question. The Commission on Chronic Illness, an independent national agency founded jointly by the American Hospital Association, the American Medical Association, the American Public Health Association, and the American Public Welfare Association, considered all the available evidence regarding the "effects of fluoridation of community water supplies upon the aged and the chronically ill" in the U.S.A. (report dated Chicago, Illinois, March 17, 1954). In this report the concluding paragraph reads: "The fluoridation of water supplies involves no new experience in human welfare. Over 3,000,000 people are living in ordinary good health on water naturally containing fluorides in the amounts recommended for caries control, or more" (my italics). The Commission goes further, urging "American communities to adopt this public health measure as a positive step in the prevention of the chronic disease, dental caries."

As regards the undoubted beneficial effects in so far as the children are concerned, all the evidence points to the difference between caries resistance of children drinking controlled fluoridated waters, which has become "most marked," as compared with children drinking non-fluoridated waters.

It is indeed curious to read the beginning controversy in the British medical press timed as it is a year or so after a similar controversy here—a controversy that still continues but with abating force, in spite of all the vituperation of the antagonists of the measure, in Massachusetts as elsewhere in the country. Incidentally, there are several anti-fluoridation bills before the present session of the Massachusetts Legislature—the sponsors either very long-haired persons, or very short-haired persons, both groups with their own particular varieties of bias. Very few average individuals, whether they be "men in the street," or "professionals," dental or medical, belong to this extremely vociferous group of anti-fluoridators.—I am, etc.,

Ayer, Massachusetts.

K. I. E. MACLEOD.

REFERENCE

¹ Report of Branford Fluoridation Caries Study, *J. Canad. dent. Ass.*, 1954, 20, 585.

Disk Lesions and Low Backache

SIR,—It is surprising that in the long discussion on low backache in your columns so little attention has been given to the relatively common occurrence of this symptom in pregnant women. Dr. E. Schleyer-Saunders (*Journal*, February 5, p. 348) has alluded to it. We found¹ that 3.7% of 3,030 women attending the antenatal clinic of the Royal Maternity Hospital in Edinburgh suffered from this symptom in such a degree as to call for special treatment. In 60% the pain commenced before, and in 40% after, the 28th week. In general the severity of the symptoms corresponded to the degree of loosening and mobility of the sacro-iliac joints. This softening at the pelvic girdle is frequently associated with an up-and-down gliding movement at the symphysis pubis, and the amplitude of this displacement as studied radiologically gives a measure of the rocking movement at the sacro-iliac joints. With the consolidation of the pelvic joints, which occurs after delivery, the symptoms tend to subside rapidly, but in a relatively large number the backache persists.

It is generally agreed, on seemingly sound evidence, that the mobilization of the pelvic joints during pregnancy is dependent upon hormonal factors, and that the change is limited to the joints. At the same time rarefaction of the adjacent bone is common, and in two instances we have been able to demonstrate that the forcible movement at the pubic joint had resulted in a tearing away of fragments of the adjacent bone. It is quite possible that similar laminar fracture may occur at the sacro-iliac joint without being revealed by x-ray.

The treatment of the backache of pregnancy is relatively straightforward. Rest in bed in the majority of cases leads to rapid relief, which persists. In the occasional case rest in bed throughout the remainder of the pregnancy and the puerperium is imperative. In the rare case, in which the pain is severe and the loosening of the joints extreme, the treatment is best given in a hammock as for fracture of the pelvis. In 15 years at the Postgraduate School of London we had only three such cases; this proves its rarity. Where in the ordinary case the backache persists after childbirth, manipulation gives relief in a high proportion.

Whilst we believe that the majority of cases of low backache in pregnancy are explained as above, there are cases, as O'Connell² and others have shown, which depend upon a disk lesion. It may be that the endocrinal factors that determine the joint lesion may predispose to disk protrusion.—I am, etc.,

Haywards Heath, Sussex.

JAMES YOUNG.

REFERENCES

¹ Young, J., *J. Obstet. Gynaec. Brit. Emp.*, 1940, 47, 493.
² O'Connell, J. E. A., *Surg. Gynec. Obstet.*, 1944, 79, 374.

SIR,—Mr. John Charnley's article on acute lumbago and sciatica in general practice (*Journal*, February 5, p. 344) is a delight to a general practitioner, perhaps most of all in the grouping of lesions and degrees of symptoms. I am particularly interested in the phenomenon that he describes as a rise of internal tension in the pulpy nucleus

due to an abnormal imbibition of water accompanied by guarding spasm of the back muscles. I have the impression that I have precipitated this condition in a number of women in the menopausal phase by giving them oestrone in small doses for even a few successive days. The backache subsides slowly after withdrawal of the oestrone, which is usually prompt since irritability and lack of well-being accompany the pain, even when flushes are relieved. The type of woman affected is a water hoarder. The pain does not resemble that accompanying pelvic congestion.

Since the publication of this article, a patient has been willing to reproduce this syndrome, which had been observed to follow treatment by oestrone on three previous occasions. This woman is post-menstrual, bothered by flushes which are relieved by oestrone, and an accepted case of chronic disk lesion following an accident.

Mr. Charnley states that reasons for this watery swelling of the pulp are unknown. If other observers can confirm any relation to oestrone intake, an endocrine approach to this aspect of the disorder may be of value. The possible antagonizing effects of ethisterone or methyl testosterone obviously need consideration. It is interesting, too, to recall Dr. Cyriax's observation that low backache in women tends to be chronic, in contrast to the more acute but briefer crises in men.—I am, etc.,

London, W.2.

ANNIS GILLIE.

SIR,—In his paper entitled "Spinal Disk Lesions" (*Journal*, January 15, p. 140), Dr. James Cyriax speaks of "patients with reducible displacement of part of a disk," who "abound in every hospital," and expresses his belief that such a "minor disk subluxation" can be "manipulated back into place," usually in one session.

A critical reader feels that such statements call for some elucidation. Can Dr. Cyriax substantiate his words with photographic or at least diagrammatic illustrations, to show exactly what structures are affected by the "subluxation" and the "reducible displacement of part of a disk"? It is difficult to visualize how a ruptured annulus fibrosus and herniating nucleus pulposus can be repaired in the brief ritual of a manipulation; in fact, it is a very severe strain upon the reader's credulity.—I am, etc.,

Halifax, Canada.

FREDERICK W. KNOWLES.

SIR,—I am sorry to see that Mr. John Charnley has come to swim with the current on the relationship between disk disorders and "fibrositis" (*Journal*, February 5, p. 344). A theory, to become established as an axiom, must be true for every case, and judged by this standard the theory that disk trouble (I use the word to cover all the gradations of pathology Mr. Charnley describes) is responsible for "fibrositis" must fall to the ground. I am tired of hearing every conceivable abnormality laid at the door of the disk, and while I am aware that, most likely, disks are responsible for hyperthyroidism, mitral stenosis, gall stones, and pregnancy, not to mention typhoid, lupus, and worms, I do not know which disks are displaced in "fibrositis" of the occipito-frontalis, temporalis, and masseter (presumably those between the basi-sphenoid and basi-occiput, or perhaps between the dens and the basi-occiput, or even between the dens and the body of C2).

I have deliberately put "fibrositis" in inverted commas because it is established beyond doubt that it is not an inflammatory lesion. But it may very well be a metabolic one which would not show under the microscope. When an unexpected demand is placed on a muscle not in training, and particularly in a reduced state of health of the patient, that muscle, as Mr. Charnley states, goes into spasm, thus restricting its own blood supply. It cannot then get rid of its metabolites and it remains in spasm until its blood supply is re-established by accurate deep friction, which traumatizes it sufficiently to produce the inflammatory response of local vasodilatation. The surrounding normal muscle-fibres must not be traumatized, of course. The same effect can often be obtained by passively stretching the muscle, hence the success, at times, of manipulation. This conception also quite easily explains the sudden onset in many cases. But I still have too great a faith in Nature's way of arranging things to believe that

the body tries to protect an internal derangement of the spine by making a few bundles of vastus lateralis go into spasm, or tensor fascia lata, or even gluteus maximus. If nature wants to protect a joint, the muscles controlling it are put into spasm, and then in no uncertain manner—not just a pencil thick (or even pencil-lead thick) fasciculus of one or two scattered areas of often unrelated muscles.

You will want proof, Sir, of my contentions, and I regret that by far the best proof I can give is to cite my own case, as I am the walking torpedo of the diskopath theory. I am still physically fit for strenuous activity of every kind (which I need not elaborate beyond saying it included Rugger till over 40), and have all my disk spaces fully maintained, in spite of having been a life-long sufferer from acute, chronic, and recurrent "fibrositis" in almost every muscle in my body, and having had both "brachial neuritis" and acute sciatica due to referred pain from trapezial and gluteal "fibrositis." The reference is proven because the massage of the areas of origin has cured the referred pain without any treatment of the spine at all. But it is a condition my 10-year-old daughter can cure for me. I look forward to the day when physiotherapists will relearn the same art, and orthopaedic surgeons and specialists in physical medicine will again come to recognize that there are more things in heaven and earth than disks.—I am, etc.,

Canterbury.

F. G. ST. CLAIR STRANGE.

SIR.—May I, as another general practitioner, support the comments of Dr. R. N. R. Grant (*Journal*, February 19, p. 480) on the "disk" controversy? We all see scores of cases of fibrositis, only a small proportion of which are sent to the hospital. Most of us would agree that the syndrome is related in some way to weather, to muscular strain, and is quite certainly epidemic. It is my impression that even the muscle groups affected vary in each epidemic, one producing "lumbago" and the next affecting the shoulder girdle. Perhaps there is a relationship to Bornholm disease, in its being a specific infection.

It is very difficult to let oneself be persuaded that what is probably second only to the common cold in causing epidemic "dis-ease" is produced by mechanical disorder.—I am, etc.,

Dundee.

RONALD A. B. RORIE.

SIR.—As a routine in general practice for more than 30 years, I have manipulated cases of low backache of sudden origin and have followed this with a firm bracing of the hips, back and front, with four or five strips of 3-in. (7.6-cm.) rigid zinc oxide plaster. Unless there was an allergy to rubber, this temporary corset gave support and comfort that was appreciated. It was removed after a fortnight, and then, but only if necessary, was physiotherapy advised.

The key word here is "sudden," for it eliminated most cases of gynaecological or urological origin. If there was a sciatica I ordered absolute bed rest for up to six weeks if needed, and have never withheld morphine. I have also used subcutaneous infiltration of oxygen into the buttocks, which, by forming a personal air ring, seemed to give comfort. One case required surgical aid; several, after one or two relapses, were helped by surgical belts; but the majority improved and appeared to be grateful.

Even allowing for fashion in diagnosis there does seem to have been a real increase in the occurrence of this disability in the last few years.

May the modern craze for comfort be the cause? The drawing-room of my youth is now the lounge, and the parental exhortation has changed from "Sit up straight" to "Oh, do relax." The old chairs had almost upright backs which kept the spinal muscles at the alert. No effort is required supinely to sit in the modern ultra-comfortable armchair, supporting as it does every part with soft pads of latex foam, but, in contrast to the old type, a big demand is made on over-slackened muscles to raise the body from its luxurious setting. Three of my cases of sudden low backache were caused in this way. Should the body have

to adapt itself to the furniture or the furniture to the body? Is the multi-spring mattress an improvement on the firmer flock or horsehair, and is it entirely blameless?

The suggestion is that our modern luxury tends to promote a laxness in the spinal tissues which renders them increasingly liable to dislocation.—I am, etc.,

London, N.W.11.

C. BERKELEY WAY.

POINTS FROM LETTERS

Experiments in Hospital

Dr. SYLVIA DICKINSON (Bristol) writes: With regard to the work done by Dr. B. Laurance at the Bristol Maternity Hospital (*Journal*, December 11, 1954, p. 1392), are any follow-up studies being made to find out whether these children subsequently react differently to infection compared with untreated children or show any other effect of the penicillin treatment in early infancy?

Trilogy

Mr. MICHAEL REILLY (Plymouth) writes: As "Fallot's tetralogy" is now so firmly ensconced in medical literature (*Journal*, January 29, p. 269), may I put forward a plea, in the interests of uniformity, that "Charcot's triad" be rechristened "Charcot's trilogy"? Triad, tetrad, pentad, and so on, have for long enough denoted mere groups of three, four, five, etc., while a cycle of four dramas, three tragic and one satiric, has for two and a half millennia been called a "tetralogy." Why not "trilogy" for Charcot's signs, which really are three tragic manifestations?

What is Health?

Dr. A. R. EATES (London, S.W.3) writes: Why do we want to know what it is? How are we to assess or measure it? . . . Health or wholeness is a harmonious development of a man's physical, mental, and moral qualities. It can only be estimated in relation to the man's environment; it must be a variable quantity. The health or fitness required of a young athlete which enables him to run 100 yards in 10 seconds is very different from that of an elderly clerk in a quiet office. Each may be equally efficient in what he sets out to do, and, so long as each can do . . . without excessive strain and with satisfaction to himself and others all the calls upon him in his day's work, each is to be classed as "healthy." Health is a relative quantity.

Medical Aspects of Professional Boxing

Dr. P. F. CASSIDY (Glasgow) writes: I have read with interest Dr. J. C. Laurie's letter on boxing (*Journal*, January 22, p. 227). I disagree that a boxer enters the ring with the object of doing damage to his opponent's cranium and its contents. He enters the ring to pit his skill and ability against an opponent, as men have done since the beginning of time. In boxing no one wishes to see unevenly matched opponents. No one who is a true lover of the sport likes to see a knock-out, because the term knock-out does not exist in true boxing parlance. Points decision is the verdict of choice. . . . In his last sentence, however, Dr. Laurie expresses the sentiments of all true lovers of the sport that "'boxing' grows on one." In this I agree, and I trust that there will always be doctors who without financial gain will give protection to those lads who, in spite of all anti-boxing advocates, continue to give pleasure to boxing lovers.

Unwrapping the "Journal"

Dr. H. LYNTHURST DUKE (Cross-in-Hand, Sussex) writes: Before you finally close this correspondence I feel you should learn of a quite unforeseen, indeed sensational, sequel, news of which I have received from a fellow member of the Association: "Re your letter 'Unwrapping the Journal,' I see you advise the Editor to have it 'loosely wrapped.' Two weeks ago the wrapping was delivered to me minus the *Journal*!"—the opposite extreme to that about which the correspondence opened and even more distracting. I can only hope the wrapper arrived in one piece and that the loss has been made good.

Mr. A. C. GOODWIN (Dawlish) writes: My experience differs completely from that of Dr. H. Lyndhurst Duke (*Journal*, February 12, p. 419) as I rarely (if ever) find the *Journal* so loosely rolled that I can carry out the methods he describes. I find the following procedure simple and efficacious in all cases. With the sharp point of the narrow blade of an ordinary pair of scissors I cut through the length of the outer layer of the wrapper (avoiding the exposed pages of the contents), then insert the point of the broad blade into the cut and run the blade along its whole length. The wrapper is then removed in one piece.

Obituary

Sir HENRY WADE, C.M.G., D.S.O., M.D.
F.R.C.S., F.R.C.S.Ed.

The death occurred at Edinburgh on February 21 of Sir Henry Wade, consulting surgeon to Edinburgh Royal Infirmary. He was 78 years of age.

The son of the Rev. George Wade, Henry Wade was born at Falkirk in 1877 and was educated at the Royal High School, Edinburgh, and at Edinburgh University, where he graduated M.B., Ch.B. with honours in 1898. For nearly two years after graduation he was on active service as a civil surgeon with the Royal Scots Fusiliers in the South African war and was awarded the Queen's

Medal with four clasps.

On his return to Edinburgh Wade became assistant to Sir William Turner in the department of anatomy in the university, and in 1903 was elected F.R.C.S.Ed. In that year he was appointed conservator of the museum of the college, and subsequently he served the college for exactly fifty years as lecturer, examiner, member of the President's council, and, from 1943 to 1953, as representative of the college on the General Medical Council. He was



[Swan Watson, Edinburgh]

awarded a gold medal for his thesis when he proceeded to the M.D. in 1907.

Wade was early appointed to the surgical staffs of Leith Hospital and Edinburgh Royal Infirmary, and was assistant surgeon there on the outbreak of the first world war in 1914, when he joined the Scottish Horse mounted brigade field ambulance and served with the unit in Gallipoli. In 1916 he was appointed consulting surgeon to the Egyptian Expeditionary Force, and for three years served in Egypt, Sinai, Palestine, and Syria. For his services with Allenby in Egypt and Palestine he was twice mentioned in dispatches, was awarded the D.S.O. in 1918, and in the following year was appointed C.M.G., receiving also the Order of the White Eagle of Serbia. On the conclusion of hostilities Wade returned to Edinburgh and resumed his appointments as conservator of the museum of the Royal College of Surgeons, lecturer in surgery in the school of medicine, and surgeon to Leith Hospital, appointments he held for 17 years. In 1924 he became surgeon-in-ordinary to Edinburgh Royal Infirmary, and remained in the active service of the hospital until he retired in 1939 as consulting surgeon. During the second world war he continued in active surgical work as consulting surgeon to Bangour E.M.S. Hospital, West Lothian. He was knighted in 1946. He was predeceased by his wife in 1929.

We are indebted to Mr. DAVID BAND for the following appreciation: Wade was a surgeon of outstanding brilliance and an enthusiastic clinical teacher. At the outset of his surgical career he devoted two years to pathology, and personally performed all post-mortem examinations on surgical cases at Edinburgh Royal Infirmary. In the post-mortem room he became interested in the changes in the upper urinary tract which accompanied prostatic obstruction, and he traced the post-operative sequelae which had

led to the fatal issue. He made serial whole sections through the pelvis and prostate in the cadaver and observed the morbid anatomy of the prostate in the various age groups and at different stages of prostatic obstruction. As a result of this investigation Wade published in 1914 in the *Annals of Surgery* a profusely illustrated monograph on the surgical anatomy and pathology of the operative treatment of prostatism. The drawings in black-and-white and in colour of the entire urinary tract in prostatism demonstrated more perfectly than had before been done the effects of backward pressure on the upper urinary tract. The whole sections clearly showed that in the operation of prostatectomy enucleation of the gland had not been complete, but that the adenomatous part alone had been enucleated through a line of cleavage between it and a false capsule produced by compression of the more peripheral gland elements. These lie within the true gland capsule and, with the latter, must remain intact if the operation of enucleation of the prostate is to be performed with success. His presentation of this work made a deep impression on Hugh Hampton Young, of Baltimore, and Wade was invited by him to attend the following year in the Buchanan-Brady Institution of the Johns Hopkins Hospital, which was to be opened as a urological department. War prevented this, but in 1920 the promised visit was made and Wade remained with Young for several months.

Between the two wars Wade published some 35 papers on urological surgery. In each, advances in surgical management were described or appraised. Throughout his career as a surgeon and clinical teacher Wade insisted on attention to anatomical detail and an adequate knowledge of surgical pathology as essential qualifications in the training of a surgeon. It was the application of these principles which brought to him such a great measure of success in the surgery of urinary tuberculosis and in the treatment of vesical tumours, including a large series of cases of total cystectomy with ureterocolic anastomosis. He was one of the first to draw attention to the invasion of the renal vein by hypernephroma, and he showed in his paper in the *Australian and New Zealand Journal of Surgery* in 1935 that in nephrectomy for tumour the renal vein could be ligated with safety between its junction with the vena cava and the limit of neoplastic invasion. His collection of serial whole sections of renal pathology was unique, and he always maintained that the radiographic appearances obtained by retrograde pyelography must be correlated with a detailed study of the pathological changes in the kidney. He held no brief for pyelographic anomalies which might be listed as due to faulty technique.

During his 15 years as chief in the Royal Infirmary Wade attracted to his operating theatre and his ward a steady stream of visiting surgeons from overseas. His Saturday morning lectures and demonstrations became an outstanding example of postgraduate instruction at its best. He travelled by invitation to America and Australia, and was awarded the honorary Fellowships of the American College of Surgeons in 1930, the Royal Australasian College of Surgeons in 1935, and the Royal College of Surgeons in Ireland in 1939. It was his forthright support of all that was genuine in surgical progress which led to his election to the most exclusive surgical societies of the English-speaking world, including membership of the International Association of Surgeons and Fellowship of the Los Angeles Surgical Society. In 1932 he delivered the Ramon Gutierrez lecture on the balanced urinary system before the American Urological Association, of which he was elected an honorary member. He was elected a Fellow of the Royal Society of Edinburgh in 1932, he was President of the Royal College of Surgeons of Edinburgh from 1935 to 1937, and he was elected an honorary Fellow of the Royal College of Surgeons of England in 1943 and of the Royal Society of Medicine in 1951.

His years of active surgical progress behind him, Wade devoted his energies to help in the formation of the National Health Service, and he became a convener of many committees in connexion with the services of the South-eastern

Regional Hospital Board in Scotland. He was a strict disciplinarian in every surgical service under his control, but there was another side to his nature. He was a student of social and natural history and was widely read in the literature of these subjects. His Harveian Oration on "Harvey in Scotland" in 1938 and his Thomas Vicary lecture before the Royal College of Surgeons of England on "The Barber Surgeons of Edinburgh" in 1949 record the diligence of his researches and his erudition. A member of the British Medical Association for over 50 years, Wade served as a vice-president of the Section of Surgery when the Association held its Annual Meeting at Edinburgh in 1927. He was a member of the Representative Committee in 1943-4, the Negotiating Committee from 1944 to 1949, and the Evidence Committee in 1947-8. He was also a member of the Medical Planning Commission.

At his country home of Pilmuir, Haddington, East Lothian, Wade had acquired and preserved an old house and garden in the Scottish baronial style. His favourite flowers were the rare primulas, and the habits of the nesting birds were observed from year to year, as many had been expertly ringed. The versatility of his interests brought to Wade a humanity and a wealth of understanding which were reflected in the lifelong friendships he made at home and abroad with all who came to know him—surgical colleagues or patients, historians or pupils.

OSWALD T. AVERY, M.D.

Dr. Oswald T. Avery, the distinguished bacteriologist, died in Nashville, Tennessee, on February 20, after a long illness.

Oswald Theodore Avery was born in Halifax, Nova Scotia, on October 21, 1877, and qualified in medicine from the College of Physicians and Surgeons, Columbia University, where he graduated M.D. in 1904. After a few years in general practice Avery was appointed associate director, department of bacteriology, Hoagland Laboratory, in 1907, a position which he left to become an assistant in the hospital department of the Rockefeller Institute for Medical Research. Here Avery began the studies on the pneumococcus with which his name will always be associated, and was one of the founders of immunochemistry. He discovered and identified the capsular polysaccharides of type III pneumococcus and demonstrated their function. He also separated the polysaccharide antigens. Avery remained at the Rockefeller Institute until his retirement in 1943, when he became a member emeritus. His writings chiefly concerned the biological activities, immunological characteristics, and pathogenic properties of the pneumococcus. This work was recognized in the award of the Kober Medal by Georgetown University Medical School in 1946, and in a Lasker Award by the American Public Health Association in 1947. Elected a foreign member of the Royal Society in 1944, Avery received its Copley Medal in 1945. He also received the Paul Ehrlich Gold Medal (1933) and the New York Academy of Medicine Medal (1944). He was Mickle Fellow, University of Toronto, in 1946. McCall University awarded him an honorary LL.D. degree in 1935, and he was an honorary member of the Pathological Society of Great Britain and Ireland.

Dr. S. D. ELLIOTT writes: Many have commented upon the similarities between Dr. O. T. Avery and Sir Frederick Gowland Hopkins. To some extent they were alike in appearance as well as in personality; both through their classical researches had a profound influence upon biological science; and both left an indelible impression on the minds of the young people who were privileged to work in association with them. Dr. Avery always disclaimed any ability to assess from a single interview the potentialities

of applicants for the coveted honour of a place in his laboratory. Yet it is remarkable how many of those who worked with him at the hospital of the Rockefeller Institute achieved distinction. The explanation, in part at least, lay in his capacity to transmit to others his own way of thinking; this, in the recipient, yielded its own ultimate harvest. Few of those who knew Dr. Avery will hear of his passing without deep emotion. His gay charm, great wisdom, and lovable character combined to make in him a unique personality. He was indeed a prince among scientists. "Good night, sweet prince."

Sir CHARLES J. MARTIN, C.M.G., D.Sc., LL.D.
D.C.L., M.B., F.R.C.P., F.R.S.

The obituary of Sir Charles Martin was printed in last week's *Journal* at p. 543. We are indebted to Dr. W. R. AYKROYD, director of the nutrition division of the Food and Agriculture Organization of the United Nations, for the following appreciation:

Many will feel a sense of loss on learning of the death of Sir Charles Martin. I had personally the privilege of working under him in the Lister Institute during the last years of his directorship in the late 'twenties. He was unfailingly kind to young research workers, and was always ready to help in clearing up their problems. He would turn from whatever he was doing—and he was always engaged in some research activity of his own—his eyes would glitter behind his spectacles, the keen incisive mind would come into operation like a smooth-running machine—and one had one's answer. No one who worked with him will ever forget his quick, illuminating comments on detailed technical questions or on the broader aspects of science. His own scientific papers were always beautifully written, and he would go to endless trouble in showing beginners how to present their scientific results and in editing their efforts. At the same time he distrusted words divorced from solid fact. I shall never forget one incisive remark, "You write too easily. That's a dangerous gift." I think that his old pupils, when undertaking some task in later years, often asked themselves, "What would Sir Charles think of this?" His influence is hard to define; it stemmed perhaps from a rare combination of unpretentiousness, honesty, and remarkable intellectual gifts. But such words somehow fail to convey what "Sir Charles" meant to those who were privileged to know him and the respect and affection which we felt for him.

The untimely death on January 10 of Dr. DONALD P. DOW has removed an outstanding personality and reduced the number of medical men whose work has left its mark on India. He was 49 years of age. Donald Peter Dow was born at Ardrossan, Ayrshire, and was educated at Airdrie Academy and at St. Mungo's and Anderson Colleges, Glasgow, qualifying by taking the Scottish triple qualification in 1930. After qualification he held the appointments of house-physician and house-surgeon at Dumfries and Galloway Royal Infirmary, and he then practised for short periods in various parts of the United Kingdom before going to India to pursue his studies at the School of Tropical Medicine, Calcutta. Dr. Dow was brought up a Baptist and always had a leaning towards the mission fields. He applied to several churches for this kind of work, but his state of health caused them to reject his applications. In 1934—when he married Miss Esther Wells at Bombay—he persuaded the Methodist Missionary Society to appoint him medical superintendent of the Victoria Leprosy Hospital at Dichpali, Hyderabad, and from then until he returned to Scotland in 1944 he devoted much time to the improvement of the facilities of the institution, particularly in connexion with the sanitary arrangements and the electricity supply, eventually building up a modern leprosarium. While at the hospital he saw the accommodation for inmates increase from 400 to 850. He also became lecturer in leprosy in Osmania University, conducting clinical courses for students

and postgraduates at Dichpali. Dr. Dow was the first missionary to become a member of the Hyderabad State Medical Council, and a final recognition of his work and worth came with the award of the Nizam's jubilee medal. During his stay in India Dr. Dow wrote extensively, his publications including lecture notes on leprosy and articles on leprosy research—he came to be regarded as an authority on leprosy—and on occupational therapy, the psychological approach, pellagra, and on other subjects. In 1944 ill-health compelled him to return to Scotland, and in the following year he established himself in practice at Newtyle, Angus, where he became widely known as a "beloved physician." A devout Christian, Dr. Dow could hold his own in theological circles, and his services as a preacher and speaker were much in demand at Strathmore and beyond. Many people derived encouragement from his logic, enthusiasm, and example. Fees he received as a preacher went to help the work of the Mission to Lepers or to augment the church funds—acts of generosity and remembrance which endeared him to a still wider circle. At the time of his death he was a member of the Angus Executive Council, a lecturer to the local branch of the Red Cross and examiner in first aid, president of the Dundee Auxiliary of the Mission to Lepers, and he attended patients at the Church of Scotland Eventide Home at Belmont Castle and the Newtyle Home for the Blind. He was a founder member of the College of General Practitioners and president-elect of the Dundee Branch of the British Medical Association. He is survived by a widow and two adopted children.

Dr. A. P. NUTTALL died on February 19 at his home at Rickmansworth, Hertfordshire, to which he had retired for family reasons 25 years ago. He was 85 years of age. Arthur Peel Nuttall was born on May 20, 1869, and was educated at the Bury Grammar School, at Rossall, and at Owens College, Manchester, from which he went to University College Hospital to complete his medical course. He graduated M.B.(London) in 1893, proceeding to the M.D. in the following year. After holding house appointments at University College Hospital (including the post of house-physician to his fellow Lancastrian Sir Thomas Barlow), he returned to his birthplace, Bury, where he joined his father in practice. When his father retired in 1905 Dr. Nuttall took over the practice until his own retirement. He became one of Bury's most respected and most successful practitioners. He was honorary surgeon to the Bury Infirmary from 1909 to 1926, when he was made honorary consulting surgeon. In his younger days Dr. Nuttall was a keen Volunteer. He was always proud of the fact that he had held the office of surgeon-major to the 5th battalion of the Lancashire Fusiliers (T.) in the days before the R.A.M.C. was constituted. He was also very proud of the honorary membership of the British Medical Association which was conferred upon him in his old age. While in retirement he was always ready to help his colleagues in Rickmansworth during periods of pressure, and he led, in fact, a very active life. His wife, formerly Miss Dorothy May Stead, died in 1953. He leaves two daughters.

Dr. G. M. ADDISON died suddenly at his home at Westgate-on-Sea on January 30 at the age of 52. George Montagu Addison was born on November 13, 1902, and was educated at Haileybury College, where he gained a science scholarship to Pembroke College, Cambridge. He went on to St. Thomas's Hospital for his clinical training and qualified M.R.C.S., L.R.C.P. in 1927, taking the degrees of M.B., B.Chir. in the following year. In 1929 he obtained the D.P.H. of the English Royal Colleges. After qualification he completed a number of hospital appointments, and then his interests turned to general practice. After practising for a time in London and Staines he went to Westgate-on-Sea in 1934. During the second world war he served in the R.A.M.C. from 1940 to 1945, through the Alamein campaign of 1941-3, and then in Europe from 1944 to 1945, attaining the rank of major. For most of his service he was employed as a hygiene officer, and in the spring of

1945 he was appointed a deputy assistant director of hygiene. After the war he returned to Westgate, where, in addition to the work of his practice, he was medical officer to St. Cecilia's Musicians Convalescent Home, the Salvation Army Eventide Home, St. Michael's Convalescent Home, and to various schools. He was also divisional surgeon to the St. John Ambulance Brigade and on the panel of the Ministry of Pensions and National Insurance. A former secretary of the Margate Medical Society, he was also secretary of the East Kent Division of the British Medical Association from 1936 to 1939. He was chairman of the standing committee of the chamber of commerce in Westgate at the time of his death.

Dr. W. G. SUTCLIFFE writes: Anyone who knew George Addison could not have failed to be impressed by his high moral integrity and his devotion to his profession. He had a keen sense of humour, and many will remember his happy way of cheering a dull meeting with his wit. He was not concerned with popular favour and never feared to express what he felt to be right. He showed great courage during the past year when, knowing his precarious state of health, he cheerfully continued to work and to support his family. He will be greatly missed in Thanet. Every sympathy is extended to his widow and to his two sons and eight daughters.

By the tragic death of Dr. LAWRENCE HENSHAW in an aeroplane accident on February 5 Nigeria has lost a particularly well loved citizen. Lawrence Michael Eken Richard Henshaw, who was born at Calabar in 1898, was educated at the Sacred Heart School there and at King's College, Lagos. He then acted as a dispenser for a time, work which helped him later when he went to Edinburgh University as a medical student. At Edinburgh he was one of a group of fellow Nigerians, many of whom have since made notable contributions to medical work in Nigeria. He graduated M.B., Ch.B. in 1927, and in the following year obtained the additional qualifications of L.M. and D.T.M.&H. before returning to Nigeria in 1928. He was employed as a member of the Nigerian Medical Service from the time he returned to his home country until 1952. Two years after he joined the Service he was granted the title of medical officer, a status which to-day would be given on entry, and in 1948 he was promoted to senior medical officer. Four years later he retired from Government service and became medical officer to the Palmol estate, near Calabar. He was appointed an honorary O.B.E. in the Birthday Honours of 1948.

We are indebted to Dr. CARMICHAEL WILSON for the following appreciation: It would be impossible to find anyone who was more popular with and more respected by all who knew him than Lawrence Henshaw, and he was known to many. As a colleague he was staunch and helpful and kind to all, no matter who they were. As a friend he could not be bettered, while his quiet joviality was a tonic to everyone, whether in hospital, at meetings, or in the home. His sterling worth and sound sense were well recognized, and he had been appointed to the governing body of the new University College Hospital at Ibadan. He was returning home from a meeting of the governing council of the Nigerian College of Arts, Science, and Technology, of which he was also a member, when he met his death. Nigeria and the Commonwealth have lost a very fine citizen who will be deeply mourned by his many friends, and not least by me.

McK. McC. writes: Colonel GEORGE A. MOORE, whose obituary was published in the *Journal* of February 19 (p. 485), was a keen and capable soldier. I first met him as D.D.M.S. of the divisions west and south of Armentières. We of the 40th division had come up from south of Arras after the great German attack of March, 1918, and were put into the front at Fleurbaix next to the Portuguese division. He knew we were to be attacked and probably driven back, and wisely prepared us all for this eventuality. The attack was not long in coming, but, thanks to Colonel Moore's

admirable administration, our losses were not heavy, though our right flank was in the air with the enemy between the ambulances and our own front line. After his retirement from the Service in 1921 he opened his house in Redcliffe Square, S.W.10, as a surgery and took up general practice. His paternal outlook on everyone endeared him to his patients, who worshipped him. During the air raids the sirens were a call to him to open his surgery and prepare tea for all of his patients who cared to come. The fearful moments were less fearful to them because of his bravery, generosity, and real Christian affection. One of his great loyalties was to all Irish graduates in and around London. He had been president of the Irish Medical Schools and Graduates Association in 1934 and continued to serve on the council, the meetings of which he rarely failed to attend. His last attendance was two days before he died. He will be missed by many of his former patients in the Redcliffe Square area, where his tall and erect soldier-like figure was so well known. He will never be forgotten by those who knew him, because of his constant charitable benevolence to his fellow men and women.

The obituary of Mr. PHILIP TURNER was printed in last week's *Journal* at p. 545. A.E.S. writes: Mr. Philip Turner was a great gentleman: quiet, somewhat shy, and always courteous. I learned from him as a dresser at Guy's. His surgery was anatomical and with minimum trauma. In later years I often saw him at the Hornsey Central Hospital. Once I met him unexpectedly in the Grand Hotel, Sheffield. He was held in respect and affection by all.

Mr. R. AFFLECK GREEVES writes: Having been privileged to diagnose and treat Lieutenant-Colonel G. E. Malcomson's eye trouble, to which Lieutenant-General Sir Ernest Bradfield refers in his appreciation (*Journal*, February 19, p. 483), I should like to correct a misapprehension on Sir Ernest's part. What Colonel Malcomson suffered from was not a retinal detachment but a bilateral paracentral choroiditis, which cleared up after the elimination of oral sepsis, leaving him with perfect central vision in one eye and slightly reduced visual acuity in the other.

Medico-Legal

MEDICAL REPORTS IN LITIGATION

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

On October 1, 1954, sweeping amendments in the procedure of the High Court were brought into force in order to make a start in implementing the recommendations of the Evershed Committee. These are aimed at reducing the cost of litigation. Broadly speaking, Masters of the Supreme Court were given much wider powers than they had hitherto enjoyed to ensure the exclusion before an action reaches the stage of trial of all unnecessary expense in properly defining what is at issue between the parties, and in preparing the evidence on both sides which will be necessary for the decision of that issue at the trial.

In cases in which medical evidence is required, Masters were empowered to order at the hearing of the summons for directions that a medical report should be agreed if possible, and, if not, that the number of medical witnesses to be called by each party should be restricted. It has of course been and will remain a common practice for joint medical examinations to be made and joint medical reports to be used in litigation if there is no real difference of opinion between the doctors advising both sides, and the joint report can by agreement then be used in evidence without either side's doctor being called.

The scope of the Master's new powers in this respect was recently discussed in the Court of Appeal in the case of

Worrall v. Reich.¹ That was an action for damages for personal injuries, and on the summons for directions the Master ordered: "Exchange medical reports; if not agreed, the medical evidence be limited to two witnesses for each party." This order was upheld by Mr. Justice Glyn Jones in chambers.

On appeal to the Court of Appeal it was decided that the order, in so far as it directed the exchange of medical reports, was invalid in that they were documents made on behalf of either party on the advice of their legal advisers in preparation for the trial and therefore privileged from disclosure. Although in some circumstances it might be desirable from the practical point of view that medical reports should be exchanged, and although it might be highly expedient that the parties should adopt that course by agreement in many cases, it could not properly be made the subject of an order.

DEATH FROM PINK DISEASE

A verdict of accidental death from pink disease was recorded on February 22 at Stoke-on-Trent on an 11-months-old baby boy. The coroner, Mr. G. W. Huntbach, said that the disease was due, not as at first thought to teething powders, but to legally prescribed grey tablets (hydrarg. cum cret.).

The baby had been healthy until about November, 1954, when he was said to have had teething trouble. The father bought some teething powders. These were Steedman's new type of powder and were shown to contain no mercury. On January 13, 1955, Dr. A. G. Mowat, the family doctor, prescribed 12 tablets of hydrarg. cum cret. because the child had a slight digestive disorder, irritability, and pains in the head, and from January 14 for the next six days the mother administered 2 tablets a day to the baby in accordance with instructions. The baby got no better, and on January 26 was admitted to hospital suffering from pink disease. After improving somewhat, the baby became restless and pyrexial on February 2 and died on February 3.

At necropsy the liver was found to show slight fatty degeneration, the kidneys on both sides contained granular casts, and both lower lungs were congested. Chemical analysis carried out by Mr. F. L. Cann, of the West Midland Forensic Science Laboratory, showed that a specimen of kidney contained 500 µg. of mercury, a liver specimen 130 µg., and a brain specimen 40 µg. Dr. C. Giles, consultant pathologist at the City General Hospital, confirmed the necropsy findings and agreed that death was from pink disease due to the ingestion of mercury.

DEATH FROM SENSITIVITY TO AMETHOCAINE

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

On January 17, 1955, Thomas Traynor, a ship's cook aged 62, was admitted to Broadgreen Hospital, Liverpool, for chest investigations for suspected bronchial carcinoma. He was also suffering from a peptic ulcer. On February 10 he was to have had a bronchogram carried out. He was given an amethocaine lozenge to suck, to indicate whether or not he was allergic to amethocaine. As he showed no reaction, half an hour later as a preliminary to undertaking the bronchogram his throat was sprayed with $\frac{1}{4}$ to 1 ml. of amethocaine solution. During this procedure he suddenly collapsed, had a convulsive fit, and died within three minutes.

At the inquest held by the Liverpool City Coroner on February 12 the pathologist at Broadgreen Hospital, Dr. Francis Whitwell, gave evidence that in his opinion death was caused by convulsions due to sensitivity to amethocaine, and that there was no satisfactory test for hypersensitivity. Sections of the deceased's lungs showed that bronchial carcinoma was in fact present.

¹ [1955] 2 *Weekly Law Reports*, 338.

Medical Notes in Parliament

PEACEFUL USES OF ATOMIC ENERGY

A motion introduced by Mr. RONALD BELL (South Buckinghamshire, Con.) on February 25 gave M.P.s an opportunity to express their hopes of the benefits to be gained from the peaceful application of atomic energy, and the use of radioactive isotopes in research, medicine, industry, and agriculture. All those who spoke shared Mr. Bell's purpose, to turn public attention to beneficial developments which had been going on unnoticed in the shadow of the great bomb explosions.

The first anxiety that was expressed was about the shortage of scientific man-power; it was said that the existing atomic programme could absorb the total output of physics graduates from British universities for several years. And the first satisfaction was that there would be no sulphurous fumes from the atomic fission generators of electric power. There was also general agreement on safety: the new atomic power stations to be built were inherently safe; the reactors could not run away and turn into junior atomic bombs, as some people seemed to fear.

Mr. BERNARD BRAINE (Billerica, Con.) questioned whether sufficient money was being spent on research, particularly in comparison with what the United States was doing. He suggested that there was a strong case for examining the finance provided for medical research in such matters as radiation sickness. The budgets of the Medical Research Council and the Ministry of Health were stretched to the uttermost. He urged that financial help should be given directly to this very special and expensive research.

Disposal Problems Solved

Mr. NIGEL BIRCH, Minister of Works, had to devote much of his reply to questions that had been asked about the £300m. capital investment programme for nuclear power stations. But on safety matters he was able to say that the most stringent precautions were taken—some people thought them too stringent—and the record had been extraordinarily good. Great advances were being made in the disposal of radioactive waste. The method depended on the degree of radioactivity; some went into the air, some was piped out to sea, some was taken in steel or concrete containers and dumped 1,000 miles out at a depth of 2,000 fathoms, and some of the very dangerous stuff had to be stored. There were some waste products, such as strontium⁹⁰ and caesium¹³⁷, that were particularly dangerous, but techniques were being evolved to put them to useful work. Caesium, for example, could be used for medical purposes. The point was that this was a manageable problem. If all electricity in the country was produced from nuclear power the dangerous products would amount to only one or two tons a year. There really was no danger, and the natural fears of the unknown that had been aroused were unnecessary.

"HORROR COMICS" BILL

The Children and Young Persons (Harmful Publications) Bill got its second reading on February 22, after some severe buffeting in debate. It is one of those measures of which all approve the end but many have serious doubts about the means chosen to ensure them, and substantial alterations will be proposed during the committee stage. No one disputed the basis on which the Home Secretary presented the Bill, to make special provision for the protection of children and young persons against the depraving effects of "horror comics." But there was vigorous criticism of the failure to deal with the whole law of obscenity in literature, on the lines suggested by the Society of Authors, instead of introducing this piecemeal measure, and serious doubts were expressed that even so its language was so wide as to endanger publishers and printers. It was apparent from the debate that in the subsequent stages efforts will be made to limit the duration of the Bill, so that its effects shall not continue and be liable to misuse after the reasons for its

introduction had disappeared; to secure that all prosecutions taken under it should be with the assent of the Director of Public Prosecutions, in order to avoid the confusion caused by different benches of magistrates taking widely different views on the extent to which pictures might tend to corrupt children; and to define more explicitly the element of intent.

Cadmium Poisoning Report

Mr. HAROLD WILSON (Huyton, Lab.) asked the Minister of Labour on February 24 what machinery existed for ensuring that the deaths through cadmium poisoning of workers employed at copper refineries were reported to the department, and whether he was satisfied that the machinery resulted in the notification of all such deaths. Mr. HAROLD WATKINSON, Parliamentary Secretary, said that any death resulting from acute cadmium poisoning at premises under the Factories Acts would be notifiable as an accident in accordance with those Acts, and satisfactory machinery existed for such notification. The question of ill effects from long-continued exposure to small amounts of cadmium was being carefully studied in the light of the recent report prepared by a member of the staff of the Medical Research Council and other available evidence both positive and negative. Mr. WILSON said the reason some of the deaths were not reported was that the disease was not generally known about. He had obtained no fewer than six certificates from registrars showing cadmium poisoning to be the cause of death, and these had not been notified to the Ministry. Mr. WATKINSON said that if Mr. Wilson would let him have the evidence it would be considered in conjunction with Dr. Bonnell's report, which was being given the most urgent attention.

Lead Poisoning Among Children

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) questioned the Minister of Health about lead poisoning occurring among children, and whether the public appreciated the danger of using paint containing lead on woodwork that children might handle. He also sought information about the deaths of two children in Manchester Children's Hospital. Miss PAT HORNSBY-SMITH, Parliamentary Secretary, replying on February 21, said that such cases were not notifiable. There were 11 deaths among children ascribed to lead poisoning in the five years ending September, 1954. Of the seven deaths from 1952 to 1954 none was reported as showing signs of lead encephalopathy; information was not available for the other deaths. Serious danger arose only when in rare cases a child developed a peculiar appetite for chewing articles containing lead which resulted in cumulative poisoning. Lead paint had been the most frequent reported cause, apart from one recent outbreak due to the use of old battery cases as fuel on domestic fires. One of the two children who died in the Manchester Hospital was stated to have chewed furniture and toys and the source of poisoning was paint; information on the second case could not be obtained. The Department had issued notes to a number of widely read journals suggesting that their readers should be warned of the danger, particularly when repainting furniture or walls, and the Minister was glad of this further opportunity of making known this occasional hazard.

Tuberculosis in Immigrants

Mr. SOMERVILLE HASTINGS (Barking, Lab.) asked the Minister of Health on February 21 what precautions were taken to ensure that immigrants from Ireland and elsewhere were not carriers of infectious pulmonary tuberculosis, and what inquiries were made to ascertain whether such immigrants had or had not been inoculated against this disease. Mr. IAIN MACLEOD stated that every person, British or alien, coming to this country was subject to the ordinary health control at the port of entry. An alien immigrant was in addition examined by a medical inspector of aliens; if tuberculosis was discovered or suspected, the medical inspector would issue a certificate to that effect and permission

to land would normally be refused. Citizens of the Republic of Ireland were not aliens. The answer to the second part of the question was "None."

Radiation Hazards in Industry

Mr. HAROLD DAVIES (Leek, Lab.) asked the Minister of Labour on February 24 what steps he was taking to study and limit radiation hazards in the health of workers exposed to ionizing radiations, and whether he would consult the Minister of Fuel and Power about the occupational health problems that might arise as a result of the programme of nuclear power development. Mr. HAROLD WATKINSON, the Parliamentary Secretary, stated that the precautions taken at factories to protect workers from ionizing radiations were carefully watched by the Inspectorate of Factories, which was notified by the Atomic Energy Authority of all consignments of radioisotopes supplied by them to factories. The Chief Inspector had also issued an advisory booklet on *Precautions in the Use of Ionizing Radiations in Industry*. He was considering, in consultation with the Chief Inspector, whether, in addition to the general requirements of the Factories Acts, more detailed special regulations would be desirable for factories using ionizing radiations. In all such matters he had the benefit of the expert advice of a radiological advisory panel, of the statutory advisory committee appointed under the Radioactive Substances Act, 1948, and of the Atomic Energy Authority itself. He was in consultation with the Minister of Fuel and Power regarding the measures that would be necessary for the protection of the health of the workers in the projected atomic power stations.

Civil Estimates

The Vote on Account for 1955-6 presented to Parliament on February 21 shows that expenditure on the National Health Service is estimated at £463,370,000, an increase of £24m. over the previous year.

Harley Street Cable.—The POSTMASTER-GENERAL said that he very much regretted the inconvenience caused to telephone subscribers in the Harley Street and Wimpole Street area. The Post Office had had to replace a section of a large cable which was in a very bad condition. By working day and night the job was finished in three weeks. They did all they could to minimize interruptions, but were seeing if it was possible in such cases to give subscribers a better system of warning.

Chiropody.—Mr. MACLEOD said that he would like to see a chiropody service available for all who would benefit from it, but financial considerations at present rule out any extension of the existing limited facilities.

Thames Pollution.—The very extensive technical investigations into the causes of pollution of the River Thames of the Water Pollution Research Laboratory have been completed. The results are being analysed; and it is hoped that in the next few months they will be ready for consideration by the departmental committee of the Ministry of Housing and Local Government.

Silicosis Claims.—In 1953 the Silicosis Medical Board dealt with 465 applications under the Workmen's Compensation Acts for certificates of death in respect of coal-miners; in 330 of these cases it was certified that death was due to silicosis or pneumoconiosis and in 135 cases it was certified that death was not due to the disease.

Universities and Colleges

UNIVERSITY OF ST. ANDREWS

The following candidates have been approved at the examinations indicated:

M.B.—Mrs. D. Avril J. Oatway (with commendation), B. O. Igwebe, M.B. Ch.B.—Sheila E. Cheong, J. S. Cook, J. L. Cribb, Rene Datner, P. A. E. Edmundson, J. G. McDonald, Anne M. MacGillivray, A. J. Mackenzie, J. A. C. Macmillan, Yvonne D. Symon, A. R. Taylor, Anne M. Thomson, Mrs. Sheila K. Tod, T. H. E. Woods.

UNIVERSITY OF LONDON

The following have been nominated for appointment as representatives of the University on the governing bodies indicated in parentheses: Professor C. G. Rob (St. Mary's Hospital); Mr.

J. D. S. Flew (University College Hospital); Mr. D. K. Mulvany (Laycock Secondary School); Professor J. M. Mackintosh (London School of Economics and Political Science); Dr. E. R. Boland (General Medical Council).

Professor W. J. Hamilton has been appointed a representative of the Board of Preclinical Studies on the Board of Advanced Medical Studies, in place of Professor J. Whillis.

Professor J. A. C. Knox has been appointed a member of the Special Advisory Board in Dietetics, Nutrition, and Household Science.

The following have been recognized as teachers of the University in the subjects indicated in parentheses: *Institute of Obstetrics and Gynaecology*, Dr. A. E. Claireaux (Pathology), Dr. J. C. Houston (Medicine), *London Hospital Medical College*, Dr. J. R. Ellis (Medicine), *St. George's Hospital Medical School*, Dr. C. W. Kesson (Children's Diseases), *King's College*, Dr. J. L. Mackinnon (Anatomy), *Middlesex Hospital Medical School*, Dr. J. D. N. Nabarro (Medicine), Dr. Margaret D. Snelling (Radiology), *Royal Dental Hospital of London School of Dental Surgery*, H. M. Pickard, F.D.S., M.R.C.S., L.R.C.P. (Dental Surgery), *St. Mary's Hospital Medical School*, Dr. P. H. Sanderson (Medicine).

UNIVERSITY OF WALES

The following degrees were conferred in Congregation on January 22:

M.B., B.Ch.—Inez Davies, W. J. Evans, R. Griffith, Margaret D. James, I. R. Lewis, H. K. Lloyd, O. McCann, V. J. Nash, B. L. P. Nelson, Jeanine Olsen, H. V. Price, I. P. Vaughan, R. N. Wade, C. G. Young.

UNIVERSITY OF BIRMINGHAM

Dr. K. H. Ginzal has been appointed Senior Research Fellow in Neuropharmacology in the Department of Experimental Psychiatry from April 1, 1955, and Dr. J. Williams Lecturer in Anatomy from July 1, 1955.

Mr. D. M. Morrissey resigned his appointment as Lecturer in Surgery on December 31, 1954.

The first line of the seventh paragraph under the heading "University of Birmingham" in the *Journal* of December 11, 1954 (p. 1428), should read "The title of University Clinical Tutor has been conferred," instead of University Clinical Lecturer.

The following degrees were conferred in Congregation on December 17, 1954:

Ph.D. in the Faculty of Medicine.—Deirdre M. Edward, M.B., Ch.B.—Yaw Asififi, P. H. Asififi, Joyce E. Bailey, Patricia A. Bramley, J. Bullock, E. P. C. Hadley, Olga R. Harbron, Eli E. L. Holt, J. W. P. Jarrams, D. Learmont, A. P. Mayne, E. T. Melley, W. K. Merfield, K. Middleton, J. D. Nicholas, P. A. North, L. J. T. Pearson, A. Sutherland, Elizabeth M. Tilsen, D. Wright, R. A. Yeomans.

SOCIETY OF APOTHECARIES OF LONDON

The following candidates, having completed the final examination, have been granted the diploma of L.M.S.S.A.:

R. N. Wade, P. M. Gurrin, P. Jago, F. R. F. Dibb, T. Freilich, A. P. Brown, E. A. Capell, D. A. Bennett, J. E. Todd, J. A. Bradford.

The following candidates have been awarded the Diploma of Master of Midwifery:

A. P. Camilleri, S. Miller.

The following candidates have been awarded the Diploma in Industrial Health:

Z. Khan, W. H. Suffield.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At a meeting of the Council of the College held on January 29, with the President, Sir Arthur Gemmell, in the chair, Professor B. P. Watson was appointed William Meredith Fletcher Shaw Memorial Lecturer for 1955.

The following were elected to the Membership of the College:

R. H. O. Bannerman, D. Barron, H. R. C. Benny, D. B. Brown, T. I. Cope, A. C. Coulthard, K. D. Drayton, W. A. W. Dutton, B. A. Gavourin, H. S. Gavourin, T. S. Ghosh, A. P. B. Harston, B. O. Howie, Beryl M. Joles, M. Konar, Wendy E. Lewington, J. D. Llewellyn-Jones, Philippa M. Ludlam, C. F. Macdonald, J. G. Mathie, A. M. Mendis, D. Methuen, Catherine H. Mitchell, N. G. Mukherjee, R. N. Nag, Chiew Seng Oon, S. Proshan, R. T. Scars, H. B. Sinha, D. H. K. Soltan, O. S. Treisman, Yin-Kai Tsao, J. K. Tully, J. A. M. Van Belkum.

The following have been awarded the Diploma in Obstetrics: L. C. Steindel, D. C. Wilkins.

FACULTY OF RADIOLOGISTS

At the examination for the Fellowship of the Faculty held in November, 1954, the following satisfied the examiners:

Radiodiagnosis—R. G. Britt, S. Davis, J. G. Duncan, R. G. Grainger, J. B. Heaz, J. W. Laws, H. F. March, L. L. Ralph, W. Stachurko. *Radiotherapy*—E. W. Emery, H. G. Frank, R. W. Gunderson, P. B. Kunkler, K. A. Newton, T. M. Prosser.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending February 12 (No. 6) and corresponding week 1954.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1955					1954				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	14	1	8	0	1	11	0	7	2	3
Dysentery ..	1,110	53	310	1		669	100	186	6	3
Encephalitis, acute ..	2	0	1	0		1	0	3	0	
Enteric fever: Typhoid ..	1	0	1	0		0	0	0	0	2
Paratyphoid ..	4	0	3	0		4	0	1	0	
Food-poisoning ..	94	15		0		109	12		0	
Infective enteritis or diarrhoea under 2 years ..				10	15				15	21
Measles*	18,363	1945	258	599	94	1,849	16	52	28	356
Meningococcal infection ..	24	2	9	2	4	40	2	11	2	2
Ophthalmia neonatorum ..	30	1	2	0		27	3	5	0	
Pneumonia†	1,156	68	313	56	5	931	38	252	10	
Poliomyelitis, acute: Paralytic ..	9	2	1	0	1	15	2	4	0	6
Non-paralytic ..	7	1				6	1			
Puerperal fever‡	251	39	8	2		280	38	13	2	
Scarlet fever ..	746	54	104	51	21	1,161	44	202	39	27
Tuberculosis: Respiratory ..	767	89	140	20		787	70	117	33	
Non-respiratory ..	85	8	27	4		117	4	33	3	
Whooping-cough ..	2,065	137	259	67	36	1,916	76	366	74	34

DEATHS in Great Towns	1955					1954				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	1	0	0	0	0
Dysentery ..	0	0	0	0		1	0	0	0	
Encephalitis, acute ..	0	0	0	0		0	0	0	0	
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	9	0	0	0	1	13	0	4	1	1
Influenza ..	84	12	8	4	2	41	8	6	0	3
Measles ..		0	0	0	0		0	0	0	0
Meningococcal infection ..		2	0				1	1		
Pneumonia ..	387	58	41	19	7	495	74	30	8	15
Poliomyelitis, acute ..	0	0			1	0	0			0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory ..	107	15	17	3	7	133	6	22	2	5
Non-respiratory ..		1	2	1	1		0	0	0	0
Whooping-cough ..	3	1	0	0	0	0	0	0	0	0
Deaths 0-1 year ..	230	24	29	7	16	297	27	37	7	25
Deaths (excluding stillbirths) ..	6,652	956	713	173	217	7,982	1207	747	147	243
LIVE BIRTHS ..	7,446	1099	862	202	357	7,756	1154	899	221	413
STILLBIRTHS ..	188	24	25			228	24	23		

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

Vital Statistics

Influenza

In the great towns of England and Wales 82 deaths from influenza were recorded in the week ending February 19. This total was 2 fewer than the previous week's. 42 deaths were recorded in Greater London, compared with 29 in the previous week, making the highest weekly total this winter.

Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in January was 109, compared with 120 in the previous month and 132 in January, 1954.

The number of cases of industrial diseases in the United Kingdom reported during January, 1955, were as follows: lead-poisoning 2, compressed air illness 2, epitheliomatous ulceration 18, chrome ulceration 20; total 42.

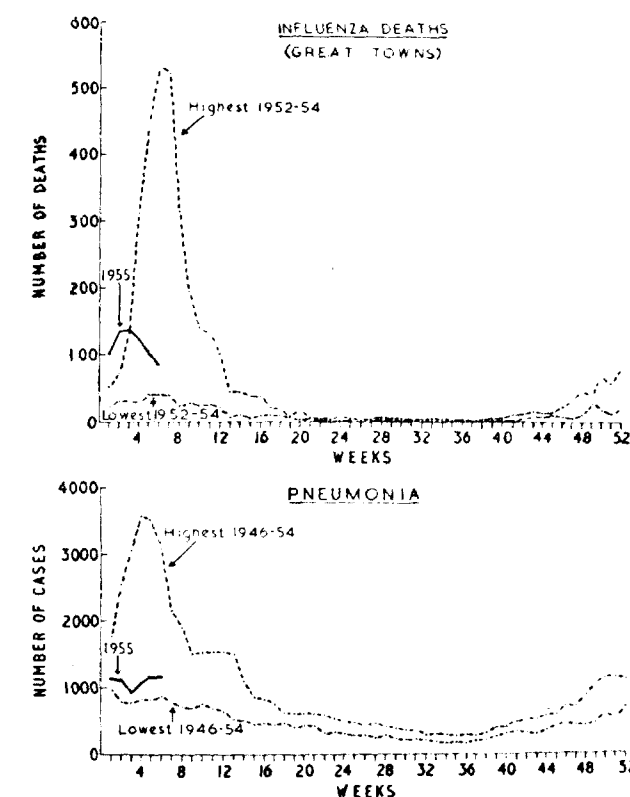
There was one death from epitheliomatous ulceration, due to mineral oil.—*Ministry of Labour Gazette*, February, 1955.

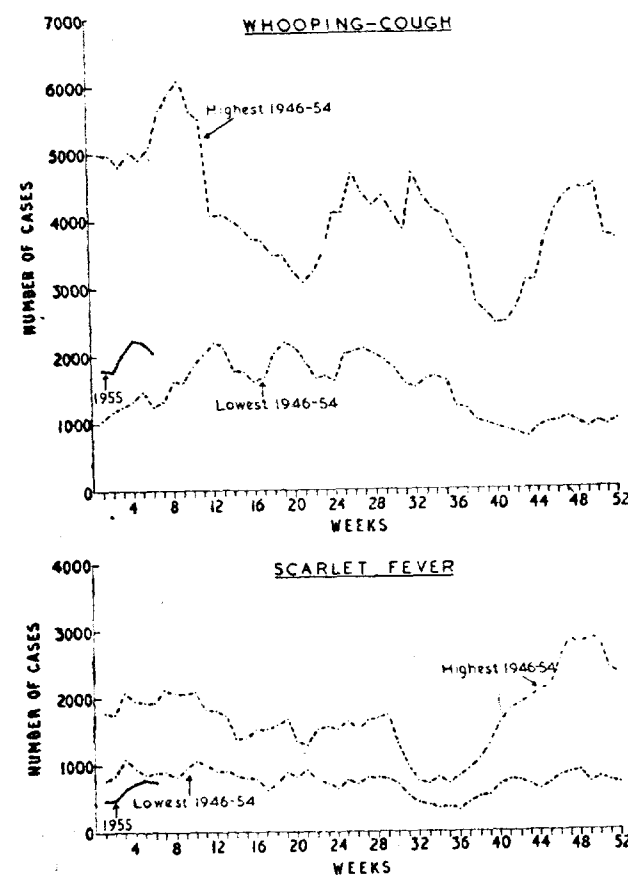
Week Ending February 19

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 682, whooping-cough 1,910, diphtheria 16, measles 19,976, acute pneumonia 1,020, acute poliomyelitis 21, dysentery 1,145, paratyphoid fever 3, and typhoid fever 4.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the nine years 1946-54 (influenza 1952-4) are shown thus -----, the figures for 1955 thus ———. Except for the curves showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.





Infectious Diseases

The largest variations in the notifications of infectious diseases in England and Wales during the week ending February 12 were increases of 5,634 for measles, from 12,729 to 18,363, and 131 for dysentery, from 979 to 1,110, and decreases of 148 for whooping-cough, from 2,213 to 2,065, and 45 for scarlet fever, from 791 to 746.

The largest rises in the incidence of measles were 1,018 in Yorkshire West Riding, from 1,853 to 2,871, 824 in Lancashire, from 2,453 to 3,277, 650 in London, from 1,295 to 1,945, 308 in Nottinghamshire, from 667 to 975, 299 in Northumberland, from 291 to 590, 268 in Essex, from 560 to 828, 250 in Cheshire, from 646 to 896, 247 in Derbyshire, from 531 to 778, 239 in Warwickshire, from 576 to 815, 216 in Durham, from 565 to 781, 212 in Middlesex, from 241 to 453. The largest falls in the local trends of whooping-cough were 36 in Warwickshire, from 133 to 97, 35 in Kent, from 137 to 102, and 30 in Essex, from 95 to 65. The only large decline in scarlet fever was 20 in Lancashire, from 126 to 106. 16 cases of diphtheria were notified, being 2 fewer than in the preceding week. 5 of the 14 cases of diphtheria were notified in Kingston-upon-Hull C.B. 16 cases of acute poliomyelitis were notified, and these were 3 more for non-paralytic and the same for paralytic cases as in the preceding week. The largest returns were London 3 and Middlesex 3 (Willesden M.B. 2).

The largest increases in the local outbreaks of dysentery during the week were Lancashire 93, Northampton 43, and Durham 34. The largest returns were Lancashire 461 (Oldham C.B. 128, Blackpool C.B. 94, Blackburn C.B. 73, Manchester C.B. 66, Stretford M.B. 20, Blackburn R.D. 10), Yorkshire West Riding 79 (Sheffield C.B. 29, Leeds C.B. 28), Durham 76 (Ryton U.D. 20, Durham R.D. 11), London 53 (Shoreditch 11), Northamptonshire 52 (Northampton C.B. 31, Kettering M.B. 17), Norfolk 48 (Norwich C.B. 29), Suffolk 40 (Woodbridge U.D. 33), Northumberland 37 (Newcastle-upon-Tyne C.B. 20), Glamorganshire 35 (Cardiff C.B. 14), Leicestershire 34 (Leicester C.B. 32), Lincolnshire 27

(Scunthorpe M.B. 15), Cheshire 26 (Stockport C.B. 14), Nottinghamshire 24 (East Retford M.B. 15), and Yorkshire North Riding 20 (Middlesbrough C.B. 19).

Medical News

World Population.—Since 1930 the population of the world has risen by 30%, according to estimates in the 1954 *United Nations' Statistical Yearbook*. In mid-1953 it stood at between 2,459 and 2,634 million, with a density of about 49 to the square mile (19 per sq. km.). These figures include an allowance of a little over 200 million, apparently, for the population of the U.S.S.R. The estimates of the populations of the individual continents (excluding figures for the U.S.S.R.) also include the densities. In persons per square mile (figures per sq. km. in parentheses), these were: Europe, 212 (82); Asia, 132 (51); North and South America, 20 (8); Africa, 17 (7); Oceania, 5 (2). The estimates of the continental populations (again excluding the U.S.S.R.) in descending order of magnitude are given as: Asia, 1,288-1,439 million; Europe, 400-404 million; North and South America, 347-355 million; Africa, 199-216 million; Oceania, 13.8-14.2 million.

Medical Man-power.—The news of the appointment of the committee under Mr. HENRY WILLINK, Q.C., to investigate Britain's medical man-power (*British Medical Journal*, February 26, p. 548) has provoked some immediate, anxious comment. Mr. ARTHUR BLENKINSOP, M.P., Parliamentary Secretary to the Ministry of Health in the last Labour Government, in a letter to *The Times*, is concerned that the committee should keep before it "the great need for a further reduction in the size of general-practitioner lists." He expresses surprise that the Government should even be "contemplating any form of restriction of entry into a profession," and notes the absence on the committee of "any representation of the public interest." The *Irish Times*, on the other hand, has been quick to see a possible threat to Irish doctors. "If a decision is taken in Britain to limit entry to the medical faculty," says the paper in an article on February 23, "a big problem will arise in the placing of Irish doctors, many of whom find openings in Britain."

Princess Louise Children's Hospital.—On February 24 the board of governors of St. Mary's Hospital decided to adopt the recommendations of their co-ordinating subcommittee on the conversion of the Princess Louise (Kensington) Hospital for Children to adult use (see *Journal*, January 29, p. 299). Two days earlier at a meeting held by the Kensington and Hammersmith Division of the B.M.A. and open to all members of the profession in these areas the following resolution had been passed unanimously by the 30 doctors present:

"Being satisfied as to the continuing needs of the sick children in the area, the medical practitioners of the Kensington and Hammersmith boroughs ask the Minister of Health to give serious consideration to the necessity for the Princess Louise Hospital to continue as a children's hospital serving the needs of the local population. We would further like to impress on the Minister that these needs should take priority over the teaching requirements of the St. Mary's Hospital Group."

This resolution was sent to the Minister of Health. It was also unanimously adopted by a meeting of the medical staff of the Princess Louise Hospital, which drew attention to similar resolutions passed by the council of the Royal Borough of Kensington and the Hammersmith Borough Council. The medical staff further deplored the proposed disbandment of the training school for children's nurses, "of which there are few in the country." In a statement the board of governors of St. Mary's say that they decided to inform the Minister of Health of their resolution only after giving careful consideration to the observations of

their standing committees and the Academic Board of St. Mary's Hospital Medical School, and to the representations of the borough councils of Kensington and Hammersmith.

Linstead Report.—The full text of the "Linstead Report"—in other words the report of a subcommittee of the Ministry of Health's Standing Pharmaceutical Advisory Committee of which Sir HUGH LINSTAD, F.P.S., M.P., was chairman—was published on March 3 (H.M.S.O., price 2s. net). The report deals with the Hospital Pharmaceutical Service. The terms of reference were to review the Service and advise on its most efficient and economical organization. The committee's recommendations were summarized in the report of the Central Health Services Council for 1953, published last July (see *British Medical Journal*, July 17, 1954, p. 146), but the present report, besides rehearsing the arguments which led to the recommendations, includes the comments on it of both the Central Health Services Council itself and the Standing Pharmaceutical Advisory Committee. The report has been adopted by both these bodies (subject to some reservations by individual members of the Standing Advisory Committee), and its recommendations on the place of the pharmaceutical department in the individual hospital, group organization, staffing and accommodation, and research have been accepted by the Minister; the remaining recommendations are stated to be "under consideration." The only medical member of the Linstead committee was Dr. JANET AITKEN.

Sheffield University.—The title of reader in forensic medicine has been conferred on Dr. GILBERT FORBES, senior lecturer in charge of the Department of Forensic Medicine. Dr. O. G. DODGE has been appointed lecturer in pathology. At the Jubilee Degree Congregation on June 29, the honorary D.Sc. of the University will be conferred on Lord ADRIAN, P.R.S.

Medical Research Council.—By an Order of the Committee of Privy Council for Medical Research, Mr. RICHARD FORT, M.P., has been appointed a member of the Medical Research Council in the vacancy created by the retirement of Mr. RICHARD WOOD, M.P.

Professor J. B. Duguid, professor of pathology at Durham University, who since January has been in Jamaica lecturing at the University College of the West Indies under the Commonwealth University Interchange Scheme, has now gone on to Colombia for a fortnight on behalf of the British Council.

Dr. Albert Schweitzer has been appointed by the QUEEN an honorary member of the Order of Merit. The only other living honorary foreign member is President Eisenhower.

News in Brief.—On February 24 the DUKE OF NORTHUMBERLAND opened a 4-million-volt linear accelerator unit at the Newcastle General Hospital costing a total of £65,000. The North of England Council of the British Empire Campaign contributed the cost of the building, which amounted to nearly £27,000.

At the Glasgow Royal Maternity and Women's Hospital on February 25 the COUNTESS OF ELGIN AND KINCARDINE opened a new £100,000 Out-patient Department.

The March issue of *Family Doctor* is now available.

COMING EVENTS

Institute of Dermatology, London.—Exhibition on benign tumours of the skin, March 4-25.

Harveian Lecture of the Harveian Society of London.—On March 7, at 8.15 pm., at the Royal College of Surgeons, Professor CLARENCE CRAFOORD will lecture on "The Diagnosis and Treatment of Intra-auricular Septal Defects." Open to all interested.

Faculty of Radiologists.—Postgraduate week-end course at the Royal College of Surgeons, Lincoln's Inn Fields,

March 19 and 20. Applications for enrolment (12s. 6d.) before March 12 from the Secretary of the Faculty, 45, Lincoln's Inn Fields, London, W.C.2.

Watson-Williams Memorial Lecture.—Mr. R. SCOTT STEVENSON will lecture on "The New Outlook in Otolaryngology" at Bristol University on March 8 at 8.30 p.m.

Oxford University Medical Society.—Annual Ball at Oxford Town Hall on March 11, 9 p.m. to 3 a.m. Double tickets (two guineas) from Mr. ALAN LOWER, New College, Oxford.

William Sheen Memorial Lecture.—Sir GLOFREY JEFFERSON will lecture on "The Aneurysms of the Cavernous Sinus" at the Reardon Smith Lecture Theatre, Cardiff, on March 16 at 8 p.m.

Oliver-Sharpey Lectures.—Professor W. MEVILL ARNOTT will lecture on "Order and Disorder in Pulmonary Function" at the Royal College of Physicians of London at 5 p.m. on March 17 and 22.

C.M.F./M.E.F. Army Physicians' Reunion.—Tenth annual dinner at Simpson's-in-the-Strand on April 2. Information from the honorary secretary, Dr. A. WHITCOX, 59, Harley Street, London, W.1.

British Occupational Hygiene Society.—Conference on "The Assessment of Health and Disease in Industry" at the London School of Hygiene and Tropical Medicine on April 4 at 11 a.m. Details from Dr. D. G. HARVEY, M.R.C. Laboratories, Holly Hill, Hampstead, London, N.W.3.

NEW ISSUES

Archives of Disease in Childhood.—The new issue (Vol. 30, No. 149) is now available. The contents include:

CONGENITAL DEFECTS IN THE PELVIC PARASYMPATHETIC SYSTEM. Orvar Swenson.
HIRSCHSPRUNG'S DISEASE IN THE NEONATAL PERIOD. Th. Ehrenpreis.
INTESTINAL OBSTRUCTION IN THE NEWBORN. H. H. Nixon.
PERITONITIS IN THE NEONATAL PERIOD. P. P. Rickham.
ACUTE INTUSSUSCEPTION IN CHILDHOOD. R. B. Zachary.
CONGENITAL DEFORMITIES OF MECHANICAL ORIGIN. Denis Browne.
CONGENITAL DEFORMITIES OF THE ANUS AND THE RECTUM. Denis Browne.
THE CARDIO-ESOPHAGEAL SYNDROME IN CHILDHOOD. Isabella Forshall.
TWO CASES OF ESOPHAGEAL STRICTURE IN CHILDHOOD. R. B. Zachary.
ACUTE DISTENSION OF THE GALL BLADDER IN CHILDREN. William Rankin.
A SURGICAL AND BIOCHEMICAL STUDY OF A CASE OF BILATERAL HYDRO-NEPHROSIS AND HORSESHOE KIDNEY. John Black and Joan Wagner.
SACRO-COCCYGEAL TERATOMA. James Lister.
CONGENITAL PYLORIC STENOSIS IN OLDER BABIES. John Rendle-Short and R. B. Zachary.

Issued six times a year; annual subscription £3 3s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

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

Monday, March 7

HARVEIAN SOCIETY OF LONDON.—At Royal College of Surgeons of England, 8.15 p.m., Harveian Lecture by Professor C. Crafoord (Stockholm): "Diagnosis and Treatment of Intra-auricular Septal Defects."
INSTITUTE OF PSYCHIATRY.—5.30 p.m., Dr. E. Stengel: Lecture-demonstration.
OXFORD UNIVERSITY MEDICAL SOCIETY.—At Radcliffe Infirmary, 8.15 p.m., Dr. F. E. Camps: The Notting Hill Murders.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Professor M. Arnot: Fever in Disease.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, 4.45 p.m., Dr. Joseph Needham, F.R.S.: New Light on Physico-Chemical Aspects of Morphogenesis.

Tuesday, March 8

●**BRISTOL UNIVERSITY.**—8.30 p.m., Patrick Watson-Williams, Memorial Lecture by Mr. R. Scott Stevenson: "New Outlook in Otolaryngology."
●**CHELSEA CLINICAL SOCIETY.**—At Rembrandt Hotel, S.W., 8.30 p.m., discussion to be opened by Dr. Neville Gorton, D.D., Rt. Rev. the Lord Bishop of Coventry, and Dr. E. E. Claxton, Assistant Secretary, B.M.A.: "Divine Healing and the Medical Profession."
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. Phyllis Wade: Radiotherapy of Skin Cancers, Part I.
LONDON UNIVERSITY.—At Meyerstein Lecture Theatre, Westminster Medical School, 5.30 p.m., Special university lecture in biochemistry by Academician W. A. Engelhardt (Moscow): "Mechano-Chemistry of Muscle."
MEDICAL SOCIETY OF LONDON.—At Claridge's, 7.30 for 8 p.m., annual dinner.
MEDICAL WOMEN'S FEDERATION: SCOTTISH EASTERN ASSOCIATION.—At Pharmacology Lecture Theatre, Teviot Place, Edinburgh, 8.30 p.m., film by Professor Jan Aird: "Separation of Conjoined Twins."
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Dr. James Walker: "Postmaturity and Fetal Anoxia."
WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Mr. J. Minton: "Ocular Manifestations in Clinical Neurology (Part I)."

Wednesday, March 9

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Mycotic Infections of Subcutaneous Tissues.
INSTITUTE OF LARYNGOLOGY AND OTITIS.—5.30 p.m., Dr. I. Friedmann: Pathology of Otitis Media: Experimental and Human (1).
INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. F. R. Kilpatrick: Tuberculosis of the Renal Tract.
LONDON UNIVERSITY.—At Physiology Theatre, University College, 5.30 p.m., special university lecture in physiology by Dr. C. R. Skoglund (Stockholm): Functional Organization of Spinal Interneurons.
NOTTINGHAM MEDICO-CHIRURGICAL SOCIETY.—8.30 p.m., Mr. J. H. Daggart: Ocular Manifestations of Systemic Disease.
OXFORD UNIVERSITY.—At Radcliffe Infirmary, 5 p.m., Litchfield Lecture by Professor C. A. Wells: Experimental Approach to Surgical Problems.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Dr. Dorothy Makepeace: Some Medical Aspects of Child Care.
ROYAL SANITARY INSTITUTE.—2.30 p.m., Dr. W. G. Patterson and Dr. S. L. Wright: Co-operation Between Local Health Authorities and the Hospital Service—Possibilities and Actualities.
ST. MARYLEBONE HOSPITAL FOR PSYCHIATRY AND CHILD GUIDANCE.—5.30 p.m., Dr. E. A. Bennet: Selection of Patients for Psychotherapy.

Thursday, March 10

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. Phyllis Wade: Radiotherapy of Skin Cancer, Part II.
LIVERPOOL MEDICAL INSTITUTION.—8 p.m., Mr. D. H. Young: Surgical Aspects of Male Infertility; Mr. F. C. Dwyer: Suppurative Arthritis of the Hip-joint in Childhood.
LONDON UNIVERSITY.—At Senate House, 5.30 p.m., special university lecture in pharmacy by Professor P. Karrer (Zurich): Curare—Alkaloids.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor G. C. Foster-Smith: Place of the Vascular Supply in Fatigue and Regeneration of Peripheral Nerve.
ROYAL EYE HOSPITAL.—5.30 p.m., Dr. T. H. Whittingham: Some Aspects of Refraction Work: (3) Refraction Work: Our Tools and Apparatus.
ST. ANDREWS UNIVERSITY.—At Physiology Department, Medical School, Small's Wynd, Dundee, 5 p.m., Dr. W. C. Swanson: Review of Carcinoma of the Breast in the Eastern Region.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. D. J. Williams: neurology demonstration.
WHITTINGHAM HOSPITAL.—At Archway Wing, 8.15 p.m., Dr. L. F. Hewitt: Bacterial Viruses and Heredity.

Friday, March 11

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. B. F. Russell: Benign Tumours of the Skin.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Dr. J. Smart: Bronchitis.
INSTITUTE OF LARYNGOLOGY AND OTITIS.—3.30 p.m., Dr. I. Friedmann: Basis of Chemotherapy in E.N.T. Disease.
LONDON UNIVERSITY.—(1) At Physiology Theatre, University College, 5.30 p.m., special university lecture in physiology by Dr. C. R. Skoglund (Stockholm): Functional Organization of Spinal Interneurons. (2) At Senate House, 5.30 p.m., special university lecture in pharmacy by Professor P. Karrer (Zurich): Curare—Alkaloids.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. W. G. Oakley: Periphrastic Vascular Disease.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Urology Lecture by Mr. D. S. Poole-Wilson: Treatment of Tumours of the Bladder.
ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Dr. Thomas Anderson: Antibiotics.
ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., Valedictory Address by the Senior President.
SOCIETY OF MEDICAL OFFICERS OF HEALTH: WELSH BRANCH.—At Park Hotel, Cardiff, 7 for 7.30 p.m., annual dinner.

Saturday, March 12

KENT PAEDIATRIC AND CHILD HEALTH SOCIETY.—At Queen's Head Hotel, Maidstone, 3 p.m., Presidential Address by Dr. P. R. Evans: Baby Farming.

APPOINTMENTS

BROWN, R. J. K., M.B., B.Chir., M.R.C.P., D.C.H., Senior Lecturer, Department of Child Health, Welsh National School of Medicine, Cardiff.
EAST ANGLIAN REGIONAL HOSPITAL BOARD.—J. R. Thompson, M.Chir., F.R.C.S., Consultant Surgeon, Peterborough and Stamford Hospital Group; R. E. B. Taggart, M.Chir., F.R.C.S., Consultant Surgeon, Newmarket General Hospital; G. C. Foster-Smith, M.R.C.S., L.R.C.P., D.A., Assistant Anaesthetist, Norfolk and Norwich Hospital Group; J. Littlejohn, L.R.C.P.&S.Ed., and Dorothea M. Norman-Jones, M.B., B.Chir., D.P.H., D.P.M., Registrars in Psychiatry, Fulbourn and Addenbrooke's Hospitals; Joan McConnell, M.B., B.Chir., Registrar in Psychiatry, St. Andrew's Hospital, Norwich; R. H. V. Ollendorff, M.R.C.S., L.R.C.P., Registrar in Psychiatry, Ipswich Mental Hospital Group; A. K. Miura, F.R.C.S., Orthopaedic Registrar, East Suffolk and Ipswich Hospital and Ipswich Borough General Hospital; Elizabeth L. Brown, M.B., Ch.B., Medical Registrar, Nayland Sanatorium; W. S. Grove, M.B., B.Chir., Medical Registrar, Foxhall Hospital, Ipswich; J. C. S. Ainley-Walker, B.M., B.Ch., D.A., Anaesthetic Registrar, United Norwich Hospitals; Kathleen M. McNamara, L.R.C.P.&S.J., Anaesthetic Registrar, Peterborough Memorial Hospital and Annexes; J. A. Scanlon, M.B., B.S., Anaesthetic Registrar, West Suffolk General Hospital.
FRANKLIN, J. A. C., M.B., B.S., D.P.H., Deputy County Medical Officer of Health and Deputy Principal School Medical Officer, Essex County Council.
GREGG, THOMAS JAMES MYLES, O.B.E., M.B., B.Ch., Regional Medical Officer, with the Welsh Board of Health for duty in South-west Wales Area.
HILL, EILEEN E., M.B., Ch.B., M.R.C.P., Paediatric Registrar at Churchill Hospital, Headington, Oxford.
KINGSTON-UPON-HULL HEALTH DEPARTMENT.—R. G. Davies, M.D., D.P.H., Deputy Medical Officer of Health and Deputy Principal School Medical Officer for the City and County of Kingston-upon-Hull, Deputy Medical Officer of Health (at Hull) to the Hull and Goole Port Health Authority and Medical Inspector of Aliens under that Authority; Margaret I. Hendrie, M.D., D.P.H., D.C.H., D.Obst.R.C.O.G., Senior Medical Officer for Maternity and Child Welfare for the City and County of Kingston-upon-Hull.
LIVERPOOL REGIONAL HOSPITAL BOARD.—Jane I. Gibson, M.B., Ch.B., Consultant Pathologist to Birkenhead and North Wirral Groups; B. H. McGuirk, M.R.C.S., L.R.C.P., F.F.A.R.C.S., D.A., Part-time Consultant

Anaesthetist for Chester and Wirral Areas; C. H. de Boer, M.B., B.Chir., F.R.C.S., M.R.C.O.G., Part-time Consultant Obstetrician and Gynaecologist to Liverpool Maternity Hospital, the Women's Hospital, and Warrington General Hospital (appointed jointly with United Liverpool Hospitals).
MACKENZIE, A. C., M.D., D.P.H., Medical Officer of Health for Borough of Shrewsbury and member of staff of Salop County Medical Officer of Health.

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ROADS, P. G., M.D., D.P.H., Deputy Medical Officer of Health, County Borough of Sheffield.

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BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

DAVIDSON.—On February 21, 1955, to Dorothy (formerly Harpur), wife of Arthur S. Davidson, M.B., F.R.C.S.Ed., D.L.O., of Cranleigh Road, Kettering, Northants, a son.
DIXON.—On February 23, 1955, in Cardiff, to Megan, wife of Dr. J. M. S. Dixon, a son.
GEE.—On February 8, 1955, at Stoke-on-Trent, to Doreen, wife of Dr. C. Gee, a brother for Michael.
LECUTIER.—On February 22, 1955, at the Duke of York Home, Bradford, Yorks, to Angila, wife of E. R. Lecutier, F.R.C.S., a son—Philip Edmond.

DEATHS

BLACKMAN.—On February 19, 1955, at Malvern, Worcs, Geoffrey Gordon Barham Blackman, M.B., B.Chir.
BOWES.—On February 11, 1955, at St. Catherine's Nursing Home, Bath, Richard Frederick Bullin Bowes, M.R.C.S., L.R.C.P., of Fiveway House, Bathaston, Bath, Somerset.
BROWN.—On February 26, 1955, at Green Garth, Yealand Conyers, near Carnforth, Lancs, Edward Vipont Brown, M.D., formerly of Manchester, aged 92. Memorial service at Friends Meeting House, Mount Street, Manchester, March 8, 1.20 p.m.
BRUCE.—On February 14, 1955, at Budleigh Salterton, Devon, Oliver Bruce, M.R.C.S., L.R.C.P., aged 74.
EDWARDS.—On February 5, 1955, at his home, The Antlers, Rathdown, Co. Wicklow, Geoffrey Dixon Edwards, M.B., B.Ch., aged 62.
GILBERT-SMITH.—On February 3, 1955, in a nursing home, Thomas Bewley Gilbert-Smith, M.R.C.S., L.R.C.P., of Fountain House, Crowborough, Sussex, aged 79.
HATCHER.—On December 19, 1954, at Greenbank Hospital, Plymouth, Devon, Georgina Roberts Hatcher, M.B., Ch.B.
HAY.—On January 29, 1955, at 25, Aglionby Street, Carlisle, James William Hay, M.B., Ch.B., aged 56.
HUMBY.—On February 2, 1955, at Lynton, Hants, Daniel Morgan Humby, M.R.C.S., L.R.C.P., L.D.S.
LEWIS.—On February 4, 1955, at 5 Hamboro Gardens, Leigh-on-Sea, Essex, Arthur Daniel Lewis, M.R.C.S., L.R.C.P., formerly of Stoke Newington, London, N., aged 81.
MACGIBBON.—On February 5, 1955, in hospital, Stranraer, Wigtownshire, George MacGibbon, M.B., C.M., of 1, Windsor Terrace, Academy Street, Stranraer.
MACKENZIE.—On February 2, 1955, Donald William Morison Mackenzie, M.B., Ch.B., Lieutenant-Colonel, R.A.M.C., retired, of Plidown, Sussex.
MACKINNON.—On February 3, 1955, at 2, Herriet Street, Pollokshields, Glasgow, Mary Jessie Mackinnon (formerly Macdonald), M.B., Ch.B., of Portree, Isle of Skye.
MACRAE.—On February 4, 1955, in Devizes Hospital, Donald Mackenzie MacRae, C.B.E., M.D., of Southbrook Cottage, Devizes, Wilts.
ROBINSON.—On February 11, 1955, at 1, Coombe Rise, Kingston-upon-Thames, Surrey, Richard Deane Robinson, D.S.C., M.B., B.S., aged 48.
SEMPE.—On February 1, 1955, at the home of his son, Kintailon, Kilmacolin, Renfrewshire, Henry Frederick Sempe, M.R.C.S., L.R.C.P., of Sandown, Exmouth, and Budleigh Salterton, Devon.
SHAW.—On February 11, 1955, at Morchard Cottage, Hardington, Northampton, Emily Helen Shaw, M.D., wife of Dr. Eric H. Shaw.

Any Questions ?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Export of Drugs

Q.—Are there any restrictions on the drugs that (a) a doctor or (b) a patient may take with him out of this country for use abroad?

A.—No export duty is chargeable on goods leaving the United Kingdom. Information about the duties and restrictions on goods taken or imported into other countries may be obtained from the Board of Trade, Export Services Branch, Lacon House, Theobalds Road, London, W.C.1 (Tel. CHAncery 4411). The exportation from the United Kingdom of drugs restricted by the Dangerous Drugs Acts and Regulations made thereunder is prohibited unless authorized by a licence issued by the Home Office Drugs Branch, Whitehall, London, S.W.1, from which department full information concerning licences and the regulations can be obtained.

Certain other drugs—that is, those specified in Group 13 of the Export of Goods (Control) (Consolidated) Order, 1954 (S.I. 1954 No. 118), as amended—may not be exported without licence from the Board of Trade, Export Licensing Branch, Atlantic House, Holborn Viaduct, London, E.C.1. Notwithstanding the provisions of this Order, however, licences are not required for reasonable quantities of such drugs which a passenger proceeding overseas might be expected to carry with him or include in his unaccompanied luggage for his own regular and private use. Additionally, a doctor proceeding overseas will be permitted to take with him or include in his unaccompanied baggage without licence reasonable quantities of such drugs as are intended for his professional use abroad. It is to be noted, however, that special regulations apply to the exportation of drugs to China, Hong Kong, Macao, Tibet, and North Korea, and the concession does not apply in respect of these destinations.

Rorschach Testing

Q.—What is the Rorschach test? How is it performed, what does it measure, and how reliable is it?

A.—If a large irregularly shaped blot of ink is made on a piece of paper, which is then folded so that the blot is pressed between two sides of paper, and the paper is then opened out again, a complexly shaped pattern with bilateral symmetry is seen. The Rorschach test forms provide a series of such shapes, photographically reproduced from originals made many years ago. The subject is asked to look at them and to imagine meaningful figures in them if he can. His responses are recorded, and are subsequently interpreted by the aid of fixed rules.

Three classifications of the responses are made, by: (1) location—that is, responses to the whole or to a part of the pattern, to the dark part of the pattern or to the white part between; (2) content of what is visualized—that is, human or animal, or man-made objects, or landscapes or maps; (3) determinant—that is, responses to shading, texture, colour (three of the patterns are coloured), responses involving the feeling of movement, etc. The results of the whole of scores based on these classifications are then recorded in a profile, which is used, together with other observations, for diagnosis. Thus numerical ratios between responses of two kinds are considered of diagnostic value for some purposes. The skilled interpreter believes he is able to provide conclusions, both of a general and a particular kind, about (1) normal balance, (2) general personality structure, (3) intel-

lectual aspects, (4) emotional aspects, (5) clinical aspects. Under the latter heading the Rorschachist claims to be able to diagnose organic disease of the brain, neurosis, depression, mania, schizophrenia. As an example, organic disease is indicated by a low number of responses of poor quality, schizophrenia by many poor "whole" responses.

There can be no doubt that such a test procedure must elicit a large amount of information, and that the skilled interpreter, especially if he is using the test as part of a guided interview, can derive valuable insight into a number of aspects of the personality. The fixed forms by which interpretation is supposed to proceed have, however, never been validated; and properly conducted controlled experiments are scanty, unreliable, and incapable of bearing the huge theoretical superstructure which has now been built up.

Implantation Dermoids

Q.—A woman of 40 has had three implantation dermoids removed from her thumb in the past few months, and it appears that there may be more developing. Do some people show a tendency to develop this condition as other people do sebaceous cysts?

A.—There is scarcely enough information given to answer this question fully, although there is certainly no known inherent tendency to the development of these lesions. Is it certain that the swellings were indeed implantation dermoids and that on each occasion there was unequivocal evidence of complete removal? Is the patient's occupation such that penetrating or punctured injuries are likely?

To distinguish them from true dermoids these cysts are now usually called "epidermoid." They may be congenital or traumatic in origin, and in the latter instance the interval between the trauma and the development of the cyst may be considerable. Congenital ones are unlikely in the hand, and so it is probable that the present case is post-traumatic. The injury is commonly, but not of necessity, a puncture, but in some cases there is no history of penetration and the cyst is thought to arise from the migration of epithelial cells from the sweat glands into a damaged area containing exudate or haematoma. If completely removed they do not recur, but as they may occasionally be multilocular the possibility of small islets of epithelium remaining must be considered as a cause of recurrence. Epidermoid cysts have rarely been reported in the bony phalanges, and, as the removal of the subcutaneous extensions of such a lesion would not be permanently curative, it would be as well to settle this question by radiography.

Modern Haemoglobinometry

Q.—What are the more modern methods of carrying out a Hb estimation in the blood? What advantages have these over the Sahli method, and how accurate is the Sahli method compared with them?

A.—The report of the Medical Research Council Subcommittee on analytical methods for the estimation of haemoglobin was recorded in a series of eight papers printed in the *Lancet*, of which three are pertinent.¹ In the first of these it was shown that the Haldane, Gowers, Sahli, Tallqvist, Tintometer, and Dare instruments were about equally inaccurate, one estimate out of twenty differing from the mean by 17% or more (coefficient of variation 8.5 to 10.9%). There was little to choose between these, but the Tallqvist was appreciably better than the Sahli. A series of wedge colorimeters were compared and these were markedly better, the coefficient of variation falling as low as 4.3% for oxyhaemoglobin. This led to the development of the M.R.C. photometer, and with this the coefficient of variation is much less, about 4%.

All these are subjective methods depending finally on a colour matching or the matching of intensities of light. The M.R.C. photometer is quicker and easier to use than the Sahli method in addition to being much more accurate, but it is, of course, much more expensive. On the other hand,

it is sent out standardized by the National Physical Laboratory and requires no further standardization, so that results obtained with it by different observers can be directly compared. The M.R.C. photometer is unquestionably the best instrument for general use.

In large hospitals objective methods using photoelectric cells and galvanometers are more commonly used. Each of these instruments costs two or three times as much as the M.R.C. instrument and has to be calibrated. Standard analysed solutions of haemoglobin are now available, and most hospitals calibrate their instruments with such samples every few months. With a good photoelectric instrument and properly calibrated glassware the coefficient of variation is very small. With National Physical Laboratory grade A glassware my own instrument gives too small a variation to express in figures. With ordinary British Standard Specification 797 pipettes and a series of half a dozen different observers the coefficient of variation is about 2%. The photoelectric method has the great advantage of being much quicker to operate than any of the others, and, since it is not a subjective method, there can be no argument over the end-point. It is for these reasons that it remains so popular in hospitals.

REFERENCE

Lancet, 1948, 1, 282; 2, 563, 971.

Ingrowing Eyelash

Q.—A man of 40 has for two years had an ingrowing eyelash on the left lower lid which impinges on the eyeball and has to be plucked out. He does not wear glasses. Is there any way of preventing this eyelash from growing?

A.—A single lash is best treated by electrolysis. This is likely to produce permanent epilation. A fine electrolysis needle attached to the negative pole is entered towards the root of the lash. The current used is 1 to 3 mA for 20 to 30 seconds. A bubble of white foam forms at the point of electrolysis. The procedure is best carried out after preliminary infiltration analgesia by 1 ml. of 4% procaine hydrochloride; it is, however, possible to dispense with this.

****** This answer is taken from the third book of *Any Questions?* Copies of the second and third books of *Any Questions?*, each containing some 200 expert answers, are available from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or through any bookseller, price 7s. 6d. a copy (postage 6d.). The third book contains a cumulative index.

Compatibility of Salts of the Same Drug

Q.—Is there any pharmacological incompatibility between different salts of the same drug, such as streptomycin calcium chloride and streptomycin sulphate, either when given together or on succeeding occasions to the same patient?

A.—In general there is no incompatibility between different salts of the same drug. But, if streptomycin calcium chloride were actually mixed together with streptomycin sulphate, there would be a precipitate of calcium sulphate. This would be undesirable for intrathecal injection, but would probably cause no trouble for intramuscular injection. No precipitation would occur if the two forms were given in successive doses, unless the time between the doses was very short and they were given at the same site.

Treatment of Dystrophia Myotonica

Q.—What is the best treatment for securing muscular relaxation in a case of dystrophia myotonica?

A.—Quinine hydrochloride by mouth in divided daily dose of 10–15 g. (0.65–1 g.) remains the treatment of choice for securing relaxation in dystrophia myotonica. At the present time procaine amide is under investigation in this connexion, but until further information is available its general use

cannot be advocated. In any case, the main disability in dystrophia myotonica results from muscular weakness rather than myotonia.

Risk of Having a Second Mongol

Q.—I should be grateful for your help with this problem. I have a patient, 32 years of age, who gave birth to a mongol six years ago. There is no mental abnormality on either side of the family. What are the chances of this woman having a normal child? There have never been any miscarriages or abortions, and this was her first and only child.

A.—Familial incidence in mongolism is very low. There is probably a slightly increased chance that a woman who has had one affected child will have another. The risk also increases with age in any mother. This woman is relatively young and it is probable that the chance that another child would be affected is not greater than, say, one in a hundred.

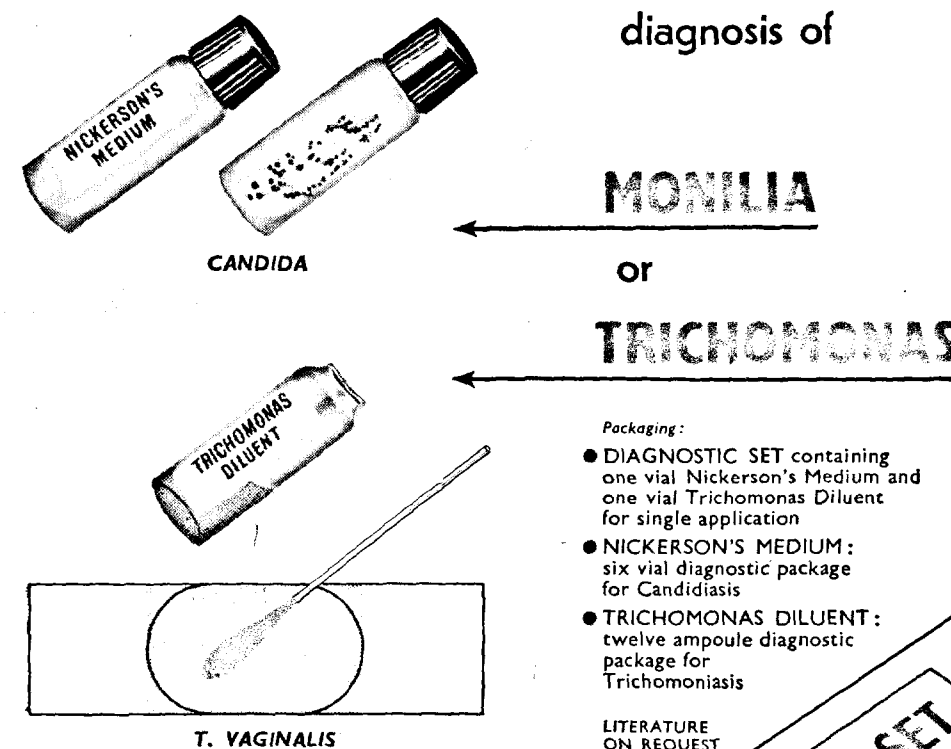
NOTES AND COMMENTS

Aphthous Ulcers.—Dr. FREDERICK SUTTON (Bristol) writes: In "Any Questions?" (January 22, p. 242) your expert states that "the painting of [aphthous] ulcers with caustic cannot be recommended, since this usually prolongs the healing process and does not prevent the formation of further ulcers." If, however, the time-honoured measure be adopted—namely, that of touching the ulcers twice daily with 2% silver nitrate in spirit of nitrous ether—not only will the ulcers immediately become less painful but in the vast majority of cases they will quickly disappear. Only a very few patients require a 4% solution, and with either of these strengths argyria never occurs. Neither from the point of view of prophylaxis, nor from the point of view of treatment, have antibiotics or antihistamines proved to be of any real value. It should be pointed out, however, that, though the real cause is unknown, it is nevertheless true that such patients have a very sensitive mucosa, and even the trauma occasioned by a toothbrush may bring about a crop of ulcers. Therefore a very soft toothbrush should be used, or even none at all, the gums being gently swabbed with a pledget of wool on the finger dipped in a liquid dentifrice. "T.C.P." or some similar preparation, 2 dr. (7 ml.) in half a tumblerful of warm water as a gargle twice daily, may have a useful prophylactic influence, and if applied undiluted to the ulcers it may bring about healing, but not so rapidly as the silver preparations above mentioned.

OUR EXPERT writes: I do not think that I can usefully add much to my original reply, in which I made it clear that unfortunately the aetiology of the condition is still obscure and any local treatment is purely symptomatic. I agree with Dr. Sutton that painting the ulcers with silver nitrate, or touching with carbolic, may desensitize them slightly, but there is, I think, general agreement among people who see many of these cases that the further destruction of tissue and possible deepening of the ulcer may in fact delay healing. I agree entirely that antibiotics, administered either generally or locally, have no beneficial effect. But it is difficult to agree or disagree with the statement that patients have a very sensitive mucosa, since this is difficult to determine. I have never noticed any association of a hard toothbrush or trauma with the condition. Most frequently the ulcers occur in crops, and they are particularly prone to occur in females. It has been said that there is some connexion with monthly periods, but I have noticed myself over the years that this does not in fact appear to be the case, but, as women have periods, they form a sort of datum line although the crops of ulcers do not really fall into any definite pattern.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Atiology, Westcent, London*. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad. ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: *Britmedads, Westcent, London*. MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association, TELEPHONE: EUSTON 4499. TELEGRAMS: *Medisecra, Westcent, London*. B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

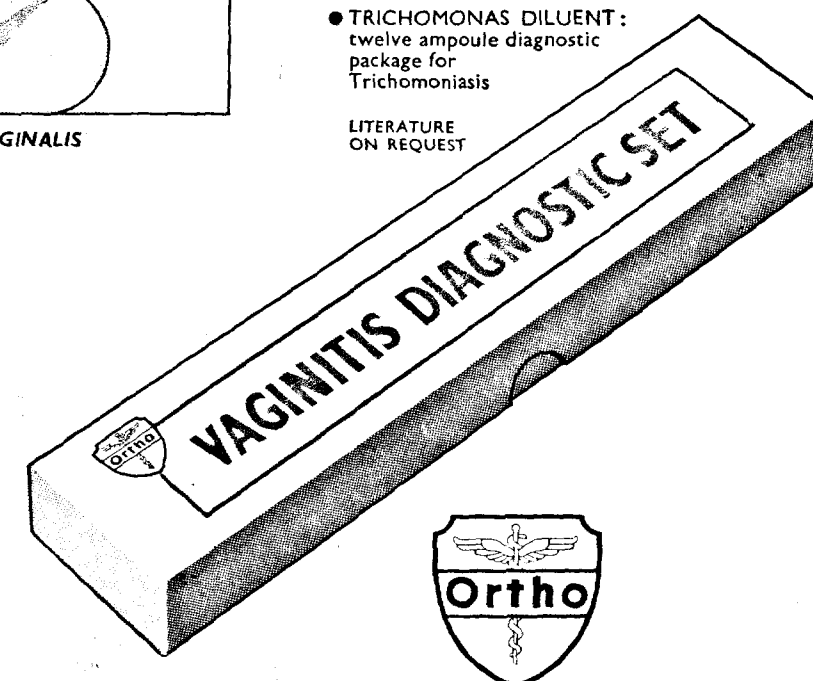
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BRITISH MEDICAL JOURNAL

LONDON SATURDAY MARCH 12 1955

MEDICINE IN RELATION TO SOCIETY*

BY

A. E. CLARK-KENNEDY, M.D., F.R.C.P.

Physician to the London Hospital and Fellow of Corpus Christi College, Cambridge

On a famous occasion in the House of Commons in the reign of King George III a certain member, Mr. Dunning, moved that "the power of the Crown has increased, is increasing, and is likely to increase still further." To-day, at the opening of the 218th Session of the Royal Medical Society, I would remind you that "the power of medicine has increased, is increasing, and is likely to increase still further." For what is the position? We can now prevent birth, terminate pregnancy, relieve pain, keep unconscious for long periods, prevent and treat many infections, suppress and increase instinct, modify the reactions of the mind with drugs, and influence personality with the knife. We can certainly prolong life. One day we may discover a chemotherapy for cancer and how to slow down the degenerative processes of age.

Mr. Dunning went on to move that the power of the Crown "should be reduced." I do not suggest that the power of medicine should, but, while the general public are acutely aware of the problems recently raised by the discovery of intra-atomic energy, they and many members of our profession remain largely unaware of the more personal ones which are being rapidly precipitated by our increasing power over the physico-chemical machinery of the human body, the basis of the individual life and mind. How, when, and to what extent should this increasing power be used? I am therefore asking you to consider, not medicine as a science (about which I sometimes think we hear too much), not even medicine as an art (about which I think we now hear too little), but the growing problem of the right use of the power of medicine in relation to Society. And how is that to be solved to the best advantage of humanity? Surely by establishing and maintaining satisfactory relationships between the three chief interested parties: the patient (you are all potential patients); the doctor (you will all soon become doctors); and the State, in which in this democratic country we are all incorporated by virtue of our votes.

The Patient

Let me begin with the patient, or rather with the potential patient, who at any moment may develop his disease, the average man who often knows or thinks he knows a little about medicine. What is his outlook to-day? Naturally he still expects his doctor to keep him and his family in health, but, as a result of increasing medical knowledge and specialization, his

attitude to his doctor has changed considerably of recent years. Further, it has changed at a time when the influence of the Churches has declined (although religion still sometimes complicates a medical problem), most people live in a structureless urban or dormitory society, the State has become responsible for health, and legal aid is available to all. He is aware that his doctor now knows relatively much less about medicine as a whole than he did a few years ago. (Hence his growing faith in specialists and his doctor's declining opportunity to become, as he so often became in the past, his patient's guide, philosopher, and friend.) On the other hand, does he, the average patient, understand that the most responsible and often most difficult diagnosis is still that between the early symptoms of organic disease and those of functional or psychoneurotic origin? (Whether to investigate or treat symptomatically may be a decision entailing life or death.) Does he realize that health is a relative term in relation to the constitution with which he is endowed; that avoiding the disease to which he is predisposed may depend on deliberate effort on his own part; that in seeking the aid of the growing power of medicine to live longer he may merely add to the total suffering which he must endure? Further, he still expects his doctor to maintain the principle of professional secrecy and protect him from exploitation at the expense of his health by his employer or the State, which, in these days of nationalized industry, is often his employer. And yet it is to the State that he looks to provide him with living conditions compatible with health and to protect him from the risks to which he is exposed in an industrial society. In addition, he now relies mainly on the State, and no longer on Church, charity, or some voluntary organization to which he subscribed, to restore his health when he is ill and look after him in his old age. But does he realize that elimination of risk demands some sacrifice of personal freedom and that State intervention in medicine tends inevitably to cut across the principle of professional secrecy?

The Doctor

Now for ourselves. On the one hand, we have a much clearer idea of the nature of disease than in the recent past, although we are faced with a much more difficult concept. For we no longer think of diseases as entities with characteristic symptoms and signs and definite dividing-lines between them. Rather the phenomenon has become to appear as a continuum like a mountain range in which the textbook diseases stand out like major peaks. (The outlook of the recently qualified doctor is very different from that of one of the older generation.) On the other hand, we

*The inaugural address delivered at the opening meeting of the 218th Session of the Royal Medical Society of Edinburgh

are all painfully conscious (even more so than our patients) that, as medical knowledge marches on relentlessly, we individually know relatively less and less about medicine as a whole. And what are the consequences of that? Some loss of confidence in ourselves and being forced into specialization or, if we attempt to remain general, greater reliance on specialists. (In some countries the general practitioner, as we know him, has almost disappeared.) Further, the growing power of medicine has not simplified practice, as the layman naturally supposes. Rather it has rendered it much more difficult and created many more opportunities for us to make mistakes.

When I first started, there were few diseases for which any radical treatment existed. Early diagnosis was often unimportant. All we could do in so many cases then was to treat symptoms and let the underlying pathological process run its natural course. Now something can be done for so many that early diagnosis is becoming increasingly necessary. For example, until chemotherapy for tuberculosis was discovered, all cases of meningitis of that variety died in a few weeks: the later the diagnosis in many ways the better; the shorter the period of agony for relatives. Now, if the disease is diagnosed early, modern treatment will effect a complete cure: if late, the patient dies or, worse still, is left a derelict for life.

Further, in spite of all our new methods of investigation, "front-line" diagnosis remains clinical. Laboratory tests and x-rays have not replaced history-taking and physical examination except perhaps in hospital, where the decision whether to investigate or not and what to start investigating has already been made by a general practitioner or in the out-patient department. And clinical diagnosis is still that which is most probable on the evidence immediately available, although there is often a less probable but more serious condition which, if sufficiently probable, must be actively excluded, provided that it is likely to be amenable to treatment. (There is no sense in causing discomfort and wasting public money in excluding some disease which is bound to be incurable.) So the general practitioner and the out-patient physician, unless they are to submit every patient to a whole gamut of expensive investigations, are compelled to take risks. Indeed, they take them every day, clinical diagnosis (although we may be loath to admit it) exemplifying the economic law of diminishing returns.

Let me give you an example. Carcinoma of the stomach and colon are symptomless diseases at first and the patient does not consult a doctor until the compensatory reactions of his body start to fail. Then in 75% of cases, I suppose, symptoms are sufficiently definite to permit a highly probable clinical diagnosis. Further, by exercising extreme care (mainly in history-taking) we can probably "get" the next 20% without investigating too many "functional colons" and "nervous dyspeptics." The remaining 5% are however, I believe, likely to defeat us and must be written off on the balance sheet of human suffering like a bad debt. Indeed, unless we are courageous in diagnosis within reason, we shall cause so much unnecessary anxiety that we shall undo much of the good which we otherwise succeed in doing, quite apart from wasting public money. True that an x-ray film of the chest every quarter, for example, might one day become an economic proposition, but routine investigations of the kind which would eliminate diseases such as carcinoma of the stomach and colon must, so far as one can see at present, remain outside the realm of practicability.

Some Moral Problems

In addition, as the power of medicine increases, we are all confronted, and confronted particularly often in hospital practice, by problems of a moral nature. Under what circumstances should birth control be advocated? When should pregnancy be terminated? To what extent should pain be relieved? When is it right to use drugs to suppress or increase instinct? To what extent is it justifiable to alter the reactions of the mind to experience such as the advent of death by means of drugs? When should leucotomy be

performed to render a patient socially more manageable and a lesser burden on society at an expense in terms of mind which it is impossible to estimate? When should life be prolonged at the cost of increased suffering by some palliative operation? For example, when should gastrostomy be performed in inoperable carcinoma of the oesophagus or colostomy in inoperable carcinoma of the colon?

And again and again I am confronted with this sort of problem. An elderly man is admitted with hemiplegia and aphasia, lies there semi-conscious, and after a few weeks shows little sign of recovery. Then his temperature and pulse start to rise and signs appear at the bases of his lungs. Clearly he is heading for pneumonia, Osler's one-time "master of the men of death." Do I put him on penicillin and prolong his misery, or on morphine and let him depart in peace? "His nearest relative should decide": it is easy to say that, but in situations of this kind can they really be told enough to understand the position sufficiently clearly to arrive at a decision? And how many relatives are capable, under the emotional stress of circumstances such as these, of decisions of this magnitude? In my experience most patients and relatives want decisions taken for them rather than to be left to take them for themselves. Further, if they are forced to take the decision themselves, does not the one which they take depend on the way the situation is explained to them? In practice the doctor is almost always faced with taking the decision himself.

Now, it is always easier to perform a palliative operation or put the patient on deep x-ray treatment or chemotherapy: easier, in fact, to do something than to do nothing. Some course of action will probably relieve his immediate symptoms, and often it prolongs his life. It will raise hopes and sometimes clear the bed for the admission of another case for whom more might be done. But what happens to the patient in the end? Looking back, would not analgesics and narcotics often have been better treatment, although the bed might have been blocked for weeks? (The use of drugs to relieve pain, even to the extent of keeping a patient unconscious for a long period, in my experience does not shorten life and is not euthanasia.) The Roman Catholic doctor in dealing with his Roman Catholic patients has firm guidance from his Church in these matters, and some may hold the view that it is always our duty to prolong life so far as is possible, but my experience teaches me that most of the non-Catholic laity would, if they knew the truth, wish doctors to exercise more moral courage than in point of fact is, I think, their practice in these situations. If the patient or his relatives really could be told the facts, they would have their doctor withhold treatment when "the game is up," and let nature take its course. But so often they cannot understand or be brought to face the decision, so that again and again in practice most of us are forced to act on our own sense of what is right in the circumstances of each case. But to that statement I hasten to add this rider. In general we should base our action on what appears to be (and we must always take the trouble to find out) our patient's philosophy of life rather than inflict ours on him when he is ill or dying. (The outlook of a man of 40, be he doctor or patient, may be very different from that of a man of 60.) It is written "Thou shalt not kill." But letting nature take its course when nature cannot be stopped is not killing. Nor in my judgment is a patient committing suicide when he refuses palliative or problematical, as opposed to a reasonably certainly curative, medical or surgical treatment. Never before in the history of medicine has it been so important to remember Clough's oft-quoted rider to the sixth commandment: "But needst not strive officiously to keep alive."

More difficult still is the decision whether to adopt a procedure which may arrest a lethal pathological process possibly only at the cost of leaving the patient a mutilated relic of his former self: for example, deciding whether to operate for a tumour of the brain. It may be that in a particular case there is a one-in-four chance (so far as

chances can be estimated) of a spectacular success and a one-in-four chance of the patient dying. If the choice lay between those two alternatives alone, there would never be any doubt of what to do. But there may be even chances of leaving him derelict for life. If the patient realized that, would he consent to operation? Yet it is seldom possible, and it is doubtful if it would be right if it was possible, to explain the position to him. So these decisions remain for us to take, and are most difficult. Further, they must remain individual. It is impossible to generalize. It is no platitude that the doctor should treat his patient and not his disease. Rather that is the first principle of medical practice. The disease, that complicated reaction between the psychosomatic constitution of the individual man and the risks to which he has succumbed, is the abstract concept. The patient is the concrete reality. There can be no disease without a man, woman, or child to suffer from it, any more than there can be a human mind, as we know it, without the physico-chemical machinery of a human body to maintain it. If I really thought that I was either under a moral obligation to keep all my patients alive as long as possible, or under a legal obligation always to apply the textbook treatment for the textbook disease, I would give up medicine to-morrow!

Responsibility for Major Decisions

Now, in actual fact by whom are these major medical decisions usually taken? Almost always, I think, by the physician or surgeon under whom the patient has been admitted to hospital, and who, although he is often a specialist in some particular branch of medicine or surgery, seldom knows much (because in his position he cannot) about the background of the patient's life. Further, they are usually taken without reference to his general practitioner. Indeed, to-day he seldom "comes into the picture," except in so far as the medical fate of a patient may depend on the specialist (Dr. X or Y or Mr. A or B) to whom he is referred in the first instance. A duty of every general practitioner is to "know" his specialists and choose that one most suitable to advise his individual patient. But the gulf of loss of contact between specialist and general practitioner has grown wider and wider of recent years, and, as things stand at present, the responsibility of the latter for any major decision ends completely in most cases as soon as his patient is admitted to hospital. Nor am I altogether happy about responsibility in a large hospital. For a patient may be attending several departments simultaneously. His G.P. has been "cut out" and no one doctor is now primarily responsible for him. Further, we seem to be developing a race of laboratory middle-men who now sometimes dominate the investigation of a patient, and therefore come to influence his treatment, and yet must know less than anyone else of the background of his life. As I see it, all major decisions in respect of a hospital patient, whether to investigate, how to treat, and above all the vital decision whether to treat, should be taken by one physician or surgeon who should be responsible for ascertaining the background of his life by getting in touch with his general practitioner.

Divided Loyalties

The problem of divided loyalties also bothers me. By the tradition in which our profession has developed, and we ourselves have grown up, our allegiance is still primarily to our patients. I say primarily deliberately, because we have two other allegiances. On the one hand, we have an inclination always to get as near the truth as possible, the scientific approach determining the pattern of medical education to-day. On the other, we have a feeling of duty to the State. True that the latter is not very strong in our minds, anyhow as yet, but duty sometimes calls awkwardly in that direction. For practically all doctors are now full- or part-time servants of the State, or, if you prefer it, of the public embodied in this democratic country in the State. Further, we are now entrusted, both in domiciliary and in hospital practice, with the expenditure of public money.

Now, at one time there were no expensive methods of diagnosis (sometimes to be proved or disproved on the post-mortem table), so that these three loyalties seldom came into collision, and, when modern methods of investigation started, we spent the patient's money, or money subscribed by the charitable or contributed voluntarily by him to a society. To-day, not only are investigations far more numerous and expensive, but they can be used to paint a much more complete picture of a disease. Sometimes this must be painted in all its details. But how often do we order investigations (apart from planned research) merely to paint more completely the picture of a disease for which nothing can be done; or, to state it crudely, how often do we spend public money merely to satisfy our own intellectual curiosity? Nevertheless, curiosity is necessary if medicine is to feel its way and each of us individually is to continue learning. The conflict of interests exists, and it is better to realize it. The only solution lies in compromise.

The State

Now for the State, the latest comer on the scene. Indeed, it is a very recent comer. It is less than 200 years since the importance of environment in the pathogenesis of disease began to be understood, and only in the memory of living man did the cost of treatment become so great that Church, charity, and voluntary organizations could no longer cope. Lloyd George's National Insurance Act was introduced just before the first world war, and Mr. Bevan's National Health Service Act just after the second. Further, in the modern world, every State has begun to take a positive interest in health for two reasons. In peace the labour force must be maintained. In war the Services must be kept up to strength. The State can no longer sit back and look on. It must intervene, and intervene with the maximum economy compatible with efficiency. So medical administrators, with financial considerations always "treading on their tails," would gain complete control of medical certification and expenditure if they could. Further, State medicine is impersonal. It thinks in terms of numbers and percentages, not in terms of individuals, dislikes professional secrecy, and would have all the information about the incidence of disease which it can get.

The State has three main functions in relation to health. First it must reduce to a minimum those risks which are prejudicial to human existence. It must therefore take responsibility for housing, water, and sanitation and enforce regulations to minimize the traumatic and chemical risks to which people are exposed in an industrial society. As to these functions of government there can be no controversy.

The control of infection is a more difficult problem. Vaccination against smallpox and inoculation against diphtheria are not compulsory, because some people have conscientious scruples against them. The State accepts these scruples (in the same way as it accepts conscientious objection in time of war), although both are actively discouraged. If, however, a patient develops smallpox or diphtheria he has no choice in the matter. He is bundled off to a fever hospital. Tuberculosis we handle differently. The patient must be notified, and is then kept under observation and encouraged to undergo treatment, but he cannot be compelled to enter a hospital or sanatorium. Public opinion would not stand for treating people with chronic tuberculosis as lepers were treated in the Middle Ages, although patients with open lesions must be almost as dangerous. Venereal disease is not even notifiable, but the State sees that facilities for treatment are easily available. Thus we compromise between eliminating risk and sacrificing freedom.

The third function of the Government is now the organization of the medical services, and as the result of the National Health Service Act doctors are becoming distributed more equitably in relation to population, the standard of medical care has been raised in many areas, and special centres are growing up where previously they did not exist.

The best medicine has not become available to everybody (there is never enough of the best to go the whole way round), but the National Health Service has brought good medicine within the reach of all. It is a great advance in social legislation, but there are difficulties and dangers inherent in the new system which it would be folly to ignore.

The State looks to the doctor not to spend public money unnecessarily. It does not expect him to waste it either in the satisfaction of his own intellectual curiosity or in acquiescing to his patients' unreasonable requests. In most cases expenditure is justified, but there are difficult cases. For example, when is an x-ray examination justified merely to convince a patient who doubts a purely clinical opinion? When is the more expensive drug justified which might do the patient just a little more good? When is physiotherapy really worth the cost of repeated visits to a hospital? But I am not suggesting that problems of this kind are new, still less that they are the result of the National Health Service. (That started at a time of economic stress and rapid progress in methods of diagnosis and treatment. Medicine was becoming so complex that the State was compelled to take over.) Rather, they have assumed larger proportions and become more difficult because, now that they are servants of the public, it is not as easy for doctors to be firm as when they gave their services to hospitals in an honorary capacity and were paid fees which they could refuse or remit. The man in the street, whatever his politics, held charity and, whatever his religion, the Church, and naturally the society to which he voluntarily subscribed, in some respect. But the State is often fair game, and he may claim the right to be investigated or treated in a certain way or given a certificate to get him this or protect him from that. The unpalatable truth is that the hospital doctor who did his work unpaid, and the consultant or general practitioner who worked for fees, have both to some extent lost the throne of freedom of action on which they used to sit.

Further, there is this added danger. If a doctor makes a mistake (we must all make mistakes sometimes), a patient is much more likely to sue him or his hospital now than in the recent past. As paid servants of the public, we are a tempting target for that dangerous few who have a "down" on the profession and enjoy publicity. Nevertheless, I am not suggesting that the recent spate of litigation against hospitals and doctors is due to the National Health Service, or that in general our patients are any less grateful than they were before it started. Rather, it is the consequence of the general public thinking that they now know so much more about medicine (when in reality they know much less), our much greater opportunity to make mistakes, and legal aid becoming (if a reasonable case for it exists) accessible to people with small incomes. True that we are probably passing through a transient spate of it, but there has been enough to tend to make doctors play for safety to a greater extent than safety should be played for. And what are the likely consequences of that? To the patient, unnecessary discomfort and loss of working time. To the State, loss of output and additional cost to the Health Service.

A further danger to the happiness of the doctor-patient relationship (on which successful medicine so much depends) is the inevitable tendency of the National Health Service to undermine the traditional principle of professional secrecy. For these are the days of reports to employers (often the State) and copious records. Hospital notes are banded about from hospital to hospital by lay secretaries and must be produced in court if demanded. The patient's record card changes hands through a central office whenever he changes his doctor. Can that too be demanded in court? Has the patient the right to insist that it or his hospital notes be destroyed? I do not know the answer to these questions.

The cost of the Health Service is, as everyone knows, steadily increasing (it is doubtful if there can be any natural limit to expenditure on health), but this is in no way due

to the Service itself. Rather, as I have already emphasized, it is due to present-day economic conditions and recent advances in expensive methods of diagnosis and treatment (which together rendered the Service necessary), and, I should add, the increasing age of the population (one of the results of modern medicine) and the higher cost of keeping old people alive (as the power of medicine increases). Economy is clearly necessary. There are already directives intended to reduce the cost of prescribing in domiciliary practice, and we are repeatedly implored to cut down x rays, expensive investigations, and the use of costly drugs in hospital. Further, it would certainly be more economical to run hospitals with a smaller number of full-time consultants than on the present half-time system. Indeed, if we let medicine get too expensive—and that rests to some extent with doctors—the National Health Service, which retains at present most that was best and has eliminated most that was worst in the old system, might be forced into the pattern of a full-time salaried medical service. And what could that be like? The allegiance of the doctor might become primarily to the State. Promotion might become based mainly on service to it rather than to the patient for which the service was intended. In the interests of economy some forms of treatment might become standardized and the progress of medicine thereby hindered.

Further, a State medical service might lead to an orthodox State medicine. But even under the National Health Service as at present organized I sometimes think that we are nearer to it than is generally realized. There is a movement to limit prescribing and reduce expensive investigations already. True that there have been no directives regarding treatment as yet, but no patient can get free homoeopathy, osteopathy, or faith healing under the Act except from a legally qualified practitioner. True, also, that at present we are free to act as we believe to be right in the circumstances of the individual life, and that Common Law holds that a doctor cannot be found negligent if he has exercised all reasonable care in diagnosis and treatment. But suppose a doctor takes the view that it is right in certain circumstances to withhold treatment and let a patient die, and is then sued by his relatives. What then? I do not think that a case of this kind has been taken to court, but, unless inaction of this kind in certain circumstances is upheld, if a case does come to court, doctors will be afraid to let nature take its course in certain circumstances, adding vastly to the sum of human misery. The rising expense of the Health Service and the growth of Common Law might between them force the orthodox medicine which we have at present into a dangerously rigid system.

Basic Principles

Three principles stand out to keep us straight.

1. The patient must remain free to choose his doctor and change him when he feels inclined. That principle has long been conceded, and is an integral part of the Act of Parliament on which the National Health Service is founded. It is Statute Law.

2. The doctor must be free to treat his patient as he thinks right, and feel confident that he will be upheld in court if, after all due consideration, he decides to withhold the textbook treatment for the textbook disease, thinking that under the circumstances it would serve no useful purpose or merely prolong suffering. This principle has not yet been established.

3. The nature of medical practice is such that the State must continue to control medical education indirectly through the General Medical Council and the medical schools of the universities, but they must not have direct power over methods of medical treatment. It must achieve economy by suasion rather than directives. It must continue to organize the medical services, but it must never command individual doctors. Under no circumstances must the growing power of medicine be handed over to committees or vested unfettered in the State.

Conclusion

After thirty-five years in medical practice I have attempted (I am afraid in a very muddled way) to paint a picture of a peculiarly difficult problem in human relationships—namely, the triangular one between the patient, the doctor, and the State. A perfect solution depends upon an agreed philosophy of life, but unfortunately that does not exist. Compromise is therefore essential. Now I must have said much with which you will not agree. I may have made statements which you positively dislike. You may think that I have painted the darker corners of medical practice in too sombre colours. But I have raised questions which must be faced. True that I have given you no answers to any of them, but I venture to hope that I have helped you toward a better understanding of the problems being raised by the power of medicine which, to adapt again Mr. Dunning's famous motion in the Commons, "has increased, is increasing and is likely to increase still further."

THE CANCER PATIENT: DELAY IN SEEKING ADVICE

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Cancer of the breast, cervix uteri, skin, or mouth usually presents symptoms which a patient can recognize and for which early successful treatment is a practical possibility. Yet of 2,700 patients attending this hospital with cancer in these sites 45% had delayed consulting their doctor for three months or more, and 17% for a year or more, after the onset of symptoms. This article describes a study of factors which influence people with these cancers to delay seeking advice. The study is based on the interviewing of a series of 75 men and 239 women patients and their relatives, resident in Manchester, Salford, and Stockport, and attending this hospital. All the interviewing was carried out by one person (J.A.-S.).

Interpretation of facts obtained by these means is inevitably subjective. Sometimes more can be learned in a few minutes from a relative than from several interviews with the patient. Conclusions are not based, therefore, on the patient's statement alone, but on all the evidence available. In addition, 63 patients were tested by the Wechsler-Bellevue method of intelligence testing to ascertain the relationship between individual I.Q. and delay.

Early in the study it appeared evident that there were two clear-cut groups of patients: (1) those who "knew" they might have cancer, and (2) those who were genuinely ignorant of the possible significance of their symptoms. The mental processes of these two groups are entirely distinct. Nevertheless, it was sometimes far from easy to place individuals into the correct category, especially as those in the first group often tried to hide the truth. The degree of awareness of a symptom, and the extent to which people will consciously accept what they suspect to be the truth, are dependent on personal factors. Shands *et al.* (1951), describing three levels of knowing, say: "(1) A person may be in

the possession of a number of facts that are not related to each other; he may know, for instance, that 'a lump may be a cancer,' and 'I have a lump,' without arriving at the conclusion, 'I may have a cancer.' (2) He may have taken the initial step of the relationship but stops short of translating the insight into action. . . . (3) A third level of knowing is that characterized by the integration of the pertinent information into the behavioural patterns of the individual."

In the present study a patient is considered to have known if there is evidence that at any level she thought of cancer in relation to her symptoms before consulting a doctor. Patients who "knew" can be subdivided according to a characteristic positive or negative response—those in whom fear is the dominating factor, and those who fatalistically accept the situation and mean to do nothing. The former group may offer a series of superficial reasons for their delay, and some of these are discussed later. Basically, these patients are motivated by fear, and their actions, wise or unwise, represent response to fear. As will be seen, fear may result in immediate action, as it ought to, but more often it leads to an only half-conscious policy of concealment and appropriate rationalization. The latter group, usually older people, are well adjusted to the situation which they do not deny.

Where there is genuine ignorance clearly no such factors operate, and delay, if it occurs, represents a normal response to the problems of health and illness which would take place regardless of the type of disease. At this point it may be noted that if education masters ignorance it may only result in a transfer to the other category.

It appeared later that the fraction falling into the two categories of "knowing" and "not knowing" varied greatly with the type of cancer, category 1 being dominant for breast cancer and category 2 for cancer of the cervix, skin, and mouth. This is, of course, an important finding in regard to the placing of emphasis in any educational campaign.

The average length of delay and numbers delaying three months or more are significantly higher among patients who knew than among those who did not know. This is not to say that they necessarily all delayed because they knew. Naturally, delay is also influenced by the degree of inconvenience suffered. The figures may therefore also reflect the fact that, generally, cancer of the cervix and mouth present troublesome symptoms earlier than cancer of the breast or skin.

Table I sets out an analysis of the whole material divided with as great accuracy as possible on these lines for the four diseases under review. In 19 cases it was impossible to determine on the evidence available whether the patient "knew" or not.

Action Related to Ignorance

Where the first symptom was not a lump in the breast women with breast cancer were apt to mistake the possible significance of their symptoms. Enlargement or swelling of the breast, a lump in the axilla, or retraction of the nipple was genuinely attributed to old lactation difficulties, menopausal disturbances, or recurrence of previous complaints. Even where the first symptom was a lump, in some cases the history was long and the lump unchanging. In addition, some put off through apparent indifference about their symptoms. They did not think the condition important, and allowed it to drag on owing to pressure of other events, and possibly low health standards and a low level of intelligence.

TABLE I.—*Delay of Patients who Knew they had Cancer and those who did not, by Site of Disease*

Site	Total	Knew	Did Not Know	Indeterminate	Delay								
					Under 3 Months			3-12 Months			12 Months and Over		
					Total	Knew	Did Not Know	Total	Knew	Did Not Know	Total	Knew	Did Not Know
Breast	127	92	31	4	52	32	17	36	27	9	39	33	5
Cervix uteri	80	18	51	11	47	9	32	22	4	15	11	5	4
Skin*	62	8	52	2	30	3	26	12	0	12	5	5	14
Mouth	45	8	35	2	26	3	22	12	5	6	7	0	7
Total	314	126	169	19	155	47	97	82	36	42	77	43	30

* Squamous-cell carcinoma and malignant melanoma only.

One case typifies this group.

A young woman did not bother about the lump in her breast until it began to "fester." Her husband agreed that they were not people to go to the doctor unless they had to. She complained of trouble with her eyes, he said, but she had not had new glasses for 20 years—she did not bother. She suffered from bad headaches, her husband suffered from stomach ulcers, and their little girl was delicate, with asthma and "nerves." Having been treated, this patient characteristically failed to respond to follow-up appointments.

Altogether one-quarter of the women with breast cancer did not realize the possible significance of their symptoms.

Almost two-thirds of the women with symptoms of cancer of the cervix were similarly ignorant. Naturally enough, younger women predominated in this group. Nineteen out of 20 pre-menopausal patients did not suspect cancer. Women of all ages from 35 to 65 attributed their symptoms to "the change," other reasons given being emotional upsets, strains, after-effects of confinement, and recurrence of previous gynaecological complaints.

Well over three-quarters of patients with skin and mouth cancer were ignorant of the nature of their symptoms. The patient with these symptoms had usually gone to his doctor (or dentist) before anxiety was aroused about the condition. Delay in these patients reflected their attitude to "doctoring," there being a general reluctance to seek advice for what seemed an exceptionally trivial matter.

Not all the 169 patients who were ignorant delayed—in fact, 46 had consulted their doctor within a month of the onset of symptoms. Further analysis showed that in over half these cases the reason for this prompt action was that the symptoms were too troublesome to neglect (flooding, painful mouth, etc.), relatives had insisted, the patient was under the doctor already or had gone about something else. Only 19 had gone within a month on their own initiative about symptoms which were not yet severe, and which they did not suspect to be cancer.

Action Determined by Fear

In essence the breast story exemplifies the fact that women do know as a matter of public knowledge that a lump in the breast is dangerous. Why the minority with cancer of the cervix, skin, and mouth suspected cancer while the great majority were ignorant can be broadly classified (Table II).

TABLE II

A disposition to worry about cancer, through having relatives or friends with the disease in same or other sites	10
Symptoms discussed with friends (in 3 cases a trained nurse) who suggested frankly the possibility of cancer	8
Mill-workers aware of danger of spinners' cancer	2
Patient a trained nurse	1
Read about cancer in paper	12
Other	34

The reaction of seeking immediate advice appears to be related to age rather than to "knowing" or "not knowing," or to intelligence. Younger people predominated in this group. Of all those who acted immediately, 18 were psychologically tested, and in this group are to be found the highest and lowest scores obtained in the test. About the

same proportion of patients who suspected cancer as of those who were ignorant sought advice immediately, or within one month of noticing symptoms—32 out of 126. These were mostly patients who had found a lump in the breast, and all but three went on their own initiative about symptoms which were not yet severe. Although these 32 had admitted to themselves the possibility of cancer it must be noted that not all sought advice with any sense of urgency. Two comments were: "It did occur to me afterwards that I wished I'd put it off a bit longer." "I thought people with cancer were wasted and ill. I wasn't ill and I wouldn't have bothered, but my daughter said if anything happens to you everything is going to come on me, so I went."

Only 15 more patients acted before the end of the third month.

The group which constitutes the main challenge to any public education project are the 79 who, though suspecting cancer, incurred substantial delay before seeking advice (three months and over). Four types of psychological reaction can be clearly seen in 68 of these patients (in 11 instances the data are inadequate). Almost half (36) had adjusted themselves psychologically in various ways to the threat of cancer. Thirty-two others delayed through a fear which inhibited action, and were in a state of conflict and anxiety. Usually some circumstance outside their own control had finally got them under medical care.

One patient in this later group, aged 59, delayed for a year after finding a lump in her breast. She "didn't tell a soul," for she knew her husband would insist on fetching the doctor. She fomented the discharging lesion and dressed it without looking at it—"I was terrified of it being something serious." Her husband, eventually noticing what was going on, fetched the doctor in spite of her insistence that the condition was improving. This patient had been an elder daughter and had nursed an ailing mother for 30 years. This experience of invalidism which had shadowed her life, and uncomprehending fear of the concept of cancer, were factors influencing her initial delay. Having delayed, feelings of guilt at "deceiving her husband" and wilfully neglecting herself made it increasingly difficult, as time passed, for her to take action.

Another patient, aged 40, found a lump in her breast and "didn't know what to do." She was "worried sick" and she readily admitted: "I concealed it from everyone." Faced with this calamity, for she never doubted it was cancer, she reacted on an emotional level and with no intellectual insight and therefore with no ability to work out the problem realistically. The emotional shock was too great and her personality a little too vague and ineffectual to integrate this new factor, and she was quite literally "ill with the worry of it." She was admitted to hospital for treatment for her stomach ulcer, and the breast condition was discovered then.

The following three common defensive reactions were noted.

Denial.—Seven patients denied to the interviewer and apparently to themselves that the condition could be serious, and they denied the implications of the disease, which were that it would not get better by itself, and that if left untreated it would kill them. They had ignored advice to see a doctor; their minds were already made up. Yet the very emphasis of their denial and the advanced stage of their disease belied their statements.

A single woman aged 43, pleasant and reserved, gave an impression of speaking with sincerity. She appeared to be on good

terms with the relatives with whom she lived. After being very fit for 12 years she developed a lump "like an abscess" in her breast. "I never thought it was anything I could not cure myself with lint and ointment, and I honestly never dreamed of worrying about it." The medical history described a huge, fixed cancer with wide skin involvement and ulceration. The smell from this lesion had become so noticeable that her relatives, to whom she had said nothing, insisted on fetching the doctor. Now here, she asked no questions, she was feeling better, and she presented an equable and completely blank front against any disturbing implications.

Suppression.—Eighteen patients did not deny that the condition was serious, but they rationalized it and did nothing. Two expressed this mechanism forthrightly. "I did think it might be cancer, but I shook it off." "I just put it right out of my mind. I didn't think of it and I didn't intend to until it hurt."

A retired ladies' companion delayed a year, when, instead of returning to her doctor as instructed, she delayed a further two years. She had always tended to put anything unpleasant away from her, she said. She felt that "cancer was a disease that people got who were dirty or who had done something wrong." The whole subject was distasteful to her and she did not wish to think of it. She had dismissed it from her mind while the lump in the breast caused no trouble, and she had two good reasons for doing so: First, she could not afford private care, and "objected to being put on show"; then, "and I don't tell this to everyone, there was no one but myself to look after my little dog."

Acceptance.—These 11 patients were mostly elderly. The severity of their symptoms alone finally induced them to seek advice. They were not looking for cures.

A patient aged 78 said: "I didn't want to be upset about it. I'm not expecting to be cured, you know."

Another old lady, living alone, said: "At my age, what was the use of bothering?" She felt that to give in to illness meant dependence on others, and she said with great feeling: "I couldn't have people coming in and running about for me."

A patient aged 76, with five years' delay, summed up the views of this group: "It didn't hurt and I'd turned 70 and had my span of life."

Some had a hard attitude to illness, regarding it as a weakness and making a virtue of "not giving in." It was something to put up with and not to complain about. In most of the stories of these older patients, however, was anxiety about dependency, about "being sent away" and losing their rooms or houses. So much depended on their keeping going, and they saw no hopeful outcome if they let themselves get into the hands of the hospitals.

Whatever the defensive reaction, fear is probably at the bottom of all delay that is not due to genuine ignorance. It sometimes derives from something concrete, childhood experiences, cancer in relatives, etc., but more often it is the reflection of a kind of cultural fear—a herd instinct rooted in prejudice and ignorance. Patients naturally have not thought it out in terms of "fear of what?" The fear of cancer is vague and is therefore usually expressed in some more concrete, secondary (or rationalized) basis. "Reasons" for delay include fear of "doctoring" and hospitals, operations, dependency, leaving home, "being sent away," losing a job, leaving a young family or a sick husband. These are more immediate and tangible and more easily expressed. They are an important part of the total situation, but it is difficult to know, had there not been fear of cancer in the background, if the patient who "knew" would have delayed for these "reasons." They are mentioned briefly in the section that follows.

Other Factors Influencing Action

Fear of Doctors and Hospitals.—Practically all the patients spoke appreciatively of their general practitioner. Yet this did not prevent expression of strong prejudices against "doctoring" in general; this attitude, and a "dread" or "horror" of hospitals, played a considerable part in delay, especially among older patients. Sometimes

this feeling derived from childhood or adult experiences, and the reasoning was simple: they were hurt or frightened in hospital and they would not go again. Those who were most afraid were often those who had never been in hospital but were full of alarming hearsay. Sometimes a patient's fears were not so much of going into hospital as of leaving home. Some housewives had become home-bound, seldom going out on their own. They may have feared that their condition was cancer, but if it did not trouble them a much greater fear was of "being sent away." Another aspect of the dislike of "doctoring" was the patient's feeling that she would be found to be making a fuss about nothing. "They think you're mithering if you keep going," expressed a common attitude.

Fear of Operation and Treatment.—Mixed up with fear of hospitals was the fear of operations and treatment, allied with doubt about the value of such procedures. Patients would say that they knew that cancer is sometimes cured, but this theoretical knowledge did not affect their tendency to delay. Over a quarter of all the patients spoke of fear of operations in connexion with their delay. Most were speaking of operations in general; others were referring specifically to radical mastectomy. Some said this was no worse than any other operation, but to some the mutilation aspect was deeply disturbing. Age was not always a factor in this. Fear of operation "because it makes it spread" was frequently met with.

A patient aged 72 said: "I don't believe in cutting, and I was expecting this if I went to the doctor." She had had a slow-growing lump in the breast for six years, and thought it would not be much bigger by the time she was 80.

Another patient said: "I always feel that if you're cut there it just goes on and you have to have more done—the beginning of a long process leading to the end." She had known two women who had died following radical mastectomy. "People seem to think it best to leave anything that doesn't hurt, and not stir it up," said another. "People believe that even if they have this operation it is just the beginning of a lot of trouble."

Friends and Relatives with Cancer.—It is difficult to say what influence looking after or having relatives with cancer will have on the patient's own subsequent behaviour when symptoms occur. Most of the relatives and friends mentioned had died, but even when some had done well this fact does not seem to have helped. The fear of cancer is such that while a bad outcome may have an adverse effect a good outcome seems to give little encouragement.

A patient had accompanied to hospital a friend who had found a lump in her breast. She had thought at the time how sensible her friend was to see to it at once. The lump was removed and the friend had no further trouble. A few years later our patient found a lump in her own breast, which she concealed from everyone until it ulcerated.

Another patient, whose mother and sister had both died of cancer of the breast, claimed complete ignorance of the significance of a lump she had found in her breast. Later, she gave away unintentionally the fact that she had known. Her sister had lived for ten years after treatment, but our patient considered it a failure. She was not prepared "to go through such painful treatment for nothing."

Domestic Difficulties.—In many cases where the reason for delay was said to have been domestic difficulties other factors were clearly involved, but in some this did appear to be an overriding consideration. Apart from domestic crises causing delay there were the housewives who had never before left their families. They felt that the accustomed pattern of life could not be upset.

"It is easy to tell other people, but it's so difficult when it comes to yourself. If it had just been myself to think of, or if it had been painful, I'd have seen to it sooner, because I did know it was dangerous to leave lumps. But I've been thinking too much of the family. I just couldn't go off and leave them to manage on their own."

Not Realizing the Need for Early Treatment.—Many patients knew in theory that they should not delay with a "lump," but there was much ignorance about whether it

was safe to delay so long as it did not hurt. Other patients, thinking the condition ultimately incurable, saw no reason to hurry.

A brisk, talkative patient of 40 had heard cancer education talks, which she thought most useful. Her father had been successfully treated for cancer of the mouth, and was now "wonderful." This patient developed a lump in her breast. "Of course, naturally your thoughts fly right away to cancer, don't they?" She delayed nine months. "I kept it to myself because I didn't want to worry my mother. I've had to tell her now, of course, but I was attending classes and I'm an active club worker—you know how you keep putting off. I definitely knew I mustn't leave it too long, for then perhaps nothing could be done. I just became conscious of the lump and made up my mind one night that it was time to see the doctor."

"I believe something can be done if things are taken in time" (delay of three months). "I knew I must get it seen to, as otherwise it might spread" (delay of one year).

Ending of Delay

Delay here is arbitrarily defined as three months or more, and this analysis concerns the 79 delayers who suspected cancer and the 72 who did not. One point stands out. Patients who "knew" tended to seek advice only when forced to do so by the severity of their symptoms. Most of those who did not know had sought advice before that stage was reached. Nevertheless, a quarter of the latter came under medical care only when their symptoms were severe. It was not, therefore, through fear of cancer that they delayed. Other factors were present—fear of "doctoring" and hospitals, waiting to see, shyness, "elderly neglect," etc., which contribute to delay whatever the disease. In a considerable number of cases the action of others ended the delay, the patient being unwilling to seek advice. The main circumstances in which delay was ended are given in Table III.

TABLE III

	Knew	Did Not Know
Patient's initiative, symptoms too painful or troublesome to ignore longer	39	18
Patient's initiative, symptoms not severe	11	21
Action of relatives or friends	19	18
Condition found by doctor, patient intending to conceal it or not bothering	6	5
Other	4	10
	79	72

Shands *et al.* (1951) mention the element of chance in the circumstances which finally decide the patient to seek advice—the "magic" intervention for which he waits. This is a very real thing. A number of patients in this series mentioned such chance happenings. From the point of view of cancer education it is an important aspect of the delay problem, for it would appear that a patient may have heard talks about the danger of "lumps" and do nothing about her own, yet months later she may go to her doctor suddenly because of a chance remark by a stranger in a queue, or because "I happened to be passing a gate with a doctor's name on it, and I just thought I would go in and ask him if he would tell me what it was." Chance stimuli are effective when the patient is already predisposed to act but is procrastinating. Education may help in the process of predisposing without necessarily providing the stimulus—this may come on a more personal level.

Relation Between Delay and Intelligence

To see if there was any relationship between delay and intelligence as measured by an accepted test an additional investigation was carried out among 63 women with breast and cervix cancer, aged under 60, who were up and about. Out of 68 asked there were five refusals (Table IV).

The Wechsler-Bellevue intelligence scale has been very much used in England for testing adults and has been standardized separately for people of different ages. This means that a 50-year-old patient is being compared with a wide variety of other people of 50, and not directly with younger or older people. The construction of the test does

TABLE IV

	Group Tested	Total Group Under 60
No delay or under 1 month	23	44
Some delay, 1-3 months	15	26
Delay of 3 months or more	25	59

not draw too heavily on educational achievement or the ability to use words.

There is no evidence that the patients with the highest scores did not delay while those with the lowest scores delayed the longest. Scores obtained by patients who had delayed a year or more are spread over the middle of the range, with perhaps a slight tendency to have higher than average scores. Results expressed in terms of the product-moment coefficient by Pearson's method give a figure of 0.18, which is not significant. It is concluded, therefore, that there is probably no significant relationship between delay and intellectual level as measured by this test.

Discussion

It has been shown that over half the patients with cancer of the breast, cervix uteri, skin, and mouth did not suspect cancer when they first sought advice. Some of these sought advice only when the symptoms were severe or troublesome. Action, therefore, depended on individual standards of fitness and the level of ill-health they were prepared to put up with. They delayed through ignorance, and we do not know what they would have done had they suspected cancer.

We do know, however, what a group of patients who suspected cancer from the beginning actually did. Nearly two-thirds delayed three months or more, while one-third delayed a year or more. This delay is greater than that found among those who did not suspect cancer. More patients who suspected cancer sought advice only when the symptoms were severe.

Prima facie, it might be argued from this that people are better left in ignorance. This might be so if they were in the habit of going to their doctor promptly with symptoms which are not troublesome and which they do not take seriously. However, it has been shown that this is not a sufficient stimulus in a large enough number of cases.

Harms *et al.* (1943), discussing causes for delay of cancer patients attending an American hospital, say that it is noteworthy that fear of cancer played a minor part. "The major cause for the patient delay is primarily lack of proper information on the cancer problem. . . . Thus the failure of the educational programme to furnish the patient with sufficient information may be held responsible for delay in at least 85% of the cases." Earlier they say: "The median delay for patients who thought they had breast cancer was 3.25 months, while the median delay for all breast cancer was 6.5 months. This suggests that the delay could be halved if all patients were aware of the significance of their symptoms." If this is so education in America has succeeded in reducing the fear of cancer which is so largely responsible for the delay of patients who "knew" in the present series. Our study has shown no ground for assuming that, given adequate information on the significance of symptoms, people in this area—particularly women with cancer of the breast—would as yet react "rationally." Cancer education here, in addition to its purely informative role concerning significant symptoms, still has the more fundamental task of convincing those who suspect cancer that ultimately they will be better off if they seek treatment soon. It has also to influence the deeper and more primitive level of thinking, with its "magical," moral, and retributive elements.

Lack of confidence in what can now be done for them is clearly an important factor in the delay of patients who suspect cancer. Two things which appear to contribute to this lack of confidence are the fate of the advanced patient and the policy of medical silence about cancer.

From the point of view of influencing people to come earlier for treatment the fate of the advanced patient has an adverse effect. As Donaldson (1952) points out, an enormous number of people are brought into direct contact with cancer every year through nursing relatives dying at home. Their attitude and that of the group around them are influenced by these experiences. At the time of increasing anxiety when the patient begins to go downhill the hospital may give him a longer appointment, and his own doctor, it is sometimes alleged, "doesn't seem to take the same interest now." Perhaps he cannot get a bed in hospital, and living conditions may be unsuitable or squalid. He may be inadequately sedated. Worst of all is the feeling that nothing is now being done for him. This is cancer as the general population knows it—unpleasant, incurable, and rejected. These are not entirely welfare considerations; they have a direct bearing on the public's lack of confidence in what can be done for the cancer patient.

A policy of silence regarding a diagnosis of cancer is maintained in general in this country in the supposed interests of the patient. Is this done at the cost of diminishing public confidence in the value of treatment? The fact of palliative treatment is not understood, and hospitals appear to be trying to cure all their patients and failing in a high proportion of cases. If the patient does well the condition "cannot have been cancer." The known cured cancer case is a rarity. This is not the place to discuss what should be done about it, but the fact is entirely relevant to the findings of this study. It is clear that one of the causes of delay is lack of confidence in the efficacy of any treatment. In some way or other it must be brought home to people that some types of cancer are not only curable but are being cured in early cases.

Summary

A study, based on detailed interviewing of 314 patients with cancer of the breast, cervix uteri, skin, or mouth showed that approximately one-half delayed seeking advice for three months or more, and a quarter for a year or more, after first noticing symptoms. Most of the patients with breast cancer suspected they had cancer; patients with the other three types of cancer were, in the main, ignorant of the significance of their symptoms. There was greater delay among those who suspected cancer than among those who did not. Two quite distinct processes operate to cause delay.

1. *Ignorance.*—Here, delay in seeking advice clearly reflects the patient's general attitude towards "doctoring" and has no special relationship to cancer as such.

2. *Fear (of cancer).*—This is clearly indicative that, in some degree at least, the patient really "knows" the probable nature of the disease. Such fear may trigger a reasonable response and make for "immediate" action. Much more often, in the group analysed, it inhibited rational action and was the underlying factor causing delay, although this was camouflaged behind a variety of more superficial ostensible reasons. Testing by the Wechsler-Bellevue intelligence scale indicated that there was no significant relationship between delay and intellectual level as measured by this test.

These distinct and mutually exclusive attitudes to the different diseases must be recognized in any schemes for public education in this field.

We are indebted to Mr. J. C. Kenna, lecturer in clinical psychology, University of Manchester, for advice on psychological testing, and to Miss E. F. May and Mrs. P. F. R. Venables for carrying it out.

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EARLY CANCER DETECTION AND EDUCATION: A PILOT TRIAL

BY

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Every clinician in the field of cancer finds that a large proportion of patients coming for treatment at present must be classed as "late" cases, in which radical cure cannot be expected. Our thesis is that many of these cases could and should have been diagnosed and treated at a much earlier stage. Efforts to reduce the delay have been on two main lines: (1) education of the public by suitable propaganda, and (2) medical examination.

Present Investigation

The Ministry of Health, in a recent circular, considers public propaganda inadvisable at present but favours local exploratory schemes to enlarge our knowledge of the possibilities.

We have sought to combine some of the advantages of both the above methods—education and examination. We feel that cancer education is desirable, but should be conducted as personally as possible between physician and patient. Education and medical examination can and should be carried out together.

It was decided to offer all the patients between the ages of 40 and 70 on the National Health Service list of one of us a brief examination conducted specifically to detect early accessible cancer and to combine this with an effort at education in the cardinal symptoms of malignant disease. The women were invited first.

Circular letters were sent out in batches, offering free medical examination: stamped envelopes and reply forms were enclosed. The word "cancer" was avoided at all times, if possible, as being in itself a potent agent of distress.

Female Patients

Invitations were sent to 766, and 422 (55%) accepted. This, we felt, was a very satisfactory response. The examinations were carried out in batches of about 20 at one session a week, lasting about 2½ hours. The patients' National Health Service cards were available to assist rapid visualization of their histories.

After taking a careful menstrual history, with special reference to heavy or irregular bleeding and discharge, leading questions were asked concerning the following: regularity of bowels, unusual constipation or diarrhoea, blood in motions, piles, abdominal pain, sore places in mouth or throat, dysphagia, dysuria, haematuria, cough, hoarseness, moles or warts, lumps or swellings, usual weight, smoking habits.

If the answers appeared unsatisfactory, further inquiry was made and all the facts were noted. The mouth, tongue, pharynx, and larynx were then examined, including indirect laryngoscopy, and the neck was inspected and palpated. The patient then passed into the undressing-room, where she was instructed to take off all her clothes and to put on a dressing-gown provided. She then passed on into the examination room, where the body was inspected, the

breasts were examined, the abdomen was palpated, and a manual and speculum vaginal examination and a digital rectal examination were made. While the doctor conducted the breast, etc., examination he took the opportunity of telling each patient that she should feel the breasts every month and at once report any swelling, and that she should always report any irregular bleeding or discharge, etc.

No attempt was made to examine the heart, lungs, or central nervous system. If any feature of the history brought out the need for such an examination it was arranged for at another time in the ordinary consulting hours. No pathological investigations were undertaken; it was considered that if any indication for special examination was present the patient should be referred to an appropriate consultant in the same way as if she had attended as an ordinary surgery patient. All examinations were purposely confined to the scope of ordinary general practice, and no attempt was made to set up a hospital-type diagnostic centre. At the conclusion of the examination each patient was given a pamphlet, listing the chief warning signs (lumps, bleeding, hoarseness, dysphagia, etc.) to be reported without delay, and emphasizing the importance of *not waiting till pain was felt*.

Recall Examinations.—Inevitably, a number of conditions were met which, while being obviously abnormal, were insufficiently well defined to merit any immediate action. These were cases for recall in three to six months—for example, some erosions, vague swellings in the pouch of Douglas, and unsatisfactory menstrual histories. The actual process of recall set a major problem, how to proceed without causing alarm and anxiety. At first, patients were told quite briefly that they would be sent for again in three months for re-examination. But experience quickly showed that they worried in the meantime and thought all sorts of things had been discovered. After trying various alternatives, we eventually decided to send each a personal note near the time of recall, offering another appointment in view of the previous findings; this had the desired effect. The recall problem is certainly one of the major difficulties of a scheme such as ours.

Results.—The principal findings are listed in Table I. Only one new major cancer was discovered (of breast). Eight patients were referred to gynaecologists for opinion

TABLE I.—Principal Results of Survey in Females

Invitations issued	766
Acceptances	422 (55%)
New cancer discovered	1 Breast (radical mastectomy performed; histologically confined to breast, no axillary secondaries)
Referred to hospital, excised, and proved benign	8 { 1 Recurrent lipoma of arm 3 Uterine fibroids 1 Ovarian cyst 1 Cervix papilloma 1 Palate 1 Thyroid adenoma
Follow-up examination for doubtful findings	32 { 21 Pelvis (uterus, ovary) 5 Breast (including 1 case of bleeding nipple, under regular observation) 4 Rectum (polyp) 2 Larynx (papilloma)
Miscellaneous	3 { 1 Dyspareunia—operation performed 1 Procidencia— 1 Larynx chondroma (asymptomatic)

on masses in the pouch of Douglas. Three have had hysterectomies for fibroids, one was discovered at laparotomy to have secondaries from a previous carcinoma of the colon, two proved to have benign ovarian cysts, and the other two refused operation. Abnormal pelvic tumours are not rare, and must always arouse suspicion. Ovarian cysts, benign or malignant, are usually symptomless for a long time, but can be felt on pelvic examination at an early stage. They represent a fertile field for prophylaxis, for benign cysts can probably become malignant, and the present-day poor results in ovarian carcinoma cannot be improved without early removal of enlarging pelvic

tumours. *This can be achieved, not by education of the patient in early symptoms, but only by periodic pelvic examination.*

Male Patients

Invitations were sent to 716 patients, and 415 (58%) accepted. The same type of history was taken and the same leading questions (where appropriate) were put. A similar examination was conducted, including mouth, pharynx, larynx, abdomen, genitalia, and rectum.

As a concession to an almost universal anxiety among men of this age group it was decided to take the blood pressure in every case. In only one instance was it found necessary to refer a young hypertensive to a physician. Practically the entire remainder were told that the reading was satisfactory and the expressions of relief and appreciation were constant.

Results.—These are summarized in Table II. No new major cancer was discovered primarily, but the pre-malignant and potentially malignant lesions discovered and

TABLE II.—Principal Results of Survey in Males

Invitations issued	716
Acceptances	415 (58%)
Minor new cancer discovered	1 Rodent ulcer of face (treated by x-rays, healed)
Pre-malignant or doubtful lesions, under observation	9 { 1 Larynx—chronic hypertrophic laryngitis. Biopsy taken, showed suspicious areas without definite invasion 3 Larynx—papillomata 1 Penis—erythroplasia 2 ? Early rodent ulcers of face 1 Testis—nodule 1 Enlarged bilateral axillary lymph nodes
Benign lesions referred to hospital	4 { 1 Cyst of hand 1 Advanced osteoarthritis of hip (on waiting-list for arthroplasty) 1 Dyspnoea (fully investigated—final diagnosis of "chronic bronchitis") 1 Molluscum sebaceum of nose (treated by curettage, healed)

kept under observation are noteworthy. Slow-growing tumours such as these carry generally a good prognosis with early removal when appearances justify active treatment.

Benign Lesions Discovered

In any series of medical examinations, however superficial, a number of benign lesions, inflammatory, neoplastic, degenerative, etc., will inevitably be discovered. Although it was not our intention to search for such common things, note was made of the obvious benign lesions as they appeared in the systems examined. Vaginal examination, for example, revealed 43 cases of cervical erosion and 10 cases of urethral caruncle. In none of these was treatment thought to be indicated. Other benign lesions found included cervical polyp, uterine fibroid, Bartholin cyst, "chronic mastitis," goitre (common in this region, on the edge of Derbyshire), and laryngeal chondroma.

An enlarging thyroid adenoma (a potentially malignant lesion) was treated by excision. One case of dyspareunia and one of procidencia were also sent to hospital and treated surgically.

Repeat Survey of Female Patients

Following the initial survey of both sexes, it seemed desirable to attempt to repeat the examination, at least in the women. Of the 422 initially examined, second acceptances were obtained in 170 (or 40%). Some drop, of course, was inevitable, and a similar experience was found by Siddall (1952).

This time we were able (by the kind help of Dr. G. R. Osborn, of the Derby Royal Infirmary) to extend the investigation by including a routine vaginal smear, by the method of Papanicolaou (Papanicolaou and Traut, 1943; Osborn, 1953).

The chief results are summarized in Table III.

TABLE III.—Principal Results in Second Female Survey

Invitations issued	422 That is, the "acceptances" of Table I
Acceptances	170 (40%)
Vaginal smear examinations	170 { 2 showed trichomonas infection 1 showed doubtful neoplastic cells
Minor operations	2 { Enlarging pigmented papilloma on abdomen; excision—histologically benign Cervical polyp removed—histologically benign
Miscellaneous	6 Referred to hospital for benign conditions (cervicitis, etc.)

Undetected Cancers

It is clearly of major importance to determine the number of cancers "missed" by our survey, as shown by the subsequent history of the patients. To this end Table IV has been compiled, with details of all the cancer cases that have been diagnosed in patients examined, beginning from the date of the first examination (July, 1951) to the present—

TABLE IV.—Malignant Cases Appearing Subsequent to Examination

No.	Site of Cancer	Sex and Age	Alive or Dead	Length of History of Symptoms	Interval from Examination to Diagnosis	? Cancer Present at Time of Examination	Value of Examination or Education
1	Colon	M 54	Alive	2 weeks	3 weeks	Yes	Prompt attendance definitely due to pamphlet
2	Bladder	M 50	..	"Cystitis" 3 months; haematuria 2 days	1½ years	No	No definite effect
3	Stomach	M 64	Dead	1 month	1½ ..	..	No effect. (Old gastric history. Neurotic subject)
4	Colon	M 52	Alive	2 weeks	1 year	..	No definite effect. (Early attendance because of primary symptom of pain)
5	Stomach	F 44	Dead	Indefinite	1 ..	..	No value. (Symptoms from secondaries only)
6	Brain	F 42	..	1 week	2 months	Yes	No value
7	Breast	F 47	Alive	1 day	1 year	No	Early self-detection through pamphlet
8	Bladder	F 57	Dead	1 week	6 months	Yes	No definite value

a period of 2 years 9 months. Column 6 gives the time interval from our examination up to the appearance of symptoms relative to the cancer, and the next column attempts to estimate whether the growth was present at the time of our examination. This estimate is necessarily personal and subjective, and apt to be very wide of the mark: it is well known that microscopically recognizable cancer can be present many years before giving signs; our "Yes" or "No" is often rather an answer to the question, Could the cancer probably have been detected by more detailed and thorough investigation at the time?—and even the answer to this more limited question is subject to a very considerable margin of error. The last column attempts to assess the actual value of the examination or propaganda as judged by the patient's subsequent history; here again considerable uncertainty enters, but we felt it important to make some attempt of the kind, if only as a basis for argument.

From column 7 it will be seen that we consider cancer to have been present but undetected by us at the time of our examination in three cases (Nos. 1, 6, and 8). In Case 6, of cerebral glioma, although symptoms of "rheumatism" appeared only two months after our examination, it is highly improbable that more thorough clinical examination by ourselves at the time would have detected anything abnormal or altered the prognosis. Case 8 was examined in January, 1952, and at the time was on the waiting-list at hospital for treatment of urethral caruncle; in March dysuria and frequency set in, and she was sent to hospital again, but the symptoms were attributed to the caruncle and she had to wait till June before being admitted as an emergency with acute retention; cancer was quite unsuspected, being discovered only on cystoscopy; it is difficult to blame anyone for this sequence of events, and nothing short of routine cystoscopy—clearly quite impracticable—could have revealed the growth sooner.

Case 2 was examined in June, 1952, and there was then some history of mild dysuria: no physical signs were found, but a note was made on the patient's card advising

reference to a urologist if symptoms persisted. His next attendance was in December, 1953, with symptoms of cystitis for the past three months; treatment for cystitis was begun, but he did not reappear till February, 1954, with two days' haematuria; cystoscopy showed multiple papillomata, one of them infiltrating and malignant. With retrospective wisdom, we might blame ourselves for not following up his original dysuria in June, 1952; the symptoms apparently improved spontaneously and an ordinary bout of cystitis gives the same clinical picture. It he had been examined cystoscopically, papillomata would presumably have been discovered, and active treatment of these might possibly have prevented the later malignant degeneration. This case, as well as No. 8 above described, underlines the value of early cystoscopy; clearly, it is an impracticable counsel of perfection to submit all cases of cystitis to this inconvenience, and a line must be drawn somewhere—just where, is the problem before us.

Cases 1 and 7 represent undoubted triumphs for the educational campaign. In Case 1 the patient stated that it

was certainly the pamphlet that was responsible for his reporting so soon; since his symptoms began only one week after his examination, the warnings would be fresh in his memory. In Case 7 the nodule in the breast was reported at once—it was less than 1 cm. in size, one of the smallest we have ever seen. Radical mastectomy was carried out, but microscopically invasion of lymphatics was evident, with secondaries in axillary nodes. In spite of post-operative radiotherapy, recurrence on the chest wall followed and the prognosis is virtually hopeless. This is an example of the biologically virulent type of growth which metastasizes from the start.

Additional evidence of the potential value of education comes from the fact that some half-dozen patients have reported since the start of the examinations, for rectal bleeding—all of them mentioning the pamphlet with its warning. All of these cases proved to be due to haemorrhoids.

Financial Cost

The chief items of expenditure were for the services of the secretary-chaperon, duplication of circulars, envelopes, and postages (including stamp enclosed for reply).

Fifty-five sessions were held and about 1,000 examinations carried out. The total cost was approximately £150.

The medical man-hours totalled about 140, but in this experimental survey the question of payment for medical services did not arise.

Discussion

Detectable Cancers

With the type of examinations we have used, "detectable" will necessarily approximate to "accessible." What proportion of total cancer will this include? Using the figures of Tod (1949) for estimated incidence in different organs for England and Wales, we may attempt an answer as follows: Out of a total incidence of 2,112 cases per million of population we may place in the "accessible" group the sites listed in Table V, giving 977—that is,

TABLE V.—List of "Accessible" Cancers, and Incidence
(Abstracted from Tod, 1949)

Site	Incidence per Million
Skin	200
Lip	16
Tongue	27
Mouth	10
Jaw (including antrum)	12
Palate	4
Pharynx (including tonsil)	18
Larynx	29
Breast	225
Parotid	5
Thyroid	8
Rectum and anus	156
Male genitals	10
Prostate	56
Uterus	132
Ovary	56
Vulva and vagina	13
	977

approaching one-half. The largest groups among the "inaccessible" types are: lung and mediastinum (171), oesophagus (54), stomach (322), other intestine (including liver and pancreas) (389), bladder (48), Hodgkin's disease and leukaemia (51)—all these together total 1,035.

From Table V it is clear that the cancers most likely to be "picked up" are: skin, breast, rectum, and uterus. Of these, the skin is the least important from the present standpoint, as the mortality is relatively low. The most dangerous of skin cancers is the malignant melanoma; there is a useful field for prophylaxis here in the removal of doubtful moles and pigmented patches, especially from sites exposed to friction and trauma.

The factor of expense has ruled out even the simpler supplementary tests such as urine analysis, Wassermann reaction, and blood counts. Since we had no intention of providing a general medical examination, we felt no compunctions about omitting these tests, as their contribution to cancer detection could not be considerable. Blood counts might have picked out, for example, a case of leukaemia, especially of the chronic lymphatic type in the elderly, where it may be almost symptomless. But leukaemias, like the reticuloses generally, are not such urgent candidates for early detection as the common carcinomas, as their ultimate prognosis is scarcely influenced by earliness or lateness of detection.

There are at least two ancillary investigations, however, that are reasonably practical policies and of real value in "large-scale" cancer detection—the chest x-ray film and the vaginal smear.

Chest X-ray Film.—Some recent results of the largest mass chest x-ray survey so far made are given by Guiss (1952); in 1,867,201 people, 3,500 "suspects" were found, and after investigation 144 carcinomas were confirmed; the operability rate (57%) and resection rate (47%) were relatively very high. Boucot and Sokoloff (1954), however, are much less optimistic about its possibilities. To be of real value the surveys would need to be repeated at intervals of, at most, six months.

Vaginal Smears.—The experienced pathologist can pick out cancer cells, even in isolation, that have been exfoliated from a malignant growth. The method has been used extensively in the U.S.A., especially as a screening test for large groups, and there is no question about its ability to pick out cancers, both of the cervix and of the body of the uterus, at a stage long before they are clinically apparent. The method has, in fact, led to increasing interest in, and detection of, the "carcinoma in situ"—that is, in the pre-invasive stage, when malignant changes are still confined to the epithelium. A recent example of its value is given by Erickson (1953): in 20,000 women of the general population screened there were 1.8% of "positive and suspicious" findings; subsequent biopsies showed about half of them to have carcinoma of the cervix, intra-epithelial or invasive. Siddall (1952), in an investigation comparable with the present one, found three early cancers of the cervix by this method in 563 apparently well women. The drawback of the technique is the relatively great length

of time required for examination of the smears, as well as the scarcity of experienced workers. This has so far confined its use in this country mainly to the gynaecological departments of a few large hospitals—that is, to patients with some complaint; here it has been found of undoubted value (Discussion, 1951).

Other Diagnostic Aids.—Investigations such as smears of gastric aspirations, routine sigmoidoscopy, etc., have been used in the U.S.A. but are practicable only in hospital, and can hardly be used on a large scale. Serological tests for cancer have also proved very disappointing so far.

Is Early Treatment Essential?

The orthodox assumption that early treatment, before spread takes place, should in general be curative has been under heavy recent criticism. On the basis of breast cancer statistics, McKinnon (1952a, 1952b) and Park and Lees (1951) conclude that the survival rate is not appreciably influenced by treatment; delay is therefore not of prime importance, and "curability" is explicable wholly by intrinsic variations in growth rate. Foulds (1951) emphasizes the complex characters of growths—rate of growth, invasiveness, aptitude for dissemination, etc., are not necessarily in step in a particular growth. Considerations of this nature help to explain the paradoxical findings that a short history of symptoms is not necessarily a good prognostic index and may even be the reverse (Walters, Gray, and Priestley, 1941; Harnett, 1953; Swynnerton and Truelove, 1952). But this does not imply that there is no difference in survival rates of patients treated in the early or later stages of the disease (Russ, 1953): all Stage 2, 3, and 4 cases will at one time have been Stage 1 cases, and if treated during Stage 1 would presumably give some at least of the superior results of Stage 1 cases.

The concept of an "early" case is clearly not as simple as was once thought, and clinical "early" cases may be pathologically late (compare Case 7 above). But, as pointed out by Kreyberg (1953) and Kreyberg and Christiansen (1953), who found that 50% of clinically very early breast cancers eventually succumbed to secondaries, early diagnosis and treatment are still of great importance, as we cannot know beforehand who will benefit. Even if the benefit is statistically modest, early treatment of the primary usually gives improved palliative effects, which are normally neglected in cancer statistics.

With the exception of the two extremes of biological virulence, earlier detection and treatment of the large intermediate group seem to hold out the best present-day hope of improvement.

Some Results in Cancer-Detection Work

The American Cancer Society (1949) quoted 0.8% cancers and 10% pre-cancerous lesions in a mixed group of 51,728 symptomatic and asymptomatic patients seen in detection centres throughout the country. Jones and Cameron (1950), from their data, estimate a potential case-finding rate of 1%. Clifton and Rush (1951) report 1.2%, while 2.6% of known cancer subjects were found to have a second malignant tumour.

Siddall (1951, 1952) reports a survey in general practice, more nearly comparable to ours, confined to women. During eight years 1,131 patients were seen; 14 cancers were found in the asymptomatic group and 22 in those with symptoms.

Psychological Aspects

This side of the problem demands the most careful consideration. Indiscriminate publicity can do a great deal of harm. Cancerphobia is common, and medical examination and reassurance can do much to combat it. Its victims, however, may promptly transfer their anxiety to some other field—for example, cardiac. The problem is not that of cancerphobia specifically, but the vastly greater one of neurosis generally.

Our own experience parallels that of Siddall (1952), who found that his patients with cancerphobia could all be

considerably or completely relieved, and that the psychological benefits outweighed the disadvantages.

As an example of the confusion and ignorance in the public mind, as the basis of so much fear and worry, it is worth noting the results of a recent questionnaire to the general public reported by Raven (1953)—17% thought cancer was infectious, 27% that it was incurable, and 20% that it was of doubtful curability.

Other Aspects

In the U.S.A. the average cost per case of cancer discovered has been estimated at anything from 1,000 to 8,000 dollars—clearly prohibitive here. On this score alone, the general practitioner's consulting-room is preferable. Moreover, it is work of a type that enhances the scope of general practice (unlike so many proposals). Conclusions about the value of periodic examinations can be reached only on the basis of large-scale surveys, with adequate follow-up. A suitable agency would appear to be the health centre, of the type recently built, and the financial cost would be relatively low.

Summary

This paper describes a survey in a general practice, in which clinical medical examination was offered to patients between the ages of 40 and 70 combined with instructional propaganda in early cancer symptoms. Four hundred and twenty-two women and 415 men responded, making acceptance rates of 55% and 58%. A follow-up examination on the women was also carried out, including a vaginal cytological smear, bringing the total of examinations to about 1,000.

The findings are reported, with details of malignant and non-malignant lesions discovered.

Some of the arguments for and against such examinations and their possible value in cancer morbidity and mortality are discussed. The psychological and financial aspects are also touched on.

It is concluded that further experimental trials on similar lines would be justified, and are necessary before any appraisal of their long-term value can be made.

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RECENT DEVELOPMENTS IN THE MANAGEMENT OF BRAIN ABSCESS*

BY

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During the last ten years there have been considerable advances in the diagnosis and treatment of brain abscess. Of overriding importance has been the introduction of the antibiotics, but superior methods of location, and experience in the methods of treatment available, have all contributed to the improved results. Thus in the Department of Neurological Surgery, Oxford, the mortality has fallen steadily (Table I). The earlier series

TABLE I.—Brain Abscess, 1938-54

Years	No. of Cases	Deaths
1938-43 (before penicillin)	48	22 (46%)
1944-48	62	18 (29%)
1950-54	36	7 (19.4%)

have been described previously (Pennybacker, 1951), and in the present paper the results over the last four years (1950-4) are recorded. During this period there were 36 cases with 7 deaths, a mortality of 19.4%. Concerning these seven deaths it should be noted that three of the patients had been admitted at a late stage, when the abscess had already burst into the ventricle and ventriculitis was established, and one other patient had had multiple abscesses.

In trying to assess these results, the bare figures do not perhaps tell the whole story, since in later years there have been an increasing number of acute cases (including metastatic abscesses, particularly from the chest) reaching neurosurgical clinics for treatment, which may weight the results adversely. The modern trend is perhaps best reflected in the treatment of abscesses resulting from paranasal sinus and otogenic infection: of 20 consecutive patients with abscesses from these sources in the last four years, 19 recovered and 1 died. However, a brain abscess is still a serious matter, and in looking to the future one should not only be seeking for further improvement in diagnosis and treatment but be attempting to reduce the incidence of brain abscess by attention to the sources of infection and also criticizing the quality of the result obtained.

Sources and Prevention

There is a general impression that brain abscess is less common than used to be the case, and this may well be so. No dramatic change is yet shown, however, in the incidence from neurosurgical clinics, but this may be due to the fact that diagnosis is much better than formerly and more cases are now recognized and sent for treatment.

TABLE II.—Source of Infection in 36 Cases, 1950-4

	No. of Cases	Deaths
Frontal sinusitis	5	1
Mastoiditis (Temporal lobe)	14	0
Mastoiditis (Cerebellum)	1	0
Chest infections	4	2
Metastatic from other sources	4	2
Direct implantation (penetrating wounds, etc.)	4	0
Infection of face, scalp, and facial bones	4	0
	36	7

The sources of infection in this series are shown in Table II. The common cause of abscess is paranasal sinus and ear infection, and it would indeed be surprising if the better social conditions of recent years and the greater

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attention given to otitis media and the chronic running ear did not lower the incidence of brain abscess. Effective treatment of ear, nose, and throat infections is the most important preventive measure in this field.

Of the 36 cases, 4 resulted from *direct wounds* of the scalp or skull. The insistence on proper surgical management of all scalp lacerations and compound fractures has yielded rich dividends, and first-intention healing is now so much a routine that there is even a danger of under-rating the relatively narrow margin of safety that exists. In a recent patient from Korea, for example, brain abscess followed a small compound depressed fracture of the skull in which definitive surgical treatment was delayed owing to the prior claims of associated severe limb injuries. It was the only case of brain abscess seen among these patients returning to Oxford.[†] Particular attention is also necessary for fractures of the skull which implicate the paranasal air sinuses and mastoid regions, since they carry an additional risk of intracranial infection (Lewin, 1954).

Before the days of penicillin, metastatic brain abscesses from *chest infection* such as bronchiectasis and empyema carried a mortality of wellnigh 100%. It is still the most lethal of all the abscesses, but many cases have now been carried through successfully, and indeed the stage has been reached where—for example, after treatment of a brain abscess secondary to bronchiectasis—removal of the affected lung may be undertaken to lessen the chance of a recurrent abscess. A recent series of successful cases so treated has been reported (Pennybacker and Sellors, 1948).

Brain abscess may complicate congenital heart disease even in the absence of bacterial endocarditis, owing to infected venous blood being recirculated through the systemic circulation without first passing through the lungs. Gates *et al.* (1947) have shown that about 5% of deaths from congenital anomalies of the heart and great vessels are due to this cause. In the cases recorded, the brain abscess has usually been solitary, so that with the recent developments in cardiac surgery the possibilities of treating the abscess and also the causal lesion are apparent. The risk of precipitating brain abscess by cardiac catheterization in the investigation of congenital anomalies has also been pointed out, and it has been suggested that penicillin and heparin should be given prophylactically.

All these factors, therefore, may combine to lower the incidence of brain abscess in the future. Indeed, in few other instances of serious complications in surgery are the opportunities for preventive measures higher than with brain abscess.

Early Diagnosis

The clinical picture of the early invasive stage of intracerebral infection with severe headache, vomiting, slowing pulse, and drowsiness passing on to coma is well known, and there is little difficulty in concluding in these circumstances that an intracranial complication has supervened. These gross symptoms and signs due to cerebral oedema and encephalitis still occur, but in many cases nowadays the early use of penicillin so controls this active and very dangerous invasive stage that the first signs of a brain abscess may be attended by only relatively mild changes in the patient's condition. Indeed, the risk is that a diagnosis of cerebral abscess may be excluded on the premise that the patient is not ill enough.

During a sinus or mastoid infection, the very fact that the patient is not as well as he ought to be should be enough to raise the suspicion of an intracranial complication, and this probability is increased if headache is present. It is at this stage that a careful neurological examination may yield unequivocal evidence. Obvious papilloedema, a hemiparesis, dysphasia, or frank ataxia may be present, but again in other patients such gross signs are absent. Frontal lobe abscesses, for example, may declare themselves by only a

mild reflex change down one side of the body, or possibly a little facial weakness or an isolated fit, or nocturnal incontinence in a patient otherwise alert. In the temporal lobe, an abscess will very commonly produce a visual-field defect in the opposite upper homonymous field, which may be missed unless confrontation tests and careful perimetry are done as a routine; and if it is in the dominant hemisphere a dysphasia may be present, but may be mild and detected only if formal examination such as the meaning of objects, etc., is carried out. A cerebellar abscess usually gives rise to nystagmus. These relatively mild signs, when looked for, are present much more often than is thought to be the case.

Lumbar Puncture.—A lumbar puncture may be invaluable, since the fluid is rarely normal in the presence of an acute or subacute abscess. The protein content is usually raised to 100 mg. per 100 ml. or more (normal 40 mg.) and there is often an increase of white cells in the C.S.F. from 10 to 200 per c.mm. Nevertheless this test should be used with caution in the presence of marked papilloedema, a slow pulse, or rapidly increasing drowsiness, since there is a risk of tentorial impaction, and in these circumstances it is wise to have facilities for dealing with the abscess at hand.

Electroencephalography and angiography are two other ancillary methods of diagnosis that have been developed in recent years and are proving helpful in the more accurate location of an abscess.

Electroencephalography.—This test may help in locating an abscess and also in differential diagnosis from such conditions as thrombophlebitis. In addition, serial recordings during the management of an abscess may give a clue should a further abscess be developing elsewhere, particularly in cases of metastatic origin. The focal disturbance seen is that common to any rapidly expanding intracranial lesion, and consists essentially of a high-voltage delta activity in the vicinity of the lesion, together with a local phase reversal. Tutton and Whittaker (1953, personal communication) have commented favourably on the use of the E.E.G. in the management of brain abscess. It has the merit of being easy to perform and not disturbing to the patient.

Angiography.—Another recent development in the diagnosis of brain abscess has been the use of angiography. For supratentorial lesions, particularly of the frontal and temporal lobes, which are the common sites for abscess, it may be invaluable and will locate the lesion accurately without the considerable upset that may attend the use of ventriculography in such cases. It affords, of course, no evidence of the true nature of the lesion, and in abscess cases the appearance is one of vessel displacement by an avascular space-occupying lesion.

Ventriculography is still used for the diagnosis of the difficult deeply seated hemisphere and infratentorial abscess, but the tendency nowadays is to employ air studies less in the acute stage, although, as referred to below, to rely on them, if anything, more in the later stages as a test of cure.

Treatment

Now that the antibiotics, usually penicillin, do so much to control the invasive stage of encephalitis and cerebral oedema, it is possible to simplify the surgery of the acute abscess, and most surgeons are agreed to-day that the first treatment of choice, and one which is applicable to the majority of abscesses, is simple needle aspiration of the abscess through a suitably placed burr-hole, repeated as required, with local injection into the abscess cavity of the appropriate antibiotic—in most cases penicillin (Tutton, 1953). Taylor (1950) favours in addition the routine use of intraventricular penicillin during this stage, and makes the point that it lessens the risks of dissemination of the infection into the cerebrospinal fluid spaces of the brain around the abscess, one of the main complications in the management of brain abscess.

Part of the success of aspiration is due to the accurate location of the abscess, and the advantages of the recent developments already referred to are apparent. The operation is conducted through a clean incision, and we have long since abandoned attempts to drain an abscess along the entry track, as, for example, through a mastoid wound, which may lead to cerebral fungus. Similarly, open drainage is rarely effective after the first escape of pus, and the insertion of tubes and subsequent manipulations may cause further brain destruction and risk of rupture of the abscess; in addition it may leave undrained a loculus of the abscess.

In a few cases aspiration with local and systemic antibiotics is inadequate to control the raised intracranial pressure during the acute stage and a decompression may also be required. In addition there are other abscesses, especially those resulting from penetrating wounds or metastatic from the thorax, in which a honeycomb of small abscesses or a complicated abscess cavity may result, for which aspiration or tube drainage proves inadequate, and in this instance excision of the phlegmon in the acute stage may be indicated. Indeed, Le Beau (1946) has advocated its wider adoption, but we would restrict this operation to those few cases in which there is no other effective alternative, since it must mean sacrifice of recoverable cerebral tissue and an increased risk of resultant disability.

Thus, although one can see a general plan of treatment emerging, there is no one operation which is applicable to all acute abscesses. To improve the results of this stage therefore requires that the surgeon should have all these methods at his disposal and consider each case on its merits. Even so, the risks of rupture of the abscess into the ventricle, as shown from the deaths in this series, and the problem of multiple abscesses remain major problems. Thus in one of two recent fatal cases the patient had a left metastatic parietal abscess treated by aspiration, supplemented later by a decompression when it was clear that more was required, but at necropsy a second abscess with gross surrounding oedema was found further forward, deep in the post-frontal region, and a third on the opposite side. In the other case (not in this series) small quantities of pus were aspirated from both frontal lobes of a patient who developed signs of cerebral infection with no obvious primary focus other than an upper respiratory infection which had resolved. At necropsy it was possible to count at least 130 small abscesses scattered through the hemispheres. These two examples may be uncommon, but they serve as a salutary reminder that the treatment of the acute abscess is unlikely to become a matter of routine.

The management of the later stages is still debatable. Most abscesses can be treated by aspiration alone in the acute stage, and some surgeons believe that if further aspirations yield no pus, and provided the patient is well, no more need be done, although the majority agree that, as a final test of cure, air studies should be carried out in the quiescent stage to ensure that no loculus remains and that the lumbar C.S.F. protein and cell content have returned to normal. This policy is attractive in its simplicity and treats the abscess with the least possible damage to the surrounding brain, and, presumably, therefore lessens the risks of ultimate scarring.

There are difficulties, however. If this method alone is to be used then the tests of cure have to be rigid; most surgeons have had the experience of the well patient with only a doubtful abnormality in the ventricular air studies and yet shown subsequently to have a large abscess. Indeed, the gross displacements seen in ventriculograms and angiograms during the acute stage are due as much to the oedema around an abscess as to the amount of pus (Schurr, 1951); and subsequently a sizable collection may remain in the frontal pole or the inferior part of the temporal lobe or the cerebellum, with the production of only minimal radiographic changes. Moreover, a negative aspiration does not exclude the presence of pus: in some instances the pus becomes so thick as not to flow through the needle;

or a loculus, which occurs in over 40% of abscesses, may be present and remain untapped; or the abscess may be missed altogether. Further, we have seen several examples where sudden and dangerous enlargement of an abscess has occurred in a patient previously doing well.

For these reasons, therefore, other surgeons have injected radio-opaque substances into the abscess cavity at the time of aspiration so that its subsequent fate may be followed. Detection of an unsuspected loculus or enlargement of the abscess may then allow a timely aspiration before dangerous complications supervene. For many years now this has been our policy, and we have used thorotrast. Oliver and Leese (1949), to overcome the objection of introducing a substance which is retained in the abscess wall, have suggested the use of diodone, which is absorbed; but this method does not confer the real advantage of using a radio-opaque substance—namely, to watch the progress of the abscess and be able to anticipate developments.

Thorotrast is of course a foreign material, and Taylor (1950) thinks that it may promote chronicity. It has also been suggested that it may increase the fibrous reaction around the abscess. The substance is also radioactive. We have not seen any obvious differences in the brain around an abscess at the time of excision whether it has previously been injected with thorotrast or not, nor, in the amounts used, have we so far seen any adverse effects from possible radioactivity. The substance has now been used for this purpose for about 14 years, so that presumably the risk is a small one. It is possible that in the future early diagnosis and effective antibiotics will make loculation of abscesses and other complications of management less common and that in some cases at least it will be possible to dispense with this additional guide. If so, it would be welcome, but at present one would feel that, as further improvement in results is likely to come from attention to individual details, the surgeon needs all the help he can get in a condition so dangerous and treacherous as brain abscess.

Excision

Apart from those particular abscesses which may require excision in the acute stage, there are others in which pus continues to reaccumulate despite repeated aspiration. In some instances this is related to the sensitivity of the causal organism to antibiotics, and careful bacteriology is, of course, an essential part of the aspiration-antibiotic regime. Nevertheless some of the most troublesome abscesses to deal with are those in which all cultures are persistently sterile, yet the behaviour of the abscess is evidence that the infection is anything but quiescent, and for these cases excision may be required.

How safe is the patient from recurrent infection when treated by aspiration alone and when it is realized that 40% of abscesses are multilocular? In a recent review of 295 abscess cases from Edinburgh, Manchester, and Oxford, Jooma *et al.* (1951) found that, of 88 survivors treated by aspiration or drainage alone, 7 developed recurrent infection (8%) at intervals of from 3 months to 13 years later, and they all died; among 96 patients who survived excision there were no recurrences. These figures should not be overemphasized, since much of the material was in the pre-penicillin era, and one would anticipate that, with recent developments and the more rigid standards of cure in the future, this incidence would fall. Nevertheless, it is clear that only by excision of the whole area can one be certain of ultimate cure. Provided, therefore, that it can be done without increasing the patient's disability, or materially increasing the mortality, excision requires consideration. We have followed this policy in the past. An added hope was that by removal of the abscess scar the incidence of epilepsy later on would be significantly lowered. As referred to below, this has only been partly realized. It is certainly true that, with the more successful management of the acute abscess by aspiration and antibiotics, fewer abscesses will need excision in the future, but there are still cogent reasons for advising excision of frontal,

[†]The patients from Korea were admitted to the Military Hospital (Head Injuries), Wheatley, Oxon, and their management will be described elsewhere.

temporal, and cerebellar abscesses when there is the slightest doubt that the infection has not resolved. In the last four years we have excised 18 abscesses (62% of the survivors from the acute stage) with no deaths.

The Primary Focus

The primary focus of infection needs to be considered in every case, although in some it has resolved before the brain abscess is evident and in others it responds to the antibiotics given during treatment. When surgery is required it is generally agreed that the brain abscess should first be brought under control. In cases of sinus infection or mastoiditis which require drainage this can then be carried out shortly afterwards with greater safety or, in other cases, deferred into the convalescent stage. More elective treatment, such as lobectomy for bronchiectasis, is usually carried out when treatment for the brain abscess is finished.

Sequelae

The late effects of cerebral abscess are three: recurrent infection, which has already been discussed, permanent neurological disability, and epilepsy. It is not proposed to discuss the permanent effects in detail except to say that grave disabilities are happily uncommon. Of the 29 survivors of the last four years, only two are permanently disabled. In one disablement was due to a decerebrate state which resulted from brain-stem compression, the patient being admitted in coma with fixed dilated pupils; in the other patient a progressive hydrocephalus developed secondary to meningitis, which accompanied the abscess. Indeed, it is remarkable how ill and handicapped these patients can be in the acute stage and yet ultimately make good functional recoveries.

Epilepsy, however, remains the major problem in patients with abscesses of the cerebral hemispheres: it develops in over 45% of the survivors. Indeed, with recovery from brain abscess becoming more the rule, this complication is likely to be more apparent to the surgeon in the future. Nevertheless, one should hasten to add that in most cases the attacks are infrequent, and in only a few are they of such an order as to render the patient unemployable. Its incidence is highest with multiple abscesses and with frontal abscesses, being well over 50%, and is least with temporal abscesses, 34%. Fortunately with the wide range of anticonvulsant drugs now available, the majority of patients are able to lead a normal life with perhaps an occasional attack, the tendency being for the attacks to diminish as time goes on. Nevertheless our aim should be to reduce its incidence if possible, and in this connexion there are at least two possibilities.

If one believes that it is the scar left after the abscess has healed, rather than the very fact of having had an acute infection of the brain, that is responsible for the epilepsy, then the smaller the scar the better, and it may be that, in the future, early diagnosis and antibiotics will lower its incidence. Again, if it is the scar that is responsible, would not excision lower the incidence of subsequent fits? Joorna *et al.* (1951) showed that the incidence of epilepsy was significantly lower after excision of a frontal abscess (44%) than after treatment by aspiration or drainage alone (72%). The fits after a frontal abscess are particularly important, since they are the more dangerous as they may occur without warning, and in this site also status epilepticus is likely. Indeed, in the review by Joorna *et al.* (1951) there were five fatal cases in the late results from status epilepticus, and all were frontal abscesses. On these results, therefore, there would appear to be a good case for excision of a frontal abscess on the grounds of epilepsy alone.

Temporal lobe abscesses also show a lower incidence of epilepsy after excision (27%) compared with aspiration alone (40%), but the practical results are not so striking, since disabling epilepsy from this site is uncommon. The explanation for this improvement with excision may lie in the fact that in excising a frontal abscess one is usually

able to take a more generous excision into the surrounding white matter and the track is usually excised as well as the abscess cavity, so that in effect a scar excision, as in operating for traumatic epilepsy, is not infrequently performed. To some extent this may also be true of some temporal lobe abscesses, particularly in the non-dominant hemisphere. It may therefore be that in suitable cases electrocorticography and removal, where practicable, of active foci in addition to excision of the abscess should receive further consideration. Certainly surgery directed to the epilepsy as in post-traumatic cases should yield results, either in the phase of active treatment or later on if epilepsy is declared and is proving a major handicap, which are at least comparable.

Summary and Conclusions

The advent of antibiotics, the wider recognition of the early signs of intracranial infection, and the use of ancillary methods of investigation such as angiography and electroencephalography have all contributed to the improved results in the treatment of brain abscess. In the series of 36 cases reported here over the last four years there were seven deaths, a mortality of 19.4%. Prevention, however, is better than cure, and the several ways by which this may be partly achieved are outlined.

Intermittent aspiration of the abscess combined with local and systemic antibiotics, usually penicillin, is recommended as the treatment of choice in the acute stage, but formal decompression may be required in certain cases. The indications for excision of the abscess both in the acute and in the later stages are also discussed.

The various ancillary methods of investigation are valuable both in differential diagnosis and in the management of a brain abscess, but it is wise to remember that in some instances the results they yield are at the best equivocal and that in dealing with intracranial infection a sound clinical appreciation of the case remains the first essential.

There are at least two major problems which call for further study. One is the management of the metastatic abscess, especially that from the chest. Frequently multiple, often multilocular, neither easy to diagnose or locate nor necessarily occurring in sites readily accessible to surgery, it remains a challenge to the surgeon. The other problem is the high incidence of epilepsy (45%) among the survivors from brain abscess. It may be that its incidence in the future will fall with improved methods of treatment in the acute stage, but the possibilities of surgical excision with the help of electrocorticography, particularly in the frontal region, merit further attention.

The recent advances in the management of brain abscess should be a stimulus to lower the mortality further and to improve the quality of the result.

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CHRONIC LEG ULCERS IN NON-THROMBOCYTOPENIC PURPURA

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Apart from a probable case reported by Osler in 1914, we have been unable to find in the literature any account of leg ulcers occurring in non-thrombocytopenic purpura. As we have seen three such cases in the last two years we think it worth while to report them.

Case 1

A married butcher aged 57 first came to the out-patient department in December, 1953, with a complaint of swollen joints for 10 days. He had a history of developing painful swollen joints 30 years previously while serving in the Army in Egypt. They became normal in six months with no residual disability (he was later a racing cyclist). In 1943 he was treated for a prolapsed intervertebral disk by laminectomy, and post-operatively developed a thrombosis of the left small saphenous vein. Following this episode he was subject to mild ankle oedema after standing for prolonged periods, but no other disability. His present illness began suddenly with swelling of the right knee and a blotchy rash on the skin surrounding that joint. In the course of the next few days, the left knee, right ankle, both elbows, and right wrist also became swollen and painful. At the same time the rash spread over both legs, and, to a less extent, over the trunk. It came as a series of crops, and the patient noticed that the spots were raised above the skin and did not itch. There was no past history of any allergic disorder and he had never taken any drugs.

On examination he was well nourished, with a purpuric rash in which there was an urticarial component, richly distributed over the legs, buttocks, and extensor surfaces of the arms, and more sparsely over the trunk. Several joints were swollen and painful on movement—namely, both knees, both ankles, both elbows, both wrists, and the left shoulder. The spleen was not palpable. Small, discrete, painless lymph nodes were felt in the occipital, the cervical, and both axillary regions. The left small saphenous vein was represented by a firm cord-like structure, which was evidently the sequel of his post-operative venous thrombosis ten years earlier. The left long saphenous vein was prominent, but there was no evidence of varicosity; and the skin was healthy apart from the purpura. In other respects, physical examination was negative. A diagnosis of Schönlein-Henoch purpura was made, and he was admitted to hospital for further investigation and treatment.

While in hospital he was found to have a persistent albuminuria with occasional red blood cells. Apart from a moderately raised E.S.R. (17 mm. in one hour by the Wintrobe method) his blood picture was in all respects normal—namely, platelets, 557,000 per c.mm.; red cells, 4,840,000 per c.mm.; haemoglobin, 14.4 g. per 100 ml.; white cells, 3,900 per c.mm. on one occasion and 8,600 on another, with a normal differential distribution. The bleeding-time (Duke) was

one minute and the clotting-time (Lee and White) 6 minutes. The one-stage prothrombin time was normal. The report on a bone-marrow examination by Dr. S. T. E. Callender was as follows: "The marrow is moderately cellular. Eosinophils are fairly frequent. Apart from this, there is no definite abnormality." The tourniquet test caused increase in size of the existing purpuric lesions, but no fresh petechiae occurred.

During his stay in hospital he developed cramp-like abdominal pain and was found to have large amounts of occult blood in the stools. Thus the classical picture of anaphylactoid purpura was complete.

He was in hospital for two months following this admission. During this time he received treatment with cortisone by mouth in a total dose of 4.2 g. over a period of three weeks. The disease was unaffected. The purpura persisted, fresh crops of lesions occurring intermittently, and there was no notable improvement in his joints. He later showed gradual improvement, with his joints returning slowly to normal and the petechial rash diminishing. As already mentioned, gross albuminuria persisted, but he remained normotensive and his blood urea was normal. The tourniquet test became strongly positive during the latter part of his stay in hospital. He was discharged from hospital on February 16, 1954, with no joint symptoms or bowel symptoms, but with a scanty petechial eruption.

He was then regularly seen in the out-patient department. He continued to have recurrent crops of purpura, mainly over the legs, with both ankles particularly affected. In March, 1954, he developed an ulcer of the left ankle at the site of a patch of profuse purpura. The ulcer persisted and became more extensive, and he was readmitted to hospital in June. At that time there were two shallow ulcers, each about 2.5 cm. in diameter, in the region of the left medial malleolus and one shallow ulcer about 7 by 1 cm. in the region of the left lateral malleolus. There was a fading purpuric eruption on the legs. Investigations at this time gave the following results: haemoglobin, 13.6 g. per 100 ml.; white cells, 6,000 per c.mm.; platelets, 248,000 per c.mm. The urine contained albumin, red blood cells, and occasional granular casts. The blood urea was 35 mg. per 100 ml.; plasma proteins, 5.4 g. per 100 ml., with albumin 3.2 g. The tourniquet test was strongly positive on admission and later became negative. With rest in bed the ulcers healed and he was discharged in 24 days, having had no fresh purpuric eruption.

Shortly after leaving hospital fresh purpuric crops occurred and he had occasional abdominal pain and painful joints. By September the purpura had become more severe and ulceration of the left ankle had recurred (see Fig.). He was readmitted to hospital, where rest in bed and eusol



Photographs of Case 1, showing large areas of ulceration and surrounding purpuric lesions.

dressings brought improvement of the ulcers. His purpura became less severe, but albuminuria persisted. When last seen, in October, the ulcers were covered by scabs and appeared to be healing well. The purpura was then absent.

Comment.—The history, physical signs, and results of investigation leave no doubt that this patient suffers from Schönlein-Henoch purpura. The only doubt that exists is whether the venous thrombosis he sustained ten years previously played any large part in the genesis of his leg ulceration. We do not think this likely, for the following reasons. He had been working for those ten years as a butcher, standing a great deal, with negligible symptoms. The ulceration occurred when he was living the life of a semi-invalid involving less need for a perfect venous return. Secondly, the ulcers were not surrounded by the eczematous changes in the skin which almost invariably accompany varicose ulceration. Finally, the ulceration occurred at a site where the purpura was so dense as to be confluent.

Case 2

A clergyman aged 62 was under our care for severe rheumatoid arthritis, which began in 1934, and later made him dependent upon an electric chair for mobility. From April, 1952, until March, 1953, we treated him with large doses of sodium salicylate with relief of his joint symptoms, but only at the expense of troublesome deafness. In March, 1953, salicylate therapy was stopped and he was put on to treatment with phenylbutazone by mouth in a dose of 200 mg. four times a day. He continued on this therapy, and on August 13 he noticed purple spots on his legs. The eruption became more profuse and he was admitted to hospital ten days later.

On examination at that time he had a profuse purpuric eruption covering both legs, buttocks, and the extensor surfaces of both arms. His joints showed evidence of long-standing rheumatoid arthritis. The spleen was not felt. All other systems were normal. Investigations gave the following: platelets, 745,000 per c.mm.; red blood cells, 4,380,000 per c.mm.; haemoglobin, 14.4 g. per 100 ml.; white cells, 8,000 per c.mm., with a normal differential distribution; bleeding time (Duke), 3½ minutes; E.S.R., 32 mm. in one hour. The tourniquet test was negative. The phenylbutazone had been discontinued before admission on the assumption that it was the agent responsible for the purpura and he was treated with calcium aspirin. The purpura appeared to be subsiding and he left hospital after one week, being anxious to return to his parish.

When seen in the out-patient department a week later several of the purpuric patches on his legs appeared to be about to slough and arrangements were made for his readmission. By the time he was admitted to hospital, a week later, painful ulcers had developed on his legs, three on the right and two on the left. On the anterior surface of the shins there were two ulcers on the right side and one on the left. Both medial malleoli were the site of ulceration. The symmetrical distribution of the lesions was notable. The surrounding skin was inflamed. At this time the purpuric eruption was confined to the legs below the knees. The results of investigations were similar to those on his previous admission, except that the tourniquet test had become positive.

The ulcers were treated with eusol dressings, and after three weeks complete healing had occurred and he was discharged from hospital on October 5.

A week later, when seen as an out-patient, the ulcers of the legs had recurred. He was unwilling to be admitted to hospital, but was seen frequently as an out-patient. From October, 1953, until February, 1954, he had several severe exacerbations of the purpura, with occasional ecchymoses. Throughout this period the ulcers repeatedly healed and broke down; they were extremely painful. Complete bed rest at home assisted the ulcers to heal, but made the stiff-

ness of his joints much worse, so that a satisfactory regime was difficult to achieve.

In April he overcame his reluctance to desert his parish and was readmitted to hospital, where it was hoped to combine treatment in bed with active physiotherapy for his joints. On examination there were fresh petechiae of the legs superimposed on areas of fading purpura. There were several ulcers of both legs, about 2.5 cm. in diameter, from which came a purulent discharge. They were treated with eusol dressings and later with tulle gras, and healed well in the course of the next few weeks. The results of investigations on this admission were: platelets, 343,000 per c.mm.; red cells, 4,290,000 per c.mm.; haemoglobin, 12.8 g.; white cells, 6,000 per c.mm., with a normal differential distribution; bleeding-time (Duke), two minutes; clotting-time (Lee and White), eight minutes; one-stage prothrombin time, normal; E.S.R. (Westergren), 52 mm. in one hour. A patch test with phenylbutazone was negative.

He was discharged from hospital in June. He has been seen since and the ulcers have not returned.

Comment.—There is no doubt that in this patient the purpura was responsible for the ulceration of the legs. The cause of the purpura is uncertain, but it is highly probable that it was a toxic effect of phenylbutazone. Non-thrombocytopenic purpura is a rare complication of phenylbutazone therapy, occurring in 4 out of 800 patients studied by Kuzell *et al.* (1953).

Case 3

A housewife aged 66 attended the skin department, Radcliffe Infirmary, in August, 1952, complaining of a painful localized swelling on the inner side of the right lower leg which had been present for three months. Three weeks later a purpuric rash developed on both arms, and later became generalized. She was referred to us and was found to have the following signs. There was a generalized purpuric rash, which was most pronounced on the extensor surfaces of the arms and on the trunk. The petechiae were discrete and raised above the surface. There was an indurated erythematous area, about 7.5 cm. in diameter, on the front of each lower leg. The distribution was symmetrical. Each area contained several ulcers which were covered with hard scabs. Apart from a palpable liver, there was no other abnormality on clinical examination.

She was later admitted to hospital, when investigations were essentially negative—namely, platelets varied from 193,000 up to 667,000 per c.mm.; haemoglobin, 11.7 g. per 100 ml.; red cells, 4,200,000 per c.mm.; white cells, 7,200 per c.mm., with a normal differential distribution; bleeding-time (Duke), 2½ minutes; clotting-time (Lee and White), 6½ minutes; one-stage prothrombin time, normal; clot retraction (Marfarlane), 50% (normal); plasma proteins, normal. Liver function tests: plasma bilirubin, 0.4 mg. per 100 ml.; flocculation tests, normal. Coombs test, the Wassermann and Kahn reactions and the tourniquet test were negative.

She was discharged after one week at her own request to care for her invalid husband, with no change in her clinical state. In December, when she was seen as an out-patient, the purpura was still present but less intense. The ulcerated area on her left leg had healed, but that on the right was still active. Blood investigations were negative, with the exception of the E.S.R., which was 102 mm. in one hour (Westergren). She refused to enter hospital for cortisone therapy and failed to attend the out-patient department until five months later (May, 1953). Her purpuric rash had by then completely disappeared, and the ulcers of the legs were healed. She refused to have a blood examination, so that we do not know whether the E.S.R. had become normal.

According to her family doctor, she remained well and free of purpura until August, 1953, when he was called in because she had died suddenly in her bed at night. The cause of death was certified as coronary thrombosis.

Comment.—It is probable that this patient's non-thrombocytopenic purpura was an example of so-called anaphylactoid purpura. It is noteworthy that she developed indurated areas of both legs before the onset of the purpura and that these subsequently ulcerated. The most reasonable conjecture would appear to be that both the indurated areas and the purpura were independent manifestations of the same underlying allergic state.

Discussion

We have no doubt that leg ulcers which persist for several months are decidedly rare in non-thrombocytopenic purpura. Davis (1948) reported 44 cases of Schönlein-Henoch purpura without mentioning ulceration among the skin lesions. Gendel (1948), in a review of the reported cases of chronic leg ulcer in diseases of the blood, likewise does not mention this association. Chronic leg ulcers have been observed in a number of blood dyscrasias, such as congenital haemolytic anaemia, sickle-cell anaemia, polycythaemia, splenic anaemia, thrombocytopenic purpura, and Gaucher's disease, in all of which splenomegaly is a frequent finding, and it has been usual to attribute the liability to leg ulceration to some abnormal action of the spleen.

In thrombocytopenic purpura the occurrence of leg ulcers is also rare, being reported for the first time by Witts (1942). It is worth mentioning that the two cases which he reported did not show splenomegaly and that splenectomy carried out on one of them had no effect upon the ulcers.

The only reference to the occurrence of leg ulcers in non-thrombocytopenic purpura appears to be the one made by Osler (1914), who states that necrotic areas may occur in purpuric states. "When a localized infiltration of blood and serum is very intense in a patch [of purpura] of considerable size, bullae form and the superficial layers of skin necrose, leaving an open ulcer." In describing a number of cases, he includes that of a girl aged 14 years who was treated in the Radcliffe Infirmary for Henoch's purpura. Although no platelet count is recorded, there seems to be little doubt from the clinical description that the diagnosis was correct. She suffered from pains in the legs, purpura, haematuria, and albuminuria. There were extensive haemorrhagic lesions on the legs, many of which broke down, leaving ulcers which took a long time to heal.

Osler's description of the genesis of skin ulceration in purpura is an apt account of how ulceration developed in Cases 1 and 2 of the present series. In Case 1 there was the possibility that a previous venous thrombosis may have been an additional cause, but we have given reasons for concluding that this was not a major element. Case 3 is totally different in that ulceration developed in indurated erythematous areas which appeared on the legs some months before the onset of purpura.

Summary

Three cases of leg ulceration in non-thrombocytopenic purpura are described.

The aetiology of the purpura was different in the three cases, one being a classical example of Schönlein-Henoch purpura, one a toxic purpura, presumably due to phenylbutazone, and one possibly a manifestation of an obscure allergic state.

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POST-PUERPERAL RECURRENT DEPRESSION

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The purpose of this paper is to draw the attention of practitioners to a form of illness which is not uncommon and which is important, not only because of the distress and incapacity which it inflicts upon the patient, but also because of the repercussions which it produces within the family group.

There are few references in the literature to the sequelae of puerperal depression. Hemphill (1952) mentions "a periodic affective illness . . . after childbirth, with subsequent attacks related to menstruation." There is little doubt that he had in mind patients such as those I am about to describe. Linford Rees (1953) has observed that "in some patients with children it was found that premenstrual tension had developed or had become worse after childbirth." These, however, are merely the passing remarks of writers who were dealing with a different theme.

Summaries of seven cases are here presented of women with a history of puerperal depressive illness some years previously, following which full health has never been regained and recurrent sharp phases of depression, tension, and irritability have occurred, with short interludes of comparative well-being. The resemblances which these patients bear to one another in their history and symptomatology appear to class them as a distinct group, to which it is proposed to attach the name "post-puerperal recurrent depression."

These patients tend to take a moral rather than a medical standpoint towards the alteration in their feelings and behaviour. While they are not rare as visitors to psychiatric clinics (5 in the last 300 new patients seen), it is probable that many of them do not seek medical advice, or, if they do, are not sent for psychiatric examination.

Typical History.—A woman of pyknic build and cyclothymic temperament suffers from a relatively mild puerperal depressive illness in her thirties or late twenties. Emotional stress or an infective illness may have coincided with the puerperium. She appears to make a good recovery from her depression, but within a short time becomes unwell again. Thenceforward, for years, she suffers from recurrent phases of depression, irritability, and tension, with phobias, obsessive fears, or hypochondriasis. The severity of her symptoms is related to the menstrual cycle, usually the premenstrual phase. Irregularity of the menses is a concomitant feature. Her moodiness, unpredictability, and loss of temper are reacted to by the children and the husband, the family atmosphere becomes clouded and unstable, and the family ceases to function as a unified group.

Case 1

Observation period, All Saints' Clinic, seven years; personal observation, two years. Large-framed woman of pyknic build, aged 38. Facial pallor. Expression morose. Para-3.

Her present illness began in 1943: after birth of her second child lacked confidence to go out and about. Within a few days of birth of third child in October, 1945, became depressed and agitated. Had a mild febrile illness attributed to throat infection at this time. Three attacks of

quinsy in subsequent eight weeks. Remained acutely disturbed for three months. Something in her head seemed to say, "Put the baby on the fire." Impulses to strangle the child or to throw her out of the window or to jump out of the window herself. "Not real voices, but thoughts in her mind."

Admitted to Midland Nerve Hospital in tenth month of puerperium. In hospital nine weeks. Treated by sedation. Acute symptoms subsided. Attended as out-patient at Midland Nerve Hospital subsequently for two months, but developed pneumonia. Stopped going.

Referred to All Saints' Clinic in August, 1946. Still plagued by impulses to strangle child. Received E.C.T., six shocks, October, 1946. No lasting improvement. Termination of pregnancy and sterilization, 1948. Attended until August, 1950, receiving analytical psychotherapy. Appreciated the opportunity to express her fears but did not lose strangling ideas, and continued to have depressed moods.

Returned to all Saints' Clinic April 18, 1952. Complained of intermittent feelings of hopelessness; lack of inclination to do things; marked irritability; depression, lasting for a few days at a time, accompanied by impulses to strangle children or throw them out of the window, to commit suicide, to smash crockery, to smack people in the face, etc. Symptoms most marked nine or ten days after start of menstrual period. Severity fluctuates at other times, and she has freedom from symptoms for two to three days at a time.

Response to Treatment.—Acetylcholine shock, 1953: no appreciable effect. Dextro-amphetamine, 10 mg., and amylobarbitone, 1 gr. (65 mg.) b.d., and supportive therapy. Moderate symptomatic benefit. Decrease in irritability and depression, and in intensity and frequency of obsessional impulses, together with some all-round improvement in the family atmosphere. Withdrawal of medication leads to immediate worsening of symptoms. Weight remains fairly constant at 10 st. 1 lb. (64 kg.).

Comment.—Severe case. Good spells infrequent and last only a day or two. Anxieties and febrile illnesses during puerperium. Symptoms related to menstrual cycle. Patient's illness had led to serious repercussions within the family.

Case 2

Personal observation, one year. Stoutish woman of pyknic build, aged 39, para-1: florid complexion; anxious expression.

Present Illness.—Seven years ago, when eight months pregnant, she developed right-sided Bell's palsy. Much worry about this. Prolonged labour—forceps delivery. Urinary infection with high fever for first week of puerperium. For next three to six months had to fight against feelings of depression and lack of energy. Got a bad fright when baby was 8 weeks old, when she found a cat lying on his face in pram. Feared he was smothered. Depression gradually diminished, but she has never felt quite well. Feelings of weakness; "no life" in her legs; avoids company; giddiness and fears of falling; lacks confidence to do things; sensitive about residual facial weakness; irritability and intolerance of noise. Symptoms vary in severity from day to day. Much worse before and during menstrual period. Gradual improvement in past one to two years, but still much handicapped before start of treatment.

Environmental Factors.—Strict mother, but no family strife. Husband's untidiness annoys her, but on the whole the relationship is good.

Previous Health and Personality.—Very active, energetic, and sociable. Very particular and fastidious regarding house and personal appearance. No previous breakdown. No severe physical illnesses. Mild chronic bronchitis.

Response to Treatment.—Excellent symptomatic response to dextro-amphetamine, 5 mg. b.d., amylobarbitone, 1 gr. (65 mg.) b.d. Feels well. Has taken a part-time job.

Actively seeks company. Symptoms return if tablets are withdrawn temporarily.

Comment.—Moderately severe case. Good spells last only a day or two. Anxiety over facial palsy and acute infection during puerperium. Symptoms related to menstrual cycle. Tendency to spontaneous improvement in recent years. Dramatic response to dextro-amphetamine.

Case 3

Observation period, All Saints' Clinic, 10 years; personal observation, two years+. Large florid-complexioned woman of pyknic build: para-1, aged 47.

Present Illness.—Began 11 years ago when her baby was about 7 weeks old. Depressed for six months; then improved but has never been quite well since. Feelings of depression accompanied by "dislike" of her husband and child; general irritability; fears of becoming insane, committing suicide, or attacking others; fatigability; discomfort, sometimes amounting to pain, in left side of head and face. Symptoms begin abruptly, last for one to three weeks and disappear rapidly. They tend to begin premenstrually and to lift soon after period ends. In past 12 months increased tendency to flushing and weeping (? menopausal).

Environmental Factors.—Much difficulty with interfering mother-in-law, who lived with patient and family. This relative's removal following a cerebral thrombosis had no appreciable effect on patient's symptoms.

Family History.—Nothing relevant.

Previous Health.—Hard-working, capable, sociable woman. Always inclined to be over-emotional and to take things too much to heart. Depressive breakdown of two to three months' duration following father's desertion of mother. No other history of psychiatric symptoms.

Physical Health.—M.P.s regular 4/28 until past six months, during which there have been floodings and amenorrhoea of up to three months. No serious illnesses. **Present physical status:** Moderate obesity; B.P. 120/85; no signs of disease found.

Response to Treatment.—No appreciable response to hexoestrol. Moderate symptomatic response to dextro-amphetamine. Time incidence of symptoms as before, but severity much decreased.

Comment.—Moderately severe case. Good spells of up to six weeks' duration. Symptoms related to menstrual cycle. Liability rather marked: probably related to menopause. Aggravating factors in environment, but modification of these has not led to change in patient's state.

Case 4

Personal observation, eight months. Large woman of pyknic build, aged 43; para-2 (children 7½, 3½).

Present Illness.—Marked irritability, with temper loss and fears of harming children. Feelings of acute despondence: "life not worth living." Tendency to avoid people. Much worse for seven days premenstrually. Good spells in which symptoms are practically absent for two to three days. Blames "selfishness" on her own part and failure to accept move to a city which she dislikes. Did not realize that she was unwell or that there was any possibility of medical treatment. Husband responsible for her seeing psychiatrist in first instance.

Onset.—Became depressed within two weeks of birth of first child seven and a half years ago. Improved after three to four months, but has never been quite herself since. Symptoms as above in comparatively mild form. Considerably worse since birth of second child.

Environmental Factors.—None other than ordinary family responsibilities. Husband extremely forbearing and considerate. Excellent home conditions.

Previous Health.—Excellent. Highly capable, sociable woman of more than ordinary intellect. Good-humoured and philosophical. No neurotic traits of any kind before

onset of present illness. **Physical Health.**—M.P.s regular, 3-4/28; no illnesses. **Present physical status:** excellent.

Response to Treatment.—Complete alleviation of symptoms on dextro-amphetamine, 10 mg. in morning, 5 mg. at noon. Retrospectively realizes the degree of her disorder. Husband (specialist physician) describes effect of dextro-amphetamine as "most dramatic" and compares it with the effect of insulin in diabetics. Continuous medication is not now necessary. Since initial week's treatment, attacks of depression have been less frequent and have yielded to renewed medication. Very great improvement in family relationships since patient has been receiving treatment, particularly in behaviour of youngest child, who previously was tending to become capricious and unruly.

Comment.—Moderately severe case. Good spells last only a few days. Environment very good. A further childbirth after symptoms had begun in mild form had a pronounced aggravating effect. Symptoms related to menstrual cycle. Patient's state tended to disorganize family and create new difficulties. Dramatic response to dextro-amphetamine. Improvement maintained after drug was withdrawn.

Case 5

Observation period, All Saints' Clinic, four years; personal observation, one year. Aged 26; para-2. Average build; good colour; mildly anxious expression.

Present Illness.—Became depressed while in hospital after birth of second child four years ago. Had fears that the nurse would drop him. Became agitated on return home, wept frequently, could not sleep. Eventually told husband that she had fears of murdering the children, or would commit suicide to prevent herself harming them. Also fears that a man would break into the house and kill her. Depression decreased gradually and obsessive fears waned in severity in subsequent three months. Since then she has had frequent attacks of depression and irritability with return of obsessive fears of variable intensity. Periods of freedom from symptoms for up to three months. Menses irregular, 6/20-30. During ill phases feels worse before and during M.P. and a little better after menstruation.

Environmental Factors.—Difficulties with husband's family at time of onset but not recently. Husband loyal to her. Elder child very active and mischievous at time of onset. Patient has turned to religion for comfort, with some success recently.

Previous Health and Personality.—Happy person, easy-going; good mixer. Menses regular until last childbirth. No serious physical illnesses. Mild depression, lasting for three to four months after birth of first child. Recovered spontaneously and completely. **Present physical status:** Healthy; B.P., 128/80.

Response to Treatment.—E.C.T. June, 1953 (six shocks). No appreciable effect. Dextro-amphetamine, 5-10 mg. b.d. Regular medication since July, 1953. Good symptomatic response. Took a part-time job in November, 1953, on own initiative, but had to stop after six weeks because it interfered too much with household management. Symptoms occur as before, but are very much milder and do not constitute a serious handicap.

Comment.—Relatively mild case. Periods of freedom up to three months. Symptoms related to menstrual cycle. Domestic worry during puerperium. Age of onset (22) younger than the majority in present series.

Case 6

Observation period, three months. Aged 37; para-1. Pyknic build; moderate obesity; fresh complexion.

Present Illness.—Began nine years ago, when baby was 7 weeks old. Husband was badly wounded in France at that time and patient had to make "an awful journey" to Portsmouth with baby on the breast. She became depressed and indecisive, and remained so for several months. Since then she has had recurrent episodes of depression and irritability lasting for two to four months, interspersed with

periods of one to two months, during which she feels comparatively well. During the spells finds everything too much trouble. Housework gets her down. She has a lump in the throat, poor appetite, and broken sleep. She sweats a lot; her legs feel like jelly, and she has palpitation and beatings in her head and ears. Annoyed with herself for being as she is. Periods irregular in duration and amount. Husband thinks that before and just after periods she is worse.

Environmental Factors.—Husband irritable and changeable since the war, but has improved a great deal in the past two years. Patient's symptoms are apparently unaffected, however.

Previous Health and Personality.—Always rather sensitive and easily hurt, but fond of sport as a girl and liked parties and dances. Fastidious; likes to do things well; inclined to be house-proud. Symptomless mitral valvular lesion, of which she is aware. **Present physical status:** moderate obesity; rough systolic murmur in mitral area; well compensated circulation.

Response to Treatment.—Symptom-free since receiving dextro-amphetamine, 5 mg. b.d., and amylobarbitone, 1 gr. (65 mg.), over past two months, but may be in spontaneous remission.

Comment.—Relatively mild case. Good spells of one to two months' duration. Severe emotional stress during puerperium. Symptoms related to menstrual cycle.

Case 7

Personal observation, three months. Aged 42; para-7. Pyknic build; moderate obesity; looks rather older than her years.

Present Illness.—Two miscarriages at three months when aged 31. Periods scanty since then. No further pregnancies. "Like this ever since." Feels depressed and cries readily; but had bright spells of a few days at a time. Irritable, restless, wants to keep changing all the time. Headaches off and on—"a pressing-down and thumping on top of the head." Gets excited easily and has palpitation at such times. Occasional attacks of diarrhoea, flatulence, and indigestion. Sleeps fairly well, but feels tired in the morning. Face puffy below the eyes in the morning. In recent years: thinness about the chest, fatter about abdomen and hips.

Environmental Factors.—Heavy family responsibilities and financial hardship.

Family History.—One brother has had a depressive attack.

Previous Health and Personality.—Nervous as a child. Intelligent at school. Active, sociable, hard-working as an adult. Depressive illness of moderate severity, starting in fourth puerperium at age 23. Treated in hospital. Spontaneous recovery in six months. **Present physical status:** Moderate obesity; no signs of disease found; B.P., 140/88; menses brief and scanty (1/28).

Response to Treatment.—Dextro-amphetamine, 5 mg. b.d., amylobarbitone, 1 gr. (65 mg.) b.d. Marked and immediate improvement. "Before, I had no interest in anything. I can keep on at anything now. I don't seem to get that irritable feeling or that depression so much. I wish I'd had these tablets before. I've had this trouble for years."

Comment.—Moderately severe case. Good spells of a few days' duration. History of depression (? puerperal) preceding onset of present illness by eight years. Present illness followed miscarriages, but course and clinical picture essentially similar to puerperal cases. Symptoms not clearly related to menstrual cycle, but menses scanty since onset.

Points in Clinical Findings

A digest of the above clinical data brings out some interesting points.

The average age of onset in these seven patients is 30. If one excludes the youngest patient (22 at onset) the average age for the others is 32.

There is a history of stress during the puerperium in six patients; emotional stress in all of these, plus an infective

illness in two. In one patient there was a history of a previous non-puerperal depressive attack. In two patients symptoms had begun in mild form during one puerperium and a further childbirth had had an aggravating effect. In one case the starting-point had been an abortion at three months.

Patients with milder symptoms enjoyed well-being for periods up to three months. Those with more severe symptoms had only occasional "good days."

There was a relation of symptoms to the menstrual cycle in six patients; in five of these there was worsening during the premenstrual phase, in one worsening at ovulation time.

Irregularity of menstruation or oligomenorrhoea of the same duration as the psychiatric symptoms occurred in five patients.

There was clinical evidence of disturbed water balance in two patients.

In the majority the pre-morbid personality showed some cyclothymic traits, but on the whole these women were well-integrated people who had reached a good all-round level before they fell ill.

Discussion

Diagnosis.—The history of puerperal depression as the starting-point of the illness could be established without leading questions in all these patients, but, largely on account of their preoccupation with current problems, some persistence was necessary to get them to give a satisfactory account of the onset. This history is the main pointer to the diagnosis, since the symptoms themselves are not of a specific kind.

Differential Diagnosis.—The majority of these patients had been regarded by their family doctors as psychoneurotic, one or two as "ordinary" depressives. The personality, history, and symptomatology are, however, quite different from what is characteristic of the neurotic: "ordinary" recurrent depressives usually enjoy much longer symptom-free periods than do these post-puerperal patients. Depression in psychopaths and epileptics may have some resemblance in frequency and brief duration of attacks to what is found in the post-puerperal group, but the history of fits or of lifelong personality disorder suffices to distinguish them.

Aetiology.—In the absence of knowledge of the nature of the depressive state and of the neuro-endocrine effects of the puerperal involutonal processes one cannot go far towards a physiological understanding of this disorder, or, for that matter, of those puerperal depressions which run a self-limiting course. The condition may, on clinical grounds, be regarded as a variant of manic-depressive disorder combined with features of the premenstrual tension syndrome. Pre-menstrual tension and its relation to disturbed water metabolism has been adequately discussed by Stieglitz and Kimble (1949), Bickers and Woods (1951), and Linford Rees (1953). Hemphill (1953) has referred to "the acute alteration in the physiological state associated with childbirth operating on a susceptible personality" . . . appearing "to activate . . . puerperal depression." Rees's (1953) remark about the precipitation of premenstrual tension by the puerperium has already been quoted. On the basis of the material under consideration it would appear that two alternative interpretations might be made: either that a relatively irreversible reinforcement of the manic-depressive diathesis may occur, or that some other alteration in the constitution—for example, tendency to premenstrual water intoxication—may supervene which increases susceptibility to depressive attacks.

Course and Prognosis.—No women of post-menopausal age have been seen suffering from this illness, and the possibility exists that the menopause may lead to an improvement in these patients. Two patients had shown slow spontaneous improvement over the years but were still far from recovery. In the others there had been little or no change, even when the environment had improved.

Response to Treatment.—Dextro-amphetamine produces a dramatic symptomatic relief in some patients and a useful improvement in others. Acetylcholine shock therapy had no effect on the one patient on whom it was tried. Electric convulsion therapy produced no lasting benefit on two patients who received it. Its known effect in alleviating a depressive attack without touching the diathesis may explain its failure here. Hormone therapy and measures to control water-retention have not been adequately explored.

Summary

A syndrome is described in which recurrent depression, irritability, and tension dating from an attack of mild but typical puerperal depression are the leading features.

The symptoms tend to be worse in the premenstrual phase.

A pyknic body build appears to be typical.

The condition follows a chronic course, and treatment is problematical.

Serious disturbance of the life of the family is a secondary effect of the illness.

The condition appears to be related to the premenstrual tension syndrome.

It is a common and important condition and is at present insufficiently recognized.

I am grateful to Dr. J. J. O'Reilly, medical superintendent of Winson Green Hospital and medical director of All Saints' Clinic, for permission to publish this paper.

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ALPHA-PROTHROMBOPLASTIN DEFICIENCIES (HAEMOPHILIA) OF DIFFERING DEGREES IN A MOTHER AND SON

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There are a number of reports in which female bleeders are described as haemophiliacs. However, it has been realized that, despite clinical similarity, the "haemophilic" syndrome can be caused either by a deficiency of any one of several essential clotting factors, or it can be due to the presence of an inhibitor of blood-clotting. Although haemophilia has been connected by most workers with a derangement of the blood thromboplastin complex, in the last few years it has been found that it consists of several components. Clinical manifestations are therefore insufficient to establish the diagnosis of haemophilia. As the various components of the clotting system have been separated from plasma,

it seems logical to apply biochemical nomenclature to haemorrhagic disorders. Since it is customary to refer to hypoprothrombinaemia or to fibrinogenopenia it has been suggested (Fantl and Sawers, 1954a, 1954b) that haemophilia be called alpha-prothromboplastin deficiency, and the related condition, known as P.T.C. deficiency (Aggeler *et al.*, 1952) or Christmas disease (Biggs *et al.*, 1952), be called beta-prothromboplastin deficiency.

Laboratory investigations are necessary to find the particular deficiency. Blood from alpha-prothromboplastin-deficient patients shows several characteristic features. There is a slightly to grossly delayed whole-blood clotting time, which can be corrected *in vitro* by the addition of blood or plasma from a beta-prothromboplastin-deficient patient. If this is not available, such plasma can be prepared from normal human oxalated plasma by adsorbing the beta factor with alumina gel or barium sulphate (Ba plasma). Further, the patient's deficiency should not be corrected by the addition of stored plasma or serum which are devoid of the alpha factor. Another indication of the clotting defect is the prothrombin content remaining in serum after clotting has taken place. In the serum of normal persons this is very low, whereas thromboplastin-deficient blood examined 60–150 minutes after clotting contains more than 12% of the plasma prothrombin. In addition to the tests which are necessary to establish the diagnosis it is desirable to estimate the degree of the deficiency. This can be carried out by the determination of the rate of thrombin formation in diluted blood in the presence of pyrocatechol, which acts as a thrombin stabilizer. The theoretical basis and the experimental details for this technique have been given by Fantl (1954b).

The Investigation

The clinical examination and laboratory investigation of a mother and her son, which we record here, show that both are suffering from alpha-prothromboplastin deficiency, although of differing degree. The mother is in fact a true haemophiliac.

Mrs. M., aged 30, stated that she bruised much more easily and extensively than the other members of her family. She suffered heavy menstrual loss, the bleeding often lasting eight days. She bled consistently after teeth extractions, the oozing often beginning one week after extraction and continuing for another week. After the birth of each of her two children she had severe post-partum haemorrhage, which on the first occasion lasted one week and was associated with a cervical tear. She submitted to radium sterilization,

following which she again bled severely and required a blood transfusion. Apart from the haemorrhagic tendency no other pathological lesions have been found. So far as it was possible to trace her family history, no abnormal haemorrhages were noted except for a vague story of excessive bleeding after teeth extractions in her maternal great-uncle, who died at the age of 80 (see Fig. 1).

Mrs. M.'s daughter, born in 1951, does not show any bleeding tendency. Her son was born in 1952. He was first admitted to the Royal Alexandra Hospital for Children, Sydney, at the age of 14 months with severe bruising of head and buttocks. The parents stated that after circumcision at the age of 10 days the child bled for one week, and could only be controlled with difficulty with several blood transfusions. Repeated attacks of extensive bruising had been observed since the age of 6 months. Primary dentition was accompanied by oozing from the gums. The child was admitted to the above hospital six times with bleeding episodes, and received several blood transfusions. The clinical symptoms of the mother are much less severe than those of her son. Table I gives the results of laboratory investigations.

TABLE I.—Laboratory Data of the Haemorrhagic Defect of Mother and Son

	Mother	Son	Normal
Whole-blood clotting time of 2 ml. at 37° C. in minutes . . .	14–30	40–>100	9–19
Skin bleeding-time in minutes. Technique (Copley and Lalich, 1942) . . .	3	3	1.5–3
Plasma prothrombin. Technique (Quick, 1951), in seconds . . .	10	10	10–12
Prothrombin assay. Technique, Fantl (1954a) in units per ml. oxalated plasma . . .	530	420	440–600
Serum prothrombin: 1 hour after clotting . . .	10	9.5	14–∞
2 hours . . .	14	9.5	20–∞
Technique, modified Quick in seconds . . .			
Serum prothrombin: 1 hour after clotting . . .	31–43	—	0–12
2 hours . . .	17–31	—	
Technique, Fantl, in units per ml. serum as % of plasma prothrombin . . .			
Thrombocytes indirect. Technique, Fonio per cubic mm. blood . . .	450,000	450,000	>100,000
Clot retraction . . .	Complete	Complete	Complete

The type and degree of the deficiency were determined in the blood of mother and son by the rate of thrombin formation. These results are given in Fig. 2.

Rate of Formation and Yield of Thrombin in Diluted Blood of Mother and Son

The laboratory data show a coagulation defect in Mrs. M.'s blood in degree consistent with the clinical findings. The whole-blood coagulation time is moderately prolonged; the residual serum prothrombin is well above the upper normal limit (Table I). The thrombin formation in Mrs. M.'s diluted blood is delayed although the yield is normal (Fig. 2, curve A). The addition to Mrs. M.'s blood of 10% normal Ba plasma, as a source of alpha-prothromboplastin, converts the rate of thrombin formation to normal (Fig. 2, curve B).

These findings are characteristic of a partial alpha-prothromboplastin deficiency. No evidence of abnormality of other clotting factors or the presence of clotting inhibitors or fibrinolysis was detectable.

There is no doubt that the son is suffering from the same type of deficiency as his mother, but, in contrast to her, his blood is completely devoid of alpha-prothromboplastin (Fig. 2, curve C), the abnormality being again corrected *in vitro* by 10% Ba plasma (curve D), but not significantly by stored plasma (beta-prothromboplastin) (curve E). In the child's case these results corroborate the evidence obtained from plasma clotting times of mixtures of the patient's plasma with that of authentic alpha- and beta-prothromboplastin-deficient patients respectively, as can be seen from Table II.

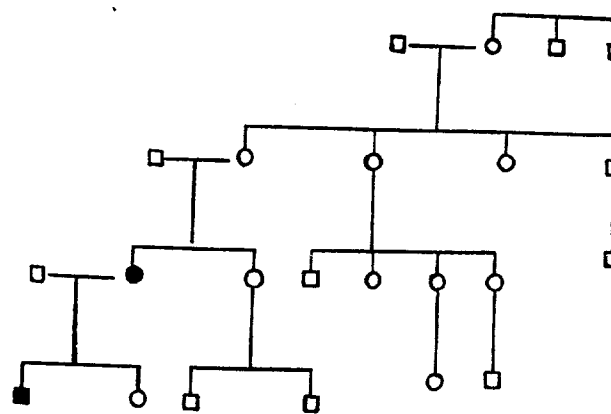


FIG. 1.—Family tree. ● Refers to Mrs. M. ■ Refers to her son. □ Refers to the maternal great-uncle of Mrs. M., who is believed to have had abnormal haemorrhages. All the other relatives gave no indication of abnormal bleeding.

TABLE II.—Recalcification Time of Oxalated Plasma Mixtures (0.2 ml. 0.01 M CaCl_2 was added at 37° C.)

	Plasma in ml. of			Normal Serum (ml.)	Clotting Time (Seconds)
	Authentic Alpha-prothromboplastin Deficiency	Authentic Beta-prothromboplastin Deficiency	Normal Albumin Plasma		
Mother, 0.1 ..	—	—	—	—	130
Son, 0.1 ..	—	—	—	—	>400
" 0.01 ..	0.1	—	—	—	400
" 0.02 ..	—	0.1	—	—	300
" 0.04 ..	—	—	—	—	480
" 0.08 ..	—	—	—	—	130
" 0.16 ..	—	—	—	—	180
" 0.32 ..	—	—	—	0.02	300
Normal, 0.1 ..	—	—	—	—	130-200

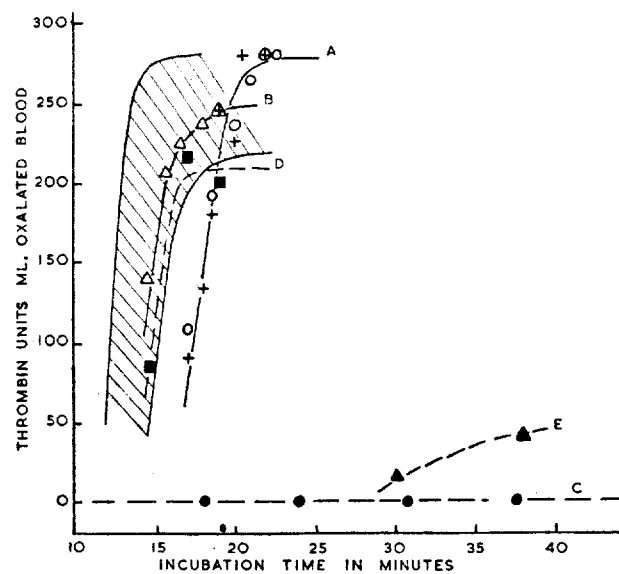


FIG. 2.—A 20% dilution of venous oxalated blood with 0.15 M sodium chloride was made immediately after collection. Mixture 1 consisted of 0.2 ml. 20% diluted blood added to 1.5 ml. of a solution containing 0.6 ml. 0.025 M CaCl_2 , 0.6 ml. 0.15 M NaCl , 0.3 ml. 0.18 M pyrocatechol in veronal buffer pH 7.4. Temperature 28° C. Thrombin was measured according to the technique of Fantl (1954a). Curves, full line (A, B), were obtained from Mrs. M's blood. Curve A + — — — — —, o — — — — — indicates mixture 1 plus 0.1 ml. 0.15 M NaCl . Curve B + — — — — —, o — — — — — indicates mixture 1 plus 10% Ba plasma. Dotted line curves C, D, and E were obtained from son's blood. Curve C — — — — —, o — — — — — indicates mixture 1 plus 0.1 ml. 0.15 M NaCl . Curve D — — — — —, o — — — — — indicates mixture 1 plus 10% Ba plasma. Curve E — — — — —, o — — — — — indicates mixture 1 plus 10% stored plasma. The shaded area presents the normal range.

Discussion

A critical review of the literature dealing with female bleeders, believed to be haemophiliacs, has been made by Merskey (1951) and by Israëls *et al.* (1951). Both groups of workers produce good evidence for the existence of congenital haemophilia in females, although the possibility that some of the cases may have suffered from beta-prothromboplastin deficiency must be considered. In both instances the homozygous state in the affected women has been established.

Additional reports of female haemophiliacs have been published (Koller *et al.*, 1950; Graham *et al.*, 1953; Quick and Hussey, 1953). With the exception of the latter, who described a sporadic case in a girl in whom the hereditary nature of the condition could not be established, the other females showed both clinically and on laboratory evidence the same degree of deficiency as their affected male relatives. Graham *et al.* (1953) have postulated the existence of a series of allelic genes which decide the plasma level of the anti-haemophilic factor in individual families. This is usually constant within an affected family, and breeds true according to the degree of the defect. Generally the inherited pro-

thromboplastin-deficiency diseases show the recessive sex link type of inheritance, but there is some evidence that the trait may not be completely recessive in female members of a pedigree.

Most of the haemophilic carrier women have not given any laboratory evidence of a clotting defect (Merskey and Macfarlane, 1951).

There is little doubt that Mrs. M and her son suffer from a well-defined congenital defect. Unfortunately the genetic features remain puzzling and unsolved. They are unique in that the mother suffers from a relatively mild haemorrhagic disorder. She is a true haemophiliac, her plasma exhibits a partial alpha-prothromboplastin deficiency, whereas her son is a very severe haemophiliac, whose blood is completely devoid of alpha-prothromboplastin. So far as can be ascertained there is no likelihood of consanguineous marriages in Mrs. M's family. Her husband and his family are free of bleeding tendencies. If the doubtful story of bleeding in the maternal great-uncle is accepted as a manifestation of mild haemophilia, it does not explain the severity of the condition in the child. It appears most probable that Mrs. M is heterozygous in respect of the gene responsible for her son's condition, but in her own case the trait is incompletely recessive. Although other possibilities could be considered, no useful deductions could be made, and it is therefore best to refrain from further speculations concerning the genetic features of the presented cases.

Summary

A congenital haemorrhagic tendency of moderate severity in a mother was shown to be due to a partial alpha-prothromboplastin deficiency (haemophilia) in her blood. Her daughter has no bleeding tendency. The son is a very severe bleeder. His blood is completely devoid of alpha-prothromboplastin. Puzzling genetic features in the presented cases are pointed out.

It is desired to acknowledge the co-operation of Dr. J. M. Alexander, under whose care the patient was. The laboratory investigations were carried out in the pathology department of the Royal Alexandra Hospital for Children, Camperdown, Sydney (director, Dr. R. D. K. Reye). One of us (P. F.) as guest worker enjoyed the hospitality and generous co-operation of Dr. Reye and his staff.

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Prostitution is the subject of a pamphlet published by the British Social Biology Council (*Occasional Paper*, No. 8, price 1s. 6d.), with the object of providing the general reader with some reliable information on the subject. The author, Eleanor French, points out that the young prostitute and the "spiv" are figures of at least equal importance in their anti-social potentialities, and yet study of the former is neglected: "The 'Teddy Boy' is accepted as a respectable subject for interest, and receives far more help and study than does the prostitute." After presenting briefly what little is known about the prostitute and her clients—"the prostitutes who have been studied by research workers have in practically all cases been the failures"—the author discusses what could be done in the way of rehabilitation and prevention. There is also a note on the legal position.

NON-TUBERCULOUS AND TUBERCULOUS EPIDIDYMITIS

BY

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Non-tuberculous (non-specific) and tuberculous epididymitis have been separately well documented in the surgical literature (Morson, 1933; Robinson, 1943; *Army Medical Department Bulletin*, 1943; Handley, 1946; Borthwick, 1947). Direct comparisons of parallel series of the two conditions are, however, rare (Stevens, 1923; Campbell, 1928; Järvinen, 1944). In this paper, based on a study of 80 cases of non-tuberculous and 28 cases of tuberculous epididymitis seen at Hammersmith Hospital between the years 1938 and 1952, an attempt is made to compare and contrast the two conditions; the differential diagnosis still sometimes remains a difficult problem. The diagnosis of tuberculous epididymitis was based on histological findings in 9 cases and on the presence of tubercle bacilli in the urine in 12; in the remaining 7 cases the diagnosis was based on persistent epididymal swelling in the presence of renal tuberculosis (5 cases) or pulmonary tuberculosis (2 cases).

The average age of the patients in both groups was 42 years; the age ranges were virtually identical—15 to 69 in the non-tuberculous cases and 13 to 72 in the tuberculous. The right and left sides were equally involved in both conditions, but the incidence of bilateral involvement in the non-tuberculous cases (9%) was considerably lower than it was in the tuberculous cases (32%).

Symptoms

Scrotal Swelling and Pain.—Scrotal swelling and pain were the commonest symptoms in both groups, and their incidence is indicated in Table I. The duration of the swelling, deduced from the statements made by the patients, is shown in Table II. Previous attacks of epididymitis, with subsequent resolution, affecting either the same or the other side, occurred in 15% of the non-tuberculous cases.

Urinary Symptoms.—Increased urinary frequency, dysuria, and macroscopic haematuria occurred in both groups (Table III), and these symptoms at times preceded the development of the scrotal symptoms. One or more of these symptoms of increased frequency, dysuria, and haematuria occurred in 47 (59%) of the non-tuberculous and in 18 (64%) of the tuberculous cases. Urinary symptoms preceded the scrotal symptoms in 26 (32%) of the non-tuberculous and 12 (43%) of the tuberculous. In the 26 non-tuberculous cases in which the urinary symptoms preceded the scrotal symptoms there was generally a short interval between the onset of the urinary symptoms and the development of the scrotal symptoms—less than 7 days in 6 cases, from 7 to 14 days in 5 cases, and 15 to 90 days in 10 cases. In the tuberculous cases the interval was always longer than 90 days.

Sinus Formation.—This was rare in the non-tuberculous cases, occurring in only 5%. In the tuberculous cases, however, it was much more common, occurring in 35%.

Tuberculosis Elsewhere in the Body.—Of the 80 patients with non-tuberculous epididymitis none had known tuberculosis anywhere in the body either before or at the time of presentation: it must be pointed out, however, that persistent epididymal swelling in the presence of tuberculous

TABLE I.—Incidence of Scrotal Swelling and Pain

	Non-tuberculous Epididymitis	Tuberculous Epididymitis
Swelling and pain	43	7
" alone	16	10
No recorded complaint of swelling or pain (patients presented with urinary symptoms)	21	11
Total	80	28

TABLE II.—Duration of Scrotal Swelling

	Non-tuberculous Epididymitis	Tuberculous Epididymitis
Less than 21 days	64	7
More .. 21	14	9
Incidental finding	1	5
No record	1	7
Total	80	28

TABLE III.—Incidence of Urinary Symptoms

	Non-tuberculous Epididymitis	Tuberculous Epididymitis
Increased frequency of micturition ..	34	9
Dysuria	27	6
Macroscopic haematuria	24	3

TABLE IV.—Incidence of Prostatic and Vesicular Nodularity

	Non-tuberculous Epididymitis	Tuberculous Epididymitis
Nodularity present	21	14
" absent	38	6
No record	21	8
Total	80	28

disease elsewhere has been accepted by us as tuberculous epididymitis. Nevertheless, allowing for the possible error in such a presumption, there was a striking difference in the cases of tuberculous epididymitis, and if only those patients in whom the diagnosis was made by histology or by the occurrence of tubercle bacilli in the urine are considered (21 cases), 76% were known to have had tuberculosis elsewhere: 11 patients had pulmonary tuberculosis, 2 renal tuberculosis, 1 spinal tuberculosis, 1 "tuberculous rib peritonitis," and 1 tuberculous cervical lymphadenitis.

Prostatic and Vesicular Involvement.—Prostatic and/or vesicular involvement, judged by the presence of nodularity on rectal examination, occurred in the cases of non-tuberculous and tuberculous epididymitis (Table IV).

Urinalysis

Records of urinalysis were available in 68 cases of non-tuberculous and 21 cases of tuberculous epididymitis. The results are shown in Table V.

TABLE V.—Urinalysis

	Non-tuberculous Epididymitis	Tuberculous Epididymitis
Coliform pyuria	35	5
"Mixed" (non-tuberculous) infection ..	10	0
Sterile pyuria	7	11
Sterile	16	3
No record	12	9
Total	80	28

The incidence of tubercle bacilli in the urine in the cases of tuberculous epididymitis was as follows:

Tubercle bacilli found on direct examination ..	8
" " " " guinea-pig inoculation ..	4
" " " " not found ..	10
No record	6
Total	28

The high incidence (at least 66%) of urinary infection in the cases of non-tuberculous epididymitis is to be noted, while the relatively high incidence (at least 26%) of secondary urinary infection in the cases of tuberculous epididymitis is of interest. Of interest, too, are the observations that 5 of the patients with non-tuberculous epididymitis and urinary infection did not admit to any urinary symptoms and 19 of those with coliform pyuria had haematuria.

Treatment

No records of treatment are available in seven cases of non-tuberculous epididymitis: conservative treatment was generally employed, but surgical measures were required in 20% of the cases. Orchidectomy was carried out in 6 cases, incision and drainage of an abscess in 5, epididymectomy in 2, and vasectomy in 2.

The majority of the tuberculous cases were treated before the introduction of streptomycin and adjuvant drugs, and surgical treatment was commonly employed. Orchidectomy was carried out in 9 cases, epididymectomy in 5, and drainage of an abscess in 1.

After-history

Postal inquiry was made in 71 (89%) of the non-tuberculous and 14 (50%) of the tuberculous cases, and replies were received on behalf of 37 non-tuberculous and 7 tuberculous cases; 4 other non-tuberculous and 13 other tuberculous cases were seen personally.

There was a striking difference in the after-histories of the two conditions. Only four of the non-tuberculous cases had further symptoms: one reported haematuria, one dysuria, one scrotal swelling on the opposite side, and one thought there was some residual scrotal swelling. In contrast, 36% of the cases of tuberculous epididymitis were known to have died.

Discussion

It would be unwise to compute the relative incidence of the two conditions from the present series of cases. It is almost certain that more cases of non-tuberculous epididymitis were seen and treated only as out-patients, and the records of such patients are not readily available to us: nevertheless, it would appear that there is at least a 3 to 1 preponderance of non-tuberculous over tuberculous cases among patients attending the out-patient department of a general hospital.

The average age incidence (42 years) in our own series of non-tuberculous cases is higher than that reported by Campbell (1928), McGavin (1943), Robinson (1943), and Handley (1946): the last two authors, however, based their observations on Service personnel, who, not unnaturally, were made up of younger age groups.

Bilateral epididymal involvement occurred in 32% of our tuberculous cases, and this high incidence confirms the reports of Stevens (1923) and Robinson (1943). Our observations do not support the statement (McGavin, 1943) that non-tuberculous epididymitis is often bilateral and simultaneous.

Although a short history of scrotal swelling favours a diagnosis of non-tuberculous disease, an acute onset can occur in tuberculosis: three of our patients with tuberculous epididymitis had histories of less than seven days. Conversely, patients with non-tuberculous epididymitis may have a scrotal swelling which has been present for as long as three years (Stevens, 1923). While it is common for a patient with non-tuberculous epididymitis to complain of a painful scrotal swelling, it is to be noted that 25% of our tuberculous cases presented in a similar way. Recurrent epididymal swelling is said to occur in 30% of non-tuberculous cases (Campbell, 1928): the incidence in the present series was 15%. Tuberculous epididymitis is persistent.

Urinary symptoms are commonly present in both non-tuberculous and tuberculous cases, but a long history of urinary symptoms preceding the onset of scrotal swelling

favours the diagnosis of tuberculosis. Macroscopic haematuria, no doubt the result of an associated *Bact. coli* cystitis, may be commoner in the non-tuberculous cases than is usually recognized: it occurred in only two of Robinson's cases (1943) and one of Handley's (1946), but in 30% of the present series. Haematuria occurred in only 10% of our cases of tuberculous epididymitis: this incidence is lower than that reported by others (Ross, 1953), but in four of our cases a previous nephrectomy had been carried out and it is possible that haematuria had preceded this operation.

Sterile pyuria, in the presence of an epididymitis, is suggestive of tuberculosis; nevertheless it occurred in 10% of the non-tuberculous cases in the present series. Conversely, although coliform and/or coccal pyuria, in the presence of an epididymitis, is suggestive of non-tuberculous disease, secondary infection of the urine was found in 26% of our cases of tuberculous epididymitis. The presence of tubercle bacilli in the urine of patients with epididymitis is practically conclusive, but it must be admitted that exceptions to this general rule could occur.

A scrotal sinus usually reflects the degree of chronicity of underlying epididymal disease; it was rare in the non-tuberculous cases, but occurred in 35% of the tuberculous cases, an incidence which is virtually the same as that reported by Stevens (1923).

Prostatic and vesicular involvement is a common finding in cases of tuberculous epididymitis: Borthwick (1947) recorded an incidence of 89%, and the incidence was 70% in the present series. Nevertheless, prostatic and vesicular nodularity occurred in 36% of our cases of non-tuberculous epididymitis. Stevens (1923) has stated that the presence of prostatic and vesicular involvement is not as significant as progression of the lesion while the patient is under observation: if a prostatic or vesicular nodule has been present for less than one month there is an equal chance that it is either tuberculous or non-tuberculous, but if it persists for several months it is likely to be tuberculous.

Judged by the benign after-history of our cases of non-tuberculous epididymitis treated expectantly, there seems to be little indication for carrying out epididymectomy in all cases of non-tuberculous disease as recommended by Järvinen (1944); there is, no doubt, a place for epididymectomy as the definitive treatment for the tuberculous patients, even with streptomycin and adjuvant therapy, but it is irrational to carry out an early excision of a non-tuberculous epididymis simply because its function has been destroyed and because it may prove to be tuberculous on histological examination. There is little doubt that the differential diagnosis between the two conditions is sometimes difficult when the patient is first seen, but it is our opinion that the diagnosis eventually declares itself either as a result of full urological investigation or after the lapse of time.

Summary

Parallel series of 80 cases of non-tuberculous epididymitis and 28 cases of tuberculous epididymitis seen at a civilian general hospital during a fifteen-year period have been compared and contrasted.

The average age of the patients in both series was 42 years and the age ranges were virtually identical.

The right side was involved as frequently as the left in both series: bilateral involvement was relatively less common in the non-tuberculous cases.

A short history of scrotal swelling occurred in 80% of the non-tuberculous cases and in 33% of the tuberculous. Pain occurred in both the non-tuberculous and the tuberculous cases; it was more common in the former. Recurrent swelling occurred in 15% of the cases of non-tuberculous epididymitis; the swelling persisted in the tuberculous cases.

Urinary symptoms were commonly present in both the non-tuberculous and the tuberculous cases, but a long

precedent history of urinary symptoms favoured the diagnosis of tuberculous epididymal disease. Macroscopic haematuria occurred in 30% of the cases of non-tuberculous epididymitis and was probably due to cystitis. Sterile pyuria was noted in 10% of the cases of non-tuberculous epididymitis: it was considerably more common in the tuberculous cases. Coliform and/or coccal infection of the urine was commonly present in the non-tuberculous cases but occurred also in 26% of the tuberculous. Tubercle bacilli were isolated from the urine in 12 of 22 cases so examined.

A scrotal sinus was rare in the cases of non-tuberculous epididymitis but developed in 35% of the tuberculous cases. Prostatic and vesicular nodularity was noted in 36% of the non-tuberculous cases and in 70% of the cases of tuberculous epididymitis. Clinical tuberculosis elsewhere in the body, either concurrent or precedent, was found in 76% of the tuberculous cases. The majority of the cases of non-tuberculous epididymitis were treated expectantly and ran a benign course. The tuberculous cases were treated by surgical excision—before streptomycin and the adjuvant drugs were available. 36% of the patients were dead within a few years.

The differential diagnosis between the two conditions is sometimes difficult and is apparent only after the lapse of time: full urological investigation is advisable.

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A PURPURIC DRUG ERUPTION CAUSED BY CARBROMAL

BY

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Carbromal (α -bromo- α -ethylbutyrylcarbamide) is a hypnotic, belonging to the class of open-chain ureides and closely related chemically to chloral, bromvaletone, and "sedormid." It was introduced in 1910 and popularized by Bayer Products Ltd. under the name of "adalin." The first report that the substance caused a drug eruption did not appear until 1921 (Loeb, 1921), and the purpuric nature of the eruption was well emphasized in the same paper. Since then, further cases have been described by Continental authors. The nearest approach to a description of the condition in the English language, however, is in a paper by Sneddon (1952), where it is cited as a differential diagnosis to purpuric textile eruptions. Usually it is merely alluded to by including carbromal in a list of drugs capable of causing purpura—for example, Brain (1950); while it has even been stated that carbromal does not cause purpura at all (Ackroyd, 1949; Beckman, 1952). However, it is generally agreed that carbromal has no effect on the blood platelets, as has sedormid, which is a well-recognized cause of thrombocytopenic purpura.

Carbromal is becoming increasingly popular in this country as a nocturnal sedative. It can be purchased

by the general public without a doctor's prescription, and seems to be the first choice of the chemist when asked for "something to make me sleep." Besides being sold as 5-gr. (320-mg.) tablets, carbromal is sold under a variety of trade names, such as "persomnia," containing, *inter alia*, 3 gr. (200 mg.) of carbromal, "dormiprin," containing 2 gr. (130 mg.), and "sornotil," containing 1 gr. (65 mg.). Finally, it is also being fairly widely advertised to the public.

In view of these facts, it was thought that a full description of the drug eruption caused by carbromal might be of value, and this paper deals with six such cases seen in the skin department of St. Bartholomew's Hospital in the first half of 1954.

Case Reports

Case 1.—A spinster aged 40 complained of a very irritating rash that had been present for four weeks. It had begun on the thighs and was still spreading. On examination well-defined patches, irregular in shape and size, were found on the thighs, buttocks, and lower trunk, consisting of petechiae and linear purpuric streaks, erythema, pigmentation, and branny scaling. Over the hips the eruption had become confluent and thickened. Increased capillary fragility was present. Five weeks previously she had begun taking persomnia, two tablets nightly. A patch test with 1% carbromal in propylene glycol was negative, but the eruption cleared in two weeks after stopping the drug. Slightly increased capillary fragility was still present a fortnight later.

Case 2.—A man aged 53 complained of a very irritating rash, present for six weeks, which had begun around the ankles, the inside of the knees, and over the hips, and which had spread steadily ever since. On examination the whole skin, with the exception of the soles, hands, and face, was affected by an eruption consisting of petechiae and linear purpuric streaks, erythema, pigmentation, and branny scaling. On the trunk, thighs, and upper arms these elements were aggregated into well-defined, irregularly shaped patches of varying size. On the forearms and lower legs the eruption was mainly petechial, in some areas diffuse and in the others confluent. Over the inner aspect of the knee-joints, the hips, and shoulders the eruption formed a slightly thickened sheet. Marked increased capillary fragility was present. He had been taking persomnia, one or two tablets nightly, for nine weeks. A patch test to 1% carbromal in propylene glycol was negative, but the eruption cleared completely in four weeks on stopping the drug.

Case 3.—A married woman aged 52 complained of an irritating eruption, present for three months, which began round the right ankle in the region of her varicose veins. On examination an eruption was seen on the legs, trunk, and upper arms, consisting of petechiae and purpuric streaks, erythema, pigmentation, and branny desquamation. On the thighs, trunk, and upper arms the eruption was patchy; over the shoulders, hips, and knees it was confluent and thickened; and on the lower legs it was profuse and mainly petechial. Slight increased capillary fragility was present. She had begun taking persomnia, two or three tablets nightly, six months previously. On stopping this drug the eruption cleared completely in two weeks.

Case 4.—A single woman aged 27 complained of an irritating eruption, which had been present for three months. On examination a grossly excoriated eczematous reaction was seen affecting the legs, thighs, and upper arms. The eruption had coincided with extreme domestic difficulties and cleared completely in four weeks as a result of bland local applications, mild sedation, and sick-leave. She was referred again, one week after returning to work, with a relapse of the eczema. This time, however, the eruption was mainly petechial, together with some erythema, pigmentation, and branny scaling, patchy on the thighs, trunk, and upper arms, and diffusely purpuric on the lower legs and forearm. It had begun on the feet, had spread suddenly in a few days,

and was extremely irritating. Increased capillary fragility was present, and persisted for a month after the eruption had cleared. She had started to take carbromal three or four tablets nightly, three months previously—that is to say, two months after the onset of the original eczematous rash. Patch tests to a saturated solution of carbromal in propylene glycol were negative, but the eruption cleared a month after stopping the drug.

Case 5.—A married woman aged 50 complained of a non-irritant rash, present for four months, which had begun on the thighs and which had steadily spread. On examination well-defined, irregularly shaped patches of varying size, consisting of petechiae, erythema, pigmentation, and branny scaling, were seen on the limbs and trunk. Some petechiae were seen between the patches and they were particularly marked and profuse on the lower part of the legs. Increased capillary fragility was present. She had been taking carbromal, one tablet nightly, for a year. The eruption cleared two weeks after stopping this drug, at which time the capillary fragility had also disappeared.

Case 6.—A man aged 42 complained of an eruption which had been present for three months and which had been irritating for one month. It had appeared first on the feet



The eruption in a typical case.

and had spread steadily to affect the limbs and trunk. On examination the eruption was found to consist of petechiae, purpuric streaks, erythema, pigmentation, and branny scaling, diffuse and mainly purpuric on the forearms and lower legs, but aggregated into irregular patches on the trunk and upper limbs. A similar eruption had appeared one year ago on the feet and had spread suddenly to the limbs and trunk within a week. It had been irritable for the first week only and had persisted for three months. Three weeks before the eruption he had begun taking carbromal, two tablets nightly, but reduced the dose to one tablet a night about three months later—that is, a few weeks before the eruption cleared. He increased the dose to two tablets a night just before the eruption appeared for the second time. The carbromal was stopped when he was first seen and the eruption cleared in three weeks, at which time increased capillary fragility, which had been present at first, could no longer be demonstrated. A patch test to a saturated solution of carbromal in propylene glycol was negative.

Discussion

The eruption was remarkably constant in all six cases and warrants no further description. Severe irritation was complained of by five of the patients, but was completely absent in the sixth. The dose of carbromal varied between 3 and 20 g. (0.2 and 1.3 g.) nightly, but in all cases was within the therapeutic range (Martindale, 1952) and bore no relationship to the severity of the eruption. Increased capillary fragility was constantly present, and in two of the cases persisted for some weeks after the eruption had cleared, but in no case was any haematological abnormality found. Patch tests were uniformly negative. Only one of the patients obtained the drug on a doctor's prescription.

Unless the purpuric element in the eruption is recognized the condition may be mistaken for pityriasis rosea, seborrhoeic dermatitis, or eczema. Two other eruptions, morpho-

logically identical with that produced by carbromal and in which irritation is usually present, must be considered in the differential diagnosis. The first of these is the purpuric textile dermatitis, first described by Hodgson and Hellier (1946), occurring among British troops in north-west Europe. Subsequent cases have been reported among civilians (Peterkin, 1948; Sneddon, 1952). Invariably the cause has been a new article of clothing, but many garments have been incriminated, such as a vest, shirt, bathing-dress, pair of riding-breeches, and a suit. The causative factor, which is not a dye, appears to be some chemical used in processing the clothing, which can, while the clothing is still new, cause capillary damage in certain individuals. In the second condition the eruption appears for no discernible reason, persists for anything from two months to a year, and resolves spontaneously. Treatment has no effect. Sneddon (1954) has suggested that these three varieties of purpuric dermatosis, due to external contact causes, to ingested allergens, and of purely endogenous origin, may be a change comparable to the eczema reaction. To regard the eruption as a particular variety of skin change which may have a number of causes appears to be the most rational approach.

The final diagnosis of a carbromal drug eruption must rest on the effect of stopping the drug. Patch tests are misleading, since a positive result is difficult to obtain, and a test dose is out of the question in an eruption which may persist for up to a month after the responsible drug has been withdrawn. Nevertheless, improvement in the intensity of both the eruption and the irritation is obvious within a few days to a week of stopping the drug, and the condition clears completely in, at the most, a month.

Summary

Six cases of purpuric eruption caused by the ingestion of carbromal in therapeutic doses are described, and the differential diagnosis is discussed.

It is emphasized that the use of this drug as a nocturnal sedative is increasing in this country, and that it may be purchased without a doctor's prescription.

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According to the U.S. Army Surgeon General, radiographs of wounded soldiers on the battlefield with a newly designed portable x-ray unit powered by radioactive thulium will soon be possible. The new device can produce an x-ray picture without electricity, water, or darkroom. The complete unit weighs only 48 lb. (21.8 kg.) and may be carried on the back. A 1-in. (6-mm.) lead plate contains the radioactive thulium and protects the user from accidental radiation exposure. The piece of thulium is expected to be effective for about one year, when it will be returned to an atomic pile for rejuvenation. The developer is a cassette or filmholder in which all pictures are made with radiosensitive paper and pads instead of film. The paper and pad are saturated with developer and stabilizer and are separated by leak-proof dividers. The cassette is wrapped with a light-proof and waterproof covering. As the cassette is exposed, the dividers are removed and the radiosensitive paper records the picture. These radiographs lack the fine detail of standard x-ray films, but are suitable for field and emergency use. A person can be trained to use the machine in a few hours, and can set it up, take a picture, and develop it within five to ten minutes. Timing of the exposure is done with a wrist watch. Each unit will cost about \$200, but additional tests must be made before it can be standardized for commercial manufacture.

Medical Memoranda

Paradoxical Haematemesis in Oesophageal Atresia

An essential prerequisite for the diagnosis of oesophageal atresia is to have the condition in mind. From the variations in its reported incidence it seems probable that in some areas the diagnosis is less frequently considered than in others. However, it may happen that because of the co-existence of an additional condition the diagnosis may be delayed or even missed altogether. As the subsequent case report shows, the occurrence of haematemesis in a case of oesophageal atresia might well obscure the diagnosis, and so lead to undesirable delay in operative treatment.

CASE REPORT

A primipara aged 35 was delivered of an apparently normal male child in her own home on the evening of October 9, 1953. The birth weight was 8½ lb. (3.7 kg.). The baby was not put to the breast. Next morning the midwife noticed that the baby's colour was poor, that the respirations sounded moist, and that there was some white frothy mucus in the mouth. The patient's own doctor was called; he examined the chest and found no abnormality. The foot of the cot was raised to drain the chest. No feeds were given that day. On the second day the baby was put to the breast, and he sucked well. The colour was good and meconium was passed. Later he brought up some thick mucus from the nose and mouth. In the evening he would not suck the breast.

Early the following morning (third day) the baby brought up some red blood. His colour was poor and he appeared to be shocked. The doctor was called again, and he immediately sent the patient to the Bradford Children's Hospital. Here a diagnosis of haemorrhagic disease of the newborn was made and 10 mg. of vitamin K was given intramuscularly. Feeds of glucose water were returned together with some bright-red blood and, on one occasion, clots. Later he passed a melaena stool. On the fourth day there was no change and no feeds were retained; it was at this time that the diagnosis was made. An attempt was made to pass a catheter into the stomach, but without success. A little lipiodol was therefore instilled into the catheter in the back of the throat and a radiograph taken. This showed the typical upper blind pouch of oesophageal atresia together with gas in the stomach, indicating the presence of an oesophago-tracheal fistula.

Soon after this the child was transferred to the Bradford Royal Infirmary, where an operation was performed a few hours later. Through an intrapleural approach the fistula between the lower stump of the oesophagus and trachea was divided, and continuity of the oesophagus was effected by an end-to-end anastomosis, using interrupted catgut sutures. For the next seven days no feeds were given, and fluid requirements were supplied by the subcutaneous route. On the eighth day a glucose-water feed was taken well. On the ninth day, however, he vomited after feeding. A lipiodol swallow was given; the radiograph showed lipiodol to be present in the stomach and was not suggestive of a leakage from the anastomosis. The child, however, did not look well, and as a precautionary measure a gastrostomy was performed under local analgesia. The gastrostomy feeds, however, made him vomit just as much as feeds by mouth, so after twenty-four hours feeding by mouth was restarted, and this time no further vomiting occurred. He made a gradual but uninterrupted recovery.

COMMENT

The occurrence of haematemesis in the presence of oesophageal atresia is, of course, rare, but the route from the stomach up the lower segment of the oesophagus through the oesophago-tracheal fistula, up the trachea, and into the

mouth has been known for a long time as an explanation for the occurrence of acid saliva in these cases. The term "paradoxical haematemesis" would seem to be a reasonable one, and serves as a reminder that vomiting can occur in oesophageal atresia with a fistula from the lower segment if there is anything in the stomach to vomit.

The delay in diagnosis in the case described was about twenty-four hours, and, as subsequent events show, was of no importance; but it takes little imagination to realize that the symptom of haematemesis might appear to exclude the diagnosis of atresia of the oesophagus in the mind of a person unfamiliar with the anatomy of the condition.

My thanks are due to Mr. J. S. Davidson, who performed the operation, for permission to publish this case, and to Dr. Elizabeth Rosenblum, of the Bradford Children's Hospital, who made the diagnosis.

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A Case of Malignant Melanoma and Pregnancy

The association of malignant melanoma and pregnancy is not commonly reported. Cases have been described of malignant melanoma giving rise to secondary deposits in the placenta or foetus, but no reference is found to the effect of pregnancy on the growth of a melanoma. The following case illustrates this relationship.

CASE HISTORY

A woman aged 39 was first seen in July, 1949. She was expecting her first child, and was eight weeks pregnant. In August she noticed that a deeply pigmented mole on her left calf was enlarging and weeping a little. There were no signs of any secondaries and she was referred to hospital for surgical opinion. A biopsy of the tumour was performed and the histological report was of a "non-malignant cellular naevus." In February, 1950, the baby was delivered, but it died six weeks later of bronchopneumonia. In May the tumour was excised and a histological report confirmed that it was a "simple non-malignant cellular naevus."

In June she was once again eight weeks pregnant. The antenatal period and delivery in January, 1951, was normal, but three weeks later she noticed a rapidly enlarging lump developing in the left groin. This was clinically a mass of glands and she was referred for further surgical opinion. A biopsy of a gland was taken and fresh sections were cut off the original naevus. The histological report stated that "the naevus is almost certainly malignant and the glands in the groin are secondaries." The glands were excised in May, 1951, and a course of x-ray therapy to the groin was given.

All was well for the next two years, and mother and baby flourished. In September, 1953, she was once again 20 weeks pregnant. The antenatal period and delivery in January, 1954, were again quite normal, but after delivery a large tender mass was felt in the left iliac fossa displacing the involuting uterus to the right. She was referred to hospital and the diagnosis of further metastases made. A further course of x-ray therapy was given and the mass of glands disappeared. The patient is at the time of writing quite well, showing no other secondaries. Unfortunately the baby is a mongol.

COMMENT

The case appears to show that pregnancy has stimulated the growth of a melanoma. It is difficult to think such an appearance could be mere coincidence, since it happened on three different occasions. Presumably the stimulus is hormonal in character, and the query arises whether pregnancy should be terminated in such cases. Since this is but a solitary case the query must remain unanswered.

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Hypoglycaemia in Chronic Alcoholism

The following case is unusual and presented certain difficulties in diagnosis.

CASE REPORT

The patient, a man aged 54, was known to be a chronic alcoholic. The doctor was sent for one morning because of difficulty in rousing him. Initially it appeared that he had been mentally very confused; about an hour later he was found by his daughter to be completely unconscious. He had spent the previous day normally and retired to bed about 9.30 p.m., apparently sober. There was no admission of any immediate alcoholic excess.

When he was examined there was a strong smell of ketones in the small airless room. He was deeply comatose, lying flat on his back, with open eyes and giving an occasional twist of his head. The skin was distinctly moist, but unfortunately the significance of this was not realized until later. The pupils reacted to light; all tendon reflexes were present and equal; abdominal reflexes were present, and no plantar responses were obtained. A catheter specimen of urine showed Rothera's test quickly and strongly positive, and Gerhard's and Benedict's tests negative. Other systems were all normal. By this time he had been in coma for about three hours.

Treatment was based on a provisional diagnosis of diabetic—that is, hyperglycaemic—coma without glycosuria. In view of some uncertainty, however, it was decided to administer dextrose intravenously before giving the insulin. At the conclusion of an injection of 25 ml. of 25% dextrose the patient at once regained immediate consciousness, in the dramatic manner associated only with recovery from hypoglycaemia.

The differential diagnoses considered at this stage were (1) ketosis and hypoglycaemia due to liver insufficiency, and possibly aggravated by inadequate food intake; (2) spontaneous hypoglycaemia; (3) diabetes mellitus.

He was admitted for investigation. One hour later his blood urea was 31 mg. per 100 ml., and blood sugar 253 mg. per 100 ml. (in view of recent glucose administration, this was not of much value). Twenty-four hours later his fasting blood sugar was 94 mg. per 100 ml. The latter was taken to exclude diabetes mellitus, of which there really was no positive evidence. The urine was tested on frequent occasions during the next few days, and no glycosuria was found. The ketosis resolved after about 36 hours without specific treatment, although he was encouraged to eat.

Liver-function tests at this stage showed: Serum alkaline phosphatase, 3 units; serum thymol turbidity, 4 units; icterus index, 3 units; serum proteins, 9.8 g.% (albumin 5.8 g., globulin 4 g.); A/G ratio, 1.45:1.

The glucose-tolerance test gave the following results:

	Fasting blood sugar	Urine Sugar	Urine Acetone
1 hour after 50 g. glucose	91 mg./100 ml.	—	—
1 1/2 hours	101	—	—
2 hours	121	—	—
2 1/2 hours	171	—	—
3 hours	100	—	—
4 hours	88	—	—

The change in the serum proteins suggests some degree of liver damage. The delay in storage of glucose supports this. The glucose-tolerance test also suggests a lowered renal threshold.

Three days after admission he had a classical episode of delirium tremens, which was treated in the usual way, and from which he recovered quite normally.

Five months later a similar incident of hypoglycaemia occurred in which he became mentally confused and disorientated. He did not go into coma and the blood sugar was 62 mg. per 100 ml. Frank ketosis was again present. Treatment and subsequent progress were as recorded in the first instance.

DISCUSSION

The recognition of hypoglycaemia dates from 1849, when Claude Bernard found that the mobilization of liver glycogen was the source of blood sugar. Between this discovery and the isolation of insulin, which does not concern us here, attention was mainly directed to the liver. Hepatic poisons were used experimentally—for example, phosphorus (Frank and Isaac, 1911)—to induce the condition.

Le Count and Singer (1926) have pointed out that alcoholics with huge fatty livers may die suddenly and unexpectedly. The large globules of fat take up most of the room in the liver cell, leaving no space for glycogen. The probable cause of death is hypoglycaemia. In this patient a similar condition probably was present, although there was no clinical evidence of hepatic enlargement.

Failure of endogenous sugar may also occur from wasting muscles and failure to replenish the stores, as in starvation. There was no evidence of either of these conditions in this case.

Ketosis has been established as due to carbohydrate lack, but many conflicting views have been put forward regarding how exactly this is brought about. One of the most recent theories is that propounded by Macallum (1930) by which ketone bodies are regarded as normal products of metabolism having an energy value of which most tissues, except the liver, could make use. In 1926 Raper and Smith suggested that the factor responsible for mobilizing fat in excessive amounts was a reduction of the liver glycogen below a certain level. MacKay (1943) has summarized the position as follows. The body is supplied with two types of fuel: "slow fuel" which represents the fat used directly by the tissues without any liver intervention, and "quick fuel"—namely, glucose and ketone bodies. He suggested that the production of ketone bodies, in times of need, was a device to conserve glucose for the central nervous system, which is unable to metabolize them. Mirsky (1942) asked, If ketone bodies are normal oxidation products why does excess ever occur? He answered this by saying that there was a maximal rate at which muscles could use ketone bodies, just as there was a maximal rate at which they could use glucose.

It is therefore postulated that hypoglycaemia and ketosis could both be explained by diffuse hepatic lesions. What evidence is there for this in the present case? The patient is a known addict to an established hepatic poison. The liver-function tests and the glucose-tolerance test show changes consistent with this argument.

This hypothesis seems to account for most of the features. However, it does not explain why such an episode should suddenly occur in a long-standing condition which showed no other immediate change for the worse. Further, if the liver involvement was severe enough to produce this picture, it might reasonably be anticipated that the liver-function tests would be more upset; but these are well known to be not unduly reliable. Also, it might be thought that the combination of hypoglycaemia and ketosis would be more common in other more obviously gross diseases of the liver than it is.

It is concluded that this is a case of fatty change in the liver due to alcohol poisoning, producing the clinical picture of hypoglycaemia and ketosis—a series of events which may be summarized thus: "Alcoholic hepatitis"→Depletion of hepatic glycogen→hypoglycaemia→production of ketone bodies by the liver.

My thanks are due to Dr. Serge Keys, who carried out the laboratory investigations.

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Reviews

CLINICAL PSYCHIATRY

Clinical Psychiatry. By W. Mayer-Gross, M.D., F.R.C.P., Eliot Slater, M.A., M.D., F.R.C.P., D.P.M., and Martin Roth, M.D., M.R.C.P. (Pp. 652+xx; illustrated. 50s.) London: Cassell and Co., Ltd. 1954.

The need for an entirely new systematic textbook of psychiatry in the English language has been realized for some time. None of those that have appeared in the last ten years have been fully satisfying from the point of view of the postgraduate who wishes to specialize in the subject. They have been either too short or insufficiently comprehensive, have been written from the point of view of one system of psychopathology, have been uncritical, or have lacked cohesion through multiple authorship. For the descriptive textbook based on long clinical experience and a discriminating knowledge of the literature it has been necessary to refer to the larger German works. Now that it has been accomplished, it seems very natural that a compromise in form should have been sought between the factual completeness of the German *Lehrbuch* and the more readable British medical text. For the first time there is now available a textbook that contains about as much theoretical information as a trainee psychiatrist needs, together with clear indications of how to supplement this from specialized and original sources. Furthermore, the field covered is a large one—that of clinical psychiatry as applied at all ages in hospital and clinic, but restricted to those aspects which are not functional disorders of mind alone. The emphasis on constitutional factors is in fact such that the psychoneuroses and psychosomatic disorders themselves receive relatively little attention except in so far as they are an expression of maladjustment due to constitutional vulnerability.

This book is based on the experience of three psychiatrists of wide clinical knowledge who have inherited much of the unwritten teaching passed from one generation to the next both at Heidelberg and at the Maudsley Hospital in London, where all three have worked. In the tradition of Mott and Mapother they have taken an active part in extending the scientific and medical approach to problems of mental illness which has been a feature of British psychiatry in the last quarter of a century. The book abounds with evidences of a rich clinical experience. Some of the asides show a unique clinical wisdom, and in reading them one is grateful that much of the personal teaching of the authors and of the Maudsley school has now found its way safely into print.

It is doubtful if any attempt to achieve a full synthesis of the two contemporary approaches to problems of mental health, psychodynamic and constitutional, could be achieved in the present state of knowledge without a good deal of fence-sitting, and the authors have made it abundantly clear that, whatever faults may be found in their presentation, this will not be one of them. The result is a somewhat downright introduction in which collectively the three authors achieve a degree of aggressiveness which exceeds that found in the individual work of each, and within a few pages they earn for themselves an honoured place on the index *expurgatorius* of the psychoanalytic faith. While by quoting the work of some of its less-balanced adherents they are able to present the excesses of the psychodynamic outlook in all their absurdity, the authors are more than reluctant to admit that any good has come out of this movement at all. It is surprising, too, that in accepting a multi-dimensional approach they show relatively little sympathy for the reaction of Myerian psychobiology, with its melioristic attitude of considering important any factor which can help the patient, to the descriptive and deterministic heritage of Kraepelin. If, however, this results in a rather spectacular attitude to mental misfortune, they are spectators who do not miss much of the game. Further, their cohesion is such

that the book, which contains many descriptions of high literary merit, might well have come from a single pen.

The chapter on schizophrenia does a great deal to clear away the air of mystery with which this group of disorders is often approached, and to make the process of diagnosis and the choice of treatment less one of intuition and fancy than it often is at present. In particular the authors' authoritative and balanced views on the place of leucotomy operations will be welcome. The sections on mental deficiency and child psychiatry together satisfy the urgent need at the moment of presenting the notable advances made in these subjects, especially in the fields of genetics and organic determinants, and as a guide to the literature of an aspect of child life that is apt to get forgotten in the much more voluminous writings based on the work of child-guidance clinics.

A fully satisfactory eclectic postgraduate textbook of psychopathology and psychotherapy, written from the point of view of therapy within the social and economic framework and incorporating the results of the experiments of the last 20 years, has still to be written, and, until it is, the psychiatric trainee will have to muddle through, as he does at present. His load has, however, been immensely lightened in the field of general psychiatry by the publication of this book. Much forethought has been shown in its design and in its selective bibliography, and the co-operation between authors and publishers has been notably successful.

ALEXANDER KENNEDY.

FLUID THERAPY

Fluid Therapy. By James D. Hardy, M.S.(Chem.), M.D., F.A.C.S. (Pp. 255; illustrated. 42s.) London: Henry Kimpton, 1954.

In its comparatively limited compass of some 250 pages this book very largely fulfils its professed aim of providing "a concise discussion of total fluid therapy." It is written by a surgeon with experience of electrolyte problems in the laboratory as well as in the wards. The opening chapter, on the physiology of body fluid, is well arranged and well illustrated; only two of its 22 diagrams are taken from the Gamble mine of electrolyte illustrations, so that in this respect it has a refreshing "new look." There is a sketchy chapter on methods, in which more than half the space is taken up by photographs of technicians operating machines. In the next seven chapters the recognized syndromes of electrolyte distortion are summarized, and a number of appropriate case reports give reality to the discussion. The last 100 pages are devoted to the clinical situations in which electrolyte problems are likely to arise, and this section includes short chapters on fluid therapy in the elderly patient, and in urology, neurosurgery, and orthopaedics.

The book is well produced, and a detailed table of contents and index make its information accessible. The references at the end of each chapter are representative of the literature without being so numerous as to discourage looking them up. The clinical emphasis is largely, but not entirely, on surgical problems, and the book seems to me fitted to arouse, maintain, or increase a surgeon's interest in rational fluid therapy.

D. A. K. BLACK.

SURGERY OF THE CAECUM AND COLON

Surgery of the Caecum and Colon. By Stanley Avlett, M.B.E., M.B., B.S., B.Sc., F.R.C.S. (Pp. 295; illustrated 45s.) Edinburgh and London: E. and S. Livingstone Ltd. 1954.

This is a new and beautifully illustrated work dealing essentially with the surgical lesions of the caecum and colon and their treatment. The preliminary 50 pages cover the surgical anatomy, symptomatology, and diagnosis, with special reference to carcinoma of the colon. Chapter II, on pathology of tumours of the colon, is contributed by Dr. James Earle. The rest of the work describes very clearly the details of surgical technique in non-obstructed and obstructed

lesions of the colon, and the management of such controversial subjects as benign tumours of the colon, polyposis, and diverticulitis. The author describes the surgical treatment of chronic ulcerative colitis by colectomy, and discusses very fairly the possibility of preserving rectal function by ileo-rectal anastomosis, which he states has been done at the Gordon Hospital in 30 cases without operative mortality and so far without need for an ileostomy. The final chapters deal with regional or segmental colitis, tuberculosis of the colon, volvulus, megacolon, and gunshot or other wounds of the colon. The importance of early diagnosis in blast injuries of the large intestine is stressed, since a mortality of 100% occurs if surgery is delayed for more than 10 hours.

Throughout this work there is a wealth of detail regarding operative techniques as well as pre- and post-operative management. The illustrations, whether diagrams, radiographs, or illustrations of surgical technique, are uniformly excellent. The book will prove of great value to surgeons who have to deal with some of these difficult and debatable subjects, and will help them in the choice of the best treatment; the details which the author has taken the trouble to recount are very important and will greatly assist in bringing cases to a successful conclusion. The production of the book is first-class, and the only misprints noticed are in the spelling of Connell, and Paul-Mikulicz should have been printed thus, otherwise Paul might be taken for a Christian name.

W. B. GABRIEL.

PROGRESS IN ENDOCRINOLOGY

Glandular Physiology and Therapy. Prepared under the auspices of the Council on Pharmacy and Chemistry of the American Medical Association. Fifth edition. (Pp. 611+xx, 80s.) London, Philadelphia, Montreal: J. B. Lippincott Company, 1954.

This book has been produced under the auspices of the Council on Pharmacy and Chemistry of the American Medical Association. The contributors are highly distinguished, among them being such well-known names as Astwood, Barter, Forsham, Eager Howard, Palmer Howard, Jailer, McCullagh, Reifenshtein, Sayers, Segaloff, Selye, and Venning. The work was first published in 1924, when the only hormones available to the therapist were insulin, adrenaline, and extracts of the thyroid and posterior lobe of the pituitary. Twelve years have passed since the last edition, and the contributors have reviewed authoritatively the new work which has been done in their own fields. The result is a book on clinical endocrinology of great value. The secretary to the Committee on Publications of the A.M.A. forecasts that this may be its last edition, as the need for this work has largely disappeared with the production of many excellent books occupied with the same subjects. This book has a special approach, however, which allows the editors to include monographs not to be found in any other work and permits them to exclude complete accounts of many conditions which require comprehensive treatment in the textbooks. There are, for example, chapters on the endocrine management of neoplastic diseases, abnormalities of sexual behaviour and intelligence in relation to endocrine disease, and common misconceptions in endocrine therapy. This last subject is discussed by John Eager Howard with the same wisdom and experience as were shown by Fuller Albright in his famous pages in *Cecil's Medicine*. The text of Howard's exhortation is that most endocrinopathies can be diagnosed from a thorough history and physical examination without extravagant laboratory investigation "performed at great expense to the patient."

The editors have rightly allowed the individual contributors to express opinions which they themselves do not necessarily share, and this may be the reason that we find Werner maintaining that the anterior pituitary has nothing to do with thyrotoxicosis because the TSH blood values are not increased, and Segaloff advising against thymectomy in myasthenia gravis without mention of Keynes's results showing 65% of patients with complete remission or considerable improvement after this operation.

This book is a valuable work of reference, and this edition should not prove to be the last.

D. V. HUBBLE.

DIAGNOSTIC ERRORS

Klinische Fehldiagnosen. By Professor Dr. M. Bürger. (Pp. 550+xx; illustrated. D.M. 59.40.) Stuttgart: Georg Thieme, 1954.

Perusal of this book on clinical mistakes in diagnosis puts one in mind of the old saying that the churchyard covered the doctor's mistakes. Here is a selection, some two hundred of them, all resurrected for the benefit of posterity. This is rather a remarkable book. The mistakes in diagnosis are carefully arranged under the various topics to which they belong, and this makes in all some 21 sections; these comprise the nervous system, metabolism, pancreas, blood diseases, and so on. Each section begins with a discussion on how mistakes in that particular subject may arise, and ends with a summary. The book starts off with a very interesting essay on diagnosis in general. The author distinguishes between "illness" and "sickness"—an interesting point. Diagnosis, we learn, can depend on "harm done" or "good done," on "intuition," and can be confused by the effects of age; it is discussed from the anatomical and topographical angles, with their associated mistakes. Under laboratory diagnosis comes the wise heading, "Omnia sunt dubitanda."

All this sounds rather elaborately German, but there is a lot of common sense in it. Unfortunately the case histories are in very small print and not particularly readable. The wrong diagnosis is given on one side and the correct diagnosis on the other, and the necropsy findings are described where pertinent. Collected over many years, some errors are now quite out of date because newer knowledge and understanding make them unlikely nowadays. These are mistakes of "agnosis," as the author would say. The skiagrams are all first-class, but the cardiograms are old-fashioned. There are a good index and many references.

Altogether this is a most unusual and interesting book, but one to be taken in small doses. One feels that one learns less from one's mistakes than one should; but, alas, however often is it never known that one has been made? Osler once quoted a famous German surgeon as saying, after a wrong diagnosis, "We didn't think right." Nowadays, with so much diagnostic information available, that is probably the main source of error, rather than ignorance or carelessness or lack of skill.

TERENCE EAST.

PRACTICAL BIOCHEMISTRY

Practical Biochemistry: An Elementary Course for Students of Medicine and Science. By G. T. Mills, H. N. Munro, and G. Leaf. Foreword by J. N. Davidson. Second edition. (Pp. 156+x; illustrated. 20s.) Glasgow: John Smith and Son Ltd. 1954.

The appearance of a second edition of this book indicates that it is filling a valuable place in the instruction of medical and science students in practical biochemistry. It is based on the teaching at Glasgow University and is supported by a foreword from Professor J. N. Davidson. It is well written, and the first part covers the list of subjects usually taught in elementary biochemical classes, such as the composition of living matter, enzymes, digestive juices, blood, cerebrospinal fluid, and urine. The second part is more quantitative and starts with an introductory account of colorimeters and polarimeters. Here the rather scanty reference to photoelectric colorimeters is to be regretted, and a little more detail in the section on tissue-function tests would have been an advantage. On the other hand, the inclusion of a section on the paper electrophoresis of serum proteins was noted as a welcome addition.

The book is well produced and moderately priced, and will undoubtedly be useful to all students attending practical classes in elementary biochemistry and to those engaged in their instruction.

N. F. MACLAGAN.

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WINTER COUGHS

As any theatre-goer knows all too well, this is the season of persistent coughs. Usually they are the result of the common cold which has "gone to the chest" and produced a chronic tracheitis or tracheo-bronchitis. Although many people recover quickly, in some the cough may persist. This is especially true of those who have an inherited asthmatic tendency or are liable to bronchospasm. In children the common cold is often accompanied by a sinusitis which persists after the nasal discharge has ceased, and this is the commonest cause of chronic cough in the child of school age. Influenza epidemics usually reach their peak in the first few months of the year, and the early, dry, irritating cough of this disease is nearly always followed by a more productive tracheobronchitis. In some patients the cough persists for several weeks after recovery from the febrile stage of the illness. If radiographs were taken of the chest of every sufferer from a persistent upper respiratory-tract infection with cough, some would be found to have mottled opacities indicating absorption collapse, a condition which is called benign or localized aspiration pneumonia.

It is clearly desirable to examine carefully all patients who seek advice about a cough which has persisted for more than a short time after an acute respiratory illness. The great majority will be found to have no eradicable cause, and treatment must perforce be symptomatic. For the child with sinusitis, ephedrine nasal drops (½% in saline) may diminish the severity of the cough. But in general the problem is to decide what sort of cough medicine to administer. Drugs given for the relief of cough fall into three main groups: those intended to liquefy the sputum and help its removal by stimulating the cough centre; those intended to depress the cough reflex; and the antispasmodic drugs which are used when bronchospasm is present as well. In view of the large quantities of cough mixtures which are dispensed—Dunlop *et al.*¹ in a pilot survey found that they constituted

8% of all prescriptions issued—it is remarkable that so few attempts have been made to assess their clinical value. The claim that emetic drugs given in sub-emetic doses will reflexly increase the bronchial secretion has never been verified in the human subject, and yet this is the basis for the use of ipecacuanha, ammonium chloride and carbonate, squill, and senega. However, Alstead² was unable to find an increase in the volume or fluidity of the sputum in patients suffering from chronic bronchitis after treatment with ordinary doses of ipecacuanha or potassium iodide.

While the value of expectorant mixtures is doubtful, we are on more certain pharmacological ground when we attempt to depress the cough reflex. Morphine, diamorphine, and methadone ("amidone," "physeptone") are all effective. This was confirmed by Hillis,³ whose method of provoking cough in normal subjects was to spray the larynx with irritant solutions. Codeine, given orally in doses of 3 gr. (200 mg.) or subcutaneously in doses of 1 gr. (65 mg.), was no more effective than saline injections. It is of special interest that in some subjects saline injections, acting through suggestion, significantly diminished the liability to cough. These observations, interesting though they are, cannot be immediately applied to the cough of respiratory disease, and most clinicians will continue to use codeine phosphate in the treatment of unwanted cough. If morphine is prescribed for this purpose it should be given in doses of at least 1/30 gr. (2 mg.). The usual morphine-containing preparation which is added to cough medicines is the camphorated tincture of opium, and the usual amount of morphine present in so-called sedative cough mixtures is of the order of 1/150 gr. (0.4 mg.) for adults and 1/900 gr. (0.06 mg.) for children. The minuteness of these doses suggests that the term depressant or sedative cough mixture is usually a misnomer. Mixtures such as the ipecacuanha and morphine mixture of the *National Formulary*, which contains chlorodyne, are more likely to be effective, though it seems illogical to combine a sedative and a stimulant expectorant in the same preparation. Methadone in doses of 2 mg. (1/32 gr.) is an effective sedative for a useless cough and is available as a linctus; it may be administered instead of diamorphine, which will no longer be imported or manufactured in Britain.

There is no doubt that the vehicle is important in cough medicines. Syrups have a soothing effect on inflamed upper respiratory passages, and the simple linctus or the squill opiate linctus of the *National Formulary* may give relief without the danger of side-effects. Sudden changes of temperature and hot stuffy

¹ *British Medical Journal*, 1952, 1, 292.

² *Lancet*, 1939, 2, 932.

³ *Ibid.*, 1952, 1, 1230.

atmospheres which may accentuate coughing should be avoided. The tickle in the throat which is so embarrassing in the theatre will usually disappear if a flow of saliva can be induced. Liquorice lozenges or almost any lozenge or sweet may be useful for this purpose. When bronchospasm accompanies a cough, greater relief is usually given by mixtures containing stramonium or belladonna or by ephedrine elixir.

It is highly desirable that more information should be obtained about the relative merits of the many preparations available for the treatment of cough. It would, for example, be fairly easy in general practice to carry out a clinical trial of linctuses. The simple linctus could be used as a control preparation and could be compared with codeine linctus and methadone linctus. This is the sort of investigation which the College of General Practitioners might well sponsor.

CANCER PREVENTION

The rising death rate from cancer in Britain cannot fail to impress our profession with the urgent need for an all-out effort to control this great killing disease. It remains one of the biggest health problems awaiting solution, though the achievements in the control of other diseases since the turn of the century give hope of progress soon in the elucidation of cancer problems, many of which are concerned with those of life itself. Meanwhile the prevention and early detection of cancer are of outstanding importance. In his recent survey R. W. Raven¹ dwelt on this at some length, since certain varieties of cancer are preventable provided the attempt is made, and he referred to the necessity for a vigorous search for possible exogenous carcinogens to whose action the population may be subjected. The prevention of certain forms of cancer in industry shows what can be achieved when the carcinogens are known, and the contemplation of the evidence linking cancer of the lung with smoking tobacco stirs the imagination with what might be done by vigorous action in an enlightened community.

Apart from some controversial data, it is generally agreed that the best chance for a patient with cancer lies in early diagnosis and efficient treatment. Discussing cancer of the cervix uteri, S. Russ² contended that if the leading facts were presented to, and understood by, the population it is a fair inference that the death rate from cancer of the cervix would fall. Knowledge is increasing about what lesions are pre-

malignant, and it is important that they should be detected in patients and treated. Hence the need for some cancer education of the public. Moreover, members of all branches of the medical profession need information of advances in this field—doctors in the public health service, for instance, may play an increasingly important part in the future. In addition, more instruction might well be given to medical students, nurses, and some ancillary workers. In this issue of the *Journal* two complementary papers on the subject appear. Drs. J. Walter and E. C. Atkinson (p. 627) call attention to the value of cancer education conducted personally between physician and patient and to the use of medical examination. Assessment of the results of an educational programme may be difficult, and it is interesting to find they detected a cancer of the colon and a cancer of the breast. The scheme's value was indicated also by the number of patients who reported with rectal haemorrhage. As to the detection of premalignant or doubtful lesions, nine male patients with various conditions required attention. Among the female patients were 32 with lesions requiring follow-up examination, and another eight were referred to hospital with lesions requiring excision but proved benign. Pelvic tumours in women are fairly common and symptomless, but can be detected on examination; early diagnosis and treatment of them, whether they are benign or malignant, are necessary, and the premalignant nature of some must not be overlooked. Over a 15-year period C. Macfarlane *et al.*³ have tried to determine the value of periodic examination in the control of cancer of the female pelvic organs and breast. They discovered seventeen patients with pelvic cancers; of these nine are still alive, with one recurrence. In addition they found 986 benign lesions of the pelvic organs in the entire group of 1,319 volunteers throughout the period; these included 547 inflammatory lesions of the cervix believed to predispose to the development of cancer. A total of 11,203 breast examinations were made on a group of 537 volunteers; 11 breast cancers were found and all had been discovered first by the patients themselves. Six of these patients are alive without recurrence from three to twelve years after treatment; two others died of coronary occlusion without recurrence, three and thirteen years later. This research shows the value of periodic examination of the pelvic organs and breasts in women who are presumably well.

Another aspect of the subject is considered in the *Journal* this week by Miss J. Aitken-Swan and Dr. Ralston Paterson; they discuss delay in seeking advice. The factors responsible for this time lag are analysed after interviewing 75 men and 239 women

patients and their relatives. It is recognized that ignorance and fear are important causes of delay, and these workers found that one-quarter of the women with breast cancer were unaware of the possible significance of their symptoms and almost two-thirds of the women with symptoms of cancer of the cervix uteri were similarly ignorant. Another fact brought out in this paper is that probably no significant relationship exists between delay and the standard of intelligence. These authors report too that a lack of confidence in what can now be done for cancer patients causes delay, a lack engendered by seeing the fate of friends with advanced disease and the silence of doctors on the subject of cancer. It is not enough to tell people of the early symptoms of cancer; they should know what action to take in certain circumstances and what can be done to help them. They should be told of patients with many varieties of the disease who are well and living normal lives many years after treatment. With this knowledge the public will be better able to play its part in the prevention and early diagnosis of the disease. The mistaken opinions that many people hold on cancer have been well brought out by R. W. Raven and J. Gough-Thomas⁴; they showed that 17% of the people they studied believed cancer is infectious, 27% believed it is incurable, and another 20% were doubtful. Two main criticisms were levelled at cancer education—that surgeries would be crowded with worried people and that cancerphobia would be created. An experiment in cancer education by Ralston Paterson and co-workers⁵ showed that these fears are groundless.

Further efforts in cancer education seem to be desirable, but how best to proceed? The Ministry of Health favours local exploratory work, and this is going on in various places. The ignorance of the public on health matters—including cancer prevention—can be gradually dispelled, and people can also be advised to consult their doctor on the appearance of symptoms or signs. Patients should quickly notice signs of cancer in the mouth, pharynx, larynx, breast, skin, salivary glands, thyroid, rectum, and cervix uteri, yet Mr. Reginald Vick's analysis at page 660 indicates that they often fail to do so. Many women discover accidentally a cancer in the breast; would it not be advisable to teach them breast palpation at definite intervals to identify a single lump? The general practitioner might well consider a periodic health examination for some of his patients, though perhaps further exploratory work such as is described in the *Journal* this week is necessary before its practicability can be finally decided.

NIGHT CRAMPS

Most of us have suffered at some time and in some degree from attacks of cramp in the legs of the type which usually affect the muscles of the calf and which always occur when the subject is at rest. Sir Arthur Hall¹ obtained a history of such nocturnal cramps from 112 of 200 normal persons between the ages of 15 and 80. That the incidence increases with age is suggested by the fact that of the people in his group who were 50 years of age or over, 70% had had cramp. Six of his subjects had had only one fulminant attack, usually following violent exertion; in 15 it was a frequent and troublesome symptom; but in most it was no more than a minor nuisance.

Many people find that cramp may be induced by certain movements of the foot or toes in bed, and they soon learn to avoid making them. Others have noted the tendency for it to occur after unaccustomed exercise, as indicated by Hall. Nicholson and Falk,² for example, reported the occurrence of severe nocturnal cramps in twenty-three young soldiers during their period of primary training, which included a good deal of marching and drill. In this group the commonest associated abnormality was some minor defect in the feet, such as pes planus. Nocturnal cramps are also a frequent complaint during the later stages of pregnancy. It has been suggested, too, that venous thrombosis in the legs may be a predisposing factor, though there appears to be no association with arterial insufficiency.

The cause of this curious malady is not known, though there is no lack of unproved hypotheses. Abnormal irritability of skeletal muscle fibres or the neuro-muscular junction, calcium deficiency, alkalosis, and "disequilibrium" of muscle electrolytes are suggestions that all have their advocates. The most popular treatment in recent years has been the administration of quinine. Harvey³ showed that quinine diminishes the ability of skeletal muscle to respond to tetanic stimulation because of an increase in the refractory period of the muscle fibres, an action comparable to the effect of quinidine on heart muscle. Moss and Herrmann⁴ gave quinine 3 gr. (200 mg.) twice daily to twenty patients whose night cramps were severe enough to disturb sleep and often lasted for months at a time. Relief was obtained within twenty-four hours, and the cramps returned when a placebo was substituted. After treatment for up to ten weeks it was often possible to stop the quinine without the cramps returning. Gootnick⁵ also reported good results from the administration of quinine to thirty patients.

In a recent study of the problem, Lippmann and Perchuk⁶ have confirmed the value of quinine salts in reducing the incidence and severity of the cramps. They also found, however, that a number of other forms of treatment were effective: these included oral dihydro-

¹ *Lancet*, 1947, 2, 231.
² *New Engl. J. Med.*, 1945, 233, 556.
³ *J. Physiol. (Lond.)*, 1939, 95, 45.
⁴ *Amer. Heart J.*, 1948, 35, 403.
⁵ *Arch. Intern. Med.*, 1943, 71, 555.
⁶ *N.Y. St. J. Med.*, 1954, 54, 2976.
⁷ *Obstet. Gynec.*, 1953, 1, 94.

¹ Raven, R. W., *Med. Offr.*, 1955, 93, 59.
² Russ, Sydney, *British Medical Journal*, 1953, 1, 580.
³ Macfarlane, C., *et al.*, *Amer. J. Obstet. Gynec.*, 1955, 69, 294.
⁴ Raven, R. W., and Gough-Thomas, J., *Lancet*, 1951, 2, 495.
⁵ Paterson, R., *et al.*, *British Medical Journal*, 1954, 2, 1219.

tachysterol, dilute hydrochloric acid or diphenhydramine, intravenous calcium gluconate, and supportive bandaging. Of all the remedies tried the most consistently efficacious, the least toxic, and the cheapest was calcium lactate, given in doses of 10 gr. (650 mg.) three times daily. The theory that there may be a deficiency of ionized calcium in these subjects has also been supported by Page and Page,⁷ who found that in two groups of obstetric patients the incidence of cramps was much higher in the group drinking larger quantities of milk. They suggest that the high content of phosphorus-containing proteins in milk leads in these patients to a rise in the inorganic phosphorus and a fall in the diffusible calcium in the blood, and they found that relief from the cramps could be obtained either by reducing the intake of milk or by administering a calcium salt free from phosphorus, such as the lactate.

IMMUNIZATION BY THE KELL ANTIGEN

The discovery of the anti-human-globulin test, or Coombs test,¹ enabled certain blood group antibodies hitherto undetectable to be recognized in many human sera. One consequence was the discovery of three new blood group systems known by the names Kell,² Duffy,³ and Kidd.⁴ The first of these to be discovered, and the most important clinically, was the Kell system.

Of the English population some 8% carry the Kell (K) antigen on their red cells. The corresponding antibody has been found in the serum of a number, now considerable, of Kell-negative persons. In every case it has been attributable to immunization either by pregnancy with a Kell-positive foetus or by transfusion with Kell-positive blood. Examples are now known of Kell antibodies active in albumin or even in saline, but it remains true that the only proved reliable method of detecting the presence of anti-Kell antibodies is the indirect Coombs test, and that with most of the available testing sera the same test must be used for detecting the Kell antigen. However, Grove-Rasmussen *et al.*⁵ claim to have devised a sensitive technique using human AB serum as a suspending medium.

Family investigations⁶ have shown that Kell reactions are controlled by a pair of allelic genes K and k. Most Kell-positive persons are heterozygotes of genotype Kk, but a small minority (theoretically 0.16% of the English population) are homozygous KK, and these if transfused with blood from a kk or Kk individual, or pregnant with a Kk foetus, are liable to become immunized to the k antigen. This was first shown to occur by Levine *et al.*, who named the k antigen "Cellano."⁷ Owing to the great rarity of KK individuals, immunization by k is of very little practical importance.

Immunization by K is, on the other hand, of considerable importance. Unlike Rh immunization, where only a minority of persons are at risk through lacking the immunizing antigen D, the majority of the population are liable to undergo Kell immunization through lacking the antigen K, but the risk is diminished by the fact

that this antigen, unlike D, is present in only a minority of donor bloods. Wiener⁸ has shown that, if D-negative persons are given two widely spaced injections of D-positive blood, 40% of them become immunized. Following Mollison,⁹ we may further assume that in clinical practice (if Rh testing were not performed) such immunization would be detected only during the direct matching test preceding yet a third transfusion, and if the blood intended for use were D-positive; in a similar way we may assume that Kell immunization, if due solely to transfusion, will be detected only on the occasion of a third transfusion or intended transfusion of K-positive blood to a K-negative recipient. From the respective frequencies of the D and the K antigens, it may be calculated that such a state of affairs will arise with only one-hundredth of the frequency with which it arises for D. Hence if D and K were of equal immunizing power, the relative frequencies of detection of immunization by D and by K would be in the ratio of 100 to 1. Since the ratio between the numbers of known cases is in fact of this order, it appears probable that in blood transfusions K is an antigen comparable in immunizing power with D. Using somewhat similar arguments, Wiener, Brancato, and Waltman¹⁰ have shown that, in pregnancy immunization, K is a very much weaker antigen than D. The severity of such cases as do occur of transfusion reactions and of haemolytic disease due to anti-K appears to be comparable to that of the cases due to anti-D. One death has with good reason been attributed to such a transfusion reaction.¹¹ Some severe cases of haemolytic disease have been described, but none of them appear to have been fatal.

Now that most mothers and practically all transfusion donors and recipients are tested for the Rh factor, the danger due to that factor has greatly diminished, while that due to the Kell antigen has presumably remained stationary and hence become relatively more important. But the rarity of anti-K testing sera shows that the absolute danger of Kell immunization is not great. Certainly the supplies of serum would not permit universal Kell testing of blood donors, or even the extensive testing that has been recommended,¹² nor would the diversion of manpower to this task be justifiable while so many other greater medical needs remain unsatisfied. But some action can be taken to avoid or mitigate the effects of immunization by the Kell antigen as well as by other antigens outside the Rh system. Some and perhaps many immunizations due to a combination of transfusion and pregnancy would be avoided if it were an absolute rule never to transfuse a woman with her husband's blood¹³—now a rare practice in England, but probably not so in some countries. Another precaution

¹ Brit. J. exp. Path., 1945, 26, 255.

² Coombs, R. R. A., *et al.*, *Lancet*, 1946, 1, 264.

³ Cutbush, M., *et al.*, *Nature (Lond.)*, 1950, 165, 188.

⁴ Allen, F. H., *et al.*, *ibid.*, 1951, 167, 482.

⁵ Amer. J. clin. Path., 1954, 24, 1211.

⁶ Sanger, R., *et al.*, *Rev. Hémat.*, 1949, 4, 32.

⁷ Science, 1949, 109, 464.

⁸ Proc. Soc. exp. Biol. (N.Y.), 1949, 70, 576.

⁹ Blood Transfusion in Clinical Medicine, p. 200. 1951, Oxford.

¹⁰ J. Lab. clin. Med., 1953, 42, 570.

¹¹ Ottensooser, F., *et al.*, *Blood*, 1953, 8, 1029.

¹² André, R., *et al.*, *Sem. Hôp. Paris*, 1954, 30, 3703.

¹³ Chown, B., *Canad. med. Ass. J.*, 1949, 61, 419.

is the use of the Coombs test in direct matching of all transfusions, at least to women before and during the child-bearing period and to all persons who either have been transfused or have been pregnant. Needless to say, the detailed serological investigation of all cases of transfusion reaction and of haemolytic disease of the newborn, while not preventing trouble, will prevent its being made worse by further incompatible transfusions. As part of this detailed investigation, it may be found desirable to search for anti-K even in sera already known to contain anti-D, for those persons who readily make anti-D may also show an enhanced capacity to make anti-K. Where such investigations are undertaken, any extensive series of results obtained should be tabulated and published as a guide to the existence or otherwise of such an enhanced immunizability.

FOOD-POISONING

Even more dismal results than in previous years are revealed by the Public Health Laboratory Service's analysis of food-poisoning outbreaks to the end of 1953.¹ In England and Wales in 1953, 5,277 outbreaks were recorded, compared with 3,519 in 1952 and 3,347 in 1951. At least 15,000 persons were reported as having symptoms, and 51 died. The organism causing death was a salmonella in 46 cases, *Staphylococcus aureus* in 2, and unknown in 3. Outbreaks included 492 of a general nature, 422 in families, and 4,363 sporadic cases. The causal organism was *Salmonella typhi-murium* in 2,405 cases, other salmonellae in 709, staphylococci in 132, *Clostridium welchii* in 25, various in 6, and unknown in 2,000. The cause was unknown mainly in those outbreaks which were not investigated because of the long delay between occurrence and reporting.

The types of salmonella isolated included 2,838 endogenous and 243 exogenous types. In this context "endogenous" means common in England and Wales and widely recognized before 1940; "exogenous" refers to organisms little known in this country before then. The endogenous organisms infecting the largest groups of cases were *Salm. typhi-murium* 2,438, *Salm. thompson* 84, *Salm. bovis-morbificans* 81, *Salm. enteritidis* var. *jena* 80, and *Salm. newport* 50. The exogenous organisms infecting the largest groups of cases were *Salm. anatum* 30, *Salm. oranienburg* 29, *Salm. bareilly* 25, *Salm. montevideo* 18, and *Salm. minnesota* 17.

As in previous years, about two-thirds of the outbreaks were attributed to infected meat, and about 80% of these outbreaks were associated with processed, made-up, or reheated meat. Milk was the vehicle of infection in 12 outbreaks (7 due to fresh, 4 to dried, and 1 to canned milk). Two of the outbreaks caused by fresh milk, due to *Salm. typhi-murium*, were large: one, which affected about 300 persons, was caused by unpasteurized T.T. milk; the other, which affected over 100 children, was caused by pasteurized school milk. In the latter

outbreak the milk was infected during bottling and after pasteurization. Of the outbreaks caused by dried milk (also infected with *Salm. typhi-murium*), one attacked about 100 schoolchildren in Yorkshire and another consisted in a series of related school outbreaks in Surrey and London which were traced to the same dried-milk plant. Infected eggs caused 25 outbreaks, of which 18 were due to duck's eggs. In 21 of the 25 outbreaks due to eggs the causal organism was *Salm. typhi-murium*. Infected sweetmeats caused 27 outbreaks: 12 of these were associated with cream buns and cream cakes and 9 with trifle, vanilla slices, and custards. Investigation of 166 outbreaks showed the source of infected food to be as follows: 58 in canteens, 42 in restaurants, 30 in shops (butchers' shops 13, cooked-meat shops 10), 21 in institutions, and 15 in private parties.

The reported incidence of food-poisoning and dysentery (reviewed in these columns recently²) is increasing. Whether the rise is due to better reporting or not—and the reported cases are only a fraction of the true incidence—it is evident that these conditions are responsible for a vast amount of preventable illness and in 1953 for almost 100 deaths. Far too many handlers of food have deplorable standards of hygiene, combining dirty habits with an attitude of indifference. The task of reducing the menace they are to the community was discussed at some length in Parliament last year, and the Food and Drugs Amendment Bill received its third reading on November 11.³ The Food Hygiene Advisory Council to be set up under this new legislation may well recommend that carefully devised propaganda, among other measures, should be directed at all food-handlers who serve the public, and the cost would probably be small against the benefit it would bring the public. Certainly the high and still rising numbers of food-poisoning and dysentery outbreaks point to an urgent need for preventive action.

TREATMENT OF ANURIA

The prognosis of acute renal insufficiency is good provided the patient can be kept alive long enough to permit structural repair and resumption of function in the distal tubule.¹ During the anuric phase treatment is by controlling so far as possible the disorders of water and electrolyte metabolism which result from the temporary exclusion of the kidneys as working organs from the system. The undesirable effects that arise when the kidneys are out of action depend partly upon inability to eliminate water, except in necessarily small amounts through the skin and bowels, and partly upon the accumulation in the extracellular fluid of toxic end-products of endogenous protein breakdown which are normally excreted in the urine. The danger of forcing fluids in these cases has been emphasized.^{2,3} Water intake should be restricted to that amount which will allow for the insensible loss, usually about 1 litre in 24 hours, depending on the surface area of the patient and his bodily and environmental temperature. To this should be added an amount of water equal to whatever

¹ Monthly Bull. Minist. Hlth (Lond.), 1955, February, 34-42.

² British Medical Journal, 1955, 1, 401.

³ *ibid.*, 1954, 2, 1236.

may be lost by abnormal routes, such as by vomiting or diarrhoea. Fluids may be given in the form of a mixture of carbohydrate and fat, whose high-calorie content minimizes the breakdown of endogenous protein and release of potassium.⁴ The diet may increase the tendency of uraemic patients to vomit, and Bull *et al.* give an emulsion of peanut-oil and dextrose solution by continuous intragastric drip.³ This lessens the tendency to vomiting, and fluid loss is minimized by returning any vomit, filtered, into the drip. If vomiting is so troublesome that the patient cannot retain the gastric tube, slow intravenous infusions of 20–50% dextrose solution given through a catheter into the superior⁵ or inferior vena cava⁶ have been given successfully.

Large quantities of carbohydrate help to keep down the level of potassium in the extracellular fluid. In concentrations of more than 8.0 mEq/l. potassium is toxic to the heart, as is shown in cases of pure hyperkalaemia by abnormalities of the electrocardiogram. Phosphate may accumulate in the plasma from much the same causes as potassium may. This leads to a depression of plasma calcium, which enhances the toxicity of potassium excess, and obscures the abnormality of the electrocardiogram due to it.¹¹ In an emergency potassium may be driven back temporarily into the cells by the administration of insulin and glucose,⁸ but Bull believes that toxic concentrations are not often encountered if the patient receives the conservative protein-free high-carbohydrate solution.⁹ Meroney and Herndon⁷ found that American battle casualties in Korea with acute renal insufficiency could not tolerate oral fluids even when given by tube. Calcium, added to the intravenous solution they employed, mitigated the toxicity of potassium. Although ion-exchange resins in the sodium phase have been used successfully to withdraw potassium into the bowel, Meroney and Herndon's patients could not take them, and when they were given rectally they were not effective. If such relatively simple expectant measures fail, the more heroic and rather more risky procedures of peritoneal¹⁰ or intestinal¹ dialysis, or the use of the artificial kidney,¹¹ or exchange blood transfusion¹² are often beneficial.

It is also important to combat infection and so prevent further tissue breakdown. Therefore any devitalized tissue should be widely excised.¹¹ Bull⁹ recommends that all anuric patients should receive a single daily prophylactic injection of 1 million units of penicillin. Nevertheless antibiotics given even in ordinary doses to patients unable to excrete them may be toxic.¹³

¹ Black, D. A. K., and Stanbury, S. W., *British Medical Journal*, 1948, 2, 1101.

² Lattimer, J. K., *J. Urol.*, 1945, 54, 312.

³ Bull, G. M., *et al.*, *Lancet*, 1949, 2, 229.

⁴ Borst, J. G. G., *ibid.*, 1948, 1, 824.

⁵ de Keyser, R., *et al.*, *Ned. T. Geneesk.*, 1949, 93, 2386.

⁶ Scott Russell, C., *et al.*, *Lancet*, 1954, 1, 902.

⁷ Meroney, W. H., and Herndon, R. F., *J. Amer. med. Ass.*, 1954, 155, 877.

⁸ Bywaters E. G. L., and Joekes, A. M., *Proc. roy. Soc. Med.*, 1948, 41, 420.

⁹ Bull, G. M., *ibid.*, 1952, 45, 848.

¹⁰ Frank, H. A., *et al.*, *Ann Surg.*, 1948, 128, 561.

¹¹ Kolff, W. J., *Amer. J. Med.*, 1952, 12, 667.

¹² Dausset, J., *Arch. Intern. Med.*, 1950, 85, 416.

¹³ Bateman, J. C., *et al.*, *ibid.*, 1952, 90, 763.

SCOTTISH HOSPITAL COSTS

Recently we drew attention¹ to the annual costing returns of hospitals in England and Wales. Those for Scottish hospitals for the same year (1953–4) have now appeared.² They, too, are drawn up under subject headings. The claim is made for these returns, as it was for the English and Welsh ones, that they enable comparisons to be made between the costs of maintaining a patient in hospitals of the same size and the same type. But to what extent are comparisons between Scottish and English hospitals valid, for at first sight it is cheaper to maintain a patient north of the border? The cost per patient per week in a general hospital of more than 300 beds is £13 9s. 9d. in England and Wales and £11 5s. 5d. in Scotland. In both cases this calculation makes allowance for what is called the vacant-bed factor—that is, for beds staffed but not used. In fact, the Scottish returns are drawn up on a basis that distinguishes between expenditure that is directly dependent on the numbers of in-patients, expenditure that is partly dependent on numbers and partly standing, and expenditure on hospital overheads such as rates and maintenance of buildings and administration. The English returns merely divide the expenditure between running charges—lumping the cost of patients' and the staff's food together—and standing charges, and adjust the total cost by the vacant-bed factor. Further, the Scottish returns extract out-patient expenditure "on the basis of the actual or estimated costs of the services rendered"; in England and Wales the gross total cost of maintaining an in-patient is again merely adjusted by the arbitrary formula that five out-patient attendances equal one in-patient day. This difference in methods of costing invalidates any comparison of items of expenditure in English and Scottish hospitals. The Scottish system of extracting out-patient expenditure altogether, instead of including it under all the subject headings and then making an adjustment in the total expenditure, certainly makes it easier for a Scottish hospital to compare its figure for, say, drugs and dressings with that of another. But what makes the total cost of maintaining a Scottish patient lower by comparison with England is the exclusion of specialists' salaries in the Scottish returns. Their inclusion would probably make the Scottish weekly expenditure much the same as the English.

One contrast can, however, be pointed out. In Scotland the cost of maintaining a patient in a teaching hospital is only 15s. to £2 a week higher than in an ordinary general hospital. In England and Wales the higher cost is about £3 10s. for provincial teaching hospitals and as much as £9 for London teaching hospitals. Scottish teaching hospitals come within the sphere of the regional boards, and the distinction in status between a teaching and non-teaching hospital are not so marked as in England. The high extra cost of independence ought to set some boards of governors thinking.

¹ *British Medical Journal*, January 8, p. 92.

² *Analysis of Running Costs of Hospitals. Year ended March 3, 1954.* Edinburgh: H.M.S.O. 9s. 6d.

EMERGENCIES IN GENERAL PRACTICE

OBSTRUCTED LABOUR

BY

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The end-result of obstructed labour, if unrelieved, is rupture of the uterus, unless the mother dies of exhaustion and shock before rupture takes place. If the uterus ruptures, the maternal mortality varies with the cause of the obstruction and the availability of expert obstetrical care, but it is always very high. It is rare for the foetus ever to survive. These considerations serve to emphasize the seriousness of neglecting actual or potential obstruction during labour.

In modern obstetric practice in Britain, rupture of the uterus following obstructed labour is rapidly becoming a rarity, although it still presents a problem of major importance in backward countries, where adequate antenatal care is not available to the large mass of the population. Obstruction is nearly always the result of malposition of the foetus or else of contraction of the maternal pelvis; less commonly it is due to atresia of the soft tissues of the birth canal or obstructing tumours. Reference to any standard textbook of obstetrics will supply a list of the malpresentations, the different types of pelvic contraction, and the soft-tissue tumours that may lead to obstruction, and there is no point in enumerating such a series here. In any case they are mostly well known and obvious. Nor will space permit of a detailed description of every individual condition that may cause obstruction. It must therefore suffice to discuss in general terms the prophylaxis and early detection of potential obstruction, and the principles underlying the management of established obstruction.

Theoretical Considerations

Within recent years we have come to understand the behaviour of the uterine muscle in labour much more clearly as the result of the work of Reynolds and others using the Lorand tocograph and other methods of obtaining tracings of uterine contractions for accurate study and analysis.

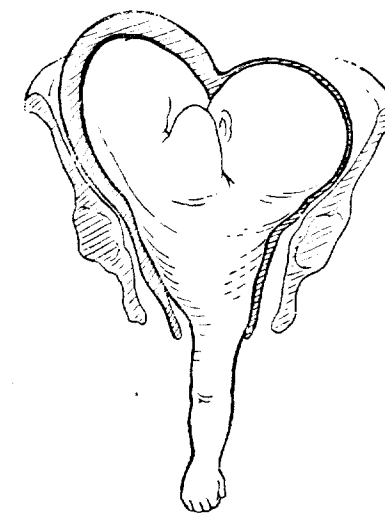


FIG. 1.—Prolapsed arm: retracted upper segment, thinned lower segment.

This confirms two fundamental facts about uterine action in obstructed labour.

1. In the presence of obstruction the pattern of uterine contractions is essentially normal: that is to say, the upper segment muscle contracts more and more strongly while the lower segment remains passive. The lower segment becomes progressively thinner (Fig. 1), and through this thinned lower segment rupture will ultimately take

place. Before this occurs, however, a pathological retraction ring (Bandl's ring), which is detectable clinically, forms at the junction of the two segments.

2. The response of the primiparous uterus to obstruction is in marked contrast to that of the multiparous one. In the former the response is a gradual increase in tonus, associated with diminishing activity. The lower segment may therefore not dilate and labour may be very prolonged, with less risk of rupture. In extreme cases the mother may die, undelivered, of shock and exhaustion; if she is ultimately delivered and survives, extensive soft-tissue sloughing may occur as a result of prolonged pressure causing ischaemia and fistulae between the rectum or bladder and the genital tract: before either of these disasters occurs the foetus may die of anoxia from progressive increase in uterine tone. In the multiparous patient, on the other hand, the response to obstruction is rapidly increasing contractions and thinning of the lower segment. Hence the uterus may rupture soon unless the obstruction is overcome relatively early in the course of labour. This difference in behaviour of the uterus is of great practical importance, and is mentioned to emphasize the greater need for urgency and speed in the management of obstruction in the multipara than in the woman labouring for the first time.

Apart from the danger of rupture of the uterus or extensive post-partum soft-tissue sloughing, there is the danger to the mother of ascending infection. This risk is especially great if the membranes rupture early and labour is protracted. In addition to the risk of injury from direct pressure, the foetus may perish from placental anoxia due to a hypertonic uterus; if it survives a prolonged labour, pulmonary or other infection, initiated during labour, may develop in the neonatal period.

From the practical point of view it will be best to consider potential or actual obstruction at different levels in the pelvis, because there are important clinical differences.

Obstruction at the Pelvic Brim

The commonest causes of this are: (a) maternal: contraction of the pelvic inlet, fibroids, or ovarian cysts; and (b) foetal: transverse lie, brow presentation, and hydrocephalus. In all these conditions there is no foetal presenting part in the pelvic cavity during the last weeks of pregnancy and in the early stages of labour, and the diagnosis is usually made before the onset of labour. However, in many cases it may be necessary to allow labour to start before certain obstruction can be detected. It is often surprising how a fibroid, even when low down in the uterus and below the foetal head, may become drawn up during labour, thereby allowing the head to descend into the pelvic cavity. Only a cervical fibroid must inevitably lead to obstruction, unless caesarean section is carried out. Should obstruction develop owing to an ovarian cyst impacted in the pelvis, caesarean section is again necessary. Such a cyst is usually adherent, and attempts to displace it upwards as recommended in older textbooks may result in rupture of or haemorrhage into the cyst.

The problems of brim contraction are many and varied, and can only be discussed here in general terms. Inlet contraction should be suspected in all cases of high head in the last weeks of pregnancy or early in labour, although disproportion and obstruction will develop in only relatively few of such cases. In the presence of a normal-sized foetus obstruction to labour is almost certain if the true conjugate is less than 9 cm., whereas if it is more than 10 cm. over

95% will end in spontaneous or assisted vaginal delivery. It is in the intermediate cases with conjugate measurements of between 9 and 10 cm. that trial of labour is especially indicated.

It is sometimes stated that it is impossible to determine whether there is or is not true cephalo-pelvic disproportion unless and until the cervix is fully dilated so that the head can descend in the birth canal. While this may be true in theory it is not entirely true in relation to inlet contraction. Early in the course of labour in these cases the membranes rupture and if the presenting part is unable to pass the pelvic brim because of disproportion the cervix may never become fully dilated, and yet obstructed labour may develop and the lower uterine segment become so thinned that it ruptures. In this type of case the differential diagnosis between delay due to cephalo-pelvic disproportion and that due to inco-ordinate uterine action of the hypertonic variety may be very difficult indeed. This in point of fact is a not uncommon clinical problem. Errors in judgment account for some at any rate of those patients whose first labour is terminated by caesarean section for alleged cephalo-pelvic disproportion and who are subsequently delivered successfully per vaginam of a similar-sized or even larger baby. Whilst trial of labour steers the patient between the Scylla of unnecessary caesarean section and the Charybdis of dangerous induction, it is not an infallible means of determining cephalo-pelvic disproportion in all cases.

The management of inlet contraction can be considered briefly under three headings.

1. Prophylaxis

Careful assessment of the high head in the last weeks of pregnancy is essential. In the multiparous patient who has previously lost a baby during the course of an obstructed labour, premature induction of labour is often advisable. Remember that the size of the baby tends to increase in succeeding pregnancies, and that obstructed labour may develop in a woman who has had several successful vaginal deliveries.

2. Early Detection

It is important to diagnose as early as possible that delay in labour is due to disproportion which will eventually cause obstruction if neglected. Early detection while the mother's condition is good and the foetus still alive and well is imperative if good results are to be obtained. Marshall's figures presented to the 12th British Congress of Obstetrics and Gynaecology, analysing 2,276 caesarean sections, showed no maternal mortality if caesarean section was undertaken within six hours of the onset of labour, 0.35% if undertaken within six to twenty-four hours, but 2.49% if labour had lasted over forty-eight hours. Nevertheless, the differential diagnosis of the cause of delay during the first stage of labour between disproportion and inco-ordinate action is sometimes far from easy. In some cases both conditions may in fact be present.

In cases of disproportion the pattern of uterine action is essentially normal. Upper segment tone increases, but at first there is normal relaxation between contractions which are regular and of normal strength. As the duration of labour increases the lower segment becomes more and more dilated and thinned until ultimately a Bandl retraction ring is formed which is visible in the abdomen. With the drawing upwards of the junction between the upper and lower segments the bladder too is drawn up, so that it becomes easily visible even though it may contain only a few ounces of urine. On vaginal examination the cervix tends to hang down from the head, which is lodged tightly in the brim and becomes progressively more oedematous from prolonged pressure. There is no spasm of the cervix during a contraction of the upper segment. A large caput forms on the head and moulding is excessive. In brim contraction asynclitism is exaggerated and posterior parietal presentation is a bad prognostic sign. The head cannot be pushed down between contractions, nor does it descend during a contraction. Moir and others have shown the value of lateral radiography

during labour in helping to arrive at a prognosis. Once the labour is obstructed lower segment caesarean section must be carried out before foetal distress or death occurs.

3. The Management of Established Obstruction

In some cases the foetus may be dead, and in multipara rupture of the uterus may be imminent. The alternatives of caesarean section and craniotomy are often debated. There is a natural tendency to avoid caesarean section if the foetus is already dead, but the hazards of craniotomy if the head is above the brim, the lower segment dilated and on the point of rupture, and the cervix not completely obliterated cannot be stressed too strongly. In such cases perforation and embryotomy carry a grave risk of shock, haemorrhage, and trauma. Modern antibiotics have made caesarean section the safer alternative for the mother even though the foetus is dead. The exception to this is the hydrocephalic head. Here, perforation alone is all that is necessary to collapse the head and spontaneous delivery will take place.

The management of obstruction due to the impacted shoulder or brow presentation requires equally careful consideration. In the absence of pelvic contraction the brow

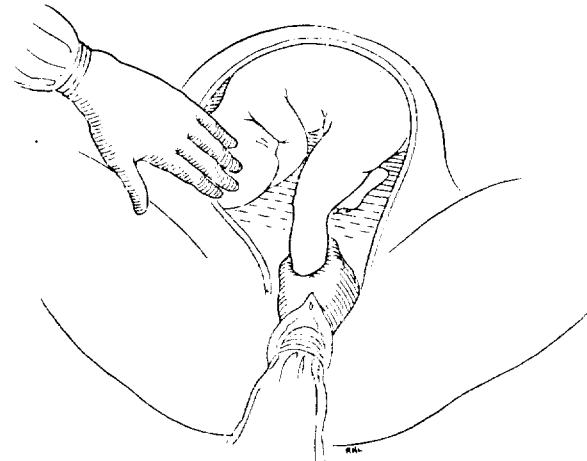


FIG. 2.—Internal podalic version.

presentation can usually be corrected manually to a face or vertex if the cervix is at or near full dilatation, and then a forceps delivery can be carried out. If diagnosed earlier in labour, very soon after rupture of the membranes, bipolar podalic version may be safely undertaken (Fig. 2). Sound obstetric judgment and experience are necessary to decide whether it is safe to carry out internal version when an arm or shoulder presents. If this is done the uterus should always be explored afterwards to make sure that the lower segment has not been ruptured. It is seldom if ever necessary to do a caesarean section for an impacted shoulder presentation with a dead foetus. Decapitation, using a decapitation saw, is not too dangerous or difficult to be undertaken by an experienced obstetrician. The patient is nearly always a multipara and the birth canal dilated so that the neck can be pulled well down into the pelvis before decapitation is undertaken. The transverse lie in the primigravida, due to gross inlet contraction, placenta praevia, or uterine fibroid, is an entirely different problem and always calls for caesarean section even though the child is dead.

Obstruction Associated With Mid-Pelvic Contraction

Mid-pelvic contraction occurs at the level of the ischial spines, the interspinous diameter falling below the normal 10 cm. and the posterior sagittal diameter of the mid-pelvis falling below 5 cm. Mid-pelvic contraction is often associated with the android-shaped pelvis, the fore-pelvis being narrowed and the anterior surface of the sacrum straightened. Often the head descends in the transverse instead of the oblique diameter of the pelvis and becomes arrested at this

level—deep transverse arrest. It is also at this level in the pelvis that obstruction may develop if contraction is present and the foetus is presenting as an extended breech.

The development of obstruction in the mid-pelvis will in most cases only become apparent in the second stage of labour. At the beginning of labour the head may be fixed in the brim, if not actually through it; the first stage proceeds normally and often rapidly, but delay occurs in the second stage. In some cases which are complicated by inco-ordinate action the cervix may not become quite fully dilated. This seldom occurs if uterine action is normal.

Failure to recognize mid-pelvic contraction accounts for a great many stillborn babies, because only rarely is the contraction so great that the child cannot be pulled through the contracted diameters with axis-traction forceps if enough force is used. In many cases if the occiput is posterior or transverse, correction of the position with consequent reduction of the diameter of the foetal head will enable a successful forceps delivery to be completed. In many cases the position of the foetus is favourable and yet the application of forceps fails to deliver the baby when reasonable force is used. Only experience can educate the obstetrician to know just what strength of pull is reasonable and safe following application when the head has not yet passed the ischial spines.

The application of forceps at this level has come to be known in recent obstetric literature as a trial of forceps. It is something that should never be undertaken deliberately outside hospital and then only by an experienced obstetrician. Few cases of trial labour should be carried to this limit, but it is important for the doctor to realize the possibility of failure of forceps being due to mid-pelvic contraction which may not have been diagnosed before labour. He may encounter such an emergency unexpectedly in domiciliary practice. If the head is very moulded he may think it is below the mid-pelvis, but in that case need experience no shame at removing his forceps and sending the patient to hospital. Caesarean section may be undertaken even at that late stage.

In hospital trial of forceps is legitimate practice, even when these difficult cases have been studied thoroughly by radiography during the antenatal period. It requires much more experience and courage to admit that the baby cannot be delivered safely by forceps than it does to pull out a dead or damaged baby by sheer force. If the baby is already dead, owing to obstruction at this level, perforation and extraction is usually preferable to caesarean section and does not carry the same risk of maternal shock and trauma as when the foetus is obstructed at the pelvic brim. Mid-pelvic contraction may cause difficulty in the delivery of the extended breech, because impaction and obstruction may occur. It is deemed by some that a trial of labour is not possible in a breech delivery. It is reasonably fair to say, however, that if the extended breech is delayed in the mid-pelvic cavity the cause of the delay is not primarily the extended legs but disproportion, due either to mid-pelvic contraction or a very large child. Bringing down the leg may enable the baby to be delivered, but the foetal loss associated with this particular procedure at this level of obstruction is very high and in my opinion caesarean section is justified under these circumstances.

Obstruction at the Outlet

While delay at the outlet is relatively common, true obstruction is rare. It may occur if the foetus is abnormally large and/or in the posterior position. It may occur if there is true bony contraction. Some authorities deny the existence of the latter in the absence of inlet or mid-pelvic contraction, but most obstetricians of experience encounter the occasional funnel pelvis. Contraction of the intertuberous diameter below the normal 10 cm. does not necessarily lead to outlet dystocia provided the posterior sagittal diameter is generous, so that the head can be born posteriorly instead of close to the symphysis pubis. Very rarely obstruction at the outlet is due to extensive stenosis of the vaginal introitus due to scarring, or to soft-tissue tumours of the vagina

(fibromata, cysts of Gartner's duct, etc.). Vulval scarring enough to cause outlet dystocia is hardly ever seen in this country, but in the Kikuyu women of Kenya and in other native tribes where female circumcision is still practised it is a relatively common occurrence.

The management of outlet obstruction is always difficult if the foetus is still alive and normal. Generous episiotomy, if necessary passing wide of and behind the anus, increases the available space enormously, so that the baby may be delivered safely with forceps even face to pubis. Bony contraction so gross as to cause genuine outlet obstruction only rarely remains undetected until so late in labour. The choice in such cases falls between a difficult caesarean section and the operation of symphysiotomy. The latter operation has received something of a revival lately, but is only rarely undertaken and then only at the hands of those who are experienced in the operation. If the child is already dead or is abnormal—for example, hydrocephalic—perforation is not difficult or dangerous at this level.

While outlet contraction and disproportion are not uncommon in a minor degree and in association with contraction of the brim or cavity, true outlet obstruction due to bony contraction is very rare. Delay and minor disproportion can usually be overcome by generous episiotomy, an operation also necessary in cases of gross cicatrization of the soft tissues.

Space does not permit of more than a passing mention of obstructed labour associated with organic rigidity, stenosis, or atresia of the cervix. Suffice it to say that it is a relatively uncommon condition, most cases of so-called rigid cervix being in fact examples of cervical spasm or associated with hypertonic uterine inertia. Nevertheless, cases of organic stenosis do occur; reports of complete annular detachment of the cervix from the pressure of the advancing head have been recorded. In most cases caesarean section is necessary, but incision of the cervix (Dührssen's incisions) may be carried out, but only if bony disproportion at all levels in the pelvis can be ruled out for certain.

Modern antibiotics have made caesarean section late in labour a procedure which is relatively safe for the mother and child. By its use we can often escape from the consequences of poor judgment and carelessness. The better our antenatal care the fewer will be the examples of obstructed labour that we shall encounter, except those which occur during the course of a planned trial of labour. A steady decrease in the incidence of obstructed labour is one of the most spectacular successes of modern antenatal care.

Next article on Emergencies in General Practice.—“Haematemesis and Melaena,” by Dr. T. Hunt.

Refresher Course Books.—Copies of the first two volumes of collected articles from the Refresher Course for General Practitioners published in the *Journal* are still available at 25s. (postage 1s.) each. The first volume contains 55 articles and the second 60. Each article has been revised and brought up to date by its author.

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An outstanding problem in Singapore to-day, according to the *Medical Department Annual Report, 1953*, is the provision of facilities for out-patients. Immediately before the 1939-45 war the annual attendance of out-patients was 87,000, in 1947 it was over 305,000, while by 1953 the figure had reached 957,000. “This development,” writes Dr. W. J. VICKERS, the director of medical services, “is quite different to that in the United Kingdom and elsewhere in that the public has created and demands a direct patient-clinic service without the intervention of the private general medical practitioner.” The demand has been met by the Government providing a National Health Out-patient Service in its hospital divisions.

PROGRESS IN CANCER REGISTRATION

A SURVEY OF THE DEVELOPMENT OF A
CANCER RECORDS BUREAU FROM
1945 TO 1954

BY

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Consulting Surgeon to St. Bartholomew's Hospital

The first steps in the introduction of a scheme for recording cases of cancer on a national basis were taken by the Radium Commission, which, from 1930 until the National Health Service Act of 1946, controlled the supply of radium to the radiotherapy centres. During the war the collection of records from the centres was suspended.

In 1939 the Cancer Act required the council of every county and county borough to make and submit for the approval of the Ministry of Health arrangements for adequate facilities for treating cancer patients in their area. They were also advised to provide for the keeping of records, which were to be submitted ultimately to an authority designated by the Ministry. In 1944 the Ministry instituted registration cards and abstract cards for approved centres. The Radium Commission introduced similar arrangements for their centres. In June, 1945, the Radium Commission was nominated temporarily as the statistical bureau for collection and analysis of cancer records. This duty was taken over by the General Register Office in 1947, with whom it rests to-day.

Formation of the South-western Regional Bureau

When the war was over, the county councils of Gloucestershire, Somerset, and Wiltshire and the county boroughs of Bristol, Bath, and Gloucester got to work. They formed a cancer advisory committee and appointed the late Professor Rendle-Short as medical adviser. At that time they were responsible not only for records but for the facilitation of the diagnosis of cancer, for the treatment of patients suffering from that disease, and for the payment for care, maintenance, and travelling expenses of all such patients. One other point should be emphasized here—the principle, strongly supported by the Ministry, was that hospitals should not be recognized for service under the Cancer Act unless the surgical staff were whole-time consultants not engaged in private practice. This caused many delays and hampered the development of the scheme.

A records office was, in the first instance, established at the Bristol General Hospital, a records officer was appointed and subsequently four clerks to assist him, the whole under the clinical control of the medical adviser, and the administrative control of the house governor of the teaching group of hospitals. This organization worked smoothly, and by March, 1948, about 2,500 new cases were dealt with annually and 1,900 survivors were followed up, making a total of 4,400 cases handled.

Similar arrangements were made in Plymouth for the counties of Devon and Cornwall, and Mr. Duncan-Wood was appointed director for that area in 1947. It was not until 1948 that the Royal Devon and Exeter Hospital and the Torbay Hospital (Torquay) were included.

The Cancer Act was repealed by the passing of the National Health Service Act in 1946, and on the appointed day in 1948 the Regional Hospital Board took over the whole organization of the South-western Region, with offices at Bristol and Plymouth and cancer record clerks at Redruth, Torbay, and Exeter.

In 1952 the medical adviser at Bristol and the director at Plymouth resigned and one director was appointed in charge of the entire region and the two offices (October, 1952). Some co-ordination between the two areas had already taken place, but each area produced its own report in its own chosen form. In 1952 the reports of cancer statistics for the two areas were combined in one volume, but in 1953 the figures for the whole region were grouped together and critically analysed under each site of cancer in the body.

As both offices had been running—though only covering a much smaller number of hospitals—since 1945, it has been possible to produce a five-year survival rate for the entire region, and since 1948 all hospitals in which cancer is treated have been included. Thus a much more valuable statistical review has been possible.

Advances in Registration

Further advances in cancer registration are being carried out. An effort is being made to get as near the 100% registration as is possible. In order to do this, hospitals of all types (including mental hospitals, geriatric units, etc.) have been prevailed upon to send in records of their cancer patients. Medical officers of health have co-operated by sending in detailed returns of all cancer deaths at regular intervals. The analysis of these returns is providing much useful information, not the least important of which is the pin-pointing of those hospitals which are failing to register their patients with the bureau. It is hoped, ultimately, to register even those patients who never go into hospital at all. Surgeons throughout the region have been asked to register their private patients with the bureau, and the majority of them have agreed to do so.

Every patient registered has a case-history sheet, which contains all the available details, often from more than one hospital. From this history an abstract card is prepared, giving essential information, which is passed on to the office of the Registrar-General. Marginal punch cards are also prepared for every patient registered, and these cards are of inestimable value in any survey that may be required, such as the annual report, and for any special statistical investigation that is carried out. The information they contain is available to any surgeon who asks for it, and we have been able to answer many inquiries.

All these developments have greatly increased the number of registrations and the work of the bureau, which has entailed a small increase of staff.

Personnel of the Bureau

The personnel is now arranged as follows: (1) The director is responsible for the control of the work of the bureau and for the production of an annual report. This involves attendance at the two offices of the bureau, one in Bristol and one in Plymouth. (2) A records officer at each place: both of whom have been with the bureau since before the appointed day. (3) The requisite number of graded clerks—four at Bristol and three at Plymouth. Recently an extra clerk has been appointed at each office to cope with the rising tide of registrations. There are also cancer clerks at Exeter, Torbay, and Redruth.

Annual Report, 1953

Below is given an analysis of the annual report of the bureau for the year 1953—issued in December, 1954. The total population of the Region was 2,897,087 (1951 census), and Table I indicates the work being done.

	Bristol	Plymouth	Combined Total
Total No. of cases registered to end of 1953	23,136	16,043	39,179
No. of new cases registered in 1953	3,883	2,705	6,588
No. of cases followed-up in 1953	10,000	6,183	16,183

The report is circulated to all the regional hospital boards, to every surgeon in the region who treats patients suffering

from cancer, to all hospitals and medical officers of health within the region, to the Ministry of Health, the General Register Office, to all relevant medical committees, including local medical committees, indicating that more copies are available for any interested general practitioners, to all radiotherapeutic departments, to all medical schools in the British Isles, and to the medical press.

It shows the state of registration in 1953 for each hospital in the two areas, the distribution of registrations by counties, and, in the Plymouth area, is accompanied by special tables showing the distribution of cancer registration in clinical areas. The report contains statistical tables which indicate under each anatomical site the total number of patients treated in both the Northern (Bristol) and the Southern (Plymouth) areas, the method of treatment, and the number of survivors. It indicates the five-year+ survival rate under each site and comments on the clinical history of the survivors.

Beneath the heading of certain "accessible" sites—the breast, cervix uteri, and uterus—the patients are classified under the recognized stages (Manchester staging) and the survival rate is indicated under each stage. When the numbers of untreated cases appear to be of statistical significance they are given.

The order in which the malignant growths are taken follows, so far as is possible, the classification of the World Health Organization. Two examples of the way in which the statistical tables are set out are shown in Tables II and III.

TABLE II.—Malignant Growths of Large Intestine (Excluding Rectum)

	Total Cases		Patients Alive	
	Bristol	Plymouth	Bristol	Plymouth
Radical surgery	95	62	41	31
Palliative	71	50	—	5
Not treated	76	35	—	—
Total	242	147	41	36
	389		77	

Five-year+ survival rate=20%.

The comments on survivors in Table II are as follows: Age—youngest 32; sex—men 27, women 50. Treatment:—Partial colectomy, 60; exteriorization and subsequent closure of colostomy, 12; colostomy only, 3; surgery and radiotherapy, 2. Sites:—Sigmoid and pelvic colon, 31; transverse colon, 12; caecum, 7; ascending colon, 6; descending colon, 6; hepatic flexure, 5; splenic flexure, 5; recto-sigmoidal junction, 5.

TABLE III.—Malignant Growths of Mouth (Excluding Tongue)

	Total Cases		Patients Alive	
	Bristol	Plymouth	Bristol	Plymouth
Surgery	11	2	8	1
and radiotherapy	—	6	—	1
Radiotherapy	32	30	3	3
Radium	15	10	7	9
Total	58	48	18	14
	106		32	

Five-year+ survival rate=30%.

The comments on survivors in Table III are as follows: Age—youngest 30, oldest 83; sex—men 23, women 9. The series includes one case of rhabdomyoma of the cheek, treated by excision. Sites:—Floor of mouth, 10; alveolus, 7; palate, 6; cheek, 5; tonsil, 2; lower jaw, 1; fraenum, 1. Biopsy was positive in most cases.

Space does not allow of the setting out of all the tables in *extenso*. In Table IV is given a summary of the figures under each anatomical site. The breast, cervix, and uterus are dealt with in a later table.

TABLE IV.—Summary of Registrations According to Anatomical Site

Site of Malignant Growth	Total Cases	Patients Alive	5-year+ % Survival
Lip	286	142	55
Tongue	141	25	17.7
Salivary glands	54	34	63
Mouth (excluding tongue)	106	32	30
Pharynx, larynx, etc.	170	25	15
Oesophagus	203	4	2
Stomach	492	25	5
Large intestine (excluding rectum)	389	77	20
Rectum	437	61	14
Pancreas	40	1	2.5
Thoracic organs	408	11	2.7
Ovary	179	43	24
Prostate	206	30	15
Testis	59	35	59
Penis	56	24	43
Kidney	59	17	29
Bladder	163	38	23
Skin (malignant melanoma)	79	25	32
Eye	18	11	61
Brain and central nervous system	29	9	31
Thyroid	52	15	29
Bone	137	16	11.6
Lymphadenoma	120	33	27.5
Leukaemia	125	9	7

Comments on some of the five-year+ survival rates shown in Table IV are as follows.

Lip.—It is distressing to note the relatively high mortality for what is, after all, an "accessible" cancer. Many of the patients presented themselves at a late stage and were treated by radiotherapy.

Tongue.—The high mortality of cancer of the tongue is demonstrated. No fewer than 48 of these patients presented themselves late and were treated by radiotherapy alone. Only two of these survived for five years.

Salivary Glands.—Parotid glands involved in 31 survivors, submandibular in only 3. All proved malignant cases.

Oesophagus.—The appalling mortality of cancer at this site is illustrated.

Stomach.—This includes nearly 500 cases with only 5% survival. No fewer than 3 patients thought to be inoperable in 1948 or earlier are alive and well to-day.

Large Intestine.—Already dealt with.

Rectum.—34 abdomino-perineal survivors, 11 perineal, 6 conservative resection, 2 with hysterectomy, and 2 inoperable.

Pancreas.—Evidently no cases of mistaken diagnosis in this series.

Thoracic Organs.—7 of the survivors treated by pneumonectomy, 4 by radiotherapy only.

Testis.—Surprisingly high survival rate. 26 seminomata, 6 teratomata, 1 adenocarcinoma. No pathological report in 2 cases. In only one patient were the testes not in the scrotum.

Malignant Melanoma of Skin.—32% alive and well to-day. All proved malignant melanoma histologically. 5 cases excision only; 15 excision and radiotherapy with 7 removal of glands; 4 wide removal.

Thyroid.—Total thyroidectomy and radiotherapy in 2 cases. Partial thyroidectomy and radiotherapy in 9 cases. Radiotherapy alone 3 cases. Radium after wedge resection 1.

Bone.—Seven cases of osteogenic sarcoma amongst the survivors.

All the figures in Table V and throughout the report cover the work of a considerable number of surgeons, and every patient was treated between 1945 and 1948.

The table indicates that the earlier the condition is diagnosed and efficiently treated the better the prognosis. The later the stage the higher the mortality.

TABLE V.—Some Five-year Survival Rates

Site of Malignant Growth and Stage	Total Cases	Patients Alive	% Survival
Breast:			
I	531	331	62
II	328	130	40
III	107	33	31
IV	228	18	8
Cervix:			
I	73	43	59
II	102	35	34
III	93	17	18
IV	32	4	13
Uterus:			
Early	123	76	62
Late	88	21	24

Summary

An account is given of the gradual development of a regional cancer records bureau.

In view of the increasing interest in cancer registration, it is hoped that this account may help those who are in the process of organizing such centres.

An analysis of the statistical review contained in the annual report of the bureau is given—showing total number of cases under each anatomical site and number of survivors. A five-year+ survival rate is given in percentages under each site. A clinical survey of survivors is detailed.

Under certain "accessible" cancers the survival rate at the various stages of the disease is indicated and the vital importance of early diagnosis and treatment is stressed.

My thanks are due to the officers of the South-western Regional Hospital Board for their unflinching help, and to the cancer records officers, without whose help this report could not have been compiled.

EPISTAXIS

At the clinical meeting for general practitioners held at the Institute of Laryngology and Otology, Gray's Inn Road, London, on February 11, Mr. C. GILL-CAREY discussed "Epistaxis."

Nine out of every ten cases of epistaxis were not serious, he said, in that there would be no grave underlying disease or risk of undue blood loss. But nose bleeding caused alarm, and the doctor's prestige was enhanced by efficient treatment. Most often the source of the bleeding was on the septum anteriorly, and could be controlled without tight packing by using a small plug of some non-irritating material such as gauze or cotton-wool impregnated with petroleum jelly or bismuth, aided by digital pressure on the ala nasi by the patient. If the bleeding recurred and cauterization became necessary, Mr. Gill-Carey suggested local infiltration with procaine and adrenaline injection (B.P.) before the removal of the plug. This would produce temporary haemostasis as well as analgesia of the nasal skin and mucous membrane. For severe bleeding from the anterior part of the septum he advised coagulation by diathermy.

When is it Serious?

Epistaxis, even when mild, might be the first sign of some serious underlying disease, such as a blood disorder, a malignant neoplasm in the nose, hypertension, or diphtheria. These and other possibilities, although not common, had always to be borne in mind.

Arterial disease was responsible for most cases of intractable bleeding, and in a third of them the bleeding artery was relatively inaccessible. Such patients were seldom benefited by a combination of nasal and post-nasal plugging. It was better to ligate the internal maxillary artery via the antrum or the ethmoidal arteries through an orbital incision. In these patients there was a real danger of coronary throm-

bosis if the blood flow was allowed to continue unchecked for too long.

Replying to questions, Mr. Gill-Carey expressed a poor opinion of ice in treatment: it had little effect on the bleeding. Nor did he advocate soaking plugging material in vasoconstrictors such as adrenaline, as vasodilation would follow the vasoconstriction. Packing an already infected nose, he agreed, increased the risk of sinusitis, and if packing was necessary for more than a few hours systemic antibiotic therapy should be given. Asked about the treatment of hereditary telangiectasis by ethinyloestradiol, Mr. Gill-Carey said that one of his own cases had been partially controlled by it, and that the treatment appeared to offer real relief in this grave and crippling disease.

Reports of Societies

CORONARY THROMBOSIS: ROLE OF DIET AND ATHEROSCLEROSIS

A joint meeting of the Sections of Pathology and Epidemiology and Preventive Medicine discussed "Coronary Artery Disease" at the Royal Society of Medicine on March 1. Professor L. P. GARROD, president of the Section of Pathology, was in the chair.

Morbid Anatomy of Atherosclerosis

Professor T. CRAWFORD (Department of Pathology, St. George's Hospital, London) opened the discussion with an illustrated account of the morbid anatomy of coronary atherosclerosis in man. The yellowish-white plaques of atheroma were well known, but it was often difficult to tell from post-mortem examination what effect they had had on the calibre of the vessel. It was certainly not true that large plaques necessarily narrowed the lumen. He had studied this problem by injection techniques using stereoscopic radiography to demonstrate irregularity and narrowing, which were particularly common in the descending branch of the left coronary artery. Normally the intima of the coronary arteries was thicker than that of comparable arteries elsewhere, even in young children. Sections through the earliest lesions showed a slightly thickened intima in which a varying amount of fat had appeared. This might be either diffusely scattered or collected into the cytoplasm of macrophages which came to lie in groups immediately beneath the endothelium. A varying amount of the material was birefringent, and chemical examination showed the presence of cholesterol and its esters as well as neutral fats. In more advanced lesions the fatty material was separated from the lumen by a progressively thicker layer of rather acellular laminated collagen fibres. Eventually the lumen became distorted, and thrombosis was apt to occur.

If the patient survived the initial thrombosis, one of two things might happen: either a lumen was quickly re-established by retraction of the thrombus to the side of the vessel, or there was a more gradual recanalization of the thrombus by fusion of the capillaries which grew into it during the process of organization. These might eventually proliferate to form a type of cavernomatous transformation of the segment of vessel. However, this was often only of temporary benefit to the circulation because the thrombotic process was frequently repeated in the new channels. The most important recent advance in the understanding of atherosclerosis was the demonstration by Duguid that fibrin incrustations occur on the intima and are quickly covered by a fresh layer of endothelium. Organization of these fibrin deposits, continued Professor Crawford, took place both from the vessel lumen and from the vasa vasorum. Small incrustations thus became organized throughout and resulted in nothing more than some fibrous thickening of the intima: but larger or superimposed deposits might be incompletely organized, a layer of unorganized amorphous debris persisting between the zones of surface and medial organization.

Experimental Production of Atherosclerosis

Dr. J. E. FRENCH (Sir William Dunn School of Pathology, Oxford) described some of the ways in which atherosclerosis can be produced in experimental animals. Spontaneous atheromatous lesions were rare in animals, he said, but could be produced artificially by procedures which caused gross disturbance of the normal lipid metabolism. This might be achieved by adding excess cholesterol to the diet of rabbits or chicks, and also by feeding cholesterol to dogs with hypothyroidism and to Cebus monkeys maintained on a diet deficient in methionine. A somewhat different type of arterial lesion had been described in rats on a diet deficient in choline.

The lesions produced by cholesterol feeding in experimental animals showed an accumulation of cholesterol, cholesterol esters, and other lipoids, mostly within macrophages, in the arterial intima, and in this respect resembled the lesions of atheroma in man.

The intimal deposits seemed to be derived from the plasma lipoids. Hypercholesterolaemia was an obvious factor, but was probably less important than the relative proportion of the different plasma lipoids. Thus the severity of lesions might be reduced in rabbits by measures which, even in the presence of marked hypercholesterolaemia, elevated the relative concentration of phospholipid and neutral fat. A further important factor was the type of complex which the cholesterol formed with the plasma proteins. In animals developing atheroma the greater part of the plasma cholesterol was in the form of β -lipoprotein—a reversal of the situation in the normal animal. Analysis of the plasma β -lipoprotein complex in rabbits and Cebus monkeys developing atheroma had suggested further that the severity of the lesions might be correlated with the concentration in the plasma of a particular cholesterol-containing component of this complex. This component was not present in the blood of normal animals. In addition to this component the plasma of cholesterol-fed rabbits contained visible lipid particles responsible for about 50% of the total cholesterol. Unlike the particles present in alimentary lipaemia, the chylomicra, these particles in the cholesterol-fed rabbit were not dispersed by the heparin-clearing reaction and might not be able to leave the blood stream in a diffusible form.

From these considerations, Dr. French suggested that abnormal cholesterol-containing lipid complexes from the plasma might accumulate in the arterial intima in one of two ways: either relatively small molecular components of the β -lipoprotein complex might permeate the endothelium and precipitate in the intimal connective tissue; or the larger particles might adhere to the surface of the endothelium, there being taken up by macrophages and incorporated in the intima by overgrowth of endothelial cells.

Fat in the Diet

Professor H. W. FULLERTON (Department of Medicine, Aberdeen), in considering the role of diet in the production of atheroma, thought that progress had been delayed by two factors: the belief that the lesion is a primary degeneration, and the assumption that cholesterol plays a primary part in causation. The amount of cholesterol required to produce atheroma in animals was enormous, out of proportion to the rather modest amounts in the human diet. Moreover, atheromatous plaques often contained other lipids. The most notable change in the nation's dietary over the last 50 years had been the increase in the consumption of fat, and there was little doubt that the incidence of coronary artery disease had also increased. Fat intake was greatest in the higher-income groups, where coronary disease was also greatest. Mortality rates were high in countries with the greatest consumption of fat: they fell in Norway when fat intake dropped during the war.

The striking incidence of atheroma in patients with hypercholesterolaemia from various causes suggested that the disease might be related in some way to the lipaemia that occurs after fatty meals. Accordingly the speaker had studied the effect of alimentary lipaemia on the mechanism of clotting. He found a striking decrease in clotting time

three to four hours after a meal containing 85 g. of fat, compared with controls on a normal ward diet. Those patients whose clotting time was shortened had also macroscopic lipaemia. Most people at some time must presumably exceed the critical level of fat intake at which clotting tends to increase, but this could hardly be the only factor in atheroma. Constitutional and sex differences were important, and there might be variations in fibrinolytic activity. The blood flow in the coronary arteries was greatly reduced during ventricular systole, and might almost cease in the left coronary: this would facilitate the deposition of preformed fibrin, and might be the starting-point of atheroma.

Atherosclerosis Not the Whole Answer

Dr. J. N. MORRIS (Social Medicine Research Unit of the Medical Research Council) described the preliminary results of a nation-wide inquiry into the epidemiology of coronary atherosclerosis. A curious feature of mortality statistics in the last 30 years had been a flattening out of the death rate in middle-aged males. This was due mainly to the high incidence in them of ischaemic heart disease and carcinoma of the bronchus. In 1950 the highest death rate from ischaemic heart disease occurred in the professional classes and the lowest among semi-skilled workers. Deaths were more common in town than in the country; and sudden death from it was twice as frequent in London bus drivers as in bus conductors.

A review of necropsy records at the London Hospital had not shown any increase in the pathological evidence of coronary atherosclerosis comparable to that which had occurred clinically. There were other puzzling relationships between the atherosclerosis and ischaemic heart disease. It was therefore decided to investigate the prevalence of coronary atherosclerosis and its various manifestations in a large necropsy series. An appeal made to pathologists throughout the country for help had met with a very generous response. The limitations of this kind of investigation were obvious; but some interesting pointers had already appeared from a breakdown of the preliminary figures. A miscellaneous group of patients—those dying from causes other than ischaemic heart disease or conditions liable to give rise to it—were used as the basis of a model of what is going on in the population as a whole. At least three-quarters of men had naked-eye pathological evidence of coronary atherosclerosis by the age of 45, said Dr. Morris. Ten to twenty per cent. of men between the ages of 45 and 70—the percentage rose with age, had many, or severe, lesions comparable to those in patients with ischaemic heart disease (though actually in the group of patients with clinical evidence of the disease one-fifth of the necropsies showed only moderate changes in the coronary arteries). If the results of this analysis could be accepted as roughly applicable to the general population, these estimates of 10 and 20% had to be compared with estimates of 1 and 5% at the same ages for those with clinical ischaemic heart disease, and the annual mortality from the disease of 1 in 1,000 in the former group with that of 1 in 150 in the latter group. It should not be assumed, therefore, that the causes of coronary atherosclerosis are sufficient to cause ischaemic heart disease. Additional social factors might be involved in the production of the clinical disease, and these might offer opportunities for preventive action.

Discussion

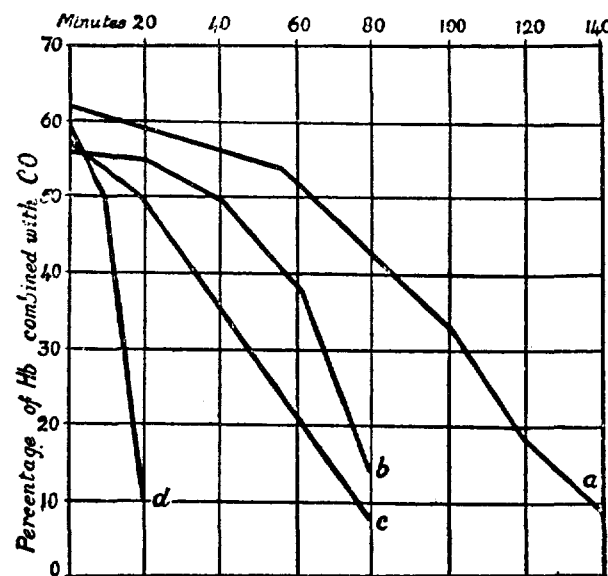
In the discussion which followed, Dr. J. E. COTTS (Cardiff) gave details of a small survey of miners in the Rhondda Valley. The incidence of clinical ischaemic heart disease was significantly greater in the heavier miners and in those with higher blood pressures. Dr. Z. A. LEUNER (London) mentioned that the α -lipoprotein concentration was lower in women than in men, and could be decreased by castration and increased by testosterone. A number of questions were asked about the part played by stress. At the moment diet and occupation seemed to be more important factors, but Dr. MORRIS hoped that psychological and endocrinological methods could soon be applied to population studies of cardiovascular disease in middle age.

Correspondence

Gases in Artificial Respiration

SIR.—The interesting and erudite article by Dr. K. W. Donald and Professor W. D. M. Paton (*Journal*, February 5, p. 313) concludes "that in first-aid practice carbon dioxide should not be administered with oxygen in the resuscitation of subjects requiring and receiving artificial respiration." The article is subtitled: "A Report to the Medical Research Council by its Committee for Research on Breathing Apparatus for Protection against Dangerous Fumes and Gases." Therefore, presumably, a main purpose of the article is to influence doctors to advise those likely to administer first aid, such as firemen and mine rescue workers, not to use oxygen and carbon dioxide mixtures. Is this conclusion correct in regard to poisoning by the commonest dangerous gas—carbon monoxide? It may be, but the report does not present much direct evidence on the point but reaches its conclusion by arguments based on general physiological considerations or by analogy with anoxic situations other than carbon monoxide poisoning.

I am not seeking to question that carbon dioxide has been excessively administered to many kinds of anoxic patients. I wish only to focus attention on the special, but



common, first-aid situation of carbon monoxide poisoning in which the main necessity is to accelerate the rate of excretion of carbon monoxide from the blood so that the haemoglobin may again carry oxygen. The use of oxygen with added carbon dioxide in the treatment of carbon monoxide poisoning was introduced by Henderson and Haggard,¹ and the graph of excretion rates of carbon monoxide here reproduced is from one of their papers² and shows curves derived from the treatment of dogs, gassed to the point of death, with (a) air, (b) oxygen, (c) air and carbon dioxide, and (d) oxygen and carbon dioxide. They claim to have confirmed these findings with men gassed up to 50% saturation. Their explanation for the greater efficacy they claimed for oxygen and carbon dioxide, over oxygen alone, was that breathing is markedly reduced when victims are removed from the poisonous atmosphere and that carbon dioxide, by stimulating respiration, facilitates the effective contact of inhaled oxygen with the capillaries of the lungs. The views of Henderson and

Haggard gained world-wide acceptance, and oxygen with carbon dioxide became the standard treatment for carbon monoxide poisoning.

My personal interest in the subject is because I was for nine years (1928-36) responsible for the treatment of all cases of acute poisoning admitted to the Middlesex Hospital. In each of these years I dealt with a few cases of carbon monoxide poisoning (on one occasion five cases at once). In the first two or three years I was not aware of the work of Henderson and Haggard and treated the patients with oxygen. Later I switched to oxygen and 7% carbon dioxide, which seemed to be very much more effective—indeed, life-saving—in roughly comparable cases. I can confirm that the breathing of severely gassed patients is often depressed and that the administration of oxygen and carbon dioxide strongly stimulates it.

The only evidence directly relating to carbon monoxide poisoning, weakening the claims of Henderson and Haggard, cited by Dr. Donald and Professor Paton are papers by Nicloux *et al.*³ and Walton *et al.*⁴ These papers did not flatly refute the findings of Henderson and Haggard, and, indeed, agreed that elimination of carbon monoxide was slightly faster with oxygen and 5% carbon dioxide than with oxygen alone; they only did not find as great a difference as did Henderson and Haggard. All these papers, including those of Henderson and Haggard, appear to be based on rather a slender amount of experimental work. They were published around 30 years ago, and to-day seem almost as little fitted to settle a very important practical question, involving the possible saving of many lives, as indirect physiological reasoning or the very fallible clinical impressions of those, like myself, who have thought oxygen, with 5% or 7% carbon dioxide, life-saving in carbon monoxide poisoning.

I would like to ask Dr. Donald and Professor Paton: (1) Have they personal experience in carbon monoxide poisoning of the comparative effects of treatment with oxygen alone and with oxygen and carbon dioxide? (2) Can they cite from the literature more evidence, directly relating to carbon monoxide poisoning, than appears in their paper? (3) Do they not think that there is need for more comprehensive experimental work in carbon monoxide poisoning (possibly sponsored by the M.R.C. Committee) before a firm and final recommendation is made to abandon oxygen and carbon dioxide treatment?—I am, etc.,

London, W.1.

H. L. MARRIOTT.

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2. *J. Amer. med. Ass.*, 1922, 79, 1137.
3. *C.R. Soc. Biol. (Paris)*, 1925, 92, 174 and 178.
4. *Arch. intern. Med.*, 1926, 37, 398.

** We showed Dr. Marriott's letter to Dr. Donald and Professor Paton, and their comments are printed below.—Ed., *B.M.J.*

SIR.—Before turning to Dr. H. L. Marriott's specific inquiries, we must emphasize again that the committee, and our paper reviewing the background of the committee's recommendation (*Journal*, February 5, p. 313), were concerned with first-aid practice, taking account of the full range of emergencies which may be encountered, and of the fact that correct diagnosis of such cases may not be within the power of the first-aid worker. There was no intention of trying to relieve doctors of their responsibilities for treatment in hospital according to their own judgment, although we hope they will consider the arguments we have advanced. Further, we do not quite agree with Dr. Marriott about priorities. The first task, even in cases of carbon monoxide poisoning, is to relieve the anoxaemia; the promotion of carbon monoxide elimination by any harmless means comes second.

As regards his questions: (1) One of the authors has treated a considerable number of cases of coal-gas poisoning, both with oxygen and with oxygen and CO₂, but, like

Dr. Marriott, would attach no weight to his "fallible clinical impressions" in the absence of detailed comparisons. Both authors have had an intensive personal and experimental experience of both respiration-stimulating and anaesthetizing concentrations of CO₂ in oxygen. This may or may not reassure Dr. Marriott, but we do not believe our personal experience to be especially relevant to the discussion.

(2) We should have included a reference to the work of Schwerma *et al.*¹ and express our regret at not doing so. The authors of this modern and detailed work, like Nicloux *et al.*² and Walton *et al.*³ "could not confirm the great increase of carbon monoxide elimination with added carbon dioxide reported by Henderson and Haggard"⁴ (to quote our original words). We were aware that there is some increase in elimination, and chose our words with care. The question is whether the increase is sufficient to justify the use of carbon dioxide in treatment. Schwerma *et al.* think not, and end their paper by saying: "Since carbon dioxide plays no demonstrable part in fortifying cardiac function, and its addition to oxygen confers no further value in resuscitation, the inevitable conclusion is that it is an unnecessary therapeutic adjunct." The various investigations differ in the details of treatment of the CO-poisoned animals. But it is significant that, for instance, Schwerma *et al.*, Nicloux *et al.*, and Walton *et al.* all agree as to the rate of elimination of CO in the untreated animal (50% eliminated in 60 minutes) and differ quite substantially from Henderson and Haggard (15% eliminated in 60 minutes). In the face of this and similar findings we think it dangerous to place too much reliance on the latter's figures.

(3) There is no doubt that more work on all aspects of resuscitation is badly needed, and it is the responsibility, not of an M.R.C. committee alone, but of all those interested in the subject to foster or initiate it. We would, of course, carefully reconsider our conclusions in the light of such work. But a recommendation is needed now, taking into account new knowledge about the actions of carbon dioxide. On the evidence available, we would feel culpable if we made any other recommendation.—We are, etc.,

K. W. DONALD.
W. D. M. PATON.

Birmingham, 15.

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4. *J. Pharmacol.*, 1920, 16, 11.

Topical Analgesia of the Urethra

SIR.—May I suggest a refinement to the method of producing topical analgesia of the urethra described by Dr. R. Bryce-Smith (*Journal*, February 19, p. 462) which I have found most useful in males? It is to pass a short rubber catheter into the urethra and connect the bakelite nozzle and tube to it.

By this means, it is easier to squeeze and massage the "xylocaine gel" into the posterior urethra. Without the catheter, adequate analgesia of the posterior urethra is, in my experience, often difficult to obtain.—I am, etc.,

Rotherham.

B. G. FORREST.

Endocrine Treatment in Psychiatry

SIR.—Dr. R. E. Hemphill in his most interesting paper on "Endocrine Treatment in Psychiatry" (*Journal*, February 26, p. 501) suggests that aggressiveness and paranoid thinking occur "in extreme conditions, and operation seems to be very seldom indicated." This I do not think is true. In my experience the women whose psychoses responded so dramatically to adrenalectomy were suffering from an average amount of virilism and we saw many more severely affected who had no psychosis. I thought that the cases associated with psychosis were those who had a peculiar psyche

and who were homosexually orientated before the adrenal dysphasia. It was the effect of the adrenal hormones on their peculiar mentality which produced mental illness. The psychosis was much more striking than the virilism. I am sure that Mr. L. R. Broster¹ would confirm this.

My reason for pointing this out, and the importance of it, is that I believe that there are many women with virilism in mental hospitals who would benefit from early adrenalectomy but who are never given the chance because it is not generally appreciated that psychosis and virilism are often associated. It was a thousand pities that owing to the war and other reasons our work on the relationship of psychosis and virilism, which seemed so promising, has terminated. Dr. Hemphill is absolutely correct in stating that "further research in the relationship between hypercortical adrenalism and aggressive paranoid behaviour might be well worth while."—I am, etc.,

London, W.1.

CLIFFORD ALLEN.

REFERENCE

1. Broster, L. R., *et al.*, *The Adrenal Cortex and Intersexuality*, 1938. Chapman and Hall, London.

Treatment of Pulmonary Tuberculosis

SIR.—Being interested in a clinic associated to some extent with Dr. T. W. Lloyd's sphere of action, I should like to comment on his letter (*Journal*, February 26, p. 538), which advocates the abandonment of pneumothorax and pneumoperitoneum treatment.

Our refill clinic sees each week some 30 or so persons, most of them well and cheerful, many of them working, and all of them apparently unaware of the undesirable nature of the therapy that is being wrought upon them. The hardship of regular attendance they sustain with fortitude, and, in a mainly rural community, the occasion is almost festive. On the whole they seem to thrive rather better than our other patients.

Most of these people have been considered and rejected elsewhere for major thoracic surgery, and nowadays a patient has to be in either pretty good or pretty bad trim to slip through that net and find himself at the receiving end of a pneumothorax needle. The suggested alternative is prolonged chemotherapy. I have insufficient experience of this to pass precise judgment, but should be most reluctant, not merely for nostalgic reasons, to close our refill clinic and trust to chemotherapy to replace entirely the beneficial presence of a little air in the right place. Prolonged chemotherapy may perhaps prove to be the treatment of the future, but I rather fancy that, if we were to abandon pneumatic treatment completely in its favour, future years would see an unknown number of long-term chemotherapy cases presenting themselves at the clinic, their gluteal regions indurated by streptomycin, their stomachs ulcerated by P.A.S., and their morale deflated by an isoniazid hangover, beseeching us to do something for their reopened cavities. We might then be glad enough to brush the dust from the pneumothorax box and, after due bronchoscopy—if a bronchoscopist is available—perpetrate yet again a pneumothorax or pneumoperitoneum.—I am, etc.,

Hereford.

T. V. R. PHILIP.

SIR.—It is stated in your leading article (*Journal*, February 12, p. 403). "During the last six years the annual decline in mortality from respiratory disease has averaged 15%, while the average decline for the previous ten years was a mere 1.5%," and, as I anticipated in my publications 10 years ago, this is being attributed to mass radiography, antibacterial drugs, and quantity of medical care. But those of us who began our efforts to stamp out tuberculosis nearly 50 years ago and who have spent some years in studying the homes of the people, learnt that tuberculosis is a disease fostered and spread by bad housing and a low standard

of living. The pioneers in tuberculosis prevention (I rank my late chief, Sir John Robertson, in the foremost field) learnt this, and accordingly they planned sanatoria treatment on the basis of a first-class home, where rest and tranquillity could be secured, while the larger problems of housing and standard of living were slowly improved. Their success with prevention and treatment is shown abundantly in the progressive decline in the deaths. The further contributions to that end, meals and milk at schools, even better housing and standards of living within the last six years, have brought even better results.

As I clearly indicated before its introduction, mass radiography can contribute nothing useful to a good medical service, but its progressive use seems to demonstrate the degeneration of clinical medicine in its revelations of massive disease which has been overlooked. We have as much right to claim that mass radiography has reduced the deaths from tuberculosis as we have to claim that its concomitant increased employment has caused the progressive rise in pulmonary cancer. It has shown what the pathologists taught us 50 years ago, that we have all had tuberculous infection, but that does not matter if it does not affect the mortality or morbidity. For the value of antibacterial drugs, we are told by some tuberculosis specialists that these are now so good the patients can be allowed not only to stay at home but to go to work. The disasters to nurses which have been so treated are recorded in the Prophit Tuberculosis Survey report.¹ If that was true why not put the treatment into the hands of the general practitioner? He with his knowledge of the home can treat the patient better than the specialists, who have lost much clinical sense by a most complete dependence upon the results of tests easily and readily obtained by scribbled initials or even the use of a rubber stamp. Since it has been proved that good housing and standard of living are far more important than "quantity of medical care," why not devote all our resources accordingly?

More particularly during the last 30 years I have watched the progressive exclusion of the practitioner from the treatment by the development of a specialized jargon assisted by the great abuse of radiology and the progressive "refinement" of middle-some interference. It is very doubtful if the success achieved by those measures, used in hundreds of thousands of cases and now quietly being discarded for more modern mutilations—measures which have converted treatment from what was the most pleasant and enjoyable into that which aggravates the disease and induces horror in the patients, the gravity of whose mental distress no one can estimate—can equal that secured by good home treatment. The unfortunate use of the general hospitals has contributed to the selfish aspirations of the specialists, who scoff at the original treatment in sanatoria at the cost of the patients. Dr. P. B. Schofield (*Journal*, February 19, p. 480) is fortunate in his experience, others have lost their lives from "treatments" by those who did not know the risks. I have seen complete recovery in the happiest of circumstances of most extensive disease without "the numerous investigations and treatments" he thinks "the patient needs."

Why not revert to the principles which dictated the development of sanatoria rather than keep those which have brought about their abandonment? Then our improved standard of living will eradicate the disease.—I am, etc.,

Birmingham, 15.

JAMES F. BRAILSFORD.

REFERENCE

- ¹ Daniels, M., et al., *Tuberculosis in Young Adults: Report on the Prophit Tuberculosis Survey, 1935-44*, 1948. Lewis, London.

Neon Lighting in Hospitals

SIR.—The ever-increasing use of neon strip lighting throughout hospitals has created a danger which I believe is not fully appreciated by those responsible for its installation. In the less up-to-date hospitals not equipped with a recovery unit in the theatre block patients may return to the wards shocked, and often with depressed respiration following chest or upper abdominal surgery, or following the residual effect of muscle relaxants, etc. These cases are anoxic, and, although the obvious case may be given oxygen, the lesser degree of anoxia will be missed by the masking of the mauve colour caused by the neon lighting. I believe that unless some form of ordinary incandescent light be kept on these post-operative cases deaths will occur from prolonged unobserved anoxia.—I am, etc.,

Manchester.

WILLIAM B. BACON.

Eclampsia

SIR.—Dr. A. W. Bauer's letter (*Journal*, February, 19, p. 481) on the subject of eclampsia will undoubtedly stimulate both interest and criticism. Early on he dismisses the need to discuss hypotheses, but promptly and naively proceeds to invoke a hypothesis himself. For he states, without proving it, that a mechanism of toxin production exists in eclampsia; urges that the source of this hypothetical toxin should be the goal of our investigations; and attributes its existence to the failure of detoxication of foetal metabolic products. His theme is, however, unacceptable, because the toxæmic process, of which eclampsia can be the climax, occurs even in the absence of a foetus, as in hydatidiform mole and in post-partum eclampsia, whilst the death of the foetus is no safeguard against its supervention—exemplified by the history of cases in which recovery from the toxæmic process had occurred during pregnancy to be followed by fits when labour eventually ensued.

Dietetic measures, successful prophylactically, invariably include severe restriction of salt, a factor which may explain the immunity from the disease enjoyed at certain periods (wartime starvation) and in peculiar climates. I suspect that in no small measure this circumstance underlies Dr. Bauer's successful treatment, in which he stimulates a low salt intake.

Two points he raises in his letter are of much importance and call for confirmation, the statement that at necropsy a typical smell of prussic acid is noticeable on opening the skull of the eclamptic, and the claim of the therapeutic value of intravenous thiosulphate both in eclampsia and pre-eclampsia. In this last connexion it is interesting to note that Lambiotte, Blanchard, and Graff¹ found, remarkably, that the thiosulphate clearances in pregnant women (but not in the non-pregnant) were much higher than those of inulin, the ratio invariably exceeding 1.0 with a range of 1.01 to 2.12. This finding caused them to conclude that thiosulphate was excreted by the tubules during pregnancy only. Some connexion may exist between this response of the tubule to thiosulphate peculiar to the pregnant state and its therapeutic action in toxæmia, and could serve once again to emphasize the rôle of the kidney in the disease.

Unlike Dr. Bauer, and in consonance with the cardinal principles of our art, I consider that the acme of therapeutics can only be attained by attack on the aetiological factor. Present-day obstetric policy, however, regretfully displays a zeal for treatment that far outweighs its quest for the aetiological solution on which to found it—an attitude, I consider, impeding advance.—I am, etc.,

London, W.1.

JOHN SOPHIAN.

REFERENCE

- ¹ *J. clin. Invest.*, 1950, 29, 1207.

Kaposi's Varicelliform Eruption

SIR.—Correspondence in connexion with Kaposi's varicelliform eruption has recalled to me an incident which occurred in January, 1949, while I was leprologist in charge of the Church of Scotland Mission scheme for leprosy control and treatment in Southern Ogoja Province, south-east Nigeria. I discovered a case of smallpox in one of the leprosy segregation villages under my care, and, fearing greatly for the consequences of spread of the infection, made arrangements for his strict isolation in a house in the village because no hospital was available. I personally vaccinated 269 possible contacts. Vaccination was by crossed linear scratch technique, a clean, dry dressing being bandaged on and left in position as long as the patient would tolerate it. There were no further cases of smallpox in the village and no cases of Kaposi's varicelliform eruption or accidental vaccinia occurred. There were, however, several cases of acute lepra reaction in those vaccinated. The patient with smallpox was treated with sulphapyridine and made a good recovery.

The efficiency with which complete isolation of the patient with smallpox was carried out may be attributed largely to

the excellent propaganda in preventive medicine initiated by my predecessor and the founder of the scheme, the late Dr. Harry Hastings. Incidentally, this illustrates how the effective control of one prevalent endemic disease may assist in dealing with others. The point of interest following the correspondence above referred to concerns the absence of Kaposi's varicelliform eruption. Drs. A. Girdwood Fergusson and W. A. Dewar (*Journal*, February 5, p. 352) define this condition as "a virus infection . . . arising in patients with a damaged skin," and it is therefore worthy of speculation in this instance whether the covering of the vaccination site was adequate and of sufficient duration (a doubtful point in African patients in that area) to prevent virus contamination of leprosy lesions, or is the skin of the leprosy sufferer an unfavourable soil for the growth of the vaccinia virus? The experience of other workers in this field might be of interest.—I am, etc.,

Glasgow, W.2.

JAMES C. P. LOGAN.

Mobile Transfusion Service

SIR.—The life-saving importance of prompt transfusion for severe shock has recently again been stressed by Sir Heneage Ogilvie (*Journal*, January 15, p. 159). The general practitioner cannot be expected as a rule to carry out emergency transfusions at the patient's home, and transport is dangerous in severe shock, especially in cases of internal haemorrhage. A mobile transfusion service is already operating for maternity cases, and, if such a service were made generally available for transfusion of blood, plasma, or "plasma savers" at the patient's home or at the spot of an accident, many lives could be saved and much worry avoided.—I am, etc.,

London, W.1.

F. E. LOEWY.

Hyperpyrexia and Anaesthesia

SIR.—I regret that in my attempt to compress my account of this case (*Journal*, December 25, 1954, p. 1526) I omitted the information desired by Dr. J. D. Whitby (*Journal*, February 26, p. 541). Laryngeal stridor was first treated with pure oxygen—a flow of 10 litres per minute was given for 2-3 minutes. As this produced little effect, nitrous oxide 5 litres/minute, oxygen 1½ litres/minute, and trichlorethylene were resumed, and 500 ml./minute of carbon dioxide was added—a concentration of about 7%. This was continued for 2-3 minutes. At the end of this time pure oxygen was given again—10 litres/minute for about one minute, with the expiratory valve fully open and the reservoir bag frequently emptied.—I am, etc.,

Milngavie, Dunbartonshire.

R. CECIL BROWN.

Fluoridation of Public Water Supplies

SIR.—Drs. H. M. Sinclair and Dagmar Wilson (*Journal*, January 29, p. 284) do less than justice to the positive benefits of fluoridation as well as to its harmlessness in the dosage proposed. It is misleading to say that "water containing 1 p.p.m. of fluoride decreases the incidence of dental caries in children up to the age of about 8 years" as if there was no protection above this age. American reports on communities with artificially fluoridated water are mostly only available for the first eight years, but Dean *et al.*¹ showed a 60% reduction in dental caries in children of 12-14 years who had lived all their life in a fluoride area. There is, moreover, ample evidence of some effect extending into adult life from Russell and Elvove,² Deatherage,³ and McKay⁴ in America, and Forrest *et al.*⁵ in this country.

Drs. Sinclair and Wilson correctly draw attention to differences in feeding habits in this country and the U.S.A.; they suggest that our addiction to tea and our greater consumption of fish may cause adults to get a higher dose of fluoride than is desirable or safe. The fluoride content of tea infusions varies greatly both with the brands used and the strength of the brew. A cup of tea of medium strength contains 0.5-1.5 p.p.m. of fluoride in addition to the fluoride content of the water used. If the whole fluid intake were to be as tea, the total concentration would not exceed 1.5-2.5 p.p.m., a concentration which we know from recent

studies in America causes no adverse effects on general health. Preliminary investigations in this country have shown that children consume relatively little tea (in any case probably weak and milky). The average consumption of fish in this country is rather less than twice the American rate; in 1951 and 1952 it was less than 1 lb. (227 g.) a week per person; the 1953-4 figure is likely to be less. Recent analyses of fish purchased in this country gave figures not higher than 1 p.p.m. F for the edible portion, and at this level the average amount of fluoride ingested would be about 0.03 mg. per day. That this figure is essentially correct is shown by the fluoride content of urine of children and adults in this country of 0.3 to 0.6 mg. per day, which agrees with values found in the United States. There is, however, some disagreement about the fluoride content of various kinds of fish, and, though fish is not a major source of fluoride, the content of fish normally consumed here is being checked.

The strongest evidence against such dietary fluoride having any deleterious effect comes from Leone *et al.*⁶ in a careful comparison of two areas in Texas, one of which had a water supply with 8 p.p.m., the other 0.4 p.p.m. Samples of the population who had lived at least 25 years in each place were thoroughly examined physically, radiologically, dentally, and pathologically in 1953, following a previous examination in 1943. Except for dental mottling in the fluoridated area, there was no relevant difference between the two groups. Similarly an article by Hagan *et al.*⁷ demonstrates no significant difference in the mortality from all causes and from heart disease, cancer, intracranial lesions, nephritis, or cirrhosis of the liver in 64 cities in 16 States, half with a high and half with a low fluoride water supply. The fluoride content of the water in some of these surveys is many times higher than any proposed in this country and well above any additional intake our diet could contribute. Studies in this country have confirmed these facts and other confirmatory studies are being considered.

Drs. Sinclair and Wilson refer to studies in Oxfordshire in which "severe dental fluorosis" was associated with the ingestion of water with fluoride levels of 0.3 and 1.2 p.p.m. This is the only occasion on which a very high degree of mottling of the enamel has been reported and ascribed to fluoride at such levels in a temperate climate. Dean⁸ found no more than mild mottling in 1.5% of 400 children aged 12-14 years examined in an area with 1.2 p.p.m. F in the water. Weaver⁹ reported slight mottling in 3.6% of the 500 12-year-old children examined in South Shields, where the fluoride level was 1.4 p.p.m. A report by Dean¹⁰ on studies of more than 7,000 children in areas with fluoride levels of 0.1 to 2.6 p.p.m. shows that even moderate mottling only occurs with a level of at least 1.8 p.p.m. F, and severe mottling with at least 2.6 p.p.m. F. Dental examination in areas where the water is fluoride-free often reveals opacities and even brown staining of the enamel very similar to those caused by fluoride. Zimmermann¹¹ states that "differentiation from fluorosis opacities has occasionally been difficult," and reports that enamel opacities were noted in 36% of the children examined in an area with no fluoride in the water; Hurme¹² reports an even higher incidence. Dean¹³ says that differential diagnosis must rule out the hypoplasia due to exanthematous diseases and nutritional disturbances during enamel development.

Drs. Sinclair and Wilson fear the additional hazard of industrial fluorosis. The main hazard of industrial fluorosis is to cattle, due to ingestion of grass, etc., on which fluoride dust has settled. The danger to man is remote. Nevertheless, fluoridation of water supplies would not be carried out in the neighbourhoods where such a situation might arise.

They state that the "level at which storage takes place" is unknown, but there is clear evidence that in fact storage takes place at every level, however small,¹⁴ and that under normal conditions there is a steady rise with age.¹⁵ Experiments (about to be published) which have been undertaken with adults in this country confirm the work of McClure *et al.*¹⁶ in America and show that as much as 95% of ingested fluorine is excreted in the urine, faeces, and sweat—not the lower figure found by Largent,¹⁷ who did not measure fluoride lost by perspiration. There is also evidence that equilibrium with a new level of intake is reached in a few days. In any case there is no evidence that retention of fluoride, when the water supply contains anything of the order of 1 p.p.m. F, causes any toxic effects whatever. Even Largent's subjects remained healthy, and did not show any radiopacity. The relation, if any, between malnutrition and fluorosis cannot be regarded as proved, and even if it were it would not seem to constitute a hazard in Britain to-day. There are few countries where calcium intake is more satisfactory.

Drs. Sinclair and Wilson take up the mission's statement that in theory any fluorine compound which will ionize in aqueous solution should have the same action on teeth, and base their disagreement on the cariostatic effect of stannous fluoride, as

compared with sodium fluoride, although more recent work by Buhler *et al.*¹⁷ showed that the cariostatic effect of stannous fluoride was decreased when the pH of the solution was raised from about two to neutrality. Tin is notorious for formation of complex ions, and it is probably true that simple ionization to F ions does not occur in this instance. But no one is proposing to use stannous fluoride, so that even if Sinclair and Wilson were correct their objection would not be a valid one.

We share Sinclair and Wilson's desire for more knowledge. But they have not produced any facts which alter the position taken up by the mission—namely, that there is no scientific evidence that fluorides at concentrations below about 1.5 p.p.m., whether naturally occurring or added to water, have any adverse effects; by contrast, there is indisputable evidence that there is a beneficial effect on teeth.—We, are, etc.,

H. H. STONES.
J. R. FORREST.

A. M. THOMSON.
J. LONGWELL.

London, W.1.

REFERENCES

- ¹ *Publ. Hlth Rep. (Wash.)*, 1942, 57, 1155.
- ² *Ibid.*, 1951, 66, 1389.
- ³ *J. dent. Res.*, 1945, 22, 129.
- ⁴ *Amer. J. publ. Hlth.*, 1948, 38, 828.
- ⁵ *Monthly Bull. Minist. Hlth (Lond.)*, 1951, 10, 104.
- ⁶ *Publ. Hlth Rep. (Wash.)*, 1954, 69, 925.
- ⁷ *Ibid.*, 1954, 69, 450.
- ⁸ *In Dental Caries and Fluorine*, 1945, edited by F. R. Moulton, p. 5. American Association for the Advancement of Science, Washington.
- ⁹ *Brit. dent. J.*, 1944, 76, 29.
- ¹⁰ *Publ. Hlth Rep. (Wash.)*, 1954, 69, 1115.
- ¹¹ *Amer. J. Dis. Child.*, 1949, 77, 61.
- ¹² *J. Amer. dent. Ass.*, 1943, 30, 1278.
- ¹³ Smith, F. A., *et al.*, *Fed. Proc.*, 1953, 12, 368.
- ¹⁴ Glock, G. E., *et al.*, *Biochem. J.*, 1941, 35, 1235.
- ¹⁵ *J. industr. Hyg.*, 1945, 27, 159.
- ¹⁶ *Fluoridation as a Public Health Measure*, 1955, edited by J. H. Shaw, p. 61. American Association for the Advancement of Science, Washington.
- ¹⁷ *J. dent. Res.*, 1954, 33, 33.

Errors of Diagnosis in Paediatrics

SIR.—In Dr. B. Schlesinger's article (*Journal*, February 12, p. 369) he refers to "the aches and pains of muscular strain and spasm in genu valgum" as being sometimes mistaken for subacute rheumatism. In my capacity as school medical officer attached to the Leeds school orthopaedic clinic for a number of years, I have seen hundreds of children referred on account of genu valgum. In 1953, I examined 151 such children and in 1954, 131, and none of these children complained of pain. Over the same period a number of children who were referred for pains in the legs proved to be suffering from osteochondrosis of the hips (often bilateral) or from osteochondrosis of the conjoined rami of the pelvis, or from an Otto pelvis. Early diagnosis of osteochondrosis of the hip is essential if the restoration of the capital epiphysis and the avoidance of consequent arthritis of the hip in middle life is to be ensured.

When a careful history is taken and the fact is elicited that the child wakes from sleep and complains of pains in the legs, or that he comes in from play and rests because of such pains, then in my experience a cause is much more likely to be found in the hip-joints or in the pelvis than in the knees. I suggest that the diagnosis of genu valgum as a cause of pain in the legs is as dangerous a label as growing pains, and equally likely to mask the true origin of the symptoms.—I am, etc.,

Leeds.

I. HOLORAN.

Spontaneous Regression of Malignant Melanoma

SIR.—Might I add to Dr. V. B. Levison's account of spontaneous regression of a malignant melanoma (*Journal*, February 19, p. 458) by reporting the following case.

In November, 1950, a white South African student aged 22 consulted me because of an enlarged supraclavicular lymph node. He had attended a colleague 18 months previously because of it and had had a chest x-ray in April, 1949, which was clear. A provisional diagnosis of tuberculous adenitis had been made. On examination, the supraclavicular node was firm, smooth, egg-shaped, and mobile, suggestive of lymphadenoma. A chest x-ray (November, 1950) showed gross enlargement of the right para-tracheal group of lymph nodes. The patient's general health was good. After consultation, he was admitted under Mr. John Gardham to the Hampstead General Hospital and the supraclavicular node was removed for biopsy. It was hard and brown on section. The pathological department of the hospital reported

"a secondary deposit from a malignant melanoma. Only the cells at the very periphery of the mass are living where they merge with the fibrous tissue capsule. The firm greyish piece of tissue which is connective tissue contains a small gland which shows several small groups of melanoma cells in the peripheral sinusoids. The nature of the growth suggests the choroid may be the seat of the primary." The other half of the gland was sent independently to the pathological department at University College Hospital, where it was similarly reported upon.

A search for the primary revealed nothing more than a small pigmented area touching the left optic disk at 5 o'clock. I allowed him to finish his M.A. early in the new year and then advised him to return home. I told him he had "sarcoid" (a disease whose prognosis a student cannot easily get from "the books"), but told his level-headed South African fiancée the true diagnosis and its outcome. I arranged to keep in touch with them and with their South African doctor.

To our surprise and quite without treatment the serial radiograms showed the para-tracheal glands gradually diminishing in size, so that by early 1952 the radiograph was normal to all intents and purposes. He has remained well the whole time, has married, and has now a year-old son. I last heard from them, and a family portrait was sent me, in September last year. It is now nearly six years since he was first seen with the enlarged supraclavicular gland.—I am, etc.,

London, W.C.1.

NICOLAS MALLESON.

Tonsillectomy

SIR.—As a G.P. who has anaesthetized for, and seen the results of, both guillotining and dissection, I have been most interested in the recent correspondence.

Regarding premedication, I support the use of atropine alone. All sedatives increase the risk by respiratory depression, and the way to calm children is proper handling. Regarding the type of operation, if Mr. E. H. Miles Foxen (*Journal*, February 12, p. 413) seeks to convince his readers that guillotining is a deplorable procedure, then he must show the courage of his own convictions by declaring outright that no one at all can achieve consistently good results by doing it. My belief is that, with the proper skill and the proper instrument, in the majority of children guillotining is as good as dissection.

There appears to exist the fallacy that, compared with dissection, guillotining demands less skill in surgeon and anaesthetist. Subscribers to this are indeed unlikely to guillotine satisfactorily. The truth is that guillotining demands just as much skill on the part of both, and the penalties of inadequate skill are heavier than in dissection. Moreover, while co-operation between surgeon and anaesthetist is necessary in any operation, in guillotining it is crucial, even literally vital, that the pair understand each other's problems and are practised at working together. Here I would go farther than Mr. Foxen and say that, however practised the pair, it is impossible with the old type guillotine to achieve a perfect result in every case attempted.

The reason is that the requirements of surgeon and anaesthetist conflict, and the limits within which both are satisfied are too narrow for even long practice to succeed every single time. The surgeon requires (1) anaesthesia of sufficient depth and length, without anoxia; and (2) a clear view of the field, and more so as the instrument is liable to slip as the cut is made. The anaesthetist's problems arise from (1) obstruction of the airway by the tonsils; (2) the impossibility of predicting precisely how long the operation will take; (3) the difficulty of altering the depth of anaesthesia once the surgeon has started, which becomes extreme once the first tonsil is removed; and (4) the certainty that when the first tonsil is removed blood will flood the pharynx and some be inhaled. The anaesthetist, acutely aware of the risks of too deep anaesthesia from blood-clot in the trachea and an absent cough reflex, is inclined to keep the patient too light. This gives rise to a vicious circle, since expeditious removal of the second tonsil is made more difficult and the dangerous stage is prolonged, during which time bleeding persists, making the manoeuvre more difficult and more dangerous still.

The haemostatic guillotine obviates all these snags. With this instrument the tonsil is gripped by a blunt blade before being cut by the sharp one. After induction of anaesthesia the first tonsil can be gripped and lifted, thus clearing the airway, relieving any anoxia, and allowing depth of anaesthesia to be adjusted to a nicety. The tonsil is then quietly excised and removed, little or no bleeding results, and the second tonsil is tackled in the same unhurried manner.

I should add that I have seen the excellent results of this instrument in the hands of Mr. H. Mower, consultant E.N.T. surgeon at the Royal Infirmary, Gloucester, whose consideration for anaesthetist and theatre staff contributes in no small manner to the success of the operation and makes the work a pleasure.—I am, etc.,

Yorkley, Glos.

ROBERT ELLISON.

SIR.—It is very easy to condemn the guillotine from the peace and calm of a teaching hospital, where most of the children's tonsils and adenoids are removed by registrars and house-surgeons. It is quite another matter when one is faced with the harsh realities of a provincial E.N.T. surgeon's life.

A colleague and myself cover between us five sessions a week at a hospital in a neighbouring town. Here we have to keep 19 children's and 15 adults' beds full, and see over 70 new patients, and up to a 100 old patients every week in the out-patient department. A wide variety of cases are dealt with, only major laryngeal surgery and fenestrations being done elsewhere. There is no E.N.T. house-surgeon, and our only help is two general-practitioner clinical assistant sessions a week. No locums are provided for holidays. The waiting-list for children's tonsillectomy is long, but is now slowly improving. Its length is still a great source of worry to the school medical authorities, to the general practitioners, and to many of the parents, and I cannot imagine that they would view any step which would threaten to slow down our progress with anything but alarm. Could Mr. E. H. Miles Foxen (*Journal*, February 12, p. 413), without extra help, manage to dissect all the children's tonsils under these circumstances (which are common in the provinces) without increasing the waiting-list, or would he say that an increase in the waiting-list was of no consequence? At the risk of repeating a dangerous platitude, I would say that the last sentence he quotes from Waugh¹ is nonsense. The complete removal of a tonsil with a guillotine is perfectly possible. The bad results seen were due to the activities of the inexperienced with a sharp guillotine. To-day the blunt guillotine is used, and the majority of cases (in this region at least) are done by consultants. A satisfactory result is the rule.

There are several answers to the problems of the children's tonsillectomy waiting-list which would obviate the need for the guillotine. The one that I like best is a letter used at one teaching hospital which says in effect, "Dear Doctor, I quite agree that these tonsils and adenoids should be removed, and I suggest that you arrange this locally." All the other answers require either extra consultants and S.H.M.O.s, which is unlikely to be acceptable to the Ministry, or the moving of junior medical staff out into peripheral hospitals, which would be unpopular with the teaching hospitals. We are left, therefore, with the guillotine—*circa* 1955.—I am, etc.,

Nottingham.

J. F. NEIL.

REFERENCE

- ¹ *Lancet*, 1909, 1, 1314.

The Inelegance of Redundancy

SIR.—I am a student beginning my clinical work, and have recently realized the often unnecessary use of medical jargon. Before I come to accept it as a necessity, may I object to a fine example in your issue of February 19? In it was an article entitled "Intermittent Positive-pressure Respiration in Bulbo-spinal Poliomyelitis: Use of the Radcliffe Respiration Pump." Respiration is by nature intermittent; why say so? To a person who does not realize

that the iron lung works by a negative pressure, the phrase "positive-pressure respiration" is without significance. I submit that the title could have been "Experience with the Radcliffe Respiration Pump in Bulbo-spinal Poliomyelitis" without any loss of precision and with a gain in clarity, brevity, and elegance.

Secondly, too often authors omit those few sentences in a general introduction that would greatly assist the non-specialist reader. In this case the distinction between "positive pressure respiration" and "negative pressure respiration," and between an iron lung and a respiratory pump, should have been made clear at once. Specialists are too apt to refer us for such explanations to a paper that we have neither the opportunity nor the time to read.—I am, etc.,

London, N.W.8.

M. W. HASLITT.

Topical Hydrocortisone

SIR.—Dr. Ronald Church's excellent article (*Journal*, February 26, p. 517) on the use of hydrocortisone ointment and your annotation (p. 530) raise certain serious difficulties under the present conditions of medicine in this country. My experience with local hydrocortisone has been essentially similar to his, though I have been more successful in ano-genital pruritus and less so in nummular eczema; also I have had cases which have responded to the stronger ointment and not to the weaker one.

The difficulty is, however, that hydrocortisone is a suppressive and not a curative agent, and directly it is stopped the patient relapses unless the underlying predisposing factor is removed in the meantime. Unfortunately, this cannot be done with many cases of constitutional eczema, and so the patient may demand to continue with his hydrocortisone ointment for months or even years. Hydrocortisone ointment costs 69s. an ounce (31 g.) for 2½% or 29s. for 1%, and, assuming an extensive case of eczema requires 2 ounces (62 g.) of ointment a day, this would be a prohibitive cost for routine treatment in a non-fatal disease; and yet if hydrocortisone ointment were freely available it would certainly be used extensively, often in ignorance of its cost. I would suggest the following general indications for the use of hydrocortisone ointment: (1) as a temporary measure in a patient suffering great distress from an acute condition such as a severe exogenous dermatitis; (2) as a temporary measure to bring under control an intractable eczematous dermatitis which has previously failed to respond to more orthodox treatment; (3) as a more prolonged form of treatment for skin lesions of small areas—such as pruritus ani—when this has been found to be the most helpful therapy. There may occasionally be some other indications, but these will serve as a guide to the reasonable use of hydrocortisone without its becoming an intolerable burden on the National Health Service.—I am, etc.,

Leeds, 2.

F. F. HILLIER.

Disk Lesions and Low Backache

SIR.—It is with considerable diffidence that I intrude into a discussion by experts on a subject without my province. I think, however, that there is a small but useful point to add to the effectiveness of the valuable exercise described by Mr. W. Grant Waugh (*Journal*, February 12, p. 412). I have also an experience to relate which may have some bearing on the puzzling aetiology of disk lesions.

Leather straps similar to those used in buses so that the hand can be passed through the loop makes the exercise less of a feat of endurance and allows it to be carried out for longer periods. A slight dropping jerk is also feasible which seems to be an important additional manoeuvre. Certainly dramatic relief can be obtained in this way, as Mr. Grant Waugh has said. Indeed, I sometimes wonder if it would not be a good thing for us all to erect a cross-bar in our back gardens to indulge in this atavism and thus counter our tendency to spinal shortening in these days of delible disks.

Some years ago a colleague and myself were asked by a worried timber merchant to investigate the growing incidence of disk lesions among his employees. He said his firm had been unloading timber in exactly the same way for over 50 years, but it was not until after the war that the disability appeared. Accordingly we spent a day at the canal side watching unloading. Here they used the method of stacking the planks on end. A 24-ft. (7.3-m.) plank was positioned so that the man's shoulder was at the fulcrum. Then by long practice in balance and rhythm the plank was carried from the barge to the storehouse. On nearing the storehouse the man started a jog trot, increasing his speed until with spine flexed he rammed the forward end of the plank into the angle between the ground and a roof support, thus running the plank into an upright position by one continuous movement. Clearly, as a method of producing a disk protrusion or arthritis this could hardly be bettered, but there still remained the all-important question of the post-war incidence. We therefore interviewed all the men and collected the data which might constitute a significant environmental influence. Most of the men who had incurred the disability had been in the Services. The only obvious contrasting feature we could find in the pre- and post-war periods was diet. Pre-war, two meat meals had been the rule, and in addition a ham or bacon breakfast. There was in fact an appreciable difference in the amount of first-class protein consumed, and one of the older employees told us that they could never manage the longer pre-war working hours on the present diet (that is about five years ago).

No doubt the matter of deficiency in essential amino-acids and other dietetic factors has been fully investigated and discarded as a possible cause, but this story may have some other aspect of interest to someone working on this subject.—I am, etc.,

Ilford, Essex.

D. LANG STEVENSON.

SIR.—Recent correspondence on backache has been most controversial and thereby intriguing. Does this not show that no one specialty is infallible, and that team work is essential? All of us are doctors, and very many of us have had "backache," but very few indeed have had "disks," and fewer still have been operated upon.

The differential diagnosis of backache is very difficult, and its treatment still more so. It therefore behoves us as consultants to work together as a team in its elucidation, and, if orthopaedic in origin, to carry out the treatment in detail personally. Moreover, it is our duty as doctors to impress upon the public that they must face up to the fact that wear and tear of the spinal column must bring its ills with it: the majority of which are curable by non-surgical means.—I am, etc.,

London, W.1.

B. WHITCHURCH HOWELL.

SIR.—As another general practitioner I gladly take up the challenge of Dr. R. N. R. Grant (*Journal*, February 19, p. 480), since I for one have never been satisfied that "fibrositis" is caused by exposure to draught. If the history is studied, a trauma will usually be traced. Thus the man who "always has a stiff neck after a hair-cut" will blame the cold sensation of the clippers or of the denudation itself, forgetting the extreme flexion into which his neck was forced by the operator. Likewise the railway traveller who returns with a "chill in the back" will admit to falling asleep whilst sitting upright in the railway carriage. The holiday-maker who has "caught lumbago on a windy beach" will have been flattening his lumbar curve either in a deck-chair or upon sand not so much wetted as hardened by a recent tide.

It is moreover idle to argue that the pain did not appear until the following day. If it is true that the disks as a whole can imbibe fluid under traction-treatment sufficiently to increase the measured height of the patient, then surely recumbency is the very position in which a damaged disk

can best swell overnight ready to declare itself by a sudden shift of internal tension when first the victim bends forward on the morrow.—I am, etc.,

Richmond, Surrey.

JOHN DANCY.

SIR.—As a high-spirited youngster skylarking in the Edinburgh Warrender Park Baths in attempting a high dive I felt I was going to hit the bottom, but by doing a quick turn in the air this I avoided. However, I felt I had "ricked" my back, and for two years I had lumbago, as we called it 47 years ago. I had some treatment for what my surgeon called a fractured articular process. I did exercises regularly. Three years later I began to play golf and even tennis. I did not risk rugger—I became a scratch golfer instead.

During the first world war and for years afterwards I had about 15 attacks of acute lumbago. During the war I observed that nearly all the soldiers wore elastic or broadish webbing belts which they said prevented their backache. In 1918 I started to wear a belt and this helped me greatly. Acute lumbago I cured with hot baths and passive movements in the hot bath. The belt relieved the ordinary back pain and I could golf, shoot, and enjoy dancing. In 1951 I had a severe motor accident, and in 1952 I was ill for 18 months and my back returned. In spite of expert orthopaedic treatment, rest, massage, and spa treatment, I was no better. However, it was suggested that I might have some spinal arthritis, and I had a course of deep x ray, and this cured the acute pain. I was greatly relieved, but the growling low back pain persisted.

Reading in the *Fishing Gazette*, April 17, 1954, an article by Ronald Strong, who had a slipped disk, and who could now fish for six hours, even after five years of torment and endless examinations and treatment, I took his advice and had a modified surgical belt made with lumbar and some anterior support. Now for one year I have had practically no pain. I can walk two miles and more, with great benefit to my general health. I am 68 years old and I hope to fish again this spring. On my advice many golfers now wear a firm belt with great benefit. A belt modified and fitted to the patient is the cure for lumbago and low backache. I sleep with a firm belt round my waist. Backache can usually be traced to an injury if a careful history of the patient's story is recorded.—I am, etc.,

Bradford.

DONALD WATSON.

Protein Value of Milk

SIR.—A recent letter (*Journal*, February 12, p. 416) from Mr. R. H. Woodcock, under the title of "Human Nutrition and the Sophistication of Foods and Feeding Habits," is based on a complete misconception and requires correction. Mr. Woodcock stated that the fall in the nutritive value of milk on evaporation or drying and subsequent storage was insignificant, because authors whom he quoted had found insignificant losses of lysine (the amino-acid most liable to damage) in these materials. These estimations of lysine were carried out microbiologically after acid hydrolysis of the proteins. It is well known that in the Maillard reaction, which takes place during the heating or prolonged storage of protein-sugar mixtures, part of the lysine becomes bound to the sugar and cannot be liberated during digestion. Most of it is still present, as indicated by analysis following acid hydrolysis, but it is not available to the consumer. The nutritive value is therefore correspondingly reduced. Chemical or microbiological analyses of proteins carried out after acid hydrolysis may therefore yield no information as to the nutritive value of a protein.

Mr. Woodcock would have done better, instead of quoting references to American chemical work on this subject, to have noted the biological experiments carried out so thoroughly at the National Institute for Research in Dairying, at Shinfield.¹⁻⁴ Among other results, this work showed that the biological value of the proteins of dried skim milk (as measured on young rats) fell from 89 to 66 on storage

at 37° C. for sixty days. Storage at room temperature under conditions which did not exclude atmospheric moisture resulted in a fall from 89 (18 months after manufacture) to 71 three years later.

I may add that I am fully aware that, under normal conditions of feeding, the reductions in biological value likely to be encountered are not important in view of the large quantities of protein being consumed. In this letter I am merely concerned with correcting the scientific inaccuracy.—I am, etc.,

London, E.C.1.

A. E. BENDER,
Research Department, Bovril Ltd.

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Whither Natural Childbirth?

SIR.—I am very pleased indeed to see the excellent letter of Dr. Constance L. Beynon (*Journal*, February 19, p. 475). Now as so few "family doctors" (if such persons still exist) do any midwifery, normal or otherwise, it is important that the clinics do not run amok. As Dr. Beynon suggests, their army of physiotherapists and other departmental specialists with great schemes for training for "natural childbirth" may defeat their own object by creating apprehension and fear by introspective thought in a perfectly normal and healthy expectant mother.

During more than 25 years of general practice, before retiring at the approach of the N.H.S., my chief interest was obstetrics. I have seen babies delivered in many parts of the world; in world-renowned teaching hospitals and elsewhere. In some I have been horrified at the extremely artificial and pseudo-scientific methods employed, even in normal cases—sometimes with disastrous results. I have seen methods of investigation during pregnancy which might have acquired a Ph.D. for some enthusiastic house-surgeon, but which appeared to me to be entirely unjustified and not likely to benefit in any way the trusting individual being investigated. I would not have allowed some of these experiments to have been carried out on any member of my own family, and therefore I could not acquiesce had they been my patients.

Forty years ago—in my student days—we were taught by brilliant experts how and when to interfere in difficult labour. Later came the preaching against "meddlesome midwifery" which was the cause of many a case being left too long for safe delivery. Since then antenatal supervision has proved its worth. In the clinic there is a multitude of specialists and their minions to bewilder the healthy woman: an ever-changing personnel.

The large number of persons concerned with each pregnancy and confinement is in itself a disadvantage and repugnant to the woman they seek to serve. The methods of Dr. Grantly Dick Read appeared to me to be rational and helped many toward "natural childbirth," but how could his methods be practised under to-day's conditions? The old family-doctor-obstetrician is unfortunately dying out, and apart from the appointment of a few expert surgeons to be called upon in a small minority of cases, I fear, has not been adequately replaced. Let us think again. A most happy caption has been selected for Dr. Beynon's letter, "Whither Natural Childbirth"?—I am, etc.,

Bournemouth.

S. H. WADDY.

Sézary's Syndrome

SIR.—In addition to the seven cases of Sézary's erythrodermia described by Drs. W. E. Alderson, George I. Barrow, and Robert L. Turner (*Journal*, January 29, p. 256) in their interesting paper, we have recorded a further case in a woman of 84.¹ This case may throw light on the nature of the condition, since it is the first to come to post-mortem examination, the histological findings of which are being studied.

So far there is no evidence that the reticulum cell infiltration of the skin and the presence of these cells in the peripheral blood is a malignant process. Alderson *et al.* state their belief that it is an early phase of a malignant reticulosis linking the conditions known as lipomelanotic reticulosis and reticulum cell reticulosis. The term reticulosis is a natural pathological extension of Aschoff's physiological concept. Unfortunately, the limits of its application are even more vague than those of the reticulo-endothelial system from which it derives. We should, however, be able to confine "malignant reticulosis" within closer boundaries and reserve that term for invasive and irreversible proliferation of reticulo-endothelial cells. In Sézary's erythrodermia there is as yet no evidence that the changes are malignant.

The lipomelanotic change in superficial lymph glands is now generally considered to be a reactive hyperplasia. It has been described in association with such benign conditions as varicose ulcer² and lichen planus.³ The histological changes are reversible and if the skin condition clears the glandular enlargement subsides. We feel that the term lipomelanotic reticulosis should be abandoned and prefer the non-specific lipomelanotic lymphadenopathy. We are, etc.,

J. FIELDING.

HAROLD WILSON.

London, W.9.

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Press Publicity

SIR.—In regard to this matter of our profession, organs of the Press, and operations on conjoined twins an apposite remark was made on a related subject on March 1 in Parliament by Sir Winston Churchill. He said: "I think the liberty of the individual must be sustained against the tyrant, it must be sustained against the mass, and it must be sustained against the machine."

We stand for the liberty of the patient to keep his disease and treatment private and for the liberty of the surgeon to preserve his modesty. The organs of the press with which we are concerned stand for giving the mass what it wants. The mass, in its day, wanted gladiatorial games, it crowds round street accidents, and it wants the details of the operating theatre.

If we believe in the principles of the Hippocratic oath we should sustain the patient and the surgeon against the mass and the machine that ministers to it. This is no matter of professional etiquette; it is a matter of values. "Prepared statements" are no solution. I would urge that if we compromise we put our profession's soul in jeopardy.—I am, etc.,

London, N.W.3.

LINDSEY W. BATTEN.

Cosmetic Materials

SIR, I am at present engaged in a revision of my book, *Cosmetic Materials: Their Origin, Characteristics, Uses, and Dermatological Action*, the foreword to which is being contributed by a Harley Street dermatologist. In the interests of the industry, the user, and the medical profession, I am anxious to obtain as much information as possible concerning primary irritation or sensitization arising from the use of substances employed in the cosmetic, toilet, and pharmaceutical industries, and for this purpose I would be very glad to receive brief details from any of your British or overseas readers of any instances in which the offending ingredients have been definitely confirmed by skin tests.

Such information should be sent to the address given at the foot of this letter; it will be personally acknowledged and full credit given to the source of the information in the new edition.—I am, etc.,

60, Broad Walk,
Heston, Middlesex.

RALPH G. HARRY.

Medico-Legal

DEATH FROM BENZENE POISONING

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

At the inquest held recently at the St. Pancras Coroner's Court on Dennis William Wood the cause of death was found to be aplastic anaemia due to benzene poisoning, and a verdict of death from natural causes was recorded by the coroner, Dr. W. Bentley-Purchase.

Mr. Wood, aged 22, was a student industrial chemist and had started work at the Portsmouth Electricity Works in 1948. In September, 1953, he fell ill, and was an in-patient at the Royal London Homoeopathic Hospital from May 12 to August 19, 1954, with anaemia, being then discharged improved. He was readmitted in October and November, 1954, for blood transfusions, but died on December 25, 1954, in hospital. He had suffered from a lack of leucocytes and platelets, the platelet count being proportionately lower than the white cell count. Dr. R. Moore, consultant physician to St. Mary's Hospital, Portsmouth, suspected benzene poisoning with entry through the skin, because the anaemia was hypoplastic. Dr. Ethel Browning, Medical Inspector of Factories, agreed that the condition was due to benzene poisoning.

Witnesses from the Portsmouth Generating Station with whom Mr. Wood had worked said that he was employed on general laboratory work. This included performing standard water-and-oil tests with benzene as a solvent, so that he would come into contact with benzene vapour. He would be working with benzene for about 1½ hours per week though not necessarily every week, and he would not get it on his hands or inhale it. The work was not considered dangerous, and the four others doing the same work had been unaffected. Mr. Wood did not work in the fume cupboard.

Dr. Browning said that it was not unusual for such a small exposure to benzene to cause anaemia. Individual susceptibility varied, and it was inhalation which usually caused the trouble.

BROKEN NEEDLE IN GIRL'S THROAT

The emergency which faced a surgeon when a needle broke in his patient's throat and then an electric lamp failed, plunging the operating theatre into darkness, was the subject of a case before Lord Guthrie in the Court of Session, Edinburgh, on March 4. He awarded £850 damages to a Dundee man on behalf of his 14-year-old daughter. The girl, it was stated, received severe scarring of the throat as a result of efforts to find the broken part of the needle after an operation for the removal of her tonsils and adenoids.

James Henderson, of Dundee, claimed on behalf of his daughter Marion £5,000 damages from Mr. G. I. Henderson, surgeon, formerly of Dundee and now practising in Australia, where his evidence was taken.

Lord Guthrie said the action arose out of an operation in Maryfield Hospital, Dundee, on March 21, 1951. (Three weeks before the operation the defendant had arranged to go to Australia, and he left in May, 1951.) At the end of the operation severe bleeding occurred, and the surgeon, by stitching, took measures to control this. While doing so, the needle broke, and two-thirds of it, about ½ in. (12 mm.) in length, remained in the child's throat. A stitch was inserted with a fresh needle, and the bleeding was brought under control. At that point the bulb in the headlamp used by the surgeon failed, plunging the theatre into almost total darkness. Replacement of the bulb took only a few seconds, and continuous anaesthesia by gas was administered to the patient while the broken needle was sought. Lord Guthrie said that the surgeon probed the soft palate

with his finger and the blunt end of the forceps. After about 15 minutes he thought he felt the needle and made an incision with a scalpel. The needle was not found and a stitch was inserted in the incision. The search lasted unsuccessfully for an hour. Next day the child was transferred to Dundee Royal Infirmary. A powerful electromagnet was placed close to her mouth and the missing part of the needle was withdrawn.

Lord Guthrie described the girl's voice as weak, hollow, and nasal, and said that she spoke like a person with a cleft palate. He said he accepted the medical evidence for the plaintiff as to proper surgical procedure in the circumstances. Defendant had departed from that standard. It should have occurred to the surgeon that prolonged probing and stretching of the fibres would have serious and possibly permanent consequences. Had he exercised the care and skill reasonably to be expected of a surgeon, after a few minutes he would have desisted from his blind search. Lord Guthrie concluded by saying that it was right to place on record that in the course of the evidence tribute was paid to the meticulous care which characterized the surgeon's normal conduct of operations.

Obituary

Dr. ADELINE ROBERTS, who died in a London hospital on January 8 in her 82nd year, was for many years distinguished among London medical women, particularly in the fields of public and social work. Adeline Mary Roberts, who was born in 1873, entered the London (Royal Free Hospital) School of Medicine for Women as a medical student in 1893. She took the London M.B. in 1898, the B.S. with honours in the following year, when it could be taken as a separate examination, and proceeded to the M.D. in 1902. After qualification she held a number of resident and other appointments, and then acted as a clinical assistant at Moorfields Hospital for several years before setting up as an ophthalmic consultant in London about 1904. Later, she was appointed consulting ophthalmic surgeon to the South London Hospital for Women. Always interested in social medicine, she was elected a member of the St. Marylebone borough council in 1912, and for some years was the only woman on the council, where she had considerable influence in matters concerning the health of women and children. When war broke out in 1914 Dr. Roberts became increasingly active, and her opportunity to undertake more systematic work came with the formation of the Women's (later Queen Mary's) Army Auxiliary Corps in 1917, when for the first time the organized help of women, chiefly for clerical and domestic duties, was made available as an accessory to the Regular Army in wartime. To provide certain medical services in connexion with this corps a small unit of medical women was formed, being attached to the R.A.M.C. and represented at the War Office by a controller of medical services of the W.A.A.C., a post Dr. Roberts held after serving in this unit for two years, first as president of the London recruiting and medical boards.

For her valuable work in connexion with the war she was appointed an O.B.E. of the Military Division in 1919. Dr. Roberts was elected to the London County Council as a representative of St. Marylebone in 1922, when she gave up medical practice and rendered unstinted service to the council until her retirement 12 years later. She was chairman of the mental hospitals committee of the council, in which she took a keen interest, and her good work as chairman of the committee during the reorganization and development of the Maudsley Hospital was widely recognized at the time. After her retirement from the L.C.C. Dr. Roberts continued to do a good deal of public work as a magistrate and for various voluntary societies, including the Invalid Children's Aid Association. She remained in London during the second world war, but increasing ill-health prevented her, to her great regret, from taking part

in any active medical or social work. Dr. Roberts, who made a worthy contribution to the work done by medical women during the first half of the century, had a clear mind, good judgment, courage, and a high sense of responsibility. As a friend, her wide experience, quiet humour, and personal charm made her a delightful companion, though to many people who did not know her well she undoubtedly presented a somewhat formidable figure. She was unquestionably an outstanding person of exceptional character and attainments, and she leaves a record of good work finely done.—J. H. T.

A memorial service for Sir CHARLES MARTIN will be held in the Chapel of St. John's College, Cambridge, on Saturday, March 12, at 12 noon.

Medical Notes in Parliament

Merit Awards

Mr. BERESFORD CRADDOCK (Spelthorne, Con.) on February 28 asked the Minister of Health on what basis the distinction (merit) award was given to consultants in the Health Service over and above their salaries; and why the identity of the doctors granted these awards from public funds was not published. Mr. IAIN MACLEOD replied that the committee set up to recommend awards was required by its terms of reference to base its recommendations on professional distinction. In his view publication of names would not be in the best interests of the Health Service. Mr. CRADDOCK asked what objection there was to publishing the names, as the grants were paid from public funds. Mr. MACLEOD said the objection surely was that, if it were known which consultants got class A, B, or C awards, patients might think they were getting different forms of treatment. That would not be the case, because factors other than clinical ability were taken into account. The same view had always been taken by his predecessors, and he believed it to be right.

Mr. BERESFORD CRADDOCK also asked the Minister whether he was aware that doctors of the highest distinction in the employ of the Medical Research Council were not eligible for distinction (merit) awards in the same way as consultants in the Health Service; and whether he would provide for such, or similar, grants to be made, in order to remove this anomaly. Mr. MACLEOD replied that, subject to certain rules, doctors employed by the Medical Research Council were eligible for distinction awards if they held honorary consultant appointments in the Health Service. Apart from this, their remuneration was a matter for the Lord President of the Council.

Medicine in the Colonies

Mr. JAMES JOHNSON (Rugby, Lab.) asked the Minister of Health on February 28 whether, in view of the growing numbers of unemployed among British doctors, he would consult with the Secretary of State for the Colonies about their being engaged in the service of Colonial governments. Mr. MACLEOD said that the Colonial Secretary and he already consulted as necessary on the needs of the Colonial governments for medical staff, and vacancies were publicly advertised in all appropriate cases. Mr. JOHNSON said there were 200 applications for each vacant job to-day in the United Kingdom. In Nigeria there were some 61,000 people per doctor and in the Cameroons 71,000. He asked the Minister to ginger things up, and set up a working party to investigate the question of seconding doctors to the Colonies, particularly West Africa. Mr. MACLEOD replied that it was not within his competence to direct doctors to any particular area. Mr. JOHNSON said that people in the Colonies thought the present scheme was not working. He wished the Minister to consider some financial inducement, perhaps a settlement scheme, to induce doctors to go to the

Colonies. Mr. MACLEOD said the problem was largely one for the Colonial Secretary, and he would bring the suggestion to his notice.

Salary Scales

Mr. H. W. BOWDEN (Leicester, South-west, Lab.) asked the Minister of Health what steps he had taken to satisfy himself that the present salary scales were sufficiently attractive to encourage young doctors to enter hospital service rather than enter general practice. Mr. IAIN MACLEOD replied that the salaries of hospital medical staff were a matter for the Medical Whitley Council in the first instance; but he knew that the need to keep a proper balance in recruitment was an important factor in the agreement on increased salaries reached by the council a year ago. Mr. BOWDEN asked if Mr. MACLEOD was aware of the difficulties experienced by many hospitals in the provinces in obtaining junior medical staff. Mr. MACLEOD said that indeed he was. It would be a mistake, however, to link those difficulties entirely with problems of pay. In many cases they arose because the hospitals were remote or unattractive. As for pay, the agreement last year did a good deal to restore the balance that was upset by the Danckwerts award. Mr. J. SNOW (Lichfield and Tamworth, Lab.) said it would be a great pity if the provision of practitioners for the countryside was in any way jeopardized. There were still many rural areas under-doctored.

Manpower Inquiry

Mr. A. BLENKINSOP (Newcastle-upon-Tyne, East, Lab.) asked if the Minister was satisfied that there was sufficient non-professional representation on the committee to inquire into medical manpower. Mr. MACLEOD said that the Secretary of State for Scotland and he were satisfied that the composition of the committee was well adapted to the work before it.

Mr. R. GOWER (Barry, Con.) complained that the medical manpower committee contained no members who had been associated with health administration in Wales, although Scotland had three and England eight. Mr. MACLEOD said the members had been appointed solely on their personal qualifications, and not as representatives of particular areas or interests. The interests of the Welsh health services, which through the Welsh Board of Health were his direct responsibility, would not be prejudiced in any way.

Dispensing Equivalents

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) asked the Minister of Health on February 28 whether he had noted that exactly similar preparations of some drugs, particularly penicillin, were manufactured by different chemical firms and stocked by dispensing chemists; that these preparations had different names; and whether he would authorize dispensing chemists to dispense an exact equivalent, irrespective of the name on the prescription. Miss PAT HORNSBY-SMITH, Parliamentary Secretary, replied that the Minister was aware of the position, but he would not feel justified in authorizing chemists to dispense preparations other than those prescribed. The matter was primarily one for the prescriber. Dr. STROSS said there were four or five oral and stable suspensions of penicillin that were exactly alike and identical in therapeutic effects. He suggested that a child suffering from pneumonia might not get anything to help it for a day and/or a night, although a similar preparation was available. He wondered what ought to be done in such a case. Miss HORNSBY-SMITH said that it would be quite unethical for a chemist to transpose one preparation for another that was ordered by a doctor. In a case of that kind there was no reason why the chemist should not telephone the doctor and ask whether he would agree to change to the comparable preparation.

Coroners' Verdicts

Mr. JAMES GRIFFITHS (Llanelly, Lab.) asked the Minister of Pensions and National Insurance if he was aware of the

concern that was felt in South Wales at the increasing number of cases in which coroners' courts had found that the death of coal-miners was due to, or accelerated by, silicosis or pneumoconiosis and in which the medical boards made contrary decisions; and whether he would consider the setting up of a competent body to investigate and report on the criteria used by the boards in arriving at their decisions. Mr. OSBERT PEAKE, replying on February 28, said he was aware that for some time concern had been felt in South Wales on this matter. He had had discussions with the Home Secretary and his predecessor about it. A circular was issued to coroners in October, 1954, drawing attention to the importance of employing experienced pathologists in cases of this kind.

Mr. GRIFFITHS said the disparity was continuing and causing widespread concern. Would the Minister consult his medical advisers about a closer examination of the problem? Mr. PEAKE pointed out that coroners were independent judicial officers, and there was great difficulty in arriving at a solution. Mr. GRIFFITHS said that a verdict that death was caused by pneumoconiosis or silicosis, after a report by a pathologist, caused much doubt about the decisions of the medical board. Was it not essential that there should be an inquiry, to maintain confidence in the boards? Mr. PEAKE said his information was that in most cases where difficulty had arisen the post-mortem examination had been conducted by a general practitioner. Therefore he thought it would be wiser to see whether the circular had any effect before considering further action.

Effects of Dust Suppression

Mr. GRIFFITHS asked the Minister of Fuel and Power if he would make a statement on the progress made in combating silicosis and pneumoconiosis among coal-miners; to what extent the measures taken were proving adequate; and what further measures were contemplated.

Mr. L. W. JOYNSON-HICKS, the Parliamentary Secretary, stated on February 28 that in South Wales, where full-scale dust suppression first started, the total number of new cases in 1953 was 1,069, compared with 3,774 in 1949. Corresponding figures for the whole country were 4,048 in 1953 and 5,807 in 1949. He was advised that the National Coal Board was making substantial progress with its dust suppression programme, and further investigation was constantly proceeding, under the Board's "twenty-pit" scheme and other types of research.

Genetic Effects of Radioactivity

Mr. F. BESWICK (Uxbridge, Lab.) asked the Parliamentary Secretary to the Ministry of Works, as representing the Lord President of the Council, what steps he had taken to satisfy himself that there was adequate research into the genetic effects of radioactivity; and if, in view of the serious issues involved, he would make a statement.

Mr. J. R. BEVINS replied on March 1 that a programme of research into the genetic effects of radioactivity was in progress under the auspices of the Medical Research Council, and plans were being made to expand and accelerate it. There was frequent consultation with workers engaged in cognate studies in the United States, and the researches in this country were planned to avoid overlapping with the American investigations.

Blindness in West Africa

Mr. A. LENNOX-BOYD, Secretary of State for the Colonies, informed Mr. C. ALPORT (Colchester, Con.) on March 2 that entomological research undertaken by the British Empire Society for the Blind in the Volta region, as part of their West African survey, was nearing completion. This was expected to lead to recommendations for insecticidal campaigns in inhabited areas of the Upper Volta along the tributary and subsidiary streams, where the incidence of river blindness was higher than along the Volta itself. As

regards the Lower Volta, the special measures that might be required if it was decided to embark on the Volta River hydro-electric project had been studied by the preparatory commission for the project, and would be included in its report. Meanwhile, substantial progress was being made by Government medical field units in the treatment of sufferers.

Palestinian Refugees

Lord JOHN HOPE, Under Secretary, Foreign Office, replying to Mr. PATRICK MAITLAND (Lanark, Con.), stated on March 2 that Palestinian refugees suffering from infectious tuberculosis were segregated and cared for in local government hospitals in Gaza and the Lebanon, in the new Government sanatorium in Amman, and in a missionary tuberculosis hospital on the West Bank. Next month the United Nations Relief and Works Agency would open a further 100-bed tuberculosis hospital in Jordan especially for refugees. Mr. Maitland said that more than 4,000 refugees had been living for more than five years in one camp near Jericho, and there were no arrangements whatever for segregation in the camp. The arrangements the Under Secretary had described were utterly inadequate. The Government, having contributed large sums to the Agency for many years, should voice this major scandal. Lord JOHN HOPE said that things might not be perfect, but the Agency was working on the advice of a public health specialist in tuberculosis from the World Health Organization. He was assured that there was no special danger to public health.

Lord JOHN HOPE informed Mr. CROUCH (Dorset, North, Con.) that the number of Palestinian refugees per doctor in the U.N. Relief and Works Agency camps was 3,556.

Recruitment for the Colonies

Mr. F. BROCKWAY (Eton and Slough, Lab.) on March 7 asked the Minister of Health if he would request the committee on medical manpower to consider the question of recruitment in relation to Colonial needs as well as to the needs of the United Kingdom. Mr. IAIN MACLEOD said that the committee's terms of reference covered all branches of the profession, and it would therefore take account of doctors who went overseas as well as those who remained in this country. Mr. BROCKWAY asked whether, in view of the great urgency for doctors in the Colonies, the Minister would consult with the Secretary of State with a view to seeing that there were openings for both British citizens and Colonial subjects to enter medical schools for this purpose. Mr. MACLEOD said that he was in touch with the Colonial Secretary. The manpower committee would be concerned only with medical training in this country, but they must take into account where qualified doctors might go from the universities, and that included the Colonies.

Mercury Teething Powders

Mr. S. SWINGLER (Newcastle-under-Lyme, Lab.) asked the Minister of Health on March 7 if he had considered the recent case of a baby's death from mercury poisoning,¹ and what action he would take concerning the supply of tablets containing mercury to infants. Miss PAT HORNSBY-SMITH said that, while the Minister was advised that mercurial preparations had a proper place in medical treatment, his medical officers had already suggested to medical officers of health that powders containing mercury should be issued from child welfare clinics only on medical advice and with precise instructions. He would consider further whether to suggest that these preparations should cease to be available at clinics at all. Mr. SWINGLER suggested that the Minister's medical advisers might issue a general warning to the public, in view of the concern created by a recent inquest. Miss HORNSBY-SMITH said she thought that the general publicity and the advice given by medical officers of health made this

¹ *British Medical Journal*, March 5, p. 610.

clear, but even if the powders were not given at clinics it would not interfere with the right of a doctor to prescribe a preparation in which this was included.

Charge for Certificates

Mr. V. COLLINS (Shoreditch and Finsbury, Lab.) on March 7 asked the Minister of Health if he was aware that many doctors charged 2s. for medical certificates issued to Health Service patients, and if he would make a regulation to prohibit this charge. Miss PAT HORNSBY-SMITH, Parliamentary Secretary, replied that general practitioners in the Health Service were not required to provide free medical certificates other than those required under the National Insurance Acts and certain other enactments which are set out in Regulations. The Minister saw no reason for altering this system. Mr. COLLINS said that often these certificates had to be paid for after a period of unemployment. If the per capita charge did not cover them, could it be adjusted so that the certificates could be issued free? Miss HORNSBY-SMITH said that certificates required to obtain benefit under any of the regulations were obtainable free, but other types of certificate were not.

Opticians' Registration

Miss PAT HORNSBY-SMITH informed Mr. A. BLENKINSOP (Newcastle-upon-Tyne, East, Lab.) on March 7 that the Government could hold out no hope of introducing legislation for the registration of ophthalmic and dispensing opticians at present. She said that the difficulty was with the Parliamentary time-table.

Mental Nursing.—There is still a shortage of mental nurses, which has been estimated at about 10,000.

Lost in Hospital.—In the three years 1951-2 to 1953-4 the value of articles recorded as lost in Scottish hospitals was respectively £18,479, £25,933, and £16,068.

Fluoridation Tests.—Experiments in the fluoridation of water are to start in Anglesey, Darlington, and Watford during the summer. Special equipment has to be provided, and the local authorities are now inviting tenders.

The Services

Major-General F. J. O'Meara, late R.A.M.C., has been appointed Honorary Physician to the Queen, in succession to Brigadier R. J. Rosie, C.B.E., retired.

Colonel C. M. Marsden, late R.A.M.C., has been appointed Honorary Surgeon to the Queen, in succession to Major-General J. C. Collins, C.B., C.B.E., retired.

Colonel J. B. S. Guy, C.B.E., T.D., R.A.M.C., T.A., has been appointed Honorary Colonel of a T.A. Unit, in succession to Colonel P. Hickey, T.D., R.A.M.C., T.A., whose tenure has expired.

A Supplement to the *London Gazette* has announced the following awards:

Third Clasp to the Territorial Efficiency Decoration.—Major (Honorary Lieutenant-Colonel) T. C. McKenzie, T.D., R.A.M.C., retired.

Second Clasp to the Territorial Efficiency Decoration.—Major (Honorary Lieutenant-Colonel) T. C. McKenzie, T.D., R.A.M.C., retired.

First Clasp to the Territorial Efficiency Decoration.—Lieutenant-Colonel A. Wilcox, T.D., and Majors (Honorary Lieutenant-Colonels) T. C. McKenzie, T.D., retired, and Sir J. C. Nicholson, R.A.M.C.

Territorial Efficiency Decoration.—Colonel G. O. Montgomery, retired, Lieutenant-Colonel T. F. Redman, Majors (Honorary Lieutenant-Colonels) W. I. Gordon and Sir J. C. Nicholson, Majors E. S. Curtiss, D. B. McVittie, E. L. Simpson (retired), and A. J. Thomson, and Captain (Acting Lieutenant-Colonel) H. K. Meller, M.B.E. (now A.E.R.), R.A.M.C.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending February 19 (No. 7) and corresponding week 1954.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1955					1954				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria	16	0	6	0	1	19	1	5	0	1
Dysentery	1,145	55	285	4	1	754	90	184	9	7
Encephalitis, acute	3	0	0	0		3	0	0	1	
Enteric fever:										
Typhoid	4	0	0	0		1	0	1	0	2
Paratyphoid	3	0	3	0		10	0	3	0	
Food-poisoning	112	16		0		224	18		0	
Infective enteritis or diarrhoea under 2 years					12 15				11	28
Measles*	19,976	2402	236	648	68	1,944	29	65	10	291
Meningococcal infection	43	8	19	5		51	8	17	2	4
Ophthalmia neonatorum	48	11	1	0		20	2	4	0	
Pneumonia†	1,020	80	267	47	3	932	48	262	4	1
Poliomyelitis, acute:										
Paralytic	13	2		2	2	15	0		4	4
Non-paralytic	8	1		0		4	0			
Puerperal fever‡	213	52	8	1		225	35	4	1	
Scarlet fever	682	28	75	52	27	1,223	54	187	35	24
Tuberculosis:										
Respiratory	713	68	128	28		792	98	174	33	
Non-respiratory	116	7	17	8		127	8	18	7	
Whooping-cough	1,910	151	192	42	27	2,099	71	354	50	61

DEATHS in Great Towns	1955					1954				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria	1	0	0	0	0	0	0	0	0	1
Dysentery	0	0		0		0	0		0	
Encephalitis, acute		0			0		0			0
Enteric fever	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	12	0	3	0	2	12	0	4	0	2
Influenza	82	19	7	0	5	45	2	2	0	2
Measles		1	1	1	0		0	0	0	1
Meningococcal infection		0	0				2	0		
Pneumonia	357	73	32	17	14	421	53	29	8	13
Poliomyelitis, acute	1	0			0	1	0			0
Scarlet fever	0	0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory	104	17	19	4	4	126	20	19	1	7
Non-respiratory		0	0	1	0		0	0	1	1
Whooping-cough	2	0	0	0	0	3	0	0	0	1
Deaths 0-1 year	247	32	38	11	18	258	25	48	5	23
Deaths (excluding stillbirths)	6,894	1085	788	181	219	7,161	1020	715	123	222
LIVE BIRTHS	7,051	1044	927	211	360	8,072	1136	963	251	460
STILLBIRTHS	185	22	27			204	23	30		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenzal pneumonia.

‡ Includes puerperal pyrexia.

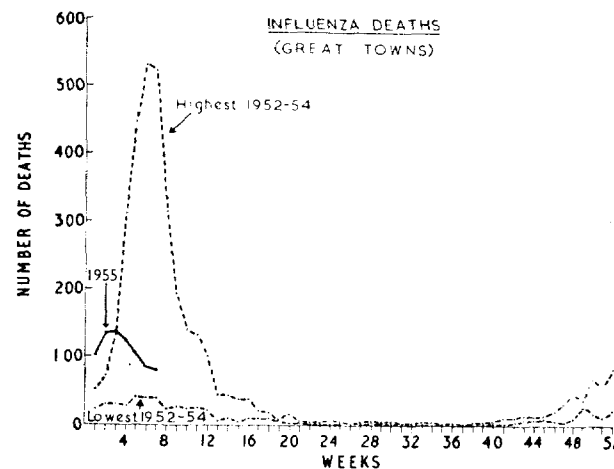
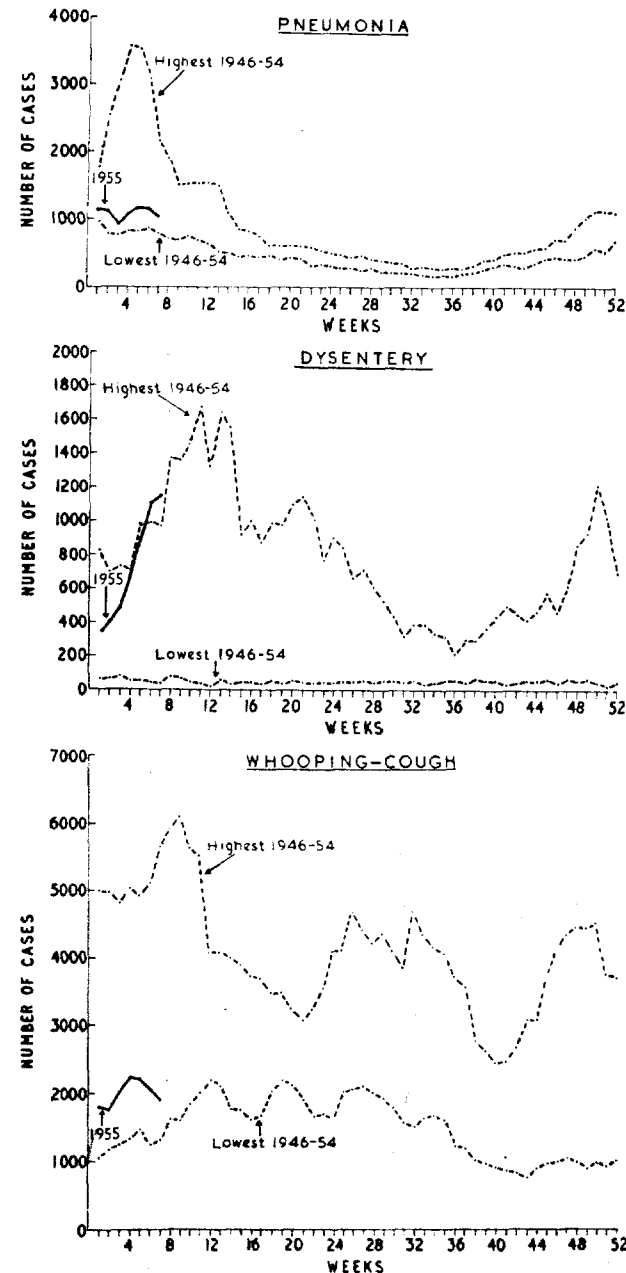
Vital Statistics

Diphtheria Low Record

In England and Wales in 1954 only 9 deaths from diphtheria were reported. This provisional figure may be compared with 23 for 1953 and 722 for 1945. The provisional figure of corrected notifications was 182, also a record low figure. In 1953 they numbered 266, and in 1945, 18,596.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the nine years 1946-54 (influenza, 1952-4) are shown thus ----, the figures for 1955 thus —. Except for the curves showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The largest fluctuations in the trends of the notifications of infectious diseases in England and Wales during the week ending February 19 were an increase of 1,613 for measles, from 18,363 to 19,976, and decreases of 155 for whooping-cough, from 2,065 to 1,910, 136 for acute pneumonia from 1,156 to 1,020, and 64 for scarlet fever, from 746 to 682.

The largest increases in the incidence of measles were 457 in London, from 1,945 to 2,402, 379 in Kent, from 675 to 1,054, 245 in Warwickshire, from 815 to 1,060, 243 in Derbyshire, from 778 to 1,021, and 111 in Nottinghamshire, from 975 to 1,086. In contrast to the general rise, two large falls in the incidence of measles were reported—of 234 in Lancashire, from 3,277 to 3,043, and 173 in Yorkshire West Riding, from 2,871 to 2,698. The largest fluctuation in the trends of whooping-cough was a fall of 73 in Lancashire, from 243 to 170. The only variations of any size in the incidence of scarlet fever were decreases of 26 in London, from 54 to 28, and 21 in Yorkshire West Riding, from 77 to 56. 16 cases of diphtheria were notified, being 2 more than in the preceding week. Half of the cases were notified in three cities. Manchester C.B. 3, Kingston-upon-Hull C.B. 3, and Middlesbrough C.B. 2.

The 3 cases of paratyphoid fever were all notified in Birmingham C.B.

21 cases of acute poliomyelitis were notified. These cases were 4 more for paralytic and 1 more for non-paralytic cases than in the preceding week. The areas with multiple cases were London 3, Lancashire 3, Devonshire 2, and Nottinghamshire 2.

1,145 cases of dysentery, 35 more than in the preceding week, were notified. The largest centres of infection were Lancashire 445 (Blackpool C.B. 122, Oldham C.B. 106, Blackburn C.B. 72, Manchester C.B. 52, Liverpool C.B. 12, Lytham St. Anne's M.B. 11, Darwen M.B. 10), Durham 71 (Easington R.D. 16), Yorkshire West Riding 60 (Leeds C.B. 26, Sheffield C.B. 17), Northamptonshire 60 (Northampton C.B. 46), London 55 (Southwark 12), Nottinghamshire 46 (East Retford M.B. 27, Mansfield M.B. 10), Northumberland 45 (Newcastle-upon-Tyne C.B. 19), Glamorganshire 44 (Swansea C.B. 16, Cardiff C.B. 13), Leicestershire 42 (Leicester C.B. 21, Wigston U.D. 18), Yorkshire North Riding 36 (Middlesbrough C.B. 35), Norfolk 35 (Norwich C.B. 15), Cardiganshire 27 (Lampeter M.B. 25), Lincolnshire 25 (Scunthorpe M.B. 24), and Staffordshire 23 (Burton-upon-Trent C.B. 12).

Week Ending February 26

The notifications of infectious diseases in England and Wales during the week included: scarlet fever, 675, whooping-cough 1,678, diphtheria 13, measles 23,700, acute pneumonia 924, acute poliomyelitis 21, dysentery 1,237, paratyphoid fever 3, and typhoid fever 4.

Medical News

Endocrine Unit at New End Hospital.—The new department of endocrinology at New End Hospital, Hampstead, was opened on March 2 by the DUKE OF EDINBURGH. The chair was taken by the Hon. JOHN FREMANTLE, chairman of the North-west Metropolitan Regional Hospital Board, by whom the first extension of the department was begun two years ago with the initiation of the radio-isotope laboratory. Among those present were the MINISTER OF HEALTH; Sir THOMAS DUNHILL, founder of the L.C.C. Thyroid Clinic, from which the new department has developed; and the representative of Organon Laboratories, Ltd., who have provided a generous annual subsidy for the research work of the department. The Duke of Edinburgh was conducted through the new premises, housed in the shell of the old maternity unit, by Mr. J. E. PIERCY, the surgeon-superintendent of the hospital, and Dr. RAYMOND GREENE, senior physician to the hospital and the originator of the extension plan. The new department includes 26 beds, a new biochemical laboratory, an extended and improved radio-isotope laboratory, an out-patient department, and a new operating theatre, all in convenient juxtaposition. The transmutation of the thyroid clinic into a complete endocrinological research unit has been made possible by a generous gift of some £50,000 from King Edward's Hospital Fund.

Eli Lilly and Lederle Travelling Fellowships.—The Medical Research Council invites applications *not later than March 28* for these travelling fellowships in medicine for the academic year 1955-6. The fellowships are for graduates resident in Britain who are likely to benefit by a period of work in the United States before taking up positions for higher teaching or research in the United Kingdom. The stipend is \$2,700 per annum for a single fellow and \$3,900 for a married fellow. The funds for the fellowships have been generously provided by Eli Lilly and Company, U.S.A., and the Lederle Laboratories Division of the American Cyanamid Company. Full details and forms of application from the secretary, Medical Research Council, 38, Old Queen Street, Westminster, London, S.W.1.

Professor R. V. Christie, professor of medicine at St. Bartholomew's Hospital, London, since 1938, has been appointed professor of medicine, and chairman of the department of medicine, at McGill University, Montreal. He has also been appointed physician-in-chief of the Royal Victoria Hospital, Montreal. He succeeds Professor E. F. MILLS. Born in 1902, Professor Christie graduated from Edinburgh University, continuing his studies at the Rockefeller Institute for Medical Research, New York, Freiburg University, and McGill University, where he is now going. He was Goulstonian lecturer to the Royal College of Physicians in 1943, and is a Censor of the College. He is also a member of the Senate of London University. Professor Christie is perhaps best known to readers of the *Journal* for his publications on the antibiotic treatment of subacute bacterial endocarditis. He expects to take up his appointment in Montreal in the autumn.

Chairs of Medicine and Surgery at Melbourne.—Melbourne University has appointed two doctors from London to its new chairs of medicine and surgery. Dr. R. R. H. LOVELL, lecturer in medicine at St. Mary's Hospital Medical School, will be professor of medicine, and Mr. M. R. EWING, senior lecturer in surgery at the Postgraduate Medical School of London, professor of surgery. Dr. Lovell, who is 35, graduated at London University and was a Naval surgeon during the war. Mr. Ewing, aged 42, also a Naval surgeon in the war, held a British-American Exchange Scholarship at the Memorial Hospital, New York, in 1950-1, and was a Hunterian professor of the Royal College of Surgeons in 1950, when he lectured on "Villous Tumours of the Rectum."

Order of St. John.—Sir STEWART DUKE-ELDER, accompanied by the Secretary of the Order, Major J. F. C. UNDERHILL, is now on tour in the Middle East. He is looking into the possibility of restoring the Ophthalmic Hospital of St. John in Jerusalem and the establishment, somewhere in the Middle East, of a research institute for the study of trachoma. It is understood that the latter would be administered by the Order of St. John and financed by interested British firms. Sir Stewart is expected to return to London at the beginning of April.

Doctors and the Press.—Dr. H. GUY DAIN, in his capacity as chairman of the Association's Public Relations Committee, has invited representatives of the Press to attend an "exploratory meeting" on March 29 at B.M.A. House to discuss "the relations between the medical profession and the Press, particularly with reference to news from hospitals." This arises as a result of recent correspondence in the newspapers about the reporting of the Keighley and Kano conjoined twins. The Press organizations invited to send representatives to the meeting are the General Council of the Press, the Newspaper Proprietors Association, the Guild of British Newspaper Editors, the Newspaper Society, the Press Association, the Institute of Journalists, the National Union of Journalists, the Newspaper Conference, the Scottish Daily Newspapers Society, and the Scottish Newspaper Proprietors Association.

Chest Diseases Group.—The formation is announced of a clinical group called the South-West Metropolitan Region Chest Diseases Group (Eastern Area). It covers the county areas of Surrey and West Sussex, and that part of the county of London within the geographical area of the regional board. The aim of the group is to promote the study of diseases of the chest, with special reference to the problem of tuberculosis. Membership is open to all doctors in the area with an interest in chest diseases. Further details may be obtained from the honorary secretary, Dr. G. C. TAYLOR, A.S.M.O., South-West Metropolitan Regional Hospital Board, 27, Queen Anne Street, London, W.1.

Trinidad's Lepers.—Dr. ERNEST MUIR, honorary medical adviser to the British Empire Leprosy Relief Association, and Dr. SOUZA LIMA, of the World Health Organization, have been invited to visit the island of Chacachacare to report on the management of the lepers there (see *Journal*, January 15, p. 175). Dr. Muir is familiar with the local conditions, as after his retirement he worked at Chacachacare during the last world war.

Dr. E. A. Wright, experimental pathologist at the Medical Research Council's experimental radiopathology research unit at Hammersmith Hospital, has been appointed to the London University readership in pathology tenable at St. Mary's Hospital Medical School.

Professor J. Cruickshank, who retired from the chair of bacteriology at Aberdeen University last year, will receive the university's honorary degree of Doctor of Laws at the summer graduation in July.

Dr. G. W. Marsh has been awarded the Polar Medal. He was Base leader and medical officer at Hope Bay, 1952-3, while a member of the Falkland Islands Dependencies Survey.

COMING EVENTS

Christian Medical Fellowship.—Mr. ARNOLD S. ALDIS, F.R.C.S., will speak on "The Extent of Medical Responsibility" at the Royal Empire Society, Northumberland Avenue, London, W.C.2, at 7.45 p.m. on March 17.

Airborne Medical Society.—The annual dinner of the society will be held at the Royal College of Surgeons, Lincoln's Inn Fields, on March 18 at 7.30 p.m. Details from the secretary, Dr. J. S. BINNING, Medical Department, Marylebone Station, London, N.W.1.

Institute of Psychiatry.—A series of postgraduate courses in psychiatry will be held at the Maudsley Hospital, Denmark Hill, London, S.E.5, starting on April 4.

Central Council for the Care of Cripples.—Conference on "The Well-being of the Disabled" at Leeds University, April 12-14. Details from the council, 34, Eccleston Square, London, S.W.1.

Brompton Hospital Association.—Dr. G. E. BEAUMONT will preside over the dinner of this association on April 15 at the Waldorf Hotel at 7.15 for 8 p.m. The cost of the dinner will be £1 5s. (excluding drinks). Application should be made to Dr. A. F. FOSTER-CARTER, Brompton Hospital, London, S.W.3.

Society for General Microbiology.—Twentieth general meeting at the Royal Institution, London, April 18-20. On April 18 at 6 p.m. Professor C. B. VAN NIEL will deliver the second Marjory Stephenson Memorial Lecture on "Natural Selection in the Microbial World." On April 19 and 20 there will be a symposium on "Mechanisms of Microbial Pathogenicity."

Postgraduate Course for General Practitioners.—A full-time course at the Cardiff Royal Infirmary and Llandough Hospital, April 25-May 7, has been arranged by the Welsh National School of Medicine. Details from the secretary of the school, 34, Newport Road, Cardiff.

SOCIETIES AND LECTURES

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

Monday, March 14

BRITISH PSYCHO-ANALYTICAL SOCIETY.—At Royal Society of Medicine, 8.30 p.m., Ernest Jones Lecture by Mr. J. Wisdom: Logic of the Unconscious.

MEDICAL SOCIETY OF LONDON.—8.30 p.m., clinico-pathological meeting.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—7.30 p.m., Dr. G. Brownlee: The Attack on the Tubercle Bacillus.

UNIVERSITY COLLEGE LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, 4.45 p.m., Dr. Joseph Needham, F.R.S.: New Light on Physico-chemical Aspects of Morphogenesis.

Tuesday, March 15

CHADWICK TRUST.—At Royal Society of Tropical Medicine and Hygiene, 5.30 p.m., Professor E. J. KING, Ph.D., D.Sc.: Silicosis.

ILFORD MEDICAL SOCIETY.—At King George Hospital, Ilford, 8.45 p.m., Professor W. C. W. Nixon and Dr. Sheila G. Ransom: Training for Childbirth.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. A. D. Porter: Actinic Eruptions.

SOUTH-WEST LONDON MEDICAL SOCIETY.—At Bolingbroke Hospital, 8.30 p.m., Mr. E. G. Muir: Abdominal Emergencies.

WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Mr. J. Minton: Ocular Manifestations in Clinical Neurology (Part II).

Wednesday, March 16

HYPNOTHERAPY GROUP.—At Royal Society of Medicine, 8 p.m., Dr. J. A. Hadfield: Place of Suggestion in Analytic Treatment.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Allergy and Immunity in Skin Diseases.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. J. F. Barrington: Indications for Treatment in Enlarged Prostate.

LONDON UNIVERSITY.—At Meyerstein Lecture Theatre, Westminster Medical School, 5.30 p.m., special university lecture in biochemistry by Academician W. A. Engelhardt (Moscow): Mechano-chemistry of Muscle.

MIDLAND MEDICAL SOCIETY.—At Birmingham Medical Institute, 154, Great Charles Street, 8.15 p.m., Professor J. H. Dible: Some Pathological Observations on Peripheral Vascular Disorders.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Weill Lecture by Professor R. McWhirter: Breast Cancer.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Dr. J. Greenwood Wilson: Housing and Health.

ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., annual extraordinary general meeting.

ST. MARKLEBONE HOSPITAL FOR PSYCHIATRY AND CHILD GUIDANCE.—5.30 p.m., Mr. G. C. Knight: Neurosurgical Treatment.

WELSH NATIONAL SCHOOL OF MEDICINE.—At Reardon Smith Lecture Theatre, Cardiff, 8 p.m., Fifth William Sheen Memorial Lecture by Sir Geoffrey Jefferson, F.R.S.: Aneurysms of the Cavernous Sinus.

WILLESDEN GENERAL HOSPITAL MEDICAL SOCIETY.—8.45 p.m., Presidential Address by Dr. T. Pearce Williams: Some Comments on the Colon.

Thursday, March 17

BRITISH INSTITUTE OF RADIOLOGY.—8 p.m., Mr. G. E. Flatman and Mr. R. E. Ellis, B.Sc.: Report on the Use of Convergent Beam X-ray Therapy at the Middlesex Hospital; Mr. K. Y. Orfan, B.A.: Rotation Therapy with the 2 MeV Van Der Graaf Generator in Sheffield.

EDINBURGH CLINICAL CLUB.—At 7, Drumsheugh Gardens, 8 p.m., Dr. Alexander Joe: Poliomyelitis—Aetiology, Diagnosis, and Treatment.

LIVERPOOL MEDICAL INSTITUTION.—At Liverpool Ear, Nose, and Throat Infirmary, 3 p.m., afternoon clinical demonstration.

LONDON UNIVERSITY.—At University College Hospital Medical School, 5 p.m., special university lecture in pathology by Dr. Honor B. Fell, F.R.S.: Response of Organs in Culture to Environmental Influences.

NORTH-WESTERN TUBERCULOSIS SOCIETY.—At Clinical Theatre, Manchester Royal Infirmary, 5 p.m., Dr. L. E. Houghton: Corticotrophin in the Treatment of Pulmonary Tuberculosis.

NUFFIELD ORTHOPAEDIC CENTRE.—At Wingfield-Morris Orthopaedic Hospital, 8.30 p.m., Professor O. Scaglietti: Diagnosis and Early Treatment of Congenital Dislocation of the Hip.

ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Lieutenant-Colonel H. N. Stafford: Colonel's Practice and Procedure.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Oliver-Sharpey Lecture by Professor W. Melville Arnott: Order and Disorder in Pulmonary Function.

ROYAL EYE HOSPITAL.—5.30 p.m., Dr. T. H. Whittington: Some Aspects of Refraction Work: (4) Effects of Lenses in Relation to Prescription and Fitting of Glasses.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—At Royal Army Medical College, 7.30 p.m., laboratory meeting.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Sir Paul Mallinson: psychiatry demonstration.

SOCIETY OF CHEMICAL INDUSTRY: MICROBIOLOGY GROUP.—At Medical Society of London, 6.15 p.m., Dr. M. Lumb: Lesser Known Antibiotics.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At Rembrandt Hotel, S.W., 7 for 7.30 p.m., dinner meeting. Sir John Charles: Counting the Cost.

Friday, March 18

BRITISH INSTITUTE OF RADIOLOGY.—5 p.m., meeting of medical members.

FACULTY OF RADIOLOGISTS.—At Royal College of Surgeons of England, 5 p.m., Radiotherapy Section Meeting. Mr. G. W. Blomfield: An Evaluation of the Clinical Results in Two Million Volt X-ray Therapy.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. F. R. Bettley.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Dr. J. Smart: Bronchitis.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—(1) 2 p.m., Mr. R. S. Murley: Carcinoma of the Female Breast, with Especial Reference to the Evaluation of the Results of Treatment. (2) 4 p.m., Dr. R. A. J. Asher: Medical Uses of Hypnotism.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Dr. J. H. Hutchison: Some New Diseases in Paediatrics.

SOCIETY OF CHEMICAL INDUSTRY: FINE CHEMICALS GROUP.—At Westminster Medical School, 6 p.m., discussion to be introduced by Dr. A. Lawson, Dr. J. H. Wilkinson, Professor N. F. MacLagan, and Dr. I. C. Gilliland: Chemical Aspects of Thyrotoxicosis.

Saturday, March 19

BIOCHEMICAL SOCIETY.—At University College London, annual general meeting, followed by scientific papers.

CAMBRIDGE UNIVERSITY MEDICAL SCHOOL.—10.30 a.m., symposium: Cardiovascular Diseases.

ST. STEPHEN'S HOSPITAL.—At Rheumatism Unit, Fulham Road, S.W., March 19 and 20, 10 a.m., each day, concentrated week-end course in the "Rheumatic Diseases."

APPOINTMENTS

CAMERON, ALICK, M.D., Deputy Medical Officer of Health for the Urban Districts of Sevenoaks; Southborough and Tonbridge and the Rural Districts of Sevenoaks and Tonbridge; Clinical Assistant, Ophthalmic Department, Bromley Hospital.

GRIFFITH, A. H., M.B., B.S., D.P.H., Senior Medical Officer, Cardiff City Council.

LIVERPOOL REGIONAL HOSPITAL BOARD.—P. D. Kelsall, M.B., Ch.B., F.F.A.R.C.S., D.A., Consultant Anaesthetist, Southport, Ormskirk, and North Liverpool areas.

WYLLIS-WILLIAMS, DAVID, M.S., F.R.C.S., Consultant Plastic Surgeon at Nottingham and Derby.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Bisset.—On March 5, 1955, to Dr. Sheona (formerly Lament), wife of Dr. H. W. Bisset, of West Hartlepool, a brother for Christine.

Jeffs.—On February 2, 1955, at Lewisham Hospital, London, S.E., to Doris (formerly Rowland), wife of Harry G. Jeffs, M.B., B.S., a sister for Carolyn Jane—Angela Gail.

Moodie.—On March 1, 1955, to Barbara (formerly Jeffery), wife of Dr. G. Moodie, of Worksop, Notts, a daughter.

DEATHS

Anthons.—On February 22, 1955, at his home, Wilfred Mark Anthony, M.B., B.S., of Church Hill, Walthamstow, London, E.

Ashcroft.—On February 26, 1955, at 25, Oakfield Drive, Upton by Chester, Cheshire, Edward Maynard Ashcroft, M.B., Ch.B., D.P.H., late of Levenshulme, Manchester, and Heaton Moor, Stockport, aged 79.

Browne.—On February 25, 1955, at Northampton, Benjamin Sidney Browne, L.R.C.P.S.Ed., late of Alcester, Warwick, and Cleeve Hill, Glos, aged 91.

Campbell.—On February 23, 1955, at the Royal Northern Infirmary, Inverness, Ranald Douglas Campbell, D.S.O., M.B., Ch.B.

Glaister.—On February 11, 1955, at Chichester, Joseph Glaister, M.B., Ch.B.

Liang.—On November 3, 1954, at Tokyo, Japan, while on his way to the U.S.A., Pow Kan Liang, M.B., F.R.C.S.Ed.

Milton.—On February 19, 1955, in a nursing home, Cheshire, Norman Vernon Milton, M.B., Ch.B., formerly of Savile Grange, and 10, Lord Street, Halifax, Yorks, aged 67.

Nicholson.—On February 14, 1955, at 22, Balliol House, Manor Fields, Putney, London, S.W., John Archibald Nicholson, M.C., M.B., Ch.B., aged 64.

Peacock.—On February 16, 1955, in a nursing home, Frinton, Essex, William Ernest Peacock, M.D.

Simpson.—On February 2, 1955, Cecil Butler Simpson, M.R.C.S., L.R.C.P., late of Fife, Yorks, aged 81.

Spurway.—On February 11, 1955, John Spurway, M.B., C.M., of Bredon, near Tewkesbury, aged 85.

Wareham.—On February 4, 1955, in hospital, Harold Edgar Wareham, M.B., Ch.B., of 16, Merchiston Avenue, Edinburgh, aged 83.

Whitehead.—On February 10, 1955, Brian Whitehead, M.C., M.R.C.S., L.R.C.P., of Hamilton House, Downton, Salisbury, Wilts.

Widdowson.—On February 20, 1955, at Odiham, Hants, Eric Arthur Widdowson, D.S.O., M.B., Ch.B.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Side-effects of Dexamphetamine

Q.—*What are the side-effects from the use of dexamphetamine sulphate or the cumulative ill-effects from the prolonged use of this drug?*

A.—The common side-effects of dexamphetamine are restlessness, insomnia, and lack of appetite; palpitation and extrasystoles occasionally occur, as do dryness of the mouth and flatulence; a persistent rise in blood pressure is very rare. Aberrations of behaviour have occasionally been reported even after moderate doses taken by susceptible persons. An amphetamine habit may sometimes develop in unstable individuals who have come to rely on the drug to restore confidence in the same way as others resort to alcohol when they have to face a difficult situation, but there is no evidence that true drug addiction develops to it, as tolerance, craving, and the withdrawal syndrome are not associated with its use. There is no risk of cumulative ill-effects resulting from even the prolonged administration of dexamphetamine in therapeutic doses.

Premature Detumescence

Q.—*A middle-aged man, happily married, complains that during the last few years, during intercourse, detumescence of the penis tends increasingly to occur before ejaculation, and that he has to satisfy his wife's orgasm by manual stimulation of her clitoris. Intercourse has rarely been more frequent than once a month, and of late years the interval is increasing. Would a hormone such as testosterone propionate help to correct matters, and would there be any risks associated with its exhibition?*

A.—This man's condition is most probably due to psychological causes, in which case testosterone propionate would be ineffective. It might, however, be tried in doses of 50 mg. twice a week: failure of a response within two weeks would confirm the diagnosis of psychogenic impotence. There are no risks attached to its administration, but should it be effective it is advisable to continue maintenance therapy with methyl testosterone in doses of 25 mg. daily by mouth.

Cellular Therapy

Q.—*What is the Niehans system of treatment? Recently there have been several references to it in the lay press. How successful is it?*

A.—A book entitled *Die Zellulärtherapie (Cellular Therapy)* has recently been published by Dr. Paul Niehans, together with 21 other contributors, from the house of Urban and Schwarzenberg (Munich, 1954). Only a review and a publisher's note on this book have been seen by the writer, but Dr. Niehans has also published a brochure on the "Biological Treatment of Diseased Organs in Human Beings and Animals" (Schlaefli, Interlaken, 1948) which has been studied. Dr. Niehans claims that degenerating tissues regain their efficiency when fresh cells are administered. Thus heart muscle cells are injected in myocardial degeneration, thyroid, gonadal, and kidney cells in gout, and cells from hypothalamic centres in hypothalamic obesity. Two injections of ovarian cell cultures are said to have imbued a 79-year-old lady with new life. The cells are taken from healthy foetal, young, or fully developed human beings or

animals, and they are usually injected intramuscularly, though sometimes they are injected near the diseased organ. It is claimed that the cells migrate and can arrive at their place of destination, presumably the diseased organ.

It must be confessed that the evidence presented in Dr. Niehans's brochure is of the testimonial type and unconvincing. Moreover, Professor Charles Rob in a recent lecture on the preservation and transplantation of human tissues¹ stated, "If one accepts the definition that a graft is a transplant of tissue which forms a permanent living union with the host, then one must conclude that—with the certain exception of identical twins and the possible exception of the cornea—a successful homologous graft has yet to be achieved." Dr. Niehans would counter this with the statement that it is possible to graft heterologous tissues into the embryo and that it might therefore be possible to graft embryonic tissues in the adult, though Burnet's review of the subject² makes this appear unlikely. Further theoretical objections are that if human tissues are used there will be a risk of homologous serum jaundice, and whatever tissues are used the treatment is likely to be expensive. Nevertheless, Dr. Niehans's theories cannot be dismissed out of hand, for recently some striking results have been obtained by Leon Jacobson, Lorenz, and others, in the protection of mice from anaemia and leukaemia after irradiation by the injection of emulsions of spleen, bone marrow, embryonic and other tissues (Ciba Foundation Symposium on Leukaemia Research, London, 1954). It is not yet decided whether the effect is a cellular or a humoral one, or whether it would be applicable to man.

REFERENCES

- ¹ *Lancet*, 1954, 2, 255.
- ² *British Medical Journal*, 1954, 2, 189.

Diet in Diabetes

Q.—*Ten minutes with the literature on diabetes mellitus reveals great diversity of teaching on what is best in dieting. The wide differences between what is thought and what is done still further complicate the position. Many diet sheets and cards, sedulously carried around by our patients, and a good many pages of the well-beloved textbooks are quite impracticable. What then is the fundamental principle which should guide us in framing a diet for a diabetic? What do we hope to attain by restricting carbohydrate, and what are the fundamental considerations which should govern the prescription of a diet for a diabetic?*

A.—A raised blood sugar is the cardinal abnormality in diabetes mellitus, and restriction of the carbohydrate in the diet is the common-sense answer to this change. Complete exclusion is not required. Carbohydrate is needed to make any diet palatable, to supply calories, and to facilitate the action of any insulin that may be used. After the introduction of insulin, some workers suggested that restriction of carbohydrate was unnecessary and the use of a "free diet" was advocated, particularly in children. Such advice would seem to be founded on false principles. A diabetic can no longer produce varying amounts of insulin for himself, according to what he eats. Instead, he gives himself a fixed amount of insulin each day, and so, to maintain his blood sugar within the normal range, he requires a fixed amount of carbohydrate.

With the passage of time it has become possible to compare the progress of groups of patients on fixed and free diets, and in every case those patients whose carbohydrate has been restricted have shown fewer bouts of ketosis and less arteriosclerotic complications than those who have eaten as they pleased.

The diet in diabetes should maintain the patient's weight at a few pounds below the average for his height and age and enable him to do a full day's work, whether this be in an office or a coal mine. On no account must a diabetic

be allowed to get fat. A daily ration of carbohydrate will be fixed between 150 and 200 grammes, depending on the total calorie value of the diet required. Fat and protein will be given in quantities to supply the calories required and to make the diet appetizing.

Fat patients with glycosuria are the exception to these rules. They require a drastic reduction in their weight and they should be given a diet containing only 800 or 1,000 calories with, in each case, 100 grammes of carbohydrate.

Whatever diet is prescribed, it should be "tailored" to match the patient's palate as far as possible, or he will not take it for long. Eight ounces (230 g.) of potatoes at one meal may appal a child patient and yet be taken with relish by a dock labourer.

Vincent's Organisms in the Mouth

Q.—I have had several reports back as positive for Vincent's organisms, and the patients' symptoms have settled without any therapy. Are these examples of carriers, and, if so, should any treatment be commenced? Are these organisms pathogenic, or do they invade the damaged tissue secondarily?

A.—This question is difficult to answer without knowing what the patients' symptoms were and what lesion was present. Vincent's infection takes the form of an ulcer of either the throat or the gingival margin, and only in material from such a lesion are the organisms present in such numbers as to be confidently identifiable. It must be remembered that this identification is purely morphological (that is, by film, not culture) and it suffers from the defect of most such methods that a distinction from other closely similar micro-organisms is difficult to make without supporting evidence. There are many spirochaetes in the mouth indistinguishable from *Treponema vincenti*, and bacilli resembling Vincent's fusiform bacillus are not uncommon. In the absence of an ulcerative lesion their presence can be disregarded.

Vincent's organisms are unquestionably pathogenic: the fusiform bacillus belongs to a genus other members of which produce lesions elsewhere characterized by necrosis, some of which can be of a very serious nature. Many conditions predispose to gingivitis, and it has been suggested that a vitamin deficiency may underlie Vincent's infection, but the occurrence of the infection, sometimes in epidemic form, among perfectly healthy and well-nourished people strongly suggests that this is not a necessary factor.

Slippery Elm

Q.—Is slippery elm safe to use for the induction of labour?

A.—Slippery elm is the bark of a tree and is only 1 to 4 mm. in thickness, so that it is obtained in flat strips which are poorly shaped for insertion into the cervix. Indeed, they may take the form of rather sharp splinters. Its reputation as an abortifacient rests on its hygroscopic property: if it is inserted into the cervical canal it swells by taking in fluid and thus causes the cervix to dilate. It is this property which also makes it difficult to sterilize. Slippery elm is therefore neither convenient nor safe to use for inducing abortion and labour.

If something of this kind is required then the obvious choice is laminaria tents, which consist of sea tangle (a kind of seaweed) and which also swell when placed in contact with the moisture of the cervical canal. These are pencil shaped and the difficulty in the matter of their sterilization is overcome by the fact that they can now be purchased already sterilized, each in a sealed glass tube.

The successful use of laminaria tents necessitates a long cervix with a canal sufficiently well formed to hold them and to be stimulated by them—conditions which rarely

obtain in late pregnancy, and, if they do, which usually contraindicate induction of labour. If the cervix is "ripe" for induction other methods such as rupture of the membranes are more certain and more safe. Laminaria tents are therefore most often used, either alone or in combination with another method, to induce abortion, and it is only in some special circumstances that most obstetricians would resort to them for the purpose of inducing labour.

Static Electricity and Car Sickness

Q.—Recently I have heard it suggested that the cause of car sickness is static electricity, and that if a piece of chain earths the vehicle patients with this tendency are no longer liable to it. Can you tell me if there is any truth in this statement? I have always imagined that motion sickness was visual or inner-ear in origin.

A.—There is no evidence that static electricity in a car predisposes to motion sickness. Though the outside of the vehicle may be affected by static electricity, the inside is not.

In aviation there is often much turbulence when an aircraft is affected by static electricity, and the turbulence is enough to account for the motion sickness, the incidence of which is usually in proportion to the turbulence. Few people are airsick when the aircraft flies above the weather, though there may be much static electricity in the clear air.

The present opinion is that the main cause of motion sickness is over-stimulation of hypersensitive labyrinths, induced by slow oscillations, resulting in vagosympathetic disturbance. Vibrations affecting the eyeball also play a part.

Fertility after Prostatectomy

Q.—I recently examined microscopically a specimen of nocturnal emission from a patient who had transurethral prostatectomy six years ago, and I found many motile spermatozoa. Surely this is contrary to all expectations. Are such patients usually fertile?

A.—If the vas has not been tied seminal fluid can still reach the prostatic urethra. After full prostatectomy it enters the prostatic cavity and then usually passes back by the easiest route into the bladder, whence it is subsequently voided. After transurethral resection the prostatic urethra may still be sufficiently tubular for the fluid to be ejaculated in the ordinary way by the urethra. The chance of fertility varies inversely with the amount of prostate removed at the transurethral resection.

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EXCHANGE TRANSFUSION IN HAEMOLYTIC DISEASE OF THE NEWBORN

BY
WILLIAM WALKER, M.D. AND G. A. NELIGAN, B.M., M.R.C.P.

(From the Department of Child Health, University of Durham)

PART I. TREATMENT

In the treatment of haemolytic disease of the newborn we regard it as proved that early exchange transfusion is superior to simple transfusion. The evidence in support of this was obtained in controlled trials carried out in various British centres between October, 1949, and August, 1951 (Mollison and Walker, 1952).

The Newcastle-upon-Tyne cases that formed part of these trials provide a comparison between early exchange and late simple transfusion. All infants in this centre were the result of spontaneous delivery. Those with a cord Hb level of 14.8 g. % or less were selected at random for either exchange or simple transfusion. When indicated, exchange transfusion of at least 60 ml. per lb. (132 ml. per kg.) body weight was carried out within nine hours of birth. A total of 86 children were included in the trial (Table I). In the group selected for simple transfusion this was given if the Hb level fell to 11 g. % during the first fourteen days of life. Apart from the type of transfusion given, all babies received identical care.

TABLE I.—A Controlled Trial of Exchange and Simple Transfusion in 86 Infants with Haemolytic Disease (National Investigation, Newcastle-upon-Tyne Centre, 1949–52)

	No. of Cases	No. with Kernicterus	No. of Deaths
Simple transfusion	42	9	13
Exchange "	44	0	2

Of the 42 babies treated by simple transfusion, 13 died, whereas of the 44 treated by exchange transfusion only two died. Nine of the 42 treated by simple transfusion developed kernicterus, whereas no baby in the exchange transfusion group did so. The probability of such differences being due to chance is about 1 in 1,000.

Five infants had birth weights of 5½ lb. (2.5 kg.) or less. By chance, all were treated by simple transfusion and four died with kernicterus. We have calculated the probabilities after excluding these cases. The findings are still significantly in favour of exchange transfusion, but of course to a less degree. In relation to both mortality and kernicterus P now equals 0.02–0.01.

The purpose of this communication is to describe our experience of 250 consecutive cases treated by adequate exchange transfusion between March, 1947, and March, 1954. The evaluation of the procedure depends on various factors, while its effectiveness is closely related to details of technique. Our experience will therefore

be presented in two parts—the first dealing with indications and results, and the second with technique. We are concerned essentially with the application of our collected observations to daily practice.

Principles

From the start we felt that exchange transfusion was indicated and justified only in the more severely affected cases of haemolytic disease of the newborn, and throughout have tried to confine it to infants in whom there was a real risk of death or in whom transfusion was almost certain to be required sooner or later.

It has been our practice to use partly packed "bank" blood from either sex, and all but one of our 250 adequate exchange transfusions have been performed by the umbilical route, as will be described in Part II.

We have aimed to carry out, within the first nine hours of life, an exchange of 80 ml. per lb. (176 ml. per kg.) body weight. This amount was decided upon because it is equivalent to at least two blood volumes, and Wiener and Wexler (1946) had calculated that this gave 85% exchange, while the use of 120 ml. per lb. (264 ml. per kg.) raises the degree of exchange only by a further 8%. The period of nine hours was chosen because it was one of the rules governing the national trials, and we found that it was a convenient time limit and gave good results. Sometimes, for one reason or another, it is not possible to complete the full 80 ml. per lb. (176 ml. per kg.) and we have accepted as "adequate" any transfusion resulting in the exchange of 60 ml. per lb. (132 ml. per kg.), as again this was one of the rules governing the national trials. Anything less than 60 ml. per lb. (132 ml. per kg.) has been classed as "inadequate." Obviously the nine-hour time limit can only apply to infants seen at or shortly after birth, but we have performed exchange transfusion on many infants seen later than this, and in such cases have begun treatment as early as possible. The effectiveness of exchange transfusion must depend to some extent on the volume of blood exchanged and the age at which it is carried out. We have not made a special point of trying to assess these factors, and any observations that we have made concerning them are incidental.

Material

The material on which this report is based is derived from 272 cases* selected for exchange transfusion between March, 1947, and March, 1954. In 1947 and 1948 only eight adequate exchanges were performed, while 19 were inadequate. During the next five years there have been 242 adequate transfusions and only three inadequate—two in 1949 and

*Cases from the Princess Mary Maternity Hospital, General Hospital, and Babies' Hospital, Newcastle-upon-Tyne, and the Queen Elizabeth Hospital, Gateshead, and a small number treated by us in other hospitals outside this area.

one in 1951. This is a reflection of the increasing experience with the technique and improvement in preparation and maintenance of equipment.

Premature induction has never formed part of our routine practice, but recently we have performed induction in cases in which there was a history of a previous stillbirth due to haemolytic disease and in which the father was homozygous Rh positive. Our experience of this type of case is limited to 10, so it is obviously much too early to draw conclusions from the results. Four of the resulting infants were treated by exchange transfusion and are included in this series. Any other premature infants in this series were the result of spontaneous premature labour or a pregnancy terminated prematurely for some independent obstetrical indication.

Indications For Exchange Transfusion

We have relied on certain criteria of severity to decide if treatment was required in a particular case, and in the light of experience have found it necessary to change these criteria on two occasions.

Our indications for exchange transfusion have been as follows, and they apply both for mature and for premature infants.

1. March, 1947, to September, 1949

(a) Any first affected infant showing jaundice or other clinical signs of disease within eight hours of birth. (b) Any subsequent affected infants showing clinical evidence of disease within the first twenty-four hours. These criteria were helpful, but depended on signs which could be difficult to assess and missed some cases that developed kernicterus, while perhaps 20% were treated unnecessarily.

2. October, 1949, to August, 1951

This was the period of the national trials, and the criterion used was a cord Hb value of 14.8 g.% or less. Eighty-six cases fulfilled this condition, but only 44 received exchange transfusion; the remaining 42 selected at random served as controls and received simple transfusion only for the treatment of severe anaemia.

The level of 14.8 g.% proved satisfactory in that only 4 of the 42 control cases did not require treatment. All four had levels between 13.2 and 14.8 g.%. As the other 11 cases in this range required treatment, we felt justified in retaining the criterion of 14.8 g.%, considering it advisable to allow for error in Hb determination, even if erring on the side of overtreatment. Moreover, 14.8 g.% corresponds with the lower limit of cord Hb in the majority of normal infants.

Ninety-five other infants with cord Hb values greater than 14.8 g.% were born during this period. None received early treatment. Twenty-three had cord Hb levels higher than 17.7 g.%. None died; indeed, only one required transfusion. We therefore felt it safe to leave untreated any infant with a cord Hb level greater than 17.7 g.%.

We were disturbed, however, to find that of 72 infants with cord Hb values between 14.8 and 17.7 g.%, five developed kernicterus, while 16 others eventually required transfusion for the relief of anaemia. One infant with a cord Hb level of 17.5 g.% died with kernicterus, while the Hb values in infants requiring transfusion were evenly distributed throughout this range—that is, 5 out of 20 with cord Hb values between 14.8 and 15.5 g.% and 16 out of 52 with values between 15.5 and 17.7 g.% required treatment. We therefore felt that the criterion of cord Hb alone was not satisfactory, because if the level was set high enough to include all infants at risk it would mean subjecting a large number to unnecessary treatment.

Between the levels of 14.8 and 17.7 g.% some different means of selecting cases for treatment was therefore required. It was in this respect that the cord bilirubin level promised to be of value. We had made cord bilirubin estimations on 52 infants in this range. The lowest level associated with the development of kernicterus was 2.8 mg. per 100 ml. In

fact, 13 infants had cord bilirubin levels of 2.8 mg. per 100 ml. or more, and three of these developed kernicterus, while five others required transfusions. In contrast, only 4 out of 40 infants with cord bilirubin levels of less than 2.8 mg. per 100 ml. required treatment. There were no deaths in this group and none required treatment in the first two weeks of life.

We therefore decided to adopt new criteria for exchange transfusion, and, as relatively few cases would be involved, considered that a controlled trial was not advisable: rather, we would judge their value by dealing with the prevention of kernicterus and the proportion of cases surviving without treatment.

3. September, 1951, to March, 1954

The criteria, still based on cord blood examination, were extended to include any infant with a cord Hb level of 14.8 g.% or less and any infants with cord Hb level between 14.8 and 17.7 g.% associated with a cord bilirubin level of 2.8 mg. per 100 ml. or more.

Since adopting these criteria, we have not seen a single case of kernicterus in a baby with less severe disease than they define. We cannot, of course, say accurately how many babies have been treated unnecessarily, but there has certainly been no mortality among the babies treated because of a high bilirubin level.

In this period we obtained cord blood samples suitable for both Hb and bilirubin estimation from 264 live-born infants with haemolytic disease of the newborn: 162 (61%) met the above criteria for exchange transfusion. A further seven infants were eventually transfused because of anaemia. No infant left without exchange transfusion died, and none required transfusion within the first three weeks of life. Altogether, 95 (36%) survived without any treatment at all. This corresponds closely with the expected proportion not requiring treatment. In a local series (Walker, 1950) collected between 1947 and 1949, when exchange transfusion was being used in only a minority of cases, 42% survived without treatment, while during the period of the national trials 43% survived without treatment.

Present Indications For Exchange Transfusion When Full Cord Blood Results Are Not Available

In cases in which for any reason the cord Hb or bilirubin level alone was available, this has been used as a guide in assessing the severity of disease. Nine infants with bilirubin levels higher than 2.7 mg. per 100 ml., but whose cord Hb was not known, were born at home and seen too late to be treated by exchange transfusion. Two died with kernicterus, three required simple transfusion, while the other four survived without treatment.

When neither cord Hb nor bilirubin estimations were available we have regarded the onset of clinical disease in the first eight hours of life as an indication for exchange transfusion, provided that evidence of brain damage was not already manifest when the infant was first seen.

In infants in whom neither the cord blood results nor the accurate information regarding the early clinical picture were available, Hb and bilirubin estimations on venous blood assisted in assessing the severity of the disease.

Indications For Repeated Exchange Transfusion

Unfortunately, early adequate exchange transfusion does not guarantee that kernicterus will be prevented. The known association of kernicterus and deep jaundice has consequently led to repeated exchange transfusions being recommended "in infants with severe and rapidly increasing jaundice, or if the bilirubin is more than 20 mg. per 100 ml. or likely to go that high." Using these criteria, Diamond *et al.* (1952) found it necessary to do multiple exchange transfusions in 20% of their cases.

In our experience kernicterus has occurred in only 2 out of 196 mature infants but in 3 out of 22 premature infants

treated by early adequate exchange transfusion. This disproportionate risk between mature and premature infants corresponds with our observation that after exchange transfusion 45% of premature infants developed deep jaundice; whereas only 13% of mature infants did so. We therefore feel that repeated exchange transfusion should be necessary only in a very small proportion of cases, and these mainly premature infants. The bilirubin level during the first week of life will probably prove the most satisfactory criterion for selecting cases for repeated exchange transfusion, and we have provisionally taken 25 mg. per 100 ml. as our indication.

Up to March, 1954, we had performed repeated exchange transfusion in only four infants. Three were born at labour induced surgically because of a previous history of stillbirth due to haemolytic disease of the newborn and because the father was homozygous Rh positive.

The fourth, a mature infant, was transfused with blood that, in retrospect, we thought had been overheated. The baby became deeply jaundiced and developed haemoglobinuria the day following exchange transfusion. As intense intravascular haemolysis was occurring, we decided to perform a second exchange transfusion. The response was dramatic; the bilirubin fell from 32.5 to 12.6 mg. per 100 ml. during the procedure. Haemoglobinaemia disappeared immediately and no subsequent haemoglobinuria occurred. Eighteen hours after the second exchange transfusion the bilirubin was 16 mg. per 100 ml., but fell thereafter, and jaundice had practically disappeared three days after the second transfusion.

Altogether in 1954 eight premature infants were treated by exchange transfusion, and two of these required a further exchange transfusion, whereas only 5 of 79 mature infants treated by exchange transfusion required further exchange. It should be pointed out, however, that two of these five were the result of premature induction at 35 weeks' gestation, while a third was first treated at the age of 4 days when the bilirubin level was 60 mg. per 100 ml.

Age at Time of Exchange Transfusion

It has always been our aim to start exchange transfusion within the first nine hours of life, but in 28 cases transfusion was not started until later, usually because the baby was born at home with resultant unavoidable delay. One such case, a mature baby, received an exchange transfusion of 80 ml. per lb. (176 ml. per kg.) at the age of 19 hours, but subsequently died from pulmonary haemorrhage and kernicterus. Of the 222 treated within nine hours of birth, 196 were mature* infants, and only two of these developed kernicterus.

Wallerstein (1947) recorded four deaths due to kernicterus among 27 cases treated by exchange transfusion. All four were treated later than twenty-four hours, when jaundice was already well marked.

We regard it as convenient and satisfactory to start exchange transfusion within the first nine hours of life in infants born in hospital and diagnosed by means of tests on cord blood. We have formed the strong impression that the general condition of infants with haemolytic disease improves during the first few hours of life—as might be expected from experience of the normal baby. If delivery has been difficult, or if the infant's condition is poor for reasons other than haemolytic disease, this preliminary period of acclimatization is all the more important, and oxygen therapy may be helpful. After nine hours we have observed a tendency for the general condition to deteriorate, and in particular a number of babies in good condition at birth were very ill by the time they were admitted to hospital for treatment.

On the other hand, immediate treatment may be called for, as in six cases in which we started the transfusion within the first hour of life. Each infant was desperately ill at birth, with a Hb level less than 6 g.% and signs of

*Weighing more than 5½ lb. (2.5 kg.) at birth.

heart failure. None had shown any improvement in the short interval before treatment started. Three survived, and the clinical improvement during the transfusion was most dramatic. The other three died during the transfusion, and two of these were found at necropsy to be hydropic.

Within these limits we feel that the actual time for exchange transfusion can be decided by convenience and by clinical observation of the individual baby, and prefer, as a rule, to begin treatment at about four to six hours.

Volume of Blood Exchanged

As stated previously, we have always aimed to exchange 80 ml. per lb. (176 ml. per kg.) body weight, or twice the baby's estimated blood volume. This accords with the recommendations of various workers (Wiener and Wexler, 1946; Wallerstein, 1947; Diamond *et al.*, 1952), and should result in about 85% of the baby's blood being replaced by donor blood. The blood required, except in babies weighing more than 8½ lb. (3.9 kg.), can be obtained from two bottles of partly packed "bank" blood. We have not varied the volume of blood exchanged in relation to the cell volume of infant and donor blood, as suggested by Veall and Mollison (1950); therefore, there has been a relatively greater degree of replacement in the more anaemic cases, and this seems to us to be an advantage. The application of Veall and Mollison's nomogram will, however, enable adequate exchange transfusion to be carried out with minimal quantities of blood. Wiener and Wexler (1949) suggested that in very severely affected infants as much as 1,000 ml. should be exchanged, but it seems to us that the slight increase in the completeness of exchange so achieved is offset by the risks of the longer procedure. Indeed, the same authors (1951) later suggested that an exchange of 100–150 ml. of packed red cells was adequate. It is well to remember that as the exchange transfusion progresses, so the relative effectiveness of each 10 ml. of blood exchanged diminishes. Therefore, if the infant's condition gives cause for anxiety towards the end of transfusion it may be wiser to stop, rather than to carry on in an effort to reach the target figure.

Our secondary aim in performing exchange transfusion has been to achieve a final Hb level of between 15 and 17 g.%. This reduces the possibility of further transfusion being required, but, more important, it depresses erythropoiesis and the production of cells liable to rapid haemolysis.

We have made no systematic observations on the relationship between percentage exchange and mortality, but in the period 1947–9, 20 cases selected because of early clinical disease received inadequate exchange transfusions. Seven of the 20 receiving inadequate exchange transfusions died, while 18 of the 51 treated by simple transfusion died—that is, a mortality rate of 35% in each group. Three cases of kernicterus occurred in the exchange and 11 in the simple transfusion groups. It seems, therefore, that exchange transfusion of less than 60 ml. per lb. (132 ml. per kg.) gives no better result than simple transfusion.

Davies *et al.* (1953) claimed that, in their experience, an exchange of 60 ml. per lb. (132 ml. per kg.) did not prevent kernicterus; whereas 80–100 ml. per lb. (176–220 ml. per kg.) exchange or two exchanges each of 60 ml. per lb. (132 ml. per kg.) did so.

Mortality in Cases Treated by Exchange Transfusion

Even accepting that adequate exchange transfusion is superior to simple transfusion, we still require to assess the part it may be expected to play in the management of haemolytic disease. Can exchange transfusion be recommended as a safe routine procedure? Are there special risks associated with the method itself? Are there some cases in which exchange transfusion is ineffective? If adopted as the treatment of choice for all cases likely to require treatment, what order of improvement in survival can be expected?

Although the results of many series of cases treated by exchange transfusion have been published (Hart, 1925;

Wallerstein, 1946, 1947, 1948; Wiener and Wexler, 1946, 1949; Diamond, 1947, 1948; Mollison and Cutbush, 1948; Diamond *et al.*, 1952), the answers to these questions are not readily found. The reason is that many of the series are small and highly selected, so that they do not represent the disease as a whole, nor is one series necessarily comparable with another.

Certain earlier reports cannot be accepted at their face value, because standards of diagnosis were changing as well as methods of treatment. The pitfalls of these interpretations are illustrated by Diamond (1947), who reported reduction in mortality with changes in treatment, as follows:

Period	Treatment	Mortality
Pre-1941	Simple transfusion (probably Rh positive)	40%
1942-4	(Rh negative)	30%
1944-6	Premature induction and simple transfusion (Rh negative)	20%
1947-	Premature induction and exchange transfusion (severe cases excluded)	10%

It seems possible that the reduction in overall mortality was not due solely to improvement in treatment, but could, in part, be explained by improvement in diagnosis. Before 1941, when the diagnosis was made on clinical grounds, only severe cases, mainly those presenting the clinical picture of icterus gravis, would be included. With the increasing use of serological methods of diagnosis one would expect an increasing proportion of the recognized cases to be mildly affected, with a corresponding reduction in mortality irrespective of improvements in treatment. In confirmation of this hypothesis, we found, during a survey of cases in the Northern Region for 1947-9 (Walker, 1950) that there was a mortality rate of 40% in cases diagnosed clinically as icterus gravis, but of only 15% in the group as a whole, which included cases diagnosed on serological evidence alone.

The published series vary in size from 9 to 208 cases and the mortality rate from 6 to 32%. Many are too small to allow evaluation of the results, while in most the indications for exchange transfusion are so numerous and varied that they allow considerable freedom of interpretation and consequent intrusion of personal bias.

More recently, other factors—for example, the use of female blood and the performance of multiple exchange transfusion—have been reported as bringing about a fall in mortality.

Results

The following are our results in all cases in which exchange transfusion of at least 60 ml. per lb. (132 ml. per kg.) was carried out.

In the past five years only 3 out of 245 infants selected for exchange transfusion have not received a transfusion of at least 60 ml. per lb. (132 ml. per kg.). Two were technical failures, while the third, born *in extremis*, died before the transfusion could be completed. It is known that premature infants are at greater risk than mature babies, and we think that infants born in hospitals offering special facilities stand a better chance than infants admitted from "outside"; we therefore present our results in three groups. No case has been omitted, and none has been included in more than one group.

Group I.—Premature Infants. All infants with birth weights of 5½ lb. (2.5 kg.) or less are included. As there are so few cases in this group, we have not subdivided them in relation to the means by which they were selected for exchange transfusion, nor by the age at which this was carried out.

Group II.—Mature infants born at home, or in hospitals not affording special facilities. These cases were selected for treatment usually because of the early appearance of clinical disease as already defined, or, in some more recent cases, because the cord blood specimen taken routinely from the infants of all Rh-negative mothers was found to be Coombs-positive and to have a bilirubin level of 2.8 mg. per 100 ml. or more. Many were not treated until after the age of nine hours.

Group III.—Mature infants born in hospitals affording special facilities, selected on the basis of cord Hb and bilirubin levels and treated within nine hours of birth. This group includes all the national trial cases.

In Table II we have classified deaths as due to haemolytic disease or to other causes. It is realized that when death occurs in a baby suffering from haemolytic disease of the newborn one can never be absolutely certain that this disease played no part in causing death. Post-mortem examinations were made in all fatal cases, and the cause of death recorded is that given by the pathologist.

The causes of death are shown in Tables III and IV, and brief clinical notes on these cases are included in an Appendix.

None of these infants had evidence of kernicterus at necropsy. All but the first and last cases were very ill at the time of transfusion, and in them the diagnosis eventually recorded as the cause of death was made before treatment was started.

TABLE II.—Results in 250 Cases of Haemolytic Disease of the Newborn Treated by Adequate Exchange Transfusion

Group	No. of Cases	Neonatal Deaths		Mortality Due H.D.N.	Kernicterus
		Due to H.D.N.	Other Causes		
I	22*	6	2	27%	2 died (A and WK)
II	37	4	3	11%	1 survived (Mu)
III	191	5	3	2.6%	1 died (G)
Total	250	15	8	6%	1 survived (F)

* 3 multiple exchange transfusions.

TABLE III.—Deaths Not Attributed to Haemolytic Disease of the Newborn

Group	Cause of Death	Survived
I	Cerebral haemorrhage	H
	birth injury	McA
II	Pneumonia	Th
	Cerebral birth injury	T
	Subdural haematoma	A
III	Atelectasis	K
	Vernix inhalation	P
	Overlaid	F

TABLE IV.—Deaths (15) Attributed to Haemolytic Disease of the Newborn

Group	Hydrops Foetalis	Kernicterus	Heart Failure	Generalized Bleeding	Cardiac Arrest	Cirrhosis of Liver	Not Known
I	2 (W) (E)	2 (W) (A)	1 (O'H)	—	1 (Be)	—	—
II	—	1 (G)	3 (DO) (D) (ATH)	—	—	—	—
III	—	—	1 (B)	2 (H) (Da)	—	1 (O)*	1 (L)
Total	2	3	5	2	1	1	1

* Died at 6 months with terminal respiratory infection. At necropsy, cytomegalic inclusion bodies were found. In the absence of proof to the contrary, this death has been attributed to haemolytic disease. No abnormality of the central nervous system could be demonstrated histologically.

Severity of Disease

The severity of disease in any particular series may differ from that in another, and this will obviously influence the results. The distribution of the factors most likely to influence the results—birth weight (Fig. 1), cord Hb (Fig. 2), and sex of baby—are shown, to serve as a means of comparison with other series.

Follow-up

First Six Weeks.—All infants were kept under observation during the first six weeks, and during this period 28 out of 229 (12%) required "topping-up" transfusion because the capillary haemoglobin level fell to less than 8.5 g.%. In 10 of these the explanation was that the infants were very severely affected and therefore exchange transfusion was

completed at a negative balance. In the remainder we could find no particular reason for the development of anaemia, but none required secondary transfusion during the first three weeks of life. These findings are in contrast to those

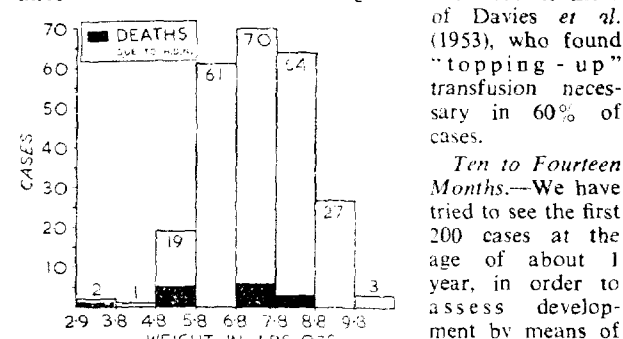


FIG. 1.—Birth weight of 250 infants treated by exchange transfusion. Males, 128; female, 116. Weight was not recorded in three cases.

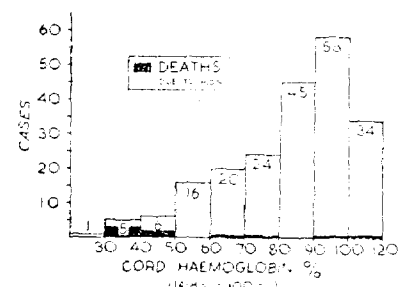


FIG. 2.—Severity of H.D.N. measured by cord Hb in 209 infants treated by exchange transfusion.

icterus, one a mature baby and one a premature infant (F and Mu) and a third was regarded as a probable case (McD.). Another infant was mentally defective, but was regarded as a primary ament, not due to haemolytic disease. The remainder were judged to be normal children.

(Since this paper was submitted the remaining 50 cases have been seen at the age of 6 months or more, and all are apparently normal.)

Later Follow-up.—Some of these infants form part of a group being followed up for a longer period, and the results will be published later.

Conclusions

Although various methods of treating haemolytic disease of the newborn have been suggested from time to time (Hardwick and Lloyd, 1941; Homburger, 1946; Kariher and Miller, 1947; Carter, 1949, 1951; Pickles, 1949), so far there is no means of preventing immunization in an Rh-negative woman, or of protecting an Rh-positive foetus against the action of antibodies, once formed. Exchange transfusion, first recommended by Hart (1925), has, however, proved of great value in treating affected infants.

Exchange transfusion is a safe routine procedure and is recommended as the treatment of choice for the 60% of liveborn affected infants requiring treatment.

In experienced hands exchange transfusion carries a very low operative risk, and this risk is practically confined to infants whose chance of survival would be very poor if treated by other means.

In our experience, premature infants have a significantly worse chance of survival than mature infants, owing mainly to the increased risk of kernicterus. Therefore, prematurity should be avoided whenever possible.

In areas where exchange transfusion is adopted as the treatment of choice for all cases likely to require treatment, a survival rate of 98% of all live-born affected infants can be expected. Confirmation of this claim is to be found from consideration of the two years 1952 and 1953 (Walker and Murray, 1954), during which 217 infants with haemolytic disease were born in the Newcastle hospitals: 15 were premature, 125 (58%) were treated by exchange transfusion, while five more (2%) required simple transfusion. Seven died, but only four of these deaths were regarded as due to haemolytic disease—a mortality rate of 2%.

We believe that cord Hb and bilirubin levels permit selection of practically all cases likely to require treatment, and consider that exchange transfusion of 80 ml. per lb. (176 ml. per kg.) body weight, carried out within nine hours of birth, is indicated in these cases.

APPENDIX: CASE SUMMARIES FOR FATAL CASES

Not Attributed to Haemolytic Disease of the Newborn

Group I

H.—B. wt. 5 lb. (2.3 kg.). Cord Hb 12.7 g.%. Cord bilirubin 3 mg. per 100 ml. Infant became ill on the fourth day and died. Mild jaundice (bilirubin 3.6 mg. per 100 ml.) at time of death. P.M.: Cerebral haemorrhage; no kernicterus.

McA.—B. wt. 3 lb. (1.4 kg.). Cord bilirubin 5.6 mg. per 100 ml. Normal respiration never established; cyanosed whenever removed from oxygen; died during exchange transfusion. P.M.: Cerebral birth injury; medullary herniation.

Group II

Th.—B. wt. 6 lb. 8 oz. (2.9 kg.). A sick child with moaning respiration, treated at 11 hours. Died at 18 hours. P.M.: Bilateral bronchopneumonia; sticky mucus in trachea; haemorrhagic exudate in pleural cavities.

T.—B. wt. 6 lb. 12 oz. (3.1 kg.). Difficult delivery with foetal distress. Died at 2 days. P.M.: Cerebral birth injury.

A.—B. wt. 8 lb. 12 oz. (4 kg.). Precipitate labour. Severe haemolytic disease and respiratory difficulty regarded as cerebral in origin. Died at 2 days. P.M.: Cerebral birth injury; large subdural haematoma.

Group III

K.—B. wt. 6 lb. 1 oz. (2.7 kg.). Cord Hb 8 g.%. Cord bilirubin 15 mg. per 100 ml. Died at 3 days. P.M.: Atelectasis; pneumonia; no evidence of kernicterus, heart failure, or haemorrhage.

P.—B. wt. 7 lb. (3.2 kg.). Cord Hb 8 g.%. Admitted with marked cyanosis and asphyxial haemorrhages. P.M.: Atelectasis.

F.—B. wt. 6 lb. 9 oz. (3 kg.). Cord Hb 16 g.%. Cord bilirubin 4.1 mg. per 100 ml. Overlaid one week after discharge aged 3 weeks.

Attributed to Haemolytic Disease of the Newborn

Group I

W1.—B. wt. 3 lb. 3 oz. (1.4 kg.). Cord Hb 4.6 g.%. Cord bilirubin 2.7 mg. per 100 ml. Twin of classical hydrops foetalis. Died during exchange transfusion. P.M.: Hydrops foetalis.

E.—B. wt. 4 lb. 10 oz. (2.1 kg.). Hb 4.8 g.%. Cord bilirubin 6.5 mg. per 100 ml. Died at end of exchange transfusion. P.M.: Hydrops foetalis.

WK.—B. wt. 5 lb. 8 oz. (2.5 kg.). Cord bilirubin 4.1 mg. per 100 ml. Died at 4 days, when bilirubin was 30 mg. per 100 ml. P.M.: Kernicterus.

A.—B. wt. 5 lb. (2.3 kg.). Cord Hb 17 g.%. Cord bilirubin 7.4 mg. per 100 ml. Died, deeply jaundiced, at 63 hours. P.M.: Kernicterus.

O'H.—B. wt. 5 lb. 3 oz. (2.4 kg.). A very ill infant that died at end of exchange transfusion. P.M.: Heart failure.

Be.—B. wt. 5 lb. (2.3 kg.). Cord Hb 11 g.%. Cord bilirubin 4.8 mg. per 100 ml. An infant the result of premature induction at 35 weeks, because of previous history of stillbirth due to haemolytic disease of the newborn. Second exchange transfusion was performed at 47 hours and the infant died suddenly during the procedure. We regard this death as caused by cardiac arrest due to hyperpotassaemia. P.M.: Nothing abnormal detected. This case is described more fully in Part II.

Group II

G.—B. wt. 7 lb. 3 oz. (3.3 kg.). Exchange transfusion at 19 hours, when deeply jaundiced. Died at 48 hours with kernicterus and massive pulmonary haemorrhage.

Do.—B. wt. 7 lb. 6 oz. (3.3 kg.). Given additional 70 ml. of blood at end of exchange transfusion. P.M.: Heart failure and dilated right heart.

D.—B. wt. 7 lb. 1 oz. (3.2 kg.). A very ill baby treated immediately after delivery. Collapsed and died during transfusion. P.M.: ? Heart failure.

Ath.—B. wt. 7 lb. 2 oz. (3.2 kg.). Very ill on admission, suddenly collapsed and died during exchange transfusion. P.M.: Heart failure.

Group III

B.—B. wt. 8 lb. (3.6 kg.). Cord Hb 5.9 g.%. Cord bilirubin 11.5 mg. per 100 ml. A very ill baby that improved dramatically during exchange transfusion but suddenly, when the transfusion was almost completed, collapsed and died. P.M.: ? Heart failure.

H.—B. wt. 7 lb. 8 oz. (3.4 kg.). Cord Hb 10.3 g.%. Cord bilirubin 1.9 mg. per 100 ml. Deteriorated towards end of exchange transfusion. Was semicomatose, with moaning respiration for 12 hours; death occurred. Had been given prophylactic vitamin K. P.M.: Haemorrhage into abdomen, pleura, pericardium, cranium; umbilical vein intact; hepatic necrosis.

Da.—B. wt. 7 lb. 4 oz. (3.3 kg.). Cord Hb 5.7 g.%. Cord bilirubin 4.9 mg. per 100 ml. Given prophylactic vitamin K. Twenty-four hours after exchange transfusion had fit, and six hours later developed pulmonary haemorrhage and died. P.M.: Haemorrhage into lungs, adrenal, kidney, and stomach; liver necrosis.

O.—Cord Hb 4.5 g.%. Bilirubin 8 mg. per 100 ml. Progressive jaundice and hepatosplenomegaly. Died aged 6 months. P.M.: Cytomegalic inclusion disease.

L.—B. wt. 8 lb. 2 oz. (3.7 kg.). Cord Hb 14 g.%. Cord bilirubin 2.9 mg. per 100 ml. Sudden death fifty minutes after exchange transfusion. P.M.: Nothing abnormal detected.

PART II. TECHNIQUE

The results of exchange transfusion in cases of haemolytic disease of the newborn, presented as Part I of this article, have convinced us that early adequate exchange transfusion is the treatment of choice for all cases in which treatment is likely to be required. The primary justification of this conviction lies in the infant's greater chance of survival, but exchange transfusion also has the very real advantage that it will avoid the necessity for frequent haemoglobin estimations and perhaps multiple transfusions.

The successful application of the principles set out in Part I depends on the performance of a series of technical procedures. In the past seven years we have attempted exchange transfusion in 272 babies, and 250 of these have been technically satisfactory. Only 3 of the 22 failures have occurred in the last five years, and this we attribute to increased experience of the procedure and improved maintenance of apparatus.

We have tried to develop a simple straightforward technique and hope that a description of the method we use and the difficulties we have encountered may be of help to others concerned with the practical management of these cases.

General Routine Governing Treatment

1. The disease is predicted antenatally by serological tests, and delivery in a hospital providing special facilities for the care of these infants is advised.
2. The umbilical cord is clamped about 15 cm. from the abdominal wall as soon as possible after delivery. Using a dry syringe and No. 1 needle, the midwife or the doctor collects 10 ml. of blood from the umbilical vein on the maternal side of the clamp. Half of the blood is transferred to a plain tube for serological tests, and half into one containing dry anticoagulant for haematological estimations.

3. If exchange transfusion is indicated, according to the criteria described in Part I, a time within the first nine hours is selected, dependent on the baby's condition.

4. Exchange transfusion is performed by the umbilical route, aiming to achieve 80-90% replacement.

5. The baby is kept in the special nursery for sick babies for a few hours; then, if well enough, he is taken to his mother in the lying-in ward.

6. Haemoglobin estimation, using skin-prick blood, is performed next day and repeated as indicated until discharge from hospital (usually on the tenth day). All babies are seen for examination and haemoglobin estimation at the age of 1 month, and a few need a further test at 6 weeks. This routine is followed in the straightforward case whether the infant has received early exchange transfusion or has been left without early treatment. If the haemoglobin level falls to less than 8.5 g.% during the first six weeks of life a simple scalp-vein transfusion is given.

Blood For Exchange Transfusion

For a baby weighing 8½ lb. (3.9 kg.) or less, two M.R.C. bottles of "bank" blood are required, usually Rh negative and of the same ABO group as the baby.

Compatibility Tests.—Blood is selected on the basis of tests in saline and serial dilutions in albumin, and by the indirect Coombs technique; ideally, both the mother's and the baby's serum are used. When the mother's serum is not available, or in an emergency, Rh-negative blood is used without performing a full compatibility test. In such circumstances we consult the record card to ensure that there is nothing unusual about the maternal antibody.

Age of Blood.—We prefer to use blood no more than three or four days old, but, on occasion, have used blood as old as 20 days without apparent ill effect. That there are advantages in using relatively fresh blood was made clear to us recently. Baby Be, a 5-lb. (2.3-kg.) premature infant with a cord haemoglobin level of 11 g.%, was treated by exchange transfusion at the age of 2½ hours. In spite of this the bilirubin rose, and at 44 hours was 24.7 mg. per 100 ml. A second exchange transfusion was carried out and a bottle of blood from the hospital bank was used. When 230 ml. exchange had been completed the baby suddenly became cyanosed, with grunting respiration, and death occurred almost immediately. At 200 ml. exchange the baby had been very well and the venous pressure 5 cm. As he had tolerated the first exchange well, and as the only unusual feature was that the blood used for the second transfusion was 15 days old, we wondered whether there might be some biochemical explanation. We found that the serum potassium level in the infant at the start of transfusion was 20.8 mg. per 100 ml. and at the time of death 57 mg. per 100 ml. The level in the transfused plasma was 65 mg. per 100 ml., and we therefore attribute this death to cardiac arrest consequent on hyperpotassaemia. This danger has been pointed out by Miller *et al.* (1952).

Hb Content of Blood.—Having been collected into acid citrate dextrose (A.C.D.), bank blood is likely to have a haemoglobin content of only about 11.5 g.%. Therefore, in order to achieve a haemoglobin level of 17 g.% at the end of the transfusion, it is necessary: (a) to give the baby considerably more blood than is withdrawn, or (b) to adjust the haemoglobin content of the transfused blood to approximately 17 g.% by removing about 200 ml. of plasma from each bottle. This latter method has been our constant practice since the very early days, because we regard overloading of the infant's circulation as a very real danger. Mollison (1951) also recommends using concentrated blood, but Diamond *et al.* (1952) advocate the use of whole blood.

On isolated occasions, when suitable bank blood has not been available, we have called donors, and have preferred to collect the blood into heparin rather than A.C.D., thus minimizing the degree of dilution.

Sex of Donor.—Allen *et al.* (1949) drew attention to the possibility that the sex of the donor might influence the

efficacy of exchange transfusion. In their series of 208 cases, 42 infants received blood from female donors, while 137 received male blood. No deaths occurred in the group treated with female blood, whereas 27 (20%) of those treated with male blood died. They claim that this is a significant difference, and state that it cannot be accounted for on the ground that blood with a high cell volume (and therefore generally from male donors) was purposely used for the most severely affected cases. However, Sacks *et al.* (1950), in their series in which the total mortality was similar to that of Allen *et al.*, found that 12.5% of cases transfused with male blood died, as against 21.8% of those treated with female blood. This suggests that the preferential use of female blood is of doubtful value. It has not been our practice to have the donor blood "sexed" before use, but we have been able to trace the sex of the donors in 158 cases. Fifty-five received male blood, 54 female blood, and 49 blood from both male and female donors. The mortality was the same in the three groups. We have taken account of the donor's sex in 12 fatal cases and in 9 very severely affected infants who survived, but could find nothing to suggest that female blood is superior to male blood. It would therefore seem unnecessary to take account of the sex of the donor when selecting blood for exchange transfusion.

Apparatus For Exchange Transfusion

The following material is required: Cord ligatures; gauze swabs; two transfusion stands; oxygen apparatus; cruciate frame; hot-water bottles; three pairs of small artery forceps; one pair of large scissors; exchange transfusion set; "polythene" catheters of two sizes, internal bore 2 mm. and 1 mm.; two short cannulae to fit tightly within catheters (S.W.G. 10 and 18 respectively); blood for transfusion; blood-collecting bottle containing acid citrate dextrose for waste.

Polythene tubing in 8-in. (20-cm.) lengths is stored in a rubber-stoppered glass tube containing 1% cetrimide and after 24 to 48 hours is sterile and ready for use. The catheter tip is cut square because a pointed catheter is more likely to perforate the vein and produce a false passage. We have found side holes a disadvantage. In 247 of our 250 cases we used a catheter with a 2-mm. bore and a 0.75-mm. wall, especially extruded for us by Messrs. De La Rue. This catheter proved satisfactory even with infants

weighing as little as 3 lb. (1.4 kg.) at birth. In two of the three remaining cases only a catheter of 1 mm. bore and 0.25 mm. wall could be passed, while the third was transfused by another route.

Transfusion Set

Many pieces of apparatus for exchange transfusion have been described. Our experience is limited to two—one described by Henderson (1950) but modified to take the larger polythene tubing, and one made for us by Messrs. Baird and Tatlock. This latter set, which we use almost exclusively, is illustrated in Fig. 3. It is very simple, and with the catheter attached the dead space is only 0.5 ml. The essential component consists of two two-way taps machined in one block with large bore throughout, and since it is very light a single operator can use it for long periods, as in the case of two immediately consecutive transfusions. The present pattern is Sima-fitting and made so that a syringe locks on to one end and a cannula on to the other. The locking device is of the pin-slot type, and this sometimes gives rise to air leaks. Therefore we have had a Luer-lock apparatus* made that is otherwise similar to that illustrated. The apparatus is completed by fitting two standard transfusion "giving sets" to the side limbs, but the one intended for waste blood is assembled without either filter or drip-chamber.

We have found "Everett" syringes absolutely satisfactory and prefer the metal-and-glass to the all-glass variety. All-glass syringes tend to stick, because any blood leaking back along the plunger is exposed to the air intermittently and dries. As a lubricant for taps and syringe silicone fluid† is used.

The ease of the operation depends on the use of a large-bore catheter, and, employing 2-mm.-bore tubing, we have not found a Tuohy adapter necessary. In most cases the same apparatus is used from start to finish without having to disconnect the syringe or wash out any part.

Sterilization.—The apparatus, apart from the catheter, is sterilized by autoclaving and is kept constantly ready for use; the syringes and cannulae in glass tubes, the set and instruments in separate "cellophane" packages.

Route of Transfusion

We normally use the umbilical vein route introduced by Diamond (1948), and, with one exception, our successful experience is limited to this route. We have found it absolutely satisfactory. Wallerstein's (1946) fears that it would be feasible only if a decision regarding transfusion were made before birth have proved unfounded. We disagree with the opinion of Field and Hawkins (1951) that many cases are seen too late for the umbilical vein to be used and that, in any case, it is dangerous because of the manipulations required and the rapid rate of transfusion.

Other routes have been recommended from time to time. The original method (Hart, 1925), also used by Wallerstein (1947, 1948), was that of saphenous or arm vein infusion, combined with the withdrawal of blood from the jugular vein or fontanelle. In our earlier cases we tried this method, but found it technically difficult, and we were able to achieve a satisfactory exchange in only one of the six cases attempted. The method also appeared to involve undue risk of bleeding from the punctured vessels.

We have practically no experience of the saphenous vein and radial artery technique originally used by Polayes and advocated by Wiener and his co-workers (1946, 1949).

No doubt anyone taking enough trouble to master a technique will in the end find it reliable, but the umbilical route, in addition to its technical simplicity, has the following very real advantages: (1) No artificial wound is made; (2) the balance between the volume of blood given and withdrawn can be maintained very accurately or varied at will; (3) venous pressure can readily be measured directly

*Supplied by the Medical Supply Association Ltd., Edinburgh.
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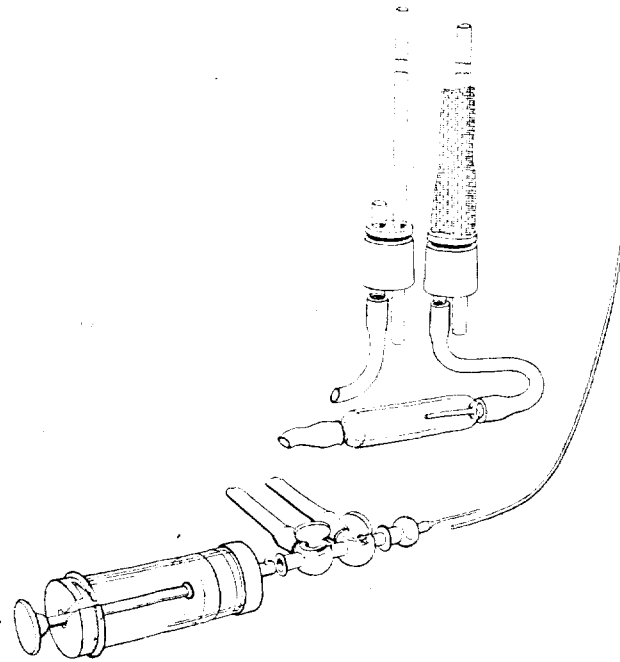


Fig. 3.—Apparatus for exchange transfusion.

when a transparent catheter is used; and (4) no important artery is ligated, for, although Field and Hawkins (1951) claim that ligation of the radial artery does no harm, Wallerstein (1948) maintains that there is a risk of ischaemia.

Technique of Transfusion

1. The transfusion is carried out in a warm room, if possible with a temperature of 75 to 80° F. (23.9 to 26.7° C.). The blood is placed in water at 98° F. (36.7° C.) for about 15 minutes before use. The baby, wrapped in gamgee so that only the face and umbilical areas are exposed, is bandaged to the cruciate splint in such a way that no bandages cross the abdomen or chest. A hot-water bottle is placed on each side of the trunk and held in place by a blanket which also forms a hood round the head.

2. Everyone entering the room wears a mask. The operator scrubs up and puts on a sterile gown, while his assistant, usually a nurse, merely washes. She records the amounts of blood exchanged throughout the procedure and notes the time taken for each 100-ml. exchange. She attends to the baby as necessary, including the administration of oxygen if required, and changes the blood bottles when indicated.

3. The cord is swabbed with 1% cetrimide and the baby is covered with a sterile towel, in the centre of which is a small hole. The apparatus is assembled and the blood and waste bottles are suspended from the transfusion stands. By manipulating the taps, blood and A.C.D. in turn are allowed to fill the rubber tubing, thereby expelling all air, while the citrate washes out any blood from the taps.

4. The umbilical cord is divided no more than 2 cm. from the abdominal wall and the stump is brought up through the hole in the towel and packed round with sterile gauze. The vein is readily identified, as it has a larger lumen than the two arteries, which usually lie close together and, because of their thicker walls, tend to protrude from the cut surface. The vein wall is grasped with artery forceps at two points opposite to each other and the closed third forceps is used as a blunt dilator to dilate the vein to a point just beyond the skin margin. A catheter is then introduced gently about 8 to 10 cm. to a point where blood flows freely back along it. If difficulty is experienced at the junction of cord and skin, the cord is gently pulled down in the direction of the pubis and the catheter rotated backwards and forwards, when it will usually pass without difficulty.

5. A direct measurement of the venous pressure can be made by elevating the external part of the catheter and measuring the height of the blood column above the abdominal wall. The measurement can be regarded as satisfactory only if the baby is quiet and relaxed and there is free fluctuation of the blood with respiration. We regard a pressure of less than 10 cm. as normal, but Diamond *et al.* (1952) regard 6 cm. as the upper normal limit.

6. The metal cannula is now inserted into the polythene catheter, attached to the tap unit, and the transfusion begun. 10 ml. of blood is first withdrawn from the baby, and, after turning the appropriate tap, is ejected into the waste bottle. Then 10 ml. of donor blood is taken into the syringe via the other tap, and, with both taps once more in line, is slowly injected into the baby. This cycle is repeated as often as necessary to complete the transfusion, and we aim to take ten minutes for each 100 ml. exchanged. On occasions we have taken as little as six minutes for 100 ml. without apparent ill effect, but too rapid transfusion often distresses the baby. Some experienced workers recommend carrying out the exchange in 20-ml. amounts, but this increases the completeness of the replacement by barely 1%, and we feel that the smaller volume is safer.

From beginning to end the operation takes about 75 minutes, which agrees with the recommendations of Wallerstein (1947), and Diamond *et al.* (1952). It is appreciably shorter than the time recommended by Mollison (1951) and Field and Hawkins (1951).

Difficulties, especially in withdrawing blood, often occur, but can usually be overcome by altering the position of the catheter slightly. Once the best position is found, every effort should be made to keep the catheter absolutely still. Gentle traction on the cord sometimes overcomes difficulties, presumably by straightening out a kink, but we have the impression that excessive traction tends to cause vomiting. The surest way to stop the flow is to suck too hard.

Defects in the apparatus can readily be located by testing it after disconnecting from the catheter.

If desired, additional blood may be given at the end of the exchange, either by the syringe in 10-ml. amounts or by slow drip, the donor set being connected direct to the cannula for this purpose. Unless it is certain that the infant will tolerate additional blood, none should be given. If necessary, a simple transfusion given several days later will serve the same purpose with greater safety.

At the end of the operation the cord is ligated in the normal way if long enough. If not, a purse-string suture is used, or a ligature tied round the skin-covered portion of the cord and removed 24 hours later.

Technical Difficulties

Introducing the Polythene Catheter

Difficulty in inserting the catheter can usually be avoided by cutting the cord sufficiently short, so that the remaining vein is not tortuous. It is also important to be sure that the lumen has been entered, for it is easy to make false passages, either alongside the vein or between the coats of the vessel wall. If the catheter has been introduced 8 to 10 cm. and blood has failed to flow, it should be suspected that the catheter is not in the vein. If suction produces only a small amount of yellow fluid this is certain. The remedy is to cut the cord shorter, if necessary flush with the skin, and start again.

Very occasionally the umbilical vein runs an atypical course, and, if varying the line of approach does not succeed, a curved probe can be used to determine the exact path of the vein. In such circumstances the introducing cannula described by Diamond *et al.* (1952) should be of value.

On one occasion we could pass the catheter only about 5 cm. beyond the skin margin, and withdrawal of blood was very difficult. We therefore cut down on the vein above the umbilicus (as described by Pinkus, 1948) and, presumably because of the more direct approach, were able to manipulate the catheter past the obstruction.

If the cord has been tied off short or occluded near the skin margin by means of a metal clip, it should be cut off close to the skin, and no difficulty should be encountered.

In the small number of secondary exchange transfusions that we have performed we have found it satisfactory in most cases to divide the cord close to the skin margin by means of a scalpel. The vein is identified and the catheter introduced in the usual way. Where we have failed with this method we have cut down on the umbilical vein. The technique employed has been to make a transverse incision through the skin about 1 to 2 cm. above the umbilical cord. The skin is then reflected back on to the cord and an aneurysm needle passed behind the cord tissue. This is incised, the vein identified, and the catheter introduced.

Once the catheter is in position the transfusion is conducted as in any other case and technical difficulties are no more frequent.

Maintaining a Satisfactory Flow

Sometimes, even when one is confident that the catheter has been introduced correctly, blood fails to flow or flows only when the catheter is withdrawn a little. This suggests that a clot is present in the vein, and if it cannot be withdrawn through the catheter then the catheter should be carefully withdrawn while gentle suction is applied. It is usually

possible by this means to withdraw the clot, after which a straightforward exchange can be performed. Occasionally parts of the clot may be left behind and cause trouble for the first 30 to 40 ml. Clotting very rarely occurs in the apparatus, but when it does we have found it satisfactory to wash out the taps and cannula with sterile water, followed by saline, then to proceed as usual. Defects in the apparatus and sticking syringes should be rarities, avoided by scrupulous care in their maintenance and preparation. No technical difficulties were encountered in 217 of our 250 "adequate" exchange transfusions. In the remainder the difficulties were as follows: introducing the catheter, 10 cases; clotting in apparatus, 5; leaking apparatus, 4; sticking syringes, 4; maintaining the flow, 10.

General Management

Oxygen Therapy.—Oxygen is not required in the uncomplicated case, but should be available for any baby who becomes cyanosed or distressed. A plastic funnel covering the baby's face is usually satisfactory, but in very ill infants a more efficient method is required. On three occasions the whole procedure has been carried out in an "isolette" incubator, because the infants were premature, grossly anaemic at birth, and showed signs of heart failure. Recently we have used a "perspex" box which fits over the baby and cruciate frame as far down as the groins (Fig. 4).

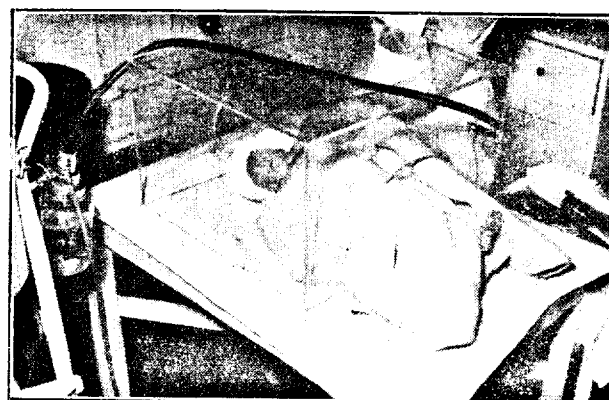


Fig. 4.—Apparatus for oxygen therapy.

By placing two hot-water bottles in the box a temperature of 85° F. (29.4° C.) can be maintained. A concentration of 50 to 60% oxygen is achieved with a flow rate of four litres a minute, and under these conditions the carbon dioxide concentration remains less than 1%. A swinging panel is provided in one wall of the box so that any necessary attention can be given to the baby. Severely affected babies benefit from a period in oxygen both before and after the transfusion.

Use of Calcium.—Theoretically, hypocalcaemia and tetany may be induced when large amounts of blood collected into citrate are used for transfusions of this kind. Therefore many workers (Wallerstein, 1948; Wiener and Wexler, 1949; Diamond *et al.*, 1951, 1952) recommend that calcium gluconate should be given at the end of, or periodically during, every exchange transfusion. We have not investigated this problem biochemically, but clinically have not recognized any signs of tetany. We gave calcium gluconate to four babies whose condition seemed unsatisfactory without any obvious explanation, but were not convinced that it produced improvement in any case. It is possible that, in removing 200 ml. of plasma from the donor blood, we also remove the main excess of citrate, but we have on occasion used whole blood without apparent ill effect.

Use of Heparin.—We have never thought it desirable or found it necessary to use heparin as advocated by Vogel (quoted by Wallerstein, 1947) and Wiener (1946, 1947, 1949).

After-Care

In the straightforward case, the baby's management following exchange transfusion does not differ from that of the normal newborn.

Antibiotics and Chemotherapy.—The prophylactic use of penicillin and sulphadiazine in all cases was recommended by Diamond *et al.* (1951, 1952). At one time 48 hours' penicillin therapy formed part of our routine in a proportion of cases, but as we found that a high percentage of organisms in the hospital concerned were resistant to penicillin we have abandoned this practice. Infection due to exchange transfusion has never occurred in our cases so far as we know. In the occasional case in which infection appears to be a real risk due to an undue amount of manipulation we have preferred to use streptomycin or chloramphenicol prophylactically.

Vitamin K.—This is given intramuscularly at birth as a routine in all cases, and has been continued for five days in many. We feel that this continued administration is not essential. Diamond *et al.* (1952) no longer recommend the use of vitamin K.

Haematinics.—There is no rationale for giving haematinics in this disease.

Breast-Feeding.—We encourage breast-feeding unless there is some other contraindication. Among over 1,000 cases of haemolytic disease we have recognized only two cases of prolonged haemolysis due to transmission of antibody in the mother's milk.

Complications of Exchange Transfusion

Many hazards have been attributed to exchange transfusion, and some apply no matter what route is used, while others concern the use of only one particular method.

Sepsis.—This should be an extremely rare sequel, and we have indicated the steps we take to prevent it in cases exposed to more than average risk. Van Loghem and Bartels (1949) recorded four deaths from infection in their series.

Air Embolism.—Wiener and Wexler (1949) have criticized the umbilical vein route on the grounds that there is a great risk of air embolism. Pickles (1949) and Mollison (1951) also list this as a possible complication. We have never experienced this calamity and consider that the use of a transparent catheter should ensure that no air enters through its lumen. Air could enter the baby by passing up the umbilical vein alongside the catheter, but this can be prevented by tying a ligature round the cord and catheter, or by closing the vein tightly round the catheter by means of an artery forceps. Van Loghem and Bartels (1949) recorded deaths from air embolism, but they elected to use rubber rather than plastic catheters.

Thrombosis of Portal Vein.—Wiener and Wexler (1949) give this as a complication, but it has never happened in our experience.

Perforation of the Umbilical Vein.—This risk, which diminishes with the experience of the operator, is always present. Unless perforation occurs within the abdomen, no serious harm is likely to result. We have made a careful examination of the umbilical vein in all of our fatal cases, but, apart from minimal bruising, have discerned no injury.

Reaction Due to Incompatible Transfusion

Van Loghem and Bartels (1949) reported this as a cause of death in their series, and obviously the risk exists as with any transfusion. We feel that in the newborn, and particularly using exchange transfusion, the dangers are less likely to be serious than in simple transfusion of older subjects. On two occasions we unwittingly used blood which was frankly incompatible.

Case 1.—A baby was given Rh-positive instead of Rh-negative blood by mistake. He pursued an uneventful course; in particular, only mild jaundice, lasting less than one week, developed, and further transfusion was not required. We were able to

demonstrate that the transfused cells were eliminated rapidly although no free antibody was detected in the infant's cord blood.

Case 2.—This was an infant with an Rh-negative mother and an Rh-positive father, but antibodies had not been demonstrated antenatally. The routine cord-blood specimen was Coombs-positive and early jaundice occurred. Exchange transfusion was carried out, using Rh-negative blood of the same ABO group as the baby, but without full compatibility tests. It was later discovered that haemolytic disease was due to ABO incompatibility. This infant also progressed satisfactorily, and, although all transfused cells were eliminated within fourteen days, no additional transfusion was required.

Overloading of the Circulation

This is a very real danger in infants grossly anaemic at birth and one that we encountered early in our experience. A baby admitted from the domiciliary practice of the hospital had a capillary haemoglobin level of 7.3 g.% at seven hours. As his condition remained satisfactory during exchange transfusion, we decided to give an additional 70 ml. of blood slowly at the end of the exchange. The baby became deeply cyanosed and stopped breathing. The catheter was disconnected and blood poured from it, obviously under increased pressure. We allowed bleeding to continue until the pressure was normal. The baby rallied, only to die three hours later, and at necropsy signs of heart failure were found. Because of this early experience we give additional blood only to infants fit at the start and throughout the transfusion, and then never more than 30 to 40 ml. If there is the slightest doubt we do not expose the infant to this risk.

That the possibility of heart failure can never be ignored was once again made clear to us only recently. A baby was born outside and admitted with severe clinical disease. The venous pressure at the start of the transfusion was normal, but, even so, we discarded 10 ml. before carrying out the exchange. At 510 ml. out/500 ml. in, the baby was well and the venous pressure normal. We decided to replace the 10 ml. to complete the transfusion. Having done so, we disconnected the catheter, and simultaneously observed the infant to be deeply cyanosed and the venous pressure to be very high. The removal of 40 ml. of blood, artificial respiration, and the intravenous and intracardiac administration of stimulants were of no avail. The infant died, and at necropsy evidence of heart failure was found. From this we learnt two important lessons: first, 10 ml. of blood is enough to precipitate fatal heart failure, and, second, one should always carefully assess the severity of the case before undertaking treatment. The haemoglobin level at the start of exchange transfusion was only 6 g.%, but unfortunately we did not make this estimation until after the baby was dead.

Before beginning treatment we would recommend that the venous pressure be measured, and, if desired, the manometer described by Mollison (1951) may be used for this purpose. If the pressure is higher than 10 cm. more blood should be withdrawn than is given until the pressure is normal. Most infants with a cord haemoglobin level of 11 g.% (75%) or less appear to benefit by having less blood injected than is withdrawn. As a very rough guide, the negative balance should be about 10 ml. for every 10% of haemoglobin below this level. Whenever the cord haemoglobin is less than 7.4 g.% (50%) we feel that the transfusion should be carried out at a negative balance, even if the venous pressure is within normal limits.

If the venous pressure is high we aim to reduce it as early as possible by removing from the baby 20 ml. of blood and replacing it with 10 ml. This is repeated until the venous pressure is reduced to normal. We regard the high venous pressure as partly compensatory for the anaemia, and consider that the above routine, using blood with a haemoglobin content of about 17 g.%, has the advantage of raising the haemoglobin level at the same time as the venous pressure is reduced. Diamond *et al.* (1952) also use this system, which we suggest is better than the practice of removing 50 ml. of blood from similar cases before injecting any.

Reaction of the Infant to Exchange Transfusion

In about 40% of infants treated by exchange transfusion the general condition deteriorates during transfusion, and in many cases no obvious cause is evident. The risk does not appear to be related in any simple way to the baby's condition at the start, to the birth weight, to the technical difficulties encountered, or to the rate of exchange. Certainly, severely ill babies usually give cause for anxiety throughout the transfusion, but it is not uncommon for an infant with relatively mild disease and in good condition at the start to deteriorate during the transfusion. Collapse is usually due to one of two factors.

(1) **Heart Failure.**—This is usually, but not always, limited to babies grossly anaemic at the start, with a high venous pressure. The main features observed in these cases are cyanosis (readily observed in the lips, but often first noticed because the blood being withdrawn from the baby has become dark in colour), rapid shallow respiration, increased heart rate, and a high venous pressure. The baby, having been active and crying, may become limp and silent or have sighing or grunting respiration with some frothing at the mouth. Oxygen, withdrawal of blood until the venous pressure becomes normal, and slowing the rate of the procedure often result in improvement. If, in spite of this, the baby's condition deteriorates, we would suggest that the transfusion be stopped and the baby placed in an oxygen box. We have done this with benefit in eight instances, and have had no technical difficulty in restarting and completing the transfusion. The catheter is clamped and left *in situ*, and is replaced by a new one when the transfusion is recommenced; alternatively, the cord may be ligated.

(2) **Shock.**—Although some babies show some degree of shock, becoming pale and quiet, with rapid shallow respirations, this is seldom severe enough to cause great anxiety, and they usually recover with warmth and slowing of the transfusion. However, in one or two such infants we have experienced difficulty in withdrawing blood. The giving of 20 to 30 ml. of blood without any being withdrawn resulted in dramatic improvement; the procedure once again became easy and all remained well. But if there is the slightest possibility that the clinical deterioration may be due to heart failure, extra blood should not be given. It is wiser to stop the transfusion, because placing the baby in an oxygen box brings improvement, whichever the cause, and the clinical distinction may be very difficult.

We foresee that full investigation of the biochemical and other factors involved may eventually explain the deterioration in the clinical condition of some of these cases.

Conclusion

We believe that exchange transfusion forms an essential part of the treatment of babies suffering from relatively severe haemolytic disease of the newborn. In practical hands it is a safe and satisfactory procedure. Linked with laboratory prediction beforehand and skilled care afterwards, it should ensure a satisfactory outcome in the great majority of cases.

The cases with which this report is concerned have been collected from a large part of Northumberland and Durham, and but for the good will of the obstetricians, family doctors, and antenatal clinic staffs this material could not have been concentrated in one centre. The Regional Blood Transfusion Centre in Newcastle-upon-Tyne has undertaken the antenatal and cord-blood serological tests necessary for the diagnosis. It is because of the efficiency of this service that such a large proportion of cases have been diagnosed antenatally, and this has materially contributed to the results. As this report deals with cases collected over a period of eight years in the Newcastle-upon-Tyne group of hospitals, it is obviously impossible to mention by name all those to whom we are indebted for help. We would like to thank our medical and nursing colleagues in these hospitals for their continuous help.

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A STUDY OF THE ACTION OF TRICYCLAMOL CHLORIDE

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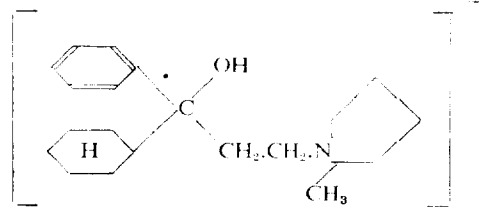
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In the search for efficient treatment of gastric and duodenal ulcer the primary object of prolonged reduction of free HCl concentration in the gastric juice has been achieved (Douthwaite and Thorne, 1954). It was postulated that the failure of single large doses of antacids was due to their rapid expulsion from the stomach, especially in cases of duodenal ulceration. Drugs which will reduce the rate of emptying should therefore prolong the antacid effect; at present this is obtainable only by the slow sucking of alkaline or buffering tablets. The difficulty of controlling nocturnal secretion might in this way be overcome.

The belladonna alkaloids and, to a far greater extent, hexamethonium (Douthwaite and Thorne, 1951) by injection, have been used for this purpose.

The object of this communication is to report our experiences with tricyclamol chloride (DL-N-methyl-3-cyclohexyl-3-hydroxy-3-phenylpropyl pyrrolidinium chloride), shown in animal experiments to have an antispasmodic and parasympatholytic action. It is an odourless crystalline substance, which is freely soluble in water. It may be given by mouth or by subcutaneous injection. The doses employed have varied from 25 to 100 mg. and are indicated in respect of each experiment.

Our object has been to test the effect on gastric and duodenal motility and tone; the influence on gastric acidity; and the effect of a single dose of antacid on the pH of the gastric juice during the action of tricyclamol.



Tricyclamol chloride

Methods

The effects of tricyclamol upon gastric and duodenal motility were observed on the x-ray screen during a barium meal and films were taken. Comparison was made with barium meals given without the drug. The influence of tricyclamol on gall-bladder emptying was shown by cholecystography with and without a dose of tricyclamol.

The effect of tricyclamol on the pH and levels of free and total acid of test-meal samples were observed and compared with control meal samples obtained without the drug. In three patients tricyclamol was given immediately after passing a Ryle tube—50 mg. intramuscularly in two cases and 50 mg. orally in one case. The meal was eaten and samples of gastric contents were taken every 15 minutes. In a fourth patient 100 mg. of tricyclamol was given orally half an hour before starting the meal.

Two of the patients also received an alkaline mixture (aluminium hydroxide gel B.P.C., 8 ml.) immediately after swallowing the meal. The stomach was not emptied of its resting contents. We wished to discover how effective tricyclamol might be in reducing the acidity of gastric contents under ordinary conditions, since, in actual treatment of peptic ulcer, drugs given to decrease acidity are used in the presence of some secretions still in the stomach. To be of value the drug should reduce acidity in the presence of previously secreted gastric juice.

Three of the four patients were given a "standard breakfast" of one boiled egg, two slices of toast, and two cupfuls of tea. Such a meal allows the response of the stomach to normal food to be measured in terms of pH and acidity, and probably represents a more usual gastric stimulus than a gruel meal. It has the disadvantage of not being directly comparable to series of test meals done in the past, when gruel was commonly used for the meal. One of these four patients received a gruel meal.

In an attempt to reduce sampling error (James and Pickering, 1949), about 30 ml. of gastric contents was aspirated at each time. After agitation of the syringe contents, about 7 ml. of the mixture was retained and the remainder returned to the stomach; 5 ml. of each sample was titrated within 24 hours of collection. (Storage at 4° C. before the estimations.) The pH was measured electrometrically. Titration to pH 3 with 0.5N NaOH solution was taken to represent the level of free acid in the samples. The level of total acid was measured by titration to pH 7.

Results

1. **Effect on Gastric and Duodenal Motility and Tone.**—Radiological observation of barium meals showed that gastric, duodenal, and small-intestinal motility and tone were considerably reduced after a dose of tricyclamol (Figs. 1 and 2 show typical appearances.) Yet in a patient with a partial gastrectomy and symptoms of the "dumping syndrome" emptying of the stomach occurred even more rapidly than usual when 50 mg. of tricyclamol was given intramuscularly before a barium meal. This was associated with extreme flaccidity of the stomach, very well seen on



FIG. 1.

FIG. 2.

FIG. 1.—Control. Four hours after barium meal. FIG. 2.—The same patient as in FIG. 1. Four hours after barium meal. Tricyclamol chloride, 25 mg., was given intramuscularly 20 minutes before the meal.

screening. In a patient in whom a cholecystogram was done the gall-bladder emptied somewhat more slowly after 50 mg. of intramuscular tricyclamol, given half an hour before a fatty meal, than in a control cholecystogram. A little dye could still be seen in the gall-bladder three hours after the fatty meal, while in control films the gall-bladder was empty two hours after the fatty meal.

2. *Influence on Gastric Acidity.*—In two patients, 50 mg. of tricyclamol given intramuscularly produced some rise in pH. This effect was short-lived and of relatively small degree. Free acid was again present after one hour in one case and after three-quarters of an hour in the other, a man with a gastro-enterostomy for many years recently complicated by a stomal ulcer. In these two cases intramuscular tricyclamol caused little change in the level of total acid, but there was a slight fall in one of the patients.

3. *Effect of Single Dose of Antacid on pH of Gastric Juice During Action of Tricyclamol.*—Two patients received tricyclamol tablets by mouth. A dose of aluminium hydroxide gel was given as soon as the meal had been eaten. One patient receiving 50 mg. of tricyclamol and 8 ml. of aluminium hydroxide gel showed a moderate rise in pH. Free acid was absent for 1½ hours and then returned in relatively low concentration. There was a smaller fall in total acidity. Another patient was given 100 mg. of tricyclamol by mouth with the additional dose of alkaline mixture. In this case there was a greater rise in pH. Free acid was absent for 2½ hours and then returned and increased in amount. There was a slight reduction in total acidity (see Fig. 3).

Uncomfortable dryness of the mouth, dilated pupils, and blurring of print on reading were noticed in most of the patients. These effects seemed more pronounced after the intramuscular than after the oral use of the drug. In one

patient who had 50 mg. of tricyclamol orally no side-effects were observed.

Discussion

Tricyclamol chloride has a marked effect in reducing the motility of the stomach and duodenum, and to a far greater extent than the results produced by hyoscyamine (Douthwaite, 1947). This action may be of value in controlling the pain of peptic ulceration, since it is likely that the pain, at least in part, is due to spasm. Certainly, in the patient with gastro-enterostomy and stomal ulcer, already mentioned, quite severe pain was relieved after repeated oral doses of 50 mg. of the drug.

Tricyclamol has been shown to have some effect in reducing the concentration of free acid in gastric contents after a meal of normal food or gruel. This might be due to diminished secretion of acid juice, or to delay in gastric emptying with a resulting larger volume of gastric contents to dilute gastric secretion, or there might be a combination of both factors.

However, the change in the level of free acid was not marked nor long-lasting when tricyclamol was given alone, and seemed too small to be of much value of itself in the treatment of peptic ulcer. There might be some additional pain-relieving effect due to the association of this factor with the much more powerful spasmolytic action of tricyclamol. Given with an alkaline mixture, tricyclamol potentiated to a certain extent the fall in the level of free acid shown to be due to alkali alone (Douthwaite, 1939). A dose of 100 mg. orally was more effective than 50 mg. Such a combination might assist the process of healing in which free hydrochloric acid is undoubtedly a deterrent factor. It is suggested that a combination of 100 mg. of tricyclamol chloride by mouth with a full dose of antacid might go some way towards overcoming the difficulty hitherto experienced in controlling nocturnal secretion in the treatment of duodenal ulcer.

Although tricyclamol decreased gastric motility, paradoxically gastric emptying became more rapid after giving the drug to a patient with partial gastrectomy. This seemed to be due to the extreme flaccidity of the stomach with greater dependence of the stoma, allowing barium to pour through at a very fast rate. Symptoms of "dumping" were not produced in this patient after taking a barium meal preceded by tricyclamol.

Side-effects sufficient to cause slight discomfort were observed in most of the patients in whom the effects of tricyclamol were studied.

Summary

A preliminary report is presented on the effects of a new parasympathetic blocking drug, tricyclamol chloride.

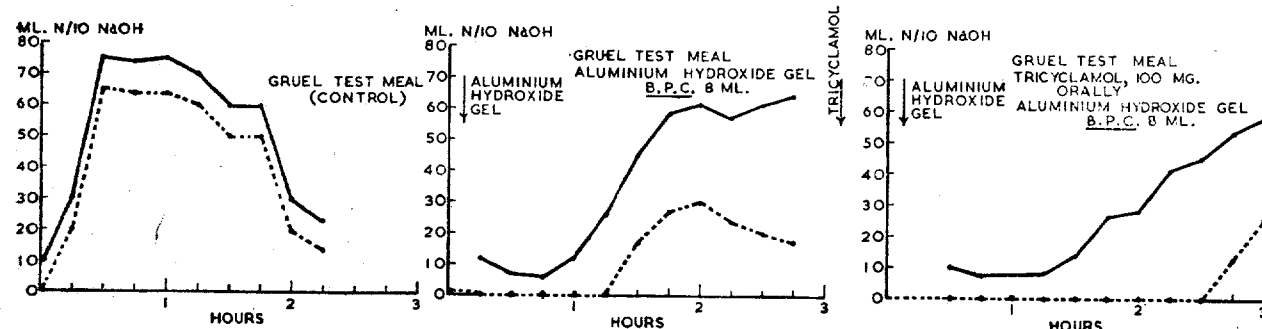


FIG. 3.—Graphs showing effect of tricyclamol on the acidity of the gastric contents in comparison with aluminium hydroxide gel and a control. ----, Free acid. —, Total acid.

The drug had a marked effect in reducing gastric motility and tone.

There was a smaller effect in reducing acidity of the gastric contents.

Tricyclamol prolonged the reduction of gastric acidity obtained by a dose of alkali.

We wish to thank Dr. J. D. Dow for the x-ray films, Professor W. R. Spurrell for providing facilities for the analysis of test meals, and Messrs. Burroughs Wellcome and Co. for supplies of the tricyclamol chloride used in these investigations.

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EFFECTS OF VALSALVA'S MANŒUVRE ON THE NORMAL AND FAILING CIRCULATION

BY

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The Valsalva manœuvre (Valsalva, 1707), by producing a rise in intrathoracic pressure, causes an acute decrease in the effective filling pressure of the heart, with consequent changes in the stroke output. An analysis of continuous arterial pressure tracings in the normal subject performing the Valsalva manœuvre has shown that a decrease in pulse pressure occurs when intrathoracic pressure is raised, and that this is followed by a phase of raised diastolic pressure (the "overshoot"). The latter phase has been interpreted as a baroreceptor response to the decreased pulse pressure of the former (Sharpey-Schafer, 1953).

Cases of heart failure might be expected to respond to the Valsalva manœuvre in a different manner, since a decrease in effective filling pressure produced by venesection may cause an increase in stroke output (Howarth *et al.*, 1946). Preliminary observations, using continuous arterial pressure records, indicated that this was in fact so (Sharpey-Schafer, 1952).

This paper presents the accumulated data on normal subjects and observations on cases of heart failure of varied aetiology. The results have been interpreted in terms of baroreceptor responses to acute changes in pulse pressure.

Material and Methods

Sixty-two subjects with a normal circulation and 63 cases of heart failure were studied. All the cases of heart failure were in sinus rhythm and had a jugular venous pressure raised from 2 to 25 cm. above sternal angle level: 19 were cases of hypertensive heart failure, 9 had ischaemic heart disease, 21 had disease of the mitral or aortic valves, 7 had cor pulmonale (emphysema), 3 severe anaemia, 2 severe thyrotoxicosis, and there was 1 each of the following: primary pulmonary hypertension, pulmonary embolus, haemochromatosis, and chronic myocarditis.

Continuous arterial pressure records were obtained using capacitance manometers (Hansen, 1949), which were also employed for the measurement of intrathoracic pressure

(Dornhorst and Leathart, 1952). In some observations a differential manometer system was used (Lee *et al.*, 1954), usually differentiating intra-arterial and intrathoracic pressures.

The Valsalva manœuvre was performed by blowing a mercury column to 40 mm. Hg and maintaining it at that level for about 10 seconds. This was easily accomplished by patients with heart failure, however breathless, and by quite young children for a small monetary reward. The procedure is without risk in heart failure for reasons that will become apparent. All subjects were supine with the trunk raised to 45 degrees with the horizontal.

Results

The difference in response between normal subjects and cases of heart failure was conspicuous (Figs. 1, 2, and 3).

Factors Affecting Response in the Normal Subject

When the intrathoracic pressure is suddenly raised to 40 mm. Hg this pressure is rapidly transmitted to all the arteries and to those veins without valves. The immediate supply pressure to many internal organs, such as the brain, is therefore essentially unaltered. In skin and muscle, however, the venous valves shut and initially the arteriovenous supply pressure is raised by approximately the same amount as the intrathoracic pressure. Since the blood-flow to a part depends on supply pressure and the calibre of the arterioles,

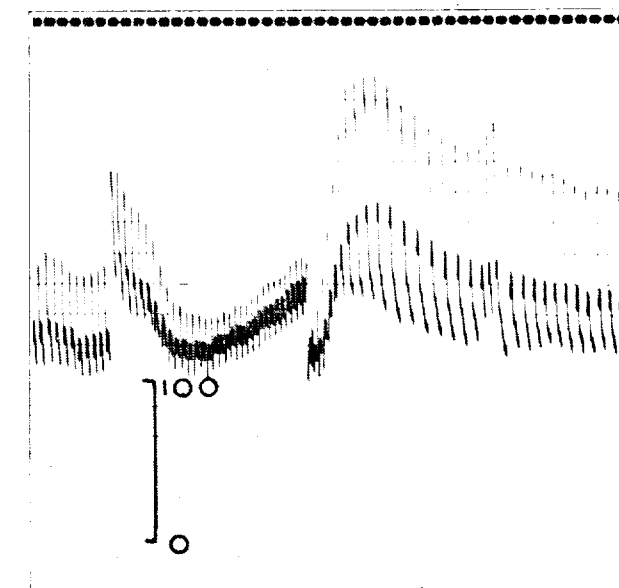


FIG. 1.—Continuous arterial record showing effect of Valsalva manœuvre in normal subject. Calibration in mm. Hg and time marker in seconds in this and subsequent records.

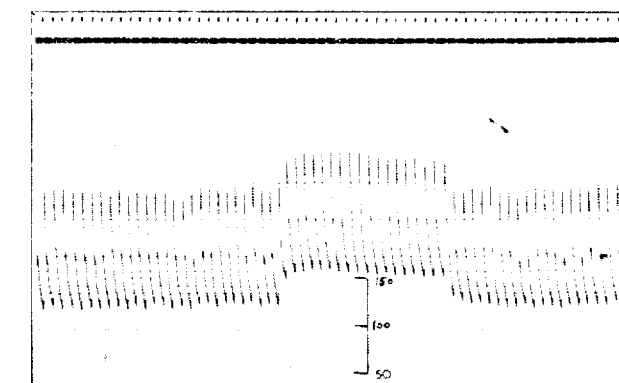


FIG. 2.—Hypertensive heart failure, showing effect of Valsalva manœuvre on arterial blood pressure.

the blood-flow to skin and muscle is initially increased. Thereafter the local venous pressure rises steadily at a rate which depends on previous vasomotor tone, the rise being more rapid in a hot limb than in a cold limb (Fig. 4); as the arteriovenous pressure difference falls the blood-flow to the part decreases. These effects may be seen directly in the capillaries of the nail-bed.

It has already been observed that the accumulation of blood in peripheral veins behind closed valves causes the central effective venous pressure to fall (Lee *et al.*, 1954), with a consequent decrease in stroke output and a fall in arterial mean blood pressure and pulse pressure. The rate at which mean arterial pressure and pulse pressure will decrease depends, therefore, on the initial state of vasomotor tone, being more rapid and considerable in the vasodilated subject. It was shown previously that the rate of fall increased after hyperventilation, which causes vasodilatation of muscle vessels (Howard *et al.*, 1951). The same results have since been found in vasodilatory states produced by indirect heating and by sympathetic blocking agents, and in cases of thyrotoxicosis. It has also been shown that if the rate of accumulation of venous blood in the periphery is decreased by cold or by a pressure suit, then arterial mean pressure and pulse-pressure changes are also decreased.

Under normal environmental conditions the arterial pressure begins to rise again after 5 to 10 seconds, with the onset of peripheral constriction (Sharpey-Schafer, 1953). Simultaneously, there is a decrease or stoppage of blood-flow in the capillaries of the nail-bed.

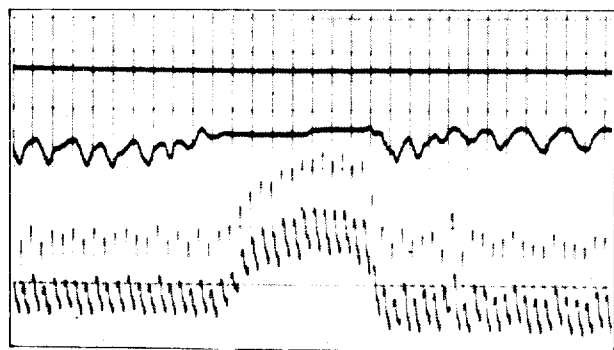


FIG. 3.—Severe hypertensive heart failure, showing increase of pulse pressure during Valsalva manoeuvre and decrease of diastolic pressure after release of the raised intrathoracic pressure.

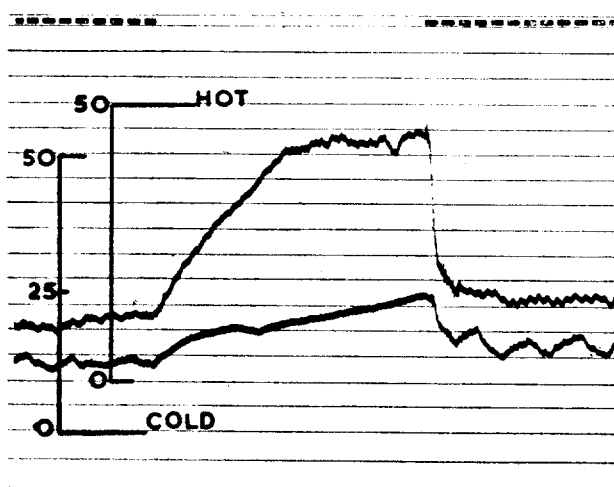


FIG. 4.—Simultaneous venous pressure records from the ante-cubital veins of both arms of a normal subject. The upper curve is from an arm previously heated; the lower from an arm at a cool environmental temperature. The Valsalva manoeuvre is signalled by an interruption of the time marker. The venous pressure rises more rapidly in the heated limb.

The results are summarized in the "normal" part of Fig. 5, in which maximum percentage change in arterial pulse pressure during the phase of raised intrathoracic pressure is plotted against the maximum change in diastolic pressure during the "overshoot." There is a direct relationship in

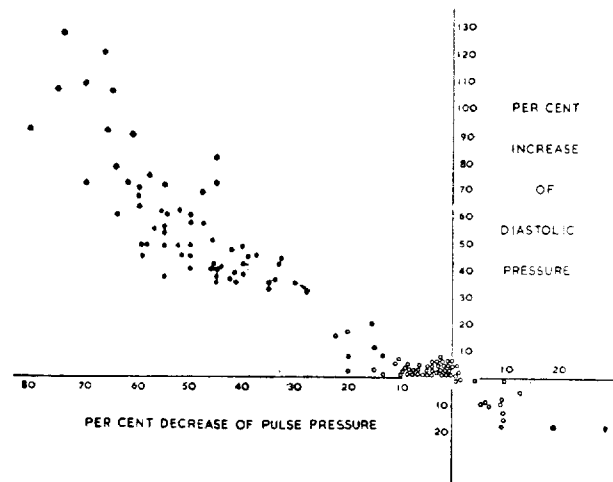


FIG. 5.—Normal subjects—black circles; cases of heart failure—open circles.

$$\text{Percentage decrease of pulse pressure} = \frac{\text{Control pulse pressure} - \text{maximum change in pulse pressure during Valsalva}}{\text{Control pulse pressure}} \times 100$$

$$\text{Percentage increase of diastolic pressure} = \frac{\text{Maximum change in diastolic pressure after Valsalva} - \text{control diastolic pressure}}{\text{Control diastolic pressure}} \times 100$$

the normal subject. In each individual a series of points may be obtained on the "normal" part of the curve by altering the initial vasomotor tone by methods described above.

Response in Heart Failure

The results fall into two groups. In the first, comprising the majority of the cases, there was no measurable change in pulse pressure during the Valsalva manoeuvre, and no subsequent "overshoot"; the classical heart-rate changes occurring in normal subjects were also absent (Fig. 2). It would appear, therefore, that in most cases the failing heart is unable to change its stroke volume immediately in response to a rapid fall in filling pressure. Since the pulse pressure remains essentially unaltered, the absence of the "overshoot" is to be expected, if the theory that the latter is due in the normal subject to a decreased pulse pressure is correct. The peripheral constriction in some cases of heart failure must of course modify the response, especially over a short period; but in spite of this an appreciable fall in central venous pressure has been measured.

In the second group of cases there was an increase in pulse pressure during the Valsalva manoeuvre, and a subsequent decrease in diastolic pressure, indicating vasodilatation (Fig. 3). It is suggested that these cases, which were clinically the most severe as judged by the height of the venous pressure and course of the illness, were on the falling limb of the Starling filling pressure-output curve, and responded to a decreased filling pressure by an increased stroke output and therefore an increased pulse pressure. The vasodilatation which followed is interpreted as a baroreceptor response to the increased pulse pressure, similar to that occurring with other increased pressure transients (Sharpey-Schafer, 1953).

The results are summarized in Fig. 5. In the first group, where no pulse-pressure changes occurred, there was no change subsequently in the diastolic pressure; whereas in the second group the increased pulse pressure was followed by a fall in diastolic pressure, the reverse of the normal.

Discussion

It has been shown previously in animals (Ead *et al.*, 1952) and in man (Sharpey-Schafer, 1953) that increased pressure transients in the circulation give rise to reflex vasodilatation by a baroreceptor mechanism. The evidence reported here confirms the theory that, with nervous pathways intact, a decreased pulse pressure produces vasoconstriction and an increased pulse pressure produces vasodilatation. The theory has been shown here to apply not only to the normal but also to the failing circulation. Baroreceptor reflexes are active in heart failure provided that the necessary stimulus is applied, as is shown by the cases with increased pulse pressure and subsequent vasodilatation. The lack of baroreceptor response in those cases showing no pulse-pressure change is in accordance with this view. Further evidence of baroreceptor activity in heart failure in response to pressure changes using other stimuli will be presented elsewhere.

The cases of heart failure reported here were all cases with a raised venous pressure and sinus rhythm. Many other cases of heart disease with a normal venous pressure and patients with abnormal cardiac rhythms have also been investigated, and the results lie on the curve shown in Fig. 5; as might be expected, some are in the normal and some in the pathological part of the graph, with others intermediate in position.

Previous workers (Hamilton *et al.*, 1944; Goldberg *et al.*, 1952; Price and Conner, 1953) have recorded "square wave" patterns on arterial-pressure records in cases of mitral stenosis and occasionally other conditions during the Valsalva manoeuvre. The explanations offered have been unsatisfactory, probably because it was not recognized that all forms of heart failure show this phenomenon.

It is of interest that the majority of cases of heart failure did not respond to the acute fall in filling pressure produced during the Valsalva manoeuvre by an increased stroke volume, as did the majority of all cases of heart failure studied by the Fick method and venesection (Howarth *et al.*, 1946). The difference in duration of the two sets of observations and the heart-rate changes occurring in the latter group may be sufficient to explain the discrepancy.

Clinical Uses

The main effects of the Valsalva manoeuvre may be observed by feeling the pulse in the majority of cases. Rate changes are easily detected, but pulse-pressure changes may also be appreciated. It is usually possible to be certain that the response to the manoeuvre is normal by feeling the pulse. Occasionally a spurious "heart failure" response may arise from weak blowing, generally seen in young women who lack the competitive spirit of males and children, or from cheating, which appears to be confined to Royal Air Force personnel who have learned to apose tongue and soft palate, thereby maintaining a mercury column indefinitely without any rise in intrathoracic pressure.

The Valsalva manoeuvre may be used to elicit the presence of heart failure in difficult cases and to establish the relative innocence of certain noisy hearts. When used, however, to assess the progress of established cases of heart failure, it shows only too often that little real change has been achieved when they are discharged "compensated" from hospital.

It is also possible by auscultation during the Valsalva manoeuvre to decide whether a murmur arises on the right or left side of the heart (Zinsser and Kay, 1950). If the murmur is from the right side it will return immediately on release of the intrathoracic pressure rise; if from the left, a delay of a few beats will be observed. This physical sign is present only if the heart is responding in a normal manner. In most cases of heart failure, since there is no change in stroke output there is no differential accentuation of a murmur. The value of the sign is therefore limited.

Summary

The Valsalva manoeuvre causes an acute reduction in the effective filling pressure of the heart and has been used to study the circulation in 62 normal subjects and 63 patients with heart failure. Continuous arterial records showed conspicuous differences in the two groups.

In the normal subjects decrease in arterial-pulse pressure was followed by a rise in diastolic pressure (overshoot). In heart failure from any cause there was usually no change in pulse pressure and no overshoot. In the remaining severe cases the pulse pressure was increased and was followed by a decrease in diastolic pressure.

The results in normal subjects and in heart failure are compatible with the general theory of baroreceptor responses to acute pulse-pressure changes. Thus decrease in pulse pressure was followed by vasoconstriction, and increase in pulse pressure by vasodilatation; unchanged pulse-pressure was without effect peripherally.

The Valsalva manoeuvre appears to be the simplest repeatable method available at the moment for studying the differences between the normal and failing circulation. It can be used clinically by feeling the pulse.

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VENOUS PULSE IN ATRIAL SEPTAL DEFECT: A CLINICAL SIGN

BY

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The value of observing the venous pulse in the neck is widely recognized, but accurate identification of the waves by timing them against the heart sounds is less commonly practised. This need not be a difficult procedure provided there is no marked tachycardia, particularly where identification of the *a* and *v* waves is concerned, as the former immediately precedes the first heart sound and the latter occurs directly after the second heart sound. Careful observation of the venous pulse in those types of congenital heart disease that predominantly affect the right side of the heart may be of value in establishing the diagnosis. The importance of the large *a* wave in pulmonary stenosis is well recognized (Abrahams and Wood, 1951; Campbell, 1954). It is surprising, therefore, that little attention has been paid to the venous pulse in atrial septal defect. Wood (1950) mentions that it is usually normal, although the venous pressure may be raised in some instances; and Luisada

(1948) states that there may be a very high auricular wave. The purpose of this communication is to describe the pattern of the jugular phlebogram in this condition, and to emphasize that its most important characteristics may be observed by simple inspection of the neck veins.

Material and Methods

Twenty-five patients with atrial septal defect and 16 normal subjects were included in this investigation. Their ages ranged between 3 and 15 years. The diagnosis in the patients with atrial septal defect was made on the accepted clinical and radiographic criteria (Bedford *et al.*, 1941), and all showed incomplete or complete right bundle-branch block on the electrocardiogram (Barber *et al.*, 1950). The diagnosis was confirmed by cardiac catheterization in 19 patients, and in five of these operation for closure was performed and the nature and size of the defect ascertained.

Synchronous jugular phlebograms with phonocardiograms and electrocardiograms as reference tracings have been recorded from each patient. In the majority of cases recordings have been taken on an Elmquist five-channel "klinik" recorder. With this method the venous pulse was usually recorded direct from the internal jugular vein, the pulsations being transmitted to a crystal of Rochelle salt by a fine metal stylus which rests gently on the skin of the neck overlying the vein. In an occasional case the jugular bulb gave a more satisfactory tracing. It was found that certain precautions were necessary to ensure that satisfactory tracings were obtained, and these apply equally to clinical observation of the venous pulse. First, the patient was propped up to about 45 degrees from the horizontal; secondly, the sterno-mastoid was relaxed by keeping his head in the midline; and, lastly, the point of pulsation from which the recording was made was palpated to be sure that there was no superimposed carotid impulse. Tracings were taken with breathing arrested in mid-respiration.

The height of the *v* wave has proved to be of importance in this investigation, and so an attempt has been made to measure this in each individual by comparing it with the height of the *a* wave in the same complex. The height of the *a* wave has been measured from the upstroke denoting the onset of auricular systole to the peak of the wave, and the height of the *v* wave from the point of maximum systolic collapse (*x*) to the peak of the wave. It may be

argued that the *v* wave should be measured from the point of pulmonary valve closure rather than from the maximum systolic collapse, as the two do not usually coincide in patients with atrial septal defect. However, the above measurement has been adopted because the large wave observed in the neck following the second heart sound is due to the combined effect of a deep systolic collapse and the large *v* wave itself, and it is with the clinical recognition of this wave in relation to the *a* wave that this investigation is concerned.

Results

So far as could be estimated by cardiac catheterization and by other data, the septal defect was of moderate or large size in all these patients. Five patients were known to have associated pulmonary hypertension, and these are considered separately. No patient was in congestive cardiac failure when the tracings were taken. The 16 subjects with normal hearts were included to demonstrate the normal phlebogram by the methods used in this investigation and to indicate the normal ratio of the size of the *a* wave to that of the *v* wave.

Normal Subjects.—Phlebograms from three of these subjects are shown in Fig. 1. The height of the *a* and *v* waves has been compared in each individual; in six they were of equal amplitude; in three the *v* wave was larger than the *a* wave, but in none was it more than one and a half times as great; in two the *a* wave was slightly larger than the *v* wave, and in five it was up to twice as large.

Atrial Septal Defect.—The level of venous pulsation above the sternal angle was measured in each patient with the trunk at about 45 degrees to the horizontal; in all it was raised, the measurement varying between 2 and 6 cm. The characteristic pattern in those cases uncomplicated by pulmonary hypertension was of a normal *a* and *c* wave, a deep and steep systolic collapse, followed by a tall sharp-rising *v* wave (Fig. 2). In those with pulmonary hypertension proved by cardiac catheterization the size of the *a* wave was increased, and the *v* wave, although still abnormally large, was not as tall as in the uncomplicated cases.

An analysis of these waves has been made in each individual.

The *a* Wave.—This wave was normal in 17 patients and larger than normal in the five with associated pulmonary hypertension (Fig. 3). The remaining three cases showed either no *a* wave and presystolic collapse or an insignificant *a* wave.

The *c* Wave.—This was normally registered in all cases.

Systolic Collapse (*x*).—In 17 out of the 20 cases uncomplicated by pulmonary hypertension the systolic collapse was deeper and steeper than normal. This is clearly shown in Case 2 of Fig. 2.

The *v* Wave.—In all the 20 cases without pulmonary hypertension the *v* wave was taller than normal and tended to rise sharply to a peak immediately after the abnormally deep systolic collapse; following pulmonary valve closure (Fig. 2) the steepness of this ascending limb was further accentuated in many cases. The height of this wave has been compared with the *a* wave in these patients; it has been termed "normal" if it was slightly greater than, equal to, or smaller than the *a* wave; "large" if it was one and a half to three times as large as the *a* wave; and "giant" if it was more than three times as large as the *a* wave. By these criteria the *v* wave was giant in seven patients and large in thirteen. In three instances it was eight times the height of the *a* wave.

In all but one of the five patients with pulmonary hypertension the *v* wave was also larger than normal, but this change was less

marked than in the uncomplicated cases. Because the *a* wave was also of increased amplitude in these patients, the height of the *v* wave could not be profitably compared with it.

Diastolic Collapse.—The diastolic collapse was well marked in most patients. In two cases in which no *a* wave was recorded it was continuous with the presystolic collapse.

Discussion

A raised venous pressure with an abnormally large *v* wave has been shown to occur in 20 children with atrial septal defect. This wave is usually sharply defined and can be seen on inspection of the neck veins and identified from the *a* wave by its relationship to the second heart sound. Its differentiation from a large *a* wave helps to distinguish this condition from pulmonary stenosis. We have

Ratio of Height of *v* Wave to *a* Wave in Normal Subjects and in Children with Atrial Septal Defect

Ratio of <i>v</i> Wave to <i>a</i> Wave	Classification of <i>v</i> Wave	Normal Subjects	Atrial Septal Defect (Without Pulmonary Hypertension)
1 : 2	Normal	5	0
1 : <2		2	0
1.5 : 1		6	0
1.5 : 1	Large	3	0
1.5 : 1		0	13
>3 : 1		0	7
Total		16	20

found a large *a* wave in some mild and moderate cases of the latter as well as in more severe cases; and it is these lesser degrees of pulmonary stenosis that may be confused with atrial septal defect because of the occurrence of a widely split pulmonary second sound in both conditions (Leatham, 1954; Bonham-Carter *et al.*, 1954).

The finding of a large *a* wave in a patient suspected of having an atrial septal defect or the development of such a wave in a known case over the course of time suggests the presence of pulmonary hypertension.

The larger wave following the second heart sound in these patients is probably caused by two separate factors. The deep and steep systolic collapse that is often present is thought to be due to a hyperdynamic right ventricle causing an exaggerated descent of the auriculo-ventricular septum. Following maximal systolic ejection there is a rebound of this septum into the cavity of the right auricle, and the height of the sharply rising wave so produced is then accentuated following pulmonary valve closure by overfilling of the right auricle from the left auricle through the septal defect. Immediately the tricuspid valve opens at the end of the second heart sound there is a sharp fall in pressure in the auricle as blood enters the ventricle, and a steep diastolic collapse wave is produced.

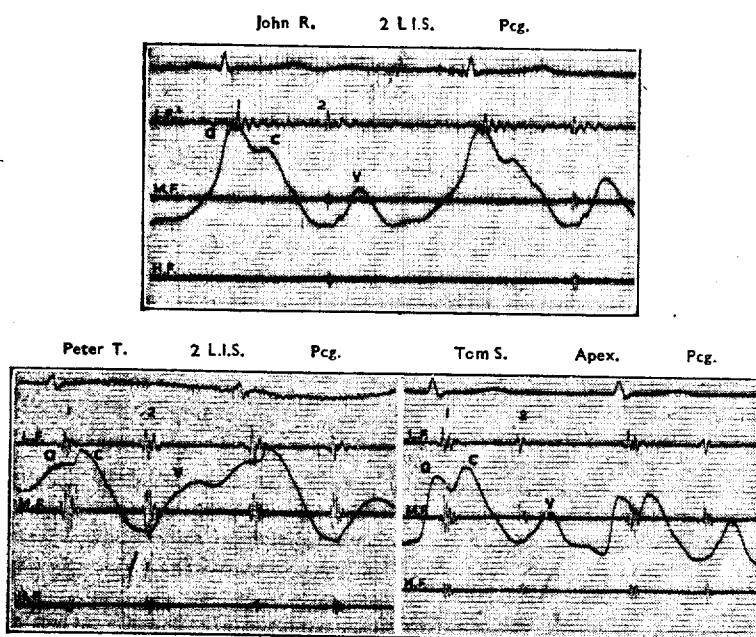


FIG. 1.—Jugular phlebogram in three normal children. 2 L.I.S. = Second left intercostal space. Pcg. = Phonocardiogram. L.F. = Low frequency. M.F. = Medium frequency. H.F. = High frequency. 1 = 1st heart sound, 2 = 2nd heart sound.

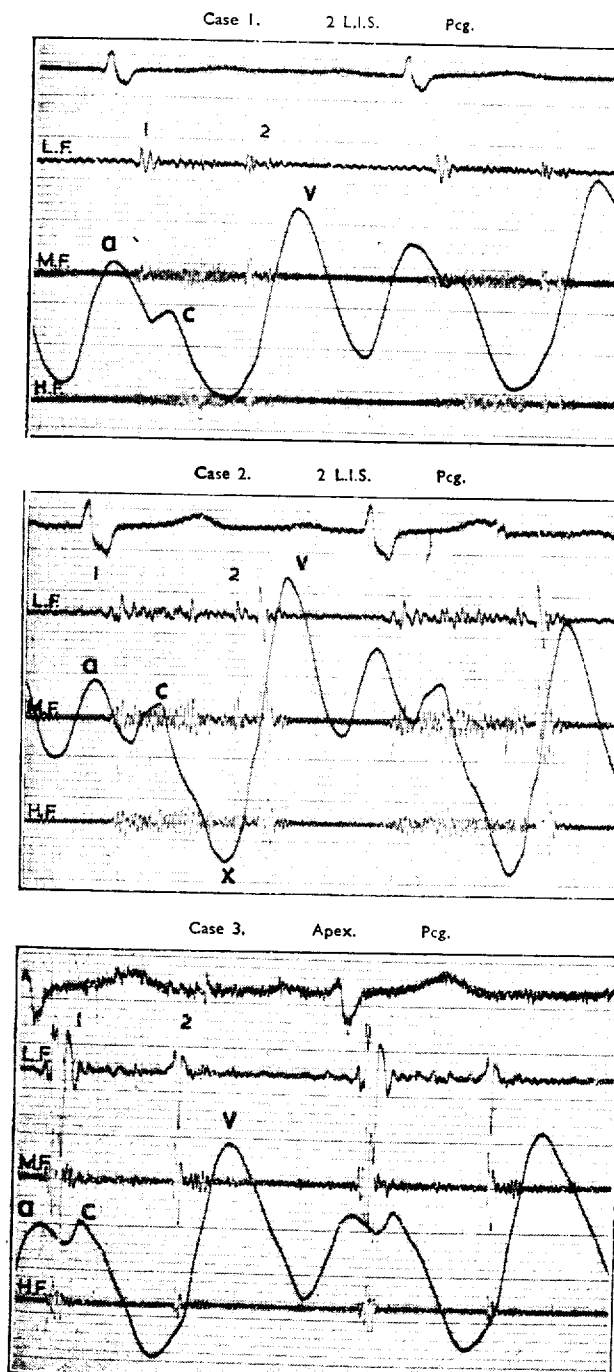


FIG. 2.—Jugular phlebogram in three patients with uncomplicated atrial septal defect. X = Systolic collapse.

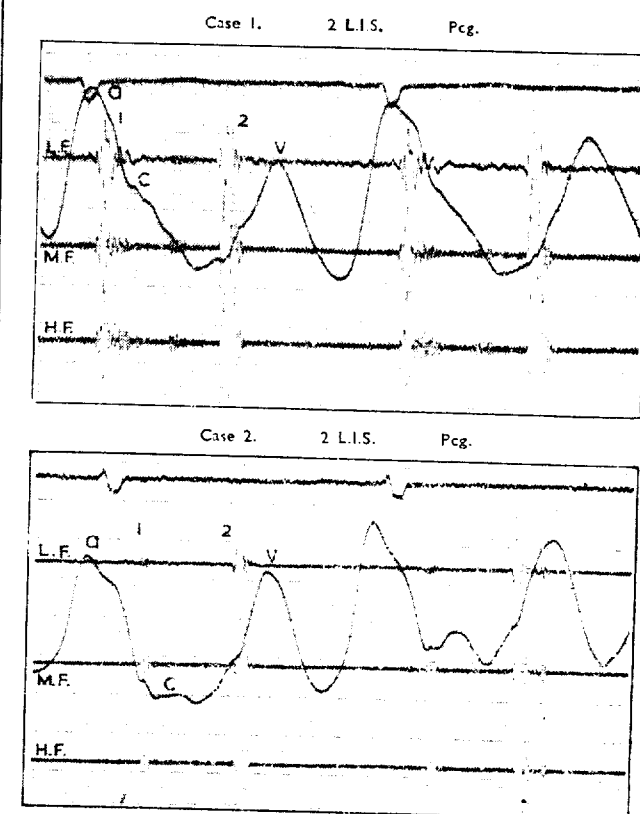


FIG. 3.—Jugular phlebogram in two patients with atrial septal defect and pulmonary hypertension, proved by cardiac catheterization.

The large *a* wave preceding the first heart sound in those cases complicated by pulmonary hypertension is probably caused in a similar way to that found in pulmonary stenosis (Laubry and Pezzi, 1913). As a result of peripheral pulmonary vascular resistance right ventricular hypertension occurs, and this then constitutes an obstruction to auricular systolic ejection, which in turn produces increased auricular systolic contraction and a large *a* wave in the venous pulse.

Summary

Inspection of the neck veins in children with atrial septal defect reveals a raised venous pressure and exaggeration of one of the waves of the venous pulse. Simultaneous auscultation identifies this large wave, by its time relationship to the second heart sound, as the *v* wave. When pulmonary hypertension is present in these patients the *a* wave also becomes larger than normal.

Recordings of the venous pulse in 25 patients with atrial septal defect compared with those of 16 normal children have confirmed these findings. They have also shown that there is exaggeration of normal systolic collapse in these patients, and this contributes to the prominence of the large *v* wave.

An attempt has been made to explain the haemodynamics of these changes in the venous pulse.

It is believed that the large *v* wave in atrial septal defect is a useful clinical sign, particularly in differentiating this condition from pulmonary stenosis.

I am indebted to Dr. Alexander Nadas for permission to include eight patients in this investigation who were seen at the Children's Hospital, Boston, Mass., and who have been mentioned in a previous communication (Reinhold and Nadas, 1954). I am also indebted to Dr. R. E. Bonham-Carter for his constant help and encouragement during this investigation and to Drs. J. F. Goodwin, C. H. M. Walker, M. G. Thorne, and J. P. M. Tizard for their constructive criticism of this paper. Mr. G. H. Bryant gave valuable assistance in helping to obtain the recordings.

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Writing in the *Scientific American* (February, 1955) on "A Study of the Anti-scientific Attitude," Bernard and Judith Mausner (respectively a social psychologist and a physician) ask: "Can scientists draw any lessons from the anti-fluoridation outbreaks?" These writers attribute the strength of the opposition to the fluoridation of water supplies to three main factors. "Firstly, the anti-fluoridation arguments are understandable, easy to follow. Their weaknesses are often difficult for a layman to grasp. Secondly, these arguments are grounded in some of the most widely held ideas and emotions of our culture. In their appeal to respect for individual rights, to fear of poison, to a watchful conservation of public funds, they ring a bell for most people. Thirdly, they are clearly related to the *Zeitgeist*, the current suspicion of scientists, the fear of conspiracy, the tendency to perceive the world as menacing. In contrast, the proponents of fluoridation have all too often ignored public psychology in presenting their case. They have relied too heavily on the fiat of organized science, and have tended to dismiss opponents as 'crackpots' and to deride their arguments. The greatest flaw has been the failure to prepare the public adequately. As a result there develops a polarization of attitudes which makes it very difficult to change opinion."

FRACTURES OF NECK OF FEMUR INCIDENCE AND IMPLICATIONS

BY

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This investigation is concerned in assessing current and future problems in the organization of treatment for fractures of the neck of the femur.

In June, 1952, a fracture and orthopaedic unit was opened in the Royal Infirmary, Dundee, to which all fractures in the city and environs are referred. This survey has been made in the belief that the 190 cases encountered in the two years completed are the total incidence and unselected. The technical details of treatment and results have not been considered except in so far as they bear on principles involved.

The series is thought to be unselected for the following reasons: (1) The region is small and the fracture and orthopaedic service complete. Fractures are no longer treated in the general surgical wards of the teaching or other hospitals. (2) All such cases are treated in a 66-bed unit in the teaching hospital, which is associated with a 280-bed country orthopaedic hospital carrying out most of the interval orthopaedic treatment for the region. (3) No recent fracture of the neck of the femur from Dundee or the environs was treated in the country hospital. (4) No case was refused admission for any reason whatsoever. (5) The small number of nursing-home cases has been included.

Classification

Study of the age incidence shows a clearly defined distribution, as is apparent in Table I. It seemed significant that two female patients under 50 had had violent falls at work,

TABLE I.—Pattern of Incidence (Female): City of Dundee Census Area

Age (Years)	Cases, 1952-3	Cases, 1953-4
Under 50	0	0
50-54	1	1
55-59	4	1
60-64	3	3
65-69	7	3
70-74	11	13
75-79	8	10
80-84	10	8
85-89	3	7
90-	1	3
Total	48	49

while none over 50 had. In the men, however, major accidents are equally scattered over the normal life-span. The average age of the male patients is lower, as shown in Table II. The average for the female patients of 75 years is higher than in previous series (Stebbing, 1927, 69 years; Watson-Jones, 1935, 60 years; Murray and Frew, 1949, 62 years). This bears out the unselected nature of the series and, presumably, the significance of the ageing trend of population distribution. The source of the classical fractures of the upper end of the femur is thus determined by age.

TABLE II.—Average Age (190 Cases)

Sex	Fracture Type	Average Age	Cases in 2 Years
Male	Cervical	66.8	14
	Trochanteric	65.5	36
Female	Cervical	75.8	67
	Trochanteric	75.4	73

The further classification of the cases as cervical or trochanteric fractures follows the accepted anatomical and prognostic points of differentiation.

Inferences from the Survey

For the reasons stated it has been found possible not only to analyse accurately the problems in management and disposal but also to relate the cases to the known population at risk. The figures thus obtained are thought to give the first accurate estimate of the incidence of these injuries. Of the 190 cases recorded, 130 arose in the districts included in the population census for the city of Dundee in 1951. The latter alone have been considered in calculating fracture rates per 100,000 population of like age and sex. It was impossible to relate the country cases to the rural population: some patients from outlying districts go to hospitals in other regions. This group of cases has been included only in analysing management and disposal.

Finally, the fracture rates have been applied to the projected population estimates for 1965 and 1975, with a view to determining the effect of the expected change in distribution by age of the population, and this is shown in Table III. The calculation has not been presented for male cases.

TABLE III.—Total Incidence (Female)

Age Group (Years)	1952-3		1965		1975	
	Population at Risk	Annual Cases	Projected Population	Expected Cases	Projected Population	Expected Cases
50-54	6,393	1	6,300	1	6,500	1
55-59	5,494	2	6,400	3	5,400	2
60-64	4,864	3	5,900	4	5,700	4
65-69	4,191	5	5,200	6	5,400	6
70-74	3,327	12	3,900	14	4,500	16
75-79	2,416	9	2,800	10	3,400	13
80-84	1,136	9	1,700	13	2,000	16
85-	513	7	900	12	1,000	14
Totals		48		63		72

It is difficult to distinguish the classical fractures of elderly men from those due to violent accident. It is for the same reason that the annual male incidence is variable as compared with the regular, annual, and inevitable group of female cases.

Incidence

The two yearly totals of female cases did not differ; and the distribution followed such an orderly pattern that the picture does not appear to have been distorted by any gross inaccuracy (Table I). The cases from the specified

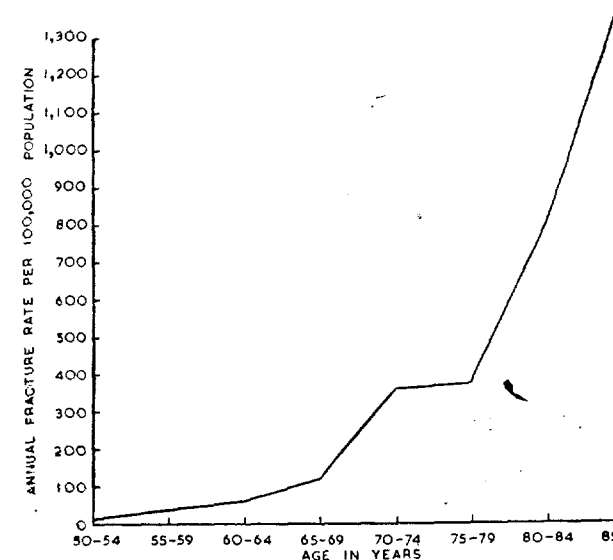


FIG. 1.—Risk of injury (females).

area, and not resulting from major trauma, have been related to the population at risk. Fracture rates per 100,000 of each age group have thus been calculated on the basis of the average annual admissions. It is clear, with the continuing trend towards a greater proportion of elderly people, that the incidence of these fractures must increase. This increase has been estimated on the Registrar-General's projected population tables. The estimate is probably conservative, as it appears that the risk of this injury increases greatly with age.

A graph showing this increasing risk is produced when the fracture rates are plotted against the age groups to which they apply (Fig. 1). Thus, not only will there be more elderly people at risk, but their average age, by being higher, will fall in an age group even more prone to these injuries. Since the incident of fracture is related to the senile state of the bone rather than to a particular mechanism, these cases must always occur. Accordingly the tendency to house ever more elderly people in institutions is in itself no safeguard. Indeed, four cases in this series came from such institutions. This is in agreement with the finding that the commonest single accident of those thus injured at home was a fall at the bedside.

The annual number of such fractures is important in planning an accident service. The cases in this series constituted 7% of the male and 20% of the female admissions.

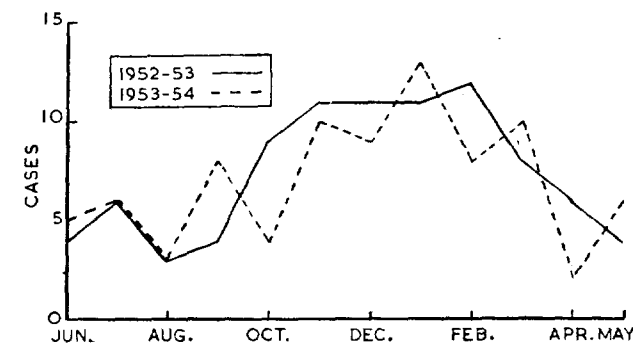


FIG. 2.—Seasonal incidence (females).

The fuller implication of this is to be found in analysis of the actual stay in hospital. Even when 78% of cases were treated operatively the average duration of stay was a few days more than that of all the other types of cases. The female cases actually occupied 22% of the bed-days for their ward in a year.

A seasonal increase in incidence was found to be a reality, as shown in Fig. 2. The explanation of this is not clear. In two consecutive wintry weeks in which came the highest number, no patient was injured in a fall out of doors. Most probably the physical integrity of elderly people is so delicately balanced that the slightest indisposition can upset it. On the other hand, the gale of 1953 which caused so many national disasters blew over three old people in the street, thus increasing the incidence for that month by 50% in a single blast.

Implications

Certain general observations on management seemed relevant to the organization of treatment.

1. Two methods of operative treatment were used. The standard operation was the insertion of a stainless-steel Smith-Petersen nail of the King type or of a similar nail bolted to a McLaughlin plate. Standardization of procedures in this way obviates the necessity for a multiplicity of internal fixation appliances and instruments related thereto. It also familiarizes the surgical and nursing team with the method. This surgical technique had an interesting sequel in one case. The patient first had a cervical fracture nailed. One year later, while freely ambulant, she sustained a

trochanteric stress fracture. This was successfully treated by bolting a plate to the nail already in position. Only two cases were treated by other surgical means.

2. No matter how skilful or experienced the surgeon, the insertion of a nail-plate and screws requires so many separate actions that the minimum time taken is considerable. The insertion of a Smith-Petersen nail alone is delayed only by difficulties in reduction or radiography. The introduction of such advances as xeroradiography will be a matter of importance in reducing the time taken. The hours spent on fractures of the femoral neck give some index to the number of surgeons, anaesthetists, and other staff required to meet the inevitable increase in cases.

3. The patients in this series were treated by a group of surgeons with similar views favouring early operative intervention. Thereafter, immediate mobilization was encouraged by the nursing and physiotherapist staff; no weight-bearing was allowed for approximately three months, at which time walking was recommenced with crutches. Operation was performed on 78% of the patients; only one died within twenty-four hours of operation and none during it. Forty-four patients were treated otherwise. Incidental medical conditions were the contraindication on 26 occasions. The length of time since injury was a reason 15 times. Other reasons were: undisplaced trochanteric fractures, 5; grossly comminuted and technically subtrochanteric fractures, 5; refused operation, 2; suitable internal fixation material not available, 2; trochanteric fracture, opposite leg short, 1.

4. The assessment of the patient's general condition was frequently time-consuming. The 190 patients presented a total of 151 significant pathological states. No less than 58% were discovered to have one or more incidental medical conditions of such severity as to influence decisions on treatment and prognosis. In the making of these decisions much help was given by the anaesthetists and physicians, who, as the series progressed, found noticeably fewer absolute contraindications to what were often regarded as life-saving operations. It is difficult to decide at which stage a patient with chronic exudative bronchitis will fare worse from surgery than from the restrictions associated with anything short of superlative non-operative measures. Deaths from chest complications in patients known to be bronchitic were, as expected, less common after nailing than during traction. In this connexion, too, difficulty was encountered in deciding the primary cause of death in fatalities. The cause given was found to vary more with the individual house officer than with any other consistent factor. Frequently it was not easier for the senior staff to decide.

5. The patient's general condition often appeared to improve for at least the first twelve hours after admission. After that, the opportunity for surgery, if not soon taken, seemed lost. This physical reaction, whether due to stress and its subsequent exhaustion or not, was paralleled in the mental reactions.

6. It rarely seemed necessary to intervene within hours of the accident; and such routine early operating could lead too readily to a reputation for ruthlessness which might not be entirely unfounded.

7. There were on average three of these operations a fortnight, each occupying one to one and a half hours' theatre time. A considerable load could thus be placed on the night staff if emergency reduction and internal fixation were routine. This was, however, sometimes done. One session included four cases. Accordingly, 76% were carried out within 24 hours and 93% within 48 hours of admission; 70% of the patients had been admitted within 24 hours of fracture.

8. The later ward management demands attentions other than the all-important one of devoted nursing. The proportion of elderly patients, when high, has a deleterious effect on ward morale. This is due largely to the nocturnal disturbances of those disorientated by senile cerebral

ischaemia. In the series no fewer than 9% had cerebral arteriosclerosis to the point of having had a catastrophe resulting in paresis; a greater number were disorientated. This aspect of ward management has already had deserved publicity with regard to the nursing of adolescents (Stuart-Clark, 1953). The sounds associated with the inevitable deaths and the utterances of the senile arteriosclerotic demented are not for young ears. It appears, therefore, that some form of segregation is necessary. In view of the expected large total increased incidence it seems probable that the answer will be found in total segregation of the female cases in special accommodation.

9. The high percentage returned to normal is discussed under the heading of disposal of the patients. This factor alone would supply an incentive to those nursing cases of fracture of the neck of the femur which is not enjoyed in geriatric wards. Further, this branch of nursing is a specialized matter which segregation would facilitate.

Disposal

In recent years much has been said of the difficulties in discharging elderly patients from hospital. Here, considerable help was forthcoming from patients' relatives, friends, and general practitioners, as shown by the disposal of 114 patients (Table IV). Of those who went home, 16 had previously lived alone. They spent an average of 46 days in hospital, a time not greatly beyond the general average.

TABLE IV.—Disposal of 114 Patients

Discharged to own home or to relatives or friends	80.7%
Discharged to the geriatric unit	12.3%
Previously lived alone	7
Previously lived with someone	5
Previously lived in institution for elderly	1
Originally admitted from geriatric unit	1
Discharged to nursing-home, cottage or other hospital	7.0%

In this series, in which mortality was high and morbidity low, the main problem was not one of the institutional disposal of an invalid, but of the delay in gaining access to the care of a relative for rehabilitation, whether the patient lived alone or not (Ferguson and MacPhail, 1954). It was noted, however, that some aged patients progressed less well after return home, for no other apparent reason than that discharge from hospital removed the only remaining incentive to the will to live.

Results

It is appreciated that results of treatment cannot be assessed at this stage. The comment, however, seems justified that, on a short-term basis, morbidity was low.

The mortality figures at the end of the two-year period are shown in Table V. The high mortality rate for trochanteric fractures in women needs explanation. In the first instance

TABLE V.—Mortality (190 Cases). Overall Mortality = 31.6%

Sex	Fracture Type	Operative Treatment		Conservative Treatment	
		No.	Deaths	No.	Deaths
Male	Cervical	12	5	2	1
..	Trochanteric	21	7	15	3
Female	Cervical	61	16	6	3
..	Trochanteric	52	20	21	5

a high overall mortality reflects the veracity of the unselected nature of the series. The 52 operation cases presented with a total of 41 serious incidental medical conditions, whereas the 21 treated without operation presented with only six serious incidentals. The explanation for this is that the majority of the cases treated conservatively happened to be so treated for reasons not likely to affect the prognosis adversely—namely, undue time from fracture till admission, gross comminution, lack of suitable internal fixation

apparatus, or patients' refusal to avail themselves of surgery. Finally, no death occurred in this group other than among those treated conservatively because of some serious incidental condition.

Summary

The total incidence of fractures of the femoral neck during two years is analysed.

The inevitable increase in incidence, which is applicable generally, is calculated.

Additional staff and accommodation will probably be required for this contingency.

The suggested segregation of female patients is discussed.

Problems in treatment and disposal are outlined.

I am indebted to Mr. I. S. Smillie, surgeon in charge, Eastern Region (Scotland) Orthopaedic Service, for much encouragement and constructive criticism; also to the surgical and secretarial staff for all their help.

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SULPHAEMOGLOBINAEMIA

A REPORT OF FIVE CASES

BY

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Cyanosis in warm skin, in the absence of obvious disease of the cardiovascular and respiratory systems and of polycythaemia, calls for spectroscopic examination of the blood, and in a proportion of such instances either methaemoglobin or sulphaemoglobin, or both, may be identified.

Methaemoglobin consists of oxidized haem linked to native globin, and is present in traces in normal erythrocytes, in which an enzyme system constantly reduces any methaemoglobin. This enzyme system is probably defective in congenital methaemoglobinaemia. Sulphaemoglobin, in contrast, is invariably a pathological product. Its exact chemical constitution is unknown, but it is thought that a sulphur atom has been incorporated in the pyrrole components of the haem molecule and that the mode of linkage of the haem to the globin moiety is altered. There is no intracellular mechanism for the reconversion of sulphaemoglobin to haemoglobin, nor can reconversion be effected by any known drugs. Sulphaemoglobin remains in the erythrocyte, an irreversible product of haemoglobin metabolism and a harmless though inert pigment, until the cell is destroyed, and there is no evidence that the formation or retention of sulphaemoglobin shortens the average life span of the cell. The only ill effect that can be attributed to it is anoxia, due to the immobilization of oxygen-carrying haemoglobin in the form of an inert pigment.

Both pigments are identified by the presence of an absorption band in the red part of the light spectrum—

the methaemoglobin band at 625–655 millimicrons, and the sulphaemoglobin band at 615–630 millimicrons. The absorption band of methaemoglobin is dispelled when a few drops of 5% potassium cyanide are added to the laked blood. This procedure leaves the absorption band of sulphaemoglobin unchanged, but it disappears on adding hydrogen peroxide alone.

In the human subject sulphaemoglobinaemia may follow the ingestion of compounds belonging to two groups: (1) nitrogen-containing compounds such as potassium nitrate, sodium nitrite, or nitroglycerin; and (2) aromatic amino-compounds, such as the sulphonamides or the aniline derivatives acetanilide and phenacetin.

Many cases of sulphaemoglobinaemia due to drugs have been reported in recent years, and the following five patients present few new features, but several aspects of their histories merit discussion.

Case 1

A spinster aged 70 came into hospital on October 26, 1951, complaining of feverishness and of pain in the right iliac fossa and in the back for two weeks. She was accustomed to taking saline aperients regularly, and her bowels were more constipated than usually. She had taken only a few aspirin tablets for the pain.

She was febrile, pale, ill, and not cyanosed. The fingers were clubbed. A blood count showed: Hb, 11.9 g. % (Sahli); red cells, 3,860,000 per c.mm.; P.C.V., 40%; M.C.V., 104 cubic microns; M.C.H.C., 29.75%; white cells, 9,200 per c.mm.; E.S.R., 73 mm. in one hour (Westergren). The urine showed a trace of albumin, no excess of urobilin, and no other abnormality. Clinical and radiological examination suggested a resolving pneumonia, and acute osteomyelitis of vertebrae D 12 and L 1 was diagnosed later. Both conditions resolved with antibiotics.

Aspirin was prescribed for her pain. On October 31 she was cyanosed, and spectroscopic examination of the blood showed a well-marked band in the red due to sulphaemoglobin. On December 17 sulphaemoglobin was still present in a 1 in 20 dilution of blood, examined in a 1 in. (2.5 cm.) thickness. On January 7, 1952, during chloramphenicol therapy, the patient developed loose stools from which type-specific *Bact. coli* (beta type) was grown. The diarrhoea stopped on January 16, and five days later no sulphaemoglobin was detected in a 1 in 5 dilution of blood. The patient went home on March 5.

She was readmitted in October, 1952, with gastric carcinoma. There was no cyanosis, and no sulphaemoglobin was detected.

Case 2

A widow aged 66 had suffered from a duodenal ulcer for 16 years, and was admitted on October 12, 1953, following a haematemesis. She had been subject to headaches most of her life, and had taken an occasional "askit" powder to relieve them. For a year her headache had been very severe and persistent, and her weekly consumption of powders had been two to three dozen. At night she took two compound codeine tablets. For 16 years she had regularly taken a powder thrice daily after meals, which was prescribed by her doctor to prevent her ulcer pain and to keep her bowels regular. For six to seven months she had had paraesthesiae of the hands and feet.

On admission she was slightly cyanosed. The haemoglobin was 4.2 g. % and R.B.C. 2,070,000 per c.mm. The urine showed green to Benedict's solution; no albumin or excessive urobilin. Next day sulphaemoglobin was detected in a 1 in 75 dilution of blood. Its concentration slowly declined, and on December 3 it was detectable only in 1 in 20.

A barium-meal examination on November 17 showed an ulcer deformity of the duodenal cap but no crater. The patient improved slowly, but the blood urea was constantly raised. Pyuria occurred in late October, and it was thought that renal function was impaired by chronic pyelonephritis. The patient returned home on December 29.

She was readmitted on June 9, 1954, following a further haematemesis. Her headaches had persisted but she had taken only aspirin for them, as instructed. She was not cyanosed, and no sulphaemoglobin was detected.

Case 3

A married woman aged 49 was admitted on March 18, 1954, for restabilization of diabetes mellitus, which she had had for four years. She had occasional headaches, and for six months had had paraesthesiae of the feet and legs. For about three months she had had pruritus vulvae with ulceration. For many months she had taken two or three askit powders a day, not to relieve pain but for their "tonic effect."

She was pale and not cyanosed. The haemoglobin was 9 g.%, R.B.C. 4,100,000 per c.mm., and W.B.C. 19,200 per c.mm. The blood was examined spectroscopically on account of the history of regular consumption of powders, and sulphaemoglobin was present. It was still detectable on April 6 in blood diluted 1 in 7.

Case 4

This patient, a woman aged 58, separated from her husband in 1936, had no children, and lived alone. She had a history of psoriasis in childhood, and of three "nervous breakdowns." She had recurrent varicose ulceration, and dressed the ulcers herself, but had neglected them recently. She had taken askit powders regularly for two years, usually three or four a day, but at times nine or ten. She had been accustomed to taking one for occasional headaches all her life, but in the past two years she took them not so much to relieve pain as to "buck her up" if she felt depressed. For several years her face had been puffy.

She was admitted on March 12, 1954, because of post-"influenzal" asthenia and constipation. She was cyanosed, dyspnoeic, and extremely weak, and had a puffy "moon face." The signs of congestive cardiac failure were present, and gravitational ulcers almost encircled the lower thirds of the legs. The pulse rate was 100; B.P. 120/50 mm. Hg. Crepitations were heard at the lung bases; knee- and ankle-jerks were absent. The anal sphincter was lax, and the rectum filled with scybala and a foul watery fluid. A blood count showed Hb. 6.3 g.%; red cells, 2,060,000 per c.mm.; P.C.V., 24%; M.C.V., 116 cubic microns; M.C.H.C., 26%; white cells, 11,700 per c.mm. The serum showed no sign of haemolysis. The red cells were normal in size and shape, and were slightly deficient in haemoglobin.

The sulphaemoglobin absorption band was seen in a 1 in 80 dilution of blood. The marrow was normoblastic and active. The W.R. was negative. The urine showed albumin, R.B.C., and red-cell casts; no excessive urobilin.

Penicillin injections were given and the ulcers dressed with eusol. On March 14 a bottle of packed red cells was given. Vitamin therapy was begun and an olive-oil enema and nightly liquid paraffin were ordered. The facial oedema steadily diminished. She refused further blood transfusion and resisted all attempts at venepuncture; at times she refused other therapeutic measures such as enemata, and was morose and difficult throughout her stay in hospital. On March 25 sulphaemoglobin was detected in 1 in 50; most of the decrease was attributable to dilution by the transfused blood. It was detected in 1 in 40 on April 6, 1 in 10 on April 29, and not at all on May 19.

The anaemia improved rapidly with oral iron therapy, and the ulcers healed. On April 22 the patient was allowed up. She had no spontaneous bowel movements during her rest in bed, and frequent enemata were given. The patient went home on June 5.

Case 5

A coal-miner aged 42 was referred by his doctor because of cyanosis. He had had rheumatoid arthritis for six years, but had been working regularly for the past five years despite some pain. Every fortnight for five years his doctor had prescribed 100 powders for him, containing aspirin, phenacetin, and codeine. He admitted that he took them "more as a habit than anything." For two weeks he had been taking three askit powders a day, unknown to his doctor.

He had cyanosis, with no dyspnoea even when he ran, and no cardiac or gross respiratory disease. Rheumatoid changes involved both hands, both feet, and the right elbow. Chest x-ray examination showed no abnormality, and the E.S.R. was 55 mm. in one hour (Westergren). The blood contained sulphaemoglobin.

He was sent home and instructed to avoid all tablets unless prescribed by his doctor, who was asked to avoid prescribing phenacetin.

Discussion

Acetanilide and phenacetin have often been followed by sulphaemoglobinaemia (Morgan and Anderson, 1940; Lazarus, 1945; Brandenburg and Smith, 1951), and constipation has appeared to facilitate the formation of the pigment in many cases. Finch (1948) postulated that an oxidizing drug and either constipation or a sulphur-containing medication were necessary for the production of sulphaemoglobinaemia. In the present series four patients had taken phenacetin, and two of these were constipated, and the fifth patient had been taking magnesium sulphate for constipation. *In vitro*, sulphaemoglobin is easily produced by the addition to laked blood of hydrogen sulphide and *para*-aminophenol, a possible breakdown product of phenacetin in the body (Campbell and Morgan, 1939). *In vivo*, *para*-aminophenol or a related compound may act upon red cells along with hydrogen sulphide absorbed from the bowel. Such absorption would be increased by intestinal stasis, and one might suggest that the sulphide content of the bowel is increased by sulphate medicaments, since *Bact. coli* is known to reduce sulphate to sulphide.

Brandenburg and Smith (1951) noted that a large percentage of their 62 patients with sulphaemoglobinaemia were neurotic. In the present small series neurotic tendencies were observed in all four patients who took analgesics.

The analgesic of choice with the four patients was the askit powder, which, incidentally, is manufactured locally. Its appeal is twofold: 0.55 g. (8.25 gr.) of aspirin and 0.4 g. (6 gr.) of phenacetin endow it with potent analgesic properties, and 0.11 g. (1.7 gr.) of caffeine citrate provides significant cerebral stimulation, even without the other 0.1-0.2 g. of caffeine in a cup of tea. (The corresponding quantities in the *B.P.C.* tablet are 4½ gr. (0.29 g.) of aspirin, 3½ gr. (0.23 g.) of phenacetin, and ½ gr. (32 mg.) of caffeine.) The attraction of askit to the neurotic patient is undoubtedly the stimulant effect, mild though it is. Of the 62 cases of sulphaemoglobinaemia described by Brandenburg and Smith (1951), at least 44 were due to analgesic preparations containing caffeine, and Morgan and Anderson (1940) recorded a case of habituation to a tablet containing acetanilide, phenazone, and caffeine. They also pointed out that true addiction implies physical dependence on a drug, and this has not been demonstrated in the case of antipyretics or caffeine; nor did any of the present patients develop any symptoms which could be attributed to withdrawal. Their dependence had been purely psychic, and habituation is the more correct term than addiction. However, the same type of personality is liable to become a true addict, and this danger must be recognized before one prescribes alternative treatment.

Anaemia is not a usual accompaniment of sulphaemoglobinaemia, but four of the present patients were anaemic. The cause of the hypochromic anaemia in Cases 1 and 3 was not clearly established; Case 2 had a bleeding duodenal ulcer, and Case 4 a chronic superficial infection and haemo-

dilution due to water retention caused by salicylates. In none of the cases was there any evidence of haemolysis.

Treatment followed the usual lines: the offending drug was withheld and aspirin alone was given to relieve any slight pain; constipation was relieved by enemata and liquid paraffin; severe purgatives were avoided lest hyperaemia of the intestinal mucosa facilitate absorption of hydrogen sulphide and perpetuate the sulphaemoglobinaemia. Blood transfusion was required for Case 4 because of anoxia, and appeared almost life-saving. No specific treatment is of any avail. Treatment of the concomitant diseases was not altered by the presence of sulphaemoglobin, and no sequelae attributable to sulphaemoglobin were noticed.

Summary

Five cases of sulphaemoglobinaemia are described. One case followed the administration of magnesium sulphate as an aperient and the other four cases were due to analgesic preparations containing phenacetin. The presence of caffeine in such preparations is thought to induce habituation, particularly in neurotic personalities. Anaemia was present in four of the cases, but was not attributable to sulphaemoglobinaemia. The principles of treatment are enumerated.

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RISE OF SEDIMENTATION RATE AT LOW LABORATORY TEMPERATURE ITS VALUE AS A LIVER-FUNCTION TEST

BY

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Most authors believe that a high laboratory temperature increases and a low one decreases the erythrocytic sedimentation rate (E.S.R.). Temperature, however, has been shown to exert an inconstant effect on the E.S.R., and in many cases a higher fall is recorded at a lower temperature when the test is performed simultaneously in hot and cold atmospheres (Weingarten, 1946; Buttaro and Tosti, 1946). It was also observed by Weingarten that a greater fall at lower temperature occurred in those cases which had some hepatic damage. Gupta (1954) proved that the higher fall at a lower temperature is due to a qualitative change in the euglobulin fraction of the plasma proteins. Since most of the flocculation reactions that test the liver function depend on the euglobulin fraction of the plasma proteins (Dyke, 1947), it was thought worth while to investigate if such a simple observation could be used to determine the liver damage.

Material and Method

Cases having definite liver damage were selected for investigation. These included cases of cirrhosis and cancer of the liver, infective and amoebic hepatitis, and chronic malaria and kala-azar. Most of the malaria patients had an enlarged liver, and all had an enlarged spleen and fever for more than three months.

Blood was collected in the morning, the patient having been kept fasting overnight. The E.S.R. was carried out by the Westergren method at temperatures of 99 and 44° F. (37.2 and 6.7° C.) in an incubator and a refrigerator respectively. The readings were taken every ten minutes for a

period of one hour. If the E.S.R. was found more than 10% higher at 44° F. (6.7° C.) it was adjusted to be a higher fall in the cold—that is, a positive reaction for liver damage—while a greater fall at 99° F. (37.2° C.) was regarded as a negative reaction; and if the difference between the two readings was less than 10% the reaction was regarded as indeterminate.

After having observed a fairly large number of cases a comparative study was made with a number of well-established liver-function tests as controls. The control reactions were the Takata-Ara, thymol turbidity, hippuric acid synthesis, blood proteins, and the Weltmann. The tests were performed in 17 cases of cirrhosis, 10 cases each of infective and amoebic hepatitis, 12 cases of chronic malaria, and 4 cases of cancer of the liver.

The Takata-Ara, thymol turbidity, and intravenous hippuric acid tests were performed according to the technique described by Dyke (1947), and the Weltmann test as described by Tyagi (1947). Proteins were estimated in the beginning of our series by the biuret reaction (Harrison, 1947), but later on the "lumetron" photoelectric colorimeter was substituted.

Observation and Results

The results of the cases studied by the fractional estimation of the E.S.R. in the hot and cold chambers are given in Table I and those of the comparative study in Table II.

TABLE I.—Results of E.S.R. in Hot and Cold Temperatures

	No. of Cases	Positive	Negative
Cirrhosis	71	51 (72%)	20
Infective hepatitis	12	0	12
Cancer of liver	10	7 (70%)	3
Amoebic hepatitis	14	9 (64%)	5
Kala-azar	2	2 (100%)	0
Chronic malaria	19	15 (79%)	4

TABLE II.—Percentage of Positives with Various Tests

	No. of Cases	Thymol Turbidity	Takata-Ara	Weltmann Reaction	Hippuric Acid	Blood Protein	E.S.R. Hot and Cold
Cirrhosis	17	76%	82%	76%	88%	71%	76%
Infective hepatitis	10	90%	70%	50%	0%	50%	0%
Cancer liver	4	25%	100%	100%	50%	75%	75%
Amoebic hepatitis	10	50%	50%	50%	50%	25%	60%
Chronic malaria	12	66%	75%	83%	58%	75%	58%

It will be seen that 51 out of 71 (72%) cases of cirrhosis of the liver gave a positive result. Cases which showed a negative reaction were usually of long standing, some of five years' duration; and it could be concluded that in many of them the activity of the disease had come to an end. In 10 out of 20 cases which showed a negative reaction, the E.S.R. at the end of one hour was less than 20 mm., while the remainder showed a tendency towards a declining E.S.R., indicating that the activity of the lesion was waning. The positive results with other tests varied between 70 and 84%. It is of interest to quote the observations of Ernst and Dotti (1948), who while doing the thymol turbidity test on 33 cirrhotics found positive results in 22 (67%). They concluded that the compensated cirrhotics in whom there is considerable fibrosis with abdominal ascites, but in whom the remaining liver parenchyma is functioning adequately for bodily needs, do not show a rise of thymol turbidity. When, however, the remaining cells are damaged by an infection, or by a toxin, or by anoxia, then the thymol reaction becomes positive. The only three cases of alcoholic cirrhosis met with in our series gave completely negative results. It is interesting to note that Kunkel (1948) also got similar findings with the thymol turbidity and the cephalin-cholesterol flocculation tests, and in a large percentage of cases a negative reaction was consistently obtained with the two tests.

In amoebic hepatitis and abscess a high percentage of positives was obtained. Out of five cases which showed a negative

reaction four had a well-formed abscess, and the E.S.R. in the fifth was only 10 mm. It may be possible that as abscess formation took place the localization of the disease allowed other liver cells to recover and to function normally. Other tests gave positive results in about 50% of the cases. In the hands of Gminder (1939) the Takata-Ara test gave 71.4% positive, while the serum colloidal test gave completely negative results (MacLagan, 1944). In four cases of amoebic hepatitis Wahi (1946) found 100% positive results with the hippuric acid excretion test.

A negative reaction in the presence of definite carcinoma of the liver remains unexplained. In the present series 2 cases out of 10 showed a negative reaction, and in a third it was indeterminate. Ernst and Dotti (1948) also observed that in several cases of carcinoma of the stomach with extensive metastasis in the liver the thymol turbidity was not raised. He also found that primary carcinoma of the liver very often gave negative results. The thymol turbidity and colloidal gold tests gave positive results in 40% (Ernst and Dotti, 1948) and 12.5% (Cates, 1941) cases respectively.

The cases of infective hepatitis showed a general slowing of the E.S.R. This is in accord with the reports of Miles (1945) and Boveri *et al.* (1947). The one-hour reading never exceeded 20 mm. in any of them. Sedimentation in the cold chamber was, however, still lower in all; so that all the patients gave a negative reaction. The general slowing of the E.S.R. was assumed to be due to the presence of bile salts. Damodaran (1948) found that in infective hepatitis concentration of the bile salts in the blood may reach 1 in 500. According to our investigations with the same concentration of bile salts *in vitro*, the E.S.R. came to a standstill. The presence of bile salts therefore considerably handicapped the evaluation of the effect of temperature on the E.S.R. Positive results from 66% (Watson *et al.*, 1945) to 99% (Wahi, 1946) have been reported with the thymol turbidity test. Serum colloidal gives 93% positives (MacLagan, 1944), while the Takata-Ara test gives 84% positives (Wahi, 1946).

From time to time workers have reported dysfunction of liver in malaria. As reported by Carter and MacLagan (1946), the thymol turbidity test gave positive results in 80% of the cases and serum colloidal gold in 94% of them. The E.S.R. was positive in 79% of the cases of malaria and in 100% of the cases of kala-azar.

Discussion

It is seen that the percentage of positives with individual tests differs in different diseases. Tests like hippuric acid synthesis, and plasma proteins, depend on the actively functioning liver tissue, and would be positive only if a sufficient amount of the liver tissue was destroyed. Other tests which appear to depend on the quantitative and qualitative variations of globulin fraction would give a negative reaction so long as the abnormal fraction is absent or present in only small amounts.

The common flocculation tests depend on the euglobulin fraction of the plasma proteins (Dyke, 1947). A closer link between the Takata-Ara test and the higher fall of E.S.R. in the cold chamber becomes evident from the observations of Baur (1948). He observed that in many cases of parenchymal disease of the liver verified at necropsy the Takata-Ara reaction was occasionally negative when done at room temperature, but became positive when done in a refrigerator. Furthermore, in cases of hepatic damage the cold Takata-Ara reaction becomes positive sooner and remains so longer than if the test is done at room temperature.

The flocculation in the Takata-Ara test is originated by mercuric chloride and sodium carbonate, and this flocculation is enhanced when exposed to refrigerator temperature, an observation very much akin to the present one, in which rouleaux formation is influenced favourably by low temperature.

It could be said that a higher fall of the E.S.R. at low laboratory temperature will in the large majority of cases indicate liver damage. The uniformly negative results in

infective hepatitis, however, cannot be adequately explained, and this is a drawback of the procedure. The general slowing of the E.S.R. in these cases was proved to depend on bile salts, yet all the cases showed a higher fall in the hot atmosphere—that is, a negative reaction.

The basis of the test is the euglobulin fraction of the plasma proteins (Gupta, 1955). The decrease of albumin and fibrinogen and the rise of euglobulin appear to be characteristic of failing liver function. It would be supposed that the diseased liver cells would not be capable of producing a special protein fraction in more than the normal quantities, and it is justifiable to assume that the euglobulin arises from extrahepatic sources, possibly the reticulo-endothelial system.

Summary

The general consensus of opinion is that the sedimentation rate of red cells increases with the increase of laboratory temperature, and vice versa. In a particular group of cases the E.S.R. is higher in a cold than in a warm temperature and (1) the accelerated E.S.R. in the cold is indicative of parenchymal liver damage; (2) the results are comparable with those obtained with other flocculation tests in general use except that the cases of infective hepatitis gave uniformly negative results; and (3) the reaction is an elaboration of a test already in universal clinical use and can be easily performed without any additional equipment: it also does not require any experience with more complicated methods, which remain the preserve of the clinical pathologist.

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The Institute of Psychiatry of the University of London, located at Maudsley Hospital, is the only university school in Britain devoted wholly to postgraduate education in psychiatry. The report from mid-1953 to mid-1954 states that the number of postgraduate students, including registrars, who received training during the year was 230, not including case workers who have spent varying periods in one or other of the departments. Students from abroad came from 25 countries. Rather more than two years ago the Guy's-Maudsley neurosurgical research unit was opened, and this has extended the clinical facilities of the Institute for teaching and research, and a number of collaborative investigations are in progress. The wider experience of temporal lobectomy for the relief of epilepsy has provided much more material than has been available hitherto, and studies to elucidate the relationship between the site of epileptic foci, the site and nature of associated lesions, the seizures, and the psychological changes have been started. In the teaching carried on at the Institute, although systematic instruction has to be given, particularly to those preparing for the D.P.M., the emphasis is on free discussion, related to reading and clinical experience.

LOW BACK PAIN TREATED BY MANIPULATION

A CONTROLLED SERIES

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The patient suffering from low back pain provides one of the commonest problems encountered by the general practitioner. Working hours lost through this form of disability must add up to a vast total. The possible causes of backache are legion, and accurate diagnosis may be difficult. In 1951 the Mayo Clinic reported a series of 2,000 cases in which the cause of chronic back pain was investigated, and in 20% no definite diagnosis was reached.

Patients complaining of acute low back pain, however, form a definite clinical group. The onset is often related to strain or trauma. The lesion in such cases must be in the region of the intervertebral joints and adjacent structures. Various controversial opinions are held concerning the exact nature of these lesions and are expressed in such terminology as fibrositis, muscle strain, sacro-iliac strain, slipped disk, etc.

Manipulation as a method of treatment for such cases has been recommended by a few clinicians but condemned by the majority, although it is regularly practised, with apparent satisfaction to the patients, by the medically unqualified manipulator. To the best of our knowledge, no attempt has been made to compile a controlled series to settle the dispute. In this preliminary report we have not entered the controversy on diagnosis; we have simply sought to establish whether or not manipulation has a place in the treatment of recent low backache. Certain established concepts of the causation of low back pain are, however, worthy of mention, as their consideration has led to the form of this investigation.

The normal spine, with its series of interlocking bony units and intervertebral disks, is a resilient structure. The adoption of the upright posture and resultant curvatures provide areas where stress and strain are maximal. Boyle (1954) showed that spondylosis in the dorsal and lumbar spine most commonly affected the joints between the seventh and eighth dorsal and the third and fifth lumbar intervertebral bodies. Degenerative disk changes are common in these areas and begin early in life, leading to fibrosis, desiccation, fissuring, and possible protrusion of the cartilaginous or pulpy portions of the disk. Cyriax (1945) has postulated that minor protrusions bulging the posterior longitudinal ligament, not severe enough to cause nerve-root pressure and sciatica, can cause pain; and that this latter is due to pressure on the adjacent dura mater. Though derangement of the intervertebral joints is undoubtedly responsible for much acute lumbar pain, it is obvious that the pendulum has swung too far and diagnosis of a "disk lesion" is apt to be made too readily. Tears of adjacent muscles and ligaments may occur, or avulsion fractures of transverse and spinous processes. Spondylolisthesis, the presence of transitional vertebrae, and other minor

congenital abnormalities may predispose to stress and strain injuries of the lower lumbar spine by altering local mechanics. Willis (1929) found the fifth lumbar vertebra partially sacralized in 4.7% and completely sacralized in 1.5% of 1,500 skeletons. Partial lumbarization of the first sacral vertebra in 1.2% and complete lumbarization in 4.1% of the same series were discovered.

Crisp (1952) stressed the possibility of injury to apophyseal joints and nipping of synovial fringes as a cause of acute lumbar pain which is amenable to dramatic relief by manipulation.

Whenever manipulation is considered one must always be aware of the rarer and more serious causes of low back pain. These must be excluded by careful clinical and radiological examination. Such causes include osteomyelitis, tuberculous caries, ankylosing spondylitis: fractures, vertebral collapse, and other sequelae of trauma, osteoporosis, or neoplasm: Paget's disease, intraspinal lesions, and pain referred from pelvic structures. These conditions are, of course, absolute contraindications to treatment by manipulation.

Method

It was decided to divide into two groups, without selection, all patients presenting with recent low back pain. One group was treated by manipulation of the lumbar spine, without anaesthesia, according to the methods described by Cyriax (1950). The other group was treated by bed rest, the use of a lumbar pillow, and analgesics. All patients were advised on the posture to be maintained while standing and sitting, and told to avoid spinal flexion and especially bending and lifting. It was of course essential that there should be no contraindication to manipulation in any of these cases, as determined by full clinical and radiological investigation. Any patient complaining of pain radiating below the buttock, or with neurological signs such as diminished reflexes in the lower limbs, muscle weakness, or paraesthesiae, was rejected for the purpose of the present investigation. A detailed history, based on a carefully considered plan, was taken in every case and a full clinical examination made by one of us. The lumbar spine and pelvis were x-rayed in all cases. The information was transferred to a series of punch cards, facilitating the future assessment of each case. Each patient was seen at weekly or shorter intervals for assessment of signs and symptoms indicating improvement or deterioration. The basic features noted in the history and examination were as follows.

(1) Sex. (2) Age group. (3) Number of previous attacks of pain. (4) Site of pain, whether bilateral or unilateral. (5) Radiation of pain. (6) Whether aggravated by coughing or sneezing. (7) Whether pain is experienced on rising from bed. (8) Whether cramps are present. (9) Whether a soft or sagging bed is used. (10) Whether employment is significant (strain). (11) Whether there is a history of associated trauma. (12) Whether improving spontaneously. (13) Whether any leg shortening ($\frac{1}{2}$ in. (1.3 cm.) or more). (14) Lumbar lordosis. (15) Lumbar kyphosis. (16) Scoliosis—adolescent; scoliosis—relevant. (17) Other deformities. (18) Hip-joints. (19) Back flexion restricted. (20) Back extension restricted. (21) Back lateral flexion restricted. (22) Back rotation restricted. (23) Straight-leg raising restricted. (24) Any abnormality of knee-jerks, ankle-jerks, or plantar reflexes. (25) Any muscle weakness in lower limbs. (26) Any loss of sensation in lower limbs. (27) Any sign of sacro-iliac joint disease. (28) Radiological evidence of congenital abnormalities, disk degeneration, or bony disease of any kind. (29) Type of treatment employed. (30) Time in weeks after treatment started before patient is free of signs and symptoms.

As previously stated, the patients in this series were placed alternately on either manipulative treatment or rest in bed and analgesics. Some of them did not carry out instructions or did not report for assessment, and have been discarded from the final series. Thus the original two groups, each of 76 patients (152 patients in all), are unequal in the final figures (76 and 60).

Results

The results of the investigation are given in tabular form. The patients treated by manipulation are referred to as Group I and those treated by rest and sedation as Group II. Age and sex distribution are shown in Table I. It was remarkable that the proportion of males was the same in each group, being 62%.

TABLE I.—Age and Sex Distribution

Age	Group I (76)			Group II (60)		
	Total	M 47	F 29	Total	M 37	F 23
	No. %	No. %	No. %	No. %	No. %	No. %
0-19	2 3	1 2	1 4	2 3	1 3	1 4
20-29	19 25	10 21	9 31	8 13	3 8	5 22
30-59	50 66	33 70	17 58	45 75	29 78	16 69
60+	5 7	3 6	2 7	5 8	4 11	1 4

Table II shows the number of previous attacks of acute lumbar pain in both groups.

TABLE II.—Previous Attacks

No.	Group I (76)			Group II (60)		
	Total	M 47	F 29	Total	M 37	F 23
	No. %	No. %	No. %	No. %	No. %	No. %
1	22 29	15 32	7 24	17 28	11 30	6 26
2 or 3	4 5	3 6	1 3	9 15	6 16	3 13
More than 3	22 29	15 32	7 24	12 20	5 13	7 30
None	28 37	14 30	14 48	22 37	15 40	7 30

Information regarding the site of pain is given in Table III.

TABLE III.—Site of Pain

	Group I (76)			Group II (60)		
	Total	M 47	F 29	Total	M 37	F 23
	No. %	No. %	No. %	No. %	No. %	No. %
Central lumbar	54 71	33 70	21 72	42 70	30 81	12 52
Unilateral	33 43	21 44	12 41	20 33	12 32	8 35
Bilateral	13 17	5 11	8 28	11 18	8 22	3 13
Radiation pain	28 37	17 36	11 38	24 40	15 41	9 39

Other information obtained from the history of the patients is shown in Table IV.

TABLE IV

	Group I (76)			Group II (60)		
	Total	M 47	F 29	Total	M 37	F 23
	No. %	No. %	No. %	No. %	No. %	No. %
Aggravated by coughing	46 60	30 64	16 55	41 68	25 68	16 69
Sagging bed used	14 16	9 19	5 17	17 28	12 32	5 22
Employment significant	25 33	22 47	3 10	20 33	19 51	1 4
Associated history of trauma	39 51	25 53	14 48	27 45	19 51	8 35
Improvement occurring	26 34	16 34	10 34	22 37	14 38	8 35

Information obtained from clinical examination is given in Table V.

TABLE V

	Group I (76)			Group II (60)		
	Total	M 47	F 29	Total	M 37	F 23
	No. %	No. %	No. %	No. %	No. %	No. %
Restricted lumbar flexion	48 63	32 68	16 55	33 55	22 60	11 48
on " extension	27 36	17 36	10 34	26 43	17 46	9 39
Restricted lateral flexion	31 41	18 38	13 45	27 45	18 49	9 39
rotation	16 21	10 21	6 21	11 18	8 22	3 13
Straight-leg raising diminished	39 51	27 57	12 41	26 43	21 57	5 22
X-ray films:						
Congenital abnormalities	9 12	7 15	2 7	9 15	8 22	1 4
Radiological evidence of disk lesion	8 11	3 6	5 17	10 17	6 16	4 17
*Other lesions	17 22	12 25	5 17	21 35	11 30	10 43

* Osteophytosis, osteoarthritic changes, etc.

The results of treatment are given in Table VI.

TABLE VI

	Group I (76)			Group II (60)		
	Total	M 47	F 29	Total	M 37	F 23
	No. %	No. %	No. %	No. %	No. %	No. %
Well in 1 week	38 50	24 51	14 48	16 27	11 30	5 22
With Lasègue's sign initially	20 26	15 32	5 17	10 17	8 22	2 9
Well in 3 weeks	28 37	18 38	10 34	20 33	13 35	7 30
" " 6 " "	1 1	0	1 3	7 12	5 13	2 9
Persistent symptoms and signs after 6 weeks	9 12	5 11	4 14	17 28	8 22	9 39
With Lasègue's sign initially	3 4	2 4	1 3	6 10	3 8	3 13
With congenital abnormalities	1 1	1 2	0	2 3	2 5	0
With radiation of pain initially	3 4	1 2	2 7	7 12	3 8	4 17

Discussion of Results

From the information obtained, we have selected certain groups of figures which we regard as of significant value. Statistical analysis has not yet been applied, because the present preliminary figures are inadequate for this purpose.

The distribution of male to female patients was 3:2. Most patients were in the age group 30-59 years and had suffered no previous attack or only one previous attack of pain. About 70% of each group complained of central lumbar pain. Unilateral and bilateral lumbar pain were much less common (see Tables I, II, and III).

There was no obvious percentage difference between male and female patients except in the group of "significant employment." As one might expect, there was a great predominance of males. Aggravation of pain by coughing occurred in about 65% of each group and each sex. The use of a sagging type of mattress, often a feather bed, may be an important factor, being noted in about 20% of all cases. Trauma might be expected to play an important part, and about 50% of the patients in each group gave such a history, with disability coming on within a short period of time (see Table IV).

The commonest signs found on examination were painful restriction of lumbar spinal flexion, occurring in about 60% of each group, and diminished straight-leg raising predominantly on one side, which occurred in about 50% of each group (see Table V).

There was a higher percentage of congenital abnormalities present than in the general population, by comparison with Willis's findings, especially of sacralization or lumbarization of L5-S1 vertebrae. This suggests that such malformations make the back mechanically unsound and prone to lesions causing backache in later life (see Table V).

Of the patients manipulated 50% were free of signs and symptoms at the end of one week as compared with 27% in the control group (see Table VI). At the end of six weeks only 12% of Group I were suffering from signs and symptoms, while 28% of Group II were still affected.

Perusal of that Table as a whole shows how simple manipulation of the lumbar spine, in the type of case described, results in freedom from symptoms and disability more quickly than does rest. It should be remembered, moreover, that the spinal manipulations were carried out by both physiotherapy students and trained staff, and the figures thus include many cases treated by relatively unskilled therapists.

It may be noted that of the patients in each group who were well after one week, over half had diminished straight-leg raising originally. If a Lasègue sign is taken to indicate a disk lesion, albeit of slight degree, then manipulation had helped to relieve it.

Of the patients in each group who still had signs and symptoms after six weeks, only a small proportion had Lasègue's sign originally on examination. It may also be noted that few of these patients had congenital abnormalities.

A relatively high number of this resistant group had radiation of pain initially, and this may be an important symptom in predicting response to treatment in either group.

Conclusion

In the patient with acute low back pain in whom the probable lesion is derangement of an intervertebral joint, including minor protrusion of a disk, and in whom irritation or pressure on adjacent structures occurs, then treatment by manipulation, without anaesthesia, seems a logical method of gaining relief from signs and symptoms.

Summary

A group of 152 patients suffering from acute low back pain were selected at random and treated either by manipulation or by bed rest and analgesics.

Full clinical and radiological examination was carried out in every case, and progress, whether improvement or deterioration, was noted at weekly intervals.

Of the patients manipulated, 50% were symptom-free and discharged within one week and 87% were discharged within three weeks.

Of the patients treated by rest in bed and analgesics, 27% were symptom-free and discharged within one week and 60% within three weeks.

After six weeks, 12% of the patients treated by manipulation, and 28% of the patients treated by rest in bed and analgesics still suffered pain and disability.

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Medical Memoranda

Amyotrophy Due to Hypoglycaemia

Neurological disturbances often occur in hypoglycaemia. Transient aphasia and hemiplegia are not uncommonly seen in hypoglycaemia due to insulin overdosage. More profound disturbances may occur, particularly in cases of islet cell tumour, when considerable diagnostic difficulty may be encountered. Lawrence *et al.* (1942) have described in detail the changes in the brain in six fatal cases of hypoglycaemia. There was widespread degeneration and necrosis of the nerve cells, particularly in the cortex, putamen, and caudate nucleus, with slighter changes in the brain-stem and cerebellum. The changes are probably due to failure of the normal cellular oxidative processes from glucose lack, although vascular factors may play a part. Rarely, lesions of the lower motor neurone, probably on the same pathological basis, may occur. Moersch and Kernohan (1938) mention loss of the anterior horn cells from a segment of the lumbar cord in an account of the changes in the nervous system from a fatal case of hypoglycaemia. Tom and Richardson (1951) describe a case of islet-cell adenoma, undiagnosed in life, which showed severe muscle atrophy of the legs. Histological examination of the spinal cord from this case showed destruction of the anterior horn cells. Roxburgh (1954) mentions wasting of the small hand muscles in the report of an islet-cell tumour in a child of 5½ years. Other cases have been described by Lidz *et al.* (1949) and Silfverskiöld (1946). The latter described two cases under the title of "polyneuritis hypoglycemia." There is no record concerning the degree, if any, of recovery, but in the

case recorded by Lidz the mental state and ataxia improved after removal of an islet-cell adenoma, but the muscle-wasting remained unaltered.

CASE REPORT

The patient was a married man aged 28 years. His past medical history was uneventful and there was no family history of nervous disease. He worked as a fitter in a large factory, but was not exposed to danger of poisoning by heavy metals or organic compounds. For at least twelve months prior to admission to hospital he complained of feeling weak, tremulous, and "queer" after any undue exertion. This often happened at his work, particularly just before lunch, after which he felt quite well again. There were times when he was unable to concentrate on his work, and his memory became rather capricious. During a holiday in June, 1953, he was found unconscious one morning and admitted to the local hospital. On examination he was found to be conscious but aphasic and there were signs of a right hemiparesis. The blood sugar concentration was 30 mg. per 100 ml., and he recovered fully and promptly following an intravenous injection of 20 ml. of 50% glucose. As he was on holiday he was given a high-fat, high-protein, low-carbohydrate diet and told to report to his doctor on his return home. His doctor referred him to Walton Hospital on August 13, 1953. He was then feeling better and refused in-patient investigation. He remained well until January, 1954, when his symptoms recurred. His wife stated that it became very difficult to wake him in the mornings until he was given a sweet drink. He had short episodes of mental confusion terminating in an attack of sweating, and was amnesic for these episodes. Both he and his wife realized that taking sugar prevented these symptoms, and he eventually carried sugar with him.

He was admitted for investigation on February 8, 1954, with the provisional diagnosis of spontaneous hypoglycaemia. He was tall and spare of build; his colour was good; and examination of the chest, heart (blood pressure 130/70 mm. Hg), and abdomen showed no abnormality. He gave the impression of being a little slow mentally. The pupils reacted normally and no abnormality was seen in the fundi; ocular movements were full, but there was nystagmus on extreme lateral gaze in both directions. There were no cranial-nerve palsies. The musculature of both shoulders and upper arms appeared to be a little wasted, but there was no detectable weakness. Both hands showed marked wasting of the intrinsic muscles, the interossei and hypothenar groups in particular. There was a little weakness of the extensors of the fingers. The tendon reflexes in the arms were brisk and equal and there was no subjective or objective sensory loss. Co-ordination was normal. The abdominal reflexes were present and equal. There was symmetrical wasting of both quadriceps, with marked fasciculation and fibrillation. The glutei and hamstrings were powerful, but there was some weakness of dorsiflexion of the left foot with a little associated wasting of the anterior tibial muscle group. The knee- and ankle-jerks were brisk and equal, and the plantar responses flexor. There was no objective sensory loss, and tests of co-ordination were normal.

Three successive fasting tests resulted in hypoglycaemia after periods of approximately twelve hours: blood-sugar values were 40, 40, and 35 mg. per 100 ml., and administration of intravenous glucose resulted in prompt recovery on each occasion, thus fulfilling Whipple's criteria. A glucose-tolerance test following a diet containing 350 g. of glucose for three days gave the following figures: fasting, 85 mg.; half an hour after 50 g. glucose, 100 mg.; 1 hour after, 85 mg.; 1½ hours after, 70 mg.; 2 hours after, 50 mg. per 100 ml. The haemoglobin was 93% and the white cell count 11,000 per c.mm., the differential count being normal. Liver function tests, including serum bilirubin, thymol turbidity, and serum alkaline phosphatase, were normal. X-ray films of the chest, skull, and cervical spine showed no abnormality. Lumbar puncture revealed clear fluid under

normal pressure, with one cell per c.mm. and a protein content of 32 mg. per 100 ml. The blood Wassermann reaction was negative. The electroencephalogram showed rather excessive low amplitude, slow activity.

At operation (Mr. N. O. K. Gibbon) on February 28 a single plum-coloured growth the size of a pea was found in the head of the pancreas and removed without undue difficulty. Convalescence was uneventful. Post-operative hyperglycaemia was not observed, the fasting blood-sugar values falling between 95 and 114 mg. per 100 ml. A glucose-tolerance test done ten days after operation gave the following results: fasting, 95 mg.; half an hour after 50 g. glucose, 130 mg.; 1 hour after, 120 mg.; 1½ hours after, 100 mg.; 2 hours after, 100 mg. per 100 ml.

Section of the tumour revealed an insulinoma, which was thought to be benign. The patient was discharged, symptomless, on March 20. When seen in the out-patient department six weeks later he felt very fit. He was working regularly and was symptom-free. The nystagmus had disappeared, but the muscle-wasting was unchanged.

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Foster Kennedy Syndrome Produced by Myelomatous Deposits in the Skull

The complete Foster Kennedy syndrome comprises an association of anosmia, primary optic atrophy and central scotoma, and contralateral papilloedema. The essential features of the syndrome are the atrophy and papilloedema, either or both of the other two components often being absent. The syndrome was first described in detail by Foster Kennedy (1911). It is usually produced by olfactory groove or sphenoidal meningiomas or by frontal-lobe tumours (Walsh, 1947). Its occurrence in any other condition is a rarity, and it is accordingly commonly seen in the 40-60 age group. Clearly, the syndrome may be due to any space-occupying lesion near to the olfactory tract.

The case described below is exceptional in that the compression was due to myelomatous deposits. Multiple myeloma also occurs most frequently after the age of 40 (Snapper, 1949). In this case the patient was unusually young, and the manner in which the case presented was more suggestive of a cerebral tumour than of myelomatosis.

CASE REPORT

A male steel worker aged 34 was first seen on July 30, 1953, complaining of generalized aches and pains which he had had for six months. These had at first affected his back and pelvic region. Later his shoulders and neck were involved. After these pains had been present for four to five weeks he developed severe frontal headaches. All these symptoms, with the exception of the headache, disappeared spontaneously five to six weeks prior to admission to hospital.

For five to six weeks before admission he had noticed that his left eye was beginning to protrude. There was no associated deterioration of vision. At the same time he developed intractable vomiting, which occurred 10 to 15 times a day. He also complained of general weakness, loss of weight, and recent nocturnal frequency of micturition. On inquiry he admitted that his food had recently become tasteless.

On examination he was clinically anaemic, but otherwise appeared in fair general health. There was marked proptosis and epiphora of his left eye. The patient had no sense of smell. There was neither diplopia nor ophthalmoplegia. The left fundus showed primary optic atrophy with

an occasional blotchy haemorrhage near the disk. In the right fundus the whole disk was ill-defined, the veins were prominent, and the complete lack of contour and blurring of the edge of the disk indicated a moderate degree of papilloedema. In addition several blotchy haemorrhages were present, mostly near the disk. The visual fields were normal, but the visual acuity of the left eye was diminished to 6/9, while that of the right eye was 6/6. He was tender over the fifth and sixth ribs on the left side. No further abnormalities were found.

Several laboratory investigations were carried out. The urine contained Bence Jones protein, but showed no other abnormality. The blood urea was 155 mg. per 100 ml. and his urea clearance was 15% of average normal standard clearance. The findings in the serum were: alkaline phosphatase, 13 K.A. units; acid phosphatase, 3 Gutman units; total protein 8.8 g. per 100 ml. (albumin 5.7 g., globulin 3.1 g.); sodium, 135 mEq/l.; potassium, 6.5 mEq/l.; alkali reserve, 18 mEq/l.; chloride, 88 mEq/l.; calcium, 12 mg. per 100 ml. The peripheral blood examination showed: haemoglobin, 51% (7.5 g. per 100 ml.); red cells, 2,500,000 per c.mm.; C.I. 1; leucocytes, 6,000 per c.mm. (neutrophils 3,000, eosinophils 60, lymphocytes 2,340, monocytes 600); no plasmacytes were seen; platelets, 250,000 per c.mm. (Lempert); E.S.R. (Westergren), 124 mm. in one hour.

Marrow smears from the right and left iliac crests and from a radiologically evident myelomatous deposit in the left clavicle showed gross infiltration with cells of the plasmacytic series, consistent with a diagnosis of myelomatosis.

Pentamidine isethionate was given by intramuscular injection on alternate days to a total of 4 g. over a period of six weeks. The patient also received deep x-ray therapy, 2,500 r depth dose to the anterior fossa of the skull, between August 12 and 28.

After these measures the proptosis and papilloedema disappeared, whilst the vomiting gradually ceased. It was at first thought that the vomiting may have been due to chronic renal failure, but as the blood urea level did not fall concurrently with the decline in vomiting it was concluded that the latter was caused by the raised intracranial tension.

COMMENT

This case presents several unusual and interesting features. Multiple myelomatosis in a man of 34 is rare. The youngest in Bayrd and Heck's (1947) series of 83 cases was 37. Though myeloma deposits are often found in the skull, producing the characteristic radiological appearance, it is relatively rare to find the tumour extending beyond the confines of these bones. This was observed in only two cases in the series quoted above. Accordingly, only exceptionally is intracranial tension raised in myelomatosis. Snapper (1949) states: "Although myeloma so often involves the skull, no convulsive seizures have been observed and the optic disks never show evidence of increased intracranial pressure." In the present case there were definite signs of raised intracranial tension—namely, papilloedema, retinal haemorrhages, and vomiting. Lumbar puncture was thought to be inadvisable in these circumstances, and so no direct measurement of the C.S.F. pressure was made. The only component of the Foster Kennedy syndrome that was lacking was the central scotoma.

I wish to thank Professor E. J. Wayne for permission to publish this case; Dr. E. K. Blackburn for the interpretation of the marrow smears and other haematological data; and Dr. G. M. Wilson for his help and encouragement.

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Reviews

ACTIVE TRANSPORT AND SECRETION

Active Transport and Secretion. No. VIII, Symposia of the Society for Experimental Biology. (Pp. 516+vi; illustrated. 45s.) Cambridge University Press, 1954.

The transfer of substances and ions across membranes and diffusion barriers in general is a most important subject of study by experimental biologists at the present time. Much is now known about the intracellular enzymes which are concerned with intermediary metabolism, but how a substrate reaches its specific enzyme system within the cell is still obscure. The existence in the cell of structures which possess their own membranes—for example, mitochondria—shows that the selection of the desirable substrate from among the diversity of substances presenting at the cell surface is only one of many problems to be considered.

This volume contains the papers read at a symposium of the Society for Experimental Biology held in July, 1953, and includes contributions emanating from departments of agriculture, botany, zoology, physiology, biochemistry, biophysics, pharmacology, clinical pathology, and experimental medicine. The subject-matter of the papers is as diverse as their origins, but some unification is achieved in a final article by J. F. Danielli entitled "Morphological and Molecular Aspects of Active Transport." Professor Danielli discusses six morphological levels at which it is profitable to consider active transport: (1) the simplest known cellular membranes such as those of red blood cells; (2) cell membranes which are specialized for the performance of active transport, such as those of intestinal epithelial cells, kidney tubule cells, and motor end-plates; (3) mitochondria; (4) vacuoles; (5) pinocytosis—the absorption of environmental fluid as discrete droplets by undulating membranes; and (6) extracellular processes, such as the flow of lymph and pumping activity of intestinal villi. Each morphological unit can display different processes of transport—for example, simple diffusion, facilitated diffusion, and active transport. Simple diffusion is the movement of molecules in an unrestricted manner under the driving force of thermal agitation; facilitated diffusion occurs also under the driving force of thermal agitation, but is restricted both by structural and by steric factors and has been recognized as occurring only at "active patches" in the cell surface; in active transport molecules, etc., are transferred across barriers by the use of an energy supply other than, or in addition to, that of thermal agitation. The energy supply needed for active transport will clearly be derived from metabolic processes, and so the study of enzymes and the effects of enzyme poisons in relation to the processes of active transfer is a rapidly developing one. Various molecular models for the intimate mechanism of active transfer have been postulated, of which that of a propelled shuttle moving forwards and backwards across the membrane, and that of a molecular carrier rotating within the membrane, are the most fashionable. The idea that, in relation to active transport, enzymes may possess important mechanical as well as catalytic functions is an interesting one that needs much further investigation. All these matters will be of significance to those, among many others, who are interested, for instance, in the processes of kidney secretion and absorption, in the mechanisms involved in nerve conduction, in the absorption of fat from the intestine, and in the transference of passive immunity from mother to foetus.

This volume, apart from one isolated instance, contains no record of the discussion that took place at the symposium; but, since the book in its present form contains over 500 pages, the inclusion of the discussions would have made it somewhat unwieldy. A more serious omission is that of an index, in the absence of which the book loses much of its potential value for reference to the present views of active investigators in a field that is necessarily somewhat diffuse.

Nevertheless this volume, which represents a valuable conspectus of expert opinion on a subject of wide importance, can be read with profit by all those to whom the mechanisms of transport and secretion are of interest.

F. G. YOUNG.

LEUKAEMIA RESEARCH

Ciba Foundation Symposium on Leukaemia Research. Editors for Ciba Foundation: G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., and Margaret P. Cameron, M.A., A.B.L.S. Assisted by Joan Etherington. (Pp. 297+xiv; 56 illustrations. 30s.) London: J. and A. Churchill Ltd. 1954.

The symposium of which this is a transcript was arranged in order to take stock of the present position of research in leukaemia. There is suggestive evidence that leukaemia is increasing, and that this is a true increase and not merely an improvement in diagnosis. The disease is inevitably fatal, and research is therefore attended by a certain sense of urgency. Among the main topics discussed was, first, the relevance of animal research in leukaemia to the human disease. Though most of our knowledge of leukaemia has come from observations in man—as, for example, the therapeutic value of arsenic, x rays, nitrogen mustard, and the folic-acid antagonists—and though the transmitted strains of leukaemia used by experimentalists differ in many ways from the spontaneous disease, we shall probably be increasingly indebted to animal research for new remedies against leukaemia and related maladies. A second main topic was the role of a virus in the aetiology of leukaemia, and particularly the interesting results obtained by L. Gross in the transmission of leukaemia to the newborn mouse. A third topic was the induction of leukaemia by ionizing radiations and the protection obtained by shielding the spleen or injecting emulsions of spleen, bone marrow, or other cells.

The symposium was an exciting one to attend, and this monograph will be a stimulus to existing and would-be researchers in this field. It will join the list of key books on leukaemia, which already includes Claude Forkner's *Leukaemia and Allied Disorders in Man*, unhappily not revised since its publication in 1938, and Engelbreth-Holm's *Spontaneous and Experimental Leukaemia in Animals*, published in 1942.

L. J. WITTS.

THE TRIAL OF CRAIG AND BENTLEY

Trial of Christopher Craig and Derek William Bentley. Edited by H. Montgomery Hyde, M.P. (Pp. 264; illustrated. 15s.) London, Edinburgh, and Glasgow: William Hodge and Co. Ltd. 1954.

On November 2, 1952, Craig and Bentley were observed breaking into a warehouse; the police were informed, and subsequently Craig shot and killed P.C. Miles when the latter, with other policemen, was attempting to apprehend him. Bentley had already been arrested. Craig, the leading spirit, could not by law be hanged, as he was under 17 years of age. He was apparently an aggressive, callous, illiterate youth, being unable to read, owing, it is claimed, to word-blindness. The reasons for the indignation aroused by the hanging of Bentley (aged 19) were pitifully expressed in Parliament by Mr. R. T. Paget, Q.C., M.P.: "A three-quarters witted boy is to be hung for a murder he did not commit and which was committed 15 minutes after he was arrested." In his address to the jury the Lord Chief Justice explained the law concerning the common responsibility of accomplices in crime in the following terms: "When two people are engaged on a felonious enterprise—and warehouse-breaking is a felony—and one knows that the other is carrying a weapon and there is agreement to use such violence as may be necessary to avoid arrest and this leads to the killing of a person, both are guilty of murder." Interesting legal problems were: How long does common responsibility endure? What are the criteria for its termination? Might not the fact of arrest be considered to terminate it? And, if not necessarily so, in what conditions would it not be so?

It would seem that Bentley made legal history by being the first to be hanged as an accomplice in a crime for which the principal in the first degree could not be executed on the grounds of age. Moreover, Bentley was considerably below average in intelligence, and it was said, according to the editor of this book, that he had been reported as mentally deficient at an approved school and had been rejected on mental grounds for National Service. Like Craig, he was illiterate.

This trial doubtless possesses considerable legal interest; from the medical point of view the interesting thing is that the medical aspects—the apparently low mentality of the two boys, and particularly of Bentley—were not raised in their defence. The introduction is clear; but Mr. Montgomery Hyde might have spared us his views on the causes of juvenile crime and such *obiter dicta* as that “it is a sad reflection on our times that both these youths were found at their trial to be practically illiterate.”

DESMOND CURRAN.

SOCIAL MEDICINE

The Meaning of Social Medicine. By Iago Galdston, M.D. (Pp. 137+viii. 22s.) Cambridge, Mass.: Harvard University Press. London: Oxford University Press. 1954.

Beatrice Lillie used to include in her wartime repertory a soprano launched on a song which she and her audience soon recognized was beyond her resources. As she approached the top note it became clear to all concerned that she wasn't going to make it, so she hastily dropped an octave and tried to pass it off as though nothing had happened. This essentially is the procedure followed by Dr. Galdston in his discussion of the meaning of social medicine. He provides an interesting account of the development of modern medicine, which he suggests has failed because it has been concerned with the treatment of disease rather than with the promotion of health. As a result, lowered mortality rates have not been accompanied by a commensurate improvement in health and well-being. Social medicine, apparently, is to put this right. But at the point at which we should expect to be told how this is to be done the subject is dropped, and the book ends on a different note, with two chapters on “Social Medicine and Medical Education” and “Social Medicine in Great Britain.” It is not the first time that recognition of a problem has been mistaken for its solution.

It is hard to see why people still find it necessary to make exaggerated claims for a new subject. One would have thought it quite sufficient if in, say, ten years the decision to establish departments of social medicine seemed in retrospect to be a right one. But the late Professor René Sand regarded social medicine as “the final flowering of the preventive and curative arts,” and Dr. Galston conceives it as “the corrective and fulfilment of the modern biological sciences.” These are claims which would tax the combined resources of the Royal Colleges and the Royal Society. Fortunately we can accept less; we shall certainly have to.

THOMAS MCKEOWN.

“BALANCED” ANAESTHESIA

The Practice of Balanced Anaesthesia. By Sylvan M. Shane, D.D.S. Preface by Juan White Morquecho, M.D. (Pp. 196; illustrated. \$5.75.) Baltimore: Lowry and Volz. 1953.

In case the reader is uncertain about the meaning of “balanced anaesthesia” a definition is supplied in the preface written by Professor Juan White Morquecho, of Mexico City, who says that balanced anaesthesia “consists of a series of proceedings in which the pharmacodynamic qualities of different therapeutic agents are taken advantage of in a rational manner.” This definition clearly covers practically the whole of clinical anaesthesia. Indeed, though the author says that his book is “not a treatise on anaesthesia,” it is just that—though not a very good one. The central theme is the use of a “balanced mixture”

consisting of oxygen, nitrous oxide, and cyclopropane in certain proportions; but the author does not hesitate to add morphine, barbiturates, and other drugs before, and barbiturates, relaxants, and analgesics during, the operation. The full range of spinal and local analgesia is also employed.

The dust cover says that the book was written for the physician, dentist, nurse, and veterinarian. In this country, at all events, only the last three might find the book of use. Postgraduates will find the standard far below the level they must aim at, while the general practitioner will almost certainly not extend his practice to this extent. The list of references given is inadequate for any serious purpose. The book hardly represents a worthwhile addition to the medical literature on anaesthesia.

W. W. MUSHIN.

A GREAT HOSPITAL

The Brompton Hospital: The Story of a Great Adventure. By Maurice Davidson, M.A., D.M., F.R.C.P., and F. G. Rouvray, O.B.E. (Pp. 152+viii; illustrated. 21s.) London: Lloyd-Luke (Medical Books) Ltd. 1954.

A hundred years ago patients suffering from consumption were not admissible to the voluntary general hospitals in London. It was owing to the enterprise and energy of Philip Rose, and to a lesser degree of John Labouchere, that the Brompton Hospital for Consumption and Other Diseases of the Chest was opened in 1842. At first the out-patient department was in Great Marlborough Street, and the in-patients were accommodated in the Manor House, Chelsea. In 1854 the north wing of the present structure was opened. We were interested to learn that in the early days the applicants for the post of assistant physician to the hospital were submitted to a clinical test of their competency before they were considered eligible for the post. In 1871 Miss Cordelia Angelica Read left £100,000 to the hospital, which enabled the south wing to be built and opened in 1882. The will containing the legacy was found in the locked drawer of a spinet, which (we are glad to know) is still preserved in the hall of the hospital.

In this beautifully produced book Dr. Davidson and Mr. Rouvray graphically describe the development of this world-famous hospital, and give pen-pictures of many of the distinguished physicians who helped to build up its reputation. They also point out how the rapid growth of surgery of the chest has improved the treatment and prognosis of many conditions. They rightly emphasize the importance of the hospital in undergraduate and postgraduate teaching. “L'Envoi,” with which the book ends, is a beautiful and moving termination of a noteworthy record of a great hospital.

ZACHARY COPE.

The distinguished French medical historian Charles-Victor Daremberg, who died in 1872, left unfinished a comprehensive bibliography of medicine. This was completed by Alphonse Pauly and published in 1874. It was intended to include all important works published to that date, including all titles found in Haller, Choulant, and Ca'llisen, arranged chronologically under each subject. This *Bibliographie des Sciences Médicales*, out of print for many years, has now been reproduced in facsimile and published by Derek Verschoyle, 13, Park Place, London, W.1, for £8 8s. Its appeal will be chiefly to collectors and bibliographers.

There have been no major changes in either the arrangement or the content of the *Hospitals Year Book 1954-55*, although a minor addition is of a list of British Standards relating to hospital equipment. There is, however, an editorial article of some importance on the best use of hospital resources, which gives a report on the progress made in hospital services since 1948 and outlines the main weaknesses and problems which require consideration if the service is to be run efficiently and economically. The *Year Book*, which costs £2 2s., can be obtained from the Institute of Hospital Administrators, 75, Portland Place, London, W.1.

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THE DISCOVERY OF PENICILLIN

The discovery of penicillin introduced a new epoch in the treatment of disease. It has been followed by an intense search for other “antibiotics,” and a whole range of bacterial infections have now come within the effective control of substances produced, for the most part, by moulds, among which *Penicillium notatum* holds pride of place not only historically but also therapeutically. We stand so close to a bewilderingly rapid sequence of discoveries that as yet we probably fail to understand fully the revolution in medicine that has taken and is taking place as a result of Alexander Fleming's discovery. It is natural that the world will acclaim a medical advance “great” in proportion to the curative benefits it brings, and on this count alone Sir Alexander Fleming has his place among the immortals. And close beside him will be Sir Howard Florey and Dr. Ernst Chain, who in a systematic investigation of antibacterial substances ten years later hit upon the technical ways and means of fulfilling the promise Fleming held out for penicillin in 1929. Fleming had the real naturalist's capacity for observation and the scientific imagination to see the implications of the observed fact—a capacity and an imagination which, it is true, only the prepared mind can compass, and which in the great discovery seem invariably to be joined to a mind that is essentially humble. As there have been some popular misconceptions of the part Fleming played in discovering penicillin it may not be inappropriate at this time of his death to recall in his own words some of the observations he summarized in his historical paper in the *British Journal of Experimental Pathology* for June, 1929:

“A certain type of penicillium produces in culture a powerful antibacterial substance.”

“The active agent is readily filterable and the name ‘penicillin’ has been given to filtrates of broth cultures of the mould.”

“The action is very marked on the pyogenic cocci and the diphtheria group of bacilli.”

“Penicillin is non-toxic to animals in enormous doses and is not irritant. It does not interfere with leucocytic function to a greater degree than does ordinary broth.”

“It is suggested that it may be an efficient antiseptic for application to, or injection into, areas infected with penicillin-sensitive microbes.”

The discovery recorded in Fleming's paper is a milestone in the history of medical progress, and the “penicillin” he discovered and named has come nearer than any other remedy to Ehrlich's ideal *therapia sterilisans magna*.

ANTICHOLINERGIC DRUGS FOR PEPTIC ULCER

During the past few years a spate of anticholinergic drugs have been introduced for the treatment of gastro-intestinal disorders, particularly peptic ulcer and enterospasm. Belladonna has had a time-honoured role, and these new preparations have sought to emulate its action but with fewer undesirable side-effects. “Banthine” (methantheline bromide) blazed the trail and has been followed by a bewildering number of other drugs, including “antrenyl,” “bentyl,” “centrine,” “lergine,” “lytensium,” “merbentyl,” “monodral,” “pamine,” “prantal,” and “wyovin,” and much has been written on both sides of the Atlantic about their pharmacological and clinical effects. In the *Journal* this week a special study of lergine (tricyclamol chloride) is presented by Drs. Pamela Aylett and A. H. Douthwaite.

All these drugs have much in common. Their chemistry is complex; they achieve an anticholinergic effect like atropine by blocking transmission either at autonomic ganglia or at the peripheral effector site; they reduce basal secretion, slow the emptying time of the stomach, and lessen intestinal muscular activity. Although side-effects are generally claimed to be slight, in practice the usual atropine-like disturbances of impaired vision and dryness of the mouth are quite common, and sometimes there may be constipation and difficulty in urination. Moreover, the response varies considerably between different patients and even in the same patient at different times.

The therapeutic contribution of these new drugs is not impressive, and they have not greatly advanced the therapy of peptic ulcer. Nor were they likely to do so, since atropine and related drugs, although undoubtedly beneficial for smooth-muscle spasm, have never been conclusively proved to give great benefit in cases of peptic ulcer, though most clinicians would agree that belladonna can help to relieve pain, particularly night pain, in duodenal ulcer. According to Nicol¹ even large doses of atropine had very

¹ Nicol, B. M., *Lancet*, 1939, 2, 881.

² Rowlands, E. N., *et al.*, *ibid.*, 1952, 2, 1154.

³ Friedlander, P. H., *ibid.*, 1954, 1, 386.

⁴ Texter, E. C., and Barborka, C. J., *Postgrad. Med.*, 1954, 16, 449.

little effect on the acid of the stomach when measured over 24 hours, and no better success seems to have been achieved by ganglion-blocking agents in this respect.² It has been postulated that slowing the stomach's rate of emptying would allow the more effective use of antacids, but this hypothesis is by no means proved. The distension of the stomach is itself an important stimulus to secretion, and slowing of the rate of emptying may well mean more prolonged secretion, which would offset the neutralization. However, using tricyclamol, Drs. Aylett and Douthwaite have prolonged the period of achlorhydria from 1½ to 2½ hours after a dose of aluminium hydroxide, but details of only two patients are given. Again, the inhibition of other intestinal secretions, particularly pancreatic, might offset any benefit to the duodenum from lowering of the gastric acidity. Indeed, in so far as these drugs are supposed to help the healing of peptic ulcer, the administration of them is still based on doubtful hypotheses and insufficient clinical study with control series.

The clinical evidence of the value of methantheline in controlled observations is unimpressive apart from some reduction of pain, and P. H. Friedlander³ did not find that the natural history of duodenal ulcer was improved. E. C. Texter and C. J. Barborka⁴ followed 250 patients with proved peptic ulcer for two years. The patients were treated identically with diet and the usually recommended forms of treatment, the only difference being that half the patients received 100 mg. of methantheline four times a day, while the remainder received 0.4 mg. of atropine sulphate four times a day. After the two years these authors, without knowledge of which drug had been given, then assessed the patients' progress: they found that those taking banthine were symptomatically improved and had had somewhat fewer and milder recurrences than those taking atropine. The recurrence rates were high in both groups—75% in the banthine group and 90% in the atropine group. When the results were separated into mild, moderate, and serious cases, the best results occurred in the group whose ulcers had been classified as mild before treatment, whereas in the group with severe ulcers it mattered little whether atropine or banthine had been used. Complications and the need for surgery were of the same frequency in the two groups. Therefore the conclusion was that, although these drugs often gave symptomatic improvement, the eventual course of the disease was not altered.

But, while the natural history of the disease is not materially influenced, greater relief of pain is important to the patient and justifies the administration of any of these preparations during the phase of active

ulceration, though it would seem reasonable to see whether the desired effect cannot be obtained with the traditional belladonna before prescribing the new, and much more expensive, preparations. The *tab. belladonnae et phenobarb.* of the *National Formulary* contains ¾ gr. (50 mg.) of phenobarbitone and ¾ gr. (26 mg.) of the dry extract of belladonna and is convenient to prescribe when some sedation is required as well.

It may be unfashionable to say so, but patients appreciate brand-new treatments, and it is an advantage to have a variety of compounds available for the management of a chronic and relapsing disease. Apart from some difference in side-effects, it is unlikely that any one of the many new preparations will prove to be superior to its rivals, and the family doctor need not feel that he must personally evaluate each preparation.

EXCHANGE TRANSFUSION

No effective prophylaxis is yet available against maternal iso-immunization from rhesus and other blood-group incompatibility between mother and foetus. The problem of preventing stillbirths from this cause is still unsolved, in spite of attempts to reduce the effects of foetal haemolytic anaemia by cortisone administration to the mother¹⁻³ or inducing labour early in a few selected cases.⁴ Treatment has therefore been concentrated on the 70% of affected babies who are born alive. The main complications in untreated infants are anaemia at birth in about two-thirds, which may be progressive, and kernicterus after 36 hours in up to a quarter. Adequate exchange blood transfusion with fresh compatible packed cells not only corrects severe anaemia without increasing blood volume but also reduces the risk of kernicterus by removing up to 1,000 mg. of bilirubin contained in over 85% of the infant's sensitized red blood cells. In our opening pages Drs. W. Walker and G. A. Neligan, of Newcastle, report the results of 250 exchange transfusions, with a remarkably low mortality of only 15 deaths attributable to haemolytic disease of the newborn. A follow-up of 200 of the survivors showed only 3 suffering from kernicterus, confirming the good long-term prognosis found by P. Armitage and P. L. Mollison.⁵ They also discuss the modern indications for the procedure

¹ Hunter, O. B., Jr., *J. Amer. med. Ass.*, 1954, 154, 905.

² Wiener, A. S., *ibid.*, 155, 63.

³ DeCosta, E. J., *et al.*, *Obstet. Gynec.*, 1954, 3, 131.

⁴ Davies, B. S., *et al.*, *Arch. Dis. Childh.*, 1953, 28, 466.

⁵ Armitage, P., and Mollison, P. L., *J. Obstet. Gynaec. Brit. Emp.*, 1953, 60, 605.

⁶ Wiener, A. S., *et al.*, *J. Pediatr.*, 1954, 45, 546.

⁷ Diamond, L. K., *Pediatrics*, 1948, 2, 520.

⁸ Mollison, P. L., and Cutbush, M., *Advances in Paediatrics*, Chapt. 5, 1954, London.

and the increasingly important technical details of it, and underline the advantages of exchange over simple transfusion. A. S. Wiener *et al.*⁶ have also emphasized this recently and reported a reduction in mortality (including kernicterus survivors) from 46.4% to 15.5% in comparable severe groups.

The greatest benefit is obtained from exchange transfusion when it is carried out within a few hours of birth with not less than 60 ml. of packed cells per lb. (170 ml. per kg.) on affected infants who are anaemic, premature, or are considered likely to develop kernicterus. Treatment is probably ineffectual once neurological signs of kernicterus have appeared, so prediction is essential. Consequently treatment may be said to begin with routine antenatal care, parental blood grouping, and maternal antibody determinations during pregnancy. These measures enable the arrival of most of the affected infants to be predicted, and hospital delivery can be arranged: birth is followed by the rapid performance of the direct Coombs test and rhesus blood-group test on the baby's cord blood. Treatment is then planned in accordance with haemoglobin levels in the cord blood. If necessary bilirubin determinations and normoblasts and reticulocyte counts can be done. The mortality of full-time babies delivered in hospital in Walker and Neligan's series was only a quarter that of babies admitted after birth, a cogent argument in favour of hospital delivery when maternal sensitization is discovered. About 60% of all serologically affected babies receive exchange transfusion. They include all babies with positive direct Coombs tests, with the exception of full-time infants with a cord haemoglobin level above 15 g. per 100 ml. Above 17.5 g. per 100 ml. there appears to be no danger of kernicterus, but the borderline group with cord haemoglobin between 15 g. and 17.5 g. per 100 ml. appear to run a 10% risk of kernicterus if untreated. However, if all in this group have exchange transfusions, the percentage of babies receiving replacements would rise considerably and many would be subjected unnecessarily to a procedure which carries a definite mortality, though small in skilled hands. The policy in the past has been to practise expectant treatment in this borderline group, unless jaundice develops rapidly after birth or an affected infant has been born to these parents previously. Here, Walker and Neligan make another important contribution, for they found that a cord bilirubin level of less than 2.8 mg. per 100 ml. carried no risk of kernicterus in the borderline group, in which it occurred in four-fifths. Thus routine testing of bilirubin levels in cord blood may help in the prognosis of difficult cases. Exchange transfusion cannot entirely prevent kernicterus, but among over 200 Newcastle babies receiving

exchange transfusion were only 5 cases of kernicterus in spite of limiting a second exchange transfusion to 4 babies. The authors recommend re-exchange if the bilirubin level rises above 25 mg. per 100 ml. after the first transfusion. Other authorities have re-exchanged up to 20% of babies, including also those who are premature or who have a history of a previously affected sibling. The kernicterus rate in Diamond's⁷ series of 257 affected babies, 87% of whom received exchange transfusion once and 20% twice, was 2%, and total mortality 13%. Mollison, however, points out that a second exchange transfusion is only one-seventh as effective in removing the infant's bilirubin.⁸ The effect of modern treatment can be gauged by the results in 125 receiving exchange transfusion out of 217 affected babies born in hospital in Newcastle in 1952 and 1953; the mortality was as low as 3.5%, including those due to anaemia and kernicterus, a figure which would be difficult to surpass even with wider indications for repeated exchange transfusion. It is a tribute to the skill and efficiency of a trained team.

The indication for late simple transfusion after replacement is usually a haemoglobin less than 8.5 g. per 100 ml. in the first six weeks of life, during which serial haemoglobin determinations should be made even after adequate exchange transfusion. The use of fresh donor blood within three days minimizes the dangers of transfusion reaction or hyperkalaemia due to leakage of potassium from the donor red cells into the plasma. Neligan and Walker met no complications from infection, air embolism, or portal thrombosis, but they emphasize the dangers of perforation of the umbilical vein. The umbilical route is convenient, for it usually requires no separate incision and may be patent for several days. The venous pressure can be measured before beginning exchange transfusion, and the danger of overloading the circulation in anaemic babies can be avoided by preliminary withdrawal of 10–50 ml. of blood. Because of the danger of circulatory failure, great care should be exercised if this deficit is made up later in the transfusion. Exchange transfusion should also be borne in mind in the treatment of premature infants, some of whom develop hyperbilirubinaemia and kernicterus in the first ten days of life in the absence of any blood-group incompatibility. The only prophylaxis would appear to be exchange transfusion, which many centres for the care of premature babies are beginning to carry out as soon as deep jaundice appears. Thus, exchange transfusion may continue to be carried out on newborn babies even if a method of preventing blood-group incompatibility is discovered.

REGIONAL COLITIS

As B. N. Brooke¹ points out in the opening paragraph of his recent monograph, there was, for a long time, a tendency to diagnose as ulcerative colitis almost any case of chronic diarrhoea for which there was no obvious cause. Closer study of the clinical features and of the pathology of such cases (and for this the increasing interest of surgeons in their management has been largely responsible) has now made it possible to group together certain patients in whom the disease seems to follow a distinctive pattern. Although granular proctitis or procto-sigmoiditis may be regarded by some² as a mild, but occasionally progressive, form of ulcerative colitis, there are several clinical features typical of this group of which spurious diarrhoea, with real constipation, and rectal bleeding seem to be the most constant. Much less frequently the surgeon sees patients in whom shallow ulceration of the mucous lining of the small intestine seems to be the primary lesion, the colon being attacked only by its later extension distally. They constitute a second and smaller (and a more controversial) group best known as ileo- or entero-colitis.^{3,4} Disordered small-bowel function and anaemia are prominent symptoms, and, in general, surgery has little to offer in their relief; it is, in fact, best avoided.⁵ Apart from the remaining majority of cases with the familiar diffuse ulceration affecting predominantly the distal part of the colon—and ending so often in total colectomy—is yet another distinctive group—namely, regional (or segmental) colitis.

Although the early reports of this form of ulcerative colitis (the term being used in its widest sense) date from the days of Moynihan,⁶ Mayo Robson,⁶ and Dalziel,⁷ its wide recognition belongs to more recent times, when Crohn and his colleagues⁸ first described a granulomatous lesion affecting the ileum. This is the commonest site of the disease, which on this side of the Atlantic is so often associated with his name. It has since been clearly established that segments of the large gut may be similarly affected. Since both the prognosis and the treatment differ considerably from those of ulcerative colitis, it is important that the condition should be clearly recognized, and therefore two recent reports from the Mayo Clinic,^{9,10} one clinical and one pathological, are specially welcome.

It used to be the practice to refer to this form of segmental colitis as "right-sided colitis,"¹¹ but the term seems to be no longer suitable, for in this series the left side of the colon was affected almost as often as the right. The segments of affected bowel seem to the naked eye to be sharply marked off from the adjoining healthy gut, and even microscopically the disease seldom spreads further than a distance of 6 cm. As in the small gut, skip areas are sometimes found, as is direct

extension to the rectum and to the ileum (one in four cases). The bowel is reddened, contracted, thickened, and inelastic; there is a noticeable increase in the subserous fat and fibrous tissue as well as great thickening of the submucosa, with stricture as an occasional complication. Although ulceration of the mucous membrane is one of the prominent features, and although polypoid hyperplasia may result, the threat of cancer seems to be less urgent than in true ulcerative colitis.

It is a disease of rather young people, the maximum incidence falling between 20 and 30. The onset may be so acute that the patient may come to immediate laparotomy as an abdominal emergency.^{12,13} More often it is insidious, and the urgency of the symptoms thereafter varies considerably. Diarrhoea is by far the most common symptom, accompanied usually by griping abdominal pain and by obvious rectal bleeding in about half the cases. Physical examination is often quite unhelpful apart from evidence of weight loss and anaemia. Of the complications, perirectal and perianal suppuration is the most frequent. In a group of 201 patients⁹ rather more than one in ten when first seen already showed evidence of infection in this situation and eight had already undergone operations on this account before the underlying disease was recognized. Medical treatment by rest in bed, dieting, and the cautious use of antibiotics was tried in 150 cases, but two out of three later relapsed. Although the group surgically treated was only a third as large, the recurrence rate was appreciably lower. Experience seemed also to show that a short-circuiting procedure has a higher record of success than a resection, whether immediate or staged. In any event, there seems to be very good reason in such cases not to overlook the diagnosis, and every justification to expect a cure by some surgical manoeuvre short of an ileostomy and colectomy.

SULPHAEMOGLOBINAEMIA

Chronic cyanosis unaccompanied by signs of cardiac or respiratory disease or by polycythaemia may be due to the presence of sulphaemoglobin or methaemoglobin in the blood. Methaemoglobin results from the oxidation of haem, while sulphaemoglobin is thought to be due to the entry of sulphur into the pyrrole component of haemoglobin. The methaemoglobin disappears rapidly, but sulphaemoglobin persists as an inert compound in the erythrocyte until the cell is destroyed, and is therefore more commonly encountered in clinical practice. Both pigments can be identified spectroscopically by the presence of characteristic bands in the red part of the light spectrum. The patient, in spite of a striking leaden cyanosis, suffers no ill effects, apart from the theoretical disadvantage of a decrease in the blood's capacity for carrying oxygen. Sulphaemoglobinaemia is almost invariably caused by drugs, the most important of which are the coal tar derivatives, acetanilide and phenacetin, the earlier sulphonamides,¹ and nitrogen-containing compounds such as nitrites and nitroglycerin.

¹ Archer, H. E., and Discombe, G., *Lancet*, 1937, 2, 432.
² Harrop, G. A., and Waterfield, R. L., *J. Amer. med. Ass.*, 1930, 95, 647.
³ Brandenburg, R. O., and Smith, H. L., *Amer. Heart J.*, 1951, 42, 582.

It is difficult to estimate the incidence of the condition from reports in the literature, but it is probably uncommon.

Dr. T. B. Begg reports five patients with sulphaemoglobinaemia on p. 701 of the *Journal* this week, and points out certain interesting features. Four were taking a proprietary compound containing phenacetin, and the fifth used magnesium sulphate to treat her constipation. G. A. Harrop and R. L. Waterfield² induced sulphaemoglobinaemia in dogs by aniline derivatives and sulphur, and it seems likely that cyanosis results from the combined action on the red cells of an oxidizing agent and hydrogen sulphide. *Bacterium coli* in the gut is known to reduce sulphates to sulphides, and three patients in the present series suffered from constipation; this is probably more than a coincidence,³ and would presumably facilitate absorption of sulphides. Women are more commonly affected than men, and neurotic traits are often present. Begg suggests that the patient becomes habituated to the stimulant effect of the caffeine in tablets containing aspirin, phenacetin, and caffeine, originally taken for their analgesic properties. Treatment is obvious: removal of the offending drug and its substitution if necessary by aspirin, relief of constipation without purging, and the correction of anaemia if present. A low-residue diet which is free from sulphur-containing foods, especially eggs, is sometimes prescribed. The cyanosis will persist for at least two months because of the life span of the red cells. No way is yet known of increasing the elimination of sulphaemoglobin.

OPHTHALMIA NEONATORUM

For purposes of notification ophthalmia neonatorum denotes conjunctivitis occurring in the newborn infant and includes almost everything from frank gonococcal ophthalmia to slight crusting of the lids. At the end of the last century gonococcal ophthalmia of the newborn was a common cause of blindness and its prevention a major public health problem. It was Credé's⁴ introduction of cleansing the eyes of newborn infants and instilling silver nitrate drops that did much to alter this state of affairs. But social changes and the efficient treatment of gonococcal infection have combined to make maternal gonorrhoea a rarity in most hospitals, and this has led to a revaluation of the use of prophylactic drops. In a recent paper from Australia Ida Mann⁵ finds that silver nitrate has some effect in preventing "sticky" eyes, though she considers that it is responsible for provoking a sterile discharge in the first day or two of life in some babies. In general her findings agree with the earlier work of Taylor and Calman⁶ at Queen Charlotte's Maternity Hospital, and like them she feels that the use of silver nitrate is unnecessary in a modern hospital. Furthermore, in an institution where adequate bacteriological examination of all infected eyes is a routine, the very rare case of gonococcal ophthalmia is diagnosed so early and treated so readily as to present no cause for anxiety.

⁴ *Die Verhütung der Augenentzündung der Neugeborenen*. 1884. Berlin.
⁵ *Brit. J. Ophthalmol.*, 1954, 38, 734.
⁶ *J. Obstet. Gynaec. Brit. Emp.*, 1948, 55, 642.
⁷ *J. Amer. med. Ass.*, 1951, 145, 1052.
⁸ *Lancet*, 1952, 1, 347.

Other forms of prophylaxis have been suggested from time to time. The instillation of a single drop of penicillin solution appears to have no rational basis, but the use of an ointment containing 100,000 units per gramme of penicillin, originally suggested by Davidson and his colleagues⁷ from the Johns Hopkins Hospital, appears to have more to recommend it. There are two distinct objectives in the use of prophylactic drops. The first is its original purpose of preventing gonococcal ophthalmia, and the second is to reduce the incidence of "sticky" eyes. Most of the latter are staphylococcal in origin, and penicillin ointment would be unlikely to be of much value, since so many hospital strains of staphylococci are penicillin resistant. On the whole it seems that in hospitals serving a population in which gonorrhoea is rare the best treatment of the babies' eyes is simple cleansing, though the medical attendant on the spot may decide that local circumstances warrant other treatment. Elsewhere some form of prophylaxis should still be practised. As a prophylactic agent silver nitrate has some dangers—in particular, it can become dangerously caustic if concentrated by evaporation, and it can also decompose on exposure to light—so the use of penicillin ointment has something to recommend it. Other antibiotics can be incorporated in an ophthalmic ointment, and might well be effective in reducing "sticky" eyes in the days immediately after birth, though O'Brien⁸ found terramycin ointment of only slight value for this purpose. The danger in recommending their widespread use for prophylaxis would be that the hospital strains of staphylococci might rapidly become resistant. Unfortunately, too, no amount of drops or ointment placed in a baby's eye at birth can prevent the numerous cases of staphylococcal eye infections occurring later in the puerperium.

VITAMIN A AND HYDROCEPHALUS

For several years Continental paediatricians, especially in France and Spain, have reported the transient appearance in infants of symptoms of acute intracranial hypertension following the administration of large doses of vitamin A. The French workers J. Marie, G. Sée, and R. Sauvage have recently summarized¹ this work, and they add further observations which define the disturbance more precisely. Thus, the ingestion of 350,000 international units of vitamin A results in malaise, restlessness, either insomnia or torpor, and often vomiting; occasionally the temperature rises. Within 24 hours the anterior fontanelle is obviously bulging, but no further abnormal physical signs appear; the fundi and electroencephalograms are unchanged. The cerebrospinal fluid is of normal composition, but the pressure is up to 150–230 mm. water, rising to 200–230 mm. on jugular compression. The disturbance fades after 24 hours, and after 48 hours the infant returns to normal. In parallel with this the level of vitamin A in the blood serum shows a sharp rise at 6 hours after ingestion, falling again after 12 hours. The authors have

¹ Marie, J., et al., *Sem. Hôp. Paris*, 1955, 31st year, 251.
² Millen, J. W., et al., *Lancet*, 1953, 2, 1234.
³ *British Medical Journal*, 1954, 1, 809.
⁴ Millen, J. W., et al., *Lancet*, 1954, 2, 679.

¹ *Ulcerative Colitis and its Surgical Treatment*, 1954, Edinburgh, Livingstone.
² Goligher, J. C., *Lancet*, 1953, 2, 38.
³ Brooke, B. N., and Cooke, W. T., *Lancet*, 1951, 2, 462.
⁴ ——— *ibid.*, 1951, 1, 1220.
⁵ *Edinb. med. J.*, 1907, 21, 228.
⁶ *British Medical Journal*, 1908, 1, 425.
⁷ *Ibid.*, 1913, 2, 1068.
⁸ *J. Amer. med. Ass.*, 1932, 99, 1323.
⁹ Neuman, H. W., et al., *Surg. Gynec. Obstet.*, 1954, 99, 563.
¹⁰ ——— and Dockerty, M. B., *Ibid.*, 1954, 99, 572.
¹¹ Crohn, B. B., and Berg, A. A., *J. Amer. med. Ass.*, 1938, 110, 32.
¹² Brownlee, T. J., *Brit. J. Surg.*, 1951, 38, 507.
¹³ Thompson, H. R., *Proc. roy. Soc. Med.*, 1950, 43, 685.

also reproduced a similar disturbance in young puppies, and they find evidence that it can occur in older human subjects whose fontanelles have closed.

They argue that the intracranial hypertension is attributable to an acute hydrocephalus resulting from the excessive transient formation of cerebrospinal fluid. Here it should be noted that vitamin A does not pass the blood-brain barrier, and the alternative possibility that the disturbance is due rather to cerebral oedema is not discussed. Since it is reproducible in young animals, the possibility could readily be tested. Should it eventually be established that excess of vitamin A promotes a sharp increase in the flow of cerebrospinal fluid, it would be peculiarly difficult to reconcile such a finding with the work of Millen and his co-workers at Cambridge, who claim that internal hydrocephalus is produced in young animals by too little vitamin A. Although in their first publication on this subject,² which was noticed in this *Journal*,³ they attributed the hydrocephalus to stenosis of the aqueduct, in a later publication⁴ they found reason to shift their ground. Intensifying the degree of maternal hypovitaminosis, they obtained earlier stages of the disease in their newborn and foetal rabbits. In these the aqueducts were not obviously different from those of controls, and they concluded that the stenosis observed in later stages was somehow a secondary effect of the hydrocephalus. In seeking for the cause of the hydrocephalus they were driven to the conclusion that excessive formation of cerebrospinal fluid was the only feasible mechanism. We are thus faced with the unlikely proposition that either too much or too little vitamin A can promote this disorder. It remains to be seen which is correct.

PHYSIQUE AND CHARACTER

Comparing Oxford undergraduates with Chelsea pensioners, Lipscomb and Parnell¹ have found that the pensioners as young men were nearly 4 in. (10 cm.) shorter and 25 lb. (11.3 kg.) lighter than the undergraduates. At the average age of 73 the fifty pensioners' heights had not altered significantly, but they were then only 5 lb. (2.3 kg.) lighter than the undergraduates. In spite of this weight gain they still had less subcutaneous fat than undergraduates, and a greater proportion of the weight was contributed by bone and muscle. Somatotyping showed them to be mainly mesomorphs, with a few mesomorphic-ectomorphs. Those who gained most weight rated most highly in endomorphy. By means of his "clock" method² of simplified somatotyping,³ based on height, weight, and three skin-fold measurements, Parnell found that over 95% of the pensioners were muscular and wiry, compared with fewer than 40% of undergraduates. The results of this investigation illustrate the value, as pointed out by Parnell in an early paper,⁴ of this method of clinical examination "in the practice of medicine, the study of healthy people, care of orphans or children in approved or ordinary schools, investigation of the benefits or otherwise of games and physical training, study of fertility or populations, personal relationships within the family or in communities,

nutritional requirements, in surveys of crime, delinquency, and indeed almost every study of mankind. In short there is hardly a topic of social interest from murder to matrimony on which records of constitution do not touch and cannot quicken interest." Sheldon and Stevens⁵ correlated different character traits with different somatotypes. They found that among mesomorphic people "group action was the keynote, vigour of thought, vehemence of expression, aggressiveness and energetic reaction, bold directness of manner, love of exercise, adventure, chance and combat, these were the prominent features. Problems were met by action, not by submission or by acceptance." And now the be-medalled heroes of the Royal Hospital, Chelsea, who have exhibited these very character traits more convincingly perhaps than any other single group of men in the world, are found to be "mainly mesomorphs with a few mesomorphic-ectomorphs." Surely the important bearing that this might have on physical standards of recruiting cannot be missed.

MacQueen⁶ has pointed out that it is possible to augment the musculature by modern techniques of progressive resistance exercise, probably well beyond the one-unit difference on the seven-point scales mentioned by Parnell.⁷ Muscular bulk so achieved is maintained with little subsequent training,⁸ and it is tempting to believe that by influencing the physique towards mesomorphy the character traits of this somatotype may also be developed. Rigorous physical training in the preflight schools of the American Army Air Forces tended to level the differences between endomorphic and ectomorphic aviation cadets.⁹ Parnell¹⁰ has found that mesomorphic students seek psychiatric advice least often, and endomorphic-ectomorphs have the highest prevalence of psychiatric and psychosomatic disorders. It is possible that a physical training regimen may reduce the incidence of these disorders in students and may even have some therapeutic value in psychiatric and psychosomatic medicine.

Kretschmer's original system of somatotyping has been superseded by that of Sheldon and his collaborators.^{11,12} To Parnell we owe the evolution of a greatly simplified method¹³ which can be quickly learned and applied in routine clinical examination. It may yet be questioned whether medical students learn enough of the variations of normal human constitution. The culture of the physique together with the culture of the mind was a prominent feature in ancient civilizations, and its present lack may be a fault in modern living.

¹ Lipscomb, F. M., and Parnell, R. W., *J. roy. Army med. Cps*, 1954, 100, 247.

² Parnell, R. W., *Eugen. Rev.*, 1952, 44, 20.

³ Sheldon, W. H., et al., *The Varieties of Human Physique*, 1940, New York and London.

⁴ Parnell, R. W., *Eugen. Rev.*, 1952, 44, 20.

⁵ Sheldon, W. H., and Stevens, S. S., *The Varieties of Temperament*, 1942, New York and London.

⁶ MacQueen, I. J., *British Medical Journal*, 1954, 2, 1193.

⁷ Parnell, R. W., *Med. Press*, 1954, 231, 3.

⁸ Delorme, T. L., and Watkins, A. I., *Progressive Resistance Exercise, Techniques and Medical Applications*, 1951, New York.

⁹ Schneider, E. C., and Karpovich, P. V., *Physiology of Muscular Activity*, 3rd edition, 1948, Philadelphia and London.

¹⁰ Parnell, R. W., *Modern Trends in Psychosomatic Medicine*, 1954, London.

¹¹ Sheldon, W. H., et al., *The Varieties of Human Physique*, 1940, New York and London.

¹² — *Atlas of Men*, 1954, New York and London.

¹³ Parnell, R. W., *Amer. J. Phys. Anthropol.*, 1954, 12, 209.

EMERGENCIES IN GENERAL PRACTICE

HAEMATEMESIS AND MELAENA

BY

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It is estimated that between 20,000 and 30,000 patients are admitted to hospital annually in England and Wales for serious gastro-duodenal bleeding. In most cases this is sudden, dramatic, and urgent, and the haemorrhage is obvious, either as a frank haematemesis or as a sudden and unmistakable tarry stool, often with diarrhoea. The vomit may be dark, like coffee-grounds, owing to the conversion of haemoglobin into acid haematin in the stomach, or it may be fresh and red just as it comes from an arterial haemorrhage. In either case it usually differs from a severe haemoptysis by being acid in reaction and non-frothy, unlike blood brought up from the lungs. The patient may be severely shocked and actually faint, or he may only become cold, weak, and restless. The pulse is quick, the blood pressure low, a cold sweat develops, and the patient, especially if elderly, often becomes confused and delirious. Pallor may be intense, and a peculiar pinched appearance of the face and nose is sometimes very striking.

In some cases, however, bleeding is insidious and difficult to recognize, so that it may continue unsuspected for long periods. It is important to remember, not only that blood oozing from the upper part of the alimentary tract may be insufficient in amount to turn the stools black, but also that patients do not in all cases take notice of dark stools, even if they are passed. In any cases of unexplained pallor, fainting, weakness, or symptoms of anaemia such as dyspnoea on exertion or oedema of the ankles the patient should be questioned about the colour of his motions and asked to notice them, particularly if he has not previously done so; it must not be forgotten, however, that many "tonics" and dyspeptic mixtures contain iron or bismuth, which darken the stools, and that much meat or green vegetables such as spinach have the same effect. A history that the patient has passed dark stools must not, therefore, at once be accepted as evidence of bleeding, and whenever possible this must be checked by a chemical test for occult blood. These tests are simple to perform, require no elaborate technique or materials, and can be carried out easily by the practitioner himself; the finding of such melaena demands, of course, a full history, examination, and investigation.

The simplest test is the Gregerson,* and for this it is not necessary to ban chlorophyll-containing foods, meat, or iron mixtures from the diet, as an immediately positive result definitely indicates blood, whilst a faintly positive one may be ignored. The possibility that the blood has come from the mouth, or from piles, or from swallowing sputum must, of course, be remembered in assessing the significance of a positive test.

*Gregerson's Test. A powder containing 0.29 g. of barium peroxide, with 0.025 g. of benzidine, is dissolved in 5 ml. of glacial acetic acid and a few drops of the solution are run on to a thin smear of faeces on a filter paper. A blue colour appearing at once or within a few seconds indicates the presence of blood, but appearing only after 20 to 30 seconds is of no significance.

Causes of Bleeding and Differential Diagnosis

Many large series of cases of haematemesis have been published, and from these and from my own experience the main causes, with their percentage incidence in Britain, may be approximately classified as follows:

Chronic duodenal ulcer	40	} 70
Chronic gastric ulcer	30	
Acute ulcer (gastro-duodenal erosions)	20	
Cirrhosis of the liver	5	
Carcinoma of the stomach	3	
Other causes	2	

In practice, the distinction between a chronic duodenal ulcer and a chronic gastric ulcer may be impossible to make and is, in fact, of relatively little importance compared with the vital distinction between an acute erosion and a chronic ulcer. This is a matter of extreme importance, since in the former case any form of surgical treatment is contraindicated, whilst in the latter it may be urgent and life-saving. In some cases the diagnosis is clear, since previous radiological examination may have shown an ulcer, and the history may be typical. In others it may be highly suggestive from the characteristic periodicity and the pain-food relationship.

It is rare, but by no means unknown, for a patient who has a chronic recurrent ulcer to deny any previous indigestion, but as a rule sudden haematemesis, with no history of any preceding pain or dyspepsia, is likely to be due to an acute erosion. This cause of bleeding is not well understood. It is certainly not infrequent, and, if all those cases in which no exact cause can be found and barium-meal examination is negative are grouped under this heading, it probably accounts for some 20 to 30% of all gastro-duodenal haemorrhages.

In some cases there is a strong presumption that an irritant drug may have caused the haemorrhage, and it is always important to inquire whether the patient had a cold, toothache, or a headache before the bleeding, as he may very well have forgotten that he had taken aspirin, "veganin," or some similar tablet, which might have caused the erosion. Drugs in tablet form are particularly concerned, and in a few cases the patient may know that he is sensitive to aspirin. In others expectorant mixtures containing quinine or ipecacuanha, or drugs such as phenylbutazone or para-aminosalicylic acid, precipitate bleeding, as may some sedatives, such as "sedormid."

Bleeding from an acute gastric erosion is often very severe, and often occurs in young people in apparently perfect health, and for no apparent reason that they can give. There is no tenderness or evidence of ulcer, and no history pointing to liver disease or primary blood dyscrasia. In a few cases the haemorrhage has recurred on several occasions, as neither the patient nor his doctor has been able to discover any cause.

Recurring haematemesis, however, for which no ulcer or other lesion has been found, may have some other less frequent, but important, causes, one of which is particularly characteristic—namely, hereditary telangiectasia. In this condition, multiple angiomas occur and as a rule can be found on examination, especially on the face, lips, or mouth, and there is a family history of gastric bleeding. The patient has almost always suffered from severe epistaxis during infancy and childhood. In one patient, aged 71, there had been over a dozen severe gastric haemorrhages since the

age of 30, on almost every occasion needing transfusion, and he had been once explored and eight times submitted to x-ray examination for ulcer, with negative results. There had never been any pain or indigestion, but, on questioning, he admitted to dangerous bouts of nose-bleeding when he was a small boy. On examination a few naevi were found on the skin, and at a second operation, which was undertaken after a radiologist had demonstrated a supposed gastric ulcer niche after a barium meal, no sign at all of any ulcer was found and the diagnosis of hereditary telangiectasia was confirmed.

In cases of portal hypertension with cirrhosis of the liver the haematemesis is also painless, but there is often a history of dyspepsia and the patient may have been a heavy drinker or have had recurrent jaundice (hepatitis); spider naevi may be found on the skin, with sometimes a characteristic facies. The liver is often palpable and in some cases the spleen also; but absence of these findings does not by any means exclude cirrhosis. The distinction from chronic ulcer, whilst often very difficult, is an extremely important one, since morphine, anaesthetics, and operation all carry serious risks in cases of cirrhosis.

Other causes of bleeding are much less frequent but may sometimes present difficulties in diagnosis. Blood diseases, such as leukaemia or purpura, heart failure, and hypertension may occasionally lead to haematemesis, and the rather more frequent hiatus hernia, with oesophagitis or ulcer, and carcinoma of the oesophagus or stomach must also be thought of. In rare cases a gastric polyp may be a cause of recurrent severe haemorrhage without pain.

Treatment of Severe Cases

The atmosphere of panic and alarm which a severe haematemesis produces in the patient and in those around him may easily spread to the doctor, and it is vital to keep calm and to give an air of reassurance and confidence as much as possible. In actual fact it is rare in these cases for a few minutes to become a matter of life and death, and it is a good thing to stress the favourable aspects of the emergency, the high recovery rate, and the well-understood lines of treatment. It may, with advantage, be pointed out that a loss of 10 to 12 pints (6 litres) of blood is not more than the body can tolerate without very serious danger, and a pint (about half a litre) is a usual amount for a blood donor to give. The degree of haemorrhage can be roughly estimated by the pallor, coldness, sweating, and collapse of the patient, the rate of the pulse, and the level of the blood pressure.

The first essential is to keep the patient warm by blankets or hot-water bottles, but this does not mean overheating. It is indeed important not to overdo it, for though the skin temperature may be low, this is partly nature's protective means of conserving internal heat, and it is unwise to promote undue dilatation of skin vessels and increase perspiration, which of course favours dehydration. Provided, however, that fluids are allowed—as they should be—some external warmth is advisable and is certainly of much comfort to the patient.

If there is much dyspnoea oxygen should be given, but this is of relatively little value if the haemoglobin to carry the oxygen is very low, and in any case is almost useless if given by the old method of holding a funnel in front of the patient's face. Some means, such as a plastic bag, a mouth-piece fitting the patient, or a nasal catheter must be adopted, but even if this is done it is not likely to be of much help if there is only pallor without cyanosis. If the haemorrhage is severe, the home conditions are bad, the patient is alone or in a hotel, or has little help available, admission to hospital is essential. The dangers of an ambulance journey are far less than those of remaining at home—but it is usually quite safe to wait a short time before having the patient moved. During this time, if the blood pressure is very low, it is worth raising the foot of the bed, but drugs to raise the pressure, such as noradrenaline, are not advisable unless a blood trans-

fusion can be given simultaneously to replace the blood lost. When telephoning the hospital it is helpful to give details of age, pulse rate, and blood pressure rather than the bare statement of a haematemesis. The use of morphine, $\frac{1}{2}$ gr. (16 mg.) hypodermically, to calm the patient and relieve shock is at this stage usually advisable, but the exact dose and the time it is given must be told to whoever takes the patient to hospital. The dangers of morphine in haematemesis are of causing undue depression of the medullary centres, especially in elderly patients with emphysema, or of the case proving to be one of cirrhosis of the liver, in which even the normal dosage may cause deep coma. It must not be forgotten also that in a very appreciable number of patients morphine itself causes vomiting, so that a dangerous vicious circle may be set up. These dangers do not, however, loom so large in the case of the initial dose given at the time of the bleeding, which greatly helps the patient to withstand the ambulance journey to hospital, as in subsequent doses.

During the first hour or two after a severe haemorrhage it is often advised to give the patient nothing by mouth at all, but frequent small drinks of cold water or fruit juice, 2 to 3 fl. oz. (60 to 90 ml.) at a time, are both safe and necessary and give some slight feeling of confidence also.

No medicines, other than morphine, are indicated at this stage, either orally or by injection, but later a sedative is often advisable, and then paraldehyde, 3 or 5 ml. intramuscularly, is very useful, or soluble phenobarbitone, 3 gr. (0.2 g.) subcutaneously, may be used. Alkalis have little if any place in treatment. If the patient remains in his home a nurse should be in attendance, and blood should be taken as soon as possible for grouping and estimation of the haemoglobin. More elaborate analysis of the blood chemistry—non-protein-nitrogen, sodium, chloride, and potassium—requires a skilled laboratory and hospital facilities.

Intravenous Therapy

In cases of moderate severity the question of intravenous therapy may not arise, but in more serious cases, if vomiting continues at all, an intravenous drip must be set up at once. The main indications for giving intravenous fluids are thirst, a dry tongue, oliguria, and a low blood pressure. If a drip is needed, intravenous glucose-saline should be given at the rate of about 100 drops a minute for the first one or two litres, after which the rate must be slower and accurate control of the electrolyte balance of the body becomes essential.

Blood transfusion may be a life-saving measure, but should not be given as a routine. It is the only effective and really physiological means of raising blood pressure if the patient is intensely blanched, shocked, and dyspnoeic; in this case the use of packed cells may enable a large oxygen-carrying capacity to be given in a relatively small volume. Any risk that such transfusion may provoke further bleeding is very small indeed, and if the blood is given slowly is almost negligible, whereas the continuation of a seriously low blood pressure is an urgent danger to life and far outweighs any fears of fresh bleeding resulting from the rise of pressure after transfusion.

In less urgent cases blood need not necessarily be given unless the haemoglobin is below 50% and the systolic blood pressure falls below 80. The patient's pulse should be charted hourly, and if the rate remains at about 120 a minute this generally means that bleeding is continuing, and is one of the clinical indications for blood transfusion. It must be remembered that the haemoglobin estimation immediately after haemorrhage may be deceptively high owing to the concentration of the blood which follows the bleeding, whilst later it is proportionately reduced by dilution with tissue fluids drawn into the circulation to maintain the blood volume. In elderly patients with emphysema it must also be remembered that there may have been some pre-existing polycythaemia and perhaps hypertension which may give a false impression of the haemoglobin and blood pressure.

Less Severe Cases

In many cases, however, the condition is not serious enough for any more elaborate measures to be needed than rest, warmth, and careful feeding. There need be no fear of giving some food and drink at the earliest stage. If the patient is thirsty he must be encouraged to drink in frequent small amounts, and cold milk or fruit drinks may be left at the bedside. Light solids may also be given from the beginning, though here it may be left largely to the patient's feelings whether he takes them or not. In younger patients solids, such as bread-and-butter, apple jelly, cream cheese, boiled egg, custard, junkets, or stewed fruit are usually welcomed within an hour or two of the bleeding, but with older patients it is often better to offer them only purées, malted-milk drinks, or jellies, without pressing them to take more. Chicken, fish, and lightly cooked tender meat may be given on the second or third day if the patient desires. At all costs thirst and hunger must be prevented, and even if the patient is afraid to eat or drink he should be encouraged to do so.

Operation

The later treatment depends upon the cause of the haemorrhage. If the patient is known to have a chronic ulcer, the question of emergency surgery must be considered from the start. Immediate operation, carried out with the help of blood transfusion, offers the chance of stopping the bleeding and radically treating the ulcer by partial gastrectomy at one and the same time, and is often advisable if expert surgical and hospital facilities are at hand. Such treatment is urgently called for if the patient has a second haematemesis within 24 to 48 hours of the first, if his age is over 50, and if there has been a long ulcer history with previous episodes of bleeding. If operation can be safely done at once, the patient is saved both the risk of further bleeding and the time spent on medical treatment, which he may well grudge if after a few weeks he has then to give more time for the resection of his ulcer. The operation, however, tends to be rather easier for the surgeon and safer for the patient if it can be held over till the ulcer has begun to heal well and the bleeding has stopped, so that if the diagnosis of chronic ulcer is not certain then the advantages of immediate laparotomy are less clear and the indication for operation is more uncertain. As a rule, if the haemorrhage continues, the history is suggestive of ulcer, and if the patient is over 60 immediate surgery is usually advisable, but the risks are certainly considerable (see below). A good blood bank and expert nursing are essential requisites.

Later Progress and Management

The stools should be watched for the disappearance of melaena, but if, as is advisable, iron is given early their colour will remain dark, even though the bleeding has stopped, and chemical tests must be utilized to show the presence or absence of blood. The bowels do not usually require any special attention for the first few days, when there is often some diarrhoea with offensive tarry stools. Later, constipation is usual—as may be the case from the beginning—and a weak soap enema may be given on the fourth or fifth day. At the same time a mild laxative such as liquid paraffin and magnesium hydroxide emulsion (*N.F.*, 1952), $\frac{1}{2}$ fl. oz. (14 ml.) once or twice a day should be ordered. It is important to keep the bowels open at this stage, for the altered blood in the intestines is thought to cause pyrexia, which may be a source of anxiety and uncertainty, and, though it is possible that the temperature is, in fact, due to general metabolic changes in body proteins after haemorrhage, it nevertheless often settles after the bowels have been emptied. It is not always easy to decide when a barium-meal examination may safely be undertaken, but in most cases this can certainly be carried out within the first ten days. It is best to do the examination at the earliest moment possible, as the healing of an ulcer is often very rapid after

a haemorrhage, and radiological examination two to three weeks after the bleeding has stopped may give an indecisive result. The dangers of early x-ray examination—within a few days of the bleeding—are slight and consist more in the risk of syncope and exhaustion of the patient than in the barium meal itself causing further bleeding, even though the radiologist may have to palpate fairly deep to demonstrate an ulcer satisfactorily.

Oral iron may be started from the beginning of treatment, and certainly within a week of the bleeding. Organic iron is more readily absorbed than inorganic, and not more than about 25% of such a salt as ferrous sulphate is, in fact, utilized by the body. Some preparation of ferrous gluconate, saccharate, or succinate is the most useful and least irritant, and it is estimated that about 30 mg. of iron in this form will raise the haemoglobin by 1%. Intravenous iron may be necessary but is not always easy to give; it is advisable only when there is extreme intolerance to oral preparations or the blood fails to improve after adequate oral dosage. A suitable oral preparation is ferrous gluconate, 0.3 g. three times a day. The official iron and ammonium citrate mixture very often causes gastric disturbance, as do the pills of ferrous sulphate unless specially coated to reach the intestine undissolved. Ascorbic acid should be given with iron as an aid to healing and to quicken the rate of recovery of the anaemia; the dose should be 200 mg. daily, or double this amount if the patient has for any reason been on a deficient diet before the haemorrhage.

Prolonged bed rest is not advisable after haemorrhage, and the patient may be allowed to get up for the commode from the beginning unless the bleeding has been very severe. He may go to the bathroom and sit in a chair for short periods as soon as his blood pressure has risen to a satisfactory level and the haemoglobin is above 60%.

In most cases he may be allowed out after three to four weeks, but the future treatment must, of course, be guided by the causative condition. The risk of post-haemorrhagic thrombosis is increased by long immobility in bed and can probably be lessened by early ambulation and the free administration of fluids.

Treatment of Oesophageal Varices

Oesophagoscopy will usually show the presence of varices, as may in many cases a barium swallow. Numerous methods of local treatment have been devised, including injection of the veins with sclerosing fluids, but none has given much success. Various operations designed to reduce portal tension of the porto-caval shunt type have been shown to reduce the varices in some cases, and ligation of the splenic artery has also been advocated, but with little to support it. Spontaneous disappearance of the varicosities is not unknown.

Prognosis

The risk of immediate death from haemorrhage is highest in cases of ruptured oesophageal varices secondary to portal hypertension, and it is a frequent mode of death in Banti's syndrome; in cases of cirrhosis over half the patients die within a year of the bleeding. In cases of haemorrhage from chronic peptic ulcer occurring in patients under 40 years of age death is rare; the risk is less than 1 in 20 amongst patients under 50, but rises to at least 1 in 10 in those over 60 and to about 1 in 5 in those over 70. In bleeding due to acute erosions death is also rare, even though the bleeding may be very severe, and the mortality in younger subjects is certainly not more than 1%. Loss of blood by vomiting is in general associated with a worse prognosis than when there is only melaena, perhaps because the loss is more rapid in the former case.

Next article on Emergencies in General Practice.—“Acute Respiratory Obstruction,” by Mr. Norman A. Jory.

MANIPULATIVE METHODS IN
ORTHOPAEDICS*

BY

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Cyriax (1955) has recently drawn attention to the fact that back lesions very often require manipulative treatment. He also mentions that members of the profession have actually recommended osteopathy to their patients (in spite of the G.M.C.'s warning notice).

My interest arose out of a chain of events. Not long after starting to do laminectomies for disk lesions I worked under a surgeon who regularly manipulated backs and necks under anaesthesia. He obtained very gratifying results without producing cauda equina lesions or other noxious sequelae. I then chanced to see a patient with recurrent low back pain and sciatica who was away from home and who showed me what her own doctor did to relieve her. I performed this rotatory manipulation quite gently and with the desired effect. Her symptoms and signs were what I regarded at that time as indicating a disk lesion. Thirdly, a young woman patient came to see me, complaining of pain in the back of the leg which was not severe unless she did certain things, but which had been present on and off for four years since a fall in which she fractured her eleventh dorsal vertebra. She had been treated in a plaster jacket for four months, so there seemed no point in trying this again. Physiotherapy and a corset were of no avail, so, wishing to avoid laminectomy if possible, I manipulated her under an anaesthetic. She lost her pain completely, but only for a week. After further trial of other methods without relief I did it again, with the same result. After the third manipulation, which again relieved her for a short time, it became clear that if she was to be treated by manipulative methods it must be done without anaesthesia. By repeated manipulation at slowly increasing periods she was eventually relieved completely and has since been able to do bending work without pain, even over prolonged periods.

I started manipulating other patients, and found that by these measures I could relieve some in whom other methods short of operation had failed. I also found some surprising results, including the complete relief of a pain localized to the inner side of the knee and associated with some limitation of extension. The more I manipulated the better my results, but there were still failures, and I was interested when one or two of these patients let me know later that they had been cured by osteopaths.

I decided that I must learn more about osteopathy, in spite of my early indoctrination against it, and by chance I met a qualified doctor now practising osteopathy in London. I spent a week seeing his patients with him, and very quickly realized that there was a lot that I could learn from him. I emphasize that I am not an osteopath but an orthopaedic surgeon.

A Fresh Approach to Back Pain

The first thing that surprised me was the way in which he examined a back. He tested each and every joint for movement and tenderness. When he found a stiff joint he examined it for position. I was also surprised to learn that the

*A paper delivered to the Gloucestershire Branch of the British Medical Association on January 13, 1955.

sacro-iliac joint is a mobile joint and that when stiff it is frequently the cause of symptoms. I was intrigued to learn a simple method of testing for its mobility.

Having been shown the technique of localized spinal examination, localized treatment was the logical sequel, and I was quickly shown a variety of methods. The principle is that the joints above and below the one to be manipulated are "locked" by positioning, and force is then applied to the joint, either directly or by using the locked spine as a lever. Needless to say, it is most important that the joint should be moved in the right direction.

Until this visit I had never used manipulation on patients with recent acute back pain, but there seemed to be no definite dividing line, and when I asked I was told that even the most acute cases would respond very well to this treatment. I have since proved this amply to my own and the patients' satisfaction.

What, then, is the acute incident that happens to produce a sudden attack of, say, "lumbago"? Surely not a displacement backwards of a piece of softened disk material (but see Cyriax, 1955). The pressure on the disk in flexion is said to be very high, and if a pathway has been made by a protrusion of disk material there is no doubt in my mind that even if it can be replaced it must protrude again as soon as the spine is flexed. Cyriax (1955) agrees that manipulation can cure these patients. I believe that the cause of the pain is to be found in a derangement of the zygapophysial joints and that this derangement is mechanical in nature. The pain may result from stretching or pinching of the capsule or of adhesions, or from reflex muscle spasm round the deranged joint.

What is a disk protrusion, and what has it to do with the joint lesion? I think this conception of the initial pathological process can perhaps throw some light on problems that have so far been obscure.

The intervertebral disk has no blood vessels: it has only lymph channels. The method of nutrition appears, therefore, to be by an osmotic pump. The osmotic pressure of disk material is high, and with the spine at rest fluid is sucked in. In the erect or, still more, in the flexed position fluid is squeezed out by a rise in the hydrostatic pressure. If relative motion of the vertebra above and below is prevented by the joint derangement and the muscle spasm round it, the pump cannot work and the disk receives no nutriment. Softening follows, and maybe protrusion.

On this theory the degeneration of teen-age disks as well as the delay often seen between injury and protrusion can be explained. This restriction of motion in the zygapophysial joint is the so-called osteopathic lesion.

It is now widely recognized that intervertebral joint derangements can cause dysfunction in somatic nerves, and it seems illogical to deny that the autonomic nerves can be similarly affected. If, however, one admits this the field of possible secondary symptoms is very much widened.

One difficulty in theorizing about the sacro-iliac joint is to find any explanation of the sites to which pain is referred in derangements of this joint. In my experience pain is referred principally to the back, to the groin and perineum, to the inner side of the knee, or to the heel. Sacro-iliac joint derangements are often accompanied by circulatory changes in the leg, which strongly suggests some involvement of the sympathetic.

One of the main reasons for having a mobile spine is to permit the eyes to be turned quickly to any direction. This function involves complicated interaction of spinal joints and muscles. If a joint becomes stuck in other than its normal position compensatory alterations of position of joints at other levels take place. In time this can lead to the production of secondary joint lesions. Lesions in the sacro-iliac joints can be either primary or secondary. The former is the common cause of acute pain in the back and leg after parturition. The latter very commonly follows lumbar joint derangements.

When considering spinal balance it is clearly of interest to know if the legs are equal in length. It follows that a

constant unilateral strain is thrown on sacro-iliac and low lumbar joints if the legs are uneven. It is very surprising to find how many patients with back trouble have legs that are unequal by more than $\frac{1}{4}$ in. (0.3 cm.), and it is equally surprising to find how much some patients' symptoms are relieved by partial correction by a heel lift.

It is clearly insufficient to measure with a tape from the anterior superior spine. The error due to movement of the sacro-iliac joint may be more than $\frac{1}{2}$ in. (1.3 cm.). Examination of both anterior and posterior superior spines in the erect position, with assessment of the heights of the iliac crests, gives a useful clinical appreciation. The only accurate method is to have the pelvis x-rayed with the patient erect and with the feet together and the knees straight. If the cassette holder is adjusted to the horizontal the relative heights of the femoral heads above the lower edge of the film give the difference.

One other structure of the effects of which the explanation is obscure is the sacro-tuberous ligament. This ligament, of course, is one of those bridging—at a distance—the sacro-iliac joint, and is commonly found to be thickened, tense, and tender in patients with chronic low back pain. I do not know what the pathological process is, but if the ligament is pressed on for upwards of half a minute it gradually gives way and in the process an aching pain is often felt in the leg or in the back. Personally I use the technique although I cannot explain its effects, because I find it helps some patients very much.

Methods of Diagnosis

The spine is usually examined erect first. Leg inequality is looked for, the relative positions of the anterior and posterior superior spines is observed, and the mobility of the spine examined in flexion, extension, and side-bending.

The usual neurological examination is then made, but in addition the mobility of the sacro-iliac joints is tested with the patient supine. This is done by using the leg as a lever. When the leg is externally rotated with a little flick with the knee flexed by about 60 degrees and the hip abducted by about 30 degrees the innominate is moved posteriorly on the sacrum. The reverse movement is obtained by internal rotation in neutral abduction and almost full extension. If the sacro-iliac joint is mobile the leg becomes apparently longer and shorter as the first and the second movements are made. The shift should be at least $\frac{1}{4}$ in. (1.3 cm.), and is best observed by comparing the levels of the medial malleoli before and after each movement.

If one sacro-iliac joint is stiff it is essential to discover what its position is. The relative levels of the superior spines have been examined already for this purpose, but confirmation can be obtained from the relative prominence of the posterior superior spines in the prone position.

The patient is then laid on the side and the upper leg is fully flexed at the hip and knee. The examiner uses his abdomen to control the leg, flexing and extending gently while palpating the interspinous intervals with the fingers. By this means it is possible to determine exactly which joints are mobile and which stiff. Interspinous tenderness is also elicited. When the stiff joints have been found the position of the joint can be determined by palpating the transverse processes with the patient still in the lateral position. The transverse process of a bone that is causing trouble will be made more prominent not only by its rotation but by the tender area of muscle spasm over it. If it cannot be felt on the one side the patient is turned over and the examination repeated on the other side.

The joints of the dorsal spine are most easily examined in the sitting position with the legs over the edge of the couch, the hands linked behind the neck, and the elbows together. The patient bends forwards, resting loosely on the forearm of the examiner, who palpates the interspinous interval with the fingers of the other hand. The determination of position is most easily done prone, when with the flat of the finger a bar of what is apparently muscle spasm can be felt overlying the transverse process, and of course rib, on the side that is displaced posteriorly.

The neck is examined in the same position with the examiner standing behind the patient and the forehead supported in one hand while the other palpates the interspinous intervals. In all these procedures it is essential that the patient should relax in order to allow whatever free movement is possible. The rotation in the cervical region is determined by palpating the transverse processes, and can be done sitting, supine, or prone with the head flexed.

Radiographs are, of course, essential in almost all cases, particularly to determine unsuspected bony abnormalities and leg length. As, however, every joint in the back is examined, the likelihood of missing infective or neoplastic processes is much less than with the orthodox type of examination.

Treatment

The basis of treatment is the replacement into its more normal position of any bone that is causing symptoms as a result of its displacement. It is therefore essential first to know which bone is displaced and in which direction. If a bone is pushed further into the wrong direction the joint is strained more and the symptoms can be made much worse.

The intervertebral joints lock in certain positions, so that they cannot be strained. Full flexion and full extension are the simplest, but are not always suitable. Side flexion with rotation also locks the joints and is most useful. A valuable technique for the lumbar spine is performed thus:

The patient is in the lateral position with the lesion uppermost. The upper part of the body is raised by pillows or by raising the end of the couch, and the shoulder is pushed backwards until the tissue tension can be felt to indicate that the joints above the lesion are locked. The leg is then flexed on the trunk until the tension can be felt to come up to the lesion from below. A thrust forwards on the transverse process then completes the manipulation when combined with a slight exaggeration of the backward rotation of the shoulder and of the flexion of the hip. Thus the upper part of the spine is locked by side flexion and rotation, the lower by flexion. In all these procedures the thrust should be of high velocity but low amplitude, a sharp thrust that is stopped almost as soon as it has begun.

The accurate perception of tissue tension is probably the most difficult part of the whole technique for the beginner to learn. It is essential, and until the art is acquired many patients will suffer unnecessarily, often without receiving any benefit.

Description of other techniques is beyond the scope of this paper.

Results

I regret that I have as yet no figures, and I cannot possibly claim not to have any failures. I am satisfied, however, that my results are much better than they were by orthodox methods alone. I still use physiotherapy, supporting garments, and occasionally plaster jackets for selected cases.

Of particular interest are certain somewhat surprising results, one of which I have already referred to—namely, pain on the inner side of the knee due to sacro-iliac joint derangement. This is often associated with some limitation of extension and a synovial effusion. It forms a most important differential diagnosis of torn medial meniscus because it is very common. I believe it to account for most of the negative explorations of the inner side of the knee-joint. The differential diagnosis can usually be guessed at on the history alone, but unfortunately some patients date the trouble accurately to an injury when "something went click in my knee." The injury is not usually such that one would expect a meniscus tear, and I presume the explanation to be that the click arose in the sacro-iliac joint but was thought to come from the knee because it was to the latter joint that the pain was immediately referred. The treatment is to manipulate the sacro-iliac joint, and the expression on the patient's face is worth watching when the knee will extend fully after the back alone has been treated.

The frozen shoulder is another condition that I have found can be relieved or, if seen in time, aborted. The

joint which is most constantly deranged in this condition is that between the second and third dorsal vertebrae. There is always associated cervical trouble, but I have been driven to the conclusion that trophic changes from sympathetic dysfunction are the prime cause.

Tennis elbow is usually associated with lesions in both dorsal and cervical regions, but for some reason the less localized variety with pain extending to the fingers seems easier to cure.

Migraine in a high proportion of cases, as well as much headache, is associated with upper cervical joint derangements, and can be relieved by their treatment. Disturbance of the sympathetic control of the vertebral artery is a possible mechanism.

The Psychological Factor

Many patients with back pain have a hysterical overlay. This has only too often been encouraged by the well-meaning but misguided remarks of our colleagues who have been unable to find the cause.

Only in a very small proportion is the overlay not relieved by successful treatment of the physical cause.

I can add my own experience of the debilitating effect of chronic back pain. I have had it, and I would recommend it as a very useful lesson to those who would treat the condition in others.

REFERENCE

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VOLUNTARY SERVICE FOR STATE HOSPITALS

The annual meeting of the National League of Hospital Friends, held in London on March 9, was addressed by Lord Beveridge, who was elected president at the meeting, and by Mr. Iain Macleod, M.P., Minister of Health. Mr. Percy Wetenhall was in the chair.

LORD BEVERIDGE said that the League concerned itself not only with helping hospitals and their patients but with patients suffering from chronic illness who were or could be treated in their own homes. It did so, not merely to save expenditure on hospitals, but because such patients, given reasonable home conditions, were likely to be much happier in familiar surroundings. The problem was to extend the possibility of medical and nursing treatment outside the hospital by means of assistance of various kinds. He appealed to women who were not fully occupied otherwise to serve as home helps. The problem of the chronic sick, with which was linked the problem of the infirm aged, was assuming larger and larger dimensions. In another quarter of a century there might well be ten million old people in this country. The need for help for such people, not only in household jobs but in the provision of companionship and occupation, would become more and more pressing.

The general practitioner, Lord Beveridge continued, had a great part to play in all this. If he could be made responsible for seeing that these domiciliary patients not only had the necessary medical and nursing care but everything else for their comfort and welfare, in which the co-operation of the local authority might have to be enlisted, it would be an ideal arrangement. Notwithstanding the existence of the National Health Service there remained a wide sphere for voluntary action, the great merit of which was that it was not tied down by regulations and Acts of Parliament.

THE MINISTER OF HEALTH, in a brief speech, said it was not known exactly how many Leagues of Friends existed in the hospital world, because many were not affiliated with the National League and many hospitals had such voluntary bodies but working under other names. He was sending out a questionnaire to the heads of all hospitals in the country in order to find out exactly how much voluntary effort was going on, and the Ministry would not be content with progress in this field until every hospital had its own local body of devoted voluntary helpers. His impression was that they were much nearer the goal than might be supposed.

Whenever he visited a hospital in any part of the country he made it a rule to ask about the associated voluntary effort, and it was very unusual to find a hospital which had not some organization of this kind. It had been suggested to him that he might send out new instructions to hospitals about enlisting voluntary service, but he did not think that much could be done by circularization; it must be left to local initiative.

One of the great opportunities for service still open in the field of voluntary effort, said Mr. Macleod, was in the treatment of the chronic sick, and it might be that the Leagues of Hospital Friends could do something to mitigate the difficulties in providing home helps and in assisting in general domiciliary treatment. The treatment of the mentally sick found us still in many ways out of date in our thinking and in our laws. There was still amongst unenlightened people an attitude towards the mentally ill that they must do all they could to change. There were special difficulties because mental hospitals were sometimes remote and difficult of access, but they must not rest content until mental hospitals no less than others were covered by "friendship." The Leagues should set themselves not to supplant but to supplement other agencies, such as the Red Cross and St. John and the W.V.S. They should not be too precise in their work. For example, a hospital might be prevented from providing some amenity because it had to install new treatment facilities, and it was here that the Leagues of Hospital Friends came in.

Nova et Vetera

DR. EDWARD HARRISON, OF HORNCASTLE, AND THE LINCOLNSHIRE MEDICAL BENEVOLENT SOCIETY*

The year 1954 marks the 150th anniversary of the foundation of the Lincolnshire Medical Benevolent Society. The society owes its origin to the indefatigable zeal and crusading spirit of a pioneer medical reformer, Dr. Edward Harrison, of Horncastle, Lincolnshire. Born in Bankfield, Lancashire, in 1766, of an old Lancashire family, he qualified in Edinburgh, and practised medicine for many years in Horncastle (later in London), and became an outstanding figure in the history of medicine, whose fame extended far beyond the boundaries of the county.

In 1820 he published a treatise† on "Remarks upon the different appearances of the back, breast, and ribs, in persons affected with spinal disease, etc." He wrote various other works during his lifetime, and his main interest was clearly in orthopaedics. He survived until his 79th year—no mean achievement for the times—and the medical tradition of the family was carried on by his nephew, Richard Harrison.

Edward Harrison's interests were not by any means wholly confined to medical reform and orthopaedic surgery, for he carried on a busy general practice, and was one of the honorary physicians of the Horncastle Dispensary, founded in 1789. Horncastle in those days was a thriving and important country market town, as readers of George Borrow will recall.

In addition to these other activities Dr. Harrison maintained a large house in West Street, Horncastle (still used as a doctor's residence), and, finding it unnecessarily commodious for his needs, he conducted there a small private mental asylum. He seems to have been a man not only of catholic medical interests but also of indefatigable energy. In the opening years of the nineteenth century he devoted much of his time and characteristic zeal to a crusade designed to raise the status of the medical profession, which had fallen to a low ebb, particularly in the remoter provinces.

*Extract from an address delivered by Dr. Allan H. Briggs, Mayor of Lincoln, at the 150th Anniversary celebrations.

†His name thus became associated with Harrison's grooves or sulcus, but it is now contended (see Naish, J., and Wallis, M. R. E., *British Medical Journal*, 1948, 1, 541) that the grooves were first described by Dr. Edwin Harrison (1779-1847), physician to the St. Marylebone Infirmary.

Quackery was rife; the qualified practitioner earned a precarious living in competition with a host of accoucheurs, apothecaries, druggists, and medical pretenders of every kind; there were no adequate standards for such remedies as were available, and medicines were unreliable and frequently adulterated. He wrote, "It appears from authentic documents that the regular faculty do not constitute one-ninth of the practitioners now occupying physic for emolument in the County of Lincoln, and that besides the errors and unintentional injuries which are daily committed by ignorant quacks upon their too credulous patients there is great reason to fear that some of them acquire large sums of money and do irreparable mischief to many pregnant women and their harmless offspring by trying to relieve the former from the natural consequences of their indiscreet and unauthorized familiarities."

The early records of the Lincolnshire Medical Benevolent Society were to show all too clearly what a laborious and hazardous occupation the practice of medicine and surgery was in those days of primitive transport, ignorance, and penury. The chance of accident or disease might quickly reduce the most successful doctor to distress and want; there was often little margin.

Dr. Harrison set about tackling these problems energetically: he determined upon the foundation of a benevolent society. He prepared a comprehensive set of rules and an "Address to the Public," which he circulated among those likely to be interested, and the first recorded meeting of the society (at which he was not unnaturally elected president) took place at the Bull Inn, Horncastle, on September 21, 1804. Some twenty founder members attended, and the preparatory work had been so well done that a substantial sum of money (£53 13s.) was already in hand. To overcome the formidable travelling difficulties the county was divided up into districts under the charge of vice-presidents, and this valuable feature of the society is still preserved, although sound finance and improving communications have rendered it necessary for the charitable work of the society to be transacted through an annual anniversary meeting, which has travelled round the country from year to year for the past century and a half.

Although the primary function of the society was benevolent Dr. Harrison had other ideas in mind: he saw in it an invaluable means of furthering his ambitions for medical reform, and also the makings of a professional society where members might hear and read dissertations on medical topics.

These multiple objects proved too much to achieve at a single stroke: medical reform was to come—the Anatomy Act of 1832, the Registration Act of 1838, and the Public Health Act of 1848. How far local agitation in Lincolnshire (and elsewhere) contributed to these measures is difficult to estimate, but the indirect influence may well have been considerable. Medical reform thus gradually dropped out of the society's affairs, and the formation of the British Medical Association (1832) and the Lincoln Medical Society (1864) covered many other purposes which Dr. Harrison had sought to serve before his time.

The benevolent functions of the society have, however, gone on from strength to strength, surviving the changes and chances of succeeding generations: the old minute-book reflects the passing of the horse chaise as a means of transport and the introduction of the railway; it saw the introduction of the penny post; it was begun before Waterloo and goes on after two world wars without interruption. Benefactions in ever-increasing volume have been a regular feature of the anniversary meetings, and the annual disbursement from subscriptions and investment income average over £300. During the first century of its life the society dispensed over £7,000, and, during the last fifty years, over £10,000 more.

This long tale of generous assistance to impoverished or disabled medical men, and to their orphans, widows, and dependants, forms a fine and impressive memorial to a great doctor, pioneer reformer, and medical visionary born before his time: Dr. Edward Harrison, of Horncastle.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Post-maturity and Breech Presentation

SIR.—Until recently post-maturity was one of the most controversial subjects in obstetrics. The majority of obstetricians will now agree that this controversy ended when James Walker¹ published his work in 1954. He showed that the oxygenating capacity of the placenta rapidly diminishes after the 40th week; by the 43rd week there is hardly any reserve in the oxygen supply to the foetus. It is therefore much easier to kill the foetus at 43 weeks. He also produced clinical evidence that the still-birth rate at Aberdeen was far greater when the foetus was post-mature, and he quoted Gibberd's similar findings at Queen Charlotte's. In both cases all deaths where disproportion or some other factor contributed to the result were excluded. Unfortunately, this valuable work has not yet reached the more widely read medical journals. Furthermore, when this dangerous complication coincides with a breech presentation, the risk to the foetus is indeed very considerable. The danger of intracranial injury from too rapid delivery is continually being stressed, and quite rightly so. The danger of too slow delivery must be almost as great when the placenta has diminished in efficiency and the oxygen supply to the foetus is only just enough to maintain its life before the delivery of the trunk. Following the delivery of the trunk, when the oxygen supply must be almost completely cut off, such a foetus cannot possibly survive if there is a delay of minutes.

There have, of course, been many obstetricians in the past who appreciated the danger of post-maturity. Yet until a year ago no authoritative textbook was prepared to admit that post-maturity constituted a danger in itself. There would appear to be two reasons for this. First, most obstetricians have at some time or another seen a satisfactory result despite an abnormally long gestation. Some placentae, like human beings, are capable of functioning efficiently well beyond the average allotted span. Secondly, there is a tendency to reason that, when a placenta is so degenerate that it cannot maintain the life of the foetus, neither will it produce an adequate amount of the hormones which are necessary for pregnancy to continue. The foetus is thus saved from death by the mother going into labour and expelling it from the uterus. This quite likely is true in the majority of cases, but not in all. It must be remembered that the maintenance of foetal life is dependent on a sufficiently large area where foetal and maternal blood are in intimate relationship, whereas an adequate production of hormones is dependent on a sufficient number of secreting cells. It is obvious, therefore, that occasionally extensive infarction may result in an insufficient area where foetal and maternal blood are in intimate contact for satisfactory oxygenation to take place and yet the production of hormones is sufficient to continue pregnancy.

This communication is prompted by a recent case where the writer was called to deliver a breech in a primigravida aged 35, and she was three weeks post-mature. The month was exposed within five minutes of the birth of the breech, and yet the foetus made no attempt to breathe. I am certain that this foetus died of asphyxia. The management of breech deliveries, more than most obstetric operations, depends on the skill of the attendant: the object of this letter is merely to stress the added risk to the foetus when the pregnancy is also post-mature.—I am, etc..

E. ROBERT REES.

London, N.W.1.

REFERENCE

¹ *J. Obstet. Gynaec. Brit. Emp.*, 1954, 61, 162.

Anaesthesia and Cortisone Therapy

SIR,—The introduction of cortisone and related drugs into general medical practice has brought with it further hazards for the anaesthetist. It may not be generally known that patients on cortisone therapy are sensitive to anaesthetic agents; this is particularly true of opiates and barbiturates.¹ Moreover, such patients tolerate blood loss badly, and Fraser *et al.*² have reported the death of a patient from post-operative shock in spite of normally adequate therapy.

It has been stated³ that all patients who have received cortisone therapy within six months prior to the proposed date of operation require special preparation. We would endorse that view, and would suggest that all patients should be asked specifically about cortisone therapy and, where indicated, the necessary preparations carried out. The pre-operative management of these patients has already been adequately described by Pender.³—We are, etc.,

F. G. WOOD-SMITH,
J. P. PAYNE.

London, W.12.

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- 2 J. *Am. med. Ass.*, 1952, 149, 1542.
- 3 Pender, J. W., *Wis. med. J.*, 1954, 53, 215.

Standards of Fitness of Commercial Vehicle Drivers

SIR,—Dr. Josefine Webb (*Journal*, February 26, p. 515) draws attention to the need for improvement in certain medical aspects of the present system of granting driving licences to professional drivers. Some months ago, however, the Association made recommendations to the Ministry of Transport and Civil Aviation for this purpose.¹

Dr. Webb has fallen into the trap of failing to compare like with like. The medical reasons for rejection of men for military service do not necessarily bear any relation to their safety as drivers; severe flat feet may indeed be a good reason for driving. It is also possible that many of the drivers whose papers were examined by Dr. Webb had declared their defects on the application form and had nevertheless been issued with a licence. The responsibility for issuing licences lies not with the applicant but with the licensing authority. The applicant's responsibility is limited to a declaration (under severe penalty) of his defects. Over three million driving licences of different kinds are issued annually, and until some new method emerges of taking medical histories on a large scale the statutory declaration will have to serve.

The pride of many public service drivers in their safe driving awards is fully justified. I wonder how many of us could maintain the accident-free record which many of these men do for 20 or more years of several hours' driving a day?—I am, etc.,

LESLIE NORMAN.

London, N.W.1.

REFERENCE

- 1 *British Medical Journal Supplement*, 1954, 1, 117.

Septic Injuries in Industry

SIR,—Your leading article (*Journal*, March 5, p. 591) on septic injuries in industry refers to work done in 1949 and 1952 on the incidence of penicillin-resistant forms of *Staphylococcus aureus* in infections of the finger, and remarks that "more recent bacteriological studies are not available."

It may help if I refer to a letter written to one of your contemporaries last December.¹ In it I reported that the casualty department at Sunderland Royal Infirmary has carried out a sample "bacteriological survey" of this problem every year since 1950. As recently as the date of that letter we have been able to confirm that there is no significant increase in penicillin resistance in these infections, provided that the examination is made on closed lesions at the time pus is first obtainable. Discharging lesions show a higher incidence of penicillin-resistant forms than closed lesions, but they show also a higher incidence of gram-negative organisms, so that it is probable that many

antibiotic-resistant staphylococci in discharging lesions are the result of secondary infection in medical or nursing clinics.²

There is, I believe, always a certain incidence of resistant forms in any series of staphylococcal infections, and it is possible that there always has been. This incidence is somewhere between 5% and 10%.³ In this area, at least, we have no evidence that it has materially increased in the last five years. The degree of resistance is usually not very high (0.16 to 0.4 U. per ml. *in vitro*), and these cases also almost always respond to a very short course of penicillin administered in large doses, combined with surgical intervention as soon as there is an indication for it.

Your leading article very rightly emphasizes the cost to individuals and to the community of this type of minor sepsis. We estimated that the annual cost to the Exchequer in sickness and injury benefit of all cases attending casualty departments is (by pure coincidence) about £1 per new case annually. Our own department sees about 15,000 cases, and a rough estimate of the cost of disability comes to £15,000. To reduce this disability by 10% repays the expense of enlisting experienced skill in treatment, and in many clinics it can be reduced by much more than 10%.—I am, etc.,

Dublin.

THOMAS G. LOWDEN.

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- 2 *ibid.*, 1953, 1, 118.
- 3 Summers, G. A. C., *ibid.*, 1952, 1, 135.

Sudden Death in Labour

SIR,—While the cause of death in the case described by Dr. Patricia E. Campbell (*Journal*, January 8, p. 87) may have been due to amniotic embolism or, as Mr. R. C. Bell suggests (*Journal*, February 19, p. 480), accidental intravenous injection of the procaine penicillin, there seems to be ample evidence that penicillin itself can cause anaphylactic shock.

In a review of eight cases of anaphylaxis and death following shortly after the administration of penicillin, Rosenthal¹ concluded that, because of the diversity of the types of penicillin used in these cases, no one type of penicillin could be regarded as the sensitizing antigen, and that penicillin *per se* must be regarded as the antigen.—I am, etc.,

Glasgow, C.2.

W. O. THOMSON.

REFERENCE

- 1 *N.Y. St. J. Med.*, 1954, 54, 1485.

Anaphylaxis After Procaine Penicillin

SIR,—Dr. Patricia E. Campbell reported a fatal case of anaphylaxis following an injection of procaine penicillin (*Journal*, January 8, p. 87) and Mr. R. C. Bell queried the cause of death in this case in a letter (*Journal*, February 19, p. 480). This correspondence prompts me to report the following case, which, although fortunately not fatal, leaves no doubt that procaine penicillin can produce alarming anaphylactic reactions.

The patient, an obese woman aged 42, had a history of rheumatism and recurrent attacks of bronchitis. She had a moderate degree of mitral stenosis, fairly well compensated. In August, 1953, she was admitted to hospital for bronchitis with cardiac strain. She was given a course of crystalline penicillin with good results. In October, 1954, she developed bronchitis and was treated at home with six daily injections of "distaquaine" suspension (300,000 units daily), again with good results. On February 2, 1955, the patient was seen at home again suffering from bronchitis with pyrexia: heart regular. She was given distaquaine suspension 300,000 units intramuscularly, and the usual precaution was taken of attempting to withdraw the piston to ensure that the needle was not in a vein. About 10 minutes later the doctor was asked to call at once as it was thought that the patient had died.

On arrival the patient was found to be in an alarming condition. She lay flat on her back, cyanotic, covered in sweat, and gasping for breath. Her pulse was not perceptible at the wrist, but auscultation of the heart revealed marked tachycardia with very faint sounds. The end of the bed was raised and an intramuscular injection of adrenaline hydrochloride 1/1,000 was

commenced, 2 ml. being administered over a period of 15 minutes. Gradually her condition improved so that she could be propped up in a sitting position, and at this point auscultation of the chest revealed sibilant rhonchi and moist rales throughout both lung fields. The patient was by this time able to drink some hot sweet tea which had been optimistically ordered up at the commencement of the adrenaline therapy. She complained of substernal tightness plus difficulty in breathing. Two hours later the patient's colour had greatly improved, her pulse was of good volume, and there was less evidence of pulmonary congestion. A few days later she was quite well and her bronchitis had cleared up.

The rapid onset of the reaction following the injection, with the collapse, cyanosis, sweating, and gasping for breath, is surely typical of anaphylactic shock. Accidental intravenous injection can be ruled out in this case. Whether the reaction was caused by the penicillin or by the procaine could not be determined, as the patient was unwilling to be subjected to an intradermal injection of 0.1 ml. of 1% procaine hydrochloride solution. Her reluctance is quite understandable considering her recent experience.—I am, etc.,

Peterborough.

DAVID C. WRIGHT.

Whither Natural Childbirth?

SIR,—Dr. Constance L. Beynon, in her letter "Whither Natural Childbirth?" (*Journal*, February 19, p. 475), seeks to halt the trend towards wider provision of preparation for childbirth. She states that "to any other generation" special training for childbearing "might seem absurd"—an argument which will carry little weight when we recall the attitude of other generations to analgesia and asepsis in obstetrics. Perhaps the term "natural childbirth" contributes to the confusion by implying something we cannot hope or wish to recapture as civilized, social beings. For civilized people, however, "painless childbirth" would seem an appropriate aim, although not always to be realized at present. This phase, however, appears to arouse Dr. Beynon's wrath, for she apparently hopes to wean women away from demanding it. As she seems to deny, by implication, the possibility of achieving painless childbirth, I feel justified in quoting my own extremely limited experience in general-practitioner domiciliary obstetrics, without claiming any special knowledge and recognizing that so small an experience presents nothing that a statistician need bother to read, let alone disprove.

It is my practice to give my patients a brief series of talks in the latter months of pregnancy, the total time taken being a little over an hour. In them, I explain the course and sensations of labour, encourage an attitude of interest and participation, rather than of resignation, and give instruction in the art of conscious physical relaxation and of rhythmical breathing for the first stage, and in deep breath-holding for the second stage. Nobody, of course, attempts to give a "balanced grasp of midwifery" in such classes, and it is absurd to suggest that they do. Once labour is well established, I remain with the mothers and assist them to apply what they have learnt. Although working in all sorts of homes and with midwives giving varying (but increasing) co-operation, I feel justified in promising mothers treated in this way that their pain will be diminished considerably in nearly all cases and entirely abolished in some.

The experience of the last 12 mothers whom I have prepared and delivered is summarized as follows. Three cases (1 primipara, 2 multiparae): no pain at any stage. Three cases (all multiparae): moderate pain for less than 10 minutes at the end of the first stage. Four cases (all multiparae): moderate pain for up to half an hour, one taking gas-and-air, another wishing to for one very painful contraction, but it was not available. One multipara had backache for about one hour, but did not want gas-and-air. One primipara, while maintaining excellent control and relaxation, required pethidine and gas-and-air for the latter three hours of the first stage.

While this method of preparation and conduct of labour undoubtedly does aid morale (and I cannot see that the maintenance of morale should be regarded as extravagance) it is not merely a case of instilling fortitude; rather it is a means of suppressing pain so that powerful uterine contractions, while still causing a powerful sensation, are not painful. As regards the many experts who find no influence on length of labour, complication rates, etc., I believe that one cause for this lies in the gulf which usually

separates the antenatal class from the labour ward. It is still rare for labour ward staff to have the time, interest, or knowledge to assist mothers to apply their methods, and few mothers are able to retain control without encouragement. The experience of the Paris polyclinic "Pierre Rouquès," where great stress is laid on labour ward support, has been definite in finding a reduced duration of labour, a reduced complication rate, and improved neonatal health.¹⁻⁴ In a recent paper on methylpentynol in labour, Bourne⁵ showed how this drug allays anxiety and facilitates relaxation, and comments that labour in these cases is often speeded up. This statement has caused no adverse comment; why, then, should we be surprised if the alleviation of anxiety by explanation and assistance, combined with instruction in relaxation (a more physiological approach), has similar effects?

As regards the second stage of labour, it is true that bearing down, like defaecation, is a reflex act. Unlike defaecation, however, this reflex is often distorted by fear, panic, fatigue, and the influence of drugs. Antenatal explanation and training in deep breath-holding ensures that when this second stage starts the mother bears down more quickly and more efficiently, which, in turn, ensures freedom from pain and normal progress.

Dr. Beynon is concerned at the sums of public money being spent on antenatal classes. Questioning hospital patients leaves little doubt that the consumer in this case appreciates the efforts made. I believe there may be a case for simplifying and shortening the preparation, and I am certain that the full effect of preparation on the course of labour will only be achieved when labour ward management is based on the principles of the classes. Meanwhile, I hope no false consideration of economy will halt a development which I believe to be both humanely and medically desirable.—I am, etc.,

London, N.W.5.

ANTHONY RYLE.

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- 2 *Gaz. méd. France*, 1952, 59, 1445.
- 3 *Revue de la Nouvelle Médecine*, 1954, No. 3, special number.
- 4 Ryle, A., *Med. Wld (Lond.)*, 1954, 80, 36.
- 5 Bourne, G., *Lancet*, 1954, 2, 522.

The National Formulary, 1955

SIR,—It is clear that the criticism of certain aspects of the *National Formulary* 1955 voiced in your leading article (*Journal*, February 12, p. 402) was misdirected. The writer ascribes to the *Formulary* the function of helping practitioners to develop "sensible, honest, logical, and economical prescribing habits." Dr. W. N. Leak, writing with authority as a member of the joint committee which revised the *Formulary*, deplores this attitude in the *British Medical Journal*, and is at pains to point out in his admirably frank letter (*Journal*, February 26, p. 541) that no such consideration guided the members of the committee in their task (the strongest corroborative evidence for this view is surely to be found in the arrangement of the book). Instead, it seems that the committee's aim was to produce a documentary report on the pattern of prescribing observed in this country during the first half of the present century. They evidently regard the gratitude of the social historians of the future as a more fitting reward for their labours than the ephemeral applause of their contemporaries. The practitioners who confided to Dr. Leak their fear that the *Formulary* "is in some way an attempt to direct their prescribing" had no reason to be apprehensive.

Dr. Leak does well to remind us of the classical experiments of Chassar Moir, which vindicated the ergot alkaloids; and he has the intellectual courage to deduce from this episode that no reliance is to be placed on contemporary opinion of the therapeutic merits of drugs. His defence of the readmission to the *National Formulary* of mist, ammon. et seneg. (which he translates for the *in-illuminati* as ammonia and senega mixture) is not based on such uncertain ground, but on the incontrovertible evidence supplied by the experience of "three generations of doctors and patients." The most hardened sceptic who could do no better than cite the contrary experience of two generations of academic doctors would clearly be outmaneuvered.

Dr. Leak takes a cautious view of the modern tendency to prescribe tablets, but is tantalizingly vague about the nature of the "overpowering burden" which this places on the

prescriber. Can he mean that, tablets being more portable than mixtures, the practitioner may be tempted to carry them in his bag? Or does he refer to the strain which is imposed on the memory by "tab. digoxin," as compared with, say, "mist. pot. brom. et valerian."? The "added expense to the State" which he mentions as a consequence of the practice is also hard to understand, since the dispensing fee charged for tablets is approximately half that for liquid preparations.

None will dispute Dr. Leak's contention that the use of bottles of medicine allows "flexible control" of dosage. The range of individual variation in volumetric capacity of domestic measures like "teaspoonfuls" is so wide that dosage is not so much "flexible" as speculative. It is readily conceded that the therapeutic effect of mist, ammon. et seneg. is largely independent of the size of dose administered. But would Dr. Leak agree that certain other drugs demand accurate rather than "flexible" dosage? I offer for his consideration digitalis, which has been well spoken of by at least eight generations of doctors and patients.—I am, etc.,

Edinburgh, 3.

T. W. G. KINNEAR.

Encephalo-trigeminal Angiomatosis

SIR.—Of all the names suggested for the Sturge-Weber-Kalischer syndrome the best up to date seems to me that which I have lately heard of—namely, the "encephalo-trigeminal angiomatosis." There can, I think, be no doubt that both the encephalic and the facial constituents of the syndrome belong to the class of haemangiectatic hamartomatous errors of tissue development roughly grouped together as haemangiectatic naevi. But the area of face involved is not always limited to the trigeminal region of one side. The haemangiectatic abnormality of development may sometimes, in various degree, involve both sides of the face and indeed portions of both sides of the body.

In spite of the coexistence of various concomitant features in most typical cases, such as congenital glaucoma on the side of the encephalic lesion, and hemiparesis of the limbs of the opposite side of the body, I think that encephalo-trigeminal angiomatosis, or better still encephalo-facial haemangiomas, is the best term for the developmental syndrome in question.—I am, etc.,

London, N.W.1.

F. PARKES WEBER.

Positive-pressure Respiration in Bulbo-spinal Poliomyelitis

SIR.—The interesting and detailed article by Drs. J. R. Harries and W. E. Lawes (*Journal*, February 19, p. 448) prompts me to record four similar cases treated by intermittent positive-pressure respiration (I.P.P.R.) in the poliomyelitis unit of the Rush Green Hospital during the past year. They were a girl of 11 years who recovered, and three males, aged 6, 24, and 28 years, all of whom died. In all four cases tracheotomy was performed under local anaesthesia and I.P.P.R. was carried on with the Beavor (mark I) respirator. Despite the obvious shortcomings of this machine—for example, the fixed rate and indifferent pressure control—it proved simple and reliable in use and gave efficient ventilation with only minor signs of CO₂ disturbance, as judged by clinical, biochemical, and fluoroscopic evidence. The cuffed tubes used were of a modified Machray pattern, for which the British Oxygen Company made me a special rubber flange fitting tightly over the tube and corresponding in shape to the "body" of an ordinary Parker or Cubley tracheotomy tube. This was secured round the neck by tapes in the ordinary way, so preventing the tube from slipping down either bronchus.

The patient who recovered was able to dispense with the tracheotomy tube after 11 days, and was finally discharged with only slight palatal weakness. The course of the illness in all three fatal cases was very similar—dramatic improvement after tracheotomy, gradual and then rapid rise of temperature over a period of three or four days to 106° or 107° F. (41.1° or 41.7° C.), followed by cyanosis, coma,

and circulatory failure which was unaffected by noradrenaline drip or other anti-shock measures. I cannot agree with Drs. Harries and Lawes that general anaesthesia is best for tracheotomy in these patients. Certainly it gives the surgeon excellent operating conditions, but there must be more than an element of risk in giving thiopentone and a short-acting relaxant to such patients who, as the authors say, are often in poor condition. Certainly we have met with no major difficulty when using local anaesthesia, and I believe this to be the safest agent.

Chlorpromazine has now been shown to increase the patient's oxygen need slightly. Moreover, it can produce prolonged hypotension, and, despite its ability to give some protection against traumatic shock, different in origin from the so-called "shock" found in poliomyelitis, I think it is more likely to do harm than good. I was glad to see the authors' insistence on an adequate, trained staff. Only those who have treated such cases can appreciate fully the nursing demands. If we should be called upon to treat any considerable number of patients needing I.P.P.R. simultaneously, this would be a major problem.

To sum up, I would say that I.P.P.R. gives dramatic relief for a time, and that it is usually easy to maintain adequate ventilation and CO₂ control, but that the outcome of the illness depends upon the extent to which the virus invades the medulla, pons, and basal ganglia. In two adults in whom necropsy was carried out, these were found to be extensively involved. This process is at present beyond our control.—I am, etc.,

Romford, Essex.

E. JAMES.

Complication of Epistaxis

SIR.—I was fortunate in witnessing the result of a spontaneous remission of a possible fatal complication occurring in a case of severe epistaxis.

An atheromatous lady of some 63 years with a typical blood pressure (170/75) developed a minor nose-bleed which became more severe as the day wore on. In spite of some temporary remissions the bleeding continued on the following day, when, in the early afternoon, I was called to deal with the haemorrhage. By the aid of digital pressure followed by plugging with an adrenaline-soaked swab the epistaxis was finally brought under control. After six hours, however, I was again called and found the patient had again developed a brisk epistaxis. She volunteered the information that she had suddenly experienced severe dyspnoea followed by a violent coughing attack which terminated in the expulsion of an object which she showed to me. It was a perfect blood cast of the whole of one main bronchus and its first division, which must have been some 6–8 in. (15.2–20.3 cm.) in length.—I am, etc.,

Woodford Green, Essex.

J. CRAUSE.

Making the Cap Fit

SIR.—During my work in several family planning clinics the problem of the patient who fails to return has been much on my mind. Sometimes one of these women returns after an absence of several years. During this time she has discontinued using her cap and has gone back to the method of coitus interruptus, with the result that she has had one or more unplanned pregnancies. These "defaulters" are nearly always the women from the poorer social strata: the very women who need our help most. As children they have been exposed to too much lack of privacy. Such women grow up with an intense prudishness and guilt about all sexual matters.

The middle-class woman will ask freely about her sexual problems and be willing to discuss them, and will demand and expect a contraceptive method which will be completely comfortable and enable her to enjoy her sexual intercourse to the full; her poorer sister, on the other hand, will have the greatest difficulty in broaching the matter at all, and will feel that it is perhaps even wrong to ask for a contraceptive that will help enjoyment of a "guilty" pleasure. If she experiences discomfort with her cap or

dislikes the paste or has some difficulty at all with the organizing of the contraceptive technique, she feels that this is her lot in life and will not complain or ask for help easily.

At a clinic we may be somewhat divorced from the reality of our patient's living conditions. It may be as well to remember that there is probably no bathroom or even inside lavatory, and that the whole family may share one room, and perhaps the cap can only be inserted in bed in the dark, or perhaps put in hurriedly hours beforehand when there may be just a moment of privacy. Where a doctor and nurse habitually work together it should be possible for them to co-operate in being imaginative in their teaching and to find out what each individual patient's difficulties and dislikes are, and to make the method of instruction more flexible to suit the patient's needs.—I am, etc.,

London, N.W.1.

ROSALIE TAYLOR.

Benzpyrene and Human Carcinogenesis

SIR.—In your admirable summary of the status of the carcinogens possibly concerned in the origin of bronchogenic carcinoma (*Journal*, November 20, 1954, p. 1213), the statement is made that "there is no doubt that benzpyrene is a dangerous carcinogen to man and animals." Although there is good evidence that certain coal tars are carcinogens to the human skin, and that such tars contain benzpyrene, a substance inducing tumours in certain animal species, there is still no proof that benzpyrene is the responsible agent in human carcinogenesis. Tar contains other carcinogens, as yet unidentified, that induce tumours in the skin of the rabbit and not the mouse.¹ The atmospheric dusts, also suggested in the origin of bronchogenic carcinoma, contain some benzpyrene in certain localities, but also contain other unidentified carcinogens active in mice.² Assuming benzpyrene to be active in man and using this assumption to make quantitative deduction may prove to be somewhat shortsighted, and in my view is likely to hinder a solution of the problem. There is no doubt that there are many more carcinogens yet to be identified, a procedure fraught with difficulties, but it will only be possible to make any confident prediction after this basic information has been gathered.—I am, etc.,

Chicago, U.S.A.

PHILIPPE SHUBIK.

REFERENCES

- ¹ Berenblum, I., and Schoental, R. *Brit. J. Cancer*, 1947, 1, 157.
- ² Kotin, P., et al., *Arch. Industr. Hyg.*, 1954, 9, 153.

Surgical Treatment of Carcinoma of the Lung

SIR.—Mr. T. Holmes Sellors (*Journal*, February 19, p. 445) is to be congratulated upon the five years' survival rate in his patients subjected to resection. However, it would be interesting to know what proportion these formed of the total number he saw with a view to surgical treatment. In my own experience the possibility of surgery is pathetically poor, even when first seen by the physician. Post-operative pain and discomfort are too frequently comparable with that following radiotherapy.

It is essential for the profession to see this problem in perspective. During the years 1940–53 Mr. Sellors and his colleagues, after tremendous efforts, have 140 patients surviving treatment at the end of three years. It is probable that, in England and Wales, 1,500 people had their lives similarly prolonged. Meanwhile, 132,000 had been certified as dying of this cancer. The yearly toll mounts steadily. In 1953 it was 15,100. Dr. Doll and other statisticians assure us that this figure will reach 25,000 within the next fifteen years, if present trends and habits continue. This means that more than 1,000,000 of our patients and our profession will die before the end of the century.

The evidence from many countries confirms the findings of Bradford Hill and Doll that tobacco consumption, especially in the form of cigarettes, is the main factor in the aetiology of this cancer. The Ministry of Health

attempts to shroud this fact in mystery. The Chancellor of the Exchequer asks that the population continue to smoke, and meanwhile there is joy in the City over increased dividends from the sale of this carcinogen. Surely, Sir, it is time we asked the Minister of Health constantly to inform the population that this toll of death is preventable. No narcotic has ever caused such widespread havoc as tobacco now does throughout the Western world. The later days of the patient dying of cancer of the lung are tragic; the later years of the chronic bronchitic clutching his cigarette are pathetic. By our example and by precept we could raise preventive medicine to the place it must occupy if much lung disease is to be eradicated.—I am, etc.,

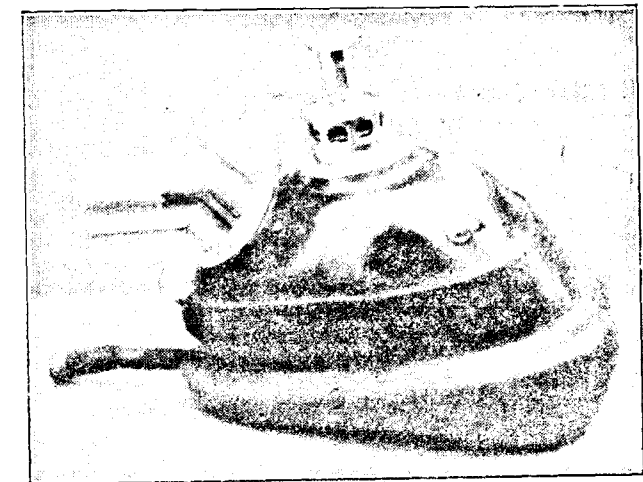
London, N.W.10.

HORACE JOULES.

Salt's Valve

SIR.—I would like to write to you about the combination of Salt's valve with Langton Hewer's thyroid mask which we use at the General Hospital, Rochford.

Salt's valve is used by some anaesthetists for assisted or controlled breathing by the semi-closed method. Some find it difficult, especially when they have to keep the chin up and at the same time press upon the top of the valve with the same hand.



This can be overcome by fixing the top of Salt's valve into the hole made in the Langton Hewer's mask as shown in the figure. I would like to thank Mr. R. F. Cooper, our operating theatre technician, who made it for me and arranged for the photograph.—I am, etc.,

Rochford, Essex.

P. M. MEHTA.

Chicken-pox Quarantine

SIR.—Is it really necessary to exclude children with chicken-pox from school? Every year tens of thousands of children each miss several weeks' school on account of this trivial disease, the mortality from which is virtually nil and which causes less general disturbance in a child than does the common cold. Despite the exclusion of cases from school, all but a very small number of children contract the disease before leaving. The only conceivable reason for continuing to isolate cases is the possibility of confusion with smallpox, but this is really a remote likelihood unless a case of adult smallpox has already been reported in the neighbourhood. Naturally those children who are feverish for a day or two at the onset of the disease could be kept at home until they felt better, but after this their mothers could be spared the joys of trying to keep a perfectly fit child amused all day for several weeks on end. The public would not need much educating to this new attitude; most mothers already know that the disease is a triviality and many do not bother to call the doctor if they know that there is chicken-pox about.—I am, etc.,

Margate.

M. CURWEN.

Mercury and Pink Disease

SIR.—In the recent case report in your medico-legal column (*Journal*, March 5, p. 610) it is twice stated that mercury was the cause not only of the death but of the disease. Is it really true that it is now an accepted fact that pink disease is caused by ingestion of mercury?

In my late practice I had three cases of pink disease in 12 years. In two of these there was ample evidence that no mercury had ever been taken. In the third, which died, it had undoubtedly been taken. The mothers of the children who survived were members of my mothers' club and their evidence that no teething powders were given would be quite reliable. On no occasion did I or my assistant prescribe mercury in these cases. I therefore maintain that death from pink disease may be due to mercurial poisoning, but that the disease itself has another aetiology. The symptoms described in the case you quote for which the mercury was given suggest to me that the child already had pink disease.—I am, etc.,

Cockermouth.

F. CHARLOTTE NAISH.

SIR.—A third inquest has been held on a child in Stoke-on-Trent who died of acrodynia associated with excessive ingestion of mercury (*Journal*, March 5, p. 610). At the second inquest in December, 1953, the manufacturers of an extensively used powder reported that mercury was being withdrawn from the formula of their products (*Journal*, December 12, 1953, p. 1330). This action has already reduced the incidence of the disease in these areas. Since January 1, 1954, however, ten cases of acrodynia (two fatal) and two cases of mercury nephrosis have been diagnosed at the major hospitals of Stoke-on-Trent and Shrewsbury. In every case there has been a history of the administration of mercury and the level of urinary mercury (estimated by Dr. E. C. Butterworth) has been high. Four patients have received grey powders on medical and one on a chemist's advice. In one case inunction of a mercury ointment was added for the skin condition. The remaining seven patients took mercury-containing teething powders.

We wish to draw attention to the fact that many of the old type of powders are still being offered for sale by retail shopkeepers. We are also concerned to find that doctors continue to prescribe a drug of dubious therapeutic value, but with known toxic properties to small infants. During 1954 the Poisons Board refused to include inorganic salts of mercury in Schedule 1 of the Poisons List. How many deaths will be required to reverse that decision?—We are, etc.,

J. G. DATHAN,
Stoke-on-Trent,
J. C. MACAULAY,
Shrewsbury.

Disk Lesions and Low Backache

SIR.—The extensive correspondence which has appeared during the past two months on the above subject has shown that there is a singular lack of unanimity in the profession in regard to the diagnosis and treatment of low back pain. One opinion it may be allowed to have established—that is, that prolapsed disk material is not the only cause of backache and the like.

I have already made some observations on the subject in a letter published in your columns (*Journal*, January 9, 1954, p. 97). I do not propose to enlarge upon them, but would like to repeat that the community has not benefited from the discovery of the association of disk lesions and sciatica as much as was hoped. Many of your correspondents have suggested that the terms lumbago and fibrositis, if not scientific, do represent recognizable clinical states. I am inclined to think it would be a good thing if we could agree to let these terms persist until we have gained a clearer view of the pathology of the conditions in question. We might then hope that the general practitioner would treat acute cases on old-fashioned lines and refrain from suspecting lesions of the disk unless there were evidence of major nerve involvement or an unusual frequency of recurrence. Such a practice would at least prevent the undesir-

able inculcation in the patient's mind that there was something radically wrong with his spine. It would also contribute to a reduction in the crowding of hard-worked orthopaedic clinics and ease the pressure on busy departments of radiology and physical medicine.—I am, etc.,

Faversham, Kent.

MAX PAGE.

SIR.—May I be allowed to join in the controversy between those in favour of manipulation in the treatment of backache and those who are not? There are so many different clinical syndromes in backache, all of which have their typical signs and symptoms, and which often pass through different phases, but for each of them the treatment of choice may be totally different. All of these conditions may have protective muscle spasm, which may denote joint and disk changes, as one of their predominant signs. Charnley¹ has shown how a disk undergoes degeneration, and this suggests that Cyriax's² conception of a disk slipping in and out may be true only in a limited number of cases. Recent articles go to prove that pain in the shoulder and arm are often produced by root cuff fibrosis³ and arthritis of the joints of Luschka.⁴ Unless we see the structures involved, as we do at operation, the actual pathology must frequently be one of surmise.

However, I believe, as Cyriax does, in gentle manipulation of all painful back conditions, but with certain provisos. In certain cases rest and other forms of treatment must be instituted with the manipulation. Manipulation is not considered in an established case of true sciatica with a positive Laségue sign, absent reflexes, and impaired sensation. In a case of this type it may cause the disk to prolapse further, resulting in a cauda equina lesion. In manipulating I never allow flexion of the spine beyond a few degrees, as a flexion strain tends to force a degenerated disk backwards towards the spinal cord. Also great care is taken in hyperextension, as a piece of loose disk may be impinging on the posterior edge of two adjacent vertebrae, with the result that it may be squeezed out by this manoeuvre towards the spinal cord.

That a patient may become symptom-free given a particular treatment does not necessarily signify that the right treatment has been given. For example, a young patient may recover from an attack of low back pain for which manipulation has been given, but his condition may keep on recurring. It may be that the best results would have been obtained by a period of complete rest in bed followed by periods first in a plaster cast, then in a McKee brace, and finally in a low back belt.

The non-manipulators would stress these points, but I would point out to them that often a gentle manipulation, especially if combined with physiotherapy and injections, frequently makes the patient symptom-free in one session. Besides, I believe that, unless manipulation is given, the joint movements, both voluntary and involuntary, are not restored to their normal range. For ordinary use movements require to be only 80% of normal, but when strenuous exercise is undertaken they need to be 100%. I believe that this 100% should be achieved wherever possible.

Many overlook the importance of the muscles. I believe that the muscles are affected at three different stages. In the first stage, because of postural strains, the antigravity muscles become tender. Secondly, later, as the result of postural strains, the antigravity muscles which should have been taking the strain fail in their duty, and strain is thrown on the joints which they should be supporting. As the condition of strain persists it causes changes in the joint, and a time comes when the condition produces, either gradually or acutely, a protective muscle spasm of all or of some of the muscles in an endeavour to prevent the joint being used. Thirdly, with the development of osteoarthritis the surrounding muscles undergo definite fibrotic changes.

If a positive attitude is taken by the practitioner, the patient is encouraged to help himself by home treatment, correct posture, how to avoid strain on the back, and the right attitude towards his disability. If the time factor is not important I would agree with the non-manipulators that rest, followed by a course of exercises and support, may be the treatment of choice, but I consider that gentle manipulation combined with rest, physiotherapy, injections, and support, often hasten a recovery, and I maintain support as long as is necessary. On the other hand, if one particular course of treatment, including manipulation, fails to

produce an improvement within a given time a different course is adopted according to the indications, even to immobilization in bed with traction, or plaster cast, or operation.—I am, etc.,

London, W.1.

W. E. TUCKER.

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- ¹ *British Medical Journal*, 1955, 1, 344.
- ² *Ibid.*, 1955, 1, 140.
- ³ Brain, W. R., *Lancet*, 1954, 1, 687.
- ⁴ Cave, A. J., et al., *ibid.*, 1955, 1, 176.

A.C.T.H. and Agranulocytosis

SIR.—Far from being unaware of the use of A.C.T.H. in agranulocytosis as your correspondents suggest (*Journal*, February 12, p. 412), we have used it in a case of chronic neutropenia, and this would have been apparent to Drs. D. G. Wraith and F. Dudley Hart had they read the reference (Hutchison and Alexander, 1954¹) given in our memorandum (*Journal*, January 22, p. 207) to which their letter refers. In that case no effect on granulocyte production was evident in serial examination of both peripheral blood and marrow throughout the period of exhibition of the drug, although in other cases of a similar nature improvement has been recorded.^{2,3}

In acute amidopyrine-induced neutropenia the theoretical indications for the use of A.C.T.H. derive chiefly from the work of Moeschlin and Wagner⁴ and Moeschlin, Meyer, Israels, and Tarr.⁵ These investigators provide evidence that the neutropenia is an immunological phenomenon due to elaboration by the patient of anti-leucocytic antibodies, and that the "maturation arrest" in the marrow is in fact due to exhaustion following excessive peripheral destruction of white cells instead of a direct toxic interference with the production of granular cells as had formerly been thought. A rational case for the use of A.C.T.H. could therefore be presented so long as it was believed that it depressed antibody formation in man; but now even this appears to be in doubt.^{6,7} A.C.T.H. may, of course, be employed empirically or in the hope of reducing the destructiveness of antigen-antibody union in a non-specific way, but the possibility exists, in theory at least, of aggravation of the acute infection in these patients, the most serious risk to which they are exposed. In our case clinical improvement had occurred with antibiotics alone when death took place suddenly from pulmonary embolism, and it is difficult to see how A.C.T.H. could have prevented this.—We are, etc.,

H. E. HUTCHISON,
HUGH CONWAY.

Glasgow, W.1

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- ¹ *Blood*, 1954, 9, 986.
- ² Bichel, J., and Kissmeyer-Nielsen, F., *Acta haemat. (Basel)*, 1951, 6, 65.
- ³ Dameshek, W., personal communication.
- ⁴ *Acta haemat. (Basel)*, 1952, 8, 29.
- ⁵ Fourth Congress European Society of Haematology, September, 1953, Amsterdam.
- ⁶ Havens, W. P., et al., *J. clin. Invest.*, 1951, 30, 647.
- ⁷ Dacie, J. V., *The Haemolytic Anaemias*, 1954, Churchill, London.

Silver Stool Sign

SIR.—It would be unfortunate if the striking condition described as silver or aluminium paint stool were to become associated with any one pathological process whether benign or malignant. In this laboratory I have seen a few watery stools which, when shaken, gave an appearance strongly reminiscent of aluminium paint, but I have seen very many more showing the same sheen or lustre but to a less striking degree. Such appearances have always been associated with the finding of fatty acid crystals in wet films examined microscopically, the number of crystals present varying with the degree of sheen as seen with the naked eye. Fresh or altered blood has not been recorded.

In a fluid stool a swirling motion serves to emphasize the less obvious degrees of this condition, and there can be little doubt that the acicular fatty acid crystals provide the physical basis for this curious appearance. A similar shimmering lustre may be seen in old exudates which contain large numbers of cholesterol crystals. The streaming effect of the fluid would seem to impart uniform shifts of alignment among the crystals, which, like a shoal of fish

in a stream, now flash broadside and a moment later almost disappear as they twist along the line of sight.

This excess of fatty acid crystals in either a formed or watery stool may have many pathological causes, but in the everyday routine specimens submitted to this laboratory, which deals mainly with cases of suspected infectious disease, I have come to associate these naked-eye or microscopical appearances with the condition (or conditions) variously known as epidemic nausea,¹ the winter vomiting disease,² viral gastroenteritis,³ etc. In its epidemic or sporadic form this disorder may attack very large numbers of children and adults, but few of these consult their general practitioner, and consultants may never see cases outside their own domestic circle. Many samples of faeces received from such cases do not show fatty acid crystals, and it is difficult to guess at the incidence of this change at some stage of the disease, but experience in this area strongly suggests that these acute but benign gastro-intestinal upsets account for the vast majority of silver stools.—I am, etc.,

NORMAN WOOD.

Reading.

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- ¹ Bradley, W. H., *British Medical Journal*, 1943, 1, 309.
- ² Zaborsky, J., *Arch. Pediatr.*, 1929, 46, 391.
- ³ Reimann, H. A., *J. Amer. med. Ass.*, 1952, 149, 1619.

Medical Numismatics

SIR.—I have an old token about the size of a farthing and made of copper; on the obverse is a phoenix and above and below the words "Health restored." The reverse side has "Dr. Eady, 38, Dean Street, Soho," surrounded by a laurel wreath. According to H. R. Storer,¹ it was minted about 1820, but I have not been able to obtain any other information about it.

Many of these nineteenth century "tokens" are not in fact tokens at all, but are advertisement tickets. It is possible that Dr. Eady issued his token either for advertisement purposes or as a receipt for prepayment, to be surrendered when future treatment or medicine was given. I should be grateful to learn whether any of your readers can throw further light on Dr. Eady and the use to which his token was put.—I am, etc.,

London, W.3.

G. E. B. PAYNE.

REFERENCE

- ¹ *Medicina in Nummis*, 1930, Boston, Mass.

Water Intoxication in Hypopituitarism

SIR.—The interesting paper by Mr. V. Wynn and Dr. O. Garrod (*Journal*, February 26, p. 505) stresses the abnormality of water balance in patients suffering from hypopituitarism, and in order to avoid the complication of water intoxication they suggest that a water excretion test should not be carried out unless the serum sodium exceeds 130 mEq per litre. We should like to reinforce this timely warning and briefly record a severe attack of coma associated with water retention following a Kepler test in a patient under our care at the present time.

During the recent cold spell a lady of 56, who had had a severe post-partum haemorrhage 26 years previously, but had not hitherto been diagnosed as suffering from hypopituitarism, was referred for admission to hospital through the bed bureau with the descriptive diagnosis of "query cerebral." On arrival in the ambulance she was found to be comatose and was taken straight to the ward, where the correct diagnosis of hypopituitary coma was made at a glance by the ward sister (who had seen previous cases). Since the rectal temperature, measured with a bacteriological thermometer, was only 87° F. (30.55° C.) warmth was applied, and later on she was given an intravenous injection of glucose to combat a blood sugar level of 35 mg. per 100 ml. There were no signs of water retention and the serum sodium was 120 mEq. Cortisone was not given, and she made an uneventful recovery in a few hours.

A few days later a Kepler test was carried out in order to confirm the clinical diagnosis and the patient drank 900 ml. of water. She excreted 23% only of this test dose and gained 0.91 kg. in



weight. No change in the clinical condition was noted until 24 hours later, when she vomited, became lethargic and drowsy, showed mental changes, and then lapsed into coma. The facies appeared bloated. The blood sugar fell to 37 mg. per 100 ml., but she failed to respond to intravenous injections of glucose and remained in coma despite a blood sugar level of 92 mg. per 100 ml. Cortisone was then given by intramuscular injection at a dose of 25 mg. every six hours, and after two days' treatment she recovered consciousness. Some interesting E.E.G. records were obtained during the first attack of coma and it is hoped to report the case more fully. It seems that the first attack of coma was precipitated by hypothermia,¹ the second by water retention, and both were associated with hypoglycaemia.

The response to treatment with intravenous glucose solution varied, and we suggest that in all cases of hypopituitary coma a search should be made for a precipitating cause and appropriate treatment given as well as correcting any hypoglycaemia.—We are, etc.,

S. R. F. WHITTAKER.
T. P. WHITEHEAD.
H. A. SALMON.

Warwick.

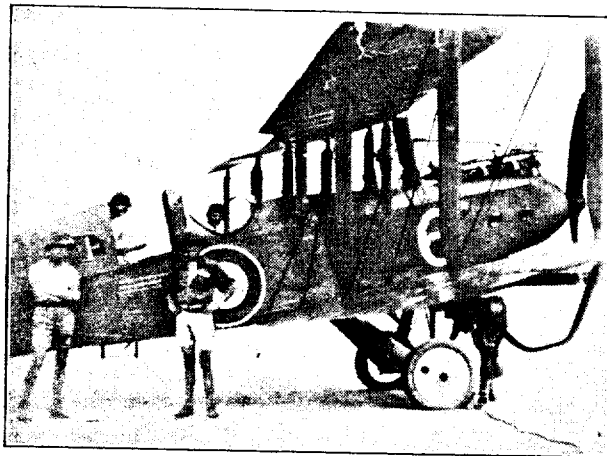
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¹ Sheehan, H. L., and Summers, V. K., *British Medical Journal*, 1952, 1, 1214.

First Air Ambulance

SIR.—This is an enlargement of a snapshot taken in Somaliland in January, 1920, and is a photograph of the first ambulance aeroplane ever used.

The ambulance was designed at the request of Air Vice-Marshal Sir William Tyrrell, then Wing-Commander, and principal medical officer of Z Expedition to Somaliland



("Mad Mullah" campaign). The machine, which was a D.H.9, was brought to Berbera in a large crate aboard the aircraft carrier *Ark Royal*, and was assembled on land. The fuselage was converted so that it could accommodate a stretcher and one or two orderlies. It had a hinged as well as a part sliding roof.

I had instructions from the wing-commander to have it tried out at the first opportunity, and the few trial runs we had proved that it would be quite comfortable for the patient. I did not know until afterwards that the pilot had some doubts about its airworthiness. It eventually proved a great success in taking casualties from the front line to the base in a little over two hours—a journey which by camel transport would have taken from 10 to 14 days.—I am, etc.,

London, W.1.

MICHAEL SMYTH.

Experiments on Human Beings

SIR.—In your leading article (*Journal*, February 26, p. 526) you mention the "split" between the "scientist" and the "doctor," now supposed often to reside within the same personality. I take it that it is common ground that there is no more fundamental matter for both doctors and patients

than assurance that the doctor will place the interests of the individual patient before the interests of "all the world." The confidence of the public in its hospitals and in doctors, within and without their walls, must surely demand no compromise with this assurance. Since the split you mention undoubtedly exists, and since advancement in the hospital service is at least closely correlated with the publication of papers, the temptation to allow the scientist to persuade, or overrule, the doctor must be increasingly substantial when the two are indeed but one. This being so, the safeguarding equitable principle that a trustee should, if possible, have no interest which conflicts with his duty (to keep paramount the welfare of the beneficiary) suggests that it is undesirable for any medical officer to experiment on his own patient: thus permission—given with the full knowledge of the nature of the experiment—would first be sought from the patient's doctor (who should not participate in the experiment). The doctor would then attempt to explain to his patient. Any experiment would be on the consenting patient of some (other) consenting doctor. Such a safeguard would allay the present public concern over the recent publicity, and would ensure that consent was valid—that is, with full explanation. Such explanation to non-medical persons alone must often be difficult or merely a mockery.

If "science" be slowed as a result of recognizing the right of the patient in this sense, then, I submit, the slowing must be cheerfully accepted. The principle is vital: any tinkering most dangerous. When the individual patient under consideration is not to benefit, but only possible future patients, the onus on the experimenter is even greater, as you point out. The recent public disclosures must surely demand at least that the profession promptly and authoritatively reaffirm the essential requirement of valid consent. The incriminated paper has not been the sole, regrettable, exception—other papers in the last three years share the opprobrium; this point was made in Parliament.

Finally, may I quote the address of Professor Pulvertaft: "We have inherited a degree of trust more entire than that given to any other group of men." The author shows the consequences of forfeiture of this trust.—I am, etc.,

Sheffield.

JOHN L. EDWARDS.

REFERENCE

¹ *Lancet*, 1952, 2, 839.

Isophane Insulin

SIR.—I wish to support Dr. E. B. Kraus in his defence of N.P.H. (isophane) insulin (*Journal*, February 19, p. 478). Through the courtesy of Messrs. Eli Lilly and Co., Ltd., I had the opportunity of using this preparation in 1952 and 1953, before it became available commercially. Although the number of cases (10) in which it was used was small, the trial was a severe one, because it was confined to pregnant diabetics.^{1,2} In such cases, insulin requirement is usually high, so that smooth 24-hour control is difficult to attain by means of a single daily injection. Yet, with N.P.H. insulin alone, good control was maintained throughout all stages of pregnancy in seven cases. In the remaining three cases, hyperglycaemia after breakfast necessitated the addition of soluble insulin which is miscible with N.P.H. The following examples will illustrate the smoothness of control (Case No. 12 had syphilis and active phthisis).

Case No.	Maturity	Dose	Blood Sugars				
			Fasting	11 a.m.	3 p.m.	8 p.m.	11 p.m.
20	36	128 N.P.H.	145	155	170		
19	34	72 "	115	140	95	90	83
16	34	78 "	120	91	83	100	91
12	32	and 28 sol. 52 N.P.H. and 24 sol.	165	150	95	125	140

In no case was there evidence of escape from control during the pre-breakfast period. Published reports³⁻⁵

indicate that the action of N.P.H. continues throughout the full 24-hour period.

It is apparent that the timing of N.P.H. action is far superior to that of globin and P.Z.I. There is considerable similarity between the actions of N.P.H. and "lente." In a proportion of cases N.P.H. needs the boosting effect of soluble insulin just as many cases need a mixture of semilente and lente. The lente group may possess an advantage in the availability of the ultralente preparation to assist in the control of cases which need intensive insulin action during the last four hours of the 24-hour period. However, with N.P.H., few cases seem to escape from control at this phase of the day. The essential difference appears to be the absence from the lente preparation of any protein or peptide material other than insulin itself.—I am, etc.,

Sunderland.

M. I. DRURY.

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- ² *Med. Ill. (Lond.)*, 1954, 8, 302.
- ³ Schneider, T., and Ehrenstein, D. A., *S. Afr. med. J.*, 1951, 25, 481.
- ⁴ Peck, F. B., and Kirtley, W. R., *N.Y. St. J. Med.*, 1950, 50, 2182.
- ⁵ Bagan, H. M., et al., *Amer. J. med. Sci.*, 1951, 222, 1.

Hydrocortisone Ointment in the Eczemas

SIR.—I was very interested to read Dr. Ronald Church's article (*Journal*, February 26, p. 517) on "Hydrocortisone Ointment in the Eczemas." It seems clear that hydrocortisone ointment is capable of reducing the eczema reaction in most circumstances. In some cases little or no response occurs, and it is obviously important to consider the factors that may influence the effectiveness of the application.

Considering first the preparation itself, Dr. Church is of the opinion that in circumstances where the 1% ointment was ineffective the 2.5% was also ineffective. This has not been my experience, and, in a number of patients with infantile eczema treated on one side with 1% and the other side with 2.5% preparations, improvement has been more marked on the latter side. The base of the ointment seems important so far as the physical characteristics of the application affect the condition treated, but it does not appear to influence the specific effect of the hydrocortisone. The frequency of application may also modify the effect of the ointment. An application once per day may keep a mild eczema under control, but in more severe states four times per day has been found to be more effective than twice per day.

Dr. Church mentions that eczema in certain sites of the body does not respond so readily as in others. He considers that this is related to the thickness of the epidermis affecting penetration, and obviously this must be an important factor. He mentions that there is little response in palmar eczema, and I would agree with this, although I have also noticed that neither the front nor the back of the fingers shows much improvement, suggesting that there may be some other factor in addition to the epidermal thickness. Perhaps penetration occurs more readily in warm, greasy, or moist sites. It is also possible that the hormone has a different quantitative effect on different areas of skin.

In Dr. Church's series weeping stages responded better than lichenified eczema, and again he suggests that this is due to poor penetration. He may well be right, but I think he has been rather unlucky in his results with lichenified eczema and lichen simplex, as a high percentage of such patients I have treated showed improvement. The itching was often relieved very quickly, but, as was expected, the eruption took a long time to clear, since, apart from the thickened skin, many months of an itching and scratching habit had to be counteracted. The severity of the eczema reaction influences the apparent response. The more severe attacks may "swamp" the effect of hydrocortisone. For example, in a patient who showed an improvement of the eczema on one arm treated with hydrocortisone and none on the other arm treated with the inert base, a sudden general exacerbation led to both arms becoming worse, and at this stage no difference in the severity of the rash on the two sides was apparent. Finally, there is, as one would expect, a considerable personal variation in response of the skin to the hormone. Similar patches of

eczema in the same sites show for no apparent reason a difference in response from one patient to another.

I would like to thank Dr. Church for reporting his experiences with hydrocortisone. The hormone is obviously going to have an important place in the treatment of eczema in its various clinical patterns, and it is through such reports that we shall gradually discover the indications, limitations, and best methods of application.—I am, etc.,

Bristol.

ROBERT P. WARIN.

Doctors and the Press

SIR.—In the *Journal* of March 12 (p. 677) is published an intimation that the chairman of the Public Relations Committee has invited representatives of the Press to attend an "exploratory meeting" on March 29 at B.M.A. House to discuss "the relations between the medical profession and the Press, particularly with reference to news from hospitals." This invitation arises from correspondence in *The Times* initiated by a letter over the name of Dr. Robert Forbes, secretary of the Medical Defence Union, wherein he accurately described the legal and ethical obligations that each doctor must observe when he is entrusted with advising and treating a patient at home or in hospital. He stressed the obligation of professional secrecy, of regarding the patients' interests as paramount, and of avoiding unethical advertisement. He also allied himself with Professor Aird in denouncing the unseemly behaviour of certain representatives of the Press when seeking to acquire information concerning the health and treatment of the conjoined Gray twins.

I also have learned of some of the devices which members of our profession were driven to adopt to protect the privacy of the treatment and the interests of the patients. This knowledge justifies me in saying that the castigation of certain representatives of the Press administered by Professor Aird in his letter to the *Observer* is well merited. It was therefore gravely disappointing for me to read a letter in *The Times* by Mr. John Pringle, the Public Relations Officer of the British Medical Association, which seemed to impute that the surgeons concerned bore some responsibility for what occurred through a failure to approach him or to accept his offer of help. He writes: "We could and would have arranged for the orderly issue to the Press of that minimum of news which rightly or wrongly . . . the Press have come to expect on these occasions having due regard all the time to the wellbeing of the patients, the feelings of the relatives and the ethical position of the doctors" (no mention is made of the legal responsibilities of the doctors). Several correspondents have protested vigorously at the unjustifiable invasion of the private lives of citizens when they are often undergoing serious mental stress from some misfortune they have encountered. Sir Linton Andrews in his letter says: "This first question is how far the Press is justified in reporting physical abnormalities that are certain to be a source of distress in the families in which they occur." The cultivation of a public interest in pathological abnormalities and their associated human distress in my view offends against the decencies of life. This is an important professional issue—a crucial issue that cannot be buried. I feel Dr. Forbes more accurately described the feelings of the rank and file of our profession when he wrote: "Every fair-minded person will surely agree that it is wholly improper for representatives of the Press to exploit the medical misfortunes of others and especially when the methods employed to collect information create impossible situations for the medical and nursing staffs of our hospitals."

May I conclude by expressing the hope that our representatives at the forthcoming conference will refuse to capitulate to the importuning of the Press or to compromise on the basic legal and ethical obligations that practitioners must discharge if they are to serve the best interests of their patients and the highest ideals of our profession? I urge our representatives strongly to present the view that the physical and mental misfortunes of our patients do not constitute legitimate "news" for dissemination to the public.—I am, etc.,

London, N.W.4

R. W. COCKSHUT.

Obituary

Sir ALEXANDER FLEMING, M.D., D.Sc.
F.R.C.P., F.R.C.S., F.R.S.

Sir Alexander Fleming, who died suddenly at his home in Chelsea on March 11, will be one of the immortals of medical history for his discovery of penicillin. An element of chance came into the discovery, but Fleming himself, who was something of a philosopher, once said, "Do not wait for fortune to smile on you; prepare yourself with knowledge," and it was a prepared mind which observed one day in 1928 that a culture plate had been contaminated by a stray mould and that around the contaminated culture was a ring of dead bacteria. It was an occurrence that would have meant nothing to many bacteriologists, but to Fleming the observation proved to be as significant as the singing kettle of James Watt or the falling apple of Isaac Newton. Fleming, essentially a humble man, was the first to acknowledge that full success was not possible without the help of others, and it was Sir Howard Florey and Dr. Ernst Chain, with their team at Oxford, who 10 years later took penicillin from the laboratory and brought it to the bedside. "The resuscitation of penicillin as a chemotherapeutic remedy," said Fleming, "is due to the brilliant work of Florey and his colleagues at Oxford."

Behind his taciturn manner and homely speech was a spirit of great modesty. The bacteriologist is almost necessarily a modest man. At his laboratory bench he is largely the "back-room" worker in medicine. The limelight rarely shines upon him. From the discovery of penicillin onwards Fleming had to accept with what composure he could—sometimes perhaps with wry amusement—the role of great man upon whom honours, including the Nobel Laureateship in Medicine (jointly with others), came pouring from many universities and academies. "Reporters, broadcasts, speeches come hard when you are over 60," he said a few months ago when the Duke of Edinburgh made a presentation to Sir Alexander to mark the silver jubilee of the discovery of penicillin. But through it all he remained the Scot, the son of Covenanter stock, greatly embarrassed at having to accept fellowships and doctorates and freedoms and other awards and to be acclaimed as one of the great benefactors of humanity. As Louis Pasteur, whose career in some ways his own resembled, yearned for the smell of his father's tannery in the Jura, so Fleming to the end of his life

never forgot the Ayrshire farm on which he was brought up. "I might have followed in my father's footsteps," he once said, "and have become a farmer, but fate decided otherwise."

Alexander Fleming was born in a humble farm home at Lochfield, near Darvel, in Ayrshire, on August 6, 1881. His father died when Alexander was only 7 years old. The boy went first to a tiny school on the moor, then to the village school at Darvel, from which he passed to Kilmarnock Academy. At the age of 14 he made his way to London, where there lived an elder brother who had already studied medicine at the University of Glasgow. In London he continued his education for two years at the Regent Street Polytechnic, and then, for economic reasons, took up work as a clerk in the office of a shipping company—not the least important part of his training, as he said afterwards.

Savings from his salary as a shipping clerk and a succession of scholarships helped him on his way as a medical student. In 1902 he entered St. Mary's Hospital Medical School. The choice of the school was fortuitous, the reason being that he was a keen swimmer and St. Mary's happened to have an active swimming-club. He won almost all the class prizes, including the senior entrance open scholarship in natural science, and he was described by a contemporary as "the most brilliant examinee ever known." He qualified in medicine in 1906, and two years later took the degrees of M.B., B.S. of the University of London, graduating with honours in physiology, pharmacology, medicine, pathology, forensic medicine and

hygiene, and winning the University Gold Medal. He had a phenomenal memory, which, it was said, made him able to absorb a textbook at a single reading. It was evident that this young man from the land of Burns had a promising future. At the age of 28 he obtained his F.R.C.S. As Sir Zachary Cope has since written, "Surgery might have gained what bacteriology would have lost. Yet surgery gained infinitely more, as things fell out."

Work with Almroth Wright

The turning-point for Fleming was his meeting with one whom he called the greatest of British bacteriologists, the late Sir Almroth Wright, who died in 1947 at the age of 85. With him he worked in close association for 40 years until Wright's death. But for that meeting with Wright, he once told an audience, "it is quite likely that I would not have been a bacteriologist, and if I had not been a bacteriologist I would not have discovered penicillin." It was at St. Mary's that Wright continued his studies of therapeutic inoculation



[Barratt's Photo Press, Ltd.]

after his epoch-making work in the Army with anti-typhoid vaccine, and he gathered round him a band of brilliant men, of whom Fleming was one. For many years Fleming continued to be, so to speak, a planet in Wright's solar system, though he also did work on his own initiative. From 1906 to 1914 onwards he was writing on the opsonic index, on vaccine therapy, and on the Wassermann reaction and salvarsan treatment.

Fleming was assistant bacteriologist at St. Mary's from 1906 to 1919, when he became assistant director of the Inoculation Department. From 1911 to 1919 he was also pathologist to the London Lock Hospitals. In 1920 he was appointed lecturer in bacteriology to the Medical School of St. Mary's, and eight years later he became professor, a chair which he occupied until 1948, when he retired as emeritus.

From 1900 to 1914 Fleming was a private in the London Scottish (T.A.) and was a member of the regimental team which won the *Daily Telegraph* Cup at Bisley in 1908. During the first world war he served in the R.A.M.C., but the association with Wright continued. They worked together at a research laboratory which was housed in the casino at Boulogne. It was here that the saline pack for the treatment of war wounds was introduced. Fleming's wartime publications included papers on the bacteriology of septic wounds, blood transfusion, and influenza; and later he contributed to the *Medical History of the War*. For his war services he was mentioned in dispatches. After the war he returned to St. Mary's. In 1919 and again in 1924 he was Hunterian Professor at the Royal College of Surgeons, and in 1928 he delivered at the Royal College the Arris and Gale lectures on lysozyme, his studies in which began in 1922, when he gave a paper on the subject to the Royal Society. If he had not subsequently discovered penicillin he would have still had a high reputation for his work on this enzyme, an anti-bacterial agent present in many animal fluids and especially in tears. Fleming was now acknowledged to be in the front rank of bacteriologists: it was said that he knew his bacteria—which he usually called microbes—as a shepherd knew his sheep.

For about ten years before he retired in 1946 Sir Almroth Wright was principal of the Institute of Pathology and Research at St. Mary's Hospital Medical School. Because of financial changes after the second world war this institute did not develop as originally planned and eventually lapsed. But the Inoculation Department at St. Mary's was renamed the Wright-Fleming Institute and Fleming was appointed to succeed Wright as its director. He retired from this post at the end of last year, being succeeded by Professor Robert Cruickshank, but he had no intention of giving up research work at the institute, which he visited regularly until the time of his death.

The Discovery of Penicillin

One day in September, 1928, Fleming had been examining an agar plate culture of staphylococci with the plate microscope, which entailed frequent exposure to the air. When, after a few days, he looked at the plate again he found a mould on it, and round the mould the staphylococci were dissolving. This was very unusual, so, as he himself said, "I made some investigations and the more I investigated it the more interesting it became. I found that the mould made a powerful and non-poisonous antiseptic which I christened penicillin. With

the subsequent purification of penicillin I had nothing to do."

Fleming's paper on the subject, published in the *British Journal of Experimental Pathology* in 1929, was "On the Antibacterial Action of Cultures of a Penicillium with Special Reference to their Use in the Isolation of *B. influenzae*."

It was an extraordinary chance whereby the right mould contaminated a culture of the right bacteria, that it was Fleming, and not some uninterested bacteriologist, who observed it, and that Fleming that morning was not preoccupied with other things and did not throw the culture impatiently away. Thus the name penicillin was given to the antiseptic agent which the penicillium mould secreted, and the name is now as familiar as any name in medicine.

Fleming made observations on the inhibitory properties of this new substance against many species of bacteria, and he showed that the unconcentrated culture could, even when diluted some 800 times, inhibit the growth of pathogenic cocci and that it was not toxic to animals. In his summary of this paper he suggested that the new penicillin might be an efficient antiseptic for application to or injection into areas infected with penicillin-sensitive micro-organisms.

But there were many difficulties in the way. It was not at that time recognized by Fleming or anyone else that the new substance could be used to destroy bacteria selectively and harmlessly within the human body. It remained more or less a laboratory curiosity until investigation into its possible therapeutic uses began in the Oxford School of Pathology in 1938. Seven years later the work was recognized by the award of the Nobel Prize for Medicine jointly to the three men most concerned—Alexander Fleming the Scot, Howard Florey the Australian, and Ernst Chain the European refugee. In 1944 Fleming and Florey had received the honour of knighthood.

Honours and Rewards

Upon Fleming himself innumerable honours were conferred. He received the Fellowship of the Royal Society in 1943, of the Royal College of Physicians of London in 1944, and of the Royal College of Physicians of Edinburgh in 1946. The honorary degree of Doctor of Science was conferred on him by three American and six European universities; the honorary degree of Doctor of Medicine by seven European universities; the honorary degree of Doctor of Laws by two Scottish universities. He was made a Fellow of important academies in many countries—Commander of the Legion of Honour in France, a Foreign Associate of the French Academy of Medicine, a Fellow of the Royal Society of Copenhagen. He was Linacre lecturer to the University of Cambridge, Cutter lecturer to Harvard University, Mayo Foundation lecturer to the University of Minnesota, Harben lecturer to the Royal Institute of Public Health and Hygiene, among others. From the last-named institute he received the Harben Medal, the first recipient of which, in 1895, had been Louis Pasteur. He was awarded, jointly with Florey, the Gold Medal of the Royal Society of Medicine in 1947. He had previously been president of the section of pathology and of the section of comparative medicine of the Society, of which he was elected an Honorary Fellow eight months ago. In 1951 he was elected Lord Rector of the University of Edinburgh, in which office

he was succeeded by Sir Sydney Smith in 1954. A Convocation member of the Senate of the University of London from 1950, he was also a member of the Board of the Faculty of Medicine. In 1945 he was president of the Society for General Microbiology, and from 1945 to 1949 he was a member of the Medical Research Council, becoming chairman in 1946 of a committee set up to arrange clinical trials of streptomycin and other antibiotics in non-tuberculous conditions. He was made an Honorary Freeman of the City of Verona in Italy on the occasion of the International Medical Congress in 1949. He was also Honorary Freeman of the burgh of Darvel, where he was born, of Chelsea, where he lived, and of Paddington, where his work was done. In the window of St. James's Church, Sussex Gardens, he is depicted in one of five medallions representing Paddington's life and history.

Fleming had other interests apart from the laboratory bench. These included painting and literature, and he was an honorary member of the Chelsea Arts Club. Rifle shooting, golf, and swimming were his other recreations, and he did much of the work himself in the garden of his country house at Mildenhall, in Suffolk.

He married, first, Sarah Marion McElroy, of County Mayo, by whom he had one son, Dr. Robert Fleming. The first Lady Fleming died in 1949. His second wife was Dr. Amalia Coutouris, a Greek bacteriologist who had come to work on the staff of the Wright-Fleming Institute in 1947, and had returned to Athens in 1952 to become head of the bacteriological department of a hospital there. She had won great respect for her bravery during the war in helping the British and New Zealand soldiers in the Greek campaign, and she was eventually captured and imprisoned by the Germans. Sir Alexander Fleming visited Athens in 1952, when he was presented with the freedom of the city and its gold medal, and he married Dr. Coutouris in the following year.

Although penicillin was given to the world as a therapeutic remedy by the brilliant work of Florey and his colleagues at Oxford, Fleming's name will always be associated with its discovery, and it was the discovery of a man working alone. In an address to students near the end of his life he said, "It is for you to create the free atmosphere which will allow genius full play. . . . Much in the future of humanity depends on the freedom of the researcher to pursue his own line of thought."

We are indebted to Sir HENRY DALE, O.M., for the following appreciation: One is inclined to expect that the opinion of the world at large will be somewhat capricious in its selection of scientific discoveries for general recognition and acclaim, and even in its allotment of credit among those who at different stages, or from different angles, have contributed to the result which has made a discovery famous. Experience suggests that the original discoverer, the man "who fished the murex up," is too often almost forgotten, so that credit comes to be given, not unworthily, but too predominantly, to those who have seen and given effect to its practical potentialities. We may be glad that no such deficiency can be suggested in the recognition which public opinion has everywhere given so spontaneously to the original discovery of penicillin, in 1929, by Alexander Fleming. The world has surely made no mistake in regarding the discovery of penicillin, and its introduction into therapeutics, as providing one of the outstanding landmarks in the progress of medical science and its applications, even in an age in which that progress is

acquiring, in so many directions, so astonishing a speed. For us who were Fleming's friends, still saddened by the thought of his sudden going, but thinking of the great work done so well, this is no time for argument, or for the allotment of credit between the man who first saw the penicillin phenomenon, recognized its interest, and studied it further with the instinct of a bacteriological and medical naturalist, and those others who, a whole decade later, first saw the possibility of what proved to be its immense importance in practical therapeutics—immense, surely, beyond any expectation of theirs—and whose researches carried it through the difficult stages to practical trial and launched it upon its beneficent career of healing.

We should rather rejoice, I think, that, for once in a way, all that penicillin has come to mean directly for the prevention and healing of infections, and even the new and successful quest which it inaugurated for other antibiotics, have become so largely impersonated, in the mind of the world at large, and in the figure of the quiet, devoted, rather dour, but always friendly bacteriologist, working loyally under Sir Almroth's inspiration and by his methods, contributing his own ingenious developments, and showing now and then a gleam of interest in phenomena of a different kind, discovering and investigating lysozyme, and then penicillin, with the eye and the enthusiasm of a naturalist.

The public have fully recognized the romantic features of the story. Those of us who belong to the community of medical research are apt to find more interest in what has seemed something of a puzzle—in the fact that Fleming, having discovered penicillin, having recognized its special properties as an antibacterial agent harmless to leucocytes, and having, apparently, made a tentative observation on the application of the crude medium containing it as an external antiseptic, left the discovery there and took more interest in the value of penicillin as a selective constituent of a culture medium than as, potentially, an internal antiseptic. I think that the main clue, at least, is to be found in the fact that neither the time when the discovery was made, nor, perhaps, the scientific atmosphere of the laboratory in which he worked, was propitious to such further enterprise as its development would have needed. Repeated failure had caused opinion then to harden, almost into a settled conviction, against the possibility of a successful chemotherapy of the common bacterial infections. Sir Almroth Wright himself had no belief in such a possibility. Even when some years later the introduction of sulphanilamide and its derivatives had removed the grounds for such scepticism, Wright, as Dr. Leonard Colebrook tells in his biography, was not impressed by the tremendous change which their coming had produced, even though it helped to prepare the way for Florey and Chain's new investigation, in 1939, of the possibility of preparing penicillin on a larger scale and purifying it sufficiently for practical trial, with the triumphant success that all the world knows.

But, though Fleming had thus put penicillin aside for a time, had almost forgotten it, perhaps, in the interest of the researches on other lines to which he had then returned, it is good to think that he lived not only to see the evidence of its immense practical value, on a scale so far beyond any which could have been predicted, but to receive so full a measure of the gratitude and admiration with which the world has greeted this wonderful gift of research to the health of mankind. His ashes, we learn, are to be buried in St. Paul's, but his name will surely live for evermore.

We are indebted to Professor ROBERT CRICKSHANK, principal of the Wright-Fleming Institute of Microbiology, for the following appreciation: Pasteur has written that in the field of observation chance only favours the mind prepared and that there are no accidents in science. Fleming in his characteristically modest way often spoke about his "lucky chance" in the discovery of penicillin, but his own description of that dramatic happening rather supports Pasteur's dictum:

"A mould spore, coming from I don't know where, dropped on the plate. That didn't excite me, I had often seen such

contamination before. But what I had never seen before was staphylococci undergoing lysis around the contaminating colony. Obviously something extraordinary was happening.

"With the background that I had, this was far more interesting to me than staphylococcal research, so I switched promptly. I am now glad that for years my interest had been directed to antiseptics and that some years before I had found in a somewhat similar manner another naturally occurring antiseptic, lysozyme. But for that previous experience it is likely that I would have thrown the plate away as many bacteriologists must have done before. . . . Instead of casting out the contaminated culture with appropriate language, I made some investigations."

It was his perceptiveness added to his earlier work on antiseptics and lysozyme, with the ingenious techniques he devised for testing their activities, that allowed him to assess and prognosticate so accurately about the value and use of penicillin at the time of its discovery.

Fleming was a born biologist, keenly observant of natural phenomena and intensely curious to know how things work. His apprenticeship with Almroth Wright was a great stimulus and inspiration to him, and perhaps in those early days he was to some extent the technician working under the direction of the master. But it is this early training taught him how to work and think about problems. Fleming soon showed that besides high intellectual ability and superb technical skill he also had originality of mind. Although he carried out a great deal of *ad hoc* research on current problems, his main interest was always the natural defences of the body—the phagocyte, opsonin, lysozyme—and the antibiotics were for him almost an interlude in the study of infection and immunity. He was particularly proud of lysozyme, the body's own antibiotic, and he was very pleased that recent studies were substantiating and amplifying some of his early work on natural immunity.

Phlegmatic Scot that he was in many ways, Fleming had a strong artistic sense. He was a beautifully neat draughtsman with the pen, and most of the diagrams in papers by himself and his colleagues were done by him. He took much pleasure in again preparing a demonstration of chromogenic bacteria growing as colours for the Queen Mother's visit to St. Mary's Hospital Medical School Centenary Exhibition last year, and in the week before his death he was busy preparing lantern slides in his own copperplate handwriting for his projected tour to the Middle East on behalf of the British Council. He willingly undertook many such visits abroad, and, if not a particularly good lecturer, his modest, diffident attitude about his achievements made him one of Britain's best ambassadors. Despite these outside commitments he continued to spend a great deal of time in the laboratory, seeing what was going on and giving useful advice on techniques and problems to all of us. We, his colleagues in the Wright-Fleming Institute, will miss him sorely, and we would express our deepest sympathy for Lady Fleming, who brought him companionship and happiness in these last few years.

We are indebted to Dr. JOHN FREEMAN for the following appreciation: It is hard to sum up the man Alexander Fleming at these close quarters of time and space. As a medical student he had swept all before him and had taken any prize there was to be had; but we never heard much of that, and he arrived in Almroth Wright's research laboratory as a very humble figure, the "little man" as he was affectionately called. He made friends easily, and kept them; but he always seemed a cryptic figure: not a talker, and seldom or never giving himself away. He was fond of card-playing, and at poker he probably never showed a card higher than was strictly necessary. His contribution to any laboratory discussion was usually in the form of Scotch grunts and terse interjections, or he reserved his words till others had talked themselves out; yet in retrospect he was usually seen to have dominated the argument—even in the days of Almroth Wright, who was a great dominator of conversations.

Fleming's chief characteristic was his humility, even under the enormous *réclame* of the public press in late years:

yet he took an impish, almost a schoolboy delight in the honours showered on him by the universities all over the world. Nobody ever found him putting on "side": he was the least pompous of mortals.

Penicillin naturally threw his earlier and preparatory work into the shade both in medical and in popular estimation, yet his laboratory colleagues may consider his beautiful demonstrations of the harmfulness of the common antiseptics when applied to our living tissues to deserve as much praise. He showed that even the slightest trace of an antiseptic in the blood stream did harm. "And yet," he burst out in one of his very rare moments of fervour, "there are at least seven hospitals in London, and Mary's is one of 'em, where they are regularly injecting this or that antiseptic into the blood stream in cases of septicaemia." He didn't get much praise for saying things like that.

The discovery of the powers of penicillin did not occur as a lightning flash of genius, but the way up to it had been built by long years of painstaking observation. He never tired of showing us culture plates showing the action of one colony of microbes in enhancing or retarding the growth of some neighbouring colony. Thus the entry of *Penicillium notatum* on to the stage had been systematically built up. Fleming was, so to speak, waiting for it.

He was, first and last, a man of the laboratory bench. He was very deft and accurate in his hand movements, and there is little doubt that he was the best technician in Wright's team; it used to be a pleasure to watch his controlled speed when handling glass in a blowpipe flame. He told me recently he was glad to be shedding all his responsibilities so that he could "muck about" at the bench once more and do real work again. His going will leave a sad gap in the organization of his beloved laboratories. We shall long miss the steadying influence of that great "little man," Flem.

PETER PATERSON, M.B., F.R.F.P.S.

Professor Peter Paterson, who was the St. Mungo professor of surgery in Glasgow University for eleven years between the two world wars, died at his home at Cove, by Helensburgh, on March 4. He was in his 85th year.

Peter Paterson, who came of farming stock, was born in 1870 and studied medicine at Glasgow University, where he graduated M.B., C.M. in 1891. Two years later, with a surgical career in view, he took the London Conjoint diploma, and in 1907 was elected F.R.F.P.S. After graduation and house appointments he continued his studies in Paris and Berlin, where he met Charles Mayo, with whom he became a lifelong friend. When he returned to Glasgow he became, with Hogarth Pringle, one of the late Sir William MacEwen's hard-driven assistants, being appointed extra dispensary surgeon at Glasgow Royal Infirmary in 1895 and also demonstrator of operative surgery in Glasgow University. He was awarded a Weber-Parkes second medal by the Royal College of Physicians of London in 1897 for his essay on a method of producing immunity against tuberculous infection, and two years later he was awarded the Foulis memorial scholarship for eminence in pathology.

In 1906 Paterson was appointed visiting surgeon to Glasgow Royal Infirmary and in the following year lecturer in surgery at St. Mungo's College, becoming professor at the college in 1910. He vacated the chair at the college some two years before he succeeded the late Professor Robert Kennedy in 1924 in the St. Mungo chair of surgery at Glasgow University. He retired from the university professorship in 1935, when he was appointed professor emeritus. For many years he was

recognized as one of the leading surgeons and teachers of surgery in Glasgow. His wife died three years ago and he is survived by two sons.

J. A. G. B. writes: Peter Paterson did not take long to establish himself in Glasgow as a rapid and safe operator, with a flair for diagnosis. As a teacher he was vivid, dogmatic, and impressive. His main interest in research was cancer. For many years he carried out splenectomy (with oophorectomy in females) in these cases, followed by prolonged injections of various extracts of sheep's spleen. Many of the results were striking, but he firmly refused to publish them.

Socially his manner was rather taciturn, and he disliked "functions" of any sort. To his circle of friends he was an interesting and charming host, and he was at his best entertaining a small tea-party in his picturesque garden on a summer afternoon. Clad in an old shooting-jacket and armed with two boxes of mealworms, he would summon a flock of his bird friends to join the party, and while they hopped around his feet or perched on his knee he would discourse on their habits and character. Peter Paterson must be the last of the "master surgeons" of the early twentieth century.

J. DILL RUSSELL, M.B., F.R.C.S.

Mr. J. Dill Russell, who was well known and highly respected as a general-practitioner surgeon at Finchley before the first world war and as a medical officer under the Ministry of Health for many years after the war, died at Windsor Hospital on February 21. He was 81 years of age.

The youngest son of the Rev. William A. Russell, John Dill Russell was born at Strabane, Co. Tyrone, on August 23, 1873. After receiving his early education in Ireland he went to the City of London School and from there to University College and University College Hospital to study medicine. His undergraduate career was brilliant, for he gained many class medals and in his second year the Filliter exhibition in pathological anatomy and pathology. At the London M.B. examination he was awarded first-class honours, the gold medal in medicine, and honours in forensic medicine. In the same year, 1896, he acquired the London Conjoint diploma and in the following year he took the B.S. degree with honours and the F.R.C.S. by examination. After graduation he held the appointments of demonstrator of anatomy and obstetric assistant at his teaching hospital, and in 1898-9 he was senior surgical officer at the South Devon and East Cornwall Hospital, Plymouth.

Dill Russell's training and bent at first inclined him to a career in pure surgery, but with his warm humanity he was also interested in people. Finally, on leaving Plymouth, he decided to enter general practice at Finchley, where he proved a great success, building up a very large practice. His surgical skill and inclination, however, would not be denied, and in connexion with his general practice he did a good deal of operative surgery, acquiring a considerable local reputation for this work. In those days the general-practitioner surgeon was a well-known feature of the medical world, but was rather rare in areas like London, with its many large teaching hospitals staffed by skilled whole-time surgeons. Dill Russell was immensely popular and beloved because of his great skill as a doctor and his complete devotion to the welfare of his patients. He would be the first to admit that in this work he was greatly helped by his wife, who was equally devoted to the care of his patients

and who loved to help on the administrative side. While in practice he became surgeon to the Metropolitan Police and to the Finchley and Hornsey Cottage Hospital and an examiner and lecturer under the London County Council.

The strain of a large practice induced Dill Russell to accept the post of divisional medical officer under the Ministry of Health in 1920, soon after his return from service in the R.A.M.C. in the first world war. This new work took him to various parts of England; later he became a senior medical officer in Whitehall, from which post he retired shortly before the outbreak of the second world war in 1939. He brought to this work the same high standards that he had held in general practice, and, where deficient, tried to raise the degree of skill and service in panel practice. Dill Russell wrote little and took no active part in medical politics. A member of the British Medical Association for over forty years, he was honorary secretary of the North London area in 1902-3 and of the Hampstead Division in 1904, and a Fellow of the Royal Society of Medicine. In the early days of the second world war he did valuable work on medical boards and in other ways. The outstanding features of his life were his scientific integrity, the thoroughness of his work, and his modesty and humanity. He was a great man, both in his attainments and in his character.

Dill Russell was singularly fortunate and happy in his home life, and he and his wife, a daughter of Dr. Frederick Wimberley, celebrated their golden wedding anniversary three years ago. It was a great tragedy, bravely borne, that two of their five sons were killed in the second world war. Two other sons, Mr. A. Scott Dill-Russell and Dr. Patrick Dill-Russell, have followed their father into medicine. To Mrs. Dill Russell, a devoted wife and mother, to the three surviving sons, and to his daughter we extend our sympathy.—W. G. S.

With the death of Dr. R. D. CAMPBELL at Inverness on February 23 the Highlands has lost one of its best-known and most revered physicians. He was 79 years of age. Ranald Douglas Campbell was born at Innellan, Argyll, on July 20, 1875, and was educated at Kelvinside Academy and at Glasgow University, where he graduated M.B., Ch.B. in 1898. After graduation he held resident posts at the Western Infirmary and the Royal Hospital for Sick Children, Glasgow, and was then resident assistant physician at the Belvidere Infectious Diseases Hospital for two years. In 1904 he left Scotland and settled in practice at Hobart, Tasmania, where he remained until the outbreak of war in 1914, when he sailed in the hospital ship *Kanowna* with the 1st Australian casualty clearing station. He served in Egypt and in the Dardanelles, where, as senior medical officer of his unit, he was the last to embark from Gallipoli at the time of the evacuation. He then came with his unit to England and later went to France, where he commanded the 3rd Australian casualty clearing station. He was awarded the D.S.O. in the 1916 Birthday Honours in recognition of his services during the Dardanelles landings, and while serving in France he received the Croix de Guerre in 1918, by which time he had attained the rank of lieutenant-colonel, and was mentioned in dispatches. After demobilization he acted for a time as deputy superintendent at the Western Infirmary, Glasgow, and then, in 1919, took over the practice of the late Dr. Wilson Black at Inverness, where he remained for the rest of his life. He became an honorary physician and ophthalmologist to the Royal Northern Infirmary, Inverness, and oculist to the Ross and Cromarty

and Nairnshire education authorities. He was chairman of the Inverness Division of the British Medical Association in 1929-30. For nearly 30 years at Inverness his general practice and hospital duties occupied most of his time. When he gave up his hospital work at the end of the second world war and his practice a year or two before the introduction of the National Health Service in 1948, he continued to maintain his connexion with the Royal Northern Infirmary by acting as the hospital's medical librarian. He is survived by a widow, a daughter of Dr. Gregory Sprott, of Hobart, and by two sons, the younger of whom is a consultant ear, nose, and throat specialist.

We are indebted to Mr. A. J. C. HAMILTON for the following appreciation: Ranald Campbell matched very closely one's conception of the ideal family physician. Of handsome appearance, always trim in his dress, a provocative and understanding twinkle in his eye, a shrewd and lively wit which on occasion could be pungent, precise and explicit in his speech, neat, clear, and unhurried in his writing, methodical in all he did—these were a few facets of his impressive personality. Where the welfare of his patients was concerned, irrespective of whether they lived in a mansion or a less pretentious dwelling, nothing was too much trouble, and only the best in treatment was good enough. In return he demanded the patient's trust and loyalty, and this he almost invariably obtained. If he did not, then he and the patient parted company. It was natural that the possessor of such a strong personality should have his detractors, but they were vastly outnumbered by his friends and admirers. Children seemed to trust him instinctively, while the elderly patients longed for his next visit. He kept himself abreast of medical advances by his reading and by the unashamed interrogation of those whose knowledge was more recent or more specialized. As a young man Campbell excelled in many forms of sport. In the Highlands his chief relaxation was fishing, and he knew well most of the beats on the Ness, the Beaulie, the Conon, and the Blackwater.

Medical Notes in Parliament

Genetic Risks of Nuclear Tests

Three questions about the potential dangers to human beings from nuclear bomb tests were put to the Prime Minister on March 10. They asked him to take the initiative in proposing the establishment of a United Nations commission to study and assess these dangers; to propose an international monitoring service to detect test explosions; and to seek the limitation of the number of experiments and thus prevent injury to the human race through worldwide contamination of the atmosphere.

Sir WINSTON CHURCHILL stated that, according to paragraph 40 of the official report issued by the United States Atomic Energy Commission on February 15, the atomic and nuclear tests so far carried out had released only enough radioactive material into the atmosphere to cause an individual living in the United States to receive the same quantity of radiation that he would have received in having his chest x-rayed at a hospital. The experts whose advice was at the disposal of Her Majesty's Government saw, he was informed, no reason to dissent from this opinion. So far as the genetic effects of exposure to varying levels of radiation were concerned, he understood that an extensive programme of research was already in progress in both this country and the United States. In addition, he was informed that the Federation of American Scientists had proposed an immediate United Nations study of the potential genetic risks of nuclear weapons tests. It seemed, however, that they were envisaging dangers from a number of tests greatly in excess of those likely to be carried out in the foreseeable future.

Mr. PHILIP NOEL-BAKER (Derby, South, Lab.) asked the Parliamentary Secretary to the Ministry of Works, as representing the Lord President of the Council, whether he would arrange to publish the information available concerning the genetic effects of the increased radioactivity due to the explosion of nuclear weapons. Mr. J. R. BEVINS stated on March 8 that he should make it clear that, except for an area in the vicinity of the explosion, the increase in the radioactivity of the atmosphere resulting from the explosions of nuclear weapons which had so far taken place was negligible in comparison with the amount already present from natural causes. Investigations were continuing, but the Lord President was advised that these had not reached the stage where any firm conclusions could be drawn from them with regard to the possible genetic effects of radioactivity on human beings.

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) asked what research was being conducted on the problem of the increasing radioactive content of the atmosphere of London, and what evidence there was regarding the association between this increased radioactivity and bronchial disease. Mr. BEVINS replied that there was no evidence that there had been, during recent years, any significant increase in the radioactivity of the atmosphere, which remained mainly due to natural causes. Nor had there so far been any evidence that radioactivity was a contributory factor in the causation of bronchial cancer, but investigations were continuing into this possibility. Measurements of atmospheric radioactivity under different conditions were being undertaken at London and in other centres.

Changing Hospital Needs

Mr. F. TOMNEY (Hammersmith, North, Lab.) asked the Minister of Health why the board of governors of St. Mary's teaching hospital group, Paddington, had decided to convert the Children's Hospital to adult use. Mr. IAN MACLEOD replied on March 7 that he understood the reason was that the board considered there was a surplus of staffed children's beds and not enough adult beds in the hospitals in this group.

Mr. TOMNEY said that the specialized assistance for children would now be more widely dispersed. Paddington, Kensington, and Hammersmith were densely populated areas, with large numbers of children. Would the Minister see if the decision could be reversed? Mr. MACLEOD replied that the decision had not yet been taken. The proposal was put forward because the board considered that on the whole the need for children's beds had diminished, which as a general proposition was true. He added, "We should beware of trying to freeze the pattern of hospital provision as it happened to be in 1948 when the scheme came in. There may well be good reasons for a change of use."

Seconding Nurses

Mr. R. W. SORESENSEN (Leyton, Lab.), in a question about the recruitment of nurses, particularly for mental nursing, on March 7, asked what was being done to divert to other hospitals, where there was a shortage, the services of nurses and student nurses in London teaching hospitals, where there was a disproportionate number. Miss PAT HORNSBY-SMITH said that among other matters the Minister had it in mind to invite teaching hospitals to consider with him whether more might be done to second student nurses to mental hospitals as part of their training.

Tuberculosis Treatment in Switzerland

The MINISTER OF HEALTH told Mr. G. WILLIAMS on March 7 that 140 patients from England and Wales were being treated for tuberculosis in Swiss sanatoria under the Health Service. He said the scheme was reviewed annually, and was due for review in September. The main reason for its introduction was the long waiting-lists, but these had

been dramatically reduced in recent years, so much so that from time to time now it was almost difficult to take up the present allocation.

Fluoridation Tests

Mr. S. P. VIANI (Willesden, West, Lab.) asked the Minister of Health what were the results established by recent work in the United States confirmed by the results of his pilot study into the fluorine content of the urine of adults in connexion with the fluoridation of water supplies; and what were the names of the authors and the dates and places of publication of these researches. Mr. IAIN MACLEOD replied on March 9 that the results showed that it was safe to add one part per million and that it was more practicable to decide the level of fluoridation in the light of dental surveys rather than by urinary examinations. References to all the relevant American work would be found in a recent publication of the American Association for the Advancement of Science, called *Fluoridation as a Public Health Measure*, which was published in Washington and could be obtained in London.

Chewing-gum.—The Food Standards Committee is considering certain aspects of the composition of chewing-gum.

Health Service Chaplains.—At the end of 1953 there were 106 whole-time chaplains employed in the Health Service; 92 were Church of England, 10 Nonconformist, and 4 Roman Catholic.

R.A.F. Standards.—In the medical standards for regular commissions in the R.A.F. (general duties) standards of visual acuity have been slightly raised and the standard of colour perception slightly reduced in the past two years.

Universities and Colleges

UNIVERSITY OF OXFORD

Dr. A. G. M. Weddell has been appointed representative of the University at the sixth International Congress of Anatomy to be held in Paris in July, 1955.

Dr. C. W. Carter has been re-appointed Reader in Biochemistry from October 1, 1955, to September 30, 1962.

The Hon. Mrs. Margaret A. Jennings, D.M., has been re-appointed Demonstrator in Pathology from October 1, 1955, to September 30, 1960.

UNIVERSITY OF CAMBRIDGE

The following degrees were conferred in Congregation on February 4:

M.D.—J. S. Pippard.
M.B.—J. F. Wood (by proxy), A. C. Johansson.

The following candidates have been approved at the examination indicated:

M.Chir.—P. F. Boreham, G. L. Bunton, W. H. Davies, G. R. C. Peatfield, W. R. Probert, J. O. Robinson.

In Congregation on February 19 the degrees of M.B., B.Chir. were conferred, by proxy, on D. M. Surrey Dane and the degree of M.B. on W. S. Ogden, also by proxy.

Dr. R. N. Salaman, F.R.S., has been elected into an Honorary Fellowship of Trinity Hall.

UNIVERSITY OF LONDON

The following degrees were awarded by the Senate on January 26:

M.D.—P. V. Suckling.
M.S.—P. B. Counsell.

UNIVERSITY OF SHEFFIELD

Drs. J. L. A. Dowse and R. S. Sneath, Demonstrators in Anatomy, have resigned their appointments.

ROYAL COLLEGE OF SURGEONS IN IRELAND

The Fellowship of the College was conferred on J. S. R. M. Lavelle and F. X. O'Connell on February 18.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending February 26 (No. 8) and corresponding week 1954.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1955					1954				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	13	0	7	0	1	11	1	6	0	
Dysentery ..	1,237	51	310	6	0	910	116	222	3	4
Encephalitis, acute ..	2	0	0	0		1	0	2	1	
Enteric fever: Typhoid ..	4	0	1	0		3	0	0	0	2
Paratyphoid ..	3	1	4	0		5	1	1	0	
Food-poisoning ..	125	16		0		160	10			
Infective enteritis or diarrhoea under 2 years ..				16	6					28
Measles* ..	23,700	2,694	283	630	45	2,099	33	66	23	422
Meningococcal infection ..	24	2	14	0		49	4	15	3	4
Ophthalmia neonatorum ..	32	2	5	0		36	8	7	0	
Pneumonia† ..	924	63	317	37		869	53	249	16	4
Poliomyelitis, acute: Paralytic ..	9	0		0	5	17	1		1	0
Non-paralytic ..	1	0				7	2			
Puerperal fever‡ ..	220	49	8	1		293	49	19	1	
Scarlet fever ..	675	35	95	39	9	1,463	53	171	42	31
Tuberculosis: Respiratory ..	762	81	163	21		841	84	123	34	
Non-respiratory ..	107	8	23	1		125	4	22	3	
Whooping-cough ..	1,678	125	151	46	10	2,098	72	327	38	76

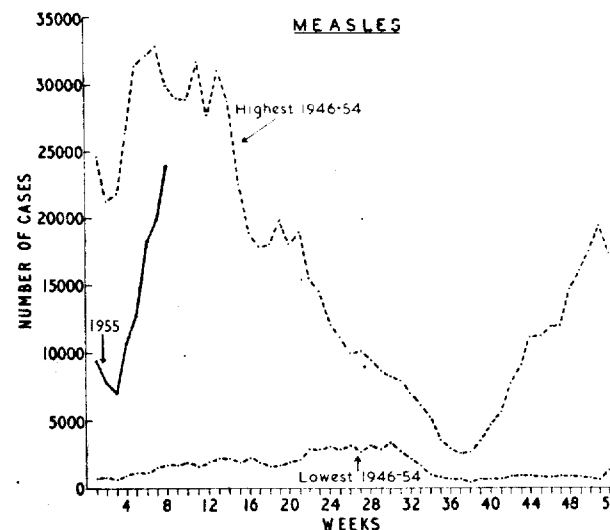
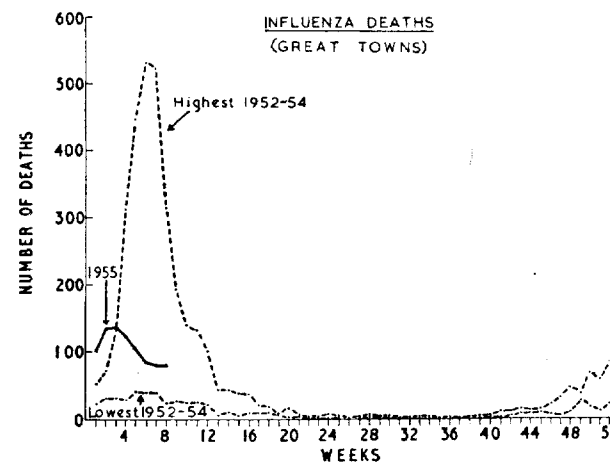
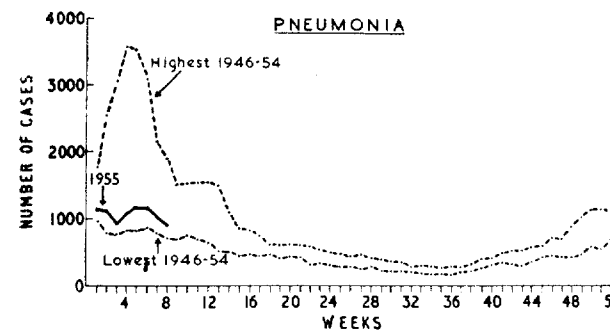
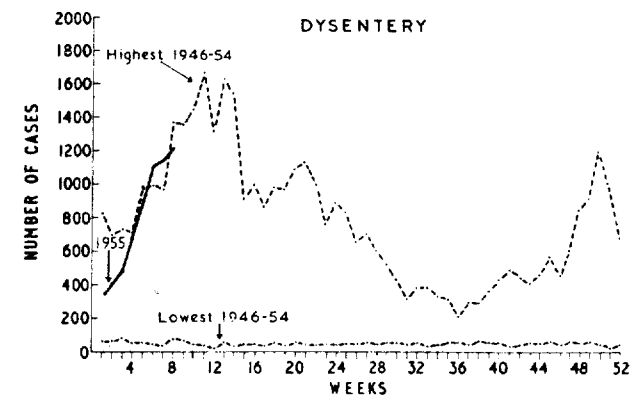
DEATHS in Great Towns	1955					1954				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute ..	0	0		0		0	0		0	
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	14	0	0	0	2	7	1	0	0	0
Influenza ..	81	9	5	5	5	23	4	1	0	1
Measles ..		0	0	0	0		0	0	0	0
Meningococcal infection ..		1	0				2	2		
Pneumonia ..	429	68	29	34	15	375	65	24	11	7
Poliomyelitis, acute ..	1	0		1	0	0	0			1
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory ..	116	15	5	2	3	101	10	26	2	9
Non-respiratory ..		2	0	0	2		2	1	0	2
Whooping-cough ..	1	0	1	0	0	1	0	0	0	0
Deaths 0-1 year ..	230	18	26	11	33	246	31	34	8	17
Deaths (excluding stillbirths) ..	7,440	1,022	710	190	237	6,651	939	728	132	187
LIVE BIRTHS ..	7,239	1,051	870	189	332	8,181	1,277	949	203	311
STILLBIRTHS ..	180	25	24			229	34	25		

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

Vital Statistics

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the nine years 1946-54 (influenza, 1952-4) are shown thus -----. The figures for 1955 thus ———. Except for the curves showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The largest variations in the trends of the notifications of infectious diseases in England and Wales during the week ending February 26 were increases of 3,724 for measles, from 19,976 to 23,700, and 92 for dysentery, from 1,145 to 1,237, and decreases of 232 for whooping-cough, from 1,910 to 1,678, and 96 for acute pneumonia, from 1,020 to 924.

The largest rises in the incidence of measles were 637 in Yorkshire West Riding, from 2,698 to 3,335; 519 in Warwickshire, from 1,060 to 1,579; 490 in Essex, from 902 to 1,392; 292 in London, from 2,402 to 2,694; 204 in Worcestershire, from 260 to 464; 189 in Nottinghamshire, from 1,086 to 1,275; 184 in Northumberland, from 590 to 774; 177 in Durham, from 843 to 1,020; 155 in Staffordshire, from 420 to 575; 143 in Surrey, from 664 to 807; 140 in Hertfordshire, from 179 to 319; 130 in Buckinghamshire, from 98 to 228; 120 in Middlesex, from 496 to 616. 675 cases of scarlet fever were notified, being 7 fewer than in the preceding week, and there were no large fluctuations in the local trends. The largest falls in the returns of whooping-cough were 41 in Staffordshire, from 92 to 51, and 34 in Kent, from 114 to 80. 13 cases of diphtheria, 3 fewer than in the preceding week, were notified.

10 cases of acute poliomyelitis were notified, and these cases were 4 fewer for paralytic and 7 fewer for non-paralytic cases than in the preceding week. The only area with a multiple case was Birmingham C.B. with 2 notifications.

The largest rises in the incidence of dysentery were 83 in Northumberland and 58 in Lancashire. The largest centres of infection during the week were Lancashire 503 (Blackpool C.B. 135, Oldham C.B. 109, Manchester C.B. 73, Blackburn C.B. 48, Lytham St. Annes M.B. 21, Liverpool C.B. 16, Darwen M.B. 16, Middleton M.B. 10, Royton U.D. 10), Northumberland 128 (Whitley Bay M.B. 28, Morpeth M.B. 27, Ashington U.D. 26, Newcastle-upon-Tyne C.B. 24), Durham 72 (Easington R.D. 15, South Shields C.B. 13, Durham R.D. 11), Yorkshire West Riding 61 (Huddersfield C.B. 20, Barnsley C.B. 11, Leeds C.B. 11), Glamorgan-shire 59 (Cardiff C.B. 28, Swansea C.B. 13, Llantrisant and Llantwitfardre R.D. 11), Leicestershire 57 (Leicester C.B. 27, Wigston U.D. 21), Northamptonshire 57 (Northampton C.B. 41), London 51 (Camberwell 10), Norfolk 31 (Norwich C.B. 13), Staffordshire 22 (Newcastle-under-Lyme M.B. 10), Yorkshire North Riding 21 (Middlesbrough C.B. 21), and Middlesex 20 (Edmonton M.B. 10).

Week Ending March 5

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 648, whooping-cough 1,834, diphtheria 17, measles 26,453, acute pneumonia 954, acute poliomyelitis 14, dysentery 1,265, paratyphoid fever 5, and typhoid fever 3.

Medical News

Medical Society of London.—The DUKE OF GLOUCESTER was the principal guest at the 175th anniversary dinner of the Medical Society of London held on March 8 in the Hall of the Royal College of Surgeons. Sir HORACE EVANS, the President of the Society, was in the chair. In proposing the health of the Society the Duke of Gloucester said that as an honorary F.R.C.S. he felt he was speaking on his own ground. Doctoring, he thought, must be a pretty hard life. The medical man had to keep abreast of things and be always ready for emergencies. Sir Horace Evans in reply referred to the Duke of Gloucester's close association with King Edward's Hospital Fund and many other medical institutions. He took the opportunity of thanking Dr. HOPE GOSSE and Dr. CUTHBERT DUKES for the work they had done for the Society, and also the honorary secretaries, Colonel R. DREW and Dr. E. C. SEWARD, and the registrar, Mr. PERCY MINTER.

Hunterian Link.—At a little ceremony held on March 10 at the Royal College of Surgeons Dr. W. S. C. COPEMAN, President of the Hunterian Society, presented to the council of the College John Hunter's coat of arms. The device, bearing the name of John Hunter, is fixed to the gallery of the great hall in the College's new wing; Lister's arms are at the other end of the gallery. Dr. Copeman, begging the President of the College to accept "this small tribute" from the Hunterian Society, recalled that in fact John Hunter had no arms; these were the arms of his brother William. In response Sir HARRY PLATT, P.R.C.S., said the council of the College accepted the gift with great joy. In the history of the College John Hunter had remained their great inspiration, and the presentation would form a link between the societies which revered John Hunter.

Royal Institute of Public Health and Hygiene.—The council announces the award of the Harben Medal, "for eminent services rendered to the public health," to LORD ADRIAN, O.M., P.R.S., and of the Smith Award, given to a medical officer of health "recognized as having done the most noteworthy work in the discharge of his official duties," to Dr. KENNETH COWAN. Both these are triennial awards. The presentations will be made at a social function at the Institute on July 20.

Fellows of University College, London.—Among the new Fellows are Professor A. BRADFORD HILL, F.R.S., professor of medical statistics at the London School of Hygiene and Tropical Medicine, Dr. A. J. MORLAND, physician at University College Hospital, and Professor SOLLY ZUCKERMAN, F.R.S., professor of anatomy at Birmingham.

Arsenic in Food.—Revised recommendations for the limits for arsenic in food have been issued by the Minister of Food in a pamphlet entitled "Food Standards Committee: Report on Arsenic" (H.M.S.O., price 4d.). Earlier reports on this subject were published in 1950 and 1951 (see *British Medical Journal*, 1950, 1, 657). Water and milk, says the new report, should not normally contain arsenic, but a content of up to 0.1 part per million would be allowable. The following limits for other nutrients are proposed: cider, 0.2 p.p.m.; "black beer," concentrated soft drinks, ice-creams, and iced lollies, 0.5 p.p.m.; certain other foods and condiments such as dried onions, edible gelatin, chicory, and spices, limits varying from 2 to 5 p.p.m. The report states that there should be no difficulty in attaining these limits under good commercial practice, and it is recommended that statutory effect should be given to them.

Advice on Head Injuries.—A six-page clinical memorandum on the early treatment of head injuries has been prepared for the North-East Metropolitan Regional Hospital Board by its advisory committee in neurology and neurosurgery. The intention is to issue the memorandum to junior hospital medical staff in the region.

Royal College of Surgeons.—At the Council meeting on March 10 it was reported that Sir GORDON GORDON-TAYLOR had been elected a Trustee of the Hunterian Collection in place of the late Sir Arthur Keith. Sir GEOFFREY MARSHALL has been awarded the Tudor Edwards Lectureship for 1955.

Professor P. B. Medawar, F.R.S., Jodrell professor of zoology and comparative anatomy at University College, London, has been appointed to the University Grants Committee. His appointment is until December 31, 1959.

Dr. Ian MacGillivray, lecturer in obstetrics and gynaecology at Bristol, has been appointed lecturer in midwifery and gynaecology at Aberdeen.

Ladies Medical Golfing Society.—This year the society's course is Wentworth. Lady doctors and close relatives of doctors are eligible for membership. The subscription is 10s. per annum. The spring and autumn meetings will be held respectively on April 25 and September 26 at Wentworth, and there will also be matches against other clubs.

Professor L. J. Witts, Nuffield professor of clinical medicine at Oxford, will receive the honorary D.Sc. of Dublin University at Trinity College, Dublin, on July 5.

Sir Henry Cohen is to receive the honorary D.Sc. of Nottingham University at a congregation on April 22, when the DUKE OF PORTLAND is to be installed as chancellor.

COMING EVENTS

American Trudeau Society.—The 50th anniversary meeting will be held at Milwaukee, Wisconsin, from May 23 to 27. There will be papers, panel discussions, and lectures on tuberculosis and other pulmonary diseases. Details of the programme from National Tuberculosis Association, 1790, Broadway, New York, 19, U.S.A.

International Congress of Comparative Pathology.—The seventh international congress will be held at Lausanne from May 26 to 31. Among the subjects for discussion are viral diseases transmitted to man by animals, atmospheric pollution, and growth disturbances. Details from the general secretariat, 19, rue César Roux, Lausanne.

NEW ISSUES

Journal of Neurology, Neurosurgery, and Psychiatry.—The new issue (Vol. 18, No. 1) is now available. The contents include:

VARIATIONS IN THE BASOPHILIA OF NERVE CELLS ASSOCIATED WITH INCREASED CELL ACTIVITY AND FUNCTIONAL STRESS. LÄRUS EINARSON and Erik Krogh.
ARGYROPHILE BODIES IN THE HUMAN SPINAL CORD. Marion C. Smith.
MORPHOLOGICAL NERVOUS CHANGES IN SURVIVORS OF SEVERE JAUNDICE OF THE NEWBORN. L. Crome.
UNUSUALLY SEVERE LESIONS IN THE BRAIN FOLLOWING STATUS EPILEPTICUS. A. Meyer, E. Beck, and M. Shepherd.
PREFRONTAL LEUCOTOMY AND THE ANTICIPATION OF PAIN. Alice Elithorn, Malcolm F. Piercy, and Margaret A. Crosskey.
INTELLECTUAL CHANGES FOLLOWING TEMPORAL LOBECTOMY FOR PSYCHOMOTOR EPILEPSY. Victor Meyer and Aubrey J. Yates.
VISUAL HALLUCINATIONS OF THE SELF IN ORGANIC DISEASE. Kenneth Dewhurst and John Pearson.
BASILAR IMPRESSION. D. G. Phillips.
SOME OBSERVATIONS ON THE ELECTROENCEPHALOGRAM IN CEREBRAL TUMOURS. J. H. D. Millar.
ALZHEIMER'S DISEASE WITH ACNE ROSACEA IN ONE OF IDENTICAL TWINS. Esther A. Davidson and E. Elizabeth Robertson.

Issued quarterly; annual subscription £2 2s.; single copy (2s. 6d.); obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

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

Monday, March 21

●BRITISH ASSOCIATION OF SPORT AND MEDICINE.—At Wright-Fleming Theatre, St. Mary's Hospital Medical School, 5 p.m., Dr. Roger Bannister: Athletics and Physiology.
●HUNTERIAN SOCIETY.—At the Talbot Restaurant, London Wall, E.C.4, 7 for 7.30 p.m., third dinner meeting. 8.30 p.m., discussion: An Assessment of Some New Drugs. To be opened by Sir Daniel Davies and Dr. Donald Reid. Dr. F. H. K. Green will sum up.

Tuesday, March 22

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. G. C. Wells: Pigmented Tumours.
LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., special university lecture by Professor Lester Cahn (Columbia): Oral Medicine.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Diagnostic Curettage in Suspected Uterine Cancer

Q.—What is the danger of a diagnostic curettage spreading cancer cells in a patient with suspected cancer of the uterus?

A.—Diagnostic curettage, by exposing vascular channels to malignant cells, must on theoretical grounds be accepted as involving some risk of disseminating carcinoma of the body of the uterus, although no more than the performance of biopsy on a suspicious lesion anywhere else in the body. There is nothing to show how great is the risk, but practical experience suggests it is small, since distant metastases are rare even when carcinoma recurs after curettage and hysterectomy. Vaginal metastases are now regarded as being the result of spread via the blood or lymph stream rather than by cellular spill through the cervix, and again there is no evidence to show that they are more frequent in cases subjected to diagnostic curettage before hysterectomy.

The alternative to diagnostic curettage would be to carry out total hysterectomy on every woman with symptoms at all suggestive of carcinoma, and most authorities would regard the risk of an unnecessary hysterectomy as being greater than that of disseminating a possible growth by curettage. Cytological studies carried out on smears of upper vaginal debris are not by themselves a sufficiently reliable method of diagnosis, so, for the present, curettage remains a proper procedure to exclude or diagnose carcinoma of the body of the uterus. Nevertheless, if the clinical features are such as to make the diagnosis practically certain, many gynaecologists would proceed to total hysterectomy without preliminary curettage. Others believe that if the curettings show naked-eye evidence of malignancy then there is less risk of growth becoming disseminated if hysterectomy is carried out at once rather than deferred for a few days pending microscopic examination and report.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Gray.—On March 10, 1955, at St. David's Hospital, Cardiff, to Marion (formerly Muir), wife of Dr. Peter Gray, a daughter.
Laidlaw.—On March 11, 1955, at Rookwood Hospital, Worcester, to Greta (formerly Muir), wife of Dr. Allan J. Laidlaw, a brother for Fiona—Alistair Malcolm Lawrie.
Nathanson.—On March 9, 1955, to Margaret (formerly Milman), wife of Dr. N. E. Nathanson, a daughter.
Summers.—On March 8, 1955, at Brixworth, Northants, to Mary, wife of Dr. H. A. Hamilton Summers, a son.

MARRIAGES

Alexander—Munro.—On March 12, 1955, at Egremont, Cumberland, Conel Patrick Alexander, M.B., B.S., M.R.C.P., of the Royal Free Hospital, London, W.C.2, to Susan Lilias Munro, M.B., B.S., of Egremont.
Baskin—Gibbins.—On March 3, 1955, in London, Dr. Michael Baskin, of Seapoint, Capetown, South Africa, to Miss Thelma R. K. Gibbins, of Surbiton, Surrey.
Stone—Dana.—On March 12, 1955, at Christ Church, Sutton, Surrey, Arthur Richard Stone, M.B., Ch.B., M.R.C.P., of Wellington, New Zealand, to Barbara Mary Dana, M.B., B.S., of Sutton, Surrey.

DEATHS

Clark.—On February 24, 1955, at her home, 4, Overleigh, Street, Somerset, Hilda Clark, M.B., B.S., aged 74.
Covey.—On February 17, 1955, at Barnwood House, Gloucester, Reginald Vionnée Covey, D.S.O., L.S.A., Lieutenant-Colonel, R.A.M.C., retired, aged 81.
Densham.—On February 23, 1955, at his home, 29, The Plantation, Worthing, Alec Densham, M.B., aged 79.
Du Boulay.—On March 1, 1955, at "Chesil," Chandler's Ford, Eastleigh, Hants, Hubert Houssemayne Du Boulay, M.R.C.S., L.R.C.P., aged 94.
Garfit.—On February 23, 1955, Charles Corringham Garfit, M.B., Ch.B., of Kirby Muxloe, Leics, aged 84.
Goddard.—On February 22, 1955, at Washington, U.S.A., Calvin Hooker Goddard, M.D., aged 63.

patients recover with little or no residual discomfort. One assumes that the zoster is not symptomatic—that is, there is no pre-existent structural nervous disease.

The Evening Rise of Temperature

Q.—Why, in most pyrexial illnesses, does the temperature rise take place in the evening?

A.—Normal body temperature measured either in the mouth or in the rectum shows a diurnal rhythm with the lowest temperature recorded in the early morning, rising steadily to reach a maximum usually about 4 p.m., and thereafter declining again. The normal difference between the morning and evening temperature is of the order of 1.2–1.5° F. (0.7–0.85° C.). In pyrexia this diurnal rhythm is in most cases still present although considerably accentuated; so the highest temperature recorded is in the late afternoon and the evening.

There are many other diurnal rhythms apart from body temperature: for instance, the rate of urine secretion rises during the day and falls in the night, and there is a diurnal rhythm in the excretion of corticosteroids. The diurnal rhythms are found in animals and plants. All these rhythms are associated with the local environment. In the case of man the day-night rhythm is imposed from early childhood, but the rhythms can be extremely persistent, even when the pattern of activity is completely altered, so a change from a day to a night shift means that the peak of temperature is reached during sleep and the nadir after several hours of work. It may take many days, or even weeks in some individuals, for any particular rhythm to change to the new pattern. The final cause of diurnal rhythms can be reasonably concluded to be the pattern of activity of the individual, but the intermediate factors are unknown. The physiology of these rhythms provides a long and fascinating chapter of ignorance. Staying in bed does not suppress the diurnal temperature rhythm, and this has been shown by many observers. It is not surprising, therefore, that pyrexial temperatures follow the normal diurnal rhythms, although set at a much higher level.

Histamine Treatment of Migraine

Q.—Can you please give me some information about the treatment of migraine with histamine?

A.—Although there have been reports from the United States which suggest that the treatment of migraine with histamine is sometimes helpful, one's personal experience has been that it is of no value.

Treatment of Mongolism

Q.—The third child of one of my patients is a mongol with all the stigmata of mongolism. He is a boy aged 9 years. What is the latest treatment of mongolism? Is glutamic acid helpful?

A.—No satisfactory specific treatment for mongolism has yet been discovered. There is no evidence that glutamic acid has any specific role in this disorder. A satisfactory diet with adequate protein includes all the amino-acids necessary. The prognosis depends on the degree of the mongolism. Occasionally a case is described in which all the physical signs are present but the individual is of normal intelligence. On the other hand, these children are sometimes low-grade idiots. Most of them are imbecile and can learn to be useful but not economically independent. They usually do better if it is possible to keep them at home rather than putting them in a special institution. This will depend on the position in regard to the other members of the family. Attempts at education should be adjusted to the apparent mental level, though a few cases of mongolism have been able to learn to read and write and profit by more formal instruction.

Bladder Training

Q.—At what age should a child be expected to be dry in bed? A professional couple are worried because their boy of 3½ years wets his bed every night and shows no signs of becoming dry. The parents remove the wet napkin when they go to bed, put the boy, and he then remains dry until the morning. What preventive measures, if any, should be instituted? So far, I have just done my best to reassure the parents that there is nothing to worry about, and that treatment would be a mistake.

A.—Most children have acquired bladder control by the age of 3½ years, but failure to do so does not imply that nocturnal enuresis will be permanent. Not infrequently there is a history in the family of delay in acquiring control, and the history may give an indication of when improvement in the boy may be expected. Routine examination of the urine is desirable to eliminate the unlikely presence of a renal condition. Other investigations are not indicated. Over-zealous "training" should be discouraged. A trial should be given to advancing the hour at which the boy is potted, and to encouraging confidence by not replacing the napkin.

Failure to Ejaculate

Q.—My patient is a married man aged 36, strong and vigorous. He has been married about four months. His wife is aged 26. He complains that he cannot get an orgasm. There is no difficulty in the marital act. His wife seems to be completely satisfied by the act. They have intercourse four or five times a week. He is in good physical health. By occupation he is a farmer, and has no mental inhibitions or complicated ideas. In short, he is a normal, healthy, hardworking outdoor man. Please suggest a line of treatment.

A.—These cases of failure to ejaculate are far commoner than was formerly believed. They are not due to any physical defect, for such patients are able to ejaculate in their sleep, and often have one of these spontaneous emissions in sleep on the same night as they have sexual intercourse or on the following night. As a rule the patient is unable to produce semen by masturbation, and for this reason artificial insemination with the husband's semen cannot be used as a means of satisfying the wife's desire for a child.

Despite the questioner's assurance that this particular patient has "no mental inhibitions," it is in this region of the mind that the explanation of his condition lies. Unfortunately these cases of failure to ejaculate usually prove more resistant to psychotherapy than do cases of failure to obtain an erection, but psychotherapy is the right line of treatment. It might be worth while making a trial of giving him some octyl nitrite to inhale at the time of intercourse. This has helped a few patients, but too much should not be expected of it.

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ENVIRONMENTAL FACTORS IN CERVICAL CANCER

AN APPROACH TO ITS PREVENTION*

BY

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Though preventive measures against disease have long been the basic goal of medical research, their possibility has never been fully appreciated in the field of neoplastic disease. This is true in spite of the fact that such an approach has appeared to be practical since Pott's classical observation on scrotal cancer in chimney-sweeps. In a few instances only, involving primarily industrial cancers, have such measures been advanced. Then recent clinical statistical studies on lung cancer, both historical and prospective, demonstrated that environmental factors play a significant part in the production of this major type of cancer. The results of these surveys have led to a continuation of efforts to search for environmental factors that might influence other types of human cancer.

Our initial environmental cancer studies concentrated on those neoplasms whose incidence data suggested significant differences between population groups. We, furthermore, first investigated epidermoid cancers because these types seem particularly dependent on extrinsic factors. Cancer of the cervix belongs to these groups of cancer. It is predominantly an epidermoid cancer and varies significantly among different population groups. Unless such variations can be accounted for by racial factors, they must be explained by differences in environmental patterns. The present communication serves to summarize the findings which may account for the observed rates of cervical cancer recently reported in greater detail (Wynder *et al.*, 1954).

Rates of Cervical Cancer

For statistically significant variables, which epidemiological cancer studies may reveal, to be regarded also as causatively significant, they must at least in part account for such differences in rates. In Table I are shown the relative rates of cervical cancer which have been reported among different population groups. Not all of the data are available as incidence data. Indian data are available only as frequency rates from Indian hospitals. The following rates are of particular interest:

(a) In the United States the incidence of cancer of the cervix among Negroes is 60% higher than among whites, and among the latter it is more common among the lower-income groups (Wynder *et al.*, 1954).

*This paper was presented in part before the Annual Meeting of the American Cancer Society, October 18, 1954, New York.

(b) The rate of cervical cancer among Jews is only one-fifth to one-tenth of that of the non-Jewish women in the United States, and the difference appears to be even greater if one takes the Jewish rate as observed in Israel (A. Symeonidis, personal communication).

(c) A recent report from Denmark by Rojel (1953) shows the rate of cervical cancer among prostitutes to be four times greater than that of non-prostitutes of similar social class.

(d) In most Asiatic and South American countries cancer of the cervix is the most common female cancer.

(e) Gagnon (1950) found no cancer of the cervix among a large group of nuns studied in Canada. A similar finding was recently shown by Schömig (1953) among German nuns.

(f) Cancer of the cervix rarely occurs in women under the age of 20; and in the majority of cases, as reviewed by Pollack and Taylor (1947), before this age, a glandular type of cervical cancer was found.

(g) The relative frequency of cancer of the cervix among Hindu women is about 45%, while it is 29% for the Indian Christians, 18% for the Moslems, and 16% for Parsees as based upon extensive records from the Tata Memorial Hospital in Bombay (Khanolkar, 1950).

These incidence and frequency rates of cervical cancer thus show a marked variation. It has been the purpose

TABLE I.—Relative Frequency Rates of Cervical Cancer Among Some Different Population Groups

Population Group	Relative Rate
Hindus	Very high
Christians (India)	High
Negroes	Low
Parsees	Low
Moslems	Low
Jews	Very low

TABLE II.—Factors which Previous Groups of Investigators Have Suspected to be of Significance in the Production of Cancer of the Cervix

1. Pregnancy and rate of pregnancy
2. Marriage and age of first marriage
3. Cervical laceration
4. Chronic cervicitis
5. Diet
6. Lack of circumcision (poor penile hygiene)
7. Vaginal discharge
8. Hormonal imbalance
9. Coal-tar douching
10. "Racial" factors

of this investigation to uncover the reason or reasons for these differences. In Table II are listed the factors which previous investigators have suspected to be associated with the production of cervical cancer.

Methodology of Study

The significance of environmental cancer surveys rises and falls with the methodology employed. It is paramount that the study is based upon a representative sample of the types of cancer one wants to study, and it is equally important that a proper comparison group is analysed in identical detail.

The cervical cancer patients were interviewed by specially trained interviewers in nine different hospitals in the United States, with the largest single group being interrogated at the Memorial Center, New York. As controls we selected patients with other pelvic disorders. The control group was age- and hospital-standardized in accord with the cervical cancer group. The analyses were based entirely on epidermoid cancer of the cervix. Microscopical diagnosis was obtained in every case. The Indian cancer cases were interviewed by Dr. P. D. Shroff at the Tata Memorial Hospital in Bombay. The same questionnaire was used for the American and Indian studies. The questionnaire attempted to include all of the factors suggested or suspected of playing a part in the development of cervical cancer that could be determined by clinical interrogation.

In part, the interview attempted to obtain information about rather personal matters. It is realized, of course, that not every patient may have told the truth about the age of her first sexual experience. It is also understood that not every patient was certain about the circumcision status of her partner. However, by careful and private interview we have tried to keep such inherent errors to a minimum. Furthermore, the control patients were questioned in the identical manner. It may thus be assumed that some of the inherent interview errors may be balanced out and that actual differences found between the cancer and control groups studied are of real rather than of apparent significance. Upon completion of the interview, the form was edited to assure complete answers to all of the questions, and then the information was coded and punched on special cards. All of the statistical analyses were carried out by Jerome Cornfield, of the Section of Biometry of the National Institutes of Health. Table III shows the number of patients on which this study is based, divided into the respective population groups studied separately.

TABLE III.—Number of Cervical Cancer and Control Patients Included in Study

	Cervical Cancer	Controls
U.S.A.:		
White (non-Jewish)	354	594
" (Jewish)	20	326
Negroes	215	391
Total	589	1,311
India:		
Hindu	255	238
Moslem	26	135
Christian	22	80
Parsee	—	62
Total	303	515

If a given variable was found to be significantly different between cancer and control groups, tests were made to determine whether the variable was independently significant or whether it simply depended on some difference in another variable. The pertinent parts of the study are summarized below.

Results

Only along two broad lines did we find significant differences between the cancer and control groups. These referred to the factors of marriage and circumcision. Two negative factors must be stressed because previous investigators had placed much emphasis on these variables. These four factors are discussed in some detail.

Marriage Factor

As in previous studies, we found fewer single women among patients with cancer of the cervix as compared with the controls. Nine per cent. of the controls had never been married, compared with only 2% in the non-Jewish cervix cases. Respective data for the Negro group

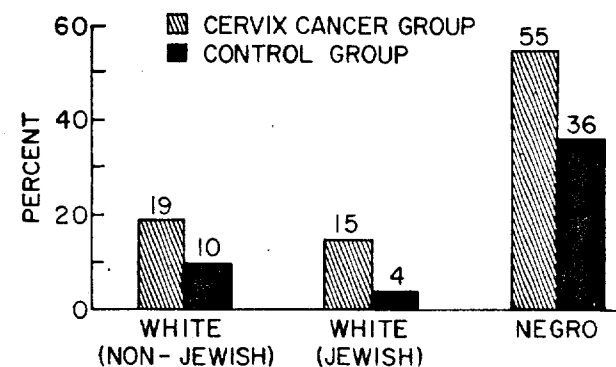


Fig. 1.—Percentage of cervix cancer and control groups in American Hospitals having first coitus at age 16 or before.

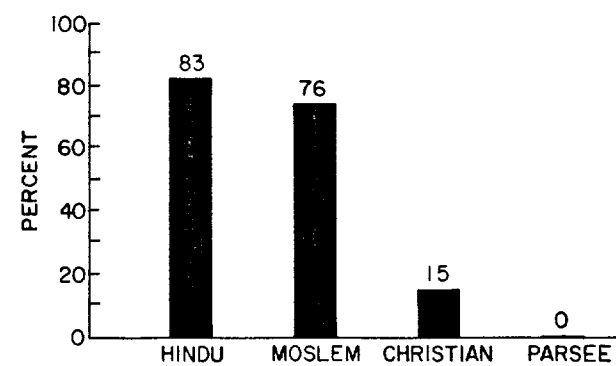


Fig. 2.—Percentage of control groups at the Tata Memorial Hospital in Bombay, India, having first coitus at 16 or before.

were 10% and 4%. The single women were of course further questioned for sexual relationship, and in only three instances out of the total white and Negro cases studied was cervical cancer found in a woman who claimed to be virginal.

Cervical cancer patients were found to marry more frequently than control patients. Of the non-Jewish white patients with cervical cancer, 30% had married more than once, in contrast to 14% of the controls. The respective figures for the Negro group were 35% and 23%.

It was a striking fact that the cervical cancer group married significantly earlier than the control group, as has been previously noted by Lombard and Potter (1950). Marriage at the age of 16 or under, for example, for the white cervical cancer group gave 14%, compared with 8% for the controls. The respective data for the Negro group were 32% and 19%, whereas it was 4% for the Jewish controls. Negroes marry at an earlier age than the non-Jewish whites, who in turn do so earlier than Jewish patients. These data are magnified and certainly of greater importance, though perhaps less reliable, if we note the age of first coitus. For the non-Jewish white cervical cancer group it was 19% before the age of 16 and for the controls 10%. Respective data for the Negroes were 55% and 36%, and for the Jewish group 15% and 4% (Fig. 1).

The Indian data showed a significantly earlier onset of first coitus among Hindus and Moslems as compared with Indian Christians and Parsees (Fig. 2). In India the age of first marriage does not necessarily reflect early intercourse, because of childhood marriages. The age of first coitus data among Hindu controls showed 83% to have had intercourse prior to age 16, whereas 76% of Moslems and only 15% of the Indian Christians, and none of the Parsees interviewed, had sexual relations prior to that age.

The data agree with the concept that those population groups with a high incidence or frequency of cervical cancer have uniformly an early onset of first sexual relationship.

Circumcision

In view of the fact that some degree of circumcision has been practised in the United States for the past 60 years and that among non-Jewish males the rate of circumcised men in the age group of 40 to 70 was shown to be 20%, this factor could be studied among the non-Jewish population groups (Wynder *et al.*, 1954). For the white non-Jewish group 5% of the cases reported exposure only to circumcised males, as compared with 14% of the controls. For Negroes the respective percentages were 0.5% and 9%. Among the

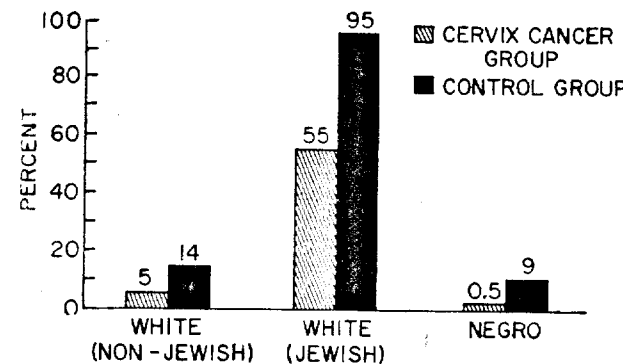


Fig. 3.—Percentage of cervix cancer and control groups at American hospitals exposed only to a circumcised sexual partner.

Jewish controls 95% were exposed only to circumcised sexual partners, in contrast to only 55% among 20 Jewish patients with cancer of the cervix (Fig. 3). Among 20 Jewish patients with cervical cancer, three had been married to uncircumcised non-Jews and six admitted to extensive relationships with uncircumcised partners. The age of circumcision does not seem of importance so long as it occurs before marriage. In India only the Moslems practise circumcision. Moslem boys are circumcised between the ages of 6 and 9. The factor of circumcision was cross-analysed and found to be independently significant.

The most desirable way to study the possible effect of penile hygiene would have been to examine the husbands of the patients studied. Because of the obvious difficulty of such a procedure, we examined males from the general hospital population, dividing them into different economic,

TABLE IV.—Percentage Distribution of "Smegma Formation" Among American and Indian Males

	No. of Cases	None	Moderate	Marked
American:				
Non-Jewish white (private)	580	92	7	1
" (clinic)	125	70	24	6
Jewish	980	99.4	0.6	0
Negro	100	44	48	8
India (Bombay):				
Hindu	130	56	28	16
Christian	50	56	30	14
Parsee	50	94	4	2
Moslem	130	100	0	0
India (Madras):				
Hindu	61	16	66	18
Christian	48	27	63	10
Moslem	31	58	42 (slight)	0

racial, and religious groups. The data show that those male groups have the highest degree of poor penile hygiene whose females also have the highest rates of cervical cancer (Table IV). This holds true for the American as well as for the Indian data. It is of interest to note, as judged from the Madras data, that not all circumcisions done on Moslems are complete.

Pregnancy

Several authors have found more pregnancies among patients with cancer of the cervix than among controls, as was indeed also found in this study. For example, in the non-Jewish white group 20% of the cancer group had more than six children, in contrast to 11% among the controls. The respective figures for the Negro cases were 15%

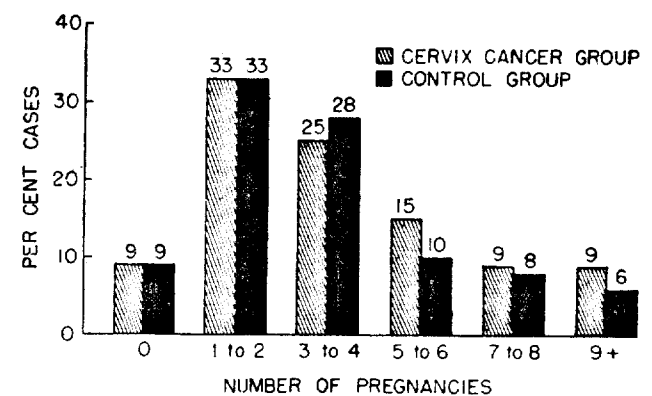


Fig. 4.—Pregnancy rate of cervix cancer and control groups for white non-Jewish women standardized to age of first marriage.

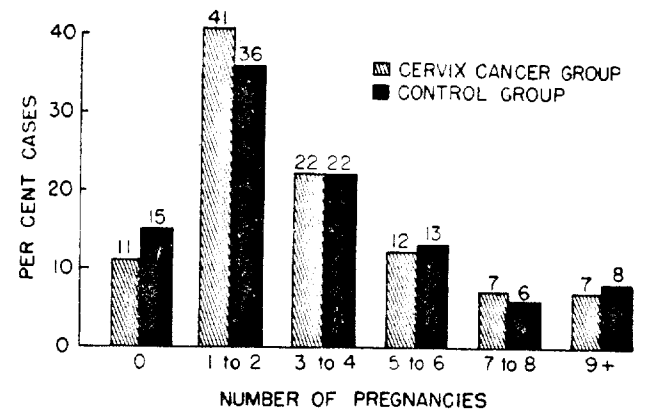


Fig. 5.—Pregnancy rate of cervix cancer and control groups for Negro women standardized to age of first marriage.

and 13%, showing no essential difference. The nulliparous rates for the white non-Jewish group were 9% and 12%, and for the Negroes 11% and 19%. In cross-analysing the data we standardized the number of pregnancies against the age of first marriage, since it was clear from recent studies by the Milbank Foundation that the age of marriage has a significant influence on the number of pregnancies (Kiser and Whelpton, 1944). In Figs. 4 and 5 we present the number of pregnancies standardized to the age of marriage separately for non-Jewish white and Negro cases, and find that there are indeed no significant differences in the rate of pregnancy between cervical cancer and control groups.

Abstinence after Menses

Abstinence from coitus for seven days after the last day of menses, as prescribed by Talmudian law, has often been thought to account for the low rate of cancer of the cervix among Jews (Kennaway, 1948). It was also thought to account for the low rate of cervical cancer among the Parsees. The following points seem to rule out this factor as one of great significance in preventing cervical cancer:

(a) Though the law is practised to some extent in the older Jewish age groups, it is generally not practised at all in the younger age groups. Among Jewish controls 30% reported no abstinence after menses. Among those who abstained, 40% did so for a full seven days. Of those who abstained over the age of 50, 50% abstained for seven days. The comparative figure for those under 50 was 28%. Very few Jewish women under 40 abstained for the seven-day period. Thus, cervical cancer should begin to increase in frequency in Jewish women if this factor were indeed of great significance.

(b) Twenty Jewish cervical cancer cases do not suffice for statistical comparison, but they seem to be in line with the controls. Five of the 20 patients in this group did not abstain after menses.

(c) None of the Parsees studied abstained for one week after menses.

Miscellaneous Factors

Other negative factors included douching, hormone therapy, and vaginal discharge. Negative factors found also include onset and regularity of menses, and number of miscarriages and abortions.

There was some difference in the rate of syphilis; however, the data indicated this to be a result of the earlier age of first intercourse among the patients with cancer of the cervix. The role of contraception remains questionable because no reliable data could be obtained on the frequency of the use of contraceptives, though the data suggested that the use of condoms was somewhat greater among the control group. We did question our patients on the frequency of sexual relations in the early part of their sexual lives. We felt, however, that the patient's memory in respect to these data was too hazy to give information which would be useful for statistical analysis.

The presence of cervical laceration could not be studied with any degree of reliability by personal interview, but, in view of the fact that there was no difference in the number of pregnancies, some doubt must be placed on the role of this factor. Chronic cervicitis was as often diagnosed among the Jewish patients as among the non-Jewish patients studied.

The study also included 32 cases of adenocarcinoma and 34 cases of carcinoma *in situ*. These are not sufficient to afford statistical analysis. In general the *in situ* cancer cases tended to be in line with the epidermoid cancer cases, while the adenocarcinoma cases went in the direction of the controls.

Discussion

For statistical association to have also causative significance the association must at least in part explain differences in incidence and frequency patterns. Table V presents

TABLE V

Population Group	Rate of Cervical Cancer	Age of First Coitus	Circumcision State and Penile Hygiene
Hindus (India) ..	Very high	Very early	Very poor
Negroes (U.S.A.) ..	High	Early	Poor
Christians (India) ..	Low	Very early	Good
Moslems (India) ..	Low	Very early	Good
Parsees (India) ..	Low	Late	Very good
Jews (U.S.A.) ..	Very low	Late	Very good

evidence suggesting that the factors of age at first coitus and lack of circumcision may account for the differences in rates of cervical cancer. In respect to circumcision, it may well be that good penile hygiene may achieve the same end.

The data suggest that virgins have the least risk of developing cancer of the cervix, whereas those groups practising early relationships and whose males have poor penile hygiene have the highest risks of cervical cancer. These two factors can, in our opinion, account for the observed differences in frequency rates. For example, Negroes tend to have early sexual relations and relatively poor penile

hygiene, and have a high rate of cervical cancer. Hindus have an even earlier rate of first intercourse and more extensive bad hygiene, and have the highest rate of cervical cancer. Jewish women have a relatively late age of first marriage, the males practise excellent penile hygiene due to circumcision, and have a low incidence of cervical cancer. Moslems marry quite early yet have only one-third of the rate of cervical cancer as compared with the Hindus. No other differences could be determined between the Hindu and Moslem data except for the circumcision variable. Parsees, with a relatively low incidence of cervical cancer, marry late, and, though they do not practise circumcision, have good penile hygiene. Cancer of the cervix is rare among women without sexual relations, and is quite frequent among prostitutes.

It does not lie within the confines of this communication to speculate upon the mechanisms by which lack of circumcision and early sexual relationships may influence the development of cervical cancer. It may be theorized that under the male foreskin exists a carcinogenic agent. This hypothesis is emphasized by the infrequency of penile cancer among circumcised males and by the fact that horse smegma has been found to be carcinogenic to mouse skin (Plaut and Kohn-Speyer, 1947). Recently, H. R. Pratt-Thomas (personal communication) induced a significant number of cervical cancers in mice with human smegma. It is of interest, too, in this respect that population groups with a high rate of penile cancer also have a high rate of cervical cancer. The fact that the latter is more common than the former may be due to the much greater tissue susceptibility of cervical epithelium to cancer formation.

The earlier onset of intercourse among patients with cancer of the cervix could be explained on the basis of special hormonal patterns or merely as a result of the socio-economic mores of a given population group. We believe it to be primarily due to the latter factor, since early coitus seems to be a consequence of socio-economic and conventional standards rather than due to a special hormonal status. It can only be speculated why early intercourse leads to more cervical cancer. It may be due to greater susceptibility of young cervical tissue. It may be because of a more active sexual life in women who marry early. It may be due to a greater variety of sexual partners in women who marry early—a factor which we were not able to study in detail. The fact that cancer of the cervix occurs more frequently, for example, in women who have been married more than once might be on the basis that these women have had two active sex lives, or on the basis that such a woman is more likely to be exposed to a "carcinogenic" male than one who has had only one marriage.

The lack of correlation of pregnancy with the development of cervical cancer is of academic as well as of statistical interest. It demonstrates the importance of properly controlled and analysed environmental studies. It is suggested that if previous investigators had standardized their data to age of first marriage the pregnancy rate of their controls would also have been similar to those of the cervical cancer patients.

Since pregnancy rate, including that of miscarriage and abortion, was demonstrated to be a negative variable, it may be proposed that factors associated with pregnancy, such as cervical laceration and poor prenatal care, may also not be significant in the development of cervical cancer.

Epidermoid Carcinogenesis

The results of this study re-emphasize the data of Pott, other industrial cancer investigators, and recent lung cancer surveys that epidermoid cancer but rarely arises in sites not exposed to extrinsic factors of irritation. The human evidence in this respect is supported by animal data. Spontaneous epidermoid cancers in laboratory animals are quite uncommon. In a large necropsy series (Wells, Slye, and Holmes, 1941) they could find only a few epidermoid lung cancers. Spontaneous skin cancer in mice is very uncommon, though this area is quite susceptible to carcinogens.

From the point of view of practical significance it makes little difference what concept one holds regarding the mechanism which transforms a normal cell into a neoplastic one. It might well be, as Warburg (1954) suggests, that extrinsic factors interfere with the oxidation mechanism of the cells and thus initiate neoplasia. Perhaps at some future date we may uncover the specific mechanism by which certain extrinsic factors may initiate cancer. From the present point of view, however, it is most important to recognize that in the absence of these factors the incidence of some cancers is greatly reduced, and that by their control we are advancing an effective means of cancer prevention.

Epidemiological Considerations

Recent epidemiological surveys on cancer have re-emphasized the significance of properly controlled and conducted clinical studies which, we believe, can add more information about the effect of environmental factors on human cancer than could be obtained from any laboratory experiment. It is a method which requires a close co-operation of qualified statisticians, clinicians, and trained interviewers. Such a team can establish data which can be regarded as experimental as any laboratory work, and thus do not represent "just some statistics." If the data obtained by such an investigation are compatible with the incidence pattern of the cancer, with its geographic distribution, and with its time trends, then, it seems, we are dealing with factors that are not only of statistical but also of causative significance.

Practical Considerations

In environmental cancer work we have to separate data into those of academic and those of practical importance. The factor of age of first intercourse is primarily of the former, whereas those referring to circumcision and penile hygiene are of the latter. The data suggest, though they do not prove, that good penile hygiene may be as effective as circumcision and that this may account for the relatively low frequency of cervical cancer among the high-income groups, a fact which of course may also be influenced by the later onset of marriage as compared with the low-income group (Wynder *et al.*, 1954). The best and most practical measure for obtaining good penile hygiene is universal circumcision. For the past ten years a high degree of circumcision has indeed been practised in the United States. In a recent study based upon reports from 84 hospitals throughout the United States, 85% of all non-Jewish male babies born in the semi-private or private class were circumcised at birth (E. L. Wynder, unpublished data). The circumcision rate was equally high among Protestant and Catholic births. Thus, if it is indeed true that circumcision acts as a preventive measure against cancer of the cervix, a marked lowering should be noted in this type of cancer in the coming generation.

In summary, this study again showed that in the development of epidermoid cancer extrinsic factors are of significance. It was demonstrated that clinical-statistical investigation, provided that it considers all of the environmental factors, can separate those that are independently and those that are only dependently significant. It was shown that factors can thus be determined which can account for marked differences in frequency patterns found among different population groups which previously had been supposed to be on the basis of racial factors. The two most important factors were those of the age of first sexual relations and the lack of circumcision, or the associated poor penile hygiene. Of these two factors, the latter has the greatest practical significance. Even these two factors, of course, represent only a link in the total chain of cancer development, and undoubtedly other factors must be present, though so far they remain unknown to us. However, if by removing a link we can interrupt a chain of development we have succeeded in preventing the chain from undergoing completion. It is along this line that environmental cancer research has its greatest purpose.

Summary and Conclusions

A study of the role of environmental factors in cervical cancer indicates that differences in age of first coitus and circumcision status or lack of good penile hygiene can explain variant incidence data of cervical cancer among different population groups.

There is no statistical evidence that pregnancy rate plays a part in the production of cervical cancer. The data on pregnancy demonstrate the significance of careful statistical analysis in separating the dependent from the independent variables. They clearly emphasize the importance of trained statistical aid in these investigations.

The abstinence period practised by orthodox Jewish women after the end of menses is not believed to be the basic factor accounting for the low incidence of cervical cancer among Jewish women.

The data emphasize that exogenous factors play a major part in the development of epidermoid cancer.

The results underline the importance of international co-operation, which can achieve more conclusive results than can be obtained from any one country alone.

The findings suggest that universal circumcision may be a practical preventive step, significantly reducing the incidence of cervical cancer.

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The downward trend in the total volume of crime in England and Wales, first noted in 1952, continued throughout 1953, according to statistics in the *Report of Her Majesty's Inspectors of Constabulary for the Year ended September 30, 1954*. Offences against property without violence decreased by 8.9%, and offences with violence by 9.5%, including 6,512 fewer crimes of shopbreaking and 1,619 fewer of housebreaking. An encouraging decrease was also shown in the number of boys under 14 and youths under 17 found guilty of indictable offences. Though the figures are still high, 20,774 and 14,549 respectively, compared with those for 1938, it is believed that the post-war wave of juvenile delinquency has at last been checked. The most disquieting feature of the report was the record of continued increase in sexual crimes; sexual offences increased by 9% and offences of violence against the person by 14% over the previous year. The public's response to the police drive to make them "crime prevention conscious" is one of the main reasons given for the reduction in the total. It is also thought that the building-up of the uniformed branches of the police, the advantage of basic training for young officers, and the still increasing assistance given by the forensic laboratories have proved a deterrent. The preliminary figures for the first nine months of 1954 show that the improvement continues. Of the non-indictable offences, traffic offences decreased by 6%, but gaming and betting offences increased by 7%. There was little change in the number of persons found guilty of drunkenness.

PSYCHICAL PHENOMENA IN TEMPORAL LOBE EPILEPSY AND THE PSYCHOSES*

BY

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The psychical phenomena which form part of the seizure pattern in certain cases of epilepsy may be said to represent a mental disorder in miniature, and for this reason their study may help us to understand the more complex and global mental disturbances found in the psychoses. We claim no originality for this suggestion, for it was made by Hughlings Jackson in 1875. And the Jacksonian epithet, "dreamy state," serves to remind us that Hughlings Jackson was one of the first to stress that psychical phenomena are just as much a manifestation of epileptic discharge as the more spectacular tonic and clonic contractions. Moreover, he was able to correlate such mental concomitants of epilepsy with a structural lesion—since in his famous case of Dr. Z, who suffered from "dreamy states," he and Colman (1898) demonstrated at necropsy a softening in the uncus of the left temporal lobe. These were some of the first stages in a long pathway which has led to present-day investigations into the psychical phenomena in temporal lobe epilepsy—investigations which will always be associated with the name of Dr. Wilder Penfield, of the Montreal Neurological Institute.

Hughlings Jackson and his contemporaries obtained their knowledge from clinical observation and interrogation of the patient during or after the seizure. This must always remain an essential preliminary to any investigation. The proof, however, that such abnormal mental experience is the product of epileptic discharge in the temporal lobe has come from electrical stimulation of the temporal lobe cortex in conscious patients. In particular it has come from the accumulated, carefully controlled, and correlated stimulations carried out in the last 30 years by Penfield and his associates (1941, 1950, 1954) during their operative procedures for the relief of epilepsy. These electrical stimulations are an essential part of the operative technique, their purpose being to delineate the epileptogenic focus, but probably no other routine operative technique arouses such strained suspense in the observer, who knows that at any moment the electrode may elicit from the patient a description of some sudden and compelling mental experience which cuts across his normal stream of consciousness. Thus, for the first time in history, man has been made to see visions and hear voices by means of the stimulating electrode and at the will of the surgeon.

The psychical phenomena which are produced by epileptic discharge in the temporal lobe or by cortical stimulation are many, and include hallucinations of vision, hearing, smell, taste, touch; illusions of distance, size, form, colour, motion, speed of sound and time;

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disturbances in equilibrium and body image; alteration in thought and affect; disorientation for time, place, and person; disturbances in speech and automatism, the latter with its accompanying memory defects.

From all this bewildering variety we have had perforce to make a selection, and here we propose to illustrate but three, which have a special bearing on the psychoses, in particular on the disturbance in thinking found in schizophrenia.

Material

The cases of temporal lobe epilepsy presented here have been selected from the first 105 cases of a series studied by one of us (S.K.) under the direction of Dr. Wilder Penfield at the Montreal Neurological Institute since September, 1952. Sixty-eight had undergone one or more craniotomies. Nine of the total were tumours, two were cysts, and the remaining 94 were atrophic lesions of the temporal lobes.

The cases of psychoses were studied at the Royal Edinburgh Hospital for Mental and Nervous Disorders, between the years 1946 and 1954, under the direction of Professor Sir David K. Henderson.

The experiences which we describe and illustrate may be stated thus: (1) The experiencing of "thoughts"—such thoughts being either indefinite or formulated. (2) The hearing of "voices" within the mind or body or from a point external to the self. (3) The seeing of persons, objects, or scenes, which, again, may be perceived within the mind or at some point external to the self.

We later present the hypothesis that all these three are but variants of the same phenomenon—that they all represent abnormal derivatives of thought.

1. Evocation of "Thoughts" in Temporal Lobe Epilepsy

We first illustrate these experiences from cases of temporal lobe epilepsy. The first case is one in which "thoughts" occurred as part of the seizure pattern and were also reproduced on cortical stimulation. The "thoughts" so induced were not clearly formulated—they may be called "amorphous" thoughts.

Case 1

A.D. was a young man of 20 who had suffered from both major and minor epileptic seizures since the age of 16. E.E.G. examination revealed an extensive epileptic abnormality in the right temporo-parietal lobes. Before operation he described what he experienced during his seizures as "two thoughts coming together." He explained it thus, "It is something whatever I may be occupied with at present is overlapped or overjoined by another thought. This thought comes along, hits me and goes back, a reminder, but I cannot give a picture of what it reminds me. Something hits me and reminds me of something which hit me before; maybe that is why I think it is two thoughts." This mental experience was followed by a squeamish feeling in his stomach. He remained able to speak and understand throughout the minor seizures.

When, during operation, cortical stimulation was made at a point 6 cm. from the tip of the right temporal pole in the second temporal convolution, at a depth of 1 cm., the patient said, "My thoughts sort of bounced together for a second," but he added that this was not exactly similar to his experience during an attack. Three later stimulations, carried out at variable intervals at a depth of 2 cm. slightly anterior, reproduced, however, a change in thought identical with that which occurred during his attacks. During the first stimulation he said "the same two thoughts which come together"; and when the electrode was withdrawn he explained that one of those thoughts was concerned with what was happening at the present time, and the second thought was of something different, but what it was he could not recall. Stimulated a second time, he said, "This is it," and crossed his index finger over his third in an attempt to illustrate what he meant. When the electrode was withdrawn he was asked whether what he experienced was a memory; he said definitely, "No, it is the thought that crosses." Stimulated a third time, he said, "It comes again," and moved his fingers in

illustration, saying, "They mixed the thought." This was followed by a feeling in the stomach. This experience of "thoughts" identical to that which formed part of his seizure pattern was reproduced no fewer than three times by cortical stimulation. These evoked "thoughts" forced themselves on consciousness as something separate and distinct from the normal stream of thought of the patient, and were recognized by him as not clearly formulated.

In a second case, both epileptic discharge and cortical stimulation induced the experience of "rhythmic thoughts," which to the patient appeared at the time of their experiencing as fully formulated, although he could not later recall their content.

Case 2

W.S. was an intelligent man of 30 with a left temporal focus. His seizures were ushered in by a sensation in the left chest, and immediately thereafter he was aware that the sounds in his environment—for example, the machinery in his factory—became louder and faster. Human voices, however, did not change. At the same time he experienced "thoughts" coming into his mind—which he described as "rhythmic thoughts—as though I were thinking of something, maybe the rhythm of poetry or music: the rhythm is always the same. It feels familiar to me during the seizure, yet I cannot recall it afterwards." When asked if they were memories, he said, "No, they were like words or combinations of words." On another occasion he added that it was like thinking two things at once. At operation, the pattern of his seizure was best reproduced by stimulation at a point 1 cm. from the tip of the left temporal pole on the second temporal convolution. He was unable to speak during the actual moment of stimulation, but when the electrode was withdrawn he said, "That was something like an attack," and described the sensation in the left chest, and his awareness of "thoughts" entering his mind, the content of which he was unable to recall.

The clinical findings in this case are almost identical with those of a case reported as far back as 1876 by Dr. Coats, of Glasgow, in which the patient's fit was preceded by giddiness and a "peculiar thought." To quote Dr. Coats: the patient "cannot tell what the 'thought' is, yet is confident that it is always the same. He always recognizes it at once when it occurs, and he tries to fix it in his memory, but he invariably forgets when the fit is over."

This induction of thoughts into the mind by cortical stimulation has occurred in other cases, and the stimulation points tend to be grouped around the second and inferior temporal gyri.

It is worthy of emphasis that these patients have difficulty in describing both the content of their induced thoughts and the manner in which they are experienced. This difficulty was well expressed by one intelligent patient, who tried in vain to describe the manner in which thoughts rushed into his mind during his seizures, and finally, in desperation, exclaimed, "It is like asking an artist to paint a picture of what roast beef smells like and he cannot do it." It seems only too probable that what we are asking of them is comparable to the impossible task of describing one sensation in terms of another.

How can we categorize this experience? In what group of abnormal mental phenomena can it be placed? We have of necessity to make use of such concepts as are at present available—although these are less than ideal—and so we would designate these intruding "thoughts" as hallucinations. There is no other word extant—although we hope in future that more precise terms will be formulated—which can cover this experience, whereby a thought, evoked either by epileptic discharge or cortical stimulation, apparently assumes a separate existence alongside the patient's own current of thought. Such separate existence would appear to be proved by the patient's ability to bring his powers of introspection to bear on it, and to describe it, however inadequately, during or after its occurrence.

Definition of Hallucination

According to the Oxford Dictionary, a hallucination is defined as "the apparent perception of an external object when no such object is present," and this placing of the hallucinatory experience outside the self is usually implied in the general usage of the term. It is a finding in psychia-

try, however, that when a patient says he "hears" certain words or phrases, that he "sees" certain objects or scenes, what he "sees" and "hears" has for him no external location, but is "heard" and "seen" in the mind. There exists to-day a disinclination to apply the term "hallucination" to these abnormal "internal" perceptions, yet the older French writers showed no such hesitation. Baillarger (1890) entitled them "psychical hallucinations" using the contrasting term "psychosensory hallucinations" to designate these abnormal external perceptions, which then, as now, were more generally accepted as constituting true hallucinations. Under this title "psychical hallucinations" Baillarger included not only these "alien" ideas which "come to" the psychotic patient in the form of "thoughts," but "voices" which he locates in the head or epigastrium. Séglas (1892) cites, with approval, this category of "psychical hallucinations" first demarcated by Baillarger, emphasizing its clinical authenticity. He himself coined the term "psychomotor hallucinations" to denote the "inner voices" experienced by psychotic patients—believing, in terms of the strict cerebral localization theories popular in his time, that such internal auditory hallucinations resulted from an excitation of the motor centre for speech. Older theories of causation need not concern us here—what is important is that these older writers clearly realized from their detailed clinical examinations that there were varying gradations in the patient's mode of experiencing hallucinations—particularly the so-called auditory hallucinations.

2. "Auditory" Hallucinations in Temporal Lobe Epilepsy

The following case illustrates the hearing of an inner voice within the head.

Case 3

W.D. was a youth of 18 who had had seizures for eight years. E.E.G. showed a shifting focus in both temporal lobes. He was bilingual, Afrikaans being his mother's tongue. His seizure pattern was a sensation in his head accompanied by a voice which spoke in Afrikaans, commanding or threatening him. He had a feeling of intense fear and finally lost consciousness. Asked where the voice came from, he said, "It was just in my head." The patient was aware that he could not speak while hearing this voice and felt that his tongue was stiff (a finding common among others who heard voices within the head). He said, "If I heard the voice I used to point to my head so that my parents would know I was going to have an attack." The voice spoke in short sentences which were accusatory or threatening, telling him "You do this" or "You do that," "You did something wrong." "Things," the patient added, "that I did not do wrong."

The next case illustrates the hearing of voices within the stomach.

Case 4

M.S. was a little boy of 7, with an eight-months history of epileptic seizures. E.E.G. showed a shifting focus in both temporal lobes. This boy described his experience during the seizure as "I have 'bumps' in my tummy, and I hear 'Do this, do that.'" Asked "Who says 'Do this, do that'?" he replied, "My stomach—I feel something talks in my stomach." On further questioning he said it sounded like a man's voice, but he did not recognize it as the voice of anyone he knew, and that he heard it only in his stomach. Asked whether he ever obeyed this voice, he replied, "I don't do what he says, I do what Mummy says." To the question, "Do you think there is a voice in your tummy?" he answered, "Yes—I don't know how he gets in there." The commands "Do this, do that," were repeated a few times and were followed by automatism and loss of consciousness. This boy never heard the voice in the intervals between seizures.

This hearing of an inner voice giving unacceptable commands is, of course, typical of schizophrenia, but in both these cases this was a momentary experience, whereas in schizophrenia it tends to be a continuous process. We shall return to this later.

The fifth case illustrates the hearing of an external voice—that is, the experience comes within the commonly accepted definition of auditory hallucinations. (This case has already been reported by Penfield and Jasper (1954).)

Case 5

S. B. was a man whose seizures began at the age of 18, and E.E.G. showed a right temporal focus. The attacks first took the form of vertigo, but a year after their onset the patient, in addition to the vertigo, heard a voice calling his name, "Sylvere, Sylvere," and this was sometimes followed by loss of consciousness. Two years later the pattern again changed, and the aura consisted mainly of a feeling of nausea behind the mid-sternum. At operation, performed six years after the onset of seizures, and four years after the voice calling his name had ceased to be part of his seizure, cortical stimulation reproduced the following:

On stimulation at a point 5 cm. from tip of the right temporal lobe, in the first temporal convolution, the patient said, "Just like someone whispering or something in my left ear—it sounded something like a crowd." Warning without stimulation produced "nothing." When stimulation was made at a point 1 cm. posterior, he said, "Again someone trying to speak to me, a single person." When asked, he added, "Oh, a man's voice—I could not understand what he said." On stimulation at a point 5 cm. from tip of the right temporal lobe on the second temporal convolution, he said, "Someone calling me in my left ear 'Sylvere, Sylvere'—it could have been my brother."

Interesting features of this case are: (1) the hearing of a voice from the side opposite to the stimulation—that is, the phenomenon of lateralization; and (2) the reproduction, by cortical stimulation, of a certain auditory hallucination—to wit, the hearing of a voice calling the patient's name—four years after it had disappeared from the pattern of his seizures.

Penfield and Jasper (1954) have reported the reproduction of auditory hallucinations by cortical stimulation in many cases, and the stimulation points are found to be concentrated around the first temporal gyrus.

These five cases have been selected from many for this one reason—that the five represent a continuous gradation or a spectrum. The epileptic discharge has evoked successively "amorphous" thoughts, formulated or "crystallized" thought, an inner audible voice located in the head, a similar audible voice with an apparent location in the abdomen, and, finally, voices seeming to emanate from the external environment. Cortical stimulation reproduced both the experiencing of thoughts and the hearing of external voices.

Hallucinations in Schizophrenia

We believe that a more complex and less well defined gradation or spectrum can be illustrated in the hallucinations of schizophrenic patients. Here interrogation of the patients presents much more difficulty, for we have to probe beneath a superstructure of delusional misinterpretations and rationalizations to discover the patient's mode of perceiving such hallucinations.

Schizophrenic Thinking

In schizophrenia the patient is continually troubled by ideas which are presented to him independent of his volition. Some appear to him as though emanating from voices in his external environment. These, the commonly accepted auditory hallucinations, represent in our opinion but one gradation of this experience. The term "auditory hallucinations" cannot be made to cover all the modes of perception of this phenomenon, nor does it sufficiently stress its intricate nature, the intimate relationship which exists between it and the patient's own thought. We may illustrate briefly the range of qualitative difference seen in such hallucinations.

In some patients these alien ideas appear as "thoughts" differing only slightly in quality from the silent imperceptible flow of normal thinking. Secondly, they may erupt in consciousness as a formulated word or phrase, with or without some extrinsic quality which the patient describes in terms of known sensations. Patient S. F. said that she experienced "strong thoughts" or "thought forms" which she described as vibrating through her head. She added that the content of these strong thoughts was quite different from what she was thinking at the moment of their appear-

ance—for implicit in this and subsequent modes of experience is the rejection by the patient of these thoughts as his own.

The next gradation occurs when the hallucinatory words and phrases exhibit some kinaesthetic—or verbal—quality which enables the patient to experience them as soundless speech within the mind. I. H., an intelligent nurse of 30, described her mode of perceiving two voices within her mind as follows: "If I compared it to lip-reading, the formation of words without the sound, that is the clearest I can describe it." (There must surely be only a minimal difference in the experiencing of "strong thoughts" and "soundless voices." This is borne out in a famous case, cited by Ségla, of a woman who said that what she heard in her mind was a "voice," and then corrected herself, adding, "No, I am explaining it badly; it is not a voice, it is a suggestion, it is a thought without sound, it is an internal voice which flesh and blood cannot understand—it is a mute voice.")

A further gradation is reached when the patient describes voices, still experienced within the mind, which have super-added to them some subtle quality of sound. W. F. described his experiencing of a voice within his head thus: "I don't actually hear it with the ear—it is not heard outside the head, but it has some sound quality within the head." (It was from this patient's spontaneous description that we borrowed the term "sound quality.") He could not further elaborate it. What seems reasonably certain is that this sound quality does not partake of the tone and timbre of the human voice. A. W. spoke of a "whisper in my head that goes on and on. I don't know where it gets the stamina." This internal voice with a quality of sound may also be experienced in other parts of the body—in the chest or abdomen, as is illustrated by the case of Y. Z., who was suffering from schizophrenia and believed that a certain Dr. T. was in her abdomen. When asked how she knew that, she replied, "I hear him speak and I feel him move." She gave as an illustration that while having a tub bath she heard Dr. T. cry out, "I am drowning." She told him "move up" and he did! This case is almost identical with that of the little boy (Case 4) who heard voices in his stomach as part of his seizure pattern.

The final stage is illustrated in the experiencing of voices which appear to the patient to emanate from his external environment. Some patients unhesitatingly liken these to actual human voices. But others do not display this certainty. They describe a far-away quality—a voice coming from a distance; or, conversely, if near at hand, they use qualifying phrases, such as "like a voice heard through a megaphone." It seems, therefore, that if an auditory component is present it does not always, even in external auditory hallucinations, simulate the tone and timbre of the human voice.

Schizophrenic patients, if carefully interrogated, may admit to experiencing not merely one but two or three of the several gradations above described. There are still further modifications of this phenomenon—for instance, all the patient's thoughts may become verbalized and appear to resound in his external environment—the so-called "echo de la pensée." This necessarily abbreviated account is nevertheless sufficient to indicate the close resemblance which exists between such hallucinations and those found in temporal lobe epilepsy. The "thoughts," the internal and external "voices," which form part of the seizure pattern in the above five cases of temporal lobe epilepsy find their counterparts among the admittedly more numerous and complex modes of abnormal perception illustrated for schizophrenia.

Syntax of "Auditory" Hallucinations

The form of syntax of hallucinations of thought and speech in schizophrenia is difficult, and often impossible, to elicit. It is common but not invariable for patients to describe them as consisting of brief phrases, commencing with pronouns of the second or third person—for example,

"You are," "He or she is," "You did," "Do it." We find striking analogues of these in two of the cases of temporal lobe epilepsy. Case 4 heard a voice in his stomach saying "Do this," "Do that." Case 3 heard a voice in his head saying "You do this," "You do that," "You did something wrong." "Things," the patient added, "that I did not do wrong." This case is of surpassing interest, since not only the syntax, but the content of the patient's hallucinations closely simulates that found in schizophrenia. Here we see evoked by epileptic discharge that specific quality of schizophrenic thinking to which later French writers have applied the term "bipolarity." The content of the hallucinations in schizophrenia tends to consist of ideas that are repugnant or terrifying to the patient, that are the polar opposite of what he himself would wish to think and do. Wherefore he feels constrained to counter them by denial or refusal, and only finally, when their continuous reiteration exhausts him, by acceptance. But acceptance does not terminate this intense mental argument, for new commands and incompatible ideas are evoked, which in their turn engender fresh tension. The patient with temporal lobe epilepsy (Case 3) experienced in episodic form a phenomenon which in schizophrenia may go on every minute, every hour, of waking life, rendering impossible single-minded concentration on all other subjects.

3. Visual Hallucinations

It has been shown that so-called "auditory" hallucinations may be experienced either within the mind or as emanating from the external environment. Visual hallucinations may likewise take the form of internal or external perceptions.

(a) In Temporal Lobe Epilepsy

The first gradation of abnormal visual experiencing is illustrated in what patients tend to describe as "flash-backs."

Case A (M. M.) has been reported by Penfield and Jasper (1954). The patient described what she experienced in some of her attacks thus: "Suddenly something flashes through my mind—it is a memory of something past; the experience may last only a few seconds, yet I feel close to that event in my life after it had occurred." She stressed the sudden appearance, brief duration, and extraordinary vividness of this mental image, which was quite different in quality from the ordinary mental pictures which are part of everyone's thinking. Here we have a visual hallucination experienced within the mind.

Case B also illustrates a vivid internal visual experience, with the additional interest of reflecting the patient's immediate interests.

A. R. (Case B) an Englishwoman of 29, was married to a Canadian butcher. She had recently received a photograph of her brother's grave in a military cemetery in Holland. During her seizures she saw, vividly etched on her mind, series of gravestones, rows of tulips, lines of lamb carcasses. She described her manner of experiencing these hallucinations thus: "They were inside my forehead. It was not as though outside on a screen. I did not actually see it in the room; it must have been a mental picture—it came to me without my own powers of direction . . . and it came suddenly." This patient had had seizures since the age of 8, but the induced visual imagery of graves, tulips, and lamb carcasses had only recently appeared as part of her seizure pattern. Her mental preoccupations dictated the content of her visual hallucinations although they played no part in their causation.

Cases C and D experienced visual hallucinations which conform to the accepted definition of hallucinations in that they were apprehended by the patient as though located in his external environment.

Case C is unusual in that it illustrates the transformation of thought into visual hallucinations at the moment of epileptic discharge. There exists a certain analogy between this experience and the "echo de la pensée" of schizophrenic patients, who say they hear their own thoughts. This patient saw his own thoughts.

D. C. (Case C), aged 16, had an extensive atrophy involving the temporal, parietal, and occipital lobes of the left hemisphere,

necessitating their complete resection. Since the age of 8 he had had frequent seizures without loss of consciousness. In the year preceding operation he had three major convulsions. He described what he experienced in these major attacks before losing consciousness. He fell down during the attack and tried to overcome it by mental effort, whereupon he was aware of all his thoughts transforming themselves into vivid external visual images. He was so terrified by this that he kept changing his thoughts, but each thought continued to transform itself into a visual image. For instance, he thought of fire-crackers, and suddenly these were seen in sunset colours of blue and mauve in front of his eyes located "about a block away," seeming to tumble down through the sky but never reaching him. Then he thought of a space ship, and it appeared as a pinkish-blue object, moving towards him, becoming smaller as it did so. He thought of maple trees in the playground, and saw them as though "upside down." (This curious anti-gravity positioning also occurred with a leptazol-induced seizure when he reported seeing the technician as though walking on the ceiling.) Finally, he thought of himself lying on the ground, and immediately saw an external pictorial image of himself, described thus: "The way I felt on the ground was the way I looked in the picture, but people were not around me. I was in different forms; I thought of something, then I saw it. I thought of myself, and then I saw myself the way I was thinking of myself." This occurred with his eyes closed, and the phenomenon disappeared when he opened his eyes, but he said that it was difficult and "unpleasant" to keep his eyes open.

The following case has been reported by Penfield and Jasper (1954).

A. B. (Case D), aged 32, an artist's daughter, had a right temporo-occipital focus. Both simple and complex visual hallucinations occurred as part of her seizure pattern. These included: (a) flickering lights seen in the left visual field. (b) Representations of famous paintings—Rembrandt's "Night Watch" and "Self Portrait." She also saw, as though in a picture, "Christ coming down from the sky." All these were two-dimensional and were seen in the left visual field, as if superimposed on the existing external environment. (c) A kitchen in the country, and she felt—although she did not see—herself there, with two boys running towards her. The kitchen and the boys appeared in three-dimensional form. Unlike a and b, this image was seen in both visual fields, and during its appearance the patient was blind to all else in her external environment.

(b) In Schizophrenia

Only brief reference can be made to visual hallucinations in schizophrenia. Generally accepted as being a less constant symptom than "auditory" hallucinations, they can on occasion assume predominance. All the visual phenomena described in temporal lobe epilepsy have been found in schizophrenia. There may occur in the latter disease many more varied and complex visual hallucinations. Bizarre hallucinations of parts of the human body are frequent. The patient may have a vision of the self—that is, autoscopic hallucination—but a somewhat similar phenomenon has been elicited in temporal lobe epilepsy (Case C). In temporal lobe epilepsy such hallucinations are an episodic occurrence, whereas in schizophrenia they are a constantly recurring experience; but in both they are of brief duration—"they come and go in a flash"—and in both they may be "seen" in the mind or in the external environment.

Basis and Unitary Nature of the Hallucinations Described

These psychical phenomena—or hallucinations—may be illustrated in the form of a spectrum at one end of which the hallucinatory experience is apprehended as "thoughts," and at the other end as visual or auditory images with an apparent location in the external environment. Intermediate are these visual and auditory abnormal perceptions—or hallucinations—which the subject experiences within his mind. The similarity which exists between these hallucinations in temporal lobe epilepsy and schizophrenia makes it difficult to avoid the inference that the latter disease is also based on some neurophysiological change, the nature of which is yet unknown.

We also submit that all these abnormal experiences are based on a single phenomenon, showing gradations in its mode of perception by the subject; or, in other words, that they all represent but different modes of perceiving abnormal derivations of thought. How, then, can we explain the various gradations? We think it is possible to do so by considering, in its simplest terms, the process of normal thinking.

Some part—the greater part—of normal thinking consists in the intangible, imperceptible linkage of elements which cannot be described in terms of known sensations. But there are superadded qualities in thinking which can be termed kinaesthetic and visual. Part of our thinking consists in the evocation of words and visual images. This is illustrated in the division of human beings into “verbalizers” and “visualizers.” It seems permissible, therefore, to assume that when some physical stimulus acts on certain areas of the brain to produce an abnormal thought—a hallucination of thought—such hallucination may present (a) as a thought—which forces itself on the attention of the subject, cannot be banished or superseded at will as in the manner of normal thought, but is nevertheless incapable of description in other terms than that of “thought”; or (b) as a visual or verbal image—of varying degrees of intensity, which the subject describes in terms of vision or hearing.

Summary

A comparison is made between certain hallucinatory phenomena or, more properly, the patient's mode of perceiving certain hallucinatory phenomena—in temporal lobe epilepsy and schizophrenia. The current popular definition of a hallucination, which implies the location of the abnormal perception external to the self, is criticized, and it is submitted that abnormal internal perceptions can also be included under the designation of hallucination. This designation, however, lacks precision, and it is hoped that in future more precise terms will be formulated to cover the many varieties of abnormal perception here illustrated.

Five cases of temporal lobe epilepsy are described in which epileptic discharge evoked respectively (a) ill-defined or “amorphous” thoughts, (b) formulated or “crystallized” thoughts, (c) a voice located in the head, (d) a voice located in the abdomen, and (e) a voice heard in the external environment. Cortical stimulation reproduced a, b, and e. Similar gradations in this type of hallucinatory experience, elicited from interrogation of patients suffering from schizophrenia, are briefly tabulated.

Four cases of visual hallucinations in temporal lobe epilepsy are described. In two of these the visual experience was apprehended within the mind of the patient, and in the third as superimposed on the external environment. (This last was reproduced by cortical stimulation.) In a fourth case the patient experienced the transformation of all his thoughts into vivid external images—“What he thought, he saw.” This bears a certain analogy to the phenomenon known as “echo de la pensée” found in schizophrenia.

It is submitted that these various gradations from “thoughts” to external auditory and visual hallucinations represent but different modes of perceiving abnormal derivatives of thought or hallucinations of thought. Since some part of normal thinking consists in the evocation of visual images and words, it is argued that a hallucination of thought may present either as a “thought” or as a visual or verbal image of varying degrees of intensity.

The finding that epileptic discharge and cortical stimulation can evoke gradations in hallucinatory experience

similar to those found in schizophrenia suggests that the latter disease may also have a neuro-physiological basis.

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CHRONIC PAIN IN THE RIGHT ILIAC FOSSA*

BY

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Chronic pain in the right iliac fossa constitutes a common problem in all branches of medical practice. The correct management of the disorder depends upon careful clinical evaluation, and mistakes are easy to make. One common mistake is the tendency among many people to rush into the much abused diagnosis of a “chronic appendix” or, as the only alternative, to treat the patient as a “neurotic.” Either of these assumptions may lead to disastrous consequences, and to avoid such obvious pitfalls it is my practice to approach the problem of diagnosis by seeking the answers to three questions: (1) Is there an organic cause for the pain apart from the appendix? If not, (2) Is the appendix genuinely at fault? Or, (3) Is the pain of functional origin? This order of questioning has been chosen deliberately, because it often happens that the appendix is removed when some other cause for the pain is present, and because it too often happens that the appendix is removed without reasonable evidence that it is diseased. Functional affections, however, should always be considered last, because there can be no greater error than to stigmatize a patient “neurotic” when in fact organic disease is present.

1. Causes of Pain Apart from the Appendix

Let us first consider those organic causes of chronic pain in the right iliac fossa which are unconnected with appendicular disease. So that nothing of importance shall be omitted, it will be convenient to classify them on an anatomical basis.

(a) *The Caecum*.—There is no doubt that chronic pain in the right iliac fossa can arise in the caecum. It may be due to gaseous distension, when the area is tympanitic, gurgling is present on palpation, and excessive borborygmi are heard on auscultation of the abdomen. In older patients it must always be borne in mind that caecal distension may signify chronic intestinal obstruction due to a carcinoma of the pelvic colon, and every effort must be made to exclude this serious disease. Loading of the caecum with soft faeces, in association with constipation, may also cause chronic pain in the right iliac fossa; in these cases a characteristic doughy feeling is detected on palpation. Pain may also arise from caecal spasm accompanying general

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colospasm; tenderness is present over the caecum and often over a rigid pelvic colon in the left iliac fossa. In such cases propantheline (“pro-banthine”), a recently developed ganglion-blocking agent, is of great diagnostic and therapeutic value. Malignant disease of the caecum seldom causes pain as its first symptom.

(b) *The Terminal Ileum*.—Chronic pain in the right iliac fossa is rarely due to disease of the terminal ileum. Crohn's disease (regional ileitis) may give rise to an attack of acute or subacute pain closely resembling appendicitis, but in its chronic form it produces the symptoms of chronic small-intestinal obstruction with recurrent attacks of colicky pain in the right iliac fossa. Young adults are usually affected, and loss of weight is common. The thickened terminal ileum is usually palpable as a tumour in the iliac fossa. A similar history of recurrent bouts of colic occurs with localized tuberculous enteritis, but here no tumour is palpable. Both these diseases are rare, but they should be considered in the differential diagnosis of difficult cases.

(c) *Mesenteric Glands*.—Enlargement of the ileo-caecal glands is a common cause of pain in the right iliac fossa in children. Pain arising in these glands is due to inflammatory disease and may be tuberculous or non-specific. In non-specific mesenteric adenitis pain may be felt in the iliac fossa or in the umbilical region, and may be colicky in nature; there is no shifting of the pain as in appendicitis, and vomiting is rare. Tenderness and muscular guarding are present, but there is no true muscular rigidity. The glandular infection often follows a sore throat and there is usually evidence of chronically infected tonsils. Tuberculous adenitis is more difficult to diagnose with accuracy, although a positive Mantoux reaction in young children is suggestive. Radiography is of little use in diagnosis because calcified (healed) glands produce no symptoms. A pale fatty stool due to blockage of lymphatic vessels (tabes mesenterica) is evidence of gross tuberculous disease.

(d) *The Urinary Tract*.—Chronic pyelitis, stone in the ureter, and hydronephrosis may all cause pain in the right iliac fossa. Frequency of micturition almost invariably accompanies chronic pyelitis, and pus cells and organisms are present in the urine. Pain arising from a ureteric calculus usually radiates from the loin to the groin, but when a stone becomes impacted in the ureter the pain may be localized to the iliac fossa. In such cases a previous history of ureteric colic is of the utmost importance and the urine should be searched for red blood cells. Chronic or intermittent hydronephrosis may cause great difficulty in diagnosis when the pain is not felt in the loin, because associated urinary symptoms are usually absent. Careful bimanual palpation of the loin must be carried out, and in all doubtful cases the urinary tract must be investigated completely.

(e) *Female Pelvic Organs*.—Gynaecological conditions are a fairly common cause of pain in the iliac fossa, but the differential diagnosis of these conditions must rest with the specialist. The classical ovarian pain of “Mittelschmerz,” spasmodic and congestive dysmenorrhoea, uterine fibroids, pyosalpinx, small ovarian cysts, and prolapse of the ovary come readily to mind. As a generalization it can be said that gynaecological causes of pain in the right iliac fossa should be considered only if the attacks of pain bear a definite relationship to the menstrual cycle, if there is some associated disorder of menstruation, or if a swelling in the pelvis is detected on rectal or vaginal examination. Pain in the iliac fossa associated with a vaginal discharge does not justify a diagnosis of salpingitis.

(f) *The Spine*.—Chronic pain in the iliac fossa may also arise from affections of the spine. A psoas (tuberculous) abscess will cause pain in the lower quadrant of the abdomen and will be associated with a palpable swelling, but backache is usually the first symptom and the lumbar spine will be rigid when movements are tested. Congenital or acquired deformities and arthritis of the spine may give rise to pain radiating to the iliac fossa, but a careful analysis of the pain will reveal its radiating character and direct attention to an examination of the spine.

A formidable number of causes of chronic pain in the right iliac fossa have now been discussed, but they must all be given careful consideration in the diagnosis of this symptom. Investigation must always include a detailed and accurate history, careful inspection and palpation of the abdomen, the performance of rectal and vaginal examinations, examination of the spine, and testing of the urine, both chemically and in the laboratory. If all these investigations are negative the next question must be posed—is the appendix genuinely at fault?

2. The “Chronic Appendix”

The term “chronic appendicitis” is misleading and is often used without any serious consideration of its meaning. Some people believe that chronic appendicitis is a clinical entity of common occurrence, others that there is no such disease. A well-known teacher has said that an honest surgeon up to the age of 35 would refuse to believe in the existence of chronic appendicitis; that between the ages of 35 and 40 he would wonder if it occurred but refuse to accept a fee for removing the appendix; and that over the age of 40 he would be convinced that it was indeed a clinical entity.

To try to understand the meaning of the terms “chronic appendix” and “chronic appendicitis” let us consider the common clinical syndromes which occur in appendicular disease. Apart from acute appendicitis, which we are not considering in this discussion, two definite clinical syndromes can be recognized—recurrent subacute appendicitis and recurrent appendicular colic. By recurrent subacute appendicitis we mean recurring mild inflammation. In the earlier of these attacks the pain begins in the epigastric or umbilical regions and settles down in the right iliac fossa; in later attacks this shifting character is often absent and the pain is felt in the iliac fossa from the beginning. Fever is slight or absent, but the tongue may be furred and the appetite lost; vomiting is uncommon. Examination of the abdomen during an attack will show tenderness and guarding in the iliac fossa, but no rigidity. Such mild attacks usually last for 12 to 36 hours and then subside, leaving the patient free of symptoms for many months or even years. With recurrent appendicular colic the pain is felt around the umbilicus, but tenderness and guarding are present in the right iliac fossa. The pain is spasmodic in character, often more severe than the inflammatory pain of mild appendicitis, and vomiting is common. There is no fever and the tongue is clean. The bouts of colic may last for a few days at a time, and the intervals of freedom between attacks are usually shorter than those between attacks of inflammatory disease.

In the intervals between recurrent bouts of appendicular inflammation or colic the patient may show no abnormal physical signs whatever. The diagnosis depends upon an accurate history and upon observations made by the practitioner during one or more of the attacks; the importance of such observations cannot be overemphasized, and without them the consultant may have great difficulty in deciding the nature of the attacks.

Recurrent subacute appendicitis and recurrent appendicular colic may be considered to represent two types of “chronic appendix,” inasmuch as the appendix is repeatedly giving rise to trouble or “grumbling”; but cannot truly be called “chronic appendicitis” because this term implies persistent chronic inflammation of the appendix. It sometimes happens, however, that after repeated bouts of mild inflammation or colic there may be persistent pain and tenderness in the iliac fossa between the main attacks. To this state of affairs the term “chronic appendicitis” might reasonably be applied.

Lastly, we must consider those patients who complain of chronic pain in the right iliac fossa without any definite preceding “attacks” to suggest recurrent inflammation or colic. The pain of which they complain may show occasional remissions, but often it persists for weeks on end,

though sometimes occurring for only short periods during a day. Such patients may show localized tenderness in the region of the appendix but no other abnormal physical signs. Can they be said to be suffering from "chronic appendicitis"? These cases are certainly the most difficult to assess, but increasing experience soon tends to dispel any scepticism about the existence of this type of appendicular disease. We have all had our share of surprises in this field. Patients about whom we were extremely doubtful before operation have shown unexpected pathological changes in the appendix; others who have had an apparently normal appendix removed have been magically cured of their symptoms. In all such patients the history is usually vague and inconclusive. Diagnosis depends upon the single physical sign of persistent localized tenderness and upon our assessment of the type of patient with whom we are dealing; here again the general practitioner can be of enormous help to the consultant with his knowledge of the domestic and personal background of his patient. Clinical impressions of this type assume great importance when we consider that accessory aids to diagnosis are often of little value. Radiographic examination of the appendix is uncertain and its results are often equivocal.

From this discussion the position with regard to the various types of "chronic appendix" may be summarized as follows: (a) With a history suggesting *recurrent subacute appendicitis* or *recurrent appendicular colic* we are on safe ground in advising removal of the appendix. (b) A similar history followed by the development of persistent pain and tenderness in the right iliac fossa may reasonably be called *chronic appendicitis*, and here again appendectomy can be safely advised. (c) *Chronic appendicitis* without a previous history of recurrent "attacks" of pain is a more difficult problem. Children should always be given the benefit of any doubt, but in adults the decision to advise removal of the appendix will rest largely upon the general practitioner's knowledge of his patient's character and his interpretation of the nature of the symptoms.

3. Functional Pain

Last of all we come to those patients with no evidence of organic disease apart from the appendix and in whom we are not satisfied that the appendix itself is genuinely responsible for their symptoms. Few patients with pain in the right iliac fossa are true malingerers, and if we are correct in assuming that there is no organic cause for their pain we are dealing with examples of the *anxiety state*.

These patients have genuine symptoms and need help, but great patience and tact are required if that help is to be given. It is surprising how often a sympathetic attitude will reveal a psychological basis for the symptoms, and sometimes the mere unburdening of his troubles will help the patient enormously. Some people are quickly assured if they are satisfied that we have made a thorough and complete examination and can convince them that there is no evidence of serious disease. Others are more difficult to manage and do not readily accept the idea that their pain is nervous in origin in spite of a completely negative examination and a series of negative investigations. The psychiatrist cannot help if the patient is uncooperative, and if our common-sense approach to the mental problem does not produce conviction we are likely to have a dissatisfied patient. But at all costs we must avoid advising appendectomy in someone we know to be a true neurotic.

All too often such patients will continue to seek further opinions until they find someone who will remove the appendix, but we must not be responsible for such action if we consider it ill advised. It is better to lose a disgruntled patient than to have him return with the same pain after an operation to which we have agreed against our own judgment. It is also better to lose such a patient than to be responsible for that dreadful sequence of events which culminates in subsequent operations for adhesions or other mythical maladies and leads to the creation of a confirmed hypochondriac.

GENERALIZED HYPERTROPHIC OSTEOARTHROPATHY IN ASSOCIATION WITH BRONCHIAL CARCINOMA

A REVIEW, BASED ON 24 CASES

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During the past seven years we have encountered in the West of Scotland no fewer than 24 examples of generalized hypertrophic osteoarthropathy in association with bronchial carcinoma. As it would appear to be the largest reported collection of patients suffering from this fascinating syndrome, and because modern surgery may handsomely reward early clinical recognition, it seems to be an opportune time to review the known facts and some theories of pathogenesis.

While the literature on the subject of generalized osteoarthropathy continues to grow, there has been little increase in our knowledge of the cause and real nature of the pathological changes of this condition since the first known description by von Bamberger in 1889. Marie (1890) named the syndrome "hypertrophic pulmonary osteoarthropathy" and defined it as a "symmetrical osteitis of the four limbs chiefly localized to the phalanges and terminal epiphyses of the long bones of the forearm and leg, sometimes extending to the roots of the limb and flat bones and accompanied by a dorsal kyphosis and some affection of the joints." This description requires little alteration to-day.

Although Hippocrates (1923), as early as the fifth century B.C., had described clubbing of the finger-nails, it was not until late in the nineteenth century that von Bamberger and Marie drew attention to the changes in the extremities associated with certain diseases. The confusion existing prior to Marie's description is illustrated by a case described by Saundby (1889) as one of acromegaly: a man aged 37 with thickening of the hands and joints died after five months, and necropsy showed "a sarcoma of the left lung with caseating pneumonia, a discovery which could only be coincidental." His illustrations put beyond doubt that he had unwittingly dealt with a case of osteoarthropathy.

Numerous reports have appeared dealing with the association of arthropathy with a variety of internal diseases. These diseases have most frequently affected the respiratory tract. Chronic lung abscess, putrid bronchiectasis, and empyema, all now fortunately rare, predominated. Brooks (1913) and Locke (1915) pointed out that at least a proportion of cases of osteoarthropathy had a malignant chest lesion. We have found it in a patient with metastatic lung tumours, and it has been reported in association with such intrathoracic lesions as arteriovenous aneurysm of the lung (Adams *et al.*, 1944), fibroma of the visceral pleura (Price-Thomas and Drew, 1953), and benign tumours of the lung and chest wall (Van Hazel, 1940).

It is interesting to note that osteoarthropathy has been described in a dog with a bronchial carcinoma (Wissing and Weisz, 1943) and in rats (Sutro and Pomerantz, 1939), a horse (Liénaux, 1909), and even a lion (Ball and Lombard, 1926).

It has been witnessed in many apparently unrelated diseases such as carcinoma of the nasopharynx, myeloid leukaemia, colitis, and steatorrhoea. Although a few cases of idiopathic osteoarthropathy have been recorded (Freund, 1938; Camp and Scanlan, 1948) one should hesitate in making such a diagnosis until a primary disease has been excluded. The fickleness of the syndrome is well illustrated by Locke's account of a patient who had osteoarthropathy for five years before a lung tumour became obvious. Such an experience was repeated in one of our series (Case 14); it was nine

months before there was radiological evidence of a lung tumour.

Craig (1937), Rottjer *et al.* (1946), Temple and Jaspin (1948), Pattison *et al.* (1951), and Ellman (1953) have all reported a small series of cases of bronchial carcinoma having joint symptoms as the presenting feature. The syndrome is seldom encountered by general physicians, and a possible reason is that the rapidly growing or oat-celled growth, common in the medical wards, does not produce osteoarthropathy. Conversely, in chest-unit patients the more chronic epidermoid variety predominates, and so it is difficult to estimate the frequency of the syndrome in all cases of lung cancer. Jack (1952) found three fully developed cases in 668 patients with bronchial carcinoma. Wierman *et al.* (1954) report an incidence of 5% in 481 resections for malignant lung

Summary of 24 Patients having Joint Symptoms Related to Lung Cancer and showing Clinical and Radiological Evidence of Hypertrophic Pulmonary Osteoarthropathy

Case No.	Age	Tumour Site	Histological Type of Tumour	Initial Symptoms and Signs	Duration of Joint Symptoms Before Correct Diagnosis Made	Treatment	Result (To November, 1954)
1	45	R.U.L.	Adenocarcinoma	Radiological shadow for 18 months	5 months	Pneumectomy, 1947	Operation death
2	51	L.L.L.	Epidermoid	"Rheumatic fever"	7 "	Pneumectomy, 1948	" "
3	47	R.U.L.	—	Stiffness and swelling of ankles and knees	5 "	Radiotherapy	Gold therapy produced a remission of joint symptoms. Died with metastases 4 months after start of treatment
4	64	R.L.L.	—	Stiffness, swelling, and pain in ankles and knees	5 "	"	No relief of joint symptoms. Died with metastases 3 months after start of treatment
5	47	R.L.L.	Epidermoid	Stiffness and pain both legs. Also haemoptysis	4 "	Pneumectomy, 1949	Complete and immediate relief of joint symptoms. Died 3 months after operation with cerebral metastases
6	56	L.U.L.	Adenocarcinoma	Haemoptysis	3 "	Pneumectomy, 1950	Complete relief of joint symptoms. Died 7 months after operation with cerebral metastases
7	53	R.L.L.	"	Pain and stiffness of knees	3 "	Lobectomy, 1949	Immediate relief of joint symptoms which, however, recurred with the appearance of osseous metastases. Died 8 months after operation
8	52	R.L.L.	Epidermoid	Pain and swelling of wrists, feet, and ankles	10 "	Pneumectomy, 1949	Immediate and permanent relief of joint symptoms. Died 6 months after operation with local recurrence of tumour
9	59	R.L.L.	Adenocarcinoma	Haemoptysis	4 weeks	Pneumectomy, May, 1951	Immediate relief of joint symptoms. Some residual stiffness of left shoulder and slight deformity of fingers. Has remained well since operation
10	59	R.L.L.	Epidermoid	Pains in legs and swelling of ankles and knees	5 months	Pneumectomy, Sept., 1947	Has remained symptom-free since operation
11	38	L.U.L.	"	Stiffness of ankles and knees	6 "	Pneumectomy, Jan., 1952	Immediate disappearance of joint symptoms. Died October, 1952, with local tumour recurrence
12	52	R.L.L.	"	Stiffness of arms and legs	2 years	Symptomatic	Died 2 months after first seen and diagnosed
13	41	R.U.L.	"	Stiffness, pain, and weakness of knees and ankle	5 months	Radiotherapy	Partial remission of joint symptoms and of chest pain. Died with cerebral metastases 12 months after diagnosis made
14	46	R.L.L.	"	Stiffness and swelling of knees	10 "	Pneumectomy, April, 1952	Relief of stiffness and pain. "Weak joints" remained after operation. Ultimate complete rehabilitation. Died December, 1953, with cerebral metastases
15	54	L.U.L.	—	Left shoulder pain	3 weeks	Radiotherapy	Partial relief of joint symptoms with corticotrophin. Complete and permanent relief after radiotherapy. Died with local tumour extension 9 months after diagnosis made
16	50	R.U.L.	Epidermoid	Lassitude and weight loss	4 months	Symptomatic	Died 2 months after diagnosis made
17	48	R.L.L.	"	Haemoptysis	4 "	Lobectomy, Sept., 1952	Immediate relief of joint symptoms. Died with generalized metastases December, 1953. No recurrence of rheumatism
18	56	R.U.L.	"	Pain and stiffness left shoulder and cough	12 "	Thoracotomy, Oct., 1952	Partial spontaneous remission of joint symptoms before operation, and continued improvement after thoracotomy. Died April, 1953, with metastases
19	52	R.L.L.	"	Cough and chest pain	5 "	Thoracotomy, Feb., 1953	Spontaneous remission of joint symptoms preceded operation. No recurrence before death from metastases January, 1954
20	49	L.L.L.	"	Stiffness and pain in hips, knees, and wrists	6 weeks	Lobectomy, May, 1953	Immediate complete relief of joint symptoms. Has remained well to date
21	55	L.U.L.	"	Swelling and stiffness of ankles	6 months	Pneumectomy, July, 1953	Relief of polyarthritides symptoms. Myocardial infarction with congestive failure during convalescence. Died with cerebral metastases March, 1954
22	57	L.L.L.	"	"Arthritis" left knee	16 "	Symptomatic	Admitted to hospital in terminal stages of illness with massive left pleural effusion. Died after 2 months' observation
23	62	R.U.L.	"	Generalized joint stiffness	3 "	Pneumectomy, July, 1953	Immediate disappearance of joint symptoms. Died with metastases April, 1954
24	57	L.L.L.	"	Swelling of knees	3 "	Lobectomy, Nov., 1953	Had usual relief of "rheumatism" and has remained well to date

lesions, but these included patients with so-called "local osteoarthropathy" or simple clubbing. It is our impression that the frequency of the generalized form is in the region of 1-2%.

Clinical Manifestations of Osteoarthropathy

From the Table it will be seen that 16 patients had joint disability as the first evidence of disease. Case 12, for instance, had stiffness for a year before the first symptoms directly related to the lung tumour appeared. All 24 patients had experienced such "rheumatic" symptoms for an interval, varying from 3 weeks to 16 months, before the presence of a tumour was suspected. Stiffness and swelling of the large and small joints of the limbs were the usual complaints; pain may be severe or be present only with joint

may occur in certain types of chronic lung and congenital heart disease without evidence of periosteal reaction or joint disability. Clubbing therefore should not be considered synonymous with osteoarthropathy, nor even necessarily the earliest stage of it (Hansen, 1954).

There may be a low-grade pyrexia, and a raised erythrocyte sedimentation rate is invariable, but these, and especially the latter, are common findings with bronchial carcinoma. Swelling of the nipples occurred in two of our patients. Stephens (1928) reported an incidence of 7% with gynecomastia in a series of 156 cases of bronchial carcinoma.

Response to Treatment

Remission of joint symptoms may occur spontaneously (Cases 18 and 19), and some relief may be obtained from nitrogen mustard (Case 8), gold therapy (Case 3), and corticotrophin (Cases 14 and 15). Some patients treated by deep x-ray therapy had partial or complete relief of "rheumatism," but the objective signs of osteoarthropathy were little altered.

The most dramatic, immediate, and complete relief of joint symptoms is produced by operative removal of the lung tumour. In all 13 patients who survived tumour resection, joint mobility was increased within hours of the operation, and the patients who had been bedridden with "arthritis" for weeks or months were walking normally within a few days. It is no exaggeration to state that these patients were dumbfounded at the relief, and more than once we found them the morning after operation studying the increased mobility of their fingers and arms in utter amazement. Just as rapidly,

they remarked that their hands and feet felt more cool, and objectively we could no longer find evidence of increased peripheral blood flow. Joint swelling subsided in a matter of days; in a few weeks, thickening of the skin of the face and around the joints had disappeared and clubbing subsided (Figs. 1 and 2). After a few months, radiological examination showed absorption of subperiosteal new bone (Fig. 3) and disappearance of osteoporosis in the wrist bones.



FIG. 1.—Clinical photographs of Case 14, illustrating (left) the furrowed and coarse features sometimes seen with osteoarthropathy, and (right) the same patient four months after right pneumonectomy.

movement, or it may be absent. Four of the patients were completely crippled and confined to bed. Sensations of warmth or burning and increased moisture of the hands and feet were sometimes volunteered.

Skin around the affected joints may show thickening and brawny oedema. A similar change is sometimes found on the face, producing rather a characteristic coarse, furrowed appearance (Fig. 1), already observed by Fried (1943).

The hands may have a rheumatoid appearance or be spade-like as in acromegaly (Fig. 2). Hands and feet are warm and moist, and pulsation may be felt in the palms and fingers and heard with a stethoscope on the brachial or femoral artery. Capillary pulsation, however, is not a feature.

Finger-clubbing is almost invariably associated with osteoarthropathy, and occasionally is the most obvious feature clinically; on the other hand, it may be very mild in degree. Conversely, it is known that advanced clubbing



FIG. 2.—Case 14. Patient's right hand (A) before operation, showing the spade-like deformity, with clubbing and thickening around the wrist- and finger-joints. Same hand (B) seven months after pneumonectomy.

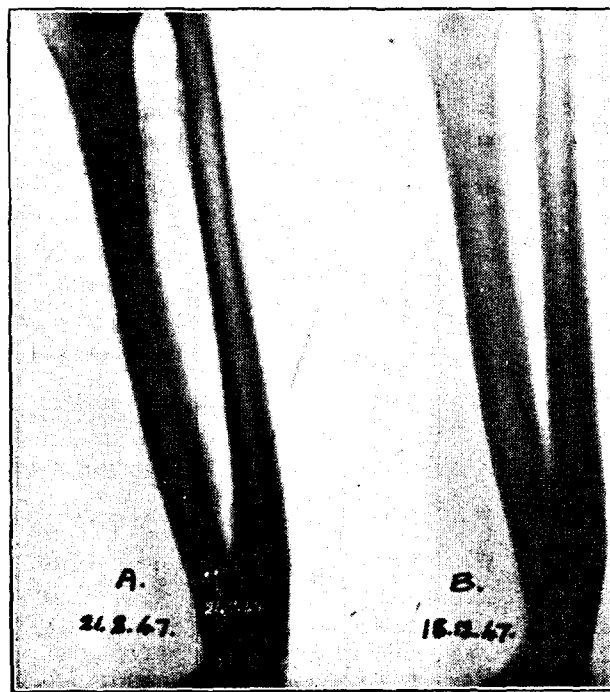


FIG. 3.—Case 10. Right radius and ulna before operation (A): note the marked subperiosteal proliferation. Film (B) three months after pneumonectomy shows considerable absorption of this new bone.

One patient (Case 7), who had obtained the usual relief from lung resection, had a relapse of "arthritis" associated with the appearance of metastases; however, this was an exception, as other patients who died from local tumour recurrence or from metastases had no such relapse before death.

Death was invariably related to tumour spread and there was little evidence that these tumours behaved differently from the more usual case of slowly growing epidermoid carcinoma. Indeed, operative results have been disappointing, only 4 out of 15 patients treated by resection being alive.

Biochemical Findings

In common with previous observers, we have found essentially normal results in most estimations carried out for the study of metabolic bone disease. An exception was the serum phosphorus level, which was found elevated in four severe cases studied. Excretion of F.S.H. (follicle-stimulating hormone) was normal, but this test brought to light a finding which may be of practical importance: in two cases the patient's urine, extracted for the hormone, appeared to contain an unidentified substance which was lethal to laboratory mice.

Arteriovenous oxygen difference was found to be very low in two patients, and in one other the figure rose abruptly after operation. This finding and increased peripheral blood flow, along with absent capillary pulsation, suggest the presence of arteriovenous shunts by-passing the capillary bed.

Skeletal and Articular Changes

The bone changes of osteoarthropathy have been adequately described by past observers (Compere *et al.*, 1935; Gall *et al.*, 1951). There is a proliferative periostitis, characterized by lymphocytic and plasma-cell infiltration, subperiosteal new bone formation, and the production of a pseudo-cortex, 1 to 5 mm. thick, which ultimately fuses with and expands the cortex. It particularly affects the lower ends of the forearm and leg bones, metacarpals, and metatarsals. In extreme cases, clavicles, ribs, pelvic bones, scapulae, and malar bones may be involved. Radiologically (Fig. 3) the picture is quite characteristic, and is perhaps most like a yaws periostitis, showing an irregular but symmetrical osteoid sheathing of the long bones. Joints in involved extremities show extra-articular thickening, but may be the seat of mild to moderately severe chronic synovitis, associated with non-specific degenerative changes in the articular cartilages. In advanced cases, deformities and even subluxations may occur. Changes in the carpus and tarsus are of an osteoporotic character.

Lung Tumour Features

Most of our patients had bulky, circumscribed peripheral neoplasms. Of these studied histologically, 17 were of epidermoid type and four were adenocarcinoma. Central necrosis was a feature in all operation and necropsy specimens. The tumours were present in the right upper lobe (6), right lower lobe (10), left upper lobe (4), and left lower lobe (4). As this type of neoplasm rarely produces atelectasis or invasion of neighbouring structures in the earlier stages, clinical silence is the rule, and yet the patient may be a helpless cripple from his associated arthropathy.

Illustrative Case Histories

Case 7.—An electrical engineer aged 53 was admitted to hospital in January, 1949, complaining of pain in his left chest for a month, pain and stiffness of his knees and swelling of the finger ends for three months, and swelling of the ankles and feet for one month. X-ray examination showed a circumscribed dense homogeneous shadow in the posterior basal segment of the right lower lobe and the changes of osteoarthropathy in the long bones. There was marked clubbing of the fingers and toes and tender extra-articular thickening around both knee-joints. Bronchoscopy showed tumour tissue in the orifice of the right posterior basic

segment orifice (histologically adenocarcinoma). He had a right lower lobectomy on March 1, 1949, and the following day his knees and ankles were much less stiff. Convalescence was uneventful and the joint symptoms disappeared completely. Six months later, however, he developed pain in his left elbow, and x-ray examination showed a metastasis in the lower end of the humerus. From then until his death in November he had a marked exacerbation of the joint symptoms. Two weeks before death he was almost unable to move his arms and legs because of joint swelling, pain, and stiffness.

Case 8.—A married woman (the only female in the series), an accountant aged 52, developed pain and swelling of the feet and ankles in November, 1948. A month later her knees became swollen and stiff, and in January, 1949, she noticed that the ends of her fingers were swollen. Five months later she had to stop work because of pain and stiffness in her hands, wrists, and elbows. The only other symptoms at this time were listlessness and "catarrh." In August, 1949, she was admitted to hospital with gastroenteritis. Generalized osteoarthropathy roused interest, and an x-ray film of the chest showed a large circumscribed shadow in the right mid-zone. She was transferred to a thoracic unit in October. By this time she was in poor general condition. She looked old and wizened, with deep facial furrows, marked swelling of joints, and clubbing of fingers and toes. X-ray examination showed a massive shadow in the right lower chest and radiological signs of advanced osteoarthropathy. In November she was given a four-day course of nitrogen mustard (total 19 mg.), which produced some relief of joint stiffness. On December 6, as her general condition had improved, a right pneumonectomy was performed with dramatic and immediate relief of her joint pains. Histology of the tumour showed an epidermoid carcinoma. She died six months later with local recurrence of the tumour, but without recurrence of joint symptoms.

Case 10.—A blacksmith aged 59 (the longest survivor) began to have pains in his legs with swelling of the ankles and knees in March, 1947. The following month he could not get out of bed because of joint stiffness. When admitted to hospital in August he had lost 2½ st. (15.9 kg.) in weight. He was investigated as a case of infective rheumatism. The blood sedimentation rate was 65 mm. in the first hour (Westergren). Clubbing of his fingers was noted, and an x-ray film showed a round shadow in the apex of the right lower lobe. Bronchoscopy confirmed the presence of an epidermoid carcinoma protruding from the apical segment orifice. He had a right pneumonectomy in September, some six months after the onset of his joint symptoms. The day after operation he was surprised at the relief of pain and joint stiffness and the improvement was progressive. Three weeks after the operation he was walking well. Four months later, x-ray examination showed marked diminution in periosteal new bone formation round the radius and ulna (Fig. 3). His progress was uneventful, and he is alive and working more than seven years after the beginning of his symptoms.

Discussion

Although simple clubbing of the fingers is a common phenomenon, true osteoarthropathy is relatively rare, and in this seven-year period we have not witnessed a case related to disease other than lung cancer. As stated recently (British Medical Journal, 1954), bronchial carcinoma would seem now to predominate as the chief cause, although Price-Thomas (1953) has stated that no condition is associated with osteoarthropathy as constantly as fibroma of the visceral pleura. This, however, is a rare tumour. It seems possible that many cases of arthropathy previously reported as associated with empyema and lung abscess were suffering from carcinomatous lung abscess or empyema secondary to unrecognized lung cancer.

Mendlowitz (1942), reviewing the "welter of hypotheses" advanced to explain the phenomenon, found them unconvincing. These included the theories of toxæmia, anoxæmia,

capillary stasis, lymph stasis, endocrine disturbance, and autonomic nervous upset. He concluded, however, that increased blood supply must form the cornerstone of any theory of production of osteoarthropathy, and certainly we have found increased peripheral blood flow a constant feature and one which disappears within two or three hours after removal of the lung tumour.

Hypertrophy and hyperplasia from circulatory changes can be observed in arteriovenous fistulae in the limbs. The increased growth of the limb was thought by Sir Thomas Lewis to result from the more rapid flow of blood distal to the arteriovenous shunt. Cross and Wilson (1952) record a case of axillary arteriovenous aneurysm with unilateral clubbing in which increased blood flow to the hand was the only demonstrable circulatory abnormality. Increased peripheral circulation was regarded by Wilson (1952) as an essential feature in acquired clubbing. He demonstrated that blood flow through clubbed fingers was greater than normal, and showed that vasomotor nerves were probably not responsible for this. Lovell (1950) found an excess of fibrous tissue in the distal segments and increase in the calibre of the digital arteries in clubbed fingers. There were abundant characteristic local arteriovenous anastomoses in the distal finger segments, near the junction of the dermis and subcutaneous tissue. He thought that the excess of blood reaching the finger-tip was mainly through these anastomoses and that the by-pass of blood away from the capillary bed might be responsible for the proliferative changes. Mauer (1947), attempting to explain the aetiology of clubbing in both cyanotic and hypervascular states, elaborated this theme. He introduced the interesting concept of peripheral tissue anoxia produced by combination of accelerated peripheral blood flow and raised erythrocyte sedimentation rate; thus erythrocytes, moving rapidly in rouleaux formation through capillaries or arteriovenous shunts, do not have an opportunity for adequate gaseous exchange. It is worthy of note that in our patients both hyperaemia and raised E.S.R. approached normal limits immediately following tumour resection.

The exact mechanism by which increased blood flow produces hypertrophy is unexplained, but from the postulations of Leriche and Policarde (1928) and of Greig (1931) it seems just possible that hyperaemia alone may be the responsible factor in osteoarthropathy. It is acknowledged that new bone is normally restrained by the periosteum, and that a bone cannot exceed its normal limits unless this membrane be removed or raised. Possibly, in this disease, subperiosteal new bone may be deposited as a result of raising of the membrane by serous effusion, an invariable accompaniment of the oedema and cellular proliferation of periosteal hyperaemia. Similar vascular changes may explain the associated subcutaneous tissue and joint involvement. Increase of periarticular circulation modifies synovial fluid both in quantity and in quality and stimulates proliferation of all connective-tissue cells.

Before considering any theory on the mode of production of osteoarthropathy by bronchial carcinoma we must bear in mind the following facts. Osteoarthropathy is produced by only a small proportion of bronchial cancers, most of which are peripheral, grow slowly and concentrically, and show marked central necrosis. There is invariable and immediate relief when such a tumour is resected. Similar relief has been reported to follow ligation of the pulmonary artery on the side of the tumour (Wyburn-Mason 1948) and also denervation of the lung hilum when the tumour could not be removed (Brea, 1948). We have witnessed remission of symptoms occurring spontaneously, following certain drugs, and also after thoracotomy. It must also be remembered that osteoarthropathy can be produced by many other tumours both within and without the thorax. Three hypotheses might be considered.

1. *Tumour affects indirectly the endocrine balance.*—Such a theory is supported slenderly by the production of bone growth and soft-tissue changes in acromegaly and by Selye's

work showing that D.C.A. can produce polyarthritis in adrenalectomized animals (Selye *et al.*, 1944). Thomas (1933) described osteoarthropathy occurring after subtotal thyroidectomy. Bariéty and Coury (1950) obtained relief of arthralgia by giving synthetic oestrogen to a patient with inoperable lung cancer. Fried (1943) reported four cases with bronchial carcinoma and osteoarthropathy, all of which showed variable clinical and pathological evidence of endocrine upset. (These changes included an acromegalic appearance, tufting of terminal phalanges, testicular atrophy, hirsutism, macroglossia, and gynaecomastia.) We have already commented on the reversible coarse facial features, and would point out that gynaecomastia (present in two of our patients) must not be accepted as certain evidence of an endocrine aetiology; it has been described in severe starvation and in hepatic cirrhosis, and we have noted it occasionally with bronchial carcinoma in the absence of arthropathy. We have not found testicular atrophy, hirsutism, or macroglossia in our patients. We have not detected any pituitary cortical or thyroid adenomatous changes in the course of three necropsies. Our biochemical investigations lend little support to this endocrine theory, and the dramatic response to removal of the tumour suggests to us a much more direct connexion between the neoplasm and the osteoarthropathy.

2. *Tumour secretes a specific chemical substance, responsible for the change.*—The rapid disappearance of symptoms and signs of osteoarthropathy after tumour resection favours such a theory and also suggests that this substance, possibly of hormonal nature, is destroyed or excreted rapidly. It seems just possible that, excreted in the urine of patients, it might even account for the severe reaction in mice found during our F.S.H. studies. Its effect could be an indirect one through the medium of hyperaemia. On the other hand, the tumour has no special cytological features which would single it out for such a secretory role. A toxic product of tumour necrosis, however, might be absorbed into the blood stream and produce such an effect. While such a theory could explain the relief following pulmonary artery ligation it could not account for the relief after hilar denervation, nor for the occurrence of osteoarthropathy in conditions other than neoplasm.

3. *Theory of an autonomic pulmonary-systemic vascular reflex.*—Cudkowicz and Armstrong (1953a, 1953b) have found precapillary broncho-pulmonary anastomoses in the lungs of patients with variable degrees of finger-clubbing and osteoarthropathy. They were unable to demonstrate such anastomoses in normal lungs or in cases of bronchial carcinoma in which no clubbing was present. The anastomoses in cases of tumour, bronchiectasis, and emphysema were seen only in the affected lobes, and there was occlusion of the pulmonary artery proximal to the anastomoses with a variable degree of recanalization. Cockett and Vass (1951) suggest that thrombosis of a pulmonary artery branch may be a stimulus to the development of these anastomoses. Gilroy *et al.* (1951) found arterial blood in the pulmonary arteries of collapsed lobes at operation, strongly suggesting the presence of bronchial arterial blood in the pulmonary circulation. Accompanying this diversion of bronchial artery blood, Cudkowicz and Armstrong demonstrated hyperplasia of the walls and narrowing of the lumina of the smaller peripheral bronchial artery branches, suggesting a state of spasm and reduced function. They suggest that impulses from the peripheral nerve fibres of the lung, rendered ischaemic by the deviation of bronchial arterial blood flow, reflexly influence the formation of the systemic arteriovenous anastomoses in the limbs, described by Lovell. Such an autonomic reflex theory could explain the occurrence of osteoarthropathy in a variety of thoracic lesions, its absence in most lung tumours, and the relief given by tumour removal, pulmonary artery ligation, hilum denervation, and vagus resection (Hansen, 1954).

All three theories have defects, but their further study will probably furnish a conclusive explanation of the syndrome. Investigations by inoculation of animals with

tumour and urine extracts, vascular studies of resected lungs, and autonomic block are all possible keys to the solution of this fascinating problem.

Summary

Bronchial carcinoma may now be regarded as the chief cause of generalized hypertrophic pulmonary osteoarthropathy. A review of 24 patients with this syndrome encountered during the past seven years is presented.

The pathogenesis of osteoarthropathy has been reviewed in the light of our clinical studies, past experimental work, and the dramatic and invariable "cure" effected by tumour removal.

Such patients are often treated for rheumatism or rheumatoid arthritis for many months, and may become bedridden cripples before the presence of a silent lung tumour is suspected.

Fifteen of the patients were submitted to lung resection. Only four are alive. Operative results in this type of tumour might be expected to improve when the significance of such joint symptoms becomes more generally appreciated.

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CARCINOMA OF BRONCHUS IN ASSOCIATION WITH ACTIVE PULMONARY TUBERCULOSIS

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Both pulmonary tuberculosis and carcinoma of the bronchus are common diseases, and it is not a matter of surprise that the two conditions should at times be encountered together. It is generally accepted that there has been, in recent years, an absolute increase in the incidence of bronchial carcinoma, a disease more common in middle-aged and elderly males. With modern methods of treatment, the mortality from pulmonary tuberculosis has shown a dramatic fall, and this implies that more tuberculous patients are surviving into the cancer age. In addition, more cases of active pulmonary tuberculosis are being found in the older men. It is to be expected, therefore, that the two diseases will be encountered more and more in association. For this reason it is of interest to describe the following six cases with the dual pathology. They were all seen during the past three years, the diagnosis being made during life and confirmed at necropsy. They demonstrate the various problems which arise in the diagnosis of these conditions when associated, and their possible interrelationship.

Case 1

A plasterer aged 50 was found, in 1935, to be suffering from bilateral fibrocavernous tuberculosis, the left upper lobe being chiefly affected. He spent two years in a sanatorium, at the end of which time his sputum still contained tubercle bacilli, but his condition was improved. He remained well and at work for the next 10 years in a stable chronic condition. When seen in 1950 he was bothered by a wheezy bronchitis, but for two years there had been no change in the radiological appearances of his lungs, which showed many calcified foci on the right side, while on the left there was some fibrotic disease of the upper lobe.

In October, 1951, he began to deteriorate. There was some staining of the phlegm, he became easily fatigued, but there was little loss of weight. He was forced to give up his work. Radiologically there was a coalescence of the opacities present in the left upper lobe. In February, 1952, streptomycin and P.A.S. were administered to him at home, with little benefit, and in May it was necessary to admit him to hospital. Tomograms of the left upper lung showed a number of large cavities, those lying posteriorly having a fairly regular outline, but there was one anteriorly which had a very irregular wall. This appearance suggested the possibility of a carcinoma having supervened on his chronic pulmonary tuberculosis. He was too ill for bronchoscopy. Despite the administration of further streptomycin, together with isoniazid, his condition deteriorated. In October the sputum still contained tubercle bacilli, but thereafter all sputa were reported as negative for tubercle bacilli on direct smear. Radiologically there was the gradual development of a large dense opacity in the left upper lung, and the left hemidiaphragm became paralysed. No radical therapy was possible, and in March, 1953, he died.

Necropsy revealed the presence of chronic fibrosis and cavity formation of a tuberculous nature in the apices of both lungs, but in the left lung there was also a round necrotic mass (7.5 cm. in diameter), macroscopically a carcinoma, lying mainly in the upper lobe, against the hilum and the aorta.

Histology showed the carcinoma to be of the epidermoid type, arranged in solid masses, with a little differentiation

into squamous cells. The cell type was relatively polymorphic, and the mitotic frequency relatively high. Tubercles were seen in sections from the adjacent portions of the lung.

Case 2

A railway clerk aged 60 was discovered by mass radiography in 1946 to have quiescent tuberculous lesions in both upper lobes. In 1949, however, he developed a cough, and radiographs showed some slight apical fibrosis on the right side, but on the left side there was infiltration in the upper and mid-zones not previously present in 1946. Examinations of the sputum were negative, but Löwenstein culture of one laryngeal swab in October, 1949, revealed a scanty growth of tubercle bacilli. In 1950 tomograms demonstrated a small thick-walled cavity in the left upper lobe. Apart from three months of bed rest, he did not receive any specific treatment, but continued at work feeling fairly well, although he did complain of undue fatigue. In April, 1952, radiographs showed his condition to be stable.

In July he developed a bad "cold," which was followed by stabbing pains in the right axilla, spreading towards the back of the right chest. At this time he had already retired from his work, but he still was very fatigued. He was bothered by considerable dyspepsia, and was losing weight. Radiologically he was found to have developed a new circumscribed homogeneous opacity in the right upper zone. Tomograms showed a well-defined opacity, but there was no central excavation. Sputum tests were negative for tubercle bacilli.

Bronchoscopy was performed, but with negative result. Nevertheless, the presence of a carcinoma was strongly suspected on radiological grounds, but treatment, either by surgery or radiotherapy, was not thought advisable. In January, 1953, he had considerable pain in the right chest and arm and he developed severe headache and vomiting. It was thought that he now had a cerebral metastasis. In April he had to be admitted to hospital. Radiologically the opacity in the right upper lobe had steadily increased in size, but sputum examinations for tubercle bacilli were negative. Later his liver enlarged, he became jaundiced, and he died in August, 1953.

Necropsy revealed an extensive lesion of the right upper lobe, consisting of areas of carcinoma round one division of the right upper lobe bronchus, and a firm plaque of similar appearance under the pleura, both layers of which were firmly adherent. The rest of the right upper lobe was necrotic, with areas suggestive of tuberculosis. The left upper lobe contained fibrocaseous tuberculous disease, with cavitation. There were also scattered firm nodules in both lungs, due to metastases. The liver was enlarged and showed fatty infiltration but no metastases, and examination of the brain failed to show any evidence of secondary deposits.

Histology showed the carcinoma to be of undifferentiated anaplastic type, and there were some foci of tuberculosis adjacent.

Case 3

A painter aged 53 developed in October, 1951, a cough with sputum, associated with fever and loss of weight. When seen in January, 1952, he was found to be in very poor condition, 1½ st. (10 kg.) underweight, with a marked kyphosis and an emphysematous chest. A chest radiograph revealed evidence of tuberculous infiltration and fibrosis in the left upper zone, the right lung being quite clear. Sputum tests were negative for tubercle bacilli. It was significant that a chest radiograph in 1948 had been normal. He spent six weeks in a sanatorium, which he left prematurely at his own request. He was then treated at home with rest and P.A.S. for four months, but with little benefit.

In May, 1952, a new small opacity appeared in the peripheral portion of the right first intercostal space. During the course of the next two years his general condition and the radiological appearance of the lesions in the left apex did not seem to alter, but the opacity in the right upper

zone showed a steady increase in size, becoming a large, rounded mass. Sputum tests were negative for tubercle bacilli. The blood Wassermann reaction was negative. His haemoglobin was 87%, and white blood count 13,100 (87% polymorphs).

In June, 1954, his clinical condition deteriorated, and he became more easily dyspnoeic. Bronchoscopy was not attempted, as it was not thought likely that any abnormality would be visible, since the growth, if present, was peripheral. Nevertheless, on clinical and radiological grounds, he was believed to have a carcinoma of the right lung in addition to the quiescent pulmonary tuberculosis in the left lung. Radical therapy was not regarded as being indicated.

In August he developed severe headaches and became mentally confused. He was admitted to hospital, where he was found to have papilloedema, and a cerebral metastasis was suspected. There were now also some subcutaneous nodules under the skin of the right forearm which had not been previously present. He became comatose, and soon died.

Necropsy revealed fibrotic tuberculous lesions in the left apex, adherent to the chest wall, while in the right upper lobe there was a large rounded solid mass of carcinoma (10 cm. in diameter) replacing most of the lobe. The nodules under the skin of the right forearm were confirmed to be secondary deposits. The right cerebellum contained one large metastasis (5 cm. in diameter).

Histology revealed the carcinoma to be of the undifferentiated, polymorphic, large-celled variety. Sections of the left apex showed evidence of fibroid tuberculosis.

Case 4

An unskilled labourer aged 64 developed in January, 1953, a cough associated with undue dyspnoea on effort. He also lost his appetite, had considerable abdominal pain after meals, and was losing weight. In March, 1953, his doctor referred him for a barium-meal examination, but no abnormality was discovered in his alimentary tract. One month later the cough was worse, there was a great deal of offensive yellow sputum, and his voice became husky. He was referred for a chest radiograph, and this revealed a dense opacity in the base of the left upper lobe with central excavation. There was pleural thickening over the left chest wall laterally. In the left lower lobe were miliary changes suggestive of tuberculous disease. He was then admitted to hospital, and the following facts were ascertained regarding his previous history. His mother had died of pulmonary tuberculosis. He himself had had three attacks of "pneumonia" before the age of 35. He had been a regular smoker of 10 cigarettes daily for most of his life.

Examination revealed him to be a very ill wasted man, with marked clubbing of the fingers. There were dullness and bronchial breath sounds, with many rales and rhonchi, on the left side of his chest, and the liver was enlarged. His haemoglobin was 72% and white blood count 16,800 (82% polymorphs). Sputum examinations revealed the presence of tubercle bacilli on direct smear. Pulmonary tuberculosis was diagnosed, but the dense opacity in the base of the left upper lobe made one suspicious of the presence of a carcinoma in addition. Any radical therapy for a carcinoma was, however, quite out of the question. Streptomycin and P.A.S. were administered, but his condition rapidly deteriorated, and he died a fortnight after admission to hospital.

Necropsy revealed the left upper lobe to be a solid mass of carcinoma and cavitation. There was one small focus of carcinoma in the right upper lobe near a bronchus. The left lower lobe presented the appearance of a localized miliary tuberculosis. The liver contained four large metastases (5-7.5 cm. in diameter). On the left side of the neck there was a large mass of glands, and smaller masses were in the anterior mediastinum and around the tail of the pancreas. There was a subcutaneous nodule at the

umbilicus, and scattered enlarged glands in the mesentery, the para-aortic area, and the pelvis.

Histology showed the carcinoma to be small-celled, poorly differentiated to an epithelial character. The cell type was moderately polymorphic, and the mitotic frequency relatively moderate. There were also tubercles distributed throughout the left lower lobe.

Case 5

A bookmaker's clerk aged 45 was seen in January, 1953, with a history of cough and sputum of six months' duration. He had regularly smoked 20 cigarettes daily. For three months he had been feeling increasingly fatigued, and had been running an evening pyrexia—to 99.4° F. (37.4° C.)—and had lost 1½ st. (10 kg.) in weight. His father had died of pulmonary tuberculosis.

On examination he was seen to be very ill, and was mentally confused. There was early clubbing of the fingers, and numerous crepitations could be heard in the left upper lung. A chest radiograph revealed a large cavity in the left upper zone, with infiltration in the left upper and mid-zones. The right lung was normal. It was of interest that a chest radiograph, taken when he was demobilized from the Royal Navy in 1944, was normal. Examination of the sputum revealed tubercle bacilli on direct smear. A diagnosis of active pulmonary tuberculosis was made, and he was admitted to hospital. Treatment with streptomycin and P.A.S. was begun at once, but despite this his condition deteriorated. In May he was bronchoscoped, but, owing to gross upward displacement, the orifice of the left upper lobe bronchus could not be seen. A biopsy was carried out on an enlarged gland in the neck, and histological examination showed the gland to be extensively replaced by an undifferentiated carcinoma, probably squamous-celled. It was now realized that a carcinoma of the lung was present, complicated by pulmonary tuberculosis, but no radical therapy for the carcinoma was feasible.

His condition deteriorated rapidly. He soon became cachectic, and clubbing was more pronounced. Radiologically there was now a larger dense mass in the left upper lung, in which there was a cavity (with fluid levels), the walls of which were very irregular, and in which one could distinguish several nodules of growth. His haemoglobin was 58%, and white blood count 15,200 (87% polymorphs). A right hemiplegia developed, and several epileptiform fits occurred, followed by marked impairment of speech. A skull x-ray film showed a small area of thinning of bone in the left frontal area, and it was thought that a cerebral metastasis was present. In July, 1953, he died.

Necropsy revealed a bronchial carcinoma involving and surrounding the left upper and lower bronchi. Distal to this in the lung was a large pus-filled abscess cavity (5 cm. in diameter). There were secondary involved glands in the mediastinum and both sides of the neck, as well as one plaque on the anterior surface of the liver and an enlarged para-aortic gland on the left side. In the brain there was a large cystic area in the left parietal region, the pathology of which was obscure.

Histology showed the lung substance to be infiltrated by cells of a poorly differentiated carcinoma of the bronchus. There were also tuberculous giant cells and endothelial cells.

Case 6

A retired welfare officer aged 69 was seen for the first time in January, 1953. He had suffered from bronchitis for many years, and in 1950 had had a brief attack of left-sided "pleurisy." He had smoked 20 cigarettes daily for most of his life. He had lost weight during the previous three months, and for one month had been having pains in the left chest associated with undue shortness of breath. His cough had become worse, and the phlegm was streaked with blood.

On examination his general condition was very poor and he was markedly dyspnoeic at rest. There was no clubbing of the fingers, but wheezy rhonchi could be heard in both lungs. A chest radiograph revealed some scattered opacities

in the right lung, and on the left side there was a dense opacity arising from the hilum and radiating upwards and outwards into the left upper lobe. Examination of the sputum was negative for tubercle bacilli, and the E.S.R. was 56 mm. in the first hour (Westergren). A diagnosis of carcinoma of the bronchus was made, but further investigation by bronchoscopy was not carried out, in view of his age and very poor condition.

In March he was admitted to hospital. He was cachectic, with an irregular pyrexia—to 102° F. (38.9° C.)—and had now developed clubbing of the fingers. Examination of the chest revealed diminished movement and air entry on the left side, and the coin test was positive. A radiograph revealed that a spontaneous pyopneumothorax had taken place on the left side. The sputum contained scanty tubercle bacilli on direct smear. The haemoglobin was 70%, and the white blood count 17,300 (81% polymorphs). The left chest was aspirated and turbid yellowish-green fluid withdrawn. This was lymphocytic and no tubercle bacilli were seen on direct smear, but Löwenstein culture proved positive. It was realized that the carcinoma was now accompanied by a tuberculous pyopneumothorax, but no radical therapy would avail. He deteriorated rapidly, and died in May, 1953.

Necropsy revealed the left lung to be a solid mass of cancer and abscesses, and perhaps tubercle, too. The left hilar glands were replaced by cancer. The neoplastic left lung had spread over the mediastinum, but the glands themselves were not obviously invaded, apart from the hilar ones. The left pleural cavity contained some purulent fluid, and the right upper lobe showed miliary tuberculosis.

Histology showed a bronchogenic carcinoma with solid epithelial alveoli but no further epidermoid differentiation. The cell type was fairly regular and the mitotic frequency relatively low. There were also scanty tuberculous follicles.

Discussion

It is now nearly 150 years since Bayle (1810), the great teacher of Laennec, described the "phthisies cancéreuses," but he used the term "phthisis" to include the wasting which might ensue from any pulmonary disease, and it is doubtful whether he was in fact describing tuberculosis and carcinoma occurring together in the lungs. Credit for the first description of the two diseases coexisting must be given to Penard (1846). In recent years it has become increasingly recognized that carcinoma and tuberculosis may occur together in the lungs, and reports have been published on the subject (Fried, 1935; Cohen, 1949; Blasi, 1950; Shefts and Hentel, 1950; Coutts, 1951; Helm and Moon, 1952; Nuessle, 1953).

Incidence

The incidence of the association of the two diseases at necropsy has varied greatly in the large series published by different authorities, and is shown in Tables I and II. Among live patients, Källquist (1952) has described a series of 5,527 cases of pulmonary tuberculosis, of which 11 (0.2%) had carcinoma of the bronchus as well; and Seyfarth (1952), in a series of 1,103 cases of carcinoma of the lung, found 11.42% to have evidence of tuberculosis also.

The discrepancies between these different series may partly be explained by the varied interpretations adopted

TABLE I

Authority	Necropsies on Pulmonary Tuberculosis	Coincident Carcinoma
Gerstl <i>et al.</i> (1946)	1,600	0.44%
Drymalski and Sweeney (1948)	2,000	0.75%

TABLE II

Authority	Necropsies on Carcinoma of Lung	Coincident Active Tuberculosis
Farber <i>et al.</i> (1949)	266	3.8%
Bryson and Spencer (1951)	866	1.8%
Gloyne (1951)	648	5.5%

by the different workers regarding what constituted tuberculous disease. Thus Bryson and Spencer's (1951) low figures included only those with chronic active pulmonary tuberculosis, as distinct from mere microscopical evidence of old chronic tuberculous lesions.

It may be concluded that the incidence of active tuberculous changes in patients suffering from cancer of the lung (as exemplified in Cases 4, 5, and 6) are not rare, while patients with pulmonary tuberculosis developing a new growth (as in Cases 1, 2, and 3) are less common.

Problems of Diagnosis

When a carcinoma of the bronchus develops insidiously in a known case of chronic pulmonary tuberculosis (as in Cases 1, 2, and 3), the diagnosis of the dual pathology is likely to be more difficult than when a diagnosed case of carcinoma of the bronchus is complicated by the finding of tubercle bacilli in the sputum (as in Cases 4, 5, and 6).

Clinically, carcinoma of the bronchus should be suspected in a man over the age of 40, usually a smoker, and known to have chronic pulmonary tuberculosis, who appears to be more ill than his tuberculous condition alone warrants, or if he is unusually dyspnoeic or has a pain in the chest which is persistent. It is of interest that in the six cases described above, haemoptysis was not a conspicuous feature. Another suspicious feature is the failure to respond to specific antituberculous chemotherapy. There may, of course, be many reasons for this, but one of them may be the complication of a carcinoma of the bronchus. Similarly, excessive anaemia and a polymorphonuclear leucocytosis (as in Cases 3, 4, 5, and 6) may indicate the presence of a carcinoma superimposed on the tubercle.

The radiological features suggestive of carcinoma are the superimposition on the tuberculous changes of a dense opacity, especially near the hilum. Enlargement of hilar glands, paralysis of a hemidiaphragm, and erosion of a rib are also helpful diagnostic signs. Where there is a thick-walled cavity with a very coarse irregular lining (often best seen in tomograms), it may merely mean a breaking-down neoplasm, but it may also indicate a cancerous development in a tuberculous cavity (as in Case 1).

Bronchoscopy (which was possible only in Cases 2 and 5) did not prove at all helpful. The diagnosis of a cerebral secondary deposit, or the biopsy of an enlarged gland (as in Case 5) or of a subcutaneous nodule (as in Case 3), may be conclusive, but it indicates that such a metastasis precludes any hope of a radical cure.

So long as it is remembered that carcinoma and tubercle in the lung do not exclude one another, it is very unlikely that the diagnosis of the two conditions occurring together will prove difficult or be unduly delayed. In a known case of pulmonary tuberculosis the early diagnosis of a superimposed carcinoma is of great importance, since otherwise it may prove too late to treat. Although the six cases described here were diagnosed correctly during life, the carcinoma was too advanced in all of them to allow any radical therapy to be considered. It should be remembered that the finding of tubercle bacilli in a case of carcinoma of the bronchus may be of minor importance so far as the practical management of the case is concerned. The treatment of the cancer takes precedence.

Relationship of the Two Diseases

The association of tuberculosis and carcinoma of the lung may be considered in various ways.

1. *The Two Diseases Exert a Mutual Antagonism.*—Rokitansky (1854), as a result of his famous morbid anatomical studies, first propounded the theory that there was an antagonism between cancer and tuberculosis, and this was supported by Raymond Pearl (1929) in his statistical studies based on the records of the Johns Hopkins Hospital. Cooper (1932), however, in his comprehensive study of the association of the two diseases, showed conclusively that the two diseases were not antagonistic.

2. *Tuberculosis (active or healed) is a Factor in the Production of Carcinoma.*—Cherry (1931), as a result of experiments on mice and his statistical studies, believed that cancer was predisposed to by previous tuberculous disease. Woodruff and Nahas (1951), analysing 23 cases of carcinoma of the bronchus, found 12 which were squamous-celled, and these were associated with large calcified foci in the same lobe or adjacent tracheo-bronchial lymph node, but not with active tuberculous disease. They suggested that it was healed tuberculosis which, leading to calcification and bronchiectasis (usually saccular, in the upper lobes), predisposed to the development of cancer, since smoking tended to produce an accumulation of tobacco products in the saccules. It has been thought by many that chronic irritation and atypical regeneration of epithelial tissues in old tuberculous cavities may lead to neoplastic changes. Bryson and Spencer (1951), however, found in the 866 cases of cancer of the lung they studied *post mortem* only four examples where the cancer arose in the wall of a bronchiectatic cavity.

3. *Cancer Activates Pre-existing Tuberculous Disease.*—When one considers the frequency of healed tuberculous foci in the lungs it is not surprising that carcinomatous infiltration into the lung, as well as the debility produced by the cancer, should lead to erosion of the tuberculous foci, with proliferation of the tubercle bacilli and reactivation of the tuberculous disease. Thus Pagel (1934) showed that a cancer nodule in the lung may be seen to be encircled by recent macroscopic tuberculous foci. Even if a very small lesion is eroded by growth, some tubercle bacilli may be found in the sputum, but this may be of minor importance (Gloyne, 1951).

It is very likely that either of the points of view described in (2) and (3) above may operate in different circumstances. It is also true, however, that in many cases the two diseases arise quite independently, running their separate courses with little effect on each other.

Summary

Six cases in which carcinoma of the bronchus and active pulmonary tuberculosis were associated in male patients over the age of 40 are described. In three a carcinoma developed insidiously in known cases of chronic pulmonary tuberculosis. In the other three, carcinoma of the bronchus was complicated by the presence of active pulmonary tuberculosis.

The interrelationship of the two diseases and the problems of their diagnosis are discussed.

The incidence of the two diseases occurring together is presented, and it is suggested that possibly this association will now be encountered more frequently.

I should like to thank Dr. C. O. Edwards for allowing me to quote Case 2, and Dr. J. C. Lees for giving me access to his necropsy records.

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ACQUIRED ICHTHYOSIS IN HODGKIN'S DISEASE

BY

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Involvement of the skin by either specific or non-specific lesions is a common finding in Hodgkin's disease. In a study of 156 cases Epstein and MacEachern (1937) found that 53.2% showed skin changes. A rare and interesting change is that of acquired ichthyosiform atrophy. It simulates congenital xeroderma so closely that it can be overlooked unless it is appreciated that the eruption has not been present since infancy. Ronchese (1943) first described the onset of an ichthyosiform atrophy of the skin in a patient with Hodgkin's disease eleven months before the patient's death and while he was apparently in good health. Since then Glazebrook and Tomaszewski (1944, 1947) have reported the skin change in association with cases of Hodgkin's disease and lymphosarcoma, Welch and Epstein (1952) in a case of Hodgkin's disease, and Forman (1953) in a case of reticulosarcoma. It is probable that the complication occurs more frequently than the scanty reports suggest, as it was present in the four following cases.

Case 1

A man aged 48, a steelworks gas-producer, some five months before admission began to feel weak and ill, and complained of a pain in the right loin which spread round to the abdomen. He vomited occasionally and was troubled with morning diarrhoea, sometimes three to four loose stools after rising. There had been a weight loss of several stones in the preceding year. On several occasions in the preceding months he had been confined to bed with attacks of so-called "flu." For two months before admission to hospital he noticed that his skin had become dry and scaly (Fig. 1) but not irritable. He was adamant that he had never had a skin abnormality before this.

On examination he appeared wasted, and the skin of the whole body and face showed a dry ichthyotic change. The ichthyosis was indistinguishable from a congenital ichthyosis, though at the time no special attention was paid to whether it spared the flexures. Enlarged glands were detected in the left supraclavicular region and in the left axilla. The spleen was enlarged a handbreadth below the costal margin. Gland biopsy showed Hodgkin's disease.

Histological examination of the skin showed only hyperkeratosis and atrophy. There was no sign of an infiltrate. Dark-adaptation tests gave results within normal limits.

The patient was included in the M.R.C. trial of R.48 and at first seemed to benefit from treatment, the glands and spleen diminishing in size. Coincident with this improvement the ichthyosis became less pronounced.



FIG. 1.—Case 1. Showing well-marked ichthyosiform change in the skin of the arm.

Five months later he was readmitted for transfusion, and his ichthyosis was then worse than it had been originally. He was readmitted on several occasions in the next two years, but contact with him was eventually lost. He is presumed to be dead.

Case 2

In August, 1953, I was asked to see a 52-year-old man in the Sheffield Royal Hospital, under the care of Dr. T. E. Gumpert. He had been admitted six days previously with a five-weeks history of severe diarrhoea, which had come on suddenly when on holiday in Germany and which had not been controlled with sulphaguanidine. For several weeks previous to the onset of diarrhoea he had felt listless and tired. Soon after the start of the diarrhoea the skin of his face felt tight and drawn and the skin of his body became dry and scaly.

On examination the skin of the chest and trunk was dry, was slightly erythematous, and showed large leafy scales; the facial skin seemed to be tightly stretched and was desquamating. On the limbs the appearance was identical with a moderate degree of congenital ichthyosis, though there was no sparing of the flexures. No enlarged lymphatic glands were found, or any abnormality on palpation of the abdomen.

At this stage the tentative diagnosis was a chronic dysenteric infection, and the skin change was ascribed to dehydration. Culture of stools, however, revealed no pathogens, and agglutinations were negative for salmonella. Sigmoidoscopy revealed only inflamed and oedematous mucosa, and a barium enema gave normal results. A blood count showed: Hb, 68%; red cells, 3,200,000; white cells, 4,400 (normal differential); platelets, 32,000. Marrow examination was inconclusive. The only other really positive finding was some enlargement of the hilar glands seen on a chest x-ray film and tomogram.

The course of the illness was one of uninterrupted deterioration. The haemoglobin and platelets fell, and extensive purpura developed shortly before the patient died, one month after admission. A tentative diagnosis of Hodgkin's disease, based on the ichthyotic skin change, the discovery of the enlarged hilar glands, and the course of the illness, was reached before his death.

Necropsy.—The relevant findings were enlargement of the glands at the base of the neck and in the mediastinum. These showed a grey uniform cut surface and were rather soft. The lungs and bronchi were not involved. Many whitish nodules were present in the omentum, which was almost devoid of fat; in the wall of the jejunum and in the wall of the ileum were firm masses made up of nodules aggregated together. They were firmer and more rubbery than the mediastinal glands. The aortic glands, and particularly those in the portal fissure and around the pancreas, were enlarged and firm. The liver showed a whitish mottling and at one point appeared to be infiltrated. The spleen was small and fibrotic. On macroscopic examination there was still some doubt about the nature of the nodules in the jejunum and ileum, which resembled carcinomata. Histological examination showed that there were deposits of sclerosing Hodgkin's disease in all coats of the bowel. The lymph nodes from the portal fissure, and the liver and spleen, showed recognizable Hodgkin's disease. The mediastinal nodes were less characteristic, and in some areas resembled an undifferentiated malignant neoplasm. The pathologist, Dr. J. I. Edwards, was confident, however, that only one pathological condition was present—Hodgkin's disease. Section of the skin showed similar findings to the first case—hyperkeratosis, with atrophy of the remainder of the skin elements and no evidence of infiltration in the dermis.

Case 3

An old-age pensioner of 67 had suffered for two years from an eczematous eruption on the feet and ankles. Some four months before he attended hospital he had developed hard painless lumps on the skin of the shoulders and chest. He had not lost weight nor did he feel unwell.

On examination a well-marked ichthyosiform change was present on the skin of the face, trunk, and limbs. This did not spare the flexures. He was uncertain how long the dry scalliness had been present, but was sure it was of recent onset. Multiple skin tumours of firm consistency and a reddish-purple colour, varying in size from a pea to a golf



FIG. 2.—Case 3. Showing multiple skin tumours on the trunk.

ball, were present over the shoulders, chest, upper abdomen, and thighs. Enlarged glands were found in the neck and the supraclavicular axillary and inguinal regions. The liver and spleen were not palpable. Skiagrams of the chest showed no mediastinal glands. Marrow puncture and blood count revealed no abnormality.

In view of the ichthyotic change, the nodules were presumed to be due to Hodgkin's disease rather than

secondary carcinomata, and this was substantiated by the histological findings of a reticulosarcoma of Hodgkin's type.

Case 4

An 85-year-old woman complained of painless lumps appearing on the back of her neck some two months previously. After discovering those lumps she had noticed others on the trunk.

Examination showed a dusky-red nodular tumour on the back of her neck and another below her left ear. Less obvious smaller nodules were present over the left parotid region and the trunk. No enlarged lymph nodes were found, nor was there demonstrable enlargement of liver and spleen. On the trunk was a mild generalized ichthyosis which she said was of recent onset. The nodules were obviously either secondary carcinomatous deposits or some form of reticulosis. The presence of the ichthyosis suggested the likelihood of the latter, and histological examination of a neck nodule showed a reticulosis of mycosis fungoides type. The nodules failed to respond to radiotherapy or triethylene melamine, and she died two months after admission to hospital.

The significant findings at necropsy were nodular plaques of greyish-white tissue on the lateral thoracic wall and on the lung beneath the pleura. The mediastinal lymph nodes were enlarged. More neoplastic nodules were present on the peritoneal surface of the small and large intestine and in the tail of the pancreas, and the mesenteric lymph nodes were massed together and enlarged. Another greyish-white mass was seen to surround the pelvis, ureter, and inferior pole of the right kidney, and more were present on the posterior wall of the uterus and in the broad ligaments. The liver and spleen showed no macroscopic change. Sections from the affected organs showed deposits of large pleomorphic neoplastic cells characteristic of a reticulosarcoma.

Discussion

In the present series of cases no light has been thrown on the mechanism of production of this curious skin change, but it seems probable that it falls into the group of non-specific skin changes, a great variety of which are known to occur in Hodgkin's disease and allied reticuloses.

In Case 1 the ichthyosis did improve during a remission of the Hodgkin's disease whilst under treatment with R.48, and

this suggests a close association between the presence of Hodgkin's tissue and the skin change. Similar improvement was reported by Welch and Epstein when their patient was given x-ray therapy. Vitamin A was being given at the same time, so there is also a possibility that this played some part in the improvement. A disorder of vitamin A metabolism due to liver damage was suggested by Glazebrook and Tomaszewski as the cause of ichthyosis, but in Forman's case blood vitamin A studies were normal, and in my Case 1 dark-adaptation tests were normal.

If the ichthyotic change were due to liver damage alone one would expect to find it in other types of severe liver disease, and such is not the case. Also, it does not occur in association with secondary carcinomatous damage to the liver.

The onset of the ichthyotic change occurs early in the course of the disease and before there has been any appreciable wasting, so that mere inanition is not the cause.

From a practical point of view acquired ichthyosiform atrophy is a rare change, but it may be of value when the diagnosis of Hodgkin's disease is in doubt, as in Case 2. It is not easily differentiated from congenital ichthyosis, though my impression is that the acquired type affects the trunk and face more than the limbs, and, also, it does sometimes involve the flexures, which are usually spared in the congenital variety. Histologically there is no difference.

The onset of an ichthyotic eruption in an adult should certainly initiate a search for an underlying lymphoblastoma.

Summary

Four cases of an acquired ichthyosis associated with Hodgkin's disease and reticulosarcoma are described. The importance of investigating cases of acquired ichthyosis for underlying Hodgkin's disease or lymphoblastoma is stressed.

I should like to thank Professor C. H. Stuart-Harris and Dr. T. E. Gumpert for allowing me to report their cases, Drs. J. L. Edwards and L. C. D. Hermitte for the post-mortem reports and histological findings, and Mr. Brookes for the photographs.

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The Victoria Cross awarded to Surgeon-Major Edmund Baron Hartley in 1879 was acquired for the record sum of £300 by the Royal Army Medical Corps when it came up for auction in London on March 17. Hartley, the son of a Devonshire doctor, was born in 1847 and qualified from St. George's Hospital in 1874. He then became district surgeon in Basutoland. In 1877 he joined the Cape Mounted Rifles as surgeon, becoming principal medical officer in the following year, and subsequently colonel in command of the Cape Medical Corps. He served in several campaigns during the Zulu war of 1877-9, and in the Boer War. He was decorated with the Victoria Cross for the conspicuous gallantry he displayed on June 5, 1879, in attending the wounded under fire at the unsuccessful attack on Morosi's Mountain, Basutoland. Other awards to Hartley included in the sale were the Cape General Service Medal with three bars (only thirteen other recipients of this medal and three bars are known), the Queen's South Africa Medal with three bars, and the King's South Africa Medal with two bars. He was appointed C.M.G. in 1900; he died on March 20, 1919, in his seventy-second year.

FOETAL FIBROELASTOSIS

BY

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Interest has been aroused from time to time in a cardiac lesion found in infants, the main features of which are thickening and opacity of the lining of the left chambers of the heart. First described as foetal endocarditis in the nineteenth century, it has subsequently been called congenital endocardial sclerosis (Craig, 1949), endocardial dysplasia (Prior and Wyatt, 1950), and endocardial sclerosis (Bonham-Carter *et al.*, 1952), and is now most generally known as fibroelastosis (Weinberg and Himelfarb, 1943). These titles reflect to some extent the changing conceptions of an aetiology which, however, has never been satisfactorily settled.

Recently a disease similar, superficially at least, to fibroelastosis in infancy has been described by several authors, including Bedford and Konstam (1946), Ball *et al.* (1954), and O'Brien (1954). This has occurred predominantly in natives of the Middle East area, and is characterized *post mortem* by cardiac enlargement and sclerosis of the endocardium; the possibility that the one may be a late stage of the other has naturally been raised. Already cases previously known as idiopathic cardiac hypertrophy of infancy, in which endocardial thickening may occur, have been linked with fibroelastosis, and this attempt to widen the scope of the disease to embrace all cases showing endocardial sclerosis is attractive. The examination of this problem has been prompted by the occurrence in the last two years in the Brighton Group of Hospitals of three examples of congenital aortic stenosis accompanied by fibroelastosis of the endocardium.

Case 1

Maternal History.—Aged 27 and in good health; W.R. negative; Group O, Rh positive. She had two healthy children, aged 4 and 7 years; there have been no abortions. Study of the antenatal records and retrospective questioning revealed no illness during the pregnancy; the parents were not blood relations.

The infant, a male, weighed 8 lb. 10 oz. (3.9 kg.) at birth. Labour was spontaneous and easy, and his immediate

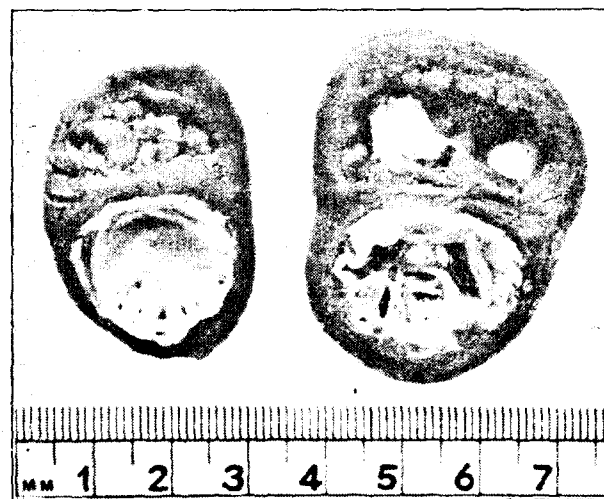


FIG. 1.—Horizontal section through the ventricles. Case 1.

recovery was good. On the first day he was observed to be somewhat cyanotic at times, and subsequently respiration became laboured and rapid with frequent cyanotic attacks, in one of which, on the fourth day, he died. No abnormal physical signs had been found during life.

Necropsy.—Complete examination revealed severe venous congestion; apart from the changes in the heart no developmental or pathological lesion was found.

Heart (Fig. 1).—Weight 25.5 g. Size, apex to base, 4.5 cm.; side to side, 5 cm.; antero-posterior, 3.5 cm. The interventricular groove on the anterior surface ended 0.5 cm. above the apex, which was thus formed from the myocardium of the right ventricle. The right atrium and ventricle were dilated and the latter was also hypertrophied (wall 0.5 cm. thick). The left atrium was normal in size and the left ventricle small. The inner lining of the left ventricle was yellow, tough, and opaque; it measured 0.5 cm. over the interventricular septum and 0.4 cm. elsewhere. The foramen ovale was patent but capable of being closed by a flap-like valve of endocardium. The ductus arteriosus was widely patent and slightly larger than the aorta in diameter. The mitral, tricuspid, and pulmonary valves were natural. The aortic valve was stenosed by fusion of the contiguous borders of the valve cusps, except for a narrow slit between the anterior and left posterior ones.

Case 2

Maternal History.—Aged 27 and in good health; W.R. negative; Group O, Rh positive; no immune antibodies in the serum. She had one child, aged 3½ years, who was healthy, and there had been no abortions. Study of the antenatal records and retrospective questioning revealed no illness during the pregnancy. The parents were not blood relations.

The infant was female and weighed 5 lb. 7 oz. (2.5 kg.) at birth. Born spontaneously, she appeared well until 2 days old, when she became temporarily dusky in colour and thenceforward suffered from cyanotic attacks; in one of these, on the fifth day, she died. No abnormal physical signs had been detected during life.

Necropsy.—There was extreme generalized venous congestion; apart from this, complete examination revealed no congenital or pathological lesion except in the heart.

Heart.—Weight 22.5 g. Size, apex to base, 4.5 cm.; side to side, 4 cm.; antero-posterior, 3.5 cm. The interventricular groove on the anterior surface of the heart ended 1.5 cm. above the apex of the heart, which was thus formed by the myocardium of the right ventricle. The right atrium was dilated, the right ventricle dilated and hypertrophied (wall 4 mm. thick); the left atrium was small and the left ventricle vestigial. The endocardium of the left ventricle was tough, yellow, and thickened, especially over the interventricular septum, where it varied from 2 to 3 mm. in thickness. The ductus arteriosus was widely patent and a little larger than the arch of the aorta in diameter. The foramen ovale was patent, but could be closed by an efficient valve-like fold of endocardium. The tricuspid, pulmonary, and mitral valves were natural. The aortic valve was stenosed by fusion of the contiguous borders of the valve cusps, except for a narrow slit between the anterior and left posterior ones; there was no fibrosis or distortion of the cusps, which remained thin and pliable. The coronary arteries were normal in origin, structure, and distribution.

Case 3

Maternal History.—Aged 20 and in good health; W.R. negative; Group O, Rh negative, with no immune antibodies in the serum. She had had no previous children, abortions, or blood transfusions. Retrospective questioning and perusal of the antenatal records revealed no illness during the pregnancy. The parents were not blood relations.

The infant, a male, weighed 5 lb. 12 oz. (2.6 kg.) at birth; blood Group O, Rh positive. Hb at birth 16.3 g. per 100 ml., direct Race-Coombs test negative. The day after birth he was observed to be dusky-coloured at times.

Cyanotic attacks thereafter became frequent, and on the eighth day he died in one of them. No abnormal physical signs had been detected during life.

Necropsy.—There was severe systemic venous congestion, but apart from this no congenital or pathological lesion was found other than that of the heart.

Heart.—Weight 17.3 g. Size, apex to base, 4.4 cm.; side to side, 4 cm.; antero-posterior, 3.4 cm. The interventricular groove on the anterior surface ended 1.6 cm. from the apex of the heart, which was formed by the myocardium of the right ventricle. The right atrium was dilated, the right ventricle dilated and hypertrophied (wall 4 mm. thick). The left atrium was small and the left ventricle vestigial. The lining of the left ventricle was opaque, tough, and yellow-white, especially over the interventricular septum, where it was 3 mm. thick. The columnae

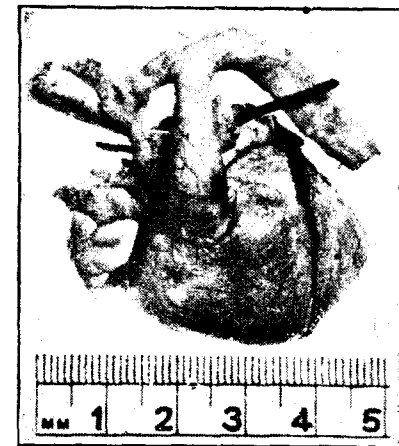


FIG. 2.—Arrangement of the great vessels in Case 3.

carneae were absent. The foramen ovale was widely patent, but could be closed by a flap-like valve of endocardium. The arrangement of the great vessels is shown in Fig. 2. The ductus arteriosus was patent, 6 mm. in diameter, and the same size as the arch of the aorta. The ascending aorta was 2 mm. only in diameter and there was no communication between it and the left ventricle. The aortic valve was closed by complete fusion of the valve-cusp borders. It was 2 mm. in diameter, and when viewed from the aortic side presented three distinct pits defined by three ridges meeting at the centre and corresponding to the edges of the aortic valve cusps. The coronary arteries arose opposite the anterior and left posterior depressions and were distributed normally; they were fed by retrograde blood-flow down the ascending aorta, which served no other purpose. The tricuspid and pulmonary valves were natural, the mitral small but not stenosed.

Microscopy

Sections were taken from the myocardium, opaque endocardium, aortic valve cusps, and coronary arteries in each case: the microscopical appearances were similar in all, so that their description may be combined.

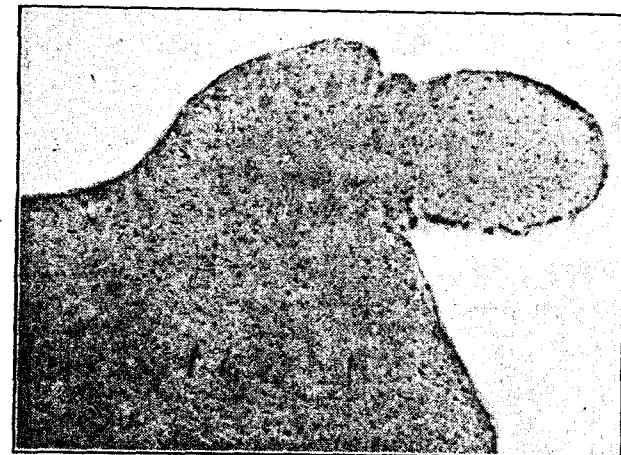


FIG. 3.—Section at point of fusion of an aortic valve cusp. (x95.)

Section of the coronary arteries taken at 0.5-mm. intervals revealed no constriction of lumen or abnormality of the wall. The aortic valve cusps showed some increase in volume, made up by interlacing bundles of collagen undergoing oedematous change. In no case was there inflammatory cell infiltration; in particular, section at the point of fusion of valve cusps (Fig. 3) showed no scar tissue.

The myocardium was normal, with no inflammatory cell aggregates or fibrosis. The junction between the myocardium and the opaque endocardium was irregular and ill-defined, and in places islands of myocardial fibres were surrounded by tongues of fibrous tissue (Fig. 4). Many of the myocardial fibres were degenerate in the junctional layer and were being replaced by fibroblasts. The bulk of the opaque endocardium was composed of normal collagen fibres, but



FIG. 4.—Section at point of junction between the myocardium and the endocardium. (x55.)

when stained with orcein and eosin a high proportion of elastic fibres were found. A feature of the junctional layer was a large number of thin-walled dilated blood vessels.

Discussion

Aortic atresia is a rare condition. Canton (1948-9) appears to have been the first to report a case, and since then 20 others have been traced—those of Shattock (1881), Summons (1906), Gauss (1916), Fraser (1921), Mueller (1924), Abbott (*Loose-Leaf Medicine*), Schrader (1928), Philpott (1928), Willer and Beck (1932) two cases, Bellet and Gouley (1932), Farber and Hubbard (1933), Wesson and Beaver (1935), Roberts (1936), Rossman (1942), Craig (1949) four cases, and Halliday (1954). Case 3 reported here is thus the 22nd recorded example. In addition to aortic atresia, all showed a hypoplastic left ventricle lined by an opaque, white, thickened endocardium with an intact interventricular septum. The appearance of the aortic atresia is striking, and descriptions exactly similar to that given in Case 3 are repeatedly encountered. It is evident that the valve cusps have developed regularly and then fused along their borders, for, macroscopically, there is usually no distortion of pattern and microscopically no evidence of fibrosis. Incomplete aortic stenosis such as was found in Cases 1 and 2 differs from that of complete atresia in degree but not in essential nature. Fusion of valve cusps occurs as in atresia, except that a slit may be left between one pair, while endocardial sclerosis is constant and hypoplasia of the left ventricle is usually found. It seems likely that atresia and stenosis are both the end-result of the same disease process.

The clinical pattern of aortic atresia is very constant. The infant recovers satisfactorily from the immediate stress of parturition and then suffers from cyanosis and difficult respiration 12-36 hours after birth. Usually no abnormal physical signs are elicited and death occurs at about 5 days old. Out of the 22 recorded examples, 14 died in less than 6 days, while, of the remainder in which the age at death was given, only 3 lived more than 15 days.

Cases of aortic stenosis pursue a very similar clinical course, and it is exceptional for an infant to live more than 14 days. The cases of Farber and Hubbard (1933) and of Du Shane and Edwards (1954), in which the patients lived for 9 weeks and 2½ years respectively, are very exceptional, but both appeared to have had typically fused valve cusps.

Recent literature on fibroelastosis gives the impression that this change may occur at any age from birth to 5-6 years of age, and that valvular stenosis may or may not be associated in any particular example. However, study of available case reports and photographs shows that the occurrence of aortic stenosis is by no means haphazard. The heart weights and times of death when stated in all the patients under 9 months old accepted by Gowing (1953) in a recent review of the subject are arranged in Fig. 5; added to these are

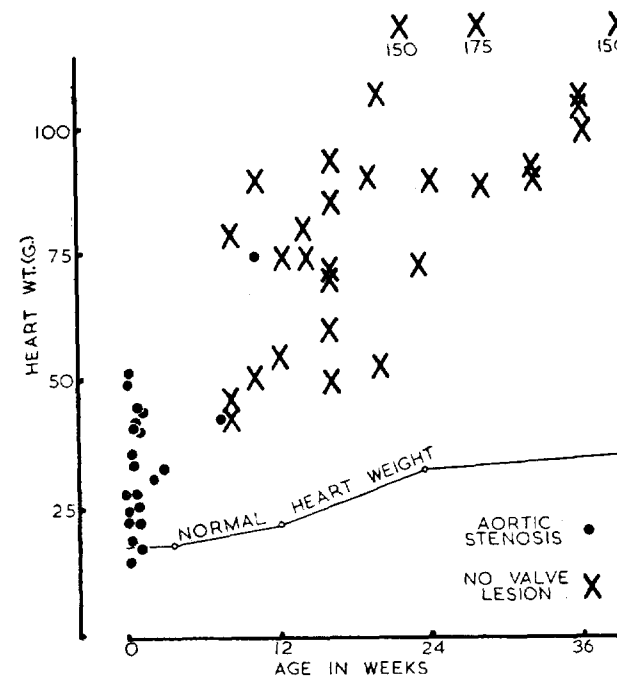


FIG. 5.—Cases of foetal and infantile fibroelastosis contrasted.

all cases of aortic stenosis or atresia which could be traced. It is apparent from this that fibroelastosis in infancy is capable of division into two groups which are in many ways contrasted.

One group, which is referred to as foetal fibroelastosis and which is represented by the three cases described in this paper, is characterized by aortic stenosis (sometimes accompanied by mitral stenosis), early death, and relative or absolute hypoplasia of the left ventricle; the heart weight is only moderately increased and is accounted for by right ventricular hypertrophy. The other group, many cases of which had been described previously as idiopathic cardiac hypertrophy of infancy, is without valvular lesions and is referred to as infantile fibroelastosis. The left ventricle is grossly hypertrophied and usually dilated, and it accounts for heart weights three to five times the normal; death is uncommon under 3 months old, and it is interesting that fibroelastosis without valvular stenosis has not been recorded at birth except in the case described by Prior and Wyatt (1950). The latter would be an interesting exception, but, since it is given no separate description and there is no photograph, it is of doubtful value. Fibroelastosis of the endocardium is common to both groups, but the gross thickening found in foetal cases is seldom seen in infantile fibroelastosis: in some of the descriptions and photographs of the latter it is so slight that it raises the question of how far the term should be stretched.

Aetiology

Gross (1941) effectively rejected intrauterine inflammation as an explanation for the changes found in foetal fibroelastosis. Subsequently maternal infection and mesenchymal dysplasia have been popular hypotheses, but neither has evidence to support it. However, the microscopical appearances have many features in common with those found in

endocardial fibrosis overlying adult cardiac infarction. The irregular junctional line and dilated vessels, the occasional report of lymphocytic aggregates and calcification, and the evident fibrous replacement of the myocardial fibres bordering the endocardium are all similar and suggest that anoxia may be common to both. The main difference between the two is lack of fibrosis in the myocardium outside the junctional layer in foetal fibroelastosis. An explanation of this may lie in the way in which the anoxia is caused.

For a considerable time *in utero*, until the coronary circulation is fully established, the foetal heart is dependent for nourishment on blood flowing through its cavities. During this period temporary closure of the foramen ovale during the course of its development, along the lines suggested by Johnson (1952), would prevent oxygenated blood in the right atrium from flowing into the left atrium and left ventricle, and this may cause degeneration of the endocardium covering the aortic or mitral valves. In the absence of sufficient blood flow to keep them apart, fusion of the raw edges of the cusps would be expected with little fibrosis or distortion. If aortic stenosis was established in this way, stenosis and consequent anoxia of the blood in the left ventricle would occur and lead to degeneration of the layer of myocardium lining the cavity and the development of the fibrosis found in foetal fibroelastosis. Naturally, the myocardium outside the area supplied from within the cavity would be unaffected and normal in appearance. All the changes found in foetal fibroelastosis would thus be explained.

Support for this hypothesis is found in the rare examples of aortic and mitral atresia accompanied by ventricular septal defects. For example, Dolgopol (1934) described a heart with aortic atresia in which the vestigial left ventricle communicated with the right through a narrow slit: the left ventricular cavity was lined by normal endothelium. One of Halliday's (1954) cases showed mitral atresia and multiple ventricular septal defects. Fibroelastosis was found in the left atrium but not in the left ventricle. If both aortic stenosis and fibroelastosis were the result of mesenchymal dysplasia the presence of an interventricular septal defect would not influence the development of the latter. On the other hand, if fibroelastosis is the result of stasis and anoxia of blood in the left ventricle the change would not occur if oxygenated blood were available from the right ventricle through a septal defect. In fact, no case of aortic atresia has been traced in which fibroelastosis has occurred accompanied by an interventricular defect, and, conversely, no case of aortic atresia with an intact interventricular septum was without fibroelastosis.

Detailed discussion of the aetiology of infantile fibroelastosis does not come within the scope of this paper. However, the rarity of its occurrence within the first two months of life makes a developmental defect of embryonic origin unlikely, and an explanation bringing it into line on the basis of anoxia may be found with further research.

A connexion between cases of foetal fibroelastosis and the group described in adults is most unlikely, for the latter have no valvular defects, while the former all appear to die at a very early age. It is still possible that cases of infantile fibroelastosis may develop into the adult group, but at the moment the gap in age between the two is formidable. An explanation which seems more acceptable is that both are caused by a similar and as yet unknown mechanism.

Summary

Three cases of fibroelastosis accompanied by aortic stenosis or atresia are described.

Study of these cases and of other published reports shows that fibroelastosis in the first year of life may be divided clearly into two groups for which the terms foetal and infantile fibroelastosis are suggested. The first, manifest at birth, is characterized by early death, aortic stenosis, left ventricular hypoplasia, and right ventricular hypertrophy. The second, usually not

covered until 3 months of age or more, has no valvular defects and shows very considerable increase in heart weight due to gross left ventricular hypertrophy.

On morphological grounds anoxia of the cardiac muscle during cardiac development seems to offer the most acceptable explanation of the changes found at post-mortem examination in foetal and infantile fibro-elastosis, and a possible mechanism for this is offered.

The connexion between foetal and infantile fibro-elastosis and the endocardial sclerosis found in adults is discussed.

I should like to thank Dr. W. A. Bourne for his advice and encouragement during the preparation of this paper. I wish to thank also Miss M. K. Lawlor and Dr. J. F. Enright for permission to report on patients admitted under their care. Mr. Jackson very kindly photographed the specimens.

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"There is at present a sickness in our country—a sickness of rumour and anxiety, of suspicion and distrust, and, at its worst, of fear and tragedy," said Dr. WEAVER, President of the American Association for the Advancement of Science, in his introductory remarks to the address of the retiring president (*Science*, February 18, 1955). Analysing the causes of this sickness, Dr. Weaver blamed the lack of "constructive courage with respect to the future," the strange lack of faith in scholarly competence, and the misguided zeal of sincere persons with mistaken ideas of good citizenship. At its worst the disease was "the result of political pressure, of personal selfishness, and of the pathological demagogues with small and nasty minds." The effect of these general and recurring fears was that confidence in government promises and even in the "Anglo-Saxon tradition of due process" had been destroyed. Commenting on the universality of this sickness, Dr. Weaver pointed out that science voiced its concern at it, not to demand protection for itself, but primarily because the problem was a universal one. As a remedy he called for the abandonment of timidity, and in its place a "really sensible, constructive stand," giving the warning that wit and patience must be used because "freedom is too precious to deserve rash or stupid support." He hoped that government concern "to improve the whole loyalty-security-secrecy setup" was a sign that the sickness of his country was waning, and at that actual meeting they were celebrating a "rededication to liberal decency."

SOME EFFECTS OF HIGH-ALTITUDE CLIMBING

INVESTIGATIONS MADE ON CLIMBERS OF THE BRITISH KANGCHENJUNGA RECONNAISSANCE EXPEDITION, 1954

BY

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During the 1954 British Kangchenjunga Reconnaissance Expedition the opportunity was taken of carrying out certain biochemical and microscopical analyses of blood and urine samples obtained by the expedition medical officer (D.S.M.) from climbers at various altitudes. These were sent by runners to Darjeeling and dispatched by aeroplane to the Medical College, Calcutta, for assessment. Although many expeditions to the Himalayas have been made, there has unfortunately been little scientific liaison between them. We understand that samples of blood were collected from climbers of the successful 1953 Everest Expedition and sent back to England for analysis. We have not seen the results of those analyses or of any investigations that may have been conducted by other parties. Referable literature is difficult to obtain.

General Observations

A significant feature worth noting in relation to this expedition was the fact that it was primarily a reconnaissance. Knowing this, the party would be less likely to experience the anxiety stresses that are often associated with the anticipation of future efforts required in attempting to reach the summit. It is usually only at levels above those reached on this expedition that the almost inevitable deterioration occurs, no matter what degree of acclimatization is simultaneously taking place.

Our approach to Kangchenjunga was along the Singalila ridge—a high-level route throughout—which, although relatively arduous, must have been responsible for the high degree of acclimatization attained by all members of the party when base camp 18,000 ft. (5,500 m.) was reached on the eighteenth day out. No climber suffered from headache, nausea, or undue breathlessness except that three members experienced occasional spells of characteristic rapid periodic breathing. Sore throat and gastro-enteritis were rare, and there were no cases of frost-bite. Some of the porters who did not wear sunglasses complained of photophobia, and a mild conjunctivitis was found on examination. It was a revelation to watch some of the porters, barefooted, carry loads through snow and ice, and sleep at night in the open with scanty clothing—such is their ability to acclimatize to cold. The sherpanis—we had 16 of these female porters—performed their duties as well as most of the men.

Rothera tests were performed on numerous occasions on the mountain, particularly after climbers had made

exhausting ascents. On only one occasion was acetoneuria found to be present, and that was on the third day out from Darjeeling at 11,000 ft. (3,350 m.). Of the two climbers who had a trace of acetone in their urine, one had enteritis. However, some morning urine samples taken on the mountain and sent to Calcutta contained acetone as detected by the Rothera test. We are at a loss to explain the disparity between the results of tests performed on the mountain and those in Calcutta, unless it is that the mountain tests were performed on samples collected in the evening and those tested in Calcutta were morning urine specimens.

Despite efforts to encourage all climbers to drink large quantities of fluid, the specific gravity of urine specimens obtained from climbers after a day of exertion frequently ranged between 1030 and 1040. It proved impracticable to estimate the total urine output in any one day, but it was apparent that this was reduced. Although members were often dehydrated, thirst, like appetite, tended to be depressed.

The liability to shock following even minor injuries incurred while climbing at high altitudes is noteworthy. It would seem to be somewhat comparable to the increased liability to shock of a woman after a lengthy confinement. One of us suffered a lacerated finger with avulsion of the extensor tendon from the distal phalanx as a result of a blow from falling rock. The degree of shock was out of all proportion to the severity of the injury. Another climber received a lacerated scalp injury from a falling rock. Although the initial shock was minimal, some delayed reaction occurred later. He was confined to bed for 48 hours and forbidden climbing for the remaining week of the trip. Chlortetracycline (aureomycin) was administered on one occasion, but so severe were the toxic effects that the drug had to be stopped. Many of these effects, such as headache, nausea, and vomiting, are aggravated by anoxia.

The following changes in behaviour and thought were noted at the higher altitudes. Memory and concentration were impaired. For example, attempts to memorize from the *Oxford Dictionary of Quotations* failed. When using the cinematograph camera the operator would often forget to turn back the turret after rewinding. Only a routine automatic action can be reliably performed. One periodically became aware of a feeling of mental lethargy, with the result that there was a tendency not to push things to a satisfactory conclusion in the face of difficulties, even though one's physical prowess might not have been exhausted. At meetings held to discuss plans, thinking was not always incisive and conclusive. Insomnia was common; discordant restless mental activity often continued far into the night. Dream content was vivid, as though one had a high fever. There were frequent requests for sleeping pills. It is probable that the effects of altitude were responsible for some unruly behaviour on the part of the porters. Discipline was not always easy to maintain.

Laboratory Investigations

We were hindered by unforeseen difficulties in our attempt to carry out prearranged investigations. The samples were flown to Calcutta from Darjeeling, but there was much unavoidable delay in getting the specimens down to Darjeeling, with the result that many of the blood samples were found to be haemolysed or decomposed when they arrived at the laboratory. The effect of heat would also be responsible for this deterioration. At that time the Calcutta area was in the grip of a heat wave, when the maximum temperature in the shade reached 110° F. (43.3° C.). It is significant that the blood samples taken in Darjeeling and examined in Calcutta during this unusually hot weather were unsuitable, whereas many of those taken later on the mountain were satisfactory. In some cases the blood had completely leaked out of the containers, although they

appeared to be leak-proof in the laboratory before packing. Care was taken on the mountain to ensure that the screw caps were tightened. The reduced atmospheric pressure at high altitude might be responsible for this leakage. We could not, therefore, obtain as many samples from various altitudes as we had hoped. On blood samples, haemoglobin percentages were estimated from iron analyses, a method which is considered by King and his associates (1947, 1948a, 1948b) to be the most reliable, although, of course, it is not absolutely free from error, because a certain small proportion of the iron, from 0.1 to 0.3 mg., is present per 100 ml. of cell-free plasma. Estimations of sodium, potassium, adrenaline, and sugar could not be done. For the study of white cells we had to be satisfied with a differential leucocyte count taken from thin films made on the mountain and sent down to the laboratory. Urine samples were tested for acetone, and quantitative analysis of chlorides was performed.

Haemoglobin Content of Blood.—Samples of blood from six climbers collected at 17,000 ft. (5,200 m.) and from four climbers collected at 21,000 ft. (6,400 m.) were available for examination. Of those collected at 17,000 ft. the iron content ranged from 52.6 to 95 mg. per 100 ml. of blood, with a mean of 74.1 mg. per 100 ml. Translated into grammes of haemoglobin per 100 ml., this comes to 15.7 to 28.4 g. per 100 ml., with a mean of 22.18 g., the percentage of iron content in haemoglobin being 0.334% (Hupfner). Of the samples collected at 21,000 ft. the iron content ranged from 57 to 64.5 mg. per 100 ml., with a mean of 61.6 mg. (17 to 19.3 g. of haemoglobin per 100 ml., with a mean of 18.4 g.).

Chloride Content of Blood.—Estimation of chloride on the above-mentioned blood samples showed a range from 419 to 620 mg. per 100 ml., with a mean of 509 mg.

Leucocyte Picture.—Films from four climbers collected at 17,000 ft. (5,200 m.) and from one collected at 21,000 ft. (6,400 m.) were available for examination. A study of the stained thin films did not suggest any lymphocytopenia or any significant eosinopenia; nor was there any suggestion of a qualitative change in the lymphocytes as found by Frank and Dougherty (1953) in their experimental studies on the effects of stress.

Acetone Bodies in Urine.—Of the two samples of urine collected from two climbers at Darjeeling, neither showed the presence of acetone bodies. Of the six samples collected from six climbers at an altitude of 17,000 ft. (5,200 m.), two gave definite reaction for acetone bodies, one gave a doubtful reaction, while the remaining three gave negative reactions. Of the two samples collected at 21,000 ft. (6,400 m.) from two climbers, both gave a definite reaction for acetone bodies.

Urinary Chloride and Creatinine.—Two samples of urine from 6,700 ft. (2,040 m.), six from 17,000 ft. (5,200 m.), and two from 21,000 ft. (6,400 m.) were available for examination. The mean chloride contents were 1.34 g., 0.878 g., and 0.7 g. per 100 ml. respectively, and the mean creatinine contents were 0.108 g., 0.128 g., and 0.169 g. per 100 ml. respectively.

Summary

A study of the climbers taking part in the 1954 British Kangchenjunga Reconnaissance Expedition was made in an attempt to assess some of the physiological changes which occur at high altitudes. Some general clinical observations are made on the stresses which occur. The results of a small number of blood and urine analyses are recorded.

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DERMATOMYOSITIS

A CASE REPORT WITH POST-MORTEM FINDINGS

BY

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Dermatomyositis is an unusual condition in which pathological changes occur not only in the skin and muscles but also in other organs. Such changes have often been reported, and Wainger and Lever (1949), in their study of three cases with post-mortem findings, concentrated their attention on those changes in tissues other than muscle and skin. They were unable to report any specific renal changes either in their own cases or in those from the literature. The fact that renal lesions, hitherto undescribed, have been found in the present case is considered sufficient justification for putting it on record. The unusual severity, the presence of jaundice, and the response to cortisone are further interesting features.

Case Report

A male office-worker aged 30, whose past medical history revealed only pleurisy with effusion in 1947, said that his present illness had started with a severe sore throat about ten days before admission to hospital on April 6, 1954. He was confined to bed, without any specific treatment, for three days. He got up on the fourth day, but because of headache, shivering, and a feeling of nausea, did not feel very well. There was no vomiting. Three days before admission he had a good deal of pain in both ankles and marked sweating. In the 24 hours preceding admission both his ankles became swollen and he had pain in his right knee- and wrist-joints. There had been no upset of bowels or micturition, but appetite had been poor for the previous fortnight.

Examination revealed a thin man, very flushed and sweating profusely. His temperature was 102° F. (38.9° C.). There was marked swelling of the left ankle- and right knee-joints. The skin over the joints was flushed, but not more so than the skin in other areas. These swellings were tender and joint movements were limited. There was some tenderness and limitation of movement in the right elbow- and wrist-joints but no visible swelling in these areas. Muscle tenderness was present, especially in the left calf, but the chief finding was of pain on joint movement. His pulse rate was 120 and B.P. 120/70; there were no murmurs. No abnormalities were observed in other systems and tendon responses were normal. A provisional diagnosis of acute rheumatic fever was made and the patient was started on salicylate therapy.

About 12 hours after admission his condition did not seem to be satisfactory. His pulse rate was increased to 130, and he was restless and complained of a good deal of pain in the right forearm. B.P. 100/70. Examination of the right forearm revealed a turgid, brawny swelling of the muscles, which showed the characteristics of a cellulitis. Joint movement was limited, and there was marked muscle tenderness. One was somewhat surprised to find a swelling of such dimensions that had not been present at the time of admission. A white blood count revealed a leucocytosis of 22,000 per c.mm. (96% polymorphs, 4% lymphocytes); Hb, 106%; E.S.R. (Wintrobe), 33 mm. in one hour. The urine contained a trace of albumin and there was a very heavy deposit of creatine. This latter finding, together with skin and muscle involvement, suggested the diagnosis of dermatomyositis.

The following day cortisone, 50 mg. twice daily by mouth, was given. During the next three days the patient's condition varied considerably. An improvement was noted by the gradual return of the pulse rate towards normal and the lessening of joint and muscle pain. Further swellings

occurred, however: his right wrist- and left elbow-joints and the muscles of the right calf became, in turn, swollen and tender. There was no swelling of trunk muscles, and the orbital tissues were not involved. These swellings occurred with amazing rapidity and seemed to reach a maximum in about six to eight hours and slowly resolve over a period of several days. About the fourth day a diffuse, erythematous mottling was noted in the swollen areas, and later this extended to the trunk and limbs but avoided the face. The dosage of cortisone had to be reduced to 75 mg. daily to prevent hypertension.

On the third day the patient felt nauseated, and vomited several times. Later he developed hiccup. The abdomen was distended and bowel sounds were few. Blood urea amounted to 171 mg./100 ml. Intravenous fluids were given and a Ryle tube was passed with intermittent gastric aspiration. The next day he was jaundiced and the urine contained bile pigments. The serum bilirubin test, performed on the fifth day, was 8.25 mg./100 ml. Although jaundice and paralytic ileus was present, the disease process seems to have been contained, for the skin and muscle swellings became less, and on the sixth day, although the patient was critically ill, there was no dermatomyositis.

On the evening of the sixth day bowel sounds were returning and flatus was passed. Blood urea was now 223 mg./100 ml. The E.C.G. was within normal limits and there was no electrolyte imbalance. The following day he was definitely deteriorating and at times irrational. His mouth was dry and the tongue glazed and swollen. He became comatose and died in the evening of the seventh day after admission.

Pathological Findings

The post-mortem examination was performed 12 hours after death. The subject was a thin male, moderately jaundiced. There was no evidence of swelling in muscles or skin, but well-marked desquamation was present on the arms and hands. Almost all the abdominal viscera were enlarged and flabby. There was some congestion of the mucous membrane of the stomach but no gastric or enteric ulceration.

The skin showed moderate keratinization but no general epidermal thickening. In the rete area there was a moderate round-cell infiltration. In the dermis the fibrous tissue bundles were loosely arranged and broken up. The deeper fat was rather increased and the sweat-gland epithelium showed infiltration with fatty droplets.

Heart Muscle.—Myocardium flabby. Weight 400 g. The cardiac muscle fibres showed fragmentation, with variation in size and shape. The nuclei remained normal on the whole. No changes in the larger or smaller vessels were seen.

Voluntary Muscle.—Many of the fibres had disappeared, but the structure remained normal so long as any portions remained. Striation was well marked. Many sarcolemmal nuclei were seen left free between the remaining fibres, and in places proliferative overgrowth of these nuclei was seen. Groups of pigment granules, negatively staining for iron but positive for melanin, were apparent here and there within sarcolemma sheaths or between fibres.

Adrenals.—Marked oedema, with cortical capillary haemorrhages and disappearance of many cells. Other cells showed loss of nuclei and irregular staining of remaining cytoplasm.

Lung.—Oedema only. Generalized capillary congestion with small haemorrhages. Oedema, patchy in distribution. In places there was endothelial proliferation of the alveolar lining. There was some thickening of peripheral fibrous coat in the arterioles. The interstitial tissue contained plasma cells with focal distribution. A moderate number of pigment-containing macrophages were also present.

Kidneys.—Both flabby, with yellow fatty streaks. 300 g. each. **Cortex:** Some glomeruli were congested; others showed hydropic degeneration. The convoluted tubules showed a marked degree of degenerative change, ranging

from cloudy swelling to necrosis. **Medulla:** A similar degeneration of the straight tubules, many of which contained blood casts. The vessels showed some thickening, chiefly of the muscle coats.

Liver.—2,000 g. Flabby, yellow, and fatty. The cells were irregular in size and shape and were separated by spaces. No cirrhosis or congestion was seen. In the portal areas the vessels and ducts appeared thickened, with loose fibrous tissue rather irregularly disposed. Some lymphocytic infiltration was also present in these areas.

Pathological Data

Date	Throat Swab	Urine	Blood Urea	Serum Creatine	Serum Creatinine	Serum Bilirubin
6/4/54	Predominant growth <i>Str. viridans</i>	Acid. Creatine + +. Many white and red cells. No casts				
9/4/54		Creatine, 840 mg./24 hrs. Creatinine, 1.100 mg./24 hrs.	177 mg./100 ml.	8 mg./100 ml.	4.5 mg./100 ml.	
12/4/54			215 mg./100 ml.			8.25 mg./100 ml.

Discussion

Not only was this case particularly acute and severe but it also presented the unusual features of kidney and liver involvement. It is extremely difficult to evaluate the significance of these hepatic and renal changes. To say that the patient died from a hepato-renal syndrome although the polymyositis was contained is not really informative, neither is it fully in accordance with the facts. The term "hepato-renal syndrome," however poorly defined, would appear to include patients dying often in coma, usually jaundiced, and in whom renal and hepatic damage is demonstrated microscopically. In the kidney severe tubule necrosis, most marked in the convoluted tubules, and in the liver cellular damage, which appears to be further enhanced by the presence of excess bile which stains the liver cells, are the usual histological findings (Dible, 1953). In the case under discussion there was very marked renal damage amounting to a cortical necrosis. Microscopically there were changes in both cortex and medulla. The glomeruli were congested, while the convoluted tubules showed a wide range of degenerative change. The liver cells were not bile-stained and there was no evidence of a primary causative lesion. There seems, then, to be considerable evidence to support the view that the renal lesions in this case resulted from the disease process of dermatomyositis.

It is interesting to record the similarity between the nature of renal lesions occurring in other collagen disease, such as disseminated lupus erythematosus and polyarteritis nodosa, and that of the renal lesions here described. In the two former conditions it is a well-established fact that cortisone and A.C.T.H. may suppress all evidence of the disease except when renal lesions occur, in which case the processes are invariably progressive. A similar failure of these hormones would appear to have been responsible for the advanced renal disease in this case. Ragan (1950) reports improvement in two long-standing cases of dermatomyositis treated with A.C.T.H. In the most recent case report by Clein (1953) mention is made of the benefit derived from cortisone and A.C.T.H. He used both hormones with equal success. He also stressed the high polymorphonuclear leucocyte count, which was also present in the case under discussion.

Summary

A case of acute dermatomyositis with necropsy findings is reported. Renal lesions thought to have resulted from the disease process are described. These do not

seem to have been recorded previously. The response of the muscle and skin lesions to cortisone is noted, while the hormone appears not to have influenced the kidney damage.

It is a pleasure to acknowledge the help and advice of Dr. A. Nelson-Jones, under whose care the patient was admitted. Dr. E. James also gave much helpful advice. Dr. S. Marshall kindly supplied the detailed histological report and Dr. F. Brafield did the biochemical investigations. Miss H. Child was most helpful with the clerical work.

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Medical Memoranda

Tropical Pulmonary Eosinophilia in a West African

This paper reports a case of tropical pulmonary eosinophilia in a Nigerian. So far as can be determined, this condition has not been previously reported as occurring in a West African.

CASE REPORT

The patient was a male Nigerian aged 45, whose occupation was a leprosy inspector.

Previous History.—In 1943 he had pneumonia affecting the left side of the chest and was in hospital for three weeks, being treated with sulphonamides. He was in the Army, in Burma, from 1944 to 1946, and in 1944 had pneumonia affecting both sides of the chest. He was ill for five weeks and was treated with penicillin and sulphonamides. In 1946 he was given oil of chenopodium for ascariasis. Later that year he was discharged from the Army in the Owerri province of Nigeria. He remained there until 1952, when he went to Calabar. He returned to Owerri province one month before he was seen with the current complaint.

Present History.—For six weeks he had complained of swellings in the skin on different parts of the body, each lasting a few days. Three weeks before being seen he had developed a dry cough, which was worse on lying down. The cough had improved slightly during the last week. For three weeks he had been short of breath on exertion—for example, on riding his bicycle on the flat. He also complained of a burning sensation all over the inside of his chest, and had been feeling generally off colour.

Examination showed that he was well nourished. Swellings were seen on right cheek, right calf, and right forearm which were probably Calabar swellings. Respiratory system: no impaired movement of the thoracic cage or impaired percussion note; medium crepitations present at both lung bases. Cardiovascular system: N.A.D. Gastro-intestinal system: N.A.D. No hepatomegaly or splenomegaly. Other signs: lymph nodes in the groins and axillae were palpable but unlikely to be pathological. The patient was afebrile.

Laboratory Investigations.—Haemoglobin, 14 g.%; R.B.C., 5,380,000 per c.mm.; W.B.C., 37,800 per c.mm. (polymorphonuclear leucocytes 5%, eosinophils 88%, lymphocytes 7%). No microfilariae were seen in thick blood films made at 12 noon. No autohaemagglutination occurred either at room temperature or when the blood was put into a refrigerator. The stool did not contain any helminth ova. Sputum: no specimen available. X-ray not available.

The blood count remained of the same order over the next seven days, after which penicillin therapy was started with 300,000 units daily for three days. Unfortunately the patient did not receive a full course of penicillin, as the observer left Nigeria at that point. One week after the beginning of the penicillin therapy the total white cell count

had fallen from 37,800 to 24,700 per c.mm. and the eosinophils from 88 to 73%—that is, from 33,264 to 18,031 per c.mm. Two months later, without any further treatment, the white cell count had fallen to 9,400 per c.mm. and the eosinophils to 60% (5,640 per c.mm.). Four months after penicillin the white-cell count was 12,000 per c.mm. and the eosinophils 57% (6,840 per c.mm.). The patient stated that he felt better.

COMMENT

It is regretted that an x-ray examination of the chest could not be undertaken. However, in view of the clinical and haematological findings it would appear likely that the patient was suffering from tropical pulmonary eosinophilia. The possible presence of a *Loa loa* infection would produce a degree of eosinophilia, but hardly one of 88% (33,264 eosinophils per c.mm.). There was no evidence to suggest the presence of another helminth infection. Hunter (1946) reported a case of tropical pulmonary eosinophilia in a European aged 37 who had been resident in Nigeria for 12 years. Wilson (1947) reported the condition in three Africans in East Africa, but it is believed that the present paper reports the occurrence of the condition in a West African for the first time. It is interesting to speculate whether this patient acquired the disease in India some eight years previously and that it had only become manifest recently, or whether it had been acquired in Nigeria.

It is not possible to say with any assurance whether or not there had been any response to penicillin in this case, although there is a suggestion that the drug had some effect.

This case was seen at the Leprosy Research Unit, Uzuakoli, Nigeria. Thanks are due to Dr. J. Lowe for permission to investigate the case and to publish the findings, and to Sister O. Smith for her co-operation.

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Long-term Prognosis in Infantile Eczema

In 1953 Purdy published the results of an investigation into the after-history of cases of infantile eczema in Edinburgh. To amplify his findings a similar investigation into the cases of infantile eczema occurring in Dundee over the same period was carried out. Letters were sent to those patients who attended the skin department of Dundee Royal Infirmary with infantile eczema during 1931-7 inclusive. The questionnaire adopted was the same as that used by Purdy, but in addition questions were included regarding the onset and disappearance of asthma. In order to have results as closely related as possible to those of Purdy, the same criteria were followed in the selection of cases from the hospital records.

RESULTS

In a large number of cases it was impossible to locate by letter persons whose last known address was that of 15 to 22 years ago. Thus Table I shows that, of 136 questionnaires sent out, 92 (67.6%) were returned as "dead" letters.

TABLE I.—Result of Questioning

Total No. of persons sent letters	136 (94 males, 42 females)
"Dead" letters returned	92
Useful replies	37 (20 males, 17 females)
Useless replies (deaths at early age)	2
Replies not returned	5

In the 37 useful replies received, 12 patients claimed to have had no sequelae to their primary attack of infantile eczema. Table II gives the incidence of the generally accepted sequelae and compares the figures found in this study with those in Purdy's series. In assessing the final results of the Besnier's prurigo group all patients were examined personally unless they had been seen recently by a consultant of this department.

TABLE II.—Results of 37 Replies

	No.	Asthma	Asthma Denied; Wheezing Admitted	Hay-fever	Besnier's Prurigo	Migraine
Male	20	9	1	5	10	1
Female	17	4	4	5	5	3
Total	37	13 (35.1%)	5 (13.5%)	10 (27%)	15 (40.5%)	4 (10.8%)
Purdy's series	93	37 (39.8%)	10 (10.7%)	39 (41.9%)	23 (24.7%)	7 (7.5%)

The overall figure for asthma is 35.1%. If the five patients who failed to return the questionnaire are classed as having no asthma then a minimum figure of 30.9% is reached. This minimum is too low, as it assumes that none of the wheezing group of five patients and none of the "lost" five patients are asthmatic. If it is conceded that the wheezing group are asthmatic a minimum of 42.8% is reached, and excluding the "lost" five patients the figure is 48.6%. This range of roughly 43 to 49% is similar to Purdy's of 30 to 50%. Asthma developed in 13 patients in the first decade and disappeared in four males and one female in the second decade.

The figures for Besnier's prurigo show a range of 35.7 to 40.5%; the minimum figure presumes a complete absence of the complaint in the five patients who failed to return the questionnaire.

Table III shows a regrouping of the patients and agrees with Purdy that asthma without skin involvement is the most frequent sequela, with a range of 23.8 to 27%.

TABLE III.—Regrouping of Cases from Table II

	No.	Asthma (or Wheezing Attacks) but No Besnier's Prurigo	Besnier's Prurigo but No Asthma (or Wheezing)	Both Asthma (or Wheezing) and Besnier's Prurigo	Hay-fever but No Asthma (or Wheezing)
Male	20	5	2	5	1
Female	17	5	2	3	1
Total	37	10 (27%)	7 (18.9%)	8 (21.6%)	1 (2.7%)
Purdy's series	93	27 (29%)	5 (5.4%)	20 (21.5%)	14 (15%)

Besnier's prurigo in association with asthma is next in frequency, with a range of 19 to 21.6%. Besnier's prurigo alone has a range of 16.6 to 18.9%, which is much higher than that observed in Purdy's series—namely, 4 to 5.4%.

Hay-fever was present in 27% cases in Table II, but in the regrouping in Table III only 2.7% claim to have hay-fever without asthma.

Migraine occurred in four patients, three of them females. I agree with Purdy that it is a very doubtful outcome of infantile eczema.

The answers to questions regarding nervous stability and intelligence were so varied that it was impossible to support or refute the widely held belief that sufferers from infantile eczema are compensated with a high intelligence.

COMMENT

Of the 37 (27%) useful replies received to a questionnaire similar to Purdy's, 25 describe at least one of the recognized sequelae of infantile eczema. Of these 25, 10 had asthma, 8 Besnier's prurigo and asthma, and 7 Besnier's prurigo alone. Although the number of useful replies in this investigation was disappointingly low, it was decided to publish the results so that they may be added to Purdy's findings, and to any subsequent figures recorded from other centres, in order that the ultimate total number may be high enough to yield an accurate picture of the sequelae of infantile eczema.

I wish to thank Dr. J. Kinnear for permission to use his cases and for his helpful advice.

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Reviews

ALMROTH WRIGHT

Almroth Wright—Provocative Doctor and Thinker. By Leonard Colebrook, F.R.S. (Pp. 286; illustrated, 21s.) London: William Heinemann Medical Books Ltd. 1954.

The story of Almroth Wright is told sharply and succinctly by Leonard Colebrook in his foreword—how he worked in the laboratory away into the night; how when he met with difficulties he developed new techniques to overcome them; how he turned his laboratory at St. Mary's into a vaccine therapy clinic; how he charmed the patients and young men whom he attracted to work with him for a pittance; and how throughout a larger part of his life his spare time was spent in writing a treatise on morals, a treatise which had not appeared when he died in 1947.

There is no doubt that Wright was a great man, and there is no doubt also that he was appreciated abroad more than at home. I saw that when I accompanied him to France in October of 1914. He was a consulting physician in the Army Medical Service, and when he visited French laboratories he was worshipped almost as much as Pasteur.

His great work was vaccine therapy, beginning with anti-typhoid vaccine and spreading to a great variety of infections, but, as the author of this book points out, he did many other good things. Indirectly his work on immunization was the means of bringing the bacteriologist into contact with the patient, thus changing his status from a servant of the clinician to a colleague who was called into consultation like any other "consultant." For this the laboratory workers of the present day should offer him thanks. The author traces his career from the beginning, but naturally by far the greater part of the book is devoted to his work after he left the Army Medical College and came to St. Mary's. There Colebrook was one of his early assistants and his disciple. He tells of the work done in what were quite inadequate laboratories with hardly any equipment except glass tubing, a blow-pipe, and some rubber teats. But out of that work came vaccine therapy.

Then there was his work on septic wounds done in the Casino at Boulogne in the first world war; his serious controversies with Watson Cheyne and others; and his later years somewhat tinged with loneliness.

Colebrook was, of all Wright's pupils, the one who saw most of his private life, and he manages to give a picture of the scientist and the man which is very fascinating. It is of especial interest to me as one who worked in Wright's laboratory from 1906 till he died, but no one who likes to read of great men could fail to enjoy the book and profit by it.

ALEXANDER FLEMING.

*. This review was written shortly before Sir Alexander Fleming's death.—Ed., *B.M.J.*

HISTORY OF COMMON DISEASES

The History and Conquest of Common Diseases. Edited by Walter R. Bett, M.R.C.S., L.R.C.P. (Pp. 334, 54s.) Norman: University of Oklahoma Press. 1954.

This is a book which the "physician of two continents" would have approved, not only as a medical historian, but because it is an example of the collaboration between British and American doctors which he did so much to encourage in his lifetime. Dr. Bett, through his associations with the United States, is thus promoting Anglo-American friendship in the true spirit of William Osler.

This book, which replaces *A Short History of Some Common Diseases*, edited by Dr. Bett in 1934, is "mainly for patients, but also for the medical profession." Six of the contributors to this volume belong to the United States. Dr. George Rosen, of Columbia University, writes on acute communicable diseases. His history of diphtheria is excellent. The waxing and waning of this disease is remarkable and might have been further emphasized. When it

reappeared about the middle of the nineteenth century, at Ash in Kent, it was then so rare that it was unrecognized by most practitioners, and Simon sent Greenhow and Burdon-Sanderson to investigate outbreaks where it was prevalent. Dr. L. J. Moorman, of Oklahoma City, contributes a history of tuberculosis, but does not allude to the great impetus that was given in this country to medical research and treatment of the disease after 1912. Bodington, incidentally, spelt his name with one *d*. Dr. E. F. Hartung, of New York University, writes on arthritis. An admirable account of the history of Bright's disease is given by Dr. R. H. Major, of the University of Kansas; Dr. D. C. Balfour, Chief, Surgery Division, Mayo Foundation, writes on gallstones; and Dr. W. G. Lennox, of Boston, lucidly traces how the belief that epilepsy was a demoniac possession came to be replaced by modern scientific knowledge.

Of the British contributions one would single out as specially interesting—Dr. Terence East on heart disease, Dr. W. S. C. Copeman on rheumatism, Dr. A. W. Cawadias on diseases of the endocrine glands, and Dr. Bett on appendicitis. The chapter on pneumonia by Dr. E. M. Brockbank and Dr. W. Brockbank reveals how strikingly sulphonamides and penicillin have altered the clinical picture of this disease. Dr. A. White Franklin sketches the history of rickets from Galen to Mellanby, giving due meed of recognition to Daniel Whistler, whose M.D. thesis on rickets at Leyden in 1645 preceded Francis Glisson's famous book of 1650-1. Dr. E. L. Murphy's account of malingering is of value, and Chapter 16, by Mr. Harold Burrows, gives in succinct form an excellent account of the development of knowledge of cancer. The bibliographies are full and useful.

Dr. Bett and his contributors are to be congratulated, while a word of praise is due to the University of Oklahoma Press for the presentation of the volume.

ARTHUR S. MACNALLY.

BIOPHYSICS AND BIOPHYSICAL CHEMISTRY

Progress in Biophysics and Biophysical Chemistry. Volume 4. Edited by J. A. V. Butler and J. T. Randall, F.R.S. (Pp. 339 + viii; illustrated, 63s.) London: Pergamon Press. 1954.

The volume under review provides a refreshing change from some of its predecessors; not only have the editors chosen their subjects wisely, but also—and this is more important perhaps—they have chosen as authors workers who are competent to write in their respective fields.

The problems associated with muscular contraction are dealt with in two articles—"The Transference of the Muscle Energy in the Contraction Cycle," by Weber and Portzehl, and "Facts and Theories About Muscle," by Wilkie—while the behaviour of polyelectrolyte gels, which must be understood if the more physical aspects of muscular contraction are to be elucidated, has been described by Katchalsky. Fernandez-Morán has given a good account of the increase in our knowledge of the structure of the nerve fibre provided by polarization optics, x-ray diffraction studies, and the electron microscope; to a physiologist perhaps the most striking feature of the work is the excellent accord between the calculations of the x-ray diffractionist and the observations of the electron-microscopist. The x-ray diffraction picture of a nerve is a series of spots on a photographic plate; by what must seem to the uninitiated a supernatural intuition the physicist can, from the shapes, positions, and blackness of the spots, state that the myelin sheath is made up of concentric shells some 180 Å thick; under the electron microscope the shells can actually be made visible and measured.

The cause of cancer is most probably to be sought in the pathology of the cell nucleus; it will therefore be satisfying to those who seek some justification for pure research to see in two articles—"The Nucleoprotein Complex of the Cell Nucleus and its Reactions," by Davison, Conway, and Butler, and "Chromosome Breakage," by Koeller—how modern physical and physicochemical techniques are revealing more and more of the secrets of this all-important body. Finally, the present volume contains an article by J. C. Kendrew, "The Crystalline Proteins: Recent X-ray Studies

and Structural Hypotheses." This is necessarily abstruse for the biologist, and its main value here resides in the candour of the author, who modestly emphasizes the paucity of definite knowledge in this field. The most spectacular advances in our knowledge of protein structure have resulted from studies on the fibrous proteins like keratin; such advances have contributed to our knowledge of the physiology of muscle and nerve. The crystalline proteins, such as insulin, albumin, and globulin, present far more serious problems in methodology, but their solution is a pressing need if we are to relate, for example, the phenomena of immunochemistry with the morphology of the proteins that are concerned.

H. DAVSON.

THE OSTEOCHONDROSES

Legg-Calvé-Perthes Syndrome and Related Osteochondroses of Youth. By Charles Weer Goff, M.D., in association with Ned M. Shutkin, M.D., and Myerma R. Hersey, M.S. (Pp. 332+xxiii; illustrated. 77s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications, 1954.

This book contains all the important known facts and theories of osteochondritis deformans juvenilis and the related lesions of other epiphyses. The name of pseudo-coxalgia is discarded and the group named osteochondroses is defined. The author, who had the assistance of Jacques Calvé before his death (he wrote the foreword), has extracted material from the enormous quantity of literature that has been accumulating for 45 years and made observations on groups of children.

This study of a condition which so often causes permanent damage to an epiphysis is most thorough; the subject is well presented and the excellent radiographs are most fascinating. It is a specialist book, and the reader will seek for the cause of the changes in the epiphysis. The "Murk Jansen and Perkins discussion" is reported (Jansen's photograph, but not that of his opponent, is reproduced). Almost all the special examinations and observations were found to be negative, and so did not prove helpful in elucidating the aetiology. However, it is stated that the "constitutional preterminators are proven factors of causality," and environmental factors, such as trauma, are superimposed. Remissions with a second centre developing in the epiphysis are stated to be more common than is usually supposed. Modified recumbency treatment is recommended. An important observation is that every patient who had been followed up for ten years or more, and who was 20 years of age or older, had symptoms of dysfunction. The reports on related osteochondroses follow a similar pattern and are well collected.

An appendix forms a charming tribute to Mrs. Smith, of Farmington, Connecticut, who remodelled on the English system a small farmhouse for the accommodation of ten crippled children. Like several in this country it has grown, and now has nearly 200 beds.

There are a bibliography, an author index, and a subject index, and the author explains his system of references. Even so, the reader will not necessarily be able to find what he may require. For instance, use is made of Burrows's classification and 1950 is placed after his name, but there is no mention of the paper in the bibliography.

This book will be of great help to all dealing with bone diseases in adults as well as in children.

ST. J. D. BUXTON.

SKIN HISTOPATHOLOGY

Histopathology of the Skin. By Walter F. Lever, M.D. Second edition. (Pp. 518+xviii; 281 illustrations, 8 in colour. 96s.) London, Philadelphia, Montreal: J. B. Lippincott Company, 1954.

The second edition of this textbook has been considerably modified and added to in certain sections. As before, the author includes a very short clinical note on each disorder, primarily for the benefit of the pathologist, though in many cases this is of somewhat doubtful value. It is difficult, though not impossible, to think of a few uncommon disorders which a careful search fails to reveal in this treatise,

but the book would no doubt be used for a very long time in current histological work before these omissions were discovered. It has in the past been largely left to dermatologists to develop the study of skin histopathology, and even now, in many places, the pathologist prefers to leave this branch of histology to the clinical dermatologist.

Dr. Lever's book will help to facilitate very greatly more widespread knowledge of dermal histology. The views expressed are thoroughly up-to-date and carefully considered, though in a work of this size there is little room for full-length discussion. This possible drawback is overcome by a well-chosen bibliography, divided into sections, which appears at the end of each chapter. The illustrations are good and show clearly what they are meant to show. There can be little doubt that this is now the best book of its kind, whether as a work of reference, a textbook, or a practical bench-side handbook. Both dermatologist and pathologist need it.

F. RAY BETTLEY.

THE VITAMINS

The Vitamins: Chemistry, Physiology, Pathology. Volume III. Edited by W. H. Sebrell, jun., and Robert S. Harris. (Pp. 665+xi. \$15.) New York: Academic Press, Inc. London: Academic Books Ltd. 1954.

It can be said at once that Volume III of "Sebrell and Harris" lives up to the high standard set by Volumes I and II, reviewed in these columns earlier this year (January 29, p. 272). This instalment completes the work, which, all in all, provides us with the most comprehensive, the most up-to-date, and the best-documented treatment of the biochemistry of the vitamins so far published.

The third volume contains chapters on the following factors: *p*-aminobenzoic acid, pteroylglutamic acid (i.e., the folic acid group), vitamin B₆ (pyridoxin and related compounds), riboflavin, thiamine, vitamin E, and lastly certain new, and as yet unidentified, growth factors. As in earlier volumes, the emphasis is particularly on biochemistry, although physiology and pathology are not overlooked. Clinical aspects and the methods of assay of vitamins are but briefly referred to, as these topics are already dealt with pretty fully in other compendious treatises available elsewhere. Twenty-three authors contribute to the present volume, all but one being American. The exception is Professor B. C. P. Jansen, the doyen of Dutch biochemists, and distinguished as the first to isolate pure crystalline vitamin B₁.

LESLIE J. HARRIS.

LABORATORY TECHNOLOGY

An Introduction to Medical Laboratory Technology. By F. J. Baker, F.I.M.L.T., F.R.M.S., R. E. Silverton, A.I.M.L.T., F.R.M.S., and Eveline D. Luckcock, A.I.M.L.T. (Pp. 330+x; illustrated. 30s.) London: Butterworth and Co. Ltd. 1955.

This modest volume from the technical staff of the Brompton Hospital aims at meeting the needs of student technicians who are preparing for the Intermediate Examination of the Institute of Medical Laboratory Technology. It consists of short descriptions of elementary laboratory methods, including such items as the cleaning of glassware, simple chemical tests, physiological techniques, sterilization methods, and haematological techniques.

There is naturally little to be found here that is not discussed more fully in larger works, but it will no doubt be very convenient for the student technician to find the material all within the covers of one book. As a minor criticism, the directions given are not always sufficiently fool-proof or explicit. For example, on page 283 we are told "the cork borer must be sharp," but the reader is not told what is to be done when it is blunt. Similarly, on page 248 the use of chloroform for killing animals is described without any indication of how it is introduced into the container.

The book is well produced, with a number of useful illustrations, which accounts for the rather high price. On the whole it will prove useful for the purposes intended, and can be confidently recommended to student technicians who feel the need for a special book on their subject.

N. F. MACLAGAN.

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RADIATION HAZARDS OF EXPERIMENTAL NUCLEAR EXPLOSIONS

The radiation injuries received by the crew of the Japanese boat *Fukuryu Maru*, with the subsequent death of one of them, gave the first inkling of the scale of radiation hazards associated with the testing of the latest nuclear weapons. But it was not until the recent official report issued by the U.S. Atomic Energy Commission¹ that the true magnitude of the problem became evident. The report deals mainly with the damage caused by the fall-out—that is, the deposition of radioactivity in the vicinity of the explosion. The amount of radioactivity in a fall-out may be measured in units of roentgen square miles, which is the product of the dose in roentgens which a person would receive, multiplied by the total area over which the fall-out occurred. The Bikini bomb tested a year ago gave a fall-out amounting to 20 million roentgen square miles²; since the area covered by the fall-out was about 8,000 square miles, the total dose delivered there, as from one hour after the explosion, was about 2,500 r.

Since the fall-out occurs over a limited area, which in the case of a test would normally be uninhabited, it does not present a very serious problem, except for unfortunate accidents as with the *Fukuryu Maru*. There is, however, the important problem of the radioactivity other than in the fall-out. A bomb with an explosive power one thousand times that of the Hiroshima type may produce, one hour after the explosion, a total amount of radioactivity equal to about 100 million roentgen square miles. Most of the radioactive fragments are sucked up with the hot gases resulting from the explosion and reach great heights, probably over 100,000 ft. (30 km.). Very little is known about the movements of the atmosphere at such heights, but it is likely that the radioactive cloud would circulate the globe many times before all the particles drifted down to the surface. Much comfort has been derived from the fact that during the long time it takes the particles to settle

down most of the radioactivity would have died out. But this safety factor has been overrated. If the radioactive dust took six months to settle down instead of six days, the residual dose delivered would be reduced only by one-half. What is more important is how long the fine dust will stay on the surface before it is washed away by rain or removed by other means: this again is difficult to assess.

The calculation of the global dose resulting from one test is dependent on so many unknown factors that at best it would give a rough estimate. There is, however, no need for such calculation, for some informative data are available. The U.S. report states that the total amount of radiation received from all nuclear detonations so far is about 0.1 r. Although this figure refers to residents of the United States, it presumably applies to any other country. In assessing the significance of this dose it may be pointed out first that, although the report attributes it to the considerable number of atomic explosions carried out so far, probably most of the dose came from the very few hydrogen bombs tested about a year ago. This is so because one H-bomb produces from 100 to 1,000 times more radioactivity than an atom bomb; the contribution of the latter may thus be neglected. The natural background of radiation, due to cosmic rays and the radioactive substances normally contained in the atmosphere, amounts to about 0.1 r per year. We may infer, therefore, that a continuation of tests on the 1954 scale—that is, several H-bombs a year—would double the natural amount of radiation.

What is the consequence of such a world-wide increase in radiation? So far as somatic damage is concerned it is quite negligible. The maximum permissible dose established for those occupationally exposed to radiations is 0.3 r per week, or 15 r per year. From the genetic point of view, however, there is no maximum permissible dose, since every increase of radiation is harmful. In setting up the maximum permissible doses account was taken of the fact that only a small fraction of the population, less than 1%, is habitually exposed to radiation. When the whole population is exposed, the dose considered genetically safe must be reduced correspondingly, which brings it down to about 0.1 r per year. It may be argued that the whole population is already subject to exposures in various radiological examinations. In fact the U.S. report states that the dose of 0.1 r is received in a single chest x-ray examination. But such a comparison is misleading. For the genetic hazard only the dose delivered to the gonads is of significance.

¹ *The Effects of High-Yield Nuclear Explosions*, U.S., A.E.C., February, 1955.

² Lapp, R. E., *Bull. Atomic Scientists*, 1955, 11, 45.

³ *Brit. J. Radiol.*, 1952, 25, 387.

and furthermore it has to be averaged over the whole population. A survey⁷ carried out several years ago in Great Britain has shown that the mean gonad dose received during chest radiography is about 0.0007 r. Even taking into account the much bigger doses received during examination of the pelvis, the survey shows that the mean dose per head of the population from all x-ray diagnostic examinations is 0.005 r per year, or one-twentieth of the natural radiation level.

It is very difficult to estimate the genetic damage which may be caused by raising the level of radiation by 0.1 r per year. Most of the evidence about the rate of radiation-induced mutations comes from experiments on *Drosophila*; only in recent years have experiments been made with mice, but these are not yet complete. At the moment the most probable figure for the dose necessary to double the rate of mutations is 30 r per generation. For man this would correspond to a dose rate of 1 r per year. A dose rate of 0.1 r per year would therefore cause a 10% increase in the rate of mutation, which is by no means negligible. But the assumption that the doubling dose is the same in man as in *Drosophila* is not well founded. Some genes are known to undergo spontaneous mutations at a much lower frequency than others; if this frequency were, say, 10 times lower, the radiation dose necessary for doubling the mutation rate would be correspondingly reduced. If this should apply to man, then the 0.1 r per year would justifiably give cause for worry from the genetic point of view.

One thing emerges clearly, that we know far too little on such an important subject, and that an intense study of it is urgently called for. From what little we do know it would appear that, although the radiation dose from the nuclear explosions carried out so far was too low to have caused much genetic damage, a continuation of the tests at the present scale over a period of many years might constitute a serious genetic hazard.

"CHRONIC APPENDICITIS"

In even the best-conducted hospitals chronic appendicitis is one of the commonest surgical diagnoses. Since treatment is almost invariably by removal of the appendix, allowing not only its immediate careful inspection by the surgeon but its more detailed study by the pathologist later, it would seem reasonable to assume that the diagnosis had long since attained a clear meaning for clinician and pathologist. But this is far from being so, as the

correspondence columns of this *Journal* have testified for some months recently; moreover, the writings on this disease (if disease it be) reveal a remarkable dearth of facts about this most ordinary complaint. As Mr. S. H. Wass says in an article at p. 752 of the *Journal* this week: "Some people believe that chronic appendicitis is a clinical entity of common occurrence, others that there is no such disease."

The problem, as it presents to the surgeon, is that of a patient who complains of recurring pain in the right lower quadrant of the abdomen, sometimes sharp, sometimes dull, and occasionally colicky, often associated with vague digestive upset, flatulence, and constipation, accompanied by, as the only positive physical sign, tenderness sharply localized to McBurney's point. Many possible causes immediately suggest themselves, and the surgeon reviews each in turn. As he casts round diligently for an alternative diagnosis to chronic appendicitis the symptoms continue. The patient and his relatives will probably long since have indicted the appendix, and the harassed family doctor may well have hinted at the necessity of having it out. Little wonder then that under the pressure of events the surgeon reluctantly (or not so reluctantly, for many factors influence his decision) feels obliged to explore the abdomen. Having drawn a blank in his search elsewhere he returns to the appendix, and is duly heartened to find it other than normal. Whether it is long (too long) and distended, or shrivelled and fibrous, or kinked or tethered, or infected, or contains a faecolith, it is removed, for removed it must be. The patient is duly informed that the appendix was scarred and better out of the way and is followed through a short convalescence. The case is duly indexed as one of chronic appendicitis, and if the registrar is in any indecision about whether to record the result as "cured" or only "relieved" he knows that no one is likely to quarrel with his verdict either way.

Meanwhile, the problem passes to the pathologist—with the hope that he will find some deviation from normal or, better still, some striking changes which might reasonably explain the symptoms. If he is

¹ Keith, Sir A., *Human Embryology and Morphology*, 1933, 5th ed., London.

² Boyd, W., *Surgical Pathology*, 1947, 6th ed., Saunders, Philadelphia.

³ Hertzler, A. E., *Amer. J. Obstet. Gynec.*, 1926, 11, 155.

⁴ Wilkie, D. P. D., *Brit. J. Surg.*, 1921, 8, 392.

⁵ Pratt, F. W. M., *British Medical Journal*, 1954, 2, 1352.

⁶ Millard, A. H., *ibid.*, 1955, 1, 230.

⁷ Moir, J. C., *ibid.*, 1954, 2, 1415.

⁸ Bourne, A., *ibid.*, 1955, 1, 45.

⁹ McLennan, I., and Watt, J. K., *ibid.*, 1954, 2, 736.

¹⁰ Wickes, I. G., *ibid.*, 1954, 2, 869.

¹¹ Westlake, E. K., *ibid.*, 1954, 2, 869.

¹² Macfarlane, J. A., *ibid.*, 1954, 2, 1109.

¹³ van Meurs, D. P., *ibid.*, 1954, 2, 1230.

¹⁴ Ackerman, L. V., *Surgical Pathology*, 1953, London.

honest he will at the outset admit to finding the decision a difficult one, and this for a variety of reasons. First, the appendix is known to change with advancing years,¹ and even the standard textbooks of histology seem at a loss to describe the normal. Secondly, it has undergone the trauma of removal. Thirdly, the pathologist may agree that Boyd² was right when he said: "To-day every appendix is condemned by some pathologist somewhere." Little wonder, then, that he often writes a non-committal report which satisfies the surgeon and his own conscience but helps not at all to advance knowledge of the disease.

But when challenged not with the individual case but the general question, Is there such a condition as chronic inflammation of the appendix, and, if so, is it common or rare? the pathologist seems to be more sure of himself.³ Acute appendicitis he knows and understands. The infection varies in intensity, and its effect is profoundly influenced by the presence of obstruction.⁴ When the diagnosis is overlooked or when operation is, for some very good reason, deferred, the acute process may subside and be followed by a resolution which is often remarkable. Inevitably, however, the appendix will carry the scars of this acute infection, sometimes spread diffusely along its length with thickening of the wall and obliteration of the lumen, sometimes limited to one short segment. But, whatever the result, this is not chronic inflammation: it is healed appendicitis. No doubt the same fibrosis can follow recurrent mild attacks of appendicitis; none of them may present clinically as an urgent illness, but the scarring that follows one attack may predispose to the next. Fibrosis obstructing the lumen may also, though rarely, lead to a mucocoele or to one or more diverticula. Of the occurrence of "chronic appendicitis," of a continuing low-grade infection with its typical cellular reaction, the pathologist has no experience. If it exists at all it must surely be a rare disease. He knows of no pathological lesion which fits in with the clinician's conception of a "grumbling" infection—that is, apart from tuberculosis, actinomycosis, and the like.

The surgeon, undismayed by the pathologist's incredulity about chronic inflammation, may speak of appendicular colic due to kinks or bands, to obliteration of the lumen, to obstruction by faecoliths,^{5 6} or even to hypertrophy of the neuromuscular complex of Masson. Even if he admits that, during abdominal operations for other disorders, he often finds equally abnormal appendixes apparently causing no trouble whatever, and even if he fails to explain away the gynaecologist's challenging comments on the high incidence of the disease in women aged between 15

and 45,^{7 8} he can still confidently claim an 80% cure rate following appendicectomy.⁹ However, it is too much to claim that this proves the symptoms were due to chronic appendicitis.^{10 11} While the 80% may live happily ever after, as do their general practitioners,¹² what of the others? It is not good enough to say that the diagnosis was in error and operation unnecessary (but without much risk). How many of them pass on to later troubles? For the easy diagnosis having been used up by removing the appendix the next surgeon is left to make a fruitless search for adhesions.¹³ Surely it is high time for a study to be made of "chronic appendicitis" with a control group of patients treated non-operatively. Until clinical and pathological findings have been carefully compared and analysed, the suspicion is bound to linger among the unconvinced that Ackerman¹⁴ was right when he suggested a change of name from "chronic appendicitis" to "chronic remunerative appendicitis."

ENDOCARDIAL FIBROELASTOSIS IN INFANTS

Endocardial fibroelastosis or sclerosis is not a common condition, but is now well recognized as a cause of death in infancy and very occasionally later in childhood. Its distinctive pathological feature is a thick, white, opaque endocardium in one or more chambers of the heart. The thickening is due to a great increase of fibrous and elastic tissue in the endocardium, with slight fibrosis of the immediately subjacent myocardium in some cases, though not in all. The chambers of the left side are most often affected, especially the left ventricle; the right atrium and ventricle are spared in most cases or are less severely affected.

The condition is encountered either as an isolated lesion in a heart otherwise developmentally normal, or associated with other cardiac anomalies, most often with stenosis or atresia of the aortic or mitral valve, sometimes with an aberrant coronary artery or coarctation of the aorta. In a paper appearing at page 765 of the *Journal* this week, Dr. J. F. Horley has pointed out that the majority of cases of fibroelastosis can be divided into two distinct groups: those associated with aortic valvular lesions and hypoplasia of the left ventricle, in which the infant seldom survives for more than a week or two and the heart is but little enlarged; and those without associated cardiac defects, in which survival for several months is the rule, and the heart is much enlarged owing to dilatation and hypertrophy of the left ventricle. The first type he calls foetal fibroelastosis, because it obviously develops before birth; the second he calls infantile fibroelastosis, apparently on the assumption that it is not congenital but develops after birth.

¹ Gross, P., *Arch. Path. (Chicago)*, 1941, 31, 163.

² Weinberg, T., and Himelfarb, A. J., *Bull. Johns Hopk. Hosp.*, 1943, 72, 299.

³ Ullrich, O., *Z. menschl. Vererb.-u. Konstit.-Lehre*, 1938, 21, 585.

⁴ Johnson, F. R., *Arch. Path. (Chicago)*, 1952, 54, 237.

It is doubtful whether this assumption is justified, despite the fact that fibroelastosis without valvular lesions is very rarely seen in infants less than three months old; for it is to be expected that, when fibroelastosis is an isolated lesion, survival will be longer than is likely in the presence of severe valvular or other congenital cardiac anomalies.

The cause of fibroelastosis is not known. Formerly it and the associated valvular lesions were believed to be a result of infective inflammation and were known as "foetal endocarditis." This theory was decisively rejected by P. Gross,¹ who favoured a developmental origin. The histology of the thickened endocardium and stenosed valves gives little support to the infective theory. A genetic origin has been postulated, and this theory gains support from the occasional occurrence of fibroelastosis in siblings, as reported by T. Weinberg and A. J. Himelfarb,² and by O. Ullrich,³ who described the case of triplets, of whom the two identical were affected, and the third, dissimilar, survived. The theory most generally favoured at the present time attributes the condition to anoxia. It was shown by F. R. Johnson⁴ that the associated cardiac anomalies are usually such as could cause anoxia of the endocardium of the affected chambers. Horley strongly supports this theory. He quotes reports by other workers to show that, when aortic atresia is accompanied by an interventricular septal defect, which admits oxygenated blood from the right ventricle, fibroelastosis of the left ventricle does not occur, although it invariably accompanies aortic atresia in the absence of such a defect. This theory less satisfactorily explains cases of fibroelastosis without other cardiac anomalies, in which there is no evident cause of anoxia of the endocardium.

Fibroelastosis is not often diagnosed with confidence during life. When other cardiac defects exist with it, these are mainly responsible for the clinical features of the case. When there are no associated anomalies of the heart, the infant often appears to be healthy for some months, and then begins to present clinical evidence of heart failure, the heart is found to be enlarged, and the electrocardiogram is indicative of myocarditis. The onset of heart failure may be surprisingly sudden, and death may follow within a few days. The reason for this severe effect on the myocardium is problematical. Gross postulates that the thickened endocardium interferes with the circulation in the heart wall by obstructing the small vessels that penetrate it to open into the chambers. Histological evidence of myocardial degeneration is seldom impressive, and often the clinical evidence of heart failure and the dilatation of the left ventricle seem disproportionate to the microscopical evidence of myocardial damage.

CLUBBING OF FINGERS

If the shade of Hippocrates reads the medical journals he may be surprised and perhaps gratified by the revival of interest in clubbing of the fingers, a sign which he first described twenty-five centuries ago. He must also

feel distressed that his successors have added so little to his own knowledge of the subject. It has now become clear that clubbing of the fingers may be hereditary and of no diagnostic significance, or it may be acquired and signify disease in other parts of the body. Acquired clubbing of the fingers and toes is sometimes said to appear occasionally without any disease being present, but the truth of this assertion may well be doubted because there are so many obscure conditions which may cause it to appear.¹ Indeed, one of the most mysterious features of clubbing is the fact that it is acquired in the course of diseases so different as bronchial carcinoma, congenital heart disease, biliary cirrhosis, lung abscess, and hypothyroidism after thyroidectomy.

In recent years it has been more widely recognized that clubbing of the digits is sometimes only a part of a generalized hypertrophic osteoarthropathy which includes periostitis, synovitis, and painful oedema of the limbs. In the *Journal* this week Drs. T. Semple and R. A. McCluskie report a most interesting series of twenty-four patients in whom this disorder was associated with bronchial carcinoma, a disease which they consider to be the chief cause of the generalized hypertrophic osteoarthropathy. Vogl *et al.*² have recently described the same condition in six patients with bronchial carcinoma and one with a chronic lung abscess. The authors of these two papers have described the classical clinical features of the condition, emphasizing the pain, swelling, redness, and tenderness in the limbs, and the stiffness of the joints in association with progressive clubbing and dusky coloration of the tips of the fingers and toes. Hypertrophic osteoarthropathy commonly calls for attention, and sometimes cripples the patient, before the presence of pulmonary disease is suspected. In such cases it is apt to be diagnosed and treated as rheumatoid arthritis without any benefit to the patient. In contrast, the authors of both papers report rapid and dramatic relief of the "rheumatic" symptoms after treatment of the primary pulmonary disease.

While our clinical knowledge of this interesting condition has advanced, we remain very much in ignorance of the nature of the processes which produce such a curious state of affairs. In 1949 it was observed in an annotation in this *Journal*³ that the subject lends itself to armchair theorizing and that physiological clues were few by comparison with the wealth of clinical data and the numerous hypotheses. The supply of hypotheses has continued to outstrip that of clues, but G. M. Wilson⁴ has confirmed the finding of an increased blood flow through clubbed fingers and has shown that this is not due to the action of vasodilator nerves. He also found that treatment of the intrathoracic disease was

¹ Leopold, S. S., *The Principles and Methods of Physical Diagnosis*, 1st ed., 1952, p. 356, Philadelphia.

² Vogl, A., *et al.*, *Amer. J. Med.*, 1955, 18, 51.

³ *British Medical Journal*, 1949, 1, 228.

⁴ Wilson, G. M., *Quart. J. Med.*, 1952, 45, 201.

⁵ Jack, G. D., *Trans. med.-chir. Soc. Edinb.*, 1952, 132, 75.

⁶ Jackson, W. P. U., *British Medical Journal*, 1949, 1, 216.

followed by a decrease in the peripheral blood flow and a retrogression of the clubbing. An increase in blood flow cannot be the whole explanation, because clubbing is not a feature of hyperthyroidism, in which there is an increased peripheral circulation, but it does appear in some cases of myxoedema, in which the peripheral blood flow is presumably sluggish. Wilson has suggested that the important factor is a blood supply in excess of metabolic requirements, and this may explain some of these apparent anomalies.

Whatever the cause of hypertrophic osteoarthropathy, it is important that the condition should be recognized, because it may be the first clue to the presence of a bronchial carcinoma, and anything which may enable an early diagnosis to be made of this disease is to be welcomed. Moreover, Vogl *et al.* consider that the condition itself is often so distressing and disabling that resection of a bronchial carcinoma may be justified by the relief of symptoms even if it does not eradicate the malignant disease. It is well to remember, however, that G. D. Jack⁵ found only three fully developed cases of hypertrophic osteoarthropathy in 668 patients with bronchial carcinoma and that it took Semple and McCluskie seven years to find twenty-four cases. It is also worth while recalling W. P. U. Jackson's warning⁶ that the combination of a cough and clubbing of the fingers does not by itself justify the diagnosis of a serious pulmonary disease, though it should certainly encourage further investigations.

EPILEPSY AND SCHIZOPHRENIA

In their interesting article on psychical phenomena in temporal lobe epilepsy at p. 748 of the *Journal* this week Drs. S. Karagulla and Elizabeth Robertson draw a number of parallels between these symptoms and those experienced by the schizophrenic patient. They principally concern themselves with hallucinations, taking this term to cover a wide range of abnormal experience. At one end is the disembodied thought, which may be formless and more a subjective experience of something going wrong in the process of thinking. This was observed in an epileptic, and was exactly reproduced by electrocortical stimulation in a strictly localized region of the right temporal lobe. It closely corresponds in form with familiar complaints by schizophrenic patients—for example, of forced thinking, of thoughts being inserted into the mind by an outside agency, or of thoughts getting crossed. In the middle of the range are hallucinatory phenomena, which are experienced as coming from within. Schizophrenics commonly report that they hear a voice coming from some particular part of the body, not infrequently the abdomen; and the authors parallel this with the experience of a 7-year-old epileptic boy, who felt something talking in his stomach as an accompaniment of the aura of an epileptic attack fired off from a temporal focus. Finally there are the completely exteriorized

¹ Grubbe, H. W., *Z. ges. Neurol. Psychiat.*, 1936, 154, 395.

hallucinations, and here the similarities are not quite so close. The schizophrenic remains at all times aware of an external reality, and even when auditory or visual hallucinations seem to him to take place in this external world he usually reports that they have a lesser or different quality of reality than actual objects and events. The pseudo-reality of the epileptic hallucination is often more real than this, as in the case reported in which the patient was blind to everything else.

There are other symptomatic differences between abnormal psychic experiences in the epileptic and in the schizophrenic. Whether the epileptic suffers from a hallucination in isolation, or as part of the aura which precedes a major convulsion, consciousness is usually to some extent clouded or altered. Probably many significant epileptic experiences never come to the notice of the doctor because subsequent memory for them is obliterated. Even when it is retained it may be incomplete. Any demonstrable alteration of consciousness is rare in the hallucinated schizophrenic, although for other reasons he may not be completely in touch, or be unable to give a clear account.

However, it is not only in hallucinations that striking similarities exist between the experiences of the epileptic and of the schizophrenic. A feeling of unreality, sudden, overwhelming, but of brief duration, is extremely suggestive of a temporal lobe attack. Similar feelings, of a more persistent nature, occur in a variety of psychiatric syndromes, but with particular frequency in the early stages of schizophrenia. Sudden changes of mood, depression, panic, ecstatic states, and moods with an other-worldly quality occur both in epilepsy and in catatonic schizophrenia. The *Wahnstimmung*, or state of mind in which everything that is going on seems to have some mysterious significance, or to have some special reference to the patient, is a common and characteristic feature of oncoming paranoid schizophrenia, and is almost as frequently observed in the twilight state which may succeed a closely spaced series of fits or accompany petit mal status. As long ago as 1936 H. W. Grubbe,¹ who was one of the pioneer workers on the psychopathology of schizophrenia, pointed out that there was no phenomenological difference between the form of the primary delusion in schizophrenia and in epilepsy. There are patients in mental hospitals, diagnosed as schizophrenic, who have fits from time to time and even die in status; we may be quite sure that some of them are unrecognized epileptics.

The work of Karagulla and Robertson owes a large part of its interest to the fact that precisely defined and complex psychic experiences could be produced by electrocortical stimulation in a narrowly circumscribed locus in the brain of the conscious subject. This was the work of Wilder Penfield, under whom one of the authors has worked in the department of neurology at McGill. Success in the surgical treatment of epilepsy, a field in which Penfield is the outstanding pioneer, would seem to depend largely on localizing the epileptogenic focus by direct stimulation under local anaesthesia; and neurosurgeons who forgo the advantages of

this technique are neglecting an important aid to localization. The particular moral which Karagulla and Robertson draw from their work, that the phenomenological similarities between epilepsy and schizophrenia are so striking as to merit further intensive study, should also arouse interest and attention.

DANGERS OF MERCURY

Growing appreciation of the importance of enzymes in relation to the action of chemotherapeutic drugs has advanced—and is advancing—rational therapeutics, and gradually the days of traditional and empirical therapy are passing away. Although the scientific approach to treatment has been chiefly concerned with the infections, it shows no signs of stopping there; the times are propitious to investigating whether the old remedies do all that they are supposed to do. One at present the subject of discussion is mercury—a time-honoured recipe for infants both in the form of calomel and as hydrarg. c. cret. (grey powder). Is there any good evidence that either of these preparations is of any value? If not, they should surely be removed from the pharmacopoeia.

Constipation in their infants has been a bugbear to mothers for generations and a "corrective" or laxative is administered to treat and even to prevent the condition—and also to a greater or less extent as a panacea. Any unexplained fever or out-of-sorts state is apt to be treated similarly. Many children are still given a regular weekly laxative—like a talisman to ward off evil things. Teething has naturally been a fruitful subject for catharsis. Some parents attribute any intercurrent upset between the ages of 4 months and 2 years to teething, and administer "teething powders." Are teething powders, of any sort, ever necessary? Teething is a physiological phenomenon like menstruation and pregnancy, and like them it may occasionally become pathological, but undoubtedly less often. Nearly all teething powders contain a laxative, yet there is no evidence that the process of dental eruptions is associated with constipation or that calomel is a febrifuge. Parents should be informed that teething is normally a natural process and that nature seldom requires assistance. If an infant is so upset as to require some treatment he should be seen and treated by the doctor, not by the chemist or grocer, who will undoubtedly continue to supply proprietary remedies if parents continue to demand them. But has the time not come to question the need for grey powders in any disorder?

Mercury is a dangerous drug, especially in infancy, and some doctors have come to consider that it should not be prescribed for internal administration in any form. The Minister of Health is "considering urgently" whether grey powders should cease to be issued from child welfare clinics.¹ If a laxative is necessary, more effective and innocuous preparations are available, such as syrup of figs or syrup of senna. Castor oil is now generally regarded as a grave risk for children,

¹ *Evening Sentinel*, March 15.

and, happily, tragedies from peritonitis due to rupture of an inflamed appendix, as a result of the violent peristaltic contractions produced by castor oil prescribed for a stomach-ache, are much rarer than they used to be. Now that the ill effects of mercury are becoming clearer, a diminution in the incidence of such pathological conditions as pink disease may be hoped for; indeed, there is already some evidence that this is happening.

ROYAL SOCIETY'S NEW FELLOWS

Among the 25 new Fellows of the Royal Society elected on March 17 are three members of the medical profession as well as several scientists whose work has contributed to the advancement of medicine. Professor A. W. Downie, one of the leading authorities on the viruses that cause human disease, is specially noted for his work on the smallpox and related viruses. He has been professor of bacteriology at Liverpool University since 1943, and before that was at the National Institute for Medical Research. Professor K. J. Franklin, of St. Bartholomew's Hospital, has been professor of physiology in the University of London since 1947. His investigations into foetal and renal circulatory systems have been notable for the ingenious techniques, including cineradiography, that he and his collaborators have used. A classical scholar, Professor Franklin has also made distinguished contributions to the study of medical history; his biography of the late Sir Joseph Barcroft appeared two years ago. Sir Harold Himsworth, secretary of the Medical Research Council since 1949, was formerly professor of medicine at University College Hospital Medical School, where his investigations were concerned chiefly with diabetes mellitus, the thyroid, and liver disease. It is good to see clinical research thus honoured in the person of one who has early exercised a great influence on medicine. Since becoming secretary of the M.R.C. Sir Harold has naturally played an important part in the organization of the clinical trials that in recent years have made the Council's work of such unique value to the advancement of rational therapeutics. Dr. D. J. Finney, though director of the Agricultural Research Council's unit of statistics, is well known to many medical men for his development of the statistical methods commonly used in pharmacology, and especially in the assay of biological preparations. Mr. A. F. Huxley, assistant director of research in physiology at Cambridge, has made important contributions to knowledge—in a school renowned for its neurophysiology—about the conduct of impulses in nerves and muscles, latterly with the aid of the interference microscope. Professor O. E. Lowenstein, Mason professor of zoology and comparative anatomy in the University of Birmingham, has been elected for his work on the comparative physiology of the vertebrate labyrinth. Professor G. P. Wells, as professor of zoology, University College, London, comes closely into contact with the medical student in his formative years.

EMERGENCIES IN GENERAL PRACTICE

ACUTE RESPIRATORY OBSTRUCTION

BY

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Acute respiratory obstruction ranks high on the list of emergencies in which prompt action is necessary to avert disaster. Unfortunately, in some cases the emergency arises so suddenly that death ensues before medical aid can be summoned; but in most cases the obstruction is more or less slowly progressive, giving time for preventive measures at all stages of its development.

Obstruction of the Nose, Mouth, and Pharynx

Lesions in the nose very rarely cause severe obstruction. Some years ago, however, a newly born infant was admitted to St. Bartholomew's Hospital in such respiratory distress that it had to be placed in an oxygen tent. A very large polyp in the left anterior nares completely blocked both nasal passages. Removal of this obstruction gave immediate relief to the distress, respiration at once becoming normal, and remaining so.

The mouth and pharynx provide a number of cases. A large foreign body—for example, a bolus of food—may be inhaled in the deep inspiration of pertussis, completely blocking both food and air passages. The foreign body should be hooked out with the index finger; in infants the retching induced by this manoeuvre often proves most effective. During anaesthesia, and in unconscious states following traffic and other accidents, the lower jaw and tongue may fall back, causing an exactly comparable obstruction. The jaw must be held forward and an airway inserted or the tongue drawn out with a tongue clip.

Acute inflammatory conditions which give rise to gross obstructive swelling include retropharyngeal abscess, usually in young children, and, rarely, lingual abscess. If seen early vigorous treatment with penicillin injections, from 100,000 to 500,000 units twice daily, should be begun, and in most cases the condition will abort. If the response is doubtful, one of the other antibiotics should be substituted: 2 g. of chloramphenicol daily in divided doses for adults, with proportionally smaller doses six-hourly for children depending on their weight; for children the palmitate emulsion is preferred, each drachm (3.5 ml.) containing 125 mg. of chloramphenicol. Alternatively, chlortetracycline ("aureomycin") or oxytetracycline ("terramycin") may be used in half the above dosage. If an abscess has already developed it should be incised. No general anaesthetic is advisable, and it is very doubtful if topical cocaine has any real effect. The child should be laid supine on a table with a sandbag under its shoulders and the retropharyngeal abscess incised. The child should then be picked up by the feet so that the released pus runs from its nose and can be aspirated by a sucker.

Quinsy does not, as a rule, cause much respiratory obstruction unless oedema has spread downwards to the glottic opening. This abscess may be evacuated by the classical stab in the soft palate or, better still, by sharp-pointed sinus forceps passed up along the supratonsillar fossa. If a general anaesthetic seems imperative a non-irritant vapour—for example, chloroform—would be indicated, the patient being placed as for tonsil dissection.

Allergic swelling of the mouth and tongue may follow a wasp or bee sting on the back of the tongue; usually when the insect has been accidentally swallowed with a drink. Or it may be a manifestation of recurring attacks of angio-neurotic oedema or of anaphylaxis in serum disease. In a patient sensitive to penicillin it has followed the introduction of a penicillin cone into a tooth socket after dental extraction. In all such cases the swelling may extend to and involve the larynx.

In severe or rapidly progressive cases the intravenous injection of 5 to 15 minims (0.3–0.9 ml.) of 1 in 1,000 adrenaline hydrochloride will usually control the swelling. If not, laryngeal intubation or tracheotomy should be performed without further delay.

Laryngeal Intubation and Tracheotomy

The choice between intubation and tracheotomy depends on several factors: the instruments available; the probable duration of obstruction; the need for suction in the after-treatment; and the experience of the practitioner. Intubation is indicated in cases of temporary obstruction. Tracheotomy should be performed if the obstruction is likely to last longer than 24 hours; another reason for it is that aspiration is easy to apply through the cannula. Tracheotomy is therefore often used in prolonged states of coma following head injuries, and sometimes in bulbar poliomyelitis. In the minds of older practitioners tracheotomy is associated with laryngeal diphtheria. But since the immunization campaign, begun in 1940, this disease has practically disappeared in Britain. Dr. William Gunn, physician in charge of the infectious diseases department of the Royal Free Hospital, in a personal communication confirming this, states that croup also has virtually disappeared, whether occurring idiopathically or associated with other diseases, notably measles. Nowadays, therefore, the young doctor is unlikely to get much experience of tracheotomy, but he should have had much practice in direct laryngoscopy during his anaesthetic clerking.

The important points in direct laryngoscopy are to have the patient's neck flexed at its lower end and extended at its upper end; and to lift the tongue and epiglottis with the blade of the laryngoscope, and not use the instrument as a lever with the upper teeth as fulcrum. Intubation is effected by direct laryngoscopy. The patient is laid flat on a table and the neck flexed forward at its lower end and extended at its upper end. If the mouth cannot be opened because of spasm this may be overcome by the intravenous injection of 50 mg. of suxamethonium chloride. The handle of the laryngoscope is held in the left hand, while the fingers of the right hand retract the upper lip to prevent its being nipped on the teeth. The blade of the laryngoscope is advanced along the dorsum of the tongue in the midline until the tip of the epiglottis is seen; it is then advanced for just over 1 cm. in a child or 2 cm. in an adult. The laryngoscope is then lifted sufficiently to take the whole weight of the patient's head and the glottis comes into view. As soon as he takes a deep breath the glottis opens, and the endotracheal tube, which is held ready in the right hand, is quickly passed between the cords. Care must be taken to lift the blade, never to use it as a lever with the upper teeth as fulcrum.

For the operation of tracheotomy the patient should be supine, a small sandbag under the shoulders, and the head well extended. The table should be tilted, with foot down, and oxygen given through a mask. An assistant should hold the head, neck, and chest in a straight line. In semi-urgent cases the neck may be infiltrated with local analgesic; in urgent ones no analgesic should be used. The thyroid and cricoid cartilages are grasped with the thumb and middle finger of the left hand, and an incision made, exactly in the midline, from the lower border of the thyroid cartilage almost to the suprasternal notch. This is deepened, bleeding points being ignored, until the corrugated anterior surface of the trachea is felt with the left index finger. This is then

opened by a stab through the second and third tracheal rings—dilators are introduced and the cannula is then passed. If time permits it is better to divide the isthmus of the thyroid gland between clamps, and then excise a circular disk from the anterior tracheal wall at that level. Finally, do not suture the wound too close to the tube, or surgical emphysema may result; and on no account open the trachea through the first ring, as this usually causes a permanent stenosis of the larynx. Difficulties are met if the head, neck, and chest are not kept strictly in line, and if a hasty stab in the trachea is allowed to close before dilators are introduced. Then, especially in infants, the tube may be forced into the fascial planes anterior to the trachea, or between the anterior tracheal wall and its mucosal lining. It needs stressing, however, that if penicillin is given in adequate dosage in the early stages of acute throat infections most of these emergencies will be avoided.

Laryngeal Obstruction

The larynx is by far the most frequent site of obstruction. The loose attachment of the lining epithelium to the underlying structures, especially in the aryepiglottic folds and over the arytenoid and corniculate cartilages, favours the rapid development of gross oedema in these situations. In childhood the larynx is relatively small in proportion to body size, the cartilages are more pliable, the mucosa less closely adherent, and its lymphatic drainage more plentiful than in the adult. Thus acute symptoms are much more readily produced in children. A slowly increasing constriction of the glottic aperture is much more readily tolerated than one which is rapidly progressive.

Foreign Bodies

The familiar condition of "food going the wrong way" produces a temporary spasm for which only the time-honoured slap on the back is necessary. A larger foreign body—for example, food inhaled during the inspiratory phase of coughing—may block the glottis completely or cause marked glottal spasm. If a laryngoscope and laryngeal forceps are immediately available the foreign body should at once be removed. If asphyxia threatens it is better to perform an emergency tracheotomy first.

Vomit or blood may enter the larynx during induction of anaesthesia and, especially when thiopentone is being used, set up severe spasm. The anaesthetic should be stopped and the foreign matter sucked out. A muscle relaxant—for example, suxamethonium chloride, 50 mg.—may be given intravenously, thus permitting the passage of a laryngoscope and, through it, an endotracheal tube. Among other foreign bodies must be mentioned the membranes of laryngeal diphtheria and of acute laryngo-tracheo-bronchitis. These may have to be removed by laryngeal forceps, following preliminary tracheotomy.

Swelling of the Laryngeal Walls

Swelling of the laryngeal walls may be due to one of the following:

Local or Adjacent Infection.—In infants an acute laryngitis may produce alarming symptoms, even to the point of needing tracheotomy. Perichondritis may follow trauma or irradiation and may complicate syphilis, tuberculosis, carcinoma, typhoid, diphtheria, and many of the specific fevers of childhood. Treatment should be directed to the primary cause if possible. Complete rest of the patient and larynx, full doses of penicillin or other antibiotic in the primary form, and tracheotomy if signs of serious obstruction develop are the appropriate measures. If an abscess develops in the larynx it should be evacuated through the laryngoscope. In Ludwig's angina full doses of penicillin may suffice to abort the infection, but if in spite of this the condition worsens incision in the midline of the neck and drainage are employed. Tracheotomy may be necessary if asphyxia threatens.

Trauma.—This may be mechanical, as in traffic accidents or following a high tracheotomy or clumsy instrumentation,

or it may take the form of scalds, as in children drinking from the spout of a teapot or hot kettle, or of burns from inhaling flames in petrol fires or from inhaling caustic fumes in industry. In accident cases early tracheotomy is indicated if obstruction is marked and there is a possibility of intra-laryngeal haemorrhage. In the other cases strict rest in bed, administration of oxygen, and sedatives to reduce the cough are usually sufficient. A careful watch must be kept for signs of impending asphyxia, a tracheotomy set being ready for instant use.

Allergy.—This has already been described in connexion with the mouth and pharynx, together with the appropriate treatment.

Oedema Associated with General Disease.—This occurs, for example, in nephritis, cardiac failure, and idiosyncrasy to iodides.

Neoplasms.—Innocent growths causing serious obstruction are rare. Malignant growths are a much commoner cause, but usually only at a late stage, when they would be the responsibility of the laryngologist. Should the general practitioner have to perform tracheotomy he should make it as low as possible in order to be clear of the growth.

Spasm

Spasm of the sphincter or paralysis of the dilators of the glottis may cause laryngeal obstruction. Spasm may be of central or peripheral origin. Possibly the commonest cause is the induction of anaesthesia, especially with ethyl chloride or ether and, as previously mentioned, with thiopentone. The anaesthetic should be stopped, oxygen administered from the anaesthetic machine, and the bag squeezed when the glottis opens. Alternatively the glottis may be watched through a laryngoscope and quickly intubated as soon as it opens.

In infants congenital laryngeal stridor, which is present night and day, and laryngismus stridulus, which may wake the infant from sleep, occasionally occur. The former causes alarm to the parents, but no great dyspnoea; the latter causes momentary but severe dyspnoea and is treated by sitting the child up, slapping its back, making it sneeze, or hooking its tongue forward with a finger. Both conditions disappear in the first few years of life.

In adults spasm may be hysterical, due to local irritation of the recurrent laryngeal nerve, or of central origin, as in tabes and tetanus. During an attack an ampoule of chloroform or amyl nitrite should be crushed by the patient and the vapour inhaled. Otherwise sedatives are given. Bilateral abductor paralysis is usually due to bulbar lesions, but may be due to pressure on, or severe injuries of, both recurrent laryngeal nerves, as after thyroid gland operations. In an established bilateral paralysis phonation is good, and quiet respiration is possible, but on exertion severe dyspnoea may develop. When no recovery can be expected the choice of treatment is either permanent tracheotomy, with the use of a tube having an expiratory valve, or operation permanently to abduct the posterior part of one cord.

In the diagnosis of these various causes of laryngeal obstruction the history and symptoms are important, but only inspection by mirror, or by the direct method in children, will establish it with certainty. In some cases time will not permit of this inspection. Obstruction sufficient to call for immediate operation is shown by recession at the suprasternal notch and epigastrium, stridor, and restlessness. Cyanosis is late, ashen pallor being more usual. Jackson stresses the importance of recognizing the cause of restlessness in obstruction, lest morphine be given in error, with disastrous results.

In all these cases urgent action is required. It is always better to operate before it is strictly necessary than to delay until it is too late.

Next article on Emergencies in General Practice.—"Agricultural Pesticides," by Dr. E. F. Edson.

Nova et Vetera

SIR THEODORE TURQUET DE MAYERNE 1573-1655

Quid de Mayernio plura?

Mayernium dixeris, omnia dixeris.

So wrote Mayerne's godson, Sir Theodore de Vaux, in the course of a long eulogy for the tombstone in St. Martin-in-the-Fields when Mayerne was buried there 300 years ago. He had died at the age of 82 after a full life, in the course of which he had been physician to four monarchs and had initiated the incorporation of two City companies.

Mayerne's father was a French Protestant and a celebrated writer of history. After the Massacre of St. Bartholomew in 1572 he had fled to Geneva, and it was here that his son Theodore was born in the following year on September 28. Mayerne received his early education in this city, and a classbook of his, which still survives and contains annotated drawings of vessels used in distillation, reflects his early interest in this subject.

From Geneva, Mayerne went to Heidelberg, where he spent four years at the university before going on to Montpellier. It was about this time, when he was only 19, that Mayerne published his first book.¹ It seems to have excited little comment, although in a letter to Humphrey Milford dated March 31, 1919, deploring the lack of a really satisfactory motor road-book, Osler writes: "[There is] not one to be put in comparison with that of my friend Theodore de Mayerne, who . . . issued one of the first and the best in Europe."²

It was probably due to Riverius, first physician to King Henry IV of France and professor of medicine at Montpellier, that Mayerne went to Paris after graduating M.D. in 1597, and was appointed one of the king's physicians. In his medical practice he made considerable use of chemical remedies, which were then regarded as an innovation, and in consequence brought upon himself the condemnation of the College of Physicians of Paris (1603). This doubtless influenced his eventual removal to England, where his reception contrasted favourably with his experiences in Paris, so that some years later, in a letter to his friend Sir William Paddy, Mayerne wrote: "[Thou] didst not look upon me with blear and swollen eyes with the vporous venom of envy; but thou didst entertain me, being a stranger, candidly and with a cheerful countenance. . . ."³ He had been incorporated M.D. at Oxford and appointed physician to the queen on his first visit to this country in 1606. He returned in 1611 after the assassination of Henry IV, and within the space of a few years was appointed first physician to the king and elected Fellow of the College of Physicians.

Power over Distillation

He soon became involved in the preparation of the first edition of the *Pharmacopoeia Londinensis*, in which he is said to have had the assistance of a French Huguenot chemist. Could this have been Gideon de Laune, who, with Mayerne, had so much to do with the founding of the Society of Apothecaries in 1618? Their first charter gave them in theory complete power over distillation of all kinds, but twenty years later, following the incorporation of the distillers, this view was challenged by Mayerne, who contended that the apothecaries were limited (or intended to be) to the preparations in the *Pharmacopoeia Londinensis*. Mayerne had been largely responsible for the promotion of the new company, and for their guidance had assisted Dr. Cademan in the publication of *The Distillers of London* . . . (London, 1639).

Mayerne had been knighted in 1624, and on the accession of Charles I was appointed his first physician, and physician to Queen Henrietta Maria. Aikin seems to think that he

made himself acceptable and necessary to successive queens by condescending to matters beneath the dignity of his profession, such as the preparation of "cosmetics of every kind, pastes, lotions, dentifrices, sweet bags, hair powders and the like."⁴ Here, however, Aikin may be doing less than justice to Mayerne's preoccupation with chemical and other experiments, as a result of which he brought calomel into use and discovered the purple colour necessary for the carnation tints in enamel painting.

In 1634 Mayerne had at last succeeded in arranging for the publication of Muffet's *Insectorum sive minimorum animalium theatrum*. The manuscript had been offered to him by Darnellus, apothecary to Muffet, who had died in 1604. The explanation of the delay in publication has a curiously modern ring, and makes one speculate about the conditions under which Mayerne worked, for he says:

"It lay for some years in my Study cast aside in the dust among Worms and Moths; truly it was not fault of mine, but of the Printers who were so greedy of Money, that though in many Countreys I invited them by my Letters, and did solicit them to receive the Orphan, yet they refused (as they said) to take upon them an unthankful business; they were not pleased with the benefit of a noble Art, unless it would pay more than the freight. O the times wherein the pains of learned men are valued at the price the work will be sold for, and the money that must be laid out for ink and paper. . . ."⁵

Mayerne is known from his portraits to have been very corpulent; it is said that he kept no regular meals, but that he had his table constantly covered so that he could eat whenever he found himself disposed. After the execution of Charles I in 1649, Mayerne was appointed nominal first physician to Charles II, and about the same time, perhaps owing to ill-health, he retired to Chelsea, where he died seven years later on March 22, 1655, from the effects of drinking bad wine.

L. M. PAYNE.

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- ¹ *Sommaire description de la France, Allemagne, Italie et Espagne, avec la guide des chemins* . . . Liège, 1592.
- ² Cushing, H., *The Life of Sir William Osler*, Oxford, 1925.
- ³ Muffet, T., *Insectorum sive minimorum animalium theatrum*. London, 1634. (Eng. trans. London, 1658.)
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Reports of Societies

LOCAL MEDICAL SOCIETIES

Joint Meeting of Manchester Medical Society and Liverpool Medical Institution

Speaking at the joint meeting in Manchester on March 2, Professor A. W. DOWNIE discussed the relationship of chicken-pox to herpes zoster. The association of chicken-pox with zoster was well recognized, he said, in that child contacts of zoster cases not infrequently developed a clinical infection indistinguishable from chicken-pox. Yet, because of the difference in clinical picture and pathology, in age and seasonal incidence, there had been in many quarters some hesitation in accepting the thesis that zoster is an infection with varicella virus. Three different views appeared to be held: (i) that one virus causes the two conditions, (ii) that the two clinical entities are due to different but closely related viruses, and (iii) that some cases, but only some cases of zoster, are caused by varicella virus. The recent investigations of Hope Simpson in one of the Shetland Isles seemed to show conclusively that the chicken-pox derived from zoster cases is in no way different from ordinary chicken-pox. The clinical picture, interval between serial cases, and infectiousness were the same, and an attack of the one kind of chicken-pox conferred immunity to the other. The experimental infections of children with zoster vesicle fluid by Kundratitz and by Bruusgaard showed that such infections sometimes resulted in clinically typical chicken-pox with subsequent immunity to further inoculation with vesicle fluid from zoster or chicken-pox cases.

Laboratory investigations had been hampered by lack of susceptible experimental animals, went on Professor Downie, but such information as was available had shown no differences between the virus from chicken-pox and that from zoster patients. The histological features of the skin lesions were the same; by electron microscopy the virus particles were identical; and they were agglutinated by convalescent serum from either type of case. Antigen in vesicle fluids cross-reacted completely in complement-fixation tests with convalescent sera. The laboratory findings thus supported the clinical and epidemiological observations that zoster is a particular kind of infection with varicella virus.

Canal Zone

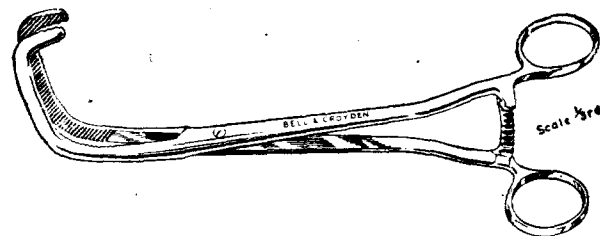
A clinical meeting was held at the British Military Hospital, Fayid, Canal Zone, Egypt, on February 28, at which paediatric cases were shown and discussed. Dr. B. E. SCHLESINGER, Hon. Consultant in Paediatrics to the Army, was among those present.

Preparations and Appliances

TWO GYNAECOLOGICAL INSTRUMENTS

Mr. H. H. FOURACRE BARNES, surgeon, the Hospital for Women, Soho Square, London, W.1, writes that he finds the two instruments illustrated below of great use in his work.

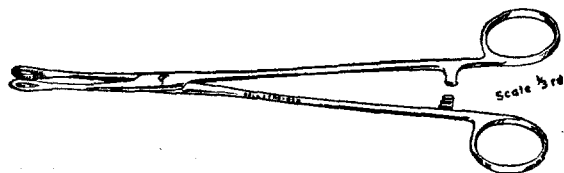
Vaginal Clamp for Radical Hysterectomy.—It is desirable to obtain a watertight cuff of the vagina below the cervix when carrying out a radical hysterectomy for carcinoma of that organ. In order to obtain this vaginal cuff, the clamp illustrated has been made by John Bell and Croyden. The shank of the clamp is angled to the jaws at a right angle,



Hysterectomy clamp.

so that the handle lies comfortably to one side of the uterus when applied to the vagina, application being made from the side. The ends of the jaws are curved to facilitate cutting across the vagina below the clamp. The jaws are heavy and grooved at right angles to the direction of the shank so as to prevent any slipping on the vaginal tissues.

Intrauterine Forceps.—In order that the cervix need not be dilated to a high degree for the introduction of intrauterine forceps, especially in the elderly, the forceps illustrated have been made by John Bell and Croyden. The small width of the blades ($\frac{1}{4}$ in.—6.3 mm.) and joint ($\frac{1}{16}$ in.



Uterine forceps.

—7.9 mm.) allows easy introduction through the moderately dilated cervix. In addition, the joint is situated at a distance from the ends of the blades so that it lies in the middle of the cervical canal of the normal-sized uterus. This allows the blades to be opened for a distance of 1 in. (2.5 cm.), when the cervix is dilated sufficiently to allow the forceps to be passed.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Chlorpromazine Jaundice

SIR,—Your correspondents Drs. J. G. Macarthur and Bernard Isaacs (*Journal*, September 25, 1954, p. 754) plead for more detailed clinical and histological study of cases of jaundice occurring during chlorpromazine therapy. Their plea has every justification, as the drug is among the most frequently prescribed and the incidence of jaundice occurring during its administration is by no means negligible. Chesney¹ (1954) reports two cases from one general practice, and it occurred in 3 of 18 patients treated by Eagles.² Other writers record a lower incidence. Thus, jaundice occurred in 3 of 71 patients treated by Lehmann and Hanrahan,³ 3 of 142 given the drug by Winkelmann,⁴ and in 6 of 500 observed by Boardman.⁵ Other cases have also been reported by Elkes and Elkes,⁶ Lancaster and Jones,⁷ Zatuchni and Miller,⁸ and Van Ommen and Brown.⁹ We have recently had the opportunity to study a patient who developed jaundice whilst taking chlorpromazine, and are therefore reporting our findings in your columns.

He was a pattern-maker of 48, of temperate habit, who had never had any physical illness and who was given 25 mg. chlorpromazine ("largactil") thrice daily for a long-standing obsessional neurosis. After he had been taking the drug for three weeks he felt feverish over a period of 48 hours, and during the subsequent three days had some vague abdominal discomfort, so he reported to his doctor, who noted that he was jaundiced. The chlorpromazine was stopped, and the patient ceased work and went to bed. During the subsequent ten weeks he remained in bed at home, afebrile, eating well and without pain or dyspeptic symptoms, but deeply jaundiced, suffering much pruritus and with acholic stools and bile in his urine. The only abnormality on physical examination was an enlarged liver which was neither irregular, hard, nor tender. Although it was thought that the jaundice was due to the chlorpromazine therapy, in view of its protracted course he was admitted to hospital for fuller assessment.

The liver function tests showed the pattern of obstruction (see table), the blood count was normal, the stools were negative for occult blood, barium studies of the oesophagus, stomach,

	Weeks After Onset of Jaundice				
	10	12	13	14	15
Serum albumin g./100 ml.	4.0	3.5	4.5		4.2
Globulin " " "	2.4	2.3	2.2		2.3
Gamma globulin " " "					
g./100 ml. alcohol	0.05	0.05	0.1		0.2
(NH ₄) ₂ SO ₄ g./100 ml.	1.8	1.5	1.9		1.1
Cholesterol free mg./100 ml.	162	180	190	140	180
Ester	162	175	270	370	320
Serum alkaline phosphatase units (Jenner and Kay) /100 ml.	19.6	22.8	43.4	36.0	10.5
Bilirubin mg./100 ml.	9.2	6.7	3.0		1.7
Prothrombin %	60	100			
Zinc sulphate:					
Turbidity (units)	1.0	1.0	2.0		2.0
Flocculation	Negative	Negative	Negative		Negative
Cephalin cholesterol					
Thymol turbidity (units)	0.5	0.5	1.0		0.5
Flocculation	Negative	Negative	Negative		Negative
Colloidal gold:					
Patterson	2	2	1		2
MacLagen	Negative	Negative	Negative		Negative

duodenum, and small and large intestines were all normal, and the chest radiograph was clear. The blood Wassermann was negative.

In view of the undue persistence of the jaundice as compared with all other recorded cases (except the fatal case reported by Boardman⁵ and the two cases of Van Ommen and Brown,⁹ which have since been published), it was thought advisable for him to have a laparotomy in case a growth was present, especially in view of the absence of evidence of parenchymatous damage in the liver function tests. Laparotomy was therefore carried out by Mr. Gourevitch. The gall-bladder and common bile duct were not dilated, the pancreas was normal, and there was no evidence

of extrahepatic biliary obstruction, but there were some large soft glands in relation to the common bile duct and the liver was rather pale and its surface granular. A liver biopsy was taken and the abdomen closed. Histological examination showed bile thrombi in the bile canaliculi but no dilatation of the bile ducts, gross peribiliary fatty degeneration of the liver cells and slight periportal round cell infiltration but no necrosis of liver cells, no regeneration, no fibrosis, and no reticulin formation. The laparotomy upset the patient very little, and since operation the jaundice has steadily faded, but a trace is still evident and the liver function tests are still abnormal (see table) 15 weeks after the onset of illness. The only treatment given has been a high-protein diet and vitamin supplements.

The histological findings in this case accord very closely with the only other detailed pathological report,⁸ and the biochemical changes are similar to those found by Elkes and Elkes,⁶ Boardman,⁵ Zatuchni and Miller,⁸ and Van Ommen and Brown,⁹ each of whom reported liver function tests showing an obstructive pattern and normal flocculation tests.

Three points are thought to require emphasis: (1) Chlorpromazine appears to be capable of producing a toxopathic hepatitis characterized by damage to the cells at the periphery of the lobule, blockage of the canaliculi by bile thrombi, and periportal cellular reaction. (2) The liver function tests in such cases show an obstructive pattern without evidence of parenchymatous damage. (3) The jaundice may last for several months.—I am, etc.,

Birmingham, 15.

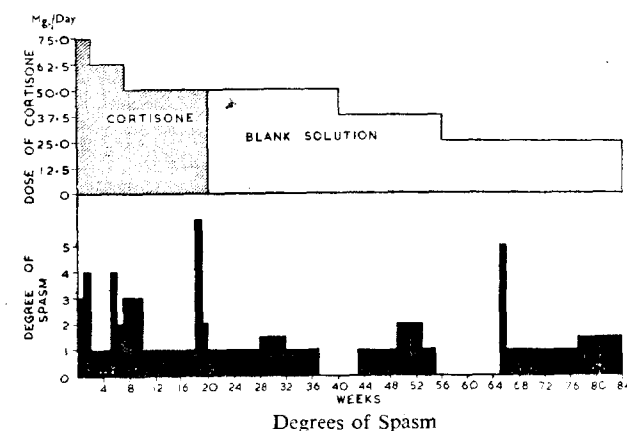
A. G. W. WHITFIELD.

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- ² *Ibid.*, 1955, 1, 46.
- ³ *Arch. Neurol. Psychiat. (Chicago)*, 1954, 71, 227.
- ⁴ *J. Amer. med. Ass.*, 1954, 155, 18.
- ⁵ *British Medical Journal*, 1954, 2, 579.
- ⁶ *Ibid.*, 1954, 2, 560.
- ⁷ *Ibid.*, 1954, 2, 565.
- ⁸ *New Engl. J. Med.*, 1954, 251, 1003.
- ⁹ *J. Amer. med. Ass.*, 1955, 157, 321.

Cortisone, A.C.T.H., and Asthma

SIR,—My two-and-three-quarter years' experience of 47 severe asthmatics treated with cortisone and/or an indistinguishable blank substance does not support Dr. H. Herxheimer's enthusiasm (*Journal*, February 12, p. 416), but is in keeping with your annotator's cautious summing up of



- 1—One to two attacks daily, easily relieved } full activities.
2—More than two attacks daily, easily relieved }
3—Spasm on exertion, free at rest.
4—Spasm on exertion plus attacks at rest.
5—Status asthmaticus.

the present position (*Journal*, January 22, p. 216). In status asthmaticus I have seen cortisone fail in high dosage, and the reports of fatal anaphylaxis after A.C.T.H. injections cannot be lightly cast aside.

My results in the long-term control of asthma with cortisone have not yielded a "high percentage of pronounced improvements." Fifty per cent. is the highest I can claim, and this will fall when the figures from a current blind trial are all included. Certainly, cases have been raised from a life of semi-invalidism to near normality; unfortunately this is not the invariable response. Success and

failure in all types of asthmatics, with a wide age range, has occurred. At present it is impossible to foretell the long-term result in any given case, though emphysematous patients with a low respiratory reserve gain no benefit.

The effects of any treatment are difficult to assess in asthmatics, who are so open to suggestion. It is chastening at the conclusion of a blind trial to find that the successful case had been taking the blank solution and the failure cortisone. It is such observations as these which make me echo "*sub judice*" with your annotator. The chart shows the course of a difficult case—the patient still swears by "cortisone," being unaware that he is on a blank solution. That trials should be blind is surely a very happy remark.

It is true that side-effects are not usually severe, but considerable weight gain due to fat or fluid retention must be balanced by material improvement if treatment is to be justified. I shall strongly "discourage its use," except in the most carefully chosen cases. Dr. Herxheimer is enthusiastic: I was much more so a year ago than I am now. Cortisone may soon be freely available; it is very expensive, not without risk, and the results vary. Let us ensure that we do not harm our patients, waste public money, and achieve nothing.—I am, etc.,

Whitefield, Lancs.

RONALD SAVIDGE.

Whither Natural Childbirth?

SIR,—I read with interest the recent letter by Dr. Constance Beynon, "Whither Natural Childbirth?" (*Journal*, February 19, p. 475). I disagree with the writer from the viewpoint of a midwife and that of the mother of two children. As a midwife I witnessed mothers in labour who had, as the writer says, "rehearsed" for it, and those who had a vague and sometimes no idea of what was about to happen. In the first cases fear was banished, which is a big step towards success; the use of drugs was reduced to a minimum, and complications to mother and baby were fewer. Sedation is used to help the mother relax, but often, owing to the use of drugs, the mother is unable to give of her best in the second stage, thus prolonging this stage. Asphyxiated babies are born due to over-sedation or sedation given at the wrong time. Instructions given to women in labour are of little or no avail.

Now from the viewpoint of a mother, which is the most important argument? I practised relaxation for each confinement. Pethidine and gas and air were given towards the end of the first stage when I had my first baby; due to this I neither appreciated what went on during the second stage nor did I help as much as I could have done. I certainly appreciated the use of pethidine and gas and air at that time, and wondered however I should get on without them when I was told when expecting my second baby that I could easily do without. They were certainly available if needed. When I went into labour I tried to relax as I had been taught, but did not achieve 100% success until the arrival of the person who had done the relaxation exercises with me during my pregnancy. I experienced no pain during contractions until the end of the first stage, and then only acute discomfort at the transitory period. The second stage was shorter because I had more energy to help, and I was brighter and more alert after the birth. If the physiotherapist, or whoever teaches the relaxation exercises, could be with the mothers in labour, or if midwives had a course in this art, then painless childbirth would be enjoyed by the many and not the few. Surely the money saved in drugs could be used to foster relaxation exercise clinics, and I am sure midwives would enjoy their work a lot more.—I am, etc.,

London, N.W.5.

HONOR KENNY.

SIR,—I am glad that the subject of natural childbirth is being ventilated in the *Journal*. I agree with Dr. Grantly Dick Read (*Journal*, March 5, p. 604) that "childbirth is a much wider subject than obstetrics" and I welcome his plea for a "full inquiry into the care of pregnant and parturient women." Dr. Constance L. Beynon says (*Journal*, February

19, p. 475) that any other generation would think it absurd that child-bearing requires special training to be natural. But what pitiful stories one hears of child-bearing in the last two generations.

I am not in practice, but I talk to a number of women in my work for the Marriage Guidance Council, and I am impressed with how often difficulties in their own marriage relationship and the functions connected with child-bearing can be traced to the stories they have heard from their mothers, or to previous unhappy experiences of their own. I am also impressed by the eagerness of the young couples to whom I talk, either before or just after marriage, to know about these natural processes and the way this knowledge leads a young wife to the fulfilling experience of labour and motherhood.

I agree that partial knowledge or understanding may sometimes be dangerous, but only if a woman is allowed to go through labour unattended or without instruction at that time. The teaching of the antenatal clinic needs to be implemented in the labour ward; only so shall we enable a woman in labour to use, in the most helpful way, her spontaneous instincts of expulsion.—I am, etc.,

East Croydon.

O. CYNTHIA HARRIS.

Gases in Artificial Respiration

SIR.—May I be allowed to discuss the comments of Dr. K. W. Donald and Professor W. D. M. Paton (*Journal*, March 12, p. 664) on my letter? I asked them for more evidence in support of their recommendation that oxygen with 7% carbon dioxide should be abandoned in the treatment of carbon monoxide poisoning. The only additional evidence they put forward is a paper by Schwerma *et al.*¹ from which they quote the concluding sentence. Anyone interested should read the paper itself before accepting this quotation as having weight in settling the question of oxygen alone versus oxygen and carbon dioxide in the first-aid treatment of carbon monoxide poisoning. The reader will find: (1) The dogs who were given pure oxygen or carbon dioxide and oxygen had their respirations maintained by mechanical resuscitators. Mechanical respiration operates to weight the comparison in favour of oxygen and such respirators would not be likely to be available for first aid. (2) Here I quote the words and italics of Schwerma *et al.*: "It was impossible to keep the resuscitator mask on the dogs after they became conscious. Our clearance studies are therefore based on the effect of a few minutes—usually two to four—of treatment followed by a period of four hours during which the animal was allowed to inhale air." Such brief administration was hopelessly inadequate.

To accord this paper the relevance and importance suggested by Dr. Donald and Professor Paton seems very strange. Even under the peculiar comparative conditions of their experiments, so unpractical when related to human first aid, the findings of Schwerma *et al.*, as recorded in their graph, showed clearance of carbon monoxide from the blood from almost lethal levels (over 80%) to levels compatible with life to be twice as fast—twenty minutes as compared with forty minutes to fall to 45%—in ten dogs who received 7% carbon dioxide and 93% oxygen (without rebreathing) compared with ten dogs who received 100% oxygen. If the time of administration had been adequate and mechanical resuscitators not used (the conditions of first aid to human beings), clearance from dangerous levels would probably have been about four times as fast for carbon dioxide and oxygen compared with pure oxygen.² This paper of Schwerma *et al.*, plus two slight papers, written 30 years ago, seems to be all the evidence, directly relating to carbon monoxide poisoning, that Dr. Donald and Professor Paton have to offer. They have not recorded any work of their own on carbon monoxide poisoning or attempted a balanced survey of the literature in which there are many more publications favourable to the use of carbon dioxide and oxygen than against.

In the first paragraph of their comments they defend their attitude by saying they were concerned with the full range of asphyxial emergencies and that correct diagnosis may not be within the power of the first-aid worker. The implication is that, if oxygen with 7% carbon dioxide is available to first-aid workers for the treatment of carbon monoxide poisoning, it may be wrongly used for patients with other forms of asphyxia in which

there may be carbon-dioxide retention. This objection is hypothetical and not real. The first-aiders concerned are not usually presented with any diagnostic difficulty. There is not much doubt, to worry firemen, mine rescue workers, and ambulance men, about what is wrong with asphyxiated persons removed from burning buildings or gas-filled mines or rooms. Such first-aid workers are trained individuals and they can be told, if it is thought advisable, only to use oxygen and carbon dioxide for poisoning by carbon monoxide.

The most serious aspect of the whole matter is that apparently the Medical Research Council Committee is issuing, or has issued, a memorandum or directive advising cessation of the use of oxygen and carbon dioxide in the treatment of carbon monoxide poisoning—a reversion to the position of the early 1920's. Such a memorandum, coming from the Medical Research Council, will be regarded as authoritative and made the basis of administrative orders regarding the first-aid equipment of the rescue services. If it so happens that the advice is wrong, then many lives will be lost that might have been saved. Experimental re-investigation on animals and human volunteers could be easily and quickly done by use of the resources of the Medical Research Council. With great respect, I submit that it is the responsibility and duty of this Committee to sponsor such work if it is giving official guidance which is contrary to generally accepted opinion.—I am, etc.,

London, W.1.

H. L. MARRIOTT.

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Mental Confusion after Porto-caval Anastomosis

SIR.—The article by Drs. L. J. Hurwitz and R. S. Allison on recurring mental confusion after porto-caval anastomosis (*Journal*, February 12, p. 387) prompts me to report a similar case which recently came under my notice through the courtesy of Professor F. A. R. Stammers.

The patient was a woman, aged 60, admitted to the Queen Elizabeth Hospital, Birmingham, under his care on June 5, 1954. Two years earlier she had had a haematemesis, and in September, 1953, it was discovered that her spleen was enlarged and that oesophageal varices were visible with a barium swallow. Two weeks before admission she again had a haematemesis, followed a few days later by another. At the time of her admission she was greatly exsanguinated (R.B.C.s 1.82 m., Hb 3.9 g.) and occult blood tests were strongly positive. There were prominent veins on the abdominal wall, and the liver and spleen were both enlarged. Other systems were healthy. Pulse 80 per minute, B.P. 140/65. Liver function tests were abnormal (total serum protein 6.2 g.%, A:G 1.6:1; ZnSO₄ turbidity 5.0 units, ZnSO₄ flocculation +++; thymol turbidity 3.0 units, thymol flocculation +; colloidal gold Patterson 3, Maclagan ++++; serum bilirubin 0.5 mg.%; total cholesterol 145 mg.%; serum alkaline phosphatase 17.1 units%) and a splenogram showed typical intrahepatic portal obstruction. After multiple transfusions Professor Stammers carried out porto-caval anastomosis on June 26, 1954. Post-operatively all went well until July 13, when she suddenly became rather confused and disorientated, but in the course of a few days her mental state improved sufficiently for her to be sent out of hospital on July 22 to convalesce at her sister's home.

However, at her sister's her behaviour became so strange that she was admitted on a temporary order to a mental hospital, from which she was transferred once more to Professor Stammers at the Queen Elizabeth Hospital on August 13. I saw her on August 19, and made the following note: "She is very confused and forgetful, and cannot perform any difficult tasks to order, because she loses the thread of what she is meant to be doing too quickly. She calculated the cost of six 2½d. stamps very fast, and is good with multiplication tables, but more complicated mental arithmetic is quite beyond her—for example, the cost of four gallons of petrol at 4s. 6½d. a gallon. She has no trouble naming her own left or right sides, or her fingers, although she is easily puzzled about the examiner's. Given her dressing-gown to put on, she got into it back to front three times in succession, each time confabulating excuses for its not buttoning up in front. Asked about herself, she says she has been 'a little nervous' since the operation, but that it is 'nothing unexpected' in a person of her age. On physical examination there

is a rhythmic tremor of the head, and a regular alternating postural tremor of the hands appears from time to time (it was most noticeable when she was holding a pencil, and appeared plainly in her handwriting). No definite tremor of legs seen. There is occasional cogwheel snatch to be felt in the wrist and elbow on right, not so distinct on left, and none in legs. The deep reflexes are normal and the plantars flexor. There is a well-marked arcus senilis bilaterally and possibly some pigmentation on the limbic side of this. ? Kayser-Fleischer ring."

Liver function tests were then repeated, and gave results now distinctly more abnormal than before operation (total serum protein 6.8 g.%, A:G 0.94:1, ZnSO₄ turbidity 10.0 units, ZnSO₄ flocculation ++++; thymol turbidity 5.0 units, thymol flocculation ++++; colloidal gold Patterson 5, Maclagan ++++; serum bilirubin 1.5 mg.%; total cholesterol 220 mg.%; serum alkaline phosphatase 20.4 units%). The urinary amino-acid chromatogram showed normal excretion (traces of cysteine, serine, glycine, glutamine, alanine, and valine), and estimation of serum and urinary copper levels also gave results within the normal range (118 µg.% and 33 µg. per 24 hours respectively). Slit-lamp examination did not confirm the suspicion of a Kayser-Fleischer ring. The E.E.G. record was grossly and diffusely abnormal and showed persistent medium and high voltage slow activity at 2.5-5 c/s in all leads, and intermittent phase reversal was seen at both temporal electrodes.

It was clear that the cerebral condition must be of hepato-genous origin, and presumably of the same general nature as that which causes liver coma. From the neurological point of view the interesting points were the tremor of head and hands, which was typically extrapyramidal in appearance, the apraxia over dressing and difficulty in calculating, reminiscent of Gerstmann's syndrome of the parieto-temporal confluence, and the tendency to confabulate explanations of her difficulties. Her E.E.G. abnormality was of the type frequently seen in confusional states arising from a variety of causes, amongst them hepatic coma. The patient was discharged from hospital to her own home a few days after I saw her, and I understand that she subsequently made good progress.—I am, etc.,

Birmingham, 15.

MICHAEL JEFFERSON.

Changes in the Mental Health Services

SIR.—Dr. F. Pilkington (*Journal*, January 29, p. 291) states that there is no clear definition of what constitutes a "mental observation ward." But surely he was arguing against the analysis which he himself submitted—that is, a total of 146 persons admitted under 3- and 14-day order (with no waiting-list or hindrance) and the liberty of the subject safeguarded by judicial authority. Of these, 107 became voluntary. Such transition should be easy and helpful to all concerned. Hence the ward is a "detention ward," vitally necessary for persons who, whilst mentally unbalanced temporarily, may injure themselves or others.

I know of many persons who have been grateful for enforced removal, thus being saved from the results of temporary mental aberration. Sometimes even the shock of a person being removed from his home has the effect of helping to bring him to his senses before the expiration of 3 or 14 days. Then a magistrate can, with doctor's help, discharge the patient to his home, and thus a bed is saved at the mental hospital for psychotic patients. Most mental hospitals are long distances from populated centres, and transport by ambulance over this distance is uneconomical.

Regarding the allegation of an undesirable change of doctor, I suggest that the consultant psychiatrist and his assistants (who are probably attached to the mental hospital) would see these patients anyway, and there would be no change of doctor. In my opinion, the Royal Commission should recommend that "detention wards" known as "observation wards" be instituted and designated in all well-populated areas for the urgent immediate care of the mentally sick, other than voluntary patients, and for the essential help and safeguard needed by the harassed G.P.—I am, etc.,

Plymouth.

A. S. BRADLAW.

Defects of Modern Treatment of Leprosy

SIR.—I have read with interest the report (*Journal*, March 5, p. 597) of the meeting of the Edinburgh Branch of the Royal Society of Tropical Medicine on March 2, at which my friend, Dr. James Ross Innes, spoke on the above subject. With most of what he is reported as saying no one would disagree: he is obviously stressing the important point that modern treatment of leprosy, although a great step forward, has not solved the leprosy problem, and that further research is urgently needed.

I think, however, he rather misstates his case when he says that "the modern treatment of leprosy based on the sulphone group of drugs is unsatisfactory," for the reason that their slowness and imperfection of action suggested that it might prove very hard to eradicate the hard core of endemic infection. Surely a similar statement could be made of the modern treatment of almost any chronic infectious disease, with the possible exception of yaws. This does not appear an adequate reason for labelling a treatment as unsatisfactory.

Regarding the value of sulphone treatment of leprosy in the control of the disease in a community, we can as yet say little because of lack of evidence. Some workers think that with a disease such as leprosy, which usually propagates itself with so much difficulty, and even dies out spontaneously under certain circumstances, sulphone treatment, with all its limitations, may, by reducing the already low degree of infectivity, exert a definite influence in producing a decline of the disease. Other workers, including Dr. Ross Innes, think that before this result is obtained a more potent therapeutic agent is necessary. All workers, however, are keen to find more potent drugs, and trials of new drugs are constantly being made. All are keen, if possible, to apply immunization methods in the control of leprosy, and the possible value of B.C.G. vaccination for this purpose is being studied. It is good that these two lines of study are to be pursued by the research unit of which Dr. Ross Innes is in charge, which, by the way, this association has been instrumental in establishing.—I am, etc.,

London, W.1.

JOHN LOWE,
Medical Secretary, The British
Empire Leprosy Relief Association

A Foreign Body in the Kidney

SIR.—Sir Heneage Ogilvie (*Journal*, February 5, p. 352), referring to a case reported by Dr. Duncan Macaulay and Mr. Thomas Moore (*Journal*, January 22, p. 205), describes a "kirbigrip" as "a small, smooth object, chemically harmless, without projections or points, ideally shaped to go round intestinal curves." Whether this is, or is not, an accurate description depends, as the late Professor Joad would have said, upon what one means by small and points. It is surely the length of a kirbigrip (4.8 cm. in Macaulay and Moore's case) relative to the lumen of the duodenum and the angle of the U-shaped curve of the second part of the duodenum that has to be considered. Though the ends are not sharpened, they are certainly pointed, and their slightly splayed arrangement probably makes it easy for the kirbigrip to impact in the duodenal mucosa. We are not told the age of the patient who swallowed the 6-in. (15.2-cm.) nail. I am, however, wholeheartedly in agreement that of all ingested foreign bodies the kirbigrip has the most evil reputation.

Several times a year one faces the problem of a kirbigrip in the stomach or already in the duodenum of a child, the parents clamouring for instant removal, or alternatively refusing consent for operation if there is a chance that the kirbigrip will pass spontaneously. Sometimes the parents have already been told by their doctor that the foreign body should be removed at once or that it will certainly pass. I believe there is something to be said for removal of a kirbigrip from the stomach of a child of less than 2½ years of age. The operation is almost foolproof, and saves much anxiety and frequent radiological examinations. When the

kirbigrip is in the duodenum, and especially if it remains in the same position, as shown by daily films, it is probably wise to remove it after 2-3 weeks. In my experience a kirbigrip which negotiates the U-shaped bend usually passes without incident. I have only seen three instances of delay at the duodeno-jejunal junction; two were removed after 2-3 weeks' observation and the third passed onwards after two weeks. I have not seen perforation of the bowel at this site.

I have had one child in which the hair-slide was partly in the kidney and partly in the duodenum at the time of operation—there were no urinary symptoms—and one which presented with a limp in which the kirbigrip was removed from the psoas muscle. Both perforated "pointed" end forward; in the second case, by the time the kirbigrip was removed it was in two pieces, the loop end having corroded away. I have probably removed upwards of a dozen kirbigrips from the duodenum after waiting up to three weeks. With good anaesthesia, an adequate incision, and closure of the duodenum with non-absorbable material, the operation is easy and safe.—I am, etc.,

Liverpool.

ISABELLA FORSHALL.

Dyspareunia

SIR.—I was most interested to read that Mr. R. Christie Brown (*Journal*, January 8, p. 106) is starting a clinic to study dyspareunia as a cause of sterility. Here in Uganda we have a tremendously high incidence of sterility, but one hardly ever meets the type of dyspareunia that is seen in the United Kingdom. If difficulty or pain on intercourse is experienced, there is in practically every case a true organic cause—in fact one wonders why it is not a much commoner symptom. Out of 1,035 patients who thought their condition sufficiently serious to come into the gynaecological wards at Mulago Hospital last year, only six complained of dyspareunia. In four of these the cause was only too obvious. Two had a large pyosalpinx, one a badly stenosed vagina following trauma at childbirth, whilst another was an interesting case of a Nubian woman from the Sudan who had undergone female circumcision as a child and, on marriage, discovered that the entrance to the vagina was almost completely occluded. This is a rare complication of circumcision in the female. The other two patients were certainly a little more of the type found at home. A woman of 30 years of age, married about eight years, had an unruptured hymen and complained of dyspareunia. However, she also had uterine fibroids, which seemed to worry her even more. In one case only there was no apparent cause, an examination under anaesthetic revealing nothing abnormal.

Dr. G. W. Theobald states in his letter (*Journal*, January 22, p. 228) that cauterizing the cervix may help to cure some cases—presumably working on the theory that chronic cervical infection causes many gynaecological symptoms. Here we have a superabundance of chronic cervicitis, practically all of gonococcal origin, but only rarely is backache or dyspareunia found. Some do complain of lower abdominal pain, however. It does appear that the complexities and anxieties of civilized life cause many marital difficulties. Here, coitus, childbirth, and breast-feeding are all accepted as perfectly natural functions, and, unless there is something organically wrong, no particular trouble is experienced by the African woman.—I am, etc.,

Kampala, Uganda.

CORALIE RENDLE-SHORT.

Tonsillectomy

SIR.—As an anaesthetist, it is with some trepidation that I enter the tonsil controversy, but, since Dr. H. B. C. Sandiford (*Journal*, March 5, p. 603) has cited anaesthesia as an important factor, I feel justified in joining the fray.

The only advantage of the guillotine operation is presumably that you can do "more than ten rather than less than four per hour." Dr. Sandiford quotes two satisfactory anaesthetic techniques; the first of these, $N_2O \rightarrow O_2 \rightarrow$ ether

with oral or nasal intubation, would have to be carried to at least the second, preferably the third, plane of surgical anaesthesia to produce the ideal operating conditions which Dr. Sandiford so rightly demands. I doubt the ability of many anaesthetists, working single-handed, to anaesthetize more than ten cases in this manner inside an hour, let alone for the surgeon also to operate on them—without a two-minute time limit. Also, the statement that turning off the ether when the gag is inserted "ensures that the patient will be in a light plane of anaesthesia at the end of the operation *regardless of time*" (my italics) is somewhat extraordinary; if the patient is deep enough to tolerate gag, tube, and operation lasting two or three minutes, it is difficult to see by what mechanism he is "in a light plane of anaesthesia" at the end of it; it is, of course, almost completely dependent upon "time." The better the operating conditions and the better the operator, the deeper will be the patient at the finish, whichever way the knobs are turned in the meanwhile.

With regard to the second anaesthetic technique—namely, a single injection of thiopentone only—I can only say that if this technique should become widespread my own children will hang on to their tonsils until they are so bad that even the most enthusiastic guillotinish would not consider them suitable for this type of operation or "anaesthetic," and the inverted commas are intentional.—I am, etc.,

London, W.14.

M. P. COPLANS.

SIR.—I have read with interest Dr. J. B. Stirling's comments (*Journal*, February 26, p. 542). The advantages of the technique I advocated (*Journal*, January 29, p. 285) over that used by Dr. Stirling are that an injection of atropine, with its adverse effects on psyche and soma, is avoided, and that with efficient team-work and the use of a recovery room 16 to 20 cases can comfortably be done in an hour. Relaxation is adequate for opening the jaws and for a clean guillotine tonsillectomy, and tachypnoea does not occur.—I am, etc.,

Hull.

W. N. ROLLASON.

Intramuscular Iron

SIR.—The widespread interest aroused by the introduction of an iron dextran complex ("imferon") for intramuscular administration is evident from the volume of correspondence which has appeared in the *Journal*. There would seem, however, to be some difference of opinion regarding the value of, and indeed the necessity for, such a preparation. It has even been suggested that oral administration of iron is the only method which need be used. We should like to make known our views on imferon, and to stress certain aspects of its use and of the technique of administration.

We first began to use this complex over thirteen months ago when we carried out some of the earliest clinical trials. It was initially given to 30 patients who were selected after full haematological investigation and shown to suffer from iron deficiency: some of them were cases of primary hypochromic anaemia (Witts's anaemia); others were associated with dietetic deficiency occasioned by such conditions as peptic ulcer (even where no frank or occult bleeding occurred), or by financial difficulty in elderly people living alone. Many had been given oral iron in apparently adequate dosage without appreciable effect, while a number had admittedly not been taking the iron prescribed by their doctors. We did not include patients suffering from such conditions as advancing malignant disease or chronic nephritis. All patients underwent bone marrow studies and fractional gastric analysis, and possible causes of chronic blood loss were sought for and excluded. Our conclusions were as follows: (1) Imferon is readily absorbed and produces a completely satisfactory haematological response. (2) It is non-toxic both locally and generally when administered in the correct dosage, and when reasonable care is taken in selecting the site of injection and the type of case to which it is given. (3) Its administration can safely be entrusted to any competent nurse.

We should like to emphasize the importance of ensuring that the substance is deposited in the muscle and not in the subcutaneous fat. If this is not done, then marked staining of the skin

will certainly occur, and, while we have not encountered any serious trouble in this direction, patients are apt to object to the cosmetic effect.

Since the original series was studied we have used imferon on a large number of other patients, and have had no cause to change our opinion that it represents a distinct advance in iron therapy. Its advantages over intravenous preparations are so obvious as to require no further comment. Imferon itself has been given intravenously, but some side-effects have been reported, and there seems to be no valid reason for administering in this way a substance which was expressly produced to avoid the hazards of such therapy.—I am, etc.,

A. GRUNBERG.

J. L. BLAIR.

Birkenhead.

Silver Stool Sign

SIR.—Sir Heneage Ogilvie's memorandum on "Thomas's Sign or the Silver Stool in Carcinoma of the Ampulla of Vater" (*Journal*, January 22, p. 208) appears to have evoked considerable correspondence. The following case may consequently be of interest.

A male patient aged 71 years was admitted on February 10 with a ten-day history of painless jaundice of increasing intensity following upon an attack of bronchopneumonia. The patient died from cholaemia 17 hours after admission, but before death passed a stool of unusual appearance, which was kept by the night staff for me to see. To my surprise this stool was the colour of aluminium paint, and, having read of the diagnostic import of Thomas's sign, I consequently made a confident post-mortem diagnosis of hepatic failure following upon carcinoma of the ampulla of Vater. To my disappointment necropsy revealed a carcinoma of the gall-bladder, with metastatic deposits around the porta hepatis and quite normal ampulla of Vater.—I am, etc.,

Gravesend, Kent.

C. A. M. WALKLEY.

SIR.—In my memorandum (*Journal*, January 22, p. 208) I did not make it sufficiently clear that the Thomas stool has the grey colour of oxidized silver or aluminium paint rather than the sheen of a new half-crown. Fatty acid crystals appear in the faeces in various disorders of fat metabolism and give the stool that metallic lustre to which your correspondents have drawn attention, but the appearance is that of brass filings rather than of silver. The classical Thomas stool is due to the mixture of blood (black) with fat (white) and it is rarely seen except in cancer of the ampulla.—I am, etc.,

London, N.W.8.

HENEAGE OGILVIE.

Grants for New Hospitals

SIR.—I disagree with Mr. R. S. Murley's objection (*Journal*, March 5, p. 600) to the building of new hospitals, and with his preference for the improvements that may be possible in old and unsuitable buildings. It is very encouraging that regional boards are to have control of new hospitals. In order to produce the greatest effect of this encouragement it is hoped that the Minister of Health will announce the aim to provide patients in every part of the country with medical facilities and with amenities of a modern standard. This will need a more equal expenditure than at present on all hospitals—teaching and non-teaching; regional boards owe it to the patients in their hospitals to press unceasingly for this.—I am, etc.,

London, W.1.

J. M. ALSTON.

Fluoridation of Public Water Supplies

SIR.—We are gratified that the members of the U.K. Mission on Fluoridation (*Journal*, March 12, p. 667) share our desire for more knowledge (*Journal*, January 29, p. 284); the need for this was the main stimulus of our letter. We note they believe the strongest evidence against dietary fluoride having any deleterious effect comes from the study

of two areas in Texas; the validity of the statistics from these areas has already been questioned (*Journal*, February 26, p. 538).

The members of the mission regard as misleading our statement that the effect on dental caries in adults of the ingestion of water containing 1 p.p.m. is much less certain than the well-established effect in children up to the age of about 8 years. Yet a member of the mission himself stated (*Journal*, January 22, p. 224) that one of the four main conclusions of the mission was that there is abundant evidence that lifelong consumption of such water "results in a substantial reduction of the incidence of dental caries in children, and probably in adults also." If there is this doubt about adults who have consumed such water from birth, we still feel justified in believing the effect upon caries in adults partaking of it after childhood to be "much less certain" than the "well-established" effect in children.

If we interpret the members of the mission correctly, they suggest the "severe dental fluorosis" found by one of us (D.C.W.) in Oxfordshire might have been caused by the hypoplasia due to exanthematous diseases or nutritional disturbances during enamel development. The original publication¹ included a photograph of teeth which do not seem to us or to those whom we have consulted to resemble changes that could arise from either of these two conditions: more important, the publication mentions that Dr. Ainsworth, to whom we are all indebted for the classic description of teeth at Maldon,² himself visited one of the Oxfordshire villages and verified the findings.

We doubted the statement of the mission in their report that "in theory any fluorine compound which will ionize in aqueous solution should have the same action on teeth." The mission now appear to agree that their statement was not true, but they claim that, even if we were correct, our objection would not be a valid one, since no one, they allege, is proposing to use stannous fluoride. Fortunately, chemical theory is not altered by what anyone proposes to add to public water supplies.

Finally, we are surprised to learn from the members of the mission that fluoridation of water supplies would not be carried out in the neighbourhood where fluoride dust might settle. The horticultural industry uses such dusts, as is implied in a statement the mission quotes in its report (p. 57): "Fruits and vegetables may be contaminated with residual fluoride dusts following the use of fluoride-containing insecticides in orchards and fields." There may be further difficulty in implementing this assurance, since there are at least 28 known sources of atmospheric contamination by fluorides. And there would remain the problem of industries other than the horticultural industry that might be introduced later into an area that was already using fluoridated water: of such the recent outbreaks of animal fluorosis on lands which had been altered by opencast coal-mining are a reminder.³—We are, etc.,

H. M. SINCLAIR.

DAGMAR C. WILSON.

Oxford.

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- 1 Wilson, D. C., *Nature, Lond.*, 1939, 144, 155.
- 2 Ainsworth, N. J., *Brit. dent. J.*, 1933, 55, 233.
- 3 Towers, K. G., *Vet. Rec.*, 1954, 66, 355.

SIR.—I was interested to read the report of the Board of Faculty of Dental Surgery of the Royal College of Surgeons of England on the fluoridation of domestic water supplies (*Journal*, February 26, p. 535). When studying the incidence of dental fluorosis in certain districts in India, Dr. D. C. Wilson¹ noted that when dental fluorosis was present so also was goitre. In England geological formations containing fluorine are found in certain districts. One of these is Derbyshire, where it appears as fluorspar, and where it is, or until recently was, mined. At one time goitre was very prevalent in certain parts of this county; it is now much less common, probably as a result of improved water supplies. Rocks containing fluorine are found in other districts in England, and these districts are places where goitre is more or less prevalent. On her return to England Dr. Wilson

continued her investigations, and obtained additional evidence that fluorine in drinking-water may be a factor in the causation of endemic goitre.

Two points suggest themselves to me for consideration. First, how is the amount to be kept approximately at the fluorine dilution decided upon, and, secondly, would an action for damages lie against those responsible for the addition of fluorine to the water supply by one who developed goitre or the disfigurement of dental mottling?—I am, etc.,

Watford.

THOMAS FENTEM.

REFERENCE
1 *Lancet*, 1941, 1, 211.

Hexamethonium Ileus

SIR.—The memorandum by Dr. H. J. Goldsmith (*Journal*, February 26, p. 522) draws attention again to the dangerous complication of ileus which may arise from parenteral or, more commonly, oral dosage of hexamethonium, which has been commented upon previously. The large dosage of hexamethonium used in the case cited is attended by severe risk of inhibition of gastro-intestinal activity, owing to the generalized ganglionic blockade produced by this drug. Constipation and diarrhoea constitute an indication for immediate withdrawal of dosage.

Four cases of ileus were encountered when hexamethonium was first applied in the Royal Alexandra Infirmary, Paisley. Subsequently an investigation of methonium homologues¹ showed that pentolinium has much less effect upon the bowel than upon the blood pressure. This ganglion-blocking agent has been used since without producing ileus even during sustained oral dosage, although constipation has occurred infrequently. As Smirk *et al.* have shown,² the combination of pentolinium and reserpine is very useful in the treatment of patients with severe hypertension, and these drugs have almost entirely replaced hexamethonium in the treatment of hypertension in this hospital.—I am, etc.,

Paisley.

J. GIBSON GRAHAM.

REFERENCES

- ¹ Maxwell, R. D. H., and Campbell, A. J. M., *Lancet*, 1953, 1, 455.
- ² *Ibid.*, 1954, 2, 159.

Manipulation and Low Back Pain

SIR.—In our recent letter (*Journal*, January 29, p. 288) we suggested that Cyriax or his colleagues should produce figures to back up his claims of almost total success with manipulation in the treatment of disk lesions of the cervical, dorsal, and lumbar regions. In the *Journal* of March 19 (p. 705) two of his colleagues have published some results of manipulative treatment in that syndrome which can be described as "lumbago."

Drs. Anthony B. Coyer and Ian H. M. Curwen have treated a series of 152 patients by carrying out manipulations, or advising rest in bed with analgesics, to alternate patients. Comparison of the figures of these apparently contradictory methods of treatment shows several differences. The first is that 50% of the manipulated patients and only 20% of the others recovered during the first week. The second is that 28% of those rested had persisting symptoms after six weeks as compared with only 12% of those manipulated. There is a third difference in that 16 (21%) of the rested cases "did not carry out instructions, or did not report for assessment"; and these 16 are omitted from the results group in 2. Every one of the 16 was of working age (Table I), and it is important to know whether they had recovered spontaneously and returned to work in a week or so, or had sought treatment elsewhere and remained uncured. If they had in fact recovered within a week, the first outstanding difference in Coyer and Curwen's results would disappear, and we should then find from Table VI that, whether manipulated or not, about 50% of all the patients had recovered in a week, and about 30% after a further two weeks. That about 80% of patients suffering from an attack of "lumbago" will recover from that attack more, or less spontaneously within about three weeks is a

piece of information which, probably, most of the readers of this *Journal* would confirm from their own clinical or even personal experience. However, like most orthopaedic surgeons, we have found that quite a few cases of acute low back pain with fixation (lumbago) can be relieved immediately by a single manipulation without anaesthesia, if seen early enough and especially within a few hours of onset of the attack.

With regard to the second outstanding difference, is it possible that chance can have placed, in the whole of Group II, an uneven proportion of cases more difficult to deal with? We feel that this may be so because, comparing the two, in the second group there were 9% more patients over 30 years of age (Table I); 20% more had significant radiological changes (Table V: disk lesions, osteophytosis, osteoarthritic changes, etc.); and 12% more were using a sagging bed so perhaps went home to rest in those same beds (Table IV).—We are, etc.,

London, N.W.1.

W. D. COLTART.

H. OSMOND-CLARKE.

Incubation Period of Herpes Zoster

SIR.—The incubation period of herpes zoster does not appear to be definitely established. The following case seems to point to an interval of two weeks from exposure to appearance of rash.

The patient, a woman of 50, had been indoors for six weeks and had had no visitors when she visited her hairdresser on February 9. The hairdresser had been in contact with his mother, whom I had attended for herpes zoster. My patient complained of severe lumbar pain on February 16, a week later. On February 23 the typical rash appeared in distribution L.2. Apart from her own family, the only outside contact had been her visit to the hairdresser, a fortnight before the appearance of the rash.—I am, etc.,

London, N.W.10.

H. BROSTOFF.

Clinical Staging of Carcinoma of the Breast

SIR.—Those who work among cancer patients are becoming increasingly aware of the difficulties of comparing the results of treatment methods owing to the lack of agreement about staging this disease. The cervix uteri is the only site for which an international staging exists, and it is a reproach to cancer specialists all over the world that in the last 25 years there has, until recently, been no real effort to do the same for other sites. At the sixth congress of the Union Internationale Contre le Cancer held in Brazil in July, 1954, the staging of carcinoma in several sites was discussed—for example, the breast, larynx, and pharynx. Oddly enough, the staging of cancer of the larynx, which is a rare disease and which is treated on a large scale in comparatively few centres, provoked long and even acrimonious discussion. By contrast, breast staging was the subject of a number of proposals, but these aroused little interest and scarcely any debate.

It seems to many of my colleagues at the Royal Marsden Hospital (formerly the Royal Cancer Hospital) that international agreement on the staging of breast cancer is more urgently required than for any other site in the body, and this for the following reasons: (1) the high incidence of the disease; (2) the large number of clinicians treating the disease; (3) to discover the effect of any one treatment upon the disease so that different methods of treatment can be compared; (4) because the comparatively high survival rate would surely make this comparison worth while; and (5) because there seems to be a reasonable hope of achieving earlier diagnosis in cancer of the breast by appropriate propaganda than in most other cancer sites and therefore it is important to try and find out whether such propaganda would succeed in improving the results of treatment.

No doubt the World Health Organization is the proper body to decide the matter, and only they can effectively advise the universal adoption of a staging which will inevitably dissatisfy many people. The next meeting of the International Union against Cancer is in London in 1958. Is it

too much to hope that before then British surgeons and radiotherapists may have met, discussed, and agreed upon a clinical staging for carcinoma of the breast so that clinicians of this country at least can put forward a basis for discussion which already commands firm support?

This letter is written in the hope of stimulating interest and action and to say that the Royal Marsden Hospital is willing to take the initiative in arranging such meetings of clinicians as would be necessary to determine this matter if no official body is likely to do so in the very near future.—I am, etc.,

London, S.W.3.

MICHAEL HARMER.

Hypodermic Injection Technique

SIR.—I feel that Dr. L. P. Lockhart's letter (*Journal*, February 12, p. 415) about hypodermic injections should be loud-pedalled. The law of averages is pretty safe, but the exception could often prove a fatality, especially with some of our heterogeneous penicillin formulations. On these grounds alone I deplore the growing popularity of the "cartridge" syringe.—I am, etc.,

Wrexham.

R. P. W. KUP.

Coarctation of the Aorta

SIR.—In view of the recent correspondence on this subject, the following case merits recording.

The patient was admitted to Westminster Hospital under the late Sir James Purves-Stewart. She was aged 45 and had been short of breath for 20 years, during which she had had seven pregnancies, including a pair of twins at the age of 34, after which her breathlessness became more severe. There were three miscarriages. On examination she was severely dyspnoeic, the heart was enlarged, and there was a loud systolic murmur at the apex. Tortuous arteries were palpable in the neck and posterior and lateral aspects of the thorax. Blood pressure in the arms was 170/110. E.C.G. showed abnormal notching of the ventricular complex. She died suddenly of cardiac failure. At necropsy the aorta was so constricted that a $\frac{1}{4}$ -in. (3.2-mm.) probe could not be passed. The aorta beyond this point was reduced to $\frac{1}{8}$ in. (12.7 mm.) in diameter, but the collateral circulation was greatly hypertrophied. The ductus arteriosus was reduced to a fibrous cord and the other viscera showed signs of chronic venous congestion.

The case came to my notice because of the specimen of heart and aorta in the pathological museum at Westminster Medical School.—I am, etc.,

London, S.W.1.

A. D. MORGAN.

Doctors and the Press

SIR.—Surely Dr. R. W. Cockshut (*Journal*, March 19, p. 731), in insisting on a policy of no capitulation and no compromise with the Press, is a little unrealistic. It rather reminds one of America's one-time splendid isolation. As a practical point it is the duty of the B.M.A.'s Public Relations Department to try to keep on friendly terms with the Press. There have been times when we have been only too glad of their help. One does not remain friends by a glassy stare and a reiteration of "No comment!" The popular press is, by definition, popular. Dr. Cockshut may not like it, but most of his patients do, and they not only lap up with avidity the sort of material he objects to but in many cases would rejoice to see themselves, complete with their troubles, right on the front page. Still, he wishes to protect them against their worse selves.

The majority of journalists are highly responsible people, and, if we wish to get their co-operation in restraining their more ebullient colleagues, surely compromise and mutual understanding are essential. A surgeon is fully entitled to object to reporters invading his hospital. I imagine there would be an equal objection if a squad of doctors burst into an editorial conference of the *Daily Mirror* and wished to take the temperatures of all present. Such things are insufferable, but there are old and tried methods of coping with gate crashers, and we do not need special medical measures.

All doctors object to personal publicity, and the Press, plagued every day by publicity hunters, finds this difficult to understand. Only by friendliness can we make them understand—but remember that anything in print in the *Medical Directory* or in *Who's Who* is public property, legally and ethically quotable. All one can ask is for no fulsome additions. We must, of course, always shield our patients—provided they wish to be shielded. But, as I have said, quite a lot do not, and will treasure all their lives the copy of the paper with their deformed picture on the front page. If we withhold information, they give it—so do their friends and neighbours.

In short, this is not a simple problem of "mind your own damned business," but one which well deserves a most thoughtful conference.—I am, etc.,

Ashted, Surrey.

W. EDWARDS.

SIR.—Dr. R. W. Cockshut (*Journal*, March 19, p. 731) appears to be rather out of touch with the facts. For some time it has been the accepted custom for doctors of the highest ethical standing to publish news bulletins on the state of health of persons deemed of interest to the public. Dr. Cockshut's urging the medical representatives at the forthcoming conference with the Press "to present the view that the physical and mental misfortunes of our patients do not constitute legitimate 'news'" is, therefore, even further removed from reality than his statement that Professor Ian Aird recently wrote a letter to the *Observer* on this subject. It was, in fact, an interview.

The exploitation of human misery by the Press or, of course, by the medical profession is damnable. But I have an uneasy feeling that some of the indignation being felt over the plight of the person most concerned in the news story that first drew attention to this whole matter is misplaced. In the course of a lengthy interview with Mrs. Davies she told me that she read "all the papers, especially the picture ones." She liked what they said about her and the twins. She thought that all the reporters who had come to see her were "very nice," with two exceptions. These, by the way, were not free-lance journalists. As for the public's reaction to what appeared in the newspapers, she had found everyone sympathetic and kind. She seemed delighted with the presents, letters, messages of good will, and offers of prayers that came her way because of the Press. Seeing that Boko and Tomu were "news" it was a great pity, when Mrs. Davies's permission was forthcoming, that the distribution of news from the hospital was not more adroitly handled. Scanty news bulletins were issued through the press officer of the large business house which had a finger in the pie, but none of the 11 doctors involved in the preliminary investigations or the operation was available to answer the obvious questions, while the surgeon most mentioned in connexion with the case refused to answer the telephone.

The unhappy result of this policy was that reporters waiting outside the hospital on the day of the operation sought news from any available source. One of the doctors who had just left the theatre said that the operation had been a success and that "Professor ——— had been wonderful." This news was rushed to afternoon papers which came out on the streets about the same time as the message from the hospital reached other parts of the hospital that one of the twins was dead.

The Press had another grievance. One national newspaper asked to use some of the pictures being taken during the operation. But the reply was that these pictures were intended for strictly medical or scientific scrutiny. Yet shortly afterwards some of these pictures were published by a weekly non-medical illustrated magazine. How did this leakage occur? And why was there no protest from the hospital at the time?

Over a year ago (*Journal*, January 16, 1954, p. 141) you mentioned the need for a clearer understanding by the medical profession and the Press of each other's problems and your hint has finally been taken. But on the same

occasion you suggested that if any surgeon were faced in the future with the dilemma that confronted Professor Aird over the Davies twins he would be well advised at the outset to seek the help of the public relations officer of the B.M.A., and thus make use of the facilities available in his own professional organization. According to a letter from your public relations officer, Mr. John Pringle, to *The Times*, this help was offered in connexion with the recent Siamese twins, but was refused. Now, Dr. Cockshut, commenting on Mr. Pringle's letter, says that it "seemed to impute that the surgeons concerned bore some responsibility through a failure to approach him or accept his offer of help." If the phrase means responsibility for what happened between the Press and the other interested parties, then I am in hearty agreement with your official in his belief that if the B.M.A. public relations officer had been invited to intervene between the doctors and the Press much of the ensuing unpleasantness could have been avoided.

In this I believe I am voicing the views of many of my colleagues in journalism. The B.M.A. "Press office" is the clearing-house for an immense amount of reliable medical information which is given promptly to the Press. That office promotes the best possible relations between the profession and the Press to the benefit of both. I feel confident that if the help of the B.M.A. had been accepted in the two cases under consideration Mr. Pringle and his staff would "have had the courteous co-operation of all but the least reputable elements of the Press."—I am, etc.,

London, E.C.4.

ALFRED BYRNE,
Medical Correspondent,
Manchester Guardian.

The Discovery of Penicillin

SIR,—To your excellent leading article "The Discovery of Penicillin" (*Journal*, March 19, p. 711), in which you quote from Alexander Fleming's first paper on penicillin, I would like to add two more paragraphs from two other of his papers: "It is quite likely that it [penicillin] or a chemical of a similar nature will be used in the treatment of septic wounds," and: "It [penicillin] has been used on a number of indolent septic wounds and has certainly appeared to be superior to dressings containing potent chemicals."

It is marvellous to see how thoroughly Fleming carried out alone his remarkable work, and how he insisted, in three different publications in 1929, 1931, and 1932, on the possible therapeutic use of penicillin in the treatment of septic wounds infected with penicillin-sensitive microbes.—I am, etc.,

Madrid.

F. BUSTINZA.

REFERENCES

- 1 Fleming, A., *Brit. dent. J.*, 1931, 52, 105.
- 2 — *J. Path. Bact.*, 1932, 35, 831.

Relief for Medical Victims of New South Wales Flood Disaster

SIR,—I have ascertained that the New South Wales Branch of the Association is organizing a fund for the relief of the doctors who have suffered as a result of the recent floods which caused widespread devastation in that State. I am sure that many members of the Association at home will welcome an opportunity of making a small contribution to this fund, and that help of this kind from the profession in the mother country will be greatly appreciated by our Australian colleagues. I shall therefore be happy to receive donations for transmission to the New South Wales Branch in Sydney.

Will contributors please make their cheques or postal orders payable to "The British Medical Association" and send them to the Chairman of Council, B.M.A. House, Tavistock Square, London, W.C.1, marking the envelope "N.S.W. Relief Fund" in the top left-hand corner?—I am, etc.,

London, W.C.1.

E. A. GREGG,
Chairman of Council.

Obituary

MAX NEUBURGER, M.D., Ph.D.

Professor Max Neuburger, the great historian of medicine, died in his native Vienna on March 15 after a long illness. He was in his 87th year, and for over forty of these he had taught his subject in the University of Vienna. He had written or edited seventeen books and about 180 papers, had founded and equipped a famous institute largely without official help, and had received decorations from five countries and honorary fellowship or membership of many learned bodies.

Max Neuburger was born in Vienna on December 8, 1868. He was descended from Jewish families which

had long been resident in Munich and Hamburg. His father, Ferdinand Neuburger, was a brilliant linguist: a native of Munich, he migrated to Vienna as a youth and became an Austrian subject in 1859. Max attended the Piaristengymnasium and then studied medicine at the University of Vienna, having among his teachers such famous men as Billroth, Nothnagel, Kraft-Ebing, Fuchs, and Politzer. Very important for his early career was Moritz Benedikt, who taught neurology. Neuburger graduated as a Doctor of Medicine in 1893, and he then spent two years as resident physician (*Secundararzt*) at the Rudolfspital. In 1896 he became assistant to Benedikt at the Allgemeine Poliklinik, a post which he held until 1908, and he became a well-known neurologist. Although he wrote little on the modern aspects of his subject, he influenced its development by his historical writings. He had a private neurological practice until 1914, but he voluntarily sacrificed more and more of this lucrative work for the sake of his humanistic studies. During the first world war he was in charge of several military hospitals, and the end of the war marked the close of his active clinical career.

For the following account of Professor Neuburger's work as a medical historian we are indebted to Dr. E. ASHWORTH UNDERWOOD: While he was still a student Neuburger published several short historical-philosophical articles. At this time the chair of the history of medicine was held by Theodor Puschmann, who had published his history of medical education in 1889. After his graduation in 1893 Neuburger was inspired and encouraged by Puschmann to carry out historical studies. Within the next two years he wrote several papers, one of which demonstrated the pioneer work of Giuseppe Zambecari as an experimental physiologist. Puschmann now encouraged Neuburger to become a Dozent, and for this it was necessary for the candidate to submit a published thesis. The result was Neuburger's important work on the history of the experimental physiology of the brain and spinal cord to the time of Flourens (1897). In 1898 he was appointed as a Privatdozent—an honorary lecturer—and his real career had officially commenced. Thus started his long association with Robert Ritter von Töply, who was twelve years his senior. Von Töply was an active military surgeon who later rose in the Austrian Army to a rank corresponding to our Director-General of



Medical Services. He was a keen medical historian, and he also was appointed Privatdozent under Puschmann: a few years later he wrote the long section on anatomy in the famous *Handbuch der Geschichte der Medizin*. Puschmann died in 1899, and the teaching was carried on by the Dozents, von Töply and Neuburger. In 1904 Neuburger became extraordinary professor, and full professor in 1912. He retired officially in 1934, but continued the work until 1938.

Neuburger's work falls naturally into two parts—his writings and the foundation of the Vienna Institute for the History of Medicine. For his research work he was superbly equipped by nature, by training, and by experience. He was endowed with a consuming interest in the medicine of all ages and of all peoples, without which none can aspire to the title of general historian, and with a historical sense which is given to few. He was gifted with a literary style of great purity and dignity. To these assets he could add his sound basic training in many languages and in historical methods. He made few detailed studies of ancient texts, and his main interest was the synthesis of the history of a subject in relation to the various cultures of the periods discussed. He has been rightly called the most philosophical of the great historians of medicine.

Neuburger's first book, his *Habilitationsschrift* on the history of the experimental physiology of the brain and spinal cord, published in 1897, is a very learned discussion of this difficult subject from Willis to Flourens and Magendie. Two other monographs, on specific nutrition and on the early history of antitoxin therapy, followed quite soon. Puschmann had expressed the wish that the enormous *Handbuch* which he had planned was, in case of his death, to be edited by Neuburger, but when Puschmann died with his task scarcely begun the publisher requested Julius Pagel, of Berlin—it would seem quite rightly, in view of the size of the work—to act as co-editor with Neuburger. The first volume, dealing with the whole field up to the Middle Ages, appeared in 1902. The second and third volumes, dealing with the histories of individual subjects, were published in 1903 and 1905. Neuburger's long introduction to the second volume is evidence of the accuracy of his scholarship and the width of his interests: in itself it would have been sufficient to establish him as a considerable historian. Of the other books which he later wrote, mention must be made of his definite biography of Hermann Nothnagel, and of his several major contributions to the history of the Viennese School. His long book on the doctrine of the *vis medicatrix naturae* (1926) in itself demonstrates the main characteristics of his work.

While he was labouring on the *Handbuch* Neuburger was also engaged on preparing his own *History of Medicine*. The first volume of this work was published in 1906, and carries the subject to the end of classical antiquity. The second volume—to the close of the Middle Ages—appeared in 1910. Neuburger never finished this great work. From a letter written late in life it is clear that he was preparing the Renaissance section in 1920. Under the sponsorship of Osler an English translation began to come out in 1910 and was completed in 1925. The history was not intended for the specialist. It is learned, very accurate, and puts each subject against the background of its time. Its only disadvantage is the intentional paucity of references.

Puschmann had intended to found an institute for the history of medicine at Vienna, but after his death the funds with which he intended to accomplish this were diverted to Leipzig. The new institute was founded there in 1905. It was endowed from the start and Sudhoff became its first director. In 1906 Neuburger and von Töply presented a memorandum to the Ministry of Education in Vienna, emphasizing the necessity for an institute, and explaining how its museum collection could be built up from material already in the possession of other institutes and hospitals. They launched a newspaper appeal for books, portraits, and museum objects. Von Töply soon retired from active participation, and the building up of the institute is due to Neuburger alone. He presented to it 1,000 books and reprints from his own library and worked unceasingly

to expand the collections and to obtain rooms for them and his seminars. They were first housed in a small space below a lecture theatre. In 1919 Neuburger had them transferred to three rooms in the national building called the Josephinum. The medical library of the Josephinum and its magnificent collection of 1,200 wax anatomical models were added to the institute. By 1934 the institute was occupying 15 rooms. On his 60th birthday a volume of essays was issued in his honour, and his portrait-medal was struck in Vienna. In 1930 Fielding H. Garrison edited in his honour a volume of translations of twelve of Neuburger's studies.

In 1939 arrangements were made for Neuburger to join the scientific staff of the Wellcome Historical Medical Museum. He arrived in London on August 26, 1939 with two suitcases and five shillings. Kind friends looked after him in his new surroundings. During the war he underwent a serious operation, and he stuck doggedly in London throughout the bombing. Practically all his previous work had been written in German, but he now began to write and publish in English. His interests became more and more centred on British medicine, and in 1943 he published a charming little book entitled *British Medicine and the Vienna School: Contrasts and Parallels*. He continued to work steadily until June, 1948, when he departed for the United States to live with his son in Buffalo. Later that year another volume of essays in his honour, edited by Dr. Emanuel Berghoff, was published in Vienna. Dr. Berghoff's biography of Neuburger, in German, was published at the same time. During four somewhat restive years Neuburger tried to accustom himself to the American way of life, but his heart and his thoughts were in Vienna. In 1952 at the age of 83 he astonished everyone by flying back to his native city, where he received a cordial official welcome. His happiness was complete. Unfortunately, before the end of that year he fell in his home and fractured his femur. Although physically incapacitated thereafter, he retained much of his mental activity until near the end.

I became acquainted with Neuburger early in the war years, and I was much impressed by the enthusiasm and the modesty of the man. He was an Honorary Fellow of the Royal Society of Medicine, and on December 1, 1943, we put out, for the meeting of the History Section on that day, a fairly complete exhibition of his printed books and papers in commemoration of his approaching 75th birthday. Neuburger was immensely touched. From 1946 until 1948 I was in much closer contact with him at the Wellcome Museum. He was still an ardent student, and his whole life was centred on the history of the healing art. He was by this time rather deaf and very myopic. Nine times out of ten, on opening the door of his room one found him poring over a book or a manuscript, using a reading-glass and with his head almost touching the page. Here in a flash was a vision of the mediaeval scholar. He never failed to express in many minor ways, sometimes unconscious, his gratitude to the people and the country that had given him freedom. His first article, in 1892, was on philosophy and medicine. A year ago he published what is possibly his last note, a brief article on the future of medicine based on its history. History and philosophy: these were the threads which ran unbroken through his long life.

In 1899 Neuburger married Johanna Conrad. They had two sons: the elder went to Tasmania in 1939, and the younger, Frederick, has been practising medicine in Buffalo, N.Y., since 1938. Frau Neuburger died in 1930. From his letters and from personal conversations it is evident that Neuburger was long and deeply affected by her death.

Dr. WALTER PAGEL writes: One of my earliest recollections is the photograph, on the drawing-room mantelpiece of my paternal home some 50 years ago, of a tall, martial figure in full Imperial Austrian court uniform, with plumed helmet, sword, and medals—and yet displaying the fine features of the scholar. It bore the familiar signature of Max Neuburger and was taken after his presentation to the Emperor when he had been appointed titular professor of medical history in the university of Vienna. Max

Neuburger was the last exponent of what may be called the "heroic" generation of medical historians. Its foremost exponents were Julius Pagel (1851-1912) and Karl Sudhoff (1853-1938). It was "heroic" because of the stupendous achievements which are due to these three men—and even more so because of the heavy odds against which they had to work at a time when historical studies in medicine were frowned upon and when there was no recognition of medical history as a subject for university teaching, departments, or research grants.

Of the three men, Sudhoff, as a practitioner well over 50, acquired an institute and, much later, a full professorship. Julius Pagel remained a practitioner throughout life, since his "extraordinary" professorship entitled him to lecture but not to "live." Neuburger, having been a practising neurologist, was given a full professorship and a department at the age of 50—yet his life before and after was a continual struggle with adversities. His stipend was always poor. He had to go through all the misery of post-war Vienna, when, hungry and cold, he wrote his masterpieces on the Vienna school in the kitchen of his flat in Neubaugasse. At the age of 70 he was subjected to the routine humiliations of Jewish scholars of highest standing at the "hearing" before an exalted member of the all-too-numerous Viennese Nazi mob. Finally, stripped of all earthly possessions, he found himself isolated from his children. This was the reward for nearly 50 years of devoted service and the sacrifices he had made for his department, to which he had given his precious library and collections. Neuburger was lucky in catching an aeroplane to London—the last leaving Vienna before war was declared.

A man of "great stature," erect and brave, Neuburger went through the London "Blitz" and a major operation—all the time working intensely and coming forward with ingenious ideas and unexpected finds. One such idea was to trace the personal contacts between British and Continental doctors, notably of the Vienna schools, and their repercussion on the development of medicine. All his works are classics of enduring vitality. Neuburger concentrated on the full presentation of subjects such as the history of neurophysiology (1897), the concept of the healing power of nature (1926), and indeed the whole of ancient and mediæval medicine (1906-11)—rather than on the detection and first edition of manuscript sources (as Pagel and Sudhoff had done).

Neuburger was an idealist whose life may be fittingly inscribed with the conversion of a famous adage: "Primum philosophari, deinde vivere." Regardless of prospects and career he followed the creative spark in himself which had been kindled in his early schooldays by his headmaster, an inspiring teacher of history. Somewhat temperamental in disposition, he fearlessly and sincerely criticized friend and foe. Already in his earlier correspondence with such friends as Julius Pagel "saturnine" streaks of pessimism, impatience, and suspicion are recognizable. This was aggravated later on by the totalitarian attitude of Sudhoff, who, as Sigerist said, treated Neuburger unfairly. All this explains why recognition and honours meant much to Neuburger, especially in his later life—and it is gratifying that he lived to see himself rightly and universally hailed as the princeps of medical historians. It is with deep sorrow that we part from the last of a generation of fine scholars and great men.

Miss S. R. BURSTEIN, of the Wellcome Historical Museum, writes: Max Neuburger was essentially a social person: people were the staff of life to him. He delighted in the written recognition of his work or his birthdays. Quick to flare up in discussion, he sometimes offended people, but he was always sad if anyone dropped out of his life. An omitted greeting from anyone—be it colleague or cleaner—could darken his day. Yet he was capable of monumental patience. Venerating scholarship to the point of hero-worship, he was full of patience, sympathy, and kindness to the self-taught. To the younger generation he freely offered all the riches of his knowledge and experience. In historical biography he hated denigration of great characters,

but he loved to seek out characters overlooked by history, especially those who seemed to have had their thunder stolen by greater personalities.

L. N. ROBINSON, C.B.E., M.D.

Dr. L. N. Robinson, formerly senior physician at the Hertford British Hospital in Paris, died at Reading on March 15, aged 85.

Leonard Nicholas Robinson was the son of Samuel Henry Robinson, of Howrah, Bengal. From Malvern College he went on to study medicine at Edinburgh, where he graduated M.B., C.M. in 1893, proceeding to the M.D. five years later. He was also a Doctor of Medicine of the University of Paris, where he continued his studies for some years and where he decided to live. In 1900 he was appointed physician to the Hertford British Hospital and he soon became widely known and respected both by his French colleagues and by the British residents in Paris. For some years he was senior member of the Medical Board for France of the Egyptian Civil Service, and in 1914 he was appointed president of the Paris Branch of the British Red Cross Society. During the first world war he served in the R.A.M.C. as a lieutenant-colonel and was mentioned in despatches. He was appointed C.B.E. in 1920 and an officer of the Legion of Honour in 1933. He continued to practise in Paris (where his telegraphic address was the word *Crusoe*), until the second world war, when he returned to live in England. The last years of his retirement he spent at Biot in the Alpes Maritimes.

Dr. Robinson married Victoria, daughter of Mr. D. Hoef, in 1903, and he is survived by his widow and daughter.

We are indebted to Dr. C. G. JARVIS for the following appreciation: The passing away of Dr. Leonard N. Robinson further reduces the very small number of British practitioners in France. For many years he had been their respected and popular senior. He will be remembered for his manifold beneficent activities. For twenty-five years he was senior physician to the Hertford British Hospital in Paris. This institution was very near his heart and he gave it unstinted time and trouble. He was also a trustee of the British Charitable Fund and honorary physician to the British Legion, giving freely to all the benefit of his wisdom and experience.

When the first world war broke out he lost no time in organizing a local branch of the British Red Cross which rendered invaluable service. In the second world war he had settled near Exeter, where he acted as chairman of the West of England section of the Committee for British Subjects Evacuated from France. Here again he freely provided assistance and advice and strove to maintain constant contact between the exiles. After the war he retired to his pretty villa on the French Riviera. Unfortunately his eyesight gave him considerable trouble and this tribulation he keenly felt, for he was a great reader.

Robinson had in Paris a wide circle of friends, and many were those whom he had assisted and advised, for his kindness was proverbial. His always pleasant manner, his sense of humour, his utter lack of petty jealousy, and his readiness to help made him a very pleasant colleague. His devotion to duty was one of his predominating characteristics. He will long be remembered by those who were privileged to know him.

D. A. PRITCHARD, C.B.E., F.R.A.C.P., M.R.C.P.

Surgeon Rear-Admiral D. A. Pritchard, Director of Naval Medical Services in the Royal Australian Navy, died in Melbourne on March 11 at the age of 59.

Denis Adrian Pritchard was born at Stanmore, New South Wales, on April 26, 1895, and from Sydney

Grammar School he went on to Sydney University, where he studied science. During the first world war he came to Britain and worked as a scientist in munition factories. He returned to Sydney to study medicine, and graduated M.B., Ch.M. in 1922. In the following year he joined the Royal Australian Navy, in which he had a distinguished career. During the last war he served as squadron medical officer in H.M.A.S. *Perth* and *Australia*, and he was present at many Pacific actions. In 1946 he was appointed Director of Naval Medical Services and an honorary physician to the King. He was a Fellow of the Royal Australasian College of Physicians, and since 1935 had been a Member of the Royal College of Physicians of London. In 1952 he was appointed C.B.E. Surgeon Rear-Admiral Pritchard married Mary, daughter of Canon Harold Portis, and she survives him with their daughter.

Sir ALEXANDER FLEMING, M.D., D.Sc. F.R.C.P., F.R.C.S., F.R.S.

Mr. A. G. CROSS, dean of St. Mary's Hospital Medical School, writes: Sir Alexander Fleming, to one who had known him as a teacher and later as a colleague, showed, apart from his scientific accomplishments, the two outstanding characteristics of modesty and of great loyalty both to St. Mary's Hospital Medical School and to the Wright-Fleming Institute, of which he had been director. He accepted all the honours which came to him as a result of the discovery of penicillin in a spirit of incredulity and with the suggestion that he was not really deserving of all these tributes. He was always ready to undertake any task for the medical school and was a constant supporter of the students in all their activities. A keen swimmer and a good shot in his younger days, he was for many years a regular supporter of the rugby and cricket teams, and he was always interested in the results of the various inter-hospital competitions. The world by his death has lost a great benefactor and St. Mary's has lost a loyal friend.

Mr. H. H. DU BOULAY, honorary consulting surgeon to the Weymouth and Dorset County Royal Eye Infirmary and to the Weymouth and District Hospital, died at Chandler's Ford, Hampshire, on March 1 at the age of 94. The eldest son of the Rev. J. T. H. Du Boulay, Hubert Houssemayne Du Boulay was born on December 8, 1860, and was educated at Winchester College, where his father was a house-master. He received his medical training at Guy's Hospital and qualified by taking the M.R.C.S. in 1885 and the L.R.C.P. in the following year. After qualification he studied ophthalmology at Leeds, and then, in 1889, he settled in general practice at Weymouth in partnership with Dr. Christopher Childs, and soon afterwards was appointed assistant surgeon to the Weymouth and Dorset County Royal Eye Infirmary. A little later he became general surgeon at the Royal Hospital, Weymouth, where he worked in close association with the late Dr. P. S. B. Wetherall. In 1921 he, together with Dr. Wetherall, Dr. J. Macpherson Lawrie, and Dr. T. H. Sanderson-Wells, was instrumental in amalgamating the Royal Hospital with the Princess Christian Hospital, to become the Weymouth and District Hospital. When he retired from practice in 1924 he became consulting surgeon to the eye infirmary and to the hospital. He then went to live at Chandler's Ford, returning to Weymouth in 1925 to receive the freedom of the borough, and at the time of his death he was the borough's oldest surviving freeman. During the 35 years he was at Weymouth Dr. Du Boulay became a well-known and respected figure. Many years ago he created something of a sensation when he gave up wearing the conventional medical attire of frock-coat and top hat and appeared in an ordinary suit with a bowler hat. Although he practised as a general physician and surgeon he was particularly interested in ophthalmology, and for a long time he was the only ophthalmologist in the town.

He never accepted the panel system and always continued in private practice. He was much better known as an ophthalmologist in south Dorset than a general practitioner, and it is chiefly through his association with the eye infirmary at Weymouth that he is remembered. An associate brother of the Venerable Order of St. John of Jerusalem, he was a lecturer to the St. John Ambulance Brigade and to the ambulance classes of the local railways, and during most of the time he was at Weymouth he acted as surgeon to the old Great Western Railway's provident society. A widower for many years, he devoted much care to his invalid wife during her lifetime. He is survived by two sons, both of whom live in Canada.

Dr. E. VIPONT BROWN, who was in general practice at Manchester for over fifty years, died on February 26 at his home at Yealand Conyers, near Carnforth, Lancashire, where he had been living in retirement since the end of the second world war. He was 92 years of age. Edward Vipont Brown was born at North Shields on February 12, 1863, and was educated at Bootham School, York, where he matriculated in 1880, and at Owens College, Manchester. He then entered St. Bartholomew's Hospital Medical College as a medical student and qualified by taking both the M.R.C.S. and L.S.A. diplomas in 1886. In later life he enjoyed telling how he and other Bart's students would absent themselves from lectures at their own medical school in order to listen to Sir Joseph (later Lord) Lister, who was then teaching at King's, a procedure which, understandably enough, annoyed the professor of surgery at St. Bartholomew's. Pursuing his studies after qualification, he obtained the London M.B. in 1888 and proceeded to the M.D. in 1901. Dr. Vipont Brown settled at Manchester in 1894 in partnership with his brother-in-law, the late Dr. Owen Gwatkin, but the latter had to leave the district soon afterwards for health reasons, and Dr. Vipont Brown succeeded to the practice and soon proved himself to be a good and reliable doctor. In time many of his patients were of the second and often the third generation of the same family, and all came to regard him not only as a doctor but as a friend in whom they could place full confidence and to whom they could always appeal for help. Throughout his long life Dr. Vipont Brown, who was a Quaker, worked hard as a disciple of peace, and he was keenly interested, also, in the temperance movement, being himself a lifelong abstainer, while, as one who attended postgraduate classes until he was in his seventies, it was perhaps natural that he should give his encouragement to adult education. Possessed of the gift of speech, he was in demand as a speaker not only by the Society of Friends but by other denominations as well. All these interests were reflected in his writings. As long ago as 1902 he wrote on Christianity and war, and in other publications he discussed the Quaker aspects of truth, the medical aspects of the temperance question, the effects of alcohol as seen by medical men, and instinct, intelligence, and religion. He became a member of the Manchester Medical Society in 1887 and was a familiar figure at its meetings until he retired at the age of 82. He was auditor of the society in 1894, a member of its committee in 1899, and a vice-president in 1920. A member of the British Medical Association for over sixty-five years, he represented Manchester (South) at the Annual Representative Meeting held at Belfast in 1909. Dr. Vipont Brown was always extremely active and busy. While at school he held the record for the mile, and in his youth cycled from York to Edinburgh on a "penny-farthing" machine. As a young practitioner he usually used a horse and trap to visit his patients, but up to an advanced age he could be seen riding his bicycle, for motor-cars never appealed to him and he could never learn how to drive one. He had the happiness to live long enough to celebrate his diamond wedding anniversary in January this year, and is survived by his widow, formerly Miss Dorothy Crowley, whom he married in 1895. His son carries on the practice at Manchester.

Medico-Legal

FORGOTTEN SWAB

In the Queen's Bench Division on March 15 Mr. Justice Pearson gave judgment for £3,000 damages in favour of Mrs. E. B. J. Urry, aged 31, of Maidenhead, against Mr. Immanuel Bierer, gynaecological surgeon, of London, W.1, and the proprietors of the Harley Street Nursing Home in respect of a caesarean operation at the nursing-home on January 7, 1953. Mrs. Urry complained that a pack about 10 in. (25 cm.) square was left inside her, necessitating an operation on January 13 for its removal.

The defendants denied any negligence. A similar action against the surgeon who assisted at the operation, Dr. Max Odens, was dismissed with costs awarded to him.

Mr. Justice Pearson, giving judgment, said the nursing-home and the theatre sister, Mrs. Gwendolen Cole, had and deserved to have the highest reputation. Mr. Bierer had long and wide experience and held a number of appointments. The nursing-home provided the packs. Mr. Bierer had not operated at the nursing-home before nor had he operated with the same theatre sister. His Lordship said the surgeon normally asked the theatre sister if swabs were correct. Then there was what might be called the ritual of the sister's count of the used packs together with any outstanding pack or packs left for the surgeon's use later. Mrs. Cole's evidence was that on this occasion there were eleven used packs and one available for Mr. Bierer. Mrs. Cole and her assistant both counted the packs audibly, and Mrs. Cole ended by pointing out the twelfth and last pack, which was available for Mr. Bierer. The judge said his view on the balance of probabilities was that it was a pre-count pack which was left behind. On that assumption, it followed that there was an error in the count, and it had been admitted that on that finding there was negligence and the nursing-home was liable.

Mr. Bierer had agreed, said the judge, that the surgeon had a duty to take reasonable precautions against leaving a pack behind, but thought that duty was performed by relying solely and exclusively on the sister's count of the swabs. His lordship found that it was not proved that that was in accordance with any approved practice. The sister's count was fallible, and some other precaution was needed. The fact that some other precaution was also fallible was not a sufficient reason against adopting it. Both Mr. Bierer and the theatre sister failed in their respective duties, and if either duty had been performed the pack would not have been left behind. There was no reason to divide the responsibility other than equally. Mrs. Urry's pain and suffering had been very great, and there would be a third operation to remove the scar and internal adhesions. There was some hope that physically she would be completely cured. Psychologically there had been terrible damage.

His lordship entered judgment against Mr. Bierer and the nursing-home for Mrs. Urry for £3,000 damages with costs. On a counter claim by the nursing-home for fees judgment was entered for £270 against the plaintiff's husband, Mr. Urry, who was given judgment for £1,146 as agreed special damages. A stay of execution with regard to £2,000 of the damages awarded to Mrs. Urry was granted pending the consideration of an appeal.

The Medical Defence Union instructed Messrs. Hempsons, solicitors, to act for Mr. Bierer and Dr. Odens.

HOSPITAL BOARD PAYS UP

In 1950 and 1951 a radiologist was employed by the South-west Metropolitan Regional Hospital Board as a part-time locumtenent consultant radiologist at various hospitals. On a number of occasions he was engaged to and did undertake a total of more than nine sessions per week, when he was employed in two or more such locumtenent posts concurrently. When he asked for payment at the rate of 3½ guineas

for each session he was told that under paragraph 7 of the Terms and Conditions of Service of Hospital Medical and Dental Staff (England and Wales) and by virtue of a Ministry of Health circular R.H.B. 49 (115) he was not entitled to be paid for more than nine sessions in any week, however many he had actually performed. As a result the board withheld the sum of £102 18s. from his remuneration. After considerable correspondence the radiologist issued a writ against the board. He has now been informed that the board proposes to pay his claim in full.

The Medical Defence Union instructed Messrs. Hempsons, solicitors, to act for the radiologist.

Medical Notes in Parliament

Teething Powders

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) asked the Minister of Health what advice he had received on the association of mercury poisoning in infants, following the ingestion of teething powders or tablets containing mercury, with pink disease; how many infants had died within the last two years from pink disease, and how many from mercurial poisoning; and in how many cases both factors applied. Mr. IAIN MACLEOD, replying on March 14, said he was advised that the degree of association between mercury poisoning and pink disease had not been clearly established. Many cases of pink disease had no demonstrable association with ingestion of mercury, and the great majority of children who had been given mercurial preparations showed no sign of the disease. It seemed possible that some few infants might have an exceptional sensitivity to mercury. In 1952 and 1953, 64 children under 5 years old were certified as dying from pink disease, and 4 from mercury poisoning; in 2 cases both pink disease and mercury poisoning were mentioned in the death certificate.

Pneumoconiosis Diagnosis

Mr. W. N. WARBEY (Buxton, Lab.) asked the Minister of Pensions and National Insurance whether he would institute an inquiry into the causes of the wide variation in the proportion of pneumoconiosis claims diagnosed as such by the pneumoconiosis medical panels in the different areas. Mr. OSBERT PEAKE replied on March 14 that he did not think the inquiry suggested would serve any useful purpose. Mr. WARBEY said that the wide variation was causing a good deal of unrest in the mining industry. It was as high as 78% in Scotland and 70% in the West Midlands, and as low as 47% in the East Midlands. Now that the scheme had been working for some years would it not be a good thing to have an inquiry, both into the diagnostic criteria and into the question whether it was really a good thing to have a panel of medical experts functioning as a final appeal tribunal for claims to benefit? Mr. PEAKE said that he could not accept that the proportion of successful claims in different districts showed that there was any wide variation in diagnosis in those districts. Conditions giving rise to the disease, the form of the disease itself, and the awareness of the risk of disease, varied greatly from district to district.

1914-18 War Pensioners

Mr. C. J. SIMMONS (Brierley Hill, Lab.) on March 14 asked the Minister of Pensions and National Insurance whether he had considered the opinion expressed in the Report of the Rock Carling Committee that some limbless and other seriously wounded men of the 1914-18 war found their disabilities more burdensome in advancing years, and had now reached a stage deserving of reconsideration; and what action he proposed to take in this matter. Mr. OSBERT PEAKE said that he was always willing to review the case of any war pensioner who applied to have his assessment reconsidered on the ground that his war disablement had grown worse. There were, he also said, 23,000 limbless pensioners, and 356 increases of assessment had been made between the

merger of the Ministries of Pensions and National Insurance in September, 1953, and the end of 1954. There were 144,000 other wounded from the first world war, and 1,000 had been given increases.

Factory Accidents

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) asked the Minister of Labour on March 15 whether he had noted the unsatisfactory figures for the number of accidents that occurred among women and girls in factories and establishments supervised by the Inspectorate of Labour; and what steps were being taken to bring the accident rate among these groups to a lower level. Mr. HAROLD WATKINSON, the Parliamentary Secretary, replied that the Chief Inspector of Factories again drew attention to the unsatisfactory trend of these accidents in his last annual report, and urged that industry should devote more thought to means of reducing the number of accidents to female workers. Inspectors of factories paid attention to this problem in their inspections of establishments employing female workers. The National Joint Advisory Council had appointed a subcommittee to make recommendations on the means by which greater freedom from accidents to workpeople generally might be achieved. He would not agree with a submission by Dr. Stross that the inspectorate tended to become grossly weakened year by year in the technical skill of its entrants. It was, he said, a special problem that had been clearly outlined, and there was an expert subcommittee working on it. He agreed with Mr. F. LEE (Newton, Lab.) that more safety committees inside some types of factory would do a great deal to help.

Vole Vaccine

Mr. JOHN RANKIN (Glasgow, Tradeston, Lab.) asked the Secretary of State for Scotland on March 15 if he had reached any conclusions as to the effectiveness of vole vaccine in the treatment of tuberculosis, as the result of the inoculations given to the children at Bridge of Weir Home. Mr. J. STUART replied that vole vaccine, like B.C.G. vaccine, was a protection against tuberculosis, not a form of treatment. So far as could be established by testing all those who were vaccinated, the effectiveness of the two vaccines was closely comparable. There had been no cases of tuberculosis in the Homes since vaccination began in 1951.

Helicopter Ambulance

Mr. J. GRIMOND (Orkney and Zetland, L.) asked the Secretary of State for Scotland on March 15 if he would arrange for a helicopter to be available in cases of emergency for serious medical cases in the Highlands, especially in islands on which the present air ambulance could not land. Mr. J. STUART said that while he was advised that there were risks in using single-engined helicopters on over-water crossings, he was considering with the First Lord of the Admiralty the extent to which use could be made of naval helicopters in extreme medical emergencies.

Resettlement in Malaya

Mr. H. HOPKINSON, Minister of State, Colonial Office, stated in answer to Mrs. LENA JEGGER (Holborn and St. Pancras South, Lab.) on March 16, that every resettlement village in Malaya had either a dispensary or a maternal and child health centre. In 1954 medical work in these "New Villages" was provided for by grants of \$2,500,000 to the Governments of the States and Settlements, and \$1,350,000 to the Red Cross, the St. John Ambulance Brigade, and the missions, all of which had since 1952 been making a magnificent contribution under emergency conditions in the rural areas.

Food and Drugs Act.—The date of bringing into operation the Food and Drugs Amendment Act has not yet been decided, but the Minister intends to bring it into force as soon as possible.

Industrial Diseases.—The Beney Committee appointed to inquire into industrial diseases not covered by the Industrial Injuries Acts is understood to be working on its report.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending March 5 (No. 9) and corresponding week 1954.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1955					1954				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria ..	17	1	4	0	1	34	1	7	0	1
Dysentery ..	1,265	64	322	17	8	1,007	94	276	12	5
Encephalitis, acute ..	5	0	0	0		5	0	0	0	
Enteric fever:										
Typhoid ..	3	0	1	0		1	0	0	0	
Paratyphoid ..	5	0	0	1		15	1	1	0	
Food-poisoning ..	111	17		4		194	12		0	
Infective enteritis or diarrhoea under 2 years ..				15	16				12	32
Measles*	26,453	3412	361	605	169	2,449	33	82	19	395
Meningococcal infection ..	32	0	12	1	5	27	3	17	0	
Ophthalmia neonatorum ..	37	4	6	0		24	0	2	1	
Pneumonia†	954	72	279	41	8	709	31	254	9	2
Polio-myelitis, acute:										
Paralytic ..	11	1				14	1			
Non-paralytic ..	3	1	2	0	1	4	0		4	0
Puerperal fever‡	235	48	6	1		241	39	12	0	
Scarlet fever ..	648	19	79	51	31	1,379	51	181	40	33
Tuberculosis:										
Respiratory ..	716	70	122	18		740	109	150	21	
Non-respiratory ..	96	7	26	3		128	7	23	3	
Whooping-cough ..	1,834	145	167	53	22	2,034	94	385	45	44

DEATHS in Great Towns	1955					1954				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	1
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute ..		0			0		0			0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	18	1	1	1	0	15	1	1	1	3
Influenza ..	70	11	5	3	6	26	1	2	0	0
Measles ..	2	0	0	0			0	0	0	0
Meningococcal infection ..		0	0				0	0		
Pneumonia ..	449	66	53	26	12	323	51	28	10	5
Polio-myelitis, acute ..	2	0			0	1	0			0
Scarlet fever ..		0	1	0	0		0	0	0	0
Tuberculosis:										
Respiratory ..	107	19	14	0	6	129	17	18	4	6
Non-respiratory ..		0	0	0	0		1	1	0	2
Whooping-cough ..	1	0	0	0	0	3	0	1	0	0
Deaths 0-1 year ..	231	41	39	15	9	275	28	28	5	15
Deaths (excluding stillbirths)	8,032	1,139	879	200	285	6,457	868	707	125	201
LIVE BIRTHS	8,050	1,144	976	208	318	8,009	1,181	904	227	399
STILLBIRTHS	231	12	18			207	23	26		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Vital Statistics

Infectious Diseases

The only large variations in the trends of the notifications of infectious diseases in England and Wales during the week ending March 5 were increases of 2,753 for measles, from 23,700 to 26,453, and 160 for whooping-cough, from 1,678 to 1,838.

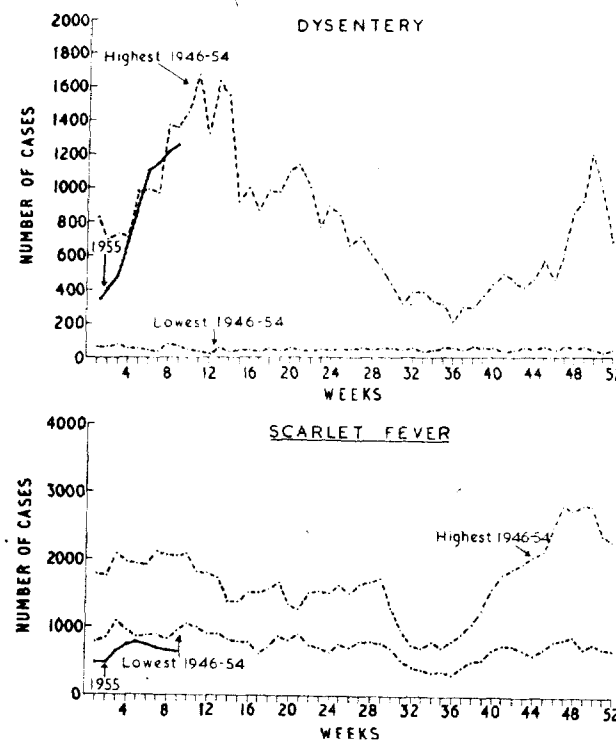
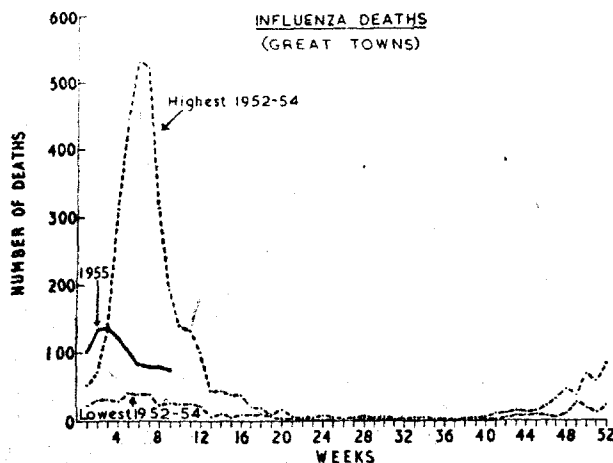
The largest increases in the incidence of measles were 718 in London, from 2,694 to 3,412, 551 in Yorkshire West Riding, from 3,335 to 3,886, 446 in Kent, from 986 to 1,432, 346 in Essex, from 1,392 to 1,738, 224 in Derbyshire, from 998 to 1,222, 195 in Warwickshire, from 1,579 to 1,774, 192 in Surrey, from 807 to 999, 192 in Middlesex, from 616 to 808, 146 in Nottinghamshire, from 1,275 to 1,421, and the only large fall was 124 in Hertfordshire from 319 to 195. 648 cases of scarlet fever were notified, being 27 fewer than in the preceding week, and no large variations were recorded in the trends. The largest rises in the incidence of whooping-cough were 53 in Lancashire, from 158 to 211, and 35 in Kent, from 80 to 115. 17 cases of diphtheria, 4 more than in the preceding week, were notified.

14 cases of acute poliomyelitis were notified. These cases were 2 more for both paralytic and non-paralytic cases than in the preceding week. The multiple notifications were Yorkshire West Riding 5 (Leeds C.B. 2) and London 2.

For the ninth consecutive week a rise has been reported in the number of notifications of dysentery. During the week reviewed 1,265 cases were notified, an increase of 28. The largest returns were Lancashire 524 (Blackpool C.B. 155, Oldham C.B. 115, Blackburn C.B. 102, Manchester C.B. 30, Liverpool C.B. 20, Royton U.D. 18, St. Helens C.B. 12, Chadderton U.D. 12, Darwen M.B. 12, Lytham St. Anne's M.B. 12), Northumberland 95 (Newcastle-upon-Tyne C.B. 30, Morpeth M.B. 19, Whitley Bay, M.B. 17), Yorkshire West Riding 85 (Huddersfield C.B. 29, Leeds C.B. 21), London 64 (Chelsea 9, Durham 62 (South Shields C.B. 10, Easington R.D. 10, Lanchester R.D. 10), Norfolk 50 (Norwich C.B. 30), Northamptonshire 47 (Northampton C.B. 31, Kettering M.B. 13), Leicestershire 37 (Leicester C.B. 24), Cheshire 37 (Stockport C.B. 22), Surrey 27 (Egham U.D. 13), Nottinghamshire 26 (Beeston and Stapleford U.D. 12, East Retford M.B. 10), Glamorganshire 26, and Yorkshire North Riding 20 (Middlesbrough C.B. 19).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the nine years 1946-54 (influenza, 1952-4) are shown thus -----, the figures for 1955 thus ————. Except for the curves showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Week Ending March 12

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 780, whooping-cough 1,881, diphtheria 9, measles 25,321, acute pneumonia 958, acute poliomyelitis 11, dysentery 1,407, paratyphoid fever 8.

Universities and Colleges

UNIVERSITY OF OXFORD

Theodore Williams Scholarships in Pathology have been awarded to Margaret R. Blears (Lady Margaret Hall) and Rosemary E. Troughton (Scholar of Somerville College).

In Congregation on January 20 the following medical degrees were conferred:

B.M.—W. G. Cowell, C. S. K. Ruck, D. Severs, Audrey M. Grumitt, and G. D. H. Lynne-Davies (in absence).

UNIVERSITY OF LONDON

In Convocation on January 8 it was announced that Dr. Patricia M. Elliott had been elected and Dr. C. A. H. Franklyn re-elected as representatives of the Faculty of Medicine on the Standing Committee of Convocation for a period of three years.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

Drs. W. R. Shanahan and O. M. P. Tobias were admitted to the Membership of the College on February 4 and Dr. K. M. Basu on March 4 (in absentia).

The Services

The *London Gazette* has announced the following awards:

Third Clasp to the Territorial Efficiency Decoration.—Brigadier A. L. Crockford, D.S.O., O.B.E., M.C., T.D., Q.H.S. (Honorary Colonel of a T.A. Unit).

Second Clasp to the Territorial Efficiency Decoration.—Major J. E. Elliott, T.D., R.A.M.C.

First Clasp to the Territorial Efficiency Decoration.—Captain (Honorary Major) H. E. Blake, R.A.M.C.

Territorial Efficiency Decoration.—Colonel R. W. Raven, O.B.E., Major (Honorary Lieutenant-Colonel) J. H. Haslett, Majors H. W. W. Good and G. H. Smith, Captains (Honorary Majors) E. W. O. Adkins, H. E. Blake, and H. S. Shucksmith, and Captain J. C. Cameron, R.A.M.C.

Medical News

Tetracycline on Prescription.—The Ministry of Health, Department of Health for Scotland, and Ministry of Health and Local Government, Northern Ireland, have arranged with the manufacturers concerned for tetracycline to be available on prescription from April 4. The Health Departments are advised by the Medical Research Council that tetracycline is suitable for the treatment of the same conditions as chlortetracycline ("aureomycin") and oxytetracycline ("terramycin"), and its toxicity is also similar, so that the same precautions should be observed in its employment (see the statement prepared by the Medical Research Council and printed in the *Journal* on October 23, 1954, p. 984).

Committee on Homosexuality and Prostitution.—The special committee of the B.M.A. which is preparing evidence for submission to the Departmental Committee on Homosexuality and Prostitution is considering whether there is any relationship between endocrine factors and some forms of homosexuality. For this purpose it wishes to invite the co-operation of medical practitioners who have among their patients homosexuals prepared to answer certain questions. Will any practitioner willing to assist kindly communicate with the Secretary of the Association, B.M.A. House? All information obtained will be regarded as confidential and anonymity will be preserved. The Secretary would also be glad to hear from practitioners with experience or information relevant to the committee's work.

David Anderson-Berry Prize.—The Royal Society of Edinburgh invites application for the 1956 David Anderson-Berry Prize, consisting of a silver-gilt medal and a sum of about £100. The prize will be awarded to the person who, in the opinion of the council of the Society, has recently produced the best work on the therapeutic effect of x rays on human diseases. Applications, which may be based on both published and unpublished work, must be in the hands of the secretary of the Royal Society of Edinburgh, 22, George Street, Edinburgh, 2, by March 31, 1956.

Alan Newton Prize.—The Royal Australasian College of Surgeons announces that the subject for the next Alan Newton Prize essay will be "The Pathogenesis and Surgical Treatment of Developmental Abnormalities of the Kidneys and Ureters." The prize is awarded biennially and is open to Fellows of the Royal Colleges of Surgeons of Australasia, England, Edinburgh, and Ireland, and to Fellows in Surgery of the Royal Faculty of Physicians and Surgeons of Glasgow. Essays, not exceeding 75,000 words in length, must reach the secretary of the Royal Australasian College of Surgeons (from whom further details may be obtained), Spring Street, Melbourne, C.I., by December 1, 1956.

Butterworth Gold Medal.—This is an award to be presented annually to the College of General Practitioners by Messrs. Butterworth and Company, the medical publishers, for an essay by a member or associate of the College on a subject connected with general practice. The subject for this year's essay is "The Influence of Home Conditions during the First Five Years of Life on the Physical and Mental Health of Children." Essays, identified by motto only and not exceeding 10,000 words, should be submitted to the chairman of the Awards Committee, College of General Practitioners, 14, Black Friars Lane, London, E.C.4, not later than September 30.

Buckston Browne Prize Essay.—The council of the Harveian Society of London has chosen "Hypertension" as the subject for the next Buckston Browne Prize Essay. The prize, consisting of a medal and £100, is open to any member of the medical profession "registered in the British Isles or Dominions" under the age of 45. The closing date for the receipt of essays is August 31, 1956. Further details

from the hon. secretaries of the society, 11, Chandos Street, Cavendish Square, London, W.1.

Welsh National School of Medicine.—Dr. A. T. JONES, senior administrative medical officer of the Welsh Regional Hospital Board, has been appointed Provost of the Welsh National School of Medicine in succession to Professor R. M. F. PICKEN, who is due to retire on September 30.

Chair of Biochemistry, Sheffield.—Dr. Q. H. GIBSON, at present reader in physiology at Sheffield, has been appointed to the vacant chair of biochemistry from April 1. He succeeds Professor H. A. Krebs, F.R.S., who left on his election last year to the Whitley Professorship of Biochemistry at Oxford. Dr. Gibson graduated at Queen's University, Belfast, in 1941, and from 1941 to 1947 was successively demonstrator and lecturer in physiology at Queen's. In 1947 he moved to the department of physiology at Sheffield. He is particularly interested in haemoglobin, and has published important papers on methaemoglobinemia.

Glasgow Medical Graduates near Sheffield.—Will those interested in forming a Sheffield Region Glasgow University Male Medical Graduates Association communicate with Dr. E. MILLAR, 5, Far Lane, Sheffield, 6?

National Spastics Society.—The society made £270,000 from its Christmas sales appeal at the end of last year. The appointment is now announced of a director-general (Lieutenant-Commander I. R. HENDERSON) to "direct and co-ordinate the increasing work of the society in connexion with its big development programme to help spastic children by opening new treatment centres and clinics throughout the country."

Sir Russell Brock has been awarded the West London Medico-Chirurgical Society's triennial gold medal. It will be presented to him at the annual banquet of the society on June 23 at the Royal College of Surgeons.

Sir Godfrey Huggins, C.H., F.R.C.S.—On February 26 we reported (p. 550) that the Queen had approved the conferment of a viscounty on Sir Godfrey Huggins, Prime Minister of the Federation of Rhodesia and Nyasaland. The name, style, and title are now announced as Viscount Malvern, of Rhodesia and of Bexley in the County of Kent.

COMING EVENTS

Edinburgh Medical Exhibition.—Professor D. M. DUNLOP will open the Edinburgh Medical Exhibition at the Assembly Rooms, George Street, at 11.30 a.m. on April 25. The exhibition will be open daily, 11 a.m. to 6.30 p.m. (7.30 p.m. on April 27), until April 29.

Fertility and Sterility.—Second World Congress will be held in Naples, May 18-26, 1956. Those wishing to contribute papers should get in touch with Dr. G. I. M. SWYER, Obstetric Hospital, University College Hospital, Huntley Street, London, W.C.1.

European Society of Cardiovascular Surgery.—The Fourth Congress will be held at Copenhagen on July 28 and 29, during the week of the International Society of Surgery. On the first day there will be a discussion on "Surgical Treatment of Chronic Pericarditis," and on the second a symposium on angiography will be held with the International Society of Surgery. The subjects of communications and discussions must be received before April 15 by the secretary-general—Dr. G. ARNULF, 41, rue Sainte-Hélène, Lyon, France. The local secretary of the Congress is Dr. A. Gammeltoft, Københavns Amts Sygehus, Copenhagen, to whom application for accommodation in Copenhagen should be made as soon as possible.

Association of Sea and Air Port Health Authorities.—The annual meeting will be held in London, June 8-10. Details from the hon. secretary, Dr. H. C. MAURICE WILLIAMS, Health Department, Civic Centre, Southampton.

NEW ISSUES

British Journal of Pharmacology and Chemotherapy.—The new issue (Vol. 10, No. 1) is now available. The contents include:

- THE MODE OF ACTION OF ANTIHYDROD DRUGS: FURTHER OBSERVATIONS ON IN VITRO INHIBITION OF OXIDATIVE PROTEIN JODINATION.** Russell Fraser, M. G. W. Hanco, and W. R. Pinney.
- IN VITRO TESTS OF CHEMICAL COMPOUNDS ON ASCARIS LUMBRICOIDES AND FASCIOLA HEPATICA.** A. Mackie, G. Marjorie Stewart, A. A. Cuder, and A. L. Misa.
- THE EFFECT OF ANTI-CHOLINESTERASE AGENTS ON THE RAT'S BLOOD PRESSURE.** P. Dirnhuber and H. Cullumbine.
- STUDIES ON THE TOXICITY OF ALKYL TIN COMPOUNDS.** H. B. Stoner, J. M. Barnes, and Janet I. Duff.
- A CORRELATION BETWEEN CHOLINESTERASE INHIBITION AND INCREASE IN MUSCLE TONE IN RABBIT DUODENUM.** Heather Shelley.
- THE ISOLATED HEART OF MYA ARENARIA AS A SENSITIVE PREPARATION FOR THE ASSAY OF ACETYLCHOLINE.** Brodie Hughes.
- THE EFFECTS OF ADRENALINE, NORADRENALINE, AND DIHYDROERGOTAMINE ON EXCISED HUMAN MYOMETRIUM.** William J. Gartell.
- THE EFFECT OF NALORPHINE ON THE ANTI-DIURETIC ACTION OF MORPHINE IN RATS AND MEN.** H. Schniedner and E. K. Blackmore.
- HISTAMINE RELEASE AND THE "STRESS" PHENOMENON.** P. A. Nasmyth.
- THE FORMALDEHYDE DERIVATIVES OF AMINO ACIDS AND THE MODE OF ACTION OF A FORMALDEHYDE-TYROSINE DERIVATIVE AGAINST INFLUENZA A VIRUS IN OVO.** Lois Dickinson.
- THE ACTION OF LYSERGIC ACID DIETHYLAMIDE ON MAMMALIAN CHOLINESTERASES.** R. H. S. Thompson, A. Tickner, and G. R. Webster.
- CARDIOVASCULAR AND RESPIRATORY ACTIONS OF 5-HYDROXYTRYPTAMINE IN THE CAT.** S. R. Kotteroda and Joan C. Mott.
- ANTITUBERCULOUS EFFECTS OF CERTAIN SURFACE-ACTIVE POLYALKYLENE ETHERS.** J. W. Cornforth, P. D'Arcy Hart, G. A. Nicholls, R. J. W. Rees, and J. A. Stock.
- HISTAMINE RELEASE IN RABBIT BLOOD BY DEXTRAN AND DEXTRAN SULPHATE.** C. G. Haining.
- THE SPASMODIC PROPERTIES OF THIOPHENYLIC ACID ESTERS AND RELATED COMPOUNDS.** M. W. Parkes.
- THE EFFECT OF COMPOUND 48/80 ON GANGLIONIC TRANSMISSION.** S. B. Gertner.
- THE EFFECTS OF SODIUM SALICYLATE ON BLOOD GLUCOSE IN THE RAT.** M. J. H. Smith.
- THE THERAPEUTIC ACTIVITY OF SOME SULPHONES AND SULPHOXIDES IN EXPERIMENTAL TUBERCULOSIS OF GUINEA-PIGS.** S. K. Gupta and R. N. Chakravarti.
- OBSERVATIONS ON Ω -AMINO-POLYMETHYLENE TRIMETHYLAMMONIUM COMPOUNDS.** R. B. Barlow, H. Blaschko, Jean M. Humms, and U. Trendelenburg.
- THE ACTION OF HETEROCYCLIC BISQUATERNARY COMPOUNDS, ESPECIALLY OF A PYRROLIDINIUM SERIES.** D. F. J. Mason and R. Wien.

Issued quarterly; annual subscription £4 4s.; single copy 25s.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

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

Monday, March 28

- INSTITUTE OF ORTHOPAEDICS.**—5 p.m., Dr. W. R. Bett: Medical Writing—The Use of Medical Libraries and the Preparation of Papers for Medical Journals.
- MEDICAL SOCIETY OF LONDON.**—8.30 p.m., discussion to be introduced by Dr J. T. Ingram and Dr. C. Allan Birch: Cutaneous Manifestations of General Disease.
- ROYAL COLLEGE OF SURGEONS OF ENGLAND.**—5.15 p.m., Mr. E. G. Muir: Treatment of Cancer of the Rectum; 6.30 p.m., Mr. N. R. Barrett: Mediastinal Tumours.

Tuesday, March 29

- INSTITUTE OF DERMATOLOGY.**—5.30 p.m., Dr. P. M. F. Bishop: Steroid Therapy.
- MIDDLESEX COUNTY MEDICAL SOCIETY.**—At North Middlesex Hospital, Silver Street, Edmonton, N., 3 p.m., clinical meeting.
- ROYAL COLLEGE OF SURGEONS OF ENGLAND.**—5.15 p.m., Mr. Rodney Smith: Treatment in Acute Intestinal Obstructions; 6.30 p.m., Professor R. McWhirter: Tumours of High Radiosensitivity.
- ROYAL STATISTICAL SOCIETY: STUDY CIRCLE ON MEDICAL STATISTICS.**—At Westminster Medical School, 6 p.m., Dr. C. J. Donellan, Dr. K. W. Cross, and Professor R. M. Tumuss: Hospital Statistics: A Discussion of Ends and Means.
- WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.**—5.30 p.m., Mr. G. C. Knight: Diagnosis and Treatment of Facial Pain and Trigeminal Neuralgia.

Wednesday, March 30

- INSTITUTE OF DERMATOLOGY.**—5.30 p.m., Dr. R. W. Riddell: Trends in the Study of Mycotic Diseases.
- INSTITUTE OF UROLOGY.**—4.30 for 5 p.m., Dr. E. G. B. Calvert: Surgery and the Diabetic.
- LONDON UNIVERSITY.**—At St. Thomas's Hospital Medical School, 5 p.m., special university lecture in pharmacology by Professor Mark Nickerson (Maritoba): Specific Inhibition of Adrenergic Responses.
- MANSFIELD MEDICAL SOCIETY.**—At Mansfield and District General Hospital, 8.30 p.m., Dr. C. M. Fletcher: Miners' Lung. Members of the Nottinghamshire Branch, B.M.A. are invited.
- ROYAL COLLEGE OF SURGEONS OF ENGLAND.**—5.15 p.m., Professor R. S. Pilcher: Pathology and Treatment of Bronchiectasis; 6.30 p.m., Mr. D. J. Browne: Congenital Dislocation of the Hip.
- ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.**—3.30 p.m., Mr. I. Minton: Prevention of Blindness in Infancy and Childhood (illustrated).
- ST. MARYLEBONE HOSPITAL FOR PSYCHIATRY AND CHILD GUIDANCE.**—5.30 p.m., Dr. J. Flint: Psychosomatic Disorders.

Thursday, March 31

- INSTITUTE OF DERMATOLOGY.**—5.30 p.m., Dr. W. R. Bett: Medical Writing.
- LIVERPOOL MEDICAL INSTITUTION.**—8 p.m., annual meeting; 8.30 p.m., Mr. R. Roaf: Hospitals and Medical Schools in India.
- ROYAL ARMY MEDICAL COLLEGE.**—5 p.m., Dr. B. E. Schlesinger: Indications for Cortisone Therapy in Paediatrics.
- ROYAL COLLEGE OF SURGEONS OF ENGLAND.**—5.30 p.m., Otolaryngology Lecture by Professor Lambert Rogers: Vascular Diseases in Relation to Otolaryngology.
- ROYAL COLLEGE OF SURGEONS OF ENGLAND.**—6.30 p.m., Mr. T. Holmes Sellers: Constrictive Pericarditis.
- ROYAL EYE HOSPITAL.**—5.30 p.m., Dr. T. H. Whittington: Some Aspects of Refraction Work: (6) Hypermetropic and Myopic Patients Compared.
- SOCIETY OF ANAESTHETISTS OF SOUTH WALES.**—At Seabank Hotel, Porthcawl, 7.30 for 8 p.m., (1) Dr. E. Harvey Franks: Intra-arterial Thiopentone; (2) Professor W. W. Mushin: Trilene Analgesia in Midwifery; (3) Dr. W. W. Mapleson, Ph.D.: Things Aren't Always What They Seem; (4) Dr. H. G. Middleton: Anaesthesia in the Treatment of Burns.

Friday, April 1

- INSTITUTE OF DISEASES OF THE CHEST.**—5 p.m., radiological demonstration by Dr. Franklin G. Wood.
- ROYAL COLLEGE OF SURGEONS OF ENGLAND.**—5.15 p.m., Mr. N. C. Tanner: Treatment of Cancer of the Stomach; 6.30 p.m., Mr. E. W. Riches: Retention of Urine.
- SOCIETY OF MEDICAL OFFICERS OF HEALTH: WELSH BRANCH.**—At B.M.A. House, 195, Newport Road, Cardiff, 6.30 p.m., joint meeting with West of England Industrial Medical Officers. Discussion: Foot Hygiene. Speakers: (a) Mr. Gwyn James, (b) an Industrial Medical Officer, (c) a representative of the British Boot, Shoe, and Allied Trades Research Association.
- WHITTINGTON CLINICO-PATHOLOGICAL SOCIETY.**—At Archway Wing, Whittington Hospital, N., 5.15 p.m., demonstration by Dr. A. L. Jacobs. Illustrated lecture by Mr. W. W. Davey: Is Your Gastrectomy Really Necessary?

Saturday, April 2

- MIDLAND TUBERCULOSIS SOCIETY.**—At King Edward VII Memorial Sanatorium, Hertford Hill, near Warwick, 3 p.m., clinical meeting and annual general meeting.

APPOINTMENTS

- HOSPITAL FOR SICK CHILDREN,** Great Ormond Street, London, W.C.—Aileen B. Donison, M.B., B.Chir., Assistant Resident Medical Officer, Tadworth Court; Barbara G. Ockenden, M.B., B.S., Assistant Morbid Anatomist; G. C. Lloyd-Roberts, M.B., F.R.C.S., Part-time Consultant Orthopaedic Surgeon; Dragomir Vuckovic, House-physician to Neurological and Neurosurgical Department; J. A. Cheese, M.D., D.C.H., and Rosemary Stephens, M.B., B.S., D.C.H., House-physicians; F. N. Bamford, M.B., Ch.B., House-surgeon.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

- Abraham.**—On March 12, 1955, at the Bristol Maternity Hospital, to Beryl (formerly May), wife of Dr. Ross Abraham, a sister for Lindsay—Susan Diane.
- Bird.**—On March 11, 1955, at the Jessop Hospital for Women, Sheffield, Yorks, to Nora (formerly Bateman), wife of Dr. Julian Bird, a daughter.
- Carstairs.**—On March 5, 1955, to Jean (formerly Dutton), wife of Captain J. R. L. Carstairs, R.A.M.C., British Military Hospital, Up Park Camp, Kingston, Jamaica, British West Indies, a son—Andrew James.
- Herrman.**—On March 14, at Crickhowell, Brecon, to Betty Howarth, M.B., M.R.C.P., wife of G. J. S. Herrman, M.B., a daughter.
- Roche.**—On March 4, 1955, at St. Teresa's Maternity Hospital, Wimbledon, London, S.W., to Susan (formerly Margaret), wife of Dr. G. K. T. Roche, a brother for Patricia, Peter, and Stephen.

DEATHS

- Holker.**—On February 25, 1955, at Withington, Glos, John Holker, M.D., D.Sc., late of Manchester, and Florida, U.S.A.
- Hyslop.**—On February 23, 1955, at Newcastle-upon-Tyne, Vincent Hyslop, M.R.C.S., L.R.C.P., of Newcastle, and 3, Prince Edward Mansions, London, W., aged 61.
- Low.**—On March 4, 1955, at Muirlands, Larbert, Stirlingshire, Nathan Chaim Low, M.D., aged 43.
- Macdonald.**—On February 10, 1955, in a nursing-home, Chrisslelle Macdonald, M.B., Ch.B., of "Dornoch," Golborne, near Warrington, Lancs.
- Macpherson.**—On March 3, 1955, at 9, Bellevue Crescent, Edinburgh, Alexander Macpherson, M.B., Ch.B., late of Accra, Gold Coast.
- Martin.**—On February 20, 1955, at Weston-super-Mare, Somerset, Philip Stanley Martin, M.C., M.R.C.S., L.R.C.P., aged 69.
- Moorhead.**—On February 26, 1955, at "Nantail," Tower Road, Jersey, C.J. John Moorhead, L.R.C.P.&S.Ed., L.R.F.P.S., aged 88.
- Nuttall.**—On February 19, 1955, at Rivermead, Rickmansworth, Herts, Arthur Peel Nuttall, M.D., late of Bury, Lancs, aged 85.
- Palmer.**—On February 26, 1955, at his home, 14, Windlesham Road, Brighton, Charles Spencer Palmer, M.R.C.S., L.R.C.P., late of Redhill, and Torquay, aged 88.
- Parsons.**—On March 4, 1955, at Kirkcudbright, Wilfred Parsons, M.R.C.S., L.R.C.P., Major, R.A.M.C., retired, of Colchester, Essex, aged 76.
- Powell.**—On February 27, 1955, at Pemberton House, Hay, Hereford, Hubert Wybrants Powell, L.R.C.P.&S.Ed., L.R.F.P.S., formerly of Passage West, Co. Cork.
- Reed.**—On February 20, 1955, at The Vicarage, Westbury-on-Trym, Bristol, William Henry Reed, L.M.S.S.A., formerly of Charlton, London, S.E., aged 90.
- Russ.**—On February 26, 1955, Charles Russ, M.B., of 7, Carlton Road, Ealing, London, W.
- Scruby.**—On March 2, 1955, Zilla Mary Scruby, M.B., B.S., D.P.H., of "Corrie," 21, Newton Road, Cambridge.
- Shipsey.**—On March 4, 1955, at Hospital of St. John and St. Elizabeth, London, N.W., William Edward Shipsey, L.R.C.P.&S.I. & L.M., of Beckenham, Kent.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Breads for Diabetics

Q.—Which of the various kinds of special breads is best for diabetics?

A.—There is not a great deal of difference between the carbohydrate values of the various proprietary diabetic breads. They vary from about 10 to 14 g. of carbohydrate per ounce (28 g.) compared with about 12.5 g. for wholemeal and 15.2 g. for white bread. The chief advantage of the special breads is that they are lighter in texture so that a greater bulk goes to the ounce. For example, four slices of one brand of diabetic loaf contain about 10 g. of carbohydrate, which is the same as one small slice of ordinary bread. The choice of bread for any individual diabetic is a matter of taste, but it should be realized that whichever bread is used the actual weight eaten for a given carbohydrate intake will not vary much, although the size of the slices may.

Head Lice

Q.—What is the most effective (a) prophylactic and (b) curative treatment for a girl, aged 7, who is being constantly reinfected at school by other children harbouring head lice? The child is clean, from a good home, and well cared for.

A.—It is not definitely known how, or to what extent, lice spread among children at school. One possibility is the use of communal hair brushes and combs, and if they are provided by the school in question the girl should be told not to use them. A short and easily combed hair style might be adopted as being less liable to become infested.

The best treatment for head lice is a thorough combing with a fine-toothed metal comb (a "Sacker" comb) to remove nits, followed by the application of an efficient insecticide. One of the best is 0.2% aqueous suspension of gammabenzene hexachloride (lindane); 2% dicophane (D.D.T.) emulsion is nearly as good. About 5–15 ml. is applied and rubbed in. The insecticide is imperceptible and should not be washed off for a week, when a further treatment is applied after a shampoo.

These insecticides could be applied regularly as prophylactics, though it is unfortunate that this should be necessary. If the girl's medical adviser is convinced that school is the source of the trouble, he might bring the matter to the attention of the school medical officer.

Prognosis and Treatment of Asthma in Children

Q.—May I seek your advice on the prognosis of asthmatic bronchitis in children and its treatment? My son, 3 years old, started the attacks a year ago after whooping-cough. The attack begins with coryza, then cough, and within a day or two wheezing and dyspnoea develop. He is also subject to urticaria. As the attack progresses the respiratory rate drops slowly to reach normal within two days. Chest radiography showed increased hilar shadow.

A.—The prognosis of asthmatic bronchitis in children is good, especially so under favourable environmental circumstances. Collins¹ in the United States has shown that the annual case rate for asthma decreases from 3.3 per 1,000 in the under 5 years of age to 0.7 per 1,000 in the age group 15–19 years (based on records of 9,000 families in 18 States visited periodically for twelve months).

Prophylactic treatment is based on reducing the tendency to nasopharyngeal and chest infection. Adequate sleep, avoidance of excessive excitement and over-tiredness, adequate vitamins, prevention of chilling by correct clothing

and warmth in the bedroom in the colder months, together with the avoidance of transference of colds from other members of the family by correct hygiene are basic requirements. It is unlikely for there to be any focus of infection in the upper respiratory tract at the age of 3 years, but the advice of an E.N.T. specialist might be obtained. Vaccines are of doubtful value. Prophylactic antibiotic therapy is perhaps best left as a last resort until all other measures have failed, and one should bear in mind the natural tendency to improve. The possibility of extrinsic allergens, foods and inhalants, playing a subsidiary or even occasionally precipitating part must be considered, especially in a child with urticaria; nor should the psychological factor be overlooked.

The treatment of the attack should start at the onset of the coryza, when there is presumably a temperature, with warmth and plenty of fluids and glucose. Antibiotics (preferably by mouth) should be given early on, at least as soon as the cough develops, and continued until the attack and temperature have ceased. The usual treatment with ephedrine and expectorants, to relieve spasm and liquefy the sputum, should also be started as soon as the cough and wheeze occur.

REFERENCE

- ¹ Collins, S. D. (1935). *Publ. Hlth Rep. (Wash.)*, 50, 1404.

Sterilizing Infected Laundry

Q.—As an economy measure all laundry from a fever hospital is in future to be sent to a communal laundry for hospitals in the group. Prior to dispatch it must be "suitably sterilized." What method is recommended? One view is that a formalin candle would be sufficient.

A.—The procedure advised in the Medical Research Council Memorandum *The Control of Cross Infection in Hospitals* (Memorandum No. 11, 1951) is soaking overnight in a 1 in 160 solution of an efficient disinfectant of the "white fluid" type. Exposure to a low concentration of formaldehyde at room temperature, besides being more difficult to provide for, would probably fail to disinfect heavily soiled linen.

Fertility in Unilateral Cryptorchidism

Q.—A man of 35 with one undescended testicle, untreated, wishes to marry. The penis, the testicle present, and the secondary sexual characteristics appear normal. He has never had intercourse, but experiences desire and has had erections. His general health and development are satisfactory. Is he likely to be normally potent, and what is the prognosis as regards fertility? Is any treatment or investigation recommended? He is one of four children, and his fiancée comes from a fairly fertile family.

A.—From the information given, there seems no reason to doubt that this man would be normally potent, but the prognosis as regards fertility is less certain. If, in fact, the scrotal testis is normal, then he should be normally fertile, but it is a matter of experience that the scrotal testis in a case of unilateral cryptorchidism is often dysplastic to a varying extent even though it may always have been fully descended.

On the whole I would advise against investigation at this stage, since the decision to marry should not be contingent upon the certainty of fertility. If, however, the patient has other views, then of course a seminal analysis should settle the point.

"Ronicol"

Q.—Can you please tell me what are the dangers of, and contraindication to, giving "ronicol" a trial in the treatment of baldness?

A.—"Ronicol" (β -pyridyl carbinol) has a dilating effect upon the small arteries and arterioles. This lowers the peripheral vascular resistance and tends to lower the blood pressure. Large doses may therefore produce giddiness, faintness, or vasovagal attacks. The dosage should be small to start with and later increased, provided no

signs of intolerance are shown. It is usual to start with 25 mg. orally four-hourly and later increase it to 50 mg.

There are no particular contraindications to the use of this drug in otherwise healthy individuals, but it would be unwise to take the drug immediately before a hot bath, as the risk of a vasovagal attack would then be greater.

The observation that a good crop of hair grew on the bald scalps of two patients under treatment with ronicol for intermittent claudication¹ does not seem to have been repeated. Had the beneficial effect of this drug on baldness been established there would be no lack of reports about it, and it seems reasonable to suppose, therefore, that the growth of hair must have been coincidental.

REFERENCE

¹ *British Medical Journal*, 1954, 2, 648.

Electrical Alternation in the E.C.G.

Q.—What is the significance of electrical alternation seen in the E.C.G.? Can it occur as an isolated phenomenon, and, if so, what significance does it then have?

A.—This is a fatigue phenomenon and probably means that not all the myocardium can respond every time to each stimulus. It is not uncommon with very fast rates, but occurring with slower rates it means myocardial disease. It is unlikely to be met with as an isolated phenomenon.

Treatment of Cyclical Agranulocytosis

Q.—Is there any known treatment which is effective for cyclical agranulocytosis? The condition has been present for 18 months in a boy of 8. Splenectomy has been considered, but in view of its uncertainty postponed. The matter is one of urgency, as the child's life is endangered during each incident of neutropenia, in some of which the granulocyte count falls to nil.

A.—There is no effective specific treatment for cyclical agranulocytosis, so far as the writer knows. A.C.T.H. has been used in several patients, but does not seem to be of benefit.¹ However, according to Reimann and de Berardinis,² who reviewed 16 cases, splenectomy produced amelioration of the symptoms or in the severity of the neutropenia in four out of six patients. There also appears to be a possibility of spontaneous improvement, and, if it is decided not to proceed with splenectomy, palliative treatment with antibiotics to cover the periods of agranulocytosis seems to be the best that can be done.

REFERENCES

- ¹ Chaiken, B. H. (1954). *Blood*, 9, 83.
² Reimann, H. A., and de Berardinis, C. T. (1949). *Ibid.*, 4, 1109.

NOTES AND COMMENTS

Oversexed Women.—Dr. MARGUERITE STEWART (London, S.W.4) writes: The reply in "Any Questions?" on oversexed women (February 26, p. 553) is deeply disturbing. It shows the wide cleavage between the materialistic and the Christian approach. To support masturbation as the answer is defeatist, leaving the person feeling degraded at being encouraged to regard a standard of behaviour which she feels less than the highest as adequate for her. In over 25 years of handling of every type of human problem in general practice, I have seen that the miracle of change and victory is possible. This needs to be stated.

Dr. J. KOHARI (London, S.E.11) writes: I was perturbed to note the ignorance of your expert on the problem of the oversexed woman ("Any Questions?" February 26, p. 553). After treating the patient with phenobarbitone and ethisterone he indulged in the praise of masturbation, using the Kinsey report as an authority. Does he suggest this as medical advice, or, if not, why mention it? This is a straightforward example of crooked thinking, because masturbation is connected with sexual stimulation and it is the sexual excitement that we want to cure. The breathlessness of those with congestive cardiac failure is not treated with climbing stairs, or the heartburn of those with peptic ulceration is not treated with irritating spices. Further, let us have the facts right. I would be interested to know whether the 96% of males or 60% of females who in the Kinsey report are said to masturbate applies to those who continuously indulge in this procedure throughout life or do so for a short period, perhaps during puberty while they actually discover the function of

their own body. The oversexed woman cannot be treated with tablets alone without regard to the background of her life. I refer to the reading of stories obsessed with sex and the viewing of similar motion-pictures. I do not wish to be misunderstood. I do not wish to limit anyone in these entertainments, but if my professional advice is sought on the treatment of sexual hyper-excitability then I should advise against them. Nor is this all. This is the negative side of the question. The patient should be told to find other activities—for example, sports, hobbies, social work, etc.—which will divert her mind and sap her unlimited energies. Also it is not a bad idea to have children, as they will probably provide an object for her adoration and an additional outlet for her trouble.

Dr. J. W. DIGNAN (London, E.7) writes: It is regrettable that the note on oversexed women (February 26, p. 553) should, in a medical journal, occupy itself with morals and should proclaim masturbation to be a normal activity free from moral or psychological stigma. One cannot but be startled by the assertion that "such advice would probably be given by most present-day psychiatrists." Surely psychology ranks masturbation as a symptom of an immature personality.

OUR EXPERT writes: I am sorry that my brief comment on masturbation in oversexed women should have caused offence to some readers. My reply was designed for doctors. It seemed reasonable, therefore, to dismiss quite shortly the obvious, time-honoured advice—which Dr. Kohari rightly stresses—by my sentence, "Sensible advice about behaviour, masturbation, and the avoidance of alcohol would doubtless also help." Indeed, every doctor must know that one advises "sports, hobbies, and social work" to men or women who suffer from sexual strain; and for married women childbearing is normally the best solution.

I assumed from the wording of the question that it related to unmarried women, and anyone who advises students and young people will know how, in some cases, the degree of effort needed to suppress sexual tension may be so great as to become in itself almost a whole-time task. For such a person I suggested that it might be better to accept the natural relief of masturbation rather than to be obsessed by a physiological tension which self-discipline, overwork, and over-exercise cannot really suppress. In Victorian times the condemnation of self-relief reached, in this country, fantastic levels: the young were threatened with insanity, impotence, and so on if they indulged in it. Surely thoughtful people nowadays take a more rational attitude. It is often possible for the doctor to give infinite relief by reassuring a patient that this practice will not have damaged his or her future marital capacities.

Dr. Dignan misrepresents what I wrote. I did not state that masturbation is "free from moral and psychological stigma," but I suggested that it might be considered "normal in the celibate adult," although "admittedly the question is a complex one." Dr. Dignan implies that there are absolute standards in matters of psychological maturity: a point of view with which I should not, personally, agree. If a married person prefers masturbation to sexual congress, one would obviously diagnose a condition of psycho-sexual immaturity. But situations differ. Troops when overseas and away from their wives quite often resort to masturbation in preference to infidelity, and that surely does not brand them as immature personalities.

Correction.—Dr. M. I. Drury's address at the foot of his letter on isophane insulin (*Journal*, March 19, p. 730) should have been given as Dublin, not Sunderland.

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THE PAEDIATRICIAN'S PART IN THE MATERNITY SERVICES*

BY

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If one turns back to the middle of the eighteenth century the early Bills of Mortality give some idea of the appalling threat to infant life at that time. For instance, during the period 1730-49 almost 75% of the children born in London died before the age of 5 years. No one would contend that the Bills of Mortality presented a fully accurate picture, and at that time there was, of course, no subdivision of infant deaths into neonatal and post-natal groups. But it is reasonable to assume that stillbirths and neonatal deaths were at that time at a level that constituted a national menace. Fortunately for this country, as Sir George Newman indicated in his Charles Heath Lectures (1932), a generation of brilliant general physicians arose during the eighteenth century—men like Mead, Heberden, Haygarth, and Jenner, whose clinical abilities were backed up by a wealth of sound common sense that encouraged them to introduce "preventive" ideas. Some of these men, like Lettsom and Cadogan, called attention to the very high rate of mortality among infants; and the former, in his *Medical Memoirs* (1774) commented upon improvements noted, even at that time, in these words: "In the nurture and management of infants as well as in the treatment of lying-in women, the reformation hath equalled that in the small-pox; by these two circumstances alone incredible numbers have been rescued from the grave."

It was in the same century that the obstetrician (or man-midwife) began to exert a significant influence—men like William Smellie and that famous son of Manchester Charles White, who published in 1773 his remarkable volume *On the Management of Pregnant and Lying-in Women, and the means of curing, but more especially of preventing, the principal disorders to which they are liable*. He strongly recommended antenatal supervision of the mother, and he is therefore entitled to an important place in the history of preventive neonatal paediatrics.

The next major event in the history of my subject was the arrival upon the scene of some of the leaders in public health. Again we find a Manchester man playing a highly important part. Edwin Chadwick—not a doctor—held the office of Secretary to the Poor Law Commission, and in 1842 there appeared his monumental

*Lloyd Roberts Lecture delivered at Manchester on November 23, 1954.

report on the conditions under which the labouring classes lived. This caused a great sensation: the Government set up a Royal Commission in 1843 to consider the facts which had been brought to light, and cities and districts began to appoint medical officers of health. Perhaps I may be permitted to remind you that Liverpool set a fine example in 1847, when she appointed a man of great distinction, Dr. William Duncan, to be the first medical officer of health in the country (Frazer, 1947). Britain was awakening to the need for a co-ordinated attack upon the causes of ill-health in general, and the Board of Health, which might perhaps be described as the great-grandfather of our Ministry of Health, was set up in 1849.

At that time Dr. Lloyd Roberts was 14 years of age, and it is a remarkable fact that his long life in active practice stretched right through the successive eras of the Medical Department of the Privy Council (which in a general sense succeeded the Board of Health), the Local Government Board (1871), and the first year or so of the Ministry of Health (1919). I have no doubt that Lloyd Roberts—a man of alert, progressive mind—read the very able reports prepared by John Simon (later Sir John Simon) when he was Officer in Charge of the Medical Department of the Privy Council, and by Dr. William Farr, who, in 1839, had been appointed Compiler of Abstracts in the newly opened General Register Office. In so far as child health was concerned, it was natural that these men should be occupied mainly with environmental causes of disease—such as sanitation, food, employment, and so forth: but we should particularly note that Farr referred to prematurity as a serious problem, and he stressed not only that infant morbidity should be taken into account as well as infant mortality, but also that more accurate clinical and pathological diagnosis was needed. Both Farr and Simon were far-seeing, courageous workers who never hesitated to express their views in unequivocal terms. It was largely through their remarkable reports that doctors, and the public, began to think constructively about foetal and neonatal mortality and morbidity.

Concern With Infant Mortality

During the last quarter of the nineteenth century there was increasing concern that the downward trend of infant mortality was lagging behind the much more

satisfactory decline of the general death rate. Furthermore, as Chalmers (1918) pointed out, the steady fall of the birth rate was tending to emphasize the comparatively stationary infant mortality rate; and the similarity between the known causes of infant mortality and of physical inefficiency among the survivors began to receive more attention. It is interesting to note, also, that the several commissions of inquiry held after the South African War of 1899-1901 underlined, perhaps rather indirectly, that the health of young children still left much to be desired and was worthy of closer attention. At all events, in the early years of the present century there were several national conferences on infant mortality, and gradually interest became focused upon the mortalities of the early weeks of life, as distinct from those occurring in the subsequent months of the first year.

Indeed, when the seventeenth International Congress of Medicine was held in London in 1913 the Section of Obstetrics and Gynaecology, under the Presidency of Sir Francis Champneys, and with Dr. Lloyd Roberts as one of the Vice-Presidents, held a full discussion on "Infant Mortality in the First Four Weeks of Life." The opening paper was by Dr. Henry Koplik, of New York, and in a masterly address he emphasized, among other things, the close relationship existing between the ills of the newly born baby and the health of both his parents. People were asking whether there might not be fundamental differences between ill-health due to congenital disorders on the one hand, and environmental causes on the other; the threats of nature as distinct from those of nurture, as it was sometimes expressed.

The time was ripe for detailed studies of foetal pathology to be undertaken, and it was fortunate for the further progress of the subject that this work was already in hand in Edinburgh, and that the investigator was an obstetrician, Dr. J. W. Ballantyne. There can be no doubt that he did more than anyone else in his time to preach the essential unity of the mother and her unborn child, with the placenta as go-between; and he gave practical expression to his teaching when he proposed that there should be "pre-maternity" units, with careful antenatal supervision of the mother, not only in her own home but at clinics.

It was my good fortune to know Ballantyne in the later years of his active life, and I am but one of many indebted to him for his guidance and inspiration. The immense experience of foetal and neonatal pathology that he had accumulated, recorded in his two great volumes on antenatal pathology and hygiene (1902-1904) was available to those who took up this line of attack upon the mortalities of antenatal and neonatal life. To quote Ballantyne's own words: "I began this work in a spirit of something very like active curiosity; I have prosecuted it with an ever-deepening interest, and I have brought it thus far with the growing sense that I have been dealing with a subject of tremendous importance for the future of the race and the individual, with, in fact, preventive medicine in its simplest and most hopeful because in its earliest aspects." These are the words of a true pioneer, and among those who came after him I give first place to Eardley Holland (now Sir Eardley Holland), whose brilliant studies of cranial stress in the foetus (Holland, 1920, 1922) had the double effect of guiding obstetrical practice and of encouraging the promotion of further work upon foetal and neonatal pathology.

Public Reaction

By the end of the first world war in 1918 public opinion was reacting strongly and constructively to the terrible loss of about one million young lives during the preceding four years; and in official circles note was being taken of the fact that during the last quarter of 1918, for the first time since the establishment of civil registration, there was an excess of deaths over births amounting to 79,443. Sir Walter Fletcher, Secretary of the Medical Research Council, had appreciated the significance of Holland's work, and his Council sponsored a scheme of pathological investigation of stillbirths and neonatal deaths in a number of centres (London, Edinburgh, Glasgow, Cardiff, and Liverpool, where I was fortunate to be the worker), and a joint report was published (Holland and Lane-Claypon, 1926).

Perhaps the greatest benefit that came from this 1919-23 epoch was that it stimulated the medical profession to take a much closer and more detailed interest in babies and the dangers which threatened them before, during, and immediately after birth. And as a natural consequence obstetricians saw to it that children's physicians with special experience of the newly born were invited to become associated with them in their work. This was indeed a novel development of the greatest significance, for it meant that individual status was to be accorded, in a practical way, to newly born babies, who from then onwards were to be regarded as *persons* entitled to enjoy the care of doctors specially charged with this duty.

I should like, on behalf of my fellow paediatricians, to express our gratitude to the obstetricians for the generous and friendly welcome they extended to us when we began to encroach upon their field of activity. If it is true that in their own early history obstetricians thought it discreet to enter the lying-in chamber on all fours, I have no doubt that their professional ability and tact soon gave them entitlement to assume the erect position. But having achieved this more comfortable posture, they might reasonably have expected to be able to advance boldly across the room without over-the-shoulder glances to see whether another figure was creeping along in the rear. All the more credit, then, to the broadmindedness and wisdom of obstetricians. I, personally, can never be grateful enough for the happiness I have enjoyed and the interest I have found in working with them. And it is highly satisfactory to note that the relations between the Royal College of Obstetricians and Gynaecologists and the British Paediatric Association have always been cordial, and have led to useful results.

Scope of the Paediatrician

The paediatrician is now firmly established as an essential member of a team which also includes obstetrician, general practitioner, and medical officer of health; he is held mainly responsible for the specialist paediatric care of newly born babies, both in maternity units and, when required, in domiciliary midwifery. His scope has widened out of all recognition during the past 30 years, as I know from personal experience; and during the same period many factors, including better obstetrics, more enlightened nursing care, and a general upgrading of the social, environmental, economic, and dietetic circumstances of the mothers, have combined to cause a considerable decline of the stillbirth rate and the neonatal mortality rate. The neonatal morbidity rate is more difficult to measure than the mortality rate, but I am convinced that with the exception of neonatal infection—to which I refer later—there has been a corresponding improvement. Even congenital malformations, which are probably no less frequent than formerly, now cause less anxiety because the prospects of effective treatment are much more hopeful, provided that diagnosis is made early and accurately and that highly skilled specialist aid is available.

As it will be necessary for me to call attention to some of the less satisfactory conditions under which our paediatric work is done in maternity hospitals, let me first try to

maintain a proper sense of proportion by giving you a brief statement summarizing the outcome when 1,000 babies (including hospital and domiciliary cases) are born in a large city like Liverpool. I think you will agree that in a general sense the results are satisfactory—in fact, very satisfactory in comparison with former times, yet undoubtedly capable of being improved. Taking the year 1950 as my example, 963 of the 1,000 babies survived not only the neonatal period but the whole of the relatively dangerous first year of life. (For comparison, it may be pointed out that in 1920 only 920 of these babies would have lived longer than one year.) Some 20 of the 1,000 babies died during the neonatal period and 11 or 12 of them had been born prematurely. In addition to the 20 neonatal deaths, there was an additional loss of 17 babies during the remainder of the first year.

About 80 of the 1,000 babies were born prematurely, and 11 or 12 of them died in the neonatal period. Babies with a birth weight under 4½ lb. (2 kg.) are in need of special care and supervision, and 35 (44%) of the 80 came into this category.

When considering loss of infant life associated with pregnancy, labour, and the neonatal period one must also take stillbirths into account. In 1950 there were in Liverpool 23 stillbirths to be remembered alongside each group of 1,000 live births.

The full statistics for 1950 showed that in Liverpool there were 16,485 births, of which 375 (or 22.7 per thousand) were stillbirths. The neonatal deaths numbered 316 (or 19.6 per thousand live births). About 65 to 70% of all births took place in the four main maternity units.

The paediatrician has important duties in connexion with the general nursing care of the babies, their feeding (both breast-feeding and, when necessary, artificial feeding), the diagnosis and treatment of their diseases, and the measures which should be taken to prevent neonatal infection. He may be responsible for the breast-milk bank, and for B.C.G. inoculation (Gaisford and Griffiths, 1954). The variety of his clinical experience is wide, but I shall comment only upon the four chief problems that confront him—namely, congenital malformations, birth injury and asphyxia, prematurity, and neonatal infections.

Congenital Deformities

There are, of course, many varieties of malformation, ranging in severity from a small supernumerary digit to a gross deformity of the skull and brain, such as anencephaly. In live-born babies the incidence of deformity is found to be about 2 to 3%; and in a series of 8,716 live-born infants recently reported by Harris and Steinberg (1954) the frequency of obvious defects was found to be at least 5%. Even a relatively slight deformity, such as a birthmark on the skin or deformed toes, should be regarded as a possible psychological or physical handicap to the individual in later life. The paediatrician needs to know not only the kind of treatment available but where it can be obtained and the best time for its application (Craig, 1954).

The diagnosis of some of the internal malformations, like oesophageal atresia, tracheo-oesophageal fistula, duodenal stenosis, and some varieties of cardiovascular deformity—to mention only a few of our problems—may be difficult, involving radiological and other special examinations. Yet many of these deformities of internal organs, which in the past were usually fatal, now receive successful treatment if the expert surgeon and anaesthetist are given their opportunity by accurate and early diagnosis. In every large district there should be a suitably staffed and equipped surgical centre for the reception of these cases from the surrounding area. Centralization is essential if the surgeons, anaesthetists, and nurses are to become thoroughly competent. At the Liverpool Neonatal Surgical Unit, in Alder Hey Children's Hospital, there are eight cots, and during the year ending May, 1953, 120 babies were admitted, and 101 of these patients required major operations.

Birth Injury and Asphyxia

To speak of birth injury and neonatal asphyxia (or anoxia, to use the more modern word) together is reasonable: from the clinical point of view, because the two conditions are often combined. But we have learnt—largely as a result of the outstanding contribution made by Barcroft (1946) and his colleagues, and Barclay *et al.* (1944)—to think of this subject in terms of physiology rather than pathology; we have to ask ourselves whether the baby's oxygen requirements are being met before, during, and after birth. In each case our study is of a moving picture, so to speak, that extends from before the onset of labour to some hours, or even days, after its termination; and harmful influences may operate, in varying and complicated fashion, from either the maternal or the foetal side. For instance, the foetus may be in a state of anoxia before birth if the mother is unhealthy or the placenta is abnormal; if there is accidental haemorrhage or placenta praevia; or when the child is post-mature and has outlived his placenta. During birth itself the influence of birth trauma (especially intracranial) or of drugs and anaesthetics administered to the mother may interfere with the child's ability to expand his lungs immediately after birth. Obstruction of the baby's air-passages by liquor amnii or blood is another possible cause of asphyxia. Ballantyne used to speak of the "physiological readjustments at birth," comprising a variety of changes which must occur if the baby is to make a successful transition from foetal life to the separate, independent mode of living that we all know. The onset of pulmonary respiration is the most important and dramatic of these physiological readjustments, and the fact that it must of necessity occur almost simultaneously with the physical stress of the birth process makes one of the major problems in obstetrics.

It is generally accepted that the foetus performs gentle, rhythmic respiratory movements before birth, and inhales liquor amnii into his bronchi. After birth, in the normal case, the liquor drains away from the mouth or is absorbed; and the prenatal respiratory movements become augmented under the influence of cutaneous and chemical stimuli acting through the respiratory centre in the spinal cord. The newly born baby is able to tolerate a relatively low oxygen concentration in his blood (hypoxia) without suffering harm; and indeed Cross *et al.* (1954) have emphasized that hypoxia is a necessity of foetal life and plays an important part in inducing pulmonary respiration. In the past there was a tendency to be over-enthusiastic about resuscitation of the anoxic baby; to-day there is general agreement that the baby should be handled with great care and gentleness, but opinions differ about the details of technique, especially for clearing the air passages of obstruction and for administering oxygen. The subject has been well reviewed by Smith (1948), Potter (1953), and Gairdner (1954). Clearly prevention, when possible, should be the keynote, and as an observer of obstetrics during the past 30 years I have been greatly impressed by the progress made in this direction.

Paediatricians, with the help of radiologists, have learnt to recognize a number of interesting respiratory conditions that may be associated with neonatal asphyxia, such as malformations, interstitial and interlobular emphysema, pneumothorax, pneumomediastinum, pulmonary haemorrhage, and hyaline membrane, with resorption atelectasis; and the possibility of infection, especially pneumonia, must always be remembered.

Prematurity

It is questionable whether there is any branch of medical practice, in any age group from birth to senility, that requires keener clinical acumen and a higher standard of nursing skill than the care of premature babies. When one remembers that about 45,000 premature babies are born each year in England and Wales, and that about 35 to 40% of these—approximately 16,000 infants—are in special need of skilled care, the importance of the subject will be apparent. The mortality rate for premature babies is falling quite well

(Taylor, 1954), and the following figures illustrate our experience in one of the Liverpool maternity units: during the period 1936-9 (inclusive) there were 679 premature births, and 140 (20%) died in the neonatal period; in the period 1949-52 (inclusive) there were 750 premature births, and 95 (12.7%) died. (It should be noted that the percentage of small-weight babies was almost identical in the two groups under consideration.) It is interesting also to note that in the earlier of the two periods mentioned the total death rate (premature stillbirths and deaths of prematures) associated with prematurity was 41.3%, and in the second period 31.3%. Between 1936 and 1952 the perinatal* mortality rate (mature and premature) of this maternity unit fell from 9.6 to 4.4%.

The improved outlook for premature babies is due to many causes—obstetrical, paediatric, nursing, social, etc. So far as their hospital care is concerned, full credit should be given to the modern types of incubator, which allow the child to be nursed naked, in an atmosphere of controlled heat and humidity, and with oxygen supply also under control. The initial period of starvation, used nowadays in many centres, has also proved helpful, though I think it may be overdone; and we believe that retrolental fibroplasia may usually be avoided by care regarding oxygen tension in the incubator.

It is a definite advantage to have the smaller premature babies accommodated together in a "prematurity unit," to which such babies born in their own homes may also be admitted when necessary. The nursing care required by these babies reaches a higher standard when selected sisters and nurses make the subject their special study; and for this the babies must be grouped together rather than scattered in various parts of the hospital; and other members of the hospital's nursing staff may be drafted into the unit to provide basic training. Furthermore, midwives, nurses, and health visitors working under the local authority scheme may also be given postgraduate "refresher" instruction in the prematurity unit. There should be close co-operation between obstetricians, paediatricians, general practitioners, and the medical officer of health in order to ensure that an adequate service is arranged for both the domiciliary and hospital care of prematures; the Newcastle and Bristol schemes, described respectively by Miller and Walton (1954) and the Southmead General Hospital Group Management Committee (1951), illustrate what may be achieved by enthusiasts.

The Joint Committee on Prematurity published a report in 1951 upon the care of premature babies in both urban and rural areas, and it should be consulted by all responsible for maternity arrangements. A valuable survey has recently been made by Crosse (1954), who has done so much for the premature in this country.

Infections

Some infections, such as syphilis, are passed from the mother to her child before birth; but I am speaking mainly of neonatal infections contracted by the child during or after birth, when, as is well known, the body's defence mechanisms are relatively imperfect. I shall not comment upon the clinical forms that infection may take in these young babies, except to say that almost every tissue in the body may be affected; the skin, eyes, respiratory tract, and intestinal tract are the commonest and the most obvious, but we also see pyelonephritis, meningitis, arthritis, osteomyelitis, septicaemia, and a few rarer types. Each neonatal infection, even if trivial when judged by "adult" standards, is potentially dangerous to the child, and constitutes a menace to other babies that are cared for in the same nursery and by the same nursing staff. In my earlier days it was unusual to see any evidence of neonatal infection in private practice. Nowadays the prevalence of such infections, at all events in maternity units, is considerable, and is increasing, as the accompanying table shows.

*Using the term "perinatal" to signify stillbirths plus neonatal deaths.

Neonatal Infections in Maternity Unit "A" Liverpool (Including Eyes, Skin, etc.)

Year	Infants Born Alive	Stillbirths	Neonatal Deaths	Neonatal Infections		Total Infections	%
				Survived	Died		
1932	1,840	137	43	38	3	41	2.2
1937	2,161	135	52	45	5	50	2.3
1942	2,115	107	50	81	2	83	4.0
1947	2,490	100	48	113	16	129	5.2
1952	2,639	83	37	231*	(10 prems) 8 (5 prems)	239	9.0

*Including blepharo-conjunctivitis (115) and skin infections (61).

In the same maternity unit, during the ten-year period 1938-47 inclusive, there were 714 (3.5%) cases of neonatal infection, made up as follows: skin, 217; eyes (non-gonococcal), 413; eyes (gonococcal), 14; respiratory, 59; alimentary, 11. The live births during this period numbered 20,479.

As evidence that this scourge is not a local problem in the Liverpool area, it may be noted that the neonatal infection rate in a maternity unit in a Yorkshire city (April to September, 1953) was 14%, and in a London maternity unit (1951) 11.1%.

It may be argued that a false impression of danger is given by the inclusion of many relatively trivial local infections (especially of the eyes and skin); but even when these are omitted the figures are significant—for example:

Maternity Unit "A," Liverpool, 1952:	
Total live births	2,639
Neonatal infections (excluding eyes and slight skin lesions)	About 95 (3.6%)
Maternity Unit "D," Liverpool, 1953:	
Total live births	2,297
Neonatal infections (excluding eyes and slight skin lesions)	137* (6%)

*Of these, 6 died.

Happily the mortality rate in neonatal infections is usually low, but this fact should not be allowed to encourage complacency. Morbidity is to be considered before mortality, for it is a truer index of the potential danger, not only to the individual patient but to all the other babies in the same ward or nursery.

Here is a problem demanding urgent attention, especially in regard to prevention; and there are at least two possible causes. One is that the natural immunity of babies to infection during the neonatal period is lower than in the past, perhaps as a result of the widespread and sometimes foolish use of antibiotics for trivial diseases, both in hospital and in domiciliary practice. Furthermore, many strains of the common infecting agents are now resistant to penicillin and sometimes to other antibiotics. But the more probable cause is the great and increasing pressure under which maternity units must work, with two disadvantages so far as the babies are concerned: firstly, there is overcrowding; and, secondly, the nurses find much difficulty in not working hurriedly. This statement implies no criticism of the nurses, who deserve congratulation for the splendid and devoted service they give under difficult conditions. We must, however, remember that the nursing care of babies takes time if their delicate skin and other tissues are to be preserved from even the slight trauma that can open the way to infection. The present position is one of danger and should be studied now, before it deteriorates. We are well aware of the pressure exerted upon maternity units to admit more and more patients, sometimes for sociological considerations, sometimes for the obstetrical needs of the mothers; and at present there are limits to hospital expansion and to the recruitment of nurses. But I feel that paediatricians have a duty to emphasize that newly born babies usually remain free of these troublesome infections if their nursing care is given under conditions which permit gentle, thoughtful handling, and when adequate accommodation is available for the infants.

Various steps may be taken, and are usually taken in maternity units, to reduce the present danger to a minimum;

but I must emphasize that a hospital giving service to children of any age must see to it that a patient who is suspected of having a contagious illness (and this includes all types of neonatal infection) shall be segregated at once. I would also urge that, except in special circumstances, the use of antibiotics should be restricted to those patients whose clinical condition indicates that their natural defence mechanisms will not be adequate.

The Door of Opportunity

I now turn to the future and deal with the stimulating opportunities that lie before paediatricians in this fascinating age-period embracing antenatal as well as neonatal life. If there should still be anyone who believes that paediatrics begins only when the child is born, let him turn his thoughts back to 1635, when Sir Thomas Browne wrote: "Every man is some months elder than he bethinks him; for we live, move, have, a being and are subject to the actions of the elements, and the malice of diseases, in that other world, the truest microcosm, the womb of our mother." Clearly the obstacle confronting anyone wishing to study the unborn child is the relative inaccessibility of the subject. Ingalls (1953) has summed up the situation very neatly in these words, "The nearly insurmountable obstacle to clinical study of prenatal sickness arises in the fact that the patient voices no complaint, remembers nothing about his illness, hides himself from view and puts off his visit to the doctor until the last possible moment." But the clinical application of modern techniques now available to physiologists, pathologists, epidemiologists, experimental embryologists, immunologists, biochemists, and physicians is opening up new fields, hitherto largely unexplored. As yet we comprehend little more than this: that before birth the baby is one component in a system made up of several parts or units, each with its sphere of influence; these units are mother, placenta, child, and father (as represented within the child's constitution). Generally speaking, the interrelationships within the system are sufficiently harmonious to maintain a balance within the limits of what we define as health; but we still know little about the fine adjustments by which such balance is maintained.

And the range of possible influences exerted by the individual units is wide—for instance, genetic, hormonal, chemical, immunological, and bacterial. An important phase in this concept of antenatal life was reached when the late F. B. Chavasse coined the phrases "maternal threat" and "foetal threat." It was in 1920, when he was working on the ABO blood groups of mother and child in the Liverpool Maternity Hospital for his M.D. thesis, that he discovered that in some cases there was incompatibility between the bloods. This was in the early days of transfusion studies when immunity reactions in blood-relationships were little understood, and long before the Rh factor was discovered in human blood. Chavasse examined the hypothesis that toxæmia of pregnancy might be caused by foetal (blood) threat to the mother, but he could find no proof. (It is interesting to note that Pike and Dickins (1954) have shown a significant excess of Group O women in a series of 541 patients suffering from toxæmia of pregnancy.)

At the same time I was working on general oedema of the foetus and was able to confirm the findings of Schridde and others that the foetal tissues (especially the liver) in this condition suggest that very active blood regeneration is occurring. I discussed with Chavasse the possibility that maternal (blood) threat to the child might be causing this remarkable response. We were not far from the truth, but neither of us appreciated that maternal threat might be a reaction to foetal (or perhaps more correctly, paternal) threat. I mention this chapter in history to illustrate the complexity of the reactions possible within the system, some advantageous, some dangerous. In general pattern, the adjustments may be as simple and smooth as the up-and-down movements of a seesaw: sometimes they can be likened to a key turning the mechanism in a lock; sometimes the end-results are happy, sometimes harmful or even tragic.

Sir Macfarlane Burnet's (1954) stimulating paper reveals how wide is the scope in regard to immunity-relationships between mother and child; and our knowledge of their hormonal relationships is growing quickly. No matter whether the paediatrician's interests are directed mainly to infections, to heredity, to immune reactions, to nutritional studies, or to any other of the possible fields of work before him, he cannot neglect the remarkable events occurring during antenatal life, and it is in studies such as these, in co-operation with obstetricians and with various specialists whose work is not primarily clinical, that the paediatrician is likely to find his most satisfying and constructive opportunities. But spectacular results may not be achieved for some time, and there are immediate problems to which attention should be given urgently.

Some Urgent Problems

First of these is the still considerable loss of infant life associated with maternity. In 1952, though maternal deaths associated with child-bearing in England and Wales had fallen to 492 (complications of pregnancy, 181; abortion, 90; complications of labour, 130; complications of the puerperium, 91), stillbirths were 15,636, and neonatal deaths 12,331, making a total of 27,967 infants who died before birth, during birth, and in the first four weeks after birth. In 1953 there were 15,681 stillbirths in England and Wales and approximately 12,113 neonatal deaths—a total of 27,794. It would be idle to pretend that, had they lived, all these babies would have been free from deformity and disease. But even when the figures are viewed in a severely critical and unprejudiced light they still come as a shock, especially to those who believe that considerable improvement is possible. One suggestion might be to hold a national investigation; but in my view it would be more valuable to invite a limited number of maternity units, located in different parts of the country, to make a careful investigation of each stillbirth and natal and neonatal death occurring in its practice. A small team composed of obstetrician, paediatrician, and pathologist would review all the circumstances of each fatality, preferably within one week of its occurrence, and would attempt to reach a firm opinion not only upon the primary cause of death but also upon the child's probable state of health if it had survived.

This type of investigation has been made in Aberdeen by Professor D. Baird and his colleagues (1954), and is an important step of great practical significance, though I suggest that its usefulness would be increased by including, as I have already proposed, the whole of the neonatal period in the review. Professor Baird uses the term "obstetric death rate" to include stillbirths and neonatal deaths occurring during the first week of life. This same group of foetal and neonatal deaths has sometimes been called "perinatal mortality," while other writers have included the whole of the neonatal period (the first four weeks after birth) in their definition of perinatal mortality. Clearly the group covered by Baird's "obstetric death rate" is of special concern to obstetricians, as it is also to paediatricians. But, as paediatricians well know, morbidity and mortality during the second, third, and fourth weeks of the neonatal period are by no means negligible and are due partly to delayed "obstetrical" causes—for example, subdural haematoma, haemolytic disease, and various pulmonary conditions; and partly to the special circumstances of neonatal life, with such problems as neonatal infections and failure of breast-feeding.

It is therefore essential that the classification ultimately adopted should take cognizance of happenings during the whole of the neonatal period.

Crosse and Mackintosh (1954) have reported the results of similar studies in Birmingham. I have spent some time making an analysis of the stillbirth and natal and neonatal deaths occurring during the year 1950 in three of the Liverpool maternity units, and as a result of this experience I am confident that findings of much practical importance would

be brought to light by the plan I suggest, and that each individual case inquiry should be conducted by the clinicians in charge and while the details are fresh in their memory.

Still another opportunity for paediatricians will be found in extending the "follow-up" work which takes place now in a number of centres. As I know from experience, this task is difficult, especially when families change their place of residence rather frequently. But we want to know more about the future for post-mature and premature babies, for babies born by caesarean section, for asphyxiated babies, for birth-injured babies, etc. Retrospective studies are not very satisfactory; but the young paediatrician who decides to keep in touch, so far as is possible, with the babies he has seen at their birth will be able to make a valuable contribution not only to paediatrics but also to obstetrics. And such work will help to give him the background essential to one who will undoubtedly find increasing opportunities for the application of what Ingalls (1953) terms "preventive prenatal paediatrics."

Conclusion

Finally, in the planning and working of the maternity service the paediatrician will be invited to make a fuller contribution than has been expected of him in the past, and if he undertakes this task with enthusiasm and in a fully co-operative spirit his services will be invaluable. He can do much to encourage contacts with general practitioners and with all those who carry out maternity duties under the local authority; he can hold "refresher" courses for doctors, midwives, and health visitors, and can use his influence to ensure that those whose work is done mostly in hospitals shall have opportunities for studying maternity and infant welfare work in the homes of the people. He can, and I think he should, seek opportunities for co-operating in the very important work of antenatal clinics, particularly (1) in regard to the education of young mothers in respect of infant welfare, and (2) to encourage breast-feeding, as Professor Gaisford suggested at the 13th Congress of Obstetricians and Gynaecologists at Leeds in 1952.

But the heart of the matter is this, that the paediatrician is now recognized as a full member of the team concerned with maternity and the aftercare of the baby; his future scope is immense, and he is anxious to give his best services.

Summary

The status of newly born babies has been rising steadily for many years, and this movement was greatly accelerated when pathological studies of stillbirths and neonatal deaths were vigorously undertaken during the first two decades of the present century.

The appointment of paediatricians to the staffs of maternity units has already yielded valuable results and is likely to be even more fruitful in the future.

The loss of infant life by stillbirth and neonatal death is still considerable (27,794 in 1953) and should receive fuller attention, along with the problems of morbidity in the neonatal periods.

The pressure under which maternity units are working at the present time presents dangers so far as the babies are concerned. Questions such as the accommodation and nursing care of the babies need careful study if the incidence of neonatal infection is to be reduced and its spread more effectively controlled.

The proper treatment of the premature baby requires special provision in maternity units, and adequate arrangements for the domiciliary care of those that do not require admission to a ward for the premature.

More should be done to give expectant mothers training in mothercraft, and to advise them in regard to diet, hygiene, preparation for breast-feeding, etc. Paediatricians are well equipped to assist in this service.

In studying the causes of stillbirth and neonatal death it is essential that each case should be considered jointly by obstetrician, pathologist, and paediatrician, bearing in mind that several causes may operate simultaneously or in succession. These causes may be primarily maternal, paternal, placental, or foetal. Conclusions based upon studies made mainly from one angle, whether obstetrical, pathological, or paediatric, are open to the criticism of over-simplification. In each case of stillbirth or neonatal death it is necessary that an agreed aetiological "priority order" should be reached. And if, as is reasonable, the conclusions are to be of value in preventing morbidity as well as mortality in young infants the studies should not be restricted to the antenatal period and the first week after birth, but should include the whole of the neonatal period.

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ORAL PREPARATIONS OF RAUWOLFIA SERPENTINA IN TREATMENT OF ESSENTIAL HYPERTENSION

BY

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The older Indian literature records the liberal use over several centuries of preparations of the roots of *Rauwolfia* species, and particularly *Rauwolfia serpentina*, for the treatment of dysentery, snakebites, and fever (? malaria). In more recent times these preparations have been used in India as sedatives and also for insomnia and insanity. By the end of the seventeenth century this use of rauwolfia root as a sedative had apparently reached Europe. The genus *Rauwolfia* belongs to the Apocynaceae and contains some 40 to 50 species, but *R. serpentina*, a large twining shrub found in India and Malaya, appears to be the main member used for these purposes, and it is therefore this plant whose roots were credited with all these most desirable qualities.

Preparations of these roots of *R. serpentina* were found to have definite hypotensive properties when tried in animals (Chopra *et al.*, 1933) in addition to producing hypnotic and sedative effects. This hypotensive action on the blood pressure has apparently been confirmed in varying degree in hypertensive patients (Vakil, 1940, 1949; Bhatia, 1942; Wilkins and Judson, 1953; Ford *et al.*, 1953; Arnold and Bock, 1953; Klausgraber, 1953; Joiner and Kauntze, 1954).

The hypotensive and hypnotic action of preparations of *R. serpentina* root would appear to reside in the content of alkaloids, of which some 15 have so far been isolated, two of the most active of these being rescinnamine and reserpine, ester alkaloids chemically related to yohimbine, differing only in the acid moiety (trimethoxycinnamic and trimethoxybenzoic acid). Reserpine makes up about 0.1% of crude preparations, and would seem in man to be more likely to cause drowsiness and diarrhoea than rescinnamine. In dogs it has only half the hypotensive potency (Cronheim and Toekes, 1955), but there is a marked variation in relative activity of these alkaloids in different animal species. There would also appear to be at least one other, as yet unidentified, highly active alkaloid in the crude extract.

Since, experimentally, rauwolfia does not interfere with transmission at the autonomic ganglia and in therapeutic dosage is neither adrenolytic nor sympatholytic, it has been suggested that the hypothalamus is the site of its activity, but this has not been proved.

Our past experience when using recommended hypotensive agents given by mouth for the treatment of essential hypertension had been most unsatisfactory. When rauwolfia became available two years ago it was therefore decided that a carefully controlled trial was essential. A prolonged period of observation by observers, if possible unchanged during the trial, of a suitable series of hypertensive patients in need of treatment, using each patient as his own control, would, it was felt, be most likely to yield results of any value at this stage of our knowledge of the treatment of hypertension.

This paper is a report to date of such a trial with a group of 39 severely hypertensive patients (38 of whom had essential hypertension) treated for a minimum period of six months and a maximum period of 20 months with rauwolfia ("rauwilloid").

Type of Hypertensive Subjects Participating and Nature of Drugs Used

The trial was confined entirely to out-patients who were fully ambulatory. So far as was practicable every patient was seen at least once every two weeks, but many were seen far more often, though in some cases these intervals had to be increased. When ill-health caused a patient to take to bed or be admitted to hospital, he or she was immediately excluded from the trial from that date, the information then available being used, however, in arriving at our conclusion.

Every patient observed had a minimum diastolic pressure when attending the out-patient department of never less than 130 mm. Hg (see Table). No patient was used in this particular trial who had been known to us for less than six months, and some had been under our observation for several years, a few having participated in our early trials with the oral administration of methonium compounds (Locket *et al.*, 1951, 1952).

All the patients (except one) were suffering primarily, so far as could be judged clinically, from essential hypertension, and none came into the category of labile hypertensives. So far as possible, all cases of severe renal insufficiency from any cause, or any cause of hypertension other than essential hypertension, were excluded. Renal insufficiency developing during the trial did not exclude the patient.

The 39 patients (see Table) consisted of 31 females, average age 55 (range 34-72) and 8 males, average age 47 (range 37-64).

Each patient on attending the out-patient department was given a number by which he was identified to the dispensary during the trial, the numbers being consecutive. According to the number of the patient, using a chart of random numbers, the pharmacist, Mr. Williams, prescribed either control tablets or active drug. At some time later during the course of the trial the patient was changed from active drug to control tablets, or vice versa. At no time were any of the clinicians or patients concerned in the trial informed whether the participant was receiving dummy (control) tablets or active drug.

In the first ten months of the trial the active preparation used was total root extract (1,000 mg. daily). Since then (January, 1954) we have used total active alkaloids (8 mg. daily). We began this trial with the oral preparations known as rauwilloid, and these have been used consistently. However, when the trial was well under way we included some patients receiving other varieties of rauwolfia, with little apparent difference. Sixteen consecutive patients in addition received 8-10 mg. of *Veratrum viride* extract ("veriloid") daily, during their entire observation period—that is, both with control tablets and with active rauwolfia.

In some patients, owing to the persistence of certain symptoms (later proved to be due to the drug), it was thought advisable to reduce the dose to 500 mg. of total rauwolfia extract, or 4 mg. of total active alkaloids, and occasionally even to stop this medication entirely. The clinician nevertheless, though suspecting that he was in these cases giving active drug, did not know this for certain until the final analysis.

Since we could detect little difference in hypotensive effect between 500 and 1,000 mg. of total root extract or between 4 and 8 mg. of total active alkaloids (nor between total extract and total alkaloids), the results of both alkaloids and total extract are considered together.

Method of Classification of Data

In assessing these results the initial observations were confined entirely to the level of the blood pressure, using

Certain Important Features of Cases Treated; Drugs Used in Treatment, and Results of Treatment on Height of Blood Pressure

Case No.	Sex and Age	Average Blood Pressure and Range During 3 Months Without Treatment Before Start of Trial		Papilloedema + = Present - = Absent	Albuminuria + = Present - = Absent ± = Occas. present	Period Under Observation in this Trial (Months)	Associated Cardio-vascular Renal Disease	Drugs Received	Result on Height of Blood Pressure of Treatment with Rauwolfia
		Systolic (mm.Hg)	Diastolic (mm.Hg)						
1	F 57	260 245-300+	160 150-210	+	+	20	L.V.F.	RE RA	S No response also + pentolinium + apresoline
2	F 56	260+ 230-280	145 135-150	-	+	8	A. of E.	RE	S
3	M 56	250 220-270	160 150-170	+	+	11	L.V.F.	RE RA RE	S
4	F 34	210 190-230	135 130-145	-	-	7	-	RE	O
5	F 53	210 180-220	135 130-140	-	+	18	L.V.F.	RE RA RE	A
6	F 57	250 240-260	145 140-150	-	-	19	A. of E.	RE RA RE	A
7	M 61	260 230-290	145 135-160	-	+	20	Int. C.	RE RA RE	G
8	F 56	260 230-280	150 140-160	+	+	20	Ret. haem.; Cere. thr.	RE	A
9	M 58	220 200-240	135 130-140	-	-	20	Ret. art. thr.	RE	A
10	F 52	275 260-300	135 130-140	-	-	6	-	RE	O
11	F 44	270 240-300+	150 145-160	-	-	20	-	RE	A
12	F 52	250 220-260	150 140-160	+	+	20	-	RE	O
13	F 50	260+ 245-300+	150 140-160	+	+	17	-	RE V	O
14	F 55	250 230-270	135 130-150	-	+	17	A. of E.	RE V	G
15	M 54	230 200-260	135 130-160	-	+	17	Cereb. thromb.	RE V	G
16	F 72	260 200-280	140 135-165	-	-	7	Senile dementia	V	A Only patient to show a fall in B.P. without receiving rauwolfia
17	M 64	220 200-230	140 130-150	-	-	15	-	RE V	O
18	F 52	200 180-220	135 130-140	-	±	16	Mitral stenosis L.V.F.	RE V	O
19	F 58	260+ 240-300+	155 140-160	-	+	16	-	RE RA V	O
20	F 41	260 150-280	170 150-180	+	+	7	Cereb. thromb.	RE V	O Received active drug during entire period until death
21	F 63	270 260-300	135 130-140	-	-	14	A. of E.	RE V	A
22	F 42	290+ 280-300+	165 140-185	+	+	18	Cereb. thromb.	RE RA V	O No response either with apresoline and pentolinium + rauwolfia + vertloid
23	F 61	230 200-240	140 130-145	-	-	6	-	V	O
24	F 55	270 240-300+	145 130-170	-	+	13	A. of E.	RE RA V	A
25	F 62	235 220-240	135 130-145	-	-	12	A. of E.	RE RA V	A
26	F 40	245 230-300	150 140-175	+	+	6	Cereb. thromb.	V	O
27	F 48	210 190-220	140 130-150	-	+	8	-	RE V	O No response with apresoline added. Had chronic nephritis and died whilst on active drug
28	M 50	195 190-210	135 130-140	-	-	10	-	RA V	A
29	F 64	250 150-300	140 135-165	-	+	8	Ret. art. thromb.	RA	S + mephenesin daily and sodium amylal nightly
30	F 46	260 250-290	140 135-160	-	+	14	L.V.F.	RA	O
31	M 47	230 210-250	140 135-165	-	-	10	A. of E.	RA	G
32	F 56	260+ 260-300+	160 150-170	-	+	7	L.V.F.	RE RA	A
33	M 37	250 200-230	160 150-180	+	+	8	-	-	O Also receiving massive oral doses of pentolinium and apresoline
34	F 42	230 200-250	135 130-140	-	-	7	-	-	O Bilateral sympathectomy between control period and trial, with no effect
35	F 55	210 200-240	140 130-150	-	-	9	-	RA	A
36	F 64	260 230-290	140 135-145	-	+	6	-	RA	S
37	F 56	210 200-240	130 130-135	-	-	6	A. of E.	RA	S
38	F 56	230 270-210	140 130-160	-	-	6	-	RA	O
39	F 54	250 270-240	135 130-160	+	±	6	Ret. art. thromb.	RA	S

The upper figure in columns 3 and 4 records the average untreated blood-pressure level, and the lower two figures the range.
L.V.F. = Left ventricular failure. A. of E. = Angina of effort. Int. C. = Intracranial catastrophe. Cereb. thromb. = Cerebral thrombosis. RE = Rauwolfia total root extract. RA = Rauwolfia total active alkaloids. V = *Veratrum viride* extract. O = No hypotensive action. S = Slight—i.e., fall 10–20 mm. Hg. A = Appreciable—i.e., fall more than 20 mm. Hg. G = Good—i.e., fall to below 100 mm. Hg diastolic and in excess of 30 mm. Hg.

to divide the patients into several separate categories. We then attempted to observe the relationship, if any, between these blood-pressure categories, the patient's symptoms, and any objective findings. In this trial, laboratory and other investigations were those essential for the diagnosis, observation of progress, and treatment of any case of hypertension of this degree of severity.

We were mainly concerned with the level of the diastolic pressure, since there is far less spontaneous variation in the diastolic level than in the systolic in these hypertensives. Also, the future expectation of trouble for these patients depends upon the height of the diastolic pressure.

All readings were obtained with the patient sitting. In every case where these showed a fall or rise in excess of 10 mm. Hg. from earlier pre-trial readings, they were checked on both arms by more than one observer.

The patients were divided into four groups according to the recorded fall of diastolic blood pressure. These were: O = no fall; S = slight consistent fall—that is, 10–20 mm. Hg; A = appreciable fall, greater than 20 mm. but not

falling below the level of 100 mm. Hg; and G = fall to a level consistently below 100 mm. Hg, and the fall was therefore always in excess of 30 mm. Hg (see Figs.).

Results

Of the 39 patients, 16 showed no consistent fall in diastolic blood pressure, 7 a slight fall, 12 an appreciable fall, and 4 a fall to below 100 mm. Hg. Of the 16 patients with no consistent fall in blood pressure, 4 had during the entire trial received either the control tablets alone or with extract of *Veratrum viride*, but never an active rauwolfia preparation. In the other 23 cases (except for one case in group A receiving extract of *V. viride* only) the fall in blood pressure occurred only whilst the patient was receiving the active rauwolfia preparation. When the patient was transferred to the control tablets the blood pressure, after a brief interval, began gradually to rise (see Figs.), and, similarly, transfer to active tablets resulted in a fall. Of 34 patients receiving active rauwolfia tablets at some period during this trial, 22 (67%) showed a fall in blood pressure of varying degree (slight in 21%, appreciable in 34%, and good—that is, to below 100 mm. Hg—in 12%) whilst actually taking the active preparation and not when on the control.

The combination of *V. viride* extract and rauwolfia gave 6 patients out of 13 who showed a hypotensive effect, as against 16 patients who showed a fall in blood pressure out of 21 receiving rauwolfia without additional *V. viride* extract. Nevertheless, the only patient in the trial who showed an appreciable fall in blood pressure without rauwolfia was actually receiving *V. viride* extract, and two of the four patients (see Fig. 2, Cases 14 and 15) in whom the diastolic blood pressure fell to below 100 mm. Hg were receiving both rauwolfia and extract of *V. viride*. It will be seen that the fall in blood pressure in Case 15 antedated the use of rauwolfia slightly, and with cessation of active drug rose slowly to a lower level than the control. This most satisfactory result, too, may be partly due to the *V. viride* extract.

The average age of patients who failed to respond to rauwolfia was 50 (range 34–64), whereas the average age of all patients who responded was 56 (range 44–64). Of the eight males, seven received rauwolfia and six (average age 55.2 years) showed a hypotensive effect (S: 1; A: 2; G: 3). Three of the seven males were receiving *V. viride* extract with the rauwolfia. Of the 31 females, 27 received rauwolfia, and of these 15 (average age 56.6 years) showed a hypotensive effect (S: 6; A: 9; G: 1). Of these 27, 10 were receiving extract of *V. viride*. The average age of the 11 females who did not respond to rauwolfia was 48.3 years.

Albuminuria in varying degree was present in 50% of patients in each of the four categories, but of 10 patients showing papilloedema 6 were in group O, 3 in group S, and only 1 in group A.

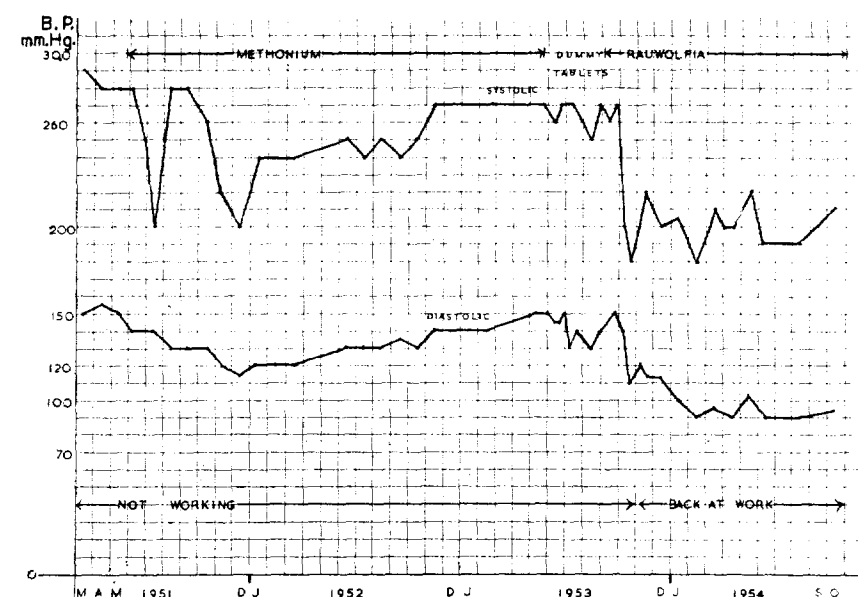


FIG. 1.—Graph of Case 7.

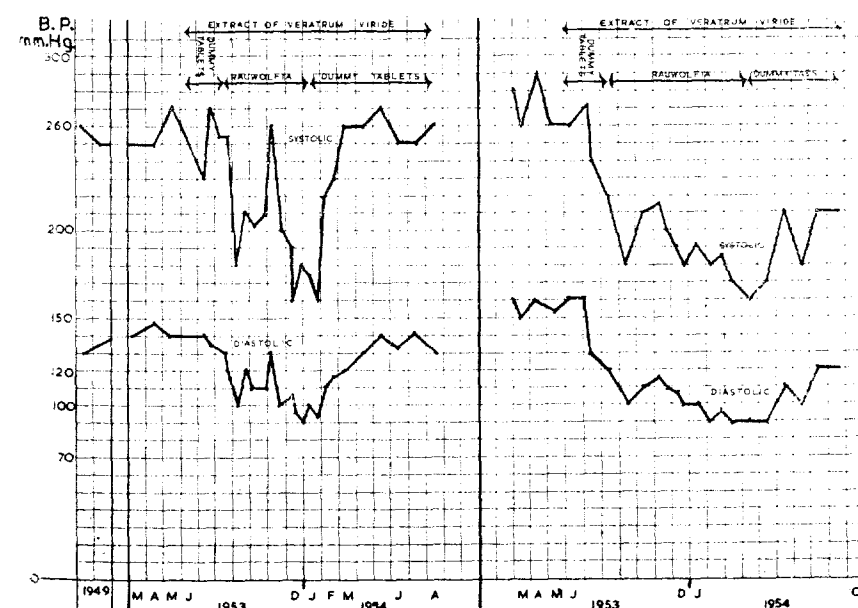


FIG. 2.—Graphs of Cases 14 and 15.

There were 8 patients who at the beginning of this trial were complaining of angina of effort—1 each in groups O and G, 2 in group S, and 4 in group A.

Four deaths occurred during the trial. One patient aged 48 who died of uraemia due to chronic nephritis (the only nephritic in the series) failed to show any hypotensive response and was actually receiving active drug at the time of her death. Two other deaths occurred in women aged 41 and 40, from cerebral haemorrhage, and one of these was receiving the active drug at the time of death. The fourth patient, a man aged 56, died of a dissecting aneurysm whilst receiving the control tablets.

In no case did we find a precipitate fall in blood pressure associated with circulatory symptoms due to hypotension which is said to occur due to "hypersensitivity" to the drug, and no patient developed postural hypotension.

In every case in which the patient responded to the drug there was a delay in the onset of the hypotensive effect, usually of 7 to 14 days, but occasionally as long as four weeks elapsed before the fall in blood pressure began. In about half the patients several further weeks on active drug were necessary before the diastolic blood pressure reached its lowest level (see Figs.). Stopping the active drug resulted in a gradual rise of blood pressure level in every case (see Cases 14 and 15, Fig. 2), but again, though in most patients one to two weeks elapsed before the blood pressure reached its previous height, in three patients (two receiving *V. viride* extract) it took at least six to eight weeks for this to happen.

Side-effects

Side-effects were seldom severe enough to necessitate cessation of treatment, though they occurred in more patients than we had been led to believe from reading the published clinical results (Klausgraber, 1953; Meilman, 1953a, 1953b; Vida, 1952). Many patients, while complaining, for example, of diarrhoea, would nevertheless state that they felt better than ever before.

Though within the limits of our trial there was little difference in the hypotensive effects using 4 or 8 mg. of total alkaloids, or alternatively 500 or 1,000 mg. of crude extract, we noticed an appreciably higher incidence of undesirable side-effects with the larger doses. Side-effects, nevertheless, occur at all therapeutic dosage levels.

Depression was complained of by 5 patients (15%), and in fact one patient who had been receiving the active drug for nine weeks with no effect on her blood pressure was admitted to hospital as a case of attempted suicide from coal-gas poisoning. Nine patients (26%) complained of one or more of the following, though rarely in any severe degree—namely, fatigue, lack of energy, drowsiness and muzziness, loss of interest, loss of libido (one male), feeling "strung up inside," and vague general malaise. These symptoms did not bear any relation to the hypotensive effect of the drug, occurring relatively as often in those who failed to respond as in those who responded adequately.

Three patients complained of flashing lights in their field of vision, and in one of these patients this was followed by a period of amaurosis lasting two or three minutes. Another patient had several brief episodes of amaurosis lasting less than a minute. In all four patients eventual transfer to the control tablet produced complete relief of these visual phenomena.

A complaint of buzzing or fullness in the head was made by five patients (15%). Nasal congestion was complained of by five patients (15%), but response to an antihistamine occurred in only two of them.

Three patients complained of nausea and vomiting (one of these was also receiving *V. viride*). Diarrhoea occurred in eight patients (24%), necessitating cessation of treatment in two and halving of the dose of drug in two.

In four cases the side-effects were severe enough for it to be necessary to discontinue the drug (two patients with depression and two with diarrhoea). One patient in fact felt so depressed at work, which he had previously enjoyed,

that he wished to change his job. Within two weeks of stopping the drug he was happy and contented again. A fifth patient, admitted as a case of attempted suicide, had the drug discontinued.

Increase in weight and in appetite occurred three times as often in the group when on the active drug, and two patients gained over 1 stone (6.4 kg.) in weight during five months on the drug. On the other hand, one patient who gained over 1 stone (6.4 kg.) in eight months never received any rauwolfia during this period.

Conclusions and Summary

In a carefully controlled series of 39 severe cases of hypertension (38 with essential hypertension and 1 with nephritic hypertension) treated for 6 to 20 months with rauwolfia preparations, we found a definite consistent fall in blood pressure in 67% of cases when actually receiving active preparations of *R. serpentina*. In most cases there was a proportionate fall in both systolic and diastolic blood pressure, but in several the fall in the diastolic appeared to be relatively greater than in the systolic. The fall was slight (10–20 mm. Hg diastolic) in 21% but appreciable or marked in 46% (greater than 20 mm. Hg diastolic), and in four patients the diastolic blood pressure fell to below 100 mm. Hg. Within the limits of dosage set by this trial, and contrary to some other published work (Meilman, 1953a, 1953b; Wilkins and Judson, 1953), these results did not appear to be appreciably contributed to by the continued simultaneous administration of oral preparations of *V. viride* extract in 13 cases, by hydrazinophthalazine in three cases, or by pentapyrrolidinium bitartrate in two cases. The use of *V. viride* extract seemed, however, to delay the rise of blood pressure, on stopping the rauwolfia. There was suggestive evidence to indicate that the better response occurred in males, and in the older hypertensive patients with arteriosclerotic manifestations, rather than the younger patients, and also that the presence of papilloedema usually meant that those patients would not respond to this drug, or only slightly.

All patients with angina of effort found it necessary to continue to use nitroglycerin, even though in one case the blood pressure dropped to normal figures. There was certainly no worsening of the pain in either its severity or its frequency, but there did not appear to be any real alleviation either.

The presence of albuminuria in varying degree did not significantly affect the hypotensive response.

There was no evidence in this series to suggest that only the mild, labile, or relatively symptomless cases respond. Quite severe cases (as judged by the blood-pressure level), symptomatically incapacitated, frequently responded better than the symptomless and often less severely hypertensive patients. Many symptoms responded well to treatment, but in a way more closely allied to reassurance than to actual specific drugs.

The cessation or amelioration of complaints of headache (but not the severe occipital headache often made worse by reclining), palpitations, precordial discomfort (frequently occurring at rest and not resembling angina of effort), vertigo, and tinnitus occurred in 80% of patients with and without active drug, and appeared to be related to the interest shown in their illness rather than the actual fall in blood pressure. Subjective symptomatic relief and objective improvement in blood-pressure levels did not show the close parallel that might be expected.

It was also our impression that, contrary to the usually accepted belief, once the patient was aware that he had

a "raised blood-pressure" repeated visits to hospital and blood-pressure measurements reassured him quite considerably.

We were not particularly impressed by the sedative or so-called "tranquillizing" action of the drug when given in the doses used by us.

From our experience in this clinical trial we felt that this was by far the most effective and useful orally administered agent for reducing blood-pressure which we have yet used. In our opinion this substance is fully worthy of a trial in every case of essential hypertension in which treatment is thought to be necessary. The severe cases, which always need treatment, are as likely to respond as the mild.

I am grateful for the constant help I received from my house-physicians and registrars, Mr. Williams, the hospital pharmacist, and the staff of the dispensary, as well as from Sister Wills and the nursing staff of the out-patient department of Oldchurch Hospital, while making these observations. This work would, however, never have been possible had it not been for the willing and active co-operation of all the hypertensive patients who have participated. I wish to thank Mr. J. A. Lumley and Riker Laboratories Ltd. for providing an adequate supply of rauwolfia extract and, later, total active alkaloids, control tablets, and *Veratrum viride* extract which enabled this work to be carried out. Finally, I am indebted to Dr. W. S. M. Grieve for many discussions and criticisms, and to my secretary, Mrs. E. D. Price, for her patience and excellent secretarial assistance.

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RESERPINE IN HYPERTENSION

BY

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Reserpine ("serpasil") is a colourless, crystalline, ester-alkaloid derived from the roots of *Rauwolfia serpentina*, crude and unstandardized preparations of which have been used in the treatment of hypertension for the past 20 years or so. It has a melting-point of 266 to 270° C., and its empirical formula, $C_{33}H_{40}O_9N_2$, contains a pentacyclic nucleus.

It is claimed that reserpine is a single entity and does not produce any of the undesired effects of the unknown alkaloids of the whole root, but possesses only its sedative and antihypertensive actions. The fall in blood pressure is characterized by a gradual beginning and a prolonged duration, and occurs in about two-thirds of all cases of essential hypertension, and may occur in renal hypertension and hypertension associated with hyperthyroidism. The desired effect is obtained even in severe cases and in cases of hypertension which have remained at a fixed level for a considerable time.

The fall of blood pressure is sustained, so that sharp fluctuations do not occur, and the effect may not disappear for several weeks after the drug has been discontinued. Experiments in anaesthetized cats show that

the hypotensive effect cannot be increased beyond a certain point despite the increase in dosage. This is taken to suggest that the drug acts mainly by protecting from abnormal tensile stimuli the autonomic nerve centres which regulate blood pressure. Postural hypotension has not been observed.

The fall in blood pressure is always associated with slowing of the pulse rate and, in some patients, with improved cardiac output. The depth of respiration is somewhat increased, but the rate remains more or less unaltered. Intestinal motility is increased in dogs but not in monkeys or rats. Diarrhoea may occur in human beings.

Reserpine produces a pronounced central sedative effect in cats, rabbits, and dogs. The animals remain quiet and sleep unless disturbed. The sedative effect is not a narcotic effect, and no electroencephalographic changes have been recorded in rats. It also does not protect against convulsant drugs. In man the lethargy is easily counteracted by caffeine or dextro-amphetamine sulphate in small doses. It occurs generally in the earlier stages of administration of larger doses, but even then it usually abates with time. Lower maintenance doses are well tolerated. In most patients there is subjective improvement associated with a sense of well-being.

The minimum lethal dose in rabbits and rats is about 10 mg. per kg., whereas its pharmacological effects are noticeable with doses of 1 µg. per kg. daily for five days. Thus the drug in recommended dosage (see below) has a wide margin of safety. In rabbits the prolonged administration of 0.1 mg. per kg. daily for 12 days or on alternative days for 24 days did not produce any changes in the heart, spleen, liver, kidneys, adrenals, stomach, or intestines. Side-effects in human beings with recommended dosage are mild and tolerable. They consist of nasal congestion—which is relieved by local vasoconstrictors—nausea, anorexia, more frequent or looser stools, headache, dizziness, heaviness of legs, and urticaria, which is relieved by antihistamines.

The initial therapeutic dose is 0.25 mg. three or four times daily, and is continued till the blood pressure falls. This occurs after a latent period, and the cause of delayed action is not known. Massive doses as used in acute experiments are not recommended. Subsequently the daily maintenance dosage may be 0.1 to 1 mg. Patients do not develop tolerance, and withdrawal symptoms do not occur. The drug is not habit-forming and there are no known contraindications to its use.

Literature

Recent clinical reports substantiate the above claims to varying extent. Löffler *et al.* (1953), using reserpine in doses varying from 0.75 to 1.5 mg. a day on 51 hypertensive patients, found that its hypotensive effect was insignificant in 27 and the blood pressure actually was higher than before in 6. In 14 the lowered pressure lasted only 12 days in spite of continued dosage, and in only 4 was the lower pressure sustained throughout the period of observation in hospital. Increase of dosage above 1.5 mg. a day did not increase the hypotensive activity, but it increased the incidence and severity of side-effects: 17 felt fatigued, 11 were depressed, 8 complained of heaviness of the limbs, 5 saw flickers in front of the eyes, 2 had bradycardia, 2 became mentally excited, 1 complained of dryness of the mouth, and 1 had miosis.

Vakil (1953) treated 25 cases with 0.5 mg. twice a day after meals for four weeks followed by a similar two-weeks course after an interval of a fortnight. After four weeks' treatment the systolic pressure dropped by 25 to 68 mm. Hg

in 11 cases, by 10 to 24 mm. in 7, and by less than 10 mm. in 3. In 1 case the systolic pressure was unaltered and 3 showed a rise of 2 to 16 mm. In 5 cases the diastolic pressure dropped by 15 to 26 mm., in 12 by 5 to 14 mm., and in 2 by less than 5 mm. Hg. In 2 cases it was unaltered and 4 showed a rise of 2 to 8 mm. During the two weeks' cessation of treatment, in 2 out of 19 cases the blood pressure fell further, in 9 it continued to remain at the lowered level, in 7 it rose but remained below the pre-treatment level, and in 1 case it returned to the original.

During the second course there was a drop in systolic pressure in 23 cases, but there was a rise in 2. There was a drop in the diastolic pressure in 21 cases, in 2 it remained unaltered, and in 2 it was higher than before. Both the systolic and the diastolic pressures fell in 19 cases. In 1 case, however, the systolic pressure rose and the diastolic pressure fell; the opposite occurred in another case. Four cases responded well to the first course but did not respond to the second; the opposite occurred in 2 cases. Side-effects were mild and infrequent: 4 had weakness, 3 suffered from excessive drowsiness, 2 had diarrhoea, 2 complained of anorexia, 1 had nasal congestion, 1 had frontal headache, and in 1 the existing vertigo was aggravated. Vakil concluded that a good result was likely in one-half to two-thirds of cases of systolic hypertension under 200 mm. Hg, and in practically all cases with pressures above 200.

Doyle and Smirk (1954) found that single doses of 2 or 3 mg. of reserpine by mouth produced a significant fall of blood pressure about four to six hours later. In 6 out of 9 patients the systolic pressure fell by 40 mm. Hg and the diastolic by 20 mm. or more. When 2 or 3 mg. was given thrice daily the blood pressure fell on the first or second day in 16 out of 20 patients. In all of these 16 cases the systolic fall was over 40 mm. Hg, and in 12 of them it was over 60 mm. The diastolic fall was over 25 mm. in 17 out of 20 cases, and more than 45 mm. in 7 of them. Some of the lowest pressures recorded were well below the basal blood-pressure levels. Slight postural hypotension was noticed when the blood pressure had fallen to normal or below normal levels. After discontinuance of the drug the blood pressure continued to remain at a significantly lower level for 12 to 24 hours. With these large doses, however, side-effects were severe. Combination with hexamethonium or pentolinium tartrate ("ansolysen") gave an additive effect, and the lowered blood pressure was more steady than with hexamethonium alone.

Douthwaite (1954) treated 12 cases of chronic benign hypertension with basal blood pressures ranging between 210/120 and 250/160 mm. They had symptoms of high blood pressure for five years or more and associated secondary cardiovascular changes; 2 had retinal haemorrhages and exudate. A sustained reduction of systolic pressure of 30 to 40 mm. and of diastolic pressure of 10 mm. was obtained with a daily dose of 4 mg. in 2 cases and with a daily dose of 8 mg. in 8 cases. Doses of 16 and 8 mg. were ineffective in 2 cases. Bradycardia occurred within three days of treatment, but had no relationship with blood-pressure readings. With a daily dose of 8 mg. 2 cases developed coarse tremor with occasional twitching of limbs, chattering of teeth, and mental distress.

Present Clinical Trial

Reserpine was administered to 24 patients with benign hypertension and to 2 with malignant hypertension. In addition it was given to 1 case of hypertension associated with chronic nephritis, to 2 cases associated with advanced arteriosclerosis, to 1 case associated with thyrotoxicosis, and to 3 cases associated with severe anxiety state.

One case of malignant hypertension and one case of chronic nephritis had advanced renal failure and characteristic changes in the fundus. The second case of malignant hypertension had early renal failure, tachycardia, cardiac asthma, and characteristic fundus changes. Eleven cases of chronic benign hypertension had associated cardiovascular changes, five of them had albuminuria with slightly impaired

renal function, five had fundus changes only, and one suffered badly from cardiac asthma.

Apart from two cases of malignant hypertension and one case of chronic nephritis, all patients were ambulant and went about their ordinary daily work. There were no restrictions in diet or salt intake. Blood-pressure readings were taken immediately the patient reported and subsequently every five minutes till they were constant for at least three readings. To begin with they were taken daily. Later, when the patients were stabilized, they were taken twice or thrice weekly.

All cases had already been under care for periods varying from two months to seven years. Their normal blood-pressure variations were therefore known. All previous treatment, if any, was reasonably discontinued before reserpine was tried. The initial dosage was 0.25 mg. three times a day for systolic pressures below 200 and 0.5 mg. three times a day for systolic pressures above 200.

Results

The effect of reserpine varied a good deal, and depended on the type of hypertension treated and individual susceptibility. The main results are summarized in Table I.

TABLE I.—Effect of Reserpine Treatment in Various Types of Hypertension

Type of Hypertension	Initial B.P.	No. of Cases	Fall of B.P. below				Maintenance Dose of Reserpine (mg. Day)
			145/90	160/100	170/110	185/115	
Benign	165-180	4	4	4	4	4	0.2 to 0.5
	95-115						
	180-200	10	7	10	10	10	0.3 to 1
	90-115						
	180-220	4	0	2	2	0	0.3 to 0.75
	110-120						
	170-240	4	1	0	0	3	0.75 to 1.5
	100-140						
	210-260	1	0	0	0	0	1.5
	140-150						
Malignant	230-290	1	0	1*	0	0	1.25
	125-130						
	165-250	2	0	0	0	0	1.5
Chronic nephritis	110-150						
	185-225	1	0	0	0	0	1.5
Arteriosclerosis	110-125						
	165-265	2	1	0	0	1	0.75
Thyrotoxicosis	70-95						
	165-195	1	0	1	0	0	0.5
Anxiety state	85-95						
	165-185	3	1	2	0	0	0.5 to 0.75
	90-105						

* During periodic fluctuations the basal blood-pressure levels rose to 220/110-120 mm. Hg.

Response in Malignant Hypertension and Chronic Nephritis

With daily doses of 1.5 mg. it was not possible to lower the blood pressure appreciably in malignant hypertension and advanced chronic nephritis. The drop in systolic pressure varied from 20 to 50 mm., and in diastolic pressure from 5 to 25 mm. But these readings were almost within normal fluctuations before treatment, and the net drop did not exceed 20/10 mm. in any case. Gross fluctuations, however, appeared to be less frequent. In all these three cases it was possible to maintain more or less a constant blood pressure between 125/80 and 135/90 throughout the day along with hexamethonium bromide, 25 mg. intramuscularly three-hourly. With the same dose of hexamethonium bromide alone the fluctuations were greater and tolerance was often produced, the lowest readings varying from 125/85 to 170/100.

Response in Benign Hypertension

In benign hypertension it was possible to bring the blood pressure to normal or within reasonable limits in less severe

TABLE II.—Effect of Reserpine Therapy on a Patient's* Blood Pressure

Day:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	27	29	33	36	40	44	47	50	55	57
S. ...	180	185	180	175	170	140	150	145	130	140	140	130	135	125	120	125	125	138	120	120	135	125	170	130	125	135	125	130	125	150	130	125	150
D. ...	110	110	105	100	90	85	85	80	80	95	95	85	85	80	80	80	85	85	85	80	90	90	110	85	85	85	90	90	90	85	90	95	
	0.75 mg. reserpine daily											0.3 mg. reserpine daily											0.75 mg. reserpine daily										

S. = Systolic. D. = Diastolic.

* A man aged 38, height 5 ft. 11 in. (180 cm.), weight 198 lb. (90 kg.), with moderate cardiac hypertrophy and normal renal function. Fluctuations in blood pressure before treatment varied from 170/100 to 195/115 mm. Hg.

and less chronic cases, whereas in the more severe and more chronic cases the results obtained were similar to those obtained in malignant hypertension. Periodic fluctuations up to plus 45/20 mm. Hg continued to occur, and to keep the blood pressure at the lower levels the dosage had to be adjusted from time to time. In some individuals rises occurred at irregular intervals on any day for no obvious predisposing cause (Table II). To these fluctuations the rises associated with the ordinary day's work were additive.

Sometimes fluctuations chiefly affecting the systolic pressure also occurred when the patient was resting in bed. Owing to these variations it was impossible to record the basal blood pressure in such cases. These fluctuations during rest were especially noticeable a few days before the blood pressure started falling and during the transition period, when it was actually falling. The systolic and diastolic pressures were not necessarily always proportionately affected either during the transition period or finally when lowered—for example, a case with an initial blood pressure varying from 185/120 to 230/140 finally settled between 140/115 and 150/115, whereas another case with fluctuations between 170/110 and 185/110 settled between 120/80 and 160/100.

With the dosage employed the blood pressure started falling between the fourth and the nineteenth day and continued to do so amidst variations till the lowest level for a particular individual was reached. This took altogether from 9 to 40 days. In 5 out of 24 individuals there was a further fall of blood pressure after it had been more or less constant for periods varying from 6 to 20 days. With the dosage used, however, readings below 115/75 were not obtained in any case. Trials with higher doses at this stage were not undertaken. In seven cases which reached blood-pressure levels round about 120/80 the drug could be discontinued for 3 to 13 days before the blood pressure started to rise again.

The time taken for the blood pressure to fall and the decision whether reserpine could be discontinued for a few or more days were dependent on individual response and were quite unpredictable. It certainly did not depend on the initial blood-pressure level or the duration of the blood pressure, the emotional set-up of the individual, or his weight, age, or sex. For example, in a rather highly strung woman aged 34, who was known to have had hypertension for about two years, the initial basal blood pressure of 185/110 took 19 days to drop to 160/100, 25 days to drop to 130/90, and 40 days to drop to 125/85-90 with reserpine 0.75 mg. daily. Reserpine was discontinued when the blood pressure was 125/85-90, and she showed the first rise to 135/95 after 13 days. On the other hand, a man aged 38 with a similar blood pressure (180/110) for about the same duration, with the same dose, dropped to 130/80 in five days. He required a maintenance dose of 0.3 mg. of reserpine daily, but had a tendency to periodic rises every three to four weeks, during which he required a daily dose of 0.75 mg. The maintenance dose could not be omitted at all in this case, and a day's omission caused an immediate rise to 150/95 or more.

A case of myocardial infarction with two attacks within two years showed a poor response to 0.75 mg. of reserpine daily for 35 days. His blood pressure, which was initially 175/95 to 185/110, continued to fluctuate between 160/95 and 175/105.

In severe cases of benign hypertension in which reserpine alone was not very effective in lowering the blood pressure,

combined therapy with phenobarbitone, mannitol hexanitrate, and hexamethonium had the following effects: phenobarbitone did not aid, mannitol seemed to help, but hexamethonium compounds were very effective. In one case, in which the original basal blood pressure of 230/115 was reduced to 160/90 with reserpine, the equivalents were: 0.25 mg. of reserpine six times daily equalled 0.25 mg. of reserpine plus 375 mg. of hexamethonium bromide three times daily, equalled 50 mg. of hexamethonium bromide intramuscularly four to six times daily, and equalled 750 mg. of hexamethonium bromide six times daily by mouth.

Other Results

Response in Arteriosclerotic Hypertension.—In arteriosclerotic cases both systolic and diastolic pressures fell, as a result of which the pulse pressure still remained relatively high and symptoms such as giddiness, throbbing in the head, and insomnia, were only partially relieved. Day-to-day variations in pressure were greater than in cases of benign hypertension due probably to effects of arteriosclerosis itself.

Response in Hypertension with Anxiety State.—In hypertension associated with anxiety state gross daily fluctuations were mostly controlled, but maintenance doses were relatively high.

Effect of Ordinary Day's Work.—The effect of an ordinary day's work, so far as could be ascertained, showed that fluctuations in blood pressure were quite common when readings were recorded at different times of the day. The fluctuations affected the systolic as well as the diastolic pressures, and rises of 10-35/5-20 mm. Hg were seen. The tendency was to revert towards the pre-treatment basal levels, although usually the rise was not so great. The effect of subsequent rest varied. Some patients took a few minutes to return to pre-exertion levels, while others took two to three hours. For example, a man of 39 suffering from chronic benign hypertension of six years' duration with lowest pre-treatment basal blood pressure of 175/110 and with lowest basal blood pressure of 130/95 under reserpine, 0.75 mg. daily, showed rises up to 165/110, which took nearly three hours to revert to 130/95, whereas a woman of 45, suffering from chronic benign hypertension of about seven years' duration with lowest pre-treatment basal blood pressure of 170/120, and with lowest basal blood pressure of 130/90 under the same dose of reserpine, showed rises up to 140/110, which took only five minutes to revert to 130/90.

Effect of Standard Exercise.—In those patients who reverted to the pre-exertion levels within a few minutes of a standard exercise-tolerance test, reserpine *per se* did not influence the types of responses to exercise. The responses depended entirely on the blood-pressure levels. As the blood pressure fell the patterns described by Fowler and Guz (1954) progressively reverted towards the normal (see Table III).

Postural Hypotension.—Some degree of postural hypotension was present in nearly all patients, especially those with systolic blood pressure above 200 who received reserpine 1.5 mg. daily. The maximum difference recorded between pressures taken lying supine on a bed and sitting up on a chair was plus 20/15 mm. Hg. Under the influence of 1/50 gr. (1.3 mg.) of atropine intravenously this effect was abolished. But the change affected mostly the diastolic pressure, which rose to pre-treatment or almost pre-treatment levels. Thus in one case the blood pressure rose from 220/100 before atropine to 220/120 after atropine.

TABLE III.—Responses to Standard Exercise at Various Blood-pressure Levels in a Case of Chronic Benign Hypertension Under Reserpine Treatment 1.5 mg. Daily. Blood-pressure Readings were Taken in Supine Position

Initial B.P. Level	B.P. Levels at One-minute Intervals							
	0	1	2	3	4	5	6	7
225	195	205	235	230	225	220	215	210
100	105	100	100	100	95	95	105	100
190	215	215	220	212	200	192	185	185
90	100	100	100	100	95	95	95	95
160	195	190	180	175	165	160	155	155
90	95	95	90	90	85	85	85	80

Side-effects

The severity of side-effects was a matter of individual tolerance and the dosage of reserpine used. Nasal congestion, anorexia, dryness of the mouth, depression, muscular weakness, heaviness of limbs, giddiness, diminished vision associated with miosis, and drowsiness occurred with varying severity and frequency. They were more frequent and more pronounced when the dose of reserpine was above 0.75 mg. daily. However, it was possible to tell the patient confidently that these would abate with time. With doses below 0.75 mg. daily, most patients could tolerate the drug comfortably after a few days, usually less than a week. A chronic alcoholic did not complain of any side-effects with 1.5 mg. daily.

Under the influence of the drug slowing of the pulse rate from 20 to 36 beats was a consistent finding. In seven cases the pulse rate slowed down to between 46 and 52 a minute. In one case with a pre-treatment pulse rate of 48 to 52, however, no further reduction took place. It increased with exercise, but remained relatively low. The bradycrotic effect was completely overcome by atropine, 1/50 gr. (1.3 mg.) intravenously. This was less noticeable in the supine position and became maximum when the patient assumed the upright posture. The bradycrotic effect was also influenced by infection. In a patient who developed pneumonia the pulse rate rose from 68 to 110 a minute.

There was no direct relationship between the bradycrotic effect and the degree of fall of blood pressure. For example, in the case mentioned above, although the pulse rate remained constant between 48 and 52, the blood pressure fell from 230/125 to 160/90 with reserpine, 1.5 mg. daily. This patient also complained of precordial discomfort, which was not complained of before. An electrocardiogram showed a prolonged S-T interval. This was also the only change in six other individuals with bradycardia. The second case of malignant hypertension mentioned above, however, developed a silent posterior infarct during the course of treatment. This may be a coincidence, but it does raise a point whether the excessive bradycrotic effect along with the fall of blood pressure favours coronary thrombosis.

The excessive bradycrotic effect caused giddiness in three of the patients with pulse rates between 46 and 52.

When the initial side-effects began to pass off all patients showed subjective improvement. Among the symptoms that were most relieved were headache, giddiness, insomnia, palpitation, and worry. The subjective improvement was not always related to fall of blood pressure or the actual state of the patient, but also appeared to occur independently of them. Thus a patient with malignant hypertension and another with severe chronic benign hypertension who died had felt well during reserpine treatment. A gratifying side-effect was relief from constipation.

Conclusion

Reserpine is a useful drug in the treatment of all types of hypertension. It lowers the blood pressure to normal or to within reasonable limits in all cases of less chronic and less severe benign hypertension, and the same effect may also be obtained in some of the more chronic and severe cases.

In the remaining chronic and severe cases and in malignant hypertension subjective symptoms and early cardiac failure are relieved and treatment with hexamethonium is facilitated. The blood-pressure readings are more steady and the dosage of hexamethonium is lowered. This is a great advantage, as adverse effects of large doses of hexamethonium are avoided.

Summary

Thirty-three cases of hypertension were treated with reserpine—24 had benign hypertension, 2 had malignant hypertension, 1 was associated with chronic nephritis, 2 with arteriosclerosis, 1 with thyrotoxicosis, and 3 with anxiety state.

Fifteen patients whose basal systolic blood pressure at the time of treatment was above 200 mm. Hg were treated with reserpine 1.5 mg. daily. Eighteen patients whose basal systolic blood pressure was below 200 were treated with 0.75 mg. daily. In the former group 2 patients were reduced to below 145/90, 5 below 160/100, 7 below 170/110, and 10 below 185/115. In the latter group 12 patients were reduced to below 145/90 and 18 below 160/100.

More details in relation to previous fluctuations and diastolic pressures are given in Table I.

Lack of adequate response was associated with chronicity of hypertension and myocardial and/or renal failure.

Periodic fluctuations up to plus 45/20 mm. Hg continued to occur, and required suitable adjustment of dosage. In some subjects irregular rises of blood pressure of about the same degree occurred on any day. Fluctuations chiefly affecting the systolic pressure occurred in some patients during rest, and it was not possible to record the basal blood pressure in them. Rises associated with routine daily work varied from plus 10–35 systolic to 5–20 mm. diastolic. The tendency in these circumstances was to revert towards pre-treatment levels, but the rise was never so great.

The blood pressure started falling between the fourth and the nineteenth days, reaching its lowest in 9 to 40 days. Sometimes after being constant for a few days it fell further, but readings below 115/75 were not obtained. In some cases it was possible to discontinue the drug for 3 to 13 days before a rise started again.

Some degree of postural hypertension was present in those who received reserpine in doses of 1.5 mg. daily.

Appreciable additive effects with hexamethonium were obtained.

Side-effects occurred with varying severity and frequency, especially with doses above 0.75 mg. daily. Within a week or so, however, they either cleared or were tolerable. When the side-effects abated there was marked subjective improvement in most cases. Constipation had a tendency to be relieved.

In some patients the bradycrotic effect was very marked and precordial discomfort was complained of. Only a prolonged S-T interval was observed in the electrocardiogram.

The bradycrotic effect was abolished by atropine, but exercise had much less effect on it.

Atropine also abolished postural hypertension. The effect was mainly on the diastolic pressure.

I am indebted to Dr. A. N. Soni, of Ciba Pharma Ltd., for the necessary literature and for a free and generous supply of serpasil, and to all the patients, without whose co-operation day-to-day observations would have been impossible.

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THE TREATMENT OF ESSENTIAL HYPERTENSION WITH PENTOLINIUM TARTRATE COMBINED WITH RAUWOLFIA ALKALOIDS

BY

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The autonomic ganglion-blocking agent pentolinium tartrate (pentapyrrolidinium; "ansolysen") is acknowledged to be an effective agent in the control of hypertension (Smirk, 1953). Difficulties have been experienced in its continued use because of the unpleasant effects of its indiscriminate ganglion-blocking activity—for example, constipation, dry mouth, visual disturbances, etc.—which accompany the hypotensive activity. The rauwolfia alkaloids have been in extensive use in India for a variety of conditions for many years. Vakil (1949)

showed that the drug has hypotensive properties. It is a central sedative and also stimulates the smooth musculature of the intestinal tract. The combined use of a rauwolfia alkaloid (reserpine) with pentolinium tartrate was described by Smirk, Doyle, and McQueen (1954), who found that less of the latter was required and that the effect was more sustained. They recommend a method of control by these drugs.

We have used this method, and present a short series of cases in which stabilization had been achieved on pentolinium tartrate alone and which were later restabilized on that drug with the addition of rauwolfia alkaloids ("rauwoiloid" 4 mg.), taken in a single dose each evening.

All the patients had essential hypertension. Their blood pressure before treatment varied from 300/160 to 240/130. None had evidence of renal involvement. The average dose of pentolinium tartrate when given alone was 840 mg. a day. The average daily dose of that drug when combined with rauwolfia alkaloids was 240 mg., a reduction of over two-thirds. One patient who required 440 mg. of pentolinium tartrate a day was restabilized on the combination with 60 mg. a day.

The corresponding decrease in the undesirable effects of the ganglion-blocking agent was very great, and some patients who had found it impossible to continue with pentolinium tartrate alone are now well stabilized and able to live active lives.

Discussion

The combined use of pentolinium tartrate and rauwolfia seems to offer a promising treatment of hypertension. In

Case No.	Sex and Age	B.P.	Clinical Features	Control by Pentolinium Tartrate Alone			Control by Pentolinium Tartrate and Rauwoiloid		
				Daily Dose of P.T. (mg.)	B.P.	Results	Daily Dose of P.T. (mg.)	B.P.	Results
1	F 50	260/150	Dyspnoea	420	120/80	Tired and faint	120	140/80	Doing full-time work
2	F 50	280/150	Cerebral encephalopathy. Congestive failure	720	170/100	Intolerably dry mouth and constipation. Blurred vision	60	170/90	Dryness of mouth slight only. Regular bowel action
3	F 63	290/130	Dyspnoea. Headaches	540	240/120	Constipation	60	200/100	Normal bowel action
4	F 59	260/150	Dyspnoea. Retinal sclerosis	480	140/80	Postural hypotension. Constipation	120	150/110	Feeling well
5	F 62	260/135	Congestive failure. Gross cardiac enlargement	120	200/100	Blurred vision. Constipation	Rauwoiloid alone	190/90	Symptom-free
6	M 48	260/150	Headaches. Visual failure. Gross retinal sclerosis	840	190/125	Refused further treatment. Dry mouth. Constipation. Postural hypotension	420	135/90	Bowels easily controlled. At work
7	F 56	280/170	Cardiac asthma	Hexamethonium bromide, oral 1,500/900	240/140	Dry mouth. Constipation. Postural hypotension	240	190/110	Mouth not dry. Constipation easily controlled. No faintness
8	F 66	250/140	Dyspnoea		150/100	Dry mouth. Postural hypotension	120	170/105	Mouth less dry. No postural hypotension
9	F 63	290/150	Dyspnoea, visual failure	240	220/140	Refused further treatment	120	190/110	Minimal side-effects
10	M 59	290/150	Angina. Heart grossly enlarged	600	200/115	" "	300	210/110	Less constipation
11	F 55	270/170	Subarachnoid haemorrhage. Encephalopathy. Gross cardiac enlargement	960	170/110	Postural hypotension. Dry mouth. Constipation. Blurred vision	720	190/110	Constipation easily controlled
12	F 40	225/140	Congestive failure	360	190/130	Intolerant of higher dosage	120	180/110	Tolerable side-effects. At work
13	F 60	230/140	Dyspnoea. Retinal sclerosis	360	180/120	Postural hypotension	240	200/110	Tolerable side-effects
14	F 39	300/160	Dyspnoea. Visual failure	720	220/120	Refused further treatment	240	160/90	Minimal side-effects. At work
15	F 49	270/150	Cardiac enlargement	1,020	190/110	Dry mouth. Blurred vision. Constipation	360	190/105	Less constipation. Feels very well
16	F 48	240/130	" "	720	170/110	Dry mouth. Constipation. Fainting	300	190/110	Less constipation. Mouth not dry. Feels well
17	F 48	250/140	Visual failure. Congestive heart failure	900	150/100	Dry mouth. Fainting	360	160/115	Mouth not dry. Less tendency to faint

P.T. = Pentolinium tartrate.

patients who are already stabilized on pentolinium tartrate alone, the dose on adding rauwolfia has usually been reduced to one-third and final adjustments made from that level.

A patient who has had no previous treatment is given rauwolfia for some weeks, as suggested by Smirk *et al.* (1954). Then pentolinium tartrate is added, starting with 20-mg. doses and increasing by increments of 20 mg. until satisfactory levels are obtained. We have found that a better control is achieved when the drug is given three times rather than twice daily.

The reduction in dosage reduces or abolishes the undesirable effects of the ganglionic blockade. Where formerly postural hypotension was a problem, this has been less evident on the combination. Rauwolfia has been shown to stimulate the intestine, and this, in addition to the smaller dose of pentolinium tartrate required, makes the control of the bowels easier. There is therefore less risk of cumulative effect through retention and subsequent absorption of pentolinium tartrate in the bowel.

Patients have been definite in expressing their views that they are much more comfortable, and have been willing to continue treatment, whereas formerly on pentolinium tartrate alone they were incapacitated by weakness, dry mouth, visual disturbances, constipation, and the variability of effect on the degree of hypotension this produced.

In most cases there is no urgency in the control of the hypertension, and gradual reductions of the blood pressure are better tolerated. The aim should be the maximum reduction which keeps the patient comfortable, since the symptoms and signs of hypertension will regress when the pressures have been reduced to levels which are still above the accepted normal.

It would seem also that, once the diagnosis of essential hypertension has been established, cases are better controlled with the patient living his normal life.

Summary

The use of pentolinium tartrate in combination with rauwolfia alkaloids in the control of essential hypertension is compared with the use of the former drug alone.

The dosage necessary with the combined drugs is greatly reduced.

The undesirable effects of the ganglionic blockade have been much lessened and patients have found the treatment more acceptable.

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The Medical Section of the Library Association held a week-end conference in Birmingham on March 25-28. Members were the guests at dinner of the Vice-chancellor (Professor ROBERT AITKEN), in whose absence Professor H. A. CRONNE presided, supported by Professor J. F. D. SHREWSBURY. In a symposium on medical libraries and literature in 1984 the chief topics discussed were the establishment of national editorial assessment boards and a consequent reduction in the number of medical periodicals, academic courses in medical librarianship, changes in the medical profession itself and their effect on library provision, national economic changes and their effects on medical libraries, and the potentialities of new technical methods in documentation. A visit was paid to the Birmingham Medical School, where the sub-dean, Professor C. F. V. SMOUT, announced plans for a new medical library building on a scale commensurate with the other splendidly equipped departments. Special exhibitions of rare medical books were on view, both at the School and at the Birmingham Medical Institute.

INEFFECTIVENESS OF CHICKEN ANTI-ULCER FACTORS IN TREATMENT OF GASTRIC AND DUODENAL ULCER IN MAN

BY

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The present study, carried out in collaboration with Professor H. Dam, is aimed at deciding whether materials acting prophylactically against gizzard ulcer in chicks have any curative effect in gastric and duodenal ulcer in man. Dam (1954) has set out the reason for undertaking this work.

The development and prevention of ulcers in the muscular stomach (gizzard) of the chick have been described by Dam (1934, 1946, 1951), Dam and Schönheyder (1934), Dam and Segal (1945), Dam, Noer, and Søndergaard (1950), Cheney (1938, 1940, 1942), and others. According to Dam and his associates young chicks reared on an artificial diet containing cod-liver oil develop ulcers which are often severe and may perforate. The disease may be prevented by including in the diet hog liver, calf's brain, or certain extracts therefrom. The prophylactic effect is associated with the lipid fraction as well as with the residue that remains after these organs have undergone extraction with fat solvents. A marked prophylactic effect is obtained by a combination of the lipid extract and an aqueous extract of calf's brain. The aqueous extract contains vitamin B₁₂ and may be replaced by this vitamin. In the lipid extract it is the highly unsaturated fraction of the fatty acids that carries protective activity. Arachidonic acid has shown such effect, while fatty acids from fish oils aggravated the symptom.

Material

We studied 152 patients with gastric or duodenal ulcer. They were admitted to the medical departments B and C of Bispebjerg Hospital and the medical department A of the University Hospital of Copenhagen during the period July 1 to December 1, 1954. Of these patients, 82 were treated with anti-gizzard-ulcer factors and 70 were given placebos. Diagnosis was based on anamnesis, x-ray examination (niche deformation), and, if present, demonstrable haemorrhage. All patients showed typical ulcer symptoms.

The patients in the two groups were chosen at random. Each of the three hospital departments was divided into two halves. All patients with gastric or duodenal ulcer admitted to one half formed the experimental group; those with the same diseases admitted to the other half formed the control group. The groups did not differ significantly in sex, age, location of the ulcer, symptoms, or duration of the disease before admission to hospital (Table I).

Treatment

Patients in the experimental group were given daily for four weeks 80 g. of "preparation A," a granulate consisting of ether extract of calf's brain mixed with three parts of

TABLE I.—Comparison of 82 Patients Treated with "Anti-gizzard-Ulcer Factors" (Experimental Group) and 70 Patients Treated with Placebos (Control Group)

Sex distribution	Male female	Experimental Group	Control Group
		55 27=2.0	45 25 =1.8
Age distribution		No. of Patients	No. of Patients
15-24 years	..	4 (5%)	3 (4%)
25-34 ..	..	12 (15%)	6 (9%)
35-44 ..	..	19 (23%)	18 (26%)
45-54 ..	..	18 (22%)	14 (22%)
55-64 ..	..	17 (21%)	19 (27%)
65+ ..	..	12 (15%)	10 (14%)
Site of ulcer			
Duodenum	..	48 (59%)	40 (57%)
Body of stomach	..	12 (15%)	13 (19%)
Justapyloric	..	11 (13%)	8 (11%)
Duodenum and body	..	1 (1%)	1 (1%)
Haemorrhage without demonstrable ulcer	..	10 (12%)	8 (11%)
Reason for admittance			
Pain	..	53 (65%)	44 (63%)
Haemorrhage	..	29 (35%)	24 (34%)
Other cause	..	0	2 (3%)
Duration of disease before admittance			
0-1 year	..	21 (26%)	13 (19%)
2-5 years	..	30 (37%)	29 (41%)
Over 5 years	..	31 (38%)	28 (40%)
Average	..	64 years	74 years

sucrose. The amount of ether extract in the 80 g. corresponded to 300 g. of fresh brain. The preparation was swilled down with milk or water. In addition, these patients received three times a day one tablet containing 5 µg. of vitamin B₁₂ ("cycobemin") and intrinsic factor corresponding to 1.8 g. of fresh hog pyloric mucosa.

The patients in the control group were given corresponding amounts of "preparation B" (placebo), a granulate consisting of one part of powder of autoclaved milk (at 120° C. for one hour) mixed with three parts of sucrose. Instead of vitamin B₁₂ tablets they received placebo tablets consisting of lactose and potato starch. Patients and nurses did not know which of the preparations given contained the anti-gizzard-ulcer factors.

Both groups were subjected to the following regimen: light confinement to bed for three weeks, thereafter out of bed. All received a purée diet, and, daily, one tablet containing vitamin A, 5,000 I.U.; vitamin D₃, 600 I.U.; vitamin B₁, 3 mg.; vitamin B₂, 3 mg.; vitamin C, 75 mg.; and nicotinamide, 20 mg. Tablets consisting of 0.15 mg. of atropine sulphate, 500 mg. of sodium bicarbonate, and 500 mg. of basic magnesium carbonate were given as required when cardialgia occurred. The number of tablets given daily was carefully recorded.

Preparations A and B were tested for anti-gizzard-ulcer activity in the Department of Biochemistry and Nutrition, Polytechnic Institute, by Mr. E. Søndergaard, as described by Dam, Noer, and Søndergaard (1950), using the mode of graduation of gizzard ulcers introduced by Cheney (1942). Preparation A together with vitamin B₁₂ showed the same

protective activity against gizzard ulcers as was found in earlier experiments (Dam, Noer, and Søndergaard, 1950) for ether extract of calf's brain given with vitamin B₁₂. Preparation B showed no protective effect in the chicken test.

Results

Several criteria were used to evaluate the result of treatment: (1) complaint of pain, which was also estimated by the number of tablets of atropine and alkali consumed; (2) intensity and duration of visible or occult bleeding, measured by benzidine tests on each stool; and (3) comparison of x-ray pictures of the stomach taken just before, during, and after treatment.

Pain.—In the experimental group 50 patients had pain which continued after they had been confined to bed and given the purée diet; 11 had pain all through the experimental period. In the control group 53 patients had pain at the beginning of the treatment, and 10 of these still had pain after four weeks' treatment. Fig. 1 shows that the cardialgia disappeared equally fast in the two groups. After one week's treatment 75% of the experimental group had pain as compared with 78% of the controls; after two weeks 56% and 54% respectively still had pain; and after three weeks 35% and 28% had pain. Fig. 2 shows that the number of atropine and alkali tablets required was a little larger in the experimental group than in the control group.

Haemorrhage.—Fig. 3 expresses the intensity and duration of haemorrhage in the two groups as measured by the number of positive benzidine reactions. Melaena was given 4 points; in cases with occult bleeding an immediately positive benzidine reaction was given 3 points; a reaction which became positive within 30 seconds, 2 points; and a reaction which was positive after 30 to 60 seconds, 1 point. The sum of each day's points for the 82 experimental patients and for the 70 control patients was then calculated as if there were 100 patients in each group. Bleeding diminished at the same rate in the two groups. In the experimental group, 29 had melaena or haematemesis, against 25 in the control group. The average time required for cessation of bleeding in the two groups was 9½ and 10 days respectively. Evaluating the treatment by reduction or disappearance of pain and/or bleeding, as shown in Table II, indicates that the results obtained in the experimental and the control group were approximately equal.

TABLE II.—Clinical Evaluation of Result of Treatment in Experimental and Control Groups

	Experimental Group (82 Patients)	Control Group (70 Patients)
Unchanged	17 (21%)	9 (13%)
Improved	63 (77%)	60 (86%)
Aggravated	1 (1%)	0
Questionable	1 (1%)	1 (1%)

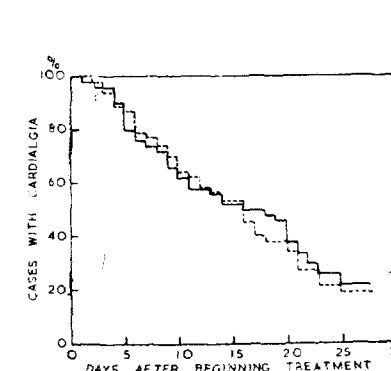


FIG. 1.—Diminution of cardialgia during four weeks' treatment. — Experimental group (50 patients). Control group (53 patients).

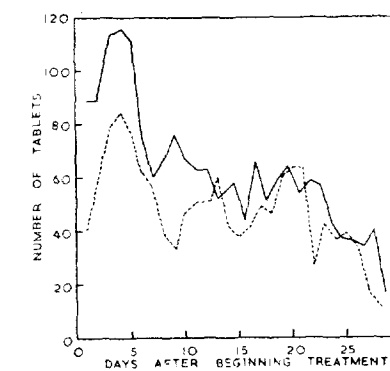


FIG. 2.—Number of tablets with atropine and alkali given daily per 100 patients. — Experimental group. Control group.

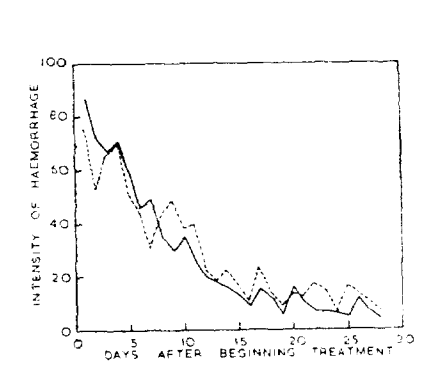


FIG. 3.—Intensity and duration of melaena or occult haemorrhage per 100 patients (see text). — Experimental group. Control group.

TABLE III.—Radiological Evaluation of Result of Treatment in Experimental and Control Groups. Comparison of X-ray Pictures of Stomach and Duodenum Taken Immediately Before Treatment, After Two and Four Weeks of Treatment, and Again Two Weeks After Cessation of Treatment

	Experimental Group (82 Patients)	Control Group (70 Patients)
Unchanged ..	36 (44%)	30 (43%)
Improved ..	28 (34%)	27 (39%)
Aggravated ..	5 (6%)	3 (4%)
Questionable ..	13 (16%)	10 (14%)

X-ray Examination.—The evaluation of the results of the treatment from a radiological point of view is based on examinations immediately before treatment, after two and four weeks of treatment, and again two weeks after discontinuation of treatment. Only obvious differences have been taken into consideration, especially diminution of niche and marked change in the deformation of the duodenal bulb or the prepyloric canal. In cases of major haemorrhage the ulcer could not always be demonstrated, and thus the x-ray pictures from such patients could not contribute to the evaluation of the treatment. Table III shows the results of the x-ray examination. Also, no difference could be demonstrated radiologically between the experimental and the control group.

Summary and Conclusions

Eighty-two randomly chosen patients with gastric or duodenal ulcer have been treated with "anti-gizzard ulcer factors" (ether extract of calf's brain plus vitamin B₁₂). Seventy similarly chosen control patients were subjected to the same regimen with placebos substituted for "anti-gizzard ulcer factors." After a preliminary short follow-up period the results of the treatment were evaluated. Diminished pain and bleeding and comparison of repeated x-ray examinations were used as criteria. The experimental and the control groups did not differ at all in their response to treatment. "Anti-gizzard ulcer factors" were thus of no value in the treatment of gastric and duodenal ulcer in man.

Thanks are due to A/S Orthana Kemisk Fabrik, Copenhagen, for generous assistance in preparing and furnishing the preparations used in this study.

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The Atomic Energy Authority has lent to the Science Museum at South Kensington a large working model of the "B.E.P.O." atomic pile, the larger of the two pioneer piles set up at Harwell. This pile went into operation in July, 1948. It is used for research purposes, and for "cooking" radioactive isotopes for use in medical research and treatment, in agricultural research, and in industry. The model goes through a complete cycle of operations in five minutes, and shows the working of the control and shut-down rods which govern the heat output of the pile, and the movement of the hoist for loading uranium rods into the pile. The uranium rods are the pile's fuel, and during its operation some of the uranium is "burnt up," and the rods become contaminated by the products of combustion. The rods then have to be removed and processed to remove the fission products.

ERYTHRODERMIA WITH LIPOMELANIC RETICULUM-CELL HYPERPLASIA OF LYMPH NODES

(DERMATOPATHIC LYMPHADENITIS)

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The association of an unusual type of hyperplasia of the superficial lymph nodes with certain pruritic skin disorders, first fully discussed by Pautrier and Woringer (1937), has been amply confirmed by subsequent authors (Hurwit, 1942; Soloff, 1942; Laipply, 1948; Obermayer and Fox, 1949; Laipply and White, 1951; Jarrett and Kellett, 1951; Wilson, 1954). There is substantial agreement that the lymph-node change is merely reactive, though there is some doubt whether the condition always remains benign: occasionally it has been found in association with leukaemia (Laipply and White, 1951) or mycosis fungoides (Bluefarb and Webster, 1950).

This syndrome is not a rarity, but its significance is still not generally recognized. The present paper is a clinico-pathological account of 13 further cases, with follow-up of from one to four years, and reaffirms the essentially benign reactive nature of the condition.

The following case reports have been classified in four groups according to the clinical diagnosis.

(a) Generalized Exfoliative Erythrodermia

Case 1.—Female, aged 74 on admission, November, 1951. The eruption had been present for a few months and there was a generalized lymphadenopathy of moderate degree. She gave a history of a previous attack in 1947 which developed at the beginning of a course of gold injections for arthritis. Psychogenic factors were marked. Biopsy of a lymph node from the groin showed pronounced reticulum-cell proliferation to form large pale-staining sheets, though the general architecture of the rest of the gland was well preserved. Eosinophils were numerous; abundant melanin, almost entirely intracellular, was scattered throughout the medulla. There was no lipid or iron pigment. After a short course of A.C.T.H. the skin condition almost settled and the lymphadenopathy subsided. She was discharged in February, 1952, and her own doctor reports that the skin gave no further trouble. The patient died in the summer of 1952 of perforated appendicitis, peritonitis, and carcinoma of the ovary. At necropsy the skin was healed and there was no residual lymphadenopathy or evidence of reticulo-endothelial disease elsewhere.

Case 2.—Male, aged 51 on admission, August, 1952. The eruption, present for 11 months, had begun with pruritus and erythrodermia of the head and neck with rapid generalization. Exfoliation, beginning two months later, was associated with generalized alopecia. Psychogenic factors, profuse sweating, and a burning sensation in the skin were notable features. On admission there was moderate lymphadenopathy and the liver was enlarged 2 cm. below the costal margin. The peripheral blood picture was normal though the sternal marrow was very cellular (10% plasma cells). Biopsy of the skin showed a moderate infiltration of the

superficial dermis by lymphocytes, reticulum cells, neutrophils, eosinophils, and plasma cells. In the lymph nodes there was the characteristic reticulum-cell hyperplasia and infiltration by eosinophils and plasma cells, with deposition of melanin pigment and very little fat; iron pigment was present in small amount. Liver biopsy revealed slight fatty change and the presence of a few eosinophils and plasma cells in the portal tracts. The patient was in hospital for more than a year, during which time he developed polyradicular neuritis and thrombophlebitis of the legs and, later, superficial necrotic changes in the tips of his fingers. The response to general and local measures was slow; most benefit was obtained from A.C.T.H. He was discharged in September, 1953, with his skin condition settled apart from some excoriations of the legs. When seen in December, 1954, the skin condition had remained quiet and the lymphadenopathy had subsided. Biopsy of a node at this time showed no sign of the dermatopathic reaction.

Case 3.—Female, aged 68 on admission, August, 1952. The eruption had been present for five weeks and there was a history of a previous attack in 1942. Her skin showed patchy thickening in addition to the exfoliative erythrodermia and there was marked lymphadenopathy, especially in the epitrochlear nodes. Pruritus was intense and the psychogenic element was very marked. In October, 1952, a vesicobullous phase developed, followed by a thickened and deeply pigmented eruption over the whole integument except the face and the anterior aspect of the trunk. The liver was enlarged 2 cm. below the costal margin though liver-function tests were normal. There was persistent eosinophilia (15–23%) in the peripheral blood. Biopsy of the skin showed a moderate, largely round-celled though slightly pleomorphic infiltrate of the superficial dermis. A lymph node showed reticulum-cell hyperplasia, and slight eosinophil and plasma-cell infiltration. There was abundant melanin but no fat or iron pigment. In May, 1953, she was discharged with the skin condition quiet, though patchy pigmentation was present. This state of affairs persisted, apart from minor localized recurrences associated with emotional upsets, until October, when, according to her own doctor, she became markedly depressed and her skin condition relapsed. She developed oedema of the face, dyspnoea, and ultimately generalized oedema with stupor, and died in November, 1953, with pulmonary oedema. Permission for necropsy was not obtained.

Case 4.—Male, aged 76 on admission, December, 1952. An intensely pruritic exfoliative erythrodermia associated with marked lymphadenopathy had been present for six weeks. Eight per cent. of eosinophils was found in the peripheral blood, and the sternal marrow was normal. Biopsy of the skin showed mild parakeratosis, blurring of the stratum granulosum, and patchy atrophy of the stratum spinosum. There was an abundant, slightly pleomorphic, mononuclear infiltrate in the superficial dermis and a few foci of similar cells were seen near the vessels and glands. The usual reticulum-cell hyperplasia with a notable amount of lipid was found in a superficial lymph node. Melanin was scanty and iron pigment was absent. The skin condition settled slowly and the patient was discharged in June, 1953. He was still clear in December, 1954.

Case 5.—Female, aged 57 on admission, February, 1952. Exfoliative erythrodermia with marked pigmentation, pruritus, and superficial lymphadenopathy had been present for three weeks. Emotional and vasomotor lability was pronounced. The peripheral blood showed mild leucocytosis with eosinophilia up to 33%. The skin condition settled and she was discharged in June, 1952, but further emotional upset precipitated a relapse. She was readmitted in February, 1953, by which time her liver was palpably enlarged. Biopsy of the skin showed the histological features of erythrodermia. The characteristic reticulum-cell reaction and lipid and melanin deposits were found in a superficial lymph node, but there was no iron pigment. A liver biopsy showed many eosinophils in the vascular spaces and a few amongst the cells of the portal tracts; otherwise

there was no abnormality. Her condition improved and she was discharged in March, 1953, since when the erythrodermia has fluctuated; there was a further exfoliative attack in November, 1953. In November, 1954, apart from minimal changes, the skin condition had been inactive for eight months, although some lymphadenopathy had persisted. There was, however, no sign of the reticulum-cell reaction and no melanin in a lymph node taken at this time, though lipid was abundant.

Case 6.—Male, aged 50 on admission, November, 1950. Exfoliative erythrodermia, present for three months, settled with routine treatment in January, 1951. It was subsequently aggravated by contact irritants, and he was readmitted in July with widespread pruritic erythrodermia and axillary and inguinal lymphadenopathy. Eosinophilia was found in the peripheral blood and sternal marrow. The pruritus subsided and the erythrodermia cleared completely by August, 1951, when he was discharged. During the next three years there was only intermittent minor papulation of the face, neck, and flexures of the elbows, except for a slight relapse in January, 1954. Biopsy of the skin and superficial lymph nodes was carried out on three separate occasions during the observation period. In the skin there was a somewhat pleomorphic dermal cellular infiltrate; eosinophils were present in appreciable numbers. The lymph nodes all showed the characteristic reticulum-cell reaction; the amount of melanin was variable. A liver biopsy was normal. In November, 1954, papulation and enlargement of lymph nodes were minimal; biopsy of a node showed no sign of the dermatopathic reaction.

(b) Exfoliative Psoriasis

Case 7.—Female, aged 37 on admission, April, 1952. Psoriasis, present since 1939, had fluctuated in severity until March, 1952, when there was a severe flare-up during treatment. On admission she had extensive psoriasis of the scalp with scattered plaques over the trunk and extremities. Her right ankle was painful and swollen, though there was no radiological evidence of bony change. Slight pyrexia was present and the E.S.R. was 75 mm. in 1 hour (Westergren). "H.P.C." (3-hydroxy-2-phenylcinchoninic acid) therapy was followed by reduction of the ankle swelling, but it caused a vesicular skin reaction, which settled on withdrawal of the drug; the arthropathy then reappeared, this time in the right knee and left wrist. Another course of H.P.C. was tried, but further skin reaction necessitated its gradual replacement by cortisone. In June, 1952, despite the cortisone therapy, joint pains and stiffness increased, especially in the spine. The cortisone was stopped and A.C.T.H. tried instead, but the skin condition deteriorated to a generalized exfoliative erythrodermia accompanied by oedema of the eyelids and ankles. There was no conspicuous enlargement of the superficial lymph nodes. Stiffness gradually extended to most joints, and periarticular swelling and some osteoporosis developed. Further treatment by cortisone and also by mepacrine was ineffective. In October, 1952, the erythrodermia showed no improvement. Biopsy of a superficial lymph node showed sheets of reticulum cells and abundant melanin; lipid and iron pigment were absent. The patient's condition deteriorated and there was increasing pyrexia associated with cough and purulent sputum; enlargement of the liver was now detected. Later in the month she complained of chest pain, and within half an hour became comatose and died. Clinical pathological findings during her illness were not informative until the day before her death, when she was found to have complete agranulocytosis (total leucocyte count, 1,200 per c.mm.); one month before her death her leucocyte count had been normal. At necropsy the findings were those of an acute aleukaemic monocytic leukaemia and exfoliative arthropathic psoriasis.

Case 8.—Female, aged 61 on admission, October, 1952. Psoriasis had been generalized at the age of 16, but subsequently only a few chronic patches had been present until June, 1952, when she developed a generalized exfoliative

attack with intense pruritus. Lymphadenopathy was confined to the inguinal nodes. Biopsy of the skin showed the usual features of psoriasis with an occasional eosinophil in the dermal infiltrate. In an inguinal lymph node there were sheets of reticulum cells, many plasma cells and eosinophils, but no lipid or pigment. She was discharged, very much improved, in December, 1952, and two years later still showed only a few isolated patches of psoriasis and no lymphadenopathy.

Case 9.—Male, aged 51 on admission, November, 1952. Psoriasis had been present intermittently for 35 years, but despite treatment it had become generalized and exfoliative six weeks before admission. In hospital the psoriasis resolved with A.C.T.H. therapy, but superficial lymphadenopathy and hepatomegaly developed. Biopsy of a lymph node showed reticulum-cell sheets with lipid and abundant melanin. In a biopsy of liver there was mild fatty change and some increased cellularity of the portal tracts with minimal pleomorphism. He was discharged almost free of symptoms in February, 1953. In October, 1954, the psoriasis remained minimal though the liver was still enlarged.

Case 10.—Male, aged 55 on admission, April, 1953. This was an example of localized exfoliative psoriasis. A few plaques of psoriasis, mainly on the legs, had been present since 1949; one was at the site of a healed stasis ulcer of the left leg. On admission the psoriatic lesions of the legs were exfoliative and the regional nodes were enlarged. Biopsy of the skin confirmed the clinical diagnosis. A lymph node from the left groin showed reticulum-cell sheets and abundant melanin but no fat or iron pigment. The skin lesions resolved with routine measures and the patient was discharged in May, 1953.

(c) Besnier's Eczema on Ichthyosis

Case 11.—Female, aged 29 on admission, September, 1952. Ichthyosis with severe atopic dermatitis had been present since infancy and there was also a history of asthma. On admission there were widespread excoriations and generalized lymphadenopathy. Emotional lability was pronounced. Biopsy of a superficial lymph node showed reticulum-cell sheets, an abundant infiltration by eosinophils, but only minimal lipid and melanin; iron pigment was absent. Her condition improved and she was discharged a month after admission. When last seen in October, 1954, lichenification and pigmentation of the skin with excoriations were still present; the lymphadenopathy was unchanged.

Case 12.—Female, aged 40 on admission, May, 1953. Ichthyosis with minor atopic dermatitis had been present since infancy and she had had asthma for 10 years. The skin condition had deteriorated during the past three years and on admission was severe and generalized; lymphadenopathy was minimal. Emotional lability was a conspicuous feature. Biopsy of the skin showed a patchy, mainly perivascular, mononuclear infiltrate with slight cellular pleomorphism; the stratum corneum and stratum granulosum were well defined. In a lymph node from the groin there were reticulum-cell sheets with a moderate infiltrate of eosinophils, plasma cells, and lipid-laden cells: melanin and iron pigment were present in small amount. She improved with routine measures and was discharged in July, 1953. In November her skin condition remained controlled, showing only moderate lichenification with minimal scaling. The lymphadenopathy appeared to have subsided. Biopsy of an axillary node at this time revealed no sign of the dermatopathic reaction though there was some infiltration by eosinophils and plasma cells and an occasional particle of iron pigment. In October, 1954, her condition had remained quiet.

(d) Reticulosis

Case 13.—Male, aged 64 on admission, July, 1952. A pruritic skin condition with photosensitivity had been present for six months. On admission erythema with thickening of the skin was generalized apart from the legs and a few

small islands on the front of the chest; there was some exfoliation on the face. The axillary and inguinal nodes were moderately enlarged and the liver was palpable 2 cm. below the costal margin. The peripheral blood and sternal marrow were normal. Biopsy of the skin showed a diffuse, abundant infiltration of the dermis by mononuclear cells; pleomorphism, though present, was not conspicuous. Reticulum-cell sheets with moderate amounts of melanin and iron pigment and minimal lipid were found in a superficial lymph node. The condition was provisionally regarded as pruritic erythrodermia and he was given a course of urethane, which had to be stopped after five weeks because of nausea and vomiting. As the skin had improved vastly and the pruritus had disappeared he was discharged in September, 1952. However, he was readmitted six months later as the eruption had recurred with much scaling. Biopsy of the skin now showed considerably more pleomorphism of the dermal infiltrate. The histological appearances of another lymph node were the same as previously. Biopsy of liver showed minor increase in cellularity of the portal tracts, including a few eosinophils and plasma cells. Further treatment with urethane combined with R 48 (β -naphthyl-di-2-chloroethylamine) until July, 1953, largely controlled the skin condition for a further six weeks, when an acute relapse occurred with severe generalized lymphadenopathy. The peripheral blood showed a leucocytosis (12,700 per c.mm.) with up to 26% eosinophils. He developed extensive oedema and died in November, 1953. Permission for a necropsy was refused.

Clinical Review

The 13 cases described, all showing lymphadenopathy with the characteristic dermatopathic reaction in the nodes, have in common a pruritic skin disorder with exfoliation at some stage. Emotional instability, as emphasized by Jarrett and Kellett, was a feature of seven of our cases, and eosinophilia was found either in the peripheral blood or in the tissues, or both, in all but three psoriatic patients. Case 10 illustrates the fact that a generalized erythrodermia is not essential to the development of the lymph-node picture, since the lymphadenopathy here occurred in the drainage area of a purely localized lesion. Our series showed no sex preponderance (seven females and six males): this is in accord with the observations of Laipply and White, and suggests that the preponderance of males noted by Jarrett and Kellett may have been fortuitous. All the patients were adults, of ages ranging from 29 to 76; other workers have found much the same age distribution.

Pathological Review

Methods.—All tissues were fixed in formol acetate; the lymph nodes were transected as soon as possible, always within 24 hours, and one-half of each was transferred to Carnoy's fluid for paraffin sections. Haematoxylin and eosin staining was used routinely on all specimens. In addition, sections of the lymph nodes were stained for eosinophils (eosin and methylene blue), plasma cells (Unna-Pappenheim), melanin (blackening by Fontana's silver method and bleaching by Mayer's method), iron (Perles), and reticulin (Foot). Frozen sections were stained for fat (Sudan III). The skin sections were also stained for melanin, and the liver biopsies were examined by special stains when required.

Results.—The skin, examined histologically in nine cases, showed the usual features of the different diseases and nothing specifically characteristic of the dermatopathic syndrome.

The lymph nodes were variably enlarged, up to 3 cm. in length, and showed no outstanding macroscopic features to distinguish them from those with simple reactive hyperplasia or grave reticulosis.

The histological changes are summarized in Table I. Reticulum-cell hyperplasia was found in all cases: the reticulum cells occurred in pale-staining sheets in the medullary part of the gland, particularly in the outer part, so

TABLE I.—Histological Features of Lymph Nodes

Case	Hyperplasia			Eosino- phils	Plasma Cells	Lipoid	Melanin	Iron
	R	S	F					
1	+	+	—	+	—	—	++	—
2	+	—	—	++	++	—	++	—
3	+	—	—	—	++	—	++	—
4	+	—	—	—	++	—	++	—
5	+	+	+	+	—	+	++	—
6	+	—	—	+	+	—	++	—
7	+	+	+	+	+	—	++	—
8	+	—	—	+	+	—	++	—
9	+	+	+	—	—	+	++	—
10	+	+	—	—	—	—	++	—
11	+	+	+	++	—	—	++	—
12	+	+	+	+	+	—	++	—
13	+	+	—	—	—	—	—	+

R = Reticulum-cell sheets. S and F = Sinus and follicular hyperplasia respectively.

that they sometimes separated the follicles widely. In all but two cases there was also a minor degree of the more usual type of reactive lymphoid hyperplasia, either sinus or follicular in type, or both. Less constant features were infiltration by eosinophil leucocytes and plasma cells. Foam cells bearing sudanophil fat were found in moderate numbers in 7 out of 12 cases examined by frozen section; they occurred scattered throughout the medulla and especially in or around the sheets of reticulum cells. Melanin pigment, mainly intracellular, was found in all but two cases, and was abundant in six; it occurred anywhere in the medulla, and its deposition seemed to be related to the degree of pigmentation of the skin drained by the node. Iron pigment was found in three cases. Reticulin fibres were scanty in the areas of reticulum-cell hyperplasia; there was no increase of collagen.

The typical histological picture was not restricted to enlarged nodes, as it was often found in those of normal size removed at the same time. The presence of both melanin and lipid together in a single node was noted in only six cases, and in only one were both present in abundance. Because of this we agree with Hurwitt and with Jarrett and Kellett that the term "dermatopathic lymphadenitis" for the reaction is preferable to the older term of "lipomelanotic reticulosis."

For practical reasons we have been unable to obtain much histological evidence about the fate of such glands. So far as can be judged, however, the picture seems to be reversible, since in most of our cases the lymphadenopathy had subsided when the skin condition cleared. In four cases a lymph-node biopsy at this time showed persistence of a little pigment or lipid, but no sign of the dermatopathic reticulum-cell reaction. The lesion therefore should be regarded as a benign reactive change, and its recognition by histopathologists is of great importance. Unfamiliarity with the condition may lead to diagnosis of grave reticulosis or, at best, to guarded opinions.

Liver Biopsies.—We have not been able to find any previous report of the state of the liver during life in this

syndrome. Needle biopsies were performed in five of the present cases with mild hepatomegaly as it was thought desirable to exclude the possibility of a generalized reticulo-endothelial reaction. In none was there any evidence of reticulosis; four showed scanty leucocytic infiltration of the portal tracts and two of these livers were fatty.

Necropsies were performed on two of the four patients who died. One of these (Case 1) died of an unrelated cause and had no sign of generalized reticulosis *post mortem*. The other (Case 7) died of an acute leukaemia, but the question whether this termination was coincidental or not cannot be decided.

Control Observations

In an attempt to establish whether the lymph-node reaction could be found in conditions other than pruritic skin disorders with exfoliation we have investigated cases of pruritic and non-pruritic skin disorders without exfoliation by the methods already described. In addition, many routine lymph-node biopsies of patients without skin disease have been carried out for any evidence of similar changes; in a few of these the full range of staining techniques was used.

The control skin cases, seven in number, were chosen because of the close similarity to the first series: they were all pruritic and had some lymphadenopathy, though none had exfoliation. Their clinical and pathological features are summarized in Table II. The only consistent difference in the histological picture in the lymph nodes from that found in the main series was the absence of reticulum-cell hyperplasia. Some of the other features, apart from iron-pigment, were found in every case, though the changes were usually mild.

The lymph-node changes found in our main series of cases, with the exception of the reticulum-cell hyperplasia, are not specific to exfoliative pruritic skin disorders, or, for that matter, to any skin disorder. This has been made clear by control observations on nodes from routine biopsy and necropsy material from patients without skin disease. We have frequently been able to demonstrate small amounts of melanin or sudanophil lipid in otherwise normal superficial nodes or in those showing only simple reactive hyperplasia: as the likely source of these substances is the skin, it is not surprising that their incidence and intensity in the lymph node be greater in pruritic skin disease. Moreover, it is well known that eosinophil or plasma-cell infiltration is a common finding in many other diseases. Reticulum-cell hyperplasia, on the other hand, appears to be a rarity apart from its association with exfoliative pruritic skin disease: we have found only one example of appreciable hyperplasia of this type in a control series of 100 patients in which 200 superficial or deep nodes, mostly showing simple reactive changes, were specially examined for this feature. We feel, therefore, that the presence with-in a superficial lymph node of reticulum-cell sheets, particularly if associated with a notable deposition of melanin or

TABLE II.—Clinico-pathological Features of Non-exfoliative Cases

Case	Age and Sex	Diagnosis	Duration (Years)	Other Features	Skin Histology	Lymph-node Histology
A	26 M	Besnier's eczema without ichthyosis	25	Asthma. Emotional lability	Conforms with diagnosis	Sinus and follicular hyperplasia
B	36 M	Psoriasis	15	Died of chronic nephritis. P.M. confirmation obtained	Typical	Mild sinus hyperplasia. Moderate amount of melanin
C	33 F	"	20	Treated syphilis		Sinus hyperplasia. Melanin scanty. A few eosinophils and plasma cells
D	58 M	Reticulosis	73	Blood eosinophilia. Hepatomegaly: liver biopsy—mild fatty change	Suggestive of early mycosis fungoides	Follicular hyperplasia. Many eosinophils and moderate amount of melanin
E	49 M	Prurigo	10	Intrinsic cerebral tumour	Erythrodermatous picture	Sinus hyperplasia. Melanin and lipid in small amounts
F	44 M	"	14	Blood eosinophilia. Emotional lability	Non-specific inflammation and eosinophilia	Sinus and follicular hyperplasia. A few eosinophils and small amounts of melanin and lipid
G	56 M	Disseminated neuro-dermatitis	1	Emotional lability	Conforms with diagnosis	Sinus and follicular hyperplasia. Moderate lipid and scanty eosinophils and plasma cells

lipoid, is almost pathognomonic of a dermatosis with exfoliation and pruritus in the skin drained by the node.

The single exception in the control series was found in a lymph node from the lymph drainage area of a malignant melanoma; it contained melanin but no recognizable tumour cells and there were sheets of reticulum cells in the melanotic areas. This isolated observation may be significant, though it could easily be coincidental, since we have not seen another example of this reaction in other equally melanotic nodes. Moreover, it will be recalled that reticulum-cell hyperplasia was absent from the melanotic nodes from our control cases with non-exfoliative skin disease.

Discussion

The present findings suggest that the dermatopathic syndrome is a specific entity in which chronic dermatosis with erythema, exfoliation, and pruritus is associated with hyperplasia of reticulum cells in the regional nodes: all our 13 cases with this skin picture have, without exception, exhibited the reticulum-cell reaction. The study has been made over the past four years, during which time we have probably seen most of the cases of severe dermatosis in the North-eastern Region of Scotland: a stable and well-defined community with a total population of nearly 500,000, of whom approximately 60% are in the age group concerned—that is, over 25 years. However, our figures for the prevalence of the syndrome in the area cannot be precise, since not every case manifesting these dermatological features in minor degree has been submitted to lymph-node biopsy. Nevertheless, it is felt that the study gives a useful idea of the prevalence of the overt case in this area.

The pathogenesis of the lymph-node reaction has not yet been elucidated, but certain observations are of interest. The common association with eosinophilia and emotional instability may well be significant as indicating possible allergic or neurogenic factors in the development of the syndrome (Jarrett and Kellett): our cases show the same relationship. We have found the characteristic lymph-node changes in association with several unrelated dermatoses, but the reticulum-cell sheets have occurred only in association with exfoliation. We have no good explanation to offer for this association: there may be some common responsible factor, or the reticulum-cell hyperplasia may be secondary to processes occurring in the exfoliating skin. The presence of melanin in the node may also play a part in the development of the reaction.

The prognosis of our cases depended upon the underlying dermatological condition and bore no relationship to the lymph-node picture. However, we are unable to affirm that the lymph-node hyperplasia does not on occasion result in malignant change, as two patients (Cases 7 and 13) died respectively of acute monocytic leukaemia and a grave reticulosis (probably mycosis fungoides). The association may be coincidental or the reticulosis may have caused the exfoliative skin condition. Nevertheless, the possibility that the neoplasia supervened on the reactive hyperplasia cannot be dismissed, since experimental studies (Gillman and Gillman, 1952; Richmond, 1954) have shown that reticulum-cell hyperplasia, artificially induced by such methods as injecting trypan blue into animals, may in fact go on to frank neoplasia.

The treatment of our cases has been by routine methods supplemented by A.C.T.H. alone in two cases (Nos. 2 and 9) and with the addition of cortisone in one case (No. 7). (Hormone therapy is fully reviewed in the M.R.C. Report (1954) and the *British Medical Journal* (1954).) The effect of A.C.T.H. was beneficial in Cases 2 and 9, but both hormones were disappointing in Case 7. This case (an example of exfoliative and atrophopathic psoriasis) is of special interest, as it was the one in which leukaemia developed, apparently as a terminal event, since clinical and pathological investigations during the earlier part of the patient's illness showed no evidence of the disease. She had been exposed to long courses of powerful drugs other than the hormones, and we

have the uncomfortable feeling that the generalized reactive changes in the lymph nodes may have been affected adversely by the therapy.

Summary

Twenty cases of different clinical types of pruritic skin disease with varying degrees of lymphadenopathy have been studied clinically and pathologically during a four-year period. Seven of these cases had no exfoliation and showed only non-specific changes in the lymph nodes, under which term we have included the presence of small or moderate amounts of melanin and lipoid. The other 13 cases, however, all had an exfoliative phase and showed, in addition to the non-specific changes in the nodes, a characteristic proliferation of the reticulum cells. This change, which we have referred to as dermatopathic lymphadenitis, is almost pathognomonic of an exfoliative pruritic dermatosis.

The dermatopathic syndrome is a fairly well defined clinical entity, and its prevalence in overt form in the North-eastern Region of Scotland, with a population of nearly 500,000, can be roughly assessed from the knowledge that our 13 cases probably represent the sum total in that area over a four-year period.

The importance of the syndrome to the pathologist is that unfamiliarity with its manifestations may lead to confusion of the lymph-node picture with that of some grave reticulosis. However, the changes are merely reactive in nature and are essentially benign; they regressed when the skin condition settled, and the prognosis of the cases was that of the primary skin disease. Nevertheless, the possibility that the reactive hyperplasia may occasionally go on to frank neoplasia has not been excluded.

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The ninth report and statement of accounts of the Joint Committee of the Order of St. John and the British Red Cross Society contains much interesting information about the excellent work being done for war casualties and for the population in general. The great bulk of the funds under the control of the Joint Committee is derived from the allocation of £6½m. from the Joint War Organization to cover expenditure for a period of roughly thirty years on the discharge of liabilities arising directly from the war of 1939-45; and the main, though not the sole, activity of the Joint Committee is the relief of ex-Servicemen and women disabled in the two world wars and their dependants. Since the end of the last war some £2m. of capital funds has been expended on the various activities of the several departments of the committee. Four institutions are administered direct by the Joint Committee; one—the rehabilitation centre at Headington Hill Hall, near Oxford—is maintained on behalf of the Ministry of Pensions and National Insurance, and eight others receive recognition and support. In the year ended June 30, 1954, assistance in one form or another was given by the emergency help and aftercare department to 81,000 men, women, or children.

AMYLOID DEPOSITS IN THE BRONCHI

BY

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Amyloid may be deposited in typical sites such as the liver, spleen, kidneys, and adrenals, with little or no amyloid in other organs, or it may be found in other tissues, largely or entirely sparing the more usual sites. No matter where the deposits occur, the abnormality may be associated with a bewildering variety of diseases, more usually tuberculosis or chronic suppuration, but it may be present as the only known disorder. The pathogenesis and treatment of amyloid lesions are unknown.

Localized amyloid disease is very rare. According to Lunzenauer (1952) it occurs in the form of tumours, but he showed that tumour formation can occur when the disease is not localized. Amyloid tumours are uncommon and tend to develop in the atypical sites. They have been reported in the larynx especially, but also elsewhere in the respiratory tract, in the tongue, pharynx, bones, conjunctiva, bladder, urethra, uterine tube, and skin. Schottenfeld *et al.* (1951) reported a case of amyloid tumours of the lower respiratory tract and reviewed 13 cases described previously, but omitted the case reported by Haynes *et al.* (1948). Lunzenauer described two cases of amyloid tumours of the lungs and accepted nine observed by other workers, but four of these were included in the list of Schottenfeld *et al.* Noring and Paaby (1952) reported a case of diffuse amyloid infiltration of the air passages. Whitwell (1953) described a case of amyloid deposits in the bronchi, and thought that two of the cases reported previously were not acceptable.

It would appear that the literature contains reports of some 21 authentic cases of amyloid tumours of the trachea and lung and that in at least six of these cases amyloid deposits were present in the bronchi. The amyloid lesions were not associated with any specific infection or known metabolic disorder. In nearly all of the cases the diagnosis was made at necropsy, and where there was pulmonary involvement multiple tumours were found in both lungs, although not in all lobes. In the case reported by Haynes *et al.* the diagnosis was made after the lung had been removed in the belief that it contained a malignant growth. The patient reported by Schottenfeld *et al.* appears to be the first in whom a bronchoscopic biopsy established the diagnosis of amyloid deposits in the lower respiratory tract. In the patient described by Whitwell the diagnosis was made again by bronchoscopic biopsy. As this was the first case to be reported in the British literature, the following similar case should be of interest.

Case Report

An upholsterer, born in 1900, was admitted to St. Charles's Hospital in November, 1951. He had experienced recurrent attacks of bronchitis for 14 years, but because of recent intermittent slight haemoptyses he underwent bronchoscopy, when a diagnosis of inoperable carcinoma of the left main bronchus was made. He left hospital, but continued to suffer chronic cough and dyspnoea with acute exacerbations, usually relieved by antibiotic therapy. He lost a good deal of weight during the last few months of 1952.

On December 21, 1952, he was admitted to Whittington Hospital with fever, severe cough, mucopurulent sputum, and increasing breathlessness for six days. On initial examination he was found to be a wasted, cyanosed man, with severe dyspnoea. The heart rate was 125 a minute, regular, with no murmurs; blood pressure 115/70. The trachea deviated to the left side, and there was dullness with moist rales, widely over the left lung.

On December 31 an x-ray film showed mediastinal displacement to the left and extensive shadowing over the left lung field with small translucencies in the lower zone suggestive of bronchiectatic cavities; also severe emphysema of the right lung. In the left lateral view there was a triangular area of shadowing in the lower posterior angle, with a concave anterior border suggesting collapse of the left lower lobe. At this time culture of the sputum produced *Staphylococcus aureus* and *Streptococcus viridans*. The white blood cell count was 21,100, polymorphonuclears 85%.

Under treatment in an oxygen tent, with penicillin and sulphadimidine, the acute symptoms abated and the patient made a good recovery from the acute infection. On January 28, 1953, an x-ray film showed considerable clearing of the shadowing of the left lung, but the appearance of collapse of the left lower lobe persisted. The appearances were similar on February 23.

On March 3 bronchoscopy by Dr. A. L. Jacobs showed the left main bronchus retracted to the left and more horizontal than usual. It was partly occluded by a mass of greyish warty tissue, apparently arising from its inferomedial wall and bleeding freely on contact. A firm nodule of this tissue was removed with the bronchoscopy forceps.

Dr. J. Lavertine's report on this biopsy specimen was: "Chronic inflammatory infiltration of surface epithelium over mucous gland adenofibroma of bronchus showing peculiar hyaline degeneration of stroma with foreign-body reaction and indefinite metachromatic reaction for amyloid. No evidence of malignancy."

On March 15 the patient was discharged from Whittington Hospital and was referred to St. George's Hospital to be considered for surgical treatment.

On admission to St. George's Hospital on June 20, his trachea was deviated to the left, respiratory movement of his barrel-shaped chest was poor, and rhonchi were scattered throughout both lungs. No other abnormalities were detected clinically. Direct examination and culture of the sputum revealed normal flora. The urine was normal on microscopical and chemical examination. Blood haemoglobin concentration was 14 g. per 100 ml. and white cells 17,000 per c.mm., 78% polymorphonuclears. The concentration of serum albumin was 3.7 g.%, and globulin 4.1 g.%. After intravenous injection of Congo red, uptake of the dye was similar to that in a control patient.

Screening showed that diaphragmatic movement and barium swallow were normal. Tomography (Fig. 1) revealed a mass which surrounded the left main bronchus and narrowed its lumen irregularly in the lower two-thirds. The mediastinum was deviated to the



FIG. 1.—Tomogram showing a mass which is narrowing and distorting the left main and lobar bronchi.

left. On June 23 bronchoscopy by Mr. A. H. M. Siddons showed the main carina to be distorted and widened; a swelling extended along the medial wall of the left main bronchus, which was narrowed slightly, and an irregular mass was seen protruding from the lower lip of the left



Fig. 2.—Section of bronchial biopsy specimen showing surface epithelium (on the left) and several dilated gland ducts surrounded by amyloid deposits (arrows). (Haematoxylin and eosin. $\times 75$.)

upper lobe bronchus. Biopsy specimens were taken from the swellings of the left main and left upper lobe bronchi. They showed bronchial epithelium and glands in connective tissue rich in amyloid deposits (Fig. 2). Characteristic reactions were obtained when the deposits were stained with both methyl violet and Congo red. There was no evidence of neoplasm. Bronchography on July 8 showed that the left upper lobe bronchus was occluded (Fig. 3). At



Fig. 3.—Bronchogram showing occlusion of the left upper lobe bronchus.

On July 17 the patient was discharged from St. George's Hospital, but during November he again became ill with increased cough and dyspnoea, and his condition steadily deteriorated. On December 21 he was readmitted to Whittington Hospital. He was then gravely ill, mentally confused, cyanosed, and dyspnoeic. There was no response to antibiotic treatment, and he died on December 24. Necropsy showed that death was due to acute purulent bronchitis superimposed on chronic bronchitis and emphysema. Massive amyloid infiltration was present in the submucosa, muscularis, and adventitia of the left and right main bronchi. The deposit in the left main bronchus had made its wall up to 0.4 cm. thick. Histological examination of the liver, kidneys, and spleen did not show evidence of amyloid. The other organs did not show any significant disease.

Summary

The literature of amyloid tumours of the trachea and lung is reviewed briefly.

A case of amyloid deposits in the bronchi is described. The condition should be borne in mind when considering the nature of a bronchial tumour.

This case is published with the kind permission of Dr. A. I. Jacobs, physician, and Dr. A. B. Bratton, pathologist, both of Whittington Hospital, and Mr. A. H. M. Siddons, thoracic surgeon, St. George's Hospital.

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SIGNIFICANCE OF PHYSIOLOGICAL PATTERN OF ANIMAL STRAINS IN BIOLOGICAL RESEARCH*

BY

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Serious problems are presented in all biological research by differences in the characteristics and reactions of experimental and control animals caused by genetic and/or environmental variables. One large source of variation, genetic difference, can be practically eliminated by the use of inbred animals. Forty-two different inbred strains of mice are maintained and studied in the Inbred Nucleus of the Jackson Laboratory, Bar Harbor, Maine, U.S.A. The majority of mouse inbred strains were originally developed for cancer research, in which their first function was to prove the existence of genetic factors influencing the incidence of cancer and the independence of inheritance of different types of tumours. The same process of inbreeding which fixed the cancer-influencing genes in each of these strains fixed practically all of the 10^4 to 10^6 genes carried by any one strain. The individuals within each of the more than 100 inbred mouse strains which now exist are as alike genetically as it is possible to make and keep living material.

Classification

What types of characters are fixed in these strains? How do they differ from each other? The classification of strain differences given in Wright and Eaton's (1929) classic paper still does very well as a description of the type of differences between inbred groups. It is particularly valuable for its demonstration that genetic differences are very important even in cases in which they do not produce obvious effects under all conditions. Their first category, *complete fixation of a phenotype*, in cases in which the genes concerned have an all-or-none effect, might be exemplified for the mouse by the difference between white BALB/c mice, carrying the genes *cc* for albinism, and black C57BL mice, carrying the genes *CC* for intense colour. The second category, *fixation of average grade*, may be illustrated by comparing the incidence of mammary tumours in C3H females with 96%, DBA/1 females with 66%, and

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C57BL/6 females with less than 1%.* These averages have remained fairly constant through the past 15–20 years.

Dr. Gowen, of Iowa State College, is responsible for the development and study of an excellent example of the third category, *fixation of relative rank*. He produced a series of mouse inbred lines differing in relative susceptibility to mouse typhoid (Gowen, 1950), the actual proportions succumbing depending, of course, upon the existence and extent of their exposure to salmonella organisms. This category overlaps in some cases the fourth, *fixation of reaction to conditions*. The high susceptibility to sound-induced seizures characterizing the DBA strain and completely lacking in the C57BL strain (Fuller and Smith, 1953) is, however, an unequivocal example of this fourth category. A qualification which should be added to this classification has to do with a similarity rather than a difference. A considerable proportion of the animals in any generation of an inbred strain must grow to fertile healthy adulthood if brother-sister matings are to continue indefinitely. During inbreeding there will tend to be a reduction in fertility, since chance prevents accumulation of all favourable genes in one package. However, genes causing all or a high proportion of individuals to have severe early abnormalities could not be fixed in a strain. Genes leading to a high proportion of serious deleterious effects appearing late, after the production of a number of litters, have, however, been fixed in many strains. These effects include various cancers as well as other types of disease. Thus in all inbred strains extremely severe genetic effects cannot appear very early in the life span.

Pulling from a hat four type-examples of characters differing among inbred strains of mice would do little to convince a jury that the use of inbred animals is essential to most types of animal research. The judges may feel that coat-colour, tumour susceptibility, typhoid resistance, and reaction to loud noises have nothing to do with the problems faced by most investigators. It is hoped that presentation of a few further examples garnered from recent literature may give some indication of the probable extent of genetic influence upon physiological characteristics. In the library of the Jackson Laboratory there are more than 1,200 references, from 1951 to 1953 journals, to studies based on inbred mice. These have been catalogued and classified in a subject-strain bibliography (Staats, 1954) which provides rapid access to literature pertinent to a particular strain or condition. For the purposes of this presentation I have listed some of the newer physiological differences among strains gleaned from this bibliography, but I have omitted from consideration a much larger number where a single strain was used simply to provide genetic uniformity or because previous work had shown it to be the best for a particular purpose.

Strain Differences in Reactions

Different strains have been shown to react very differently to several external environmental factors. The nature of disease produced by a certain pathogen may depend upon the genotype of the host. For example, the Newcastle virus usually causes pneumonia when administered intranasally to DBA/2 and C3H mice, but produces encephalitis in DBA/1 mice (Liu and Bang, 1952). Genetic difference may alter the survival time of individuals infected with a certain

*Inbred Nucleus means animals born 1948–50.

pathogen. The average survival of DBA/2 mice after standard inoculation with the malaria-producing *Plasmodium berghei* is 9.9 days, of C57BL mice 13.2 days, and of their hybrid DBA $\times$ C3H F₁, 19.7 days (Greenberg *et al.*, 1953). The longer survival of the hybrid is due to its greater ability to tolerate parasitaemia rather than to delay in infection. Certain strains of mice are frequently plagued with diseases which never hit mice in adjacent pens. The infantile diarrhoea of C3H mice (Runner and Palm, 1953; Russell, 1954) is an example of this type of *strain-limited susceptibility*. It may hit as many as 50% of litters born in winter months, and is especially frequent in first litters.

Strains differ in their capacity for *antibody production* (Fink and Quinn, 1953). Antibodies against protein were produced in five strains by intramuscular injection of egg albumen. Animals of the highest strain, DBA, were more than four times as reactive as those of the lowest strain, BALB/c. Injection of pneumococcus polysaccharide also showed significant differences among the same five strains, but the order of reactivity is very different. A Lilly, the most sensitive, was four times as reactive as C57BL/6.

Experiments which involve taking research animals to outlying districts have created a necessity for finding animals which can tolerate very low temperature and sudden change. Weanling BALB/c mice have such *cold tolerance*, and when put outdoors in winter can easily survive for 30 days, including periods of 0° F. temperature, while C57BL mice under the same conditions die in less than a single day (Curran, 1955). On at least three occasions serious loss to animal colonies has resulted from fumes of chloroform or allied products (Deringer *et al.*, 1953; Shubik and Ritchie, 1953). Males only of particular strains are affected. In a Jackson Laboratory catastrophe more than 74% of DBA/2, 51% of DBA/1, 32% of C3H, and 10% of BALB/c breeding males died within a week with a characteristic *toxic destruction* of the kidney. This event had no effect on females of these strains or on large colonies of six other strains in the same room.

It is clear that variations in reactions to external agents such as have been described above could wreck an experiment using non-homogeneous animals. It is also clear that there are "strains of choice" for particular experiments. There is also considerable evidence that the endocrine picture varies with genotype in a way which may interfere with interpretation of experimental results. It has been shown that strains differ in their *content of particular hormones*. Evidence has been presented indicating the gonadotropin content of DBAs is 1.5 times that of mice of the A or 020 strains (Mühlbock *et al.*, 1952). The thyroxine level of C3H appears to be approximately 1.5 times that of C57BL (Gross and Schwartz, 1951). Strains also vary in their *sensitivity to particular hormones*. It has been shown that the C57 group of strains is approximately 12 times as sensitive as the DBA, BALB/c, or 129 strains in its eosinophil response to adrenal cortical hormones (Wragg and Speirs, 1952). The type of reaction of different tissues to a particular hormone varies with strain. The susceptibility to oestrogen of breast, vaginal epithelium, and endometrium of three strains has been compared (Silberberg and Silberberg, 1951). The Silberbergs reported the mammary tissue of DBA and A more susceptible to oestrogen than that of C57BL, and the vaginal epithelium and endometrium of C57BL very sensitive, of DBA intermediate, and of A strain relatively resistant. Recent work by Drasher (1955) indicates that the strain difference in uterine reaction may be one of duration of reaction rather than of initial susceptibility.

Strains of mice differ qualitatively in their *reaction to extirpation* of endocrine organs. Removal of ovaries from day-old C57BL mice does not alter the fate of their adrenals. The same operation on DBA females eventually leads to nodular hyperplasia of the adrenal, with secondary effects on other endocrines. In CE females the same operation results in adrenal cortical carcinomas. Recent work

on the inheritance of these differences (Woolley *et al.*, 1953) has shown 100% adrenal cortical carcinomas in the F₁ hybrids of both C57BL and DBA with CE.

At present a rapidly expanding field of study is strain difference in enzyme activity. In this field I am not qualified as an expert, but can at least list enzymes which have been studied. For example, within the past three years differences among strains have been described in liver β -glucuronidase (Law *et al.*, 1952; Fishman and Farmelant, 1953; Sie and Fishman, 1953), mammary glucuronidase, and esterase (Cohn and Bittner, 1951), serum tributyrinase (Tuba, 1952), and serum alkaline phosphatase (Tuba, 1953). The work on probable mode of inheritance of difference in liver glucuronidase activity, which is less than one-tenth as high in C3H as in A strain mice (Law *et al.*, 1952), is particularly impressive.

Physiological Strain Differences

In addition to the Jackson Laboratory's attempt to keep up with the growing knowledge of the characteristics of inbred strains by following the literature, certain observations have been carried out on the animals maintained in the Inbred Nucleus of the Jackson Laboratory which indicate physiological strain differences. A study of the formed elements of the blood of young adults from 18 different inbred strains, for example, showed that differences among strains contributed very significantly (0.1% level) to variations in erythrocyte number, haematocrit, and haemoglobin, even though there were great overlaps between strains (Russell *et al.*, 1951). The mean haemoglobin content varied from 12.2 g.% for C3H/Jax to 15.0 g.% for BALB/cJax. Strain differences in leucocyte characteristics were also very conspicuous in spite of the wide variation within strains to be expected in a character so easily influenced by environmental factors. The mean total leucocyte counts for the various strains ranged from 5.87×10^9 for RIII/Jax to 11.43×10^9 for C57BL/6Jax, and strain differences contributed very significantly (0.2% level) to the total variance. The differential leucocyte count also varies significantly with strain (0.1% level), with the entire C57 group of strains very low in granulocyte percentage. Subsequent work has shown that different genes affect granulocytes and agranulocytes (Budds *et al.*, 1953), since the rank order for granulocyte number (C3H>DBA/1>BALB/c>DBA/2>A>AKR>C57BL/6) is very different from that for agranulocyte number (C57BL/6>DBA/1>BALB/c>DBA/2>A>C3H>AKR).

In the Inbred Nucleus breeding mice are retired at 1 year of age, but they are allowed to live out their life-span for

Mean Life-span of Male and Female Mice from the 10 Largest Inbred Colonies

Strain	Mean Life-span (Days)	
	Females	Males
<i>High-moderate Mammary Tumour Strains</i> (in order of decreasing incidence)		
C3H	314.4	424.3
DBA/1	399.4	411.5
DBA/2	431.0	401.0
A/He	389.2	453.8
<i>Low Mammary Tumour Strains</i>		
A/Jax	447.8	467.4
AKR	284.2	272.2
BALB/c	485.0	475.4
C57BL/6	562.7	529.4
C57BR/cd	482.9	457.2
C57L/He	513.5	490.6

the study of their potentialities for specific types of disease. The Table compares the mean life-span of males and females from the ten largest inbred colonies, using animals born during a three-year period, 1948-1950 (Russell *et al.*, 1955). Several conclusions can be drawn from these data. They confirm the previous observation that mammary tumours strike at different ages in different strains. As a general rule, the longevity of females in mammary tumour strains is less than that of males, but there is one exception in our data, in DBA/2. The extent of the sex-differential

in survival in mammary tumour strains also varies with the strain. The differences among means of males of all strains and females of the low mammary strains show that factors other than mammary tumour susceptibility strongly affect survival, so that strain means can run from approximately 280 days for the AKRs, which usually die with lymphatic leukaemia, to approximately 550 days for C57BL/6. In low mammary strains, under the conditions of our colony, females tend to outlive their mates slightly, although there are exceptions. It is clear that ageing processes must vary greatly with strain. It is hoped that analysis, now under way, of necropsy data collected on these strains will increase our knowledge of patterns in mouse gerontology. Whatever the causes behind these genetic ageing differences, their existence could lead to erroneous results from long-term experiments involving heterogeneous animals, and could dictate the choice of inbred animals to fit the time requirements of particular experiments.

Importance of Genetic Differences

The literature examples on endocrine balance and response and on enzyme activity, plus the Inbred Nucleus examples on blood picture and longevity pattern, show that there must be great differences in internal constitution and relationships influenced by genes. As with the reactions to external agents, such differences within an experiment could lead to fallacious conclusions. If we could only come to know each strain well enough, such differences between groups could be invaluable tools. There is so very much to know. The million or so genes carried by a single mouse may have direct or indirect effects on many characters. The nature of effect of any particular gene may depend a great deal on its interaction with other genes. We have seen that genetic differences do not always have an all-or-none effect, but may alter average grade, relative rank, or reaction to conditions.

This means that two genetically different individuals may under some conditions be identical for a given character, but under other circumstances will differ. It also means that there are variations within as well as between inbred strains. The recent rapid increase in examples of strain differences means that more and more investigators are coming to realize the importance of genetic difference and are beginning to tap the mine of information that is waiting for them in the already established inbred types. Many of them have started their experiments to test a hypothesis on the basis for a known strain difference, as the incidence of a certain type of tumour (Gross and Schwartz, 1951; Silberberg and Silberberg, 1951; Mühlbock *et al.*, 1952; Greenberg *et al.*, 1953), but more often than not they have turned up what appears at present to be a completely independent attribute of the strain difference. Other investigators have accepted the extremely valuable concept of "strains of choice" for a given experiment, and start their investigations with a cross-strain test of their particular procedure or substance. This is an extremely wise course of action, since they eventually obtain both suitable and genetically homogeneous material. Unless they are theoretical geneticists, however, their interest ends with establishing their base-line.

Since this is a paper on the significance of physiological pattern of animal strains, it seems suitable to mention the great importance of variations within strains to students of the relation between heredity and environment. Analysis of association of intra-strain differences with life-history differences, including parental effects, is the most valuable tool in this field (Wright and Eaton, 1929; Runner and Palm, 1953; Russell, 1954). For characters with great intra-strain variation, greater variation between strains often provides geneticists with the only evidence that genes have anything to do with the character (Russell *et al.*, 1951; Budds *et al.*, 1953).

Thus the rapidly increasing knowledge of inherited differences between strains in their reaction to conditions, their internal balance, and their normal levels of certain cells or

substances makes it more and more apparent that genetic homogeneity is essential to most physiological work, and that genetic variety between strains provides an array of valuable tools for particular types of physiological experiments.

Summary

The use of inbred strains in biological research is essential for fixation of either phenotype, average grade, relative rank, or reaction to conditions. Examples are presented of each type of strain differences in mice, gleaned from 1951-3 literature and from research in the Inbred Nucleus of the Jackson Laboratory. These include differences in disease susceptibility, nature of disease produced by a given pathogen, survival time of infected individuals; capacity for antibody production, cold tolerance, reaction to specific toxins; sensitivity to and content of various hormones and reaction to endocrine extirpation; and differences in normal blood-cell levels, life-expectancy, and pathology pattern.

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The Singapore Anti-tuberculosis Association has recently published a well-illustrated account of the origin and activities of the Royal Singapore Tuberculosis Clinic, which has been in existence since 1948. In a foreword to the book the Right Hon. MALCOLM MACDONALD, Commissioner-General for the United Kingdom in South-east Asia, refers to the great increase in the work of the clinic, and continues: "Despite this attack, tuberculosis still remains a vast and dangerous problem in Singapore. Just how vast and how dangerous is still far from understood by the general population." The figures given in this book should dispel complacency. There may be as many as 50,000 patients needing treatment for tuberculosis in Singapore. Every day at the Royal Tuberculosis Clinic, which is a voluntary organization, some 20 new cases of tuberculosis are discovered—a steady 8 to 9% of those x-rayed each month. In all, nearly 60,000 radiographs are taken every year and 55,000 blood sedimentation tests performed. Between three and four thousand patients are under treatment at any one time, and in 1953 the total of patient attendances was over 150,000. The work of the clinic is carried on in two separate units, one for diagnosis and the other for treatment. There are no beds, but domiciliary treatment has proved remarkably successful, particularly among the Chinese. A children's clinic has now been started, where some 130 children a month are brought by their parents.

PELVIC TUBERCULOSIS

A REPORT ON 19 CASES

BY

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Morgagni (quoted by Norris, 1931), in the eighteenth century, was the first to recognize pelvic tuberculosis, but no further mention of the disease is found in the medical literature until 1831. Since that time numerous reports have appeared. The recent advent of streptomycin, P.A.S., and isoniazid has stimulated a new interest among gynaecologists.

The incidence of pelvic tuberculosis in the female is said to vary in different parts of the world. Sharman (1952), in Glasgow, and Rabau (1950), in Israel, have reported a high incidence of the disease in their respective clinics. I consider that pelvic tuberculosis in the Lebanon is more common than is generally believed, and this report is the first of its kind from that country.

Material

A review of the records at the American University Hospitals, Beirut, revealed 35 cases listed under the heading of pelvic tuberculosis for the seven-year period July 1, 1946, to June 30, 1953. However, a careful study of the case records shows that the diagnosis was established histologically in only 19 cases, and this study is confined to these 19 proved cases. The age incidence is shown in Table I.

TABLE I.—Age Incidence

Age	No. of Patients	Percentage
10-19 ..	0	0
20-29 ..	7	36.8
30-39 ..	6	31.6
40-49 ..	4	21.1
50-59 ..	2	10.5
Total ..	19	100

Nulliparae, 8 (42%); average age, 28.6 years. Multiparae, 11 (58%); average age, 36.6 years.

During the same seven-year period there were 2,492 admissions to the gynaecological service of this institution. Thus the incidence of pelvic tuberculosis in these 2,492 admissions was approximately 0.8%. This is considerably lower than Leon's (1950) figure of 2% for all gynaecological conditions. Greenberg (1921) gives the incidence of tuberculous salpingitis among 24,155 gynaecological admissions to the Johns Hopkins Hospital as 0.83%.

Symptoms

Abdominal Pain.—The commonest symptom encountered in this series was low abdominal pain. This was present in 57.8% of the cases. Typically, the pain was of a dull nature, beginning in one of the lower quadrants and later being bilateral. Acute abdominal pain with fever simulating acute salpingitis or appendicitis has also been reported. Usually the attacks of pain became worse during the menstrual periods, but dysmenorrhoea *per se* was the admission complaint in only 15.8% of our cases. Backache was present in 27.4%.

Sterility.—The next commonest complaint was sterility (52.7%). It was primary in 42.2% and secondary in 10.5%. These figures are in sharp contrast to those given by Brown *et al.* (1953), who report it in only 6.9% of their cases. Greenhill (1951) states that tuberculosis is an infrequent cause of sterility, but in some parts of the world 5 to 6% of all endometrial biopsies performed on infertile women show tuberculosis. Sharman (1952) found histologically proved endometrial tuberculosis in 5.2% of 2,985 patients

with primary sterility. Liljedahl and Rydén (1951) state that among 499 women who were sterile the incidence of genital tuberculosis was 10%. During the seven-year period of this study 250 sterile women were admitted to the gynaecological service of the American University Hospitals. Ten of them were found to have genital tuberculosis, an incidence of 4%.

Fever.—This was usually of a low-grade nature and often unnoticed by the patient. It was present in nine cases (47.4%).

Leucorrhoea.—The discharge was usually not profuse and was of a watery character. It was found in seven cases (36.8%). Two patients reported the discharge as foul-smelling.

Ascites.—Swelling of the abdomen due to fluid, either in the past history or on admission, was present in six patients (31.6%). One patient also had a pleural effusion.

Menstrual Disturbances.—These may take various forms. In our series the commonest complaint related to the menses was an irregularity of the periods (27.4%). Amenorrhoea and menorrhagia had an incidence of 21.1% each. The amenorrhoea in these cases was the result of the general condition of the patient rather than infection in the genital tract. The incidence of dysmenorrhoea in our series, 15.8%, is lower than the figure given by Greenberg (62%).

Findings

Physical.—Bimanual pelvic examination often yields very instructive information in cases of pelvic tuberculosis. In 31.6% of our patients pelvic masses were felt unilaterally or bilaterally, usually the latter. However, a simple thickening, induration, or fixation of the adnexal tissues was just as common (31.6%). The fundus was found retroverted and fixed in 27.4%. In 15.8% of the patients the uterus was enlarged and the pre-operative diagnosis was myoma of the uterus. In three cases the pelvic findings were regarded as normal (15.8%). In one case the cervix was granulating, and bled easily on examination. Carcinoma of the cervix was suspected, but the biopsy revealed tuberculosis.

If one combines the cases diagnosed as myoma of the uterus with those in which the findings were normal, it will be seen that 31.1% of the patients had no indication of the presence of the disease.

Owing to the widespread use of antibiotics, the younger generation of gynaecologists rarely see the large tubo-ovarian masses of gonorrhoeal or streptococcal origin so often encountered in the past. The presence of such masses should nowadays arouse a suspicion of their nature.

Laboratory.—Once the diagnosis of genital tuberculosis is made, an x-ray examination of the chest should be made routinely. This was done in 13 of our 19 cases (68.4%), and evidence of healed or active pulmonary lesions was found in 7 (53.8% of those subjected to the examination). The total leucocyte count was below 10,000 in 11 patients (57.8%). When such a result is found in a febrile patient the possibility of tuberculosis should be strongly entertained. The differential count showed lymphocytosis (lymphocytes over 30%) in 27.4% of our cases. Anaemia as measured by an erythrocyte count lower than 4 millions was present in 42.2% of our patients.

Table II gives a comparison between our results and those of other authors.

Histological (Tables III and IV).—One or both Fallopian tubes were available for histological study in 10 cases, and all were found positive for tuberculosis. This illustrates the fact that pelvic tuberculosis is primarily tuberculosis of the tubes. Endometrial tissue was studied either by biopsy or from a uterus removed at operation in 13 cases. Tuberculous lesions were found in 11 (84.6%). The cervix was examined in five cases and found positive in two (40%). One or both ovaries were available in 10 cases, and lesions were found in two (20%). Both these were cases of tubo-ovarian abscess. The ovary is believed to be protected from

TABLE II.—Comparison of Our Statistics with Others

Finding	Present Series (19 Cases)	Brown <i>et al.</i> (1953) (158 Cases)	Greenberg (200 Cases)
Abdominal pain ..	57.8%	69%	80%
Sterility ..	52.7%	6.9%	60%
Primary ..	42.2%		
Secondary ..	10.5%		
Fever ..	47.4%	35.4%	62.5%
Leucorrhoea ..	36.8%	62.6%	72%
Backache ..	27.4%	10.1%	30%
Ascites ..	31.6%	21.5%	
Irregular periods ..	27.4%		
Amenorrhoea ..	21.1%	15.8%	6.5%
Menorrhagia ..	21.1%	20.2%	41.5%
Dysmenorrhoea ..	15.8%	8.8%	62%
Dyspareunia ..	5.3%	3.8%	
Positive chest x-ray film ..	53.8%	27%	
Leucocytes below 10,000 ..	57.8%	78%	+65%
Lymphocytosis ..	27.4%	24%	

Note.—Greenberg's 200 cases are all of tuberculous salpingitis only.

TABLE III.—Sites Affected

Site	No. of Cases	Percentage
Endometrium ..	11	57.8
Fallopian tubes ..	10	52.7
Peritoneum ..	4	21.1
Ovaries ..	2	10.5
Cervix ..	2	10.5
Myometrium ..	1	5.3

TABLE IV.—Relation Between Tissue Available for Histological Study and Percentage Positive

Tissue	No. Available	No. Positive	% Positive
Oviducts ..	10	10	100
Endometrium ..	13	11	84.6
Cervix ..	5	2	40
Ovaries ..	10	2	20
Myometrium ..	6	1	16.6

infection by its thick capsule of tunica albuginea. Lesions in the myometrium were found in only one of the six specimens examined (16.6%).

Peterson (1922) found tubal involvement in 86.3%, uterine in 50%, and ovarian in 43%. Tuberculosis of the vagina and vulva is extremely rare. This was absent in the present series.

Methods of Diagnosis

The diagnosis in all our 19 cases was established histologically. This is an ideal that cannot always be achieved. Since early diagnosis is desirable, and since tissue is not always available for study, other methods of establishing the presence of the disease have been devised. Apart from the history and the pelvic findings, the following measures are at the disposal of the gynaecologist:

1. **Diagnostic Curettage.**—According to Brown *et al.* (1953) 18.9% of cases are diagnosed by study of the endometrial curettings. Some investigators stress the danger of spreading the infection by curettage, and Sharman (1952) maintains that a single negative biopsy does not rule out the disease.

2. **Culture of Menstrual Blood and Cervical Mucus on Löwenstein's Medium.**—Kirchoff *et al.* (quoted by Greenhill, 1952) had positive cultures in 10 out of 19 cases of proved genital tuberculosis. In eight of the nine missed cases tubal but not endometrial tuberculosis was present. Furuhashi (quoted by Greenhill, 1952) believes that the most efficient way of diagnosing genital tuberculosis is by culture of the vaginal contents on several pre-menstrual days or of menstrual blood.

3. **Guinea-pig inoculation of menstrual blood.**

4. **Hysterosalpingography.**—Ekengren and Rydén (1950) have advanced detailed criteria for the radiological diagnosis of tuberculous salpingitis. A closer co-operation between the gynaecologist and the radiologist is necessary to achieve better results in this field.

Discussion

As stated at the beginning of this paper, 16 out of 35 cases were discarded because of the lack of positive proof of the diagnosis. Had we used some of the investigative measures outlined above we would undoubtedly have found a higher incidence of genital tuberculosis among our patients. In many of the 16 discarded cases there was strong presumptive evidence of the disease, and guinea-pig inoculation or culture of the menstrual blood would almost certainly have established the diagnosis in some.

Summary

Data of 19 cases of tuberculosis of the female genital tract investigated at the American University Hospitals, Beirut, are presented. The commonest complaints and physical findings are discussed and details of the histological findings in biopsy specimens analysed.

Pelvic tuberculosis is not rare. Its incidence among 2,492 gynaecological admissions to this institution is 0.8%. The diagnosis of the disease would be more frequently established if the measures outlined could be routinely used.

I wish to thank Dr. D. Homer Rea for permission to publish these cases and for advice on the preparation of this paper.

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Medical Memoranda

Extreme Fluid and Electrolyte Loss Due to Villous Papilloma of the Rectum

A case of a large mucus-secreting villous papilloma of the rectum producing extrarenal uraemia, acidosis, and dehydration as the result of severe diarrhoea is here described. Recovery followed treatment of the fluid and electrolyte loss and resection of the tumour.

CASE REPORT

A single woman of 57, who had previously been in good health, began in 1951 to have attacks of diarrhoea. She said that during the attacks she might pass as many as 20 motions a day, which were fluid and often colourless. At the start the attacks did not last longer than 48 hours, and then the bowel action might be normal for weeks. She never passed any blood. She gradually began to lose weight and strength, but never consulted a doctor. A week before her emergency admission to hospital in May, 1953, the diarrhoea became extreme with almost continuous rectal fluid loss. She also complained of paroxysms of severe pain in the back of the legs and in the abdomen. There was occasional vomiting. She did not remember the 18 hours previous to coming into hospital.

On admission she was moribund, and the immediate clinical impression was that she was in the terminal stage

of diabetic coma. There was intense acidotic breathing, and, from the flaccidity of the skin and the low eyeball tension, evidence of extreme dehydration. The tongue was dry and furred, the pulse feeble and rapid, and the systolic blood pressure only 60 mm. Hg. She was catheterized, but no urine was found in the bladder. A bowel action occurred which consisted of clear fluid apart from a few flecks of white mucus.

Her condition was so poor that she was not moved from the casualty examination couch. An intravenous infusion of normal saline was set up and 5 pints (2.8 litres) run in as fast as possible. Methylamphetamine, 30 mg. intravenously, was also given. Her condition immediately improved. She became conscious and the systolic blood pressure rose to 100 mm. Hg. She was then transferred to a ward and given a further 3 pints (1.7 litres) of normal saline intravenously during the night. The next morning she had improved greatly, and, as she was now able to drink, the drip was discontinued. Streptomycin sulphate, 0.5 g. four times a day, was given for three days. The stools on the first of these days continued to be fluid and frequent, but thereafter, over the next week, gradually became coloured and infrequent, although they were still fluid and contained mucus.

The day after admission the serum chemistry was as follows: blood urea, 205 mg. per 100 ml.; sodium, 295 mg. per 100 ml. (128 mEq/litre); chloride, 327 mg. per 100 ml. (92 mEq/litre); potassium, 15.8 mg. per 100 ml. (4.1 mEq/litre); CO₂ combining power, 25 vols. % (11.2 mEq/litre). A blood count showed: red cells, 5,960,000 per c.mm.; haemoglobin, 120% (17.8 g.%), white cells, 15,700, of which 82.5% were polymorphonuclears. The stools contained mucus, pus cells, occasional red blood cells, and macrophages, but no cysts, ova, amoebae, or *Giardia lamblia*. No pathogens were isolated in culture. The urine contained pus cells, red cells, and fairly numerous granular casts. There were no organisms. Twenty-four specimens of urine were collected, and, as might be expected, of the intake of 5 g. of sodium chloride daily the average output was 0.05 g. of chloride and 0.1 g. of sodium in 24 hours. In spite of this salt retention and unrestricted fluid intake the serum chemistry was very slow to return to normal.

Six days after admission the serum chemistry was as follows: urea, 155 mg. per 100 ml.; sodium, 275 mg. per 100 ml. (120 mEq/litre); chloride, 312 mg. per 100 ml. (88 mEq/litre); potassium, 16.2 mg. per 100 ml. (4.2 mEq/litre); CO₂ combining power, 40 vols. % (17.9 mEq/litre). Twelve days after admission it was: urea, 65 mg. per 100 ml.; sodium, 273 mg. per 100 ml. (119 mEq/litre); chloride, 324 mg. per 100 ml. (91 mEq/litre); potassium, 24.8 mg. per 100 ml. (6.4 mEq/litre).

She was placed on 15 g. of salt daily, and on the sixteenth day the blood urea had fallen to 28 mg. per 100 ml. The urine was free from albumin and there were no casts. The general appearance of the patient was quite normal.

There were never any abnormal findings on abdominal examination, but a soft mass was just palpable on rectal examination. On sigmoidoscopy a papillomatous growth of the pelvo-rectal junction was seen. The pedicle had a wide base. On attempting to pass the sigmoidoscope above the papilloma vision was obstructed by the rush of fluid faeces escaping from above. The rectal mucous membrane was quite normal. Histologically the biopsy specimen had the appearance of a villous papilloma.

Four weeks after admission Mr. B. N. Brooke opened the abdomen through a left paramedian incision. A large tumour was found in the lower sigmoid and the upper rectum, the rest of the colon being quite normal on inspection and palpation. The tumour was excised and an end-to-end anastomosis performed.

Post-operative recovery was uneventful and the patient was discharged ten days later. When seen subsequently she felt and looked well, and there was no complaint of diarrhoea.

The specimen was a villous papilloma of the colon. Section of the growth showed marked cellular hyperchromatism and occasional mitoses, but there was no invasion of the bowel wall at the base of the tumour.

COMMENT

The classification of benign tumours of the colon and rectum is much confused. Bockus (1944) gives a separate place to the villous papilloma as a variety of adenoma. Bacon (1938) describes the villous papilloma as a rare and single tumour, which may often become very large. He says it is more common in men than in women, and occurs between the ages of 35 and 55. On section the tumour is made up of innumerable villi lined with columnar cells, and the very large surface area of the tumour explains the opportunity for fluid loss. It is stated that malignant degeneration occurs in 20% of the cases (Rankin *et al.*, 1932). Burns (1950), in reporting nine cases, does not mention fluid loss to the point of dehydration. Eight of his patients are alive and well following various operations; one died from the operation. Further perusal of the literature has not revealed a case record in which the amount of fluid and electrolyte lost from the surface of the tumour was so great that extreme salt depletion and extrarenal uraemia was produced.

My thanks are due to Dr. C. F. Hawkins and Mr. B. N. Brooke for their help and permission to publish.

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Recovery from an Incompatible Blood Transfusion Complicated by Anuria

Grossly incompatible blood transfusions have become rare since the intricacies of the indirect and direct matching tests have been appreciated. Nicholson (1948) reported from a group of blood banks 67,844 transfusions with 18 haemolytic reactions and 3 deaths. It is unlikely, therefore, that any individual doctor will see or treat many cases of incompatible transfusion.

Discombe (1952) discussed the causes and treatment of six ABO incompatibilities which had occurred during the transfusion of over 10,000 bottles. He emphasized the two types of clinical response to incompatible transfusion: one with immediate circulatory collapse, which carries a very high mortality; the other ordinary haemolytic reaction, with pain in the loin, rigor, fever, and haemoglobinuria, sometimes followed by anuria, which is less lethal. None of the cases described by him developed anuria, and all recovered. He attributed this success to the Borst (1948) regime (Bull *et al.*, 1949), which in his experience had changed a 100% mortality following the forcing of fluids and intravenous sodium sulphate into a 100% recovery.

The following case developed complete anuria which lasted for 12 days, and is therefore thought to be worth recording.

CASE REPORT

A Chinese woman aged 28 was admitted to hospital in the early hours of the morning with the typical signs and symptoms of a ruptured ectopic pregnancy. She had had amenorrhoea for seven weeks. She was advised immediate operation, but refused. During the day her symptoms increased in severity, and 14 hours after admission she consented to laparotomy. By this time she was slightly shocked. Following the administration of two bottles of plasma substitute her condition improved. Laparotomy

confirmed the diagnosis: there were 3-4 pints (1.7-2.3 litres) of free blood in the peritoneal cavity. The right Fallopian tube was removed.

After the operation her condition was fairly satisfactory, but, influenced by her relationship to a member of the nursing staff and the appearance of three males who wished to donate blood to her, it was decided to give a transfusion on her return to the ward. Two of the donors were declared to be compatible, and before recovery from anaesthesia had taken place 1,000 ml. of blood was given. Nothing abnormal was noticed during the transfusion. Twelve hours later she was seen to be slightly jaundiced. As she had not passed urine spontaneously, the bladder was catheterized and 2 oz. (57 ml.) of dark brown urine obtained. This was found to contain free haemoglobin, and was the last urine to be passed for 12 days.

An immediate cross-check on the compatibility of the blood was carried out and the patient was found to be Group A and both donors Group B. Although the laboratory technician had cross-matched the blood, he had failed to group either the donors or the recipient. 80 ml. of 5% sodium bicarbonate was given intravenously, and the patient started on the Bull-Borst regime:

Glucose	..	400 g.	
Peanut oil	..	100 g.	
Acacia	..	q.s. to emulsify	
Water	..	to 1,000 ml.	per 24 hours

via an intragastric drip.

No previous experience with such a small fluid intake in a tropical climate with high humidity was to be found in the available literature, and no facilities for biochemical investigation were at hand.

Twenty-four hours later her condition appeared to be deteriorating. Her jaundice was by this time intense: she complained of severe nausea, her temperature was 103° F. (39.4° C.), and her pulse was weak and rapid. The relatives were told that the prognosis was almost hopeless.

On the following day her condition was unchanged, and she vomited three times. The vomit was strained and returned to the stomach. On the fifth day her general condition had slightly improved: the jaundice was less intense and her temperature was normal. She complained of severe thirst, but as her tongue was moist extra fluid was withheld. The bladder was again catheterized, but no urine was obtained. The blood urea at this time was 90 mg. per 100 ml. From then on, subjectively, she showed slight daily improvement; however, daily catheterization proved that no urine was being secreted. The blood urea on the 10th day was 165 mg. per 100 ml.

On the 12th day 3 oz. (85 ml.) of urine was removed from the bladder. She was allowed small quantities of fruit juice by mouth, and also drank 150 ml. of Darrow's (1950) potassium solution. On the next day she passed 30 oz. (850 ml.) of urine spontaneously, and the intragastric drip was stopped.

Penicillin, 500,000 units b.d., was given throughout the period of anuria.

From then on recovery was uneventful. She was discharged from hospital on the 22nd day. At this time she still had a slight icteric tinge. Two weeks later this had completely disappeared and the blood urea was 28 mg. per 100 ml. When last seen, three months later, she was extremely well: the blood urea was unaltered, a urea concentration test was within normal limits, and the blood pressure was 120/75.

I wish to express my thanks to the Director of Medical Services, Federation of Malaya, for his permission to publish this case.

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Reviews

GENERAL PRACTICE IN THE U.S.A.

The Physician and His Practice. By eighteen authorities. Edited by Joseph Garland, M.D. (Pp. 270+xii. \$5.) Boston and Toronto: Little, Brown and Co. 1954.

This book, which is edited by the editor of the *New England Journal of Medicine*, contains nineteen essays by eighteen hands, and is intended to guide the American doctor about to settle in practice. Its main interest for the British reader therefore lies in the picture it gives of the American scene and in the contrast with conditions in this country. It is stated in one article that at least half the community rely upon general practitioners for their medical care, and that 85% of all conditions in the community can be treated by well-trained general practitioners. Dr. Donald Clark, employing what may be called the Collings estimate of the general practitioner, which has been so much criticized in this country, reckons (writing apparently of the immediate past) that not more than 10 to 20% of general practitioners could be said to be competent. He classifies general practitioners into three classes: (1) those who have been inadequately trained by one year or less of "rotating" internships; (2) those who have been more adequately trained by two or more years of resident appointments; and (3) those who have by their continued industry developed into general-practitioner specialists. He adds the warning (in italics) that the more interested the general practitioner becomes in a specialty the less competent he may be as a general practitioner. If this assessment of the adequate training of the general practitioner is accepted here, it can be said that its implications have not yet been realized by those responsible for his education and his employment.

All the essays are informed by this same high seriousness, this starry-eyed sense of mission which makes the modern American so formidable a competitor. Even the doctor's wife and the doctor's children are bladen to realize the obligations of their high calling. One can imagine nothing more likely to diminish the marriage rate among English doctors than that all our sixth-form girls be given by their careers mistress the chapter entitled "The Doctor's Wife" to read. Yet the author of this essay provides the only joke in the book when she writes, "How very fortunate is the doctor's family that has encountered no greater dereliction than an enterprising young son's sale of tickets for admission to his father's library to view illustrations in medical books!"—a jest which she improves by a delightful mixed metaphor: "The doctor's and the clergyman's children share alike the pains of the halo that pinches."

This book also tells the embryo doctor how to manage his office, his aide, his partnerships, his investments, his insurances, his income tax, his real estate, and his will—in a word, his business as well as his profession. The disparity in our financial situations is illustrated by the advice to the practitioner to buy 100,000 dollars of life insurance and to pay his aide 54 dollars a week, and by the facts that the medical student spends more than 2,000 dollars a year, and that an unmarried doctor whose net income is 12,000 dollars a year has 8,000 dollars left to spend after paying his income tax.

There are some excellent chapters in this book, particularly one by Sidney Burwell on the evolution of the doctor, and another on the choice of opportunities by J. H. Means.

D. V. HUBBLE.

A STUDENT'S BIOCHEMISTRY

Biochemistry. By Abraham Cantarow, M.D., and Bernard Schepartz, Ph.D. (Pp. 848+xxv; illustrated. 55s.) Philadelphia and London: W. B. Saunders Company. 1954.

This is a new book which, according to the authors, is designed primarily to meet the needs of the first-year medical student. Its 848 pages follow conventional lines of treatment,

in which first is discussed the chemistry of carbohydrates, lipids, and proteins, including nucleoproteins. A chapter is then devoted to the chemistry of haemoglobin, porphyrins, and related substances. Vitamins, enzymes, and digestion are followed by a section on metabolism, including intermediary metabolism, water balance, and "inorganic metabolism." The book concludes with chapters on hormones, on the chemical composition of tissues, blood and other body fluids, and on urine function and renal function.

The authors have had long experience of teaching medical students, and this is shown in their lucid treatment of fundamental matters which may cause difficulty to those beginning the course in biochemistry. But in some instances the authors set their didactic sights too high. It is doubtful if the average medical student will understand the expression "Bonds hybrid, ca 2.3 covalent" (p. 119) in the formula illustrating methaemoglobin; nor is he likely to follow the argument that, because the designation "vitamin B₁₂" is applied to cyanocobalamin, in which the CN is bound co-ordinatively to the Co atom, "accordingly, B_{12a} (same as B_{12b}) is hydroxocobalamin" (p. 205).

The volume contains more than the number of slips in structural formulae usual in a new book. On page 129 the structures of vitamins A₁ and A₂ are identical, a reference to carbon atoms by numbers in the text being rendered nugatory by the absence of numbering in any of the formulae. The formula for ascorbic acid on page 141 is incorrect, and many double bonds are lacking on page 172. On page 663 the structure called pregnenolone is correct, but confusion will arise because this name is more commonly applied to an isomeric structure. Many of these slips will doubtless be corrected in any future edition, but the bulk of this rather discursive book is unlikely to be substantially reduced.

F. G. YOUNG.

THE THEMATIC APPERCEPTION TEST

The Thematic Apperception Test and the Children's Apperception Test in Clinical Use. By Leopold Bellak, M.D., with the assistance of Marjorie Bristol. (Pp. 282+x. \$6.75.) New York: Grune and Stratton. 1954.

This is a book for the specialist, being principally addressed to clinical psychologists and psychiatrists. It has the further limitation that those psychologists and psychiatrists who are still allergic to psychoanalysis should avoid it. Dr. Bellak is a psychiatrist and psychoanalyst, and his understandings and formulations would in large part be meaningless to those of too different a persuasion.

The thematic apperception test (T.A.T.) consists of a series of rather vague pictures to which the patient is asked to tell a story. It was invented by H. A. Murray in 1935. The large literature concerning the test is listed in the bibliography. Murray's original method of interpretation has, in fact been little used. Dr. Bellak here attempts to systematize interpretation by a method of scoring on rather complicated sheets. The rationale of this system is explained. To this reviewer it seems that the system is unnecessary, and so cumbersome that only wealthy American clinics could afford the time to use it. On the other hand, Dr. Bellak's interpretations in the many clinical examples given seem logical and indeed, in most cases, inevitable. The examples are numerous, and the chapters on interpretation are honest in admitting the limitations of the method. No one using or wishing to use the T.A.T. should fail to read this book.

The analogous Children's Apperception Test was invented by Dr. Bellak. It consists of a series of pictures of animals, devised in the belief that children identify with and project on to animals more easily than on to people, which is probably often true. This test is also described and many clinical examples of stories and their interpretations are given. Again the scoring sheet seems unnecessarily and Germanically complicated.

This is an extremely valuable book requiring hard work on the part of the reader.

STEPHEN COATES.

BIOCHEMISTRY OF SEMEN

The Biochemistry of Semen. By T. Mann, M.D., Sc.D., Ph.D., F.R.S. (Pp. 240+xiv; illustrated, 16s.) London: Methuen and Co., Ltd. New York: John Wiley and Sons, Inc. 1954.

Workers in the field of semen chemistry and physiology (and they now include a substantial number of biochemists, clinicians, zoologists, and veterinarians) will be greatly indebted to Dr. Mann for having written this treatise with masterly skill. The information which it compresses into a very modest compass is culled from numerous sources, the majority of which are comparatively inaccessible, and the bibliography of nearly a thousand items speaks eloquently for the completeness of this survey. To the writing of this book Dr. Mann has brought not only his authoritative knowledge of the subject, a clarity of expression, and preciseness, but also a conspicuous degree of scholarship. No better choice of author could be conceived for this contribution to the series of monographs on biochemical subjects published by Methuen.

The book begins with an account of the main structural and physiological features of spermatozoa and the accessory glands, and proceeds with a detailed description of the physical and chemical properties of semen and of the methods used for the evaluation of its quality. A particularly happy feature is the inclusion of much comparative data from many mammalian as well as non-mammalian species. Next, the influence of extraneous factors—hormones, sperm-egg interacting substances, spermicidal agents, sperm diluters, ionizing radiations, and deep freezing—receives consideration. Later chapters deal with metabolic processes which supply the spermatozoa with energy for their motility and survival. The identification of the sugar of seminal plasma as fructose was one of Dr. Mann's numerous original contributions to this subject, and it is therefore fitting that this substance, its secretion by the accessory glands, and its metabolism by spermatozoa, should receive special attention. Other chapters discuss the occurrence of inositol, lipids, and citric acid; nitrogenous bases including spermine, choline, and ergothioneine; and the protein constituents and enzymes of spermatozoa and seminal plasma.

This book ought to be in the possession of anyone who in any way is concerned with animal reproduction.

G. I. M. SWYER.

ANAESTHESIA

Fundamentals of Anaesthesia. Prepared under the Editorial Direction of the Consultant Committee for Revision of *Fundamentals of Anaesthesia*, a publication of the Council on Pharmacy and Chemistry of the American Medical Association. Third edition. (Pp. 279; illustrated, 30s.) Philadelphia and London: W. B. Saunders Company. 1954.

This excellent manual will be remembered by most anaesthetists working during the early part of the war as one of the best summaries of the subject. The present edition, appearing after an interval of ten years, brings the material up to date with little increase in the number of pages. The authors are all familiar names in the American literature on anaesthesia, and their contributions have been welded into a remarkable uniformity of style. The field covered is comprehensive. The physiology, chemistry, physics, pharmacology, and toxicology of anaesthetics, local analgesia, complications, and every other aspect of the subject are all dealt with. Any anaesthetist is certain to find something of interest here. This includes candidates for examinations, who may justifiably consider this one of the best books for revising their subject. The style is one of brevity both of words and of illustrations; tabulation is used throughout. One surprising, but at the same time comforting, feature of the book is the little divergence between British and American views on anaesthesia, either theoretical or technical.

The book is thoroughly recommended, and the authors are sincerely congratulated on a valuable contribution to the teaching literature on anaesthesia.

W. W. MUSHIN.

PERIPHERAL VASCULAR DISEASES

Peripheral Vascular Diseases: Diagnosis and Treatment. By William S. Collens, M.D., and Nathan D. Wilensky, M.D. Second edition, by 17 contributors. (Pp. 622+xxxii; 366 illustrations, 66 in colour, 86s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications Ltd. 1954.

The second edition of this well-known textbook is conceived on broad lines, and includes within its scope not only vascular diseases of the extremities, but also affections of the vascular tree of the central nervous system, the skin, and the viscera. This breadth of viewpoint is further illustrated in the section on arteriovenous fistulae, where the haemodynamic alterations associated with this condition are discussed and the reduction in size of the heart after excision of the fistula is shown. Recent advances have been made in the understanding of the basic physiology of capillaries, and these are discussed in relation to the genesis of peripheral vascular diseases. In particular the work of Chambers and his associates in this field is summarized. Due emphasis is given to the importance of modern antibiotics in controlling secondary infection complicating peripheral vascular diseases. The authors stress the fact that antibiotics have probably been responsible for saving more limbs than any other recent therapeutic advances.

The book, which is well arranged and clearly illustrated, is divided into two main sections. The first deals with the physiology, anatomy, and pathology of peripheral vascular diseases, and there is a full section on clinical methods and diagnosis. A second portion of the book is devoted to treatment. The importance of the application of the basic laws of physiology to general treatment is stressed, and a detailed account of the specific therapy for individual diseases given. It is a pity that the index of subject-matter is so incomplete.

The book is a most readable and comprehensive monograph in which the practical therapeutic approach to disease is never lost sight of.

J. P. D. MOUNSEY.

EYE SYMPTOMS IN NEUROLOGY

Klinik der Augensymptome bei Nervenkrankheiten. By Werner Kyrleis. (Pp. 153+xi; illustrated, D.M. 32.) Berlin: Walter de Gruyter and Co. 1954.

This book on eye symptoms in neurology by Werner Kyrleis is an elementary exposition of neuro-ophthalmology. The first section of six chapters deals with eye symptoms in nervous disorders, discussing optic atrophy, papilloedema, field defects, pupil anomalies, motor anomalies, and disturbances of the cranial nerves. A further eight chapters give a more strictly neurological approach. Here the common nervous disorders are discussed with special emphasis on the ocular anomalies. The simple plan of this book and the rather confident teaching are eminently suitable for an elementary exposition.

ARNOLD SORSBY.

Antibacterial Drugs, a Short Review by S. W. BIBLE, Lecturer in Pharmacology in the University of Ceylon (Ceylon University Press), was written at the behest of a Committee of the Faculty of Medicine of that university, following inquiries which showed that difficulty was being experienced in keeping abreast of knowledge in this subject. It describes the properties and uses of sulphonamides and the principal antibiotics, defining the indications for and appropriate dosage of each, and mentioning any toxic or other undesirable effects which may result. There are sections on combined treatment, and a concluding summary of clinical applications which ventures on the difficult task of making a first and second choice of drug for treating each infection. It is characteristic of the rational attitude adopted that infections are primarily classified here according to the organism causing them. The instructions given are clear, well-informed, and orthodox; if they were strictly followed, many patients would benefit and much of the misuse now so common would be obviated. This pamphlet deserves a wider circulation than in Ceylon, or alternatively authorities elsewhere might consider issuing something similar. Of the 52 items in the reference list, 16 are papers or editorials in this *Journal*.

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GENETIC EFFECTS OF NUCLEAR RADIATION

A new dimension was added to our understanding of the biological effects of ionizing radiations when H. J. Muller discovered, not quite thirty years ago, that they affect the determinants of heredity. As is well known, every animal receives from each parent a set of hereditary factors, or genes. The two sets, coming together in the process of fertilization, determine the potentialities which will be realized to a greater or less extent as the circumstances of the individual's development allow. The genes are remarkably stable, being passed on from parent to offspring through many generations without alteration. But even under normal circumstances the stability is not absolute. Occasionally a gene will change suddenly into a new form—a process known as "mutation." This word merely names the process; it does not describe it, since in fact we have very little idea of what happens when a gene becomes altered or in what the alteration consists. However, if ionizing radiations reach the genes, which lie on the chromosomes within the nucleus of every cell in the body, mutations are provoked. Mutation may contribute to the deleterious effects of ionizing radiations on somatic tissues, but most adult tissues can probably put up with a fairly high rate of mutation without showing any very harmful effects. The situation is much more serious when ionization reaches tissues which will ultimately give rise to the germ cells. A mutation produced here will, again, probably have little effect on the cell in which it occurs. But if the germ cell which is eventually formed carries the mutated gene, the individual to which it gives rise in the next generation will start life with a set of genes of which one is abnormal; and the mutated gene may be handed on again and again through many subsequent generations.

A mutated gene will often not make its presence felt immediately after it has arisen. Each individual receives two of each kind of gene, one from each parent. If one of the two is abnormal—is present only "in single dose," as genetic jargon has it—either of two situations may arise: the single normal gene may confer on the animal almost normal developmental potentialities, or the abnormal gene may, to a varying extent, exert some influence on development. The former situation, in which the abnormal gene is

said to be recessive and its effects are concealed if there is a normal partner for it, is probably the more common, at least where genes with striking effects are concerned. But that tentative conclusion is based mainly on experience with lower animals. We have not yet anything like a full understanding of what may be the situation in man, in whom recessive genes are hard to detect. In particular it is not at all certain that it applies to genes with slight effects; they may well be the commonest type, but are extremely difficult to identify.

During the course of evolution, natural selection will have ensured that, by and large, the most useful form which a given gene can take will have become the most widespread form; any change from it will almost certainly be a change for the worse. An increase in the frequency of mutation is not to be encouraged. A certain amount of mutation is probably inescapable. In the main, this natural mutation seems to be due to an inherent instability of genes; but to an extent which is probably slight, though in man not fully known, it is brought about by cosmic rays and the radioactivity of the earth's surface. The effect of artificially caused ionization is to add to this natural background. Geneticists have extensively studied the effect of ionization in provoking mutations, but nearly all the work has been done on such cheap, rapidly reproducing organisms as flies, moulds, and bacteria. The investigations which have been made on mammals have been chiefly on the mouse, and have nearly all been devoted to studying the effects of heavy doses of radiation which will cause mutations frequent enough to be discovered even when only small numbers of animals are bred. These experiments have contributed much to the theory of the situation, but by their very nature they miss giving direct answers to the questions which, we hope, are most germane to human affairs.

If atomic bombs were to be exploded in warfare, some of the survivors would probably be exposed to rather large doses of irradiation, of the same order of magnitude as have been used to provoke high rates of mutation. Even if we escape that catastrophe, we may still have to reckon with the possible effects of low intensities of ionization. Not only are x rays becoming more widely used both in industrial practice and in medicine, but, as we discussed in these columns last week,¹ experimental explosions of hydrogen bombs liberate ionizing particles which add their quota to the background of radiation over a very wide area.

It is obviously of the greatest importance to discover how much additional ionization is being produced in this way, but the figures given in the recent House of Commons debate² seem open to

¹ *British Medical Journal*, March 26, p. 775.

² For report see p. 856.

several interpretations. The Minister of Health quoted from the report by the United States Atomic Energy Commission on the effects of test explosions, which states that "the total amount of radiation received by residents of the United States for all nuclear explosions to date . . . has been about one-tenth of one roentgen unit." And he pointed out that the natural background radiation is about 0.1 r per year. This would suggest that we have already, in the ten years or so since the first atomic explosions occurred, accumulated the equivalent of an extra year's natural radiation. Experimental explosions are becoming more frequent and larger in scale, and their effects on atmospheric ionization are to some extent cumulative, both of which points suggest that the next year's additional radiation will take considerably less than ten years to accumulate. On the other hand, Mr. Macleod went on to say that "the figure is calculated on the assumption that a man stands outside in the open for 24 hours a day for 50 years," which seems to imply that mankind has not yet received an extra 0.1 r, but is being subjected to it at a rate of only 0.02 r per year. This is the interpretation which has been put on the figures by the more conservative leading geneticists, such as Professor C. H. Waddington in Britain and Professor A. H. Sturtevant in the U.S.A. It is essential that the point should be cleared up in an authoritative way. Are we accumulating an excess annual dose in something less than ten years, or in fifty? And how fast is the rate increasing? It would seem sensible, and quite easy, to set up a monitoring service which would keep a watch on atmospheric ionization, at first on a national and perhaps eventually on an international basis. The driver of a motor-car about to free-wheel down a slope might think it only prudent to examine as carefully as possible the lie of the land ahead and to inspect the brakes.

At present we have no precise knowledge of the rate of mutation produced by low intensities of radiation in any mammal, let alone in man, and are forced to argue by extrapolation from results obtained with flies or moulds. Even with these simpler organisms experiments with low intensities have been few, and their results not altogether consistent. The best estimate to which they lead, according to Professor Sturtevant, is that the excess ionization produced by atomic explosions so far would cause about one extra very harmful mutation per 50,000 conceptions, and perhaps about the same number of slighter ones in addition. This is based on the estimate that the excess ionization has been at the rate of 0.1 r per generation. But the figures, although they probably give a rough idea of the order of magnitude, are largely guesswork. Energetic steps should

be taken to measure the actual mutation rates of mammals (presumably our long-suffering friend the mouse is cast for the part) exposed to low-intensity radiation. Experiments with other animals have failed to show that any dose is too low to be effective, but we need to make sure whether some fortunate circumstance causes there to be a safe "tolerance" dose in mammals. Again, in some species it seems probable that if a dose of irradiation is received in a limited period of time its effect gradually wears off, in the sense that most of the mutations are concentrated in germ-cells which were at a particularly sensitive phase of their development at the time of exposure. We have as yet no knowledge whether this is true in mammals, or, if so, how long it takes for the effect to wear off. The practical problems which call for further scientific research are innumerable. Mr. Macleod did not allay anxiety when he stated that the expenditure of the Medical Research Council on all research connected with the effects of radiation amounted to £208,000. How much, or perhaps we should ask how little, of this sum was devoted to work directly concerned with the genetic effects of low-intensity ionization on mammals?

AGRICULTURAL POISONS

The application of toxic chemicals to control weeds and insect pests begins early in April and will continue for several months. Since 1951 few cases have been recorded in Britain of poisoning due to these potentially dangerous substances, though they have been increasingly used. This satisfactory record is due largely to a greater awareness of the risks, particularly to spray operators working in fields and orchards, where protective measures and adequate supervision are difficult to arrange, and to the action taken to ensure that everyone concerned in pest control handles these chemicals carefully. The Agricultural (Poisonous Substances) Act, 1952, and its regulations provide statutory protection for persons applying certain toxic chemical substances in agriculture by defining the conditions in which these substances may be used.

Although measures to prevent poisoning are being revised and improved, the risk of poisoning, which may be rapidly fatal, remains for everyone concerned in the manufacture and application of these substances. Because spraying must be carried out when weather conditions and the stage of the crop's growth are favourable, there is a temptation for spray materials to be used hurriedly and without due care. In such circumstances poisoning may result for which the correct treatment promptly administered may save

life. Dr. E. F. Edson, in an article at p. 841 of the *Journal* this week, summarizes the knowledge available about the nature of the substances used as weed-killers, insecticides, fungicides, and crop defoliants and their effects upon man, and describes the treatment of poisoning by these substances. Experience suggests that the risk of poisoning by many of them is slight except when large amounts are ingested accidentally or with suicidal intent. For poisoning by the hydrocarbon group of insecticides the treatment is non-specific and along the lines generally adopted for any form of acute poisoning following ingestion. This group includes D.D.T., B.H.C., and lindane, aldrin, dieldrin, heptachlor, chlordane, and toxaphene. These substances can be absorbed through the skin, and a case has been reported of a young woman dying within 40 minutes of spilling chlordane concentrate on her dress.¹ The symptoms of acute poisoning by the chemicals in this group include stimulation of the central nervous system, with convulsions and coma preceding death. When poisoning is due to ingestion, the symptoms from the central nervous system are preceded by nausea, vomiting, and diarrhoea. Treatment is symptomatic, and sedation by means of adequate doses of barbiturate is most effective. The liver and kidneys may later show signs of being affected, and patients recovering from acute poisoning should be kept under observation. Although D.D.T., chlordane, B.H.C., and similar substances have been used in considerable quantities in many parts of the world, there is no evidence to suggest that persons using them as insecticides suffer any serious risk of acute or chronic poisoning.

Medical emergencies arising during the manufacture and use of spray materials are almost entirely due to two groups of compounds—the dinitro-compounds, such as dinitro-*ortho*-cresol (D.N.C. or D.N.O.C.) and dinitro-2-secondary-*butyl*-phenol (dino-seb, D.N.B.P.), and the organic phosphorus compounds, of which T.E.P.P. and parathion are the best-known. It is to these two groups of substances that the regulations under the Agricultural (Poisonous Substances) Act, 1952, apply. The danger of both groups of compounds lies in the fact that the effects of absorption are cumulative, and the early symptoms may be misinterpreted or ignored by both workman and doctor. The progress from this stage to serious illness and possibly death may be extraordinarily rapid.

Poisoning by D.N.C. or other dinitro compounds occurs most commonly during a spell of hot weather and in people who have been at risk of absorbing it for several days. Experiments on human volunteers have shown that repeated small doses of D.N.C. by mouth cause the concentration in the blood to rise, without causing symptoms, to a level of about 20 μ g.

per g. of whole blood. At this point the administration of a further small dose, less than 1 mg. per kg. body weight, causes a sharp rise in the concentration of D.N.C. in the blood associated with headache, lassitude, and general malaise. Estimation of blood D.N.C. in cases of poisoning indicates that the symptoms can be related to the blood D.N.C. concentration. These observations suggest that spray operators and others at risk of absorbing D.N.C. should be transferred to other work when the blood D.N.C. concentration is above 20 μ g. per g. of whole blood. Dr. Edson refers to simple methods for the estimation of dinitro compounds in the blood.

The early symptoms and signs of poisoning by dinitro compounds are an unusual feeling of well-being, sweating, mainly at night, insomnia and restlessness, increased thirst, anorexia, yellow coloration of the sclera, chrome-yellow urine, and raised basal metabolic rate. Late signs, which may develop rapidly and less than an hour before death, are an anxious appearance, profuse sweating (described in one case as so excessive that the sternal notch filled with sweat as one watched), intense thirst, yellow skin, air hunger, listlessness and apathy, rising temperature and pulse rate, and a striking increase in basal metabolic rate. Convulsions and coma, probably due to anoxia, precede death.

Since these symptoms are due to acceleration of the oxidative mechanisms in the body, resulting in an increased need for oxygen and efficient heat loss, and since no antidote to D.N.C. poisoning is known at present, treatment must be directed towards ensuring adequate oxygen intake, promoting heat loss, replacing lost fluids and electrolytes, and allaying anxiety. The skin should be washed, but since D.N.C. dyes the tissues washing will not remove the yellow colour. Absorption through the skin is not of great importance in this form of poisoning. Successful treatment of a man seriously poisoned with D.N.C. is described in detail by A. B. Pollard and J. F. Filbee.² The scheme of treatment was similar to that recommended by Dr. Edson. Patients recovering from poisoning by dinitro compounds should not resume work with them until the concentration of D.N.C. in the blood is less than 5 μ g. per g. of whole blood.

The organic phosphorus compounds inhibit the enzyme cholinesterase, so that acetylcholine (a transmitter of nerve impulses), which is destroyed rapidly by cholinesterase, accumulates at nerve endings throughout the body. The signs and symptoms of poisoning are those of excess acetylcholine acting at particular sites. They include, first, those due to muscarine-like action of the poison, such as anorexia, nausea, vomiting, cramp-like abdominal pain, excessive sweating and salivation followed by pallor,

¹ Barnes, J. M., *Toxic Hazards of Certain Pesticides to Man, Wld Hlth Org. Monogr. Ser.*, 1953, No. 16, p. 58.
² Pollard, A. B., and Filbee, J. F., *Lancet*, 1951, 2, 618.

miosis, diarrhoea, involuntary micturition and defaecation, broncho-constriction, pulmonary oedema, and cyanosis; secondly, those due to action on the central nervous system, such as giddiness, apprehension, restlessness and headache, progressing to ataxia, tremor, drowsiness, and convulsions; and thirdly those due to nicotine-like action, such as twitching of the muscles of the eyelids and tongue, spreading to affect the muscles of the face and neck and the extraocular muscles, and finally generalized weakness of voluntary muscles. In the individual case of poisoning by an organic phosphorus compound some, but by no means all, symptoms and signs from each group will be observed. The presenting symptoms will depend on the properties of the substance responsible and the route by which it has been absorbed. Accordingly the symptoms may be predominantly gastro-intestinal or pulmonary in the first stage, or may be mainly from the central nervous system. Anyone who has recently been at risk of absorbing an organic phosphorus compound and who develops any of the symptoms listed above should be presumed to be suffering from poisoning until the diagnosis is disproved. Confirmation of the diagnosis of organic phosphorus poisoning can be obtained by estimating the blood cholinesterase. Edson discusses the methods and the interpretation of results.

Atropine is a specific antidote to the muscarine-like action of the poison on the central nervous system: 1-2 mg. (1/60-1/30 gr.) should be given by intramuscular injection as soon as possible after the onset of symptoms and repeated at hourly intervals until signs of atropinization appear. If pulmonary oedema is already present, postural drainage to remove fluid should be attempted, and oxygen under slight pressure should be administered when necessary to overcome bronchoconstriction. In contrast to the dinitro compounds, the organic phosphorus compounds are absorbed readily through the skin, so that clothing should be removed promptly and the skin washed thoroughly. The nicotinic effects are not altered by the administration of atropine and no antidote to them is known. Close observation is necessary to ensure that muscular weakness does not cause failure of respiration or difficulty in swallowing, with aspiration into the lungs. Artificial respiration may be necessary for long periods. Some of the organic phosphorus compounds cause damage to the central nervous system, and two cases have been observed in which paralysis of all four limbs developed in the third week following apparent recovery from the acute effect of poisoning by an insecticide. Patients should be kept under observation until this possibility is excluded, and until blood cholinesterase is within normal limits.

In treating patients poisoned by these substances there may be little time in which to apply life-saving

measures so that they can be effectual. Consequently there must be no delay in carrying out the emergency treatment and in arranging for the patient to be admitted to hospital.

TETRACYCLINE

April 4, 1955, is a significant date in the history of therapeutics in this country, for on it the last of the present major antibiotics is to be derestricted. It thus marks the end of a period of over ten years during which successive antibiotics from penicillin onwards have been available either only in hospitals or, in addition, only from the Ministry of Health for limited indications—this at a time when they were freely available in the United States and some other countries. The time lag between such availability in America and with us has varied, that for aureomycin (chlortetracycline) having been the longest—fully five years—and for erythromycin the shortest. The subject of this final derestriction is tetracycline ("achromycin," "tetracyclin"), which has the structure common to both chlortetracycline (aureomycin) and oxytetracycline (terramycin) without the minor attachments characterizing the two latter. As might be expected, the action of all these three antibiotics is very similar: there is little to choose between them in their activity against the commoner bacteria, and cross-resistance between them is complete. Minor differences are the somewhat greater activity of oxytetracycline against *Ps. pyocyanea*, of tetracycline against *Proteus*, and of chlortetracycline against *Str. faecalis* and *Staph. aureus*.¹ Chlortetracycline has also been found more effective than the other two in the treatment of experimental pasteurellosis.²

There may also be minor differences in the degree of absorption and the concentrations attained in the blood,³ and a further advantage claimed for tetracycline (probably of little clinical significance) is greater stability, but the claim of this drug to superiority rests mainly on its alleged lesser tendency to produce side reactions. The importance of this advantage, if it is real, should not be minimized. It has long been recognized as a drawback of the broad-spectrum oral antibiotics that they often cause nausea, with or without vomiting, and diarrhoea: these effects led to an emphatic preference for injections of penicillin by the patients in the Medical Research Council trial in pneumonia. A sore mouth and pruritus ani are apt to follow, and occasionally the multiplication of *Candida albicans*, which is responsible for these symptoms, may lead to more serious consequences. Any antibiotic treatment which suppresses most of the flora of the alimentary tract—and this includes not only chlor- and oxytetracycline but the combination of penicillin and streptomycin—may be complicated by infection with antibiotic-resistant staphylococci. This sometimes takes the form of a fulminating and even fatal enterocolitis, and the published accounts of this condition convey the impression that it more readily develops in patients who have undergone a major abdominal operation.

¹ Love et al., *Proc. Soc. exp. Biol. (N.Y.)*, 1954, **85**, 25.

² English, *Antibiot. and Chemother.*, 1954, **4**, 1082.

³ Purcell, *Proc. Soc. exp. Biol. (N.Y.)*, 1954, **85**, 61.

⁴ *J. Amer. med. Ass.*, 1954, **154**, 561.

⁵ *New Engl. J. Med.*, 1955, **262**, 173.

What evidence is there that tetracycline administration involves a lesser risk of either the milder or the more severe of these complications? The original claim to this effect was borne out by the observations of Finland and his colleagues,⁴ who found tetracycline least, and oxytetracycline most, liable to produce diarrhoea—chlortetracycline being intermediate between them. Tetracycline may well be better tolerated in the general sense, but there is no evident reason why it should render the alimentary tract any less susceptible to infection by a staphylococcus which will be as resistant to it as to the other two drugs. It is not certainly known how these superinfections arise, but all that we now know of the behaviour of this organism points to cross-infection in a unit where a resistant strain has become established as the most likely source. How will patients treated with tetracycline fare in such an environment? The study of Frei and his colleagues⁵ of the tetracycline treatment of pneumonia perhaps gives an answer to this question, although it includes no evidence confirming the hypothesis of cross-infection. They treated 26 patients with tetracycline in a dose of 1 g. every six hours and 31 with soluble penicillin, 300,000 units being given twelve-hourly. There was no distinguishable difference in therapeutic efficacy as judged by any of five criteria, but, whereas none of the penicillin-treated patients experienced any ill effects, eight of those given tetracycline had side reactions. Four had nausea, vomiting, and a profuse diarrhoea—with *Staph. aureus* predominating in the faeces—necessitating the abandonment of the treatment and the substitution of penicillin; three other patients are mentioned as having had a milder form of the same condition; and one patient had a glossitis and pharyngitis which was in part staphylococcal, another a skin rash, while the remaining two had superinfections due to other organisms. It can be argued that the dose of tetracycline was excessive: on the other hand, this study proves this drug has the same defect as oxy- and chlortetracycline in at least some degree. In the opinion of these authors, "a direct comparative study is still needed" to define the relative merits of these drugs from this standpoint. It will now be open to anyone with suitable clinical material in this country to make such a comparison for himself.

RAUWOLFIA IN HYPERTENSION

The mortality of patients suffering from hypertension, however mild, is greater than in those whose blood pressure may be said to be normal. If there existed a reliable, safe hypotensive drug which could be taken by mouth it should be of benefit to everyone with hypertension. Unfortunately there is no such drug. It hardly needs repetition that the symptoms of hypertension are those of the complications, and headache and anxiety are mainly iatrogenic. Any drug prescribed with sufficient conviction will have a calming effect, without necessarily reducing the blood pressure. Everyone would agree that severe hypertension with papilloedema must be treated, and the best drugs for this purpose are ganglion-blocking agents (notably hexamethonium¹). Until fairly recently they were adminis-

tered by subcutaneous injection several times a day, but now it appears likely that reasonable control can often be obtained with pentolinium tartrate ("ansolysen") by mouth. The dangers of such treatment are not great, but include paralytic ileus, which may be disastrous. The side-effects of postural hypotension, difficulty in accommodation, dry mouth, and constipation, can all be very unpleasant.

For the treatment of hypertension without papilloedema but with diastolic pressures usually ranging from 105 to 125 mm. Hg there are now two drugs available which are safe in moderate dosage and can be taken by mouth. They are the rauwolfia alkaloids and veratrum and its derivatives. Of these two, rauwolfia is probably more satisfactory, having superior hypotensive action with fewer side-effects in the dosage used. In 1582 Leonard Rauwolf, a German botanist, published the results of his investigations of medicinal plants which he had studied during an expedition to Asia and Africa. One of these plants was subsequently named after him and is what we now know as "rauwolfia." Of the many species of rauwolfia the most important is *Rauwolfia serpentina*, which grows mainly in India: extracts from it have been used intermittently for a variety of disorders during the last three or four centuries, but it was not until a few years ago that an alkaloid (reserpine) was isolated which was found in animal experiments to have a hypotensive and sedative action. When given to unanaesthetized animals it causes a reduction of spontaneous activity with no change in the normal electroencephalographic pattern, in contrast to the effect of barbiturate administration. In dogs miosis appears early and is prevented by excision of the ciliary ganglion. In the cardiovascular system sinus bradycardia occurs and varying degrees of hypotension are recorded. The bradycardia is abolished in animals by atropine, and the hypotensive effect is not altered by change of posture. It is unlikely that the action of the drug is related to autonomic blockade, and it has been suggested that its main seat of action is in the region of the hypothalamus.

The papers in this issue by Dr. Inder Singh (p. 813) and Dr. S. Locket (p. 809) describe the clinical use of rauwolfia, and their results confirm the findings of others.^{2,3} The drug brings about a mild or moderate reduction of blood pressure at the expense of only mild toxic effects such as nasal stuffiness, diarrhoea, and depression. In another paper Drs. C. W. Curtis Bain, F. Ashton, and B. P. Jones (p. 817) report that rauwolfia in combination with pentolinium tartrate enables less of the latter very potent but toxic drug to be used. This is a more encouraging use for rauwolfia than in combination with veratrum.⁴ Thus the drug treatment of hypertension is gradually being put on a more satisfactory basis, the subcutaneous ganglion-blocking agents being available for severe hypertension, the oral ganglion-blocking agents together with rauwolfia for moderate hypertension, and rauwolfia alone for mild hypertension.

¹ Smith, K. Shirley, Fowler, P. B. S., and Edmunds, V., *British Medical Journal*, 1954, **2**, 1244. See also leading article at p. 1276.

² Wilkins, Robert W., et al., *New Engl. J. Med.*, 1954, **250**, 477.

³ Doyle, A. E., and Smirk, F. H., *Lancet*, 1954, **1**, 1096.

⁴ Joiner, C., and Kauntze, R., *ibid.*, 1954, **1**, 1097.

ASSISTANTS IN GENERAL PRACTICE

Since early in 1953, when the Assistants and Young Practitioners Subcommittee of the General Medical Services Committee first called attention to the difficulties experienced by young doctors in becoming established principals in the National Health Service, the employment of assistants in general practice has been the subject of controversy. That some young doctors have difficulties no one disputes, and it is generally agreed that the chief cause of the trouble is the blocking of promotion by a hard core of principals who make a habit of advertising posts "with a view" and yet take none of a succession of assistants into partnership. It is difficult to say quite how much of this sort of thing there is, and accurate evidence is hard to get. Our correspondence columns in recent months have borne witness to feelings of frustration, and Dr. Leslie Potter, in the Annual Report of the B.M.A.'s Medical Practices Advisory Bureau,¹ says that there are too many "blind alley jobs" being offered to young doctors. Yet he also says that available figures suggest that the number of so-called permanent assistants is falling; and this is in line with the increase in the number of partnerships recorded in the Medical Practices Committee's report.²

As a solution of their problem the young practitioners have consistently advocated proposals aimed, in the main, towards a reduction of the additional list of patients (2,000 in number) allowed to a principal by virtue of his employment of an assistant. They think that, as things are, having an assistant is too profitable financially for a principal and that this is a real deterrent to him to make his assistant a partner. The G.M.S. Committee, although sympathetic towards the unestablished practitioners' difficulties, has been unable to accept their suggested remedy and has made a report which will go before the Annual Conference of Local Medical Committees on May 19.³ Its recommendations must be studied in the whole context of the report of which they are a part. The need to impress on assistants the importance of entering into a formal agreement when taking a post may seem elementary unless it is realized how often this precaution is neglected. The recommendation suggesting that local executive councils should have, in consultation with local medical committees, additional powers to regulate the employment of assistants provides means for selectively dealing with those principals who, as the report puts it, flagrantly disregard the principles of fair treatment.

The report's final recommendation is that a principal who registers with the executive council an agreement with an assistant with a view to partnership should be able to claim retrospective payment on the basis of notional lists for a period up to a maximum of one year when the partnership is implemented; it should be an appropriate incentive to the fair-minded principal who is willing to give a hand to a junior colleague.

¹ Supplement, March 26, p. 120.
² Ibid., September 11, 1954, p. 113.
³ See this week's Supplement, p. 151.

The G.M.S. Committee's proposals are a constructive answer to the problem and would not upset the harmonious relations which exist between the majority of principals and assistants.

ACCURACY IN BIOASSAY

The assay of many therapeutic substances, and the investigation of new substances of possible therapeutic value, entail the use of animals, and such use accounts numerically for by far the greatest number of laboratory animals, most of them being mice. It is plainly important to choose the right sort of mouse, or other species, so that the accuracy of assay should be as great as possible, and in this connexion genetically identical animals have been suggested as a more reliable instrument than mixed strains. Winton¹ reported in 1926 that one inbred Wistar rat was, in the assay of red squill, about as useful as ten rats of mixed breed, and attributed this to genetical uniformity. Over the last twenty years the use of inbred strains has achieved increasing popularity in the interests of accuracy, even though it may be suspected that in not every case of their reported use has the extent of inbreeding been such as to produce near-homozygous animals. But the fact that attention was directed to the pedigree of animals meant that their environment was also under more or less strict control, and, as Lane-Petter² has pointed out, this in itself may contribute much towards uniformity.

Elsewhere in this issue of the *Journal*, Dr. Elizabeth Russell discusses the difference in physiological responses that may exist between inbred strains of mice, and puts forward convincing evidence to support her views. The right inbred strain is a valuable instrument of research, which should therefore make more use of homozygous strains than it does. On the other hand, Grüneberg³ has pointed out that homozygous animals are sometimes less stable developmentally than heterozygotes and may therefore be less uniform, and adds his warning that not all reputed "pure lines" are homozygous. McLaren and Michie⁴ have concluded that, at least for some purposes, a balance has to be struck between homozygosity, which leads to phenotypic variability, and heterozygosity, which may operate in the reverse sense. Moreover, even if genetical identity contributes to uniformity—as it undoubtedly does for very many purposes—homozygous animals are not the only ones available; animals in the first-generation cross between two different homozygous strains are partially heterozygous, but always in the same way, and meet the criterion of genetical identity as fully as homozygous animals, while being less variable. Biggers and Claringbold⁵ have suggested that, for uniformity of response to bioassays, each test should be examined on its merits: for some tests a suitable inbred strain will serve, but for others the first-generation cross between two inbred strains will be preferable, and for yet others randomly bred animals will not only be as accurate but may even be superior as well as being (generally) easier and cheaper to produce. It is for the bioassayist to make the choice in the light of his own requirements.

¹ *J. Pharmacol.*, 1927, 31, 123.
² *Lab. Pract.*, 1952, 1, 31.
³ *Nature (Lond.)*, 1954, 173, 674.

⁴ *Ibid.*, 1954, 173, 686.
⁵ *Ibid.*, 1954, 174, 596.

EMERGENCIES IN GENERAL PRACTICE
AGRICULTURAL PESTICIDES

BY

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This article sets out to help general practitioners, especially those in areas of intensive agriculture or horticulture, to deal with emergencies arising from the use of chemical pesticides. A short article can only emphasize the more important facts, in the hope that interested practitioners will then seek further information.

Chemicals Used

There is now a large and annually increasing range of pesticidal chemicals, with many proprietary brands and special-purpose variants. These chemicals differ so much in toxicity to animals and potential hazard in use that any attempt to divide them into such simple groups as "comparatively safe" and "hazardous," as in the Table, may need revision later. The safest chemical can be dangerous if sufficiently mishandled, while the most hazardous can be safely used so long as adequate precautions are maintained.

Pesticides in Common Use

Purpose	"Comparatively Safe"	"Hazardous"
General herbicides	Borates Sodium chlorate *C.M.U.	Sulphuric acid (corrosive) Arsenites
Selective weed-killers	Sodium trichloroacetate 2,4-D 2,4,5-T M.C.P.A. { hormone- type growth *M.C.P.B. { regulators *Pentachlorophenol	D.N.C. (dinitro- <i>o</i> -cresol) D.N.B.P. (dinoseb, dinitrobutyl phenol)
Fungicides	Copper compounds Sulphur Zineb, Thiram Lime sulphur Dilute D.N.C. or D.N.B.P. Captan	Lead arsenate Organic mercurials, e.g., ethyl, methyl, phenyl, or other mercurial salt. (Also used in seed-dressings)
Crop defoliants	Monochloroacetate	D.N.C. Arsenites
Insecticides and acaricides	Tar oils Derris Pyrethrum "PCPPCBS" D.D.T. B.H.C. and lindane *Aldrin, Dieldrin *Chlordane, Heptachlor Organic phosphorus compounds: *Malathion *Methyl-demeton	Lead arsenate Nicotine Organic phosphorus compounds: Parathion T.E.P.P. (H.E.T.P.) Schradan Dimetox Demeton

* These chemicals are of recent introduction and their comparative safety is provisional.

Over 90% of British pesticide usage involves the comparatively safe chemicals listed above. Many growers still prefer to pay professional spraying contractors to carry out hazardous operations, but the more experienced are now tending to use the hazardous chemicals themselves.

Occupational Hazards

The main occupational risks are unremoved splashes and smears of chemical on the skin, chiefly on the hands, from handling concentrated preparations or contaminated equipment, and the prolonged inhalation of airborne mist or dust whilst spraying. Ingestion may sometimes occur—for example, from blowing or sucking at blocked jets or contamination of food or water. Eye contamination may produce local effects but hardly ever any risk of poisoning. Vapour concentrations out of doors are rarely high enough

to be of toxicological importance; the important inhalational hazard is that of particles, not vapour. Frequently repeated minor over-exposures are markedly cumulative in their effects, but early effects are usually slight and tend to be ignored or misconstrued until acute illness begins to show itself. Risks are dictated not simply by the nature of the chemical used but also by the suitability and serviceability of equipment, the worker's own care and cleanliness, and the duration of his exposure.

The chief users of the hazardous chemicals are spraying contractors and their employees, farm workers, workers in greenhouses, orchards, hopfields, and market gardens, private farmers, workers in seed-dressing establishments, and scientific workers. Deliberate or accidental ingestion may occur in adults or children, as dangerous chemicals are often insecurely stored by purchasers. The hazardous chemicals are not easily available to or much used by amateur gardeners, whose occupational exposure and risk is therefore small.

The period of most intensive use and consequent risk is from early April to August or September, the peak months being May, June, and July. Periods of fine hot weather intensify field spraying and sharply increase risks. Pesticide usage is most concentrated in the Eastern, South-eastern, and Midland counties, but is quickly extending.

As in most other countries, fatalities occurred in England during the early years of use. Eight agricultural deaths occurred between 1946 and 1951, all in contract spraying operators in hot weather, from the intensive use of D.N.C. as weed-killer, obviously without adequate safety precautions. The ninth death occurred in a glasshouse worker in Guernsey in 1954, due to over-absorption of parathion. There have also been a number of cases of mild poisoning, but it is encouraging that there has been no fatality or serious accident from the use of D.N.C. since 1951, despite its wider use.

Emergencies from "Comparatively Safe" Chemicals

With chemicals of comparatively low toxicity, emergencies are only likely from accidental or deliberate ingestion of large single doses. The effects would then probably include violent nausea, prompt severe vomiting, purging, and abdominal pain, leading on to mental confusion, collapse, tremors, stupor, circulatory failure, respiratory distress, cyanosis, convulsions, and death in coma. With such compounds the full severity of the case may not be apparent for some hours or even days. If there is prompt vomiting or a gastric wash-out is performed quickly, a patient may survive the immediate effects, later to show prolonged weakness, or delayed further illness, due to secondary effects on, for example, the liver, kidney, or nervous system. Such effects may at times be due to the solvent, not to the active chemical. The prognosis should be guarded for at least one or two weeks.

General procedures in such medical emergencies are suggested below. The modes of toxic action of the less hazardous chemicals are rarely known, and, with two exceptions, there are no specific antidotes or pharmacological antagonists to be recommended. The most urgent needs are the rapid removal of residual chemical from the stomach, followed by good nursing, symptomatic and supportive treatment, with careful observation during the recovery period for late effects on the liver, kidney, blood, nervous system, or gastro-intestinal tract.

Poisoning by the comparatively safe organic phosphorus insecticides malathion and methyl-demeton should be treated as later advised for the more toxic organic phosphorus compounds. Pentachlorophenol closely resembles D.N.C. and D.N.B.P. in its manner of disrupting carbohydrate metabolism, and acute poisoning should be treated as suggested for the more toxic compounds.

Emergency Procedure in Pesticide Poisoning

Most of the following suggestions are elementary, but they are often forgotten, despite their proved importance in any case of acute poisoning:

1. Make urgent inquiries about what chemicals had been used in the past few days, and examine any available instructional leaflets or container-labels from the immediate place of work. Note that workers often mix a hazardous with a safe chemical—for example, parathion with D.D.T., or T.E.P.P. with a copper fungicide. Treat as for the most dangerous.
2. Start any recommended treatment immediately. Cases with rapid onset tend to deteriorate further, and speed is vital.
3. Unless already done, carefully remove all outer working-clothes and thoroughly wash the exposed skin with soap and water to remove unabsorbed chemical.
4. If the chemical is known or believed to have been swallowed, induce vomiting unless the patient has already vomited repeatedly. In all cases it is preferable to pass a well-lubricated gastric tube, evacuate the stomach contents, and wash out repeatedly with warm water. About one pint (half a litre) of a dilute solution of sodium bicarbonate (1%) may then be left in the stomach. If available, activated charcoal (1 or 2 tablespoonfuls) could be given to conscious patients.
5. If the patient is obviously ill, disturb him as little as is compatible with treatment. Exertion will dramatically increase the severity of effects, especially with the hazardous compounds, and may lead to death.
6. Rapid effective sedation is therefore necessary for restlessness, excitement, or apparent imminence of convulsions—for example, injection of sodium amylbarbitone, 0.4–0.8 g. (7–12 gr.), or sodium phenobarbitone, 100–200 mg. (1½–3 gr.), intravenously in urgent cases, or otherwise intramuscularly. Morphine should not be used.
7. Anticipate coming therapeutic needs—for example, for oxygen supplies, saline, or glucose-saline infusion.
8. Do not send a seriously ill patient off to hospital unless it is quite certain that this will be the best for him, and that he can receive all necessary treatment *en route*.
9. Save vomitus, chemical container, and the worker's clothing, in case of later inquiries.
10. If in doubt about diagnosis, treatment, or procedure seek outside medical help.*
11. The patient's workmates may also be approaching a dangerous degree of over-exposure. They should be examined and not allowed to return to work or home until it is quite certain that they are fit to do so.
12. Ensure that the occurrence is notified to the local Ministry of Agriculture safety inspector.

Their extent of usage and worker-hazards suggests that attention should now be focused on D.N.C. and organic phosphorus compounds, and then on the less widely used arsenical, mercurial, and nicotine compounds.

Dinitroresol Poisoning

Absorbed D.N.C. or D.N.B.P. rapidly upsets carbohydrate metabolism and increases the basal metabolic rate, an effect usually tolerable in cool or cold weather conditions, but liable to cause dangerous effects when heat loss is limited by, for example, hot sultry weather. The general clinical picture is that of a worker with yellow-stained hands, face, or hair, with excessive sweating, thirst, and air-hunger.

Mild cases may show nothing but copious sweating and thirst; the patients are sometimes feeling particularly well, presumably owing to the moderately increased metabolic

rate. Severe cases are likely to show profuse and continuous sweating, fast pulse, nausea, vomiting, weakness, malaise, restlessness, dehydration, yellow sclera, scanty urine of fluorescent yellow hue, albuminuria, and deep rapid breathing. Fulminating cases may be drenched in sweat, dyspnoeic, cyanosed, comatose, or having convulsions even when first seen. There is usually a history of a few days' progressively increasing, but ignored, sweating and tiredness. Body temperature may be raised.

Laboratory tests in severe cases would show a tremendous rise in basal metabolic rate and the presence of D.N.C. in the blood and the urine. Photoabsorptometric methods of determining D.N.C. levels in the blood have been described by V. H. Parker* and D. G. Harvey,† and I have recorded a simple comparator method, eminently suitable for both emergency and routine purposes.‡ All hospitals in the major cereal-growing areas should be equipped to determine blood D.N.C. levels very quickly (see Appendix for details of collection, etc.). Symptoms are likely to be absent below 25–30 µg. of D.N.C. per ml. of whole blood, mild at 30–40 µg. per ml., severe at 45–55 µg. per ml., very severe at 55–65 µg. per ml., and critical at over 65–70 µg. per ml. The analytical methods apply equally well to D.N.C. and D.N.B.P., which are equivalent in hazard and effect. Since serum protein binds most of the circulating D.N.C., serum D.N.C. levels are twice as high as those given above for whole blood: some hospital laboratories quote serum levels. Urinary D.N.C. levels are not a good index of absorption or of the severity of the case. Whole-blood D.N.C. levels normally decrease at about 1 µg. per ml. of blood a day on removal from further exposure. The yellow staining of the skin is a specific persistent dyeing action, extremely difficult to avoid even in careful workers, and needing days or weeks to wear off. It does not therefore reflect the severity of the case, nor even the certainty that the case is one of D.N.C. poisoning.

Treatment

There is as yet no known specific antagonist to the effects of D.N.C. in the body, and treatment is aimed at the rapid promotion of maximum heat loss and the complete relief of anoxia, restlessness, and dehydration. Mild cases require little but a few days' enforced rest, freedom from further exposure, frequent cold sponging, minimum clothing and bedding, and abundant soft drinks. They should not resume work with D.N.C. for a month, or until the blood D.N.C. level is down to 5 µg. per ml. (All users are strongly urged by manufacturers to seek medical advice as soon as they notice unusual sweating.)

The most effective emergency method of cooling the severely affected patient is to remove his clothing and cover him with a wet sheet subjected to vigorous air movement to cause evaporative cooling—for example, by relays of helpers with large fans, electric fans, or a reversed vacuum cleaner acting as a blower, preferably carried out in the shade with free ventilation. Water should periodically be sprinkled on the drying sheet, or a fresh wet sheet used. Cold wet cloths to the head, ice-packs, ice to suck, and abundant cold drinks for the conscious patient, and, if possible, a cold-water rubber-bed or wetted stretcher, all promote further heat loss.

Restlessness demands the use of quick-acting barbiturates. Dehydration is almost certain to exist; conscious patients should drink copiously and often of cold drinks with added glucose (1 oz. per pint—40 g. per litre) and salt (1 teaspoonful per pint). An unconscious patient should ideally have a fast intravenous glucose-saline drip. Failing this, large volumes of rectal saline should be administered. Dyspnoea demands oxygen therapy by nasal tube, oral tube, face-mask, improvised "cellophane" or paper head-tent and open tube, or resuscitator.

*Analyst, 1949, 74, 646.

†Lancet, 1952, 1, 796.

‡Ibid., 1954, 1, 981.

The acute illness may last for 12–24 hours, and the above treatment may be required throughout that time. The prognosis in the fulminating cases is bad despite energetic treatment. Severe cases need a guarded prognosis for the first 24–36 hours, but thereafter the outlook improves. No delayed after-effects have as yet been reported in recovered acute cases. There should be no exposure to D.N.C., D.N.B.P., or other hazardous chemicals for at least two months; this usually means until the next season.

Organic Phosphorus Insecticides

All present-day organic phosphorus (O.P.) insecticides cause similar toxic effects, by inactivating acetylcholinesterase enzyme (ChE) of the tissues and thus permitting acetylcholine to accumulate dangerously. Since ChE regenerates only slowly, frequent small over-exposures are cumulative in their effects but often symptomless until ChE reserves fall to perhaps 5–20% normal. Illness then occurs, first affecting involuntary muscles and secretory glands, then the voluntary muscles, and finally vital brain centres.

Early or mild cases with gradual onset show malaise, fatigue, weakness, cold sweats, pallor, nausea, vomiting, abdominal discomfort, irritability, apprehension, or restlessness. Severe cases develop headaches, visual disturbances, confusion, vomiting, colic, diarrhoea, dyspnoea, and fine fibrillary tremors of hands, lids, face, or tongue. Very serious cases develop salivation, lacrimation, bronchorrhoea, severe diarrhoea, incontinence, basal rales, circulatory collapse, cyanosis, severe dyspnoea with a sense of suffocation, mental confusion passing to stupor, muscular weakness with tremors and convulsions, and coma. Fatal cases end with gross pulmonary oedema, cyanosis, bradycardia, and fall in body temperature.

The pupils may be pinpoint and fixed, and there may also be a sense of asthma-like tightness of the chest. These effects can, however, be misleading, being producible by the local eye or chest effects of exposure to spray mist of T.E.P.P., parathion, or demeton. Where present, they are presumptive of exposure, but not necessarily of poisoning. On the other hand, severe poisoning can occur with some organic phosphorus compounds—for example, schradan or dimefox—without miosis or bronchial constriction. The clinical diagnosis of organic phosphorus poisoning relies on concurrent effects on secretions, muscles, and brain. There are no external indications of contamination, but there will be a history of exposure within the past few days. The confirmation of diagnosis relies on demonstrating reduced ChE activity in the circulating blood. The technique is specialized, but is now available at certain regional laboratories (see Appendix). A simple colorimetric method has recently been introduced, suitable for emergency and routine testing. Activity is usually expressed as percentage of normality of healthy adults. Values above 80% normality imply that no significant absorption has taken place; there is no important upper limit. Cases with values between 50% and 80% normality are usually symptomless, but indicate over-absorption. Slightly early effects, mainly abdominal discomfort and cold sweats, may occur at 20–30% normality. Severe cases would be expected to have very low ChE activity in the blood—for example, 5–10%—but some apparently severe cases of parathion poisoning have had up to 50% normal values, while some cases of over-exposure with ChE levels reduced to 5% normality have proved symptomless. Thus, ChE levels are vitally important for confirmation of the diagnosis of an illness or over-exposure in workers, but low activity results may bear no obvious relationship to the clinical severity of effects.

Treatment

The recommended general emergency procedures should be carried out as they apply. The specific antagonist to organic-phosphorus-induced hypersecretion, involuntary muscle contraction, and some central effects is atropine sulphate. Unfortunately, it does not prevent muscular

tremors or weakness. All but very minor cases should be given atropine sulphate immediately (unless the worker has already had an initial oral dose elsewhere) in high dosage (initially 1–2 mg. (1/50–1/30 gr.)) intramuscularly, or intravenously in very ill patients; then ½–1 mg. (1/100–1/50 gr.) subcutaneously, repeatedly (at intervals of ½–3 hours, depending on the severity of the case) and for a prolonged period (12–48 hours, if the patient's condition remains poor). The atropine dosage needed in organic phosphorus poisoning vastly exceeds orthodox dosage schedules for this drug. The risk is of giving too little in severe cases, rather than too much. In a recent severe case, for example, 45 mg. of atropine (¾ gr.) was given intravenously in three hours, with recovery.

Here a special word of warning must be given:

1. If atropine is given erroneously in D.N.C. poisoning, the patient will stop sweating and may then die. The two types of poisoning must never be confused.

2. Practitioners should send the receiving hospital details of atropine and other drug dosage already given.

Restlessness must be combated immediately by quick-acting barbiturates. Dyspnoea demands continuous oxygen. Pulmonary oedema requires quick recognition and postural drainage. A recent suicidal case in Germany showed dramatic improvement in lung oedema after the injection of a mercurial diuretic; in a severe case injectio mersalyli (2 ml.) should be given intravenously.

Sudden failure of respiration justifies prolonged artificial respiration, preferably with positive pressure. Breathing may be resumed and survival follow. Care should be taken not to overload an already struggling circulatory system by saline infusion or transfusion of plasma or blood. On theoretical grounds, harm would result. Similarly, morphine should not be used. Good nursing is required, and the patient must not be left unattended while acutely ill.

The prognosis in very severe cases is poor, despite treatment. In such cases it is apparently not enough to have dried up the secretions and eased the involuntary muscles and anoxia; central effects dictate survival. Severe cases may be pulled through by intensive treatment. Mild cases usually respond extremely well to atropine. Full recovery can usually be expected, even in severe cases, if the first few days are survived, but careful observation should be kept for delayed effects on the nervous system for some weeks after organic phosphorus poisoning.

Cholinesterase activity returns to normal at the rate of about 1% a day, so a severely affected person should have no further exposure for at least three months. It should be noted that persons with a temporarily low cholinesterase activity may be hypersensitive not only to all organic phosphorus insecticides, but also to anticholinesterase muscle relaxants, procaine, neostigmine, eserine, or D.F.P.

Arsenical Preparations

There is increasing use of arsenites as weed-killers and defoliants. The toxic effects of over-exposures may include reddened eyes, skin rashes, sore throat, hoarseness, coryza, vomiting, diarrhoea, headaches, hallucinations, haematuria, aphasia, and peripheral nerve lesions. Eventual confirmation of the diagnosis is by finding arsenic in the urine in excess of the normal 0.008–0.15 mg. of As per litre of urine. The specific antidote to be used along with the general emergency procedures is dimercaprol in doses of 200 mg. intramuscularly every four hours for two days, and reduced doses for ten days.

Organic Mercurials

Organic mercurials occur in many fungicidal seed-dressings and spraying mixtures. Fatalities have occurred in Europe owing to the volatility of ethyl and methyl compounds, but inhaled dusts are also hazardous. The possible effects include gastric upsets, headaches, trembling, clumsiness, slurred speech, confusion, ataxia, nervous irritability, and

Specialist advice in such cases may be sought from the Medical Research Council's Department for Research in Industrial Medicine, the London Hospital, London, E.1. (Tel.: Bishopsgate 3255); or, when suggested on container labels, from the medical departments of the larger manufacturing concerns.

change in temperament. Rashes or blistering of exposed skin may occur as local effects of primary irritancy. The diagnosis may be confirmed by finding over 20-30 µg. of Hg per litre of urine. Dimercaprol therapy should be carried out in severe cases, although the results are not likely to be as favourable as in arsenical intoxication. The neurotoxic effects of mercurial poisoning tend to persist or slowly increase, and prognosis must be guarded. The skin lesions respond well to orthodox treatment as for thermal or minor chemical burns.

Nicotine Preparations

Nicotine still has considerable use in horticulture. Its toxic effects, most serious in non-smokers, include nausea, vomiting, pallor, vertigo, palpitations, tachycardia, chest pain, excitability, diplopia, incoordination, and collapse. Nicotine is less cumulative as a result of minor over-exposure than are most pesticidal materials. There is no specific antagonist to the effects of absorbed nicotine, treatment being that suggested under general emergency procedures, and symptomatic.

Prevention of Over-exposure to Pesticides

During the coming four to five months over 2,000,000 acres in this country will be sprayed with crop-protection chemicals. About one-tenth of this acreage will involve the use of hazardous pesticides, often under conditions of some risk. The safeguarding of potential worker-casualties from these modern agricultural operations remains a matter of great concern to users, employers, distributors, manufacturers, and Government departments. Many real steps have been taken to ensure safety, so far as this is currently possible, by mutual collaboration between these groups and by legislative measures. The practitioner is himself able to make some important contributions. He should be able to recognize and treat casualties as effectively as present knowledge permits. Medical treatment often stands a poor chance of success in serious cases, however, so whenever an opportunity presents itself he should enjoin on his user-patients the need for care, especially in the prevention and avoidance of contamination. He could also detect unsafe working methods by arranging for periodic analyses of blood D.N.C. levels in major users of dinitro-weed-killers, or for ChE levels in organic phosphorus insecticide users, and could with advantage carry out periodic scrutiny of workers, especially of contract spraying operators, during their season of major risks.

APPENDIX

The following details about laboratories to which specimens may be sent for blood D.N.C. and blood cholinesterase estimations are based on information provided by the Ministry of Health.

Blood D.N.C. Estimation.—Five millilitres of oxalated blood is required for this estimation. Blood must be taken in a dry syringe not previously sterilized with spirit. The specimen, or the patient, should be sent to the hospital to which the practitioner normally refers patients for pathological tests of any kind.

Blood Cholinesterase Estimation.—Five millilitres of oxalated blood, taken under the same conditions as for D.N.C. estimation, is required. Specimens may be sent either direct to Dr. E. N. Allott, Group Laboratory, High Street, Lewisham, London, S.E.13; Dr. E. M. Darmady, Pathological Laboratory, Central Laboratory, Milton Road, Portsmouth; Dr. D. H. Fulton, Memorial Hospital, Peterborough; or Dr. P. Kidd, Pathological Department, Royal Infirmary, Worcester; or, alternatively, the specimen should be sent to the hospital laboratory which the practitioner normally uses. Specimens sent through the post should go by letter post and be marked "Pathological Specimen (Agricultural Poison)."

Next article on Emergencies in General Practice.—"Diabetic and Insulin Coma," by Dr. J. D. N. Nabarro.

SELECTION OF PATIENTS FOR PSYCHOTHERAPY

Which patients with neurosis should be accepted for systematic therapy? This is a question that confronts every psychiatrist, and it is made no easier by the very large number of such patients now coming forward for treatment. In a lecture at the St. Marylebone Hospital for Psychiatry and Child Guidance on March 23, Dr. E. A. BENNET addressed himself to this problem.

Psychotherapy, said Dr. Bennet, took many forms: the kindly interest shown by the family doctor towards his patient; the psychological element accompanying physical treatments in psychiatry; art therapy; and, in particular, the methods ranging from explanation and suggestion to the often rigidly ordered types of analysis employed in the neuroses. Before accepting any patient with neurosis for systematic treatment—their present concern—at least two preliminary interviews were desirable, and these should be therapeutic as well as diagnostic.

Therapist and Patient

Psychotherapy, unlike most methods of treatment in general medicine and surgery, was always conducted upon a personal basis. The therapist was in the treatment, and for better or for worse his personality counted. Patients might select their therapist when treatment was arranged privately, but in hospital or clinic this was rarely possible. Nevertheless, in a department with a big staff it was essential, in the selection of patients, to take note of the personalities, predilections, and preferred methods of the therapists. One therapist might choose patients in the younger age groups, another do his best work with those in the second half of life, a third use supportive methods, and a fourth formal analysis.

Further, in selecting, the psychiatrist must do his best to decide whether a particular patient was likely to respond to the treatment available and so justify the heavy expenditure of medical time involved, before adding his name to the waiting-list. The dull individual with an intelligence below the average should be rejected; likewise those with established psychotic symptoms, and reluctant patients sent (or brought) for treatment they did not want. Although such patients might be treatable, the demand for treatment was so high that the needs of others ruled them out.

The patient's expression of a need for psychological treatment should be taken seriously in the selection. An intelligent person, aware that there was something within his personality which needed attention, was often quite right. He might be successful in life and the antithesis of the "chronics" who frequented every medical out-patient department and became, to the student, the prototype of the "psychological case." Sometimes these patients reported that they had asked their doctor to send them to a psychiatrist and had been told that they did not need to see one—that they were not "the neurotic type." But, eventually, the doctor was persuaded to ask for an appointment. An importunate attitude on the part of a patient might even indicate suitability for psychotherapy.

The value of an affirmative diagnosis was often overlooked by doctors who diagnosed neurosis by the exclusion of organic disease, went on Dr. Bennet. Their medical training was responsible for this, and it was an attitude that frequently bred invalidism. Fruitless and often expensive investigations were disheartening, especially to an anxious patient, and the possibility of psychotherapy might be welcomed. Nor were psychotherapy and physical investigation mutually exclusive, but could well proceed *pari passu*. Likewise, when necessary, sedatives and other medicines should be prescribed by the psychiatrist, whatever type of psychotherapy he might be using. Some analysts would disagree with this and insist that medicine must be prescribed by another doctor, claiming that otherwise the transference

would be interfered with. But to withhold these aids because of a theoretical objection might protract treatment unduly and lead to an uneconomical use of the therapist's time.

Depressives and Obsessionals

Patients with depression formed the largest group of psychiatric invalids, and many of them would respond to psychotherapy. But a careful history was necessary before advising psychotherapy. Involuntional depressives and those with defined endogenous mood swings should be given electric convulsion treatment. Patients with conversion symptoms were often depressed and so were those with morbid anxiety and tension, and both these groups could be helped by psychotherapy. In these patients, and often more definitely in the patient with an obsessional neurosis, the symptoms were more severe when they were depressed, and it might be difficult to separate the reactive and endogenous elements in the depressive features of the illness. However, this was often unnecessary or even impossible to do. The main point of importance here was that during the depression the psychoneurotic features were better defined and hence perhaps more open to treatment.

Certain characteristics in the obsessional patient, when clearly marked, indicated that psychotherapy was desirable. These features were a sense of guilt about the symptom, marked secrecy concerning it, and a dread of growing older—of the passing of time. The sense of guilt might be overwhelming and suicidal impulses difficult to control. Nevertheless, these three characteristics served the purpose of preserving the symptom, and by recognizing this the patient could be helped to see what his symptoms meant.

Transference was an inevitable and essential process in psychotherapy. Yet in selecting patients no one could be prophetic about it, for unconscious elements in both therapist and patient were involved which would only become evident during the treatment. Cure or amelioration was the product of a dynamic situation in which two personalities, working co-operatively, sought to solve the problem set by the neurosis. Hence the selection of patients for psychotherapy could never be a fixed procedure, a technique, which any sensible person could learn and apply. It demanded an "intelligence of the heart" as well as experience and sound judgement.

Reports of Societies

RADIOTHERAPY AND GENERAL PRACTICE

An example of the value of the exchange of ideas between two branches of the profession was the joint meeting of the Sections of Radiotherapy and General Practice at the Royal Society of Medicine on March 18. On this occasion the object was to draw attention to the many ways in which the radiotherapist can help his general-practitioner colleague, and it may have surprised some of those present how wide this field is, particularly outside the obvious territory of malignant disease. But a second and no less important purpose was once again to stress the overriding value of close consultation between specialist and practitioner in planning the treatment of the individual patient.

The opening speaker was Dr. DAVID BROWN, a general practitioner from Liverpool. Although, as he said, both diagnosis and treatment had nowadays come to depend on special techniques, it was still important for the general practitioner to stay in charge of his patients, to decide on their treatment, and to assess the final results. Radiotherapy, continued Dr. Brown, could be used for many non-malignant conditions. It was specially valuable for skin complaints. In disorders giving rise to pruritus, x rays were not always curative, but they allayed symptoms, prevented complications, and brought ease of mind. Radiotherapy was particularly helpful in neurodermatoses, eczema, lichen planus,

and pruritus ani and vulvae. Although with the last two conditions the ideal was to find and treat the underlying cause, this was often far from easy. Radiotherapy also benefited infective skin conditions, such as sycosis barbae, where an antibacterial action was produced without the risk of bacterial resistance so often seen when antibiotics were used. Keloids might be softened, and the cosmetic results in treating radiosensitive naevi were most satisfactory. Radiotherapy could also be used to diminish secretions in seborrhoea and acne.

Many gynaecological disorders were amenable to radiotherapy: ovarian sterilization was simple, and metropathia and other forms of functional bleeding could be relieved safely and without the upset to family life occasioned by surgery. When surgery was contraindicated fibroids could be treated successfully. Among other conditions, osteoarthritis of the spine responded to radiotherapy, and the relentless course of the disease was slowed. Excellent results were achieved in ankylosing spondylitis, but in young women there was a grave risk of damage to the ovaries.

Malignant Disease

Malignant disease of the skin was common, and it was in the treatment of basal and squamous-cell carcinomata of the skin, and of cancer of the lip, that the real triumphs of radiotherapy could be seen. In growths of the tongue and buccal cavity radiotherapy combined with plastic surgery was becoming increasingly successful. In tumours of the nasopharynx and larynx cure was less likely, but distressing symptoms were relieved.

Breast cancer, went on Dr. Brown, was a cause of much anxiety to the family doctor. In the early stages surgery offered the best hope, later on surgery should be used together with irradiation, while in advanced disease radiotherapy alone was indicated. Cancer of the cervix was also dreaded by practitioners, since it afflicted women at an age when they were so essential to their growing families. The disease was probably best treated by panhysterectomy and irradiation. Radiotherapy was unfortunately of little value in carcinoma of the stomach or lung, both of which were becoming so common in practice. In Hodgkin's disease and leukaemia full liaison between the practitioner and the radiotherapist could often lead to prolongation of life, reduction of toxæmia, and the relief of unendurable symptoms. In patients for whom neither surgery nor radiotherapy offered any hope of cure, irradiation was often the best method of giving temporary relief from unpleasant symptoms, particularly ulceration and offensive discharge, thus enabling the patient to be nursed at home.

Co-ordination of Services

Dr. Brown then raised the question of co-ordination between practitioner and radiotherapist in the treatment of patients. He stressed that the family doctor's main responsibility was in early diagnosis, but it was equally important that the radiotherapist should keep the practitioner informed about the subsequent course, since it was on the practitioner that the responsibility of ultimate management would fall. All details of treatment should be sent to the doctor immediately the patient left hospital. When palliative treatment was being considered it was essential that the practitioner should be consulted.

Medical students, said Dr. Brown in conclusion, saw too little of the work of the radiotherapy departments; and the unbalanced amount of time devoted to surgery biased them when they passed into practice. There was a case also for appointing practitioners as clinical assistants to radiotherapy departments.

The Radiotherapist's Viewpoint

Dr. J. S. FULTON, director of the Radiotherapy Service in the Liverpool region, the next speaker, thought that radiotherapy had emerged from its adolescence, and that the

radiotherapist must now be prepared to accept full clinical responsibility for the patient. Though most of his work would concern malignant disease, the radiotherapist could help a great deal in simple conditions. Both plantar warts and keloid scars responded well to irradiation, and good results could be expected in cavernous haemangiomas. In the early stages about two-thirds of patients with osteoarthritis were relieved, and excellent results were found in ankylosing spondylitis. In treating Eustachian-tube deafness substantial benefit was seen in more than three-quarters of the patients. Many skin diseases were amenable to irradiation, and menopausal menorrhagia responded well.

In malignant disorders, radiotherapy was of great value in skin cancer, where good curative and cosmetic results were achieved. In carcinoma of the lip, a disease of smokers, radiotherapy was the best form of treatment, since the whole lip was potentially carcinomatous and could not be dealt with by surgery. Neoplasms of the tongue and mouth were mostly suitable for radiotherapy, and were treated by moulds or dentures containing radium or by radium needles. The Finzi-Harmer technique had proved successful in 73% of patients with intrinsic carcinoma of the larynx; and total laryngectomy should be reserved for patients failing to respond to radium. In cancer of the uterus the best surgical results were never so good as the best results from radiotherapy, especially if radium and x rays were used together. The treatment of breast cancer was still a controversial topic; though there was a place for irradiation in most cases, it was important to treat each patient as an individual problem. The main problem in carcinoma of the lung was that of early diagnosis, since it was only in the early stages that surgery was justified. There was probably a place also for radiotherapy in the treatment of the early case. Wilm's tumours in childhood should always have radiotherapy before surgical removal was attempted. Irradiation played an important part in the treatment of carcinoma of the nasal sinuses.

There was still some doubt, went on Dr. Fulton, about whether the reticulososes were *unifocal* or *multifocal* diseases, but there was no doubt that in Hodgkin's disease it was well worth while to give efficient treatment to the first local group of glands. Palliative treatment should aim not only at prolonging life but at relieving pain and other distressing symptoms. Radioactive isotopes had not justified the early hopes. The best results were to be found in the use of radioactive phosphorus in polycythaemia and of radioactive iodine in the diagnosis of thyroid disorders.

Dr. Fulton was in full agreement that collaboration with practitioners was of the utmost importance. Cancer was an urgent condition; there should be no need to delay the first consultation by an appointment system; new patients should be seen at once by the specialist likely to be responsible for treatment. Progress reports should be sent to the family doctor whenever a course of treatment was concluded, and possible complications should be emphasized. Shortage of beds meant that aftercare would be largely in the hands of the practitioners. There was great benefit to be derived from the domiciliary services both in early consultation and in the care of the reaction phase after treatment.

Discussion

In the subsequent discussion Dr. WALTER LEVITT reminded the meeting that radionecrosis might follow the treatment of plantar warts if adhesive strapping was applied after treatment. Radiotherapy played a most important part in the treatment of uterine haemorrhage. Dr. N. S. FINZI emphasized the importance of collaboration between practitioner and radiotherapist. In the early days of radiotherapy only the hopeless cases had been referred for treatment, and for this reason there had been a tendency for radiotherapy to fall into disrepute. Happily a fairer view was now taken by both the profession and the patient. With regard to gynaecological cases he had seen patients with fibroids up to the ensiform cartilage that had responded well to radiotherapy. Dr. R. J. MINNITT (president of the

Section of General Practice) paid tribute to radiology in the early diagnosis of disease.

Dr. G. F. ABERCROMBIE raised the question whether a patient should be told that he had malignant disease. Among others taking part in the discussion were Dr. LINDSEY BATTEN, Dr. TALBOT ROGERS, Mr. I. G. WILLIAMS, Dr. J. R. NUTTALL, Dr. ANTHONY GREEN, and Dr. J. JACKSON RICHMOND. There was general agreement that a patient should be told the truth about his disease only if the practitioner or specialist was quite sure that he genuinely wanted to know the truth.

LOCAL MEDICAL SOCIETIES

Liverpool Medical Institution

At a meeting on March 10 Mr. DONALD YOUNG, consultant surgeon at Warrington Infirmary, described what surgery could do for the infertile husband. A brief consideration of the anatomy, physiology, and development of the male genital tract showed how an accurate anatomical diagnosis might be reached in cases of azoospermia. For instance, once spermatogenesis had been proved by testicular biopsy, the presence of fructose but not spermatozoa in the ejaculate meant that there must be bilateral obstruction in the vas deferens below the level of the seminal vesicles; if, however, the ejaculate contained neither spermatozoa nor fructose, then there was either bilateral blockage of the ejaculatory ducts or bilateral absence of the vas deferens. Testicular biopsy played an important part in deciding which cases would be amenable to surgery: they were those with azoospermia but proved spermatogenesis in at least one testicle, and those with large varicoceles. Recent work had suggested that removal or ligation of the latter would promote the production of spermatozoa, probably by lowering the temperature of the scrotum.

Obstructive azoospermia, continued Mr. Young, could be caused by several factors in the vas deferens—congenital, traumatic, or infective. The commonest of the congenital abnormalities was absence of the vas deferens. Eight such cases had been found in over 900 patients attending the Liverpool Infertility Clinic. In addition, there had been two cases of unilateral absence and five of incomplete development or stenosis of the vas. Treatment of congenital absence of the vas deferens had been attempted by forming an epididymal fistula and by making an artificial spermatocele. Treatment of traumatic obstruction was by excision and end-to-end anastomosis of the vas. Only two cases of traumatic obstruction had been found in 133 cases of azoospermia investigated. The results from this operation were good. The relief of azoospermia due to bilateral blockage of the vas deferens was by the delicate operation of epididymo-vasostomy.

Manchester Medical Society

The opinion that spinal analgesia in prostatic surgery should now be abandoned was urged by Dr. T. H. CHADWICK, consultant anaesthetist to the North Manchester Group of Hospitals, in an address to the Section of Anaesthetics on February 17. The improvement in spinal analgesics in 1930, he said, had led to their enthusiastic acceptance by surgeons for prostatectomy because they provided for the first time operating conditions previously unattainable. In an attempt to minimize the inevitable serious reduction of blood pressure, with its attendant tissue anoxia, a modified technique combining low spinal and local analgesia was evolved. This technique, though eminently satisfactory to the surgeon, did not preclude the dangers of sepsis. For that reason a technique employing the least toxic drugs, nitrous oxide, thiopentone, curare, and pethidine, was now used, intravenous administration of the non-volatile drugs being imperative in the poor-risk case. Mortality had dropped from 34% for spinal analgesia to less than 1% with this technique.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Blood Groups in Relation to Peptic Ulceration

SIR,—The paper by Professor Ian Aird *et al.* (*Journal*, August 7, 1954, p. 315) induced us to investigate the ABO blood groups in patients who had been treated for peptic ulceration in the two surgical departments of Ullevål Hospital, Oslo, in the years 1945–54. The results of the investigation will be published elsewhere. They were in full agreement with those of Aird *et al.* In particular, it is of interest to note the difference in the proportion A/A+O between patients with gastric ulcer and patients with duodenal ulcer. The data from both investigations are as follows:

	No. of Patients			
	Gastric Ulcer Blood Group		Duodenal Ulcer Blood Group	
	O	A	O	A
London	314	228	535	311
Manchester .. .	122	90	225	148
Newcastle .. .	102	58	288	157
Oslo	179	189	282	250

The difference between the two ulcer types is not significant if either investigation is considered alone. If, however, we combine the data according to the method recommended by Aird *et al.*, we find χ^2 for the difference = 5.63 with 1 degree of freedom. The probability that such a difference, or an even greater one, will arise by pure chance is less than 1 : 50 ($P = 0.018$). The weighted mean difference in the proportion A/A+O between gastric ulcer and duodenal ulcer is 0.040. A significance test for the combined material according to the method suggested by Cochran¹ gives approximately the same result ($P = 0.021$).

The Norwegian data thus strongly support the observation reported by the British investigators that there seems to be a difference in blood group frequencies between gastric and duodenal ulcer.—We are, etc.,

KNUT WESTLUND,
HELGE HEISTÖ.

Oslo, Norway.

REFERENCE

¹ Cochran, W. G., *Biometrics*, 1954, 10, 417.

Fluoridation of Public Water Supplies

SIR,—Though it is evident from the correspondence in the *Journal* that the hazards of fluoridation are a subject of controversy among the scientific experts, the question is not one really of science but of medical ethics and of the freedom of the practitioner to give what he judges to be the best advice in the interests of his patient, and of the patient to carry it out.

It is, at any rate, legitimate for any one, medical or lay, to hold that we already absorb a sufficient level of toxins, and that a small but daily addition through the water supply is inadvisable, especially to anyone in poor health. There is no medical indication whatever for the administration of fluorides to adults, and for local councillors to make the decision to do this, and to impose it upon the patients of those medical practitioners who may consider it inadvisable in individual cases, is a dangerous precedent for interference in the medical field by the political power. I can see no reason why the treatment of dental caries should make an exception to the rule that consent to any form of treatment should be essential, and that no one should be subjected to any treatment which offers him no expectation of benefit.

I understand that enthusiasts for fluoridation will not be content until the benefits of fluorides are made available to children who do not drink the public water supply; and if

this can be done, they can be made available to all children whose parents consent. When the same amount of attention has been paid to finding legitimate ways of making this treatment available to children, without forcing it on everyone else, as has been paid to studying this illegitimate method of dosing everybody, including unwilling people, through the public water supply, I do not believe that the difficulties will be found insuperable.—I am, etc.,

London, S.W.1.

FREDERICK C. ENDEAN.

Relationship Between Menstruation, Urine Acidity, and Ovulation

SIR,—When investigating the pH of the first morning urine specimen of a representative sample of schizophrenics and healthy normals, a significant difference in acidity (measured with the potentiometer) was found between the two groups ($P=0.05$), the urine of schizophrenics being the more acidic.

During the course of these studies I made the following observation: the pH of the first morning urine specimen of a healthy female drops to pH values around 5.2 to 5.0 24 to 12 hours before the onset of menstruation; for instance, pH=5.8 two days prior, pH=5.25 one day prior, and pH=5.1 about three hours prior to the arrival of menstruation. There is also an increase in urine acidity (drop in pH) before the onset of ovulation, though this is less marked than that occurring shortly before the onset of menstruation.

These preliminary observations need, of course, confirmation and extension before their usefulness can be assessed in terms of practical applicability—for example, by use of a special paper pH-indicator revealing the varying degrees of acidity in the first morning urine by different colours.—I am, etc.,

Regina, Canada.

ROLAND FISCHER.

Heatstroke or Malaria?

SIR,—Under the heading "Lowering the Body Temperature," Dr. C. E. H. Milner writes a letter (*Journal*, October 9, 1954 p. 872) which includes some of his experiences of hyperpyrexial heatstroke in Mesopotamia in the summer of 1917 during the first world war.

He states: "About 5 p.m. the ambulances began to roll up . . . full of blue, unconscious, naked soldiers, suffering from alleged heatstroke. These proved in reality to be cases of hyperpyrexial cerebral malignant tertian malaria." His letter, however, does not state the proportion of blood smears that proved to be positive. Also, about 36 years ago, in an article on this same epidemic, Dr. Milner¹ expressed the view "that heatstroke, as a clinical entity, is non-existent; and is nothing more than a symptom, on a hot day, of malignant tertian malaria."

This would appear to mean that, in Dr. Milner's opinion, it is impossible for any person to be attacked by hyperpyrexial heatstroke unless he has previously been infected with the parasite of malignant tertian malaria. This point, because of its obvious bearing upon immunity and treatment, is one of considerable practical importance. The truth of it would be difficult to prove conclusively, and equally difficult to disprove. However, the following evidence may help to clarify the situation. While in Mesopotamia in 1917 I dealt with an exceptionally large number of heatstroke cases during this memorable epidemic, and found many instances where no evidence of malaria could be obtained despite careful search for it. I have no record of the proportion of positive malarial blood smears that occurred in my cases, but, from memory, I doubt if they exceeded 25%. I regarded the malaria merely as a complication which would naturally be expected among a community of soldiers, many of whom had lived for a considerable time in India or Mesopotamia.

In August, 1917, several troopships arrived at Basra from England at intervals of about a week. In the first ship-load an appalling outbreak of heatstroke with a very high mortality rate

occurred during the ten-hour journey up the Shatt-el-Arab river. Following this I received instructions to meet the remaining ships at the head of the Persian Gulf, and to deal with the heatstroke problem during the journey up river to Basra.

The occurrence of fully developed cases of heatstroke on these latter ships was greatly modified by a system of prevention which had already proved thoroughly successful in my 60-bed hut at the hospital in Basra, which I described in 1919.¹ Nevertheless, on each of these latter ships about four or five actual heatstrokes occurred, and about 40 others certainly would have occurred had the patients not been placed under preventive treatment (all of the prevented cases had complete suppression of sweating, and a temperature of at least 103° F. (39.4° C.)).

Here we have a series of instances where heatstrokes and potential heatstrokes occurred in large numbers at the final stage of a voyage from England before any of the troops had set foot on Mesopotamian soil. And the question arises—Were all or any of these heatstroke patients malarial subjects? There was no opportunity to examine blood films during the river journey.

The S.M.O. of one of these ships told me that no attacks of malaria had been treated on the voyage.

This ship came via the Cape, and the only stoppages were a couple of days at Capetown and Durban which took place in July, during the southern mid-winter. The troops, therefore, could not have picked up malarial infection during the voyage. Consequently, if there were any malarial soldiers among them they could have become infected only through a previous visit to some malarial country. But changes of climate are said to precipitate malarial attacks in infected persons, and as no such attacks occurred on a long voyage, which crossed the Equator twice, and spent some time in the fairly cold region of Capetown in mid-winter, it seems that there were few, if any, infected soldiers on board. Unfortunately, I did not ask the heatstroke patients on my ships if they had ever left England before. Their replies might have produced conclusive evidence regarding their freedom from infection. However, the troops were not British "regulars," and I formed the opinion that this ship, at any rate, provided an example of heatstroke occurring under circumstances in which the influence of malaria could be fairly and reasonably eliminated.

Results of treatment throw some further light upon this subject. All of the heatstroke patients on my ships had recovered consciousness before the ships reached Basra; and none of them received a single grain of quinine, nor was any venesection done. The treatment given served no purpose other than to remove their hyperpyrexia: they recovered quickly. Furthermore, I have been fortunate enough on several occasions to be present (with the means of treating the hyperpyrexia ready at hand) at the moment that the patient became unconscious, and have proved that the immediate application of treatment to such early cases can restore consciousness within 20 to 30 minutes. Such a quick result is possible when the superheated blood has been allowed to affect the brain for only a minimum length of time; but it seems highly improbable that a similar result could be obtained by hyperpyrexial treatment alone (and no antimalarial therapy included) if the unconsciousness was due to cerebral malignant tertian malaria.

A heatstroke country is, generally, also a malarial country. It is therefore not surprising to find heatstroke and malaria co-existing in people who have lived in a malarial district long enough to become infected. But I feel quite sure that heatstroke can, and often does, occur alone without any necessary association with malaria.—I am, etc.,

Ewey Bay, Australia.

K. G. HEARNE.

REFERENCES

- ¹ *British Medical Journal*, 1918, 1, 638.
- ² *Ibid.*, 1919, 1, 516.

Chicken Anti-ulcer Factors in the Treatment of Gastric Ulcer

SIR.—The question whether nutritional factors which counteract gizzard ulcer in chicks may cure gastric or duodenal ulcer in man is of considerable interest to the clinician. We have therefore carried out a series of experiments in order to test this problem. One group of ulcer patients was given a dietetic preparation containing milk and cream powder, vitamins, a decholesterolized lipid extract of calf's brain, and defatted calf's brain. A control group was given a corresponding preparation from which the latter two components were omitted. Calf's brain or a lipid extract thereof together with the defatted calf's

brain have previously been found to counteract gizzard ulcer in chicks.¹ Until now 22 hospitalized patients with roentgenologically verified ulcer have been treated.

In both groups most of the patients became free of subjective symptoms during four weeks of treatment. After treatment x-ray examination showed that ulcer had disappeared in about half of the patients in both groups. This is the same result as that obtained by common dietetic treatment. Thus the presence in the preparation of the above-mentioned chicken anti-ulcer factors had no influence on the results.—We are, etc.,

Copenhagen.

CARL AAGE KROHN.
ERLING LUND.

REFERENCE

- ¹ Dam, H., et al., *Acta physiol. scand.*, 1950, 21, 315.

** An article on this subject by Dr. K. Bröchner-Mortensen and his colleagues appears at page 818 of this issue.—Ed., *B.M.J.*

Eclampsia

SIR.—Dr. John Sophian (*Journal*, March 12, p. 666), in his criticism of my letter (*Journal*, February 19, p. 481), flatters me unduly in supposing that I have established a new hypothesis of eclampsia. I have but pointed to new evidence in the aetiology, and—as I have no possibility of testing it—I have asked the profession—that is, the clinicians—to confirm or refute Grauert's claim. Far be it from me to exchange one hypothesis for another one. On the contrary, I fully agree with Dr. Sophian that the right way of combating disease can only be attained by search for aetiological factors. And this is just what I proposed. Unfortunately, the Editor, for brevity's sake, asked me to cut that part of my letter in which I pointed to the contradictory premises on which the endocrinological hypothesis is based.

Dr. Sophian's reference to the well-known cases of eclamptic fits in the absence of a foetus does not invalidate the theory of endogenous toxins. Modern pathology knows by comparative study of other diseases that abnormal reactions can continue automatically even after the "focus" has ceased to act.

In his criticism of the diet I am advising Dr. Sophian has overlooked the much more important items of avoidance of all overheated fats and the increased intake of proteins and roughage (recently also advised by Australian clinicians). The low salt consumption is only one part of the diet.—I am, etc.,

London, W.1.

ALBERT W. BAUER.

Night Cramps

SIR.—I was interested to read the annotation on night cramps (*Journal*, March 12, p. 653). From time to time I have read of various treatments and have often wondered when I would see mephenesin recommended. It has always seemed to me that if night cramps were actually cramps this would be a rational treatment though not a cure.

Since 1952 I have done various locums in general practice and have met with about a dozen cases; unfortunately I have kept no exact record, but every case had complete relief, the dose of mephenesin being one tablet at night or a dessertspoonful of the elixir unless it caused a burning sensation in the throat. All the cases of cramp were in old people. I would be most interested to hear whether I have been just lucky with mephenesin so far, whether it is just a placebo, or whether it has a therapeutic value.—I am, etc.,

Woodbridge, Suffolk.

H. R. ODLUM.

Management of Brain Abscess

SIR.—The article by Mr. Walpole Lewin (*Journal*, March 12, p. 631) on his series of cases of brain abscess was most interesting and instructive, and his wise conclusions based on his excellent results are admirable. However, I cannot agree with his advice on the management of all cases of otogenic abscess. It has been known for many years, and discussed in detail by Macewen,¹ that many of these abscesses

arise by direct continuity of the disease through the bony confines of the temporal bone, the dura mater, and the arachnoid and pia mater membranes. It is possible to call these abscesses subdural, but the fact remains that an area of brain tissue is eroded away and that pus and granulation tissue are situated in the geographical space of the brain, separated from the neural tissue by a capsule of varying thickness. This type of abscess is very much commoner than the more deeply seated one which arises probably by thrombophlebitis. I have given fuller details elsewhere² of these processes.

I maintain that, in those abscesses which arise in continuity with chronic infection in the mastoid bone, the route of access to them is the route by which they arrived, whereas the deep-seated abscesses are in the nature of intracranial neoplasms and can best be discovered and treated by surgeons like Mr. Lewin skilled in these particular techniques. It is unfortunate that many neurosurgeons have not recognized that there are at least these two types of abscess, widely differing in aetiology and therefore, I believe, in treatment. Mr. Lewin's only reference to the matter is the sentence: "The operation is conducted through a clean incision, and we have long since abandoned attempts to drain an abscess along the entry track, as, for example, through a mastoid wound, which may lead to cerebral fungus." This cannot be reconciled with my own personal experience, or with that of many of my colleagues. I have never yet seen a cerebral fungus arise in this way and I have always understood from neurologists, even if not from neurosurgeons, that a cerebral fungus is an indication of a persisting rise in intracranial pressure probably indicating a persisting intracranial lesion. I was sorry to see that this statement about cerebral fungus is still being made and is being passed on as common knowledge. I would say that the condition is unknown in modern otological practice conducted in properly equipped departments.—I am, etc.,

London, W.1.

MAXWELL ELLIS.

REFERENCES

- ¹ Macewen, W., *Pyogenic Infective Diseases of the Brain and Spinal Cord. Meningitis, Abscess of the Brain, Infective Sinus Thrombosis*, 1893. Macchese, Glasgow.
- ² Ellis, M., in *Modern Trends in Diseases of the Ear, Nose and Throat*, 1954, edited by M. Ellis. Butterworth, London.

Early Cancer Detection

SIR.—Very few articles have been published which deal seriously with the psychological aspect of cancer and cancer education, and it is a pleasure to read the one by Miss Jean Aitken-Swan and Mr. Ralston Paterson (*Journal*, March 12, p. 623), which will be most helpful to those of us who are trying to carry out cancer education among the public.

The authors point out that among the patients suffering from cancer of the breast, and who delayed in seeking advice, 80% "knew" that they might have cancer, and later in the discussion it is stated that "prima facie, it might be argued from this that people are better left in ignorance." This argument will certainly be seized upon and accepted by the "anti-cancer educationists," and therefore it must be answered at once. The answer is simple; there is no evidence that any of the 80% were educated concerning cancer. Before attaching any importance to this figure it would be necessary to discover what proportion of the female adult population "know" that they have cancer—that is, think they have—never go to a doctor, and never develop the disease.

The authors seem to admit this when they say: "Our study has shown no ground for assuming that, given adequate information on the significance of symptoms, people in this area—particularly women with cancer of the breast—would as yet react 'rationally.'" Even knowledge of certain facts is not "cancer education," and it will take many years of "education" before cancer apprehension is sufficiently diminished so that public opinion and other factors will help the sufferer to report at once. There is little doubt that in America this has been accomplished, and the Americans are willing to talk as freely about cancer as they do about other diseases, a fact which has often been erroneously interpreted by doctors in this country as being due to cancer-

phobia. Whilst congratulating the authors on the article, there is still great need to study the psychological outlook towards cancer of people who have no symptoms or disease, and are, in fact, the people whom we are trying to educate.

After many years of experience of cancer education, including two years' whole-time intensive work on the "Yorkshire experiment"—a full report of which it is hoped will be available in a few weeks' time—I am convinced that cases of true cancerphobia, which in any case are rare, are not created by cancer education. Such people are phobia-minded from the start, and if it is not fear of cancer it will be heart disease or fear of being buried alive. On the other hand, "cancer apprehension," which is almost universal, can be and is being diminished by well-planned cancer education.

I should also like to congratulate Dr. J. Walter and Dr. E. C. Atkinson (p. 627) on their pilot experiment on early cancer detection based on periodic examination of apparently healthy people, which must have been carried out at much personal sacrifice of their leisure hours. Space does not permit a detailed discussion on this large subject, but my impression is that in America and Canada they are beginning to consider that the small number of unsuspected cases discovered does not justify the cost in medical man hours or money. In my opinion, Dr. Walter and his colleague have made one appalling psychological blunder during their experiment. They state: "The word 'cancer' was avoided at all times, if possible, as being in itself a potent agent of distress." It is this policy of hush-hush, particularly on the part of the profession, that is doing untold harm, and is one of the main factors which keeps cancer apprehension in existence, which in turn is the chief cause for the delay in visiting a doctor.

The statement that "the Ministry of Health, in a recent circular, considers public propaganda inadvisable at present" may lead to misinterpretation as to the desire of the Ministry. As I understand the position, the Ministry feels that the time has not yet arrived for the Ministry itself to carry out a nationwide campaign, but that public propaganda (education is a better term) should be carried out by each individual local health authority, using its own methods.

Mr. R. M. Vick also published an article in the same number of the *Journal* (p. 660). He kindly sent me the full report in which, in the case of cancer of the breast and uterus, he correlates the five-year survival rate with the stage of the disease and the delay in seeking advice. A careful study of these figures—space does not permit of the reporting of the calculations—suggests that if all accessible cancers were treated immediately the symptoms were first noticed (a quite impossible achievement) it would be found that the disease was present in all four of the recognized clinical stages, but that in reality there would be three types of clinical stage I, depending on the rate of growth: (a) those that had already disseminated; (b) clinical stage I about to disseminate; (c) those clinical stage I, slow-growing, well-differentiated growths of which there were still 147 in Mr. Vick's series at one year or more after symptoms had been noticed with a five years' survival of 59.8%. It is the clinical stage I (b) type that education hopes to get treated at once, but what proportion of that type exists at present quite unknown; indeed, it is unknown in what proportion the various stages are represented at the time symptoms are first noticed. Mr. Vick's figures record the delay 0-3 months, but if sufficient figures of delays 0-1 month, with the correlated "stage" and five-year survival rate, could be obtained, then some clue might be forthcoming as to the proportion of the various stages likely to be found when the disease is first noticed, and some idea of how many lives might be saved by cancer education could be calculated. It should be noted that in Mr. Vick's figures, taking all stages, the five-year survival rates fell from 52% with delays of 0-3 months to 37.6% with delays of one year or longer.—I am, etc.,

York.

MALCOLM DONALDSON.

SIR.—The article on March 12 (p. 627) entitled "Early Cancer Detection" by Drs. J. Walter and E. C. Atkinson gives rise to a most disturbing line of thought. Eight hundred and thirty-seven patients were examined to detect early cases of carcinoma; this examination was full and painstaking, and in this examination only one or two new cases were found. Yet in the next year and a half, in that same series, eight cases of carcinoma occurred.

On the surface there does appear to be justification for the line of thought that the examination and warnings given to the patients gave rise to an alarming increase in the incidence of cancer. The figure of 2 in 837 is in line with the figures given in the same issue of the *British Medical Journal* in the article "Progress in Cancer Registration" by Mr. Reginald Vick. He has a total of 39,000 cases registered in a population of 2,897,000, or 1 in 700, but the occurrence of eight more cases in the next year and a half is most alarming.

We have no proof and can obtain none that early discovery of cancer results in a decrease in the morbidity rate of cancer. We cannot say that the early investigation and treatment of cancer is not detrimental, and here we have grounds for believing that it is actually detrimental. If we accept, even partially, Selye's stress syndrome theory we must accept that stress causes imbalance of the hormones. We treat carcinoma with large doses of hormones. Is there a connexion between the stress of cancer diagnosis and treatment, and the morbidity of cancer? When a new drive to diagnose a type of carcinoma commences the morbidity rate rises to a surprising extent and later wanes; this is exemplified by the recent rise in cases of lung carcinoma, and the fall in cases of uterine growths, in this area.

These statements are not put forward as a reasoned argument but as foundation for thought. But the fact remains that, when 837 patients were carefully examined, only one case of carcinoma of the breast and one minor rodent ulcer of the face were discovered, but that within 18 months of this examination eight fresh cases had occurred (of which three died). To the unbiased observer such examination does seem to be a very uncertain procedure.—I am, etc.,

Pertworth, Sussex.

W. A. BALL.

Treatment of Pulmonary Tuberculosis

SIR,—Dr. T. W. Lloyd (*Journal*, February 26, p. 538) thinks that the time has come to abandon pneumatic treatment (pneumothorax and pneumoperitoneum) in favour of prolonged chemotherapy, while Dr. T. V. R. Philip (*Journal*, March 12, p. 665) still finds the former methods useful and points out some of the disadvantages of prolonged chemotherapy. Dr. J. F. Brailsford (p. 665) appositely draws attention to the outstanding importance of building up and maintaining resistance to the disease by good nutrition and hygienic ways of living. These various views are of interest, but they deal with isolated points and do not reach the heart of the problem. This is that treatment need no longer be empirical, but can be reasoned out and its effects studied, not in a vague way for the disease in general, but specifically for each of its two types and four forms, by taking into account their distinctive natural histories. The first step, therefore (which cannot be dodged), is to make a correct classification of every case according to the type and form of the disease. The second step is to take into account the epidemiological factors influencing infection on the one hand, and acquired resistance on the other. Management of tuberculosis then becomes to a great extent standardized.

It is impossible to judge between the conflicting views expressed by your correspondents as applied to any case without considering whether the case is primary in type and benign or malignant in form, or whether it is secondary in type and fibro-carcinoma or fibrous in form; and also whether the treatment is aimed at controlling the original initial lesion without or with its associated foci. Benign primary disease does not need either chemotherapy or collapse therapy. Malignant primary disease requires prompt and prolonged chemotherapy, and, when by this means the associated foci are healed, the original lesion, whether then visible or invisible, can be controlled better and more cheaply by pneumoperitoneum than by prolongation of chemotherapy. Although cases of malignant primary disease are now infrequent in Britain, they are still quite common in many countries. I recently saw some hundreds of them in South Africa. In this form there is very little fibrosis in the progressive stage to hinder the action of chemotherapy. It is quite a different matter with secondary tuberculosis, where fibrosis is present

almost from the beginning and where it permeates at least the initial lesion to the end. It is the associated foci which are most amenable to chemotherapy, especially when they are fresh. Chemotherapy should be used, intermittently if necessary, to deal with any fresh foci resulting from fluctuating activity, but prolonged chemotherapy is unnecessary and undesirable. Fibrous lesions may be active for a long time and yet inaccessible to chemotherapy. Such cases are best controlled by collapse therapy until acquired resistance can be built up and maintained so strongly that the fibrosis becomes converted into non-active sclerosis.

Some cases, therefore, require "pneumatic treatment" as well as chemotherapy, and all cases should have their acquired resistance maintained at a high enough level to prevent relapse. In an analysis of 2,008 chest clinic cases, in which all forms of existing treatment, singly or in various combinations, had been tried, I have shown in my recent book¹ that the best results were obtained by "rest treatment" alone in benign primary disease, by rest and chemotherapy followed by collapse therapy (children excepted) in malignant primary disease, and rest, intermittent chemotherapy, and collapse therapy (especially pneumoperitoneum) in both forms of secondary disease.—I am, etc.,

London, N.W.8.

REFERENCE

¹ Sekulich, M., *Tuberculosis*, 1955, edited by H. Stanley Banks. Heinemann, London.

MILOSH SEKULICH.

Oesophageal Atresia

SIR,—Mr. E. R. Lecutier's description (*Journal*, March 12, p. 647) of haematemesis occurring in a case of oesophageal atresia, where the fistula from the lower oesophageal segment into the trachea was of a considerable size, prompts me to mention a case of oesophageal atresia I had under my care 2½ years ago.

In June, 1952, a baby boy was admitted to the department of thoracic surgery at the Leeds General Infirmary when he was 11 days old. He was born in a small maternity home. His doctor noticed that he was unable to swallow his saliva and choked when an attempt was made to feed him. A paediatrician was consulted, who suspected the child had oesophageal atresia, but he was surprised to find that he was able to pass a catheter down the child's mouth into the stomach without much difficulty and aspirate gastric contents. A few ml. of water were introduced into the stomach and the catheter withdrawn. Atresia was therefore considered impossible. Further attempts at feeding all failed; the catheter was passed again without difficulty and more fluid introduced into the stomach. The child continued to deteriorate, so he was transferred to the Leeds General Infirmary, where an x-ray revealed a blind upper oesophageal segment. Bronchopneumonia was present in both lungs due to inhalation of attempted feeds. At operation, when the child was 11 days old, a wide lower oesophageal segment was found entering the posterior wall of the lower end of the trachea. It was detached and anastomosed to the upper segment. The child survived and has continued to thrive. He can eat anything, but he has bronchiectatic changes in his right upper lobe following the lung infection.

I know of no other case of oesophageal atresia where it has been possible to pass a catheter into the stomach via the trachea and aspirate gastric contents. It is surprising that this child did not have acid digestion of its bronchial mucosa in the presence of such a large oesophago-tracheal fistula.—I am, etc.,

Leeds.

GEOFFREY H. WOOLER.

Sudden Death in Labour

SIR,—I was interested to read the letters commenting on my report (*Journal*, January 8, p. 87) of "Sudden Death in Labour Following Penicillin Injection." In view of the suggested diagnosis of amniotic fluid embolism, or amniotic fluid infusion, I would add that one relevant finding was that the uterus was intact and the membranes ruptured only at the cervix. I realize that this does not exclude amniotic fluid infusion, but in the cases reported, where the membranes had ruptured at the normal site, there was overaction of the uterus, forcing the fluid into the cervical vessels. Reid *et al.*¹ state that the usual sequence of events in amniotic

fluid infusion is premature rupture of the membranes, vigorous labour, cyanosis, and anoxic convulsions. In the case I reported the uterus was not hypertonic, the contractions were, in fact, weak, and the uterus relaxed normally between contractions. She was not at any time given "pitocin."

I agree that the time element is against the diagnosis of penicillin anaphylaxis, but the absence of an overactive uterus is surely against that of amniotic fluid infusion. Histology of the lungs would, of course, have been conclusive in the latter case, and I regret that I am unable to give further details of the necropsy. The post-mortem report was loaned to me by the coroner and contained no histological data.—I am, etc.,

Palwal, Punjab, India.

P. E. CAMPBELL.

REFERENCE

¹ *Amer. J. Obstet. Gynec.*, 1953, 66, 465.

Natural Childbirth

SIR,—I was very interested to read Dr. Constance Beynon's (*Journal*, February 19, p. 475) and Grantly Dick Read's (*Journal*, March 5, p. 604) letters, and feel that as I have very recently gone through a series of classes during pregnancy to prepare me for "natural childbirth" I can give a true and tried viewpoint of this subject, which at least one of the above-mentioned cannot.

Under the eager supervision and with the enthusiastic encouragement of my husband (a G.P.), I most diligently went to weekly relaxation classes, where I and a band of other pregnant women were given exercises and instructive talks on the processes taking place within us by a most competent instructress. I carried these out to the best of my ability daily in my home. I read a great deal of the available literature, and so enthused did I become in this subject that I preached to the unconverted and rounded up many more mothers-to-be for the classes. I felt I had got it down to a fine art, and I awaited childbirth in a completely happy, relaxed, and elated frame of mind. I admitted myself to hospital in this state and contentedly awaited events.

Let me state categorically that a great deal of what I was taught to do was physically impossible in labour, and much of what was possible one hadn't the inclination to do at that time. It is one thing to do these "exercises" on the floor of the local welfare centre, and quite another to try to do them in labour. Furthermore, I found that so becalmed and relaxed and optimistic of the easiness of childbirth had I become that I was totally unprepared for the really serious and hard business involved. I am afraid, therefore, that after being Dr. Grantly Dick Read's most ardent and loudest fan I can now say that Dr. Beynon summarizes my thoughts. I have changed to her way of thinking merely by attempting to put into practice the theories of Dr. Grantly Dick Read. The point is: is it worth having one's morale high in pregnancy, only to be battered in labour, and very low post-natally? I would add that I have checked my reactions with quite a few other recent mothers, all former advocates of Dr. Grantly Dick Read's teachings, and in each case my own experience was confirmed.—I am, etc.,

Harold Wood, Essex.

CONSTANCE LYNN.

Salicylates in Anticoagulant Therapy

SIR,—In considering the treatment of a patient with coronary thrombosis in general practice, I have often wondered if there is not some safer form of anticoagulant therapy which could be instituted in the home without the constant vigil of the clinical pathologist.

In this respect I would like to make a suggestion the efficiency of which perhaps may not approach that possible in hospital, yet, weighed against the risk of transfer to hospital, may be at least a step in the right direction. It is well known that salicylates lower the level of plasma prothrombin and so reduce coagulation time. So far as

I can see there are very few contraindications to the administration of salicylates to patients who must be nursed at home. Perhaps one disadvantage would be the fact that the drug administered as sodium salicylate would increase the plasma volume by virtue of the sodium ion. This difficulty may not be completely overcome by administering the drug in the form of the acetyl derivative, since much of this would be converted into sodium salicylate before absorption. Anyhow, this disadvantage would be important only in the case of the larger infarcts associated with cardiac failure, and in all other cases it is reasonable to suppose that the anticoagulant effect would far outweigh the effect of the increased circulatory volume.

I would be extremely interested to hear comments on this therapy.—I am, etc.,

Wembley.

M. H. SINGER.

Primary Aldosteronism

SIR,—I wish to congratulate Dr. J. W. Conn (*Journal*, December 11, 1954, p. 1415) on his fine clinical achievement in reporting to the Central Society for Clinical Research in Chicago (October 29, 1954) the paper in which he characterized a new syndrome in endocrinology: primary aldosteronism. Since I have been referred to in Dr. Conn's letter I would like to make some additional remarks.

First of all, an increased production of aldosterone (at that time called electrocortin) in the patient suffering from a so-called "potassium-losing nephritis" was first reported by Dr. C. L. Cope and myself (patient Mrs. A) in the *Journal* (June 5, 1954, p. 1290). At the time that paper was sent for publication I—and I want to emphasize that this is my personal opinion, as I do not want to commit Dr. Cope in what I am going to say—was not aware of the possible significance of the fact. At the beginning of 1954 I moved to New Zealand and I proceeded with my experiments on the excretion of aldosterone after surgical trauma. It is a very well known fact that all relatively major operations are followed by a loss of potassium. As a result of my experiments I have been able to report in a preliminary communication to the Otago Medical School Research Society (October 21, 1954)¹ that the loss of potassium and retention of sodium which follows an operation are associated with an increased excretion of electrolyte-regulating corticoid, statistically highly significant when compared with the pre-operative level, and that, what is still more interesting, the increased level of this corticoid returns to its pre-operative level when the urinary electrolyte values in the operated patient recede to the pattern before operation (unpublished data).

These findings seem to prove that a hyperproduction of aldosterone is a constant feature after operation, when electrolyte alterations are present. Thus at the time I obtained these results I fully realized the significance of the increased excretion of aldosterone in the patient Mrs. A. In the middle of August, 1954, I wrote a personal letter to Dr. M. D. Milne communicating to him the result of my experiments in the surgical field, telling him my conviction that the main trouble in Mrs. A's case was hyperproduction of aldosterone, and suggesting to him to re-study the patient according to this line. What Dr. Milne thought of this suggestion I cannot ascertain, but as far as I know the study was not carried out, as in the otherwise most interesting paper by Miss B. M. Evans and Dr. M. D. Milne (*Journal*, November 6, 1954, p. 1067) "no further comment was made upon this finding," to quote Dr. Conn's own words.

Another case reported as of unknown cause, which I undoubtedly believe must be considered as primary aldosteronism, has been mentioned by Dr. M. Taubenhaus, of Chicago.² To my knowledge the first detailed clinical description of a case of this peculiar condition is due to Kjerulf-Jensen, Krarup, and Warming-Larsen.³ Although they stated that the excretion of corticoids was rather low in their patient, aldosterone was not known at that time (1951), and, further, this steroid has such a surprisingly strong activity in very minute amounts that, even when

excreted in sufficient quantities to produce biological disturbances, its presence does not influence the total amount of urinary corticoids.

I am not writing in order to claim any priority at all in the description of the syndrome of primary aldosteronism, but, first, to afford some data—hidden from the limelight—which later on, when the importance and frequency of this fascinating syndrome are fully appreciated, may help to record the successive steps which have led to the establishment of primary aldosteronism as a clinical entity; and, secondly, to make it clear that at least someone amongst the clinical and research workers involved in the case reported by Miss Evans and Dr. Milne became fully aware of the significance of the increased excretion of aldosterone in that case as early as the middle of 1954. Ethical considerations deprived me of making any comment before Dr. Milne published his case. He has produced an impressive collection of biochemical data in the paper with Miss Evans, but I feel that they have missed the point, indeed the main point. I am very glad that the syndrome has now been fully segregated by Dr. Conn, who has done an excellent piece of work.—I am, etc.,

Dunedin, New Zealand.

J. G. LLaurado.

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- ¹ *Proc. Univ. Otago med. Sch.*, 1954, 32, 20.
- ² *Metabolism*, 1954, 3, 274.
- ³ *Lancet*, 1951, 1, 372.

Mental Symptoms Caused by Carbronal

SIR.—It might be of interest to note that carbromal, in addition to producing purpuric eruptions as described by Dr. Peter Borrie (*Journal*, March 12, p. 645), may also cause acute and chronic mental symptoms of a non-specific kind.

A number of such cases have been described by G. Magnussen.¹ Reviewing cases of acute poisoning of demonstrable origin, admitted to Copenhagen hospital over a period of one year, he found that carbromal was the third commonest agent responsible.

In a patient seen recently carbromal medication was no doubt a contributing factor to the picture of depressive illness with which the patient presented. She had been taking "persomnia" tablets (which contain carbromal) most days for six to seven months, usually not more than six to eight tablets daily, at one time "a couple of bottles full" within a few days. This produced an acute toxic episode lasting for about two to three days characterized by feeling extremely sleepy, relaxed, muddled, "as if drunk"; her speech was slurred. During the last few months she had become increasingly quarrelsome, irritable, undecided, listless, and feeling depressed—features which Magnussen described in cases of chronic poisoning.

On admission the bromide level of the blood was elevated to 125 mg.%. This finding, as well as the raised bromide level in the C.S.F., is a constant feature of chronic carbromal poisoning and may be also of diagnostic help in cases where skin eruption is the presenting feature. Four weeks after admission her serum bromide had returned to normal and her mental state greatly improved.

It is felt that because carbromal drugs are freely available in this country (as Dr. Borrie has pointed out) its potential dangers should be more widely known.—I am, etc.,

London, S.E.26.

G. STROH.

REFERENCE

- ¹ Magnussen, G., *Ugeskr. Læg.*, 1947, 109, 359.

Diet and Coronary Artery Disease

SIR.—I should like to comment on your report (*Journal*, March 12, p. 662) on the meeting at the Royal Society of Medicine. Professor H. W. Fullerton emphasized the importance of increased fat intake in the production of hypercholesterolaemia and its possible influence on atherogenesis, a concept to which I referred in the past in some detail.^{1,2} During the last few years further research into the cholesterol problem has shown that cholesterol is transported by different fractions of the plasma proteins and is kept in solutions by phospholipids. The percentage of total cholesterol

carried by *alpha*-lipoproteins was found to be higher in women under the menopausal age than in men, but it was approximately the same in women and men above 45. In survivors from coronary infarction, however, the *alpha*-lipoprotein fraction diminished markedly and the *beta*-lipoproteins increased correspondingly. Oestrogen administration in patients who survived myocardial infarction increased the *alpha*-lipoprotein fraction and decreased the *beta*-lipoproteins³ and at the same time diminished the total blood cholesterol level.⁴ Withdrawal of oestrogens was quickly followed by re-establishment of the previous conditions.

These blood lipid changes might give some explanation for the well-known male preponderance in coronary disease. There is in fact much to indicate that Paul D. White's "coronary individual" is characterized by physical and mental masculinity, and that the condition of "oestrogenicity" is associated with relative immunity to coronary disease.⁵ The corresponding lipoprotein pattern for the latter would be an increase of the *alpha*-lipoproteins, and this was found indeed in castrates.⁶ Further, in extensive necropsy studies (1) an apparent diminution of coronary atherosclerosis was evident in males treated with oestrogens on account of prostate cancer; (2) a significant increase in coronary atherosclerosis was demonstrated in oophorectomized (hypo-oestrogenic) women; and (3) less atherosclerosis was found in hyper-oestrogenic women suffering from breast cancer than in normal controls.⁷

All these seem to indicate that sex hormones may influence atherogenesis by a mechanism which includes the distribution of lipoproteins in the blood, in addition to other aetiological factors like increased fat intake and hypercholesterolaemia. Whether the disturbance of fat metabolism is a fundamental defect in atheroma formation or only secondary to other causes, further histochemical research as outlined by Professor T. Crawford at the meeting may clarify.—I am, etc.,

London, W.1.

Z. A. LEITNER.

REFERENCES

- ¹ Leitner, Z. A., *Lancet*, 1954, 1, 1078.
- ² ———, *Med. Wld.*, 1954, 81, 249.
- ³ Barr, D. P., et al., *Trans. Amer. Ass. Phys.*, 1952, 65, 102.
- ⁴ Oliver, M. F., and Boyd, G. S., *Brit. Heart J.*, 1953, 15, 387.
- ⁵ Gertler, M. M., and White, P. D., *Coronary Heart Disease in Young Adults*, 1954, p. 36-79. Harvard University Press, Cambridge, Mass.
- ⁶ Furman, R. H., et al., *Amer. J. Med.*, 1954, 16, 594.
- ⁷ Rivin, A. U., and Dimitroff, S. P., *Circulation*, 1954, 9, 533.

The Aftermath of Hysterectomy

SIR.—I recently took part in a television programme as a doctor—I am retired—in which the operation of hysterectomy was discussed. The discussion arose after a letter from a viewer in which she said that a surgeon had advised her to have the operation and she had gone into hospital afraid and worried because she really did not understand what was going to be done. She also stated that many of the women in her ward were in the same position.

Arising out of the discussion were further letters. Here is an extract from one: "Three years ago I had my uterus and ovaries removed, and was told on leaving hospital that it would make no difference to my married life. This was very wrong and I have been very worried for almost three years. Recently I had occasion to go to hospital again and on mentioning the matter I was immediately given a course of hormone treatment. This has certainly made all the difference, and I cannot believe the change it has made to my married life. . . . I wonder why in one of the biggest London hospitals this was not mentioned to me after the operation?" Another letter says that the writer had a subtotal hysterectomy and one ovary removed for a large fibroid at the age of 39 years. The letter goes on to say: "Tragically for me, my husband changed completely from a loving and devoted husband to a morose, bad-tempered and, in fact, cruel man almost immediately upon my return from hospital. He moved into a separate room and has stayed there ever since, yet before the operation we were inseparable and devoted to each other."

These letters give one a great deal of food for thought, at least if one is a woman. In the first place, are we doing our duty as doctors if we allow people to be operated on not knowing in the least what the operation involves? If any doctor or surgeon

tells me that patients are too unintelligent to understand, I do not agree. Unless the person is a mental defective, one can explain any operation in simple language with benefit, for a worried patient is not going to recover as well as an unworried one. Then whose duty is it to prescribe hormone therapy for a woman who has had her ovaries removed? If the surgeon does not do so, how is it that the patient's G.P. does not do so? Does it benefit a woman to get rid of her troublesome symptoms if by doing so her whole nature as a woman changes and her marriage cracks up?

Finally, is the husband sufficiently considered in this matter? Does he have the matter explained to him, and is he told that in certain operations, as for instance subtotal hysterectomy, his relations with his wife will not be affected? There is another aspect to this husband question. I know at least one other case when the husband turned completely against the wife after hysterectomy, saying that the idea of having intercourse with a woman who had been mutilated by removal of the womb revolted him. A last point: I have been told by a number of women who have had removal of the uterus in early middle age that they suffer the most acute depression after the operation at the times when normally they would have menstruated. None of them had been told of this beforehand. Is there anything to be said for this policy?—I am, etc.,

Dunmow, Essex.

WINIFRED COPPARD.

Treatment of Coughs

SIR.—I have read with interest your leading article (*Journal*, March 12, p. 651) on the treatment of "winter cough." While I must agree wholeheartedly with the necessity for antitussive measures, especially in the chronic bronchitic with cor pulmonale, I feel that the measures outlined are merely an acquiescence in a chronically unfavourable state of affairs. We must do better than that. Many of these cases are, through economic necessity, dragging themselves to work despite the warnings of tired hearts and bodies, and of physicians who find themselves forced to tender advice even though they know it will be unacceptable. Are these cases to be treated with opiates which, while smothering the racking cough, smother the patient also? What is gained by suppressing cough is lost by increasing dyspnoea, retained sputum, constipation, and asthenia.

I admit that I myself prescribe small quantities of tr. camph. co. or syr. codein. on occasion, but with the pharmacological advances which offer us antitussives—for example, "taoryl," "benylin," "becantyl"—which are not fraught with these disadvantages, is it not time that we rid ourselves of the habit of prescribing linct. scill. opiat., m. ammon. chlor. c. morph., etc., except in the most hopeless cases? I must confess that I have not yet had time to evaluate becantyl, but I have for over two years used taoryl with great success in these cases, and many between 55 and 65, and over, owe their continuance of useful work to this drug. I have seen no untoward results whatever, even with maximum dosage. Benylin I have also used, but with less spectacular results.

I must apologize for stressing a proprietary by name, but there is, as far as I know, no analogous preparation. I admit to being biased against "reputed therapeutically equal or analogous results"—to me the proof of the pudding is in the eating, not in the "Cohen category number."—I am, etc.,

London, E.2.

MORGAN D. KAVANAGH.

Lead-poisoning in Children

SIR.—We would like, if we may, to add an amendment to our article on "Lead-poisoning in Children" (*Journal*, February 5, p. 324). We felt that the danger of lead-poisoning should be stressed at an early date, although at the time of writing it seemed unlikely that we would be able to find the source of the metal in Case 2. However, this has now been traced to a repainted cot.

We do not think that it is only children with pica who get lead-poisoning, as it is not unusual for an infant, whether

from boredom or due to teething, to suck the cot side. This is the most probable source of the metal in cases of poisoning in young children, so that the repainted cot may be regarded as a dangerous article.—We are, etc.,

H. B. MARSDEN.
VERA K. WILSON.

Pendlebury, near Manchester.

Speaking Up

SIR.—It has long been my opinion that something ought to be done to improve the deportment of medical people who appear on public and lecture platforms. We often hear about the illegibility of doctors' prescriptions, but nothing is said about their behaviour as public speakers. When a good paper is marred, as it often is, by poor delivery, a great deal of the value of the contribution is lost to the audience.

A clear, confident, and well-pitched voice (which does not necessarily mean a loud one) will carry conviction to the audience. Fidgeting movements of the hands (and often legs) are usually the outcome of nervousness and lack of elocutionary experience. It is not to be expected that the medical curriculum, already overloaded in its programme, will cater for possible orators among its trainees. Students and young graduates, however, would find ample recompense for their pains if they were to attend a course of elocution "off the record." The gain to them when the time came for entry into the domain of lectureship or teaching would be inestimable. A feeling of competence to "get across" and create a favourable impression would react immeasurably on themselves and their listeners and facilitate the message they wish to convey.—I am, etc.,

London, W.1.

J. HAMILTON MCILROY.

SIR.—Recently at the Royal Society of Medicine there was a joint meeting of general practitioners and dermatologists. There were about eight speakers on either side. The dermatologists, with perhaps one exception, spoke with hushed voices, as if they were holding a very private consultation which the patient—who was not present—must on no account overhear. The general practitioners, on the other hand, again with perhaps one exception, spoke up and clearly, with refreshing audibility. Let me add that the dermatologists are by no means the only specialists who at their own meetings are inclined to speak in a whispering conversational style as though they were talking to one person only, with no regard for the periphery of their audience. Is it a reflection, carried into the lecture theatre, of the subdued manner of the consultant at his clinic as compared with the free and hearty bedside manner of the family doctor? The explanation is anybody's guess; the fact remains.—I am, etc.,

London W.C.2.

H. COOPER.

Boxing Injuries

SIR.—I am most grateful to you for having published my short note on boxing injuries under "Points from Letters" (*Journal*, January 29, p. 292). In the meantime I came across a publication in the German journal *Die Medizinische* about observations of kidney damage through boxing in 103 American professional boxers during 1952 and 1953.

Urine tests were done and were normal before the fight. Urine tests were done 5 minutes after the fight, and the findings were as follows: albumin in 68%; traces of acetone in 14%; rise of specific gravity in 80%; pH reduction in 39%; glucose in 9%; red cells in 73%; casts (granulated and hyaline) in 26%.

Nothing was known about delayed kidney damage, whilst acute kidney damage was present very often. It was suggested that all ex-boxers should be subjected to medical examination and every boxer should only be admitted to another fight if the urine tests are within normal limits.—I am, etc.,

London, N.3

H. SIMON.

REFERENCE

- ¹ *Die Medizinische*, 1955, No. 5, xxiv.

Advertising by Post

SIR,—Dr. A. K. Jones's letter (*Journal*, March 5, p. 599) about advertisements has drawn timely attention to a problem which is becoming of increasing importance to doctors and manufacturers alike. It is said that our mail from the drug firms weighs about 3 lb. (1.36 kg.) a month, and when one realizes that this goes to every doctor in the country the cost in postage alone seems fantastic (as a source of revenue to the Post Office it must be a rival to the football pools). The manufacturers must realize that a busy doctor has neither the time nor the energy to wade through a pile of advertising literature every morning, so why do they waste their shareholders' money sending them? Surely here is an ideal opportunity for the B.M.A. to do something before the daily flood of pamphlets becomes even more out of hand than it is now. (I believe it is even worse in America.) Perhaps discussions could be held with the Pharmaceutical Society and the drug houses persuaded to make their advertisements more uniform, rational, and rationed. Dr. Jones's suggestion of a card system is excellent (to his list of headings on the card might I add references to relevant articles in the *Journal*, etc.?).

I would like to mention that other form of advertising that afflicts us, the drug-firm travellers. I have nothing against them personally, for they are all models of politeness. But they are quite unnecessary. And, frankly, when one is very busy they are nothing but a nuisance. I feel the firms should ask us by post if we are prepared to receive their representatives. If we do not wish to see them it is rather discourteous to send them. Few of us are rude enough to bang the door in their faces once they have arrived.

Recently I have been wearied by the conflicting claims of rival firms as to the superiority of their own particular brand of oral penicillin. In the long run we must decide for ourselves what is best for our patients, partly from what we read in textbooks and journals, and partly from our own experience. Advertising must be left out of it as much as possible except to give us the basic information about preparations. It would be a good thing if all drug firms had a strict code of ethics and agreed to plague us as little as possible.—I am, etc.,

Penrhyneddudraeth, Merioneth.

CLAUD C. M. WATSON.

SIR,—I would like to support the idea proposed by Dr. A. K. Jones (*Journal*, March 5, p. 599) about postal advertising by means of standard cards. For the past eight months I have been returning the bombardment of the pharmaceutical manufacturers with a pamphlet recommending the same sort of thing—lately suggesting that the most suitable size of card would be that of the N.H.S. patients' record card (E.C. 8) for which most general practitioners already have potential filing space in their surgeries. The response has been much the same as that described by Dr. Jones. Certain organizations do produce index cards, but it would be much more useful if the job could be done through the co-operation of all the manufacturing firms.—I am, etc.,

Walsall.

J. P. LESTER.

SIR,—I, as a manufacturer of medical products, can readily sympathize with the views of Dr. A. K. Jones (*Journal*, March 5, p. 599) on the question of advertising material sent to the profession, if indeed the majority of doctors discard unopened as high a proportion of such literature as he suggests—namely, 90%. Although many manufacturers will doubtless give serious consideration to his suggestion of standardizing the size and style of informative literature, I am not convinced that this is necessarily the solution to the problem, or whether the method would in fact enable the doctor to select any more easily the information on a particular proprietary product he wishes to study.

In their efforts to avoid being included in the unfortunate proportion of discarded literature, many manufacturers are constantly adopting more original techniques of getting their

information over to the doctor in the hope that such will be among the favoured proportion singled out for detailed study. In attempting such an objective, however, manufacturers may sometimes run the risk of incurring disfavour or even annoyance among doctors, and even when occasions arise no one is more full of regret than the manufacturer concerned, as no ethical firm has the wish to disturb the good relationship that has, in general, existed over the years between the industry and the practitioner. It would enable manufacturers to co-operate more closely with the profession in providing the literature required if other doctors would express their views on the question of standardization of size and style as suggested by Dr. Jones.—I am, etc.,

London, E.1.

JAMES H. CLAYTON,
Chairman and Managing Director,
Harker Stagg Ltd.

Nasal Catarrh and Electric Razors

SIR,—I feel it is worth putting on record an unusual case of allergic rhinitis. The patient was a man of about 50 who suddenly developed the most distressing nasal catarrh, for no obvious reason. He went for a cruise to Madeira, and noticed that while he was symptom-free on the boat he was just as bad whilst there and on returning. At this point he noticed a large amount of dust in the nasal secretion after using an electric razor, and realized that he had been unable to use it on board ship. Also, looking back, it was at the time of starting to use this method of shaving that the symptoms were first noticed. Since reverting to soap and a razor he has been quite well.—I am, etc.,

Hitchin, Herts.

A. S. PORTER.

Cases of Pentosuria, Cystinuria, and Alkaptonuria

SIR,—My colleagues and I are investigating the population genetics of three rather rare metabolic disorders: pentosuria, cystinuria, and alkaptonuria. We would be very grateful if general practitioners and consultants could put us in touch with any patients known to have any of these disorders.—I am, etc.,

Department of Biochemistry,
London Hospital Medical College,
Turner Street, London, E.1.

H. HARRIS.

Muscular Dystrophy Group

SIR,—The Central Council for the Care of Cripples has decided to form a group or association of patients suffering from muscular dystrophy, and has already found that there is considerable interest in such a development, particularly among the patients and their parents. Numerically the problem is not a large one, but the people concerned are often isolated, and it is the Central Council's intention to establish a friendly link; to provide interest and amusement for the children; and to distribute leaflets of general information to parents, members, and others.

It is beyond dispute that research is of paramount importance, and your readers will agree, we feel, that there can be no firmer basis on which to develop the work which is contemplated than through the advice and support of the many distinguished neurologists and other specialists who have accepted appointment to the Medical Advisory Committee which the council has set up.

The chief difficulty from the Central Council's point of view as a voluntary society is to find the people it wishes to help. Nevertheless, ascertainment of the extent of the problem is an essential if real progress is to be made. I am therefore writing to ask anyone in sympathy with this movement to put their patients or others known to them in touch with the Central Council for the Care of Cripples. I must emphasize that the group will remain within the aegis of the council, which intends to use its existing county associations rather than to superimpose a new organization.—I am, etc.,

34, Eccleston Square,
London, S.W.1.HARRY PLATT,
President, Muscular Dystrophy Group,
Central Council for the Care of Cripples.

Obituary

C. J. A. WOODSIDE, M.B., F.R.C.S.I.

Mr. C. J. A. Woodside, senior surgeon to the Royal Victoria Hospital, Belfast, and to the Craigavon Hospital, Belfast, died suddenly on February 14 at his home at Belfast. He was 60 years of age. Born at Ballymena, Co. Antrim, Cecil John Alexander Woodside was educated at Ballymena Academy, Campbell College, and Queen's University, Belfast, where he graduated M.B., B.Ch., with first-class honours in medicine, and with the award of an exhibition in 1917. He then received a commission in the R.A.M.C. and served abroad, being demobilized in 1919 with the rank of captain. On returning to civilian life, he became house-surgeon at his teaching hospital, and, later, surgical registrar, a post which he held for a number of years. In 1925 he obtained the Fellowship of the Royal College of Surgeons in Ireland. Though he took an active part in clinical surgery, he always maintained an interest in the academic side. After two years as demonstrator in anatomy at Queen's University, he was appointed as assistant to the lecturer in operative surgery. He was elected to the staff of the Royal Victoria Hospital in 1933 and was senior surgeon for the past few years. Woodside was a skilful and dextrous surgeon, experienced in all branches of the art, but he had a special interest in urology from the early days of his career, and was a member of the British Association of Urological Surgeons. His administrative ability was put freely at the disposal of his teaching hospital, and after the passing of the Health Services Act in 1948 he assisted the Northern Ireland Hospitals Authority by serving on several of its committees and by acting as chairman of its hospital staffs committee. He was a Fellow of the Ulster Medical Society, and an active member of the British Medical Association for over 30 years. He acted as honorary secretary of the Ulster Branch of the B.M.A. from 1927 to 1934, and was president of the Northern Ireland Branch in 1943-4. A member of the Council of the Association from 1943 to 1947, he also served for a number of years on the old Irish Committee (later, the Northern Ireland Committee) and on the Central War Emergency Committee.

Of a shy and retiring disposition, Woodside's main interest was in his profession, but he sought his recreation in literature and art. He was held in great admiration by colleagues and patients, and the Royal Victoria Hospital and all associated with it are the poorer for his passing.

AGNES C. SCOTT, C.B.E., M.B.

Dr. Agnes Scott, formerly chief medical officer of the Women's Medical Service in India, died at the Hostel of St. Luke, London, on March 22. She was 79 years of age.

Agnes Catharine Scott was born on October 26, 1875, the second daughter of Canon John Scott, and was educated at Leeds Girls' High School and at the Yorkshire College, now the University of Leeds. She then entered the London (Royal Free Hospital) School of Medicine for Women, in order to equip herself for work as a medical missionary, and obtained her M.B. in 1901. After graduation she was obstetric assistant at the New Hospital for Women (now known as the Elizabeth

Garrett Anderson Hospital) and then went to India in 1903 to work at St. Stephen's Hospital for Women in Delhi under the Cambridge Mission. A few years later she was posted to the hospital at Karnal under the same mission, but returned to Delhi to superintend the building of the new St. Stephen's Hospital, of which she was subsequently in charge. The call for an experienced medical woman in the Punjab made her decide to enter the Women's Medical Service, and she went to Lahore as assistant to the inspector-general of civil hospitals in 1917. She remained in that post until 1923, and in the following year succeeded Dr. Margaret Balfour as chief medical officer of the Women's Medical Service. She left India in 1932, but continued to work until 1939 as medical adviser to the Countess of Dufferin's Fund at the India Office in London.

Agnes Scott was peculiarly fitted by her early experience for the important work she did later. She had been in charge of a small hospital in a country town (Karnal), had superintended the building of a large (for those days) hospital in the capital of India, and had been superintendent of this hospital. Her own experience in running two different types of hospitals enabled her to grasp the needs of such hospitals in personnel, equipment, and methods of working. All this knowledge was put to very good use in both the posts she held after leaving the service of the mission. She was also much interested in the training of midwives, and forwarded this good cause in India with wisdom and sympathy.

When she became chief medical officer of the Women's Medical Service, Agnes Scott became also a member of the council and executive committee of the Lady Hardinge Medical College, then still a young institution, and it fell to her to staff the college from the cadre of the Women's Medical Service. This was no easy task, since there were few specialists available in those days. Partly in order to meet this difficulty and partly because she wished to increase the number of Indians in the service, she instituted a training reserve. Young doctors who had been educated in India were admitted to this reserve, and after proving themselves suitable by working as assistants in the larger hospitals for women they were sent to the United Kingdom with scholarships for further training. This enabled promising young women to gain additional experience and higher qualifications, thus fitting them for responsible posts on their return to India. The scheme was a noteworthy contribution to the training of Indian medical women for work in India.

Agnes Scott was of a quiet and reserved nature, but her reserve hid a very warm heart. Though the officers of the Women's Medical Service may have found her a little awe-inspiring during inspections, they recognized the wisdom behind her advice, her strong sense of justice, and her appreciation of all work faithfully performed, sometimes in loneliness and difficulty. To the end she retained her interest in medical missions and was chairman of the medical mission committee of the Society for the Propagation of the Gospel from 1937 to 1947. She was awarded the Kaisar-i-Hind gold medal in 1926 and was appointed C.B.E. in 1931.—R. Y.

Dr. G. H. H. MANFIELD died at Nottingham General Hospital on March 17 at the age of 77. George Herbert Hind Manfield was born at Ixworth Thorpe, Suffolk, on July 24, 1877, and was educated at Framlingham College and at Guy's Hospital, qualifying M.R.C.S., L.R.C.P. in 1901. After holding a number of house appointments he

went into general practice at Shenstone, Staffordshire, where he soon acquired a reputation not only as an excellent doctor but also as a horticulturist, a tennis player, and a keen captain of the local cricket club. His slight lameness had prevented him from being accepted for Guy's Hospital Volunteers, but when the first world war broke out in 1914 he joined the R.A.M.C. and served in France, being awarded the Military Cross for gallantry in 1916, and in Salonika. In 1919 he returned to Guy's for a year, and then worked for the Ministry of Pensions at Derby and Nottingham, finally taking over a practice at Nottingham, where he remained for 32 years. For more than half that time he was honorary surgeon to the Nottingham and Notts Hospital for Diseases of the Throat, Ear, and Nose until its amalgamation with the General Hospital under the National Health Service. Despite the increasing strain of a growing practice and service on numerous medical boards during the second world war, he continued to display the same energy in his work as always. Service to others was the keynote of his life.

The obituary of Professor PETER PATERSON was printed in the *Journal* of March 19 (p. 735). Mr. DAVID RANKINE writes: Many of his old students will have learned with sorrow of the death of Peter Paterson—a born surgeon if ever there was one, and an enthusiastic teacher. He took a very keen and personal interest in any student who himself was keen, and he was always delighted to have his ex-students visit him. True he might greet one with such a quotation as "The dog that was sick has returned to his vomit and the pig that was washed to its wallowing in the mire," but this was but an aspect of his kindly humour. He was impatient with humbugs, and would say that he would prefer a student to give a wrong diagnosis with good reasons than a right one with no reasons at all. For years the third floor in the Glasgow Royal Infirmary was a by-word under the regime of Peter Paterson, and the late Milne McIntyre—both of whom will be ever remembered by us of their time.

Medico-Legal

DAMAGES FOR HOT-WATER BOTTLE BURNS

Damages of £770 with costs were awarded to George Brown, aged 46, a North Staffordshire butcher's assistant, who alleged at Stafford Assizes on March 21 that he was burned on the leg by a hot-water bottle when being rushed to hospital in an ambulance after an accident at his work in January, 1953. Brown claimed damages from Staffordshire County Council alleging negligence.

He told the court that while working in a Newcastle butcher's shop his knife slipped and pierced his right groin. He fainted, but remembered being in the ambulance with a burning pain in his legs. He was unable to speak. In hospital he could still feel the pain in the calves of his legs. When he regained consciousness after an operation his right leg was bandaged near the calf, and two or three days later another burn was found on his left leg. He had had treatment for the burns for six months after the accident and went back to work on June 20, 1953.

In answer to Mr. Norman Carr, for the defendants, Brown agreed it was vital to rush him to hospital in order to save his life. Also for the defendants, ambulance driver G. E. Roberts said that he had been told that the bottles had been filled by the previous shift at 1.30 p.m. The call to go to the plaintiff was received about 2.50 p.m. When the bottles were applied they had covers and Brown was wearing trousers and socks. Another ambulance driver who attended the accident said that during the journey to hospital Brown told him he was cold, but said nothing about being hot.

Giving judgment for Brown, Mr. Justice Hilbery said there was no doubt that one of the hot-water bottles applied

was so hot as actually to burn the plaintiff's right leg badly and his left leg less so. While he was satisfied the bottle was covered, the Judge added that if a hot-water bottle seriously burned a patient unable to look after himself it was impossible to say sufficient care had been taken. A scar left by one of the burns, he said, might reopen at any time.

The Judge refused an application for a stay of execution pending consideration of an appeal.

Medical Notes in Parliament

EFFECTS OF RADIOACTIVITY ON MAN

The concern that has been increasingly expressed, in Parliament and outside, about the possible effects on mankind of radioactivity released in thermonuclear experiments was concentrated into a motion and an amendment which were debated in the House of Commons on March 22.

The motion, signed by Dr. EDITH SUMMERSKILL (Fulham, West, Lab.) and six other women Labour M.P.s, urged on the Government the need for further consideration of the long-term effects of nuclear explosions, expressed fears about the dangers facing humanity from continuing radioactive contamination of the atmosphere, and pressed for a conference of American, Russian, British, and French scientists—as suggested by Mr. Attlee in the recent defence debates.

The amendment was the Government rejoinder to this, and was moved by the Minister of Health, Mr. IAIN MACLEOD. It placed the first importance on efforts to achieve comprehensive disarmament, and welcomed the Government's decision to continue and expand research on the medical and biological aspects of nuclear energy, and to collaborate by every practical means with countries with whom arrangements already existed or who could usefully be brought into consultation. His assessment of things, based on expert advice, seemed to be summed up in the observation that at present levels of irradiation it seemed improbable that there was anything more than an interesting basic scientific problem and a situation that must be watched very carefully.

Radiation Effects Cumulative

Dr. SUMMERSKILL said that man had invented a lethal weapon the properties of which offered a threat to the procreative powers of women. If that was proved conclusively, and the evidence so far filled them with the gravest misgivings, the instinctive aversion to fighting which prompted every normal woman might find world-wide expression.

She had no intention of making sensational statements about the genetic effects of experiments with the hydrogen bomb. Her desire was to convince the House and the Government that there was a *prima facie* case for an examination of the whole problem by scientists of the highest repute. The Prime Minister had recently quoted the United States Atomic Energy Commission report that the amount of radiation so far released by nuclear explosions was no greater than that to which a patient having an x-ray of the chest was exposed. But they overlooked the fact that the effect of radiation in the atmosphere was cumulative. It was wrong to talk about permissible levels of radioactivity, because uranium and radium were found all over the earth, and any addition to the existing store of radiation might be responsible for an increase in the incidence of some disease. Some scientists were of opinion that here might lie the key to the development of cancerous growth, which so far had baffled research workers.

There had been 65 nuclear explosions so far—50 American, 12 Russian, and 3 British. Scientists were expressing the opinion that these explosions could not continue without the danger of serious damage to health. The

professor of biophysics in the Medical School of Osaka University had reported, after examining the people exposed to the Bikini test explosion of March, 1954, that the most seriously injured fishermen had their blood-forming function seriously impaired and their reproductive organs seriously affected. In some of them the number of sperms was 100 to 700 per cubic millimetre compared with the normal 50,000 to 100,000, and in addition there were abnormal types of sperm. There was evidence that a pregnant woman who was exposed to only a moderate dose of radiation ran the risk of aborting or giving birth to a stillborn child.

The danger that lurked in the fall-out of radioactive particles after nuclear explosions was serious; they could be blown for thousands of miles, and they might remain active for years. It was said that radiostrontium could fall out at great distances and later could be eaten—through being in vegetables—by humans and by grazing animals, which in turn provided human food. Bone had a special attraction for radiostrontium, and the human foetus was highly sensitive to radiation. It was therefore argued that the foetus might be destroyed through milk obtained from cattle which had grazed in infected grass. Mr. Strauss, chairman of the U.S. Atomic Energy Commission, had sought to be reassuring, but he could not prophesy what would happen in a hydrogen bomb war, when abortion and stillbirths might become almost universal. Lord Adrian, one of Britain's most famous scientists, had said that such a war might "lead to a degree of radioactivity which no one can tolerate or escape, and thus end the human race."

A Permissible Level?

Mr. MACLEOD, who described the subject as a strange and difficult one to debate, had armed himself with the best advice he could get, and, while acknowledging that what he said must be the responsibility of the Government, claimed that it would not be in conflict with the views of the Medical Research Council and its committees, which had been considering the matter for eight or ten years. Comment and controversy had been caused by the pronouncement of the United States Atomic Energy Commission that the total amount of radiation received by people in the U.S. from all nuclear detonations so far—Russian and British included—was about 0.1 r, or about one-hundredth of the average natural exposure during a person's reproductive lifetime. British calculations, derived from monitoring measurements taken by the Atomic Energy Authority, showed that the figure here would be about one-third of the American figure. Even this figure of 0.03 r was artificially high, because it assumed that a man stood outside in the open for 24 hours a day for about 50 years (to the extent that he was indoors or under cover the figure would be greatly reduced), and that none of the activity weathered away from the surface of the ground, which of course would happen. The effective average dose received by someone in this country from all the bombs so far exploded was therefore a great deal less than 0.03 r.

The real question was—What level is permissible? What is the threshold of radioactivity beyond which man's genetic constitution might stand at risk? The accepted international dose for workers on radioisotopes and radiologists was 0.3 r a week, or about 15 r a year. That was enormously greater than the figures they had been discussing; but it was also fair to point out that in a whole community the number of genes at risk was enormously increased, and therefore the number of matings that might conceivably be harmful was also considerably increased. The more he went into the subject the more he found that the scientists disagreed. Estimates of the dose of radiation over a generation that was likely to double the spontaneous mutation rate varied from 3 r to 300. He was told that a figure of 50 r over 25 years was as good a guess as could be made. The increase in the United States had been only a tiny fraction of this, and in Britain it had been much smaller still. Perhaps that would bring a little comfort and a sense of balance.

A great deal of research went on in the M.R.C. unit at Harwell, and there were other institutions at Hammersmith Hospital and in Leeds. The work was being supported in many university departments. The M.R.C. expenditure for work in its own establishments on all aspects of the effects of radiation was £208,000 in the provisional estimates for 1955-6. He was authorized to say that if the Council, after examining its research programme in the light of this new commitment, reported that an increase in its expenditure was essential this would have favourable consideration from the Chancellor of the Exchequer.

He summarized his argument in four conclusions: (1) radiation produces genetic effects, and the radioactivity of the planet has slightly increased as a result of nuclear bomb explosions; (2) present knowledge is insufficient to fix at all precisely the level of radioactivity above which genetic damage would significantly affect the well-being of populations; (3) research in genetic changes is inevitably slow; (4) it most unlikely that the increase in radioactivity which has occurred so far will have any appreciable genetic effect.

Finally he expressed the Government's doubts about the two current suggestions being canvassed—the proposal for a scientific conference; and the extension of the agenda for the international conference at Geneva in August to explore the benign and peaceful uses of atomic energy. He asked the House to support the Government in seeking the extension of the methods of collaboration which already existed. In medical knowledge and information these were reasonably full and satisfying, and it was hoped to see them extend into other spheres. There had never been a power which at the same time held such possibilities of doom or bright hope. The Government accepted the responsibility to tell the country all the facts that could properly be disclosed, and in the defence debates they had done that.

Among the nine other speakers, of whom six were women, Mr. WALTER ELLIOT (Glasgow, Kelvingrove, Con.), claiming his qualification as a certified midwife, suggested that a White Paper embodying and perhaps extending the facts given by Mr. Macleod—the *ipsissima verba* of the scientists instead of the Minister's quotations from them—would be useful. There was no need to bother too much about the effect of atomic war on the genes of the human race a thousand years hence. The damage would be much more immediate to the bone marrow and its blood-forming cells than the later effect on the reproductive cells. Miss ELAINE BURTON (Coventry, South, Lab.), concluding the debate for the women, took the Minister to task for the inhuman statement that this was an interesting scientific problem. The objections to a conference she regarded as the negation of doing anything. A conference might help eventually to bring about disarmament. The Minister of Works, Mr. NIGEL BIRCH, in the final speech, added the information that there was no danger of radioactivity from the use of atomic power for civil purposes. Such radioactive materials as were emitted were very weak and their effect was not cumulative.

The motion was rejected by 290 votes to 250, and the amendment agreed to.

Research in Britain

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) on March 22 asked the Parliamentary Secretary to the Ministry of Works, as representing the Lord President of the Council, what official research was being conducted in Britain on the effects of radioactivity on reproductive cells; and to what extent this research was being conducted on mammals. Mr. J. R. BEVINS told him that a large programme of research on the effects upon the germ cell of exposure to radiation was being undertaken at the Medical Research Council's Radiobiological Research Unit at Harwell, and related studies were in progress at several other establishments of the Council. Most of the work was carried out with mice.

Dr. STROSS asked what research had been conducted into the danger threshold beyond which the radioactive contamination of the atmosphere might damage mankind's genetic

constitution. Mr. BEVINS said that the M.R.C. programme of research on radiobiology aimed at extending knowledge on all the hazards which radiation might hold for human beings. There was, however, no way at present in which direct evidence of genetic damage to human beings from radiation could be obtained.

Mr. W. WELLS (Walsall, Lab.) asked the Minister of Defence on March 23 whether he would arrange for experiments to test the uses of smoke in counteracting the effects of nuclear and thermonuclear explosions. Mr. H. MACMILLAN stated that experiments had already been started under the authority of the Minister of Supply, the results of which would be of interest both to Civil Defence and to the Services.

Rising Standard of Living

Mr. HEATHCOAT AMORY, Minister of Food and Agriculture, put up to answer a detailed arraignment of the Government on March 23 for their management of the national housekeeping, claimed that the standard of living was higher than it had ever been.

Mr. F. T. WILLEY (Sunderland, North, Lab.) produced a catalogue of price increases to support his case that the Tory policy had resulted in the food trades becoming a profiteers' paradise.

Mr. AMORY admitted an increase in the cost of living, but between 1949 and 1951 prices rose on average slightly over 6% a year, and wages rose on average by 5½%. Between 1952-4 the average increase in prices was a little over 3% a year, and the average increase in wages by 5% a year.

Food accounted for about 30% of total private expenditure. In terms of calories, the consumption per head was at the rate of 3,120 a day, the highest figure ever recorded. The diet of the nation was more palatable and more nutritious. More of the calories were being obtained from meat, and less from bread and other starchy foods. In 1954 the country ate 50% more meat, 30% more bacon, and 15% more sugar, and drank 20% more tea than in 1951. It was significant that even in cases where some foodstuffs had increased sharply in price, as for tea and home-killed meat, consumption had increased. In 1954 the nation spent £49m. more on sweets and ice-cream than it spent on milk and £130m. more than on bread. Consumption of sweets was 7 oz. a head before the war, and 8.5 oz. in 1954. The B.M.A. figures recorded the diets of pensioners as being adequate both in energy value and in all the important nutrients.

Diminishing Demand on Swiss Sanatoria

The impending termination of the schemes for sending tuberculosis patients for treatment in Swiss sanatoria was announced on March 22.

Mr. IAIN MACLEOD, in a statement on the scheme covering England and Wales, said that they began to send patients to Davos in the autumn of 1951, when waiting-lists for tuberculosis beds stood at over 7,000. The provisional figure for the end of 1954 was 2,500, and this of course included a large number of patients who were on the point of being admitted at once. Several hospital regions now had virtually no waiting-list. Some were closing tuberculosis beds or turning them over to other purposes. Well over 900 patients from England and Wales had been sent to Switzerland by the Health Service, and this had been a most valuable contribution to the work against respiratory tuberculosis. But taking into account the diminished pressure to-day on tuberculosis beds at home, and the recent difficulty in finding enough suitable patients who were willing to go to Switzerland for their treatment, he was satisfied that there was no necessity to extend the scheme beyond this autumn, when contracts with the sanatoria expired. Suitable arrangements would be made for winding it up so as not to discharge patients from the sanatoria in Davos before they were fit.

To this announcement he added his thanks, and those of the patients who had been sent, to the Sanatorium Angletterre

and the Park Sanatorium for the welcome they had given and the efforts they had made on the patients' behalf.

Commander T. D. GALBRAITH, Under Secretary of State for Scotland, in a corresponding statement, said that when this scheme began in June, 1951, the Scottish waiting-list for hospital treatment for respiratory tuberculosis, which had reached a peak of over 3,000 in June, 1949, had stood at over 2,000 for five years. Over 900 patients had gone to Switzerland under the scheme, which had thus provided a valuable supplement to Scottish hospital resources at a time when they had been under extreme pressure. It was clear that they could not usefully send any more patients to the Sanatorium Wolfgang, where they had had the use of 70 beds. Most, if not all, of the patients now in that sanatorium would remain there until the time when they would come back to Scotland in the ordinary course. For the present they were continuing to send patients to the Sanatorium du Mont Blanc, where they had the use of 120 beds, which would be sufficient to accommodate all the patients coming forward under the scheme.

Commander GALBRAITH stated in reply to Mrs. JEAN MANN (Coatbridge and Airdrie, Lab.) that the number of staffed beds available for the treatment of respiratory tuberculosis in Scotland had increased from 5,335 at the end of 1950 to 6,098 at the end of 1954. The number of patients awaiting admission had dropped from 2,303 in December, 1950, to 486 in January, 1955.

Thoracic Surgeons

Mr. H. BOARDMAN (Leigh, Lab.) asked the Minister of Health on March 21 how the four surgeons exclusively employed on thoracic surgery in the Manchester Region compared with the number so employed in each other region, and giving the estimated population figures in each case. Mr. MACLEOD gave the following figures:

Region	No. of Surgeons	Estimated Population Mid 1953
Newcastle	6	2,911,200
Leeds	6	3,044,900
Sheffield	7	4,172,700
East Anglia	4	1,462,900
N.W. Metropolitan ..	9	3,874,600
N.E. "	5	3,039,800
S.E. "	6	3,197,400
S.W. "	9	4,620,900
Oxford	2	1,458,000
South-western	7	2,768,200
Welsh	5	2,594,000
Birmingham	8	4,470,000
Manchester	4	4,372,800
Liverpool	6	2,102,600

The figures include surgeons employed at teaching hospitals except in London, as these do not serve any one region. They do not distinguish between whole-time and part-time appointments. In addition, there are in some regions surgeons engaged in thoracic surgery and in other branches of surgery.

Care of the Aged

The House of Lords, at the instance of Lord BEVERIDGE, discussed on March 23 the social and human problems of old age, as noted in the Phillips report. He said that the decay of physical and mental faculties meant that increasing care by others was as necessary in the last years of life as in the first. The change in the age structure meant that whereas in 1901 there were 10 people of working age to every one of pensionable age, the ratio was now three to one, and in 1979 would be less than two and a half to one.

The right policy was to keep elderly people as far as possible in their own homes; but to make the home the right place there must be adequate machinery for discovering the failing strength of old people, which might make a transfer to hospital necessary, before it led to tragedy. There should be some known person in every neighbourhood to whom the need for care could be reported. He criticized

as ludicrously inadequate the 30,000 home helps; and suggested that the industrial life offices might use their money and organization to make it easy for everyone while of working age to pay an insurance entitling them to a place in a home when they came to need it. He also criticized the Government's refusal to spend £1m. for a chiropody service for old people while spending £14m. on cheaper tobacco for them.

Lord WISE, among others, opposed the proposal of the Phillips Committee for raising the age at which pensions should be payable. Lord BURDEN said there were hundreds of elderly people in mental hospitals who were there simply because there was nowhere else for them to go and no relatives to look after them. Lord AMULREE emphasized the necessity of finding out in time when an old person was in need of care and attention. The borough in which he worked had a population of 140,000. In the past six months roughly 200 pensioners aged 60 to 65 had applied for admission to hospital. They were the type who in the old days would have gone into the Poor Law hospital rather than the voluntary hospital. Ninety of the 200 were living by themselves. Fifty of the 90 were living comfortably and well. Forty were living in conditions of dirt, squalor, and neglect that one would not have believed possible in 1955. Many of them were starving, but, having had suitable treatment and rehabilitation, they could again take up some kind of normal life. If the same proportion was applied to the rest of the country there must be an enormous reservoir of human misery.

The Earl of SELKIRK, replying for the Government, said the aim should be to enable the aged to remain at work as long as possible, to keep in their own houses, and to ensure that they never felt that they had no further contribution to make. He agreed that the volume of assistance and domiciliary services was not adequate, but they were expanding, and there were many opportunities for voluntary organizations to take a full part. He had been disturbed by what Lord Amulree and other peers had said, and sought to make it clear that anyone who knew of someone needing assistance, financial or otherwise, should inform the National Assistance Board or the local authority.

Thoracic Surgery.—There are four surgeons in the Manchester region exclusively employed on thoracic surgery, representing 0.91 per million estimated population. The figure is lower than that of neighbouring regions (see table on p. 858) and the national average, and the regional board is arranging to improve it.

Leprosy.—In England and Wales there are 164 notified leprosy patients and two special hospitals for them, one near Redhill (Surrey) and the other near Chelmsford (Essex).

Scottish Doctors' Lists.—The average number of patients on doctors' lists in January, 1955, was 1,976, compared with 2,016 in April, 1953, and 2,152 in January, 1952.

Dental Courses.—The number of courses of dental treatment in Scotland, other than emergency extractions and the supply of dentures, increased from 603,000 in 1951 to 715,000 in 1954.

Ancillary Dental Workers.—No extension of the use of ancillary dental workers in any part of the dental services is possible pending further legislation.

Universities and Colleges

UNIVERSITY OF LONDON

The degree of Ph.D. in the Faculty of Medicine was awarded to A. H. Kitchin, M.B., Ch.B. (St. Thomas's Hospital Medical School), on February 1, and to H. H. Khalil (Guy's Hospital Medical School) on February 15.

UNIVERSITY OF MANCHESTER

The Council of the University has approved the following changes in status of members of the staff, to take effect from October 1, 1955: Dr. J. N. Mills, Senior Lecturer in Human Physiology; Dr. J. E. Kench, Senior Lecturer in Biochemistry in the Department of Occupational Health; Dr. N. W. Preston, Lecturer in Bacteriology; Mr. D. C. Racker and Mr. C. E. B. Rickards, part-

time Lecturers in Obstetrics and Gynaecology; Dr. Alexander Nicol and Dr. Tom Wade-Evans, Assistant Lecturers in Pathology; Dr. Kenneth Bloor, Assistant Lecturer in Surgery; Dr. D. J. Rose, special Lecturer (part-time) in Mental Deficiency (instead of Mental Diseases); Dr. R. M. Young, Assistant Lecturer (part-time) in Clinical Psychiatry (instead of Mental Diseases).

Vital Statistics

Week Ending March 19

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 839, whooping-cough 1,924, diphtheria 10, measles 29,018, acute pneumonia 980, acute poliomyelitis 13, dysentery 1,816, paratyphoid fever 7, and typhoid fever 2.

Infectious Diseases

The largest variations in the number of infectious diseases in England and Wales during the week ending March 12 were increases of 142 for dysentery, from 1,265 to 1,407, 132 for scarlet fever, from 648 to 780, 43 for whooping-cough, from 1,838 to 1,881, and a decrease of 1,132 for measles, from 26,453 to 25,321.

The fall in the incidence of measles was largely confined to the northern and southern sections of the country, while in the midlands substantial increases were recorded. The largest rises in the number of notifications of measles were 346 in Warwickshire, from 1,774 to 2,120, 239 in Middlesex, from 808 to 1,047, 212 in Staffordshire, from 666 to 878, 167 in Essex, from 1,738 to 1,905, 149 in Lincolnshire, from 328 to 477, and 100 in Hertfordshire, from 195 to 295, and the largest falls were 801 in Lancashire, from 2,924 to 2,123, 786 in London, from 3,412 to 2,626, 444 in Kent, from 1,432 to 988, 343 in Derbyshire, from 1,222 to 879, 149 in Yorkshire West Riding, from 3,886 to 3,737, 118 in Northumberland, from 827 to 709, and 117 in Durham, from 925 to 808. No large fluctuations were recorded in the trends of scarlet fever. The largest fluctuation in the trends of whooping-cough was a fall of 44 in Lancashire, from 211 to 167, 9 cases of diphtheria were notified, being 8 fewer than in the preceding week. The only areas with multiple cases were Plymouth C.B. and Hull C.B. with 2 cases each.

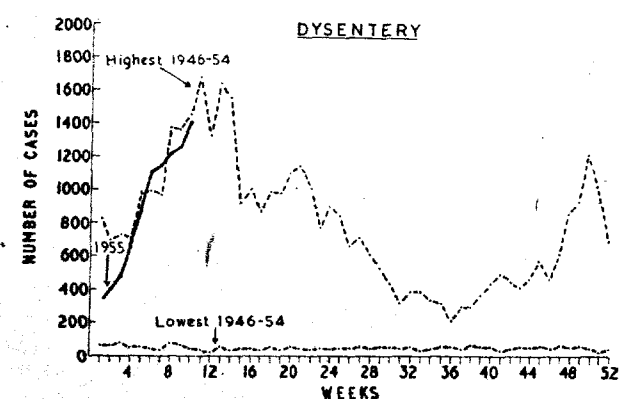
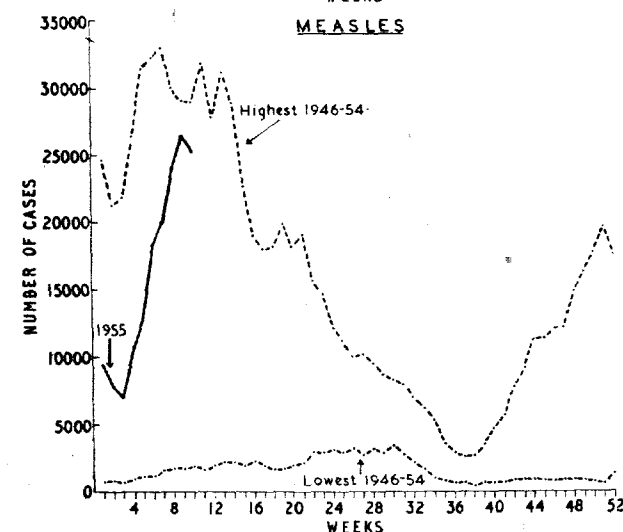
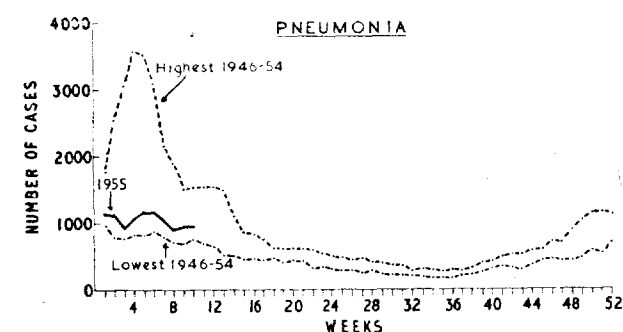
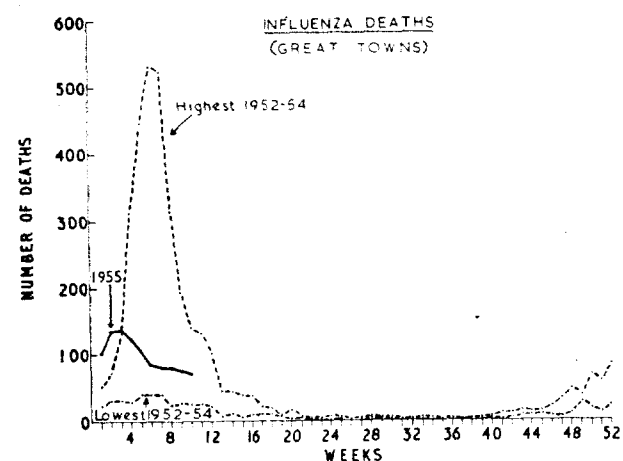
11 cases of acute poliomyelitis were notified, and these were 2 fewer for paralytic and 1 fewer for non-paralytic cases than in the preceding week. Yorkshire West Riding with 3 notifications was the only area with more than 1 case.

The largest rises in the incidence of dysentery were Durham 52, London 49, Leicestershire 40, and Norfolk 30. The chief centres of infection during the week were Lancashire 494 (Blackpool C.B. 108, Oldham C.B. 99, Blackburn C.B. 79, Manchester C.B. 53, Liverpool C.B. 36, Lytham St. Anne's M.B. 18, Royton U.D. 15, Chadderton U.D. 13), Durham 114 (Felling U.D. 28, Easington R.D. 22, Sedgefield R.D. 18), London 113 (Hackney 58, Southwark 11), Northumberland 95 (Morpeth M.B. 23, Newcastle-upon-Tyne C.B. 21, Whitley Bay M.B. 15, Ashington U.D. 13), Norfolk 80 (Norwich C.B. 47, St. Faith's and Aylsham R.D. 13), Leicestershire 76 (Leicester C.B. 58, Wigston U.D. 10), Cheshire 55 (Stockport C.B. 38), Northamptonshire 46 (Northampton C.B. 25, Kettering M.B. 17), Glamorgan-shire 46 (Cardiff C.B. 24, Swansea C.B. 14), Yorkshire West Riding 45 (Leeds C.B. 23), Lincolnshire 35 (Scunthorpe M.B. 26), Nottinghamshire 23 (East Retford M.B. 10), Staffordshire 22 (Stoke-on-Trent C.B. 10), and Surrey 22.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the nine years 1946-54 (influenza, 1952-4) are shown thus -----, the

figures for 1955 thus —. Except for the curves showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending March 12 (No. 10) and corresponding week 1954.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1955					1954				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	9	0	7	2		22	2	12	1	2
Dysentery ..	1,407	113	304	15	1	1,001	118	236	6	5
Encephalitis, acute ..	3	0		0		3	0		0	
Enteric fever: Typhoid ..	0	0	0	0	1	2	0	0	0	
Paratyphoid ..	8	0	1	0		96	1	0	0	
Food-poisoning ..	181	16		0		344	18		0	
Infective enteritis or diarrhoea under 2 years ..				16	9				12	17
Measles* ..	25,321	2626	411	590	120	2,213	41	87	22	513
Meningococcal infection ..	51	3	11	2	1	47	8	21	1	
Ophthalmia neonatorum ..	25	1	7	0		35	4	3	0	
Pneumonia† ..	958	74	295	59	16	755	35	235	16	3
Poliomyelitis, acute: Paralytic ..	9	1	0	1	0	15	2		5	0
Non-paralytic ..	2	0				7	1			
Puerperal fever ..	252	45	8	0		239	43	15	0	
Scarlet fever ..	780	39	82	41	23	1,476	70	178	58	45
Tuberculosis: Respiratory ..	623	74	151	21		886	93	130	30	
Non-respiratory ..	110	8	18	3		118	6	26	4	
Whooping-cough ..	1,881	139	182	40	23	2,093	75	383	46	33

DEATHS in Great Towns	1955					1954				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	1	1
Dysentery ..	1	0		0		0	0		0	
Encephalitis, acute ..	0			0		0	0		0	
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	9	0	2	0	0	13	2	0	0	1
Influenza ..	72	6	2	2	8	25	2	2	0	1
Measles ..	0	0	0	0		0	0	1	1	
Meningococcal infection ..	3	0				0	2			
Pneumonia ..	488	94	27	15	15	293	38	28	13	6
Poliomyelitis, acute ..	0	0		0		0	0		0	
Scarlet fever ..	0	0	0	0	0	0	0	0	0	0
Tuberculosis: Respiratory ..	110	11	6	2	7	108	8	22	2	13
Non-respiratory ..		4	1	0	1		1	0	1	1
Whooping-cough ..	1	0	0	0	0	3	0	1	0	0
Deaths 0-1 year ..	233	29	27	8	12	253	28	39	4	15
Deaths (excluding stillbirths) ..	7,623	1084	716	150	320	6,457	864	716	123	228
LIVE BIRTHS ..	7,810	1193	975	187	472	8,484	1306	958	229	396
STILLBIRTHS ..	227	30	24			220	23	29		

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

Medical News

World Health Day.—The anniversary of the official adoption of the World Health Organization's constitution on April 7, 1948, is being celebrated this year under the slogan "Clean Water Means Better Health." The purpose of World Health Day, 1955, writes Dr. M. G. CANDAU, director-general of W.H.O., in his message, "is to help stimulate understanding of the basic relationship between water resources, health, and civilization itself." Describing the outlook in many Asian countries, Dr. Candau quotes expert opinion as believing that "the sickness rate could be halved by protecting water supplies and providing proper facilities for the disposal of wastes." Turning to the "privileged citizens who can unquestioningly trust the water which flows from their household taps," Dr. Candau bids them remember the army of scientists, laboratory workers, engineers, health administrators, and others whose constant labours make this possible, and to realize their responsibility in avoiding pollution of their natural water reserves.

Mental Health.—Last week there were two meetings in London concerned with mental health. On March 22 the Lord Mayor of London presided at a meeting at the Mansion House to raise money for the Mental Health Research Fund, and on March 24 and 25 the National Association for Mental Health held its annual conference. The Research Fund was founded in 1949 by a small body of professional and lay men and women who believed that mental health and mental illness were not receiving the share of attention in research that their immense importance demanded. At the Mansion House meeting, Sir GEOFFREY VICKERS, V.C., chairman of the Fund's research committee, justified the Fund's separate existence by saying that he thought it wrong, in any field, for research to be dependent on a State source, however well administered; and, secondly, he held that interest in particular fields of research gained by being canalized. The other speakers were the hon. Dr. WALTER MACLAY, Dr. DENIS HILL, and Dr. ELIOT SLATER. It was announced at the meeting that the Fund's first Fellowship had been awarded to Dr. J. D. MONTAGU, of Runwell Hospital, Essex. The annual conference of the National Association for Mental Health, held at County Hall, Westminster, was opened by the Minister of Health, Mr. IAIN MACLEOD. The conference discussed the preventive aspects of mental health work. After the opening ceremony Professor F. A. E. CREW, F.R.S., professor of public health at Edinburgh, gave an address on "Opportunities for Preventive Work in the Health and Education Services." The subjects of the other sessions were "Practical Problems in the Local Authority Services," "New Schemes in Practice," and "Promoting Mental Health in a Local Community."

Industrial Health and Safety Centre.—When the Factory Department of the Home Office was transferred to the Ministry of Labour and National Service during the last war, the industrial museum at 97, Horseferry Road, London, S.W.1, was included in the transfer. The lay-out of this museum has now been redesigned greatly for the better, and many new exhibits added. To mark the revolution that has taken place there the name of the museum has been changed to the Industrial Health and Safety Centre, and on March 22 the new centre was formally declared open by Sir WALTER MONCKTON, the Minister of Labour and National Service. Everything that can be done to safeguard and improve the health of industrial workers is demonstrated at the centre—from first-aid to feeding, from safety in foundries to safety at sea—and different aspects of industrial health will be chosen for special display from time to time. Doctors with an interest in occupational health can be shown round the centre by the inspectors of factories on duty there, or, if a special appointment is made, by one of the medical staff of the Ministry.

Faculty of Anaesthetists Dinner.—Over two hundred were present at the Seventh Anniversary dinner of the Faculty of Anaesthetists of the Royal College of Surgeons held at the College on March 23. The Dean of the Faculty, Dr. BERNARD JOHNSON, presided. Sir CHARLES DODDS, F.R.S., proposed the toast of the Faculty, and the DEAN, in reply, outlined some of the aims of the Faculty and what it had already achieved. It was concerned, he said, mainly with three things—education, clinical standards, and scientific research. With regard to the latter, he paid tribute to the generous financial support given by leading pharmaceutical firms, who had, between them, so far contributed £65,000 to research in anaesthesia. Sir RUSSELL BRAIN, P.R.C.P., acknowledging the toast of the guests, proposed by the Vice-Dean of the Faculty, Dr. R. F. WOOLMER, referred to the fact that anaesthesia was now coming to the help of the physician, notably in cases of bulbar poliomyelitis and tetanus. The more specialized specialists become, said Sir Russell, the more dependent they are on each other.

Royal College of Obstetricians and Gynaecologists.—Mr. VINCENT MASSEY, Governor-General of Canada, and Dr. GEORGE W. CORNER, of Baltimore, have accepted the Honorary Fellowship of the College, and will attend for formal admission on July 22. The William Meredith Fletcher Shaw Memorial Lecture for 1955 will be delivered by Professor B. P. WATSON, of Columbia University, New York.

Edinburgh University.—Among those who will receive the honorary Doctorate in Law of Edinburgh University at the graduation ceremony on July 8 are Dr. J. G. GREENFIELD, consultant pathologist to the National Hospital for Nervous Diseases, Professor J. B. S. HALDANE, F.R.S., Professor of Biometry at University College, London, and Sir SYDNEY SMITH, Rector of Edinburgh University.

British Society for Research on Ageing.—The following honorary officers and members of the executive committee have been elected: *Chairman*, Sir CHARLES DODDS, F.R.S.; *Vice-Chairman*, Sir FRANCIS FRASER; *Secretary*, Dr. G. H. BOURNE; *Treasurer*, Professor P. L. KROHN; *Members of Committee*, Professor J. F. DANIELLI, Dr. H. B. FELL, F.R.S., Professor K. J. FRANKLIN, F.R.S., Professor P. B. MEDAWAR, F.R.S., and Professor R. E. TURNBIDGE. Inquiries concerning the Society should be addressed to the hon. secretary, Dr. G. H. BOURNE, London Hospital Medical College, London, E.1.

Pamphlets for Parents.—The National Association for Mental Health is issuing a series of pamphlets for parents having difficulties with their children. The latest is called "Children Who Dislike Their Food," and is written by a lay psycho-analyst, formerly on the staff of the association. Other titles in the series are "Children's Fears," "Children's Jealousies," "Temper Tantrums," "Breast Feeding," and "Habit Training," and more are to come. The pamphlets, which cost 1s. 3d. (by post 1s. 4½d.) each, are said to be specially suitable for distribution through child welfare clinics.

Professor Robert Cruickshank, director of the Wright-Fleming Institute of Microbiology, St. Mary's Hospital Medical School, London, has arranged a three-week lecture tour of medical schools in Canada. After that he will go to New York for a week. He will leave London on June 16 and plans to be back on August 2.

Change of Title of a Medical Journal.—At the beginning of this year the *Philippine Journal of Surgery* altered its title to the *Philippine Journal of Surgery, Obstetrics and Gynecology* to indicate its wider coverage. The volume numbering will be continuous with that of earlier issues.

COMING EVENTS

Association of Clinical Pathologists.—The 54th general meeting will be held at Douglas, Isle of Man, on April 13, 14, and 15. Scientific papers will be read. Details

from the honorary secretary, Dr. W. H. McMENEY, Maida Vale Hospital for Nervous Diseases, London, W.9.

South-West Metropolitan Chest Diseases Group.—Inaugural meeting at 2.30 p.m. on April 23 at St. James' Hospital, Balham (see *Journal*, March 12, p. 677). Sir CLEMENT PRICE THOMAS will speak on "Carcinoma of the Lung."

Concert in Aid of R.M.B.F.—Mr. STEPHEN WEARING will give a pianoforte recital at Oatlands Park Hotel, Weybridge, at 8.30 p.m. on May 6 in aid of the Royal Medical Benevolent Fund. Tickets (£1 ls. and 10s. 6d.) from Dr. ROLLO BALLANTYNE, 20, Hersham Road, Walton-on-Thames, Surrey.

Congress of French-speaking Endocrinologists.—The third congress will be held in Brussels from June 18 to 20. Details from Professor J. LEDERER, 233, Avenue de Tervueren, Brussels.

International Society of Surgery.—The sixteenth congress will be held in Copenhagen, July 24-31, under the presidency of Professor EVARTS A. GRAHAM (U.S.A.). Two subjects to be discussed will be "The Risks of Surgical Operations" and "Hepatectomy." The congress is open only to members of the society. Surgeons wishing to join should apply to Mr. H. W. S. WRIGHT, F.R.C.S., 9, Weymouth Street, London, W.1, from whom full details may be obtained.

Health Education.—Summer school on "Opportunities and Methods in Health Education," at Reichel Hall, University of North Wales, Bangor, August 16 to 26. Details from Central Council for Health Education, Tavistock House North, Tavistock Square, London, W.C.1.

International Society for the Study of Biological Rhythm.—Fifth conference at the Karolinska Institute, Stockholm, September 15-17. Main items: "Rhythmical Phenomena in the Nervous System," "Cybernetics," and "Rhythm and Industrial Medicine."

European Haematological Society.—Fifth Congress in Freiburg-im-Breisgau, Germany, September 20-25. Details from Dr. A. PINEY, 152, Harley Street, London, W.1.

Medical Association of South Africa.—The 40th Medical Congress will be held at Pretoria on October 17-22. Details from the Joint Organizing Secretaries, Room 28, Administrative Building, General Hospital, Pretoria.

SOCIETIES AND LECTURES

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

Monday, April 4

AUXILIARY ROYAL ARMY MEDICAL CORPS FUNDS.—At 11, Chandos Street, W., 5 p.m., annual general meeting.

INSTITUTE OF PSYCHIATRY.—5.30 p.m., lecture-demonstration by Dr. E. Stengel.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. H. Osmond-Clarke: Fractures of the Upper End of the Femur; 6.30 p.m., Professor Ian Aird: Management of the Pancreas in Upper Abdominal Surgery.

Tuesday, April 5

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Lister Oration by Mr. V. E. Negus: Comparative Anatomy and Physiology of the Respiratory Tracts in Relation to Clinical Problems.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND.—6.15 p.m., Dr. C. E. Dukes: Tumours of the Colon and Rectum.

WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., neurological demonstration by Dr. C. C. Edwards.

Wednesday, April 6

INSTITUTE OF ORTHOPAEDICS.—8 p.m., senior clinical conference. MIDLAND MEDICAL SOCIETY.—At Dudley Road Hospital, Birmingham, 8.15 p.m., clinical meeting; 9.30 p.m., annual general meeting.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. H. J. B. Atkins: Carcinoma of the Breast; 6.30 p.m., Mr. D. H. Patey: Mixed Tumours of the Parotid Gland.

ST. MARYLEBONE HOSPITAL FOR PSYCHIATRY AND CHILD GUIDANCE.—5.30 p.m., Dr. F. D. Wide: Psychoanalysis and General Practice.

SOCIETY FOR VISITING SCIENTISTS, LTD.—7.30 p.m., discussion: Allergy—Current Conceptions. Speakers, Dr. B. N. Halpern, Professor J. R. Marrack, and Dr. J. Pepys.

Thursday, April 7

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, W., 8 p.m., Professor Alexander Kennedy: Human Reactions to Danger.

APPOINTMENTS

ANDERSON, NORMAN ERIC WILSON, M.B., Ch.B., D.P.H., D.T.M.&H., Group Medical Superintendent, Southern Lanarkshire Hospitals.

BALL, J. D., M.B., M.R.C.P., Physician in Charge of the Miners' Chest Diseases Treatment Centre at Llandough Hospital (United Cardiff Hospitals).

CARROLL, JAMES, M.B., B.Ch., D.P.H., D.C.H., District Medical Officer of Health and Assistant County Medical Officer of Health, Burton Latimer, Corby, Desborough and Rothwell Urban Districts and Kettering Rural District.

DREW, CHARLES EDWIN, M.V.O., M.B., B.S., F.R.C.S., Part-time Consultant Thoracic Surgeon, St. George's Hospital, London, S.W.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—R. H. Gaman, B.M., B.Ch., D.P.M., Consultant Psychiatrist/Medical Superintendent, Risbridge Hospital and Riversfield Home; P. A. H. Clements, M.R.C.S., L.R.C.P., Assistant Senior Medical Officer, Board's Headquarters Staff; A. M. Jatoi, M.B., B.S., Surgical Registrar, West Norfolk and King's Lynn General Hospital; L. Essex, M.R.C.S., L.R.C.P., Anaesthetic Registrar, West Norfolk and King's Lynn General Hospital; J. D. Culligan, L.R.C.P.&S.I., Anaesthetic Registrar, East Suffolk and Ipswich Hospital.

GORDON, RONALD M., M.B., Ch.B., D.P.H., Medical Officer, Department of Health for Scotland.

HARMAN, JOHN W., M.B., B.Ch., Director of Pathology, St. Kevin's Hospital, Dublin.

MANCHESTER REGIONAL HOSPITAL BOARD.—A. A. Cashmore, M.D., Consultant Child Psychiatrist, Booth Hall Hospital; F. J. Hebbert, M.D., F.R.F.P.S., Consultant in Geriatrics, Blackburn and District Hospitals; B. O'Hare, M.B., B.Ch., D.M.R.D., Assistant Radiologist, Bolton and District Hospitals; H. I. Heffernan, L.R.C.P.&S.I., D.A., Assistant Anaesthetist, Ashton, Hyde, and Glossop Hospitals; D. L. Fox, M.B., Ch.B., D.P.M., Assistant Psychiatrist, Lancaster Moor Hospital. All whole-time appointments.

NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD.—P. M. Tow, Ph.D., M.B., B.S., Consultant Psychiatrist, Hill End Hospital; T. H. S. Burns, B.M., B.Ch., F.F.A.R.C.S., Consultant Anaesthetist, Royal Northern Hospital and City of London Maternity Hospital; D. A. Davies, M.D., M.R.C.O.G., Consultant Gynaecologist, St. Mary's Cottage Hospital, Hampton, R. G. Law, M.D., M.R.C.O.G., Consultant Obstetrician and Gynaecologist, Whittington Hospital, including duties at New End Hospital; W. M. McIntyre, M.D., M.R.C.P.Ed., Consultant Psychiatrist, St. Marylebone Hospital; Dorothea B. J. Halstead, M.B., Ch.B., F.F.A.R.C.S., D.C.H., Consultant Anaesthetist, Hounslow Hospital; Betty E. Powe, M.D., D.C.H., Admissions Officer (S.H.M.O.), Central Middlesex Hospital; S. H. Lucas, M.R.C.S., L.R.C.P., D.P.M., Consultant Psychotherapist, Portman Clinic; J. G. Sommerville, M.B., Ch.B., Assistant Physician (S.H.M.O.), in Physical Medicine, Medical Rehabilitation Centre, Camden Road, N.W.

PARKEN, DOUGLAS STUART, M.B., B.S., D.P.H., D.C.H., Deputy Medical Officer of Health, Swindon Municipal Borough.

BIRTHS, MARRIAGES, AND DEATHS

DEATHS

Ajrekar.—On March 10, 1955, at 319, Aldborough Road, Seven Kings, Ilford, Essex, Mukund Shripad Ajrekar, M.B., B.S., of Poona, India.

Banham.—On March 17, 1955, at 16, King's Drive, Eastbourne, Sussex, Cecil Walter Ramsay Banham, M.R.C.S., L.R.C.P., formerly of Hurstmonceux, Sussex, aged 85.

Brand.—On March 18, 1955, at 25, Froggatt Court, Finchley Road, London, N.W., Hamish Douglas Ferguson Brand, M.B., Ch.B., Colonel, late R.A.M.C., retired.

Collingham.—On March 19, 1955, David-Horace Collingham, M.R.C.S., L.R.C.P., of 27, Maid Causeway, Cambridge, formerly of Lincoln.

de Boer.—On March 17, 1955, at Shirley, Adesfield Road, Hemel Hempstead, Herts, Alice de Boer, L.R.C.P.&S.I., L.R.F.P.S., aged 83.

Dunne.—On March 4, 1955, at Winchester, Hants, James Stuart Dunne, D.S.O., F.R.C.S.I., Lieutenant-Colonel, R.A.M.C., retired, of Whitechurch, Hants, aged 77.

Edwards.—On March 19, 1955, Edward Charles Edwards, M.D., of 33, The Green, Shaldon, Devon, late of Penzance, Cornwall, aged 83.

Fitch.—On March 19, 1955, in New Zealand, Keith Simpson Fitch, O.B.E., F.R.C.S.Ed., Lieutenant-Colonel, I.M.S., retired.

Goodchild.—On March 7, 1955, Nathaniel John Goodchild, M.R.C.S., L.R.C.P., of 2, Templars Crescent, Finchley, London, N., late of Sidney House, Highgate Road, London, N.W., aged 89.

Hodges.—On March 17, 1955, George Montague Williams Hodges, M.B., B.S., of Dallington, Sussex, formerly of Deddington, Oxon.

Killard-Leavey.—On March 10, 1955, at a nursing-home, Barnstaple, Devon, Timothy Joseph Killard-Leavey, M.R.C.S., L.R.C.P., aged 84.

Lakin.—On March 13, 1955, in the Private Patients' Home, Robert Lakin, M.D., of 12, Heaton Moor Road, Stockport, Cheshire.

Lucas.—On March 6, 1955, at Eskbank, Midlothian, Frederick Richard Lucas, L.R.C.P.&S.I., L.R.F.P.S., of Rerwick Lodge, Eskbank.

McLaren.—On March 14, 1955, at Edinburgh, Robert McLaren, L.R.C.P.&S.I., L.R.F.P.S., of 28, Oxbgangs Road, Edinburgh, aged 83.

McLean.—On March 15, 1955, at St. Mary's Hospital, Newport, Isle of Wight, Neil McLean, M.B., Ch.B., D.T.M., D.T.H.

Manfield.—On March 17, 1955, at the General Hospital, Nottingham, George Herbert Hind Manfield, M.C., M.R.C.S., L.R.C.P., of 64, Clarendon Street, Nottingham.

Marshall.—On March 10, 1955, at 5, Christchurch Road, Worthing, Sussex, Reginald Prynn Marshall, M.R.C.S., L.R.C.P.

Metcalfe.—On March 17, 1955, George Metcalfe, M.B., Ch.B., of 56, Higher Reedley Road, Brierfield, Lancs, aged 53.

Shearer.—On March 9, 1955, at Myrtle Cottage, Carbis Bay, Cornwall, Donald Francis Shearer, M.B., F.R.C.S., aged 90.

Stein.—On February 21, 1955, at 1, The Orchard, Blackheath, London, S.E., Charles Stein, O.B.E., M.D., late of Shipston-on-Stour, Worcs, aged 93.

Straus.—On February 22, 1955, at Paynes Farm, North Curry, near Taunton, Somerset, Willi Straus, M.D., aged 81.

Tabuteau-Herrick.—On February 27, 1955, at Warrington, Surrey, Augustus William Tabuteau-Herrick, F.R.C.S.I.

Turner.—On February 28, 1955, at his home, "Heddingham," First Avenue, Middleton-on-Sea, Sussex, Joseph George Turner, F.R.C.S., F.D.S. R.C.S., aged 85.

Vickers.—On March 4, 1955, Thomas Hedley Vickers, M.R.C.S., L.R.C.P., D.O.M.S., Surgeon Commander, R.N., retired, of Jetwells, Goudhurst, Kent, aged 77.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Dangers of Intravascular Penicillin

Q.—How common are serious reactions to penicillin if it is given accidentally into a vein? Does their incidence warrant any further precautions than attempting to aspirate blood into the syringe before injecting the penicillin? Are some preparations of penicillin more apt to lead to these serious reactions than others?

A.—Considering the enormous quantities of penicillin administered by intramuscular injection and the comparatively few reports of reactions occurring following accidental intravascular administration, no further precaution other than attempting to withdraw the plunger of the syringe need be taken.

The consequences of intravascular administration, however, depend very considerably on the type of preparation used. In the great majority of cases an aqueous suspension could be injected intravenously with little danger, whereas the oily suspensions and emulsions, and in particular those containing procaine, would produce serious and sometimes fatal reactions.

Influenza and Epistaxis

Q.—In the recent influenza epidemic I have noticed that in a number of cases a spontaneous epistaxis has occurred about the second or third day of the disease. Could you tell me if this has been seen generally and if any cause can be suggested?

A.—In about 20% of young adults with influenza there is epistaxis. The actual numbers vary from epidemic to epidemic, and in some large series of cases epistaxis has not been noted. Several observers have commented on its occurrence during the recent influenza B outbreak in children. Epistaxis is presumably due to the intense engorgement in the submucosa of the upper respiratory tract which accompanies the virus infection of the epithelium.

Lipoid Pneumonia from Nasal Drops and Sprays

Q.—Has the use of oily nasal drops and sprays been shown to be directly responsible for the development of lipoid pneumonia? In those patients who have developed the condition were there significant contributory factors depressing the cough reflex? What is the incidence of lipoid pneumonia?

A.—The evidence relating the use of oily nasal drops or sprays to the development of lipoid pneumonia is circumstantial rather than direct. Although disorders of the cough reflex and of deglutition predispose to aspiration from the upper into the lower respiratory tract, lipoid pneumonia has been reported in patients without any interference with these functions. Exogenous lipoid pneumonia must be clearly distinguished from endogenous lipoid pneumonia; in any chronic pneumonic condition, such as may occur behind a bronchial obstruction, fatty change may occur in the chronic inflammatory cells, giving rise to an endogenous lipoid pneumonia. The most frequent sources of the oil in exogenous lipoid pneumonia are oily nasal drops or sprays and mineral oil taken by mouth, in both instances over a prolonged period. It has been shown that iodized oil introduced into the nose of a sleeping person can be demonstrated in the lungs on the following morning. The localized nature of some exogenous lipoid pneumonias suggests that oil from the nose or pharynx may have been aspirated in this way during

sleep into the broncho-pulmonary segment which is most dependent in the patient's customary sleeping posture. The incidence of exogenous lipoid pneumonia is difficult to assess, largely because diagnosis is usually impossible without the opportunity for histological examination which may be afforded either by lung resection or as a result of post-mortem examination. With this proviso, the condition appears to be rare. However, in view of the possible dangers, and of the little evidence of positive benefit from their use, oily nasal drops and sprays are best avoided.

Hypertrophied Labia

Q.—I have a female patient of 16 who complains of discomfort from swelling of the labia—according to the mother, the labia minora. It is now brought on only by exercise, such as badminton and especially cycling. It was at its worst 18 months ago, when the labia would swell after exercise sufficiently to cause difficulty in walking. The patient (and her mother) say that at that time her periods were abnormal, occurring fortnightly and lasting for a week; now she has them for five days in 28. I could find nothing abnormal on examination except that the labia minora were possibly rather large for the patient's age. I should be very interested to have comments on this case.

A.—This girl probably has a moderate degree of hypertrophy of the nymphae, a not uncommon condition. It is sometimes alleged to be a sign of masturbation, but it is more likely a developmental anomaly. Often it is symptomless, but it can be troublesome in that the labia tend to get chafed and sore during exercise, and sometimes they react by becoming oedematous and painful. Symptoms are most often seen during adolescence, and this may be because of the increased activity of the sebaceous and sweat glands in the skin of the vulva and of a tendency to leucorrhoea at that age. Failure to realize the need to wash carefully in the folds of the vulva may also be a factor.

If the symptoms are improving active treatment is probably unnecessary. The girl should be advised to wash and dry the skin carefully and often, and to avoid powder, which tends to cake in the crevices. Before exercise she should apply a barrier cream such as zinc and castor oil or one of the proprietary preparations, and this may prevent chafing. If the labia continue to cause trouble the ultimate line of treatment is to reduce their size by a plastic operation.

Methonium Compounds in Left Ventricular Failure

Q.—In what circumstances are methonium compounds indicated in left ventricular failure? Are there any special dangers, and what results may be expected?

A.—Methonium compounds (for example, hexamethonium, pentolinium) will lower the blood pressure and relieve the strain on the heart in hypertensive left ventricular failure. The dosage required is variable and should be determined by the sphygmomanometer in the individual. In acute left ventricular failure 2.5 mg. pentolinium can be given intravenously and repeated in ten minutes if the pressure does not fall with the first dose. If a profound drop in pressure takes place this can be corrected by changing the posture towards recumbency. The effect of methonium can be one of dramatic relief: owing to the uncertainty of dose-response, however, it is not likely to displace morphine as the most effective remedy for emergency use.

Methonium compounds have a real place in the management of chronic hypertensive left ventricular failure. If begun in the early stages before gross enlargement has occurred symptomatic relief may be dramatic and sustained for years. They are especially valuable in the younger age groups before extensive arteriosclerotic changes have developed. A single large injection on going to bed may prevent nocturnal dyspnoea. Methonium should be regarded as a supplement to digitalization rather than an alternative form of treatment. The difficulties and dangers

of methonium treatment are now well known, and recent papers should be consulted for details—for example, that by Brenda Morrison.¹

Efforts have been made to reduce the work of the failing heart with methonium in non-hypertensive cases. These trials are as yet inconclusive.

REFERENCE

¹ *British Medical Journal*, 1953, 1, 1291.

Acid Urine

Q.—I would be glad if you could tell me if there is any dietary method of keeping an extremely acid urine nearer neutrality. At present 40–60 gr. (2.7–4 g.) potassium citrate is needed daily for this purpose.

A.—The amount of acid excreted in the urine in health depends very largely on the amount of animal protein consumed, and a low-protein vegetarian diet does make the urine more alkaline. Before recommending such a treatment, however, one would have to know whether the presence of "extremely acid urine" was in fact responsible for the patient's symptoms; if these are really due to urinary infection, this should be treated by antibiotics and not by potassium citrate. It is assumed that the common causes of a metabolic acidosis—diabetes, diarrhoea, anorexia—have been excluded. If the patient has no symptoms, and a normal alkali reserve, the finding of a urinary pH down to 4.5 has no pathological significance, and no treatment is required.

Treatment of a Phantom Leg

Q.—I would appreciate advice on the treatment of a phantom leg in a man of 65 who was wounded in the first world war. So far I have not tried any of the long-acting local analgesics, and I have been wondering whether it would be worth trying one, and, if so, what methods to adopt.

A.—Phantom leg sensations are of no importance unless they are painful, but it seems likely in this case, as the phantom sensation has either persisted since the first world war or has developed as a delayed effect in recent years, that in fact the patient is complaining of one of the several types of phantom pain, probably a sudden neuralgic sensation with a jerking of the stump.

It is most helpful in the handling of this type of case to observe the effects of blocking the nerves to the end of the stump. The nerve concerned is identified by the position in the phantom to which the pain is referred, and if, as usually, the pain is referred to some part in the sciatic nerve distribution, then a sciatic nerve block with procaine may be a very instructive procedure. If, as often happens, this procedure causes numbing or disappearance of the phantom sensation, then this indicates that most of the abnormal neural discharges are originating at the neuromata at the end of the stump, and in this type of case repeated injections with procaine may give lasting relief. However, this type of case is also very suitable to treatment by percussion, either with a mallet and applicator or by a mechanical vibrator. Both of these measures gradually destroy the fine nerve fibres in the neuroma. So successful has been this treatment in many instances that a small type of vibrator is now supplied by the Ministry of Pensions on loan to cases of painful amputation stump or phantom pain. Further information with regard to this treatment can be found in a paper by Russell and Spalding.¹

REFERENCE

¹ *British Medical Journal*, 1950, 2, 68.

NOTES AND COMMENTS

Static Electricity and Car Sickness.—Dr. W. E. HICK (Cambridge) writes: I disagree with your expert's remarks on "the present opinion" of the cause of motion sickness ("Any Questions?" March 12, p. 680). There are two aspects—the eliciting conditions and the physiological mechanisms. With regard to the latter, I should be interested to hear of any reasonable evidence that the possession of "hypersensitive labyrinths" is a necessity. Even the weaker postulation of "hypersensitivity to labyrinthine stimulation" is dubious. The effects of the "magic swing" and similar devices which only produce an illusion of body movement would have to be explained away. "Over-stimulation" is also a somewhat unfortunate expression. Taking vertical acceleration alone, the values during running are very much greater than are commonly experienced in a large ship. The lower frequency in a ship (of the order of 0.1 c/s) is relevant, but not because it causes over-stimulation. Slow rotation at constant speed with the gaze directed upwards or downwards can also be extremely unpleasant; but it can only stimulate the labyrinths when starting and stopping (and not abnormally, even then).

I think the most useful summary of the evidence is that motion sickness is just a variety of the more general phenomenon vertigo sickness. Everybody knows that vertigo, whether caused by vestibular disease, drugs, motion, anomalous behaviour of the visual world, or anything else, tends to produce vomiting. "Vertigo" here denotes a confusion in spatial orientation, particularly with respect to gravity; the apparent magnitude of the latter is to be remembered, as well as its direction. Whether the word "giddiness" is used by the sufferer depends on the situation and on certain linguistic factors. "Vibrations affecting the eyeball" would shift the image on the retina, and thus possibly add to the confusion. But this is a minor contribution in the usual "sick-making" conditions.

Individual differences in susceptibility are probably due to the sensitivity of the vomiting reflex to vertigo, and to practice. Medical palliation is, of course, mostly limited to attacks on the former, but it is worth remembering that the latter is an active process of learning to achieve orientation by making a better selection from the total sensory information. As a skill, it is largely unconscious; but, like other skills, it is more quickly acquired when there is conscious effort directed by insight, as many people have found out for themselves.

Aphthous Ulcers.—Dr. GEORGE GRAHAM (London, W.1) writes: I have been troubled with these ulcers (*Journal*, January 22, p. 242, and March 5, p. 618) ever since I was a small boy—two or three times a year for many years, but now much less frequently. For the last thirty years or so I have always touched the ulcer with a silver nitrate stick, which I carry in my dressing-case. The actual application is exceedingly painful, but is followed by an immediate relief of pain, the ulcer being covered with a white coagulum. The pain may return after 24 hours or so and is again at once relieved by another application. I have never had to repeat the treatment a third time, as the ulcer is no longer painful and heals rapidly. I have treated successfully many patients in this way, but I always warn them that the initial pain is very great. I have used 2% gentian violet if many ulcers were present, but it is not so good as a silver nitrate stick for a single ulcer.

OUR EXPERT writes: The application of silver nitrate, either in solution or as a stick, to the aphthous ulcers appears to have many adherents. It is, of course, a painful procedure, but may have the benefit in single ulcers, as some correspondents have pointed out, of relieving pain. The ulcers frequently appear in crops of several at a time, and it was in this type of case that silver nitrate was not recommended, as the majority of opinion is against its use. It is unfortunate that a common and painful condition still has an obscure aetiology and somewhat empirical treatment.

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THE DEVELOPMENT OF BRITISH ENDOCRINOLOGY*

BY

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Few, I suppose, to-day would deny that endocrinology is a branch of the biological and medical sciences, integrated as a coherent whole to form the subject of textbooks, journals, and societies, and indeed to constitute the professional vocation of a small group of workers who call themselves endocrinologists. Nevertheless it has from the beginning so permeated many other branches of science and medicine as to become an integral part of them. This it will continue to do more and more as the subject unfolds under the warm sunshine of advancing knowledge. Thus it is physicians and physiologists, biologists and biochemists, pathologists and pharmacologists who by their contributions have founded and established endocrinology so that its study and practice have now become essential not only to their own but to other specialties. Should this need, however, be neglected, not only will their own branches of science and medicine suffer, but endocrinology will wither.

British workers have played a distinguished part in the development of endocrinology both in the past and during the present generation, and to-day, with a journal, a society, and a section at the Royal Society of Medicine, endocrinology in this country would seem to flourish and prosper and to be firmly established. Will it continue so in the future? This is the theme I wish to develop.

"Internal Secretions" and "Hormones"

So far as I can discover, the earliest British contributors to endocrinology were Thomas Willis and Richard Lower, both of whom hinted at the possibility of some mechanism of internal secretions. Willis was at school in Oxford and became batteler to a canon of Christ Church and thus matriculated from "the House" in 1636 and took the degree of B.M. ten years later. He was a contemporary of Robert Boyle, John Locke, and other future Fellows of the Royal Society, which received its charter in 1662. When the monarchy was restored Willis was rewarded for his loyalty by being appointed Sedleian Professor of Natural Philosophy at Oxford. During the time he held this chair he wrote much on anatomy, describing of course, among other things, the circle of Willis, and taught a number of students who were subsequently to become famous, such as Christopher Wren. In 1666 he moved to London and built

up a lucrative practice. His reputation is difficult to assess. Was he the inventor of the nervous system, the founder of biochemistry (he tasted the urine for diabetes), the peer of Sydenham, Heberden, and Bright, or a parasite living on his pupils' ideas? It is said that he refused a knighthood because he had been declared by the Merry Monarch to have killed more of his subjects than an invading army. Richard Lower, his pupil, who may well have inspired some of his ideas, including those concerning internal secretions, followed Willis to London in 1666 and eventually became the "most noted physician in Westminster and London" and a confidant of Nell Gwynne. He fell foul of the King, however, and his practice and reputation suffered accordingly. In 1675 he was expelled from the Royal Society, probably for not paying his subscription. Nevertheless he was one of the many physicians who attended the royal deathbed and tortured the wretched Charles, as Macaulay says, "like an Indian at a stake," while he was being "a most unconscionable time a-dying." The first contributors to British endocrinology were therefore colourful, successful, and worldly.

Though endocrinology made few advances during the next 200 years, the conception of internal secretions kept recurring, and George Gulliver, who enjoyed the curious distinction of being surgeon to "the Blues" as well as a Fellow of the Royal Society and a Foundation Fellow of the Royal College of Surgeons, was one of those who played upon this theme by postulating in 1840 that the adrenal glands elaborate a substance which they discharge into the venous blood. The term "internal secretion" was first used by Claude Bernard in a lecture at the Collège de France in 1855, but the word "hormone" was introduced half a century later by Bayliss and Starling. In 1902 they discovered secretin, and felt that its production in one part of the body and its transport to other parts on which it effected changes were not adequately described by calling it an "internal secretion." In their search for a more appropriate term the word "hormone" was suggested, and Starling used it in 1905 in his Croonian Lectures at the Royal College of Physicians. Starling had carved out a distinguished career for himself in the Physiology Department at Guy's, but as the authorities were unwilling to give him full control of the department he left in 1900 to become Jodrell Professor of Physiology at University College. He was succeeded at Guy's by M. S. Pembrey, who from the first took undisputed command of his department. Two years earlier Guy's had lost another distinguished physiologist through inadequately defining his ultimate prospects, for Gowland Hopkins had been enticed

*Based on the Presidential Address to the Section of Endocrinology of the Royal Society of Medicine, delivered on October 27, 1954.

+Sir Charles Symonds, in his recent Harveian Oration (*British Medical Journal*, 1955, 1, 119), has refuted this suggestion and has borne testimony to Willis's high repute.

to Cambridge by Michael Foster to undertake research in chemical physiology. I mention these facts because they are relevant to my theme.

History of British Endocrinology

The history of endocrinology consists of accounts of the achievements of men who did not call themselves endocrinologists, but were physicians, therapists, chemists, pharmacologists, pathologists, and experimental physiologists.

Physicians

From the physicians I choose Addison and Gull, for the circumstances leading up to the descriptions of Addison's disease and myxoedema are characteristic of the atmosphere of the second half of the last century when men had nothing but their eyes, their ears, their finger-tips, and their clinical sense to rely upon. Thomas Addison had spent all his life studying disease at the bedside and in the post-mortem room before he published, at the age of 62, his celebrated monograph in 1855. He was a distinguished dermatologist, and it was under his direction that Joseph Towne modelled in wax the superb collection of specimens of skin disorders which are still to be seen in the Gordon Museum at Guy's Hospital. He had long been intrigued by the morbid state characterized by "anaemia, general languor and debility, remarkable feebleness of the heart's action, irritability of the stomach, and a peculiar change of colour in the skin, occurring in connexion with a diseased condition of the suprarenal capsules." Six years previously he had communicated a paper concerning "a remarkable form of anaemia" occurring in patients the whole surface of whose bodies "bears some resemblance to a bad wax figure." Addison wrote sparingly, and it must have taken considerable persuasion on the part of Samuel Wilks, his junior colleague, to get him to produce the finely worded and beautifully illustrated monograph which is to-day such a highly treasured gem among the exhibits of British endocrinology. Unfortunately Addison was to derive little pleasure or satisfaction from it. It is true that Trousdale, during the next year, hailed the monograph and christened the condition Addison's disease. It is also true that, after reading Addison's monograph, Brown-Séquard, later to become physician to the National Hospital for Nervous Diseases, Queen Square, an F.R.C.P. and F.R.S., founded experimental endocrinology by removing the adrenals from a curious assortment of animals and by deducing from the consequently high mortality rate that these glands were essential to life. Nevertheless the medical fraternity at Edinburgh, where Addison had obtained his M.D., would not acknowledge the disease, and two or three papers read before the Medico-Chirurgical Society were not accepted for publication in its *Transactions*. Addison was deeply hurt by this, as he had not long before been president of the society. In 1860 he retired from public life and his beloved Guy's, and shortly afterwards committed suicide.

How different was the background of Gull's disease! In 1850, at a meeting of the Medico-Chirurgical Society, with Addison in the chair, Thomas Curling, a surgeon at the London Hospital, reported two cases of sporadic cretinism with absence of the thyroid gland. No one paid much attention, and it was 21 years before a further five cases of sporadic cretinism were reported to the same society by Hilton Fagge, of Guy's Hospital, ironically with Curling himself in the chair. Fagge recalled Curling's cases and the fact that the thyroid was absent, giving credit to his senior colleague and late teacher, Dr. Gull, for having acquainted him with the principal features of the condition. One of Fagge's patients was obviously suffering from juvenile myxoedema, and this led him "to speculate as to what characters would be present, should the disease (if that be possible) arise still later in the course of adult life." Two years later, in 1873, Sir William Gull read a paper to the same society "On a cretinoid state supervening in adult life in women." In it he described five cases, referred to Fagge's paper, and

expressed the belief that these cases were examples of the condition which Fagge had predicted. Gull's paper was brief, and would probably have attracted little attention but for the forcefulness of his character and the fact that he was at this time the most famous physician in the country. Two years previously he had been called in by Sir William Jenner to attend the Prince of Wales, who was suffering from typhoid fever. Seeing that the Queen had lost her beloved husband from the same complaint, it is understandable that when the Prince recovered Gull received not only the heartfelt thanks and gratitude of the nation and the Queen but also a baronetcy. Gull resigned from Guy's at the age of 50 to attend to his busy practice, and died in 1890 following the third of a series of cerebral haemorrhages. On recovering from the first he is said to have remarked, "One arrow has missed its mark, but there are more in the quiver." He left £344,000.

It was, however, William Ord, of St. Thomas's Hospital, who in 1877 gave a full and classic account of the condition and called it "myxoedema." During the next five or six years studies were being made on the Continent of the results of total extirpation of goitrous thyroid glands, and Sir Felix Semon, the laryngologist, on reading Kocher's paper on "cachexia strumipriva," recognized in the description the classic picture of myxoedema, and drew the attention of the Clinical Society of London to the matter. Though Semon's idea that cachexia strumipriva, myxoedema, and cretinism were all due to the same cause was at first ridiculed, eventually the Clinical Society set up the Myxoedema Committee in 1883, with Ord as chairman and Sir Victor Horsley as one of the members. Semon was obviously more familiar with the Continental literature than most of his colleagues, for he was in fact German, and when he came to this country in 1875 he spoke hardly a word of English.

Therapists

Treatment, other than empirical quackery, was practically non-existent in those days, and in endocrinology the first to succeed in carrying out a rational form of therapy was George Murray, of Manchester. Here is Sir Walter Langdon-Brown's description of what happened, as recounted to him by Murray himself. At the time of the setting up of the Myxoedema Committee there was a tendency to regard myxoedema as a failure of excretion, hence the patient's bloated appearance. Murray, however, after consulting Horsley, with whom he had worked at University College Hospital, suggested it was due to loss of an active internal secretion; and in 1891 he demonstrated a case of the disease to the Newcastle and Northumberland Medical Society and announced that he proposed to treat it by means of an extract of thyroid gland. A senior member of the society said that it would be just as sensible to treat a case of locomotor ataxia with an emulsion of the spinal cord. Murray arranged with a slaughterhouse to be allowed to dissect out sheep's thyroid glands, of which he proposed to make an extract. The Newcastle Medical School refused to give him facilities for this, but Armstrong College provided him with a room in which to prepare his extracts. Towards the end of that year he triumphantly demonstrated the same patient, now an active and sprightly woman of 46 as the result of injections of his extracts, to the same society. The patient lived to be 74, by which time she had received the equivalent of 870 sheep's thyroids.

Murray was, of course, lucky, for a crude extract of sheep's thyroid glands is as good a therapeutic agent for thyroid deficiency as any other. The therapists of the present generation usually have to rely upon the physiologist or the chemist to supply them with their active principle. Thus Lawrence, the pioneer and leading exponent of the treatment of diabetes in this country, had to wait for Banting and Best to introduce insulin before his own life could be saved and he could alleviate the sufferings of so many diabetics during the past 30 years. It was necessary for Reichstein to synthesize deoxycorticosterone acetate before

Leonard Simpson could apply it to the treatment of Addison's disease; and until Dodds had made stilboestrol available oestrogen therapy was virtually ineffective.

Chemists

Chemists, indeed, have played a particularly distinguished part in the history of British endocrinology, as the following examples will show.

On Christmas Day, 1914, a pure, crystalline, and physiologically active protein was isolated from the thyroid gland by the American chemist E. C. Kendall, who, believing that the essential component was oxyindole, christened it "thyroxindole," which was later shortened to "thyroxine." (The terminal *e* was added to conform to the British system of nomenclature of this class of compound.) In 1926 Harington showed that the active principle was a derivative of tyrosine, indeed a condensation product of 3:5-diiodo-tyrosine, and not of indole, and in 1927 Harington and Barger synthesized thyroxine. It is peculiarly fitting, therefore, that it was in Sir Charles Harington's laboratory that Dr. Rosalind Pitt-Rivers conducted the studies which led to the realization that triiodothyronine is in fact the true hormone of the thyroid gland. By 1929 and 1930 pure crystalline oestrogens were being extracted from the urine of pregnant mares, and G. F. Marrian succeeded in obtaining oestriol from human pregnancy urine. In the same year Marrian isolated pregnandiol, the inert urinary metabolite of progesterone, subsequently to be isolated in pure crystalline form five years later. The elucidation, in 1932 and 1933, of the structure of the cyclopentenophenanthrene ring system cleared the decks for an intensive chemical study of the steroids, including the sex hormones, in which an important part was played by J. W. Cook and his collaborators, who were largely responsible for determining the structure of the natural oestrogens. Struck by the existence of no fewer than five natural oestrogenic substances, Dodds and his colleagues began to wonder how specific was the molecular structure for oestrogenic activity, and they soon found a compound, 1-keto-1:2:3:4-tetrahydrophenanthrene, which did not contain the cyclopentenophenanthrene skeleton but which was weakly oestrogenic. They subsequently established the fact that the phenanthrene structure was not essential for oestrogenic activity, and they eventually tested the potency of the very simple compound anol (*p*-hydroxypropenyl benzene) and found it to be highly active. However, when attempts were made to repeat the work, some batches of anol were found to possess only very slight activity, and it was obvious that the activity in the first batch must have been due to a contaminant. The work was continued in collaboration with Sir Robert Robinson, and it was shown that the active compound was in reality 4:4'-dihydroxy- α - β -diethylstilbene. The introduction of this cheap and highly potent oral compound completely revolutionized oestrogen therapy.

In the androgen field Leonard Simpson, Alison Macbeth, and de Fremery had reported abnormal quantities of male hormone in the urine of certain cases of virilism from 1933 onwards, but the chief credit for developing a reliable and accurate method of estimating urinary neutral 17-ketosteroids belongs to Callow. It is of some interest to note how this came about. In 1936 Professor A. W. M. Ellis (now Sir Arthur Ellis), of the London Hospital, appeared before the Hormones Committee of the Medical Research Council and pressed strongly for the establishment, under the Council's auspices, of an endocrine laboratory institute in which hormone assays and estimations could be carried out to assist clinicians in the diagnosis and treatment of endocrine disorders. The Committee considered the proposal and decided that a useful start could be made by trying to find a method of determining the urinary metabolites of the androgens produced by the gonads and adrenal cortex. The task was placed in the capable hands of Dr. R. K. Callow, and his staff was augmented by an additional biochemist, whom he subsequently married. Callow and

his colleagues modified the Zimmermann colorimetric method for determination of urinary androgens and put it on a secure basis.

The most recent chemical achievement of which British endocrinologists may be proud is the discovery by S. A. Simpson, J. F. Tait, and H. M. Grundy of the very potent adrenocortical hormone, aldosterone.

Pharmacologists

Pharmacologists have also made valuable contributions to British endocrinology. Dr. George Oliver, a physician who practised in Harrogate during the summer months, had gained the impression that patients suffering from low blood pressure would derive benefit from injections of an extract of the adrenal gland. Trying this out on his son, he thought he detected a contraction of the radial artery. In considerable excitement he rushed up to London to tell his friend Professor Schäfer (Starling's predecessor in the Chair of Physiology at University College) about it. Schäfer was actually conducting an experiment which involved measuring the blood pressure of an anaesthetized dog, and, polite though incredulous, he injected some of the extract into the animal and was astonished to see the mercury almost shoot out of the top of the manometer. The date was 1894, and in the following year Benjamin Moore, working in Schäfer's laboratory, correlated this pressor substance with the adrenomedullary chromagen. Later adrenaline was isolated and its relationship with the sympathetic nervous system remarked upon. A little later still Sir Henry Dale pointed out that noradrenaline reproduced the actions of the sympathetic impulses with even greater fidelity. In 1906 W. E. Dixon obtained from a heart which had been subjected to vagus stimulation an extract which inhibited frog's heart muscle. This substance, subsequently known as acetylcholine, was discovered by accident in ergot of rye by Dale and identified by Dale and Ewins in 1914; it was found to be released at parasympathetic nerve-endings by Dale and Dudley in 1929 when, as Sir Henry has modestly put it, they "were looking for something else."

Pathologists

Pathology, perhaps, has contributed surprisingly little to British endocrinology. Nevertheless there are three exceptions. The first is the detailed description of the histology of the thyroid gland by Wilkinson King in 1836. He described the colloid and showed that it passed into the lymphatics and so into the great veins, adding that "whilst the nourishment of a part is indispensable to its existence, the influence which it exerts upon the circulating fluid may be more or less needful for the healthy subsistence of the entire animal"—a prophetic forecast of the principle of internal secretions. King succeeded Thomas Hodgkin as curator of the museum at Guy's at the age of 28, and his literary output was very considerable; but, as Wilks said, "though young he had an aged worn look and a chronic cough," and he died of pulmonary tuberculosis at the early age of 38. The second exception is the description by A. C. Crooke in 1935 of hyaline changes in the basophil cells of the pituitary in cases of Cushing's syndrome, and the third the observation by H. L. Sheehan that the majority of cases of panhypopituitarism are due to post-partum necrosis of the gland and present clinically as cases of secondary myxoedema and not, as described by Simmonds, as pituitary cachexia.

Experimental Physiologists

Last I come to a group of endocrinologists whom I find difficult to classify, and I think perhaps I can best describe them as experimental physiologists. Actually they may be surgeons, like Astley Cooper and Victor Horsley, performing thyroidectomy on puppies or monkeys; or they may be anatomists, like Zuckerman, whose contributions and those of his school have always been careful, painstaking, and prolific, and yet have ranged over a surprising variety of subjects from the menstrual cycle and the functions of the prostate to the interactions of the hypothalamus and the

pituitary; or neurophysiologists, like G. W. Harris, whose studies of the hypothalamus and the pituitary have been outstanding. They may be engaged on agricultural research, like S. J. Folley, whose studies at Reading have laid the foundations of modern lactational physiology. They may be biochemists, like F. G. Young, whose fascinating studies of the role of the pituitary in carbohydrate metabolism have identified the diabetogenic hormone with the growth hormone. Or they may be truly experimental physiologists, such as the late F. H. A. Marshall and his disciple, A. S. Parkes, whose work on the physiology of reproduction virtually created this branch of endocrinology and has certainly maintained its standard unsurpassed throughout the world.

The object of this historical review has been to point out that the contributions of the British school were noteworthy and important and have gained for British endocrinology a high reputation. The following account suggests that that reputation has been maintained during the last quarter of a century.

The "Journal of Endocrinology"

By the late 1930's it was becoming obvious to a few workers actively engaged in various fields of endocrine research that there was a growing need for a journal in which their results could be published. A small group of ten therefore decided to launch a British journal devoted to the publication of original work in endocrinology. Each of these ten individuals having guaranteed a certain sum of money, the *Journal of Endocrinology* eventually came into being. Sir Henry Dale acted as chairman of the committee which conceived, devised, and launched the project, but, at his own request, he was not appointed chairman of the council of management. Dr. A. S. Parkes was accordingly elected to this post, and Professor F. G. Young became the secretary. With Sir Charles Dodds as editor, the first number of the journal was published in June, 1939. It could hardly have appeared at a less propitious moment. Before the next number was printed the second world war had broken out. Many of the journal's subscriptions came from overseas and therefore promptly ceased at the outbreak of hostilities. Had it not been for the subventions granted from time to time by the Royal Society the journal would assuredly have succumbed. Indeed, at one stage during the war the treasurer was obliged, in order to keep the journal afloat, to call upon the guarantors to pay up half the money they had guaranteed. However, it seems to have been endowed with a miraculous buoyancy, and to-day it is a flourishing concern which publishes four or more numbers a year under the editorship of Professor Zuckerman.

The Society for Endocrinology

Once the war was over, one or two members of the council of management felt the need for periodic symposia on endocrine subjects and suggested that a society should be formed to deal with the organization of such gatherings. The council recognized the rapid expansion that was taking place in endocrinology and the desirability of founding a society membership of which should be open to the many workers now actively engaged in the study of this subject. They felt that this society should take over management of the journal, which should become its official publication. The treasurer, however, insisted that the society should repay the guarantors the money they had individually disbursed to keep the journal alive during the days of its financial difficulties. This money having in due course been repaid, the Society for Endocrinology was founded and held its first meeting at Guy's Hospital in July, 1946, when Sir Charles Harington delivered the inaugural address. Dr. Parkes became chairman of the committee of the society and Dr. S. J. Folley the honorary secretary. The society's first symposium was held in December, 1946. Dr. Folley became chairman of the committee in 1951, and with the two present secretaries, Professor C. H. Gray and Professor N. F. MacLagan, has led the society forward to become the

flourishing and respected body that it now is, upholding the highest traditions of academic endocrinology, and enjoying a reputation certainly equal to that of any society of endocrinology throughout the world.

The Section of Endocrinology of the Royal Society of Medicine

In the meantime the clinicians were not inactive. Towards the end of 1944 Dr. Raymond Greene was exploring the possibilities of establishing a Section of Endocrinology of the Royal Society of Medicine and was not finding his task easy. There were some who disapproved of carving another slice off the body medical, and there were others who felt that the creation of a Section of Endocrinology might deprive existing sections of many subjects that they themselves would like to discuss. There were still others who felt that clinical endocrinology was not yet based on a scientific foundation, that most clinical endocrinologists were quacks, and that a Section of Endocrinology would become a sounding-board for their "hot air." On the other hand, Dr. Greene had one or two loyal supporters, particularly Mr. L. R. Broster, who was able to plead the case before the Council of the Royal Society of Medicine. Thus it is almost entirely due to these two enthusiastic pioneers that this section came into existence on January 26, 1946, exactly six months before the Society for Endocrinology held its inaugural meeting. The first president of the section was Sir Walter Langdon-Brown, the two vice-presidents were Mr. Broster and Dr. Gardiner-Hill, and the senior secretary was Dr. Raymond Greene. Indeed, the new section emerged as such a smart equipage that a certain wit christened it "the Section of West-Endocrinology." Sir Walter Langdon-Brown was unfortunately prevented by illness from making a personal appearance before the section, and his presidential address was read for him by Dr. Raymond Greene. On the death of Sir Walter, Mr. Broster became president.

The section flourished from the start, and its meetings were attended by large gatherings which filled the Barnes Hall. Almost immediately all resistance, resentment, and opposition disappeared. The section has always been on the most cordial terms with the Society for Endocrinology, and during the year 1948-9 Dr. Parkes was president of the Section of Endocrinology and chairman of the committee of the Society for Endocrinology. From time to time the section and the society have held combined symposia, and the council of the one and the committee of the other have on occasions met together—for instance, when they asked the Medical Research Council to consider providing facilities for certain laboratory investigations, such as urinary hormone assays, to clinical departments which were unable to have these carried out in their own hospitals. As the result of this approach the Medical Research Council set up a Clinical Endocrinology Committee, which has, among other things, published a standard method of determining urinary 17-ketosteroids. It has also made arrangements to distribute certain steroid reference standards otherwise difficult to obtain. In 1952 the section and the society set up a committee under the chairmanship of Mr. Broster to consider how best to encourage progress in endocrinological research in this country in the future.

The Addison Lecture

As the result of a benefaction to the medical school by one of its old students, Guy's Hospital established an annual lecture to commemorate the part played by Thomas Addison in the foundation of modern endocrinology. The inaugural Addison Lecture was delivered by Sir Charles Dodds in 1946. It has been the custom to select the lecturers alternately from this country and from overseas, and the subsequent lecturers have been Professor E. B. Astwood, of Boston; Sir Henry Dale; Professor G. W. Corner, of Baltimore; Professor F. G. Young, of Cambridge; Professor T. Reichstein, of Basle; Professor S. Zuckerman, of Birmingham; and Professor Lawson Wilkins, of Baltimore. Among

those who have taken the chair at these lectures have been Sir Charles Harington and Dr. E. D. (now Lord) Adrian.

Whither Endocrinology?

At the present time clinical endocrinology has not acquired the status of a specialty to the same extent as has neurology or orthopaedic surgery or psychiatry or paediatrics; the number holding appointments on hospital staffs as endocrinologists can be counted on the fingers of one hand. But, with due respect to the other three, it is fair, I think, to say that this small handful cannot claim the credit for the high record in which British endocrinology is held. As I have already pointed out, there are anatomists, experimental physiologists, biochemists, clinical pathologists, pharmacologists, therapists, physicians, surgeons, and even professors of social medicine, who by their research work, their writing, their teaching, their inspiration, and their flair for organizing have raised its standard and made its great reputation.

How can this be maintained? How are future scientists to be trained in, and future doctors to be taught, endocrinology? Above all, what inducements exist at the moment, or are likely to arise in the near future, to attract recruits into endocrinology? Is there to be an Institute of Endocrinology established for postgraduate training? I think not. To be comprehensive, its laboratories, its wards, its clinics, and its specialist departments for the study of diabetes and other metabolic disorders, thyroid disease, paediatrics, neuro-endocrinology, gynaecological and obstetric endocrinology, let alone the more abstruse biological and biochemical research, would spread and sprawl to such an extent that if grafted on to a certain famous postgraduate hospital they would land up in the neighbouring gaol. Furthermore, one could not hope to concentrate the present generation of established endocrinologists in such an institute. Most of them are comfortably ensconced in the departments they have already built up for themselves through their own enterprise and the good will and personal interest of their colleagues. In fact such centralization would be a retrograde step. Regionalization is the modern policy of medical planning.

Is there to be a special course in endocrinology for premedical students, a diploma in endocrinology, a College of Endocrinologists? Again, I think not, for endocrinology is not a pigeonhole specialty, but rather a cross-section of the biological sciences and of medicine, surgery, and gynaecology. We who are specially interested in endocrinology do not want to confine it to ourselves; we want to spread our gospel. We want to collaborate, not to insulate; to co-operate, not to isolate.

Nevertheless we are firmly convinced that endocrinology is an established, respectable, orthodox, and rapidly expanding biological and clinical science. We would do much to prevent it from being stifled, swallowed up, derided, or ignored. So what must we do? Those of us who hold appointments in undergraduate teaching hospitals must select from our collection a few only of our most classic cases of common endocrine disorders and demonstrate them to the students simply and attractively. These demonstrations should be memorable but infrequent, for the medical student has more than enough to learn already, and endocrinology is only a very limited part of that amount. In postgraduate teaching it might be an advantage to arrange a systematic course of lecture-demonstrations given by those who have made a special study of this specialty.

Recruitment

There are physicians and others who are members of the Section of Endocrinology who have established themselves and made their names famous as endocrinologists, whatever they may officially call themselves. There are younger and more junior Fellows of the Royal Society of Medicine who attend the meetings of the section simply because they wish, quite rightly, to broaden their medical education. A few, however, may be genuinely interested in endocrinology and

would like to specialize in it, if only they dare take the risk. And the question is, dare they take the risk? Of course, if you want to be successful in life you must always take a risk. You must take a risk if you aspire one day to become a consultant physician, for there are not nearly enough consultant posts in internal medicine to accommodate the many hundreds of hard-worked, underpaid, and well-qualified medical registrars. And you of the present generation live in a competitive age in which only a few can reach the top in whatever walk of life you choose. Nevertheless there are sufficient consultant posts in medicine, surgery, obstetrics and gynaecology, neurology, dermatology, ophthalmology, oto-rhino-laryngology, orthopaedics, genito-urinary surgery, paediatrics, anaesthetics, radiology, radiotherapy, and psychiatry to attract recruits who are prepared to spend more years in training for them than they took to become qualified doctors.

But what of endocrinology? There are, I think, opportunities for training. In most schools of medicine there are posts to be held in the departments of clinical chemistry or clinical pathology where the basic technique may be learnt, and there should be vacancies for men so trained to work at registrar level in the departments of those who have established themselves as experts in some branch of clinical endocrinology. Another method—though I am not suggesting that it is necessarily the only method—of obtaining such training has been provided by the Medical Research Council. In 1951 this body launched a scheme of Clinical Research Fellowships. The holder of one of these Fellowships is paid at registrar level and is given the opportunity of acquiring the techniques and disciplines of those basic sciences relevant to his clinical interests, or of working in a department of recognized standing already engaged in clinical research, such as the clinical units of the Universities or the Medical Research Council. If he makes a success of his Fellowship, there is the possibility that he might obtain one of the Council's Rockefeller or other Travelling Fellowships and thus have the opportunity of broadening his outlook by working in the department of some distinguished foreign expert in the particular specialty he has chosen. Furthermore, he may do this without losing his place in the queue, for the Council has insisted on a promise from the applicant's sponsor of an appointment at the end of the training period. But what appointments are, in fact, available at the present moment, either in general clinical endocrinology or in some branch of endocrinology? The answer is, I am afraid, "None." Now this is disastrous, for unless you can offer the trainee some prospects, some goal to aim at after you have so carefully, arduously, and expensively trained him, you will find no recruits, and clinical endocrinology in this country will wither and die.

How is this very serious and urgent situation to be remedied? Not, I think, by setting up a whole crop of new departments of clinical endocrinology, for this would take more time than, in our urgent predicament, we can afford. It would require a large capital grant and a substantial endowment, which are most unlikely to be provided either by the National Health Service or by the University Grants Committee in these stringent times. It would need the greatest good will and active co-operation of the clinical staff of the hospitals in which the new departments are to be set up, and indeed it is very doubtful whether one could "sell" the scheme to medical committees and boards of governors of hospitals, already short of beds and with the present drastic cuts in their maintenance costs, even supposing they were sympathetically attuned to the idea of creating and expanding a new specialty. This does not mean that I do not hope that existing departments of endocrinology will flourish to the mutual benefit of themselves and the hospitals in which they are established, and by their example prepare the way for the foundation of other such departments at the earliest expedient moment. I hope also that existing departments of endocrinology may be given the opportunity of playing their part in training future endocrinologists.

But at the moment, I think, our best chance of overcoming the serious predicament of lack of recruits in endocrinology is to encourage the establishment and expansion of the endocrine aspects of certain branches of the medical sciences which cannot afford to ignore endocrinology if they are to make their proper contributions and retain their high reputation in this age of rapid scientific advances. I will take two examples to illustrate what I mean. The first is paediatrics. Lawson Wilkins has shown the close relationship between paediatrics and endocrinology, and through his inspiration, enthusiasm, and hard work he has made far-reaching contributions, not only to paediatrics, but to endocrinology. He has broadened the scope of paediatrics and, far from snatching the livelihood from the mouths of the paediatricians, he has presented them with a new stock-in-trade, and on account of his work and that of others like him paediatricians throughout the world are being consulted more and more about endocrine problems. If the paediatricians of this country would select and encourage one or two of their promising young registrars and have them fully and carefully trained as endocrinologists, and then be prepared to give them consultant status with charge of beds and full responsibility for the care of patients, I feel sure that this step would redound to the credit of British paediatrics. My other example is gynaecology. In my view there is need for more gynaecological endocrinologists. In the first place, disorders of menstruation constitute a rather complex aspect of applied physiology which can be thoroughly comprehended only by someone with a fair knowledge of general endocrinology and biochemistry, and it is seldom that the gynaecologist has this knowledge. His training and outlook are totally different. The surgical skill and technique of the gynaecologist, the mechanical manipulations of the obstetrician, and the necessarily rapid repetition of pelvic examinations in the out-patient clinic are unlike the careful recording of menstrual cycles and the precise timing in relation to the menstrual cycle of endocrine therapy, familiarity with the dosage, potency, toxicity and efficacy of different preparations, and the complementary activities of the adjoining endocrine laboratory unit. Nevertheless endocrinology is playing an increasing part in gynaecology. Let the gynaecologists single out and encourage a few of their promising young registrars and have them fully trained as endocrinologists, and then appoint them with consultant rank to gynaecological professorial units or special gynaecological hospitals. Then give them an endocrine laboratory, and they will provide an added stimulus to the work and enhance the reputation of the department or hospital concerned.

I have chosen only two examples: I could develop my theme further. Clinical endocrinologists are needed in thyroid clinics, fertility clinics, and departments of internal medicine, rheumatology, urology, dermatology, allergy, and even surgery. They may be purely clinical endocrinologists with a background training in either physiology or internal medicine, or they may be recruited from the ranks of the specialty on to which it is intended to graft endocrinology. In either case they should have full consultant status. This is not, in my view, an unrealistic dream. It needs enlightened boards of governors and tolerant and sympathetic medical committees, and heads of departments with a determination to carry out their plan. Unless in some such way consultant posts are created soon, endocrinology in this country will surely wither.

The *British Journal Photographic Almanac* for 1955 (Henry Greenwood and Co., 5s., or cloth-bound 7s. 6d.) has several articles on recent progress, both in techniques and apparatus, which will be of interest in hospital radiography departments. It is pointed out how much radiography has benefited from new advances in isotope production, and how photochemistry is helping to unravel complex chemical problems. A six-page table gives summary information about materials for medical photography. The photographic reproductions are excellent.

PNEUMOCOCCAL MENINGITIS

A SHORT SURVEY OF 78 PATIENTS IN THE BRISTOL CLINICAL AREA

BY

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In general the prognosis in pneumococcal meningitis has been poor; indeed, before the availability of the sulphonamides it was almost hopeless, 100% mortality having been recorded by Toomey and Roach (1939) and Silverthorne (1948), and a review of 631 cases from the literature revealed but one survival (Waring and Weinstein, 1948). After the introduction of the sulphonamides the mortality remained at about 60 to 80% (Table I), but marked improvement followed the introduction of penicillin, although very varied results have been reported (Table II). In some the mortality is 20% or less, but the average for the results quoted is 40% (Table II).

TABLE I.—Mortality of Pneumococcal Meningitis Treated with Sulphonamides Alone (Various Authors)

Authors	No. of Cases Treated	Mortality
Appelbaum (1945)	139	65%
Dowling <i>et al.</i> (1942)	72	94%
Hartmann <i>et al.</i> (1945)	34	63%
Hodes <i>et al.</i> (1943)	60	58%
Jackson (1950)	82 (excluding those treated with sulphonamide only)	79%
Neal <i>et al.</i> (1940)	30	67%
Rhoads <i>et al.</i> (1940)	22	68%
Sweet <i>et al.</i> (1945)	40	92%
Walker and James (1945)	28 (one patient treated with penicillin)	64%

TABLE II.—Mortality of Published Series of Cases of Pneumococcal Meningitis Treated with Penicillin

Authors	No. of Cases	Mortality
Appelbaum and Nelson (1945)	67	61%
Appelbaum <i>et al.</i> (1949)	125	26%
Bunn and Peabody (1952)	20	35% (25% if 2 patients who died during treatment from other causes are excluded)
Dowling <i>et al.</i> (1949)	87	56%
Feibush <i>et al.</i> (1952)	22	68%
Galloway and Chambers (1953)	27	33%
Gibson and James (1952)	31	10%
Hall <i>et al.</i> (1946)	17	24%
Jackson (1950)	51	43%
Lowrey and Quilligan (1948)	17	18%
Nemir and Israel (1951)	15 (all infants and children)	7%
Ross and Burke (1946)	19	16%
Smith <i>et al.</i> (1946)	38	24%
Sweet <i>et al.</i> (1945)	16	56%
White <i>et al.</i> (1945)	50	64%
Total	602	40%

Present Series

During the period January 1, 1946, to May 31, 1953, pneumococcal meningitis was diagnosed in 78 patients in hospitals for acute cases in Bristol. Hospitals for chronic cases were not included in the survey. A number of recurrences brought the total number of attacks of meningitis to 84, in 82% of which the pneumococcus was cultured from the C.S.F. either in life or at necropsy, and in the remainder it was seen in a stained smear.

Mortality.—Of the 78 patients 38 died, a mortality of 49%. A necropsy was performed on 28 (74%). The mortality calculated according to the number of attacks of meningitis was 45%.

Age Distribution.—The age distribution of the patients in 10-year periods is shown in Table III. In addition the period from birth to 1 year of age is included. The

TABLE III.—Age Distribution of 78 Cases of Pneumococcal Meningitis in Bristol

Age	No. of Patients	No. Dying	No. Recovering	Mortality
0-1 year	20	7	13	35%
0-9 years	42	15	27	36%
10-19	6	3	3	50%
20-29	2	1	1	50%
30-39	9	5	4	55%
40-49	3	1	2	33%
50-59	7	7	0	100%
60-69	8	5	3	62%
70+	1	1	0	100%
Total	78	38	40	49%

mortality for each age group is shown. Notable features are the relatively large number of infants and children under 10 years old and the steep rise in mortality for those patients aged 50 and over. Only 3 recoveries occurred in 15 patients in the latter group (82% mortality). For infants the mortality was 35%, or rather below the average (49%).

Cause of Meningitis.—In many of the patients there was a demonstrable primary focus of infection, in some it was apparent during life and in others only at necropsy. In a few trauma was the immediate cause and in a large group no cause was found (Table IV). Cases with a clear terminal

TABLE IV.—Apparent Primary Cause of Meningitis in 78 Patients

Apparent Primary Cause	No. of Patients	No. Dying	No. Recovering	Mortality
Middle ear or mastoid infection	30	12	18	40%
Pneumonia	8	4	4	50%
Nasal sinus infection	3	3	0	100%
Panophthalmitis	1	0	1	0%
? Bacterial endocarditis	1	0	1	0%
Trauma	9	4	5	44%
No cause found	26	15	11	58%
Total	78	38	40	49%

bronchopneumonia only have been excluded from the "pneumonia" group. In the "trauma" group six had head injuries, in two the meningitis followed nasal operations, and in one it followed a perforating injury of one internal ear.

Level of Consciousness on Admission to Hospital.—In 37 of the attacks the patient was either fully conscious or at worst stuporous on admission to hospital, and death followed in 9 (24% mortality). In 31 attacks the patient was delirious or comatose when admitted and death followed in 19 (61% mortality). In 12 attacks continuous convulsions were occurring at the time of admission and death followed in 8 (66% mortality). (Two attacks occurring in patients

TABLE V.—Distribution of Attacks of Pneumococcal Meningitis According to the Length of Illness Before Admission to Hospital*

No. of Days' Illness before Admission to Hospital	No. of Attacks of Meningitis	No. of Attacks with Fatal Outcome	No. of Attacks with Recovery	Mortality
Less than 1	10	7	3	70%
1	18	10	8	56%
2	9	6	3	67%
3	15	1	14	7%
4	5	2	3	40%
5	4	2	2	50%
6	1	0	1	0%
7	7	2	5	29%
More than 7	8	3	5	37%
Unknown	3	3	0	100%
Total	80	36	44	45%

* Excluding four attacks, two of which developed in patients who were being treated in hospital for another condition and two in patients transferred from outside the area for operation.

transferred to the area for operation and two in patients admitted to hospital for a condition other than meningitis have not been included.)

Duration of Illness Before Admission to Hospital.—An analysis of attacks according to the number of days of illness before the patient's admission to hospital is shown in Table V.

Treatment

Chemotherapy and Antibiotics

Table VI shows the sulphonamide and antibiotic treatment given. There are four groups: the first, designated "standard therapy," consists of attacks treated with a sulphonamide together with penicillin by both the intramuscular and the intrathecal routes. Group 2, designated

TABLE VI.—Sulphonamide and Antibiotic Treatment of 84 Attacks of Pneumococcal Meningitis

Treatment	No. of Attacks of Meningitis	No. of Attacks with Fatal Outcome	No. of Attacks with Recovery	Mortality
1. Standard treatment	54	20	34	37%
2. Incomplete treatment	14	11	3	79%
3. Additional treatment	13	4	9	31%
4. No specific treatment	3	3	0	100%
Total	84	38	46	45%

Occasionally one of the items of the "standard" treatment was omitted in patients in group 3.

"incomplete therapy," contains those attacks treated as in group 1 but incomplete in some respect—for example, no sulphonamide, no intrathecal penicillin, etc. Group 3 shows those attacks treated as in the preceding groups, but with one or more additional antibiotic. Group 4 shows those attacks not specifically treated.

The additional therapy in Group 3 consisted of intramuscular streptomycin in two attacks, intrathecal streptomycin in two, chlortetracycline (orally) in four, chloramphenicol (orally) in two, and chlortetracycline (orally) with intrathecal streptomycin in one.

The majority of patients receiving penicillin were given an intrathecal dosage of 5,000 to 30,000 units, once or at most twice daily. In two cases 500,000 units was given in error at a single injection and in both death followed within 24 hours preceded by generalized convulsions. Sulphonamides were used as for any acute infection, and intramuscular penicillin was given in a dosage which varied from about 100,000 to 1,000,000 units in 24 hours divided usually into three- or four-hourly doses. In 45 attacks under 250,000 units in 24 hours was given, and in the remaining 39 more than this amount was used. The mortality was 45% in the group receiving the smaller amount and 46% in that receiving the bigger dose. If the 10 attacks in which no penicillin was given intrathecally are excluded from the lower-dosage group the mortality in the remaining 35 attacks was 34%. Two of the patients receiving no intrathecal penicillin recovered.

Surgical Measures

The operation of mastoidectomy was performed five times in the series, being done 38, 8, 7, and 2 days after the patient's admission to hospital in the four cases which recovered. In the one fatal case, that of a baby aged 4 months, it was done on the day of admission. Burrholes were made in the skull for penicillin administration after the development of a block in the spinal theca on three occasions; one patient recovered. In one of the others the meningitis was apparently controlled after this treatment, but the patient remained comatose and died possibly with a cerebral abscess; there was no necropsy. Three further patients were investigated by ventriculography to exclude an intracranial abscess, but none was found. One had developed a right arm paresis which slowly recovered, and the other two were recurrent cases and are mentioned below.

Recurrent Cases

In five patients in the series recurrences occurred. In one, that of a boy aged 8 years when he had his first attack in 1947, recurrences occurred five times, with long intervals between attacks. Only in the first was an infective focus discovered and this eliminated by mastoidectomy. The second patient, a man aged 30, was reinfected through defects in the floor of the anterior cranial fossa. Removal of nasal polypi and a bilateral Horgan's operation were carried out in 1949, following which he had C.S.F. rhinorrhoea. Three weeks after the operation he developed a purulent meningitis from which no organisms were isolated. Two months later a proved attack of pneumococcal meningitis occurred, and after preliminary medical treatment an exploration revealed a hole in the right side of the floor of the anterior cranial fossa which was covered by a graft. After 18 months of good health another attack of pneumococcal meningitis occurred and yet another six months later. In March, 1951, further exploration revealed another hole in the floor of the anterior cranial fossa, this time on the left side, which was also covered by a graft. He remained free from further attacks of meningitis following this, only to die in May, 1953, from a spindle-cell sarcoma arising in his abdominal wall.

The third patient, a lad aged 16, was admitted to hospital with a purulent meningitis the day following a minor head injury in January, 1949; there was no radiological evidence of fracture. No organism was isolated. After a rapid recovery he remained well until 18 months later, when he had a proved attack of pneumococcal meningitis. A good response to medical treatment occurred and he has remained well since.

The fourth patient, a man aged 30, was admitted to hospital with pneumococcal meningitis after a history of 24 hours' headache and vomiting. He was in coma. He responded to treatment and no focus of infection was discovered. He remained well until four years later, when he had another attack, coma occurring only a few hours after the onset of headache. In spite of early treatment he died within 24 hours of admission. Necropsy revealed a purulent meningitis and an astrocytoma of the mid-brain causing obstruction of the aqueduct and internal hydrocephalus. There was no infective focus.

The last patient, a girl aged 16, had a splenectomy for Banti's disease at the age of 12 years and developed a meningitis one year later. No organisms were isolated. An attack of pneumococcal meningitis occurred after another two years (1950) and failed to respond well to medical treatment. She was therefore transferred to the Bristol Neurosurgical Unit for investigation, where ventriculograms were negative and the meningitis slowly responded to continued sulphonamide and penicillin therapy. A relapse occurred as soon as treatment was stopped, but she responded well to chloramphenicol. The presence of an apical systolic murmur in her heart suggested the presence of bacterial endocarditis and she was accordingly given a six-weeks course of penicillin, 2,000,000 units a day. She remained well until 1952, when she died at home after a short illness, possibly another attack of meningitis.

Associated Diseases and Conditions

The meningitis was found in association with other conditions in 10 cases: diabetes mellitus twice, Parkinsonism, cirrhosis of the liver, astrocytoma of the mid-brain, hydro-nephrosis and chronic pyelonephritis, right upper lobe bronchiectasis, Banti's disease, situs inversus totalis, and familial acholuric jaundice. All except the last two of these patients died.

Discussion

The present series of cases of pneumococcal meningitis is entirely unselected and includes patients already suffering from a serious disease, which accounts for the high mortality. If only those attacks in which full sulphonamide and penicillin therapy was given are considered the mortality is 37% of 54 attacks (Table VI), and, furthermore, excluding those cases in which death occurred within 24 hours of admission to hospital, the mortality becomes 28% of 43 attacks, a figure comparable with all but the very best results (Table II).

Age is a very important factor in relation to prognosis in the disease, particularly poor results occurring in patients aged 50 or more. This is not only the impression from the present series (Table III) but has also been the experience of others (Table VII), although it was not a notable feature

TABLE VII.—Relationship Between Age and Mortality Rate in Pneumococcal Meningitis. Percentages Calculated from Figures Given by Various Authors

Authors	No. of Cases	Mortality in Ages (Years)			
		Under 40	Over 40	Under 50	Over 50
Appelbaum (1945)	67	44%	73%	54%	72%
Feibush <i>et al.</i> (1952)	22	45%	80%	44%	85%
Jackson (1950)	125	67%	76%	—	—
Lepper and Dowling* (1951)	43	—	—	23%	41%
Sweet <i>et al.</i> (1945)	56	68%	89%	—	—
White <i>et al.</i> (1945)	50	—	—	52%	88%
Present series	78	41%	74%	40%	81%

* Not including chlortetracycline-treated cases.

of the series of Smith *et al.* (1946). Very young patients had a poor prognosis before penicillin became available (Cooke, 1941; Waring and Weinstein, 1948; Jackson, 1950), but the prognosis for infants when penicillin is used appears fairly good. With penicillin treatment, Waring and Weinstein (1948) noted a 69% recovery for patients under 2 years old (58 cases), while Nemir and Israel (1951) lost only one of nine infants, and Ross and Burke (1946) achieved a recovery of all nine infants. In the present series also the prognosis for infants with penicillin therapy was better than average (Table III).

The commonest predisposing cause of the meningitis in the present series was middle ear and mastoid infection (38%) (Table IV), but in 33% no cause could be found. Pneumonia has often been noted as a common if not the commonest cause of pneumococcal meningitis (Table VIII) but accounted for only 10% of the cases in this series.

Trauma is evidently a rare cause (Tables IV and VIII) but is, however, a very important one, as recurrences are

apt to occur, especially if the thin floor of the anterior cranial fossa has been fractured. The covering of the damaged bone with a graft of fascia lata proves an effective means of preventing further attacks. Defects in the floor of the anterior cranial fossa causing meningitis may be congenital in origin (Galloway and Chambers, 1953).

Coma and convulsions at the time of admission to hospital indicated a poor prognosis in this series, the difference in mortality between those fully conscious or only stuporous on admission and those having convulsions or comatose being statistically significant. This result might be reasonably anticipated; it was also found by Lepper and Dowling (1951), but was not confirmed by Feibush *et al.* (1952) in a small series of cases.

It is apparent from Table V that those patients who were ill for three days before admission to hospital had the best prognosis. There was only one patient older than 50 years in that group, but even after removing all patients aged 50 or more the mortality for those ill less than three days before admission was 61% (31 cases), for those ill more than three days 24% (21 cases), and for those ill just three days 7% (14 cases). All the fulminating cases are obviously included in the first group, in which 62% were in coma or having convulsions when admitted. Twenty-seven per cent. of the 14 cases ill for three days and 52% of those ill for more than three days before admission to hospital were in coma or having convulsions when admitted. It is probable that more of the last group would have recovered had full medical treatment been started earlier.

Combined sulphonamide and penicillin therapy still remains the treatment of choice in pneumococcal meningitis, and the penicillin should be given by both the intramuscular and the intrathecal routes. Excellent results have been obtained by this method (Ross and Burke, 1946; Smith *et al.*, 1946; Gibson and James, 1952) (Table II). Sulphonamides should be given as for any acute infection, but the daily intramuscular requirement of penicillin is not clear. Smith *et al.* (1946) were using at first about 120,000 units daily in three- or four-hourly doses or by continuous intramuscular infusion, while Gibson and James (1952) were using latterly 1,600,000 units daily. As already shown, in the present series those cases receiving more than 250,000 units daily fared no better than those receiving less, and the two groups appear comparable so far as age distribution and level of consciousness on admission to hospital are concerned. Dowling *et al.* (1949) have said that intrathecal penicillin administration is unnecessary provided that large enough doses are given intramuscularly. They treated 66 cases by the ordinary method and 21 cases without intrathecal therapy and 2,000,000 units of penicillin every two hours intramuscularly: the mortality of the first group was 66% and of the second 38%, results which are not good and can hardly be used as an argument for rejecting intrathecal therapy. Smith (1951) found a clinical and bacteriological relapse in a baby with pneumococcal meningitis when given a non-potent dose of intrathecal penicillin in spite of massive intramuscular penicillin dosage every two hours.

In spite of the 75% cure of 20 cases without intrathecal penicillin by Bunn and Peabody (1952), there is no convincing evidence that intrathecal therapy with penicillin should be abandoned. It should remain part of the routine management in pneumococcal meningitis, and should be given in daily doses of about 20,000 units for about 7 to 10 days or until the meningitis is obviously under control. Much larger doses should not be used, as they are known to produce damage to the spinal cord and cauda equina or even convulsions and death. As little as 50,000 units intraventricularly has produced convulsions (Johnson and Walker, 1945). Gibson and James (1952) thought the dangers were exaggerated and gave even their infants 50,000 units at a single dose.

Although there is no clear-cut evidence in favour of giving very large intramuscular penicillin doses when intrathecal

treatment is being given, it is probably wise to give at least 2,000,000 units daily in divided doses with intervals of not more than four hours between injections. Fortunately the pneumococcus is usually highly sensitive to penicillin and does not develop resistance during treatment.

There is no evidence in the literature that treatment with antibiotics in addition to penicillin will improve the prognosis. On the contrary, there is evidence that the addition of chlortetracycline therapy leads to a worsening of the prognosis. Lepper and Dowling (1951) treated 43 cases with the usual intramuscular and intrathecal penicillin and 14 with the addition of chlortetracycline. In the first group 30% of the patients died, and in the second 79%, a statistically significant difference.

Surgical treatment for the elimination of foci of infection in the ears, mastoids, or sinuses was regarded as a mainstay of treatment in pneumococcal meningitis before penicillin was available (Neal *et al.*, 1940; Walker and James, 1945), but with the use of penicillin Smith *et al.* (1946) never found such operations necessary in the acute phase and often not at all. Ross and Burke (1946) found no surgery necessary in their 19 cases. Mastoidectomy was required five times in the present series in spite of penicillin therapy. A certain number of recurrences can probably be prevented by the removal of chronic sepsis in ears, mastoids, and sinuses after treatment of the meningitis.

Burr-holes are made in the skull for the intraventricular administration of penicillin or for the diagnosis of an intracranial abscess. Penicillin may be given intraventricularly if a block with exudate prevents its free access to the brain when administered by the lumbar route. Cisternal administration of penicillin may suffice but does not guarantee that it will reach the ventricles. Spinal block is not common in pneumococcal meningitis. Intraventricular penicillin administration was needed in only two of the last 19 cases of Smith *et al.* (1946) and was required only three times in the present series. Intracranial abscess is also a rare complication. Smith *et al.* (1946) found this only twice in their 38 cases, and in reviewing the literature Waring and Weinstein (1948) found only 3.6% of 386 cases and none in 86 treated with both penicillin and sulphonamides.

Pneumococcal meningitis may complicate other and serious diseases as previously shown, when the prognosis is correspondingly poor. The association with diabetes mellitus and hepatic cirrhosis in this series led to diagnostic difficulties and delay in treatment.

Summary

A short survey of 78 cases of pneumococcal meningitis in the Bristol Clinical Area is presented with a discussion of certain aspects of aetiology, prognosis, and treatment.

The mortality was 49%, or 45% in 84 attacks of meningitis, as there were some recurrences. The cases were unselected, and included those already with chronic and wasting diseases.

It has been shown that the prognosis was much worse in patients over 50 years of age, but that the results in infants and young children were better than the average; also that coma or convulsions occurring at the time of admission to hospital influenced the prognosis very unfavourably.

Middle ear or mastoid disease was the commonest primary source of infection, but almost as frequently no source of infection or other predisposing cause could be demonstrated. Pneumonia was an uncommon source of the infection.

Prognosis was worse in those cases with a period of illness greater or less than three days before hospital admission, presumably because the fulminating cases

TABLE VIII.—Predisposing Cause of Pneumococcal Meningitis Expressed as Frequency Distribution in Percentages to Nearest Whole Number. Collected Figures of Various Authors

Predisposing Cause	Appelbaum <i>et al.</i> (1949)	Dowling <i>et al.</i> (1942)	Dowling <i>et al.</i> (1949)	Appelbaum and Nelson (1945)	Gibson and James (1952)	Jackson (1950)	Sweet <i>et al.</i> (1945)	White <i>et al.</i> (1945)	Total, Excluding Present Series	Present Series
No. of cases	125	72	87	67	31	125	56	50	613	78
Middle ear or mastoid infection	29%	29%	18%	45%	26%	29%	11%	46%	29%	39%
Pneumonia	22%	28%	32%	25%	23%	26%	34%	18%	26%	10%
Fractured skull or other trauma	6%	4%	2%	3%	13%	—	5%	—	3%	12%
Others	6%	25%	5%	3%	23%	7%	30%	12%	12%	6%
No cause found	38%	14%	43%	24%	16%	38%	20%	24%	30%	33%

* 3% had middle ear or mastoid infection also.

were admitted quickly while some of the others were left too late before in-patient treatment was started.

My thanks are due to the consultant medical staff of the Bristol Hospitals for permission to use their records, and especially to Dr. J. Macrae, of the Ham Green Fever Hospital, for his help; to Drs. A. M. G. Campbell and J. K. Lloyd for valuable criticism; and to Dr. G. Herdan for statistical advice.

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DESACETYL METHYLCOLCHICINE IN TREATMENT OF MYELOID LEUKAEMIA

BY

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In 1953 Moeschlin and colleagues reported that desacetylmethylcolchicine ("colcemid") had beneficial effects on a group of patients with chronic myeloid leukaemia, while some encouraging results were also noted in a few cases of acute myeloid leukaemia and in two patients in the acute myeloblastic phase of chronic myeloid leukaemia. On the other hand, chronic lymphatic leukaemia failed to respond and might even have been made worse. The profound depressive effects on the granulocytogenesis were accompanied simultaneously by a reduction in the size of the spleen and an increase in the red blood cell count and haemoglobin values.

Desacetylmethylcolchicine was isolated in a pure form by Santavy and Reichstein (1950) from the mixed alkaloid extract of *Colchicum autumnale* and was found to have a relatively low general toxicity, some 30-40 times less than colchicine (Schär *et al.*, 1954), which, although having a very marked inhibitory effect on cell mitosis, is too toxic for safe clinical use (Jacobj, 1890; Dustin, 1938; Bucher, 1939).

Lichtman (1954) has described in detail the effects of desacetylmethylcolchicine on the blood cellular elements in rabbits and cats, producing a diminution of total leucocyte count in two days after intravenous administration and in 12-14 days after oral treatment. With cessation of treatment the leucocytes rapidly returned to normal levels.

We have been able to repeat the observations of Moeschlin and his colleagues in a series of leukaemias and leukaemoid conditions, and are reporting here some of our results with chronic and acute myeloid leukaemias.

Dosage and Control

The initial oral dose of 3 mg. of colcemid daily was increased after three to four days to a total of 7-10 mg. daily according to the white-cell count. This dosage was continued until the leucocytes dropped to approximately 25,000 per c.mm., and was then stopped for three to four days. A daily maintenance dose of 3-5 mg. was then instituted. Daily white-cell counts, platelet counts, and haemoglobin estimations were performed until the maximal effect on the white cells had been attained; thereafter counts were done twice weekly and finally every one to two weeks.

Chronic Myeloid Leukaemia (8 cases)

Of eight patients with chronic myeloid leukaemia there was a distinct clinical improvement in six (Cases 1-6); their appetites improved, they gained weight and experienced far more energy; their spleens rapidly decreased in size and became barely palpable. In the remaining two (Cases 7

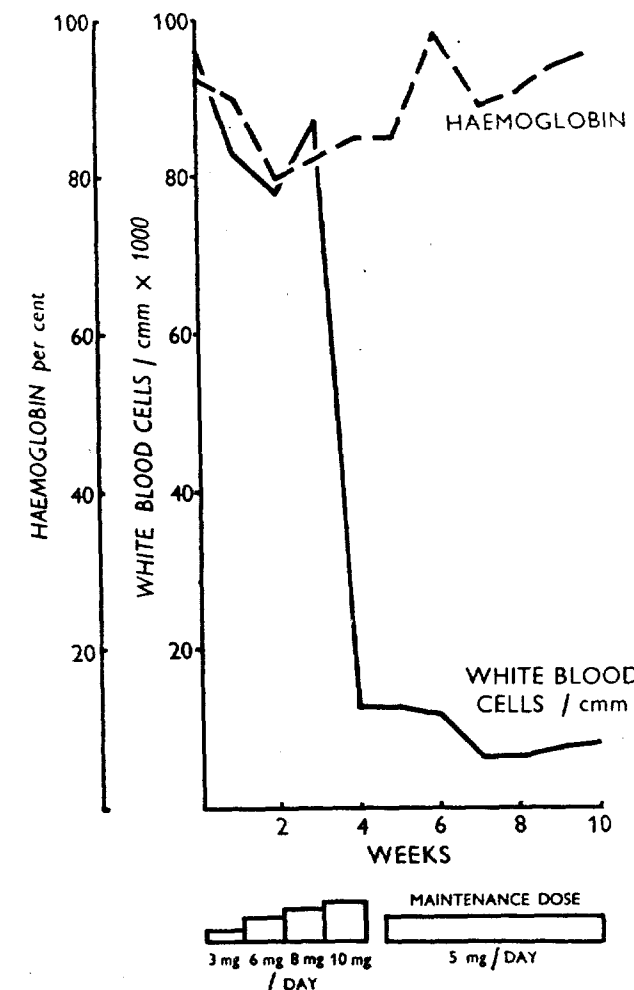


FIG. 1.—Case 6. Effects of colcemid on the total white cells and haemoglobin levels.

TABLE I.—Chronic Myeloid Leukaemia Treated with Colcemid

Case	Age and Sex	Before Treatment		After Treatment		No. of Days of Initial Treatment	Total Initial Course mg.	Max. Daily Dosage mg.	Maintenance Dosage mg.	Effects on Splenomegaly (cm. Below Costal Margin)
		W.B.C.	Hb	W.B.C.	Hb					
1	60 F	136,000	58%	4,100	71%	21	76	10	3	13 to 2
2	72 M	116,000	60%	3,900	69%	14	63	6	4	16 to 0
3	62 F	180,000	50%	5,500	64%	36	74	10	5	11 to 4
4	44 F	427,000	62%	26,000	80%	43	302	10	10	13 to 2
5	42 M	299,000	55%	13,050	70%	42	126	10	Discontinued (allergic reaction)	12 to 4
6	64 M	92,000	93%	12,000	96%	29	192	10	5	10 (no effect)
7	59 M	57,000	70%	6,950	73%	14	42	5	4	11 to 9
8	34 M	75,000		65,000		42	296	10	Discontinued (no effect)	

Previous treatment: Cases 2, 3, 7, and 8 had had myleran; Cases 3, 7, and 8 had also had 6-mercaptopurine.

and 8), colcemid had little effect on the splenomegaly, but these two had also become resistant to "myleran" and 6-mercaptopurine, both of which had failed to influence the degree of splenomegaly. In Case 7, in spite of a reduction in the white-cell count from 57,000 to 6,950 per c.mm., there was no improvement in the clinical condition.

In Table I details of these cases are shown. Cases 2, 3, 7, and 8 had received previous medication with myleran, and Cases 3, 7, and 8 had also had 6-mercaptopurine and had become resistant to treatment; one of these (Case 8) also failed to respond to colcemid. So far, Cases 1-6 have been maintained in satisfactory clinical and haematological states for periods of four to nine months on maintenance doses of 3-10 mg. All were treated as out-patients and carried on with their normal household duties or occupations.

In Case 5, in spite of a very satisfactory remission, colcemid had to be discontinued owing to an allergic reaction, but the patient maintained his improvement after a further three months. At the height of the depressant action on the granulocytes (white cells 11,400 per c.mm.) the patient experienced difficulty in swallowing and had scrotal tenderness and some loss of scalp hair. On examination there

was a generalized congestion of the fauces and erythema of the scrotum. This rapidly subsided on discontinuing treatment, and was thought to be a sensitivity reaction to colcemid.

It is important to institute a maintenance dose as soon as the white cells have reached the desired level; failure to do so may result in a rising white-cell count that may be resistant to treatment for several weeks. Fig. 1 shows the effects of instituting a maintenance dose at the correct time, and Fig. 2 shows the effects of withholding an early maintenance dose. It is interesting to note that the second course of colcemid found necessary to restore a normal white-cell count was much greater in total dosage than that required initially—229 mg. as against 63 mg.

In spite of the dramatic effect on the total white cells, in no case did the differential picture return completely to normal. In the majority there was a considerable reduction in the percentage of promyelocytes and myelocytes, but they persisted to a lesser degree when the white cells were restored to a more normal level; in several the initial basophilia persisted.

Marrow biopsies performed after treatment showed reduced cellularity and fewer promyelocytes and myelocytes, but the overall picture still remained that of chronic myeloid leukaemia.

There was a rise in the haemoglobin values and red-cell counts, but their maxima were not reached for several weeks after the white cells had reached their maximal fall. The platelet counts in all were unaffected by the treatment, many remaining at the original high levels.

Myelofibrosis

The effects of colcemid on two patients with myelofibrosis are shown in Table II. The two cases are described separately because, although presenting like chronic myeloid leukaemia, the clinical and haematological findings suggested that these were actually examples of myelofibrosis.

Case A.—A housewife aged 64, who had had rickets in her childhood, had received x-ray treatment for chronic myeloid leukaemia before she was referred to us; attempts to obtain a marrow specimen had been repeatedly unsuccessful. Five months after x-ray treatment she was admitted to hospital complaining of severe bone pains in the limbs, loss of energy, and dyspnoea. The spleen was enlarged 13 cm. below the subcostal margin; red cell count, 3,320,000 per c.mm.; haemoglobin, 60%; platelets, 130,000 per c.mm.; total leucocyte count, 56,400 per c.mm. (polymorphs 4.5%, lymphocytes 2%, monocytes 0.5%, eosinophils 0.5%, basophils 0.5%, "blasts" 3%, promyelocytes 3.5%, myelocytes 11.5%, metamyelocytes 3%, atypical cells 71%). The atypical cells resembled normoblasts but were found to be peroxidase-positive. Attempts to obtain marrow from the sternum and iliac crest were repeatedly

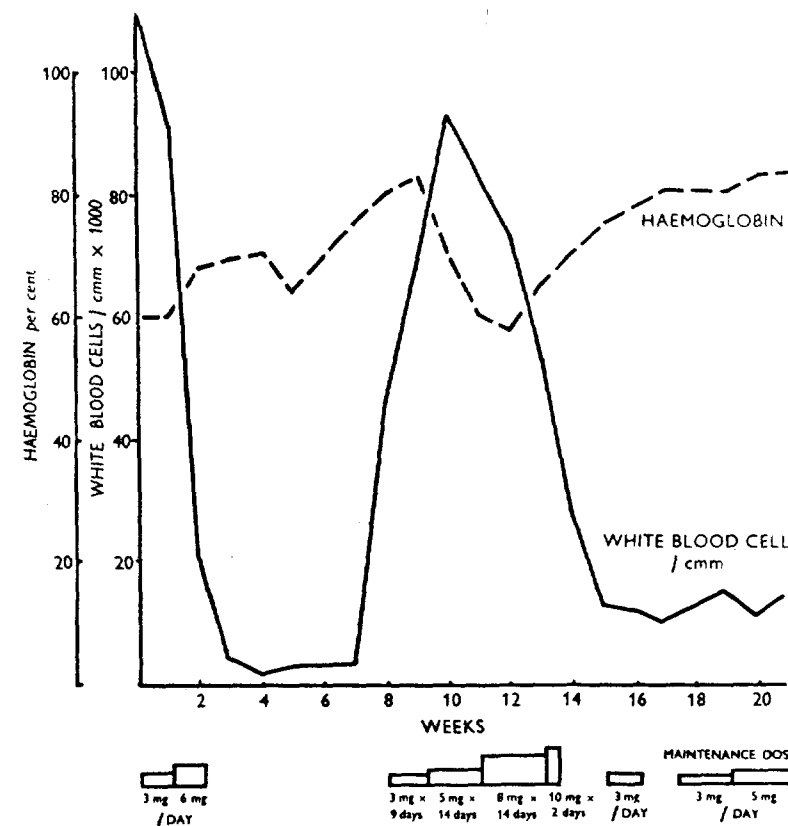


FIG. 2.—Case 2. Effects of colcemid on the total white cells and haemoglobin levels.

TABLE II.—Myelofibrosis Treated with Colcemid

Case	Age and Sex	Before Treatment		After Treatment		Duration of Initial Treatment (Days)	Total Dose (mg.)	Maintenance Dose (mg.)	Effects on Splenomegaly (cm. Below Costal Margin)
		W.B.C.	Hb	W.B.C.	Hb				
A	64 F	56,400	60%	7,200	56%	3	3	1	13 to 8
B	40 F	75,000	62%	26,100	56%	5	15	2-3	15, 11, 12

unsuccessful: the bones were found to be extremely hard, but x-ray films of the skeleton showed no detectable abnormality.

Colcemid was administered cautiously in a dose of 1 mg. daily, and after a total dosage of 3 mg. the white cells were 7,200 per c.mm., red cells 3,010,000 per c.mm., haemoglobin 54%, and platelets 125,000 per c.mm. The differential count showed a persistence of the atypical granulocytes: polymorphs 5.5%, lymphocytes 1%, monocytes 0.5%, eosinophils 1%, basophils 0.5%, "blasts" 2%, promyelocytes 2%, myelocytes 9%, atypical cells 78.5%. Transfusions were given and the haemoglobin eventually rose to 81%, and the loss of energy and dyspnoea subsided. The bone pains were controlled with phenylbutazone 200 mg. twice daily. She has been maintained in this improved clinical state for six months on a daily dose of colcemid 1 mg. The white-cell count has been kept within normal limits, but the abnormal differential has remained more or less unchanged.

Case B.—A housewife aged 40 was referred to us with a history of sudden haemoptyses and was found to have anaemia and considerable splenomegaly (15 cm. below the subcostal margin). A blood count showed: red cells, 4,550,000 per c.mm.; haemoglobin, 62%; platelets, 305,000 per c.mm.; white cells, 75,000 per c.mm. (polymorphs 54%, lymphocytes 11%, eosinophils 3.5%, basophils 4%, myeloblasts 13.5%, promyelocytes 1.5%, myelocytes 8%, metamyelocytes 4.5%); there were 6 nucleated red cells per 200 white cells. The marrow biopsies in several different bones were repeatedly unsuccessful; with the use of considerable force the needle entered the marrow cavity, but no marrow was ever aspirated. Radiological examination of the skeleton and chest was negative. After a total dosage of 15 mg. of colcemid, the white-cell count fell to 26,100 in five days (polymorphs 31.5%, lymphocytes 8.5%, monocytes 0.5%, eosinophils 3%, basophils 17.5%, "blasts" 14%, promyelocytes 4%, myelocytes 14%, metamyelocytes 7%); haemoglobin, 56%; red cells, 4,540,000 per c.mm.; platelets, 300,000 per c.mm. The patient felt improved in herself, had far more energy, and there were no further bleeding episodes. On a daily maintenance dose of 2-3 mg. this clinical improvement has been maintained for five months, the total white cell count has been kept within normal limits, but the abnormal differential count has remained unchanged.

Chronic Lymphatic Leukaemia

Case X.—A man aged 63 presented with generalized lymphadenopathy, splenomegaly (5 cm. below costal margin), and blood and marrow pictures of chronic lymphatic anaemia. The blood picture before treatment was red cells, 3,670,000 per c.mm.; haemoglobin, 83%, white cells, 224,000 per c.mm. (polymorphs 5%, lymphocytes 91%, lymphoblasts 3%, metamyelocytes 1%).

Colcemid, 3 mg., was given daily, and after six days' treatment the white cells had risen to 326,000 per c.mm., while the differential count showed 17% lymphoblasts. His general condition deteriorated with pyrexia, anorexia, and malaise. Treatment was discontinued and within seven days the "blasts" disappeared from the peripheral blood and the white-cell count dropped to its initial level, while his clinical condition slowly improved.

There is no doubt that colcemid aggravated the condition, and if treatment had not been discontinued an irreversible acute leukaemic phase might well have persisted. This experience is similar to that of Moeschlin *et al.* (1953), and we feel that colcemid should not be given to patients with lymphatic leukaemia.

Acute Myeloid Leukaemia

In Table III Cases I, II, and III had acute myeloblastic leukaemia which had failed to respond to other forms of therapy, and Case IV had received no previous treatment. Cases V and VI had suffered from long-standing chronic myeloid leukaemia which had developed an acute myeloblastic phase.

Colcemid was given in doses of 3 mg. daily and increased to a maximum of 5 mg. a day, while supportive therapy with transfusions and antibiotics was also given.

Colcemid had little effect on the clinical condition in Cases I-III; there was no improvement in general well-being and no effect on the bleeding diathesis. However, in all three

TABLE III.—Acute Myeloid Leukaemia Treated with Colcemid

Case No.	Before Treatment		After Treatment		Time taken (Days) for Blood Changes in the Previous Column	Previous Treatment	Duration of Leukaemia from Start of Treatment and Present Clinical Condition
	"Blast" W.B.C.	"Blast" Cells	"Blast" W.B.C.	"Blast" Cells			
I	37,100	95%	26,000	49%	14	6-Mercaptopurine, Cortisone A.C.T.H. gel	Died 3 months
II	18,100	13%	7,400	30%	17	"	" 3 "
III	24,000	54%	7,950	32%	27	"	" 5 "
IV	9,200	69%	2,400	19%	14	None	" 3 "
V	148,000	38%	253,000	32%	31	Myleran, 6-Mercaptopurine	Still living 4 months. Very poor condition
VI	57,000	42%	90,000	32%	21	Myleran	Still living 5 months. Very poor condition

was a fall in the total white-cell counts and a decrease in the number of myeloblasts. The red cells and platelets were reduced in numbers, and this would probably have been more pronounced had transfusions not been given.

Colcemid did not have any beneficial effect in Cases V and VI; in fact, their white-cell counts increased and their clinical condition deteriorated.

Discussion

The results of treating chronic myeloid leukaemia with colcemid are encouraging. It appears that this compound is a more selective granulocyte depressant than other chemotherapeutic agents. The disadvantage of myleran in producing thrombocytopenia and aplastic anaemia, and in some cases precipitating an acute myeloblastic leukaemia, have so far not been seen in any of this small group of cases after treatment with colcemid. This drug is more effective in the early stages of chronic myeloid leukaemia, but in one patient who had survived for four years (on a variety of chemotherapeutic agents) it was completely ineffective. The clinical effects are just as striking as the effects on the blood; with reduction of splenomegaly, improvement in appetite and increase in weight and general well-being were very notable features. From the early results with colcemid it would appear worthy of further trial in chronic myeloid leukaemia, so that its long-term effects may be compared with other well-tried forms of therapy.

In both the patients with myelofibrosis the white cells were extremely sensitive to colcemid and dropped to low levels in three and five days respectively. This is in sharp contrast to the effects on the white cells in the more typical chronic cases of myeloid leukaemias.

The results of treating acute myeloid leukaemia and the acute phase of chronic myeloid leukaemia were disappointing. In spite of some reduction in the number of myeloblasts in the differential counts clinical deterioration continued, and in no case was a complete or even temporary remission obtained.

Summary

The effects of desacetylmethylcolchicine ("colcemid") on some cases of chronic myeloid leukaemia, myelofibrosis, chronic lymphatic leukaemia, and acute myeloblastic leukaemia are described.

Colcemid is of greatest value in chronic myeloid leukaemia, having a distinct depressant action on the

granulocytes and producing rapid reduction of splenomegaly and a marked clinical improvement in six of eight such treated cases.

The disadvantage of many other agents such as myleran in producing thrombocytopenia and aplastic anaemia was not seen in cases of chronic myeloid leukaemia treated with colcemid.

The effects of colcemid on myelofibrosis are considered.

Colcemid would seem to be contraindicated in the treatment of chronic lymphatic leukaemia, and evidence suggests that it may even produce an acute change.

Colcemid has little or no beneficial effects on acute myeloblastic leukaemia.

This work has been done during the tenure by one of us (B.J.L.) of the Sybil Mary Pilkington Research Fellowship, and we would thank Messrs. Ciba Ltd. for the supply of colcemid.

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TEN-YEAR RECOVERY FROM CHRONIC LYMPHOCYTIC LEUKAEMIA

BY

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Reports of recovery from leukaemia are extremely rare. I wish to present the case of a patient who undoubtedly suffered from chronic lymphocytic leukaemia eleven years ago, but has since recovered both clinically and haematologically and has so far survived for ten years. I wish to stress that the point here is not the time of survival. Many patients have survived for ten and more years, but they have always shown signs of the disease, at least as far as an abnormal blood picture.

Case Report

The patient, a female textile worker, was born in 1882. In April, 1940, she had a severe attack of faucial diphtheria with pharyngeal palsy, diaphragmatic palsy, head-drop, and brachial palsy. There was nothing else relevant in her past history.

When seen on July 7, 1943, she complained of lassitude, dyspnoea, sweating, cramps in the legs, and indigestion for about one year. For the same period she had had two lumps in the left armpit.

Examination showed enlarged cervical, supraclavicular, axillary, and inguinal lymph nodes. They were firm, discrete, and quite painless. The spleen extended as far as the left iliac fossa, the notched medial border reaching the umbilicus. It was not tender. The sternum and tibiae were tender on tapping. There were some bluish nodules under the nail-bed of some toes. The urine showed a trace of albumin. There was no excess of urobilinogen or urobilin, and nothing abnormal in the deposit. Blood: R.B.C., 3,480,000; Hb, 70%; C.I., 1; W.B.C., 224,000 (polymorphs 3,360, lymphocytes 219,520, monocytes 1,120). The lymphocytes were fairly mature cells bigger than normal. The stain was taken well by the red cells. There were no nucleated red cells.

The patient was admitted for x-ray therapy, eight doses of 50 r each being given to the spleen. Thereafter the margin of the spleen was just palpable below the ribs, and the W.B.C. numbered 17,100, with 13,766 lymphocytes.

She began to lose her tiredness, dyspnoea, and abdominal pain, and started to feel well. The lymph nodes became gradually smaller, without, however, returning to normal size. The spleen was firm and painless and remained palpable three fingerbreadths below the left costal arch. Serial blood counts (see Table I) showed normal haemoglobin and red cells, with slightly raised total leucocytes, of which 75-80% were lymphocytes.

It was decided to give a further series of x rays to the cervical and axillary glands, and 50 r to four fields twice weekly to a total of 400 r was applied in May, 1944. Thereafter the glands were smaller, soft, discrete, freely mobile, painless, and about the size of a pea. The inguinal glands were no longer palpable. The size of the spleen was unchanged. The patient felt well in herself and did her housework and shopping.

In February, 1945, she developed a lower respiratory infection, the first of many more to follow. She made a slow recovery on symptomatic treatment, the blood picture being unchanged. After this the margin of the spleen could only just be felt below the ribs. The glands were unchanged in size. Further serial blood counts throughout 1945 and 1946 were normal (see Table I). In January, 1947, she again developed bronchopneumonia. In April the blood picture returned to normal. Cervical and axillary glands were palpable, and the spleen could not be felt. At the end of June, 1947, she again developed bronchitis, and a further bronchopneumonic attack occurred in December, 1947, and again in June, 1948. No glands could be felt anywhere, nor was the spleen palpable in December, 1948. In March, 1949, she started once more to cough and was feverish. She again had pneumonia in April, 1950, in January, 1951, and in April, 1952. She had a *Haemophilus influenzae* infection in January, 1953. In January, 1954, she developed erysipelas of the right cheek and forehead.

A blood count in July, 1954, revealed a hypochromic anaemia (Hb 65%). Seven weeks later, after iron medication, the haemoglobin was 83%.

Cases from the Literature

It is difficult to find sufficiently well-documented cases in the literature for comparison. Forkner (1938) quotes quite a number of cases, but most of these do not bear close scrutiny. Naegeli (1931), referring to chronic lymphocytic leukaemia, states that "published cures relate probably always to lymphatic reactions." Heilmeyer and Bege-mann (1951) in the latest German textbook do not even mention cure. Kolmer (1949) states that true leukaemia is invariably fatal, alleged recovery being due to errors in diagnosis. Wintrobe (1951) merely states that there are a number of reports of cure, but does not give his own opinion. So much for the rarity, even denial, of the possibility of recovery.

One case of recovery was described by Schiassi (1933).

A man aged 20 developed right pleurisy in 1911. In 1923 he developed left pleurisy with fluid. An enlarged spleen was found. A blood count in 1924 showed 200,000 leucocytes, of which 40% were immature granulocytes. Chronic myelocytic leukaemia was then diagnosed and a series of x-ray treatments were given. On his discharge in December, 1924, the leucocytes numbered 25,200, with 10% immature granulocytes. The spleen and liver were reduced to nearly normal limits. He returned to work. In July, 1928, he suffered from lassitude, loss of appetite, and pains in the right leg. He had 120,000 leucocytes (12% immature). Further x-ray therapy was given and the leucocytes fell to 12,400 on discharge. In December, 1931, he again felt weak and had pain in the left hypochondrium. The spleen and liver were not palpable. He had 18,740 leucocytes, with some myelocytes. In February, 1933, he had a haemoptysis. There were no palpable lymph nodes anywhere. The liver and spleen could not be felt. There was diminished air entry over the left lower chest and an x-ray film showed pleural thickening at the left base. The lung

TABLE I

Date	Hb %	R.B.C. (mil. c.mm.)	C.I.	Leucocytes	Polymorphs	Lymphocytes	Monocytes	Eosinophils	Basophils
				per c.mm.					
7.7.43	70	3.48	1.00	224,000	3,360	219,520	1,120	0	0
6.8.43*	75			41,400	4,554	36,432	414	0	0
13.8.43	62			17,150	2,658	13,806	600	86	0
17.8.43	62			17,100	2,650	13,766	684	0	0
29.9.43	89	5.35	0.83	9,900	1,881	7,920	0	99	0
7.12.43	97	4.44	1.09	9,100	1,729	7,189	91	21	0
8.2.44	86	4.81	0.89	10,900	2,289	8,284	327	0	0
18.4.44	95	4.54	1.05	11,200	2,016	8,848	112	112	112
31.5.44*	80	4.03	1.00	12,800	3,072	9,088	512	128	0
25.7.44	83	4.45	0.93	8,600	1,806	6,622	172	0	0
18.10.44	91	5.16	0.88	6,200	2,232	3,782	124	62	0
24.1.45	85	4.87	0.85	8,000	2,480	5,120	80	160	160
15.2.45†				3,800	1,786	1,938	76	0	0
24.4.45	93	4.94	0.94	7,200	2,160	4,896	0	0	144
7.8.45	105	5.34	0.98	5,000	1,568	2,700	0	50	50
6.11.45	89	4.90	0.86	4,900	1,568	3,185	147	0	0
7.5.46	87	4.91	0.89	3,300	2,079	1,089	132	0	0
6.8.46‡	77	4.39	0.88	2,800	1,484	1,036	168	84	28
4.1.47§	83	3.90	1.05	16,100	11,753	2,737	966	483	161
19.1.47§	73	3.83	0.95	11,100	8,325	1,443	666	666	0
28.4.47	85	4.49	0.95	7,900	4,503	2,528	632	237	0
18.8.47	80	4.64	0.86	1,525	320	1,159	31	15	0
19.9.47	84	4.59	0.92	5,000	3,100	1,550	100	200	50
8.3.48	93	4.54	1.02	2,600	1,820	624	78	52	26
6.8.48	90	4.81	0.94	7,000	4,690	2,030	140	140	0
29.12.48	89	4.36	1.02	5,700	3,591	1,710	228	114	57
5.8.49	84	5.02	0.84	5,300	3,816	1,219	212	53	0
9.1.50	87	5.02	0.87	4,500	3,060	1,215	225	0	0
7.8.50	97	4.26	1.14	4,000	3,000	960	40	0	0
27.6.51	82	4.68	0.88	7,300	4,307	2,774	146	73	0
25.7.52	85	4.73	0.9	5,000	2,800	1,750	250	150	50
14.7.53	92	4.61	1.0	3,200	2,080	864	64	160	32
21.6.54	65	5.53	0.59	6,800	4,352	2,108	272	0	68
11.8.54	83	4.90	0.85	3,900	2,652	1,092	117	39	0

* After x-ray therapy. † "Cold." Temperature 101° F. (38.3° C.), pulse 80. ‡ "Cold." § Pneumonia.

TABLE II (Modified from Schiassi, 1933)

Date	Hb %	R.B.C. (mil. c.mm.)	Colour-index	Leuco-cytes	Myeloblasts and Promye-cytes	Myelo-cytes	Metamye-cytes	Poly-morphs	Eosino-phils	Baso-phils	Lympho-cytes	Mono-cytes
				per c.mm.								
9.8.24	85	4.160	1.0	200,000	26,800	34,000	13,800	115,600	1,600	0	5,000	3,200
28.8.24	45	4.500	0.5	275,000								
5.9.24	First x-ray treatment											
9.10.24	54	3.800	0.71	152,800	13,752	10,696	22,920	79,456	7,640	1,528	10,696	6,112
31.10.24	Second x-ray treatment											
1.12.24	60	3.800	0.79	82,000								
18.7.28	54	4.750		25,200	504	630	1,764	17,388	756	252	2,142	1,764
24.7.28	Third x-ray treatment			120,000	6,000	8,400	0	102,000	1,800	0	600	1,200
25.7.28	Fourth "											
23.7.28	Fifth "											
27.8.28	47	3.800	0.61	12,400	Some myelocytes and promyelocytes							
8.1.32		4.108		18,740				14,992	187	187	2,624	562
19.5.32	90	4.900	0.91	7,000				5,915	175		665	245
8.3.33	60	3.725	0.81	7,400				6,038	222	45	414	618
7.5.33	80	4.600	0.87	5,100				3,825	102	26	867	280

fields were otherwise clear. No tubercle bacilli were found in the sputum. The blood (see Table II) showed a slight hypochromic anaemia. The number of leucocytes was normal. The differential count was normal except for an increased percentage of neutrophils and a decrease of lymphocytes.

Another case was reported by Gloor (1930) from Naegeli's clinic, but was followed up for only two years.

Discussion

The case of chronic myelocytic leukaemia reported by Schiassi seems the only one comparable to the case reported here. I have quoted it more extensively because I think it is not as well known as it deserves to be, possibly owing to the fact that it was published in a little-known journal. Schiassi himself concludes that one can no longer talk of leukaemia or a leukaemic myelosis, but that it is now a case of a chronic respiratory affection with slight hypochromic anaemia. The fact remains that his case shows five years' remission with clinical and haematological recovery.

With regard to the case now reported, I do not think that the diagnosis of chronic lymphocytic leukaemia is in doubt at all. The clinical findings, enlarged lymph nodes, and enlarged spleen, together with the blood picture of moderate orthochromic anaemia and 219,520 lymphocytes, represent a classical case.

The patient has twice been subjected to x-ray therapy. There was a steady decline in the number of lymphocytes after the first course, and after the second course the blood picture became normal and has remained so. It would be impossible now to make a diagnosis of chronic lymphocytic leukaemia from the blood picture. The spleen and lymph nodes were a little slower in regressing, but the spleen has been palpable since April, 1947, and the lymph nodes since August, 1948. A remarkable feature of this patient is her proneness to infections, almost wholly respiratory. It is not clear whether this is due to leukaemia or whether she has a diminished resistance, or whatever one likes to call it. It must be pointed out, however, that she did not suffer from these infections before she had leukaemia.

There is a voluminous literature covering the influence of infections on leukaemia. As regards the effect of infections, Jaffé (1932) found the normal defence reaction lacking in the absence of myeloid tissue. Wintrobe (1951) states that this is consistent with his findings of a higher incidence of infections in cases of lymphocytic as compared with myelocytic leukaemia, and an unusual vulnerability to infections in the former. My patient with chronic lymphocytic leukaemia seemed certainly more vulnerable to infections. However, as her blood picture has been normal for the past ten years it must be assumed that she possessed a normal amount

USES OF CHLORPROMAZINE IN MENTAL HOSPITAL PATIENTS

BY

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of myeloid tissue, sufficient for a normal defence reaction. Her proneness to infections cannot therefore be explained by a lack of myeloid tissue. If one assumes that it has some connexion with the leukaemia one has to look for another explanation. It may be that the formation of antibodies was altered in some way, if it is assumed that these are formed by lymphocytes. However, this is unproved. Hickling and Sutcliffe (1928) report a case of pneumonia in chronic lymphocytic leukaemia in which they found a moderate amount of protective antibodies in the serum after recovery.

The question of a remission of leukaemic signs through intercurrent infections has been summed up by Wintrobe and Hasenbush (1939). They come to the conclusion that there is little evidence for this even in the literature. In the case here presented it does not seem that the frequent infections have contributed to the remission. The recovery has taken place throughout unaffected by the infections.

Summary

A case is presented of ten years' clinical and haematological recovery from chronic lymphocytic leukaemia.

The clinical history of the patient, with blood pictures extending over eleven years, is given.

The literature is reviewed and one similar and one doubtful case are quoted and discussed.

The present case is discussed as regards diagnosis, frequency of intercurrent infections, and the influence of infection on leukaemia.

It is a great pleasure to thank Dr. C. J. Young, head of the Pathological Department, Bradford Royal Infirmary, for his constant encouragement, without which this paper would not have been written, and for kindly going through the manuscript. He has also given me considerable help with the laboratory investigations and advice in the management of the patient. I also wish to thank Dr. F. E. Chester-Williams for treating the patient and for permission to quote details of the x-ray treatment.

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The number of fatal accidents in the home is rising every year, according to the figures quoted by C. A. Boucher in the March issue of the *Monthly Bulletin of the Ministry of Health*. Whereas there were 4,904 fatal accidents in 1949, in 1953 there were 5,895. During the last ten years 57,413 people have died as a result of home accidents, and of these approximately 10,000 were children aged under 5; children under 5 and old people of over 65 accounted for four-fifths of the total figure, the peak risk period for a child being in the third year of life. Although 1953 saw a drop in the figures of children killed accidentally, the number of old people affected increased, about 60% of the accidents in this group being due to falls. It was hoped that the regulations introduced under the Heating Appliances (Fireguards) Act of 1952 would reduce the fatalities due to burns, but the provisional figures for 1954 indicate that the situation has worsened. The regulations apply only to heating appliances on sale and not to those already in the home. To counteract the large number of these fatal accidents the Home Safety Department of the Royal Society for the Prevention of Accidents has set up 70 local committees and hopes to set up more. A Home Safety Group has also been inaugurated, which will supply posters and propaganda.

Since its original use by Laborit and Huguenard (1951) in anaesthetic practice chlorpromazine hydrochloride ("largaetil") has found a steadily increasing application first in the anaesthetic sphere and later in psychiatry.

Courvoisier *et al.* (1953) have investigated the pharmacology of the drug in animals, and from the psychiatric standpoint its most important properties appear to be its depressant effect on central nervous and autonomic activity and its potentiation of narcotic and analgesic drugs.

Early investigation into the psychiatric uses of the drug by Delay and his collaborators, reported in a series of papers (see References), has subsequently been confirmed and enlarged upon by a number of workers on the Continent, particularly by Sigwald and Bouttier (1953a, 1953b), Staehelin and Kielholz (1953), Flügel (1953a), and more recently in this country by Anton-Stephens (1954). All authors are agreed that its most striking effect is its sedative action in all states of tension, agitation, or excitement of whatever origin, but that this sedative effect is entirely different from that produced by the barbiturates or other hypnotics in that the patient is able to take a normal interest in his environment and perform his ordinary duties without, except in the early stages, any undue sleepiness.

Even when a soporific state arises, the patient is as easily roused as from normal sleep and tends to fall asleep only if he has no external interests at the time. Furthermore, Flügel (1953b) has shown that there is no falling off in mental capacity as measured by psychological tests—in some cases there is even an increase—and that the E.E.G. is not altered in the same way as with ordinary hypnotics. This unique sedative action of the drug has been variously described as a "chemical leucotomy" (Delay and Deniker), "a harmonizing of the personality" (Flügel), and "a state of psychic indifference" (Anton-Stephens).

The drug has been used in a wide variety of psychiatric conditions, and some success has been reported in almost all these conditions, but the most generally accepted indications are excitements of all kinds (manic, schizophrenic, or organic), agitated depression, neurotic tension states, and drug intoxications. Opinion about its effect on chronic psychotic states is more divided, but these conditions have been less extensively investigated.

Chlorpromazine has been in use at Springfield Hospital since November, 1953, and between then and the end of July, 1954, just under 500 patients have received the drug for periods varying from a few days to six months.

This paper reports the findings on the 205 patients (55 male and 150 female) who received treatment between November, 1953, and the end of March, 1954.

Selection of Material and Assessment of Results

The earliest cases treated were seriously disturbed chronic psychotics, but as the efficacy of the drug became more apparent the field of application steadily widened to include every type of case catered for by a large mental hospital.

Acute and chronic disturbed psychotics, however, are by far the largest class of patients in the series.

Patients whose treatment had to be stopped for any reason before they had received it for a week, and the few who had E.C.T. concurrently, are excluded from the results, otherwise the series includes all patients starting treatment during the stated period.

Results were assessed either when treatment was stopped or, in cases in which treatment was prolonged, at a time not less than eight weeks after the start.

The following criteria of improvement were used:

1. Not improved.—Slight or no change either in symptoms or in behaviour.
2. Slightly improved.—Decrease in symptoms and disappearance of gross behaviour disturbance.
3. Moderately improved.—Improvement in adjustment at hospital level or to the outside world at a dependent level, as shown by taking an interest in environment and in ward social activities and employability within the hospital.
4. Much improved.—Improved in adjustment to the outside world at an independent level, as shown by increase in initiative, reliability, and responsibility.
5. Recovered.—Symptom-free, with insight and capacity for adjustment to the outside world at the same level extant before the breakdown.

Where there was any doubt about the correct assessment the less favourable was chosen.

Dosage and Management of Cases

The early cases received a commencing daily dosage of 25 mg. t.d.s. intramuscularly, increasing to 50 mg. t.d.s. after the first three days. At the end of a week they were given the same dose orally. Despite reports that the drug is fully and rapidly absorbed from the intestinal tract, it was soon realized that a larger oral dose was required to produce the same effect. The oral dose was therefore increased to 75 mg. t.d.s. Later the intramuscular route was abandoned except in those who were too resistive to take drugs readily by mouth, as there seemed no special advantage in starting treatment by injection. This, however, is contrary to the findings of most other workers, who advocate starting treatment by injection except in very mild cases. Subsequent attempts to confirm the finding that treatment is more effectively initiated by intramuscular injection have failed to reveal any advantage. Improvement when it occurred was gradual whether the drug was administered orally or by injection, and the dramatic effects produced in the first 24 hours that are quoted by most authors were absent in this series.

Although there were many individual variations, the most generally adopted scheme of dosage in the later cases was to give 50 mg. t.d.s. orally in the first week, 75 mg. t.d.s. in the second week, and 100 mg. t.d.s. in the third and subsequent weeks. Very few patients failed to tolerate this dosage, and these were mainly among the neurotics and mildly disturbed psychotics.

Some patients received higher dosages than 300 mg. daily, but in general the impression gained was that most patients who improved with the drug did so on 150 mg. daily. Of those who failed to improve on 150 mg. a large number improved when the dose was increased to 225 mg. daily, and of those who still failed to improve at this level a few did so on 300 mg. Little further improvement could be expected with higher doses.

The more disturbed and chronic psychotic patients both tolerated higher dosages and required more drug to produce betterment. Improvement was noticed in some cases within a few days of starting treatment but in others not for several weeks. In only one case did improvement start after the patient had been on treatment for more than two months, and in the great majority of cases the maximum benefits of the drug had been achieved in three months. Treatment was therefore not abandoned as useless in under two months and was not as a rule prolonged beyond three. It was

terminated abruptly without any withdrawal effects being noticed in any case.

Almost all cases treated were ambulant from the start, the only exceptions being those whose mental state necessitated a period in bed, and all elderly people or those with cardiovascular dysfunction. Although a few patients complained of slight giddiness, particularly during the first few days of treatment or immediately following an increase in dosage, no marked hypotensive effects were observed except in those with arteriosclerosis or some other cardiovascular disease and in one other case.

In the early cases all sedatives were withdrawn and only later prescribed with great caution owing to the possible risk of potentiation. Experience, however, showed that this risk was negligible in normal dosage, most patients not only tolerating but also at first requiring whatever sedatives they had been having before the start of chlorpromazine treatment. The potentiating effect of chlorpromazine was noticeable only in those in whom continual narcosis was produced, when it was possible to do so with much smaller doses of barbiturates in association with chlorpromazine than would have been possible with barbiturates alone.

Unless, therefore, individual needs suggested some modification, it was customary to treat ambulant patients with an initial dosage of 150 mg. daily; to increase this to 300 mg. in the course of three weeks; and to maintain it at this level for three months, when treatment was abruptly terminated. But as opinion about the most suitable dosage and duration of treatment was changing throughout the period under review there is no doubt it will continue to evolve in the light of further experience.

Results

Table I shows the results in the different diagnostic groups in 196 cases. The remaining nine patients died while under treatment. They were all elderly patients and seriously ill physically before chlorpromazine was started. None were

TABLE I.—Results in Different Diagnostic Groups

Diagnosis	Recovered		Much Improved		Moderately Improved		Slightly Improved		Not Improved		Total No. of Cases
	No.	%	No.	%	No.	%	No.	%	No.	%	
Schizophrenic group of diseases	4	3	17	12	39	29	39	29	37	27	136
Endogenous depression	2	11	4	21	4	21	2	11	7	37	19
Neuroses and psychopathic states	2	11	6	33	2	11	1	6	7	39	18
Organic states	—	—	—	—	6	38	5	31	5	31	16
Mania and hypomania	1	14	—	—	2	29	2	29	2	29	7
Total	9	5	27	14	53	27	49	25	58	29	196

expected to live. The cause of death, which was in each case ascertained by post-mortem examination, was pulmonary embolus from femoral thrombosis in one case, and in the rest either bronchopneumonia or the cardiovascular changes associated with senility. It was not thought that chlorpromazine could in any way be incriminated.

Schizophrenics comprise the largest single group, and a sufficient number have been treated to form a rather more definite impression of the value of the drug than in any other diagnostic group. But although 136 cases have been treated, no very definite prognostic criteria have emerged, both remarkable successes and equally unexpected failures being quite common. In the more acutely disturbed patients, the drug has a quieting effect in a few days, but the dramatic change described by other authors within 24 hours has not been noticeable in this series. In fact, where excitement has been intense it has invariably been necessary to give barbiturates in large doses in addition to chlorpromazine. It is, however, in just these acutely disturbed patients that the prognosis in schizophrenia is best, and it is doubtful whether chlorpromazine in any way improves

the outlook, although it is certainly a very effective sedative when used either alone or in conjunction with barbiturates.

On the other hand, in schizophrenics of poor prognosis—that is, in chronic cases and in the paranoid group—the value of the drug is much less ambiguous. Of the 136 schizophrenics treated, 55 had been in hospital continuously for two years or longer; their average age was 41 ± 1.8 years and the average stay in hospital prior to treatment 8.5 ± 0.9 years. All of them were seriously disturbed patients, but in this extremely unpromising group the following results were obtained: much improved, 2 (4%); moderately improved, 15 (27%); slightly improved, 21 (38%); not improved, 17 (31%).

The two patients who were much improved had both been in hospital for four years and both had previously had insulin, E.C.T., and prefrontal leucotomy without any improvement at all. They were both very difficult turbulent patients. One of them has now been out of hospital for three months and is earning her living, and the other is expecting to leave shortly.

The effect of the drug in these cases is somewhat similar to that of leucotomy but without its disadvantages. There is first a stage which Anton-Stephens well describes as one of psychic indifference in which delusions and hallucinations persist but no longer have the same emotional significance, and consequently there is considerable improvement in behaviour. Later the delusions and hallucinations themselves fade and in some few patients an unexpected degree of insight has developed.

In some patients the effects are clearly symptomatic only, as relapse occurred shortly after withdrawing the drug. But, although the long-term results of chlorpromazine treatment are as yet unknown, immediate relapse is surprisingly rare even in chronic patients if the drug is not withdrawn too soon. And improvement, once started, often continues for many weeks after the drug has been discontinued. It is felt, therefore, that an important effect of chlorpromazine is to make possible the rehabilitation of patients who were formerly too disturbed for this to be accomplished. In this respect it can again be compared to leucotomy.

In endogenous depression the results shown in Table I are unimpressive. This can largely be attributed to the fact that patients who failed to respond quickly to chlorpromazine were taken off the drug and given E.C.T. It is therefore possible that if treatment had been prolonged results would have been better. In general it was felt that E.C.T. is a more effective treatment for depression than chlorpromazine. On the other hand, in two cases of chronic retarded depression of nearly two years' duration which had either failed to respond or had responded but briefly to E.C.T., given on more than one occasion in the past, the results were excellent, a far more satisfactory remission being achieved with chlorpromazine, and one which has so far lasted in the first instance for four months, and in the second for two. Chlorpromazine may therefore prove a useful line of treatment in cases of depression which fail to respond to E.C.T.

In the 16 patients suffering from organic dementia improvement was largely symptomatic and relapse was frequent when treatment was stopped.

The findings in neurotic patients were in agreement with those of other workers in suggesting that states of anxiety or emotional tension were the most likely to respond to chlorpromazine. On the other hand, one chronic hysteric, whose principal complaint was irritation of the ear, completely lost her symptom. That this was a direct response to chlorpromazine and not due to suggestion was demonstrated by substituting identical neutral tablets, unknown to the patient, when her symptoms returned, to disappear once more when chlorpromazine treatment was resumed.

Psychopathic states behaved in a similar way to neuroses, the best results occurring when there was considerable associated anxiety. In one class of patients, the aggressive psychopaths, chlorpromazine appeared definitely to be con-

traindicated. Not only did it not produce any improvement, but it often increased the tendency to explosive outbursts of violence. While the number of cases in the series is too few to be more than suggestive, this experience has been repeated in cases treated subsequently.

Of the seven cases of mania and hypomania treated, only one was better than moderately improved. This man, who recovered, was the only case of acute manic excitement treated, and the effect of chlorpromazine was very impressive. Barbiturates had controlled his excitement only very ineffectively and he had developed pneumonia, so that both his physical and his mental conditions were causing grave concern. Within 48 hours of starting chlorpromazine he was overactive and euphoric, but was co-operating well and was no longer a nursing problem of any sort. The other six cases were all chronic hypomanics, and a good hospital adjustment was the best that could be achieved.

All patients were classified as acute, subacute, or chronic cases, according to the time they had been in hospital before treatment was started. Those who had been in less than six months were regarded as acute cases, from six months to two years as subacute, and over two years as chronic. This method of classification has the merit of being unambiguous. On the other hand, it does not take into account previous breakdowns, or the duration of the illness prior to admission. As information on this score was too often missing, it was felt to be the most satisfactory classification in the circumstances, but it is obviously biased towards the acute end of the scale.

In general, most of the acute cases were receiving chlorpromazine as the first line of treatment, the subacute group had recently failed to respond to some other form of therapy, and the chronic group had already received all appropriate treatment for their condition without improvement. There was no difference in the average age of the three groups, which was just over 40, nor in the dosage they received, and the mean durations of illness were 6 weeks, 13 months, and 9 years respectively.

Table II shows the results.

TABLE II.—Results Analysed According to Duration of Stay in Hospital Before Treatment

Time in Hospital Before Treatment	Recovered		Much Improved		Moderately Improved		Slightly Improved		Not Improved		Total No. of Cases
	No.	%	No.	%	No.	%	No.	%	No.	%	
1-6 months	9	10	20	21	23	25	19	20	22	24	93
6-24 "	—	—	5	13	15	39	6	16	12	32	38
Over 2 years	—	—	2	3	15	23	24	37	24	37	65
Total	9	5	27	14	53	27	49	25	58	29	196

As might be expected, the best results were achieved in the acute cases. But there are too many imponderables concerned in assessing the results in acute psychiatric cases for any definite assertions to be made about a new line of treatment unless carefully controlled trials are made, and this the present survey does not pretend to be. The preliminary impression gained is that chlorpromazine has a part to play in the treatment of acute psychiatric conditions of all sorts, but the detailed indications for its use remain to be worked out. In the subacute group, the part played by extraneous factors in any improvement produced becomes less important, and in the chronic cases any change can even more certainly be attributed to the drug. It is in these two groups that the value of chlorpromazine is felt to be beyond doubt.

It will be noted that 37 out of the 103 subacute and chronic patients (36%) reached a level of good hospital adjustment or better. All the patients in these two groups were previously making a poor adjustment and the great majority were seriously disturbed.

The indications for chlorpromazine have been considered by most authorities to be largely symptomatic—that is, in

states of excitement, agitation, or emotional tension. All patients were classified, therefore, according to their psychomotor state. In the overactive group were classed excited, aggressive, or emotionally unstable schizophrenics, manics, agitated depressives and seniles, and anxious neurotics, while the inhibited group contained catatonic stupors and detached schizophrenics, retarded depressives, and apathetic neurotics. Detached schizophrenics who became periodically impulsive were placed in a separate category.

The results shown in Table III are somewhat surprising. Although more patients recovered in the overactive group and more inhibited patients did not improve, if the recovered

TABLE III.—Results Analysed According to Psychomotor State

Psychomotor State	Recovered		Much Improved		Moderately Improved		Slightly Improved		Not Improved		Total No. of Cases
	No.	%	No.	%	No.	%	No.	%	No.	%	
Overactive	8	6	17	13	31	25	35	28	35	28	126
Inhibited	1	2	9	17	15	29	6	12	21	40	52
Inhibited with impulsive outbursts	—	—	1	6	7	39	8	44	2	11	18
Total	9	5	27	14	53	27	49	25	58	29	196

and much improved are grouped together on the one hand and the slightly improved and not improved on the other, the results are almost identical in both inhibited and overactive patients. This suggests that some revision is needed in the conception of chlorpromazine as being mainly a symptomatic treatment for excited states.

Chlorpromazine and Leucotomy

The effects of chlorpromazine have often been compared to those of leucotomy. It might therefore be supposed that patients in whom leucotomy had failed would equally fail to respond to chlorpromazine, and, conversely, that chlorpromazine might prove a useful prognostic indicator for leucotomy. Neither of these suppositions is borne out by the results in this series.

The results in 28 patients in the series who had previously been leucotomized were as follows: much improved, 3 (11%); moderately improved, 6 (21%); slightly improved, 11 (39%); not improved, 8 (29%). These results do not vary significantly from those in the series as a whole, and lend further support to the view that chlorpromazine can be of value in prognostically poor cases.

On the other hand, four patients who failed to respond in any way to chlorpromazine have made a very good immediate response to leucotomy, though it remains to be seen whether this will be maintained.

Side-Effects and Toxic Reactions

The various side-effects and toxic reactions recorded in the literature were noted in this series, but, as their occurrence in a much larger number of cases is the subject of a separate communication, no details are mentioned here.

Summary and Conclusions

The results in 205 patients treated with chlorpromazine are examined.

A tentative scheme of dosage and duration of treatment is discussed. It is not felt that the intramuscular route offers any advantages over the oral.

Results in the different diagnostic categories suggest that chlorpromazine may play a useful part in the treatment of acute states of excitement of all sorts, in neurotics in whom tension or anxiety is a prominent symptom, and in some depressive patients in whom E.C.T. has proved ineffective.

The most striking results, however, were obtained in chronic psychotic patients in whom the prognosis would

normally be very bad. It enabled a few of these patients to be discharged and many more to make a good hospital adjustment.

In chronic patients it was felt that the chief part played by chlorpromazine was to make possible the rehabilitation of those in whom this was formerly impossible and that, while in some relapse occurred immediately treatment was stopped, in others improvement still continued.

There seemed to be little difference between its effect on overactive and inhibited patients.

As good results were found after leucotomy as in other chronic patients.

I wish to thank Messrs. May & Baker for kindly making supplies of chlorpromazine available for this trial; Dr. Robert Forgan, of May & Baker, for his very valuable help and advice; and Dr. H. C. Becle, medical superintendent of Springfield Hospital, for much helpful criticism in the preparation of this paper.

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CHLORPROMAZINE IN TREATMENT OF ELDERLY PSYCHOTIC WOMEN

BY

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One of the difficult nursing problems in a mental hospital concerns the group of elderly long-stay patients who suffer from periods of restlessness, confusion, and disorientation or who are continually in a state of agitation, with stereotyped speech and activity. The Board of Control (1954) stated that, "on January 1, 1953, 28.8% of the mental hospital population were over the age of 65 and two-thirds of these were women."

A related problem is the shortage of nursing staff, owing to which large wards of noisy, difficult patients have to be in the care of too few nurses, or patients have to be left at night with inadequate supervision. It is hoped to show that chlorpromazine ("largactil") may play a part in the solution of these problems.

Since interest in the psychiatric use of chlorpromazine was roused by Sigwald and Bouttier (1953), who summarize the literature, and by Ey and Bérard (1952), who used it as a method of prolonged sleep treatment (*cure de sommeil*) in psychiatric patients, various authors in this country have published series of cases suggesting its value when tension and agitation predominate—Anton-Stephens (1954) on psychiatric patients with varying diagnoses, Garmany *et al.* (1954) in psychoneurosis, Elkes and Elkes (1954) in psychosis, and Howell *et al.* (1954) in geriatrics.

The present series is a group of elderly psychotic women with varying diagnoses but having in common

the fact that they became nursing problems because they were noisy, abusive, violent, and destructive, or required constant attention for feeding and dressing.

Case Material

Forty-eight women aged from 58 to 87 were chosen, all being nursing problems to a varying degree. Many had been in hospital for several years, but some had been recently admitted with diagnoses of senile dementia. Table I shows the age grouping and the diagnoses.

TABLE I.—Age Grouping and Diagnoses

Age	No.	Diagnoses	No.
58-60	1	Schizophrenia (including paranoia paraphrenia)	13
60-70	18	Agitated depression	6
71-80	22	Dementia (all organic causes)	29
Over 80	7		
Total	48	Total	48

Two of the patients were later withdrawn from the trial—one because she developed jaundice, and the other because she fell and sustained a fractured femur.

Method

These 48 patients were divided into two groups: the parenteral Group P (22 patients), beginning treatment by injection, and the oral Group O (26 patients), receiving oral treatment only.

Group P.—Eleven of these patients were given a course of 50 mg. of chlorpromazine thrice daily by injection for one week, followed by 50 mg. thrice daily by mouth for three weeks. At the same time the other 11 patients received one week's treatment with an equivalent volume of inert control injection followed by three weeks' treatment with inert tablets. At the time of the experiment no one knew into which half of the group each patient fell. At the end of the first four weeks the two half groups were reversed, so that those receiving chlorpromazine now received control tablets while those on control tablets received chlorpromazine. For reasons discussed later, it was felt that patients should not receive further parenteral therapy, and oral therapy alone was used in the second month.

Group O.—This group originally consisted of 26 patients, half of whom began treatment with chlorpromazine, 25 mg. thrice daily for three days, then 50 mg. thrice daily for ten days, and 75 mg. thrice daily for two weeks. It was from this half of the group that the two cases had to be withdrawn. The other half received corresponding numbers of control tablets, and after a month the two halves of the group were reversed in a manner similar to that described above.

Summary of Results

Table II shows the number of patients in each group falling into categories of improvement. Three degrees of improvement were considered:

- + Some improvement: somewhat less agitated and restless; able to sleep without sedative.
- ++ Definite improvement: more rational and talkative; less restless; not so disturbed by delusions.
- +++ Marked improvement: able to look after herself, whereas she had been unable to do so hitherto; spontaneous conversation; could take part in social activities.

Dealing first with Group P, and taking the two treatment subgroups together and the two control subgroups together—that is, A1 and B2, also A2 and B1 (see Table II)—and grouping the results as either improved or not improved, we get $\chi^2 = 17.8$ and $P \leq 0.001$. The difference between the treatment and the control groups was highly significant. Similarly, in Group O $\chi^2 = 16.3$ and $P \leq 0.001$ —again highly significant.

TABLE II.—Number of Patients Falling into Various Categories of Improvement

	Group P				Group O			
	Improvement			No Change or Relapse	Improvement			No Change or Relapse
	+	++	+++		+	++	+++	
1st month:								
Treatment (A1)	4	5	2	0	2	2	3	4
Control (B1)	1	0	0	10	3	2	0	8
2nd month:								
Now control (A2)	3	0	0	8	2	1	0	8
Now treatment (B2)	2	3	2	4	8	2	0	1

The two patients who were withdrawn were in subgroup A1 of Group O.

It is necessary to differentiate clinically between those patients who improved on treatment and relapsed when receiving control tablets and those who improved when receiving control tablets or in whom no change took place. Combining Groups O and P, patients were found to fall into six further groups (Table III). It will be seen that 28 (60.9%) cases showed some degree of improvement with chlorpromazine, while if group 3 is added the figure is 33 (71.7%).

TABLE III.—Number of Patients in Each Category of Improvement

Group	No. of Patients
1 Improved on treatment. Relapsed on control	12
2 No change on control. Improved on treatment	16
3 Improved on treatment. Maintained on control	5
4 Improved on control. Maintained on treatment	4
5 Improved on treatment. Improved more on control	1
6 No change on control or on treatment	8
Total	46

Note: Group 3 probably corresponds to group 1, but where the effect of treatment was prolonged into the control period.

When assessed according to diagnosis, there was no significant difference between the groups.

Comment on the Series

It was very noticeable that patients on treatment looked ill, with pinched, drawn faces, and pallor, though there was no subjective complaint.

Cases of pyrexia and tachycardia were much more frequent in the group receiving parenteral therapy. When an inflammatory area developed at the injection site, this was associated with pyrexia (four cases), but five more cases had temperatures of 100–103° F. (37.8–39.4° C.) (axillary), usually lasting four or five days and subsiding without other medication and without discontinuing the drug. Only two of the Group O cases had temperatures during the period of treatment.

TABLE IV.—Liver-function Tests on Patient who Became Jaundiced

Date	Van den Bergh Direct	Serum Bilirubin mg. 100 ml.	Ser. Alk. Phosphat. Units	Thym. Turb. Units	Blood Urea mg. 100 ml.	Protein (g.%)			
						Total	Alb.	Glob.	A/G Ratio
8.9	+	4.6	55.1	3.0	30	6.66	3.77	2.89	1.3:1
15.9	—	1.8	—	—	—	—	—	—	—
24.9	—	1.5	—	—	—	—	—	—	—
27.9	—	0.97	45.7	4.0	32	6.86	3.46	3.40	1.02:1
11.10	—	1.2	39.4	0.7	36	7.9	5.3	2.6	2.04:1

One case of jaundice has so far occurred. This first appeared 21 days after the beginning of treatment, and was preceded by two days' pyrexia to 102° F. (38.9° C.). The patient had received a total of 2,700 mg. of chlorpromazine at that time. It was noticed that her skin appeared yellow before the conjunctivae. A bradycardia down to 40 a minute developed, and persisted for three weeks. Urine was dark, but stools were not noticeably pale. Liver-function tests on this patient are shown in Table IV.

The following report is that of another patient who received chlorpromazine, developed jaundice, and then

recovered. Some weeks later she died of bronchopneumonia, an illness believed to have been quite unconnected with the jaundice.

A married woman aged 79 was admitted to a geriatric ward, where a diagnosis of senile dementia was made and she was given chlorpromazine both orally and parenterally. After 32 days, and after receiving a total dosage of 3,875 mg. in two courses separated by ten days, she developed jaundice. This occurred on the fourth day of the second course, when only 750 mg. of chlorpromazine had been given; treatment was discontinued. The jaundice subsided in two weeks. She was admitted to this hospital two months later, dying two weeks after admission. The cause of death, bronchopneumonia and pulmonary embolus, was confirmed at necropsy. Section of the liver showed nothing specific except moderate fatty changes and patchy lymphocytic infiltration in the portal areas.

Drowsiness, sometimes accompanied by a subjective giddiness, occurred in 11 cases. It usually passed off after the first two weeks, and in itself was not a serious complication. It was probably responsible, however, for the case of fractured neck of the femur. In elderly patients, in whom the risk of fracture is already present, the unsteadiness or drowsiness may well lead to a fall. This patient fell about one and a half hours after receiving her tablets. All patients were put to bed—though not all could be kept there—for an hour after receiving treatment, and this one fell soon after getting up.

Senile patients often become noisy, confused, and deluded after fractures, and chlorpromazine has been found very useful in such cases. It is noteworthy that, in the two cases in which fractures have occurred in elderly patients who were on chlorpromazine at the time, the common agitated, confused state did not develop. One of these has just been described, and the second case occurred while electroplexy was being given as well as chlorpromazine.

Other mild side-effects were dryness of the mouth, abdominal pain and diarrhoea, polyuria, and rashes. These responded to simple medication and did not warrant discontinuation of treatment.

Discussion

These results show that chlorpromazine has been effective in improving the general behaviour of a group of elderly psychotic women, though this improvement was not uniformly good. Most of them became more manageable, with few noisy outbursts or demonstrations of violence, and were able to feed and dress themselves. While several cases showed striking improvement, no patient in this group was considered fit for discharge, although two were going out with relatives for week-ends. Several patients have become employable, and have been able to take part in the social activities of the ward, the cinema, and coach rides.

It is necessary to compare these results with those which could be obtained using other forms of treatment at present available. Firstly, of course, these patients were chosen from those who had not responded adequately to other forms of sedation—all had been receiving large and frequent doses of paraldehyde or barbiturates, while several had had maintenance electroplexy. When they were included in the series and had this sedation stopped, many of them became very noisy and difficult; these patients were subsequently found to be having control tablets. Sedation by paraldehyde, barbiturates, or bromides suffers from the disadvantage that large doses are needed for long periods, and, even if the drugs are varied, problems of tolerance, habituation, drug rashes, and bromism arise. The patients are drowsy and confused, and unable to look after themselves, whereas after the first two weeks on chlorpromazine drowsiness usually passes off and the sedative effect seems to continue. After the drug has been discontinued the effect persists for a period varying from two to six weeks, and thus it may be possible to give periodic courses instead of continuous treatment. There seems to be no indication for routine parenteral therapy, even for a short introductory period, unless there is an urgent need to quiet a confused or agitated patient.

Adequate dosage is usually 150–200 mg. in divided doses daily, and the last dose should be given fairly late in the evening so as to ensure a good night's sleep.

I would like to stress the value of chlorpromazine in the treatment of restlessness following fractures in elderly patients. This is rapidly controlled, so that adequate operative and splinting technique may be carried out. It is in this type of case that the intramuscular route should be used, at least for the first few days. It is important to realize that in elderly patients, with the risk of fracture, use of the drug may be an additional hazard: it is little consolation to know that it is effective in the treatment of the condition it has helped to cause. Thus patients must be encouraged to rest for some considerable time after they have received their tablet—one to two hours if possible—and the dosage should be regulated so that the minimum is given to produce a therapeutic effect.

The question of the occurrence of jaundice is one of great importance. In this series there has been only one case (2%)—in fact, it is the only case that has occurred in this hospital, where at least 80 patients have received reasonably long courses of not less than 150 mg. of chlorpromazine daily. Until the action of the drug in the liver has been fully demonstrated, I feel that one should discontinue treatment while there is any sign of liver damage, and I would be reluctant to use it unless it was urgently indicated, in spite of the finding in the section of liver, which showed no evidence of permanent damage that could be attributed to the chlorpromazine. It is noted that in the other case described, where the patient died, there had been a pause in treatment, and jaundice recurred after treatment was renewed. The possibility of a sensitizing effect must be considered, especially as many psychotic patients, unless under careful observation, may not take all the tablets given and therefore dosage with the drug may only be intermittent.

It is difficult to understand why a demented patient should improve when taking chlorpromazine when she does not do so with other sedative drugs such as paraldehyde. The response is probably due to reduction in tension and response to hallucinations without alteration in the basic dementia. Thus, although the misinterpretations still occur, they are no longer charged with the same degree of tension and the patient can spare time to deal with her immediate surroundings. Sedative drugs merely damp down the cerebral response as a whole, while chlorpromazine acts selectively in a manner similar to the operation of leucotomy, for which reason it has been called the "chemical leucotomy." The possibility of its use as a therapeutic test for leucotomy, even if its effects do not persist, must be investigated.

The question of whether chlorpromazine can restore a chronic mental hospital patient to a condition of health sufficient to enable him or her to be nursed at home or in a home for the aged must also be considered. The patients described here were cases of extreme difficulty, and several of them have improved a great deal, though not enough for discharge. Experience with these, and with less difficult patients in the hospital, suggests that this drug may prove of much value for those patients who are still at home but tend to wander round the house at night and keep the rest of the family awake, or who are somewhat preoccupied with hypochondriacal symptoms. If this is so, it will go some way towards solving the problem of shortage of bed-space and of nursing staff in mental hospitals.

Summary

In a controlled experiment, where each patient acted as her own control, 46 elderly psychotic women were treated with chlorpromazine ("largactil"), and in 33 (71.7%) cases there was some degree of improvement. Two serious complications, jaundice and fractured femur, were considered, but were not thought to preclude the use of the drug as an aid in the nursing of the difficult patient.

I wish to thank Dr. R. E. Hemphill, medical superintendent, Bristol Mental Hospitals, for permission to use these cases; Dr. D. F. Early for his guidance and encouragement in preparing this paper; Dr. K. R. L. Hall for his help with the statistics; and Dr. W. Sandry for the report on the liver section. I also wish to thank the nursing staff, dispenser, and laboratory staff for their unfailing assistance, and Messrs. May & Baker for supplying the largactil and the corresponding control tablets and injections.

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L. CANICOLA INFECTION TREATED BY PENICILLIN

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Human infection with *Leptospira canicola* is infrequently recorded in this country although the organism is widely distributed in the canine population. Thus Stuart (1946) has shown that 25 to 40% of dogs in Glasgow are infected with the organism, and Broom and MacIntyre (1948) found similar figures in London. In dogs the organism produces a pyelonephritis, following which the animals may excrete the organisms in the urine for several months (Stuart, 1946).

The literature has been admirably reviewed by Broom (1951). He believes the infectivity to be low, since it is usual to find that only those in a household who have nursed an infected dog and who have cleaned up its dejecta are liable to contract the disease. Although the routes of infection are not known with certainty, the entry would appear to be through intact or broken skin, mucous membranes of the upper respiratory tract, or the conjunctivae. Bathing in contaminated water is a not uncommonly reported mode of infection.

The clinical features are those of an influenza-like illness of sudden onset, with signs of meningeal irritation appearing early in the illness in about two-thirds of cases (Alston, 1949).

We report two further cases arising in Glasgow. One of these was a laboratory infection, and it was possible to estimate the incubation period. Both were successfully treated with penicillin.

Case 1

Five days before admission to hospital a housewife aged 52 was suddenly taken ill with severe pains in the legs and paraesthesia from the knees to the ankles. On the second day of the illness she began to complain of severe throbbing frontal headache and pain in the neck. On the following day the pains and paraesthesia in her legs disappeared and were replaced by severe backache. On the fourth day of the illness persistent nausea, retching, and vomiting began, associated with an erythematous rash on her legs.

On admission to hospital she was found to be a flushed, rather drowsy woman with a pyrexia of 100° F. (37.8° C.). Discrete erythematous macules were present on the front of both legs, with a pin-point erythema over most of her

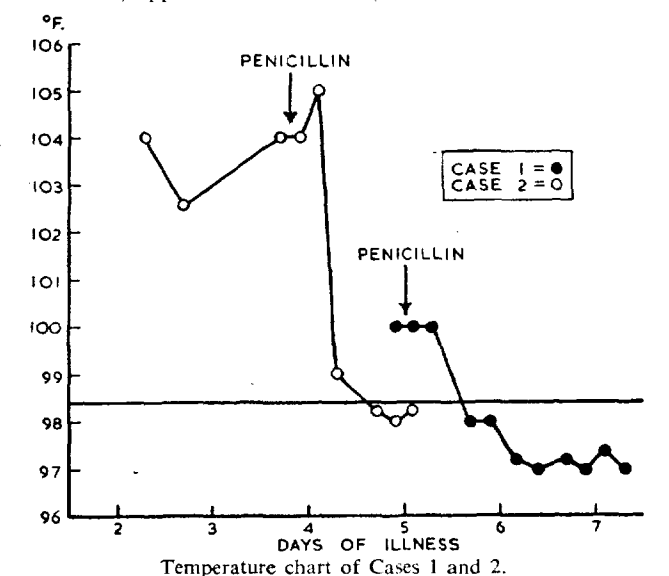
back. The edge of the liver was palpable, as was the tip of the spleen. Slight neck rigidity was demonstrable. There was no jaundice. The total white blood count was 12,500 per c.mm. (85% polymorphs, 8% lymphocytes, 4% monocytes, 2% eosinophils). The E.S.R. (Westergren) was 40 mm. in the first hour. The urine showed no abnormality.

On lumbar puncture clear fluid was obtained at a pressure of 180 mm. of water. A pleocytosis of 584 cells per c.mm. (86% lymphocytes, 9% monocytes, 5% polymorphs) was present. The chemistry of the fluid showed: protein, 45 mg. per 100 ml.; sugar, 67 mg. per 100 ml.; and chloride, 725 mg. per 100 ml. No organisms were found microscopically or on broth culture.

During the two weeks preceding her illness the patient had been nursing a sick dog, and in view of this the veterinary surgeon who had been treating the dog was consulted. He stated that the dog had been suffering from a renal infection, and, whilst he had no bacteriological evidence of *L. canicola* infection, he thought this a likely diagnosis in view of the frequency of such infection among dogs in Glasgow.

In the light of this opinion, a provisional diagnosis of "canicola fever" was made, and, after blood specimens had been obtained for diagnostic purposes, treatment was instituted with crystalline penicillin, given intramuscularly in doses of 250,000 units six-hourly. This was begun one hour after admission—that is, on the fifth day of illness—and continued until the fourteenth day.

Within 24 hours there was relief of symptoms, and, after 48 hours, apparent clinical cure (see Chart).



Bacteriology.—The organism was not obtained on blood culture using ordinary media nor on guinea-pig inoculation, but serological tests confirmed the diagnosis in both the patient (Table I) and her dog, the latter's serum agglutinating *L. canicola* to a titre greater than 1/30,000. The same tests made on members of the patient's household, who had been in contact with the dog, were negative.

The patient was dismissed symptom-free two weeks after admission. A lumbar puncture carried out just before discharge showed a clear fluid under a pressure of 50 mm. of

TABLE I.—Results of Serum Agglutination Tests in Two Cases of *Leptospira canicola*

Day of Disease:	Case 1					Case 2				
	5th	13th	23rd	50th	72nd	8th	19th	24th	44th	
Reciprocals of titres with:										
<i>L. canicola</i>	0	1,000	10,000	1,000	1,000	Neg.	Neg.	1,000	1,000	
<i>L. icterohaemorrhagiae</i>	0	0	10	0	0	..	..	100	30	

water and containing 17 lymphocytes per c.mm. The chemistry of the fluid was normal. The patient showed no evidence of relapse after six months' observation.

Case 2

A lecturer in veterinary medicine aged 33 was suddenly taken ill with headache, shivering, and backache. On the second day of the illness the headache became much more severe and he vomited repeatedly. On this day he was seen at home by one of us, when the only findings were a pyrexia of 104° F. (40° C.), a tachycardia of 140 a minute, and some abdominal distension. There was no evidence of a meningeal reaction. He was treated expectantly with half-normal saline by mouth. On the third day of the illness he felt slightly better. The vomiting had stopped, though nausea, retching, and headache persisted. The temperature was now 102.6° F. (39.2° C.), but on the following morning the headache was again intense and retching severe. The temperature was now 104° F. (40° C.). The spleen was palpable three fingerbreadths below the left costal margin, and small pink macules 1 mm. in diameter were present on the skin of the abdomen. A specimen of blood was taken for broth culture. The white cell count was 7,400 per c.mm. (93% polymorphs, 6% lymphocytes, 1% monocytes). The urine contained albumin and a few erythrocytes. The E.S.R. (Westergren) was 40 mm. in the first hour.

At this point the patient was closely questioned about the possibility of having acquired any infection in the course of his work. He now remembered that seven days before the onset of the illness he had broken a tube containing a culture of *L. canicola* and in so doing had cut his finger. He had immediately washed the wound with a solution of penicillin.

It seemed probable that the patient was suffering from *L. canicola* infection, and after a further specimen of clotted blood had been removed for culture he was given one million units of crystalline penicillin intramuscularly. Two and a half hours after the injection he had a very severe reaction. He felt very ill, and on taking his temperature found it to be 104° F. (40° C.). Immediately afterwards a severe rigor occurred which lasted about eight minutes. He felt extremely weak and was unable to feel his own pulse. After an hour he began to feel better, and, whereas previously he had been extremely restless, he was now content to lie still. Five and a half hours after the first injection of penicillin he was given a second dose of one million units. By this time he felt better, though he still looked very ill and had a temperature of 105° F. (40.6° C.). Two and a half hours later there was a marked improvement in his condition. His temperature was now 99° F. (37.2° C.), and his headache less severe (see Chart).

By the following morning (fifth day of illness) his improvement was remarkable. He had slept soundly, his appetite had returned, and the headache was only slight. The temperature was normal and the urine contained only a faint trace of albumin. The spleen was still palpable three fingerbreadths below the left costal margin.

The patient then made an uninterrupted recovery, the headache vanishing after three more days and the spleen soon becoming impalpable. He had received one million units of penicillin three times daily from the fourth to the seventh day of illness inclusive and the same dose twice daily from the eighth to the tenth day.

Bacteriology.—No growth was obtained from the broth culture. The specimen of blood clot was inoculated on to special media, and after four days' incubation *L. canicola* was isolated. The findings of serological tests carried out are shown in Table I.

Discussion

Pyrexia of Unknown Origin and Lymphocytic Meningitis

The ubiquity of *L. canicola* in this country is such as to make infection with this organism a possibility in every case of obscure fever. The clinical features, apart from the high

proportion of cases of meningitis, are often indistinguishable from those of any septicaemia. The clue to the diagnosis lies in the history of contact with a sick dog.

That the leptospira may be the cause of a lymphocytic meningitis should also be borne in mind. Broom (1951) examined the sera of 642 cases of aseptic meningitis and found that 25 gave positive reactions for leptospirosis (17 *L. icterohaemorrhagiae*; 8 *L. canicola*). The report by the Virus Reference Laboratory, Colindale (1953), gives the following results of serological examination of cases of suspected virus infections of the central nervous system during 1949 and 1950.

Year	No. Tested	No. Positive for Leptospirosis
1949	130	10 (7.7%)
1950	196	8 (4.0%)

This report suggests that increasing awareness of leptospirosis may be responsible for the lower figure of 1950, since sera were often sent direct to Dr. J. C. Broom and bypassed Colindale.

Minkenhof (1948), Broom (1951), and Joe and Sangster (1951) all emphasized the necessity for distinguishing between the meningitis of leptospirosis and that of non-paralytic poliomyelitis. Indeed, Alston (1949) reported that two-thirds of the cases of *L. canicola* infection in man showed signs of meningeal irritation. Broom and Joe and Sangster pointed out that a raised E.S.R., which is usual in leptospirosis, may be useful in excluding poliomyelitis where the sedimentation rate is usually normal. The raised E.S.R. in Case 1 illustrates this point.

Incubation Period

Kelser and Schoening (1948) showed that the incubation period of *L. canicola* infection in hamsters was 6–10 days. The incubation period has not, however, previously been accurately determined in man. The unique circumstances of the mode of infection in Case 2 would appear to place it at about seven days.

Treatment with Penicillin

The recorded cases of human infection with *L. canicola* between 1946 and 1951 which were treated with penicillin are enumerated in Table II. The results do not appear

TABLE II

Case No.	Author	Penicillin		Result		
		Days of Illness*	Daily Dose (Units)	Cure	Relapse	Failure
1	Rosenbaum (1946)	12–18	?	—	—	No significant effect
2	Baber and Stuart (1946)	6–9	60,000	—	68th day	—
3	Laurent <i>et al.</i> (1948)	6–10	600,000	—	16th day	—
4	" "	4–7	600,000	Alleviation of symptoms on 6th day	—	—
5	Weetch <i>et al.</i> (1949)	17–?	960,000	—	—	Patient died 24th day†
6	Mackay-Dick and Watts (1949)	8–15	2,300,000	—	17th day	—
7	" "	29–51	360,000	—	47th and 78th days	—
8	Campbell <i>et al.</i> (1950)	9–12	2,000,000	—	Recrudescence of fever during treatment	—
9	" "	4–14	200,000	—	—	—
10	Joe and Sangster (1951)	8–16	200,000	Claim only modification of course of disease	—	—
11	Joe and Sangster (1951)	7–?	?	—	—	No spectacular benefit
12	Fox and Fyfe (1951)	3–11	?	—	—	—
12	Fox and Fyfe (1951)	6–19	300,000	—	24th day	—

* Days of illness are inclusive.
† Coincidental chronic nephritis.

POLYAGGLUTINABILITY OF HUMAN RED BLOOD CELLS

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Amongst the abnormal agglutinations, polyagglutination is a rare phenomenon and few cases have been reported. It is a transitory agglutinability of red cells developed *in vivo* and characterized by the agglutination of cells by a proportion of normal sera independent of their group agglutinins. It is not connected with auto-agglutination.

In ABO blood grouping the so-called Landsteiner's law states that if an agglutinin is present in the red cells of a blood the corresponding agglutinin must be absent from the plasma, and if the agglutinin is absent the corresponding agglutinin must be present. The first part of this law is a logical outcome of the situation, for if both agglutinin and agglutinin were present the cells would be agglutinated (Wright, 1952), but in cases of polyagglutination this law cannot and does not stand. This factor is known to appear in some diseased states, though it has been recorded in some healthy individuals as well, but in both cases it is found to be transitory. Whether there is any influence of this polyagglutinability on the diseased process is not yet known. It is very difficult to understand what initiates this agglutinability of these cells and why the process of agglutination is inhibited *in vivo* but initiated *in vitro*.

It has been described that *in vitro* the infection in a sample of blood may change the cells in such a way that they are agglutinated by all sera (Hübener-Thomsen-Friedenreich phenomenon). Friedenreich has shown that filtrates of certain bacteria contain an enzyme which acts on human red cells, changing a latent antigen to an active one, which is known as Friedenreich's T-antigen (Race and Sanger, 1954).

Case Report

A married Hindu woman aged 30 was admitted to Chittaranjan Seva Sadan Hospital on December 28, 1953. She had had four children, but no history of miscarriage or abnormal labour. Her first baby died a few years after birth; the other three are all living and in good health. Her menstrual history was normal. The last menstrual period was September 25, 1953. She had never had any transfusion. On admission to hospital she complained of pain in the lower abdomen for 22 days, bleeding per vaginam for 22 days, and fever for two days.

On examination the patient was very anaemic. There was no jaundice. Her temperature was 102.6° F. (39.2° C.) (the high fever continued until death), pulse 140, respirations 20, blood pressure 110/80 mm. Hg. A blood count showed Hb, 36%; red cells, 2,160,000; white cells, 13,400 (polymorphs 80%, lymphocytes 12%, monocytes 8%). The urine was acid in reaction and showed no abnormality.

Pelvic abscess was diagnosed and posterior colpotomy was performed. A substance like anchovy sauce was found. Microscopical examination of this showed inflammatory cells but no malignant cells. As transfusion was advised, the serum and the washed cells (suspended in normal saline) were tested, but in spite of repeated efforts we could not determine the group. The patient was Rh-positive with

encouraging. The difficulty in assessing the value of penicillin therapy is common to all conditions which tend to natural cure. It is especially difficult when different doses have been used and treatment has begun at different stages of the disease. In the case of *L. canicola* infections a further factor must be taken into account. McIntyre and Stuart (1949) have shown that in dogs there is an invasive or septicaemic stage followed by a later stage where there is renal involvement. Dogs in the first stage all recovered after penicillin treatment, but there was a 50% mortality if the kidneys were involved. The ineffectiveness of penicillin in the renal stage of the infection is further suggested by McIntyre and Montgomery (1952) and Brunner and Meyer (1949), who have shown that the organism can be recovered from the renal tubules 14 months to two years after treatment.

The very rapid response to penicillin in high dosage in our two cases strongly suggests a therapeutic effect. It is to be noted that both were treated early and were probably mainly in the septicaemic stage, although Case 2 showed some albuminuria. The severe reaction shown by Case 2 was of Herxheimer type, and is further evidence of a lethal effect on the organisms. It is perhaps significant that the only other recorded case of rapid improvement after treatment with penicillin (Case 4 in Table II) also received large doses early in the disease.

Stagg and Leibovitz (1951) believe that chlortetracycline ("aureomycin") is an effective therapeutic agent in *L. canicola* infection. The evidence for this is inconclusive, since in their case 18 hours of treatment with penicillin in high dosage had preceded chlortetracycline. In experimental *L. canicola* infection in hamsters, Heilman (1945) found that the protective effect of penicillin was greater than that of streptomycin.

Since no other satisfactory treatment is known, it seems desirable to treat recognized examples of this disease with large doses of penicillin as early as possible after infection.

Summary

Two cases of human infection with *Leptospira canicola* are described.

L. canicola infection should be considered in the differential diagnosis of unexplained pyrexia or lymphocytic meningitis.

Evidence is produced to show that the incubation period of the disease is about seven days and that the early administration of penicillin in high dosage is an effective form of therapy.

We are grateful to Dr. L. D. W. Scott, under whose care Case 1 was treated, for permission to publish, and for his helpful advice. We are also indebted to Dr. T. Anderson and Professor E. J. Wayne for their help in the preparation of this article and to Dr. J. C. J. Ives for his assistance in the bacteriological investigations.

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C and D and negative with E antigen. The Kahn test was negative. The patient's cells were tested against α and β sera (Table I). The cells were agglutinated by both the sera, indicating Group AB, but when the serum of the patient was also matched against known cells A cells were agglutinated but there was no reaction with B cells (Table I), indicating Group B.

TABLE I

α Serum and patient's cells	..	+++ (agglutination)
β " " "	..	+++ " "
A cells " " serum	..	+++ " "
B " " "	..	--- (no agglutination)

As the need for blood transfusion was urgent, and as no definite group could be determined, we tried to cross-match with 10 Group O bloods, 4 Group AB bloods, 10 Group B bloods, and 12 Group A bloods. The results are shown in Table II. All these tests were done repeatedly and in dilutions of 1:4, 1:8, 1:16, 1:32, but without any change of results either at room or at refrigerator (4 to 6° C.) temperature.

TABLE II

	Group O		Group AB		Group B		Group A	
	Serum	Cell	Serum	Cell	Serum	Cell	Serum	Cell
Patient's cells	+++	---	+++	+++	+++	---	+++	+++
" serum	---	---	---	---	---	---	---	---

+, Agglutination. —, No agglutination.

The above grouping and cross-matchings were also done by the test-tube method at 37° C., but the results were the same as with the slide method. The serum and clotted blood of the patient were left in the refrigerator for more than one month at 4 to 6° C. and all the tests were repeated, but no change was detected. On all occasions her own serum did not agglutinate with her own red cells. The possibility of contamination can be excluded, as we performed all the tests immediately after the blood was withdrawn. The patient died on January 18, 1954.

Discussion

The first case of polyagglutinability was reported by Levine and Katzin (1938). They found that the red cells (Group O) of patients suffering from pneumococcus type I infection treated with sulphonamide and serum agglutinated with 15% normal sera independent of group. This peculiarity disappeared four months after recovery. Gaffney and Sachs (1943) reported two cases, of which one occurred in a patient with congenital syphilis and the other in a healthy adult. In both cases they found polyagglutination and concluded that both bloods were of Group O subjects.

Levine and Katzin's patient was also of Group O. In the first case of Gaffney and Sachs the titre of polyagglutinability went on increasing from 47 to 100%, in their second case it increased to 73%, and in both cases the cells and serum of patients agglutinated with both α and β serum and A and B cells respectively, but the cells failed to agglutinate at 37° C., thereby giving the correct grouping of the patient—that is, O. In neither case was there autoagglutination either at refrigerator or at room temperature. In all three cases this polyagglutinability was transitory and disappeared within four to six months.

In our case cells agglutinated with α and β serum and serum agglutinated with A cells but failed to agglutinate B cells and never agglutinated their own. We are thus inclined to describe the phenomenon here as polyagglutinability instead of panagglutinability.

Gaffney and Sachs found that the sera which agglutinated the cells of the patients at room temperature (20 to 25° C.) did not agglutinate at 37° C. This question does not arise in our country, because our room temperature is always around 37° C. In our case repetition of the tests in different dilutions and at our room temperature (34 to 37° C.) and at

refrigerator temperature (4 to 6° C.) did not show any alteration in any way. This type of agglutination gives a false idea about the grouping of patients.

The cross-match report (Table II) gives a peculiar result, and no definite conclusion could be reached; in order to come to a conclusion we made a back calculation to suggest that the patient was possibly of Group B.

Observations of different authors at different times suggest that panagglutination is due to bacterial contamination. Schiff *et al.* (quoted by Gaffney and Sachs, 1943) produced panagglutinability of cells artificially by bacterial contamination, in which the red blood cells did not agglutinate with their own serum and thus the difference was only one of degree.

Though the existence of a relationship of cold agglutination with polyagglutination was suggested by different authors, our case did not show any such relationship, as we got the same result in different temperatures, including that of the room.

The actual pathogenesis of polyagglutination is far from certain, but we have already mentioned that the T-antigen is responsible for some such abnormal agglutination as is described by Friedenreich and supported by Henningsen, Holländer, Van Loghem, Van der Hart, and Heier (Race and Sanger, 1954). In our case the patient was dangerously ill and ultimately died of the disease; it seems possible that bacteria were in some way responsible.

It is evident from the above that previous authors got agglutination at room temperature but not at 37° C., but we found the same result at room temperature, at the refrigerator temperature, and at 37° C. incubation. As our patient was seriously ill, it seems that the degree of bacteraemia or septicaemia might play some part in the phenomenon by transforming the latent T-antigen of cells into an active one. Further experimental work is necessary before any conclusion can be reached.

Summary

Polyagglutinability observed in a case of pelvic abscess with septicaemia is described and the relevant available literature reviewed.

The similarity between polyagglutinability and panagglutinability is observed and discussed.

The fact that such a case brings out the problem of correct grouping has been stressed.

T-antigen seems to have an aetiological bearing in such cases.

We wish to express our appreciation to Dr. A. E. Mourant, director, Lister Institute, London; Dr. R. Dutta-Choudhuri, pathologist, Chittaranjan Cancer Hospital; and Dr. Swadesh Basu, visiting surgeon, Chittaranjan Seva Sadan Hospital for Women. We thank Dr. Subodh Mitra, director, Chittaranjan Cancer Hospital, for his interest and help in this study.

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An unusual case is described in the latest (1954) annual report of the Medical and Dental Defence Union of Scotland Ltd. "A National Service candidate, aged 18, was referred by the examining board to an ear, nose, and throat specialist for an opinion. The latter, on examining the candidate when referred to him, undertook to wash out the candidate's antrum, a procedure to which the candidate's father objected, as having been done on a minor (or infant) without the parent's consent. While the claim was not pressed, the consultant was advised that he had been in error in his zeal, as he was entitled to do nothing more than furnish a report to the medical examiners who had referred the candidate."

VARICOCELES OF THE ROUND LIGAMENT IN PREGNANCY, SIMULATING INGUINAL HERNIAE

BY

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It is worthy of note that swellings in the groin appearing for the first time in pregnancy do not seem to have attracted the attention of obstetricians and general surgeons. The similarity between femoral hernia and saphena varix is well recognized, but the likeness between a varicocele of the round ligament of the uterus appearing in the groin in pregnancy and an inguinal hernia appears to have been overlooked. A scrutiny of 16 standard textbooks in obstetrics, of 15 standard textbooks in general and operative surgery, North American and British, failed to reveal any comment. Textbooks on diseases of the vulva gave no information, and of the standard works on varicose veins only one made any reference to the subject, and then not specifically mentioning pregnancy: Verovitz (1941) states that "varices of the round ligament are often mistaken for an inguinal hernia." We believe we are describing a not uncommon condition which has been overlooked by clinicians, which is usually misdiagnosed, and which is omitted from the textbook literature.

The not infrequent occurrence of swellings in the groin, appearing for the first time in pregnancy and subsiding during the puerperium, had been noticed by us for some years. Although almost indistinguishable from an inguinal hernia on clinical examination, there seemed to be good reason to think that they were in reality varicoceles of the round ligament. Case 2, described below, stimulated our interest, so that medical officers in the antenatal clinics at Queen Charlotte's Maternity Hospital were asked to refer to us cases of "lumps in the groin." In a 12-weeks period 12 such patients were found and were followed through their pregnancy, labour, and post-natal period.

Case 1

This patient, aged 36, developed varicose veins of both legs during her first pregnancy in 1936. The veins subsided after delivery, returning during her next pregnancy, in 1951. During this second pregnancy lumps appeared in both groins, were diagnosed as herniae, and operation was advised. This advice was not taken.

She attended an antenatal clinic at Queen Charlotte's Maternity Hospital on July 27, 1953, in the 10th week of her third pregnancy, with a letter from her general practitioner referring her because of the history of inguinal herniae appearing in the previous pregnancy. On examination at that time the pregnancy was confirmed, notice being taken that varicose veins were present in both legs (including the upper thighs) and both labia majora. No mass could be produced in either groin, but a note was made that varicoceles of the groins were likely in view of the past history.

The following notes were made during the remainder of the pregnancy, the labour, and the puerperium. August 27: Swelling in right groin present (Fig. 1) diagnosed as a varicocele. September 24: Swelling in both groins, aching at the end of the day. A dragging sensation and aching in the groins continued until delivery. March 5, 1954: Spontaneous

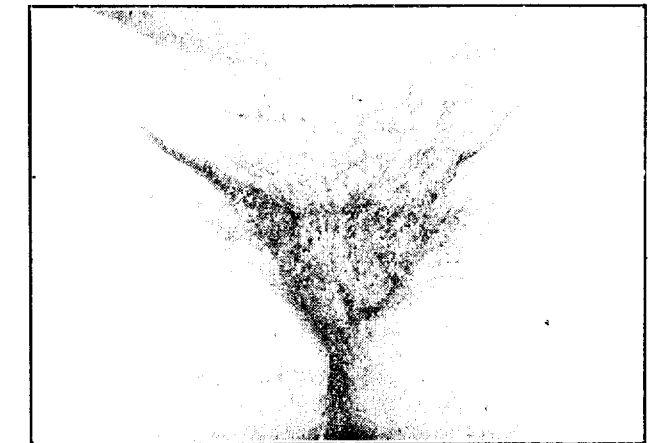


Fig. 1.—Case 1. Photograph taken at 14th week (August 27, 1953), showing a swelling in the right groin.

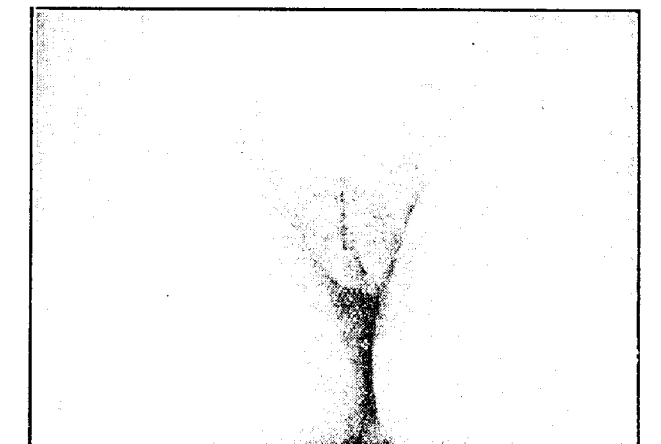


Fig. 2.—Case 1. Photograph taken eight weeks after delivery (May 3, 1954).

vertex delivery; total duration of labour, 2 hours 25 minutes. March 12: Varicose veins improved, slight lump present in each groin. April 8: Very little swelling present in groins. May 3: No swelling present in either groin (Fig. 2).

Case 2

A patient, aged 27, pregnant for the first time, was booked for delivery at Queen Charlotte's Maternity Hospital, the expected date of delivery being February 16, 1953. Until October 6, 1952, no abnormality was detected, but on that attendance at the clinic the patient complained of a lump in the left groin; she was referred to an obstetric consultant, who diagnosed a left inguinal hernia, suggesting no active treatment. On January 1 varicose veins of the vulva were first noted.

At 9.40 a.m. on February 16 there was a spontaneous vertex delivery of a living female infant after a labour lasting 9 hours 50 minutes.

During the forenoon of the 17th the patient complained of pain in the right lower abdomen. On examination a tender mass was present in the right groin, measuring 1½ in. by 1 in. (3.8 by 2.5 cm.), irreducible, and diagnosed as a right inguinal hernia. At 5.30 p.m. the mass was unchanged, with normal bowel sounds. The opinion of a general surgeon was obtained, and at 9.30 p.m. he operated, the

provisional diagnosis being an irreducible right inguinal hernia. Under general anaesthesia a right oblique inguinal incision was made, dividing the right external oblique aponeurosis. This exposed the mass, which was found to be a collection of thrombosed vessels in the substance of the round ligament. This was divided, excised, and ligated at the internal abdominal ring. A small hernial sac was found to be empty; it was transfixed and excised. The inguinal canal was closed by suture of the conjoint tendon to the inguinal ligament. The post-operative recovery was uneventful, the patient leaving hospital on March 2. On April 14 healing of the right groin was perfect, and there was no evidence of a left inguinal mass.

It was thought that the "left inguinal hernia" in this case was a varicocele of the round ligament which subsided after the pregnancy, whilst a smaller varicocele of the right round ligament which was not discovered during pregnancy became thrombosed immediately after delivery, probably owing to the alteration in the size of the uterus producing a circulatory disturbance; both varicoceles were in association with varicose veins of the vulva.

Discussion

We believe that nearly all groin tumours first appearing in pregnancy are due to varicosities of the round ligament, which at first sight simulate an inguinal hernia. While in 2 out of the 12 cases under review there was little evidence of varicose veins, apart from the varicocele of the groin, in the remaining 10 varicosities of the vulva, with or without similar lesions of the thigh, were present, often to a gross degree. In seven patients a diagnosis of inguinal hernia was made when the mass was first seen, before being referred to us, and in one case operation had been advised.

It does not appear likely that a hernia of the inguinal region should make its first appearance during pregnancy, for, although there is an increase in intra-abdominal pressure, most of the structures which would fill the hernial sac (with the exception of free fluid) are kept out of the way by the bulk of the pregnant uterus and broad ligament. Some authorities (Berkeley *et al.*, 1938; Baird, 1950) state that pre-existing herniae frequently disappear during the later months of pregnancy, "the reason being that the enlarging uterus pushes the intestines away from the inguinal ring and presently blocks access to them" (Berkeley *et al.*, 1938). Strangulated inguinal herniae are extremely rare in the later months, and, in fact, Gaudier (1894) states that a strangulated inguinal hernia and pregnancy are incompatible. Although it is generally agreed that known pre-existing herniae tend to be temporarily cured during pregnancy, this series of 12 cases of swellings in the inguinal region first appearing in pregnancy was collected in the short space of 12 weeks. It is known that early in pregnancy, in the first trimester, there is a great increase in the vascularity of the pelvis, and varicose veins of the lower extremity may appear or worsen before the size of the uterus is likely to affect the venous return. The veins of the round ligament form an anastomosis with those of the vulva, and will join in any generalized varicosity—thus a varicocele of the round ligament is formed.

Clinical Features.—The clinical features of varicoceles of the round ligament are similar to those of an inguinal hernia. The patient complains of a lump and an aching feeling in the groin. The situation is identical, since both veins and hernial sac accompany the round ligament in the inguinal canal. Both swellings disappear on lying down and reappear on standing, though a varicocele may return more gradually than a hernia and is a little less circumscribed. A varicocele is of course dull on percussion and more closely resembles a hernia containing omentum than one containing bowel. The signs and symptoms of both conditions are therefore very similar, and it is only possible to make a diagnosis by the fact that in the case of the varicocele the swelling appears for the first time during pregnancy. The absence of varicose veins elsewhere does not exclude the diagnosis of a varicocele of the round

ligament. Thrombosis of the varicose veins is a complication which still further increases the resemblance between an inguinal hernia and varicocele of the round ligament, and is described in Case 2. This complication produces a firm, tender, irreducible swelling simulating a strangulated inguinal hernia, and a differential diagnosis becomes an urgent necessity, in view of the entirely different treatments required.

Treatment.—No active therapy has been found necessary in the patients we have seen. Suggestions to operate during pregnancy indicate that the probable aetiology of the lesion has not been appreciated. It is not necessary to commit a patient to bed rest because of the condition, although it is known that this occurred in a patient elsewhere, not in our series, in the belief that an inguinal hernia was present. A truss may, by giving support, add to the comfort of the patient. Reassurance, with a simple explanation of the temporary nature of the lump during pregnancy, and the recommendation of the usual supportive measures for the relief of vulval and leg varicose veins, is all that has been found necessary.

We wish to express our thanks to members of the clinical staff of Queen Charlotte's Maternity Hospital for helping to collect the cases, and to Mr. Bailey, of Queen Charlotte's and Chelsea Hospital photographic department, for the photographs.

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THE SYMMETRICAL FORM OF STATUS BONNEVIE-ULLRICH (TURNER'S SYNDROME)

BY

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AND

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In 1930 Ullrich reported a case of multiple congenital anomalies in an 8-year-old girl that was typical of a syndrome since known on the Continent as the symmetrical form of status Bonnevie-Ullrich. This child was of short stature, had a webbed neck (pterygium colli), an increased carrying angle of the arms (cubitus valgus), hypoplastic nipples, a highly arched palate, drooping angles of the mouth, hyperflexibility of the shoulder-joints, and irregular short nails of the hands and feet. The upper eyelids were prominent and heavy, giving the impression of bilateral ptosis. The ears were closely attached to the side of the head. At birth there had been a marked pitting oedema of the nuchal region and the extremities. The oedema, "congenital lymph-angiectatic oedema," disappeared during the second year of life.

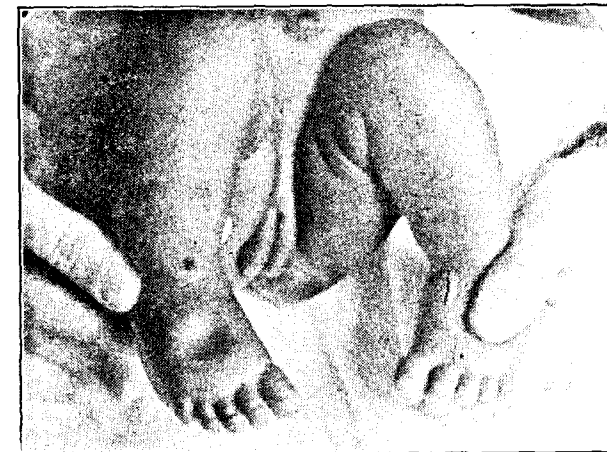
Ullrich (1949) observed that this syndrome is identical with Turner's syndrome and the syndrome of ovarian agenesis, which have since been described and discussed in the English language literature by authors evidently unaware of his original report. It is apparent, however, that, whereas Ullrich (1930) described the congenital anomalies in great detail, it was the endocrinological aspects which aroused most interest in the American

and British literature. It is our purpose to present a typical case of this syndrome occurring in an African infant.

Case Report

A 3-week-old Bantu female was first seen on April 8, 1953. The mother complained that the infant had been "swollen" since birth.

Physical Examination.—**Head:** The circumference of the head was 14 in. (35 cm.). There was marked pitting oedema of the scalp, especially over the occipital region. Some oedema was present round the eyes, and the epicanthic folds were prominent. The bridge of the nose was flattened and somewhat broad. The corners of the mouth were drooping and the palate was highly arched. The upper parts of the ears were bound to the margin of the scalp. The superficial scalp veins were unusually conspicuous and large. The cranial nerves appeared normal. **Neck:** There were broad loose folds of skin over the postero-lateral aspects of the neck (pterygium colli). The occipital hair-line was low. **Chest:** The skin over the whole of the back was loose (cutis laxa). The chest was somewhat broad in shape. The nipples were hypoplastic, being pin-point in size. The heart and lungs were clinically and radiologically normal. **Abdomen:** The tone of the abdominal musculature was normal. A small umbilical hernia was present. **Extremities:** There



Photograph showing pitting oedema of the extremities.

was marked pitting oedema of the extremities (see Fig.). The nails of the fourth and fifth toes of the left foot and the fifth toe of the right foot were absent. The remainder of the nails of the hands and feet were spoon-shaped. There was a laxity of all the joints of the limbs, and the elbow-joints could be passively placed into a marked degree of cubitus valgus. **Genitalia:** The external genitalia appeared normal.

Investigations.—The urine was normal. Haemoglobin, 13 g. per 100 ml.; blood urea, 10 mg. per 100 ml.; serum proteins, 6.8 g. per 100 ml. (albumin 3 g., globulin 3.8 g.); thymol turbidity test, 1 unit; thymol flocculation, Takata-Ara, and colloidal red tests were negative; serum sodium, 350 mg. per 100 ml. X-ray plates of the spine, skull, and extremities showed no skeletal abnormalities. The mother's Wassermann reaction was negative.

Examination of Family.—The parents and the two other siblings were examined clinically and radiologically. The upper parts of the ears of the father and the two children were closely attached to the scalp margin, but no other abnormality was observed.

Progress.—When the child had been in hospital for one month she developed gastro-enteritis, which lasted for three days. During this period the oedema disappeared completely and recurred only when the diarrhoea and vomiting had stopped. She was discharged six weeks after this. When seen again, at the age of 6 months, the child was in

good health and mental development appeared to be normal. The circumorbital and nuchal oedema had disappeared, but pitting oedema of the extremities was still prominent.

Discussion

Turner (1938), unaware of Ullrich's report, described a triad characterized by webbing of the neck, cubitus valgus, and infantilism which he had observed in seven adult females. Numerous similar cases have since been reported by others (Sharpey-Schafer, 1941; Albright *et al.*, 1942; Varney *et al.*, 1942; Wilkins and Fleischmann, 1944; Lissner *et al.*, 1947; Del Castillo *et al.*, 1947; Dorff *et al.*, 1947; Jackson, 1950; Jackson and Sougin-Mibashan, 1953). Congenital anomalies observed by these authors, in addition to the webbed neck, cubitus valgus, and short stature emphasized by Turner, included the low hair-line at the nape of the neck, dystrophies of the ears, "shield" chest, arched palate, scoliosis of the spine, and coarctation of the aorta. Cases in a few females under the age of puberty were also recognized (Goldberg *et al.*, 1947; Silver, 1951; Cutler and Silver, 1953; Jackson and Sougin-Mibashan, 1953; Vulliamy, 1953).

Some authors have apparently avoided the term "Turner's syndrome"—firstly, because Turner (1938) considered that the sexual infantilism was of pituitary rather than gonadal origin, and, secondly, because congenital webbed neck or cubitus valgus was not invariably present. However, the term "syndrome of ovarian agenesis" is even more unsatisfactory, as the condition has been observed, though less commonly, in males (Flavell, 1943; Dorff *et al.*, 1948; McCullagh, 1948; Greenblatt and Nieburgs, 1948; Reforzo-Membrives *et al.*, 1949; Sohval, 1951; Cunningham and Harley, 1951; James, 1952; Sougin-Mibashan and Jackson, 1953; Mackenzie, 1953). It is possible that the term "Bonnevie-Ullrich-Turner syndrome," as suggested by James (1952), would do most to clarify the present somewhat disjointed situation and combine the contributions to the subject from both the Continental and the English language literature.

Our patient has shown virtually all the salient features of the syndrome as listed by Ullrich (1949). This author emphasized the frequency with which the "congenital lymph-angiectatic oedema" occurs, and considered the formation of this subcutaneous fluid during prenatal life to be the main aetiological factor in the various congenital anomalies seen. In over a hundred patients reported in the English language literature, however, we have found reference to oedema in only two case reports. Silver (1951) stated that the feet of his patient, aged 2 years and 8 months, were described as having been "swollen" at birth; and Vulliamy (1953), in his report of an 8-year-old girl, described "unexplained oedema of hands and feet at birth, persisting in the feet for the first three years." Pitting oedema was a very prominent feature in our patient, and was, in fact, the reason that the mother sought medical advice. It is difficult to understand how, if it were present, such a conspicuous abnormality could have been so frequently overlooked. Ullrich (1949), however, stated that the swelling disappears during the first two years of life. As our patient is the first under the age of 2 years whose case is described in the English literature, this may well explain why oedema has so seldom been mentioned.

No definite hereditary factor has yet been discovered. Unfortunately we were able to trace only our patient's immediate relatives, but were impressed by the complete attachment of the upper parts of the ears to the scalp margin in the father and the two other siblings. This particular anomaly was seen by Sharpey-Schafer (1941) in his patient; it is apparent to a moderate degree in the photograph of the male patient of Sougin-Mibashan and Jackson (1953), and is well marked in the male African reported by Mackenzie (1953). Whether this ear anomaly represents a very mild form of the syndrome in the relatives of our patient it is at present impossible to determine, but it was considered distinct enough to merit being put on record.

ADDENDUM.—Since this paper was written a case of this syndrome associated with hypertrophic pyloric stenosis has been recognized in a 2-months-old infant (Keay and Lewis, 1954). These authors, however, described the oedema of the extremities in their patient as non-pitting in character.

We are indebted to Dr. J. D. Allen, superintendent of the Baragwanath Hospital, for permission to publish this report. We wish to thank Dr. E. Kahn, under whom the patient was admitted, for his encouragement and advice.

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Medical Memoranda

"Primary Myxoedema" in a Man of 30

Myxoedema was first described by Gull (1874) when he wrote "On a Cretenoid State Supervening in Adult Life in Women." It was Ord in 1878 who first used the term "myxoedema" to describe these cases of hypothyroidism. It is well known that myxoedema generally occurs in middle-aged and elderly women. Myxoedema in young males is uncommon, and so far as can be ascertained is either due to "pituitary myxoedema" as described by Means *et al.* (1940) or present as a true myxoedema following total thyroidectomy. It is therefore most unusual to find a case of "primary myxoedema" in a man of 30.



FIG. 1. Photograph taken on October 23, 1953. FIG. 2. Photograph taken on November 28, 1953.

CASE REPORT

A gardener aged 30 was first seen in consultation in October, 1953. He complained of a rash on the hands and forearms which was due to a plant-contact eczema. His

general appearance was most striking, as shown in Fig. 1. On further questioning he admitted to the following symptoms: (1) the gradual onset during the past two years of increasing weariness, which was now extreme towards the end of the day; (2) increase in weight; (3) a preference for hot weather and a feeling of the cold "right through him"; (4) a deepening of his voice and a slowing and hesitant speech; (5) a drying of the skin—"he had not sweated for months"; and (6) his hair was becoming coarse and lifeless.

On examination there were no physical abnormalities apart from a bradycardia of 50. The serum cholesterol was 400 mg. per 100 ml. and the blood urea 67 mg. per 100 ml. of serum. Examination of the urine showed: sp. gr. 1009, sugar, nil; albumin, slight trace; no casts or red blood cells. X-ray examination of the pituitary fossa was normal.

Treatment with L-thyroxine sodium 0.1 mg. daily for a week, then 0.1 mg. twice a day, was started on October 23. Improvement was most dramatic, both in his appearance as shown in Fig. 2, taken five weeks after Fig. 1, and in the blood chemistry as shown in Fig. 3, the serum cholesterol and the blood urea returning to normal within twenty-eight days.

He felt perfectly fit and all his symptoms had disappeared. His voice was now normal, he could sweat, his hair was improving in texture, he had lost weight, and he was no longer weary.

COMMENT

This record is of particular interest as it describes a case of "primary myxoedema" in a young man which responded dramatically to a relatively small dose of thyroxine and showed a fall, not only of the serum cholesterol as would be expected, but also of the blood urea. The fall in the blood urea was presumably due to the increased metabolism. Or could it have been due to a clearing of "cholesterol-clogged" arterioles in the kidneys?

I am grateful to Dr. C. A. K. Bird, of Macclesfield Hospital, for his advice and help with the blood chemistry in this case.

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Ventricular Tachycardia following Exercise in a Case of Angina Pectoris

It is felt that the following case is interesting enough to be placed on record.

CASE REPORT

A man aged 46 attended the out-patient department giving a history typical of angina pectoris of four months' duration. The attacks had never occurred before this, had on no occasion lasted longer than 10 minutes, and had never been severe enough to cause absence from work. Apart from "pleurisy" 10 years previously, no history of any past

illness was obtained. He worked as a light machinist at a lathe in a nearby factory. He was married and had a family of four sons. No familial history of any ailments was obtained.

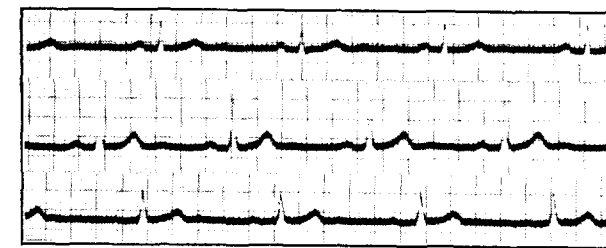


FIG. 1.—Standard leads taken at 11 a.m. Normal.

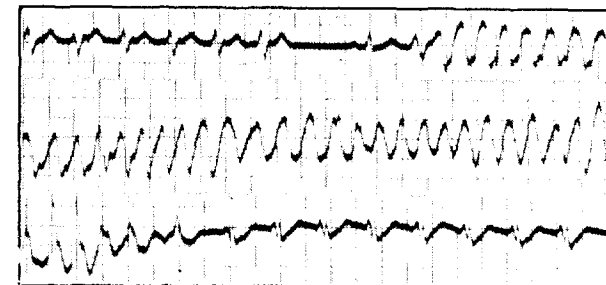


FIG. 2.—Standard leads taken at 11.15 a.m. The tracings show ventricular complexes which vary in size and which are deformed, the appearances being those of ventricular tachycardia or ? flutter. Rate 330 a minute.

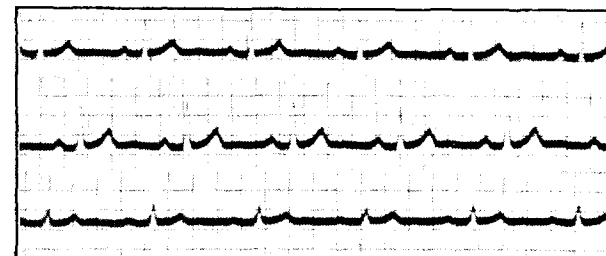


FIG. 3.—Standard leads taken at 2.15 p.m. Normal.

Little of significance was found in the various systems, but examination of the cardiovascular system revealed: pulse, 70, regular, good volume and tone, arterial wall normal; blood pressure 150/100; apex beat displaced slightly downwards and outwards; a soft systolic murmur audible over the apex. Fundi: early silver wiring and tortuosity of the vessels.

Investigations.—Hb, 110%; white cells, 9,000; E.S.R., 19 mm./hour. W.R. and Kahn test negative. Urine normal. Chest x-ray examination showed no active disease in the lung fields; slight tenting of the right diaphragm was due to a minimal adhesion; the heart shadow was normal. Electrocardiograms were taken (1) before exercise (Fig. 1); (2) after exercise which caused a typical attack of retrosternal pain with sweating and coldness; the symptoms were relieved by inhalations of amyl nitrite (Fig. 2); and (3) 3½ hours after exercise (Fig. 3).

Trinitrin tablets for individual attacks, and quinidine sulphate, 6 gr. (0.4 g.) three times daily, have been given since. Up to the time of writing the patient managed fairly well, although he still had occasional tightness of the chest.

COMMENT

Schwartz (1942) describes three phases in the production of ventricular fibrillation—ventricular tachycardia proceeding to multifocal ectopic beats and eventual establishment of ventricular fibrillation. The ectopic beat prior to the run of tachycardia (initial premature beat) bears a constant relationship to the preceding ventricular complex, and all such beats appear to be identical in form and direction.

Runs of ventricular tachycardia are thought to originate from an irritable ventricular focus, and are the precursor of fibrillation.

Wetherbee *et al.* (1952) published tracings showing ventricular tachycardia following quinidine therapy in six cases of auricular fibrillation. Schwartz *et al.* (1953) showed tracings of transient ventricular fibrillation following quinidine therapy in cases of atrioventricular dissociation. A case of complete heart block described by Gresham (1952) gave rise to a series of electrocardiograms showing, at first, runs of ventricular tachycardia but, terminally, evidence of ventricular flutter and fibrillation.

The case described would appear to be in the first phase described by Schwartz in the production of ventricular fibrillation, and it is interesting to postulate an irritable ventricular focus arising from recurring relative ischaemia of a patch of ventricular musculature.

I wish to express my sincere thanks to Dr. Robert Mowbray for his constant help and permission to publish this case. I would also like to thank both the secretarial staff and members of the E.E.G. department, Dryburn Hospital, for their valuable assistance.

ROBERT BRUCE, M.B., B.S.

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Grafting of Finger-nails

The restoration by grafting of lost or congenitally absent finger-nails is a subject upon which very little has been written. After carrying out a series of experiments it may be of interest to record that in suitable cases either the whole or part of the toe-nail can be transferred to the finger or thumb.

Apart from the disfigurement associated with absence of a nail, there is often a considerable reduction in function in the finger-tip. The normal nail acts as a support to the highly sensitive pulp, and without this counter-pressure the finer qualities of tactile appreciation are blurred. In the index finger or thumb this may be a very real disability in fine work.

The example shown here is the hand of a girl aged 8 in whom the middle finger showed congenital absence of a nail associated with brachydactyly (fusion of the distal and middle phalanges). Part of the great toe-nail with its



Restoration of middle finger-nail by free grafting of part of a toe-nail. One year after operation.

germinal matrix was implanted on the finger, and one year after the operation is seen growing normally. The donor toe-nail has also regenerated and causes her no discomfort.

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Reviews

TROPICAL ARCHITECTURE

Conference on Tropical Architecture, 1953. A report of the Proceedings of the Conference held at University College, London, March, 1953. (Pp. 144; illustrated. 32s.) London: George Allen and Unwin, Ltd. 1954.

The problems presented by tropical architecture are as numerous and as varied as is the scene in tropical towns, packed as they are with innumerable forms of life and activity. The demand for a place in the jostling life of these towns is increasing, for, as Mr. C. Y. Carstairs states in an admirable introduction to this publication, one of the results of public order and better preventive and curative medicine latterly introduced into the Tropics has been a steep rise in population, and people unable to find a living on the land are crowding to the towns. "The expanding populations of the world cannot be fed unless more food is produced more efficiently by fewer farmers and peasants." Thus thousands are "extruded from an agricultural economy which no longer needs them." A tremendous social problem is being treated and must be tackled by promoting industrial development and planned housing schemes if the squalor of disorderly, insanitary, shanty-town slums is to be avoided. At this conference these and related problems were discussed, and the many subjects dealt with included the tropical aspects of planning, indoor climate and thermal comfort, style in architecture, traditional and modern building materials and construction, new building techniques, building with timber, and architectural education and training. On all these there are excellent papers which will be of interest, not only to architects and town planners, but to sociologists, educationists, and medical men. Professor Crowden reviews physiological principles underlying thermal comfort in the Tropics—a subject of importance to all who dwell in such regions, and one of which he has made a special study. Application of these principles to architecture has been attended by very good results.

Since the war several new towns and townships have been built, and already considerable experience in modern methods of construction and planning has been obtained and is here discussed. Problems very different from those encountered in temperate regions have had to be faced; thus the green open spaces so pleasant in temperate regions, and in tropical countries in which there is a high rainfall, in an arid climate become barren and dusty and are then used as public latrine areas or rubbish dumps. Underdeveloped regions often being synonymous with poor regions, financial stringency is usual, and much thought and ingenuity have been directed towards development of economical methods of ventilation, protection from dust storms, and making the best use of sunlight and breezes. A possible criticism of the conference is that insufficient attention appears to have been devoted to discussing and to encouraging research in domestic drainage, sewage disposal, and those aspects of building designed to limit fly-borne and intestinal infections. These remain one of the major sources of disability in the Tropics.

The book throughout is illustrated by numerous excellent and very informative photographs and diagrams. It can be strongly recommended, and is of the greatest importance to all concerned with the welfare of tropical peoples.

A. W. WOODRUFF.

CHILD GROWTH AND DEVELOPMENT

Growth and Development of Children. By Ernest H. Watson, M.D., and George H. Lowrey, M.D. Second edition. (Pp. 296; illustrated. 53s.) Chicago and London: The Yearbook Publishers Inc. 1954.

This is a second edition of a book the first edition of which has fully established its worth and has found its place in the reference libraries of teaching schools and on the shelves of paediatricians. In this edition the authors have

introduced changes in the chapter on physical growth and a new and valuable chapter on the growth and development of the face, jaws, and teeth, and on tooth eruption and malocclusion. The book gives a useful summary of knowledge on physical growth, including the development of organs and bones, with a brief account of nutrition, the development of behaviour, and the role of the endocrine glands.

The numerous references, totalling almost 300, are a particularly useful feature of the book, but it is regrettable that they refer almost entirely (in 96% of cases) to American work, to the exclusion of important work done in this country and elsewhere.

It is unfortunate that the book contains virtually no discussion of the normal variations which occur in development. For instance, on page 132 it is stated without reservation that in the normal child the anterior fontanelle is obliterated on palpation between 10 and 16 months of age. This is true of the majority of normal children, but not by any means of all. The doctor who is worried because a fontanelle is open at 18 months, or because the skull circumference is greater than the average, or because a child is smaller than the average in weight or height, or because a child is later than usual in walking, will receive no help in these pages in deciding whether his patient is normal or otherwise. It is hoped that the next edition will remedy this defect and attempt to draw some distinction between what is average and what is normal. The index, furthermore, should be improved.

This is hardly a book for the expert who has a special interest in any of the various aspects of development which it discusses, for the subject is such a wide one that it inevitably deals superficially with each item; but it does give an excellent bird's-eye view of development as a whole, and as such it will be valuable for almost all doctors who are concerned with the care of children, whether paediatrician, school medical officer, child welfare officer, or family doctor.

R. S. ILLINGWORTH.

CONGENITAL HEART DISEASE

Congenital Heart Disease: An Illustrated Diagnostic Approach. By Henry S. Kaplan, M.D., and Saul J. Robinson, M.D. (Pp. 126+xii; illustrated. £5.) New York, Toronto, London: McGraw-Hill Book Company, Ltd. 1954.

This book is yet another addition to the fairly numerous "atlases" of congenital heart disease that have appeared from several countries during the last few years. Its authors are respectively Professor of Radiology and Assistant Professor of Paediatrics at Stanford University School of Medicine, San Francisco.

It consists of two sections: the first is a presentation of the clinical features of various diagnostic procedures used in congenital heart disease, and the second a radiological atlas. The first section is in general excellent, the material being presented clearly and concisely; the atlas portion is well arranged, with drawings superimposed upon the cardiac shadow to demonstrate the position of the chambers and great vessels. The idea is good, but the angiocardiograms on which the atlas is based are of very poor quality and quite unconvincing; most show a merely formless opacity, much below the standards expected to-day. The aortograms of aortic coarctation are, for instance, just dreadful, whereas it is possible to show the lesion clearly and unequivocally. There is similarly no real demonstration of the lesions in Fallot's tetralogy or in pulmonary valve stenosis.

Like its fellow-atlases, this book is of approximately quarto size—a habit that seems to have grown upon us. It is an awkward size for handling, reading, and storing on the shelf. There seems no reason why a smaller and more convenient size could not be used.

The publishers state that it is intended primarily for the general practitioner and medical student. Its whole format is very suitable for direct, concise student teaching, and in this it succeeds admirably. The expert will find but little

in it for him. For students the price seems rather high, although the abundant illustrations make a high price inevitable. They will have to rely upon borrowing it from a library.

RUSSELL BROCK.

A SELFLESS SURGEON

The Scalpel, the Sword: The Story of Dr. Norman Bethune. By Sydney Gordon and Ted Allan. (Pp. 271+xv; illustrated. 16s.) London: Robert Hale Ltd. 1954.

Dr. Norman Bethune was born of pious Presbyterian parents at Gravenhurst in Ontario in 1890. By dint of working during vacations as a waiter or lumberjack he was able to study medicine at a university. Before he was qualified he served in the first world war as a stretcher-bearer in a Canadian field ambulance. He was wounded at Ypres, and on being invalided home obtained his medical degree and then served as surgeon-lieutenant in the British Navy. When the war was over he came to London and took the F.R.C.S. After marrying a young Scots lady of good family he returned to the New World and settled in practice in Detroit, where he gained a surgical reputation at the local hospital. He was then laid low by pulmonary tuberculosis, and while in a sanatorium read the writings of Dr. E. Alexander. He thereupon "stormed into the administrative building" and insisted that an artificial pneumothorax should be performed upon himself. This was done and he speedily got well. After his recovery he worked with Archibald, the famous thoracic surgical pioneer, and himself soon achieved success in that branch of surgery. He and his wife were divorced, but remained friendly.

Bethune was impetuous and irascible. He was impatient, and sometimes angry, with those who did not share his views. He had within him the missionary zeal, but not the doctrinal beliefs, of his godly parents. He became disgusted with ordinary practice and thought a State service was needed. He became a Communist, and, consenting to act as surgeon to the Spanish Republican Forces, did good work in arranging a transfusion service. Then he toured America and lectured in order to obtain funds for the Spanish cause. Finally, in 1938, he went to China to organize the surgical arrangements for the guerrilla Communist Forces. After almost two years of incredibly hard and self-sacrificing work he died of septicaemia in 1939 at the early age of 49.

The first part of this book deals with Bethune's early life and work in Spain; it is rather diffuse, and, while it may be attractive to a lay reader, is likely to be irritating to the medically qualified because of its melodramatic style and the unusual values it puts upon medical attainments and things in general. The second part, which deals with Bethune's experiences in China, is more restrained, and gives many extracts from his own writings penned in China. We see him here as a competent, selfless, hard-working surgeon who was absolutely devoted to his patients. On several occasions he continued operating, with scanty assistance and poor equipment, for two days continuously. His improvisations, his method of operating near the front line, his remarkable use of blood transfusion under the most difficult circumstances, stamp him as a pioneer. Dr. Richard Brown said of him: "Norman Bethune boasted that he was a Communist. I say he was a saint of God." To the reviewer the second part of the book was a delight and compensated for the rather turgid style of the first part.

ZACHARY COPE.

NATIONAL INSURANCE IN AUSTRIA

Praxis der Begutachtung. By Simon Mayr. Foreword by Lorenz Böhler. (Pp. 73+xi; illustrated. D.M.20.) Vienna, Bonn: For Medizinische Wissenschaften by Wilhelm Maudrich. 1954.

This little volume, for the title of which there is no English equivalent, presents an accurate and succinct description of National Insurance in Austria. Written by a consultant of

the great Hospital for Accidents in Vienna, and with a foreword by Professor Böhler himself, it carries unquestioned authority. It deserves the close study of all those, whether medical men or administrators, who have to deal with both health and accident insurance in this country.

Professor Böhler points out the immense importance of accuracy in both diagnosis and prognosis in insurance, the necessity for special training and experience in those who undertake the work, and the lamentable results which may follow if a mistake is made. Dr. Mayr, who was himself a general practitioner before he became consultant to the Accident Clinic, stresses the importance of an appreciation of these problems in general practice and of early recognition of conditions which may at this stage be easily corrected.

The first section describes the general organization of the clinic, which deals with some 50,000 cases each year, and gives an account of the provisions for compensation by the State. The second section, occupying two-thirds of the book, considers in detail all the conditions which may arise as the result of accidents to any part of the body. It is well illustrated and typical cases are clearly described. It concludes with a series of diagrams of possible injuries to the fingers, with a note in each case of the accepted percentage disability, which might well be adopted by our own Ministry of National Insurance and which would be of great assistance to both medical and appeal tribunals.

HENRY SOUTTAR.

A MYCOLOGICAL ATLAS

Practical Mycology: Manual for Identification of Fungi. By Sigmund Funder. (Pp. 146; illustrated. No price.) Oslo: Broeggers Boktrykkeris Forlag. 1954.

This little book, fairly described as a manual for the identification of fungi, is proffered as an introduction to mycology for beginners. It is in fact a mycological atlas comprising a large collection of excellent line drawings illustrating the characteristic microscopic morphology of various genera of fungi, with the minimum of textual description.

A short introductory section deals briefly with the fundamentals of mycology, the basis of classification, and elementary laboratory methods. The major part of the book, consisting of drawings of microscopical preparations designed as an aid in the identification of the fungi, is divided into three sections. The largest of these deals with fungi of general interest, the other two being devoted respectively to fungi of importance to the plant pathologist and those of medical interest; to the last section is appended a useful dichotomous key to the human mycoses. A schematic classification of 122 genera of the *Thallophyta* and a short glossary of mycological terms complete the volume.

As a textbook this work is wanting in balance. The admirable collection of plates for the identification of fungi will prove valuable to those with a basic knowledge of mycology, but to the beginner it is not an adequate introduction.

J. T. DUNCAN.

ATHEROSCLEROSIS

Experimental Atherosclerosis. By Louis N. Katz, M.D., and Jeremiah Stamler, M.D. (Pp. 375; illustrated. 75s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

It is remarkable how much information is gathered together, reassembled, and presented in logical sequence in this relatively short book of 291 reading pages. Appended are 713 references complete with titles. The authors have collected a vast amount of sifted evidence, to which they themselves have contributed in no small measure, in support of their proposition that altered cholesterol-lipid-lipoprotein metabolism plays a key role in human atherogenesis. The book is necessarily concise, well written, and therefore easily read, suitably illustrated to clarify the text, and full of detailed fact. It is strongly recommended to all workers in this important field, and will surely prove a milestone, if not a half-way house, on the road to full understanding of atherosclerosis and its consequences.

PAUL WOOD.

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NORADRENALINE

In 1946 the work of U. S. von Euler¹ drew attention to this very close relation of adrenaline. A substance which by its properties was indistinguishable from noradrenaline was found in the spleen, the heart, and the nerves of the sympathetic chain, and, when Tullar² separated the optical isomers of the synthetic compound, it was finally identified as L-noradrenaline. Von Euler put forward the view that noradrenaline was the chemical transmitter of sympathetic nerve impulses, and was in 1949 shown to be correct by Peart,³ who demonstrated that noradrenaline was liberated in the blood when the sympathetic nerves to the spleen of the cat were stimulated.

Noradrenaline has been used clinically to restore the blood pressure in various conditions, for which purpose it is superior to adrenaline primarily because noradrenaline does not accelerate the heart. This is the consequence of its greater pressor effect, which causes by reflex action an increased vagal tone. The greater pressor action of noradrenaline is explained by the fact that it constricts the vessels in the muscles as well as those in the skin and viscera, whereas adrenaline dilates those in the muscles. The properties of noradrenaline therefore enable it to be given by an intravenous drip so that its effect is always under control and can be increased or diminished at will. So readily indeed does the blood pressure respond to an increase or a decrease in the rate of inflow of noradrenaline that, when it is given, a constant watch on the blood pressure must be kept. The other precaution is that, once an infusion of noradrenaline has been started, it should not be terminated abruptly, since the blood pressure may then fall. This is because noradrenaline, like adrenaline, depresses the transmission through the sympathetic ganglia of the impulses which maintain vascular tone, and before the infusion of noradrenaline is finally stopped the trans-

mission must be given time to recover. Noradrenaline infusions have been used to maintain the blood pressure during the operation of removing an adrenal medullary tumour and also in the treatment of shock following cardiac infarction. Shirley Smith and Guz⁴ described its use in six patients in whom the systolic blood pressure had fallen to levels between 45 and 80 mm. and who seemed about to die. In each there was prompt clinical improvement, and, though two who had had previous infarctions died within three and four days, the others recovered well, and the lives of three were saved by the treatment.

The current interest in noradrenaline concerns the purpose of its release from the adrenal gland. Vogt⁵ has determined the presence of noradrenaline in the plasma of the adrenal vein of the cat, when the gland has been denervated previously. She found a mean secretion of 34 m μ g. of noradrenaline per minute, compared with 21 of adrenaline. In the normally innervated gland Duner⁶ has found that about three times as much noradrenaline is secreted. What is the purpose of this secretion? Does noradrenaline have a special function of its own, or is this simply the overflow of noradrenaline which is synthesized but cannot be stored? The work of West and his colleagues⁷ has shown that in foetal and neonatal life noradrenaline greatly predominates both in the rabbit and in man and that very little adrenaline is present. Later the position is reversed. Hence, ontogenetically, adrenaline seems to replace noradrenaline, and therefore phylogenetically adrenaline can be regarded as a more efficient form of noradrenaline. In the blue whale there is very little adrenaline. Since Bülbring⁸ has shown that noradrenaline is the precursor of adrenaline, the noradrenaline found in the adrenal vein may be the secretion of an unwanted product.

Comparisons between the amounts of noradrenaline and adrenaline in the adrenal vein during rest and activity have shown that the relative amounts change. Thus von Brücke and his colleagues⁹ found that the percentage of adrenaline was raised by stimulating areas in the hypothalamus. Von Euler and Folkow¹⁰ likewise found that the percentage of adrenaline was much greater following stimulation of the central end of the sciatic nerve or of the brachial plexus than it was when the carotid arteries were clamped. Finally, Folkow and von Euler¹¹ have published evidence that the proportion of the two substances in the adrenal vein can be modified by stimulating different points in the hypothalamus. Stimulation of one point caused a rise in the output of noradrenaline without raising the output of adrenaline, while stimulation of a different point caused a rise in the output of adrenaline and little or no effect on that of noradrenaline.

They conclude that in the adrenal medulla there are separate cells for producing adrenaline and noradrenaline and that these are innervated by separate fibres with a different hypothalamic representation.

Eränkö¹² has used histochemical methods which reveal brightly fluorescing cell groups in the adrenal medulla; and he has shown that, when different species are examined, the percentage of the medulla occupied by fluorescing cells is very similar to the percentage of noradrenaline in the mixture of the two amines. To establish the connexion between fluorescing cells and noradrenaline more securely, Eränkö adopted the following ingenious procedure. He cut serial sections of fresh frozen glands of the cat and the hamster. Alternate sections were examined histologically for the distribution of the fluorescing islets, and the other sections were freeze-dried. He then picked out of these freeze-dried sections the pieces which the histological examination had shown to contain many fluorescent islets, and found them to contain more noradrenaline than the pieces from the same section which contained fewer fluorescing cells. Eränkö also tested the effect of injecting rats with insulin and with nicotine. He found that insulin caused a selective depletion of adrenaline and a disappearance of the chromaffin reaction from all but some cells which form islets similar to the fluorescing islets. The fluorescence of these islets was not affected by insulin. This observation agrees with the previous evidence that in insulin hypoglycaemia there is a predominant release of adrenaline. On the other hand, when Eränkö injected nicotine there was a selective loss of noradrenaline and a disappearance of fluorescing and chromaffin material from the islet cells. These observations, made possible by the methods worked out in the Department of Pharmacology in Edinburgh, constitute an important advance in our knowledge of the physiology of the adrenal medulla.

CASTRATION OF SEX OFFENDERS

Castration has been used as a form of treatment or punishment for sex offenders since at least 1500 B.C., and continues to arouse controversy. Some consider it to be a barbaric and primitive custom; its modern advocates can claim that the real effects are rarely studied impartially and that it offers an alternative to years of imprisonment. Surprisingly little is known about the effect of castration on normal human males. Castration before puberty leads to serious diminution in sexual responsiveness, but when performed after puberty the only certainty is that the effects are very variable. Beech¹ points out that "the literature is replete with references to complete retention of sexual function in individuals who have been castrated for

many years," but that nevertheless the human male usually experiences a gradual loss of mating ability. Kinsey² questions whether this gradual loss is not largely due to the effects of advancing age, which his own studies have revealed in detail for the first time, since many of the reports do not give the age of the castrates. Most reports have failed to give detailed information, perhaps because the truth is hard to come by. Lange³ found that victims of accidental castration exaggerated the ill effects in order to obtain financial compensation, and Stürup⁴ that castrated sex offenders are apt to boast about their potency, at least for a time. However, some types of medical treatment have been found effective even when their rationale is rather suspect, and this may be so of castration. The cautious programme carried out at the Herstedvester psychopathic prison in Denmark is much more fully described than others and deserves careful study.⁴⁻⁶

Danish law permits treatment in a special institution of sexually abnormal and other offenders who are not certifiable as psychotic or mentally defective but are not amenable to punishment. The detention is for an indefinite period. Sex offenders, selected after careful study, may be offered the opportunity of volunteering for castration; if so, they are usually released in about six months, although they remain under supervision of the institution. Some 190 offenders were castrated in the ten years after the treatment became legal in 1935. Few are said to resent or to regret it afterwards, and some who establish themselves socially are pleased with the results. Any judgment of the effects is made difficult by the low rate of recidivism of sex crimes and the great variety of offences and of personality in the offenders. In a 10-year survey of over 3,000 sex offenders in Denmark⁶ the rate of recidivism for sex offenders in general was 16.8%. Except in incest cases 70-80% of the recidivism is homologous (the same sex offence). The highest rates of recidivism are for exhibitionism (32.4%), indecent assaults on boys (27.9%), and rape (22.3%). Analysed by personality, if the cause of any sex offence was considered to be "psychopathy," the recidivism was 37.6%, and, if "sexual abnormality," was 61.1%. Castration is never carried out for social convenience or security alone, but only in cases of severe but non-certifiable mental abnormality virtually untreatable by other means, and when the offences have been serious and the prognosis is bad. Thus 13.8% of men convicted of rape were castrated, 14.3% of those

¹ Beech, F. A., *Hormones and Behaviour*, 1948, New York.

² Kinsey, A. C., et al., *Sexual Behaviour in the Human Female*, 1953, Philadelphia.

³ Lange, T., *Die Folgen der Entmannung erwachsener an der Hand der Kriegerführungen dargestellt*, 1934, Leipzig.

⁴ Stürup, G. K., *Acta psychiat. neurol. scand.*, 1946, 21, 781.

⁵ —, *Report of Scandinavian Psychiatric Congress*, 1946.

⁶ —, *Int. Review of Criminal Policy*, No. 4, 1953, H.M.S.O.

¹ v. Euler, U. S., *Acta physiol. scand.*, 1946, 11, 168.

² Tullar, B. F., *J. Amer. chem. Soc.*, 1948, 70, 2067.

³ Peart, W. S., *J. Physiol.*, 1949, 108, 491.

⁴ Smith, K. S., and Guz, A., *British Medical Journal*, 1953, 2, 1341.

⁵ Vogt, M., *Brit. J. Pharmacol.*, 1952, 7, 327.

⁶ Duner, H., *Acta physiol. scand.*, 1954, 32, 63.

⁷ West, G. B., et al., *Clin. Sci.*, 1953, 12, 317.

⁸ Bülbring, E., *Brit. J. Pharmacol.*, 1949, 4, 234.

⁹ Brücke, F. v., et al., *Arch. int. Pharmacodyn.*, 1952, 88, 407.

¹⁰ v. Euler, U. S., and Folkow, B., *Arch. exp. Path. Pharmacol.*, 1953, 219, 242.

¹¹ Folkow, B., and v. Euler, U. S., *Circulation Research*, 1954, 2, 191.

¹² Eränkö, O., *Nature (Lond.)*, 1955, 175, 83.

committing indecent assault on boys, but only 2% of the much larger numbers committing indecent assaults on women and girls, for whom the prognosis is much better. Among 500 criminals admitted to Herstedvester before 1948, 199 were sex offenders (apparently about 2.5% of all sex offenders). Of these, 175 have been released, 117 after castration and 58 without castration; 15 are dead or in mental hospitals; 9 are still detained. Of the 117 castrated and released, only 5 have again committed a sex offence in a period of 4-10 years. Of the 58 who were released without being castrated, 25 again committed the same kind of offence. Seventeen of these later consented to be castrated and were released; so far they have not been convicted of further offences. Thus a total of 134 have been released after castration, with a homologous recidivism of 3.7%. Perhaps the most interesting feature is that all the 5 men who committed a sex offence after castration were homosexuals who associated with boys. Thus the recidivism for castrated heterosexuals was nil, but was about 10% for the 49 homosexuals who were castrated. The homosexual's attitude to castration may be more complex, and his opportunity for legitimate expression more limited, though homosexual activity between adults is not an offence in Denmark. The castrated and non-castrated groups, however, are not strictly comparable, since there is a natural tendency to risk releasing the minor offenders, such as exhibitionists, and to detain—sometimes for 10-15 years—men convicted of rape who refuse castration.

In Britain there are probably few advocates for the castration of sex offenders; and the Danish results, impressive as they are, do not suggest that castration offers such a sound solution to the problem of treating these people that we should re-examine the basis of our reluctance to use it. Nevertheless the more frequent passing of sentences of up to fourteen years' preventive detention may stimulate a humanitarian demand for some alternative to imprisonment. The production of reversible castration by means of oestrogens, perhaps implanted, might be worth studying.

PURE RED-CELL ANAEMIA

Marrow hypoplasia or aplasia is now known to affect haemopoiesis in more than one way. In what might be called typical aplastic anaemia the hypoplasia affects the formation of leucocytes and platelets as well as red cells and gives rise to pancytopenia in the peripheral blood. Less commonly, the formation of red cells is seriously affected and leads to a profound reticulocytopenia, although the production of leucocytes and platelets continues normally or almost normally. This latter type of anaemia—pure red-cell anaemia¹—gives rise to several

distinct clinical entities. The first of these is a chronic anaemia in infants—congenital hypoplastic anaemia² or erythropoiesis imperfecta.³ The second is an acquired chronic anaemia in adults—sometimes apparently associated with tumours of the thymus.⁴⁻⁵ And thirdly a temporary condition occurs occasionally in the course of congenital haemolytic anaemias⁶⁻⁸ and rarely in autoimmune acquired haemolytic anaemia⁹⁻¹⁰ or in previously healthy children.⁷

Pure red-cell anaemia of infants is usually diagnosed in the first year of life, though the infant may appear healthy at birth. Anaemia is the sole symptom and the children develop normally as a rule. The most striking pathological feature is the virtual or perhaps complete absence from the marrow of the nucleated precursors of the red cells. Nothing certain is known of the cause of the disorder. Recently, however, K. I. Altman and G. Miller¹¹ have demonstrated anthranilic acid in the urine of several children suffering from pure red-cell anaemia; this suggests an abnormality in tryptophan metabolism, but the link between the abnormality and the anaemia remains obscure. Periodic transfusion is usually necessary, and the outlook for the patient is rather grave. Even so, spontaneous cure or substantial improvement has been reported. Some of these children have been treated with A.C.T.H. or cortisone, or by splenectomy, or both. The results seem unpredictable and usually unsatisfactory.^{3, 12}

It is uncertain what relationship there is, if any, between the pure red-cell anaemia of infancy and typical aplastic anaemia leading to pancytopenia. Moderate degrees of leucopenia have been observed in children who otherwise would seem to belong to the group of pure red-cell anaemia.¹³ A further complication is the finding of peripheral reticulocytopenia (with normal leucocytes and platelets) in children whose marrows show normal or even increased numbers of erythroblasts instead of the expected hypoplasia. In these patients arrest of maturation rather than red-cell aplasia seems to be the cause of the anaemia.¹⁴

Pure red-cell anaemia in adults is a rare disease, and the pathogenesis is uncertain. In at least nine patients a tumour of the thymus (usually a benign thymoma) has been associated with the anaemia; some but not all of the patients have had myasthenia gravis.⁴⁻⁵ The case histories recently reported by Drs. J. N. M. Chalmers and K. Boheimer in this *Journal*¹⁵ are particularly interesting. The first patient developed temporary remissions following, respectively, thymectomy and splenectomy, and later went into apparent permanent remission after

receiving a course of A.C.T.H.; the second patient responded similarly to A.C.T.H. after thymectomy and splenectomy, which in themselves had conferred little or no benefit. Two other patients referred to by Chalmers and Boheimer responded to thymectomy (without splenectomy or A.C.T.H. therapy), but in neither of the patients of Ross and co-workers⁵ was the operation successful. Chalmers and Boheimer suggest that the anaemia may be brought about by an inhibitor of erythropoiesis, formed in lymphoid tissue, and that thymectomy may be successful, depending upon the degree of interference with erythropoiesis. In Chalmers and Boheimer's own patients, on this hypothesis, removal of the spleen as well as the thymus did not remove sufficient lymphoid tissue for erythropoiesis to proceed; only after subsequent A.C.T.H. therapy, which perhaps caused a further depression of lymphoid tissue, did erythropoiesis take place normally. In those cases, too, in which a similar type of anaemia has occurred with no evidence of a thymic tumour remission has followed splenectomy with or without subsequent A.C.T.H. or cortisone therapy.¹⁵ Finally, it should be mentioned that patients suffering from pure red-cell anaemia have been recorded as responding to riboflavine¹⁶ and cobalt.^{17, 18}

The concept of inhibition of erythropoiesis resulting from hyperplasia of lymphoid tissue is especially interesting. The spleen had often been thought capable of inhibiting haemopoiesis; usually, however, the result of "hypersplenism" is pancytopenia. The case reported by G. Eisemann and W. Dameshek,¹⁹ in which red-cell hypoplasia associated with an auto-immune haemolytic anaemia disappeared following splenectomy, might be looked upon as an example of a more specific type of hypersplenic activity.

SEASONAL INCIDENCE OF PEPTIC ULCER

It has long been a clinical impression that the symptoms of gastric and duodenal ulcers are exacerbated in the spring and autumn. If they are, the fact is of considerable theoretical interest, for it may provide a clue to the aetiology of two conditions which at present elude us. Few objective data support the impression, and they are not altogether consistent. The subject is reviewed by A. C. Ivy, M. I. Grossman, and W. H. Bachrach.¹⁹ Data for the month of onset of pain, haemorrhage, perforation, and death all show a decreased incidence in summer and a sharply increased incidence in the late autumn or winter. Most data have been obtained from the northern hemisphere, but the same rhythm has also been shown to exist—so far as symptoms are concerned—in the southern hemisphere.²⁰ Some data suggest that there may also be an increase of activity in the spring, but the evidence for this is not striking. In fact, R. A. Jamieson,²¹ who studied the distribution of nearly 8,000 cases of acute perforation treated in the three main Glasgow hospitals, found that throughout this period

of the year the incidence was remarkably constant. A partial explanation of these differences may perhaps be found in the grouping together of cases of gastric and duodenal ulcer. According to R. S. Boles and M. P. Westerman,²² who have recently reported on 320 cases of peptic ulcer admitted for haemorrhage to the Philadelphia General Hospital over the five years 1949-53, the peak months for gastric ulcer admissions were between January and June, with a lower incidence in the late summer and the autumn; while duodenal ulcer admissions showed two peaks of incidence, one in March and the other in November, with a minimum in July. Boles and Westerman suggest that the pattern for duodenal ulcer may be related to changes of temperature—the peaks of incidence occurring in the months in which the extent of the change between the beginning and end of the month is the greatest. They also suggest—though they provide no data in support—that haemorrhage may be precipitated by changes in barometric pressure. The correlation shown between temperature change and incidence of haemorrhage is undoubtedly close over the latter half of the year, but it is much less striking during the first six months, and, if their explanation were to be accepted, it would be necessary to postulate some additional factor responsible for the relatively high incidence in the middle of the winter. Other explanations put forward in the past are that the activity of an ulcer may be stimulated by upper respiratory infections or by the ingestion of vegetables which are subject to seasonal fluctuation in their supply. These suggestions, though stimulating to research, are based on very little factual data, and it may well prove that Jamieson was right in concluding that, so far as perforations are concerned, the decrease in incidence between mid-July and October is due to the physical rest associated with holidays and comparable to the reduced incidence characteristic of Sundays and Mondays and of the early hours of the morning.

THIS YEAR'S BILL

An increase of some £25m. in the total cost of the Health Service in 1955-6 had already been foreshadowed in the Vote on Account published a few weeks ago. The detailed estimates¹ that have now appeared show how the increase is distributed among the different branches of the Service.

The interesting thing is that each main branch shows an increase of some sort, though where the cost is partly offset by patients' payments—in the pharmaceutical, dental, and supplementary ophthalmic services—the net increases, after allowing for these payments, look insignificant against a background of £462m. being spent on the Service as a whole. But, small as they are, they give the impression that the effect of the charges has to a certain extent worked itself out. The gross cost of dental treatment is still well below the peak it reached in the early years of the Health Service—when dentists' fees were higher. But at £35½m. (reduced by charges to patients to £27½m.) it has climbed some way from the

¹ Lescher, F. G., and Hubble, D., *Quart. J. Med.*, 1932, **25**, 425.

² Diamond, L. K., and Blackfan, K. D., *Amer. J. Dis. Child.*, 1938, **56**, 464.

³ Cathie, I. A. B., *Arch. Dis. Childh.*, 1950, **25**, 313.

⁴ Chalmers, J. N. M., and Boheimer, K., *British Medical Journal*, 1954, **2**, 1514.

⁵ Ross, J. F., et al., *Blood*, 1954, **9**, 935.

⁶ Owren, P. A., *ibid.*, 1948, **3**, 231.

⁷ Gasser, C., *Sang.*, 1950, **21**, 237.

⁸ Singer, K., et al., *J. Lab. clin. Med.*, 1950, **35**, 721.

⁹ Davis, L. J., et al., *Glasg. med. J.*, 1952, **33**, 263.

¹⁰ Eisemann, G., and Dameshek, W., *New Engl. J. Med.*, 1954, **251**, 1044.

¹¹ Altman, K. I., and Miller, G., *Nature, Lond.*, 1953, **172**, 868.

¹² Smith, C. H., *J. Pediatr.*, 1953, **43**, 457.

¹³ Palmén, K., and Vahlquist, B., *Acta haemat.*, 1950, **4**, 273.

¹⁴ Bernard, J., et al., *Sem. hôp. Paris*, 1951, **27**, 2985.

¹⁵ Loeb, V., et al., *Amer. J. Med.*, 1953, **15**, 499.

¹⁶ Foy, H., and Kondi, A., *J. Path. Bact.*, 1953, **65**, 559.

¹⁷ Seaman, A. J., and Koler, R. D., *Acta haemat.*, 1953, **9**, 153.

¹⁸ Fountain, J. R., and Dales, M., *Lancet*, 1955, **1**, 541.

¹⁹ Ivy, A. C., et al., *Peptic Ulcer*, 1950, London.

²⁰ Linn, H., *Med. J. Aust.*, 1946, **2**, 649.

²¹ Jamieson, R. A., *British Medical Journal*, 1947, **2**, 289.

²² Boles, R. S., and Westerman, M. P., *J. Amer. med. Ass.*, 1954, **156**, 1379.

¹ Civil Estimates for the Year Ending March 31, 1956, Class V. H.M.S.O., 6s.

low level it fell to when the charges were first introduced. A similar trend can be observed in the cost of the ophthalmic service. As regards the pharmaceutical service, a year ago the estimate (for 1954-5) was much the same as for the previous year, and there seemed some hope that a combination of charges and exhortations to doctors to prescribe economically had stabilized the cost of this service, which had gone up inexorably since 1948. But in the event a supplementary estimate of some £2m. was needed in the course of the year, and this year's estimate, though only slightly higher at £55m. gross (and £47½m. net), is £7m. higher than the estimate for the year when the shilling charge was introduced.

In all these cases the rise in the estimates reflects a bigger demand by the public rather than a rise in the cost of providing the Service, though drugs are certainly no cheaper. So far as the hospitals are concerned, the increase in the estimated advances to boards is largely accounted for by higher salaries and wages and other maintenance costs. The recent award to nurses was estimated to cost over £4m. a year, and in this instance there are expected to be more staff to pay, for 8,000 more nurses and midwives are now being employed than a year ago. The number of consultant and other medical staff, on the other hand, is roughly the same. On the whole, however, this year's estimated rise of nearly £20m. in the cost of maintaining the hospitals is due to the higher cost of the existing service rather than to any noticeable expansion. That will not come until the new hospital building programme, announced earlier this year to start in 1956-7, has been completed. But long before that the Guillebaud committee on the cost of the Health Service will have reported, and—just possibly—some change in the method of financing the hospitals may have been introduced.

CEREBRAL BASIS OF MEMORY

The relationship of mind and brain remains as firmly established and its exact nature as obscure as in the days of the Hippocratic school. The question has been of perennial interest to neurologists, and within the last few decades they have been able to throw light on the more limited problem of which parts of the brain especially influence consciousness. While Pavlov's view of the cerebral cortex as an analyser and therefore an essential organ for fine discriminatory consciousness remains unassailed, recent interest has focused on the neural background of the more crude diffuse "awareness" that must lie behind discrimination. The occurrence of pathological sleep in man in encephalitis lethargica with lesions shown to be maximal in the hypothalamic region, and later Hess's¹ production of sleep by electrical stimulation of limited sites in the diencephalon of animals, both directed attention to subcortical structures. The late Sir Hugh Cairns, in his Victor Horsley lecture,²

reviewed the evidence, from his own considerable experience, for a causal connexion between disturbances of consciousness and lesions of the brain stem and diencephalon. He concluded that such lesions could produce "severe disturbance of consciousness which arises without any direct involvement of the cortex or cortico-spinal pathways," and suggested that the reticular formation was an important part of the anatomical background for this.

Cairns's interest in this field has been maintained by his colleagues in the Oxford Medical School, and Williams and Pennybacker³ have made a valuable study of disturbance of memory in patients with brain tumours involving the floor and sides of the third ventricle. All of their four cases showed a Korsakov type of memory defect—amnesia with confabulation (that is, answering questions and recounting experiences without regard to actual happenings). In one the relation of symptoms to the function of third ventricular grey matter seemed particularly well established, because a cystic tumour which pressed on these structures was present: when the pressure was relieved by evacuation of the cyst symptoms subsided, only to recur as the cyst again filled up. The authors provide convincing collateral evidence that the memory disturbances were not associated with other and more diffuse cerebral lesions or with such factors as raised intracranial pressure. The quality of the memory defects was of special interest. Usually they were accompanied by some reduction in responsiveness and alertness, though the general dementia seen in other cerebral lesions was not present. But the striking feature was the confabulation and pseudo-reminiscence produced by attempts at recalling memories: it was almost as if the content of memory was still there but that its orderly arrangement and temporal sequence were at fault. In this sense the disturbances seem to follow the diffuse rather than discriminatory pattern of other subcortical lesions. A study⁴ of the mental disturbances in tuberculous meningitis is also concerned with defects of memory. In some patients such defects were prominent, consisting especially of "an inability to organize past events in correct temporal sequence"; and in these cases also the inflammatory process directly involved the floor of the third ventricle. The authors are cautious in connecting the two observations, but their evidence for a causal relation seems convincing and confirmatory of other work.

SUCROSURIA

Not so long ago "marasmus" was a term used to cover ignorance about the reasons why certain infants did not thrive after birth. Modern diagnostic methods, in particular chromatography, have shown that these infants may suffer from serious metabolic disorders, and it should be accepted that any child with obscure wasting requires urgent and specialized investigation. In this way, for example, Moncrieff and Wilkinson¹—writing in a special number of *Acta Paediatrica* in honour of Professor A. Wallgren's 65th birthday—have recently discovered sucrose in the urine of three such

¹ *Acta paediat. (Uppsala)*, 1954, 43, Suppl. 100, p. 495.

patients. Sucrose is a disaccharide which, unlike other common sugars, does not reduce alkaline copper reagents. It is rapidly split by hydrolysis in the intestine—probably by a combined action of gastric juice and succus entericus—into its component sugars, glucose and fructose, which pass quickly to the liver. If sucrose escapes hydrolysis it enters the tissue fluids, where it behaves as an inert substance and is excreted by the kidneys. Because of its rapid absorption this particular sugar is often used in the treatment of hypoglycaemia. Its presence in the urine has occasionally been reported in patients with gastro-intestinal and pancreatic disorders.

Studies by paper chromatography show that most sugars are excreted in small quantities in the urine of infants. In Moncrieff and Wilkinson's cases, however, abnormal amounts of fructose, lactose, and sucrose appeared after milk feeds (which contain lactose and sucrose). A single dose of sucrose increased the abnormality. When various combinations of dietary sugars were fed to the infants it was possible to recover individual sugars from the urine provided that sucrose and lactose were present in the diet. Moncrieff and Wilkinson are not yet able to say what is the nature of the defect in carbohydrate metabolism in their patients. Attempts to measure the activity of succus entericus were not wholly successful, but the fact that fructose was excreted after a dose of sucrose suggests that splitting takes place in the intestine. There must, however, be very rapid absorption before hydrolysis is complete, and it is significant that both sucrose and lactose are disaccharides, which perhaps compete with each other for hydrolysis. More will be learned about the utilization, storage, and excretion of sugars when further cases of this abnormality are detected. All three infants suffered from mental defect and hiatus hernia in addition to the sucrosuria. It is not clear whether these are associated congenital lesions or whether they are closely related to the sucrosuria. Necropsy in one infant showed developmental abnormalities in the brain, and it is difficult to imagine a relationship between an oesophageal lesion and abnormal sugar metabolism. On the other hand, galactosaemia is known to result in mental retardation. The fact that two infants died and the third is mentally and physically backward makes it unnecessary to stress the need for early detection of this interesting new metabolic error.

ELECTRICAL ACTIVITY OF THE UTERUS IN LABOUR

During the last few years interest has been shown in the recording of the electrical activity of the human uterus during labour.¹⁻³ In a recent paper C. M. Steer⁴ has reviewed his findings in 556 parturient women in whom recordings were made with his electro-hysterograph (E.H.G.). The value of this review is enhanced by the fact that the E.H.G. findings were not allowed to influence the management of any case, nor were they used to classify a labour as normal or abnormal. The E.H.G. is a device employing three pairs of elec-

trodes placed on the abdominal wall so that one pair lies over the right uterine cornu, another correspondingly on the left, and the third over the midline of the fundus. The location, duration, frequency, and amplitude of the electrical waves can thus be recorded. The waves are present only during uterine contractions, whether of true or false labour at or before term, and between contractions there is a relatively smooth tracing in which the electrocardiogram can usually be seen. The wave of electrical activity begins simultaneously with the mechanical contraction, some 10-20 seconds before pain is appreciated: the electrical wave and the pain end simultaneously, at which time relaxation begins, to become complete in a further 15-30 seconds. In normal labour the frequency of the waves is ½-2 cycles per minute, while the amplitude varies from 50 to 500 microvolts in direct proportion to the clinical strength of the uterine contractions.

Steer considered in particular detail 51 labours, all but two in primigravidae, in which a clinical diagnosis of uterine inertia was made. Such a diagnosis was based on the failure of the cervix progressively to dilate, with the strength and frequency of contractions remaining unchanged or becoming weaker. The eventual duration of labour varied from 15 to 120 hours with a mean and median of 35 hours. The significant finding by E.H.G. was the absence of electrical activity during contractions in five of these 51 women. Two of the five were treated with pitocin by intravenous drip, while in the other three only sedative and supportive measures were employed; but in all five cervical dilatation never progressed beyond two fingerbreadths, and caesarean section was required. In Steer's opinion these are cases of true primary uterine inertia, and he remarks, as others have done, that this is a rare condition. In the remaining 46 women electrical activity was present, and Steer regards these as cases of slow but basically normal labour, in which stimulation with pitocin is nearly always effective. He notes, however, that disproportion was present in over one-third of these 46 cases. The importance of such coexistence of disproportion and inertia, an association which again has been remarked by others, lies in the fact that stimulation with pitocin may succeed in overcoming minor disproportion and effecting vaginal delivery, but only at the cost of damage to the foetus.

The electro-hysterograph can thus serve to distinguish between the more common slow normal labour and the rarer true inertia which represents some basic disturbance of uterine muscle activity. Such a distinction can also be made by observing the results of stimulation with pitocin, but without the same absolute safety. The nature of true inertia is still unexplained. The uterine muscle contracts but does not provide sufficient force for progressive labour, and Steer concludes by suggesting that the fault may lie either in the contractile apparatus within the uterine muscle fibre or in the transmission of the impulse to contract.

¹ Steer, C. M., and Hertsch, G. J., *Amer. J. Obstet. Gynec.*, 1950, 59, 25.
² Halliday, E. C., and Heyns, O. S., *J. Obstet. Gynaec. Brit. Emp.*, 1952, 59, 309.

³ Lévy-Solal, E., et al., *Presse. méd.*, 1952, 60, 1335.
⁴ Steer, C. M., *Amer. J. Obstet. Gynec.*, 1954, 68, 867.

¹ *Das Zwischenhirn*, 1949. Basel.

² *Brain*, 1952, 75, 109.

³ *J. Neurol. Neurosurg. Psychiat.*, 1954, 17, 115.

⁴ Williams, M., and Smith, H. V., *ibid.*, 1954, 17, 173.

EMERGENCIES IN GENERAL PRACTICE

DIABETIC AND INSULIN COMA

BY

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The treatment of severe diabetes mellitus involves the use of one or more of the many insulin preparations now available and the prescription of a suitable diet. There is an increasing tendency for the routine management of these patients to be undertaken in special hospital out-patient clinics, partly because in some cases it is difficult and time-consuming, and partly because the help of dietitians and other ancillary workers may be required. The general practitioner is apt to see his diabetic patients only if some emergency arises, such as an intercurrent infection or the development of ketosis or severe hypoglycaemia. When this happens, lack of familiarity with the patient's diabetic condition makes his task much harder.

Diabetic Coma and Pre-coma

It is now generally accepted that diabetics fall broadly into two groups—those who are underweight and those who are overweight when the condition is recognized. It seems likely that in the first type insulin-lack is the underlying cause, whereas in the second type insulin is still being produced by the pancreas in approximately normal amounts. Both groups have a high blood sugar with glycosuria and polyuria, but those suffering from insulin lack tend, in addition, to produce an excess of ketone bodies unless adequate replacement therapy is given. If these ketone bodies are being formed so fast that they accumulate in the blood, the patient may be said to be in a state of diabetic ketosis, and unless treatment is given will deteriorate, first becoming drowsy and finally unconscious. Coma resulting from severe diabetic ketosis is fortunately rarely seen nowadays, and the practitioner is concerned with recognizing the condition in the pre-coma stage, which in itself is to be regarded as a medical emergency.

Severe diabetic ketosis or diabetic pre-coma is usually defined on a biochemical basis (carbon dioxide combining power less than 20 vols.%), but on clinical assessment it may be said to be present when, following a period of severe diabetic imbalance, there is evidence of dehydration and the patient's breath smells strongly of acetone. In this condition there is a heavy glycosuria and in almost all cases ketone bodies are present in sufficient concentration to give a positive ferric chloride reaction.

Patients with recently developed diabetes rarely reach the stage of severe ketosis before seeking medical advice. Known diabetics may go into ketosis because the dose of insulin prescribed for them is inadequate or because their syringe is defective and they are not getting the full amount. Much more commonly it follows a sudden increase of insulin requirement produced by an intercurrent infection, usually of the upper respiratory or gastro-intestinal tract. Occasionally an emotional upset increases the insulin requirement enough to lead to diabetic ketosis.

Recognition of Severe Diabetic Ketosis

Severe diabetic ketosis does not develop in a matter of hours: with very few exceptions the patient will give a history of thirst, polyuria, and nocturia for several days. As the ketosis becomes more severe, appetite is lost and increasing nausea is followed in many cases by vomiting. Intense thirst persists until consciousness is lost. Some patients, when they lose their appetite or start to vomit,

reduce or omit their insulin injections—a step that still further aggravates their condition. Constipation is the rule and is occasionally associated with severe abdominal pain suggestive of an acute attack of appendicitis or some other surgical emergency. In a few cases the acidotic respiration is very striking and the patient's chief complaint is of breathlessness or dyspnoea.

A history of increasing thirst and polyuria followed by nausea and vomiting in a diabetic patient should warn the practitioner of the possibility of diabetic ketosis. The most important findings on physical examination are signs of dehydration—a dry red tongue, inelastic skin, and often a reduction of blood pressure. The breathing is usually very deep and may be rapid. The breath smells strongly of acetone.

Examination of the urine is of great importance, and, unless the patient is unconscious or severe dehydration and hypotension have led to impairment of renal function, there is seldom any difficulty in obtaining a specimen. This should first be tested for sugar. There is no longer any need to use Benedict's solution or to boil the urine in a test-tube over a spirit flame. The "clinitest" tablet method has been shown to be accurate and reliable and is much more convenient for use in the patient's home. If the urine contains less than 2% sugar it is extremely unlikely that the patient is in diabetic ketosis. An approximate quantitative assessment of the percentage of sugar in the urine is obtained from the colour chart provided with the tablets. Corresponding colours obtained with Benedict's test, using 0.5 ml. urine and 5 ml. reagent, are as follows:

	Clinitest Colour	Benedict Colour
0%	Blue	Blue
1%	Yellow-green	Cloudy green
1%	Yellow-brown	Yellow
2% or more	Orange	Red

If there is a heavy glycosuria the urine should next be tested for ketones: a number of methods are available. The sodium nitroprusside or Rothera test is extremely sensitive and in practically all cases of severe diabetic ketosis it is very strongly positive. The ferric chloride test is much less sensitive and a true positive result indicates a gross ketonuria and the presence of a severe degree of ketosis. Unfortunately, however, salicylate medication leads to a false-positive reaction in the ferric chloride test and it is not uncommon for patients, feeling unwell on account of their unbalanced diabetes, to take a couple of aspirins. Methods are available for distinguishing the false-positive from the true-positive ferric chloride reaction, but these involve boiling the urine for 10 minutes and are not really suitable for use in the patient's home. Recently a tablet modification of the Rothera test has been introduced and has greatly simplified the detection of significant degrees of ketonuria. When using the "acetest" tablet a ++ or +++ reaction indicates marked ketonuria, corresponding to a true-positive ferric chloride reaction. It must be emphasized that the colour given by the acetest tablet is much weaker than that of the original Rothera test, and any patient giving a ++ or +++ result on the chart provided with the tablets should be considered to have severe diabetic ketosis and to be in urgent need of treatment.

Diagnostic Difficulties

A number of conditions have been incorrectly diagnosed as diabetic ketosis: salicylate poisoning, meningococcal meningitis, and subarachnoid haemorrhage may be quoted

as examples. Such errors are rare and may be avoided by careful consideration of the clinical features and critical assessment of the results of the urine tests. There are two situations, however, which more often give rise to difficulty.

Obese diabetics, seriously ill with cerebral or coronary thrombosis, often develop some degree of starvation ketosis. The presence of ketonuria in a drowsy or comatose diabetic may lead to the diagnosis of diabetic ketosis being made. Obese diabetics, however, do not lack insulin and are not liable to develop true diabetic ketosis. The differentiation between true diabetic ketosis and starvation ketosis occurring in a seriously ill obese diabetic is of some prognostic importance. Diabetic ketosis usually responds dramatically to suitable treatment, whereas large doses of insulin are unlikely to help the obese diabetic.

Severe diabetic ketosis may on very rare occasions be present without ketonuria. Failure to excrete the ketones is the result of secondary impairment of renal function. These patients always have oliguria. The clinical features and especially the strong smell of acetone in the breath should point to the correct diagnosis.

Prevention of Diabetic Ketosis

The practitioner is particularly concerned with the prevention of ketosis in a diabetic patient who develops an intercurrent infection. Not only must he treat the infection as intensively as possible but also ensure strict control of the diabetes. These patients should be instructed to test their urine before each meal, or, if they are not taking food, at least four times a day. If the intercurrent illness is severe, long-acting insulins (globin, protamine zinc, or insulin zinc suspension) should be discontinued and regular doses of soluble insulin given instead. One-third of the previous total dose should be given six-hourly; when calculating the dose to be taken the practitioner should ask to see both the insulin bottle and the syringe and verify the usual dose taken. This is necessary because patients often refer to marks on the syringe as units, and as most syringes are graduated for single-strength insulin, whereas that usually used is double or quadruple strength, confusion can easily arise.

If the urine tests continue to show 2% or more of sugar the insulin dose should be increased by about 10% every six hours until the urine sugar falls to 0.5% or less. When the urine is sugar-free, the insulin dose should be reduced. If the patient is unable to take food, glucose drinks should be given at a rate of about 10 g. of glucose hourly (10 g. glucose=approximately one level tablespoonful of glucose powder). If there is severe vomiting insulin should still be given based on the results of the urine tests, but if the urine sugar falls below 2% while there is a heavy ketonuria (++ or +++ with acetest tablets) parenteral therapy is indicated and the patient should, if possible, be sent into hospital. If the intercurrent infection is only mild the patient's usual insulin may be continued, but if there is 2% of sugar in the early morning urine the dose should be increased by 10% (patients using protamine zinc insulin alone or insulin zinc suspension should increase the dose by 20%) and further tests taken before each meal. If 2% glycosuria continues an additional small dose of soluble insulin should be given before meals and at bedtime.

The method of control outlined for these patients is only applicable if the renal threshold for glucose is normal. Some diabetics have an abnormally low threshold and pass sugar in the urine, sometimes up to 2%, while their blood sugar is in the normal range. Patients soon discover if they have this abnormality, and know that for them a sugar-free urine is a warning of impending hypoglycaemia. In these cases the best indication that an increase of insulin dose is needed is the presence of thirst and polyuria, but, if the intercurrent infection is at all severe, blood-sugar estimations are likely to be needed and admission to hospital should be advised.

Emergency Treatment of Severe Diabetic Ketosis

Severe diabetic ketosis requires hospital treatment, and this is essential if there is dehydration associated with nausea or vomiting. Furthermore, experience has shown that a delay of even a few hours may influence the ultimate outcome, therefore the practitioner should initiate treatment before leaving the patient's home. Every practitioner should have a supply of soluble insulin (80 units per ml. strength) and of sterile ampoules of 50% glucose solution, so that he can take them on any emergency call to a diabetic patient. In severe diabetic ketosis soluble insulin in large doses is required, and if the practitioner is certain of the diagnosis he should give 50 to 100 units by deep intramuscular injection. A dose of 100 units is to be regarded as the standard for a case of severe ketosis with dehydration, nausea, and vomiting, but if the patient is a previously undiagnosed diabetic or a child the dose should not exceed 50 units.

In less severe cases without any nausea or vomiting, treatment can, when necessary, be undertaken at home. If the patient is an adult and a known diabetic, treatment should be started with a dose of 50 units of soluble insulin. At the same time fruit-flavoured saline drinks should be ordered (2.7 g. of salt—about half of a level teaspoonful of table salt—in a pint (570 ml.) of water) and given at the rate of one to two pints (half to one litre) every three hours. After the first three hours glucose should be added to the drinks, about 50 g. spread over each three-hour period. Urine tests should be made every three hours and the insulin dose repeated if the urine still contains more than 2% sugar. If the patient is unable to produce a urine specimen after three hours, it suggests that the blood sugar has been reduced to the normal range and that in consequence the glycosuria and polyuria are controlled; the next insulin dose should therefore be omitted. As the glycosuria decreases, glucose and insulin in smaller doses should be continued until the ketonuria is abolished. If the patient is responding satisfactorily to treatment a reduction of the ketonuria should be apparent by the sixth hour; if this has not been achieved or if there has been vomiting at any time in the course of treatment it is probably advisable to send the patient into hospital. The principal steps to be taken in the management of patients with diabetic ketosis treated at home are given in the following table:

Treatment of Diabetic Ketosis at Home

Note: This is not suitable for patients who are nauseated or vomiting.

On making the diagnosis give 50 units of soluble insulin intramuscularly and start fruit-flavoured saline drinks.

At 3 hours:

Obtain a urine specimen and test for sugar and ketones.

If urine sugar 2% give 50 units of insulin

" " " 1% " 32 " " "

" " " 0.5% " 16 " " "

" " sugar-free or if no specimen obtainable omit insulin

Add glucose to saline drinks—50 g. every three hours

At 6 hours:

Obtain and test urine specimen

Repeat insulin as at three hours

Continue glucose-saline drinks. If glycosuria is 0.5% or less, milk and light diet may be started

If there has been no improvement in the patient's condition and ketonuria, transfer to hospital is advisable

If the ketosis has been precipitated by an intercurrent infection immediate steps should be taken to treat the infection.

Hypoglycaemic or Insulin Coma

Although "insulin reactions" or mild hypoglycaemic attacks are quite common in diabetics taking insulin, severe episodes leading to coma are relatively rare. The commonest causes of insulin reactions are unusual exercise, missed and delayed meals, or a sudden alteration in the insulin requirement. The reactions resulting from physical exertion may be somewhat misleading in patients taking long-acting insulins, because, instead of occurring during or immediately after the

exercise, they tend to be delayed and to come on during the night or even the next day. Reactions due to a sudden alteration of insulin requirement may occur after an illness in which the insulin dose has had to be increased. When the patient is convalescent and resumes normal activity the insulin requirement often falls rapidly and it is difficult to judge the dose required.

Recognition of Hypoglycaemic Coma

Patients on soluble insulin usually have adequate warning that their blood sugar is falling dangerously low. Blurring of vision, slurring of speech, unsteadiness of gait, sweating, or a sense of unreality all draw attention to the need for glucose or other easily assimilated carbohydrate food. Patients using long-acting insulins may have insulin reactions following this pattern, but in some cases there may be loss of consciousness without any of the warning signs; in others the patient becomes disorientated and violent so that he fails to appreciate the situation and may refuse to take a glucose drink. Another danger with the hypoglycaemic attacks of the long-acting insulins is that they tend to come on during the night. When this happens a severe attack will result in the patient being found to be unrouseable in the morning. Mild nocturnal hypoglycaemia often leads to unpleasant nightmares, and the patient wakes the next morning drowsy, and with a headache which may be relieved by breakfast or persist through the day.

When the blood sugar falls to an unusually low level during a hypoglycaemic attack, typical epileptic convulsions may occur. In older patients with cerebral vascular disease Jacksonian fits and hemiplegia may result from mild hypoglycaemia.

Hypoglycaemic coma compared to diabetic coma is a condition of rapid onset. The patient is seen going about his business and apparently quite well, and then half an hour later he is found unconscious; or he goes to bed normal in the evening and the next morning he cannot be roused. Further details about the case are of value in making the correct diagnosis. It is helpful to know that the patient is a diabetic taking insulin—for this reason all diabetics who take insulin should carry a card giving the details. Secondly, a knowledge of the patient's meals and activities may give a clue to the diagnosis, whether at the time the attack came on the patient was late for a meal or whether there had been some unusual physical exertion.

On examination there is usually a striking absence of physical signs. The patient, unless actually having an epileptic convulsion, appears to be sleeping quietly, breathing normally, well hydrated but pale, and sometimes sweating. In severe attacks the plantar responses may be extensor and in older patients there may be signs of a hemiplegia. Urine examination is of little value; the presence of urine in the bladder containing 2% sugar does not exclude hypoglycaemic coma, because the urine may have been secreted before the blood sugar fell, or the patient may have a low renal threshold. In some cases a trace of acetone may also be present.

Emergency Treatment of Hypoglycaemic Coma

Hypoglycaemia is a dangerous condition. If the nutrition of the brain is seriously affected, recovery may be delayed or never occur; after a severe episode of hypoglycaemia the patient may be dull and retarded for several months, and permanent mental defect has been described in children after repeated attacks. Immediate treatment is needed, and the best way to restore the blood sugar in an unconscious patient is to give an intravenous injection of 40 ml. of 50% glucose solution. In most cases the patient will rouse after this has been given, but after a severe attack it may be 24 hours or more before consciousness is regained. If the patient fails to respond to intravenous glucose, arrangements should be made for transfer to hospital so that continuous intravenous therapy can be given. If the patient does respond, glucose drinks should be given by mouth; this is particularly important if the attack is due to a long-acting insulin, because

the patient can easily slip back into hypoglycaemic coma. A dose of 50 g. of glucose should be given at once in about 300 ml. of fruit juice, followed by a further 50 g. an hour later, or, better still, if the patient is able to take it, a normal meal.

Some of the most severe attacks have occurred when a patient found in coma due to hypoglycaemia has been incorrectly diagnosed as being in diabetic coma and given a large dose of soluble insulin. The differentiation between these two types of coma is seldom difficult—hypoglycaemia comes on rapidly or overnight, the patient is not dehydrated, and there is no smell of acetone in the breath. Coma due to diabetic ketosis follows several days of severe thirst and polyuria, and the patient is drowsy for 12 hours or more before consciousness is lost, dehydration is marked, and the breath smells strongly of acetone. If the practitioner is in any doubt, an injection of 50% glucose solution should be given; this will lead to an immediate improvement in nearly all cases of hypoglycaemia, whereas if the case is really one of diabetic coma little or no harm will result.

Next article on Emergencies in General Practice.—“Corrosive Poisoning,” by Dr. J. D. P. Graham.

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ADVANCES IN CARDIOVASCULAR SURGERY

REPORT OF AN INTERNATIONAL SYMPOSIUM AT THE HENRY FORD HOSPITAL, DETROIT, MARCH 17-19

[FROM A SPECIAL CORRESPONDENT]

The outstanding contribution to this symposium was that of WALTON LILLEHEI (Minneapolis). Earlier in the programme a panel had discussed the diagnosis and treatment of congenital pulmonary stenosis, during which WILLIS POTTS (Chicago) and HELEN TAUSSIG (Baltimore) described their vast experience with the indirect or shunt operations and Sir RUSSELL BROCK (London) strongly advocated direct surgery in the form of either pulmonary valvotomy or infundibular resection; the latter even went so far as to state that in the future the treatment of the tetralogy of Fallot would be a direct operation during which each of the congenital malformations would be corrected. It was Lillehei who showed that such an operation is now a reality. He reported the results of 30 operations on patients using a controlled cross-circulation technique which allows the surgeon to open the heart widely and gives plenty of time for carefully performed intracardiac procedures under direct vision.

Septal Defects

Lillehei had confirmed the work of Andraeson that both venae cavae can be clamped for 20 to 30 minutes provided the azygos venous flow continues, which means that no great quantity of blood need be provided by an external circulation to maintain life. In his technique the donor's (usually the mother) superficial femoral artery is cannulated and the blood passed through a small pump to the patient's aorta via the subclavian artery, the flow being reinforced when necessary from a reservoir of oxygenated blood collected from the arteries of other donors. The blood is

then returned from the patient's venae cavae by a second pump to the veins of the donor. After the establishment of the cross-circulation both of the patient's venae cavae are clamped and the heart is opened. Lillehei reported that, using this technique, 22 interventricular septal defects had been closed with seven deaths, two patients with the tetralogy of Fallot had been treated by closure of the interventricular septal defect and resection of the infundibular stenosis with one death, and in six patients the abnormality of atrio-ventricularis communis had been corrected with three deaths; there had been no donor mortality; the oldest patient of his series had been a 14-year-old girl weighing 100 lb. (45 kg.), but Lillehei felt that the method could be used with success in adults.

The discussion on the treatment of interatrial septal defects included the description of diagnostic aids by both ANDREW MORROW (Bethesda) and CLARENCE CRAFOORD (Stockholm). The former stated that with a small shunt the oxygen differences between the two sides of the heart might vary only slightly from normal, but that if nitrous oxide was used as a test gas the differences were greater. Crafoord described a double balloon catheter which could be passed through the septal defect: inflation of the balloons could then be used either to estimate the size of the defect or to block the defect and study the changes which this produced. Various methods of closure were described; both CRAFOORD and TYGE SONDERGAARD (Aarhus) used a strong non-absorbable ligature which they passed round the defect, guiding the needle with a finger placed in the atrium. CHARLES BAILEY (Philadelphia) showed how he had modified his patch operation, which he introduced in 1952, and also how it was possible to treat an associated mitral stenosis by passing a finger through the defect before its closure. And GILBERT BLOUNT (Denver) stated that Henry Swan, using hypothermia, had closed 24 secundum defects by a direct suture under vision. There had been only two deaths in this group, and all but two of the closures were considered to be complete when tested at the follow-up.

Patent Ductus and Transposition of the Great Vessels

Other aspects of congenital heart disease which were discussed included atypical patent ductus arteriosus. ROBERT ZIEGLER (Detroit) felt that a patent ductus entering below a coarctation (infantile ductus) should be operated on at an early age with closure of the ductus and resection of the coarctation. FRANK GERBODE (San Francisco) described 12 children with a balanced ductus (pressures the same on each side) treated by operation, all of which still have evidence of pulmonary hypertension, while one adult with the same lesion had done well; he also mentioned that he had diagnosed by pressure readings at operation one case of ductus with a reversed flow; this he had left alone. WILLIAM MUSTARD (Toronto) stated that transposition of the great vessels was the leading cause of death in congenital heart disease in infancy. There were three possible operations: transposition of the veins, cross-grafting of the great arteries, and transposition of the great arteries, including the left coronary. He preferred the last, and had performed it with the aid of an extracorporeal circulation using a monkey lung as an oxygenator on 16 infants, but had no success as yet. CRAFOORD and EARLE KAY (Cleveland) described their modifications of these procedures, but, like Mustard, their results had so far been unsatisfactory.

Diagnostic Techniques

Diagnostic techniques were discussed by many of the participants, including JOHN LIND (Stockholm), who described his technique of performing selective angiocardiology with a synchronous electrocardiogram, and BENGT JONSSON (Stockholm), who stressed the danger of repeated injections of contrast medium at the same session. RICHARD BING (Birmingham, U.S.A.), in an outstanding contribution, described some of his experiences with cardiac catheterization aided by a new type of catheter which could be bent

in any direction by means of nylon threads to facilitate its passage through the heart. He had shown by coronary sinus catheterization that the relative contribution of carbohydrate and non-carbohydrate metabolism to the total myocardial oxygen consumption was in the range of only 24% for carbohydrate and 76% for non-carbohydrates such as fatty and amino-acids; and that in experimental coronary occlusion under hypothermia the metabolic effects of interruption of a coronary artery were much less severe than without hypothermia, probably owing to a reduction of enzyme activity.

REJANE HARVEY (New York) thought that it was logical to insist on the demonstration of raised pulmonary artery pressure by cardiac catheterization before advising mitral commissurotomy, in order to exclude those patients with myocardial insufficiency. OLGA HARING (Chicago) believed that in mitral stenosis of rheumatic origin there was always some regurgitation, and she used the electrokymogram of the left atrium to detect the degree of this regurgitation.

Mitral Valvular Disease

The treatment of mitral stenosis was discussed by a panel whose combined experience must have reached many thousands of operations. The main point which emerged was that technique and selection have now become standardized. On the other hand, the problem of mitral regurgitation, which was introduced by DWIGHT HARKEN (Boston), is still unsolved. He stated that the various baffle operations which he had introduced had proved unsatisfactory and that he was now trying to reduce the circumference of the annulus by open operation under hypothermia. ROBERT GLOVER (Philadelphia) was trying to do the same thing by inserting a purse-string suture around the valve, and four out of five cases had been improved by the operation. CHARLES BAILEY had now given up his pericardial flap operation and was using a piece of costal cartilage wrapped in pericardium in the hope of creating an adequate baffle. For aortic insufficiency he was passing a nylon suture around the valve ring in order to reduce its circumference.

Aortic Stenosis and Regurgitation

CHARLES BAILEY stated that he had performed 211 operations for aortic stenosis using the transventricular route, but that he now used a digital technique, the finger being inserted through a pouch of preserved homologous pericardium sewn to the aorta.

CHARLES HUFNAGEL (Washington) described his operation for aortic insufficiency using a leucite valve inserted into the upper descending aorta. He had operated on 80 patients with a hospital mortality of 20%. STANLEY SARNOFF (Bethesda) described the anaemia which usually develops during the first few weeks after this operation; it ceases spontaneously after this period, but has to be treated by transfusions of packed cells if relative coronary insufficiency and death were to be avoided.

Hypothermia

The panel on hypothermia which WILFRED BIGELOW (Toronto) conducted was divided into two groups: the majority, including DENTON COOLEY (Houston), HARRIS SHUMACKER (Indianapolis), and HENRY SWAN (Denver), favoured surface cooling, whilst Sir RUSSELL BROCK preferred veno-venous blood-stream cooling; all the participants favoured rapid rewarming. SWAN, in addition to the closure of atrial septal defects already mentioned, had used hypothermia on twelve patients with no deaths in whom he had operated on the pulmonary valve under direct vision. Another method of obtaining direct access to the heart was mentioned by CRAFOORD; using a complete extracorporeal circulation, he had resected a large myxoma of the auricle from a woman of 40, and she was alive and well one year later.

Aortic Aneurysms and Occlusive Disease

HENRY BAHNSON (Baltimore) reported that he had resected 26 aneurysms of the thoracic aorta, excluding coarctation aneurysms, with eight deaths, and COOLEY stated that he and MICHAEL DEBAKEY (Houston) had resected 101 abdominal aneurysms (17 of these had leaked prior to operation) with 18 deaths.

CHARLES ROB (London) gave the results of a follow-up of 93 homologous arterial transplants, the majority for occlusive arterial disease, inserted over a period of five years. He pointed out the good results which followed such surgery in the aorta, iliac, and some popliteal arteries, and the very careful selection which should be practised before a femoral transplant was inserted.

Blood Vessel Substitutes

This panel included ARTHUR BLAKEMORE (New York), who gave his views on plastic cloth. The most widely used material appeared to be orlon dipped in polyvinyl. ERIC NANSON (Saskatoon) was using nylon taffeta, which could be heat-sealed, thus making a seam unnecessary. In the field of homologous arterial transplantation OSCAR CREECH (Houston), HUFNAGEL, ROB, and EMERICK SZILAGYI (Detroit) used freeze-dried material. SZILAGYI had developed an outstanding method of sterilizing contaminated arteries with beta-propiolactone. CREECH and ROB were in agreement that the degree of ingrowth of recipient tissues was less than had been thought.

Just before the conclusion JAMES FRYFOGLE (Detroit) described a method of arterial suture using temporary split metal cuffs which may well revolutionize this branch of surgery. He stated that with this method he had transplanted the whole aortic arch of a dog in hypothermia time, with survival of the animal. It was a pity that time did not allow us to hear more from him.

Great credit is due to the organizers of this symposium, which was an outstanding success. The local members of the programme committee, Dr. ROBIN BUERKI, the executive director of the Henry Ford Hospital; Dr. CONRAD LAM, the symposium chairman; Dr. JOHN KEYES, the secretary; and Dr. EMERICK SZILAGYI and Dr. ROBERT ZIEGLER deserve the sincere thanks of all the participants. We understand that the proceedings of this symposium are to be published in book form by Saunders and Co. in about four months' time.

DOCTORS AND THE PRESS

An exploratory meeting between representatives of the Press organizations and the medical profession was held at B.M.A. House on March 29 (see *Journal*, March 12, p. 677) to discuss relations between the medical profession and the Press, particularly with reference to news from hospitals. Dr. H. Guy Dain (chairman of the Public Relations Committee of the B.M.A.) was in the chair, and the following attended:

Medical Representatives

Dr. E. A. Gregg, Chairman of Council, B.M.A.
Mr. L. Dougal Callander, Treasurer, B.M.A.

Dr. H. M. Cohen
Dr. F. Gray
Dr. D. F. Hutchinson
Mr. J. R. Nicholson-Laiely
Dr. A. Talbot Rogers
Dr. W. Woolley

Members of Public Relations
Committee, B.M.A.

Dr. Robert Forbes, Chairman of Central Ethical Committee, B.M.A.

Dr. J. G. M. Hamilton, Chairman of Journal Committee, B.M.A.

Sir Harold Boldero, Representative of Joint Consultants Committee.

Press Representatives

Sir Linton Andrews (General Council of the Press).
Mr. J. L. Palmer (Newspaper Society, also representing the Scottish Newspaper Proprietors' Association).
Mr. David Prosser (Guild of British Newspaper Editors).
Mr. Norman Robson (Newspaper Conference).
Mr. C. Webster (Scottish Daily Newspaper Society).
Mr. H. Gudenian (Periodical Proprietors' Association).
Mr. Edward Davies (Press Association).
Mr. Brian R. Roberts (Institute of Journalists).
Mr. H. J. Bradley (National Union of Journalists).
Mr. S. W. Rumsam (B.B.C., "Sound" Radio).
Mrs. Mary Adams (B.B.C., Television).

Mr. S. Heald represented the Ministry of Health as an observer. The Newspaper Proprietors' Association, which was to have sent an observer, was unavoidably prevented from doing so.

The meeting decided to establish a committee to examine the subject in detail and to formulate proposals for further consideration by the full meeting. The following were appointed to the committee:

Sir Linton Andrews	Dr. H. Guy Dain
Mr. H. J. Bradley	Sir Harold Boldero
Mr. H. Gudenian	Dr. R. Forbes
Mr. J. L. Palmer	Dr. F. Gray
Mr. David Prosser	Dr. J. G. M. Hamilton
Mr. Brian R. Roberts	Mr. J. R. Nicholson-Laiely
Mr. Norman Robson	Dr. A. Talbot Rogers
	Dr. W. Woolley

It was decided to invite the Newspaper Proprietors' Association to nominate a representative to the committee. The first meeting of the committee will be held on Wednesday, April 27.

Nova et Vetera**MEDICAL ART AND HISTORY IN EXETER**

Under the auspices of the Devon and Exeter Medico-Chirurgical Society a medical historical exhibition was opened on March 31 by Dr. J. W. Cook, F.R.S., Principal of the University College of the South-West. The exhibition is centred on the classics of medical literature from the library of the Cathedral Church of St. Peter, Exeter, and from the Exeter Medical Library; it also includes documents from the city archives relating to the ancient Exeter hospitals, and documents and portraits from the early years of the Royal Devon and Exeter Hospital. Thus it provides an introduction to medical history of interest alike to lay as well as to medical men and women. But more than this is attempted, and the exhibition gives emphasis to the beauties of sixteenth-century printing in Italy and the excellence of engraving up to the end of the eighteenth century.

Although to modern thought the idea of a provincial metropolis may be contradictory, it was quite otherwise up to the end of the eighteenth century. Then the city played a dominant part in the life of the south-west of England. It was the focal point of religious and social affairs, of government, industry, and commerce, and it provided leaders in medicine. In the early nineteenth century it had its own medical school. The Church has played an important part in medical history, as is to be seen from the possession by Exeter Cathedral of many of the more important classics of medical literature up to the early part of the eighteenth century. These include a fourteenth-century manuscript copy of John of Gaddesden's *Rosa Anglica* and an incunabulum of Celsus. Hippocrates, Galen, Manardus, John of Vigo, Vesalius, Eustachius, Paré, Fabricius, Spigelius, Harvey, Sydenham, and many others are represented. In the Exeter Medical Library the seventeenth, eighteenth, and early nineteenth century are particularly well covered. A very special attraction is the Vesalius *de Fabrica*, represented by a handsome copy of the great 1555 edition, the 400th anniversary of which is commemorated in the illustrated catalogue available. Among the City of Exeter's archives are documents relating to the foundation of the first hospital in the city, that of St. Mary

Magdalene in the twelfth century. It was first devoted to lepers, then to the scrofulous, and to-day, on a new site, is an almshouse. In addition the exhibition is showing a large Hunter collection, which also touches upon the work of the Hunterian disciples, including the eccentric genius John Sheldon, who worked for the last twenty years of his life in Exeter.

The Royal Devon and Exeter Hospital, many of whose portraits and early documents are on view, was founded in 1741 during the social revolution which saw the beginnings of several other notable provincial hospitals as well as most of the London teaching hospitals of to-day, apart from Bart's and St. Thomas's.

The exhibition has been organized by the president of the Devon and Exeter Medico-Chirurgical Society, Mr. Norman Capener, and is open throughout the month of April from 1.30 to 5.30 p.m. daily.

Reports of Societies**LOCAL MEDICAL SOCIETIES****Liverpool Medical Institution**

The value of "C-reactive protein" as a sensitive test for activity in rheumatic fever and tuberculosis was discussed in a contribution to the Institution on March 24 by Dr. S. E. KEIDAN, lecturer in child health at Liverpool. In 1930, he said, during investigations of the chemical and immunological properties of pneumococci, Tillet and Francis had isolated a polysaccharide (Fraction C) from the bacterial body which was found to form a precipitate with the serum of patients suffering from various infective illnesses. Precipitation occurred only during the acute phase of the illness and could no longer be demonstrated after recovery. In 1943 Löfstrom independently reported the occurrence in human serum of a substance which caused capsular swelling and agglutination of pneumococci. The substance was found only in the serum of patients in the acute stages of various bacterial diseases or with conditions characterized by tissue destruction. It was later suggested that this substance was identical with the precipitin for C-polysaccharide which had been previously described. This precipitin, C-reactive protein, was eventually separated from serum and obtained in crystalline form. It proved highly antigenic to rabbits, and the antiserum produced is a sensitive test for its presence in serum.

Clinical studies in rheumatic fever, continued Dr. Keidan, had shown that the detection of C-reactive protein in the serum is both the most consistently positive laboratory index of rheumatic activity and the most sensitive. The test is, however, non-specific, and may be positive in myocardial infarction and malignant disease as well as in the presence of any inflammatory process. His own studies, using rabbit antiserum, had been done on 70 children with a variety of illnesses. In 16 cases of rheumatic fever, 11 with polyarthritis gave positive tests, 2 cases with chorea and carditis gave positive tests, and 3 cases of pure chorea gave one negative, later becoming positive, and 2 weak positive. Four suspected cases gave negative results in 3 cases and positive in the other; none of them developed further evidence of the disease. One child in congestive failure had a very low sedimentation rate but a strongly positive test for C-reactive protein. Fifteen cases of tuberculosis were studied. Five out of six patients with primary infections gave positive tests, and in the one who was negative there was doubt about the activity of the disease. Two cases of meningeal and two of miliary tuberculosis were positive. Two cases of pleural effusion were negative, one later becoming weakly positive. Of two cases of post-primary disease, one was negative and one positive. Tests in children suffering from other infections were usually positive. In 32 newborn babies, 28 gave negative tests, and the four who were positive were found to be unwell, either with infection or with a history of anoxia at birth.

It was suggested that C-reactive protein might be an antibody precursor, and that its persistence in rheumatic fever might be due to an inherited or acquired failure to synthesize a particular type of antibody against haemolytic streptococcal infection.

Manchester Medical Society

Twenty-three babies out of every 10,000 born alive require general surgical operations in the first month of life, according to figures given by Mr. A. JOLLEYS, a Manchester paediatric surgeon, in a contribution to the Section of Surgery on March 8. Most of the congenital malformations from which these babies suffer are remediable. In intestinal and oesophageal surgery both practical experience and the results of experimental work suggested the value of simple end-to-end anastomosis with one layer of unabsorbable sutures. The early diagnosis of many of these malformations was of paramount importance, and it was essential to carry out a routine examination of the child at birth.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

The Ban on Heroin

SIR,—Your annotation (*Journal*, July 25, 1953, p. 196) on the omission of heroin from the *British Pharmacopoeia* suggested that this should be a precedent for Government authorities to make the use of the drug illegal. I protested in a subsequent letter (*Journal*, August 8, 1953, p. 338) to you, but my voice was of one crying in the wilderness. With sinister failure to seek the views of the profession as a whole, the Government has now decided to implement the recommendation of the Economic and Social Council of the United Nations regarding the manufacture and use of heroin. After the expiry of the current licences for the general manufacture and import of heroin under the Dangerous Drugs Act, small quantities will be manufactured in this country for scientific purposes only and the import of the drug will not be permitted. The full implication of this astonishing move is certainly not grasped by the majority of practitioners. It is nothing more or less than direct interference with our liberty to prescribe for patients what we think is best for them.

The ban on heroin is being imposed not in response to any demand for such action in Great Britain, but solely as the result of political pressure from foreign countries, notably the U.S.A. and the World Health Organization. The United States has a vast problem of drug addiction, and has since 1925 forbidden the manufacture or importation of heroin. The result could have been foreseen. Addiction is still rife there because the cost of the drug has rocketed. This provides the stimulus for the black marketeer to take any risk to spread the heroin habit. The lessons of prohibition and opium control have been as seed fallen on stony ground.

Pain, the most clamant of all symptoms, must be relieved. Have our legislators been advised that morphine causes severe vomiting in 10% of patients, or that pethidine, a drug of addiction, is less reliable than heroin, and is also frequently emetic in action? Have the medical advisers, who are presumably behind this move, forgotten that codeine, except in constipating and highly depressant doses, may not ameliorate the cough of tracheitis? The fact is there is no complete substitute for heroin. Our D.D.A. is a highly effective agent to discourage addiction. This governmental ban will inflict untold hardship on a multitude of patients in a futile attempt to save foreign decadents from addiction.

Clinical practice must be kept free from political interference. The views of the royal colleges and general practitioners should always be sought on matters of this kind. Let us not view meekly the sacrifice of freedom on the altar of woolly humanism.—I am, etc.,

London, W.1.

A. H. DOUTHWAITE.

Chicken-pox Quarantine

SIR,—Dr. M. Curwen (*Journal*, March 19, p. 727) asks the pertinent question: "Is it really necessary to exclude children with chicken-pox from school?" Certainly, in junior schools, it could be argued that it would be more logical to take steps to spread chicken-pox rather than attempt to control it. Chicken-pox is such a prevalent disease that few, if any, of us can hope to escape exposure to infection during life. Whereas an attack experienced during early school life is likely to be mild and to occur at a time of least inconvenience, an attack later in life tends to be more severe and to occur at an inopportune moment, interfering with important events such as examinations and big sporting occasions, a good topical example being this year's Cambridge boat race crew.

I think that Dr. Curwen is right in suggesting that very many children are excluded from school for an unnecessarily long period on account of this relatively trivial disease. There is very little, if any, evidence that cases of chicken-pox remain infectious for longer than five or six days after the appearance of the rash. During this period most patients are suffering clinically from the disease and are better resting at home, even if not in bed. At the end of a week, however, if the clinical condition permits, I see no reason why patients should not return to work and children to school. The present policy of waiting until each and every scab has separated before release from isolation is far too rigid, and, as Dr. Curwen has indicated, gives rise to a lot of unnecessary absence from school and to parental frustration. In special circumstances, such as the admission of a case to a paediatric unit, it may be advisable to play for absolute safety and wait until every scab has separated, but the vast majority of cases could be released from isolation much sooner, and a period of one week from the appearance of the rash would, in my view, be quite adequate.—I am, etc.,

Oxford.

J. F. WARIN.

SIR,—Dr. M. Curwen (*Journal*, March 19, p. 727) recommends the ignoring of all precautionary treatment in an attack of chicken-pox. I venture to suggest that there is one very important and sometimes dangerous complication, the onset of which would be made all the easier by such procedure—namely, acute nephritis. One of the worst cases I ever saw of this disease was during the later stages of an attack of chicken-pox in a child whose parents had either overlooked or had ignored the attack and had allowed the child to lead a normal life.—I am, etc.,

Southsea.

M. ASTON KEY.

Natural Childbirth

SIR,—My letter on the subject of natural childbirth (*Journal*, February 19, p. 475) was deliberately provocative; I set out to try to rock the boat. Unfortunately prejudice and immature reasoning have tended to distort the argument. May I therefore clarify some points? (1) I did not condemn preparation for childbearing, only "special training"; of course we all prepare our mothers in one way or another. It is over-elaboration in teaching and training that I see as a danger. Even Dr. Anthony Ryle (*Journal*, March 19, p. 725) admits that there may be a case for simplifying and shortening. (2) My main attack was on training for the second stage of labour. All my experience and reasoning rebel against this practice. On the question of the first stage and relaxation exercises I left an open verdict. (3) I do not disapprove the quest for painless childbirth—quite the reverse. I am afraid Dr. Ryle, and possibly others,

misunderstood the phrase where I was praising the pioneer work (thinking particularly of Dr. Grantly Dick Read) which weaned women away from demanding painless labour by artificial means. Twilight sleep, unnecessary forceps delivery, and even caesarean section were demanded by some women not so very long ago to save them from pain in labour. (4) The extravagance to which I was alluding was the tendency for local authorities and other bodies to appoint special personnel, often without full midwifery knowledge, to run clinics to train women for childbirth. I believe that all teaching should be given by the doctor, midwife, or hospital team who are going to look after the same woman in labour. Is Dr. Ryle putting the clock back or using false considerations of economy when he teaches his patients himself? (5) There is a danger that, either from inexperience or from too great enthusiasm for one particular facet, we lose sight of the fact that with modern improvements in labour management, even without all the palaver beforehand, women on the whole are having satisfactory confinements. Patients have recently been heard to say that books and classes make it all seem so much more complicated than it really is. (6) In a process with such a high rate of normality we must assess our results by focusing attention not on the successful cases but on the failures. Unfortunately the less successful tend to keep quiet, overshadowed by a feeling of frustration and inadequacy, while the successful ones are only too ready to applaud, particularly when it has been instilled in them that their own skill has played so large a part. Would that more Mrs. Constance Lynns (*Journal*, April 2, p. 851) came forward and that the Mrs. Honor Kennys (*Journal*, March 26, p. 785) would reason out that it is no praise of any method if it takes a previous confinement and a physiotherapist standing over them to achieve a satisfactory second birth. (7) My plea is that the way should be left open to allow of trial of a variety of methods and that we should not be too ready to accept or to publicize that any particular regime is right in its entirety. Knowledge of childbirth, like knowledge about sex, should be instilled gradually during the process of growing up. Only "topping up" would then be required when the time came.

It seems by implication that my experience to form an opinion on this problem has been doubted. To Dr. Grantly Dick Read (*Journal*, March 5, p. 604) I would say that I base my views on 18 years of private obstetric practice with complete and personal care of some 900 women, the majority of whom achieved normal birth, as well as on my observation in consultant practice. To Mrs. Kenny I would say that I, too, am a mother (of four), but I believe that personal experience should not be given undue weight. From the midwife's point of view I can only speak through having been very closely associated with them for many years. It is certainly not my finding that their instructions to women in labour are of little or no avail. With experience they give very few, because they learn that nature directs the process better than they can if allowed to do so.

Finally, I will not accept Dr. Ryle's suggestion that "civilized social beings" are beyond hope of natural childbirth. Some, it seems, would nearly go so far as to imply that women require psychiatric treatment before being able to achieve their natural heritage of bearing children. Please let us keep our sense of proportion and help women to take childbearing in their stride, regarding it as a normal, natural, and not unduly difficult process.—I am, etc.,

Hove.

CONSTANCE L. BEYNON.

Environmental Factors in Cervical Cancer

SIR,—Dr. Ernest L. Wynder's paper (*Journal*, March 26, p. 743) made very interesting reading. In particular, I would commend his statement that international co-operation is of importance in achieving "more conclusive results than can be obtained from any one country alone." Among U.S.A. Negroes he found the rate of cervical cancer "high," the age of first coitus "early," and circumcision state and penile hygiene "poor." May I suggest that this important

research be extended elsewhere? For example, figures from Nigeria, where the Ibos—of pure Negro stock—have a 100% male circumcision rate, may go further to elucidate the place of epidemiology in the investigation of cervical carcinoma.—I am, etc.,

Glasgow, C.3.

W. I. B. ONUIGBO.

Hypodermic Injection Technique

SIR,—Dr. L. P. Lockhart (*Journal*, February 12, p. 415) rightly calls attention to the danger of injections being given without first withdrawing the plunger of the syringe. But, passing from the dangers to the discomfort of injections, may I mention a simple way of reducing the pain caused by injections? Needless to say, the smaller and sharper the needle the less the pain, but a satisfactory needle is only one of the secrets of semi-painless injections; the other and more important is this.

When about to give the injection let the needle of the loaded syringe rest lightly on the skin so that the patient, although conscious of its touch, is unaware of its sharpness; *continue to hold it thus for five to ten seconds*, and then suddenly, and as quickly as possible, pierce the skin to the necessary depth. With this technique many babies being immunized against diphtheria neither cry nor register pain, and many adults with previous experience of receiving injections have remarked, "That was the most painless injection I have ever had."

I think the explanation for the relative freedom from pain when injections are given in this way is that the stimuli of touch and pain are thereby separated. It was Pavlov, I believe, who stated that the brain cannot react to more than one stimulus at one time. A slap may cause one to jump, and momentarily one is uncertain whether the slap was a painful or painless touch. When, however, the touch is accompanied by pain (as in the case of an injection) the perception of pain seems to dominate that of touch, and the stimuli of pain and touch are both recorded by the brain as pain. The pain therefore becomes magnified. On the other hand, when a stationary object has been gently touching the skin for a period, one ceases to be conscious of it—for example, as in the case of the clothes one wears. By dissociating touch from pain and adopting the simple technique mentioned, scores of thousands of injections every day could be made relatively painless.—I am, etc.,

Reading.

K. D. SALZMANN.

Dermatomyositis

SIR,—The case described by Dr. Hillas G. Smith (*Journal*, March 26, p. 770) does not appear to me to be that of dermatomyositis. The diagnosis seems to have been made on the increased creatine output in the urine, together with "skin and muscle involvement."

The skin and muscle involvement appears to be that of painful erythema and swelling over painful joints and muscles, following a history of severe tonsillitis. Acute dermatomyositis usually starts as an acute febrile illness resembling influenza, with shivering attacks, hyperpyrexia, and general muscle aching, but no joint involvements. The face is involved first, with erythema and swelling—the infra-orbital swelling being marked and persistent. The patches of erythema are diffuse and not confined to joint areas. The patient complains that he cannot carry out certain movements, not because his joints are painful but that he just cannot do it—i.e., his muscle power is lost.—I am, etc.,

Bradford.

ALLAN BIGHAM.

Grants for New Hospitals

SIR,—Dr. J. M. Alston (*Journal*, March 26, p. 789) has misread my letter (*Journal*, March 5, p. 600) on the subject of grants for new hospitals. I did not advocate the patching up of old hospitals (indeed, I have worked for too long in such places), nor did I object to the building of new hospitals. I cited specific examples of a situation in the North-west Metropolitan Region, where I advocated new buildings for some of the old hospitals in addition to, or even instead of, some of the proposed new hospitals. I am, of course, well

aware of the fact that, even with the latest proposals from the Ministry, we shall be doing only a fraction of the hospital building which was taking place immediately prior to the war. This being so, it is surely all the more important to re-examine the present building programme, and to ensure that the needs of the public will be properly and economically satisfied. In many instances it will prove much easier to rebuild old hospitals (in part or in whole) rather than to build new ones and then be faced with additional staffing problems and overhead expenses.

I stated in my last letter that local medical opinion had not so far been consulted. I have since been informed that the Management Committee in the area concerned has also not been consulted. This is surely a curious and deplorable state of affairs, and I feel certain Dr. Alston will agree that the gentleman from Savile Row does not always know best.—I am, etc.,

Radlett, Herts.

R. S. MURLEY.

Post-maturity and Asphyxia

SIR,—Dr. E. Robert Rees (*Journal*, March 19, p. 723) draws attention to a danger which is, I am sure, not generally recognized among midwives, or perhaps even among some doctors. I refer to the fact that in some cases of post-maturity the placenta has diminished in efficiency and the oxygen supply to the foetus is only just enough to maintain its life. The placental circulation is interrupted during a prolonged second stage contraction and asphyxia may well result. How often has one seen or read of large, healthy-looking post-mature boys born after a prolonged labour but unfortunately dead on arrival. The nurse's satisfaction at having maintained an intact peritoneum is a very poor compensation for this misfortune.

One remedy is of course an episiotomy done without delay, and followed by forceps if necessary. I should also like to stress that the use of gas-and-air analgesia may very well be enough to turn the scale against the child's survival. The medical certificate of fitness for gas and air refers only to the mother, and is given at a time when post-maturity has not entered the picture. I do not know whether this is pointed out to midwives in their gas-and-air training, but very much doubt it. I also think that local authorities issuing these sets should consider the fact that in certain circumstances they are potentially lethal weapons.—I am, etc.,

Shipley.

HENRY S. RUSSELL.

Post-puerperal Recurrent Depression

SIR,—I have read with interest Dr. A. B. Hegarty's paper on post-puerperal recurrent depression (*Journal*, March 12, p. 637). Any paper which draws attention to the fact that premenstrual symptoms are common, often severe, rarely treated, and usually curable is to be welcomed. But I fail to see in what respect the condition he mentions differs from the premenstrual syndrome which has so often been described, most fully by Dr. Dalton and myself. He quotes previous mention by Hemphill and by Rees, but dismisses their statements as "the passing remarks of writers who were dealing with a different theme." The rest of the extensive "literature" is left out altogether, except for a brief mention of the work of Stieglitz and Kimble and of Bickers and Woods.

Why "a different theme"? It would appear that the right of Dr. Hegarty's syndrome to a separate existence rests upon his selection of patients who, in addition to the main complaint of ovulatory or premenstrual mental disturbance, have a pyknic build, have suffered from puerperal depression, and have irregular menses. On this principle medical literature would soon be overburdened with syndromes. If one looked for them one could probably collect a number of cases of a most interesting and hitherto undescribed condition of acute appendicitis occurring in blonde women with ingrowing toe-nails whose husbands are heavy smokers (will Dr. Horace Joules please note?).

I do not propose to examine again the case records of the 84 patients described by Dr. Dalton and myself, but I feel quite sure that many of them were pyknic, many of them had irregular menses, and some of them had had puerperal depression. Many of them had flat feet, too.—I am, etc.,

London, W.1.

REFERENCE

¹ Greene, R., and Dalton, K., *British Medical Journal*, 1953, 1, 1007.

Adrenocortical Activity and Puerperal Depressive States

SIR,—In his enlightening article (*Journal*, February 26, p. 495) Dr. R. I. S. Bayliss has revealed some interesting data on the blood levels of 17-hydroxycorticosteroids during pregnancy and the puerperium. It appears that the high mean level of 24 µg. per 100 ml. blood occurring during the last month of pregnancy falls rapidly after parturition, reaching a normal value by the eighth post-partum day.

It is now well known that the sense of well-being and elation experienced by many patients receiving A.C.T.H. is liable to give place to a temporary depressive phase when the drug is withdrawn. It might be, therefore, that the mental depression so common in women during the second week of the puerperium is associated with the relatively sudden fall in circulating corticosteroids which Dr. Bayliss describes. If this is so, then the more severe case of puerperal depression, showing obvious deterioration, might be tided over this critical period by the administration of gradually diminishing doses of A.C.T.H.—I am, etc.,

Leeds, 2.

K. A. EXLEY.

Manipulation and Low Back Pain

SIR,—Drs. Anthony B. Coyer and Ian H. M. Curwen (*Journal*, March 19, p. 705) have compared the treatment of low back pain by manipulation with treatment by bed rest and simple analgesics. In assessing their results they have analysed all the 76 patients treated by manipulation, but only 60 of the 76 patients who were advised to go to bed and take simple analgesics. The reason for the exclusion of these 16 patients is that they "did not carry out instructions or did not report for assessment." No information is given about the results in these 16 patients, and if it is assumed that all of them did well the apparent differences between the two treatment groups will largely disappear. It is a great pity that no information is provided about the discarded 16 patients, since their exclusion destroys the value of what would otherwise have been an interesting study.—I am, etc.,

Manchester.

J. H. KELLGREN.

Pre-employment Examinations

SIR,—The Chief Inspector of Factories in his Annual Report for 1953 refers to the fact that the number of first examinations for employment under the Factories Act (269,379) was larger than the number of subsequent examinations (218,367), whereas the reverse would be expected. A probable explanation lies in the fact that several "first" examinations are done in respect of some young persons, as, if they move from the area of one A.F.D. to that of another, form 71 (card for the use of A.F.D.) does not follow them. Indeed, it may happen that it does not follow from job to job even within the area of one A.F.D., since a new card is prepared by the employer for the first examination at the place of the new employment. The A.F.D. will use this, and if he files the cards by factories the duplication will not come to light.

The reasons for refusal of certificates of fitness, which the Chief Inspector lists in table L1 of his report, may not present an accurate picture of the health of young persons seeking factory employment, since many applicants are seen by a works medical officer before being taken on. Thus the A.F.D. to a factory which has its own medical officer is likely to have a very small number of rejections. Where the works doctors is also the A.F.D. the number will be nil.

Of course, an unsuccessful applicant can always try his luck elsewhere, and if he is again unlucky his particular defect will be twice recorded.—I am, etc.,

Wrexham, near Bristol.

REFERENCE

¹ Cmd. 9330. H.M. Stationery Office, London.

Clinical Board Meetings

SIR,—I have recently returned from 14 months in North America, most of which was spent in one fairly typical city hospital in the U.S.A. There was one particular feature which does not seem to be generally known here and which I think should be widely adopted in the hospitals in this country. I refer to the so-called board meetings which are a regular feature in nearly all American hospitals. The commoner boards are the tumour boards, the pathological boards, the endocrine boards, etc. The great benefit of these boards might be clarified if I were to mention how one example, the tumour board, worked.

To its weekly meeting came physicians, surgeons, gynaecologists, pathologists, the radiotherapist, the radiologist, and any other interested consultants, as well as the housemen. Interesting and perplexing tumour cases were presented. Someone familiar with the case, usually the consultant or his houseman, would give the relevant history, physical findings, and results of investigations. The patient would then be examined by those at the meeting. A discussion would follow, directed by the chairman of the board, on the diagnosis, treatment, and prognosis of the case. A healthy sign was the frequency of open disagreement and the sympathetic attention paid to the opinion of the lowliest houseman. The board would finally advise the course of treatment, but the consultant whose case it was was in no way obliged to follow the recommendation of the board, though he nearly always did so. The end of the meeting was devoted to follow-up cases previously presented, with reports of progress.

I feel that the institution of boards of this nature would be of material benefit to British doctors and to the patients they aim to serve.—I am, etc.,

London, N.18.

MICHAEL C. LATHAM.

Anticholinergic Drugs for Peptic Ulcer

SIR,—The final paragraph of the leading article (*Journal*, March 19, p. 711) calls for comment. Is not the appreciation of "brand-new treatments" by patients often short-lived? The "brand-new" description will often convey to them a major advance in therapy, leading to high hopes and ultimate disillusionment. It may give patients the impression that the doctor is doing his best for them, and help to satisfy the emotional dependence which the chronically ill are apt to develop with regard to their doctor. But surely we should encourage as many as possible to develop a courageous understanding of their ailment, and discourage the hypochondriasis which so frequently results from over-treatment. We should also remember we are doctors, not salesmen, whether public money is involved or not.—I am, etc.,

Barton-on-Humber, Lincs.

S. H. F. HOWARD.

Bolus Obstruction

SIR,—Having read reports of small bowel obstruction resulting from the impaction of a variety of undigested foodstuffs (*Journal*, December 18, 1954, p. 1484, and November 27, 1954, p. 1301) we would like to record our recent experience in the management of a patient with small-bowel ileus where the impacting bolus consisted of undigested meat.

Recently a female of 67 years was admitted to Hammersmith Hospital complaining of central abdominal pain and vomiting of eleven hours' duration. The onset was abrupt, and the vomiting was associated with bouts of colicky pain. Clinical examination revealed an elderly edentulous patient having obvious attacks of intestinal colic accompanied by vomiting and with a soft non-tender abdomen. No mass was palpable and no evidence

of the cause of the obstruction could be found. It was decided to observe her overnight, during which time a piece of undigested meat 3 cm. by 2 cm. by 1 cm. was discovered in the vomit. Further questioning revealed that 12 hours prior to the onset of symptoms the patient had eaten a meal of sheep's heart and sausages which she had not masticated properly because of ill-fitting dentures. A tentative diagnosis of bolus obstruction was made, and, as the clinical signs of unrelieved obstruction persisted, laparotomy was performed. This revealed a firm rubbery bolus impacted in the terminal ileum about 90 cm. from the ileo-caecal valve. The ileum above this point was dilated and congested. The mass was with difficulty milked into the caecum and the patient made an uneventful recovery. Small pieces of meat but no bolus were recovered from the stools post-operatively.

In a review of 178 cases of bolus obstruction, Ward-McQuaid¹ found no case of obstruction from this cause. But from our experience in this case it is clear that to the long list of possible ingredients of an impacting food bolus we must now add incompletely masticated meat.

We are grateful to Mr. M. R. Ewing, F.R.C.S., for advice and permission to record this case.—We are, etc.,

G. E. ALLIN.

J. G. BRICE.

London, W.12.

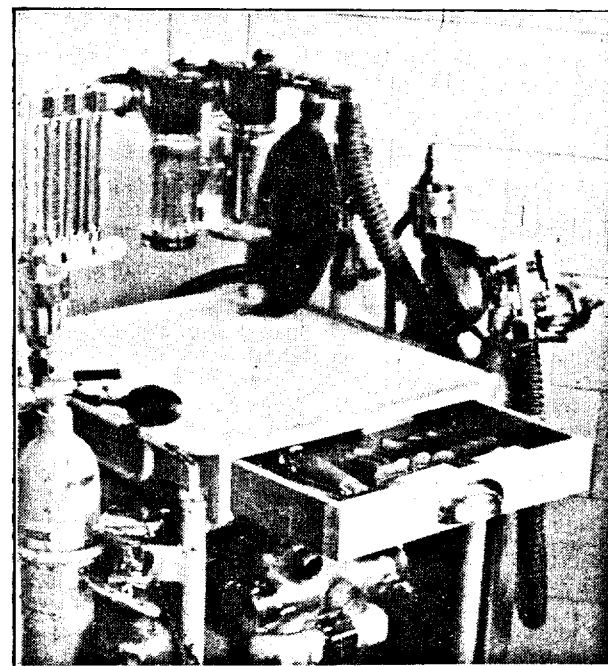
REFERENCE

¹ *British Medical Journal*, 1950, 1, 1106.

Additional Drawer for the Boyle's Machine

SIR,—I find that at the start of an operating session the essential anaesthetic accessories—laryngoscope, Magill's forceps, mouth gag, etc.—are neatly laid out on the top shelf of the anaesthetic machine, but in a short time the maintenance of this state of neatness, however desirable, becomes something of a nuisance.

In an attempt to obviate this difficulty I designed the drawer unit illustrated for the B.O.C. Boyle's apparatus. This unit fulfils two important criteria: (1) An unobstructed top shelf is provided. (2) There is adequate additional storage space for the essential anaesthetic accessories just at the anaesthetist's hand.



The unit, which was made by Mr. Young, of the Belfast City Hospital Works Department, consists of a wooden box-like structure which has a washable plastic top, and contains a drawer of the greatest possible size—that is, 15½ × 13 × 2 in. (40 × 32.6 × 5.1 cm.). It is fitted in place of the original glass top shelf of the Boyle's apparatus and occupies the space between the upper structural frame and the under surface of the surrounding guard rail. This latter

forms a lip around the edge of the new top shelf. In use the drawer has been found to be large enough to hold the laryngoscope, mouth gag, Magill's forceps, airways, connectors, lubricating jelly, cylinder key, etc., and has been proved to be of great practical value.

I wish to thank Dr. James Sutcliffe and Mr. J. Poots for the photograph.—I am, etc.,

Newtownards, N. Ireland.

J. A. MCNEILLY.

Fluoridation of Public Water Supplies

SIR,—In their letter (*Journal*, March 26, p. 789) Drs. H. M. Sinclair and Dagmar Wilson, in a kind reference to me, mention a visit I made to an Oxfordshire village at Dr. Wilson's invitation to see and verify some of her cases of fluorotic teeth in the early days of her investigation.

Dr. Wilson has done an immense amount of work on this subject and I have done nothing since 1933, for lack of the necessary laboratory experience. I feel, therefore, some reluctance to offer criticism. I did, however, have the advantage at that time of having been able to examine in detail the teeth of a whole series of Maldon school-children, including all the age groups up to 16, and the further advantage of familiarity, as a dentist, with teeth in general, and I am sure that Dr. Wilson will not mind my correcting her implication that I verified all her findings. There was, among the fairly mild cases of fluorotic teeth, one apparently marked one showing dense brown staining which on closer examination we discarded because the stain proved to be superficial and could be removed, though with difficulty.

This incident is only of significance in connexion with the possibility mentioned by others that occasional cases can occur closely resembling mottling whose aetiology is in doubt. I have recently been shown another such case by Mr. Howell, of the Royal Dental Hospital: this was a variety of congenital amelogenesis imperfecta, and the stain was not removable.—I am, etc.,

London, W.1.

N. J. AINSWORTH.

SIR,—My interest in this subject has recently been aroused not only by the correspondence in the *Journal*, but also by being asked by a patient, who apparently resides in one of the proposed "experimental areas," whether an increase in her fluoride intake would be injurious to her health. So far the evidence as to whether there is any risk of physical disease by adding 1 p.p.m. of fluoride to the water supply is most controversial. No mention, however, has been made of the possible psychological effect on a nervous patient who is forced by a medical officer not known to her, or by a committee of laymen, to increase her consumption of fluorides.

Surely some method of ensuring an adequate intake of fluoride in children up to the age of 14 years could be devised and the general practitioner allowed to advise his patients, to the best of his judgment and ability, about the taking of this potentially lethal substance.—I am, etc.,

Bangor.

EYNON VAUGHAN.

Hydrocortisone Ointment in the Eczemas

SIR,—I was extremely interested to read in Dr. R. Church's paper (*Journal*, February 26, p. 517) and your annotation (p. 530) on the use of topical hydrocortisone in various dermatoses confirmation of my own limited experience with this type of therapy. It would seem evident that sufficient trials have now been carried out to evaluate the worth of this new therapeutic agent, and to establish that there are no dangers attached to its use.

Skin conditions, I find, make up a large proportion of one's general practice, and many of these prove quite intractable to the treatments readily available to G.P.s. Consequently, with the long-term and diverse treatments one has recourse to, these cases may tend to cost the N.H.S. large but "hidden" sums. One imagines that the only reason hydrocortisone ointment is not freely available is one of cost; but if this new agent will control symptoms, and

perhaps cure much more quickly, then surely it will prove to be more economical, if not cheaper, on a weight-for-weight basis than tar and zinc ointments. When can we in general practice hope to be free to prescribe this valuable addition to our pharmacopoeia?—I am, etc.,

Manchester.

S. EDEN.

Treatment of Pulmonary Tuberculosis

SIR,—Regarding any tuberculous infection and its effects, there are, since Koch's epoch-making discovery in 1882, many well-known factors. Of these, weight of infection, site, virulence of the organism, natural resistance of the host, allergy, and acquired immunity are the time-honoured "big five." Time was when the relative significance of these factors, *inter se*, largely dominated the whole clinical course of a tuberculous patient's illness. By and large good general health and greater natural resistance went hand in hand, so that the poorer-class patient had a greater chance of dying—but even here there were exceptions, particularly where the soil was virgin. There is much evidence that mortality and morbidity from tuberculosis are declining, but it is at once clear that, depending only on better social standards and the like, it would be a long time indeed before the disease became epidemiologically insignificant.

Fortunately, the "big five" above mentioned are no longer supremely important. Though one would be hesitant to say they now merely jutted up as rocks in a sea of new discoveries, nevertheless the old horizon has been shattered. Following hard on the discovery and development of antibiotics and chemotherapy and the ever-rising standards of anaesthesia came the increasing significance of thoracic surgery in tuberculosis. As the old horizon fell away, new vistas hitherto undreamed of—unless by the prescient—were opened up. And it is now not hard to understand why the patient's attitude to tuberculosis is being transformed. The *mens sana* is being established.

I cannot, in any degree, bear out Dr. J. F. Brailsford's sanguine remarks (*Journal*, March 12, p. 665) regarding current trends in the treatment of pulmonary tuberculosis. "Pleasant" is hardly a suitable adjective for any surgical operation—despite the advances in anaesthesia—and mutilating, in a sense, it can be. But pleasant it is indeed to find that those of our patients who have been transferred for surgical treatment return to continue their convalescence renewed not only in body but obviously in mind also. Here it is apposite to make a few additional observations. In the majority of our cases major operation has been performed under infiltration analgesia, yet terror, anguish, and psychological upheaval are absent. Most of these patients return—some quite soon—to self-supporting employment. The recurrence of positive sputum is rare. Hospitalization has been considerably reduced—especially now, as waiting-lists shrink. Further, the grossly swollen waiting-lists until recent times surely bear witness to the inadequacies of the past. Treatment may have been "most pleasant and enjoyable," but, despite any amount of honest endeavour, it had gross limitations. In assessing any method the results are all-important.

It is surely timely now to express the hope that when the reservoir of chronic infection has been effectively drained by the thoracic surgeon, and those unfortunates who developed their disease too early to be redeemed by chemotherapy, etc., are no more, then the family doctor with the facilities which are at his disposal will ensure that tuberculosis never gets beyond the earlier stages at which, in modern times, it can be adequately dealt with in the home.—I am, etc.,

Stornoway.

EWEN A. CAMERON.

The National Formulary, 1955

SIR,—Dr. T. W. G. Kinnear (*Journal*, March 19, p. 725) can hardly expect his criticism of my letter (*Journal*, February 26, p. 541) on the *National Formulary* to be taken as anything but a leg-pull, but, seeing you have published it, may I reiterate that, though we all wish prescribing to

be sensible and honest, the use of these adjectives in your leading article (*Journal*, February 12, p. 402) did imply that those who disagreed with the writer were not sensible or honest—which is, I think, untrue and certainly regrettable. If Dr. Kinnear had read your leading article he should have noticed that you used the term "ammonia and senega mixture" which I repeated, and which, incidentally, was more correct for my purpose, for many variants of this mixture have been used throughout the years.

I am sorry Dr. Kinnear cannot see my point about tablets, but although the new *National Formulary* does in one case prescribe a quarter of a tablet to be used—against which I protested, as one cannot expect many mothers to divide a tablet into reasonably equal quarters—the variations in dosage from infancy to adult life can seldom be properly graded with tablets, whereas they can with mixtures: and the variations between thirds, quarters, fifths, etc., of a tablet are much greater than those of the household teaspoon, etc. The point of mentioning economy was that it is, unfortunately, not uncommon to order 100 tablets and patients can easily carry them—and often leave many unused—but few doctors would order the equivalent 40 oz. or Winchester quarts for their patients to take away.

Similarly about "overburdening" the prescriber. In a mixture there are rightly main ingredients and adjuvants or modifiers. To get the same effect—which is a correct therapeutic aim—one would have to order a number of tablets or remember the name of the innumerable combinations which are quite justifiably being offered. It is no secret that the pundits condemn these, as Professor Dunlop did the comparatively simple "drinamyl" at Glasgow last year; though, to my knowledge, if the question had been handed to one of the other members of the panel he would have said it was a most valuable tablet. When we get this acute difference of opinion between the academic and the G.P. or even the consultant, it is inevitable that opinions on the content as well as the format of the *Formulary* should also differ widely. Few would criticize it more strongly than I could, but as it is it remains an honest effort to meet many differing requirements, and it is up to each doctor to use as much of it as he can; and when he disagrees he will be safe in thinking charitably that there has been some valid reason for the apparent oddity.—I am, etc.,

Winsford, Cheshire.

W. N. LEAK.

Psychical Phenomena in Epilepsy and the Psychoses

SIR,—The article by Drs. Shafica Karagulla and E. Elizabeth Robertson (*Journal*, March 26, p. 748) expresses views with which many will be in sympathy. I feel the response of epileptic patients to drug treatment is an interesting corollary to the writers' opinions. Some anti-convulsants alleviate the mental symptoms somewhat, but they only do so in patients showing affective disorders. The more psychotic the thought content and behaviour, the less benefit there is likely to be derived from such drugs. Any change of mood is largely masked by these symptoms, whereas many patients with merely neurotic reactions improve dramatically.

The drug I have in mind particularly is primidone ("mysoline"), and these results were noted when it was first used in the epileptic wards of Long Grove Hospital, Epsom, in 1952.—I am, etc.,

Croydon.

REFERENCE

Adderley, D. J., and Monro, A. B., *Lancet*, 1953, 1, 1154.

DAVID J. ADDERLEY.

Treatment of Vaginal Discharges

SIR,—As a taxpayer I feel the waste in the large quantities of expensive proprietary preparations which are issued to National Health patients for the treatment of vaginal discharges. As one who often sees the end-results of these cases, I deplore the frequent results of giving pessaries in quantity and without supervision.

The trouble begins, I think, with the well-meaning traveller who claims that his firm have found the cure for

the trichomonas or monilial infections, if not both. The preparation is conveniently packed up as a month's supply of pessaries or medicament (jelly or cream) and all prescribable on the E.C.10. Alas, in that month how much harm can be done. First, the preparation may be excellent, and fulfil all the claims, but in that case a small supply would have sufficed for cure. Secondly, as frequently happens, especially with sulphonamide and acetarsol preparations, the trichomonas and other infecting organisms are quickly destroyed, leaving the vagina clear for the monilia, which seems to flourish on the pessary debris, particularly those with a carbohydrate base. If this has been allowed to go on for long, the result may be a monilial infection which nothing will cure.

I feel that if only some cheap and simple glycerin or lactic acid pessaries could be ordered, to use alternating with the more patent and costly preparations, the results would be so much better. I have recently been prescribing a pessary of phenylmercuric dinaphthylmethane disulphonate with 2% lactic acid. This is a step in the right direction, as it is a combined preparation and easy to order and use. I have found it markedly more successful than the same preparation without the lactic acid.—I am, etc.,

London, S.W.4.

ELIZABETH GOURLAY.

Medical Numismatics

SIR,—Although I personally can throw no light upon "Dr. Eady," I can at least add one more token to Dr. G. E. B. Payne's collection (*Journal*, March 19, p. 729).



This professional token, or more properly jetton, dates from about 1850 and was lent to me by Dr. Thomas Marmion on the occasion of the opening of the new Battersea Varicose Ulcer Clinic. Issued by John Mappin, Surgical and Deformity Instrument Maker of Newhall Street, Birmingham, it shows on the reverse side the sites of the various circumferential measurements necessary when making an elastic stocking.

Dr. Marmion tells me that these tokens of the late nineteenth century were not necessarily sanctioned by the Crown as legal tender, but nevertheless they often circulated locally and were redeemed by the originator for legal money. Thus John Mappin's token, if traded in another shop in the same street, is likely to have been accepted with the same alacrity as a farthing.—I am, etc.,

London, W.1.

STANLEY RIVLIN.

The "Nape Naevus"

SIR,—The communication of Dr. F. Parkes Weber (*Journal*, March 19, p. 726) on the Sturge-Weber-Kalischer syndrome prompts us to record our observations of a condition we have come to term the "nape naevus." This abnormality consists of a cutaneous capillary haemangioma ("port-wine stain") in the region of the hair line posteriorly. The naevus may extend below the hair line, usually in a roughly triangular shape overlapping both sides of the spine, or it may be of irregular delineation and perhaps composed of separately spaced components. In some instances the naevus was confined to the area below the hair line while in others it extended upwards over the occipital region and occasionally was only visible, with careful observation, on separating the hair.

Our interest was aroused by the finding of a naevus in this situation in two patients who suffered from epileptic seizures and who demonstrated intracranial calcification of the type seen in the Sturge-Weber-Kalischer syndrome. Subsequently we came to regard the nape naevus as a concomitant of neurofibromatosis, but when our observations

were extended to include a routine search of the skin hidden by the hair above the nape of the neck we became impressed by the frequency of its existence. In view of this high incidence of the nape naevus in patients not suffering from epilepsy or neurofibromatosis it is difficult to consider it as a component confined to any one particular syndrome. Some patients with the nape naevus also displayed similar naevi in other parts of the body, and, unless looked for carefully, these could readily be missed. Lastly a hereditary aspect of the nape naevus was demonstrated in several subjects. A member of the staff, for example, was able to trace its presence through three generations, the naevus in all those affected being in the nape of the neck. In one example of the nape naevus associated with fits and intracranial calcification, examination of the father showed a very extensive naevus covering almost the whole of the right side of the head but hidden from view by the hair.—We are, etc.,

J. SHAFAR.
A. DOIG.

Burnley, Lancs.

Haemorrhagic Disease of Newborn

SIR,—In 1951 one of us (I. K.), with a colleague,¹ recorded the occurrence of haemorrhagic disease of the newborn presenting as a unilateral proptosis; two cases were reported with complete recovery. We now wish to record a further example of this syndrome with post-mortem confirmation of the haemorrhage situated in the orbital fossa behind the eyeball. This newborn infant died of atelectasis and also had a proptosis of the right eye. Necropsy revealed the cause of the proptosed eye as being due to a haemorrhage in the orbital fossa pushing the eyeball forward.—We are, etc.,

I. KESSEL.
F. C. FRIEDLANDER.

Johannesburg.

REFERENCE

¹ Kessel, I., and Glynn Williams, C., *S. Afr. med. J.*, 1951, 25, 126.

Exchange Transfusion in Haemolytic Disease of the Newborn

SIR,—We have read with very great interest and benefit the excellent paper on the above subject by Drs. William Walker and G. A. Neligan (*Journal*, March 19, p. 681), and from our small experience in the Ronswood Hospital unit find ourselves in complete agreement with them on many points. We have, however, found that, in spite of the most careful maintenance and the use of silicone fluid, syringes do tend to stick from time to time. We have found that the simplest solution to this problem is to have half a dozen syringes in our emergency exchange transfusion set. We have found that as many as six may be required during the course of an exchange of 500 to 600 ml.—We are, etc.,

J. A. CHALMERS.
C. J. THORNBERRY.

Worcester.

Treatment of Coughs

SIR,—The whole trend of your leading article (*Journal*, March 12, p. 651) is that the treatment of cough should be by sedative cough mixtures; you apply this especially to patients who "seek advice about a cough which has persisted for more than a short time" and whom you consider it "clearly desirable to examine carefully." Sir, in general practice we rarely prescribe for coughs of even short duration without careful examination; serious acute disease may frequently only have been present for a short time and the patient still ambulant when he first consults us, but I will not dwell on that now since I have not access to the paper concerned, on the experiment of giving three grains of codeine to suppress cough, though I should scarcely like to repeat it.

When I first joined the wartime R.A.M.C. my regular colonel quoted to me an old regulation of the Service which, so he said, laid down "Mist. expect. sed. will be prescribed for not more

than two days; after that mist. expect. stim. will be prescribed." I regret the clinical interference, but I still think this was good advice and probably saved many lives and much invalidism; patients have frequently come to me with persistent minor bronchial catarrh treated for too long with sedative mixtures and very quickly relieved with pot. iod., and pot. iod. only. I have seen a fellow patient in hospital dying of Gee's linctus every four hours. From a personal point of view I have frequently obtained great relief with a single dose of pot. iod., though a similar effect may be obtained by the ingestion of large quantities of hot tea—embarrassing if one is short of breath, and not always convenient to work or sleep. I believe antispasmodics, very valuable in moderation, can have the same deleterious effect as sedatives when given in excess, since I suspect "normal spasm" may have some physiological action in extruding the sputum.

I agree that in severe advanced chronic bronchitis pot. iod. is of little or no value, but I suggest that sedative mixtures are dangerous to these patients when lack of sleep at night outweighs their disadvantages. At least pot. iod. does little harm if the patient likes a cough bottle, and one can ring the changes on hot fluids, postural coughing, inhalations, antispasmodics, local heat, and antibiotics—anything but sedative cough mixtures. It should be remembered that many patients given a relatively strong linctus will take too much unless very specifically warned. Anyone can suppress most coughs, just as anyone can suppress most pains with opiates, but this would hardly be regarded as the practice of medicine. You appear highly optimistic in regarding a clinical trial of linctuses in cough—a subjective symptom unless one lives with the patient—as easy. I feel it would be neither easy nor particularly useful. Further research into the mode of action of potassium iodide in troublesome but not advanced bronchial catarrh and in asthma, and search for new and more effective sputum liquefiers, would be more helpful.

Sir, only a strong sedative could control my indignation and I make no apology for my views, those of one of the 10,000 or so G.P.s who have been treating "cough" every day for 16 years, in other words "cough specialists." I hold no brief for senega, ammonia, liquorice, chloroform, squill, syrup of Virginian prune, or any of the other deleterious substances sometimes advocated. Let others defend them.—I am, etc.,

Amble, Northumberland.

R. P. ROBERTSON.

Cancer Education

Sir,—The paper by Drs. J. Walter and E. C. Atkinson (*Journal*, March 12, p. 627) describing an early cancer detection and educational scheme in general practice reveals that, of 1,482 presumably healthy list patients, no fewer than 837 (56%) accepted an offered free medical examination, the purpose of which was to detect early cancer. The fact that one new case of (metastasizing) cancer was discovered is noteworthy, but the really interesting feature of this experiment is the amazingly high number of volunteers, which in itself conflicts with the theory that many people are afraid of cancer detection.

Hull, a city of 300,000 inhabitants, has been taken over by the cancer educationalists as a suitable experimental centre and we are constantly bombarded with British Empire Cancer Campaign lectures and leaflets on the subject. Also, we can listen to recorded cancer talks by merely dialling a number on the local telephone system, and, since these talks are given in serial fashion, we have the opportunity to apply to the Marie Curie Memorial Foundation for the scripts of any previous talk we may have missed. The Kingston-upon-Hull Corporation has now entered into the spirit of things with a huge notice in the local newspaper telling the "facts." To an intelligent man with an interest in the subject, the collected facts are really a series of warnings. He is urged to watch for ulcers and lumps in skin, lip, mouth, and throat, etc.; he is told to watch his stools and urine for blood; to watch out for hoarseness and dysphagia. The ladies are advised to search their breasts for lumps (not more than once every 3 months) and to keep a careful watch on their menstrual cycles. And, of course, if ever in doubt we are all urged to consult our doctor.

Your leading article on this subject (p. 652) states that there is need for some cancer education of the public, having satisfied yourselves that the main criticisms against it—that surgeries would be crowded with worried people and that

cancerphobia would be created—are disproved by the experiment in cancer education carried out by Dr. Ralston Paterson and co-workers.¹ Such an assumption is surely premature. The huge business concern did not become huge after its first few advertisements; nor was the enormous incidence of bowel sickness created by the initial advertisements for purgatives. In any case, the Ralston Paterson experiment was carefully controlled and confined itself to certain neoplasms (breast excepted) almost certainly readily curable in the very early stages of the disease. Here in Hull we have propaganda directed against certain neoplasms extremely difficult to cure at any stage of the disease—bladder and oesophagus, for example. For that matter, what is an early neoplasm? Duration of lump is not by any means necessarily tied to stage of disease. Breast, so popular with the educationalist, is notorious in this respect. Even the better-behaved neoplasms, such as cervix, are often advanced and quite incurable in spite of a short history of bleeding and vice versa. What about those unfortunate women who are told to feel their mastitic breasts? It is difficult enough for the experienced clinician to make a diagnosis readily, without biopsy. Once the public do start taking notice it would be most unfortunate if any doctor were to miss an early cancer after the patient has presented it on a plate, so to speak. All such patients will be pushed on to the hospital consultant, who would not dare to turn away any lump, however innocent, without biopsy or local excision.

Is it really necessary? Is there any reason to suppose that doctors to-day die less frequently of this disease than do other professional groups? The V.D. campaign during the war was well worth while for the very reason that quick cure could be offered the patient in practically every case; but in the present state of our knowledge cancer education, on any large scale, is merely putting the cart before the horse.—I am, etc.,

Hull.

K. W. BEETHAM.

REFERENCE

¹ Paterson, R., et al., *British Medical Journal*, 1954, 2, 1219.

Neon Lighting in Hospitals

Sir,—I would like to support the plea of Dr. W. B. Bacon (*Journal*, March 12, p. 666) for the abolition of neon lighting in anaesthetic and recovery rooms and operating theatres. With this form of illumination it is quite impossible to detect minor degrees of cyanosis, despite the asseverations of the manufacturers to the contrary. I already know of an anaesthetic death from unrecognized anoxia in a patient undergoing herniotomy under spinal analgesia.

The introduction of strip lighting in modern hospitals is an unfortunate example of a tendency which is becoming all too common in medicine: the assumption that because a thing is new it must be good.—I am, etc.,

London, W.1.

MASSEY DAWKINS.

Doctors' Visits and Coronary Infarction

Sir,—There have been an article and a letter lately in the *Journal* (February 5, p. 318, and February 26, p. 539) about patients suffering from coronary infarction dying shortly after being seen by the doctor. Your correspondent seems to think that this occurrence is more or less confined to hospital in-patients. However, it can also happen when visiting a patient in his home, as an experience of mine testifies.

I was asked to see a man who had been rather ill in the night with chest pains and attacks of dyspnoea. These symptoms undoubtedly were due to coronary insufficiency. In all probability he had a coronary infarction. There was a history of "bad heart" for years, made worse by chronic bronchitis. Also he had been suffering from hypertensive symptoms. His age was approximately 68 years. He was much better on the following morning when I called to see him. There are two points worth noting which I think are

more important than any details of clinical examination—that is, the fact that he was deaf and I had to shout to make him hear, also the fact that I questioned his self-diagnosis of "bad heart." His wife thought that he was rather upset by my questioning his diagnosis. Also she seemed to think that I need not have shouted quite so loudly. At all events I learned later that the patient, although quite comfortable when I left the house, died a few minutes later. I also learned subsequently that the deceased was a sensitive type of person rather easily upset.

In future I shall speak softly to all patients, whether deaf or not. Also I think it is as well to agree with any opinions that they may express.—I am, etc.,

M. B. BARRY.

Melanoma and Pregnancy

Sir,—Dr. H. Stewart's statement (*Journal*, March 12, p. 647) that "no reference is found to the effect of pregnancy on the growth of a melanoma" calls for comment. Pack and Scharnagel¹ have suggested that "every prenatal examination of the mother should include a survey of her pigmented moles, and those subject to irritation, as well as any situated on the genitals or feet, should be removed and histologically examined." Cunningham² writes that, because of the unusual rapidity with which melanomata grow and metastasize in pregnancy, prime consideration must be given to prophylaxis. The stimulant is, of course, the melanocyte-stimulating or melanophore-expanding hormone of the pituitary, the secretion of which, according to Lerner *et al.*,³ increases progressively from the eighth or ninth week until term, after which it reverts to normal in a few days. Nevertheless, therapeutic abortion is said to have no effect in checking the growth of melanomata.

The melanophore-expanding hormone is also responsible for the enlargement of lentigines or for the appearance of new ones in some patients receiving treatment with corticotrophin. It seems clear therefore that hormonal influences are of the greatest importance in the activation of melanomata, as witness the benignity of these lesions before puberty.—I am, etc.,

London, W.1.

BRIAN RUSSELL.

REFERENCES

- ¹ Pack, G. T., and Scharnagel, I. M., *Cancer*, 1951, 4, 324.
- ² Cunningham, J. A., in *Progress in Fundamental Medicine*, 1952, edited by J. F. A. McManus, p. 28. Kimpton, London.
- ³ Lerner, A. B., et al., *J. clin. Endocr.*, 1954, 14, 1463.

POINTS FROM LETTERS

Chilblains

Dr. W. M. GRAY (Culter, Aberdeenshire) writes: Your annotation (*Journal*, March 5, p. 592) prompts me to send the following prescription, my use of which is purely empirical. In every case in which I have prescribed it the results have been very satisfactory and the patient has been relieved of the sores (open) and pain and discomfort. . . . I copied the prescription from the *British Medical Journal* many years ago and it has done all it claimed. Perhaps it may improve the circulation and is so simple: pot. cit. 15 gr. (1 g.), sod. bicarb. 10 gr. (0.65 g.), inf. gent. 2 dr. (7 ml.); 2 dr. (7 ml.) three times a day to be taken at very beginning of itching or other symptom.

Night Cramps

Colonel P. F. CHAPMAN (Taynuilt, Argyll) writes: I was interested in the annotation on night cramps (*Journal*, March 12, p. 653), having myself been a sufferer. I was surprised to find no mention made of what I have found in my own case, and in that of others to whom I have recommended it, an infallible preventive and cure. It is to take a few mouthfuls of strong salt and water before turning in at night. My last meal often consists of porridge, and I find by oversalting this the same end is attained. . . . I have found myself, as pointed out in your annotation, that night cramps occur after heavy exercise such as marching and drill, or now, in my own case, after a long day's walking over the hill after game. This method of prevention and cure is a very simple one, and I feel sure will prove efficacious in a very large number of cases. The administration of saline either by the mouth or into the blood is now routine in cases of heat stroke.

Obituary

H. M. J. PERRY, C.B., O.B.E., F.R.C.P.

The death of Major-General Marrian Perry occurred at his home at Walton-on-Thames, where he had been living in retirement for some years, on March 23, 12 days after his 71st birthday.

Henry Marrian Joseph Perry was born at Cork on March 11, 1884, and was educated at Queen's College (now University College), Cork, qualifying L.R.C.P.&S.I. in 1906. Commissioned in the R.A.M.C. in the following year, he served in China as a young man, but had returned to home service well before the outbreak of the first world war in 1914. He went to France with the original British Expeditionary Force and was made prisoner of war during the early period of hostilities.

It was after repatriation that Perry began his career as an Army pathologist, and he finished his war service with a rising reputation. At the end of the war Leishman began his reorganization of the Army pathological services, and, recognizing Perry's great ability, posted him to the Royal Army Medical College, Millbank, where he was to spend so many years of his professional life, and where he was appointed professor of pathology in 1922. In 1926 he was seconded to the Foreign Office to serve as director of the Egyptian public health laboratory service, with his headquarters in the Cairo central laboratory. It was a responsible post with quite wide terms of reference, and Perry proved to be a good choice.

In 1930 he returned to the Army to take up a further period as professor at Millbank, and later was promoted to hold the combined appointment of professor and director of pathology, a post he continued to hold until the second year of the second world war, after which he retired from the Army and gradually gave up professional work altogether. For his services in the first world war Perry was appointed O.B.E. in 1919, by which time he had attained the rank of major, and for his work at Millbank he was appointed C.B. in 1937. Promoted full colonel in 1934, he became major-general in the following year. He was an Honorary Surgeon to the King from 1933 to 1940, and he was elected F.R.C.P. in 1941. He is survived by his widow, formerly Miss Mary E. Brewer, whom he married in 1912 and to whom we extend our sympathy.

We are indebted to Lieutenant-Colonel H. J. BENSTED for the following appreciation: Perry will best be remembered by senior and retired officers of the R.A.M.C. for his pathology and bacteriology lectures in the junior and senior courses of instruction at Millbank, but those who worked closely with him knew him for a most painstaking technician and a reliable bench worker. He took a great deal of trouble over everything that he set out to do. In order to make himself certain of delivering without notes an unhesitating and word-perfect lecture, he used to learn



[Lalayeite

his carefully prepared script and then declaim it silently as he walked round and round the lake of St. James's Park. These efforts were not wasted, for his lectures were very widely appreciated. Perry had a strong personality, but he also had a good deal of charm and could carry a committee without obvious effort. He was quick to see the importance of any scientific development that might be of importance to the health of the Army, and the encouragement that he gave to the investigations that led to the improvement of the Army T.A.B. vaccine and the introduction of active immunization against tetanus are witness to this. Perry was always well served, but the development of the Army pathological services in the second world war owed much to his own foresight and organizing ability.

R. G. LADKIN, M.B.E., B.M., D.P.H.

The sudden death from poliomyelitis of Dr. R. G. Ladkin on March 14 at the age of 36 has cut short a career of the highest promise and deprived Uganda of the services of an outstanding medical officer. To those privileged to know him he will be remembered as the ideal Colonial medical officer. Able, resourceful, adaptable, he seemed to be filled with boundless energy and was always willing and co-operative, and interested in every aspect of medical work in East Africa and in many fields outside medicine. He had a vivid personality, and was that forceful, formidable man, a truly realist Christian idealist. He knew only too well the frustrations and difficulties of medical work in Africa, the immense problems, the meagre resources, but he never let them daunt or deter him, and he flung himself cheerfully and selflessly into the task of improving the life and health of the African people of Uganda.

Ronald Greaves Ladkin was born on January 13, 1919, and was educated at Kingsbridge Grammar School and at Exeter College, Oxford, where he was Stapledon Scholar and Devon Scholar, taking the B.M., B.Ch. degrees in 1942. After a period as house-physician at the Radcliffe Infirmary he entered the Colonial Medical Service in 1943 and spent some years in the more remote districts of Uganda before being posted to Kampala, where he taught anatomy in the medical school of Makerere College and carried out much surgery at Mulago Hospital. He became interested in genito-urinary surgery, and this led him to a special study of venereology, which in turn led him towards public health. He took his D.P.H. in 1948 and visited Trinidad to study venereal disease control. On his return to Uganda he was given the medical charge of Mengo District and later of the Province of Buganda. This included the peri-urban African areas around Kampala, in whose problems he became deeply interested and of which he gained a vast knowledge. This post entailed much safari work, at which he was an expert and in which he took great pleasure. His clinical acumen, which he retained to the full, led him to the discovery that the so-called pygmies of the Mabira Forest were in fact pathological dwarfs. It also caused him to institute an improved system of dispensary returns so that he was able to analyse the causes of African morbidity. All the information he collected and the knowledge he gained were generously shared with his clinical colleagues: he lectured to medical students, and frequently spoke at meetings and conferences of the British Medical Association in Uganda. This willingness to help others is gratefully remembered, and it is a sad blow that the frequent concluding remark—"Ask Ron Ladkin—he's sure to know"—will never again

elicit his generous help. One of his greatest assets was his knowledge and understanding of the African mind and his ability to persuade Africans to co-operate with him. In part this was because they recognized his curative skill and were the more willing to accept his advice on prevention. His work in Buganda led to great improvements in many fields of public health and attracted the attention of medical visitors from other countries. His colleagues watched his activities with admiration and respect, and his appointment as M.B.E. in 1952 for his work in Buganda gave them much pleasure.

Ronald Ladkin had become more and more convinced of the necessity for health education in Africa, and he took up this problem with his usual enthusiasm, using many new techniques of his own devising. His success in this field was so outstanding that he was transferred to medical headquarters at Entebbe, where a new post, that of senior medical officer in charge of health education, was created for him, and his sphere was widened to include the whole Protectorate. In this capacity he travelled ever more widely. He spent much time and worked very hard in detailed planning and had interested many different bodies in this task. All his plans, which were coming to fruition when his untimely death took place, will go forward as he would wish, but his zeal and energy will be sorely missed and years will pass before another medical man can gain the detailed knowledge of the health problems, especially of the peri-urban areas, which Ladkin possessed.

Just as his official life was full, happy, and rewarding, so was his unofficial. He was active in the affairs of the Red Cross. He was a founder and past president of the Uganda Mountain Club, and spent many happy hours climbing and exploring, especially in the Ruwenzori mountains. He enjoyed playing cricket and would cheerfully hurl down fast balls for long spells under the hot African sun. Shortly after going to Kampala he married a nursing sister of the Colonial Nursing Service. His home life was ideally happy, and his wife ably supported all his work. Everywhere they went they set themselves to create a beautiful garden ablaze with colour. He lies under the green grass and the blue skies of Entebbe within sight of Lake Victoria. Uganda and his colleagues there have lost a great servant and friend they could ill afford to lose. The sympathy of all their friends goes to his widow and three young children in their great loss.—J. N. P. D.

F. H. SCOTSON, M.B., F.R.C.S.

Mr. F. H. Scotson, one of Manchester's leading surgeons, died on March 23 at the age of 55.

Born on January 28, 1900, at Manchester, where his father, Dr. F. C. Scotson, was a well-known general practitioner, Frederick Hector Scotson was educated at Manchester Grammar School and at Manchester University. He had a distinguished record as a medical student and was awarded numerous prizes and distinctions, including the Bradley Memorial Scholarship in surgery and the graduate prize in medicine. In 1922, in his 23rd year, he obtained medical degrees from both the Manchester and London universities, being awarded honours in his final examination at Manchester. In the following year he took the London Conjoint diploma, and in 1924 passed the final examination for the F.R.C.S., but, being under age at the time, did not qualify to receive the diploma until the following year. After graduation he was appointed house-surgeon at Manchester Royal Infirmary, the first of a long series of

appointments to that hospital: he was resident surgical officer from 1927 to 1929 and later surgical officer to out-patients and surgical tutor. During this period he took the opportunity to visit some of the American clinics. In 1930 he was appointed honorary surgeon to the Manchester Northern Hospital and to the Manchester Victoria Memorial Jewish Hospital, and a few years later he became consultant surgeon to the Crumpsall Hospital.

Scotson was a general surgeon with his chief interest in the surgery of the abdomen. He published a number of papers in this and other journals and spared no pains to keep abreast of current surgical ideas. He was a keen and good teacher and for the past seven years had been a lecturer and examiner in surgery in Manchester University. At the time of his death he was president of the section of surgery of the Manchester Medical Society and was to have given his presidential address on the subject of peptic ulceration. He was a past president of the Middleton and North Manchester Medical Society and a former vice-president of the Manchester Pathological Society. He was twice married: first, in 1928, to Annie M. Bradbury, who died in 1940, and second, in 1942, to Leila M. B. O'Connell, who survives him, together with her son and the two sons and one daughter of his first marriage.

R. L. H. writes: F. H. Scotson was an excellent technician and a shrewd clinician. In addition, he was always extremely kind to and thoughtful of his patients. He led a very active professional life, for besides a heavy hospital programme he had an extensive private practice. His friends had told him he was working far too hard, and unfortunately their prophecy proved true, for the constant nervous strain under which he was working precipitated a breakdown which never satisfactorily cleared up. A remarkably tolerant man, he had, in addition to his professional ability, many endearing personal qualities. His natural friendliness was apparent to all, and as "Scottie" he will be remembered and his loss mourned by all his colleagues in Manchester. His patients have lost not only a good surgeon but a friend.

Dr. NEIL McLEAN died on March 14 at Ryde, Isle of Wight, where he had been in practice for the past eight years. A native of Skye, Neil McLean was born in 1898, and he graduated M.B., Ch.B. at Glasgow University in 1924, after seeing active service with the Cameron Highlanders in France, the Balkans, and Russia in the first world war. At the university he was a well-known shinty player, gaining his blue. He joined the Colonial Medical Service in 1926, and served in Kenya for twenty years, retiring as senior medical officer in 1946 after a severe illness.

P. R. writes: Neil McLean did valuable work in Kenya, especially in sleeping sickness research, for which he was awarded the North Persian Forces Memorial Medal in 1931, an award given for the best piece of original work in tropical medicine for the year. For a time he was stationed in the Masai Reserve, and when he was posted elsewhere the Masai tribe offered the Government a large number of their precious cattle to have him back again, probably a unique tribute to a doctor and an index of the affection with which natives of all the Kenya tribes regarded him—an affection shared by the European population, officials and settlers alike. Neil will long be remembered by all who knew him, and their sympathy goes out to his wife and three daughters. In 1935 he married Miss G. Davidson, of Whitley Bay, who proved a constant support and strength to him. His was a lovable personality, and his cheerfulness and courage in adversity won the admiration of his friends. I can see him now sitting with his microscope at a camp table under a thorn tree on the shore of the Nyanza, talking Luo to his

patients with a strong Gaelic accent, or, dressed in an old kilt, fishing from a boat in Broadford Bay, singing quaint Gaelic airs. Though greatly incapacitated by cardiac trouble, he took up practice in Ryde in 1947, where he continued, making a brave fight against declining health, until his death at the early age of 56.

Medical Notes in Parliament

Radioactive Contamination Report

Mr. ARTHUR HENDERSON (Rowley Regis and Tipton, Lab.) asked the Prime Minister on March 29 if he would publish a White Paper containing all available facts and information, together with the report from British scientists, on the effects of continuing radioactive contamination of the world's atmosphere.

Sir WINSTON CHURCHILL stated that the Government had already invited the Medical Research Council to review the existing scientific information on the medical aspects of nuclear radiation and to prepare a report. The report would cover the medical aspects of nuclear radiation, including the genetic aspects. It would review existing scientific information and set forth the most up-to-date information and the latest research results available. The report would be laid as a White Paper.

London Atmosphere Measurements

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) asked the Parliamentary Secretary to the Ministry of Works (as representing the Lord President of the Council) on what evidence his estimate was based that there was no significant increase in the radioactive content of London's atmosphere during recent years. Mr. J. R. BEVINS told him that it was based on measurements made in London periodically since 1947. Dr. STROSS said that M.P.s who went to the Chester Beatty Research Institute, as members of the Parliamentary and Scientific Association, were informed that the radioactive contamination of the London atmosphere was 10 times as high now as when measurements first began, and was 300 times the normal during the great fog of 1952. Was that taken into account, could it be checked, and would it not be significant? Mr. BEVINS replied that he had checked the statement in Dr. Stross's pamphlet that the radioactivity had increased 10 times. There must have been a misunderstanding during the visit to the Institute, because he was assured that the increase in radioactivity since 1947 had been negligible. It was true that the measurements that were taken were very limited, and the evidence was not conclusive in its present form. Nevertheless, he would like to refute the statement that there had been a large increase in radioactivity. Dr. STROSS asked him to check that point with the Chester Beatty Institute, and make certain that the facts given to those who were present were as he had stated. Mr. BEVINS said that the Lord-President had checked with the Institute. The Institute denied that the statement was made, and said that if such a statement were made there had been a misunderstanding on one side or the other.

Hospital Workers' Protection

Mr. S. SWINGLER (Newcastle-under-Lyme, Lab.) asked the Minister of Health on March 28 what regulations he had issued about the protection of hospital workers using radioactive substances and about the disposal of radioactive waste in hospitals. Miss PAT HORNSBY-SMITH, Parliamentary Secretary, said that it was the normal practice of hospitals in the Health Service to observe the recommendations of the British X-ray and Radium Protection Committee about protection and working conditions in x-ray and radium departments. This code of practice was, however, in some

respects out of date, and the Minister hoped to bring into operation shortly a revised code approved by the Radioactive Substances Advisory Committee which included a section governing the disposal of radioactive waste.

Charges Against M.R.C. Denied

Mr. PETER FREEMAN (Newport, Lab.) asked the Parliamentary Secretary to the Ministry of Works, as representing the Lord President of the Council, whether he was aware that a number of cases had recently been brought to the courts of cat-stealing on a large scale and that several people had been convicted for this offence; that these cats had been stolen for sale to medical research laboratories, as admitted in court; that the cost of the defence and the fines had in some cases been paid by the M.R.C. and that they had employed the same counsel in most of the cases; what authority existed for the payment of such expenses out of public funds; how much had been spent on each of these cases in the last six months; and what action he proposed to prevent a recurrence of such incidents. Mr. BEVINS, replying on March 29, stated that he was glad to have the opportunity of stating, quite unequivocally, that there was no truth whatever in the hon. Member's allegations against the M.R.C. Mr. FREEMAN said that further inquiries should be made. Counsel who defended these cases was known to have made a voluntary statement that the fines and costs had been paid either by the M.R.C. or one of its members. This was confirmed by a Mr. Taylor, of Rectory Square, London, E.1, who supplied over 100 cats a week—most of which had been stolen—to the M.R.C. The same counsel was employed to defend Mr. Taylor, and had been employed on repeated occasions. Some brothers named Bailey were recently ordered to pay £170 in fines and costs, and they had admitted that in that case the cats stolen had been sent direct to the M.R.C. Mr. BEVINS said that the Lord President of the Council had been into the matter with meticulous care, and was satisfied that none of the suggestions in the question was based on evidence. The barrister whose name was supplied to him had had no contacts of any sort with the M.R.C. As for statements made in court, defendants sometimes told the truth and sometimes they did not. Mr. FREEMAN gave notice that he would raise the matter again.

Doctors' Telephones

Mr. D. WALKER-SMITH (Hertford, Con.) asked the Minister of Health on March 28 whether he would seek powers to ensure that general practitioners in the Health Service should be available to their patients on the telephone. Mr. IAIN MACLEOD replied "No," but added that, without prejudging any entirely exceptional case, it seemed quite clear to him as a general matter of common sense that a doctor providing general medical services was not in a proper position to fulfil his obligations to visit his patients when their condition so required if he did not make reasonable arrangements for them to communicate with him by telephone.

Foreign Patients in Hospitals

Mr. A. HURD (Newbury, Con.) asked if the Minister of Health would make a sample check of admissions to hospitals to show the numbers of patients who were not ordinarily resident in the United Kingdom, and to find out how many had come here with the purpose of obtaining free hospital treatment. Miss PAT HORNSBY-SMITH, Parliamentary Secretary, replied on March 28 that the Minister was not satisfied that the information obtained would be of sufficient value to justify the very considerable work which would be involved.

Progress in Leprosy Treatment

Mr. W. TEELING (Brighton, Pavilion, Con.) on March 30 asked the Secretary of State for the Colonies how many leper hospitals there were in the Colonies, where they were, and in what Colonies lepers were refused permission, even when suitably accompanied, to visit towns away from the

leper centres. Mr. H. HOPKINSON, the Minister of State, Colonial Office, stated that there was an institution for the treatment of leprosy in every Colony in which the disease was endemic, either in leprosy hospitals, out-patient departments of general hospitals, or in separate settlements or villages. Contact with the general public in the case of patients under treatment was related to the risk of infection in each case. Mr. TEELING said that recent discoveries had led those studying the disease to consider that it was no longer necessary to have completely isolated settlements. Would the Minister make sure that the Colonial Office was keeping that in mind? Mr. HOPKINSON said he entirely agreed. Many of the new drugs had made it possible to treat an increasing number of cases as out-patients, to allow patients in institutions to go home for short periods, or to discharge them altogether.

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) asked if we may take it that it is now accepted that leprosy is not a dangerously infectious or contagious disease, and that free movement does not necessarily bring danger to the community. Mr. HOPKINSON replied "Yes." The danger depended on the specific case, but in a general way people still retained a serious dread of the disease. Only education on the effects of modern drugs and so on would eradicate that fear.

Mr. TEELING also asked how many lepers were on the leper station near Fiji; what had been the expenditure on this leper island over the last five years, year by year; and how many of the lepers there were European, Fijian, and Indian, respectively. Mr. HOPKINSON informed him that there were 634 patients in the Fiji Leprosy Hospital at Makongai. Expenditure in Fijian pounds was 51,000 in 1949, 55,000 in 1950, 58,000 in 1951, 69,000 in 1952, and 64,000 in 1953. Three of the lepers were Europeans, 139 Fijians, and 193 Indians. Mr. TEELING asked if it would be possible to bring those people back into Fiji and Suva. The leper island was far away, and the lepers felt completely cut off. Mr. HOPKINSON said he would refer the suggestion to the Governor of Fiji. He added in answer to Mr. T. L. IREMONGER (Ilford, North, Con.) that Gilbertese, Samoans, Cook Islanders, and others were also treated in the colony. Generous help had been given to the hospital from the New Zealand Leper Trust Board and others.

Blood Tests for Motorists

Mr. S. P. VIANI (Willesden, West, Lab.) asked the Minister of Transport on March 30 whether he was aware that a majority of the public were in favour of the imposition of a blood test for motorists involved in serious accidents; and if he would give consideration to the introduction of legislation to enable such tests to be carried out in the future. Sir F. MEDLICOTT (Norfolk, Central, Nat. Lib. and Con.) asked if, in view of the recent substantial increase in the number of deaths and injuries on the roads, the Minister would make legislative provision for the imposition of a blood test on all drivers of motor vehicles involved in accidents causing death or serious injury. Mr. JOHN BOYD-CARPENTER, answering them both, said that he had no evidence either to confirm or to reject the assertion made by Mr. Viani. Research was being carried out jointly by the Medical Research Council and the Road Research Laboratory to find out, under laboratory conditions, how precisely measured quantities of alcohol affected driving performance and whether such effect could be satisfactorily assessed. He hoped their report would be available this year.

Mr. VIANI said that his question was based on evidence provided by a recent Gallup poll conducted by the *News-Chronicle*. Sir F. MEDLICOTT said the reliability of this test had been largely proved—which provoked cries of dissent—and it would be a much more satisfactory way of ascertaining the condition of drivers than the present tests of conduct. Mr. BOYD-CARPENTER said that he would rather await the conclusions of the Road Research Laboratory tests. Mr. R. R. STOKES (Ipswich, Lab.) said that most M.P.s

would fail to pass such a test immediately after lunch, and it bore no relation whatever to the condition of the driver.

Doctors' Lists.—The average number of patients on doctors' lists on July 1, 1954, was 2,219 in England and 2,077 in Wales. In July, 1951, the numbers were 2,391 and 2,348 respectively.

Cortisone Products.—The Minister of Health is not yet in a position to make cortisone products available on prescription by general practitioners.

Medico-Legal

£2,000 DAMAGES FOR SILICOSIS

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

On March 25, 1955, a majority of the First Division of the Scottish Court of Session upheld an award by Lord Wheatley to John Harkness Wardlaw of £2,000 damages. Wardlaw had sued his employers, Bonnington Castings, Ltd., for damages for lung injuries sustained through inhaling silica dust during his employment as a steel dresser from January, 1942, until May, 1950, when he was found to be suffering from pneumoconiosis. It was Wardlaw's job to operate a pneumatic hammer in the dressing shop to remove steel rags from castings.

Wardlaw's case was that his pneumoconiosis was caused by a breach of duty by his employers to take reasonable care for his safety, among other things by failing to provide employees in the dressing shop with masks or respirators to intercept the dust, and that such masks were a simple and inexpensive precaution which was frequently adopted in the foundry industry.

Lord Carmont, dismissing the appeal, said it would not do for the employers to say that it was much more likely that the disease was contracted through work at a hammer close to the source of dust rather than from breathing the air of a shop which was generally contaminated. Even if most of his inhalations took place near the source of dust, a minority of inhalations from the general atmosphere of the shop needlessly contaminated through breakdown of the extractors might well have contributed a quota of dust to Wardlaw's lungs and so helped to produce the disease. The evidence did not show that in 1950 a mask or respirator was in common use, but the employers had failed to show that silica dust from sources other than the hammer had played no part in causing the disease.

Lord Russell, agreeing with Lord Carmont, said that, having anxiously considered the evidence, he was of opinion that the employers had not discharged the onus resting on them.

The Lord President, Lord Clyde, would have allowed the appeal. In his dissenting judgment he said that, although an effective mask would have prevented the inhalation of the particles of silica dust loosened from the surface of the casting by the hammering operation, the evidence showed that in 1950, in spite of considerable research and effort by Government and departmental committees, no such respirator or mask existed. In his view the evidence did not show that the breakdown in ventilation had any causal connexion with Wardlaw's disease, and Wardlaw had failed to discharge the onus that it had. In his view the ventilation breakdown had been the employer's only breach of duty, and it was not shown that its effects had caused the disease.

SURGEON WINS FEE CLAIM

Judge W. H. Paton gave judgment for an orthopaedic surgeon at Bristol County Court on March 28 against a woman dancing teacher who alleged that the surgeon had forced her to walk on a broken ankle. The judge said he could not accept her story and entirely exonerated the surgeon. The judgment, with costs, was given to

¹ *Scotsman*, March 26, 1955.

Mr. Kenneth H. Pridie, of Clifton, Bristol, on his claim for £48 6s. for his professional services rendered to 56-year-old Mrs. Mary Ellen Boss, of Bristol. A counter-claim by Mrs. Boss for damages for alleged negligence was dismissed.

Mrs. Boss, a dancing instructress, said she broke her ankle in October, 1949, and Mr. Pridie set it in plaster. The next month she went to his surgery. He took her sticks away from her and insisted that she was only suffering from nerves. He told her to walk the length of the room to the x-ray table. She said that Mr. Pridie told her friend and partner, Miss Hilda Walker, who was with her at the time, to go home for Mrs. Boss's other shoe, so that she could walk home. "He removed the plaster and manipulated my foot, with great pain to me, and said my ankle was perfect," and that she would dance as well as ever she did. Mr. Pridie went outside, but then rushed in and said, "Don't put that foot to the ground. If you do you will be a cripple for life." Mrs. Boss said she replied, "You are too late. You have made me walk already." She said she went home in an ambulance.

Mr. Kenneth Pridie, a consulting orthopaedic surgeon to several hospitals, said that before ever he saw Mrs. Boss he examined the radiographs which had been taken at Bristol Royal Infirmary. He realized that she had a very severe fracture of the ankle, which was bound to produce a permanent disability whatever treatment she had. He gave her an injection into the ankle and a sedative, manipulated the bones, and put on a plaster. Dealing with the events at his surgery in November, 1949, Mr. Pridie said he sent Miss Walker for the shoe before he had examined Mrs. Boss, but when he did so he found that the ankle was unstable. It was not until five years later that he first knew it was being alleged that he had compelled Mrs. Boss to walk on the ankle. He had no complaint from her that day about anything. She was very emotional and he did his best to comfort her.

Judge Paton, giving judgment, pointed out that Mr. Pridie eventually performed an operation on Mrs. Boss. It was very difficult, he said, to believe that a person who had really been treated as she says she had been treated by Mr. Pridie would have allowed him to go on treating her. It has never been suggested that she even considered anybody else doing it. He was quite unable to accept her story. No doubt she became extremely despondent and upset, and had persuaded herself that she was badly treated by Mr. Pridie. The judge was completely satisfied that, so far as Mr. Pridie was concerned, there was nothing in his conduct of this case with which he should reproach himself.

The Medical Defence Union instructed Messrs. Hempsons, solicitors, to act for Mr. Pridie.

Universities and Colleges

UNIVERSITY OF OXFORD

In Congregation on February 26 the degree of D.M. was conferred on J. F. D. Frazer and A. L. Turnbull.

Dr. E. M. Vaughan Williams has been elected to an Official Fellowship at Hertford College.

In Congregation on March 8 the appointment of Dr. D. St. C. Roberts as a Clinical Tutor in Ophthalmology from April 1, 1955, to September 30, 1957, was approved.

James Learmonth Gowan (Lincoln College) has been elected to the Philip Walker Studentship in Pathology for two years from October 1, 1955.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At a quarterly meeting of College held on February 1, with the President, Sir Stanley Davidson, in the chair, the following were elected Members of the College:

G. J. Summers, A. Muir, D. P. Puri, L. E. Wynter, S. Bell, A. K. Black, M. B. Morris, J. A. Kay, I. M. Cuthill, D. C. Peiris, T. S. Kalyanani, P. S. Macfarlane, H. M. P. Perera, F. V. Edrington, D. M. Chakraborty, V. Srinivasan, P. M. Hewlett, G. F. Trobridge, B. Kaplan, E. D. Myers, M. S. Karve, H. S. Wong, T. A. Cunningham, D. C. Sen, F. O. Simpson, C. G. Caro.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending March 19 (No. 11) and corresponding week 1954.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1955					1954				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	10	0	3	0		18	2	5	0	2
Dysentery ..	1,816	195	321	16	1	1,124	125	276	11	10
Encephalitis, acute ..	0	0		0		4	1			
Enteric fever: Typhoid ..	2	0	0	0	1	2	2	0	0	
Paratyphoid ..	7	0	0	0	0	45	0	0	0	
Food-poisoning ..	117	10		1		159	18		3	
Infective enteritis or diarrhoea under 2 years ..				12	7				13	26
Measles* ..	29,018	3,685	374	583	93	2,325	57	107	49	428
Meningococcal infection ..	48	4	22	1	2	36	3	11	2	1
Ophthalmia neonatorum ..	33	4	4	0		41	3	4	0	1
Pneumonia† ..	980	58	257	42	18	704	39	220	1	7
Poliomyelitis, acute: Paralytic ..	10	2		0	1	13	0		2	0
Non-paralytic ..	3	0				6	1			
Puerperal fever§ ..	252	43	9	0		262	34	7	2	
Scarlet fever ..	839	42	88	61	19	1,282	41	144	36	32
Tuberculosis: Respiratory ..	688	71	139	25		790	97	192	16	
Non-respiratory ..	90	13	28	5		120	10	24	4	
Whooping-cough ..	1,924	154	155	51	53	2,543	104	426	37	43

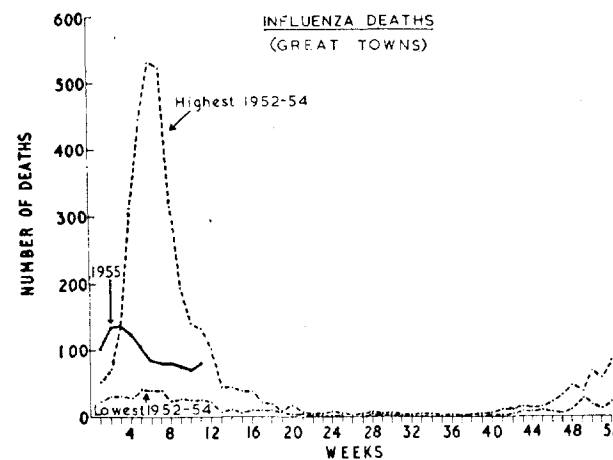
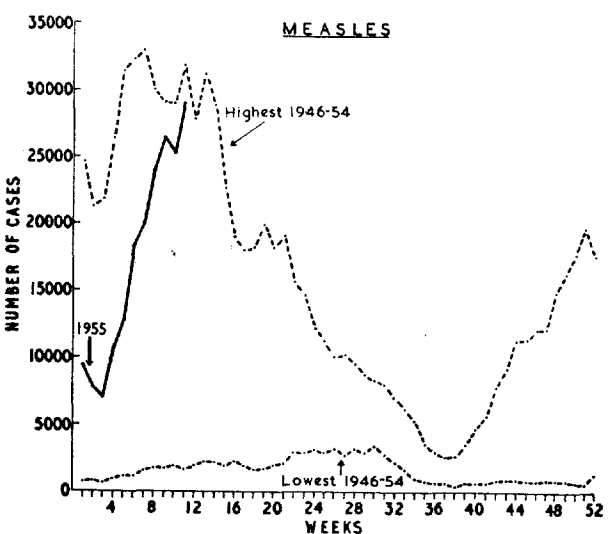
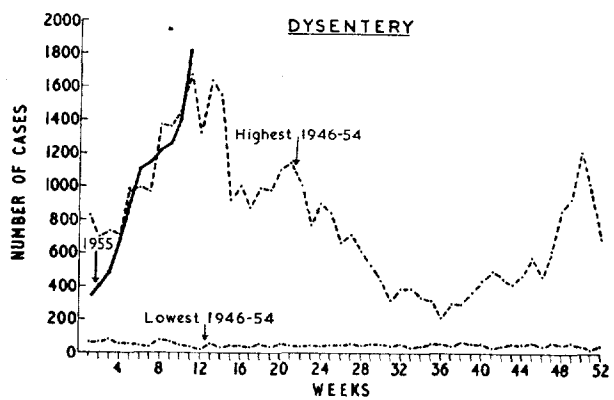
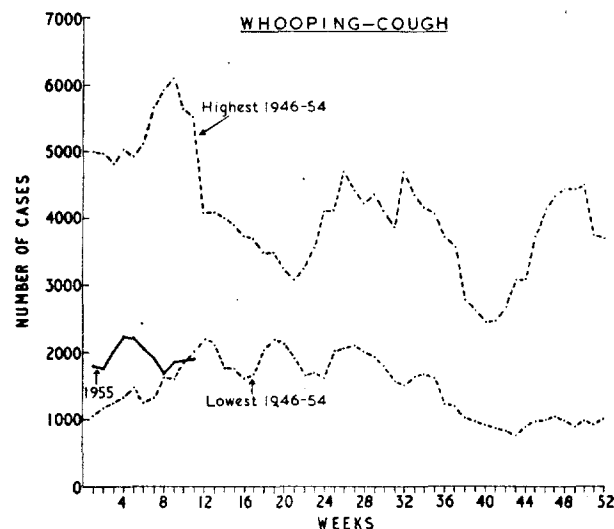
DEATHS in Great Towns	1955					1954				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	1	0		0		1	0		0	
Encephalitis, acute ..		0	1		0		0	0		0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	3	0	2	0	1	15	0	1	2	2
Influenza ..	82	10	4	2	15	25	2	3	0	0
Measles ..		2	1	0	0		0	0	0	0
Meningococcal infection ..		1	1				0	2		
Pneumonia ..	458	78	42	24	18	311	40	32	14	7
Poliomyelitis, acute ..	0	1			0	3	0			0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory ..	92	15	15	0	9	111	18	17	3	5
Non-respiratory ..		2	1	0	0		1	1	1	2
Whooping-cough ..	2	0	0	0	0	1	0	1	0	0
Deaths 0-1 year ..	240	30	42	6	14	241	24	39	10	18
Deaths (excluding stillbirths) ..	7,525	1,122	717	156	277	5,943	771	664	149	158
LIVE BIRTHS ..	8,167	1,234	928	215	258	7,953	1,180	1,059	245	362
STILLBIRTHS ..	197	18	27			201	15	29		

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

Vital Statistics

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the nine years 1946-54 (influenza, 1952-4) are shown thus ----, the figures for 1955 thus ———. Except for the curves showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

Infectious diseases were more prevalent in England and Wales during the week ending March 19, and the rises in the number of notifications included 3,697 for measles, from 25,321 to 29,018, 409 for dysentery, from 1,407 to 1,816, 59 for scarlet fever, from 780 to 839, and 43 for whooping-cough, from 1,881 to 1,924.

The largest rises in the incidence of measles were 1,059 in London, from 2,626 to 3,685, 365 in Yorkshire West Riding, from 3,737 to 4,102, 364 in Middlesex, from 1,047 to 1,411, 313 in Surrey, from 986 to 1,299, 263 in Northumberland, from 709 to 972, 250 in Warwickshire, from 2,120 to 2,370, 218 in Kent, from 988 to 1,206, 180 in Essex, from 1,905 to 2,085, 178 in Durham, from 808 to 986, 176 in Glamorgan-shire, from 167 to 343, 174 in Derbyshire, from 879 to 1,053, 146 in Southampton County, from 156 to 302, 141 in Lancashire, from 2,123 to 2,264, and 105 in Staffordshire, from 878 to 983, and the only large fall was 100 in Lincolnshire, from 477 to 377. The only variation of any size in the trends of scarlet fever was a rise of 47 in Yorkshire West Riding, from 57 to 104. The largest fluctuation in the returns of whooping-cough was a decrease of 30 in Cheshire, from 62 to 32. 10 cases of diphtheria were notified, being 1 more than in the preceding week. Areas with multiple cases of diphtheria were Plymouth C.B. 3, Liverpool C.B. 2, Birmingham C.B. 2.

13 cases of acute poliomyelitis were notified, and these were 1 more for both paralytic and non-paralytic cases than in the preceding week. The largest returns were Yorkshire West Riding 5 (Batley M.B. 2), Warwickshire 2 (Birmingham C.B. 2), and London 2 (Hackney 2).

For the eleventh consecutive week a rise has been recorded in the incidence of dysentery, and the number of notifications during the week reached a new record level, being 144 above the previous highest level recorded in 1951. The largest centres of infection during the week were Lancashire 700 (Blackpool C.B. 286, Oldham C.B. 86, Blackburn C.B. 69, Manchester C.B. 69, Liverpool C.B. 49, Chadderton U.D. 33, Middleton M.B. 18, Salford C.B. 15, Lytham St. Anne's M.B. 15, Royton U.D. 14, Failsworth U.D. 10), London 195 (Hackney 103, Shoreditch 33, Islington 14, Stepney 11), Durham 156 (Sedgefield R.D. 56, Felling U.D. 23, South Shields C.B. 15, Gateshead C.B. 11), Northumberland 114 (Newcastle-upon-Tyne C.B. 30, Morpeth M.B. 24, Whitley Bay M.B. 23), Yorkshire West Riding 94 (Leeds C.B. 37, Huddersfield C.B. 21, Sheffield C.B. 11), Leicestershire 90 (Leicester C.B. 62, Melton Mowbray U.D. 13), Norfolk 70 (Norwich C.B. 55), Cheshire 52 (Stockport C.B. 33), Northamptonshire 44 (Northampton C.B. 23, Kettering M.B. 14), Lincolnshire 41 (Scunthorpe M.B. 36), Surrey 39 (Farnham U.D. 26), Yorkshire North Riding 30 (Middlesbrough C.B. 24), and Glamorganshire 25 (Swansea C.B. 12).

Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in February was 119, compared with 108 (revised figure) in the previous month and 114 in February, 1954.

The numbers of cases of industrial diseases in the United Kingdom reported during February, 1955, were as follows: lead-poisoning 6, compressed air illness 3, epitheliomatous ulceration 18, chrome ulceration 27; total 54. There were no deaths.—*Ministry of Labour Gazette*, March, 1955.

Medical News

Wellcome and Carlsberg Foundations.—At the Apothecaries Hall on April 4 the Wellcome Trustees and directors of the Wellcome Foundation, Ltd., entertained at dinner the members of the Carlsberg Foundation and the management of the Carlsberg Breweries of Copenhagen. Sir HENRY DALE, O.M., F.R.S., chairman of the Wellcome Trustees, presided, in the presence of a distinguished company of guests. The link between the two Foundations is that for all practical purposes their constitution and aims are identical. Both were created with the object of using for philanthropic purposes the whole of the profits of a continuing industrial concern. The Carlsberg Foundation is the senior and came into being in the 1880's following the founding of the Carlsberg Breweries by the late J. C. Jacobsen and their extension by his son. They left the ownership of their breweries to an independent foundation consisting of five eminent Danish citizens appointed by the Royal Danish Academy of Arts and Sciences, whose responsibility it is to apply the profits from the breweries to scientific research and the promotion of the arts, for the benefit of the Danish nation.

Scottish Orthopaedic Council.—On March 21 the Scottish Orthopaedic Council agreed to dissolve. In a statement after the meeting it was pointed out that orthopaedic services were now firmly established in all five regions of Scotland, and therefore the work for which the council was formed has been accomplished. Since its inception in 1942 the council, as the channel through which grants from the Lord Nuffield Fund for Cripples were distributed in Scotland, has disbursed over £24,000 to assist with orthopaedic clinics, educational establishments for crippled children, and other aids for cripples in Scotland. In addition the Nuffield Trustees have made grants amounting to £26,500 for hospital developments at Philipshill, Busby, and Princess Margaret Rose Hospital in Edinburgh. A balance of £17,000, earmarked for orthopaedic developments in Scotland, is to be used for the construction of occupational therapy and workshop departments at the proposed spinal injuries unit at Edenhall, Musselburgh, and to extend the residential training establishment for severely handicapped girls at Anton House, Broughty Ferry.

Kirk Duncanson Fellowship.—The council of the Royal College of Physicians of Edinburgh invites applications for a Kirk Duncanson Research Fellowship of the value of £600 for two years from October 1, 1955. Applicants should submit details of their proposed research and the place where it will be done to the Secretary of the Royal College of Physicians of Edinburgh, 9, Queen Street, Edinburgh 2, before May 7.

Royal Flying Doctor Service.—The QUEEN has honoured Australia's Flying Doctor Service by granting permission for it to be known in future as the "Royal Flying Doctor Service of Australia." An account of the service, given by

Dr. ALLAN VICKERS, the service's senior medical officer, was printed in the *Journal* last year (June 19, p. 1436).

Instruments for Users of Radio-isotopes.—The Scientific Instrument Manufacturers' Association of Great Britain has published a catalogue to help the user of radioactive isotopes in selecting electronic equipment to suit his special needs. The first copy of the catalogue, which is called "Radio Isotope Instrumentation and Accessories," was presented to Sir JOHN COCKCROFT, F.R.S., at a ceremony in London on March 30. Details are given in the catalogue about apparatus for radioactive assay and radiation monitoring and other equipment such as isotope containers and isotope-handling apparatus. Last year, according to figures supplied by the Atomic Energy Research Establishment at Harwell, there were 9,692 orders for radio-isotopes for use in Britain, of which over half came from hospitals, while 6,694 orders were received from abroad. The comparable figures for 1948 were 1,379 and 35. The catalogue may be obtained from the Scientific Instrument Manufacturers' Association, 20, Queen Anne Street, London, W.1.

COMING EVENTS

Westhill Hospital, Dartford.—Postgraduate course for general practitioners, every Thursday afternoon at 2.30 p.m. from April 14 to June 23. Inquiries to Dr. J. C. HOGARTH, Westhill Hospital, Dartford.

Wessex Rahere Club.—Spring dinner on April 30 at the Royal Clarence Hotel, Exeter. Details from Mr. A. DAUNT BATEMAN, 11, The Circus, Bath.

Christian Medical Fellowship.—Two house-parties have been arranged: May 6-9, at the Belsfield Hotel, Bowness, Windermere; and May 20-23 at Linden Hall Hydro, Bournemouth. Details from the Secretary of the Fellowship, 39, Bedford Square, London, W.C.1.

NEW ISSUES

British Journal of Ophthalmology.—The new issue (Vol. 39, No. 4) is now available. The contents include:

SOME OBSERVATIONS ON THE WATER-DRINKING TEST IN GLAUCOMATOUS AND NON-GLAUCOMATOUS SUBJECTS. D. Campbell.
INFLUENCE OF LOCAL ASCORBIC ACID CONCENTRATION ON COLLAGENOUS TISSUE HEALING IN THE CORNEA. T. A. S. Boyd.
THE PRESSURE IN THE CANAL OF SCHLEMM. E. S. Perkins.
VASCULAR SUPPLY OF THE OPTIC PATHWAY. II. FURTHER STUDIES BY MICROARTERIOGRAPHY OF THE OPTIC NERVE. J. François, A. Neetens, and J. M. Collette.
OPHTHALMOLOGICAL COMPLICATIONS OF MULTIPLE MYELOMATOSIS. E. Clarke.
CLINICAL REPORT ON THE RESULTS OF FIFTY CASES OF ROUTINE DACRYOCYSTORHINOSTOMY. G. J. Romanes.
MULTIPLE ISLANDS OF RETINOBLASTOMA. A STUDY OF THEIR INCIDENCE RATE AND THE TIME SPAN OF THEIR APPEARANCE. H. B. Stallard.
CORNEAL INFECTIONS AFTER CORTISONE THERAPY. Y. Mitsui and J. Hanabusa.
OCULAR MANIFESTATIONS IN A CASE OF HAEMORRHAGE INTO THE FOURTH VENTRICLE. M. Sengupta.

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

SOCIETIES AND LECTURES

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

Tuesday, April 12

●ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Sir Clement Price Thomas: Resection for Pulmonary Tuberculosis; 6.30 p.m., Professor F. A. R. Stammers: Complications of Gastrectomy.

Wednesday, April 13

HARVEIAN SOCIETY OF LONDON.—8.15 p.m., Sir Adolphe Abrahams, Sir Arthur Porritt, and Dr. Roger Bannister: Medical Aspects of Athletics.
●ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Sir Russell Brock: Some Aspects of the Surgical Treatment of Mitral Stenosis; 6.30 p.m., Professor A. M. Boyd: Management of Phlebitis and its Complications.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Dr. A. I. G. McLaughlin: Incidence and Prevention of Dust Diseases in British Industry (illustrated).

Thursday, April 14

BASINGSTOKE PLASTIC CENTRE MEDICAL SOCIETY.—At Rooksdown House (Park Fawcett Hospital), Basingstoke, Hants, 7.30 p.m., Professor R. H. S. Thompson: Skin Enzyme Problems in Burns; Dr. W. J. H. Butterfield: Abnormal Carbohydrate Metabolism in Burns; Dr. P. A. Gorer: Serology of Tissue Transfer; Mr. Douglas M. Jackson: Early Primary Surgery with the Use of Homografts; Dr. J. P. Bull: Early Electrolyte and Fluid Balances.

FACULTY OF HOMOEOPATHY.—At Royal London Homoeopathic Hospital, 5 p.m., Dr. H. Fergie Woods: Sciatica; Dr. N. J. Pratt: Analysis of 100 Consecutive Homoeopathic Prescriptions.
INSTITUTE OF PSYCHIATRY.—5.30 p.m., inaugural lecture by Professor H. Mollwain: Maudsley, Mott and Mann on the Chemical Physiology and Pathology of the Mind.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. Norman Capener: Hip Joint—Surgical Approaches and Procedures; 6.30 p.m., Mr. V. H. Riddell: Toxic Goitre.

Friday, April 15

BIOCHEMICAL SOCIETY.—At Department of Biochemistry, The University, Liverpool, 11 a.m. (Saturday, April 16, 11.15 a.m.), joint meeting with Association of Clinical Biochemists.

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—3.30 p.m., clinical meeting for general practitioners. Mr. W. S. McKenzie: Surgical Treatment of Deafness.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Professor Lambert Rogers: Carotid Aneurysms; 6.30 p.m., Mr. J. N. Barron: Skin Grafting for the General Surgeon.

Saturday, April 16

CAMBRIDGE UNIVERSITY MEDICAL SCHOOL.—10.30 a.m., symposium: Tuberculosis and Other Diseases of the Chest.

APPOINTMENTS

DAVIDSON-LAMB, WILLIAM, M.C., M.B., Ch.B., D.P.H., Deputy County Medical Officer of Health and Deputy Principal School Medical Officer, Gloucestershire County Council.

DEWAR, JOHN, M.B., Ch.B., D.P.H., County Medical Officer of Health, Joint County Council of Moray and Nairn.

GIBSON, JANE ISABELLA, M.B., Ch.B., Consultant Pathologist, Birkenhead and North Wirral Hospital Group (Liverpool Regional Hospital Board).

IRWIN, DAVID, M.B., Ch.B., D.P.M., Deputy Medical Superintendent, St. George's Hospital, Morpeth, Northumberland.

MASON, RICHARD MICHAEL, D.M., M.R.C.P., Consultant Physician to Department of Physical Medicine, The London Hospital, Whitechapel, E.

RAINSFORD, C. R. C., M.D., D.P.H., D.T.M., Medical Officer of Health, Braintree and Bocking and Witham Urban District Councils, and the Braintree and Dunmow Rural District Councils, and Assistant County Medical Officer, Essex.

REID, EDWARD NEIL, M.B., Ch.B., D.P.H., Medical Officer of Health, Kilsyth, Stirlingshire.

RICHCESTER, MARIE-JOYCE, L.R.C.P.&S.Ed., Assistant Medical Officer of Health (Midwifery and Child Welfare), Blackpool.

RICHARDS, NORMAN A., M.D., M.R.C.O.G., Part-time Consultant Obstetrician and Gynaecologist to the Stafford Group of Hospitals.

SHEMLIT, PHILIP, M.B., F.R.C.S., Surgical Consultant, The Military Hospital, Tidworth.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—Joan M. Waterfall, M.B., Ch.B., D.A., Primary F.F.A.R.C.S., temporary Senior Anaesthetic Registrar at Frenchay Hospital, Bristol; Mary F. West, M.B., B.S., D.A. (Part I), Anaesthetic Registrar at Southmead Hospital, Bristol; G. P. Jolly, M.B., B.Chir., M.R.C.O.G., D.O.Bst.R.C.O.G., Registrar in Obstetrics and Gynaecology at Southmead Hospital, Bristol; Angela D. Fuller, M.B., B.Chir., D.C.H., Paediatric Registrar at Southmead Hospital, Bristol; J. S. Knutzen, M.B., Ch.B., Ear, Nose, and Throat Registrar to the Bath Group of Hospitals; M. J. Gallagher, M.B., B.S., F.R.C.S., Orthopaedic Registrar at Princess Elizabeth Orthopaedic Hospital, Exeter; T. L. Schofield, Ch.M., F.R.C.S., Consultant Surgeon to Bath Clinical Area.

UNIVERSITY COLLEGE HOSPITAL OF THE WEST INDIES.—Dinah J. Hony, M.B., B.S., Registrar in Anaesthetics; Ruth Porter, M.B., Ch.B., D.C.H., Medical Registrar.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Hetherington.—On March 25, 1955, to Monica, wife of Dr. A. W. Hetherington, Redcote, Rainham, Essex, a daughter—Jane Mary.

DEATHS

Dunn.—On March 30, 1955, at 62, Cecil Street, Hillhead, Glasgow, James Churchill Dunn, D.S.O., M.C., D.C.M., M.D., D.P.H.

Mann.—On March 29, 1955, at Drummie House, Letham, Angus, David Mann, M.B., F.R.C.S.Ed.

Nicoll.—On March 17, 1955, at Womersley, Surrey, James Thomson Bell Nicoll, M.B., Ch.B., aged 55.

Pank.—On March 13, 1955, at Market Rasen, Lincs, Harold William Pank, M.R.C.S., L.R.C.P., aged 80.

Petrie.—On March 17, 1955, at Chertsey Hospital, George Ford Petrie, M.D., of Woking, Surrey, late of Elstree, Herts.

Roe.—On March 17, 1955, at 20, Billing Road, Northampton, Robert Bradley Roe, M.R.C.S., L.R.C.P.

Scott.—On March 22, 1955, at the Hostel of St. Luke, London, Agnes Catherine Scott, C.B.E., ½ B., of Cleves, France Lynch, Stroud, Glos, aged 79.

Sharp.—On March 18, 1955, Alexander Sharp, C.B., C.M.G.T.D., F.R.C.S.Ed., Colonel, A.M.S., retired.

Thomas.—On March 21, 1955, at Addenbrooke's Hospital, Cambridge, John Glyndor Treharne Thomas, M.C., M.R.C.S., L.R.C.P., D.P.M., of 353, Hills Road, Cambridge, aged 62.

Thorp.—On March 16, 1955, at Bafford Cottage, Charlton Kings, Cheltenham, Glos, Henry Thorp, M.Sc., M.B., Ch.B., formerly of Lymm, Cheshire.

Wallis.—On March 16, 1955, William Evershed Wallis, M.B., B.Ch., of Oakhurst, East Grinstead, Sussex, aged 71.

Woodward.—On March 22, 1955, at Coventry, Herbert Croker Sperling Woodward, M.B., B.C., of Kingston Bagpuize, Abingdon, Berks, aged 86.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Wet Clothes

Q.—What, in healthy people, are the disadvantages of getting wet, and staying in wet clothes? How is the picture modified by atmospheric temperature, relative humidity, amount of clothing, and regular use of soap and hot water in washing? Primitive people, even the malnourished, appear to get wet and stay wet for long periods without discomfort or subsequent ill effect.

A.—Presumably the questioner is thinking of the old advice: "You must get those wet clothes off before you catch your death of cold." It is doubtful if wearing wet clothes ever gave anyone a cold; but when the outer garments are wet there is evaporation from them and the surface temperature of the outside clothing will fall below that of the surrounding air, possibly to the wet-bulb temperature. The temperature gradient from the skin to the outer surface of the clothing is therefore increased; at the same time the replacement of the insulating air between the fibres of the cloth by non-insulating water will decrease the thermal insulation of the clothing. These two factors together cause a man in wet clothing to lose heat more rapidly to the environment than a man in dry clothes. Skin temperature and later even body temperature may fall. It has been said that when the body temperature does fall there is diminished local resistance to infection, especially in the nasopharyngeal tract (although experimental work has failed to confirm this). To this extent, therefore, wearing wet clothing might contribute to catching a cold, but the cold infection has got to be there to be caught.

Atmospheric temperature and humidity have an effect inasmuch as these two factors govern the wet-bulb temperature. For physical reasons the surface temperature of the wet clothing can never fall below the wet-bulb temperature, and the higher the humidity the nearer does the wet-bulb temperature approach the atmospheric dry-bulb temperature. At high humidities therefore the skin surface gradient is less affected than at low humidities.

The more clothing worn, within limits, the warmer the skin, so long as the clothing is dry. If this clothing suddenly becomes soaked and so loses all its insulation the thermal gradient from the skin to the surface of the clothes will be very steep and heat loss will be rapid. When very little clothing is worn the skin temperature may be almost the same in the clothed as in the unclothed areas, and wetting the clothing will then make very little difference.

The regular use of soap and water, according to O'Brien,¹ predisposes to prickly heat and allied skin conditions, as it removes the natural fats of the skin. As prickly heat and intertrigo are more likely to develop in damp areas of skin, it is possible a well-washed individual might suffer more in this respect if he had to live in wet clothes than one of the "great unwashed." The questioner may also be thinking of the value of grease as thermal insulation. It has been found experimentally, however, that in immersion experiments the minimum thickness of grease on the skin which will have any effect on the rate of cooling is 1.8 mm. This represents 2.7 litres of grease for an average-sized man—and a mighty long time between baths.

I doubt if primitive men are any better able to withstand the purely physical effect of wearing wet clothes than are others; but they may be better prepared to put up with the discomfort, as they may have no alternative. On the other hand, a primitive man may be wearing fewer

clothes, with the advantage already noted, or he may even take all his clothes off. Once clothes are wet right through their insulation value is almost nil, and a naked man is actually better off, as the area from which evaporation can take place may be 25% less. The really important thing here is knowing what to do when one's clothes do get wet. The old Scots shepherds were said to turn their plaids wet side in when the rain stopped; in this way they stopped excessive evaporation and consequent cooling. Changing wet socks for dry socks, even though the boots are still wet, restores the insulating power of the sock and is also a great comfort; it is both physically and physiologically justified.

REFERENCE

¹ Brit. J. Derm., 1947, 59, 125.

Ringworm

Q.—In treating a case of ringworm affecting the groins, axillae, and toes, should the fungicide be applied widely to all areas showing scaling (such as between the toes) irrespective of whether inflammation is present or not? What disinfection of clothes and bedding is advised? How should the bathroom floor (made of wood) be disinfected?

A.—Fungicide should be applied to all areas where there is scaling.

Bed linen is disinfected by the usual process of washing, and most types of underclothing can be boiled. The feet of socks or stockings are probably best sterilized by soaking in lysol or some similar disinfectant before they are washed.

For the disinfection of a wooden floor, scrubbing with soap and water would probably be efficient.

Dangers of Adrenaline During Prostatectomy

Q.—What is the risk of injecting adrenaline into the prostatic bed prior to performing a prostatectomy? Would you consider 1.5 ml. adrenaline (1 in 1,000) diluted with 40 ml. of saline to be a small, medium, or a large dose? General anaesthesia is used, but trichlorethylene, cyclopropane, and chloroform are avoided.

A.—There is some risk that in injecting adrenaline solution into the prostatic bed some or all of it might get into the circulation. If this did happen 1.5 ml. of adrenaline would be a large dose for anybody. Little is gained by making the dilution of adrenaline intended for vasoconstriction much stronger than 1 in 100,000. If the whole 40 ml. of solution is to be injected, the required dilution is obtained by mixing 0.5 ml. of adrenaline in 50 ml. saline. Few genito-urinary surgeons require this volume for the purpose described. Usually a few ml. only of the solution is injected into two or three points in the prostatic capsule. In these circumstances the stronger solution mentioned in the question may be used, since the dose of adrenaline would then be kept to about 0.5 ml., a reasonably safe dose.

The risk of sudden death due to adrenaline is present with any form of anaesthetic; it is probably increased in the case of the three anaesthetic agents mentioned in the question.

Hitch-hiking to Australia

Q.—Two patients of mine are shortly hitch-hiking to Australia via Yugoslavia, Greece, Turkey, Syria, Iraq, India, Pakistan, Singapore, Burma, and Indonesia. Can you please tell me what inoculations and vaccinations they should have before starting on this journey? Can you also tell me what antimalarial drug is advised, in what doses, and during what part of the journey should this be taken? Are any other health precautions advised?

A.—Travellers are required by international law to be vaccinated against smallpox, and must be in possession of a valid international certificate of vaccination. As these particular travellers are going through India and Pakistan they

should also be vaccinated against cholera; this, too, is legally required as a condition of entry into these countries. Although vaccination against the enteric group of fevers is not required by law, it is advisable to have this done. There is no special order in which the above vaccinations should be carried out. Vaccination against yellow fever is legally required of those travelling to tropical Africa or America, and it is recommended that this be done at least four days before smallpox vaccination if this is also required.

The most effective antimalarial prophylactics are proguanil in doses of 100 mg. daily and chloroquine in doses of 300 mg. (base) weekly. It would be advisable to start taking the prophylactic on reaching the Mediterranean littoral and to continue thereafter throughout the journey and for three weeks after entering the non-malarial region at the end of the journey.

Among other health precautions the most important is the use of safe water supplies, and if safety cannot be guaranteed water should be boiled. Salads and other uncooked foods should be avoided. A valuable book, designed for the lay reader and dealing with general health problems in the Tropics, is *Health and Disease in the Tropics*, by Charles Wilcocks, published by Oxford University Press, price 15s. The Ross Institute, c/o London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1, also issue a pamphlet entitled "Notes on the Preservation of Personal Health in Warm Climates."

Constant Sexual Urge in an Old Man

Q.—I have a patient in his late eighties with a moderately enlarged prostate who is tormented with an almost constant sexual urge. He is impotent. Frequency of micturition is the only other symptom. Would oestrogen therapy help?

A.—Although it is possible that stilboestrol in a dose of 5 mg. daily might diminish the sexual urge, it is unlikely to do so if erections do not occur. Probably the best treatment would be prostatectomy if the other symptoms justify it.

Hairy Tongue

Q.—During the last six months in this practice I have seen an increasing number of hairy tongues, with and without glossitis. Some have been present for only a few days or months, others for years or even for life. (a) Are several clinical types of hairy tongues recognized? (b) What is their cause? (c) Has there been a recent increase in the incidence of the condition?

A.—There are probably at least four types of black hairy tongues with differing aetiologies: (1) congenital and familial, when the condition is present from birth and is sometimes known as ichthyosis of the tongue; (2) parasitic, when it is due to various micro-organisms (yeasts, particularly *Candida albicans*, actinomycetes, and microbacilli); (3) the result of chemical irritants, such as toothpaste, mouthwashes, and disinfectants; (4) following the local or systemic use of antibiotics, particularly chlortetracycline ("aureomycin").

It is difficult to say whether there has been an increase in the incidence of the condition in recent years, because we see only a small proportion of those afflicted with this benign malady. The literature and personal experience suggest that there has been an increase in the incidence of hairy tongue, and that antibiotics, particularly those of the tetracycline group, are responsible for this increase, as many patients develop the condition towards the end of, or shortly after, a course of one of these drugs.

Lozenges containing antibiotics are more likely to produce black tongues, and they have also followed the use of an ointment containing chlortetracycline on the lips.

A number of cases arise spontaneously, and recently studies of the tongue with Wood's light have shown that the flora of the dorsum of the tongue may change very rapidly in the apparently normal, healthy mouth, so that it

is not surprising that occasionally a brown tongue follows this spontaneous change in the flora. With increasing use of mouthwashes, antibiotic drugs, toothpastes containing various chemicals, and the like, it is probable that the condition will be more frequently met with in the future.

Cigarette Stains on the Fingers

Q.—How can one take off nicotine stains from hands and mouth of heavy cigarette-smokers, without irritation to the skin? Attempts with hydrogen peroxide, up to 20%, and 10% sodium hypochlorite solution have been only partially successful.

A.—It is presumed that these stains are caused not only by nicotine but by tar as well, though I have no precise information on this point. The stains can be removed comparatively easily with pumice stone, and it is probably better to do this periodically than to make frequent applications of strong chemicals to the skin. However, the use of a cigarette holder will prevent most of this staining.

NOTES AND COMMENTS

Thiourea.—Dr. J. H. PETERS (Atlanta, U.S.A.) writes: In answering a question regarding thiourea ("Any Questions?" November 13, 1954, p. 1179), it is stated that the compound had been administered in 1-2 g. daily doses and was abandoned in favour of "more active . . . compounds" and because it was unpleasant to take and imparted an odour to the breath. Actually, thiourea has been used successfully for therapy of hyperthyroidism, administered in quite low (70-280 mg. per day) doses, displays relatively little toxicity, and is pleasant to take.^{1,2,3,4} The authors of these investigations reported halitosis only when the drug was given intravenously. Actually the early abandonment of thiourea in favour of other goitrogens was due to a combination of factors. One was that early investigators did set dosages too high and experienced the difficulties mentioned in your answer. In the meantime, the introduction of propylthiouracil, and later of aminothiazole, proved to be so successful that thiourea, which may actually be less toxic than either, has been ignored. I pass this information to you lest readers might consider using the compound in excessive doses in cases not tolerating other goitrogens.

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2. ———, *J. clin. Invest.*, 1946, 25, 597.
3. ———, *ibid.*, 1947, 26, 446.
4. ———, Elkington, J. R., Peters, J. P., and Winkler, A. W., *Amer. J. med. Sci.*, 1947, 215, 123.

OUR EXPERT writes: This additional information on the administration of thiourea to man should help to allay any remaining fears about the possible harmful effects of traces of thiourea present in oranges.

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 16 1955

NOTES ON CANADIAN MEDICAL HISTORY

BY

H. E. MacDERMOT, M.D., F.R.C.P.(C.)

Montreal

A short paper on the history of Canadian Medicine of necessity will be highly selective. I have therefore chosen to deal with a few of its earlier aspects only.

It is natural to date the development of medicine in Canada from the time of the French settlements in the seventeenth century, but the North American Indians had their own medical knowledge, and there is much in it to interest us. Several well-known vegetable drugs, such as sarsaparilla, jalap, cinchona, and guaiacum were native to North America and were used by the aborigines. One writer even gives the Thompson Indians credit for employing organo-therapy in their use of beavers' testicles for pain; and undoubtedly some tribes realized the value of an infusion of spruce tips in scurvy. Jacques Cartier learnt this from them to good effect. However, their medical knowledge in general is chiefly of ethnological interest.

The Early Practitioners

From the little that is known of the first medical men to arrive in the country, they seem with a few exceptions to have been barber surgeons and apothecaries. They came in the first instance with Champlain on his voyages to Acadia and Quebec, and later with the troops and colonists for New France. By the beginning of 1700 it is said that about 96 people practising medicine were scattered along the shores of the St. Lawrence up to Montreal. Many of these can have been little better than charlatans.

Two names, however, deserve attention. One is Michel Sarrazin (1659-1734), who came out in 1685 as surgeon and later was made chief surgeon to the troops in Quebec. He returned to France to take his degree in medicine, and then returned to settle in Canada, being named royal physician. His practice extended over an area which would have been large even with modern methods of transportation, and there were the added dangers of travelling between Quebec and Montreal. Still, he managed to carry on a great deal of botanical and zoological work, which he reported to l'Académie Royale des Sciences, of which he had been made a corresponding member in the same year (1699) in which Sir Isaac Newton had been admitted. He made a collection of over 200 plants and sent them back to Paris. Tournefort, of the Jardin Royal, forerunner of Linnaeus, named the pitcher plant (*Sarracenia purpurea*) after Sarrazin. He was the first to put the production of maple syrup on a commercial basis and to describe the blueberry. His work on Canadian fauna was extensive and unequalled; he described the beaver, the porcupine,

and the muskrat, which he dissected, but when he came to examine the skunk he failed, because, in his own words, "it had a frightful smell, capable of making a whole canton desert." In his latter days, however, he fell on bad times: he lost all his money and died a pauper.

Jean François Gaultier (1708-56) was his successor as royal physician, and a worthy one. He too did outstanding work in botany, natural history, and entomology. His name is enshrined in the wintergreen plant, *Gaultheria procumbens*.

Otherwise, men of mark did not begin to appear until the early nineteenth century. They will be mentioned later.

In Ontario, then called Upper Canada, settlements began considerably later. The Treaty of Versailles in 1783 saw the migration of a large number of so-called United Empire Loyalists from across the border. Few medical men came with them to Upper Canada, the explanation apparently being that physicians in the American colonies were not forced out of the country as much as in the case of the other professions. It is probable, too, that the rigours of pioneering life were too severe: as was said, the pioneer physician needed the constitution of a horse and the clothing of an Arctic explorer.

There were not more than 40 qualified men in the province as late as 1815. Quacks flourished. An appeal is found in a Kingston newspaper against quacks "who, without one ray of science, presume to thrust the created into the presence of the Creator."

But gradually better men came in, chiefly retired regimental surgeons, and Boards were set up to control practice, as had been done in Lower Canada (Quebec). Amongst the earliest names of importance are those of James MacAulay; William Baldwin, who laid out the present Spadina Avenue of Toronto as the approach to his summer home "Spadina"; the eccentric "Tiger" Dunlop, whose unusual last will and testament is frequently quoted; and, perhaps most notable of all, Dr. Christopher Widmer. A born leader, Widmer initiated the building of the Toronto General Hospital and was early interested in medical education. He was termed the Father of Surgery in Upper Canada. His name was associated with every medical enterprise, and his energy, ability, and foresight made him a dominating figure till his death in 1858.

Of 260 doctors whose biographies appear in Canniff's *History of the Medical Profession in Upper Canada*

from 1783-1850, 70 were graduates of Scottish universities, 43 of English, 28 of Irish, and 40 of American. Thirty-nine had their training wholly or in part under the system of apprenticeship.

The eastern provinces of Nova Scotia, New Brunswick, and Prince Edward Island were so distinct from Upper and Lower Canada that their early history is quite a separate chapter. They seem to have had no shortage of physicians, as was the case in Ontario. Some were French, but the majority were English, and with the founding of Halifax in 1749 several medical men came into the country. The old churchyards in Halifax have many records of medical interest. One tombstone to two young brothers who died of diphtheria bears the following commentary: "Stranger; whether has the disease or medical omission clad meast in their last claiht?"

From 1775 to 1800 there was, as in Upper Canada, a large influx of the United Empire Loyalists, but in this case they were accompanied by many physicians. Nathaniel Perkins, one of the first to practise varicella in Boston; W. J. Almon; and the Hon. John Halliburton were all prominent men. The name of Abraham Gesner is outstanding. A native of Nova Scotia, he had studied under Abernethy and Astley Cooper. His work in geology and natural history was notable. He discovered coal oil, inventing the word "kerosene" for it. His old refinery still exists, and is owned by the Standard Oil Company.

In the West there were pioneer doctors with the fur-trading establishments as early as 1814. Dr. (Sir) John Schultz built the first house in Winnipeg. He later became the Lieutenant-Governor of Manitoba, and in welcoming the Canadian Medical Association at one of its early meetings in the West (Banff) exhorted them to "pause and reflect for a moment that they were where for economic purposes Canada was widest, and no longer a mere arable strip on the banks of the St. Lawrence."

In the North-West Territories, which comprised what is now Alberta and Saskatchewan, there were occasional medical men with explorers and fur-trading settlements. Dr. J. Richardson, with Sir John Franklin in his overland journey to the Polar sea, makes a reference to Edmonton in 1820 (it had been founded in 1795 as a fur-trading centre) as having much goitre, and Dr. W. B. Cheadle treated patients there on his transcontinental journey.

With the formation of the Northwest Mounted Police (the "Mounties") in 1873 a regular succession of surgeons began, the first being Dr. George Kittson. Dr. R. G. Brett (1851-1929), Ontario born, helped to found the Manitoba Medical College, then moved to Alberta and became a leading medico-political figure. He established the sanatorium at Banff.

The building of the Canadian Pacific Railway (finished in 1885) brought yet more medical men into the country, and by 1889, the year in which the Canadian Medical Association held its meeting in Banff, there were 33 physicians registered in the N.W.T.

There is no difficulty in naming the pioneer doctor in British Columbia. This was Dr. John S. Helmcken (1825-1920), a graduate of London, who came to British Columbia in 1850, as surgeon to the Hudson's Bay Company. At one period he described himself as "the leading practitioner from San Francisco to the North Pole, and from Asia to the Red River of the north." This

was easily accounted for, as he was then the only practitioner within those limits. He filled a large place in the medical and political life of British Columbia, and his house in Victoria is preserved as a museum. He was one of the delegates to Ottawa from the province to support terms of union with Canada.

Medical Teaching

As the better type of men increased medical boards were set up for the control of medical practice (in Lower Canada in 1788; Upper Canada in 1795; Nova Scotia in 1828), but these had little control over the large numbers of unlicensed practitioners. Often these latter were the only form of practitioner available under pioneering conditions. There was no medical teaching in the country, as would be expected. The Canadian medical student had either to be satisfied with the training of an apprentice or else go abroad at great expense.

At this very early stage of development a well-organized medical school was formed in Montreal in association with a general hospital to provide clinical teaching. The teachers—four Edinburgh graduates—were the staff of the Montreal General Hospital, founded in 1819, and their school, which was opened in 1823, was at first called the Montreal Medical Institution. In 1829, however, the school agreed to become the Medical Faculty of McGill University, thereby gaining the right to confer degrees, whilst enabling the University to begin active operation as required by the terms of its foundation.

This school owed its formation to the desire of its four founders to raise the professional standards in Canada. The names of the four founders were John Stephenson, A. F. Holmes, William Robertson, and William Caldwell. They were men, of strong personalities. Caldwell had fought a duel over some derogatory comments on the first proposal to build the hospital. Holmes became the first dean of McGill Medical Faculty, but was no more influential than the more reserved Robertson. Stephenson apparently was the *vis a tergo* in the organization of the school. As a student he had the distinction of being the first to be operated on by Roux, of Paris, for cleft-palate, and his Edinburgh graduation thesis *De velosynthesi* is still preserved in the Osler Library at McGill.

These men left their mark on the school by their transmission of the Edinburgh tradition of clinical teaching in the wards. This school has the longest uninterrupted record of bedside teaching in North America*; it was what attracted Osler to McGill.

The first attempt to form a medical school in Ontario was made by Dr. John Rolph in 1824. Rolph was at once a politician, which got him into a great deal of trouble; a member of the Bar, which probably helped him out of trouble to some extent; and a well-trained surgeon. He had studied under Astley Cooper and had great attainments as a lecturer. He became involved in the rebellion of 1837, fled to the States with a price on his head, and was finally pardoned in 1843, when he came back to Toronto and began his school again. He gathered good men around him, notably Dr. Joseph Workman (1805-94), who probably had more brilliant mental powers than Rolph himself. Rolph's school was eventually taken into the University of Toronto in 1887. There were two other private medical schools in Toronto for a time which also merged with the University.

Even when they became medical faculties of universities the older medical institutions remained largely independent for many years, making their own appointments and controlling their own finances. The right to grant medical

*Clinical teaching at the bedside had been carried on at the Pennsylvania Hospital in 1756, but it was interrupted by the War of Independence and was not resumed in the Edinburgh tradition until Osler went to Philadelphia in 1884. Macphail rightly speaks of "two faint streams from Edinburgh across the Atlantic, one to Philadelphia and one to Montreal." ("Sources of Modern Medicine," *Canad. med. Ass. J.*, 1933, 28, 239).

degrees, however, was always retained by the universities. This discouraged the formation of weak and undesirable institutions.

The following is a list of the Canadian Medical Schools in geographical order from east to west:

Established Canadian Medical Schools

	Founded as a Medical Faculty or School in
Dalhousie University, Halifax, N.S.	1868
Université Laval, Quebec City	1853
Université de Montréal, Montreal, Que.	1843
McGill University, Montreal, Que.	1823
University of Ottawa, Ottawa, Ont.	1945
Queen's University, Kingston, Ont.	1854
University of Toronto, Toronto, Ont.	1844
University of Western Ontario, London, Ont.	1881
University of Manitoba, Winnipeg, Man.	1883
University of Saskatchewan, Saskatoon, Sask.	1926
University of Alberta, Edmonton, Alta.	1913
University of British Columbia, Vancouver, B.C.	1950

Up to 1914 those seeking postgraduate training still turned almost wholly to British and Continental centres, French-speaking doctors in particular going to Paris. The first world war checked this severely. The second war ended it altogether as regards the Continent. The great expansion in hospitals and research centres in the U.S., but also in Canada in such institutions as the Montreal Neurological Institute and the Banting and Best Institute in Toronto, has reversed the direction of postgraduate migration.

No university degree in medicine of itself confers the right to practise in Canada. Each province retains the control of licensure within its boundaries. Some schools require their students to register with their home province before beginning their course. Even this registration, however, only gives the right to practise in that particular province.

There were many years of discussion before the provinces agreed on a uniform registration which would permit of Dominion-wide practice. This was one of the first objectives of the Canadian Medical Association when it was formed in 1867, but it was only achieved in 1912 by the persistence and statesmanship of Dr. (Sir) Thomas Roddick (1846-1923) after his election to the Federal legislature.

A Newfoundlander by birth, Roddick had early shown his outstanding capacities. It was he who first brought Lister's methods convincingly before the profession in 1877.* In 1885 he was put in charge of the medical services in the Riel Rebellion in Saskatchewan, work which required not only organizing ability but unusual physical endurance, for which his powerful physique was well prepared. His real genius, however, lay in the patience and imperturbability by which he was able finally to harmonize apparently irreconcilable views and to persuade men to rise above provincialism. Roddick evolved the Canada Medical Act (the "Roddick Bill"), by which a medical register under a Dominion Medical Council was set up. Those passing an examination set by the Council were to obtain the right to register for practice in any province without further examination, on complying with the regulations pertaining thereto. Thus the right of the provinces to control their licensure was not disturbed, whilst it did away with the

*Sir Thomas was the first medical man outside of the British Isles to be chosen as President of the B.M.A. This was on the occasion of the first visit of the B.M.A. to Canada in 1897.

necessity for taking separate examinations for each province to which a man might wish to go.

In the carrying out of this Dominion registration certain complicating factors have arisen in late years, chiefly relating to the large numbers of medical men from other countries seeking to practise in Canada. But there has been no change in the general tenor of the legislation.

Newfoundland

The union of Newfoundland with Canada (1949) is too recent for the inclusion of its medical history in this sketch. It may be said, however, that the first colonists to reach Newfoundland (1610) had no medical men with them. The comment by Guy, the leader of the expedition, after ten months in Newfoundland, was that only four had died during the winter, and in his opinion "all of them if they had as good will to work as they had good stomachs to their victuals would long since have been recovered."

The first medical men came with a French military force in 1662, and military surgeons came and went with the various expeditions. Dr. William Carson, an Edinburgh graduate, has left a name for his fearlessness in urging reform in the government of the island, and was chiefly instrumental in having the first hospital for civilians built in St. John's in 1813. Before that, two military hospitals existed (one for infectious disease), but they were almost exclusively for the soldiers of the garrison.

Hospitals

The first hospitals in Canada were built in the stormy years of the French settlements in the seventeenth century at Quebec and Montreal, and later at Three Rivers. The oldest is the Hôtel-Dieu of Quebec, begun about 1641, but suffering many vicissitudes from attacks by the Indians.

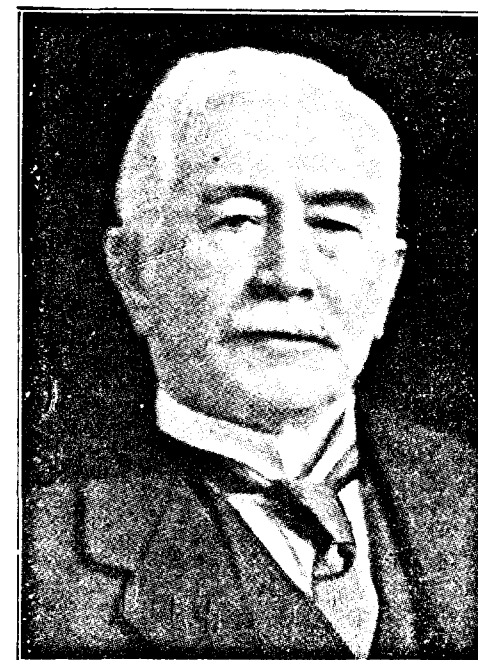
The Hôtel-Dieu of Montreal was built first in 1644, and was due entirely to the courage and ability of Mlle. Jeanne Mance. She had no training as a nurse, but devoted herself to the care of the sick of the small colony. The hospital suffered much from

poverty. It was burnt down three times. In 1861 it was moved uptown from its site in the business section, and has become greatly enlarged and completely modernized.

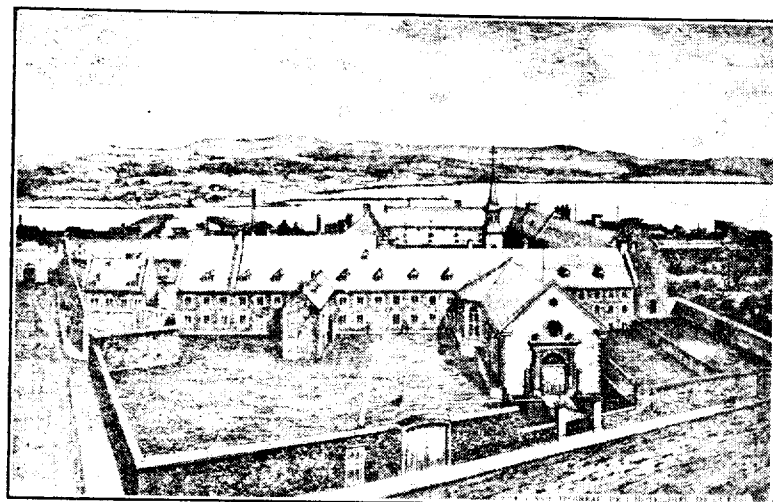
The oldest English hospital in Canada is the Montreal General Hospital. It was founded in 1819 and its original building was erected in 1822. It arose as a direct result of the rapid growth of Montreal, and of the floods of immigrants arriving in Canada in the post-Napoleonic period. It was a teaching hospital from the beginning, as already mentioned, and for about 60 years was the only English hospital in the city. Osler studied in its wards and later was one of its physicians. Much of the material for his original *Textbook of Medicine* was drawn from his experience in its wards and necropsy room. The hospital is now being transferred to a more suitable site uptown.

The Royal Victoria Hospital, the second teaching hospital to appear in Montreal, was opened in 1892, and immediately began to build up a first-class staff. In the last 50 years there has been a tremendous expansion in hospitals in the city and province.

In Toronto (first called York) the Toronto General Hospital was built in 1820, but was taken over by the Provincial Government for parliament buildings in 1824,



Sir Thomas Roddick.



L'Hôtel-Dieu de Québec in 1816. The walls date from 1696.

and was not used as a hospital until 1829. The T.G.H. has seen many changes and difficulties before becoming the present very large and modern institution (1,418 beds).

Toronto can claim the honour of having established the first hospital for children in the Sick Children's Hospital. Beginning in small rented quarters in 1875, it has gradually been built up into an institution of international reputation.

It was in the Department of Physiology of the University of Toronto that Banting and Best did their original work on insulin in 1921. The Banting and Best Department of Medical Research was established by the Board of Governors of the University as the result of a special grant made by the province of Ontario in 1923.

Medical Journals in Canada

The first Canadian medical journal, *Le Journal de Médecine de Québec*, was published in Quebec in 1826 by a young French doctor, F. X. Tessier. It had both French and English papers, and was well conceived; but it was much too far ahead of the medical strength of the country, and ceased in 1828.

It was 1844 before the appearance of the next journal, the *Montreal Medical Gazette*. Although it lasted for only a little more than a year, it was the beginning of a series of publications which managed to maintain medical journalism in various guises until some degree of permanence was attained. It was as difficult then as it always has been to find men both capable of editing and willing to make the necessary sacrifices. Two men stand out in the early years.

Dr. Archibald Hall, of Montreal, started the *British-American Journal of Medical and Physical Science* in 1845, and for eight years waged a losing battle against a small circulation and lack of funds. But he produced a first-class journal, which reflects his championship of high standards, his courage and dignity, and his absolute certainty that he was always in the right. He strongly reproved the profession for failing to support him even after a second venture later on; but he seems to have been too dictatorial, too bitter, and too easily irritated to carry on a journal successfully.

In contrast there was Dr. John Fulton, of Toronto, who edited *Canada Lancet* (1868-1922)—first called the *Dominion Medical Journal* (1868-9)—from 1872 to 1887, and drew high praise from Osler for his publication. It was successful because he was methodical and business-like, even if it

lacked the fire which warmed the pages of Hall's journal. As Osler said, Fulton learned the lesson "that success cometh neither from the east nor from the west, nor yet from the south, but is found in close attention to the everyday details of life, no matter how trivial."

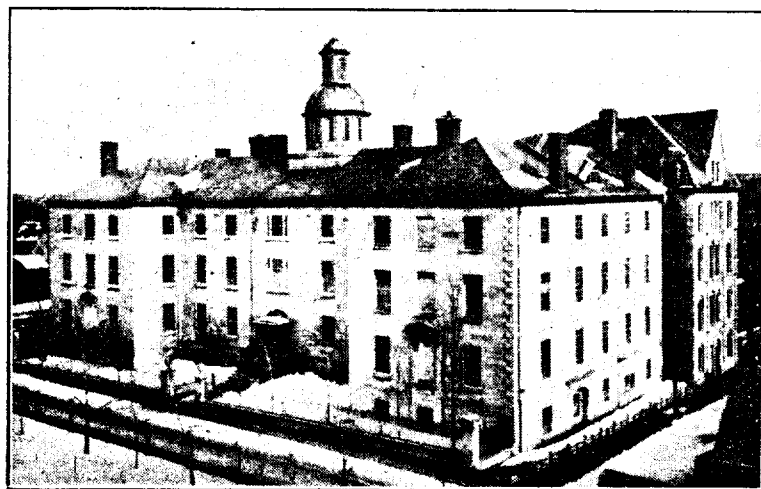
Several French journals have been produced. *L'Union Médicale*, begun in 1872, has the record for the longest uninterrupted publication under one title. But the *Canadian Medical Association Journal* has an older lineage. Its progenitor was the *Canada Medical Journal and Monthly Record of Medical and Surgical Science*, which first appeared in 1864. The two editors, George Fenwick and G. W. Campbell, parted company in 1872, owing to "personal differences," and each then carried on a journal of his own under slightly different names. Campbell's journal, the *Canada Medical Record*, was very much his own affair, and ceased with his death in 1904.

But Fenwick learned the wisdom of teamwork and was able to attract to the staff of the *Canada Medical and Surgical Journal* the best men in the Montreal profession. Under the later title of the *Montreal Medical Journal* it reached great heights in the journalistic field, especially under the editorship of Andrew Macphail, who exploited to the full his clear and pungent style. In 1910 the proprietors of the journal agreed, in the interests of organized medicine, that it should become the *Canadian Medical Association Journal*, along with the *Maritime Medical News*, a Halifax publication. The difficulties which beset the journal in the war years are mentioned later; it need only be added that its editorship was undertaken in 1921 by Dr. A. D. Blackader (1843-1932), as Macphail had resigned on account of ill-health. Dr. Blackader, who was then in his seventies, gave himself wholeheartedly to the work of building up the journal, and when he resigned in 1930 he had placed it on a solid foundation.

A total of 72 periodicals have appeared in Canada in the course of 128 years. At present there are 18, including provincial Bulletins and undergraduate publications. Medical journals are not now undertaken with the apparent light-heartedness of last century. The economic implications are too severe, and advertising support is indispensable in almost every instance.

The Canadian Medical Association

The desire to organize the profession in Canada arose several years before the time was ripe for carrying it out. In 1844 Dr. Joseph Painchaud, of Quebec, suggested the



The Montreal General Hospital as it was when Osler was a student there.

formation of a "Medical Fund or Association" whose main object was to be a charitable one. The *Montreal Medical Gazette* (the earliest Montreal medical journal) at once proposed to widen the scope of the Association to include the dissemination of medical information and to obtain representation of its wants in legislation. The two medical societies of Toronto and Montreal then combined in developing the movement, with Dr. F. Badgley, of Montreal, as one of the most active leaders.

However, friction developed between the medical societies and the so-called "districts," and the movement failed utterly. Another attempt four years later began in a better spirit, but lacked organization enough to get beyond the first meeting. The wonder is that these efforts were made at all. Communications were difficult, and the number who realized the value of organization was very small. The eastern provinces were not approached in the matter at all.

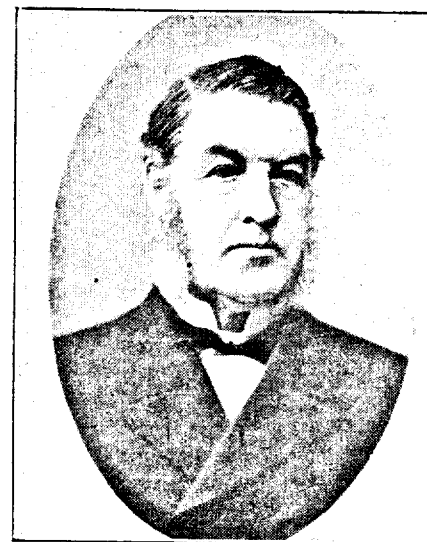
The third attempt followed on, though it was not directly the result of, the political union of the Canadian provinces in 1867. Dr. William Marsden, of the Quebec Medical Society, who had taken part in the earlier abortive attempts, was now the first to realize, or at any rate to act on, the more favourable prospects for medical organization which would arise from confederation. He was further stimulated by a visit he had paid that year to a meeting of the American Medical Association, as delegate from the College of Physicians and Surgeons of Quebec, bringing back reports of what was being proposed in regard to education and licensure.

His report was taken up by the Quebec Medical Society, and a committee, composed of Drs. J. A. Sewell, William Marsden, R. H. Russell, P. D. Tessier, L. J. A. Simard, F. H. A. Larue, and H. Blanchet, drew up an appeal to all members of the profession in Canada (now nearly 3,000) to meet in Quebec for the organization of an Association. The chief object named was that of medical legislation.

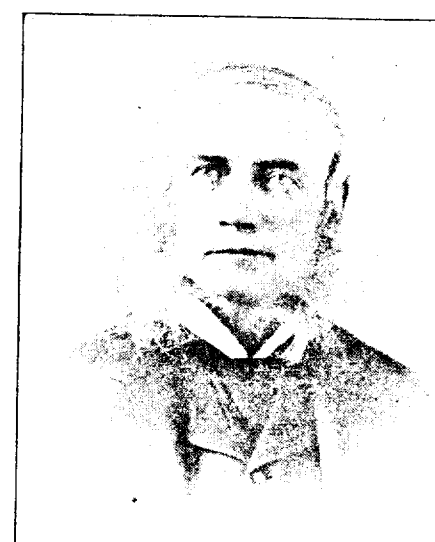
This time there was no hesitation. On October 9, 1867, 167 medical men met in Quebec, including representatives from Upper and Lower Canada, as well as from Nova Scotia and New Brunswick, and the organization of the Association was successfully completed, with Dr. (Sir) Charles Tupper as president.

The first annual meeting was held in Montreal, again under the presidency of Dr. Tupper, of whom Osler has said that he was a brilliant example of success of the doctor in politics, although "he never really served two masters—he was a politician first and a practitioner only when stranded by the exigencies of party." The value of his experience to the Association in its formative years was inestimable. His physical attributes were remarkable. He lived to the age of 94 and actually "stumped the country" for his party in his 80th year, and successfully, too. And yet he had been ready at the age of 59 to give up all activities, as he was believed then to have Bright's disease. His case was mentioned by Osler in his paper "On the Advantages of a Trace of Albumen and a Few Tube Casts in the Urine of Men above 50 Years of Age" (*N.Y. Med. J.*, 1901, 74, 949).

It should be added that Dr. Marsden, who was rightly called the Father of the Association, refused nomination



Sir Charles Tupper in 1891.



Dr. Palmer Howard, outstanding in the early days of the C.M.A.

even as vice-president. Extremely retiring in disposition, he preferred to work without recognition, but did accept the presidency in 1873.

The Association immediately began to discuss the problem of medical education and licensure. The first proposal favoured an Act similar to the Medical Act of Great Britain, setting up a general council of medical education for registration. No other subject occupied more of the time of the Association in its early years, and none gave rise to more frustration. In 1874 it was dropped altogether, by common consent, fully vindicating the reflection of Dr. Joseph Workman, of Toronto, that "our greatest, and alas, too palpable want is Union—honest, earnest, self-sacrificing Union—and our next great want is prudence."

The other subjects dealt with at the first meeting were those of statistics and hygiene, and the formulation of a code of ethics. It was only in the third year that a programme of scientific papers was presented. In the tenth year the scientific proceedings were published in printed form; the secretary of the publications committee that year was William Osler.

The Association took some credit to itself for its continuous representations to the Government on the necessity for centralizing the control of public health. Its records show an appreciation of the Government's action in finally establishing a Department of Public Health in 1919.

It is of interest that a proposal was made in 1876 in favour of uniting the Canadian and American Medical Associations. After due consideration, however, and the expression of most cordial feelings on both sides, it was decided to let the matter drop, and merely to continue to exchange courtesies by sending delegates to each other's meetings.

The Association has had its difficult periods. At the end of the first 25 years, for example, interest in it seems to have sunk very low, even to the point of a suggestion in 1893 that it should disband. Membership was small, and only a faithful few carried on the work, notably men like LeBaron Botsford, of St. John, N.B., E. M. Hodder, W. H. Hingston, H. S. Birkett, Joseph Workman, R. P. Howard, F. N. G. Starr, and Alex McPhedran.

Then it gained new life, and in 1910 an Association journal was begun with Dr. (Sir) Andrew Macphail as editor. But just as the journal was getting well under way the war broke out. The editorial staff went overseas on active service, along with a good many contributors, and only the devotion of one or two unofficial editors, notably Dr. Maude Abbott, kept the journal going, whilst the Association itself had great difficulty in carrying on. No

meetings were held in 1915 and 1916, and by the end of the war the financial position of the Association was extremely bad.

The turning-point came at the annual meeting in Halifax in 1921. It was realized then that reorganization was essential. The various provincial organizations had not been brought closely enough into relationship with the Association, and the finances needed immediate attention. A full-time secretary was appointed in the person of Dr. T. C. Routley, a bond issue was raised, and once more the Association began to expand. Within a few years it had paid off the bond issue and was showing the vigour and growth which has brought it to its present stature.

The Association has continued not only to deal with the profession's educational and economic problems, but to concern itself with social and political developments. Post-graduate lectures were first organized in 1925, and were carried on throughout Canada for seven years, with the help of generous grants from the Sun Life Assurance Company. A Department of Hospital Service, also aided by this company, was carried on for 20 years.

Health insurance has probably occupied the attention of the Association more continuously than has any other subject. The principle of insurance against the cost of illness has received the support of the Association, particularly through the medium of prepaid medical care plans.

The first proposals to establish a Royal College of Physicians and Surgeons of Canada were made at the annual meeting in Vancouver in 1920, the primary object being to stimulate study and postgraduate work in medicine and surgery. The idea gradually matured, and the College was finally incorporated by Act of Parliament in 1929. Once launched, the College became an entirely independent organization.

Inspection and accreditation of hospitals is one of the later activities of the Association. This work had previously been done in Canada by the American College of Surgeons, and on their withdrawal from this particular field the Association initiated plans for the necessary machinery to carry it on. To Dr. E. K. Lyon, of Leamington, Ont., is due most of the credit for focusing attention on the importance of this phase of hospital life and of eventually bringing into being the Commission to deal with it. The C.M.A. contributes the major part of the very heavy cost of this work. Formation of a College of General Practice originated within the Association some five years ago, and the College came into being last year, with a full-time secretary. There has been an encouraging response to this movement, but of course it is still at a very early stage of development.

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There is little information on the growth and physical development of Indian children, according to the latest annual report of the Nutrition Research Laboratories at Coonoor. However, a start has been made. Workers at the Coonoor Laboratories first analysed data in the literature on 46,000 boys from various parts of India, and from this prepared growth curves for them. Then a homogeneous group of about 2,000 boys were examined from around Coonoor, and their growth curve was found to correspond closely to that derived for India as a whole. But, what is more interesting, these curves were found to parallel, though at a slightly lower level, recent growth curves for British and American boys. The report poses the question of the influence of nutrition in producing the lower growth progression found in the Indian children.

TREATMENT OF POLYCYTHAEMIA WITH RADIOACTIVE PHOSPHORUS

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Polycythaemia was first treated by radioactive phosphorus (P^{32}) in 1940 by Lawrence, who has reported 201 cases dealt with since that time (Lawrence *et al.*, 1953). Two reports have already been made in this country, comprising 20 cases (Bodley Scott, 1953) and 27 cases (Abbatt *et al.*, 1954). P^{32} was used in the Royal Marsden Hospital at the end of 1948, and 48 cases have been treated since then. Our purpose is to draw attention to the benefits that may be expected and to comment on certain features of the symptomatology and course.

Radioactive phosphorus is prepared by the irradiation of pure sulphur, and is obtained as a solution of orthophosphoric acid. It has a half-life of 14.3 days, but excretion of part of the administered dose in the urine reduces its effective half-life in the body to about 10 days.

When P^{32} is administered the phosphorus participates in the general biochemical reactions of the body. A large amount is incorporated into those cells in which proliferation is most active, because this is where the turnover of phosphorus is greatest. One of the most active tissues in this respect is the bone marrow, and this activity is increased when there is marrow hyperplasia as in polycythaemia or leukaemia. The injection of radioactive phosphorus therefore provides a method of irradiating the overactive haemopoietic tissues more selectively than can be done with external irradiation.

Dosage

The patient is admitted to hospital. The P^{32} is injected intravenously as a solution of sodium phosphate. There are no side-effects and no irradiation reactions have been observed, even following the administration of the maximum dose. After the P^{32} has been given, the urine is collected and its radioactivity measured. The patient is discharged from hospital when the excretion has reached a safe level (100 mC in 24 hours), which in practice means two to three days after the injection.

Two methods of P^{32} dosage have been employed. At first all patients were treated by a "split" dose—that is, two injections of P^{32} at an interval of about two months. Subsequently it was thought that a single injection would probably be sufficient for some patients, and both methods are now used according to the severity of the disease. The split dosage was used for 28 patients, with an interval of 6-12 weeks between the injections. The dose was usually 5 mC followed by 4 mC. The smallest amount given in the two injections was 6 mC and the largest 12 mC. A single injection was given to 16 patients as the first treatment. The dose varied between 4 and 7 mC, according to the severity of the symptoms and haematological findings. The single dose is more convenient, and, since there is no obvious difference

in the results, it is used whenever possible, and almost always in the treatment of relapse. Further treatments are usually required every one or two years throughout the duration of the polycythaemia. The largest total amount of P^{32} given to one patient to date is 36 mC.

The inhibition of the bone marrow persists in most cases for a year or more. But the effect on the circulating red-cell mass, and hence on the symptoms, becomes apparent only gradually, in the course of two to three months. If this period of gradual improvement is added to the period of gradual worsening before treatment is again worth while, it may be found that a patient who needs treatment once a year is properly controlled for only two-thirds of the time. In order to shorten the period of improvement we have done a massive venesection at the same time as injecting P^{32} on 48 occasions when the patient has had a notably high red-cell mass. This is made possible only by a simultaneous infusion of a plasma substitute to prevent shock and heparinization to keep the blood flowing. By this means it is possible to bring the haemoglobin down to a normal figure in one operation. The most that has been removed is 5 litres, replaced by 3.6 litres of dextran: the haemoglobin fell from 155% to 94%. It has been found best to reduce the haemoglobin to slightly below normal, since the excretion of plasma substitute in the next 48 hours usually causes it to rise again by about 10%. The replacement should be a half to one litre less than the quantity withdrawn; a rise of pulse rate shows that insufficient plasma substitute is being replaced. It is advisable to keep the patient in bed for a day and forbid solid food, lest fainting or nausea occur.

Present Series

The distribution by age and sex is shown in Table I. It is very difficult to determine the age at which polycythaemia develops, since for a time there may be no symptoms, and

TABLE I.—Age When First Seen at the Royal Marsden Hospital

Age:	30-39	40-49	50-59	60-69	70-79	80+	Total
Male	3	5	8	5	2	1	24
Female	1	4	3	10	5	1	24
Total	4	9	11	15	7	2	48

even when they occur they are often too mild to send the patient to a doctor. For example, a woman first diagnosed at the age of 39 said she had had symptoms since adolescence, and it was clear that her symptoms were due to polycythaemia. Perusal of the histories suggests that the disease was present for an average of four to five years before it was diagnosed.

The frequency of the various symptoms is shown in Table II.

TABLE II.—Main Symptoms of Above 48 Cases

	Cases	%
High colour	48	100
Haemorrhagic phenomena	27	56
Dyspepsia: all cases	17	35
cases with D.U. on x-ray film	6	12
Splenic pain	14	29
Pruritus	17	35
Thrombosis: venous	8	17
arterial	9	19
Dyspnoea, headache, dizziness, etc.	10	21
Ulceration, chronic sepsis, or gangrene	9	19

The high colour is most evident on the face, but is here an unreliable diagnostic guide. It is best to examine the conjunctivae, tongue, nail-beds, and especially the palms of the hands, in which high colour is at least as reliable a guide as an isolated blood count. A complaint of red eyes was not uncommon, and a few patients had been treated for "conjunctivitis" over many months; but soreness was present in only one case. Telangiectases were common on the cheeks. The heightened colour has a distinct purplish tinge, which is, in fact, the natural colour of concentrated oxyhaemoglobin and is not necessarily due to the presence of reduced haemoglobin.

Thromboses and haemorrhages were both common. Arterial thromboses were found in those sites where their occurrence is most easily detected—that is, in the retina, internal capsule, pons, and the coronary, femoral, and popliteal arteries. Venous thromboses were common in the legs. Haemorrhages occur from the nose, upper and lower gastro-intestinal tract, ruptured varicose veins, gums, and as ecchymoses. Prolonged bleeding is also apt to occur after dental extractions and operations. Both thromboses and haemorrhages might occur at the same time, with a normal or high platelet count and no demonstrable abnormality of coagulation or prothrombin generation. It is probable that the haemorrhages are due to some capillary abnormality.

Dyspepsia had the usual characteristics of peptic ulcer, and a duodenal ulcer was demonstrated in 6 of the 17 dyspeptics. Pruritus was usually generalized and always worse in the palms and soles; it is aggravated by a hot bath. Chilblains, ulceration, sepsis, and partial gangrene of the toes were common and occurred in cases with apparently normal vessels. Other symptoms commonly complained of were dyspnoea, faintness, palpitations, headache, thumping in the head, dizziness, fatigue, lethargy, and a congested feeling in the face and head. Splenic pain was due either to infarction or to the weight of the tumour. The spleen was definitely enlarged in 27 of our cases and was below the umbilicus in 9.

Haematology

The most reliable measures of red-cell concentration both at the Royal Marsden Hospital and elsewhere have been the haemoglobin or packed cell volume. The red blood cell count has commonly been extremely variable and unreliable, which is probably due to the difficulty of homogenizing samples properly. No patients were regarded as polycythaemic unless the readings were well above normal—for example, Hb, 130%; P.C.V., 60%; R.B.C., 7,000,000. As is well known, there is usually an increase of polymorphs, with a few metamyelocytes, and less often of platelets. These associated changes are best seen in marrow puncture or biopsy.

Blood Volume

The ordinary methods of haematology measure the concentration of red cells or haemoglobin, and in polycythaemia the concentration is of course raised. The essential pathological change, however, is an increase in the red cell mass, and this can be deduced from measures of concentration only if it is known that the plasma volume remains constant. It would therefore be desirable to have simple and accurate methods of measuring both the red-cell mass and the plasma volume that could be used in clinical medicine. Unfortunately, the measurement of blood volume is attended by considerable theoretical and practical difficulties. Until recently the usual method was to measure the plasma volume by dye dilution and to deduce the red-cell mass from the haematocrit. Radioactive tagged protein fractions of normal plasma can now be used. The plasma volume, however, is not a constant quantity, because water passes in and out of the capillaries in various states of body activity. The same applies to some extent to any substance used as a marker. Moreover, the venous haematocrit is not an accurate measure of the proportion of cells to fluid in the vascular system as a whole. The ratio of cells to fluid is different in arteries, capillaries, and veins, where the rate of flow is different, and the distribution in these compartments will also vary with differing states of body activity. It is, however, now possible to measure the red-cell mass directly by tagging cells with radioactive iron, phosphorus, or chromium. These measurements are simple and fairly accurate, and so the plasma volume is best deduced from the red-cell mass and haematocrit, using appropriate correction factors.

These observations may be sufficient to show why there is no wide and accurate knowledge of blood-volume changes in polycythaemia. It is generally thought that the plasma

volume tends to be unchanged or even to be diminished as the red-cell mass increases until high haematocrit levels (55% $\pm$) are reached (Mollison, 1951). Our limited observations show that this is usually true, though patients with high haematocrit levels (over 75%) may also have a low or normal plasma volume. Measures of the red-red concentration, by haematocrit or haemoglobin estimations, are therefore usually proportional to the red-cell mass, but this is not always the case. One of our patients has a greatly increased plasma volume, so that he is plethoric though not polycythaemic as ordinarily defined.

We have found that the chromium method is simple to use and consistent in its results, and we are now defining normality in this way. Patients with normal concentration may still retain a plethoric appearance of the face, eyes, and especially of the palms. This does not indicate a raised total blood volume, but is due to an irreversible dilatation of the skin venules.

Diagnosis

The long time that elapsed before some of our cases were diagnosed suggests that polycythaemia is not always readily detected—which is probably due to its rarity or to unfamiliarity with the symptoms.

Once polycythaemia has been recognized there appears to be little difficulty in distinguishing cases that are secondary to heart or lung disease. Doubts may exist where there is emphysema and no splenomegaly, but they are usually settled by the state of the bone marrow. A mistake was made in a man who had gout, nephritis, and multiple arterial abnormalities. Despite his normal marrow he was eventually treated with P^{32} 3 mC and venesection, which threw him into right heart failure. Cardiac catheterization showed that he had a persistent ductus with flow reversed owing to pulmonary hypertension.

Cases are not accepted for treatment unless they are actually polycythaemic when seen. In some cases the only evidence presented has been a raised red-cell count, which is fallacious. It is also just possible that long remissions may occur naturally or with conventional treatment—one man, a roving Irish labourer, had been treated for 13 years at six different hospitals with venesections and phenylhydrazine, but was quite normal for the year and a half that we observed him. Two other patients who undoubtedly had a marrow dysplasia were diagnosed for many years as cases of polycythaemia, which they may well have had; but they had none with us, and one became leukaemic and the other is probably developing myelofibrosis.

Course and Prognosis

The natural history of polycythaemia is probably not completely known. The disease is not common, its course is very long, and the sufferers have not previously been collected into special clinics. It is usually regarded as a disease of older persons that remains with them till they die or are killed by a stroke, which is the natural termination of the disease. This is true of most cases, but exceptions are common enough to deserve mention. The early age at which it may occur has been noted. The other exceptions are those that develop leukaemia or myelofibrosis.

Transition into myeloid leukaemia is not uncommon; the change from leukaemia to polycythaemia is rare but has occurred in our series. Others become anaemic owing to replacement of the bone marrow with reticulum cells or fibroblasts. Anaemia may also be due to haemolysis, which can be stopped by splenectomy as in leukaemia and lymphadenoma. In some cases the erythropoietic tissue is not confined to the bone marrow, but is found in the liver and spleen, and may even form sizable discrete tumours elsewhere which erode bone. The production of polymorphs and platelets is usually both increased and abnormal, and in

some the platelet level is so high that the diagnosis of essential thrombocythaemia might have been made with equal justification.

Observations of this sort have made it impossible to maintain concepts of polycythaemia, leukaemia, myelofibrosis, and so on as separate diseases, though the terms are retained for convenience. The present tendency is to regard them as possible manifestations or phases of a neoplastic disease that affects primitive mesenchyme cells. Although polycythaemia may be but a phase, it is clearly one that is both stable and benign, so that once patients enter into it they are likely to remain in it for the rest of their lives.

These considerations have some bearing on treatment, especially with radiation. Radiation can play a part in the causation of both leukaemia and marrow aplasia. Can it be held responsible for the leukaemia and myelosclerotic terminations of polycythaemia? Leukaemia is known to supervene without radiation therapy, and it has been estimated that its frequency is no greater after P^{32} (Lawrence *et al.*, 1953; Stroebel, 1954). One of our cases became leukaemic, and another is probably going that way. The evidence for myelosclerosis is less certain because of its rarity. But cases certainly occurred before the advent of P^{32} , and the replacement of erythroid tissue by reticulum and fibrous tissue, such as occurs with myelosclerosis, has not been seen after radiation aplasia. One of our cases developed myelosclerosis and another probably did.

Another point is that though P^{32} is indicated in the polycythaemic phase it may be harmful in another. Leukaemia usually develops quite suddenly, and there is no difficulty in detecting its onset. In contrast, the patients who are developing myelosclerosis appear at first to be in a satisfactory remission lasting a year or so. Eventually the blood count sinks below normal and they die despite transfusions. We have been somewhat uneasy about five of our patients whose remissions have lasted more than two years. But two with the longest remissions, over three and over four years each, have now become polycythaemic again. It appears that a fall below the normal haemoglobin is the ominous feature, not the length of remission.

Effect of Treatment

The objects of treatment are to prevent disastrous vascular accidents in the central nervous system and to relieve the patient of annoying symptoms.

Our own observations are not sufficient to prove that major thromboses have been prevented, though none has occurred since treatment. Stroebel (1954) has shown from a ten-year study of 241 cases that the expectation of life is increased with treatment. Most symptoms are completely relieved when the blood count is controlled. This applies particularly to ulceration and sepsis of the toes, haemorrhagic phenomena, the various "congested" feelings, and splenic pain and enlargement. Pruritus has sometimes proved resistant. Dyspepsia has seemed to be improved, except where ulcers were present. In general all patients are better and most are symptomatically normal. Those who have had other forms of treatment are quite certain that P^{32} is both more effective and much more convenient despite the occasional admission to hospital that is required.

Most symptoms that are continuous, such as facial congestion, headache, dyspnoea, ulceration, and gangrene, are clearly due to the increased blood volume, since they are immediately relieved by an exchange venesection. Pruritus is diminished, but seldom completely, and tends to persist in the palms, especially after a hot bath. It is probably caused in part by the irreversible dilatation of the skin venules. We can draw no conclusions about haemorrhagic episodes, thromboses, and dyspepsia because they are too inconstant. The spleen diminishes slowly only when the P^{32} has had time to act. It became impalpable in 10 of the 27 cases in which it was enlarged.

Commentary on Cases

Group I: Observed for More than One Year.—(A) *Successfully treated* (29 cases). Of these, 17 have had more than one treatment. The average length of remission was nearly two years. The longest was four and a half years and the shortest nine months. Of the 12 cases which have had only one treatment the longest remission is three and a half years. (B) *Inadequately treated* (5 cases). Two of these were young men with severe and resistant polycythaemia. One has received 36 mC of P^{32} in four years and the other 17 mC in four and a half years. Possibly this dosage was unnecessarily cautious. Two were elderly women who had difficulty in attending regularly. The last was a man of 49 in whom remissions have been short and incomplete for over three years. Although his haemoglobin is now normal he still has a large spleen and a raised blood volume.

Group II: Observed for Less than One Year (7 cases).—These cases look like doing well, though it is too soon to be certain.

Group III: Dead (4 cases).—(1) Female aged 63 with over 10 years' history. Between 1949 and 1953 she was given 20 mC of P^{32} in three episodes with good remissions. After the last she gradually became anaemic and died from acute myeloid leukaemia. (2) Male aged 42. Severe polycythaemia was treated with 13 mC of P^{32} . A year later the patient became anaemic and died, according to reports, from

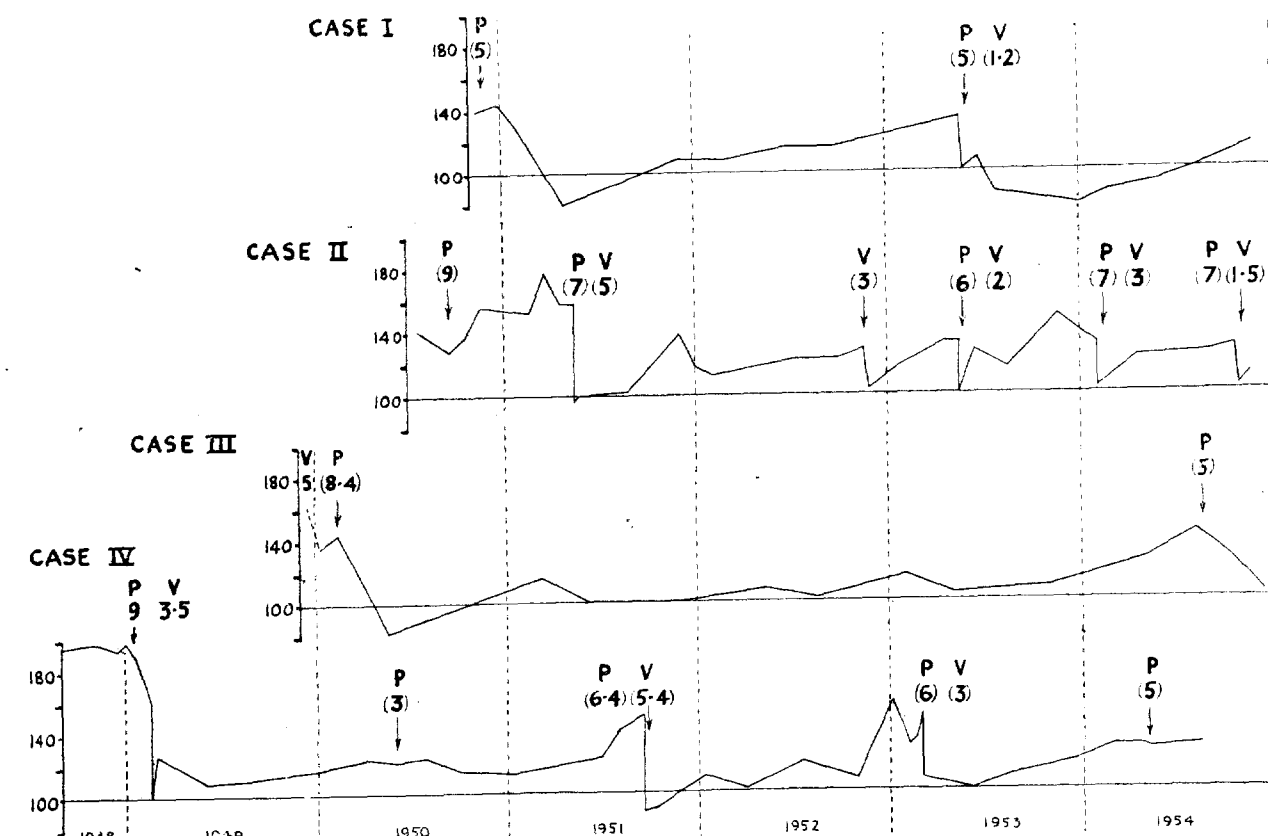
myelosclerosis. (3) Male aged 66. Admitted to hospital with a cerebral thrombosis in 1947. Severe polycythaemia was diagnosed and he was treated by bath irradiation to the trunk (4.2 m.g.r.). In 1948 he was given 4 mC of P^{32} with no effect, and he died elsewhere four years later with polycythaemia. (4) Male aged 77. Diagnosed 1948. Given 7 mC of P^{32} in 1950. Remission for two years was followed by anaemia due to myelofibrosis and haemolysis, of which he died six months later.

Group IV: Insufficiently Followed Up (3 cases).—These patients attended too irregularly for any conclusion to be drawn about the effect of treatment.

Summary

A group of 48 patients treated with radioactive phosphorus is described. In severe cases the blood concentration was brought to normal by a massive venesection and simultaneous infusion of plasma substitute.

The presenting symptoms and general course of the disease are reviewed. Observation over a period of up to six years shows that the blood concentration can be kept at or near normal in most cases. When this is done symptoms are relieved. Relief may last from just under one year to over four years, with an average of just under two.



The haemoglobin chart of four illustrative cases. P means the injection of radiophosphorus and the figure in brackets is the dose in millicuries. V means a venesection; the figure is the amount in litres removed, a smaller amount of dextran being replaced.

Case I.—Good control. A woman now aged 68. She is sensitive to small doses of P^{32} (5 and 4 mC). Note that the fall to normal is quicker with venesection and P^{32} than with P^{32} alone. She was out of control in the winter of 1952-3. This is the only case in which the haemoglobin level fell below 100%.

Case II.—Bad control. A man now aged 38. Note the absence of visible effect of 9 mC of P^{32} in 1950. Haemoglobin brought to normal in 1951 by a large venesection, but continues to range around 130% despite subsequent treatments. Total dose of P^{32} was 36 mC and probably should have been more. Nevertheless he is much better for treatment.

Case III.—Good control. A woman now aged 70. Remission of over four years after 8.4 mC of P^{32} , which is the longest we have seen. Note that the haemoglobin did not fall below normal despite the long effect of P^{32} .

Case IV.—Good control. Man now aged 73. A very severe case, but easily treated. The haemoglobin has been kept normal for nearly six years. Note the sudden relapses in 1951 and 1953. The slow rise of haemoglobin in 1954 is of a different type. The small dose of P^{32} in 1950 was possibly unnecessary.

This treatment is quite the most effective and is the least disturbing to the patient.

We would like to thank Professor D. W. Smithers, of the Radiotherapy Department, and Professor W. V. Mayneord, of the Physics Department, and members of their staffs, for making this work possible. We are also grateful to numerous colleagues in this and other hospitals for referring cases to us, and in particular to Dr. P. E. T. Hancock. The earlier cases in the series were treated by Dr. R. J. Walton, to whom we acknowledge our debt.

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PROTHROMBIN AND THE ONE-STAGE PROTHROMBIN TIME*

BY

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The discovery that the prolonged prothrombin time of stored human plasma was caused by the disappearance of a clotting factor, hitherto unrecognized (Quick, 1943), made it clear that prothrombin activity depended on more than prothrombin itself and that the one-stage procedure could no longer be regarded unequivocally as a specific test for this constituent. When it was subsequently established that the plasma contained a second prothrombin accessory factor (Alexander *et al.*, 1952), the need for a reinterpretation of the test was further emphasized. It is the purpose of this paper to present pertinent experimental and clinical observations that should be helpful for the re-evaluation of the test, and for furnishing at least a partial answer to several basic questions concerning the prothrombin time.

Methods and Materials

Since the purpose of this study is a critical evaluation of the one-stage prothrombin time, it is necessary to limit discussion to results obtained by the original rigidly standardized method (Quick, 1938). Of particular importance is the source and preparation of the thromboplastic reagent. Rabbit brain carefully cleared of blood and blood vessels and dehydrated with acetone not only has a high and constant activity but is devoid of both stable and labile factors.

In this study blood was collected with a silicone-coated syringe and needle and kept in test-tubes similarly coated. All clotting tests were carried out in uncoated glass test-tubes at 37° C. unless otherwise stated.

Tricalcium-phosphate-treated Plasma.—By means of this adsorbent, prothrombin and stable factor are quantitatively removed, while labile factor and fibrinogen remain unaltered. Since rabbit plasma is exceedingly high in labile factor, it serves as a good source for this agent as well as for fibrinogen. The preparation of the tricalcium phosphate

reagent and the procedure for deprothrombinizing plasma have been described in detail (Quick, 1951). Plasma treated with tricalcium phosphate is designated as "Ca₃(PO₄)₂ plasma." Stable factor was prepared by the method of Duckert, Koller, and Matter (1953). In many experiments aged serum from normal blood served as the supply of this factor.

Serum Prothrombin Time.—The blood or plasma was clotted in a glass test-tube at 37° C., centrifuged 15 minutes after a solid clot had formed, and reincubated for an additional 45 minutes. The prothrombin time was carried out as follows: 0.1 ml. of fresh rabbit plasma deprothrombinized with Ca₃(PO₄)₂ was mixed with 0.1 ml. of 0.02 M CaCl₂ and 0.1 ml. of thromboplastin reagent (from rabbit brain). To this mixture 0.1 ml. of the serum was blown in and the clotting-time determined. In this procedure the deprothrombinized rabbit plasma supplies both fibrinogen and stable factor.

Three patients with true congenital hypoprothrombinaemia were available for this study. Two are brothers whose prothrombin times have remained 19 to 26 seconds for the past seven years. The third is a girl whose prothrombin time is 37 seconds. The patients have a normal concentration of labile factor and their prothrombin time is not shortened by stable factor. A patient with pure stable-factor deficiency was also utilized in this investigation. Her prothrombin time varies from 26 to 55 seconds, but is usually about 27 seconds. The addition of stable factor prepared according to Koller completely corrects the prothrombin time. A detailed study of these patients has recently been presented (Quick, Pisciotta, and Hussey, 1955).

For the sake of simplicity the terms "labile" and "stable" (factors) are employed. Labile factor may be considered to be synonymous with factor V or proaccelerin of Owren and ac-globulin of Seegers, while stable factor is probably the same as factor VII of Koller, proconvertin of Owren, S.P.C.A. of Alexander, stable prothrombin conversion factor of Owen, and co-thromboplastin of Mann.

Why is the Prothrombin Time Constant in Fresh Normal Plasma?

Few values of blood are as constant as the prothrombin time. It is consistently 12 seconds in normal subjects, in contrast to the wide variations of prothrombin concentration as measured by the two-stage method, which, according to Mann and his associates (1948), may vary from 244 to 452 units. While it is established that three agents—namely, prothrombin, and stable and labile factors—affect the prothrombin time, it remains to be determined which of these is specifically responsible for the 12-second value of normal blood. A rather convincing answer can be found from the results of Table I. It is to be noted that an excess of neither

TABLE I.—Effect on Prothrombin Time of Adding Excess Labile and Stable Factors to Normal Plasma and Plasma Deficient in These Accessory Agents

	Prothrombin Time (Seconds)		
	Original	With Excess	
		Labile Factor*	Stable Factor†
Normal plasma	12	12	11½
Stored plasma (labile factor deficient)‡	16	12	16
Plasma deficient in prothrombin	21	21	21
Plasma deficient in stable factor..	39	40	12

* To 0.1 ml. of plasma, 0.01 ml. of rabbit plasma deprothrombinized with Ca₃(PO₄)₂ was added.

† To 0.1 ml. of plasma, 0.01 ml. of aged serum prepared from normal blood was added.

‡ Stored in a silicone-coated test-tube for 24 hours at 4° C.

labile nor stable factor significantly shortens the prothrombin time of fresh normal plasma. After storage in a silicone-treated container for 24 hours, the prothrombin time is increased to 16 seconds. The addition of excess

labile factor in the form of deprothrombinized rabbit plasma corrects the prothrombin time to 12 seconds, whereas stable factor has no effect. The addition of labile factor does not correct the prolonged prothrombin time of plasma from a patient with congenital deficiency of stable factor, but a small quantity of aged serum, which has an excess of this factor, brings the value to exactly 12 seconds. Plasma with a prolonged prothrombin time due to a true deficiency of prothrombin is not corrected by an excess of either labile or stable factor.

These results clearly suggest that the concentration of prothrombin fixes the value of the prothrombin time, provided adequate amounts of labile and stable factors are present. Since excess of these accessory factors exerts a corrective effect only on those plasmas which lack the specific factor, it seems clear that a deficiency of any one is not compensated by an excess of the other two. The determinant of the prothrombin time is the component which decreases below a minimal critical level. In normal blood, labile and stable factors are in excess while prothrombin is the limited factor and, therefore, is the agent responsible for the prothrombin time. The constancy of the prothrombin time of fresh normal plasma can therefore be explained by assuming a fixed level of prothrombin.

Why Does the Prothrombin Time Change During Storage?

It is generally accepted that the increase of prothrombin time during storage is caused by a decrease of labile factor. Apparently, the rate of disappearance is related to the calcium-ion concentration, for it is much more when blood is mixed with one-ninth its volume of 0.1 M sodium oxalate or 0.2 M sodium citrate than with 0.1 M sodium citrate. The latter does not completely depress the concentration of ionized calcium and, as seen from the results recorded in Table II, no demonstrable amount of labile factor is lost in

TABLE II.—Changes in Prothrombin Activity of Normal, Prothrombin-deficient, and Stable-factor-deficient Blood During Storage

	Immediate	After 24 Hours' Storage	
		In Glass	In Silicone
Normal blood (9 volumes) and sodium oxalate 0.1 M (1 volume)	12	15	16
After adding labile factor ..	12	8	12
stable ..	11½	15	16
Normal blood (9 volumes) and sodium citrate 0.1 M (1 volume)	12	9	12
After adding labile factor ..	12	8	12
stable ..	11½	9	12
Prothrombin-deficient blood (9 volumes) and sodium oxalate 0.1 M (1 volume) ..	23	37	39
After adding labile factor ..	23	17	23
stable ..	23	37	39
Stable-factor-deficient blood (9 volumes) and sodium oxalate 0.1 M (1 volume) ..	39	30	33
After adding labile factor ..	40	25	30
" " stable ..	12	18	18
" " labile and stable factor ..	11½	9	12

24 hours. Significantly, with this anticoagulant no change in the prothrombin time occurs if the plasma is stored in a silicone-coated tube, but a marked decrease is observed when stored in glass. This rise in prothrombin activity can be explained either by an actual increase in prothrombin or by the generation of an accelerator. Irrespective of which explanation is correct, it is obvious that storage in glass increases prothrombin activity as measured by the one-stage test. Owing to the simultaneous decrease in labile factor, the increase in activity is usually masked. Thus the prothrombin time of oxalated plasma after 24 hours' storage in glass is 15 seconds, but when labile factor is added it decreases to 8 seconds. The plasma in the silicone-coated test-tube has nearly the same prolonged prothrombin time, but labile factor reduces it only to 12 seconds. This suggests that the generation of prothrombin activity is slower in silicone than in glass.

When oxalated plasma deficient in stable factor is stored the prothrombin time is further increased in both glass and silicone. If labile factor is added, a partial correction occurs, whereas the addition of stable factor caused no shortening. When both labile and stable factors are added the prothrombin time is reduced to 8 or 9 seconds. Plasma from a patient with true hypoprothrombinaemia likewise, when stored, exhibits a further prolongation of the prothrombin time which is partly corrected by the addition of labile factor. Stable factor has no corrective action.

From these results one may conclude that if the increase in the prothrombin activity of stored plasma is caused by the generation of an accelerator, it is produced independently of either labile or stable factors. It is significant that plasma which lacks prothrombin shows only a small increase in activity on storage and that neither stable nor labile factors bring the prothrombin time to normal. Two basic causes account for changes in the prothrombin time of stored plasma: the first is a loss of labile factor, the second is either an actual increase of prothrombin or the generation of an accelerator independent of either labile or stable factors. In the absence of labile factor the increase of this prothrombin activity is masked.

Why is the Prothrombin Time of Serum from Haemophilic or Thrombocytopenic Blood Shorter Than That of Plasma?

When plasma deprived of platelets by means of high centrifugation or obtained from subjects having thrombocytopenia or haemophilia is clotted in glass, the serum has a prothrombin time of 8 seconds provided the plasma is normal—that is, gives a value of 12 seconds (Table III). It is certain that the poor consumption of prothrombin explains in

TABLE III.—Prothrombin Time of Plasma and Its Corresponding Serum in Haemophilia and Thrombocytopenia

Type of Plasma	Platelet Count	Prothrombin Time		
		Of Plasma	Of Serum	Of Stored Plasma with Labile Factor Added
Haemophilic ..	300,000	Sec. 12	Sec. 8	Sec. 8
Thrombocytopenic ..	65,000	12	9½	8
Normal (highly centrifuged) ..	3,000	12	8	8
Hypoprothrombinaemic (congenital) ..	270,000	20	180+	16
Congenital hypoprothrombinaemia (highly centrifuged) ..	3,500	20	20	16
Stable factor deficient ..	250,000	27½	73	18½
"centrifuged" .. (highly)	3,000	27½	19	18½

part the short prothrombin time, but does not account for a value of 4 seconds less than that of the fresh plasma. Since the same decrease occurs in plasma stored in glass to which excess labile factor is added, one may conclude that a common mechanism is responsible for the increased prothrombin activity. As already stated, the most obvious explanation is either an actual increase in prothrombin or the generation of an accelerator.

When one compares the prothrombin time of the serum obtained from normal blood with that of blood from a patient with true hypoprothrombinaemia, one finds that the serum prothrombin becomes extremely prolonged in the latter and only to 20 seconds in the particular normal blood used in this experiment. When blood from the hypoprothrombinaemic patient is highly centrifuged and the resulting plasma clotted, the serum has about the same prothrombin time as the serum, thus suggesting that either little new prothrombin is formed or little accelerator is generated.

The results obtained on blood lacking stable factor are particularly interesting. With an adequate supply of platelets the consumption of prothrombin as measured by the serum prothrombin time is fairly high, indicating that

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deficiency of stable factor does not prevent normal utilization of prothrombin. When stable factor is added in determining the prothrombin time of the serum a value lowered to normal is obtained, thus showing that the serum does not contain adequate amounts of the factor to assure an accurate prothrombin time. Even more striking are the results when the stable-factor-deficient and platelet-poor plasma is clotted. The serum shows a prothrombin time less than that of the plasma but still markedly prolonged. The addition of stable factor brings the prothrombin time to 9 seconds. Since the addition of a fixed amount of stable factor corrects the prothrombin time of the fresh plasma from the patient with pure stable-factor deficiency to 12 seconds and the serum from the platelet-poor plasma to 9 seconds, it is obvious that these two values are not fixed by the stable factor. The results obtained on the serum from true hypoprothrombinæmic plasma suggest that the serum prothrombin time is closely related to the prothrombin concentration.

The answer to the question heading this discussion is: The prothrombin time of serum from haemophilic or thrombocytopenic blood is shorter than that of the corresponding plasma because almost no prothrombin is consumed and, in addition, there is formed either additional prothrombin or an accelerator independent of labile or stable factors.

Why is the Prothrombin Time of Blood of Newborn Babies Normal When Measured by the One-stage Method and Low by the Two-stage Procedure?

If it is possible to answer this question satisfactorily a real advance should be made in clearing the confusion concerning the interrelationship of prothrombin and accelerators. The original study of Brinkhous, Smith, and Warner (1937) established that the prothrombin is only about 30% as high in newborn as in adult blood. Equally as incontrovertible is the fact that the prothrombin time is 12 seconds in almost all newborn infants whose mothers had adequate amounts of vitamin K (Quick, Murat, Hussey, and Burgess, 1952). Warner, Brinkhous, and Smith (1939) explained this difference by postulating a change in convertibility of prothrombin. Later, the discovery of the labile and stable factors made it appear probable that these accessory factors might in some way be accountable for this striking discrepancy. The finding that the labile factor is normal in newborn blood (Quick, Flood, and Hussey, 1953; Owen and Hurn, 1953) eliminates this agent from consideration. The report of Loeliger and Koller (1952) that the stable factor is reduced in newborn blood clearly shows that it cannot be the agent that compensated for the lack of prothrombin and thereby normalizes the prothrombin time.

The results of a few simple experiments recorded in Table IV offer pertinent information. While the prothrombin time of newborn plasma is 12 seconds, which is the same as

TABLE IV.—Comparison of Prothrombin Activity in Adult and in Newborn Blood

	Prothrombin Time	
	Adult	Newborn
1. Fresh plasma	12 sec.	12 sec.
2. Stored plasma*	9 "	12 "
3. Serum from platelet-poor plasma	8 "	12 "
4. Plasma diluted with equal volume of saline	15 "	15 "
5. Plasma diluted with equal volume of $\text{Ca}_2(\text{PO}_4)_2$ -treated plasma	12 "	15 "

* In glass at 4° C. for 24 hours with 0.1 M sodium citrate.

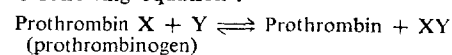
that of adult plasma, it fails to show the characteristic shortening of the latter on storage. Likewise, the prothrombin time of serum prepared from platelet-poor newborn plasma is not 8 seconds, as is the serum from platelet-poor adult plasma, but is 12 seconds, which is the same as the original plasma.

Earlier it was pointed out that the increase in prothrombin activity of adult plasma on storage or in serum from platelet-poor plasma could be explained by postulating either an actual increase in prothrombin or by the evolution of an accelerator. From the results obtained on newborn plasma

it is clear why the first is the more likely explanation. According to the two-stage test, the prothrombin of newborn blood is only about one-third of that in adult blood. Since no evidence of an accelerator in newborn blood has been demonstrated, it seems quite plausible that the augmented prothrombin activity in adult blood is caused by an actual increase in prothrombin derived from an inactive precursor that may be designated as prothrombinogen. According to this hypothesis, newborn blood lacks this precursor, and this accounts for the low prothrombin obtained with the two-stage method. The one-stage method specifically measures active prothrombin and is unaffected by prothrombinogen.

Further support for the concept is obtained from the results of experiments 4 and 5 of Table IV. If either newborn or adult oxalated plasma is diluted with an equal volume of saline the prothrombin time is increased to 15 seconds. If, however, plasma treated with $\text{Ca}_2(\text{PO}_4)_2$ is used as the diluent, the prothrombin time of adult plasma remains 12 seconds, whereas that of the diluted newborn plasma is 15 seconds. Apparently, $\text{Ca}_2(\text{PO}_4)_2$ -treated plasma contains a factor which can convert inactive prothrombin to the active state. Since newborn plasma is devoid of prothrombinogen, the addition of the deprothrombinized plasma cannot increase the active prothrombin, and therefore the prothrombin time becomes prolonged to 15 seconds, the same as is obtained by dilution with saline.

To present the hypothesis in an easily comprehensible form one may visualize prothrombinogen as prothrombin kept inactive by an inhibitor, "X." On storage the inhibitor deteriorates, thus liberating prothrombin, which accounts for the increased prothrombin activity. Plasma treated with $\text{Ca}_2(\text{PO}_4)_2$ contains an agent which can activate prothrombinogen presumably by removing the inhibitor. If the factor be designated "Y" one can postulate an equilibrium according to the following equation:



This is undoubtedly an oversimplification, but the essential idea offers a logical answer to the four basic questions presented. It appears to be the Y factor which fixes the level of free prothrombin in human blood, and therefore it is the basic determinant of the prothrombin time. There is evidence that the concentration of this agent is determined by heredity. A family has been reported in which a mother and two of her children have a prothrombin time of 16 minutes, due presumably to a lower-fixed concentration of factor Y (Quick, Flood, and Hussey, 1953).

According to the present findings, the answer to this fourth question is: The newborn plasma has a normal prothrombin time because it has a normal concentration of free prothrombin, but it has a lower prothrombin as measured by the two-stage method because it is devoid of prothrombinogen. Its total prothrombin content which the latter test measures is much lower than in adult blood.

Relation of Haemorrhage to Prothrombin Time

In the early study of poisoning from spoiled sweet clover hay it was observed that a heart puncture caused fatal haemopericardium whenever the rabbit's prothrombin time was markedly prolonged (Quick, 1937). Later it was shown that a puncture caused fatal bleeding when the prothrombin time was 24 seconds or longer (Quick, Honorato, and Stefanini, 1948). Interestingly enough, these findings correspond remarkably well with human findings. Two boys who have a prothrombin time varying from 19 to 26 seconds due to congenital true hypoprothrombinæmia have a rather mild but distinct bleeding tendency. A girl of another family who has a more severe deficiency of prothrombin, with a prothrombin time of 35 seconds, has a much more severe bleeding condition. A woman aged 50 who has a prothrombin time which varies from 27 to 51 seconds due to a pure deficiency of stable factor has a rather mild bleeding history.

The exact relation of the prothrombin time to haemorrhage in the human is difficult to determine. In most types

of coagulation defect bleeding does not occur unless induced by trauma. Even a severe haemophilia with a clotting-time over one hour may have no bleeding episodes for long periods. Since the newborn infant with a normal prothrombin time but a low prothrombin as measured by the two-stage method can undergo surgery with impunity, one can conclude that the one-stage method is the more reliable in that it measures the fraction of prothrombin that apparently participates directly in haemostasis.

Discussion

A hypothesis has been offered to help answer four basic questions concerning the prothrombin time. The central idea is that the prothrombin in adult blood is present partly in the active form and partly as prothrombinogen. The one-stage method measures only the active prothrombin, while the two-stage test determines total prothrombin—that is, both the active and the inactive fractions. The early studies of Bordet (1919) already indicated the possibility of inactive prothrombin. He concluded that all of the prothrombin was in the precursor state, to which he gave the name proserozyme. The concept of Warner *et al.* (1939) of an altered convertibility of prothrombin is in accord with the basic concept provided one reinterprets convertibility. It is unlikely that the prothrombin molecule can have gradations of convertibility. There is a much greater probability that the convertibility follows the all-or-none law. It is either entirely non-convertible—that is, in an inactive state—or fully convertible, and the apparent convertibility actually is the ratio of free to total prothrombin. The higher the percentage of free prothrombin, the greater will appear to be the convertibility.

Whether the hypothesis is accepted or not, it must be recognized that the prothrombin time of plasma is easily altered by relatively simple factors such as contact with glass. Any modification of the original procedure is apt to measure something different from what is present in the plasma immediately after removal from the vein. Modifications designed to measure prothrombin specifically deserve particular scrutiny. Contrary to the claims that the prothrombin time is not a measure of prothrombin, it can be argued from the evidence presented in this paper that it is actually the only method which determines active prothrombin. It is to be emphasized that the one-stage and two-stage methods do not measure the same thing in human blood, and therefore there is no justification to use the two-stage procedure as the criterion to evaluate the one-stage test. Since deficiency of stable and labile factor can easily be detected and the test corrected accordingly, the one-stage method continues to remain the simplest and probably the most reliable means to determine prothrombin.

Summary

In this study evidence is offered to show that the constancy of the prothrombin time of fresh normal human plasma is due to the fixed concentration of active prothrombin. The increase of prothrombin activity during storage and during the clotting of haemophilic or platelet-poor plasma can be explained simply by the assumption that adult blood contains in addition to active prothrombin a high concentration of inactive prothrombin (prothrombinogen) which does not influence the one-stage method but is measured by the two-stage test. During storage or clotting the precursor is converted to active prothrombin, which in the hypoprothromboplasmic states is not consumed and therefore accumulates. Newborn blood contains a normal concentration of active prothrombin but is devoid of prothrombinogen, which accounts for the normal prothrombin time but the low prothrombin as measured by the two-stage test.

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CARDIAC GLYCOSIDES IN THE TREATMENT OF CARDIOGENIC SHOCK

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Myocardial infarction complicated by severe shock is usually attended by a mortality estimated as high as 93% (Rosenbaum and Levine, 1941). Numerous forms of therapy have been advocated for this serious complication, including vasopressor agents, transfusions, and cardiac glycosides (Hellerstein and Brofman, 1951). The use of the first two agents has been fairly well clarified in the past five years, but the role of cardiac glycosides, in the absence of overt or predominant congestive failure, is as yet unsettled.

Four cases are presented to illustrate the specific use of the cardiac glycosides in the treatment of cardiogenic shock, and in so doing to demonstrate survival from the usually lethal combination of pulmonary oedema and shock.

Case 1

A 60-year-old undigitalized hypertensive man entered hospital in shock. He had had a previous myocardial infarction four years prior to admission. He collapsed on the morning before admission and was found to be cold, sweaty, cyanotic, and unresponsive. No blood pressure was obtainable. There were bilateral moist rales up to the scapulae. An electrocardiogram showed an acute posterior myocardial infarction with bizarre arrhythmias, including ventricular tachycardia, ventricular bigeminy, and auricular flutter. He was given 50 mg. of procaine amide hydrochloride ("pro-nestyl") intravenously, with conversion to a normal sinus mechanism. Treatment with intravenous noradrenaline raised the blood pressure to 100/80, but he remained unresponsive and in clinical shock. Slowing of the infusion resulted in an immediate fall in blood pressure. He was then given 0.4 mg. of lanatoside C intravenously. Thirty minutes later the heart sounds became more distinct, and he was able to speak and recognize his family. Blood pressure was maintained without vasopressors. Signs of congestion virtually

disappeared. He was given another 0.4 mg. of lanatoside C and appeared to be doing well. Approximately one hour after this dose he suddenly died. A pre-terminal electrocardiogram showed ventricular fibrillation. Post-mortem examination showed a fresh posterior myocardial infarction and pulmonary congestion.

Comment.—Shock and coma responded specifically to lanatoside C. Blood pressure was maintained without vasopressors. Death may have been related to a digitalis-induced arrhythmia.

Case 2

A 49-year-old white woman with disseminated lupus erythematosus had been on cortisone, 75 mg. daily, and had had severe hypertension, congestive heart failure, and angina pectoris. She was maintained on digitalis, 0.1 g. daily, but this had been omitted two days before admission. Five hours before admission she developed left anterior chest pain followed by acute dyspnoea and cyanosis. On admission to hospital she was found to have rales to the apices and gurgling respirations. The blood pressure was 250/138, pulse 152, respirations 40. An electrocardiogram showed left ventricular hypertrophy and a possible anteroseptal myocardial infarction.

The patient was treated initially with morphine, 10 mg., atropine, tourniquets, and a 250-ml. venesection, with a fall in blood pressure to 110 systolic. Pressure was maintained at this minimum level with phenylephrine hydrochloride ("neosynephrine") intravenously in 5-15-mg. doses. When the blood pressure was at its peak of 110 systolic the pulmonary oedema became worse; however, when the blood pressure became less than 90 the pulmonary oedema lessened, but the patient became unresponsive. As the hours wore on she remained in coma and pulmonary oedema at all blood-pressure levels. The pulse rate was 135 and the blood pressure could not be maintained above 100 mm. Hg. At this time ouabain was given intravenously in divided doses of 0.05 mg., to a total of 0.15 mg. Forty-five minutes after initiation of this therapy three things occurred: the patient awakened and became alert, the blood pressure was easily maintained at any level on phenylephrine, and despite the blood pressure being maintained at about 120 to 130 mm. pulmonary oedema cleared.

Comment.—In this patient shock and coma were successfully treated with ouabain. Vasopressor action was aided and supported by digitalization.

Case 3

A 65-year-old widowed white woman had had a known hypertension of 160/100, angina pectoris, and probably myocardial infarctions for fourteen months before admission. Twenty-four hours before admission she developed severe substernal pain with radiation down the left arm and sweating. These disappeared only to recur four hours before admission, and were associated with progressively severe dyspnoea and later with orthopnoea and cyanosis. The patient entered the emergency ward, where her blood pressure was 190/110, pulse 150, and respirations 40. She was cyanotic, foaming at the mouth, the veins were full, and rales were heard to the apices. A diastolic gallop and pulsus alternans were present.

Oxygen, 15 mg. of morphine sulphate intravenously, and a 300-ml. phlebotomy was given. On this treatment respirations were noted to be less laboured. However, about half an hour later the blood pressure fell to 100/80 with disappearance of peripheral pulses and she lapsed into coma. She appeared to be in clinical shock at this time. Thereupon 0.2 mg. of ouabain was given intravenously. The pulse rate dropped from 150 to 120 in 15 minutes and the pulse became strong. The blood pressure rose to 125/80 and she awakened. Half an hour after the administration of ouabain she had transient multi-focal ventricular premature beats, treated successfully with 250 mg. of procaine amide hydrochloride intramuscularly. She gradually recovered. An electrocardiogram showed left ventricular hypertrophy and

an anteroseptal infarct of uncertain duration. The sedimentation rate, white blood count, and blood sugar rose early with a fall in all three after the first two weeks, substantiating the clinical impression of myocardial infarction.

Comment.—This patient with shock and pulmonary oedema responded dramatically to digitalization. The dramatic clinical improvement probably cannot be attributed to the fall in heart rate from 150 to 120 because in the absence of mitral stenosis such a rate is seldom critical. The equivocal electrocardiogram is probably caused by the two prior infarctions.

Case 4

A 68-year-old white woman had been having exertional dyspnoea, chest pain, and paroxysmal nocturnal dyspnoea for two months. She was brought to hospital unconscious and slightly cyanotic. The skin was clammy and cool; blood pressure 280/140; pulse rate 130; respiratory rate 32. She had not been digitalized. There were rales to the apices and the veins were full. An electrocardiogram showed an anteroseptal infarct and auricular flutter. She was treated with oxygen, 10 mg. of morphine sulphate, and venesection without effect. The blood pressure fell to 120/70 and the typical picture of shock developed. Then 0.125 mg. of ouabain was given intravenously; in 20 minutes she was awake, with clearing of her chest and stabilization of blood pressure at 160/80 and a heart rate of 110. She was discharged four weeks later.

Comment

Herrick (1912), in his classic article on the subject, recommended the routine use of digitalis in myocardial infarction. Within the last 25 years, however, clinicians have been hesitant to use digitalis in myocardial infarction because (1) the tolerance of the experimentally infarcted heart to digitalis is decreased (Travell *et al.*, 1938), and (2) both digitalis and myocardial infarction increase the likelihood of ventricular irritability and arrhythmia, and their effects may be additive in the same patient (Goodman and Gilman, 1941). In 1951 Askey gave digitalis to half of a group of 100 patients with proved myocardial infarction. He failed to show any increased incidence of arrhythmia or sudden death in the digitalis-treated group. In fact, Gilson and Schemm (1950) administered digitalis for its classical contraindication—namely, ventricular tachycardia—with salutary results in four patients.

There appears to be general agreement regarding the use of cardiac glycosides for frank congestive failure complicating cardiac infarction, but whether these agents have any role in treating the shock of cardiac origin is less certain. Goodman and Gilman (1941) take a strong position in opposing its use as follows: "Digitalis is contraindicated during the first few days following an acute coronary thrombosis. The clinical picture is usually one of shock rather than congestive heart failure, and digitalis, by further decreasing cardiac output, may make the patient worse."

Recent haemodynamic studies have contributed much to an understanding of this problem. Clinical shock implies that the blood pressure in the arterial tree is much less than normal. The level of the blood pressure depends on the height of systemic resistance—that is, vasoconstriction or dilatation—and the level of the cardiac output. Either the resistance or the cardiac output is low when there is shock. It is only in a small group of patients that a low systemic resistance is seen. G. Lee (personal communication) has demonstrated in some patients with the severe pain of an infarction that there may occur a marked muscle vasodilatation with a concomitant normal cardiac output and resulting fall in blood pressure. Most patients, however, show vasoconstriction with an increased systemic resistance and a decreased cardiac output (Freis *et al.*, 1952).

The lowered blood pressure indicates either inadequate, although increased, constriction or a greatly depressed cardiac output, out of proportion to homeostatic compensation. This decrease in output is related either directly to the myocardium itself or to poor venous return consequent

upon decreased venomotor and muscle pump activity. This latter is seen in nitrite syncope and spinal anaesthesia. However, this possibility seems less likely because shock often exists in the presence of an elevated venous pressure, and the simple restoration of venous pressure by either position in bed or intravenous infusion is not usually effective. The decreased output, then, is probably the direct result of a decreased myocardial contractility (Corday *et al.*, 1949) with the consequent immediately limited ability of the heart to do work following myocardial infarction. The ultimate response of the heart will, of course, depend on the size of the area of infarction and ischaemia, although small infarcts may in and of themselves initiate shock. The whole pattern is a vicious cycle in that the low perfusion pressure occasioned by the myocardium results in poor coronary inflow, with further myocardial ischaemia and hypodynamic myocardial contraction (Wiggers, 1923).

Why the systemic resistance is not maximally increased is not clearly understood. Whether there is a vasomotor paralysis with poor cerebral flow is not known, but in this regard cardiogenic shock is similar to traumatic shock. The first line of defence, then, is to further increase this systemic resistance and decrease the vascular bed to be perfused. The second line of defence is to increase the stroke work of the heart and hence perfusion pressure and minute output. Here has rested the controversy.

Harrison (1939) was among the first to call the shock of coronary thrombosis forward failure and thus semantically implicate the myocardium itself. Stead and Ebert (1942) reported six cases of myocardial infarction resulting in shock. One patient received ouabain and there was an increase in the blood pressure, although the patient subsequently died. Boyer (1944) stated that the shock and the pulmonary oedema syndromes were simply different stages of the same myocardial insult, and perhaps digitalis should be used in both conditions. Fink *et al.* (1953) described the cases of 10 patients in varying degrees of shock who had received lanatoside C. Their criterion for the use of this agent was an elevated venous pressure, suggesting that in such cases shock was myocardial in origin. In every case, despite the ultimate outcome, the blood pressure rose following digitalis administration while the venous pressure was variably affected. It is noteworthy that three of their patients had nearly normal venous pressure and still showed improvement in arterial blood pressure.

Lee (personal communication) demonstrated the fallacy of accepting normal venous pressure as an index of minimal right ventricular failure in patients with myocardial infarction. Although the venous pressure was normal, the gradient between veins and right atrium had disappeared and the right atrial pressure was higher than normal. Finally, studies by Sarnoff *et al.* (1954) have shown that the production of simple haemorrhagic shock in normal dogs results in elevation of left atrial pressure, while right atrial pressure is normal. These experimental observations fit well with the clinical fact that many patients with myocardial infarction have normal venous pressures, yet show pulmonary congestion first by x-ray examination and finally at necropsy (Friedberg, 1950).

Our own clinical reports support the above-presented evidence. The effect of the cardiac glycosides is not only to improve the stroke output of the heart but to increase its ability to deliver the blood against the increased peripheral resistance. The first patient demonstrated clearly that a normal arterial pressure could be maintained solely by digitalis. The second patient demonstrated that increased blood pressure could be delivered by the heart when digitalized optimally, and that this could be done without the production of pulmonary oedema. Similarly, shock was averted solely by the use of ouabain in two patients who had the combination of shock and pulmonary oedema. It is particularly noteworthy that all four patients had been in coma as well as shock; two received vasopressors without effect, yet came out of coma without change in blood pressure following cardiac glycoside, and one patient no longer

had pulmonary oedema yet maintained an increased arterial pressure. This suggested that cerebral and coronary blood flows were probably increased.

This is not to propose the standard use of the cardiac glycosides in myocardial infarction, but rather to re-emphasize that so-called cardiogenic shock is a manifestation of forward failure. Clinical methods of defining failure of the left ventricle are poor, and the right ventricle seldom manifests gross failure early in acute myocardial infarction. Finally, patients not previously in failure and with normal blood volumes may not develop massive right-sided congestion. Because overt evidence of failure is frequently absent, therapy in this type of shock is seldom aimed at the heart itself.

It is recommended that an orderly therapeutic problem might include the following: (1) morphine sulphate for pain; (2) position in bed for its effect on blood pressure and venous return; (3) phlebotomy for elevated venous pressure; (4) vasoconstrictor agents for increasing systemic resistance and arterial pressure; and (5) cardiac glycosides for increasing stroke work and with it cardiac output and arterial pressure. Each should be tried in additive succession—realizing the physiological contribution of each agent—that is, how digitalis may support the pressor response to phenylephrine hydrochloride as in Case 2. Digitalis is still a potentially dangerous drug and should be used only when the indications are clear cut. The dose is important in avoiding acute toxicity. We achieved therapeutic responses with 25-50% of the generally accepted effective dose of ouabain (Friedberg, 1950). The first patient may have died in a fashion temporally related to digitalis intoxication, and the third patient developed premature bigeminal beats thirty minutes after a remarkable therapeutic effect had been achieved. We recommend small doses of intravenous glycoside. Ouabain has not been a dangerous agent in our hands because we have used 0.05, 0.1, or 0.2 mg. as initial doses instead of the recommended 0.5 mg., and similar aliquots of other intravenous preparations.

Conclusions

Four patients, one in clinical shock and three with shock and pulmonary oedema, were treated primarily with a cardiac glycoside intravenously in small doses. All four patients showed remarkable clinical response, with a rise in blood pressure, decrease in pulmonary oedema, and dramatic clearing of coma. Three of the four ultimately survived. It is re-emphasized that the shock of myocardial infarction represents true myocardial failure and that the use of digitalis may be highly efficacious. When given, digitalis should be administered in doses fractionally 25-50% of the initial dose given to the average cardiac patient. In so doing many of the toxic complications may be avoided.

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LYMPHANGIOGRAPHY

A TECHNIQUE FOR ITS CLINICAL USE IN THE LOWER LIMB

BY

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Arteriography and phlebography have been used in clinical medicine since their development some twenty years ago. The early work with these techniques was done by dos Santos *et al.* in 1931, Moniz *et al.* (1932), and dos Santos (1938). A comparable method of studying the lymphatic circulation would be of obvious value, but its development has been delayed by technical difficulties. Lymph vessels, or at least normal ones, are much smaller than the arteries or veins used in angiography. They contain colourless lymph, which makes them difficult to see, and under normal circumstances they may be empty or nearly so, existing as potential spaces like the pleura or peritoneum (Kinmonth, 1952). Special methods have therefore been developed to make the lymph trunks visible to the naked eye at operation and opaque to x rays so that radiographs could be made to study their role in disease in man. Some of our findings have already been described (Kinmonth, 1951, 1952, 1954; Kinmonth and Taylor, 1954). This paper describes a method which has proved useful in practice and which embodies certain technical improvements. The general principle is that the lymph trunks are made visible to the naked eye by subcutaneous injection of a diffusible blue dye so that radio-opaque solution can be injected direct into them through a small needle.

Lymphangiography of the Leg and Thigh

(1) The diffusible dye patent blue* (also known as patent blue violet or patent blue V) is made up into an isotonic solution (11%) in distilled water and sterilized by autoclaving. About 2 to 2.5 ml. of this solution is injected subcutaneously between the toes, roughly 0.5 ml. into each web, which is massaged with gauze for about half a minute.

(2) The ankle-, knee-, and hip-joints are then passively moved repeatedly through their full range for five minutes. The dye, which permeates the lymph trunks soon after injection, is thus moved along them so that they are filled as far as the pelvis. In this dosage (up to 2.5 ml. for an adult) the dye is without toxic effects. It is, however, absorbed into the blood stream, and the patient soon becomes blue in colour. The anaesthetist and the nursing staff in the ward are warned of this. It is excreted in the urine, and the patient regains a normal complexion in about 24 hours. Severe oedema of the limb should be reduced so far as is possible by elevation and massage for a few days beforehand, because the flow of dye through the lymph trunks may be retarded if they are waterlogged by tissue fluid.

*Obtainable from G. T. Gurr, 36, New King's Road, London, S.W.6.

(3) A bloodless field is helpful in the next stage. This can be produced with a rubber bandage and air cuff, but a better way is to tilt the patient into a full Trendelenburg position so that the limb is sharply elevated.

(4) A transverse incision is made in the skin of the dorsum of the foot about 2 in. (5 cm.) proximal to the webs of the toes (Fig. 1). The lymph trunks run upwards in the line of the long axis of the foot, and it is sometimes possible to see them filled with the blue dye through the skin before the incision is begun. They lie very close to the skin, which is thin in this situation, and so the incision must be deepened by cautious light strokes of the scalpel.



Fig. 1.—Injection of diodone into a lymphatic (see description in text).

Small bleeding points are coagulated with the diathermy. Lymph trunks of normal size are just under 1 mm. in diameter. A length of some 5 or 6 mm. is exposed by gently pushing apart the edges of the incision with the scalpel. A clean exposure of the superficial aspect of the vessel is necessary, but its whole circumference must not be free or it may collapse and make injection impossible.

(5) At this stage it is helpful to distend the lymph trunk with dye. An assistant places a finger on the skin an inch (2.5 cm.) above the incision, and presses gently to obstruct the lymph trunk, and the surgeon massages the interdigital area so that the dye passes up and fills the exposed length. The exposed length of lymphatic is held as straight as possible by grasping the areolar tissue next to it in the distal part of the incision. All is now ready for the injection.

(6) The radio-opaque solution used is 70% diodone. The preparation known as "pyelosil" has given good results in our experiments. It has been kept warm until required, when a 10-ml. syringe is filled with it. A No. 18 hypodermic needle is firmly mounted on the syringe. This is the smallest needle of the standard sizes and its bore will just allow the viscous solution to pass. The needle point is introduced some 2 mm. into the lymph trunk and the piston tentatively advanced. If it is accurately placed, diodone enters and the vessel becomes white and transparent. If, however, the needle point lies in adventitia a bleb forms and the injection must be stopped and another attempt made, often in another reach of the lymphatic or in another vessel. If all is going well the injection is continued, the surgeon watching the needle-point and an assistant telling him of the progress of the piston along the barrel of the syringe. The diodone is injected as rapidly as the small bore of the needle will allow. The full 10 ml. is injected if possible, but sometimes rapid extravasation around the needle occurs before this and the injection is then stopped. Surprisingly good delineation is sometimes obtained with injections as small as 1 ml. Minor leakage of diodone around the needle during the injection is gently mopped up with cut pieces of gauze by an assistant, who takes care not to disturb the needle point.

(7) The needle is withdrawn when the injection is complete and the table immediately altered from the Trendelenburg to the horizontal position.

(8) The x-ray tube is moved into position and radiographs are made of the whole limb with as little delay as possible. The sooner they are made the better will be the definition, because the diodone starts to diffuse through the permeable walls of the lymphatics after a few minutes, giving rise to blurred outlines in the film. The films have been placed in position under the limb in the beginning so that no time is lost at this stage.

Radiological Technique

As with all radiographic procedures in operating theatres, radiography in these cases is carried out under certain difficulties. Examination is even more difficult when the thicker parts of the body such as the pelvis, abdomen, and thorax have to be radiographed.



Fig. 2.—Normal lymphangiogram: 6 ml. of 70% diodone was injected and the films were exposed one minute later.



Fig. 3.—Lymphangiogram in a patient with idiopathic lymphoedema: 10 ml. of 70% diodone was injected and the films were exposed one and a half minutes later.

Good definition and reasonable contrast are essential, as normal lymphatics are demonstrated as fine opaque filaments in the soft tissues.

It has been found advantageous to use non-screen film for the extremities and screened films for the thicker parts. Exposure times need not be as critical as in arteriography, as the flow of opaque medium through the lymphatics is comparatively slow, but immobilization is essential, and undue delay may result in blurred lymphatic outlines, due to seepage through the walls of the vessels.

The films or cassettes are placed in boxes, under the sterile towels, below the part to be examined and prior to the injection. Several non-screen films can be used if necessary, each protected from the other by lead-protected trays, the box being long enough to carry on each tray two 15 x 6-inch (38 x 15-cm.) films placed end to end. There is no appreciable gap between the end-to-end films, so that little of the lymphatic system is undemonstrated. Almost the whole length of a limb can be radiographed at one time

with a special type of tube arm which we use on these mobile units to give adequate focus-film distance. The trays are removed one by one from the distal end of the box as each exposure is made.

In general, it is unnecessary to take serial films of each area (such as are required in arteriography) unless more of the lymphatic system has to be filled by a further injection. It is of great advantage to have a wedge filter to compensate for the varying thickness of the lower limb, and the recent use of such an accessory, similar to that which we use in arteriography, has been of much value in improving the quality of the films. A difficulty may be to make interchange of the filter simple, as it is not always practicable to have the same mobile x-ray set available for this type of operating-theatre work.

A cassette and a fixed grid, usually in a cassette tunnel, are used for the successful demonstration of the inguinal glands and pelvic lymphatics, and the abdominal lymphatic channels have also been so demonstrated. As stated above, it is surprising how small quantities of opaque medium, such as 1-1.5 ml., give good delineation of the lymph vessels

when there is little sign of dilatation. If, however, gross dilatation and varicosity exist, a much larger quantity may be necessary to demonstrate all the ramifications of these vessels and to outline the more proximal lymph vessels in leg and arm. With care and co-operation much interesting information concerning the state of the lymphatic system can be gleaned by this type of examination.

For the limbs our technique has been as follows. Non-screen film: 65 kV, 65 mA; time, 2 seconds; distance, 48 in. (122 cm.).

For the thicker parts:—cassette and grid: 80 kV, 45-50 mA; time, 1.5 seconds; distance, 48 in. (122 cm.).

It is important that each new technique should be thoroughly supervised by a radiologist, as difficulties occur in operating theatres which may require special equipment, and discussion between surgeon and radiologist may be necessary to reconcile the problems with which each is faced, in order to evolve a satisfactory solution to the problem and obtain the best possible results.

Results

The method has been used to study lymph vessels in lymphoedema praecox, post-mastectomy oedema of the arm, post-phlebotic ulceration and oedema of the leg, congenital arteriovenous fistulae, and other diseases. Some of the findings have been reported elsewhere, and it is not proposed to give further details here, but instead to describe some examples illustrating the technique.

A normal lymphangiogram is shown in Fig. 2. The lymph trunks remain the same width in their course up the limb, unlike veins which become wider. Bifurcation occurs frequently, so that the trunks appear to multiply as they pass upwards. The ampullae of valves are often seen.

The lymphangiogram shown in Fig. 3 was taken from the leg of a patient with idiopathic lymphoedema (Fig. 4). The lymph vessels are tortuous and wide. There is both

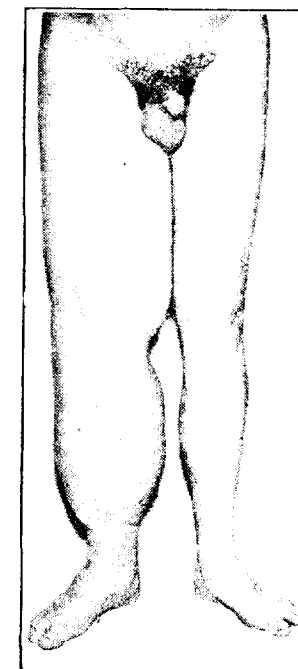


Fig. 4.—Idiopathic lymphoedema. Lymphangiogram shown in Fig. 3. Operation gave considerable amelioration.

lateral and retrograde flow of the dye into other lymph vessels. These features are never seen in normal lymphatics.

We wish to thank Professor Sir James Paterson Ross and the other members of the Surgical Professorial Unit at St. Bartholomew's Hospital for their help and encouragement in developing this method.

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THE DELLWOOD FIRE

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In the early morning of Easter Sunday, April 18, 1954, a fire occurred in the nursery of Dellwood Maternity Home, Reading, which resulted in the death of 13 newborn babies. Dellwood is a general-practitioner obstetric unit of 17 lying-in beds dealing with normal cases. The hospital staff serve in a consultant capacity. The building is about fifty years old and there have been a few structural alterations during the twenty-four years of its use as a maternity home. The nursery measures 20 by 12 ft. (6.1 by 3.6 metres), with two doors and two windows: the floor boards are of deal covered by linoleum.

The fire was caused by the flue of a hot-water boiler which in September, 1953, had been moved so that it ran beneath the floor of the nursery. It has been established by subsequent inquiry that the installation of the flue complied with the local building regulations, though the experts who assisted the Regional Board in their inquiry agreed that the regulations need overhauling. It seems likely that the fire began slowly, with much smouldering of wood over a large area of floor. This, the destructive distillation of soft wood and also of some linoleum, filled the room with thick smoke, until finally part of the floor caught alight and the flames spread to one of the cots. It is thought that the room may have been filled with smoke for between 20 and 30 minutes.

There were 15 babies in the nursery, the doors of which were closed, while the windows were kept slightly open. A gas fire was burning. A nursing staff of two were on duty and the nursery was visited at intervals during the night, the last visit before the fire being about 3.15 a.m. The fire was discovered by one of the sisters*

*Sister E. M. Holland was later decorated with the George Medal by Her Majesty the Queen.

at 4 a.m., and she immediately began to remove the babies from the room while help was being called. While removing the first babies she received considerable burns of face and arms and was in great distress from inhalation of smoke; she continued to bring them out one by one, and finally collapsed when the last one had been carried out. She was subsequently admitted to hospital.

One of us (R. A. R.) first saw the babies at 4.30 a.m. One whose cot had caught fire was dead following extensive burns involving the whole body, with some charring. Three others were transferred to the Battle Hospital at once and placed in oxygen boxes. One of these had some superficial burns of the face. All three were limp and pallid and in great respiratory distress. There was much clear viscid discharge from nose and eyes and complete nasal obstruction. The remaining 11 babies were in good general condition, but all were coughing a little and had some discharge from the nose and eyes. Their colour was generally good apart from slight occasional cyanosis produced by coughing attacks and interference with breathing by nasal obstruction. During the day there was some deterioration. Respiratory rates were rising, and in all cases cough had increased: a little clear yellow fluid was occasionally coughed up or aspirated. Scattered rales, in every case, became audible in the afternoon and evening. Oxygen boxes had by this time been obtained for all the cases.

That evening it was decided to clear a hospital ward and make special arrangements for nursing staff, and early on Monday morning all the surviving babies were transferred in oxygen boxes to the Royal Berkshire Hospital. An alarming increase in respiratory obstruction developed in all the cases, and on Monday evening it seemed unlikely that any of the babies would survive. The appearances were similar to those with which we are familiar in asphyxia due to hyaline membrane, with, in addition, signs of upper respiratory tract irritation: but these were strong infants several days old, and were making very forcible efforts to breathe, whereas in hyaline membrane asphyxia we are dealing usually with a shocked or feeble baby. Thus the characteristic contrast between struggling respiratory effort and poor breath sounds on auscultation was very striking.

Two of the babies began to improve after the third day and finally appear to have made a good recovery. There is no reason to suppose that these two suffered less exposure to the smoke than any of the others.

Treatment

All the babies were given oxygen, the first three being placed in oxygen boxes on admission to hospital, and the remainder (who at first stayed at Dellwood) being similarly treated later on the first day when chest signs were appearing and extra boxes had been obtained. Before this, some oxygen was given by tube and funnel or catheter when coughing attacks led to cyanosis. Mucous secretions were aspirated at intervals as needed, and 5% sulphacetamide was applied to the nose and eyes. Penicillin was given in all cases, starting on the morning of the first day with 100,000 units eight-hourly by injection. The dose was later reduced and given orally to the babies who survived. Humidification was maintained by electric steam-kettles.

At midday on Monday, the day after the fire, streptomycin (100 mg. eight-hourly) and cortisone (50 mg., then 25 mg. eight-hourly) were added to the treatment.

The babies were nursed with the foot of the cot raised and were kept for most of the time in a high concentration

of oxygen, with a flow of four to five litres a minute. The position was altered from side to side at two-hourly intervals and aspiration of the nose and pharynx was carried out by catheter and electric sucker very frequently. Temperature and respiratory rates were recorded at hourly, and later at two-hourly, intervals. Feeds, at first of glucose-saline and later of milk mixture, were given by oesophageal tube during the first 48 hours. Aspiration of the trachea was attempted in three cases without apparent benefit, and hardly any mucus was obtained by this method. Gastric oxygen was given to several babies *in extremis*, and in one of these it was noted that the colour improved and was maintained for about half an hour after all respiratory movement had ceased.

In those babies who survived the first 48 hours percussion drainage was attempted in addition to postural drainage and frequent changing of position. This seemed to produce some good results: mucus was coughed up and aeration seemed to have improved. In one baby (one of those who recovered) a large bronchial cast was aspirated from the nose on the sixth day, after one of these periods of percussion drainage.

Outline Course of Individual Cases

Case 1.—Male aged 6 hours. Died during fire. Extensive burns and charring.

Case 2.—Female aged 6 days. Superficial burns of face and chest and oedema of eyelids. Respiratory distress was apparent immediately, with severe coughing, grey cyanosis, and much mucous discharge from nose and eyes. Was transferred to Battle Hospital and placed in oxygen and steam, with frequent local treatment to nose and eyes. Penicillin powder applied to burns. Progressive deterioration throughout the day until death at 10.33 p.m. Survived 18½ hours.

Case 3.—Male aged 9 days. Very slight scorching of face. Respiratory distress and cyanosis from onset. Transferred to Battle Hospital and placed in oxygen box. Much greenish-yellow mucus was aspirated from nose and pharynx. Slight deterioration throughout day. Feeds of glucose-saline given by tube were retained. At midday trachea was aspirated but no mucus obtained. Condition became steadily worse during the night. Died at 4.55 a.m. on the second day. Survived 25 hours.

Case 4.—Female aged 2 days. Had seemed to be in good condition at first and during the first day. Onset of dyspnoea and cyanosis during early morning of Monday, with subsequent rapid deterioration. Died at 6.30 a.m. on the second day. Survived 26½ hours.

Case 5.—Female aged 4 days. Some cyanotic attacks with coughing on first day, but general condition was fairly good and feeds were retained well. Slowly increasing distress on second day as the respiratory rate rose. Died at 10.45 a.m. on the second day. Survived 31 hours.

Case 6.—Female aged 8 days. Condition seemed fairly good at first, but the respiratory rate rose to 60 during the first 24 hours, after which dyspnoea increased progressively. On account of the very great respiratory distress the trachea was aspirated on the second day on two occasions, but this produced no relief and very little mucus was obtained. Died at 6.10 p.m. on the second day. Survived 38 hours.

Case 7.—Male aged 3 days. Well, apart from slight cough during the first 12 hours. After this period similar course to Case 6. Strong baby, making violent respiratory efforts. Period of intermittent breathing preceded death at 6.30 p.m. on the second day. Survived 38½ hours.

Case 8.—Male aged 4 days. After some slight intermittent dyspnoea and cyanosis during the first 24 hours appeared to be improving. Much stained mucus had been aspirated from the pharynx. There was a rapid deteriora-

tion with increasing dyspnoea during the evening, and he died at 9.10 p.m. on the second day. Survived 41 hours.

Case 9.—Male aged 3 days. In good condition in early stages, symptoms gradually increasing after the first 24 hours. Died at 10 p.m. on the second day. Survived 42 hours.

Case 10.—Male aged 7 days. This baby showed early signs and was one of the three (with Cases 2 and 3) who were transferred to the Battle Hospital immediately after the fire. He had improved, respiratory rate had fallen, and feeds were retained satisfactorily. Cyanotic attacks and rising respiratory rate recurred during the night of Monday and became more severe in the early morning. One unsuccessful attempt was made to suck out the trachea. A period of several hours of marked head retraction preceded death at 4 a.m. on the third day. Survived 48 hours.

Case 11.—Female aged 6 days. This baby remained in fairly good general condition until 24 hours after the fire, respiratory rate remaining in the region of 40 a minute. There was very slight scorching of the face and one hand. Pyrexia with temperature 102° F. (38.9° C.) developed during the second night, and, following this, chest symptoms and signs increased until she died at 10.24 a.m. on the third day. Survived 54 hours.

Case 12.—Male aged 2 days. Gradual development of symptoms during the first 24 hours, after which there seemed to be a steady improvement. At 2 a.m. on Tuesday became hyperpyrexial: temperature 107° F. (41.7° C.). This subsided, but the baby did not improve further, and after repeated attacks of cyanosis and development of head retraction, died at 11 a.m. on the third day. Survived 55 hours.

Case 13.—Female aged 3 days. Course was very similar to the previous one, with pyrexia—temperature 104° F. (40° C.)—during the second night and final deterioration after early improvement. She died at 12.50 p.m. on the third day. Survived 57 hours.

Case 14.—Female aged 3 days. The early course was similar to previous cases, but there was some improvement in aeration during the third day and subsequently as mucus was coughed up and aspirated. Percussion drainage seemed to be increasingly effective, and on one occasion was followed by the production of a large cast. From the fifth day there was a steady improvement, though an x-ray film (Fig. 1) on the sixth day showed that extensive areas of collapse were present. Cortisone was reduced to 12.5 mg. eight-hourly on the fourth day, and stopped after a further 24 hours. Oxygen was gradually withdrawn and penicillin and streptomycin were stopped on the ninth day. On the eleventh day an x-ray film

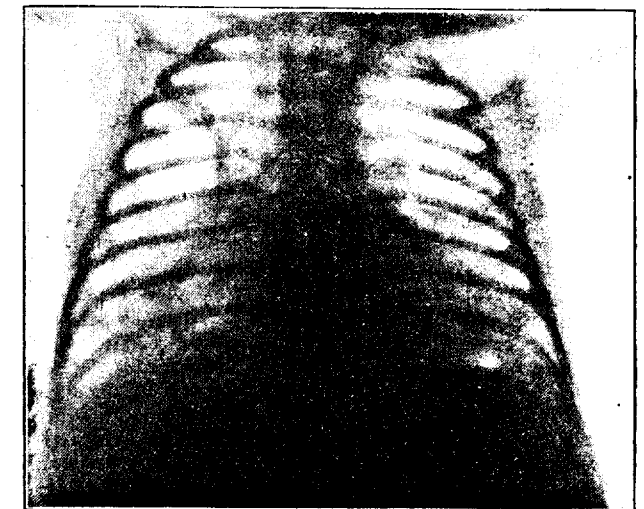


FIG. 1.—Case 14. Chest film on sixth day of illness, showing extensive areas of collapse consolidation. Later films show complete clearing.

showed considerable clearing. There were several alarming cyanotic attacks at this late stage, but these were of brief duration. Breast-feeding was re-established, and she was discharged home fully breast-fed and symptom-free on May 5, 17 days after the fire. Subsequent x-ray films show clear lung fields.

Case 15.—Male aged 7 days. Course was parallel to that of Case 14, and this infant was fully breast-fed by his mother when he was discharged on May 5. Both mothers had been admitted to re-establish feeding as soon as the babies began to improve. As in Case 14, there were several brief but alarming cyanotic attacks during convalescence associated, it seemed, with the separation of bronchial casts. Some yellow staining of the skin in both these babies persisted until a few days before their discharge.

Pathology

Post-mortem examination of the respiratory tract was carried out initially by Dr. J. A. Hardy, police surgeon at Reading. Permission was given by the coroner for further investigation of the specimens to be undertaken, and accordingly one lung from each case excepting the first was made available for examination in the Department of Morbid Anatomy, Hospital for Sick Children, Great Ormond Street.

Naked-eye Appearances

The most striking changes were seen in the bronchial tree, where the formation of a membranous cast had occurred in each case. In Cases 2 and 3 this was still firmly

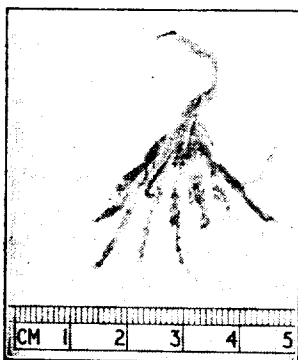


FIG. 2.—Cast of bronchial tree removed at necropsy. Black flecks of carbon are seen scattered throughout the specimen.

attached to the bronchial wall, and consisted of a thick layer of greenish-yellow material flecked with carbon. This replaced the normal shiny bronchial mucosa. A little yellow watery fluid was also present in the bronchial lumen. In those cases which survived longer, separation of this membrane from the bronchial wall had occurred. The cast now appeared as a firm tubular structure surrounded or indented by a quantity of sticky brownish mucoid material. Separation occurred initially in a patchy fashion so that only in those cases surviving longest was it

possible to extract a whole cast of the bronchial tree without leaving portions behind (Fig. 2). The extent of involvement of the large bronchi was similar in all cases, none of the main branches being entirely devoid of a membrane. In many cases secretion of mucus together with the resultant dislodgment and infolding of the cast had led to a severe degree of bronchial obstruction.

Involvement of the smaller bronchi and bronchioles was less constant, and in the gross specimen it was usually difficult to distinguish cast formation in air passages of this size from the bronchiolitis and adjacent bronchopneumonia which was subsequently shown histologically to have complicated several cases.

Congestion and oedema of the lung tissue was present in all the specimens, but was particularly noticeable in Cases 2, 3, and 4. Interstitial emphysema and oedema were also frequently seen, with resultant accentuation of the mosaic pattern produced on the pleural surface by the lobules.

Occasional large interstitial emphysematous bullae were also present. There were considerable areas of collapse and alveolar emphysema in all specimens, although the quantity of lung tissue involved in these changes varied somewhat from case to case. In most of the lungs collapse predominated over emphysema. All the specimens showed pleural

haemorrhage, varying in size from scarcely perceptible petechiae up to extensive haemorrhagic areas involving a considerable proportion of the pleural surface.

Histology

Examination of the larger bronchi showed that, while the greater part of the epithelium had been destroyed, not all areas were quite so severely affected, and in a few places the epithelium had been spared completely. This was particularly noticeable where relative protection had been afforded by mucosal folds, or near the ducts of mucous glands. In the less severely affected regions the epithelial cells had desquamated either singly or in clumps. The cytoplasm was swollen, homogeneous, and intensely eosinophilic, and the nuclei either showed degenerative changes or had disappeared. In the more severely affected parts individual cellular detail was less evident. The necrotic cells had fused together, replacing the epithelium by a densely eosinophilic membrane containing occasional nuclear remnants and patchy aggregations of carbon particles.

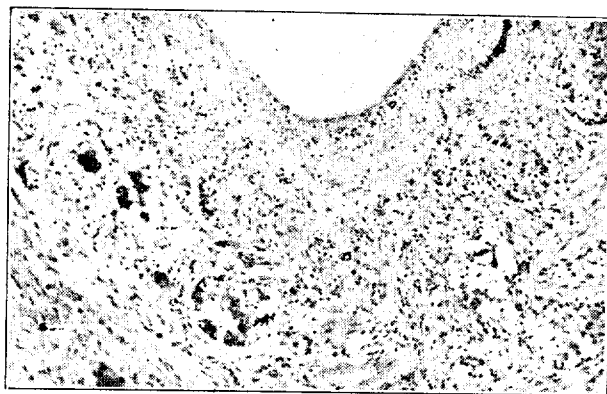


FIG. 3.—Destruction of bronchial epithelium with formation of a thick membranous cast. Cast contains carbon particles and is still attached to the bronchial wall. ($\times 90$.)

The bronchial walls were intensely congested and oedematous, and frequently haemorrhagic. Moderately numerous inflammatory cells were present in the cast and adjacent bronchial wall. These consisted of approximately equal numbers of polymorphs and mononuclear cells. At a later stage secretion of mucus from the underlying glands occurred, with resultant separation of the membrane from the bronchial wall. This process was barely starting in Cases 2 and 3, in which most of the cast was still attached (Fig. 3), but became progressively more advanced in those cases surviving longer, when large quantities of mucus could be seen lying between the cast and the bronchial wall. In some of the bronchi this led to complete occlusion of the lumen. Where separation had occurred the bronchi were sometimes devoid of a lining epithelium, although usually a few of the basal cells had been spared. No definite evidence of epithelial regeneration was seen in any of the specimens.

Cast formation in the bronchioles was very much less extensive, the majority being uninvolved in this process. In several cases there was acute bronchiolitis, which in Cases 2, 3, and 4 had progressed to well-developed bronchopneumonia. Cases 8, 10, and 11 showed very much earlier bronchopneumonic changes. This bronchiolitis was independent of the presence of bronchiolar casts, and was commonly seen where the latter was absent. The inflammatory exudate in the bronchiolar walls was very much more cellular than that seen in relation to the casts in the large bronchi.

The alveoli were congested and oedematous, and showed well-marked collapse and emphysema. In addition to the oedema fluid the alveoli contained carbon particles, small quantities of eosinophilic fibrillary material which gave negative stains for fibrin, and moderate numbers of mono-

nuclear cells, many of which were vacuolated. Occasional squames were present in some of the lungs, but no hyaline membrane was seen. The interstitial tissue was oedematous and often contained large air spaces (Fig. 4). There were numerous interstitial and intra-alveolar haemorrhages. The latter were not particularly extensive except in Case 5, in which large areas of the lung were involved, giving an appearance reminiscent of pulmonary infarction.



FIG. 4.—Interstitial emphysema, with large air spaces in interlobular septum. ($\times 55$.)

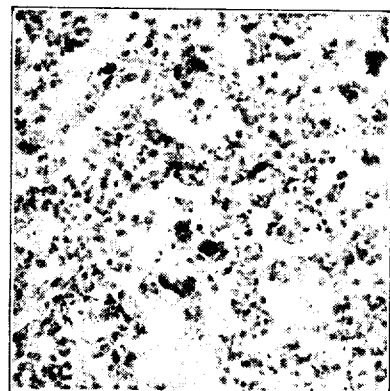


FIG. 5.—Droplets of lipid material (appearing black) within the alveoli. ($\times 200$.)

tions of painted wood and linoleum were distilled separately. In each case a brown oily distillate was obtained. No attempt was made to analyse this, but it was smeared on slides and subjected to the same staining procedure (Scharlach R) as the histological material. In the case of the distillate from the painted wood, small quantities of positively staining material were obtained, while in the case of the linoleum a considerable proportion of the distillate stained positively by this method. Thus it seemed reasonable to infer that the lipid material in the lungs had been inhaled in the smoke.

From the gross and microscopical appearances it was not possible to determine which cases had suffered the greatest exposure to the smoke, nor was it possible to correlate the severity of the bronchial lesion with the quantity of either carbon or lipid present.

Discussion

These 12 babies died as a result of progressive bronchial occlusion together with pulmonary oedema and infection. The first three babies to die showed less severe obstruction than the subsequent cases; little separation of the cast had occurred, but pulmonary oedema was much more pro-

nounced, and there was extensive bronchopneumonia. In the later cases pulmonary oedema and infection were less prominent features, but bronchial obstruction had become much more complete as a result of secretion of mucus and displacement of the membranes cast into the centre of the bronchial lumen.

The retention of such large quantities of mucus within the bronchial tree was due largely to two factors. Firstly, much of the mucus was trapped between the bronchial wall and the cast, and removal was often further impeded by the fact that adjacent parts of the cast were still adherent to the bronchial wall. Secondly, the removal of mucus was prevented by the destruction of most of the ciliated epithelium.

The formation of the bronchial cast was attributed to irritant substances present in the smoke to which the babies were exposed. Membranous bronchitis is a recognized, though fortunately uncommon, complication of some infections, notably diphtheria, and has also been reported following the inhalation of certain war gases (Winternitz, 1920), nitrous fumes (von Oettingen, 1941), and after exposure to atomic radiation (Liebow *et al.*, 1949). Lesions very similar to those described above were reported as occurring in some of the victims of the Coconut Grove fire.

There is every reason to believe that if the babies had survived the initial hazards of pulmonary oedema and infection, and the later period of bronchial obstruction, complete restoration of the bronchial epithelium might have occurred, regeneration proceeding from the surviving islands of epithelium in the mucosal folds and duct orifices (Wright, 1950).

If the course of events is reviewed in the light of subsequent investigations the most important question that arises is whether anything further could have been done to help these babies. Atropine might have been given in sufficient doses to diminish secretion. It might, however, also have made secretions more viscid and less likely to separate. Humidification by mist, perhaps with the addition of a detergent, might have been used, but this could have led to fatal increase in the already great amount of fluid in the lungs. Cortisone might perhaps have been given earlier and in larger doses; but in addition to diminishing exudative responses cortisone has other effects, including that of promoting fluid retention and possibly diminishing resistance to infection. More vigorous and intensive aspiration of the lower respiratory tract might have been attempted, including perhaps aspiration through tracheotomies, but such procedures in the newborn have their own risks and probably a high mortality. They might, however, have been effective in the babies who survived to the third day, when some of the casts were beginning to separate.

The simple measures which were attempted were carried out by ourselves and by the nursing staff. The latter, working in eight-hour shifts, showed skill and gentleness that were all that could be desired. Percussion drainage was at first performed by one of us, but later, too, this was taken on by the nursing staff in some cases.

A tragic event such as this should not perhaps be used as an argument for or against any system of care. The custom of putting all the babies into a nursery for the night so that the mothers can sleep undisturbed is a widespread one, and is particularly the rule in smaller maternity homes. Quite apart from the possibility of a disaster such as this, the system is, we think, a bad one, and we would repeat the opinion frequently given by paediatricians and obstetricians that the proper place for the normal newborn baby is in a cot close to the mother's bed.

Summary

An account is given of the Dellwood fire which caused the death of 13 newborn babies. Two babies survived and are now apparently normal. One baby was found dead. The others died within three days of the fire.

The symptoms were those of increasing respiratory distress, pyrexia, cough, and cyanotic attacks. Death was due to bronchopneumonia in the first 24 hours, or later to bronchial obstruction caused by casts consisting mainly of fused necrotic epithelial cells. The bronchial changes were due to inhalation of smoke.

Treatment included oxygen, chemotherapy, cortisone, percussion and postural drainage, and aspiration of mucus from the mouth and nasopharynx. Tracheal aspiration and gastric oxygen were used, but the results were disappointing. The question of possible alternative treatment is discussed.

Among the many who helped us during these babies' illness we would like especially to record our thanks to Dr. B. Schlesinger, Dr. D. Foskett, and Mr. E. Hunt Williams. Acknowledgments are due to Dr. J. A. Hardy, the police surgeon in Reading, who on H.M. Coroner's instructions carried out the post-mortem examinations. In later investigations valuable technical advice was received from Mr. L. C. Nickolls, Director of the Metropolitan Police Laboratory. Valuable help was received in the laboratory investigations from Dr. C. de Courcy and Mrs. A. Hopkins. We are also grateful to Dr. M. Bodian for assistance in the preparation of this paper, and to Mr. Derek Martin, of the Department of Medical Illustration, Great Ormond Street, for the photographs.

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THE SOCIAL AND PSYCHOLOGICAL BACKGROUNDS OF TUBERCULOUS CHILDREN

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One of the projects undertaken by a research team investigating the effects on personality development of separation from the mother in early childhood was a follow-up of children who, because they had tuberculosis, had been separated from their mothers, and in a sanatorium, for a period during their first years of life (Bowlby, Ainsworth, Boston, and Rosenbluth, 1955). This required us to investigate the social background of these children, and the present study is a by-product of the main research. It gives some findings relating to the economic and housing conditions, the extent of family illness and disruption, and some of the psychological attitudes found among members of these families during the year 1950. Although we are aware that what is described will not be new to workers in the field of tuberculosis, our impression is that that knowledge exists in rather a fragmentary form.

The gross sample studied was obtained by extracting from the records of a sanatorium the record of every child admitted between birth and 4 years, between January 1, 1940, and November 30, 1948, inclusive. From this sample were eliminated children whose primary tuberculosis was complicated by bone or abdominal infection, those who had left the county of Middle-

sex, who had gone into the care of other institutions, or who had died, and those who were not yet of school age. The resulting sample consisted of 60 children—41 boys and 19 girls. They had all returned to their homes and were attending schools in the county. The present addresses of the children were traced with the help of the chest clinic and education authority records.

The need to make direct systematic inquiry of the families in which we were interested was recognized by the staffs of chest clinics, and in arranging the interviews it was of great help to be able to state that both the sanatorium and the local chest clinics were co-operating in the research. The warm welcome and readiness to talk which the psychiatric social worker met with in most families are believed to be a tribute to the sanatorium, which most families remembered with gratitude. Lack of co-operation was on each occasion related to reluctance to disclose an especially difficult or disturbed family situation.

The total sample of 60 children came from 57 families. Two families, containing three children, refused altogether to co-operate, and one of two siblings was in a residential school. The total number of families remaining is therefore 55, containing 56 children.

The average length of interviewing time was four to five hours, usually spread over two or three visits. The psychiatric social worker spent a little time at the beginning of the first interview explaining the purpose of the research. Once the family had agreed to co-operate she attempted to guide the interview so as to cover the main points on which information was sought. Where there was reluctance to give information this was not pressed for. On the other hand, the parents often talked at length about their problems, and in many cases revealed their attitudes to tuberculosis and to the tuberculosis service. It was thus, incidentally and unasked for, that much of our material was obtained.

Economic and Housing Conditions

The families were rated for economic and for housing conditions, each on a four-point scale. The rating "A" for economic conditions implies an income on which the family could manage fairly well and afford an annual holiday. The rating "B" implies an economic situation that is fairly adequate. The rating "C" implies a rather poor income, usually only one parent being at work, in an unskilled occupation, and the family finding it difficult to make ends meet; a summer holiday was out of the question, or possible only once in a while and at great sacrifice. The rating "D" implies that the families suffered real economic hardship. These were the families the mothers of which were widows and had to live on widows' pensions supplemented by a little earning of their own or by the National Assistance Board. The distribution of ratings is shown in Table I.

TABLE I.—*Economic Circumstances of 55 Families*

Rating	No. of Families
A: Comfortable	6
B: Fairly adequate	20
C: Poor	16
D: Economic hardship	13

Not infrequently the psychiatric social worker heard accounts of severe economic hardship in the parent's own childhood, and also during the pre-war or early war years, when the sample child was an infant. But with the great majority of the families the economic situation had taken a marked turn for the better in the post-war years. At the time of the inquiry the black spot was the 13 families rated "D"

which constitute one-quarter of the families concerned, and which were living on a bare subsistence level. Twelve of these families were existing on widows' pensions, and in the other the father had been ill for the past two years and the family lived on National Assistance money. It seemed that they could not afford all the food they should have, and the psychiatric social worker heard stories of children having to stay away from school on rainy days because they did not possess adequate clothing.

Most of the families lived in good, usually small, semi-detached suburban houses, often on council estates. The rating "A" for housing conditions indicates that the house was very good and there were sufficient rooms for the children to have their own bedrooms; rating "B" also implies good housing, but with the need for some sharing of bedrooms; rating "C" was given either where the house was in a poor condition or where, although the house was a reasonably good one, it was not large enough for the family; rating "D" implied that the house was in a poor condition and there was inadequate space. The distribution of ratings is shown in Table II.

TABLE II.—*Ratings of Housing Committee*

Rating	No. of Families
A: Very good	10
B: Good	24
C: Poor	15
D: Inadequate	6
	55

Of the six families living in inadequate housing conditions, one lived in a condemned house, three had only part of a house each with quite insufficient room for the family, and the two others lived in old-fashioned small houses where there was gross overcrowding.

Family Illness and Disruption

The extent to which there had been illness in the family with consequent disruption was very great. In the 55 families, only the children of 29 were living with both their parents in an intact family. The remaining 26 families (containing 27 children) were all disrupted, either through the death of one or other of the parents (in 22 families) or because the parents were separated (in 4 families).

In the great majority of cases this disruption was due to tuberculosis, either in the past or in the present. Nineteen parents and 8 siblings had died from the disease. Altogether infection or death from the illness had occurred in a parent or sibling in 33 of the families, leaving only 22 families in which the child studied was the only case. Table III presents the incidence of cases of tuberculosis in the families

TABLE III.—*Extent of Tuberculous Illness in the 55 Families*

	Both Parents	Father Only	Mother Only	One Sibling	More than one Sibling
Past tuberculosis	1	16	11	11	5
Death from tuberculosis	1	16	1	6	1
Present tuberculosis	—	—	9	2	—

other than the sample child. In addition to the deaths shown in this table, two fathers and three mothers had died of other causes.

Table IV shows the presumed source of the child's infection. It will be seen that about half the children were believed to have been infected by one of their parents.

TABLE IV.—*Contact Through Whom Child was Thought to Have Been Infected*

Contact	No. of Children
Father	18
Mother	11
Grandparents, uncle, or aunt	10
Neighbour	4
Contact unknown	13
	56

In addition to the 22 families which had been disrupted by death, four were not intact for reasons of illegitimacy (1), divorce (2), and separation (1).

Even among the 29 children who were living with both parents family life was not always normal. In two cases the parents had, since the child's birth, separated for a while, but had later decided to live together again. In one of these the ostensible cause for the separation had been father's dread of mother's tuberculous illness. There were four families in which the mother was ill with tuberculosis at the time of inquiry, and in several other cases the mothers were very preoccupied with their own health and worried in case they had tuberculosis. In two more families the fathers were ill, but the nature of the illness was not known to the psychiatric social worker. In a further eight families father, mother, or a sibling had had tuberculosis at one time or another, and family life had therefore been upset owing to the absence of a member in a sanatorium, with consequent anxiety about the health of other members of the family. This leaves a balance of only 13 families whose family life had been relatively undisturbed.

Attitudes and Feelings

In the course of the inquiry it became apparent what far-reaching and complex psychological repercussions were aroused by the existence of a tuberculous illness in a member of a family. Many parents spent a considerable time in discussing with us their fears for their own or their children's future health, or whether or not to tell the child about his having had tuberculosis in early childhood. As a result, much incidental light was thrown on the attitudes to the illness and on the ways these had influenced their relationship to their children and their neighbours. As these attitudes to tuberculosis were not the focus of interest, they were not systematically investigated and therefore there are gaps in our information. In the description which follows it is thus not possible to give accurate figures of the numbers of families concerned.

Fear of Tuberculosis

As was only to be expected in view of the extent of the illness and the number of deaths among these families, a conscious fear of it and its implications was very widespread. In a surprising number of cases (about one-fifth), however, the parents dealt with these anxieties by attempting to deny that there had been any tuberculous illness at all. The most striking was where a father, whose wife and son had both been in the sanatorium for considerable lengths of time, attempted to convince the psychiatric social worker that he had x-ray plates to prove that neither of them had had tuberculosis at all. He felt that there had been some plot to take his family away from him. (His wife had been infected by her mother, whom she had nursed until the mother had died of tuberculosis.) This man does not approve of his son going to the chest clinic now. He was clearly very paranoid, extremely suspicious, and willing to co-operate in the research only after the psychiatric social worker had explained that we were not really concerned with the reasons for the child's having had to go to hospital but only with his subsequent development.

Although this man's reactions were exceptional, similar attitudes in lesser degrees were present in quite a number of parents. There were cases where a mother or father had in the past refused to go to a doctor or into a sanatorium after the diagnosis had been made, staunchly denying that there was anything wrong with them. Some of them had died at home, and before doing so had infected their young child. One woman told the psychiatric social worker that it was almost a relief to her when her husband died, as she felt that that had saved the child's life, because he had refused to let the child be seen by a doctor. The father of one family and the mother in another were ill at home at the time of the investigation, afraid that they might

have tuberculosis, but protesting that there was nothing really wrong and that they did not think it was necessary to consult a doctor.

Several parents maintained that they did not know why their children had had to go to the sanatorium. Even where the hospital stay had been a very long one they insisted that it had probably been only for observation, not because the child had really been ill. This attempt to deny the illness was clearly bound up with a tremendous fear of it; in some cases both attitudes existed quite consciously side by side. One mother, who had herself on two occasions been in a sanatorium, and whose child had had tuberculosis too, was in a continuing and constant panic about this illness. She remarked several times during the interview, however, that she did not think that either she or her child had really been ill, and clung to the belief that no doctor had ever told her in so many words that either of them had actually had tuberculosis. At another time she said, however, that she did not suppose they would have been kept in hospital so long if they had not been ill.

The attempt to deny the illness because of so overwhelming a fear of it thus led, in a number of families, to a failure to take proper measures for prevention and treatment. These findings are consistent with those of Gore and Hartston (1953), who, reporting on the results of questioning more than a thousand mothers of young children, found that 69% of them thought that there are many people who are afraid to be examined in case they have tuberculosis.

In a number of families (again about one-fifth) the reaction was the opposite to denial, and took the form of constant hypochondriacal fears for the families' health even in the face of frequent reassurance by their doctors that there was now nothing wrong; their lives appeared to be permanently overshadowed by fears for the children's health. Some mothers were so worried about their own health that it was difficult to get them to talk about anything else. One woman in particular described in detail all the symptoms from which she was suffering, which were identical to the symptoms which her own mother had had just before she had died of tuberculosis. Her doctor had assured her that there was in fact nothing wrong with her, but she was still very afraid that she was ill, and was also constantly watching her children's health for the slightest signs of indisposition. She said that she would be reassured only if she had an x-ray examination, but that her doctor would not give her a letter for an examination at the chest clinic, and without it the chest clinic would not see her.

In some cases the children had caught their parents' fears. One 13-year-old girl was said to be constantly preoccupied with her health and was always weighing herself. This girl was afraid to go to bed at night and always found one excuse after another to put it off for as long as she could. Frequently, when her mother finally said she must be tired now, she would reply, "Who wants to go to bed? People die in bed." She was said to grind her teeth, to sleep-walk, and often to talk and shout out in her sleep. Another young girl was described as a "proper old woman" by her mother, always fussing about her health and demanding aspirins.

Parents' Feeling of Guilt

Even where there were no great fears for their own or their children's health a certain pampering and over-protectiveness towards the child who had been ill was fairly general. Although this attitude is a very natural and understandable one after the child's return from the sanatorium, it frequently continued and was still very pronounced at the time of the investigation, years after the child's complete restoration to health. In these cases it seemed connected with the mother's feeling of guilt and assumption of personal responsibility that the child should have been ill at all. In some few cases there might have been legitimate grounds for the mother's feelings that had she taken greater precautions the child might not have been

infected. One woman, for instance, said that she was entirely to blame for the child's illness because, when he was a toddler and his father was ill at home, she was on one occasion not quick enough in removing the father's eating utensils and found the child with the father's spoon in his mouth.

Even where there was no reason whatsoever to think that the parents were in fact responsible for the child's illness through any lack of precaution—for instance, where the contact through whom the child was infected was unknown—some mothers said that they somehow felt guilty that their child should have been ill. In other cases it appeared to the psychiatric social worker that the parents protested too much that the blame for the illness lay elsewhere (with the grandparents, neighbours, etc.), and it seemed that unconsciously they also felt it was their own fault.

This widespread feeling of guilt no doubt played its part in leading a majority of the mothers to an initial over-anxiety and overprotection of the child. However, such attitudes are almost inevitable in a mother after her child has been away from her for a long time and especially if he shows some of the emotional disturbances which commonly follow such separations. In consequence, in considering the subsequent relations of mother and child, it is not easy to determine how much is due to the mother's sense of guilt and how much to the child's disturbance following separation and to the mother's attempts to meet the disturbance.

Attitude of Overprotection

It seemed that some of the mothers soon realized that it was important that their child should be treated the same as his siblings and so should not feel that he was a special case. Other mothers said that only after a while did they realize, through bitter experience, that the child was harmed by this attitude of overprotection, of constant watchfulness and anxiety about his health. In these cases the children had reacted by considering themselves special cases, or else had rebelled and become difficult to manage. Some of these mothers were able gradually to relax and allow their children more independence, but in some cases difficulties persisted; the children continued to insist that they must have special treatment because they had been ill. Other parents were quite unable to overcome their constant over-anxiety, and seemed to be unaware that they might be harming the child by it.

Although the knowledge that tuberculosis is an infectious illness was general among the 55 families, there quite often persisted side by side with it the belief that it is a hereditary disease. In several families there was some discussion and a wish for reassurance that the children, who are at present all well and not in contact with any tuberculous person, would grow up healthy; in particular, anxiety was expressed that, because there had been tuberculosis in the father or mother's family, the children were likely later to fall ill too. No doubt because of the great frequency of cross-infection in families the belief that tuberculosis is hereditary dies hard. Gore and Hartston (1953) found it expressed by 43% of the mothers questioned.

Should Parents Tell?

At the same time, much more surprisingly, it seemed to be taken almost for granted among many families that psychological factors influence both the incidence and the course of the illness. In those cases where the parents raised the problem whether or not to tell their children that they had been ill in early childhood, one of the main arguments against it was that the child might later worry and thus again develop tuberculosis. One woman said of her husband that when he fell ill she felt that he did not stand much chance of recovery as he was such a worrier. Another family agreed to co-operate in the research only when they were reassured that the child would not, through the psychiatric worker, get to know that he had ever been

in a sanatorium; they were determined never to tell him, as if he were to know about it he would worry and therefore fall ill again. Another woman said that her sister had announced that, should she ever have tuberculosis, she would not be ill long; when subsequently she did fall ill she died within a few months. This same woman was also determined never to tell her daughter that she had been ill, again for fear that the girl might worry and thus inevitably fall ill again. Many similar remarks showed that there was a very general belief that there is a close interaction between psychological attitudes and the course of the illness.

These attempts to keep the illness a secret from the child were perhaps also another indication of the mother's unconscious feeling of guilt that the child should have been ill at all and of the fear that he would blame her for it. Another important factor, however, was that it was felt that having had tuberculosis was equivalent to "being branded for life," a phrase the psychiatric social worker heard several times. It was felt to imply both a social and a vocational stigma. There were fears whether the child later might have difficulties in finding employment if he knew, and therefore would have to tell, that he had once had tuberculosis. An adoptive mother of one of the children said that she had not disclosed the fact that the child had ever had tuberculosis even to a new general practitioner: "Why should I tell him—let him find out for himself."

Ostracism

In some families the attempt to keep the illness a secret from the neighbourhood had been the response to most painful experiences of ostracism and of consequent loneliness and isolation. The popular feeling that tuberculosis is a result of neglect, poverty, uncleanness, and therefore a very shameful disease, as well as the tremendous fear of infection, resulted in cases of what seem to have been really cruel behaviour. One boy, who was 6 years old on his return from the sanatorium and did not go to school until 18 months later when he was perfectly well, had found that at school no other child would play with him. He was shunned equally by the children in his street. He was told by the mother of a little girl in his school that he must not breathe in her face, and several children, at their parents' request, were not allowed to sit next to him. He also started at a Sunday school at about the same time, but two children told him that if he continued to go to Sunday school they would have to have the windows open all the time. The parents did not send him there after that. On his eighth birthday his mother invited some children to tea, but none came. They have not attempted to give parties for him since.

Stories of ostracism of this kind in cases where there was no longer the slightest risk of infection were not infrequent. Whether true or exaggerated, the result had been that some families felt themselves to be outcasts and became determined to keep their past illness a guilty secret. Having themselves experienced such ostracism, too, families often found that they had not the heart to take necessary precautions against the very real risks of infection by a member of their own family. For instance, one woman said that she used to take her small child to see her own ill sister as the latter adored the baby and "it would have been too cruel to keep the baby away from her."

It is perhaps of interest that many of the attitudes and feelings that struck the psychiatric social worker when visiting these families are noted also as the characteristics of children between 6 and 13 years suffering from tuberculosis and in hospital (Dubo, 1950). Dubo noted, among other findings, their intense anxiety and preoccupation with thoughts of death, their attempts at denial, the feeling of being different from other people and stigmatized, and their tendency to take personal responsibility for the illness. She concludes that there is a need for psychotherapy as part of the treatment programme.

Conclusion

Although a tremendous amount has already been achieved in combating it, tuberculosis remains the most important infectious disease at the present time. The close interrelation between adverse socio-economic conditions and incidence and course of the illness has long been recognized, and much has been done in the last decades to improve economic conditions for the tuberculous patient. That a great deal more remains to be done is testified by the enormous case load each welfare officer in a chest clinic still has to carry, these cases being primarily those of families where there is still an urgent need to ameliorate material and economic hardships.

From a psychiatric point of view a number of studies have been made relating tuberculosis to temperament or personality type, either from the point of view of the effects of suffering from tuberculosis on the patient's personality, or of the effects of the patient's personality on the incidence and course of the illness—for example, Wittkower (1949). There appears to be a paucity of studies, however, on the effects of the illness on the patient's social relationships, whether within the family or with the community outside. What struck us so forcibly in this inquiry were the extent of the social and emotional problems resulting from a tuberculous illness in a family, the complexity of the feelings and attitudes aroused, and in particular the tremendous need found in so many of these families to talk about their anxieties. It seemed almost as if this had been their first opportunity for a long time to do so to someone who was prepared to listen at length.

In view of the pressing needs for more preventive work, medical care, sanatorium beds, better housing, and more financial assistance, it may seem premature to ask that help be given to tuberculous families for their emotional and social problems. Yet we believe that these needs will have to be met in future, both for the sake of the families themselves and for that of the community. Not only is there much unhappiness which could be alleviated, but, because of the seriousness of the disease, very strong feelings are aroused which in many cases, instead of leading to wise action, lead the sufferer to behaviour which makes matters worse for himself and others. The more aware health workers of all professions are of such feelings and the greater their skill in handling them, the more effective their work is likely to be as regards both health education and case work with individual families.

The observations reported in this paper were made in the course of a research project sponsored initially by the Sir Halley Stewart Trust and later by the Central Middlesex Group Hospital Management Committee (which manages the Tavistock Clinic) and the International Children's Centre, Paris, for all of whose support we are grateful. We are particularly indebted to Dr. J. C. Roberts and the staff of Harefield Hospital and to the regional hospital boards and county council staffs of the chest clinics which serve the County of Middlesex, for their co-operation in the inquiry, and to Mr. James Robertson, of the Tavistock Clinic, who assisted us in it.

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FATAL AGRANULOCYTOSIS DURING TREATMENT WITH CHLORPROMAZINE

BY

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Although only recently introduced, chlorpromazine is already a widely prescribed drug. Serious complications encountered during its use should therefore be made known. The aim of this note is to record the clinical details of a patient who died of agranulocytosis during a course of treatment with chlorpromazine.

Literature

Mild and transient leucopenia during the early weeks of treatment with this drug is well recognized (Andersen, 1954), but fully developed agranulocytosis has seldom been recorded. Lomas (1954) drew attention to a 69-year-old woman who developed agranulocytosis after receiving 6 g. of chlorpromazine in 41 days. The total leucocyte count fell to 680 per c.mm., of which only 11% were polymorphs. The drug was withdrawn and prophylactic penicillin was administered, but after 10 days there was still no improvement in the blood count. The patient was then given five injections of 50 mg. of cortisone. Subsequently the white blood count rapidly became normal. A second case was reported from Denmark by Munch-Petersen (1954). His patient was a 71-year-old woman who was given 10.6 g. of chlorpromazine in 48 days. On the 46th day of treatment she developed diarrhoea and on the 48th her temperature rose. The white-cell count was 800 per c.mm., of which 14% were polymorphs. The patient was treated with repeated blood transfusions, folic acid, and prophylactic penicillin. In spite of a mild bilateral bronchopneumonia she made slow but steady progress, and nine days after the initial blood examination the white-cell count was again normal. A third example has been recorded in Norway by Giacobini and Lassenius (1954) in a 57-year-old woman who was treated with a combination of chlorpromazine and promethazine. The latter antihistaminic drug was used to enhance the sedative effect of chlorpromazine and to guard against any untoward sensitivity reactions. This latter device was notably unsuccessful. On the 40th day of treatment the patient complained of pain in the limbs and lassitude, and on the 45th day a blood count showed 900 leucocytes per c.mm., of which 200 (22%) were polymorphonuclears. The patient was treated with blood transfusion and penicillin, and recovered well. A fortnight after the discovery of agranulocytosis no abnormality could be found in the white-cell count.

All these patients were women, all were of middle or old age, and all recovered. All developed agranulocytosis at about the sixth week of treatment with chlorpromazine, and in none were there any warning signs of sensitivity to the drug. The patient described below differs from them in that she was a young woman, her illness proved fatal, and clear-cut clinical evidence of sensitivity to chlorpromazine preceded the development of agranulocytosis by an interval of 2½ weeks.

Case History

The patient was a married woman aged 38. She had first consulted a psychiatrist in 1943, when she was 27. A diagnosis of hysteria was made, and she subsequently attended the psychiatric out-patient department fairly regularly for a number of years. Her symptoms during this time were very numerous, and no organic cause for them could be found. They did not improve. In 1951 she was admitted to hospital in an hallucinated and maniacal state, which necessitated her early transfer to a mental hospital. There was little or no response to a course of electric

convulsion therapy, and she ultimately returned home. Between 1951 and 1954 she complained frequently of lassitude, syncope, excessive menstrual loss, and pain involving most parts of the body. These symptoms could be temporarily controlled only by frequent changes in treatment. Many remedies were therefore used. They included compound tablets of codeine; sodium salicylate and potassium citrate in simple mixtures; aspirin, phenacetin, and caffeine tablets; "hypon" tablets; and "amenorone" tablets. None of these preparations is known to depress the activity of the bone marrow. Amidopyrine and the sulphonamides were not used.

On August 17, 1954, treatment with chlorpromazine was recommended. The initial dose was 25 mg. three times daily, and this was doubled nine days later, the patient receiving 150 mg. daily on and after August 26. On August 28 she complained of lassitude and fever, and her temperature was 101.2° F. (38.4° C.). Although examination revealed no obvious cause for the fever it was thought best to treat her with procaine penicillin intramuscularly for three days. The fever lasted only two days. On September 1, however, 14 days after the treatment with chlorpromazine had started, she complained that she was passing pale faeces and dark urine. Jaundice was confirmed on clinical examination. Like the fever, this also was short-lived, and on September 4 was barely discernible. On September 6 a third complication arose: an irritating rash developed on the limbs. Two days later the presence of a discrete maculo-papular erythema was confirmed: it involved all four limbs, but particularly the thighs and calves. On September 10 the rash had gone. Up to this point treatment with 150 mg. of chlorpromazine daily had been continued without interruption. It was now continued throughout 2½ weeks of relatively good health. On September 27, however, after receiving 5,475 g. of chlorpromazine in 41 days, the patient developed ulceration of the gums and tongue and her temperature rose to 101.2° F. (38.4° C.). An immediate blood count showed 900 white cells per c.mm. (polymorphonuclear leucocytes 10%, lymphocytes 90%). A diagnosis of agranulocytosis was made. Treatment with chlorpromazine was stopped at once, and the patient was immediately admitted to hospital.

On admission the patient lay still and resented examination. Her temperature was 100° F. (37.8° C.), pulse 100, and respirations 22. Her tongue was dry and furred. There were numerous small ulcers on the mucous membranes of her tongue and pharynx. The gums were also ulcerated. There was no pallor of the mucous membranes, and no jaundice, rash, oedema, or enlargement of the lymphatic glands. The heart and lungs were normal; the liver and spleen could not be felt; and the urine contained neither albumin nor sugar.

In spite of the withdrawal of chlorpromazine and the prophylactic injection of 500,000 units of penicillin intramuscularly twice daily, the patient did not improve. An irregular fever between 99 and 101° F. (37.2 and 38.3° C.) was maintained, and ulcerative stomatitis persisted. Daily blood counts, the results of which are given below, showed a persistent grave granulopenia.

Date	Hb %	R.B.C. per c.mm.	W.B.C. per c.mm.	Polymorphs %	Platelets per c.mm.
27.9.54			900	10	
28.9.54	83		1,600	10	
29.9.54	83	3,800,000	1,500		
1.10.54			1,400		
2.10.54	70		900	15	290,000
4.10.54			800	5	

On October 2 profuse diarrhoea developed, and from this point the patient rapidly deteriorated. Next day she developed right lower lobar pneumonia which failed to respond to 2,000,000 units of penicillin intramuscularly, 500 mg. of oxytetracycline intravenously, and 2 g. of oxytetracycline

intramuscularly, all given within 24 hours. On October 4, one week after admission to hospital and seven weeks after starting treatment with chlorpromazine, the patient died. Permission for necropsy was not granted.

Comment

For two reasons it is difficult to avoid the conclusion that chlorpromazine was responsible for this fatal agranulocytosis. Firstly, the agranulocytosis developed six weeks after the first dose of chlorpromazine; this interval corresponds with that noted in other recorded cases. Secondly, the agranulocytosis followed definite evidence of sensitivity to chlorpromazine. Transient fever, jaundice, and skin rashes are well recognized as complications of treatment with chlorpromazine. The other drugs used before treatment with chlorpromazine began can scarcely be incriminated. They do not carry the reputation of toxicity towards the bone marrow, and they had been taken frequently and harmlessly by this same patient on previous occasions.

This case suggests that evidence of sensitivity to chlorpromazine should be treated with respect. Fever, jaundice, and skin eruptions during the early weeks of treatment should be taken as danger signals and should compel repeated examination of the blood, if not withdrawal of the drug. Ulcerative stomatitis, particularly if it occurs at about the sixth week of treatment, should be an absolute indication for the immediate cessation of chlorpromazine therapy.

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CYST FORMATION SEVEN YEARS AFTER A CUTIS GRAFT REPAIR OF HERNIA

BY

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The use of skin in the repair of hernia was suggested more than forty years ago in Germany (Loewe, 1913), and was first applied clinically to post-operative incisional herniae (Rehn, 1914). It did not come into any general use for inguinal herniorrhaphy until Mair (1945) published his paper. The possibility of cyst formation due to the persistence of epithelial or glandular elements was not noted in the first two series of cases published (Mair, 1946; Marsden, 1948), but was stressed by Strahan (1950) in a series of 413 cases. Strahan found nine definite cases of cyst or sinus formation, with a number of others in which the presence of a cyst was suspected but not proved by actual operation. Most of the cysts in Strahan's series were small; but two were large, and his Case 3 is very similar to the one reported here.

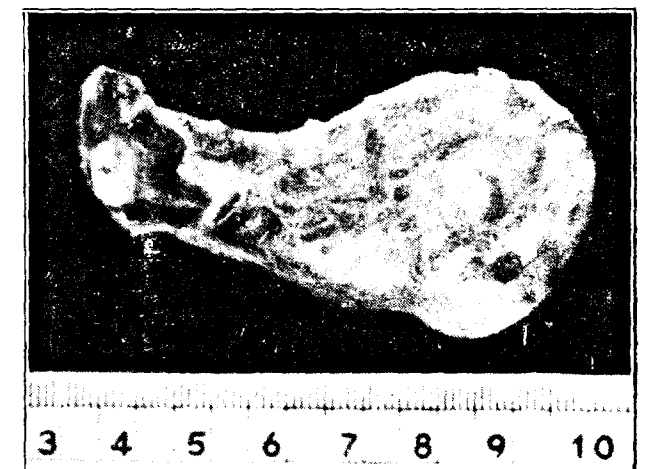
Case Report

A railway worker aged 48 first developed a left inguinal hernia in 1946. The hernia was operated on in May, 1947, and the transcript of the rather brief operation note reads as follows: "Left inguinal incision. Poor musculature. Direct inguinal hernia. Cutis graft repair performed. Patient to remain in bed three weeks." The patient stated that he had made an uncomplicated recovery after operation, and that he had not returned to his job, which entailed heavy lifting, until August, 1947. He remained quite free from symptoms and from any sign of recurrence until June, 1954—more than seven years after the operation—when he began

to complain of pain in the groin, radiating into the testicle, and later noticed a swelling under his operation scar. He was examined by a surgeon, who diagnosed recurrent left inguinal hernia.

Examination showed a heavily built overweight man with protuberant abdominal wall rather heavily laden with fat. There was a well-healed oblique operation scar in the left inguinal region, and beneath it an elongated smooth solid swelling lying in the long axis of the inguinal canal. It was not reducible, but appeared to have some impulse on coughing. A diagnosis of incarcerated omentum in a recurrent hernial sac was made—the details of the previous operation being overlooked through an over-hasty perusal of a rather illegibly written case record.

At operation the first feature noticeable was the unusually dense fibrotic obliteration of the normal layers of the inguinal musculature. The swelling was obviously solid, and, after it had been separated from the spermatic cord and dissected up, it became apparent that it stopped short



at the internal ring and had no communication with the peritoneal cavity. The swelling, which measured 7 cm. in length and nearly 3 cm. in greatest diameter, was removed intact. Its removal left a potential weakness in the posterior wall of the inguinal canal, which was repaired with silk sutures after a relaxing incision in the anterior rectus sheath.

The patient made an uncomplicated recovery after operation, and left hospital with no evidence of any recurrent herniation.

The swelling, when examined after removal, proved to be a cyst, with walls varying from 2 to 5 mm. in thickness. It contained a waxy inspissated material, and several dark hairs, one of which was an inch (2.5 cm.) in length, were seen lying free in it. Histological examination of the cyst wall showed a well-formed squamous epithelial lining, with a connective-tissue backing resembling normal dermis, though without its papillary structure. The size and shape of the cyst are well shown in the photograph.

Comment

Apart from the cases mentioned by Strahan in his large series, only two cases have been reported in this country of cyst formation after buried skin-graft operations (Clarke, 1952; Powell and Ewing, 1952). Clarke made a thorough review of the relevant literature, and discussed the factors favouring cyst formation. His case, however, like most of the others, was a small cyst discovered coincidentally at operation for recurrent hernia. The possibility of the persistence of buried glandular elements was recognized by Rehn in his original paper. Experimental work by Zimches (1931) showed that a piece of skin inserted free into muscle tissue tends to curl up into a U shape and regularly to form an inclusion cyst; and even if sutured into position

under normal tension the epithelium may grow over the opposing surfaces and so form a cyst. This work was confirmed by Uihlein (1939), and all subsequent writers on the subject have emphasized the necessity of suturing the graft under as great a tension as possible—in contradiction of all the accepted rules for hernia repair. It is obvious, however, that this is a factor which cannot be controlled with complete certainty, and Strahan concluded that, in spite of the most careful technique, any surgeon doing a large number of these operations will inevitably meet some cases of cyst formation. Whilst this does not condemn the method, it must temper enthusiasm for it.

The present case is of interest for the large size of the cyst, requiring operative removal although the hernia itself had not recurred, and for the long interval of seven years between the implanting of the graft and the appearance of the cyst.

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Medical Memoranda

Caeco-colic Intussusception Complicating Perforated Appendicitis

The association of caeco-colic intussusception with acute appendicitis seems to be rare, only one case having been found in the literature.

CASE REPORT

A boy aged 22 months was admitted to hospital on January 24, 1954, with a history that 48 hours previously he had had abdominal pain and had vomited once. After a few hours the pain went away, but it recurred 24 hours later, and there had been periods of screaming with evident abdominal pain and pulling up of the legs, and usually a vomit. The attacks lasted for 5–15 minutes and occurred every hour or so. Between the attacks he was quiet, and in the few hours before admission became rather drowsy and disinterested. He had been taking fluids fairly well between the attacks.

Examination showed a flushed and toxic-looking little boy. His pulse was 160 and temperature 101° F. (38.3° C.). The tongue was coated, but there was no evidence of dehydration. The abdomen showed generalized rigidity, maximal on the right side, where there was extreme tenderness. Rectal examination revealed a "bogginess" in the recto-vesical pouch but no blood. The chest and C.V.S. showed nothing abnormal. A diagnosis of peritonitis from appendicitis was made, although the recent history suggested an intussusception.

Operation.—Under anaesthesia a rather bulky, sausage-shaped mass was felt just to the right of and above the umbilicus. On laparotomy through a right paramedian incision a diffusing peritonitis was found and an amount of thin pus with small fibrin flakes was sucked out. The small gut was only slightly distended. The apex of the intussusception had reached the right transverse colon; it was pushed back and easily reduced. The apex was caecal, at the level of the appendicular base, which could not be seen, as the proximal half of the appendix was retroperitoneal. This part of the caecum was thickened and congested and the appearances extended back along 4 in. (10 cm.) of ileum, the mesentery of which was rather bruised. The distal 1½ in. (3.8 cm.) of the appendix, which was visible, was congested correspondingly, and it was obvious that all this gut was

fully viable. Over the area of the appendicular base was a small yellow patch, and on following the appendix back to its base by opening the peritoneum a small abscess surrounding a gangrenous perforated segment was revealed. The base was just clear, and appendicectomy was carried out. A small drain was inserted down to the area and the abdomen was closed.

Post-operatively the patient took fluids orally and was given penicillin and streptomycin by intramuscular injection, and after a slow first 24 hours he made a rapid and completely uneventful recovery. He was discharged twelve days later.

COMMENT

The clinical picture was interesting in that the recent history suggested intussusception, whereas the examination suggested peritonitis from appendicitis. The clear viability of all tissue except the perforated gangrenous segment of the appendix confirms that the appendicitis preceded the intussusception. It obviously must have done, otherwise there would have been no peritonitis. The presence of a localized abscess on the caecal wall initiated the intussusception.

It was remarkable how innocent the visible portion of the appendix looked, and this case may serve to emphasize that the appendix should be closely examined, especially where the apex of an intussusception is caecal. A small caecal abscess as an initiating mechanism was noted by Gavin Cleland (1953), but under different circumstances—following appendicectomy with invagination of the stump. Lipin and Miller (1948) reported a case of acute appendicitis complicated by intussusception in a man aged 21.

I wish to thank Mr. John Talbot for the opportunity of dealing with this case.

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Recovery after Penetrating Wound of the Heart

Contrary to the accepted belief of the popular fiction writer, injury to the heart by a penetrating wound of the chest may occur without an inevitably fatal result. The following is a report of a case which came under my care.

CASE REPORT

On April 2, 1953, at about 10.30 p.m., a man of 22 was brought into the General Hospital, Ashton-under-Lyne, following a knife injury sustained during a brawl. He was extremely shocked and suffering from extensive blood loss. His clothing was heavily bloodstained and small cuts were present in his overcoat, jacket, and shirt in the left pre-cordial region. He was semiconscious and irritable, and needed considerable restraint to prevent him falling from the stretcher. Respiration was deep and sighing, there was extreme pallor of the lips, face, and hands; sweating was profuse, and no pulse was discernible at the wrist or in the neck.

After a slow blood transfusion the blood pressure rose to 56 mm. Hg, and it was decided to remove his clothing and examine his chest. There was a vertical incised wound in the fifth left intercostal space, about 1 in. (2.5 cm.) in length and 1 in. lateral to the mid-clavicular line. The wound was not now bleeding. Percussion revealed a stony dullness over the left half of the chest, with considerable mediastinal shift to the right. On auscultation no breath sounds could be heard on the left side of the thorax. A diagnosis of haemothorax was made, probably with injury to the left lung. When the systolic blood pressure had risen to 110 mm. Hg preparations were made for an emergency thoracotomy. However, on arrival at the theatre the blood pressure had fallen to 45 mm. and further resuscitation and transfusion were necessary before the operation could be started.

An incision was made along the line of the fifth rib and costal cartilage, from the mid-sternal to the mid-axillary line. On exposure of the rib, it was seen that the fifth costal cartilage had been severed close to the costo-chondral junction and the parietal pleura was open for about 1½ in. (4.4 cm.) vertically. The rib and cartilage were excised sub-periosteally from sternum to posterior axillary line, and the bed of the rib was incised medially and laterally from the edges of the original wound. After spreading the other ribs to open the wound, it could be seen that the left side of the thorax was occupied by a large quantity of blood clot, obscuring the viscera completely. About 3 pints (1.7 litres) of clot and blood-stained fluid were removed. No evidence of injury to the lung could be found; but a blood clot was protruding through a wound in the pericardium about 1½ in. (3.8 cm.) long on the anterior aspect close to the left border. The opening was enlarged to form an L-shaped flap, which was turned back, and the clots were removed from the pericardial cavity. This rendered the heart visible, and it was seen that ½ in. (1.3 cm.) lateral to the anterior coronary vessels, towards the left border of the heart, there was an incised wound lying in the length of its fibres and about 1½ in. (3 cm.) long. No blood was issuing from this wound and no attempt was made to separate the wound edges, which had adhered to each other. Five interrupted sutures of size 0 chromic catgut were inserted deeply, using each suture as a stay whilst inserting the next stitch, before cutting the ends. As much of the remaining clot as possible was removed from the pericardial space and the pericardium was closed loosely with 00 chromic gut. After further careful inspection the thorax was closed in layers without drainage, the left lung being inflated by the anaesthetist. The patient was then returned to the ward, and at that time his systolic blood pressure was 96 mm.

The following evening the mediastinum had deviated to the right and respiration was becoming laboured. There was dullness at the left base and both lungs were moist to auscultation. Aspiration of the left side of the chest yielded 10 oz. (280 ml.) of heavily blood-stained fluid. A similar aspiration after a further 24 hours yielded 12 oz. (340 ml.) of fluid, not so heavily blood-stained. No further aspirations were necessary, but an attempt was made to regulate the transfusion so that the blood pressure remained at about 100 mm.

The patient made an uneventful recovery and was discharged from hospital four weeks after admission. When seen six weeks later his only complaint was pain at the left base on coughing. There was no dyspnoea on moderate exertion.

I wish to thank Mr. P. W. Bleasdale for permission to publish this case; also the anaesthetist, without whom the operation would have been impossible. Last, but by no means least, I thank the nursing staff and laboratory technicians of the hospital.

R. W. LAWRIE, M.R.C.S.

A Case of Acute Nephritis in Pregnancy

Acute nephritis occurring during pregnancy is said to be rare. O'Dwyer and Montgomery (1954) reported three cases, and state that a search of the literature yielded only a further 23 cases. They suggest that with conservative treatment the course of acute nephritis is not adversely affected by pregnancy.

The following case of acute nephritis occurring in the fourth month of a second pregnancy is reported. The pregnancy resulted in normal delivery at term and apparent recovery of the mother. This was followed two years later by a third successful and normal pregnancy and delivery.

CASE REPORT

A 2-gravida aged 31 was first seen at the antenatal clinic on August 28, 1951, when three months pregnant. Her first pregnancy in 1945 had been normal. Her general condition was satisfactory. The urine contained no albumin,

the blood pressure was 130/70, and the haemoglobin 84% (12.5 g.). She attended again on September 11, when her general health remained satisfactory, the urine contained no albumin, the blood pressure was 120/70, and she had gained 1 lb. (0.45 kg.) in weight. There was no oedema present at either attendance.

On September 15 she developed a sore throat which lasted for three days, but did not seek medical advice until a week later, when she first noticed the dark red colour of her urine. On September 27, after three days of complete rest in bed at home, she was admitted to hospital on account of the rapid appearance of considerable oedema.

On examination on admission she looked ill, her face was pale and distinctly puffy, and there was considerable pitting oedema of the abdominal wall, sacrum, and legs. She was in no pain. The throat appeared normal. Her temperature, heart, and lungs were normal. The pulse rate was 80–84 a minute. The blood pressure was 144/92. There was no tenderness in the abdomen or renal angles and micturition was painless. The uterus corresponded to an 18-weeks pregnancy. The urine was a smoky red, boiled nearly solid, and a catheter specimen showed a heavy deposit of albumin, 6 pus cells per 1/6 field, many red blood cells, and a few epithelial cells. No casts were reported but much amorphous debris. Culture gave a scanty growth of *Bact. coli*. A throat swab showed no β haemolytic streptococci. In the first 24 hours 55 oz. (1.6 litres) of urine was passed and the albumin present measured 2 g. per litre (Esbach).

Treatment at the outset comprised absolute rest in bed and restriction of fluids and salt. Milk, fruit drinks, and glucose were allowed, and added vitamins. During the first 14 days in hospital the urinary output remained satisfactory; the oedema slowly lessened and disappeared. The urine remained, however, smoky red, and on October 10 the albumin measured 6 g. per litre (Esbach). The haemoglobin was 54% (8.5 g.). The retinæ were normal and the patient looked and felt better. The blood pressure varied from 140/88 to 148/92. During the next ten days the urine became normal in colour, the albuminuria diminished to 2.5 g. per litre (Esbach), and the blood pressure fell to 130/80. Oral iron was given and the protein in the diet was rapidly increased. She was discharged home to rest in bed on October 22. She was readmitted twice for a few days in November and again in January for reassessment.

On November 8 albuminuria was 1.5 g. per litre (Esbach) and the blood pressure 112/70, and on January 2, 1952, a catheter specimen of urine showed a faint trace of protein, and the deposit an occasional leucocyte and red cell with some epithelial cells and debris. Cultures showed no significant growth. The pregnancy proceeded normally. The blood pressure was 124/82 and haemoglobin 80%. The patient continued resting, mostly in bed, at home, on a normal diet with added vitamins and iron.

On February 26 she was normally delivered, in hospital, of a healthy 8 lb. 3 oz. (3.7 kg.) infant. The placenta appeared to be normal. At post-natal examination on April 16 she looked well, her blood pressure was 116/90, and an ordinary specimen of urine showed a faint trace of albumin.

Two years later, on March 3, 1954, after a normal pregnancy, she was normally delivered of her third child, a healthy infant weighing 8 lb. 10 oz. (3.9 kg.). Her blood pressure remained normal and was 120/70 at the sixth month, 10 days before delivery, and in the puerperium. The urine remained protein-free throughout. There was no oedema present before delivery. Post-natal examination six weeks later was normal.

I gratefully acknowledge the help given by Mr. William T. Kenny. I also thank Dr. John M. Malins, who kindly saw this case and confirmed the diagnosis of acute nephritis.

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Reviews

PERIPHERAL NERVE INJURIES

Peripheral Nerve Injuries. By the Nerve Injuries Committee of the Medical Research Council. Editor: H. J. Seddon. Medical Research Council Special Report Series No. 282. (Pp. 451+xvi; illustrated. 55s.) London: H.M. Stationery Office. 1954.

Early in the second world war, as a direct result of the Medical Research Council's work in the first, a Committee on Nerve Injuries was appointed. This included neurological physicians and surgeons, orthopaedic surgeons, and anatomists. Special peripheral nerve injury centres were established; the work in them was co-ordinated largely through the efforts of the late Dr. George Riddoch, and the clinical workers made their material available to anatomical, physiological, and statistical study. The results of this great work are contained in the present substantial volume. It is mainly clinical, with excellent clinical photographs, diagrams, and photomicrographs. Many of the chapters deal with the surgery and orthopaedic management of the injuries, and there are monographs on rates of regeneration, vasomotor and vascular changes, electromyography, and factors influencing functional recovery, to mention only a few of the contents.

It is in the tradition of the Medical Research Council that it makes its accurate researches available to the hospital worker in a form he can enjoy. This compendium on nerve injuries is an excellent example of that practice. The large number of contributors must be pleased to see the results of so many years of work so clearly available to a wider field. Though the study of peripheral nerve injuries is a very specialized subject, as this book shows, most of us see a few examples each year. The value of this collection of monographs will be as a source of reference to knowledge acquired when, in war, it was possible to raise this subject to the status of a specialty.

DENIS WILLIAMS.

CHEMICAL SPECIFICITY IN BIOLOGICAL INTERACTIONS

Chemical Specificity in Biological Interactions. Edited by Frank R. N. Gurd. (Pp. 234+xv; illustrated. \$6.) New York: Academic Press Inc. London: Academic Books Ltd. 1954.

This is the third memoir of the University Laboratory of Physical Chemistry Related to Medicine and Public Health, Harvard University, and includes a foreword in memory of Dr. Edwin J. Cohn, Professor of Biological Chemistry at Harvard, who died suddenly on October 1, 1953, when the book was nearly ready for the printer.

This volume is largely based on a series of seminars held at Harvard during February and March, 1952. The chapters and authors are as follows: chemical specificity in biological interaction (E. J. Cohn); the effects of x-ray and other radiation on proteins and living tissues (S. Warren); physical and chemical properties of the steroids related to protein binding (R. B. Turner); biochemical problems of the steroid hormones (T. F. Gallagher); some studies on the active principles of the posterior pituitary gland (V. du Vigneaud); the influence of ion-exchange chromatography upon our concept of the structure of ribonucleic acid (W. E. Cohn); special problems in the formation of metal complexes (C. D. Coryell); interactions of metals with small molecules in relation to metal-protein complexes (J. Schubert); the specificity of metal complex formation (G. Schwarzenbach); the interactions of proteins with small molecules and ions (G. Scatchard, W. L. Hughes Jr., F. R. N. Gurd, and P. E. Wilcox). A short memoir of Konrad Dobriner (1902-52) by T. F. Gallagher is also included.

The treatment throughout is largely physico-chemical, and the biological aspects of the subject sometimes take second

place, though Warren's chapter is an exception in this respect. The importance of metals in biological systems is already well realized, and the chapters devoted to the interaction of metals with many different types of substance, and particularly with those of biological significance, is a valuable summary of the situation in an important but diffuse subject and one that is clearly related to the title of the book. References to the original literature follow each chapter, and the volume constitutes a valuable summary of research in selected aspects of an important but limited field of biochemistry.

F. G. YOUNG.

THE THYROID GLAND

Endemic Goiter: The Adaptation of Man to Iodine Deficiency. By John B. Stanbury, M.D., Gordon L. Brownell, Ph.D., Douglas S. Riggs, M.D., Hector Perinetti, M.D., Juan Itoiz, Ph.D., and Enrique B. Del Castillo, M.D. (Pp. 209; 53 figures. 32s.) Cambridge, Massachusetts: Harvard University Press. London: Oxford University Press. 1954.

Lectures on the Thyroid. By J. H. Means, M.D. (Pp. 113; illustrated. 24s.) Cambridge, Massachusetts: Harvard University Press. London: Oxford University Press. 1954.

There is a Means Club in America, but even if there were not the name of Means would be certain of immortality. These two small books display two aspects of his genius: the first is the product of his inspiration, the second its direct secretion.

There are few places to-day where endemic goitre can be studied conveniently in its natural state, unspoiled by the well-intentioned interference of the medical profession. Means conceived the idea of sending an expedition to Mendoza in Argentina, and the first book is the result. It describes in detail our present knowledge of the metabolic pathways of iodine and the manner in which these pathways may be deflected by iodine deficiency; the effects of thyroid administration, and of the exhibition of the blocking agent methimazole and the stimulant thyrotropin. The descriptions have an admirable clarity, and if thereafter the authors stray into somewhat terrifying mathematics they succeed in making even this section clearer than the appearance of the formula-filled pages would at first suggest.

The second book is an easier one for the uninitiated to follow. It consists of a series of lectures given by Dr. Means in various medical schools in the U.S.A. and England, and succeeds in making a lot of confusing subjects readable and clear. The place of the thyroid in the endocrine system, the physiology of the thyroid, the newer treatments of thyroid disorders, the aetiology of Graves's disease, and the place of iodine in physiology are discussed with a charming discursiveness which suggests dinner-table conversation recorded by a tape machine and edited by a scholar.

The first of these books is for the specialist, but the second provides excellent reading for everybody.

RAYMOND GREENE.

PSYCHOSURGERY

Psychosurgery and the Self. By Mary Frances Robinson, Ph.D., and Walter Freeman, M.D., Ph.D., F.A.C.P. (Pp. 118+ix; \$3.) New York and London: Grune and Stratton. 1954.

Prefrontal Leucotomy and Related Operations: Anatomical Aspects of Success and Failure. By Alfred Meyer, M.D.(Bonn), and Elizabeth Beck. (Pp. 60; illustrated. 10s. 6d.) Edinburgh and London: Oliver and Boyd, for the William Ramsay Henderson Trust. 1954.

Psychosurgery and the Self is the production of a non-medical psychologist to which Dr. Walter Freeman contributes a chapter. Taking up the "tremendous challenge to a psychologist"—namely, that batteries of established tests have yielded singularly little in the investigation of the personality changes that occur after operation—the author, Dr. Mary Frances Robinson, as the result of the employment of what she describes as "really three controlled interview techniques," reaches the hypothesis that "psychosurgery changes the structure of the self through reducing

the capacity for the feeling of self-continuity." An attempt is made to elucidate the concept and its implications for psychology and psychiatry. This discussion ranges over a wide field. Few would disagree with the contention that leucotomized patients tend to live to an unusual extent in the present.

Prefrontal Leucotomy and Related Operations, on the other hand, is a monograph of outstanding importance, and has the learning, clarity, and distinction to be expected of any work coming from Professor Alfred Meyer's Department of Neuropathology at the Institute of Psychiatry, Maudsley Hospital. It is based upon the study of 102 cases that came to necropsy, and gives a brilliant survey of what is known at present concerning the problem of the relevant role of quantitative and qualitative—that is, more regional—factors in producing the effects that are observed after operation; which in its turn bears upon the characteristically worded question posed by Freeman: "Do the frontal lobes function by mosaic or by mass action?"

Although Professor Meyer is too polite to say so directly, his work has been handicapped by inadequate case records. Special efforts, too, should be made to preserve the brains of leucotomized patients when they die; material invaluable for research is often wasted.

As the authors point out in the final paragraph of their conclusions: "Medial and orbital cuts are now being given a trial in many neurosurgical centres. The growing experience with these and other selective operations, particularly if in the fullness of time they should be anatomically controlled, will slowly resolve this problem of the relative role of quantitative and qualitative factors." This, from the clinical point of view, means how much to cut and where.

This monograph can be recommended without reserve.

DESMOND CURRAN.

LIVER PATHOLOGY

Pathologie du Foie: Etudes Cliniques et Biologiques. By Etienne Chabrol. (Pp. 214; 26 illustrations. 1,200 fr.) Paris: Masson et Cie. 1954.

This volume on the pathology of the liver is the fourth of a series on various aspects of hepatic disease written since 1941 by this distinguished French clinician. It makes no attempt at a systematic presentation, but comprises a miscellany of 23 chapters, ranging from 4 to 24 pages in length, dealing with topics as diverse as researches on biliary albumin and mucin and the evolution of the spa treatment of hepatic diseases. Despite this apparent diversity, the book retains a distinct sense of unity, partly because it is so obviously based upon the personal experience of a single individual, and partly because of the author's passionate desire to get away from the older concept of organ diseases and to present hepatic disease as only a special manifestation of a general body disturbance.

Anyone unfamiliar with the current French literature on the liver will find here much to surprise and interest him. Great claims are made for the use of antibiotics, especially aureomycin, in the treatment of various hepatic disorders, particularly infective hepatitis and cirrhosis. While appreciating that none of the antibiotics at present available has any effect upon the hepatic viruses, the author is convinced of the great importance of secondary infection and of its susceptibility to antibiotic therapy. Equally stimulating are the views expressed concerning the nature of gall-bladder pain and the role of the female hormones in its genesis, with special reference to their action upon the mucus secreted in the biliary passages.

Because of the obvious ignoring of work done outside France this book can in no sense presume to give an up-to-date presentation of our knowledge of hepatic disease. But as a record of one man's experience of over 50 years' work in both the laboratory and the clinic as the associate of many of the distinguished investigators of liver disease that France may rightly claim it can be warmly recommended.

L. E. GLYNN.

THE HOSPITAL ALMONER

Readings in the Theory and Practice of Medical Social Work. Edited by Dora Goldstone. (Pp. 344+vi; 37s. 6d.) Chicago: University of Chicago Press. London: Cambridge University Press. 1954.

Before 1948 many doctors regarded the main function of the hospital almoner to be assessment of the ability of patients to pay for their treatment. This was not a view which almoners themselves were prepared to accept. For many years they had attempted to establish a role more satisfying to themselves and more useful to patients, and the creation of the National Health Service gave them their opportunity.

For anyone who wishes to learn what almoners now consider to be the nature of their work this book by an American medical social worker (almoner) will be of value. It consists of a series of articles which deal with various aspects of medical social work in the United States, but most of the opinions expressed would probably be endorsed by almoners in this country. It seems clear that almoners now regard their most important task to be the practice of "casework" in a medical setting; but "casework" is variously defined. In one article (p. 109) its object is stated to be "to provide help to ill and disabled people with the personal problems associated with illness, its treatment and prevention"—a statement likely to be generally regarded as unexceptionable. Elsewhere (p. 112) the role of the caseworker is said to be "to help the person in trouble assess his situation, the problems and assets within himself and his environment, in order that he may capitalize on his strength and resources in moving toward maximum responsibility on his own behalf." This is the kind of service about which many doctors and some almoners are doubtful. The task of redefining the role of the hospital social worker is one which requires and merits the attention of doctors as well as of almoners.

THOMAS MCKEOWN.

EMERGENCY TOXICOLOGY

Handbook of Emergency Toxicology. By Sidney Kaye, B.S., M.Sc. (Pp. 303+xviii; 42s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1954.

Emergency toxicology—that is to say, the recognition and treatment of acute poisoning at the earliest possible moment with a view to saving life—is the keynote of Mr. Sidney Kaye's handbook, but it also contains much information of great value to those who have to deal with the after-effects of the emergency.

The various poisons are listed alphabetically, with descriptions of their properties, minimum lethal doses, toxic symptoms, and specific identification. A drawback of such a strict classification and compression is an occasional lack of clarity, especially with regard to the symptoms. These are not described in order of appearance, or in terms of their acuteness or chronicity. This applies particularly to the comparatively few industrial poisons listed. Under benzene, for instance, the consequences of long-continued chronic intoxication are not distinguished from the acute effects—rapid irregular pulse, ataxia, dizziness, etc., leading to death.

Undoubtedly the most valuable part of the book is on the analysis of specimens of urine, gastric lavage, vomitus, and blood, and of tablets and capsules. This will be of great value to laboratory investigators who have rapidly to identify and determine the toxic substances concerned. The analytical procedures, described clearly and methodically, include not only isolation by steam distillation and extraction by suitable organic solvents, but also the most modern methods of photoelectric colorimetric estimation and absorption spectrography. This affords great facility for quick reference to any suspected toxic agent.

Suggestions for therapy are backed by the authority of the medical staff of the Department of Legal Medicine, Medical College of Virginia, and make a further admirable contribution to a book which cannot fail to fill a long-felt want in the field of toxicology.

ETHEL BROWNING.

BRITISH MEDICAL JOURNAL

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CANADIAN MEDICINE

With the Toronto Meeting casting its agreeable shadows ahead, the sketch of Canadian medical history which appears in the opening pages of this issue gives a useful and in parts a picturesque background to a meeting which itself will be historic. Dr. H. E. MacDermot traces the story of medicine in Canada from the time of the early French settlers to the highly organized medical community which is now serving a nation of 15 million people stretched across the larger part of the North American continent. Canadian medicine has had its written history, notably a two-volume work covering four centuries, published in 1928, but Dr. MacDermot's selective picture, with its reference to outstanding events and personalities, is very welcome and apposite.

The history of medicine in Canada is linked with the history of the country itself. Many of the early doctors shared to the full the hardships, fatigues, and perils of the pioneers in other fields. They took their full part in the advance of settlement and civilization from the banks of the St. Lawrence to the Pacific coast, from the parallel of latitude 49° to the Arctic archipelago. Some of them, like medical men in other parts of the Commonwealth, notably South Africa and Australia, attained political as well as professional eminence and helped their country on its way to responsible government. The first president of the Canadian Medical Association when it was founded in 1867 was Dr. (afterwards Sir) Charles Tupper, who thirty years later became Prime Minister of Canada; and Sir Thomas Roddick, president of the first meeting of the British Medical Association in Canada at Montreal in 1897—indeed the first president of the Association outside the British Isles—was a member of the Federal Legislature.

From rough beginnings there has gradually been established a system of medical education and practice in Canada which is second to none. There are now twelve medical schools, the third to be founded being the University of Toronto, established 110 years ago, and in order of date preceded only by the two universities—French and English—of Montreal. It

was in the University of Toronto that William Osler, himself born in Ontario, began the study of medicine, although his name is more closely associated with McGill. In the department of physiology of the same university Frederick Banting began his researches on the internal secretion of the pancreas. The contributions to medical knowledge of the Canadian medical schools and laboratories make a brilliant list. Canada has also its own medical literature, which is studied all over the world. One of the remarkable features of the earlier period, as Dr. MacDermot points out, was the prolificity of medical journals; and since the first of them in 1826—a French publication—72 journals have been established, most of which have died a natural and generally an early death. There are now 18 journals, and conspicuous among them is the *Canadian Medical Association Journal*, the editorial chair of which Dr. MacDermot, to the general regret, is shortly to relinquish.

At one time Canada had, nominally, some half-dozen Branches of the British Medical Association, but they seem never to have functioned as Branches and to have had only a paper existence. Then in 1924, on the proposal of the Council of the British Medical Association in London, the late Sir Jenner Verrall and the late Dr. Alfred Cox, then secretary, were sent as delegates to Canada, and the result of a most cordial visit was an affiliation of the two Associations. Affiliation was then a new idea, though it has since been adopted in the case of the Medical Association of South Africa and more recently the Indian Medical Association. The bond with Canada which was then formed was more of a sentimental than of a material nature, but it has proved strong and enduring over thirty years, as many such loosely knit bonds do where the British people are concerned. It has been strengthened by much two-way traffic across the Atlantic, and among Canadian visitors none has been more welcome than Dr. T. C. Routley, who will preside over the Toronto Meeting. Dr. Routley became general secretary of the Canadian Medical Association in 1921, at a time when it was in low water after the first world war. The relationship between the professions in the two countries has been further strengthened by the three previous visits of the British Medical Association to Canada—the first, as already stated, in 1897, to Montreal; the second, in 1906, to Toronto, and the third, in 1930, to Winnipeg. With the exception of the Melbourne Meeting in 1935, these are the only occasions on which the British Medical Association has left this country for its Annual Meeting.

The heritage of British institutions has left its stamp on medicine in this the oldest and largest of

the British Dominions, as it has on other aspects of Canadian life. In many respects the progress and pattern of medicine in public affairs, in science, and in education has been the same in the two countries. The ties will be further strengthened by the forthcoming meeting at Toronto, which is looked forward to on both sides of the Atlantic with high expectations.

NEW PATTERNS OF MALARIA CONTROL

The mass of detailed information now gathered on the intensive use of residual insecticides, particularly D.D.T., during the last ten years permits an appraisal of their value and limitations. The eradication of malaria had not previously been considered practicable except in small areas and under special circumstances, but soon after the introduction of the new insecticides the virtual abolition of the disease was envisaged in many places and has been effected in some. In only two areas have the vector anophelines been completely eradicated; in both the mosquito was an introduced species not indigenous to the country. The reason for the failure to eradicate vectors elsewhere is that the indigenous mosquito species probably antedated the advent of man, and, though they have since become more or less domestic in habit, a proportion of them still maintain their original association with wild animals and natural resting places. This sylvan population continues to live independently of man and inaccessible to routine control measures, but it can readily replace the domestic population when this is eliminated by insecticidal campaigns; and, by virtue of its ability to adjust to a new environment, it can become parasitic on man and a vector of malaria.¹

A problem now causing concern is that strains of insects which originally proved susceptible to deposits of these insecticides have sometimes shown an increasing resistance to their effects, at first to D.D.T. but later to other chlorinated hydrocarbon preparations. The resistant strains are no longer susceptible to spraying of insecticides in dilutions and at intervals which are economically practicable. The development of resistance was first observed in houseflies, then in certain other insects, and some recent observations indicate its appearance in at least two anopheline species.²⁻⁴ It probably develops as a result of natural selection and repeated sub-lethal contacts with the insecticides and is transmitted hereditarily. As to

certain other anopheline species which still remain susceptible to deposits of residual insecticides in the dosages normally applied, control by residual spraying has ceased to be effective because the mosquito has changed its habits and stopped frequenting sprayed buildings.⁵

The difficulties that have arisen in residual insecticidal spraying for malaria control have made urgently necessary further intensive study of the reactions of anophelines to these chemicals if they are to go on being as valuable as they have been. The principles on which they are to be applied should also be clearly defined so far as our present knowledge allows, and Pampana⁶ has recently discussed the changing strategy of malaria control. He emphasizes that malaria can be eliminated without elimination of the vector and that it is necessary to control transmission only during the lifetime of the malaria parasites inhabiting their human hosts. When all the plasmodia have died out—after a control period of three to four years for *Plasmodium falciparum* and *P. vivax*, which alone are widespread—further transmission is impossible even though anopheline vectors remain numerous; and provided the disease is not reintroduced the area will remain free of malaria. This is an important revision of an opinion previously widely held—that control by the spraying of residual insecticides had to be continued indefinitely unless the vector was eradicated. Experience has shown that elimination of indigenous malaria vectors is exceedingly difficult, and to spray residual insecticides over a long time is to risk creating an anopheline strain resistant to this method of control. Insecticidal spraying must therefore be restricted to as short a period as allows satisfactory control.

Certain conditions must be fulfilled before the spraying campaign can be safely discontinued. The first essential is the absence of malaria transmission for several years over most of the territory. In order to ensure this, no sources of infection must remain in the control area. In addition to applying the usual criteria for determining endemicity (particularly spleen and parasite rates), cases of malaria must be actively searched for, and they should be shown to be absent for at least a year before discontinuing spraying. The control campaign should be carried on thoroughly and simultaneously over as large an area as possible, which should preferably be surrounded by a zone in which malaria is absent naturally or as a result of control measures. The danger of reimporting the disease from contiguous malarious territories has to be guarded against, and if it can be arranged these areas also should undertake control campaigns simultaneously. Ideally, control should extend over a whole continent, and this objective has been adopted

¹ Logan, J. A., *The Sardinian Project*, 1953, p. 353, Baltimore.

² Livadas, G. A., and Georgopoulos, G., *Bull. Wild Hlth Org.*, 1953, 8, 497.

³ Georgopoulos, G. D., *ibid.*, 1954, 11, 855.

⁴ Garrett-Jones, C., and Gramiccia, G., *ibid.*, 1954, 11, 865.

⁵ Trapido, H., *ibid.*, 1954, 11, 885.

⁶ Pampana, E. J., *ibid.*, 1954, 11, 513.

⁷ Vincke, I. H., *ibid.*, 1954, 11, 785.

⁸ Farinaud, M.-E., and Choumara, R., *ibid.*, 1954, 11, 793.

in America. The final safeguard is the introduction of measures to ensure rapid detection of any case of malaria and prompt prevention of transmission. The reintroduction of malaria into a population which as a result of control of the disease has lost its acquired immunity might lead to a grave epidemic, and if the local vector had become resistant to residual insecticidal spraying one of the most efficient and economical control measures would be ineffectual. The new pattern of campaign against malaria outlined here necessitates the organization of exceptionally thorough control programmes over very large areas comprising several territories, and entails greater expenditure than hitherto and better methods of detecting isolated cases of malaria. But it would be more effective and produce more rapid results. Though more costly for a few years, it would lift the burden of indefinitely recurrent expenditure on malaria control.

The problems raised by these new public health measures have stimulated interest in older and proved methods of control. New chemotherapeutic compounds are being tried either alone or in combination with D.D.T., and perhaps in suitable circumstances malaria may be eradicated sooner by a combination of these methods than by D.D.T. alone.⁷ In this way it may be possible to reduce the risk of resistance developing to the insecticide or of behavioural change by the vector while at the same time avoiding the expense of the type of campaign envisaged by Pampana. Although the new insecticides create new and possibly serious problems, malariologists can devise methods of overcoming them.

E.C.T. IN PREGNANCY

Convulsion therapy is now accepted as a reliable means of terminating most attacks of endogenous depression months or years before they would remit of their own accord. The intense suffering of these patients and the constant risk of suicide justify the induction of epileptic fits not only in physically healthy subjects but, with the proper precautions, in patients who would be regarded as increased anaesthetic risks. Depressive states are not infrequent in pregnancy, yet the risk of inducing a miscarriage must have deterred many psychiatrists from giving E.C.T., and one well-known textbook of psychiatric treatment lists pregnancy as a contraindication to it.¹ Information in the literature is scanty, but it hardly supports the view that E.C.T. carries more risk of miscarriage than does a brief anaesthetic. F. B. Charatan and A. J. Oldham,² reporting a case and reviewing the literature (which covers only about a dozen cases), conclude that convulsions can be induced after the fourth

month with little danger of miscarriage. This is consistent with our knowledge of the idiopathic epileptic fit. C. W. F. Burnett³ found that in sixteen pregnant epileptics only one miscarriage occurred, and that was in a patient who had fallen heavily in a fit.

E.C.T. is now usually administered with thiopentone and a relaxant, and there is no reason to suppose that this procedure is more likely to harm the foetus than a brief general anaesthetic given for any other purpose. At the same time, unnecessary anaesthetics are usually avoided during pregnancy, and the number of reported cases in which E.C.T. has been successfully given is small. On inquiry of eight experienced psychiatrists, however, all but one said they had given E.C.T. during pregnancy but had hesitated to put the fact on record. Since the alternative to treatment is an intensely unhappy pregnancy, with the possibility of labour and the puerperium in a psychotic state, and since severe depression in early pregnancy is sometimes considered as justifying termination, there would appear to be slight reason for hesitation. Perhaps the greatest risk lies in anoxia due to a poor airway at the time of treatment, but with an experienced anaesthetist the risk must be small. While an adequate number of records of successful cases is being accumulated, the administration of E.C.T. in pregnancy would seem to be justified when there are strong indications for it—the same precautions being taken as with a general anaesthetic.

MENTALLY HANDICAPPED GIRLS

What happened to 207 mentally handicapped girls after they left school has recently been studied at the department of public health and social medicine in the University of Glasgow.¹ The study covers the social and economic history, but not the medical history, of the girls for a period of six years between leaving one of the special schools for the mentally handicapped in Glasgow and the attainment of age 22.

The social background of these girls was by no means typical of Glasgow as a whole. Almost 90% of the fathers who were still alive when the girls left school could be placed in the lower ranks of the social hierarchy. About 25% of the girls suffered from some degree of speech impairment, while 12% were described as "of poor physique or having some severe physical impairment." When we add to this 31% of the girls "from homes classified as frankly 'bad'" by an experienced social worker, it will be realized that mental dullness was by no means the only handicap with which the girls left school to begin a career. By 1954, when they had reached the age of 22, 55 were already married. If the girls are divided into two groups, according to whether the school measurement of I.Q. was below or above 50, the outstanding fact emerges that all who were married were drawn from the over-50 group. However, the marriage rate of about 28% for this group compares with nearly 40% for all women of the same age in Glasgow enumerated at the 1951 census. The chance

¹ Ferguson, T., and Kerr, Agnes W., *Glasg. med. J.*, 1955, 38, 50.

of marriage for the under-50 group can scarcely be said to exist. So far as could be ascertained the illegitimacy rate among the unmarried was about the same as in Glasgow as a whole.

The employment history of the girls shows the same remarkable dichotomy at the 50 level of recorded I.Q. None of the under-50 group had a record of five or more years in employment, while about 75% of the remainder had. The authors record the number of different jobs held by the girls, but in the absence of comparable data for normal adolescents the figures cannot be interpreted. Of those in employment when the study was made, nearly half were in occupations that would be classed as semi-skilled, but "general labouring work, often dirty, sometimes in foundries" claimed about one in five. The authors point out that in the present industrial conditions there is no lack of work in Glasgow which can be performed by educationally retarded girls. In an era of full employment their problems are social rather than economic.

Should the authors decide to publish a more extended account of their interesting survey they might provide a little more information. In the first place they give no hint of the way in which their 207 subjects were selected, beyond the fact that they had attended a special school for the mentally handicapped. They may have been all who left special schools in a specific year, or all who came within a certain range of recorded I.Q., or all for whom information could be obtained. If the last was forced upon the investigators, then clearly some warning about possible sources of bias will be needed. The tendency to parade our successes and hide our failures is not unknown. Moreover, in making comparisons, the authors do not consider the errors inherent in the sampling process. One or two rough tests suggest that they have satisfied themselves that the points of interest to which they draw attention could scarcely be ascribed to errors of this kind, but attention might well be drawn to the point in view of the small numbers in some of the groups. Finally, some of the comparisons made with Glasgow as a whole may be misleading in view of the social background of the subjects. The marriage rates set out in the study suggest that the chances of marriage for the group with I.Q. over 50 are reduced by about one-third as compared with normal subjects. It is known, however, that the average age at marriage is apt to be low if the social class is low. Had the subjects been compared with a control group drawn from the same social milieu, it seems likely that an even larger difference in the marriage rate might have been brought to light.

BLOOD COAGULATION

The one-stage prothrombin-time test, introduced by A. J. Quick,¹ is a reliable method for controlling dicoumarol therapy, despite the fact that the test is largely empirical and there is much controversy about what it actually measures. The classical theory of blood coagulation held that in the presence of optimum thromboplastin—that is, brain extract—and calcium the rate of thrombin formation depends on the concentration of prothrombin.

If this were true, the one-stage prothrombin-time test would be a specific measure of prothrombin. This thesis was destroyed by the discovery of two coagulation factors, distinct from prothrombin, which play an important part in the activation of prothrombin by brain extract. Quick² noted that the one-stage prothrombin time of oxalated plasma became prolonged during storage, and that this abnormality was corrected by the addition of fresh plasma from which all prothrombin had been removed by a prothrombin adsorbant—for example, barium sulphate, aluminium hydroxide, or Seitz filters—but not by old serum. This factor was termed "labile factor" by Quick. Another factor which affects the one-stage prothrombin time is found in a stable form in plasma and serum, and is therefore called "stable factor." This factor is adsorbed by prothrombin adsorbants. The prolonged one-stage prothrombin time of plasma deficient only in the stable factor is corrected by the addition of prothrombin-free, normal serum. Recent evidence suggests that brain extract undergoes preliminary reactions with calcium, labile factor, and stable factor to form the complete thromboplastin, which activates prothrombin.³⁻⁵ Thus it would appear that plasma is clotted in three stages by brain extract: (1) Brain extract + labile factor + stable factor + calcium form complete thromboplastin. (2) Prothrombin reacts with complete thromboplastin to form thrombin. (3) Fibrinogen reacts with thrombin to form fibrin. The one-stage prothrombin-time test is a measure of the time required for these three reactions. Since the concentrations of calcium and brain extract are standardized, the most important factors which influence the prothrombin time of plasma are labile factor, stable factor, and prothrombin. Quick postulates that plasma prothrombin occurs in an inactive form (prothrombogen) and an active form. He believes that in the presence of optimal calcium, brain extract, labile factor, and stable factor the one-stage test is a measure of active prothrombin, and he and Clara V. Hussey present evidence to support this view in an article at p. 934 of the *Journal* this week. Many other workers in this field would question the hypothesis.

The prolongation of the one-stage prothrombin time produced by administration of dicoumarol is due to reduction of both prothrombin and stable factor. The stable factor rapidly falls to less than 10% of normal, but prothrombin, measured by a two-stage technique, seldom falls below 40% of normal.⁶ This and other evidence suggests that the reduction in stable factor may be more important than that of prothrombin in determining the one-stage prothrombin time in a patient on dicoumarol.⁶

If Russell's viper venom and lecithin are substituted for brain extract, the one-stage prothrombin-time test becomes insensitive to changes in stable factor. With this reagent the test shows prolonged prothrombin time of

¹ Quick, A. J., *J. biol. Chem.*, 1935, 109, lxxiii.

² — *Amer. J. Physiol.*, 1943, 140, 212.

³ Biggs, R., et al., *J. Physiol. (Lond.)*, 1953, 122, 554.

⁴ Flynn, J. E., and Coon, R. W., *Amer. J. Physiol.*, 1953, 175, 289.

⁵ Owren, P. A., et al., *Sang.*, 1954, 25, 752.

⁶ Douglas, A. S., *Brit. med. Bull.*, 1955, 11, 39.

⁷ Jenkins, J. S., *J. clin. Path.*, 1954, 7, 29.

⁸ Rapaport, S. I., et al., *Blood*, 1954, 9, 1185.

¹ Diethelm, O., *Treatment in Psychiatry*, 1950, Thomas, Springfield, p. 152.

² Charatan, F. B., and Oldham, A. J., *J. Obstet. Gynaec. Brit. Emp.*, 1954, 61, 665.

³ Burnett, C. W. F., *ibid.*, 1946, 53, 339.

plasma deficient in prothrombin and labile factor, but the test is normal with plasma deficient in stable factor.^{7,8} In the presence of optimal labile factor, as in the plasma of a patient on dicoumarol, the one-stage prothrombin-time test with Russell's viper venom and lecithin is a roughly specific measure of prothrombin.⁸ But this thromboplastic reagent has proved to be unreliable in controlling dicoumarol therapy, for serious haemorrhage may occur at a time when the one-stage prothrombin time with Russell's viper venom is only slightly prolonged. Likewise the two-stage test is not a sound method for controlling dicoumarol therapy. Thus there appears to be no correlation between the prothrombin level and the danger of haemorrhage; a reduction in stable factor, or some other coagulation factor, may be more closely related to the risk of haemorrhage during dicoumarol therapy.

Although, as Quick believes, the one-stage test may measure active prothrombin in the presence of optimum labile and stable factors, as in normal plasma, this is not necessarily true for plasma in a patient on dicoumarol, which is deficient in both prothrombin and stable factor. With such plasma the one-stage prothrombin-time test is a non-specific measure of the total coagulation defect produced by a dual deficiency of prothrombin and stable factor. For this reason the test, with brain extract, is a more reliable guide for anticoagulant therapy than methods that are more specific for prothrombin.

PSYCHOSOMATIC APPENDICITIS?

The aetiology of acute appendicitis remains unknown and its varying incidence in different social classes unexplained. At first sight this might seem one of the last conditions in which to invoke a psychosomatic explanation, but if the activities of the colon and the small intestine are influenced by stress and emotion, why not those of the appendix? In an investigation of psychological factors in ulcerative colitis in 1948, J. W. Paulley started using cases of acute appendicitis as controls. He found, however, that they were usually tense individuals with an unduly rigid outlook, and their attack of appendicitis had often been closely related in time to some family disaster or period of emotional strain. They were therefore considered unsuitable as controls after nineteen had been interviewed. He has now examined¹ a further ten consecutive patients with acute appendicitis, and claims to have found the same kind of precipitating situation in eight of the ten. A. L. Ribeiro,² practising in Kenya, has also recently reported fear or anxiety as a cause of appendicitis. He described four cases of negro women in whom appendicitis developed soon after they had been threatened in various ways.

As Paulley says, the records of his 29 cases (or 30 if the well-known case of King Edward VII is added) prove nothing, but they raise interesting questions. The higher incidence of acute appendicitis in the upper social grades seems to be definite. Will this turn out to be due not to differences in diet, but to the in-

creased stress to which the more diligent and responsible members of society are exposed? Perhaps the answer will be found when surgeons take psychosomatic histories from all their patients.

SICKLAEMIA AND FLYING

It has long been known that in those inheriting the sickle-cell trait sickling of the red blood cells is brought about by anoxaemia. This fact is made use of in the commonly used rapid method of detecting sickling, in which a reducing solution consisting of 2% sodium metabisulphite is mixed with the suspected blood.¹ It is to be expected, therefore, that sickling in the blood of those carrying the trait will be accelerated when they are taken to high altitudes in unpressurized aircraft and that this may lead to sickling crises or other complications. Sullivan² first reported such a complication in an 18-year-old coloured American soldier who had sicklaemia and who in May, 1947, while on a flight across the Rocky Mountains complained of nausea and cramp-like pain in the left upper quadrant of the abdomen. The pain persisted for six days, recurred during a return journey six days later, and again persisted for several days. The patient was found to have a firm, tender mass (15 cm. in diameter) in the painful area of the abdomen. The mass regressed but little during the subsequent two months. Cooley and his colleagues³ reported six further cases; these patients were all negroes who had flown for at least one hour in unpressurized aircraft at altitudes between 10,000 and 15,000 ft. (3,000 and 4,600 m.), and in five of them the symptoms—very much the same as those in the case already described—came on while they were crossing the Rocky Mountains en route from Korea. Splenectomy was performed in each case, and massive infarction of the spleen without major arterial thrombosis was invariably found. Conn⁴ has added a further two similar cases to the series. Both the patients were negroes who had flown over the Rocky Mountains: they were treated conservatively, as Sullivan's patient was, with excellent results.

In these nine reported cases there appears to be a clear association between the occurrence of splenic infarction and anoxaemia caused by flying at a high altitude in unpressurized aircraft—the absence of pressurizing is confirmed in six of the cases and may be taken as likely in the remaining three. Findlay, Boulter, and MacGibbon⁵ showed that flight at such altitudes may cause sickling of circulating red blood cells. They carried out experiments on three African volunteers bearing the sickle-cell trait who were taken in an unpressurized aircraft to 15,000 ft. (4,600 m.). No ill effects resulted, though all three had sickled red blood cells in the peripheral blood after 10–15 minutes at that altitude. Findlay and his colleagues rightly concluded that, "though flying for a short time at 15,000 feet does not necessarily induce a sickling crisis through reduction of oxygen tension, it may obviously cause an increased rate

¹ Daland, G. A., and Castle, W. B., *J. Lab. clin. Med.*, 1948, 33, 1082.

² *Ann. int. Med.*, 1950, 32, 338.

³ *J. Amer. med. Ass.*, 1954, 154, 111.

⁴ *New Engl. J. Med.*, 1954, 251, 417.

⁵ *J. roy. Army med. Cps.*, 1947, 89, 138.

⁶ *J. Amer. med. Ass.*, 1954, 156, 955.

of sickling, and as Africans vary in the reduction of oxygen tension necessary to produce sickling it is possible that sooner or later an African will be found who will sickle when flown at 10,000 or 15,000 feet for a comparatively short time." The splenic infarction reported by the American observers appears to be a direct result of this increased rate of sickling at high altitudes. Among those who have studied such cases, there is, however, one dissenting opinion about the necessity of exposure to high altitudes. Doenges and his co-workers⁶ reported splenic infarction in two negroes after flights at between only 4,000 and 6,000 ft. (1,200 and 1,800 m.). Both patients bore the sickle-cell trait, but were found to have haemoglobin C in their blood as well as haemoglobin S, and this raises the possibility that the presence of haemoglobin C may make the patient more liable to develop this complication under conditions of slight anoxaemia than does haemoglobin S.

The observation of splenic infarction in those carrying the sickle-cell trait need cause no alarm among the air-travelling negro public. Civil airlines do not normally fly unpressurized aircraft at heights greater than 7,000 ft. (2,100 m.), and at this level the condition is unlikely to develop except possibly among the rarer haemoglobin-C carriers. The smallness of the risk is emphasized by the fact that no complications of sicklaemia have yet been reported among the many thousands of negroes carried by the British Overseas Airways Corporation and its associates operating in Africa. The real importance of the observation lies in the fact that those carrying the sickle-cell trait should be excluded when personnel are being selected for piloting aircraft or for other work at considerable altitudes or under conditions of relative anoxaemia.

AMYLOIDOSIS IN RHEUMATOID ARTHRITIS

Amyloid degeneration has been recognized for just over 100 years as a serious but relatively uncommon complication of chronic suppuration and other chronic diseases, especially those associated with much breakdown of tissue such as osteomyelitis and pulmonary tuberculosis. But its incidence in rheumatoid arthritis is generally regarded as low. That this impression is probably based on inadequate necropsy investigation is suggested by the recent reports by D. L. Fingerman and F. C. Andrus¹ and by G. Teilmum and A. Lindahl² of thirteen cases out of sixty-one and of seventeen out of twenty-eight respectively. When the five cases of J. M. Ræce and T. B. Reynolds³ are included, the published reports of generalized amyloidosis associated with rheumatoid arthritis now total ninety-seven. Two-thirds of these cases have been published in the last ten years, a testimony to the growing interest in the rheumatic diseases rather than to any change in their pathological characteristics.

The distribution of the amyloid deposits in these cases is that usually found in so-called secondary amyloidosis. The spleen, kidney, and adrenals are the organs princi-

pally affected, though the liver and lymph nodes are also frequently involved. Albuminuria is the commonest clinical feature calling attention to the onset of amyloidosis; less often splenomegaly, with or without hepatomegaly, may be the presenting sign. In most of the recent cases the Congo red test has been of help in diagnosis.

The association between rheumatoid arthritis and amyloidosis is of the greatest theoretical interest for the light it might throw on the pathogenesis of these two aetiologically obscure maladies. The work of G. Hass⁴ and others has shown that chemically amyloid is closely related to the interfibrillary ground substance of connective tissue. Both are composed of glycoproteins the polysaccharide moieties of which yield on hydrolysis a hexosamine, a hexuronic acid, and acetic and sulphuric acids. As amyloid deposition occurs in the affected organs in close relationship to reticular fibres and just outside capillary endothelium, it is essentially a deposition within the ground substance of substances closely related to it in chemical composition. This suggests that the excessive breakdown of connective tissue might release into the blood stream ground substance components in soluble form capable of precipitation elsewhere as amyloid. Experimental attempts to induce amyloidosis on these lines have consistently failed. The alternative hypothesis, put forward by G. Teilmum,⁵ accounts in a more satisfactory manner for the association of amyloidosis not only with rheumatoid arthritis but with the other conditions with which it is more frequently found. According to Teilmum amyloidosis is the result of a perversion of the protein-synthesizing function of the reticulo-endothelial system, and especially of its pyroninophil derivatives the plasma cells and their immediate precursors. These cells are concerned with the formation of antibodies in response to antigenic stimuli, and according to this author their maintenance of this function is controlled by the antithetic actions of ascorbic acid on the one hand and adrenal corticoids on the other. The breakdown of this control in the face of persistent antigenic stimulation then results in the local deposition of amyloid. Apart from accounting for the pre-eminent distribution of amyloid in the tissues rich in reticulo-endothelial components such as the spleen and liver, it also provides a reasonable explanation for the associated abnormalities in the serum proteins. And, although the evidence for a persistent antigenic stimulus in rheumatoid arthritis is scarcely convincing, the predominant role of the plasma cell in the typical rheumatoid lesions is unquestionable.

Sir Russell Brain was re-elected President of the Royal College of Physicians of London on April 4. He was first elected President of the College in 1950.

At the meeting of the Council of the British Medical Association on April 13, Professor Norman B. Capon, of Liverpool, was presented with the Dawson Williams Memorial Prize for 1955 in recognition of his work in child health, particularly in the field of neonatal paediatrics.

¹ *Ann. rheum. Dis.*, 1943, 3, 168.

² *Acta med. scand.*, 1954, 149, 449.

³ *Amer. J. med. Sci.*, 1954, 228, 554.

⁴ *Arch. Path. (Chicago)*, 1942, 34, 92.

⁵ *Ann. rheum. Dis.*, 1952, 11, 119.

¹ Paulley, J. W., *Arch. Midx Hosp.*, 1955, 5, 35.

² Ribeiro, A. L., *Lancet*, March 19, 1955, p. 521.

EMERGENCIES IN GENERAL PRACTICE

CORROSIVE POISONING

BY

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A corrosive is a substance which causes destruction of tissue at the site of application; in dilute solution many corrosives merely have an irritant effect, but irritants may corrode at certain sites. According to this definition the effects of a corrosive should be limited to its local action, but some of them produce serious effects from absorption, so the classification is a loose one. Corrosives may be defined more accurately therefore as "substances having an acute and predominantly local action involving destruction of tissue." The speed and the destructive nature of the poisoning constitute an emergency in which early and effective treatment is essential.

Incidence

According to the Registrar-General's Statistical Reviews, corrosives are an infrequent cause of death (see Table).

Deaths from Violent Causes (England and Wales)

Year	Total	All Poisons	Corrosives
1950 ..	18,889	3,274	184
1951 ..	19,756	3,557	157
1952 ..	18,802	3,666	129

A survey of 4,393 reports of post-mortem examinations conducted by the Department of Pathology in the Welsh National School of Medicine during the five years 1948-53 showed that the cause of death was by poisoning in 39 persons. Of these, one was due to carbolic acid and one to ferrous sulphate. A survey of the diagnoses made on 58,540 admissions to the three principal institutions of the United Cardiff Hospitals during 1951, 1952, and 1953 reveals that 251 cases of poisoning were treated. Of these, only nine were due to the classical corrosives taken internally, of which five were due to "lysol" or carbolic. During the same period 201 patients were treated for external burns due to hot objects—fires, electrical apparatus, heating devices, scalds, friction, irradiation, or chemicals. Only four were due to corrosives. Of a total number of 25 cases of burns and chemical injuries to the eye, 15 were due to corrosives. The Annual Report of the Chief Inspector of Factories for 1949 shows that of a total of 8,787 accidents involving the eye, 235 were due to chemicals (167 lime and cement). The precise number due to corrosives is not stated. The same source states that of 569,485 accidents in 1949, 1950, and 1951, 21,595 were due to hot liquids, molten metal, and corrosives. No detailed analysis is available.

It may be deduced from these and other sources that corrosive poisoning is not a common cause of emergency.

Corrosives Likely to be Encountered

The following are the common corrosives: (1) *Acids*: (a) Inorganic—hydrochloric, sulphuric, and nitric; (b) organic—carbolic, cresol and related products, oxalic. (2) *Alkalis*: sodium and potassium hydroxides and carbonates, lime. (3) *Other corrosives*: formaldehyde, salts of certain heavy metals, bichromates.

When taken internally the majority of poisonings are due to lysol and related products, with acid (usually hydrochloric) the next most frequent. From analyses of deaths by poisoning in England and Wales during 1950, 1951, and 1952,* it is seen that of 335 cases of corrosive poisoning 175 were due to lysol, phenol, and related products, and 59 to acid. The common source of the cresols is by purchase of

disinfectant fluids. While most cases are suicidal, a few accidents occur, presumably owing to the keeping of small quantities of disinfectant in old medicine or liquor bottles (19 accidents to 156 suicides in this series). Accidents are evenly distributed between men and women, but the latter preponderate in the use of this method of self-destruction (115 women to 41 men).

Corrosive poisoning from swallowed mineral acid is much more common than that from caustic alkali, and the majority of cases are due to suicidal attempts (12 accidents to 52 suicides). Most of the accidents happen to men, and hydrochloric acid is by far the commonest agent. The same applies in the case of suicide, though the preponderance of males to females is less. The cause for this is obscure, but spirits of salts (hydrochloric acid) may be purchased from the pharmacist and kept in old bottles prior to use as a cleaning agent for glazed surfaces. Hydrochloric and sulphuric acids are widely used in industrial processes, and some may be obtained from the factory for private purposes such as soldering fluid.

Oxalic acid is less common as a corrosive agent than it used to be, but a few cases of poisoning still occur (seven suicides and one accident in the three years). The usual source is the purchase of salts of lemon, or salts of sorrel, from the pharmacist for use as a cleaning agent. The introduction of detergents may have made this poison less readily accessible.

Formalin is not a common agent, three suicides and one accident having occurred during 1950-2. It may be obtained freely for use as a hardening agent in photography, and has been used as a disinfectant for soft furnishings and other unwashable articles. It is used in the plastics and cellulose industries.

Heavy metals when ionized from dilute solutions of a salt act as astringents (blue-stone and silver-stick), but if their concentration is high they may act as corrosives. Of recent years there has been increasing concern about young children having access to ferrous sulphate tablets, which are attractive in appearance, 23 deaths from this cause being reported in the series of 335 mentioned above. Ferrous gluconate and other non-toxic iron compounds are being increasingly prescribed and the incidence of ferrous sulphate poisoning may therefore be expected to decrease. Of 6,598 children admitted as in-patients under the care of the Department of Child Health of the Welsh National School of Medicine during 1951-3, two suffered from ferrous sulphate poisoning, whereas during the seven-year period 1947-53, there were 15 cases.* A part of the syndrome results from absorption of excess iron, but a part of it is undoubtedly due to the local action on the gastro-intestinal mucosa, and perforation or late sequelae of extensive corrosion of the pyloric area of the stomach have occurred. Children who have swallowed these tablets should therefore be treated vigorously and urgently for corrosive poisoning.

When applied externally the circumstances are usually accidental, with the exception of the rare and execrable crime of vitriol throwing. Cases may be divided into two types:

(1) *Chemical Burns of the Skin*.—These are usually due to strong acid or alkali spilled or splashed at work. They are seldom severe, as the substance is easily washed off. Phenol or lysol on the skin can be removed before it does much damage. Emergencies from such causes are therefore rare.

*Watkins, A. G., Bray, P. T., and Gray, O. P., *British Medical Journal*, 1954, 1, 335.

*Pharm. J., 1953, 171, 50; 1954, 173, 284.

(2) *Severe Irritants and Corrosives in the Eye*.—By far the most common cause is lime burn in agricultural and building workers, the solid particles of calcium oxide adhering to and destroying tissue as a result of dehydration, and the hydroxide acting as an alkaline irritant. Accidents usually occur during the process of slaking the lime or while spreading it on fields, etc., or when applying it to walls and floors as a limewash. Cement contains 65% lime.

General Management

Certain principles apply to the management of all cases of poisoning. They apply no less to poisoning by corrosives than by barbiturates or other drugs.

1. The physician should consider each occasion on which the remote possibility of poisoning arises as urgent and make every effort to treat his patient promptly. Most of these occasions will prove to be false alarms, but the day will arrive when speed in giving attention is rewarding. Despite this urgency he must be calm, cool, and unhurried in procedure and obviously in control of the situation to an extent even greater than usual. Corrosive poisoning has a demoralizing effect on the patient's relatives and friends.

2. The first step is to safeguard respiration. Place the patient prone for fear of inhalation of vomitus. If there is any embarrassment to breathing, clear the airway and institute artificial respiration, at the same time requesting the presence of someone who can relieve you of this duty (many people have had training in first-aid methods; the police are expert). Fortunately, this urgent measure is seldom needed at first with corrosive poisoning, but may soon become important if oedema of the glottis develops. For this reason never delay unduly before sending the patient to hospital. Many patients who take fatal doses of corrosive fluids die of suffocation. Tracheotomy* may be necessary.

3. The next step is to remove such amounts of the corrosive as may be still active, or unabsorbed. In a case of external burns this may be the main treatment required; when dealing with a burn of the eye it is difficult but very necessary to be thorough. In the case of internal consumption of strong corrosives it is seldom advisable to use the stomach tube for fear of perforation. Details of gastric lavage will be given in next week's article on "Barbiturate and Aspirin Poisoning," should the physician decide to wash out the stomach.

4. The diagnosis of the probable nature of the corrosive should be established as soon as possible and the medico-legal aspect considered. This involves the questioning of relatives and attendants, the recovery and careful preservation of probable sources of the poison, and inspection of the patient.

5. The collection and preservation of specimens of vomitus and of any remaining portion of the presumed poison or of its container are important. This task may be temporarily delegated to a reliable attendant, but it is the physician's duty to supervise the matter closely. Specimens may be temporarily collected in any clean container—for example, glass jam-jars—but should subsequently be transferred to stoppered and labelled bottles.

6. It may be possible, depending on the probable diagnosis, to institute specific measures to neutralize acid or alkali or to counteract possible results from absorption of other substances. The measures so far taken can then be reviewed, and the degree of urgency in transferring the patient to hospital decided upon.

7. A brief general examination of the patient should be made at this stage and short notes prepared for future reference. If necessary, an analgesic may be administered now—for example, injection of morphine sulphate, $\frac{1}{4}$ gr. (15 mg.) for an adult—if respiration is adequate. Particular attention should be paid to the skin, lips, mouth, breath, vomitus, respiration and circulation, and the mental state.

*For details of the technique of tracheotomy see the article in this series on "Respiratory Obstruction," by Mr. Norman Jory (March 26, p. 781).

8. The nearest suitable hospital should be warned and transport arranged from the emergency ambulance service. The urgent nature of the case should be emphasized if necessary. Oxygen may be needed for the maintenance of respiration during the journey to hospital.

Diagnosis and Emergency Treatment of Individual Syndromes

The principal aid to diagnosis is the history and circumstances of the case. The clinical picture may be helpful, as follows.

Lysol, Phenol, Cresolic Preparations

The patient may have complained of a hot burning taste and severe internal pain, but not for long, as phenol produces a surface analgesia. Vomiting may not occur, or only once. The effects of absorption appear quickly—a few minutes to half an hour—with giddiness, delirium, and perhaps convulsions and coma. The patient is often found in this latter state. The breathing is stertorous, and the pupils are constricted; the mouth is burned dull white with phenol and the lips and chin are stained dark, while with lysol and other cresolic preparations the mouth is burned dark brown. There is usually a characteristic odour. If the physician has reached the case within fifteen minutes of the occurrence he may wish to pass a stomach tube and wash out. The addition of half an ounce (15 g.) of magnesium sulphate or a pint (570 ml.) of milk to the washing water is advantageous. Above all, guard the respiration by placing the patient prone and clearing the throat. Administer 100 mg. of leptazol subcutaneously, or 0.5 g. nikethamide intramuscularly, if breathing is poor; wash the external burns with soap and water, and order hot-water bottles as a simple measure to combat shock while awaiting immediate transference to hospital.

Inorganic Acids and Caustic Alkali

The patient is very collapsed, having experienced severe pain and violent vomiting almost as soon as the corrosive was swallowed. The jaw may be clenched, the mouth full of viscid mucus and shreds of tissue, white, foamy, blood-stained, or, later, coloured yellow or brown (acid). The vomitus contains altered blood and shreds of mucosa, apart from food. Hydrochloric and nitric acids produce an irritant fume and suffocation is often marked. Little can be done for it, as the air passages are affected. The skin around the mouth may be burned brown (acid) or white and soapy (alkali). The mind remains clear. Place the patient prone; clear the throat; do not use a stomach tube. For acid burns, endeavour to give sips of "milk of magnesia," if available, diluted 50% with water; chalk, or any gastric antacid, or dilute toilet soap in water; or the whites of two eggs in a pint (570 ml.) of water; or, if none of these is available, weak sodium bicarbonate (one teaspoonful to one pint (570 ml.) of water). The danger of the latter is the violent evolution of gas. For alkali give one part of domestic vinegar to three parts of water. Administer $\frac{1}{4}$ gr. (10 mg.) of morphine and 1/100 gr. (0.6 mg.) of atropine intramuscularly. If oxygen is available, administer it. Keep the patient warm, and give 0.5 g. of nikethamide intramuscularly if the circulation is failing. Send the patient to hospital as soon as possible.

External burns should be well washed with soap and water (acid) or diluted vinegar (alkali), and dressed with weak solution of bicarbonate (acid) or saline (alkali), and the patient transferred to hospital for further treatment. To prevent subsequent infection an injection of 300,000 units of procaine benzylpenicillin with 100,000 units of benzylpenicillin B.P. may be given with advantage.

Oxalic Acid and Oxalate

These have a rapid double action—immediate corrosion and subsequent depression of the heart and nervous system. A concentrated solution has similar effects to the inorganic acids, giving rise to pain, vomiting of altered blood,

suffocation, shock, and collapse. If the solution is less concentrated or salts of sorrel have been used, vomiting may be delayed, in which case the stomach should be washed out as soon as possible. Send to the nearest pharmacy for a pint (570 ml.) of lime-water, dilute it with an equal quantity of water and use it as the washing fluid, leaving the last half-pint (280 ml.) in the stomach. If a washout is not undertaken administer 4 fluid ounces (110 ml.) by mouth. If chalk is more readily available, give a teaspoonful stirred up in milk and repeat the dose three or four times. Respiratory or circulatory failure may require the injection of leptazol, 100 mg., with or without the administration of oxygen. Send the patient to hospital as soon as possible.

Formalin

Formalin causes acute pain and vomiting, and suffocation from the fumes. The stomach should be washed out with a solution of a teaspoonful of baking soda to a pint (570 ml.) of water, otherwise sodium bicarbonate should be given by mouth in warm water. Respiratory distress may require oxygen. Admit all cases to hospital, as sequelae may develop.

Ferrous Sulphate

This substance displays two actions—immediate irritation with possible corrosion, and late effects from absorption. The patient is usually a child, and the case presents with retching and vomiting, often of altered blood or mucosal shreds, pallor, tachycardia, and great drowsiness with restlessness; collapse occurs later. Hold the child upside down and tickle the fauces to promote vomiting. If gastric lavage is undertaken use a teaspoonful of sodium bicarbonate to a pint (570 ml.) of water and leave 100–250 ml. in the stomach. Guard against inhalation of vomitus, apply warmth, and send the patient to hospital.

Lime Burn of the Eye

Immediate treatment consists in vigorous washing with water poured from a jug, kettle, or tap. As blepharospasm is severe try to introduce cocaine eye-drops to facilitate this. Continue the washing for half an hour, and when the conjunctiva is cocaineized inspect it carefully, evert the upper lid, and remove any adherent particles. Forceps or even fine scissors may be needed. Particularly effective in removing lime from the cornea is a solution of 2 oz. (57 g.) of ammonium tartrate in one pint (570 ml.) of distilled water, which should be kept in all first-aid rooms in workplaces where lime or cement is used. Unfortunately this solution must be used fresh. It is therefore necessary to keep the ingredients in separate bottles and to mix them immediately before use as an eyewash. When the eye has been cleaned, instil homatropine eye-drops, followed in a few minutes with liquid paraffin, cover the eye with a pad, and send the patient to an ophthalmic centre. Time spent by the practitioner on this treatment is more important than hasty evacuation of a patient who may still have lime particles in the eye.

Medico-Legal Aspects of Poisoning

If the patient dies before the arrival of the doctor or before removal to hospital, report the matter to the coroner or fiscal, who will in due course decide on the cause of death. If the patient is alive on arrival a decision must be reached whether the cause of the poisoning was accident, attempted suicide, or attempted homicide.

(a) If the poisoning is due to accident there is no obligation to report the matter unless the poisonous agent is one referred to in the Factories Act, 1937, administered while the patient was at work. The common corrosives are not included in the list of notifiable conditions.

(b) If the case is one of attempted suicide the practitioner should, in law, notify the police. However, this is an obligation which is more honoured in the breach than in the observance, and I have no knowledge of any practitioner having ever been prosecuted for failure so to do.

(c) If there are reasons to suspect foul play it is essential to supervise the removal of the patient to hospital. If suspicion is strong, notify the police as quickly as possible; if weak, consult the hospital authorities and let them confirm or refute. If the patient is *in extremis* and there is any reason to suspect a homicidal attempt, a dying deposition should be taken before removal. Disturb the scene as little as possible, and endeavour to ensure that no one else does so, if possible by locking up the place of death.

When the patient is transferred alive to hospital, all relevant details should be communicated by sealed letter to the medical man in attendance, especially the diagnosis of corrosive used and the treatment already given. Secure the poison container and any residues, and remove and label them. The specimens of vomitus, stomach washout, urine, etc., should be taken away in clean jars and transferred to bottles with screw tops, fixed with adhesive, and labelled with the patient's name and address, date, and nature of specimen. Lock them up in the surgery with an inventory so that they can be produced and identified if needed. Take notes at the time of the occurrence or immediately after, paying attention to the chief symptoms, the stated history, the time at which one was summoned, and the time of arrival, the alleged time at which the poison was taken, the time of death if that has occurred and is known, and any relevant statement made by the patient (in his own words). Consult the patient's medical record and make a note of any previous illness which might have some bearing on the present problem.

In the case of an external burn fairly full notes should also be taken in case of subsequent proceedings for compensation. If an accident has occurred at work, advise the patient to have the matter recorded in the "accidents book" if that has not already been done. Should death occur subsequently these notes will be needed in connexion with the inevitable coroner's or fiscal's inquiry; should the patient recover and no public inquiry ensue, the specimens may be destroyed and the notes filed with the case sheet for reference should late sequelae develop.

Next article on Emergencies in General Practice.—"Barbiturate and Aspirin Poisoning," by Dr. T. J. Thomson and Professor S. Alstead.

MODERN ASPECTS OF LIVER AND BILIARY DISEASE

[FROM A SPECIAL CORRESPONDENT]

A highly successful symposium on "Modern Aspects of Liver and Biliary Disease" was held for consultants at the Postgraduate Medical School, Hammersmith Hospital, London, from March 28 to April 1. The programme consisted of lectures, discussions, case demonstrations, films, and the demonstration of techniques used in the investigation of liver disease. It is possible to pick out only a few of the topics discussed.

Management of Jaundice

Professor N. F. MACLAGAN (Westminster Hospital) outlined the biochemical methods used in the diagnosis of liver disease. As a routine, the urine—preferably passed in the afternoon—should be examined for bilirubin, urobilinogen, and bile salts. In addition, serum bilirubin, alkaline phosphatase, and one or two of the flocculation tests should be done: he favoured the thymol turbidity and colloidal gold tests. Estimation of serum proteins and bromsulphalein excretion might give useful evidence of liver cell function. In the majority of cases these biochemical tests would confirm the clinical diagnosis.

Dr. SHEILA SHERLOCK (Postgraduate Medical School) stressed the importance of pain and pruritus, together with deep jaundice, as features of obstructive jaundice. Pruritus

was only a transient symptom in infective hepatitis, and the appearance of spider naevi suggested this diagnosis. Daily inspection of the stools was of great value in assessing the degree of obstruction, and the presence of occult blood suggested the presence of a carcinoma. In a few patients, where jaundice was prolonged or deep, a liver biopsy or even laparotomy might be necessary to establish the cause, but it was wise to wait three weeks. Treatment of infective hepatitis consisted of rest in bed until jaundice had disappeared, together with a nutritious diet. It was probably unnecessary to give excess protein or to restrict fat. Severe exertion and alcohol should be forbidden for at least six months after the attack. Obstructive jaundice which could not be relieved surgically was associated with three factors which required treating: pruritus, steatorrhoea, and a tendency to haemorrhage. Testosterone propionate given sublingually sometimes relieved itching. The patient should take a high protein, low fat diet, with large doses of calcium by mouth, and the fat-soluble vitamins, A, D, and K, should be given by injection once or twice a month.

Portal Hypertension

Dr. P. C. REYNELL (Oxford) said that the majority of cases of portal hypertension were due to obstruction within the liver—cirrhosis—or to extrahepatic obstruction of the portal venous system. A collateral circulation between the portal and systemic veins developed in the region of the oesophagus, rectum, umbilicus, diaphragm, and retroperitoneal tissues. Of these only the oesophageal vessels were important because of their liability to rupture, the other channels serving as useful means of decompressing the portal venous pressure. Splenomegaly was also a feature of portal hypertension, but occasionally the spleen could not be palpated. Haematological changes also occurred: anaemia was often due to bleeding, while leucopenia and thrombocytopenia were part of a non-specific "hyper-splenism" and seldom required treatment. Haemorrhage from oesophageal varices was the most important effect of portal hypertension, and occurred in about 25% of patients with cirrhosis. It was often fatal.

Professor R. MILNES WALKER (Bristol) stressed that the only indication for surgery was the danger of serious haemorrhage. Patients with jaundice, ascites, and serum albumin levels below 3 g. per 100 ml. were bad operative risks. The new technique of splenic venography—the injection of radio-opaque dye into the spleen so as to outline the portal venous system—was of great value to the surgeon in demonstrating a patent vein for anastomosis. End-to-side porta-caval anastomosis was the operation of choice, but in patients with abnormalities of the portal vein end-to-side spleno-renal anastomosis might be possible if the splenic vein was patent. Direct operations on the varices, often combined with splenectomy, were less satisfactory, but could be undertaken to control bleeding. It should be remembered that gastro-intestinal bleeding in patients with cirrhosis might be due to peptic ulceration. Thirty-five out of 42 patients who had undergone porta-caval anastomosis were well up to four and a half years after operation, and the recurrence rate of bleeding after this operation was only 5%, a much better figure than with any other form of therapy.

Ascites

Dr. R. I. S. BAYLISS (Westminster Hospital) said that two primary factors were needed for the production of ascites—namely, a lowered plasma albumin level and an increased portal venous pressure. There was abundant evidence, both clinical and experimental, that neither alone resulted in ascites. A number of secondary factors had been invoked, the most popular at present being increased adreno-cortical activity. It was well known that patients with cirrhosis and ascites retained sodium extremely avidly, the sodium content of body secretions being negligible, even on a normal salt intake. This suggested a humoral factor, and similar changes could be produced by the administration of aldosterone. Nevertheless it was possible that aldosterone is secreted in

response to sodium retention. The damaged liver could not conjugate corticoids efficiently, and this might be a factor in perpetuating ascites. The part played by the anti-diuretic hormone of the posterior pituitary was difficult to evaluate because of unsatisfactory methods of assay, but the patient with cirrhosis could metabolize exogenous pitressin normally. Finally, reduction in renal blood flow has been reported, and this may lead to increased reabsorption of sodium.

Dr. A. PATON (St. Thomas's Hospital) pointed out that the patient with ascites due to cirrhosis always had a poor liver, and that therefore any form of operative treatment was extremely hazardous. Surgical methods of lowering portal venous pressure had been advocated, but all had disadvantages. Talma-Morrison omentopexy and hepatopexy (the application of magnesium trisilicate to the abraded liver and diaphragm advocated by Madden) were simple operations which would increase intervals between tapings, but were probably no more effective than strict medical regimes. Porta-caval anastomosis was almost always contraindicated, and the latest operation of hepatic artery ligation unphysiological. Measures aimed at raising serum albumin were also unsatisfactory, though good results had been claimed with the use of salt-poor human albumin. However, this substance was expensive, large quantities must be given intravenously, and severe reactions had been reported. Paracentesis abdominis had many disadvantages, and should never be used as the sole means of treatment: infection, shock, a low-salt syndrome, and hepatic coma were all potential dangers, but even more important was the removal of large quantities of albumin in the ascitic fluid.

The majority of patients with ascites would respond to a strict low-salt diet, containing less than half a gramme of sodium a day, together with mercurial diuretics and 1–3 g. ammonium chloride by mouth daily. It was wise to give 1 g. potassium chloride also to make up for the loss of potassium which accompanies the diuresis. This regime might take a month or two to control ascites formation, and an initial paracentesis was often necessary. There was then a striking increase in sodium excretion in the urine and the serum albumin level rose; it might be possible eventually to relax sodium restriction. A few cirrhotics developed ascites as the result of some recognizable precipitating factor, such as alcohol, bleeding, or infections. Here treatment should be directed against the responsible factor. Another small group had intractable ascites which would not respond to the low-salt regime. These were often young patients with an "active" cirrhosis, and their prognosis was extremely bad.

Hepatic Coma

Dr. SHERLOCK discussed the neurological manifestations of liver disease, which she has termed "portal-systemic encephalopathy." The syndrome might occur in both portal cirrhosis and infective hepatitis, and recognition was important because it was often reversible and preventable. Mental changes resembled those of other organic dementias. The onset was often insidious and consisted of a change in behaviour, together with confusion and disorientation, which might be followed by stupor and coma. Patients with the syndrome had sometimes been admitted to psychiatric hospitals before the underlying liver disease was recognized. Motor disturbances consisted of a characteristic "flapping" tremor of the outstretched hands, rigidity, exaggeration of the tendon reflexes, and ankle clonus. The plantar responses were usually flexor. The tremor might spread to involve the whole body, and dysarthria and ataxia result. There was a characteristic fluctuation in the neurological features, and it was extremely rash to give a prognosis in the individual case. If the syndrome occurred in infective hepatitis it was usually rapidly progressive and the prognosis extremely bad. In portal cirrhosis, however, it might appear in a chronic form, or be precipitated by such factors as haemorrhage, operations, paracentesis abdominis, infections, alcohol, and the intake of nitrogenous substances. Hepatic coma was believed to be due to the inability of the liver to metabolize

nitrogenous compounds absorbed from the intestine, either because of poor liver-cell function or because these substances pass the liver through the extensive collateral circulation generally found in portal hypertension. Treatment in these cases should be directed at the precipitating factors, and in the chronic cases restriction of protein intake had proved effective.

Mr. A. G. RIDDELL (Manchester) said that normally ammonia absorbed from the gut was removed by the liver. In patients with liver disease it might get into the general circulation in the manner suggested by Dr. Sherlock. Ammonia, which was known to produce similar effects in animals, had been incriminated as the cause of hepatic coma, and certainly high blood-ammonium levels could be demonstrated in some, but by no means all, patients with hepatic coma. The syndrome could be produced by giving a high-protein diet, urea, ammonium chloride, or ammonium-containing ion exchange resins to patients with cirrhosis. It was seen also in patients who had undergone porta-caval anastomosis, about 10% developing episodes of stupor following the operation. Haemorrhage from varices was a well-known cause of hepatic coma, and it was interesting that blood introduced into the stomach of a cirrhotic would reproduce the syndrome. Treatment consisted in withholding any substance containing ammonia. Haemorrhage must be arrested as soon as possible by the use of an oesophageal balloon, and enemata should be given to remove blood from the intestines. The diet should consist largely of glucose, and chlortetracycline might help by depressing bacterial activity in the gut. Glutamic acid, either intravenously or by mouth, might be useful supportive therapy in coma following bleeding, but was of no value in the chronic syndrome or in the fulminant type associated with infective hepatitis.

Nova et Vetera

A DOCTOR IN CANADA IN 1862

In 1935 the Association held its Annual Meeting at Melbourne. Half of the party from Britain travelled via Canada and Vancouver, the other half via U.S.A. In March, 1935, the *British Medical Journal* published an account of the influence of the late Dr. W. B. Cheadle in promoting the development of Western Canada and the construction of the Canadian Pacific Railway. A correspondence which followed produced some further facts: from these sources what here follows is compiled.

Dr. W. B. Cheadle, M.D., F.R.C.P., who died full of years in 1910, was then consulting physician to St. Mary's Hospital and to the Hospital for Sick Children, Great Ormond Street, a much-esteemed London teacher and consultant. In 1862-3 he accompanied the late Viscount Milton on a buffalo-hunting expedition to the middle west of Canada. After travelling 500 miles by canoe, and more on foot, from the most westerly settlements, they wintered in a log hut, subsisting on frozen salmon and dried buffalo beef. When spring came they went further westwards, crossed the Rocky Mountains by the Tête Jaune Pass, and narrowly escaped death by starvation on the far side. Cheadle was a man of exceptional physique; it was his strength and endurance that saved the party from disaster (he lost 41 lb. in weight during the journey). Returning to England, they published a book, which they called *The North-West Passage by Land*, describing their adventures. The title-page says it is by Viscount Milton and Dr. Cheadle, but Cheadle was actually the sole author. The book is very well written, and became a best seller: many editions were published in the next 15 years.

Cheadle was very insistent upon the potential agricultural wealth of Western Canada. He wrote: "From the Red River to the Rocky Mountains, along the banks of the Assiniboine and the fertile belt of the Saskatchewan, at least 60 million acres of the richest soil lie ready for the farmer

when he shall be allowed to enter in and possess it. This glorious country, capable of sustaining an enormous population, lies utterly useless except for the support of a few Indians, and the enrichment of the shareholders" (of the Hudson's Bay Company). He pleaded strongly for the construction of a transcontinental railway, without which, he pointed out, no settler could embark on farming. Parliamentary questions were asked, both in England and in Canada; as a result the Canadian Government sent out a commission of railway engineers, whose report disclosed no difficulties that could not be overcome. A Canadian Pacific Railway had already been advocated for some years: Cheadle's support hastened the realization of a project which would, of course, have anyhow materialized sooner or later. He is commemorated by a town named after him in Alberta. His companion, Viscount Milton, did not outlive his father, the sixth Earl FitzWilliam, and thus did not succeed to the earldom. His son was the seventh earl and his grandson was the eighth: Lady Juliet FitzWilliam is his great-granddaughter. The present (tenth) earl is a collateral relative, but not a direct descendant. A copy of the book, it may be added, is in the Association's library.

HENRY ROBINSON.

THE APPRENTICE IN MEDICINE*

A few years ago Dr. Harold Brodribb, of St. Leonards-on-Sea, showed me the indenture of his great-grandfather putting himself apprentice to William Randall, of Southampton, Apothecary and Citizen of London.† This form of indenture was used with only minor changes for at least the three hundred years after the Statute of Labourers and Artificers of 1563, and for every kind of apprentice. From the earliest recorded times young men were not considered responsible until the age of 23 years, and all technical education rested on an apprentice basis in the interval between 16 years, when the general grounding in the humanities ended, and this technical coming-of-age. Beyond the teacher-pupil relationship in the art, master and apprentice undertook towards each other mutual responsibilities in the conduct of life. The terms sound as archaic a note to-day as does the underlying philosophy of a strict contract with human behaviour as the subject. Such attempts to control the freedom of choice in others would not be tolerated in the free society of to-day: "What I do out of hours is none of your business."

This control took odd forms at times, when, for example, in 1556 no surgeon's apprentice was "to wear a beard past fifteen dayes growing upon a pain of his master's losing 6s. 8d." This was rescinded in 1557—how fascinating to know as the result of what petition, manifesto, or strike action. The master at his best taught his pupil not only technique but how he must live.

In the forties of last century references to behaviour drop out in some or are attenuated in others to teaching by the master and a promise to "obey and protect and serve" by the apprentice, although the original wording was in use at least until 1846. In some of the latest forms permission is given during the last two years to attend "such lectures and anatomical schools and hospitals as are usually commonly attended" (1851). Brodribb spent the sixth and seventh years of his apprenticeship at St. Bartholomew's, at the feet of Abernethy, Lawrence, and Stanley, although no permissive clause appears in his indenture.

In 1815, the year before Brodribb's indenture, an Act extended the sphere of influence of the Apothecaries' Society from London and seven miles beyond to the whole country, ordaining a five-year apprenticeship. This gave the Society, founded as a craft guild in 1617 as a splinter from the Grocers' Company, a chance to control and represent the general practitioner. But the leaders of the profession were college men, and college influence and the growth of universities, including London University, in the nineteenth

*Abridged version of a paper read to the Osler Club of London. †Owing to the impossibility of reproducing the indenture clearly, only the capital initial is in facsimile.

century won the day. Real power rests, as it ever did, with those who control the register, the curriculum, and the examination. Meanwhile the apprentice system had failed to keep pace with the expansion of trades and crafts caused by the discoveries of drawing-room scientists—the eighteenth century's version of to-day's back-room boys. In 1814 an Act of Liberation allowed any man to exercise any craft or trade he pleased whether apprenticed or not, and trade apprentices began to live at home and to earn wages while training. The growth of trade unions led from time to time to restrictions of numbers and proportions of apprentices and of conditions of employment, restrictions curiously like those imposed by the guilds six or seven hundred years before.

Medicine follows these trends after the long and dignified delay that befits a learned profession. Only in recent years have the hospital resident medical staff earned a salary while serving an apprenticeship of learning at the end of training. Many of those who apply for admission to a medical school, like those who embark on the career of general practice to-day, must feel that there is now a very definite restriction of entry into the profession.

Views on the Apprentice System

Modern thought about medical education calls for a re-examination of the apprentice system. Has anything been lost that should be rescued? Walter Rivington, surgeon to the London Hospital, in his publication *The Medical Profession of the United Kingdom* (Dublin, 1888), has something to say on this point. He was a man of foresight, and advocated in those early days whole-time clinical professors and the linking of all dispensaries and hospitals with medical schools.

"Another subject is how to secure the advantages which sometimes resulted from the old system of apprenticeship? How, in other words, can certain deficiencies in hospital education be supplied? A completely qualified student brought up only at a hospital school, may be deficient in the very points which are needed for his success in practice. His 'diplomatic functions'

may have been uncultivated—he may have no tact—he may be unable to prescribe well, have never seen cases of measles, scarlet fever, smallpox, and many children's ailments; may not know how to deal with patients, or to keep books, or to arrange a surgery. All these wants can be fully supplied by residence with a busy general practitioner, and the best period of residence is either after the end of the third year, or after obtaining a qualification to practise. We should be inclined to require every assistant to a general practitioner to have passed the proposed examination at the end of the third year. The passage of this examination should entitle a student to a certificate that he was fit to attend midwifery cases not requiring instrumental interference, and to perform those minor acts for which assistants—unqualified assistants—are required. He should not be allowed to sign death certificates: students living with practitioners before this period should be called, not assistants, but pupils. There should be no more unqualified assistants, but there should be 'certificated assistants,' and any infringement of the rules laid down as to the extent of assistance for which the certificate should be granted, should be visited with serious penalties on the general practitioner. Certificated assistants should not be permitted to manage bogus dispensaries or to carry on branch practices. . . .

In this statement of 66 years ago there seems to be a foreshadowing of the pre-registration house appointment and the trainee assistant. Is it possible that these can achieve the balance, so much desired, between technical education in the science and craft of medicine and training for the life of the doctor?

Pieté demands a footnote on the life of that William Perrin Brodribb (1800-69) whose apprenticeship indenture is here illustrated. He was the son of Uriah Brodribb, of Warminster, and the family had farmed their own land at Clifton, in Somerset. Henry Irving (Brodribb) was of the same family.

William Perrin, after apprenticeship to a doctor in Southampton at the age of 16, finished his training at St. Bartholomew's Hospital. He qualified M.R.C.S. (1822) and L.S.A. (1823), and these certificates are still in existence. In 1838 he moved from Southampton to 12, Bloomsbury Square, London. His second wife was Miss Aitken, daughter of a neighbouring doctor, Charles Rachemont Aitken, into whose



His Indenture witnesseth, That *Wm Perrin Brodribb* Son of *Uriah Brodribb of Warminster, Grocer*

doth put himself Apprentice to *William Randall of Southampton, Apothecary & Citizen of London*

to learn his Art; and with him (after the Manner of an Apprentice) to serve from the Date hereof until the full End and Term of Seven Years, from thence next following, to be fully complete and ended. During which Term, the said Apprentice his said Master faithfully shall serve, his Secrets keep, his lawful Commands every where gladly do. He shall do no Damage to his said Master, nor see it to be done of Others, but that he to his Power shall let or forthwith give Warning to his said Master of the same. He shall not waste the Goods of his said Master, nor lend them unlawfully to any. He shall not commit Fornication, nor contract Matrimony, within the said Term. He shall not play at Cards, Dice,

Tables, or any other unlawful Games, whereby his said Master may have any Loss. With his own Goods or Others, during the said Term, without License of his said Master, he shall neither buy or sell. He shall not haunt Taverns or Play-houses, nor absent himself from his said Master's Service Day or Night unlawfully. But in all Things, as a faithful Apprentice he shall behave himself towards his said Master, and all his, during the said Term. And

(the Sum of *Three hundred & fifteen pounds* of lawful Money of Great Britain, being

paid or secured to the said Master, as the Consideration for taking his said Apprentice) the said Master his said Apprentice, in the same Arts which he useth, by the best Means that he can, shall teach and instruct or cause to be taught and instructed; finding to his said Apprentice, Meat, Drink, Apparel, Lodging, and all other Necessaries, according to the Custom of the City of London, during the said Term. And, for the true Performance of all and every of the said Covenants and Agreements, either of the said parties bindeth himself unto the other by these Presents.

In Witness whereof, the Parties above-named to this Indenture have put their Hands and Seals, the *third* Day of *September* in the *fifty sixth* Year of the Reign of our Sovereign Lord *George the third* by the Grace of God, of the United Kingdom of Great Britain and Ireland, King, Defender of the Faith, and in the Year of our Lord, One thousand Eight hundred and *sixteen*

Sealed and delivered (being first duly stamped) in the Presence of

S. Buckler

William Randall

William Perrin Brodribb

house he later moved (No. 7, Bloomsbury Square). He had a successful private practice in this middle-class neighbourhood and he was surgeon to the Magdalen Hospital, then in Blackfriars Road. For the last seven or eight years of his life he was Secretary to the Court of Examiners of the Apothecaries Hall.

He had three sons—the first, a Fellow of St. John's College, Cambridge, later achieved fame by a translation, with Church, of Tacitus. By his second wife he had A. A. Brodribb, for many years Parliamentary Correspondent of *The Times*, and C. A. Brodribb, whose descendants carry on, without a break, the medical tradition founded by W. P. Brodribb.

I am indebted to Dr. Harold Brodribb for a photograph of the indenture and to Mr. Poynter, of the Wellcome Historical Medical Library, for gathering the indentures in that library for my inspection.

A. WHITE FRANKLIN.

Reports of Societies

PRESENT STATUS OF HYPOTHERMIA IN ANAESTHESIA

On April 1, under the chairmanship of Dr. BERNARD JOHNSON, dean of the Faculty of Anaesthetists of the Royal College of Surgeons, the Section of Anaesthetics of the Royal Society of Medicine debated the present status of induced hypothermia. The opening papers were both by anaesthetists with wide experience of this technique.

Dr. C. F. Scurr (Westminster Hospital) opened with a review of the physiological changes that accompany a general lowering of the body temperature. He pointed out that at normal body temperature tissue anoxia from circulatory arrest leads to cellular death unless rapidly relieved. In cases of cardiac arrest, for example, the heart might be restarted by massage, but often as a result of the delay the brain suffered irreversible damage. Hypothermia reduced the cell metabolism in a linear fashion so that cells could survive anoxia for longer periods. Animal experiments had shown that at a body temperature of 25° C. the circulation to the brain could be completely occluded for 20 minutes without either physiological or histological evidence of cerebral damage. Recently, Bailey had reported a case of complete circulatory interruption in a child for 22 minutes at a temperature of 21.6° C. in whom there was no evidence of cerebral damage 30 hours after operation.

Benefits and Dangers

The indications for hypothermia were fourfold, said Dr. Scurr. First, intracardiac procedures requiring an open heart, temporary occlusion of the venae cavae, and cessation of the circulation. Second, certain congenital cardiac anomalies in which there was cyanosis or the great vessels required transplantation. Third, intracranial procedures involving temporary arrest of the circulation to part of the brain: it had been suggested here that hypothermia might also increase the margin of safety of induced hypotension for neurosurgical procedures. Finally, operations or grafts to the great vessels supplying vital organs. Under normal conditions the kidney and spinal cord could barely withstand 30 minutes of circulatory arrest, but under hypothermia (27–28° C.) ischaemia of two hours' duration had been reported with only minimal—although definite—signs of transient paraplegia.

Amongst the disadvantages of the hypothermic state was the increased irritability of the myocardium which might lead to spontaneous ventricular fibrillation. The exact cause of this irritability was imperfectly understood. The evidence that ionic changes or anoxia of the myocardium were the sole cause was contradictory. A possible cause was that during hypothermia acetylcholine production was depressed, so that the pacemaker lost its dominance and ectopic foci appeared. The fact that neostigmine has a powerful protective action against ventricular fibrillation was in keeping with this theory. Most workers of experience agreed that

hyperventilation, with carbon dioxide absorption, helped to reduce the incidence of cardiac irregularities during hypothermia. Nevertheless continuous electrocardiographic control was essential throughout the operation, as the appearance of arrhythmias or ectopic foci was regarded as a danger signal.

Other disadvantages of hypothermia were the production of the stress response to cold and the increase in viscosity of the blood as the temperature fell.

Technique

Of the two main methods of reducing the body temperature—namely, surface cooling and the extracorporeal circulation—the surface method, using a cooling blanket, had been the most favoured at the Westminster Hospital, continued Dr. Scurr. The patient was anaesthetized with ether, cyclopropane, or thiopentone/nitrous oxide/oxygen and a muscle-relaxant to prevent shivering. The body was then wrapped in a cooling blanket, through which water circulates at 2–4° C. Before the desired temperature was reached the pump was stopped and warm water passed through the blanket. This reduced the tendency of the body temperature to continue to fall after the cooling process had ceased.

Dr. T. CECIL GRAY then described the experience of members and associates of the Liverpool Department of Anaesthesia with 110 operations under hypothermia. In the first 40 cases the technique originally described by the French authors had been used, intermittent doses of chlorpromazine, pethidine, and promethazine hydrochloride being administered. This method had now been abandoned because of the difficulty in controlling the shivering and the length of time to lower the temperature. The present method was to induce light anaesthesia with thiopentone/nitrous oxide/oxygen, prevent shivering with a muscle-relaxant (D-tubocurarine), and then give moderate doses of chlorpromazine to aid the cooling process. Surface cooling with either ice-bags or a cooling blanket was preferred. The patient's position should be changed every 15 minutes to prevent pooling of the blood, which would otherwise result in a sudden fall in the body temperature when the patient was finally moved. A colour film demonstrating the method used for cooling a patient prior to an operation for porto-caval anastomosis was then shown.

Mortality and the Reaction to Cold

Dr. Gray went on to say that he agreed in principle with Dr. Scurr's indications for hypothermia in clinical surgery, with two modifications. First, he did not think that cooling was necessary in cases of congenital heart disease undergoing a Blalock operation. Second, in general surgery it appeared to provide some protection against surgical trauma as well as permitting the use of hypotension in subjects who might otherwise be considered unsuitable for this. To date, investigation of patients undergoing hypothermia had failed to confirm the view that pituitary-adrenal responses were modified by cold. On the other hand, an investigation in animals suggested that inhibition of the stress response might account for some of the benefits of hypothermia.

In the Liverpool series there had been 13 deaths in the 110 cases. The high mortality was largely due to the nature and magnitude of the surgical procedures. There were, however, three cases of fatal pulmonary embolus in this group, which might be significant. Dr. Gray concluded by stating that hypothermia was a specialized technique which carried very definite risks, and at present it should be used only in the larger centres. Provided the temperature was not reduced below 28–30° C., the lowered metabolism and possible diminution of the stress response had proved of value in selected cases for general surgery.

Discussion

In the discussion that followed, Dr. J. W. DUNDEE (Liverpool) described a neurosurgical case in which the middle cerebral artery had been occluded for eight minutes at a body temperature of 30° C. without any signs of post-operative cerebral damage. In another case at a similar

temperature hypotension in the head-up position had been maintained for four hours without ill effect.

Dr. B. G. B. LUCAS (University College Hospital, London) stressed the difference, under hypothermia, of the heart and the brain in their tolerance of ischaemia. At normal temperature the brain was the more sensitive to ischaemia, while at temperatures of 25° C. the brain would withstand circulatory arrest for 30 minutes, whereas the heart would tolerate arrest for no longer than 15 minutes. Therefore for endocardial surgery taking some time, either some form of coronary perfusion was necessary or much lower temperatures would have to be used.

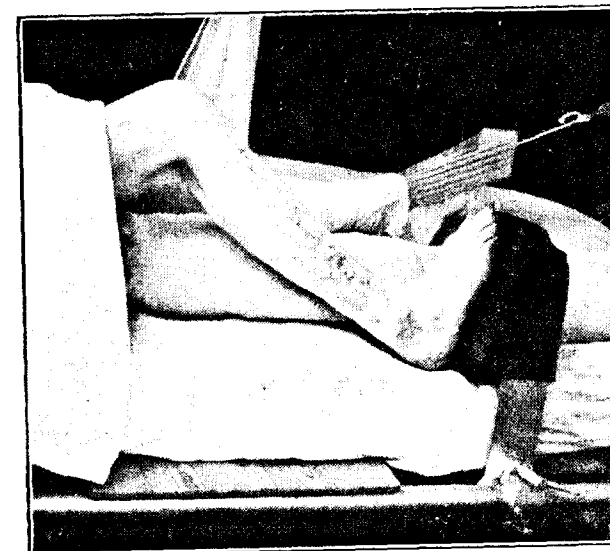
Mr. C. E. DREW (Westminster Hospital) thought that operations on children with congenital cyanotic heart disease were better done under hypothermia, as this allowed the surgeon greater freedom in choice of operative technique if some unusual malformation were encountered. It also lessened the risk of cerebral thrombosis in these patients.

Dr. G. JACKSON REES (Liverpool) thought that hypothermia should not be used for children with congenital cyanotic disease undergoing a Blalock operation, as this only increased the risk without providing any benefits. Adequate ventilation with a high percentage of oxygen was far more important.

Preparations and Appliances

BED FOOT-REST

Mr. G. T. F. BRADDOCK, orthopaedic registrar, Whittington Hospital, London, N.19, writes: The foot-rest here shown has been simply made by the hospital carpenter and the theatre technician from old orthopaedic traction fittings. This attachment fulfils the following functions: (1) It allows the patients to push themselves up in bed, and to keep themselves from sliding down the bed when traction is



applied to the other limb. (2) It encourages constant use of the good limb, and therefore reduces the tendency to thrombotic complications as well as maintaining muscle tone. (3) It prevents foot-drop. (4) It acts as a bed cradle and prevents the clothes from touching the unaffected foot. It is unnecessary to remove the foot-rest during sleep. (5) It prevents the development of a sore heel, which is very common when the patients have to push themselves up in bed with their heels. (6) It reduces the energy necessary, by the nursing staff, in lifting patients up the bed.

Patients who have had the benefit of this attachment complain bitterly if it is removed. Its use need, of course, not be confined to patients in traction. All of us who read in bed are conscious of the difficulty in keeping up.

Correspondence

Primary Aldosteronism

SIR,—Dr. J. G. LLAURADO's interesting letter (*Journal*, April 2, p. 851) raises several matters requiring further explanation. Professor Conn¹ has now published a preliminary account of the first recognized case of primary aldosteronism, and ends by stating that a right adrenal cortical tumour, 4 cm. in diameter, has been excised. Information regarding the effects of the operation on the disease is awaited with great interest. This pioneer work makes it very probable that the case reported by Evans and Milne² as "potassium-losing nephritis" was in fact another example of primary aldosteronism. The patient has improved dramatically with medical measures alone, and is not fully convinced of the necessity of further investigation. It is hoped, however, that further investigations may become possible.

We agree with Dr. Llauro that the two cases he quotes are probably examples of this disease, as is also the case described by Earle *et al.*³ The reason for the emphasis on impaired renal function in all these cases is that potassium deficiency produced by primary aldosteronism or by other causes will result in a nephropathy which may closely simulate primary renal disease. Many cases have now been published^{4–8} in which severe potassium deficiency has produced this nephropathy associated with vacuolization of the cytoplasm and pyknosis of the nuclei of renal tubular cells, the so-called "clear cell nephrosis." The resulting renal functional impairment has been studied by Schwartz and Reiman,⁹ who found a reduction of the glomerular filtration rate and renal plasma flow with complete isothermia. These functional defects were abolished by treatment with potassium supplements. One of us¹⁰ has shown that a corresponding defect in the urinary acidification mechanism can be produced by comparatively mild experimental potassium depletion.

So-called "potassium-losing nephritis" is certainly not invariably due to primary aldosteronism. We consider that the following points would favour a diagnosis of primary aldosteronism: (a) absence of definite evidence of a primary nephritis; (b) the need for very large potassium supplements to maintain a normal serum potassium level—in the patient of Earle *et al.*,³ 625 mEq daily (equal to 46 g. potassium chloride) was needed to do this; (c) evidence of an adrenal tumour; (d) excretion of excess aldosterone; (e) renal biopsy showing the characteristic tubular lesions of potassium deficiency without evidence of primary nephritis.

At the time our joint studies were made we were unable to tell whether or not the aldosterone output was primary or secondary to the electrolyte abnormalities. As it was already accepted then that aldosterone output is increased in the nephrotic syndrome and in other oedematous states, a secondary cause for this high output seemed to ourselves and to Dr. Llauro to be more probable. We were relieved, therefore, to observe that Dr. Llauro does not claim any priority in the description of the syndrome of primary aldosteronism. In our opinion Professor Conn deserves full credit for his brilliant exposition of this interesting but rare new disease.—We are, etc.,

C. L. COPE.
M. D. MILNE.

London, W.12.

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Sickling and Malaria

SIR,—With reference to the recent correspondence published in the *Journal* on the subject of the possible relationship between sickling and malaria (*Journal*, November 13, 1954, p. 1162, and January 29, p. 285) may we add a brief note quoting the preliminary findings of some malarionetrical indices investigated in an African child population aged between 5 and 12 years?

Of the total of 529 children recently seen in the course of two surveys in Southern and Northern Nigeria 107, or 20.2%, were showing the sickle-cell trait. The comparative results of two malarionetrical indices, crude parasite rate and positive parasite density index in sicklers and non-sicklers respectively, are shown in the following tables.

TABLE I.—*Sicklers*

Age Group (Years)	No.	Crude Parasite Rate	Positive Parasite Density Index
5-7	36	64.0	2.61
8-10	38	55.2	2.29
11-15	19	68.5	1.93
Total	93	61.2	2.32

TABLE II.—*Non-sicklers*

Age Group (Years)	No.	Crude Parasite Rate	Positive Parasite Density Index
5-7	148	47.3	2.89
8-10	178	65.8	2.19
11-15	110	49.0	1.63
Total	436	55.3	2.20

The figures quoted above do not indicate any constant relationship between the two malarionetrical indices and the presence of the sickling trait. In particular there is no evidence of any contrast between the positive parasite density of sicklers and non-sicklers. In the 5-7 age group the difference between the index figures of 2.89 and 2.61 corresponds to a difference of geometric means of approximately 470 and 380 parasites per cubic mm. This difference between two mean parasite densities is too small to warrant our concluding that the malaria affecting these Nigerian children differed in severity in sicklers from that seen in non-sicklers. This investigation continues now on a larger scale.—We are, etc.,

H. M. ARCHIBALD.

Lagos, Nigeria.

L. J. BRUCE-CHWATT.

Clinical Staging of Carcinoma of the Breast

SIR,—The letter by Mr. Michael Harmer (*Journal*, March 26, p. 790) must meet with the approval of all clinicians interested in the study of carcinoma of the breast. Any progress in the assessment of the results of treatment is materially hampered by inadequate clinical staging, and Mr. Harmer enumerates reasons why the breast is peculiarly suitable for a universal agreed staging.

The survey of cancer published in 1952 by the British Empire Cancer Campaign collected over 2,000 cases—nearly 30% of all the cases of cancer in the female. And the average age was in the fifties, so it is not primarily a disease of old age. In addition, various advances in treatment—especially endocrine control—have increased the relatively good survival rate even further.

But there are so many centres and so many surgeons that a simple staging seems essential. A complex staging will never succeed except in those few well-equipped and staffed centres: simplicity is the keynote, even if it can allow considerable clinical variations. If surgeons could be persuaded to indicate in the notes their estimated clinical staging at the first attendance of the patient it would save much tedious perusal of records with its consequent difficult reassessment. Prior to the war I was associated with the Clinical Research Committee of the British Empire Cancer Campaign, and more recently have followed up our cases

here in Leicester. In both instances the clinical staging was the stumbling-block in the investigation, and much time was expended in sifting out the relevant clinical details. If a simple staging was adopted then it can be widely disseminated and we can start to assess results, knowing exactly that we are discussing the same problem.

I welcome Mr. Michael Harmer's initiative and wish him every success in his quest for a universal staging: for a sound basis of staging is the firmest foundation in the study of the results of treatment.—I am, etc.,

Leicester.

G. C. SAWYER.

SIR,—I should like to be allowed to add a footnote to Mr. Michael Harmer's letter (*Journal*, March 26, p. 790).

There is associated with this department, which is responsible for statistical analysis of data relating to cases of cancer registered in England and Wales, a committee under the chairmanship of Dr. A. H. T. Robb-Smith which advises on cancer statistics generally and on the national registration scheme in particular. At recent meetings this committee, which is a subcommittee of the Registrar-General's Medical Advisory Committee (chairman, Sir Ernest Rock Carling), has been much concerned with the problem of establishing uniform systems of staging. Largely for the reasons enumerated by Mr. Harmer, it has selected the breast as the most suitable site for immediate study. In doing this, the committee is, of course, taking account of various existing methods of staging, including those considered at the sixth congress of the International Union against Cancer.—I am, etc.,

General Register Office,
London, W.C.2.

R. M. BLAILEY.

Manipulation and Low Back Pain

SIR,—In your recent spate of articles and correspondence on low back pain, we see a reawakening of interest in manipulation. Twenty years ago there was a flurry in the medical profession created by the success of certain bone-setters. Orthopaedic surgeons enthusiastically tried out some rather rough and ready manipulative techniques, but because the results with powerful manipulation under anaesthesia were unsatisfactory their interest waned, and in fact waxed in the opposite direction, condemning manipulation as a dangerous practice. Now, since intervertebral disk lesions are better understood, a new wave of interest has sprung up and we have an impressive array of medical men strongly advocating manipulation in the treatment of low back pains: R. Barbor, J. F. Bourdillon, L. S. Calvert, A. B. Coyer and I. H. M. Curwen, E. J. Crisp, J. Cyriax, A. C. Elkin, W. Grant Waugh, D. B. Ramsay, G. O. Tippet, W. E. Tucker, and R. W. R. Watson.

Bourdillon (*Journal*, March 19, p. 720) and Watson (*Journal*, February 12, p. 413) strongly advocate the osteopathic method of manipulation. Cyriax has claimed a method of manipulation, now so often referred to as the Cyriax technique, which is essentially derived from the osteopathic methods. Many others are striving to develop techniques of manipulation themselves. What a pity that the experience of 80 years in the art of manipulation as exhibited by the best osteopaths is not being utilized by the medical profession as a whole. It is not the fault of the osteopaths. They are there and ready to help in the training of medical men. The London College of Osteopathy has been training doctors for the past ten years, and, as we see from Cyriax's article (*Journal*, January 15, p. 140), osteopathy has become recognized in France and Switzerland, and for a long time now has been recognized in the U.S.A. Why is Britain so far behind in this matter? It is high time that we here in England appointed a committee of medical men interested in this field to get together and study the matter so that the public at large can benefit from the undoubted advantages, which can accrue from the osteopathic methods of manipulation.—I am, etc.,

London, W.1.

ALAN STODDARD.

Chicken-pox Quarantine

SIR,—I do not entirely agree with Dr. M. Curwen (*Journal*, March 19, p. 727) that chicken-pox is a trivial disease at all times.

Some 15 years ago I was called to attend a boy 6 years old who was suffering from chicken-pox and who was allowed to go about the house for about a week without medical attention. The parents thought it "was only chicken-pox, and the whole school had it." I was called in because the boy was walking in circles and to one side all the time, and was unduly sleepy. This case turned out to be one of encephalitis lethargica, and a consultant called in confirmed the diagnosis of encephalitis lethargica caused by the chicken-pox virus. The patient recovered, leaving sequelae of enuresis and stammering. The enuresis got better after a few years but the stammering persists to this day.

It would be interesting to know the views of fever consultants on the opinion expressed by Dr. Curwen.—I am, etc.,

London, N.9.

M. P. K. MENON.

Ovariectomy and Coronary Disease

SIR,—The work of Rivin and Dimitroff,¹ Paul White,² and Leitner³ (see Dr. Z. A. Leitner's letter, *Journal*, April 2, p. 852) is of considerable moment to the gynaecologist. This research proves that excess cholesterolaemia has an intimate connexion with coronary heart disease. If this be so, then the school of thought that maintains that every hysterectomy should include total ablation of both ovaries is annihilated, for it would appear that, quite apart from the disastrous menopausal symptoms so produced, such a patient is in imminent danger of becoming what Paul White calls a "coronary individual"—a condition which may exist until she is 60 or over. Moreover, it emphasizes the great danger of using radium or x-rays for fibroids, metropathia, or functional conditions. It would seem, therefore, that in addition to conserving the ovaries in all non-malignant conditions we should give very careful instruction as to the avoidance of a dietary rich in fat in such patients, for the incidence of severe coronary atherosclerosis in castrated females approximates that in males, a ratio that normally is in the region of one in ten. Indeed, this remarkable sex difference in the incidence of atherosclerosis suggests that oestrogenic hormones exert an inhibitory effect upon the pathogenesis of coronary disease.—I am, etc.,

London, W.1.

V. B. GREEN-ARMYTAGE.

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Natural Childbirth

SIR,—If a woman is fortunate in being helped to have a happy, healthy pregnancy it is a pity if she expects, in this far from perfect world, to go through childbirth too without any disappointment or physical distress, and I hope no class in training for natural childbirth is led to expect absolute perfection every time. I, too, have been enthusiastic in recommending intelligent mothers to learn to help themselves by relaxation and exercises, and found this of great value in my own case. I did not have the benefit of training in a class: I had to read and practise on my own. One of my reasons for wanting to try natural childbirth was the way in which a patient, having a normal confinement in hospital, seemed to be deprived of full consciousness at a time when she could be of most use in delivering herself. Even in first-stage labour, under practically any medication, she seemed to require more rather than less nursing attention; I asked myself if I should not prefer full consciousness and the ability to lie quietly (though I did not know

anything about relaxation then), rather than be under the influence of one of the analgesics then in use and not be sure of my even remaining on one of the narrow hospital beds. In my three confinements the end of the first stage was the most trying, and control was most likely to be lost then; but one knew that the second stage was not far away, with something to see for one's hard work. Incidentally, I would like to hear more nurses and doctors referring to "contractions" instead of "pains." In all fairness, it should be noted that natural childbirth is not claimed to be painless childbirth.

Some benefits, which are obviously not in doubt, are (1) increased co-operation of the patient—childbirth is not a passive event; (2) reduction of ignorance and of fear of the unknown; (3) giving of hope and a feeling of security, even when there seemed very little to feel secure about, as during the war years.—I am, etc.,

Old Cumnock, Ayrshire.

MARY MACK.

SIR,—May I add a letter to the recent correspondence in the *Journal* concerning natural childbirth? I am a doctor's wife, but not medically qualified, and had my first baby seven months ago. I too was an ardent believer in Dr. Read's ideas and attended antenatal classes. The birth of my baby was a wonderful experience which I have no wish to forget. Everything went as I had been led to believe. Lest it should be thought that I was one of those women who would have had an easy time in any case, may I state that my pelvic measurements were anterior-posterior diameter 105 mm., transverse diameter 105 mm., and the head did not engage until a few hours before the actual birth, labour lasting 24 hours in all? Relaxation enabled me to wait patiently through a long first stage—the second stage lasted only 20 minutes.

I do not understand Mrs. Constance Lynn's reference (*Journal*, April 2, p. 851) to the exercises she had to do during labour, as there are none. The exercises one does throughout pregnancy are to prepare one's muscles for the hard work they will have to do during the second stage, which in my case they certainly did, as I was able to make the fullest use of my contractions. Mrs. Lynn was misled if she believed that nothing was required of her but to "contentedly await events." I was warned that labour meant what it said—hard work—and that I would experience some degree of discomfort, perhaps acute at some stage. However, my son's indignant wail as he entered the world amply rewarded my hard work. I felt no exhaustion either immediately after the birth or later.

I do feel, however, that a labouring woman needs an attendant to encourage her towards the end of the first stage, when even the best-trained mother can forget what she has been taught and lose control over her emotions. I had my husband to help me here, but I realize not all mothers are so fortunate. Perhaps a rearrangement of hospital routine which cut out the inessential jobs (is it really necessary to do five or six swabbings a day?) would leave the midwife free to do her real job of attending to the mother instead of the mother being left on her own "to get on with it."

Incidentally, I too have compared notes with other relaxation patients, the great majority of whom agree that relaxation was a wonderful help. The midwives at the hospital I attended also said that relaxation patients had easier births than other patients.—I am, etc.,

Yeovil.

P. M. LEADLEY.

SIR,—It seems fair enough that doctors' wives should have their say in this correspondence. Therefore, as the mother of three children, and also as a speech therapist with some experience of teaching relaxation, I should like to reply to Mrs. Constance Lynn's letter (*Journal*, April 2, p. 851).

First, good and effective relaxation is, as much as anything, an attitude of mind, and is achieved not by "trying to relax," or by diligent practising of a set of exercises, but by learning to "let go" mentally and physically. For this reason I

should be most careful to avoid the word "exercise," with its associations of gymnastics and effort, in connexion with relaxation. Secondly, those who teach relaxation to expectant mothers should be very careful to make it quite clear that the aim is to minimize pain in childbirth, and not to give a completely effortless and carefree labour. Anyone who has tried it will probably agree that giving birth to a child is the hardest work that a woman is ever likely to do, and it is most important that she should realize this. Mrs. Lynn states that she herself was "totally unprepared for the really serious and hard business involved."

My own confinements were all normal and straightforward, and during each I was able to practise relaxation with excellent results. For the first I was Dr. Dick Read's patient, and had no anaesthetic or analgesic. The only really unpleasant part was at the end of the first stage, and during the birth of my second child the pain at this point was effectively relieved by pethidine.

During my third labour I was led by sheer curiosity to try the gas and air machine brought along by the midwife, but I most certainly would not use it again. In my opinion it leads to lack of co-ordination, with subsequent loss of control and ability to co-operate in the second stage. Most people with no personal experience of childbirth seem to think that some form of anaesthetic is necessary at the moment of crowning, but I have not found this to be painful, although naturally it is extremely uncomfortable. For a woman who is still alert and unfuddled this can be an exciting moment of approaching achievement, and it is so soon followed by the joy of hearing the child's first cry that it is well worth the discomfort.

It seems to me that in normal conditions, knowing how to relax and how to use that knowledge, with possibly some relief from pain when full dilatation is near, the average woman should be able to achieve and enjoy natural childbirth. That she does not do so in many cases leads one to suspect either that she has been taught wrongly or that she herself is, for one reason or another, incapable of relaxing properly. I feel that Mrs. Lynn is a little hard on a system which many people have found helpful, her only evidence being that it does not work for her personally.—I am, etc.,

London, N.10.

ALISON DUDDINGTON.

SIR,—As one who has obviously followed the correspondence "Whither Natural Childbirth?" I feel justified in replying to Mrs. Constance Lynn's letter (*Journal*, April 2, p. 851) not only as a mother of two children—the first born after I was aged 30 by caesarean section and the second, a 9 lb. (4 kg.) boy, three and a half years later, absolutely naturally after a labour lasting less than four hours—but also as one who has taught some hundreds of women this approach to childbirth and been present at the labours of most of them. Therefore I write as a teacher with considerable labour ward experience, and as a mother.

With all due respect to this lady's ability, I cannot help feeling that in fairness to her instructress, and perhaps those who attended her confinement—before she states "categorically . . ."—a full description of her conduct during labour should be made clear to her readers. It seems strange to me that, if she had been taught this method in its entirety, she could have been "totally unprepared for the really serious and hard business involved." I find this difficult to understand if her antenatal teaching had been correctly carried out, for the woman, adequately instructed, is always told to expect "serious and hard work." After all, is this not the meaning of the word "labour"? I also find it difficult to understand her remark, "A great deal of what I was taught to do was physically impossible in labour, and much of what was possible, one hadn't the inclination to do at that time." It appears that Mrs. Lynn, once my husband's "most ardent and loudest fan," allowed her enthusiasm to override a practical and commonsense approach to a perfectly natural function—woman's most cherished heritage.—I am, etc.,

Petersfield.

JESSICA DICK READ.

Purpuric Drug Eruption Caused by Carbromal

SIR.—Dr. Peter Borrie (*Journal*, March 12, p. 645) cites six cases of a purpuric eruption which he attributes to carbromal. During the course of my practice over a number of years I have prescribed carbromal in one of the forms mentioned—that is, "persomnia"—regularly to many patients, including many children, and never have I encountered, as a result, any skin eruption or, indeed, any other untoward side-effects.

In the article Dr. Borrie emphasizes that the dose of carbromal (which varied between 3 gr. (0.2 g.) and 20 gr. (1.3 g.) nightly) "bore no relationship to the severity of the eruption." This seems to be an indication that individual idiosyncrasy (allergy) was the possible causal factor involved, although my own experience tends to indicate that the incidence of such an idiosyncrasy, if present, is less than that which one commonly associates with penicillin or aspirin. In view, therefore, of the efficacy and enormous margin of safety of carbromal and other of the open-chain ureide series, compared with the barbiturates, the incidence of any such side-effects would appear to be almost clinically negligible. It is also worth noting that all the cases described apparently cleared up completely without treatment.—I am, etc.,

London, E.18.

G. F. NEWBOLD.

Chronic Discoid Lupus Erythematosus

SIR.—I was very interested to read the article (*Journal*, February 5, p. 329) by Dr. H. J. Lewis on the treatment of chronic discoid lupus erythematosus with chloroquine sulphate. Since reporting a case so treated in 1953¹ I have had the opportunity of treating five more cases without a failure, and I can completely endorse Dr. Lewis's conclusion that chloroquine sulphate is as efficient a form of palliative therapy as any previously used. The average maintenance dose has been one tablet of chloroquine sulphate daily—equivalent to 150 mg. of base.

My original patient, who has been on therapy for almost two years, has continued to improve, although on one occasion when she stopped her treatment there was an almost immediate relapse.—I am, etc.,

Bulawayo, S. Rhodesia.

J. CHARLES SHEE.

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Swallowed Hair-grips

SIR.—In view of the recent correspondence on the above subject, may I submit details of an interesting and unusual case which came under my care whilst resident surgical officer at the Barnsley Beckett Hospital some years ago?

A single girl of 19 said she had swallowed a hair-grip several days previously. X-ray showed the presence of a hair-grip placed centrally in the lower hypogastric region, considered therefore to be in the lower coils of the ileum. She was asked to attend again in two days' time. Further x-ray then showed no appreciable change in the position of the hair-grip; she had no symptoms. A third x-ray two days later showed no change. She complained of suprapubic ache and discomfort, but there were no abnormal physical signs. She was admitted for observation. Next day she passed a small amount of blood in her urine. She was cystoscoped, and the hair-grip was seen in the bladder, covered with greyish-white phosphatic concretion, with a globular enlargement over the crook of the hair-grip, looking very much like a small doll. There was an associated cystitis. She readily gave written consent to operation and removal. I removed the foreign body by suprapubic cystotomy and noted that her uterus was enlarged to the size of approximately a 10- to 12-weeks gestation. She was discharged on the tenth day without complications.

It was difficult to determine when this hair-grip was inserted, although it was obvious that she had used it in

an attempt to induce abortion. She persistently maintained that she had swallowed the hair-grip, and denied vigorously that she was pregnant. I understand that subsequently she was delivered of a full-term infant.—I am, etc.,

Leeds.

ISAAC ROSE.

Malignant Melanoma and Pregnancy

SIR.—We were interested in Dr. H. Stewart's report (*Journal*, March 12, p. 647) of a case of malignant melanoma in which neoplasia was stimulated during pregnancy, and his comment that this association has rarely been reported.

We have recently seen a case of malignant melanoma in a woman of 29. A pigmented naevus was removed from the patient's left leg in June, 1953, during her second pregnancy. The area was widely excised, when the section showed a malignant melanoma. Her child was safely delivered and she was well and showed no signs of recurrence until January, 1955, when a lump was first noted in the left groin. She was then in the 24th week of a further pregnancy. Excision proved this to be a secondary deposit from a malignant melanoma and she has now been evacuated to England for further treatment.—We are, etc.,

M. A. W. ROBERTS.

E. I. KOHORN.

Benghazi.

Hypoglycaemia in Chronic Alcoholism

SIR.—Dr. J. S. Taylor (*Journal*, March 12, p. 648) described the interesting case in a chronic alcoholic of fatty liver changes producing hypoglycaemic attacks. Fatty liver is very common in chronic alcoholics, in whom its incidence has been estimated at 75%.¹ Of 150 alcoholics at Warrlingham Park Hospital—the great majority of whom showed no liver enlargement—approximately 75% had abnormal results in at least one out of a number of liver function tests (carried out by Dr. W. W. Kay). Most frequently positive was the bromsulphalein test—that is, in approximately one-third of the 80 patients in whom it was performed.

As far as hypoglycaemia in alcoholism is concerned it has been pointed out that the symptoms of impending hypoglycaemic shock resemble alcoholic "jitters,"² and it has been suggested that hypoglycaemia may be responsible for neurotic symptoms occurring in chronic alcoholics.^{3,4} Tintera and Lovell⁵ suggest that, following primary and secondary hypofunction of the adrenal cortex in alcoholics, craving for alcohol results when blood sugar falls to a certain low level. Lovell⁶ explains the alcoholic's apathy, physical weakness, etc., as being caused "to a large measure" by his low blood sugar (according to others⁷ the chronic alcoholic's fatigability is "in great part . . . a consequence of protein, and particular vitamin, shortage"), and ascribes the "often astonishingly rapid" response of alcoholics to adrenal cortex extract to the restoration of the blood sugar balance and of liver functioning. The importance of the restoration of blood sugar balance in alcoholics has been stressed repeatedly,^{8,9} and according to Lolli¹⁰ "some cases of alcohol addiction are precipitated (but not caused) by an underlying spontaneous hypoglycaemia, correction of which is an adjuvant to treatment of the addiction."

An investigation in 21,000 non-alcoholics showed hypoglycaemia below 80 mg. in 11% of cases.⁸ In alcoholics relatively low fasting blood sugars were frequently found by Strecker and Chambers²; Voegelin *et al.*⁹ found hypoglycaemia in 17.1% and hyperglycaemia in 6.6% of 303 chronic alcoholics. Feldman¹¹ saw among 150 alcoholics a level below 0.80 g./l. in 1.34%, between 0.80 and 1.10 g./l. in 95.33%, and between 1.11 and 1.20 g./l. in 3.33% (Hagedorn's method), and Valera *et al.*¹² found no difference between alcoholics and non-alcoholic controls. In our own material of 135 alcoholics the average blood sugar level for 102 males was 86 mg./100 ml., for 33 females 97 mg./100 ml., for the total of 135 89 mg./100 ml. (method modified after King). The level was—in mg./100 ml.—below

80 in 35%, between 80 and 120 in 61%, above 120 in 4%. According to King,¹² 80% of normal adults have a fasting blood sugar value between 68 and 96 mg./100 ml., 10% have a lower and 10% a higher level; the corresponding percentages among our alcoholics were 58, 14 (below 68 mg./100 ml.) and 28% (above 96 mg./100 ml.) respectively.

Results of glucose tolerance tests too show great differences. "Lower than average" curves "as a whole" were noted by Strecker and Chambers,² no difference in glucose tolerance between a group of male alcoholic addicts and a control group of male abstainers and social drinkers was observed by Valera *et al.*¹² a decrease in glucose tolerance in 41% of 303 alcohol addicts was found by Voegelin *et al.*⁹ an increase in tolerance in 44% of 50 alcohol addicts by Karlan and Cohn.¹³

The considerable variation in the findings of different observers seems to support the view of Valera *et al.*¹² that whilst "a sizable proportion of alcohol addicts exhibit a normal glucose tolerance," "the population of alcohol addicts is sufficiently irregular, in respect to glucose tolerance, to yield different results in different samples," thus reflecting also in this aspect the fact that alcoholics are not a homogeneous group of people.—I am, etc.,

Warrlingham, Surrey.

M. M. GLATT.

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Tetracycline

SIR.—In your annotation on tetracycline (*Journal*, April 2, p. 838) you mention a paper by Frei and his co-workers¹ in which they compared the use of penicillin and tetracycline in the treatment of pneumonia. Twenty-six patients were given tetracycline in what they state "a relatively high dosage of 4 grammes a day," and 31 patients were given a relatively small dosage of 600,000 units of aqueous potassium penicillin. What were they trying to find out? They had read that Finland² had demonstrated that with the use of chlortetracycline, oxytetracycline, and tetracycline the frequency of diarrhoea differed directly with the dosage. When tetracycline was used in a dosage of 1 to 1.5 g. daily, 2% of patients had diarrhoea. When the dosage was increased to 2 g. a day this percentage rose to 5, and they have now demonstrated that on 4 g. a day this side-effect occurred in 15% of patients. All the 31 patients in the penicillin group suffered no ill-effects. A similar study in the treatment of pneumonia was carried out by the Medical Research Council in 1951.³ Patients in this study were given an initial dosage of 2 g. of aureomycin, and then 1 g. every six hours. As was to be expected with this dosage, side-reactions with aureomycin were much greater than with penicillin.

These two studies did not take into account the recommended dosage of aureomycin. This dosage was arrived at after consideration of extensive pharmacological investigations and the results of clinical studies undertaken throughout the world. In the large majority of cases the dosage of aureomycin and tetracycline should not exceed 1 g. a day for an adult. Each 250 mg. capsule should be given with a glass of cold milk or bland fluid. By this means side reactions may often be avoided.⁴ Further comparative studies on how much more of the tetracyclines the patient can stand are, in my opinion, of little value. In the light of recent work on the effectiveness of small amounts of

antibiotics* surely it should be the aim of clinical investigators to determine the smallest amount of antibiotic that is effective therapeutically. It has been stated* that if the lowest effective dose of an antibiotic is used the infecting organism is unlikely to become resistant. Since the development of resistance to all the antibiotics is a subject of major clinical importance, and the excessive use of antibiotics appears to predispose to this development, it cannot be too strongly emphasized that practitioners should not use at the present time a dosage in excess of that recommended in the *British Pharmacopoeia* (1953). The publication of papers on ill effects produced by excessive dosage of antibiotics will have one good result if it focuses attention on the importance of correct dosage.

Your annotator also comments that if tetracycline produced fewer side-effects than either aureomycin or terramycin, the importance of this advantage should not be minimized. That terramycin produces fewer side-effects has been shown in at least six published papers in the last few months. In this country Abbott and Parry,⁷ using a dosage of 1-2 g. daily of tetracycline, found no side-effects from its use. In a study of tetracycline Wilson⁸ stated that "side-effects were uncommon and unimportant." In a comparison of 180 patients treated with the tetracyclines Weaver and McCorry⁹ have noted that the incidence of side-effects with tetracycline was half that encountered with the use of oxytetracycline. The paper of Finland has already been referred to in which he noted that side-effects from tetracycline were minimal. The evidence available shows that tetracycline has certain unmistakable advantages over oxytetracycline and chlortetracycline which cannot be arbitrarily dismissed with the statement that the tetracyclines have the same toxicity.—I am, etc.,

A. T. MENNIE,
Medical Director,
Lederle Laboratories Division,
Cyanamid Products Limited.

London, W.C.2.

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- 7 Abbott, J. D., and Parry, H. E., *Ibid.*, 1955, 1, 16.
- 8 Wilson, R., *J. Irish med. Ass.*, 1955, 36, 51.
- 9 McCorry, R. L., and Weaver, J. A., personal communication.

Temporal Lobe Epilepsy and the Psychoses

SIR,—I was interested in the valuable paper on "Psychical Phenomena in Temporal Lobe Epilepsy and the Psychoses" by Drs. Shafica Karagulla and E. Elizabeth Robertson (*Journal*, March 26, p. 748), but I wonder how justified are their comparisons between the two diseases. Surely the analogous symptoms are produced by the fact that they are both the result of a disorganization of the same machine, but this does not imply that the nature of the disorganization is similar. To take a simplified example, a "knock" in an internal combustion engine can be produced by poor fuel, a wrongly timed ignition, or a worn big end. Yet no one suggests that the causation is similar.

Again, what of those psychoses which are produced rapidly in a few hours by great strain? Or in a case which I saw many years ago in which the psychosis disappeared almost instantly? This was that of a woman about 40 years of age who was suffering from a paranoid psychosis and a coincidental mitral stenosis. She was grossly hallucinated and deluded, and spent most of her time parading the ward shouting at those who seemed to be persecuting her. Suddenly in the midst of her shouting she developed an embolus in her left middle cerebral artery. She did not lose consciousness, but at once had a right-sided hemiparesis and complete aphasia. After many weeks her paralysis recovered and her speech came back. She was then able to tell me that the "voices" had ceased at once, at the very moment her limbs became paralysed and she lost her power to talk. Obviously,

with the abolition of her power to express herself in words the internal ideational constructive power was abolished. This was the source of the hallucinations, and the "voices" ceased magically. Such an experience does much to uphold J. B. Watson's¹ view that thought is only suppressed speech. It suggests also that schizophrenia is a purely functional illness and that it is not caused by foci of deterioration such as one finds in epilepsy.—I am, etc.,

London, W.1.

CLIFFORD ALLEN.

REFERENCE

- 1 Watson, J. B., *Psychology from the Standpoint of a Behaviourist*, 1929. Lippincott, Philadelphia.

Speaking Up

SIR,—The correspondence on poor standards of speech at medical meetings (*Journal*, April 2, p. 853) gives me the opportunity to comment without, I hope, appearing impertinent to my seniors. I submit that the pathetic and irritating mumbling usually inflicted on the audience at learned medical societies is due to the following factors: (1) nervousness, and the traditional Englishman's reluctance to make himself conspicuous; (2) the fear that emphatic oratory will be ridiculed as conceit or charlatanism; and (3) laziness; many eminent doctors do not seem to realize the importance of clear and emphatic public speaking, and would consider it beneath them to learn how to prepare and deliver an address.

Frequently the speaker resorts to reading (or mumbling) verbatim from a script. But why "read papers"? Matter designed to be assimilated by the eye is seldom ideally composed for absorption by the ear, even if clearly read. Medical papers should be printed in the appropriate journal or "proceedings" shortly before the meeting. The writer could then deliver (not read) a short summary, and the matter could then be discussed (surely the real value of such gatherings) before most of the audience had left to catch trains or sunk into coma.—I am, etc.,

London, W.1.

NORMAN A. PUNT.

Night Cramps

SIR,—May I point out that your annotation on night cramps (*Journal*, March 12, p. 653) omitted to mention the value of nicotinic acid or nicotinamide in preventing such cramps? Nicotinic acid was recommended some years ago in answers to "Any Questions?" and I have found it to be efficacious.—I am, etc.,

Chalfont St. Giles.

H. H. KING.

REFERENCE

- 1 *Any Questions?* 1952, second series, p. 17. B.M.A., London.

Hysterical Hyperventilation with Carpopedal Spasm

SIR,—A girl of 8 years was seen recently who had developed a morbid fear of appendicitis. One of her school-friends had recently had her appendix removed, and, from personal knowledge of this latter child, I am sure that no morbid details were spared in conversation. The former child was the third in a family of four girls, and, unlike the others, seemed to be withdrawn and perhaps a little emotionally unstable.

The first episode occurred one evening when she cried out with sudden severe abdominal pain. The pain continued for half an hour and was alleged to be in the umbilical region. A full clinical examination failed to provide a diagnosis, and, as the pulse rate and temperature were normal and the pain had mysteriously passed away, the child was reassured and was soon playing quietly. A visit several hours later revealed no further developments. The second episode occurred 24 hours later. This time there were pains in the abdomen, a choking sensation, and painful, paralysed arms and legs, with tingling. The child was sobbing uncontrollably and was hyperventilating for about 20 minutes. The hands were typical "*les mains d'accoucheur*." The child was reassured and a minute or so of breath-

holding stopped the painful spasm, and within five minutes the adducted thumbs relaxed. Shortly afterwards the choking sensation (due to a lump, presumably "globus hystericus") disappeared and a full clinical examination revealed nothing to suggest appendicitis.

The mother admitted that the child had a dread of developing appendicitis. This started about the time the school-friend returned from hospital with an account of her experiences.—I am, etc.,

B.A.O.R., 33.

J. CLARKE.

Acute Respiratory Obstruction

SIR,—I have read with great interest Mr. Norman Jory's article on acute respiratory obstruction (*Journal*, March 26, p. 781). In the paragraph on laryngoscopy he states that if the mouth cannot be opened because of spasm this may be overcome by the intravenous injection of 50 mg. of suxamethonium chloride. This is undoubtedly most effective. However, I feel that it should be emphasized that not only will this relax the jaw muscles but that it will also relax the glottis and paralyse some, if not all, of the muscles of respiration, depending on the size of the patient, for a period of from three to five minutes. One will probably then be dealing with an apnoeic patient; certainly there will be no deep breath.

I suggest, therefore, that if this line of treatment be carried out it should be stressed that one must be prepared to apply adequate artificial respiration, preferably with oxygen, until such time as the effect of the relaxant has ceased.—I am, etc.,

Blackrock, Co. Dublin.

K. P. O'SULLIVAN.

Selection of Patients for Psychotherapy

SIR,—Dr. E. A. Bennet's lecture at the St. Marylebone Hospital for Psychiatry and Child Guidance, as summarized in the *Journal* (April 2, p. 844), comprises the broad wisdom which is linked with his name. The address, as such, would most certainly have met the wishes of his audience; he could, however, have delivered it with equal facility 30 years ago.

It is a sombre reflection, if valid, that advice on psychotherapeutic procedure remains a personal rather than a clinical issue. It is a distressing thought, if true, that the word depressive is used to denote the indication for either electric convulsion therapy or psychological interference. It is a disconcerting cogitation that the diagnosis of obsessional neurosis, as described by Freud during his formative years in Vienna, bears little resemblance to the nowadays use of the term obsessional. The latter depicts a psychiatric state which, dependent on the predilection of the physician consulted, may be treated either by prefrontal leucotomy or one or other of the disparate psychotherapeutic techniques.

The inference seems to be that competent selection of patients for psychotherapy demands a strict application of intelligence of the head rather than what Dr. Bennet calls an "intelligence of the heart."—I am, etc.,

London, W.1.

MURDO MACKENZIE.

Investigations on Everest

SIR,—With reference to the paper on "Some Effects of High-altitude Climbing," by Dr. D. Stafford Matthews et al. (*Journal*, March 26, p. 768), it is stated that the authors have not seen the results of any investigations conducted on Everest. I append a list of references¹⁻⁵ to work done on Everest which has already been published. Further results will appear shortly.—I am, etc.,

London, N.W.3.

G. PUGH.

REFERENCES

- 1 Pugh, L. G. C. E., *Food Consumption and Energy Balance at Various Altitudes*, 1953. Swiss Foundation for Alpine Research.
- 2 ——— *J. Physiol.*, 1954, 126, 38P.
- 3 ——— *J. Glaciol.*, 1954, 2, 363.
- 4 ——— *J. Physiol.*, 1953, 123, 25P.
- 5 ——— *Geographical Journal*, 1954, 120, 184.
- 6 ——— *Uniforms and Industrial Clothing Catalogue*, 1954.
- 7 ——— *Proc. Nutr. Soc.*, 1954, 13, 60.
- 8 ——— *Proc. roy. Soc.*, 1954, 143B, 14.

Obituary

A. F. MacCALLAN, C.B.E., M.D., F.R.C.S.

Mr. A. F. MacCallan, consulting ophthalmic surgeon to the Westminster Hospital and the Royal Eye Hospital, and pioneer in the study and eradication of trachoma, died in Westminster Hospital on March 31 after a short illness. He was 83 years of age, and had continued in active practice until a few weeks before his death.

Arthur Ferguson MacCallan was born on October 23, 1872, the only son of the Rev. J. Ferguson MacCallan, vicar of New Basford, Notts. He was educated at Charterhouse, Christ's College, Cambridge, and St. Mary's Hospital Medical School, where he was a university exhibitioner. After qualifying in 1898 he graduated M.B., B.Ch. in the following year and also took the F.R.C.S. He completed his ophthalmic training by three years as house-surgeon at Moorfields Eye Hospital, and almost immediately afterwards (1903) was appointed as ophthalmologist in the department of public health, Cairo. Here he remained for 20 years, interrupted only by his service in the R.A.M.C. during the first world war, when he was mentioned in dispatches.

It was while MacCallan was in Egypt that Sir Ernest Cassel, having successfully financed the building of the Great Aswan dam, had decided to confront the vast problem of trachoma, which had been a scourge of Middle East countries since prehistory, by the training of a corps of Egyptian oculists. To this end a travelling eye hospital was formed which offered scope for all the energy, enterprise, and administrative ability that MacCallan so happily embodied. His success was immediate, and eye hospitals were built in all the major provinces staffed by his enthusiastic pupils. By the time he returned to England mass treatment had been instituted, and the disease seemed to be at least under some sort of control. He retired with the honours that he deserved, receiving for his ophthalmic services to the Egyptian Government the Order of the Nile (second class) and the Order of Medjidieh (third class), and being appointed C.B.E. in 1920 and an officer of the Order of St. John of Jerusalem. His work was commemorated in 1931 when a bronze bust, commissioned by the ophthalmic surgeons of Egypt, was unveiled by the British High Commissioner. His major textbook on trachoma, published in 1936 and translated into many languages, remained for many years an authoritative guide.

MacCallan returned to England in 1924 and started a practice in London. In the same year he saw an advertisement in *The Times* for the post of assistant ophthalmic surgeon to Westminster Hospital, and he successfully applied for this. He was later appointed also as surgeon to the Royal Eye Hospital. On reaching the age of 65 in 1937 he retired from the active staff of the Westminster, but he returned to the hospital during the second world war, when the ophthalmic department had been depleted of consultant staff on the death of Mr. A. D. Griffiths. Thereafter he still continued his researches in trachoma in a laboratory at the Westminster Medical School. In 1935 he was appointed as second president of the International Organization against Trachoma, a high office that he held for 20 years until, at the International Congress of Ophthalmology in Montreal last autumn, he handed over the

active leadership to Dr. G. B. Bietti, but was himself appointed honorary life president in recognition of his great and long services: by the same token he was also appointed a life member of the Ophthalmological Society of the United Kingdom, of which he had been vice-president. He had also served as secretary and vice-president of the Ophthalmological Section of the Royal Society of Medicine, and was a distinguished member of many foreign ophthalmological societies. In 1918 he married Hester, daughter of the late Bishop Boyd Carpenter, and she survives him, together with two sons and a daughter.

P. D. T.-R. writes: A. F. MacCallan was an unforgettable personality. From his early days in the mid-Victorian vicarage, through a long and inspiring term of office in Egypt, at his English hospitals, and finally as chairman of his own parish council in Hertfordshire, his life was coloured by a sense of duty and dedication that fully merited the renown he won. Forthright and vigorous, intolerant of obstruction, he was ideally suited to driving through the inertia that has blocked progress in the Egyptian health services for so many years. Yet his dynamic mien was at all times leavened by especial charm of manner and a readiness of humour that stole the affection even of his critics. He belonged to a vanished generation of empire builders, and his war against the trachoma virus was on a heroic scale; while the gratitude of countless near-blind is his just reward.

G. F. PETRIE, M.D.

Dr. George Petrie, who was for many years on the staff of the Lister Institute of Preventive Medicine and finally retired in 1944, died on March 17, aged 81.

After a short period as a student at Edinburgh University George Ford Petrie continued his medical education at Aberdeen, where he graduated M.B., Ch.B. in 1898; five years later he proceeded to the M.D. with highest honours. It was while he was a student that he developed a keen interest in pathology and bacteriology, and after a short period as an assistant in general practice in Yorkshire and as a research student in the Lister Institute he was appointed assistant bacteriologist to the Institute in 1902, working in the serum department at Elstree under the late Dr. George Dean. From then on he took an increasingly important part in many of the investigations designed to throw light on the aetiology and control of epidemic diseases. In 1905 he was a member of the Indian Plague Commission under the late Sir Charles Martin, and from 1911 to 1913 was bacteriologist under Dr. Charles Todd to the Plague Investigation Commission set up by the Egyptian Public Health Department. He also went with the British Delegation to the International Plague Conference in China in 1911, contributing a review of an outbreak of plague in North China to the published proceedings of the conference. About this time he was the author of several other articles on the subject of plague, including a report on the examination of rats collected in Suffolk and Essex. After serving in the R.A.M.C. as a bacteriologist in France during the first world war, he returned in 1919 to the serum department of the Lister Institute, succeeding Dr. MacConkey as bacteriologist in charge in 1926. He became a leading authority on antisera, particularly in connexion with their production in quantity, and it was largely due to his work that it was possible to produce quickly the large amounts of tetanus antitoxin required for the civil population in the last war. He should have retired in 1939, but after a very brief period of rest he returned to work in October, 1940, first to take charge of the library of the Lister Institute, then temporarily housed in Aldenham School,

and in 1941 he again took over the supervision of the serum department during the absence of Dr. C. R. Amies in the R.A.M.C.

Dr. Petrie was the author of many papers on subjects connected with his specialty, and in 1934 he collaborated with the late Sir Alexander Fleming in writing *Recent Advances in Vaccine and Serum Therapy*. After he had retired he compiled an anthology of *British Medical Science and Practice*, and he was engaged on other literary work at the time of his last illness.

O. D. BROWNFIELD, C.B., O.B.E., M.B.

Surgeon Rear-Admiral O. D. Brownfield, who served in the Royal Navy for nearly 36 years, died on March 29 aged 64.

Owen Deane Brownfield was born on February 22, 1891, the son of Dr. H. M. Brownfield, of Petersfield. From Epsom College he went on to St. Thomas's Hospital, qualifying in 1914. He entered the Royal Navy as a temporary surgeon-lieutenant in October of that year, and during the first world war he served at the R.N. Hospital, Haslar, and in H.M.S. *Excellent*, H.M.S. *Chester*, and at the R.N. Barracks at Portsmouth. In 1919 he was awarded the O.B.E. for valuable services given while serving in these appointments. Having graduated M.B., B.S., London, after the war he was transferred to the permanent list of the Royal Navy towards the end of 1919, and promoted surgeon lieutenant-commander. From 1931 to 1935 he was medical specialist at the R.N. Hospital, Malta, holding the rank of surgeon-commander, and then after a period at sea he was placed in charge of the cadets' sick quarters at the R.N. College, Dartmouth, in 1937. In 1940 he was appointed to H.M. Hospital Ship *Vita* as medical officer in charge and holding acting rank as surgeon-captain. He was confirmed in this rank in 1941. After a period of service at the R.N. Auxiliary Hospital, Barrow, Burney, he became medical officer in charge at the R.N. Auxiliary Hospital, Trincomalee, Ceylon. On his return to the United Kingdom in 1945 he was principal medical officer at H.M.S. *Collingwood* until 1947, when he was promoted surgeon rear-admiral. Until his retirement in 1950 he was medical officer in charge at the R.N. Hospital, Malta. Surgeon Rear-Admiral Brownfield was appointed C.B. in 1948, and for three years before he retired he was King's Honorary Physician.

After his retirement he returned to live in Petersfield and became a member of the Council of the B.M.A. in 1951. He was also a member until the time of his death of the Armed Forces Committee and the Waverley Evidence Committee, playing a full part in the deliberations of these committees. His many old friends in the Navy and the new friends he made as a result of his interest in the work of the B.M.A. will regret the passing at a comparatively early age of one who served his country and his profession so faithfully and so well.

E. C. SPRAWSON, M.C., D.Sc., F.D.S. R.C.S. M.R.C.S.

The sudden death of Professor Evelyn Sprawson, which took place at a committee meeting in London on April 6, removes a considerable figure from the field of dental surgery and research. He had held the chair of dental surgery and pathology of the University of London, and was consulting dental surgeon to the London Hospital, where he had formerly been director of dental studies.

Evelyn Charles Sprawson was born on February 18, 1881. From King's College School, London, he went on to study dentistry at the Royal Dental Hospital, where he won the Walker and Saunders scholarships. After a further period of study at Charing Cross Hospital he qualified in medicine in 1905, winning medals for ophthalmology and midwifery, and shortly afterwards he joined the staff of the dental school at the London Hospital, where in the course of his career he achieved great distinction not only as a practising dental surgeon and as a teacher but also as a wise adviser in the affairs of his profession. He served on numerous Government committees and as one of this country's representatives at international congresses all over the world. An obituary column could readily be filled with the titles of the various offices he held during his career. He had been deputy chairman of the Dental Advisory Council; chairman of the Board of Studies in Dentistry and member of the Faculty of Medicine of the University of London; and examiner in dental surgery to the Royal College of Surgeons, to several universities (including two overseas), and the Dental Board of the United Kingdom. He served on the Medical Research Council committee for the investigation of the causes of dental diseases, and was a member of the Home Office Tribunal for the Dangerous Drugs Acts. The reputation he had gained as an investigator was shown by his election to the presidency of the International Association for Dental Research and to the honorary presidency of the Section of Histology when the International Dental Congress met in Paris in 1931. The year 1940 saw his election to the presidency of the Odontological Section of the Royal Society of Medicine, in which he was for many years a frequent contributor to the discussions. He had also been president of the Dental Officers Group of the Society of Medical Officers of Health. Sprawson, who held the degree D.Sc. of London University, was elected F.D.S. R.C.S. in 1947. Ten years earlier he had been Hunterian Professor at the College, and he was the Sir John Tomes prizeman in 1930.

In all that concerned the welfare of his profession Sprawson took an eager interest. His work on the council and committees—often very detailed and anxious work—of the Medical Protection Society occupied much of his time. He had been a member of the British Medical Association for 45 years.

Many papers by Sprawson appeared in the proceedings of scientific bodies concerned with dentistry and allied subjects, and he collaborated in the editorship of the last four editions of *Dental Surgery and Pathology*, the work so closely associated with his old colleague and chief, Sir Frank Colyer. He was also editor of the *British Dental Annual*. In the first world war Sprawson served with the R.A.M.C. in the British Expeditionary Force and was mentioned in dispatches and awarded the Military Cross. For many years he was a member of the 28th Battalion of the County of London Artists Rifles and received the Territorial Forces efficiency medal. In the last war he was consulting dental surgeon in certain of the sectors of the Emergency Medical Service. His chief interest outside his profession was aviculture, which he followed at his Surrey home and on which he wrote occasional papers.

We are indebted to Mr. A. M. A. MOORE for the following appreciation: By the sudden and unexpected passing of Professor Evelyn Sprawson, England has lost one of her most distinguished dental surgeons. He was an eminent

contributor to our knowledge of many of the problems of dental surgery, and very many members of the dental profession in practice to-day owe much to his teaching and inspiration.

Sprawson was a shy, quiet, and retiring man, who took the greatest personal interest in the students working in his department, and he will always be remembered for his many kindnesses and acts of generosity to those in need. For many years he held the post of honorary consultant dental surgeon to Dr. Barnardo's Homes, and continued to attend the children at the homes long after his retirement from the staff of the London Hospital. It gave him great joy to feel that he was helping in some way to carry on the work of the founder, and it was a constant pleasure for the members of the staff to meet and work with this remarkable man.

Sprawson had much to do with the original establishment of the dental department at the London Hospital, which has now grown into one of the larger teaching units of dental surgery in the University of London. He played an active part in the life of the university and was one of the few dental professors to be granted the degree of doctor of science. Before his retirement from the staff of the London Hospital some years ago he was presented with his portrait by past and present members of the dental school—the only dental surgeon of the London Hospital to be honoured in this way so far. This portrait now hangs in the students' dining room of the London Hospital Medical College, and will be a constant reminder to future generations of a very great man.

Medico-Legal

MISTAKE NOT NEGLIGENT

A young, newly qualified hospital doctor, in discharging a man who went out into the street and collapsed and died of coronary thrombosis, made a mistake but was not negligent, said Mr. Justice Ashworth at Liverpool Assizes on April 1. He was giving judgment for the West Cumberland Hospital Management Committee and Dr. J. P. Graham in an action for damages brought against them by Mrs. Elsie A. Parkinson, of New Brighton, Cheshire. Her husband, Mr. S. A. E. Parkinson, aged 39, a crane driver, was found dead near Workington Infirmary on July 11, 1953.

In his judgment Mr. Justice Ashworth said that Parkinson went to the infirmary soon after 4 a.m. on the day he died and complained of chest pains. Dr. Graham, then house-physician there, gave him two tablets of codeine and told him to return later for x-ray examination. A quarter of an hour afterwards Parkinson was found dead near the hospital, and the judge said he was satisfied he died from a massive coronary thrombosis. The fact that Dr. Graham took an hour over the examination showed he was anxious on this, his fourth day at Workington, to acquit himself well, and the judge accepted his account of what he saw and did. It was conceded that the diagnosis was mistaken.

After hearing medical witnesses the judge said he had come to the conclusion that Dr. Graham was not negligent in failing to diagnose coronary thrombosis, and was not negligent in rejecting coronary thrombosis. If that was so, he was not negligent in sending Parkinson home, and there was not a sufficient element of uncertainty in his mind to require him to send for his superior. He made a mistake, but was not negligent. The judge said that even if the plaintiff had succeeded the damages would have been very small. Even if rest or treatment might have prolonged Parkinson's life, his future contribution as a breadwinner would have been negligible.

Dismissing the claim, the judge said: "I would like to add that if one merely knows that a man has died in the street in the early hours of the morning, after being discharged from a hospital to which he went in pain, one is

inevitably tempted to draw the conclusion that it ought not to have happened. That illustrates the danger of only knowing part of the story. Once one adds that in the hospital he was examined carefully for nearly an hour, and that the signs and symptoms on balance negated any serious condition, then that first conclusion must in fairness be disregarded."

The defendants did not ask for costs.

The Medical Defence Union instructed Messrs. Hempsons, solicitors, to act for Dr. Graham.

ULNAR NERVE PARALYSED

An agreed settlement has been reached in an action for negligence brought at Leeds Assizes against two doctors and members of the nursing staff of Castleford, Normanton and District Hospital. The allegations against one doctor and against the nursing staff were withdrawn. The action was brought by Robert Bucktrout, aged 50, of Castleford, who claimed damages for personal injuries from the Leeds Regional Hospital Board and also from Dr. Elva M. Chivers, an anaesthetist, of Pontefract, and Dr. N. I. A. Shohet, then resident surgical officer at the hospital.

Bucktrout's case was that he was admitted to hospital on November 28, 1951, for operative treatment of perforated peptic ulcer. A male nurse, Mr. F. Calvert, first gave him an injection, and then in the operating theatre he was given an injection by Dr. Chivers in his left arm. The latter injection, he said, caused him pain before he became unconscious. Dr. Shohet performed the operation. When Bucktrout recovered consciousness he saw that his left arm had been tightly bandaged between the shoulder and elbow, and when the bandage was removed he saw the arm was black and swollen. The sequel to the operation was that the ulnar nerve was paralysed and Bucktrout was under hospital treatment until January, 1953.

When the hearing had been proceeding for five days a consultation between the parties resulted in their coming to terms on the basis that judgment should be given to the plaintiff with costs for £350 against the hospital board and against Dr. Chivers. As to Dr. Shohet, he was exonerated from any charge of negligence, and judgment was given for him against the plaintiff. Dr. Shohet did not press for costs. The hospital board and the doctors agreed to the settlement on the understanding that the plaintiff withdrew all allegations not only against the hospital board and the two doctors but also against the nursing staff of the hospital, and particularly against Mr. Calvert. The £350 damages were apportioned between the hospital board and Dr. Chivers.

Mr. Justice Slade said he thought the parties had been well advised, and he regarded it as a satisfactory settlement.

The Medical Protection Society instructed Messrs. Le Brasseur and Oakley, solicitors, to act for Drs. Chivers and Shohet.

Medical Notes in Parliament

Group Practice Loans

Miss PAT HORNSBY-SMITH, Parliamentary Secretary, Ministry of Health, told Mr. J. K. VAUGHAN-MORGAN (Reigate, Con.) on April 4 that at the end of March, 1955, some £36,000 had been paid to 11 partnerships in England and Wales, including 38 doctors, as loans for the establishment or improvement of group practice.

Inspection of Doctors' Surgeries

Mr. VAUGHAN-MORGAN asked when the current inspection of doctors' surgeries was expected to be completed. Miss HORNSBY-SMITH stated that inspections were being carried out under arrangements made by the British Medical Association and were, she understood, progressing well; but the Association could not yet say when they would be completed.

Poliomyelitis Research

Mr. GEORGE DARLING (Sheffield, Hillsborough, Lab.) asked the Parliamentary Secretary to the Ministry of Works, as representing the Lord President of the Council, whether he was satisfied with the scope of the research being undertaken to discover an anti-poliomyelitis vaccine, in view of the recent report of the World Health Organization, which showed that the incidence of poliomyelitis increased with improvements in living standards, that current methods of treatment had proved to be inconclusive, and that all hopes of dealing successfully with the disease depended on the discovery of a suitable vaccine. Mr. J. R. BEVINS, replying on April 4, said that an extensive programme of research on poliomyelitis vaccines was being supported by the Medical Research Council, by the National Fund for Poliomyelitis Research, and by certain pharmaceutical firms. The effort in this country was being co-ordinated by the Medical Research Council, and he was advised that all promising lines were being developed.

Colouring Matter in Food

Dr. A. D. D. BROUGHTON (Batley and Morley, Lab.) asked the Minister of Food what comments he had now received from the catering industry, from manufacturers of colouring materials used in food, or from other interested bodies on the report of the preservatives subcommittee of the Food Standards Committee concerning the preparation of an approved list of substances which might be added to food. Mr. HEATHCOAT AMORY stated on April 4 that the comments received to date related for the most part to points of detail concerning the recommended colours. Some objections had also been lodged against the principle of a restricted list of colours for use in food. Replying further to Mr. N. DODDS (Dartford, Lab.), he said that a period had been allowed for anyone who desired to do so to make representations. That period—to March 31—was now over, and he was actively considering what action was required. Dr. BROUGHTON asked the Minister to regard the matter as one of urgency in view of statements made in the report, and to make sure that coal-tar derivatives used in colouring food should be prohibited in the near future. Mr. AMORY assured him that there would be no avoidable delay in taking action.

Mr. DODDS asked the Minister of Food if he would ban the colouring of kippers with coal-tar dyes, and encourage a return to the practice of producing the appetizing appearance and health-giving properties by smoking instead of painting. Mr. AMORY replied that the addition to food of colouring matters including coal-tar dyes had been the subject of a recently published report by the Food Standards Committee. Consideration was being given to representations from interested parties with a view to a decision on the committee's recommendations. Mr. DODDS asked if the Minister could give a categorical denial that the dyeing of kippers was harmful to health. Mr. AMORY explained that his intervention must be limited to harmful effects. He was anxious to consider the recommendations and the representations made in connexion with these before he reached a decision.

Edinburgh Doctors' Survey

Mr. E. G. WILLIS (Edinburgh, East, Lab.) asked the Minister of Pensions and National Insurance if he was aware that in a recent survey made by 159 doctors of 5,086 elderly persons in Edinburgh it was found that over 200 were in need of financial assistance; and whether he would take steps to meet this hardship. Mr. MARPLES, the Parliamentary Secretary, replied on April 4 that he had seen an account of this summary in the Press, but he did not know on what basis the statements about financial need had been made. It was open to anyone in need to apply to the National Assistance Board.

Mr. WILLIS asked the Secretary of State for Scotland the following day if he was aware that in this survey it was discovered that there was a large need for physiotherapy;

and that of these elderly patients some 1,274 had need of domestic medical assistance and 1,270 were in need of nursing, hospital treatment, or rehabilitation; and whether he would take steps to deal with this. Commander GALBRAITH, the Under Secretary, replied that this survey was conducted as part of a joint study, in which Edinburgh Corporation and the South-eastern Regional Hospital Board were participating, of the needs of elderly patients in Edinburgh. The assessment of its findings, in particular as to the relative importance of the various needs reported by the general practitioners, was a matter primarily for these authorities, who would take careful note of them in considering the development of the various services for which they were responsible under Statute. Mr. WILLIS commented that the results of the survey should completely destroy the complacency of the Government about the conditions of old folk. Commander GALBRAITH retorted that there was no complacency. These particulars were collected so that a study could be made, and that was going on.

Army Medical Practice

Mr. S. HASTINGS (Barking, Lab.) on April 5 asked the Secretary of State for War what administrative arrangements were made to ensure that in peacetime a soldier who felt unwell could, as a right, claim to be seen by a doctor. Mr. ANTHONY HEAD told him that there was normally a daily sick parade at a fixed time attended by a doctor. A soldier who needed urgent medical attention would be seen either by the regimental medical officer or else, if special circumstances demanded, by a civilian doctor. He assured Mr. Hastings that the War Office aim was that in all cases decision whether a soldier should be seen by a doctor or not should not be taken by a person without medical training.

Mr. F. GOUGH (Horsham, Con.) asked when, and why, Royal Army Medical Corps surgical teams were removed from the establishment of a parachute battalion. Mr. HEAD stated that field surgical teams manned by the Royal Army Medical Corps had never been included in the establishment of a parachute battalion. They were held as an Army pool, and six were allotted to the Airborne Division. In airborne operations they dropped with the field ambulances providing medical aid. Mr. GOUGH said that during the war there were surgical teams with the battalions, who dropped with the battalions, and who saved thousands of lives. Mr. HEAD agreed, but said they were still held in a pool and attached to the battalions for operations, possibly for a prolonged period.

Hydrocortisone Ointment

Mr. A. R. W. LOW, Minister of State, Board of Trade, told Mrs. L. JEGER (Holborn and St. Pancras, South, Lab.) on April 5 that there were 91 licences issued in respect of hydrocortisone acetate ointment, to a value of £321, since January 1. Mrs. JEGER said the ointment was manufactured near Folkestone. It was only because of the unhelpful attitude of the Minister of Health that doctors outside the hospital service could only get the ointment by reimporting it. This was a waste of everybody's time. Would Mr. Low have a word with the Minister of Health and see if things could be improved? Mr. Low replied that Mrs. Jeger would not like to deprive the people who were allowed to import the ointment of the right to do so.

Hospital Pharmacists

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) asked the Minister of Health whether he was aware of the shortage of pharmacists in the hospital service; and for how many assistants and senior assistants there were vacancies at the nearest available date. Mr. MACLEOD stated on April 4 that in August last there were deficiencies on complements of 281 in the basic grade and 64 in the senior grade. Dr. STROSS asked what the Minister had in mind to remedy the deficiency. Mr. MACLEOD answered, "Nothing very much at the moment." The main and obvious question was about salaries, and that was a matter for the Whitley Council.

Recruits to Dentistry

The MINISTER OF HEALTH announced on April 1 the following members of the Interdepartmental Committee which the Secretary of State for Scotland and he are setting up to inquire into the shortage of recruits to the dental profession: Sir Arnold McNair, Q.C. (chairman), Mr. J. E. H. Duckworth, L.D.S., Dr. J. L. Trainer, L.D.S., Dr. R. O. Walker, L.D.S., Sir Wilfred Fish, F.D.S., Professor F. C. Wilkinson, F.D.S., Mr. G. E. Gittins, M.A., Mr. I. D. McIntosh, M.A., Mr. G. R. Moxon, Mrs. Mary Stocks, B.Sc., and Professor A. P. Thomson, F.R.C.P.

Atmospheric Radioactivity

Mr. J. R. BEVINS, Parliamentary Secretary to the Ministry of Works, informed Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) on April 6 that no measurements of atmospheric radioactivity in London earlier than 1947 were known. Since that date measurements of radiation backgrounds had been made in the physics department of the Royal Marsden Hospital; these were the measurements made under the auspices of the Medical Research Council. Other measurements made there since 1930 were designed to ascertain the degree of exposure of workers using x-ray apparatus and radium.

Mr. SOMERVILLE HASTINGS (Barking, Lab.) asked if the Government would initiate an inquiry into the genetic effects of radioactivity on human beings by means of an investigation of the biological history of those who were engaged in x-ray work some 40 or more years ago. Mr. BEVINS said that it was thought wise to await the report which the Government had invited the Medical Research Council to make. The Council's attention had, however, been drawn to Mr. Hastings's suggestion.

He added in a reply to Mr. ROY MASON (Barnsley, Lab.) that measurements of the radioactivity in the atmosphere at various heights showed that no danger had existed over these islands from thermonuclear explosions.

Fluoride Content in Water

Mr. J. GRIMOND (Orkney and Shetland, Lib.) on April 6 asked the Minister of Housing and Local Government what steps his department had taken under Section 111 of the Public Health Act, 1936, to check that water did not contain a degree of fluorine which rendered it unwholesome. Mr. D. SANDYS told him that the section mentioned required local authorities to satisfy themselves that the water supplies in their districts were wholesome. The advice of his medical and technical officers was available to them. Before he approved the use of a new public source he had to be satisfied that the proposed supply was wholesome, and in recent years particular attention had been paid to fluoride. His officers were collecting information about the fluoride content of the water supplied by statutory water undertakers in England and Wales, beginning with those serving a population of more than 100,000.

Claims for War Disability

Brigadier J. G. SMYTH told Mr. F. H. HAYMAN (Falmouth and Camborne, Lab.) on April 5 that the numbers of applications for war disability pensions referred to independent medical experts in each of the past three years, and the numbers in which advice favourable to the applicants was given, were: 1952, 49 and 10; 1953, 21 and 8; 1954, 18 and 3.

He gave Mr. Hayman the following totals of war disability claims and their result:

Year	Received	Accepted	Rejected
1952	27,850 (1,040)	11,940 (85)	13,060 (810)
1953	27,100 (1,260)	11,710 (105)	13,900 (740)
1954	23,200 (910)	9,600 (120)	12,550 (640)

The figures in parentheses relate to the 1914 war and are included in the main figures. As a number of the claims accepted or rejected in each of the years 1952-4 were made in previous years, the sets of figures are not strictly comparable.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending March 26 (No. 12) and corresponding week 1954.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1955					1954				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	11	0	3	0	2	14	0	9	1	0
Dysentery ..	1,815	204	334	18	1	1,315	194	366	2	23
Encephalitis, acute ..	4	0		0		6	3			0
Enteric fever:										
Typhoid ..	2	0	0	0	1	2	0	0	1	
Paratyphoid ..	4	1	1	0		20	0	0	1	
Food-poisoning ..	118	23				130	17			0
Infective enteritis or diarrhoea under 2 years ..					12					14
Measles*	28,682	3,337	435	605	116	2,067	32	176	32	452
Meningococcal infection ..	41	3	18	3	2	35	4	17	4	
Ophthalmia neonatorum ..	45	2	7	0		34	3	11	0	
Pneumonia†	984	46	257	11	42	661	41	222	12	9
Poliomyelitis, acute:										
Paralytic ..	6	1		0	1	15	1		4	0
Non-paralytic ..	4	1				9				
Puerperal fever‡	247	38	9	0		233	43	3	1	
Scarlet fever ..	815	35	102	50	18	1,492	94	166	38	35
Tuberculosis:										
Respiratory ..	646	65	132	21		785	92	147	29	
Non-respiratory ..	86	9	28	2		95	5	21	5	
Whooping-cough ..	1,867	128	137	50	63	2,553	93	466	30	58

DEATHS in Great Towns	1955					1954				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	1
Dysentery ..	1	0	1	0		0	0	0	0	
Encephalitis, acute ..		0			0			0	0	0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	6	1	4	0	1	8	0	3	0	4
Influenza ..	48	8	0	0	14	22	3	1	0	0
Measles ..		1	0	0	0			0	0	2
Meningococcal infection ..		0	1				0	0		
Pneumonia ..	438	70	33	14	20	257	35	27	7	7
Poliomyelitis, acute ..	1	0			0	1	0			0
Scarlet fever ..		0	0	0	0			0	0	0
Tuberculosis:										
Respiratory ..	108	7	14	0	8	96	14	16	4	12
Non-respiratory ..		1	1	0	0		3	0	0	2
Whooping-cough ..	2	1	0	0	0	2	0	0	0	0
Deaths 0-1 year ..	245	29	38	6	11	270	30	30	9	14
Deaths (excluding stillbirths) ..	7,386	1,070	760	163	282	5,906	836	706	128	188
LIVE BIRTHS ..	7,864	1,194	961	232	508	8,346	1,233	931	257	378
STILLBIRTHS ..	203	22	28			210	22	21		

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

Vital Statistics

Tuberculosis and Cancer in 1954

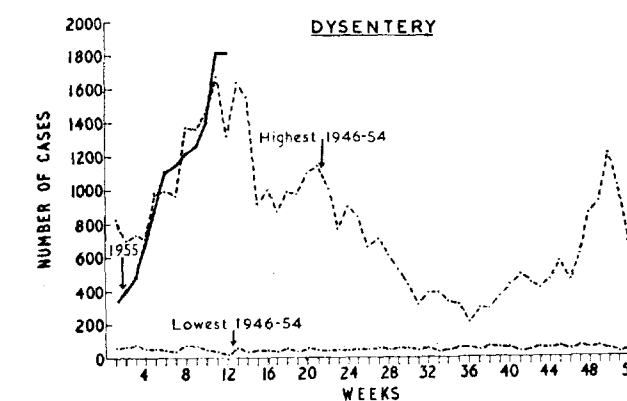
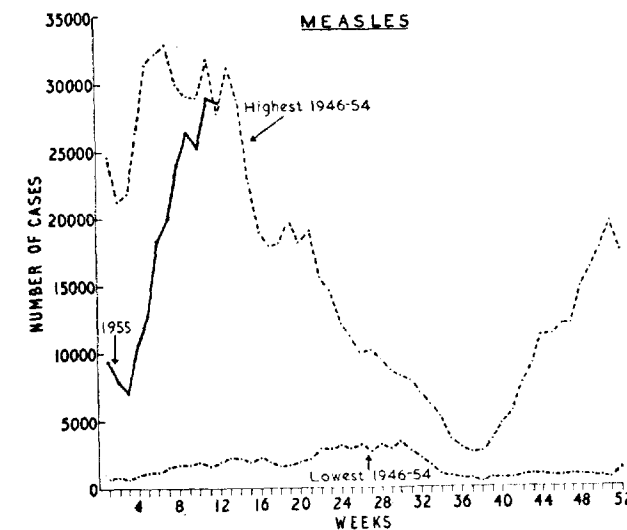
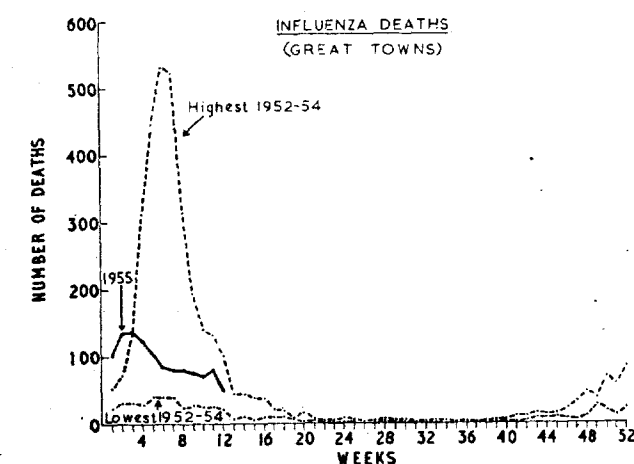
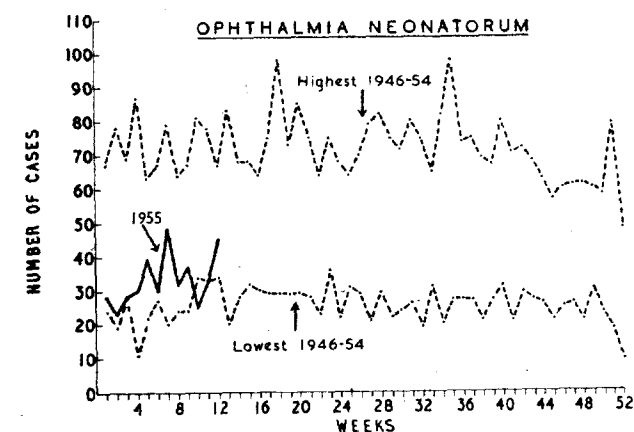
The total number of deaths in England and Wales from respiratory tuberculosis in 1954 was 7,069 (against 7,913 in the previous year), giving a provisional death rate of 160 per million persons. This is a decrease of 11% compared with the previous year, and means that since 1947 the death rate has fallen by more than 65%. The death rate from other forms of tuberculosis was 19 per million persons, compared with 22 for 1953.

The provisional death rate for all forms of cancer for men was 2,222 per million population, and for women 1,862: the 1953 figures were 2,165 and 1,835, respectively.

The rise in the rate for men includes an increase from 607 to 657 per million population for deaths assigned to cancer of the lung and bronchus, making a total increase since 1947 of 70%. The rate for cancer of the lung and bronchus for women increased from 98 per million in 1953 to 102 in 1954. Of the male deaths from cancer (47,319), 30% were certified as due to cancer of the lung and bronchus. Of the deaths of women (42,780), only 5% were so certified.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the nine years 1946-54 (influenza, 1952-4) are shown thus ----, the figures for 1955 thus —. Except for the curves showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

A small decline occurred in the number of notifications of infectious diseases in England and Wales during the week ending March 26. The largest falls were 336 for measles, from 29,018 to 28,682, 57 for whooping-cough, from 1,924 to 1,867, and 24 for scarlet fever, from 839 to 815.

The largest declines in the incidence of measles were 422 in Lancashire, from 2,264 to 1,842, 348 in London, from 3,685 to 3,337, 239 in Derbyshire, from 1,053 to 814, 184 in Lincolnshire, from 1,361 to 1,177, 145 in Durham, from 986 to 841, 137 in Northumberland, from 972 to 835, and 125 in Kent, from 1,206 to 1,081, and the largest rises were 540 in Warwickshire, from 2,370 to 2,910, 163 in Middlesex, from 1,411 to 1,574, and 119 in Leicestershire, from 87 to 206. The only large fall in the returns of scarlet fever was 37 in Yorkshire West Riding, from 104 to 67. The chief fluctuations in the trends of whooping-cough were a rise of 41 in Cheshire, from 32 to 73, and a fall of 39 in Kent, from 134 to 95. 11 cases of diphtheria were notified, being 1 more than in the previous week.

10 cases of acute poliomyelitis were notified, and these were 4 fewer for paralytic and 1 more for non-paralytic cases than in the preceding week. The largest returns were Yorkshire West Riding 3 and London 2.

1,815 cases of dysentery were notified, being 1 less than the very high level recorded in the preceding week. The largest returns were Lancashire 629 (Oldham C.B. 157, Blackpool C.B. 155, Blackburn C.B. 58, Manchester C.B. 48, Liverpool C.B. 34, Chadderton U.D. 32, Whiston R.D. 18, Milnrow U.D. 16, Middleton M.B. 15, Preston R.D. 15, Southport C.B. 14, Crompton U.D. 10), London 204 (Hackney 91, Shoreditch 36, Islington 22, Southwark 10), Durham 177 (Sedgefield R.D. 35, South Shields C.B. 21, Seaham U.D. 20, Felling U.D. 19, Hebburn U.D. 18, Stanley U.D.

16, Easington R.D. 14), Northumberland 111 (Newcastle-upon-Tyne C.B. 27, Blyth M.B. 25, Bedlington U.D. 19, Hexham U.D. 10), Yorkshire West Riding 81 (Leeds C.B. 29, Dewsbury C.B. 18), Leicestershire 79 (Leicester C.B. 64), Norfolk 73 (Norwich C.B. 55), Lincolnshire 44 (Scunthorpe M.B. 29, Stamford M.B. 10), Warwickshire 43 (Birmingham C.B. 22, Nuneaton M.B. 16), Cheshire 38 (Stockport C.B. 26), Glamorganshire 35 (Cardiff C.B. 21), Northamptonshire 35 (Northampton C.B. 17), Surrey 33 (Carshalton U.D. 11), Yorkshire North Riding 25 (Middlesbrough C.B. 22), Rutland 22 (Oakham U.D. 22), Sussex 21 (Chichester R.D. 19), and Cumberland 20 (Whitehaven M.B. 12).

Scotland in 1954

The preliminary return for 1954 shows that the birth rate, 18.0 per 1,000 population, was slightly above the rates for the four preceding years. Infant mortality was 31 per 1,000 registered births and was the same as in 1953, which was the lowest recorded. The stillbirth rate, 25 per 1,000 total births, was also the same as in 1953. The death rate was 12.0 per 1,000 population, and was 0.5 above the rate for 1953 but 0.3 below the average of the five preceding years. The death rate from all forms of tuberculosis was 22 per 100,000 population and 20 from respiratory tuberculosis; these rates were 23 and 19, respectively, below the average of the five preceding years. The number of deaths from the principal epidemic diseases was 254, 133 fewer than in 1953. These deaths included 176 from influenza, 41 from meningococcal infections, 25 from whooping-cough, 8 from measles, 2 from diphtheria, 1 from typhoid, and 1 from scarlet fever. In addition there were 20 deaths from acute poliomyelitis.

Quarterly Returns for Scotland

The birth rate for the December quarter of 1954 was 17.0 per 1,000 population, being 0.1 below the rate for the December quarter of 1953 and 0.1 above the average of the five preceding fourth quarters. The infant mortality rate was 31 per 1,000 registered births; this was 1 below the rate for the corresponding quarter of 1953 and 8 below the five-years average. The general death rate was 11.9 per 1,000 population, being 0.6 more than in the December quarter of 1953 but 0.2 below the five-years average. The death rate from tuberculosis was 20 per 100,000 population and that for respiratory tuberculosis was 18; these rates were 22 and 19 respectively below the average of the five preceding fourth quarters. Deaths from the principal epidemic diseases numbered 78, including 62 from influenza, 10 from meningococcal infections, 5 from measles, and 1 from whooping-cough. No deaths were reported from diphtheria, scarlet fever, or typhoid.

Medical News

Ophthalmic Hospital of St. John.—Sir STEWART DUKE-ELDER has just returned from the tour of the Middle East which he undertook with the object of finding a site for the rebuilding of the Ophthalmic Hospital of St. John in Jerusalem (see *Journal*, March 12, p. 677). A new site for the hospital and the proposed research institute has been purchased outside the Old City, and it is hoped that the building will be finished by the end of 1956. The present hospital has 45 beds, but the new one will have 70 beds and, in addition, a special wing to house the research institute. The latter will have a separate staff, but will be under the overall control of the Order of St. John. The staff of the institute, when complete, will consist of a medical director, three British scientists, three Arab scientists, and a number of technicians. Research on trachoma will be an important part of the work of the institute. The initial cost of the hospital and institute is expected to be about £250,000.

Dr. Charles Hill.—It was announced from Downing Street on April 7 that Dr. CHARLES HILL, formerly Secretary of the British Medical Association, had succeeded Lord DE LA WARR as Postmaster-General. He had been Parliamentary Secretary at the Ministry of Food since 1951.

Poliomyelitis Vaccine.—Successful vaccination against poliomyelitis was claimed in the U.S.A. on April 12 for the vaccine developed by Dr. JONAS E. SALK. According to Press reports, Dr. T. FRANCIS stated that the vaccine was safe, effective, and potent. Preparations are now proceeding in the United States to make the vaccine widely available. In Britain, commenting on the news, a Medical Research Council spokesman said that two British pharmaceutical houses are already developing a similar vaccine. The firms concerned are understood to be Glaxo Laboratories and Burroughs Wellcome and Co.

Individual Efficiency in Industry.—A conference on "Individual Efficiency in Industry," arranged by a joint committee of the Medical Research Council and the Department for Scientific and Industrial Research, was held in Cambridge from March 31 to April 3, under the chairmanship of Sir GEOFFREY VICKERS, V.C. The conference was attended by both representatives of industry and research workers. The subjects discussed included the effects of environment and continuous work on performance, training problems, and the physiological and psychological aspects of machine design. The last session was on "The Industrial Application of Research Results." During the conference there were demonstrations at the Medical Research Council's unit for research on applied psychology and at the university engineering laboratories.

Hammersmith Premature Baby Unit.—A small party was held at the Hammersmith Hospital, London, on April 5 to welcome the 1,000th baby to be admitted to the premature baby unit. The unit was opened on December 1, 1947. Most of the babies cared for in the unit have been born in the obstetric department of the Hammersmith Hospital, but over one-third of admissions have been of babies born at home or in other hospitals and nursing-homes. About 800 nurses from Great Britain and 19 other countries have received periods of training from a few weeks to six months in the unit in the past seven years. In addition there have been over 7,000 visitors to the unit.

Birmingham University.—Mr. A. L. D'ABREU, part-time lecturer in surgery, has been given the title of reader in thoracic surgery. Dr. W. TREVOR COOKE has been appointed to a part-time readership in medicine.

Sir Harry Platt, P.R.C.S., is to receive the honorary LL.D. of Manchester University on May 11.

COMING EVENTS

Medical Art Society.—Annual exhibition at Walker's Galleries, 118, New Bond Street, London, W.1, from April 15 to 30, 10 a.m. to 5 p.m. (except Saturdays, 10 a.m. to 1 p.m.).

Institute of Diseases of the Chest.—Clinical demonstrations, open to medical practitioners without fee, will be given by Dr. J. G. SCADDING in the lecture-room of the Institute (in the grounds of the Brompton Hospital, Fulham Road, London, S.W.3) on Fridays at 5 p.m., from April 22 to July 8.

North-Western Tuberculosis Society.—A joint meeting with the British Tuberculosis Association is being held in the Clinical Sciences Building of Manchester University on April 22. The programme includes a symposium on chronic bronchitis. Details from Dr. M. J. GREENBERG, Manchester Chest Clinic, 352, Oxford Road, Manchester 13.

Medical Society for the Care of the Elderly.—Annual general meeting at the Whittington Hospital, London, N.19, on May 6 and 7. Details from the hon. secretary, Dr. A. N. EXTON-SMITH, at the Whittington Hospital.

NEW ISSUES

British Journal of Venereal Diseases.—The new issue (Vol. 31, No. 1) is now available. The contents include:

NORWAY CONQUERS VENEREAL DISEASES. Thomas D. Elliot.
TOPICAL CORTISONE IN SYPHILITIC INTERSTITIAL KERATITIS. Gordon O. Horne.
TREATMENT-RESISTANT SYPHILIS. R. V. Rajam and P. N. Rangiah.
YAWS IN MANCHESTER. Sydney M. Laird.
EFFECT OF ROOM TEMPERATURE ON SEROLOGIC TESTS FOR SYPHILIS. Hilfred N. Borsick, Ad Hattis, and Sidney Olansky.
VDRL SLIDE FLOCCULATION REACTION FOR SYPHILIS PERFORMED ON ACTIVE SERA. Ekkehard E. Schmid and T. Vclaudapillai.
COMPARISON OF THE IDE AND HARRIS (VDRL) SLIDE FLOCCULATION TESTS IN NIGERIA. L. R. Boulger and D. A. Cannon.

Thorax.—The new issue (Vol. 10, No. 1) is available. The contents include:

OSTEOPLASTIC THORACOPLASTY. Sir Russell Brock.
PATHOLOGICAL STUDIES OF MODIFIED PNEUMOCOCCUS IN COAL-MINERS WITH RHEUMATOID ARTHRITIS (CAPLAN'S SYNDROME). J. Gough, D. Rivers, and R. M. E. Seal.
THE TECHNIQUE AND COMPLICATIONS OF PULMONARY VALVOTOMY WITH SPECIAL REFERENCE TO THE TRANSARTERIAL APPROACH. Frederik Therkelsen.
INDICATIONS FOR THORACIC AORTOGRAPHY. Walther Falholt, Gregers Thomsen, and H. Gosta Davidsen.
CLOSURE MECHANISMS AT THE CARDIA WITH SPECIAL REFERENCE TO THE DIAPHRAGMATIC-OESOPHAGEAL ELASTIC LIGAMENT. P. M. Peters.
DOUBLE AORTIC ARCH. R. E. Steen and S. J. Douglas.
RARE CARDIAC ANEURYSM IN A YOUNG ADULT. Kevin P. Clearkin and Henry Budic.
THE MANAGEMENT OF CONGENITAL OESOPHAGEAL ATRESIA AND TRACHEO-OESOPHAGEAL FISTULA. Keith D. Roberts, Ivo J. Carré, and James McN. Inglis.
SARCOMA OF THE OESOPHAGUS. D. Millar Bell.
NON-SPECIFIC OESOPHAGITIS. K. V. Lodge.
THE MECHANISMS OF BREATHING IN NEWLY BORN BABIES. M. B. McIlroy and E. S. Tomlinson.
FRACTURE OF THE TRACHEA AND BRONCHUS. John Dark and P. Jewsbury.
AN ANALYTICAL REVIEW OF SPONTANEOUS HAEMOPNEUMOTHORAX. R. J. Calvert and Eric Smith.
TWO CASES OF INTRALOBAR SEQUESTRATION OF THE LUNG. C. McDowell, Douglas Robb, and J. S. Indyk.
MEDIASTINAL EMPHYSEMA AND ITS OCCURRENCE IN ARTIFICIAL PNEUMOPERITONEUM. C. S. Breathnach.

Published quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

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

Saturday, April 16

SOUTH-EAST METROPOLITAN REGIONAL TUBERCULOSIS SOCIETY.—At Bow Arrow Hospital, Dartford, 10.30 for 10.45 a.m., Dr. M. O. J. Gibson: Tuberculosis in Childhood.

Monday, April 18

INSTITUTE OF PSYCHIATRY.—5.30 p.m., lecture demonstration by Dr. E. Siegel.

MEDICAL SOCIETY OF LONDON.—8.30 p.m., First Lettsomian Lecture by Dr. J. G. Scadding: Treatment of Pulmonary Tuberculosis.

●ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Professor C. A. Wells: Cancer of the Bladder; 6.30 p.m., Mr. F. W. Holdsworth: Traumatic Paraplegia.

Tuesday, April 19

ILFORD MEDICAL SOCIETY.—At King George Hospital, Ilford, 8.45 p.m., Dr. Robert Forbes: Recent Developments in Medical Litigation.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Lumleian Lecture by Dr. A. M. Cooke: Some Aspects of Skeletal Disease.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor John Foster: Evaluation of Current Methods of Treatment of Idiopathic Stricture of the Valve of Krause.

SOCIETY FOR THE STUDY OF ADDICTION.—At Medical Society of London, 8 p.m., Mr. F. T. Hillier: Handwriting in Relation to Drug Addiction and Alcoholism (illustrated).

SOUTH-WEST LONDON MEDICAL SOCIETY.—At Bolingbroke Hospital, 8.30 p.m., Mr. K. M. Walker: Sexual Problems in General Practice.

WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., neurological demonstration by Dr. N. G. Hulbert.

Wednesday, April 20

CHADWICK TRUST.—At Reardon Smith Lecture Theatre, National Museum of Wales, Park Place, Cardiff, 3.30 p.m., Dr. N. R. Beattie: Role of the Public Health Inspector.

●HYPNOTHERAPY GROUP.—At Royal Society of Medicine, 8 p.m., Dr. Denis E. R. Kelsey: Rationale of Hypno-Analysis.

MIDDLESEX COUNTY MEDICAL SOCIETY.—At London Airport, 2.30 p.m., tour; 5 p.m., Dr. A. S. R. Fellers: Transport of Sick Persons by Air.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Mr. A. W. Marsden, M.Sc.: Supply of Milk and Dairy Products to the Public (illustrated).

Thursday, April 21

GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.—At Glasgow University Union, 7.30 p.m., debate with Dialectic Society.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Lumleian Lecture by Dr. A. M. Cooke: Some Aspects of Skeletal Disease.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor N. R. Barrett: Primary Tumours of Rib.

●WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—7 p.m., dinner at Falsstaff Hotel, 7.30 p.m., visit to Fleet Street; 9 p.m., lecture by Mr. W. Redpath: The Bones at St. Bride's; 10 p.m., to see the Daily Express "put to bed."

Friday, April 22

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Dr. J. G. Scadding.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Serous Otitis

Q.—A woman of 60 complains of intermittent deafness and gurgling noises in her ears for the last three years, worse in the morning. On auriscopic examination, bubbles are seen passing through clear fluid in the middle ear. This becomes more marked when the cheeks are blown out with the mouth and nose closed. What is the cause of this, and the treatment?

A.—The appearance described by your correspondent suggests the presence of a clear fluid in the middle ear cavity, a condition known as serous otitis. Attention was drawn to the comparative frequency of this condition by Hoople and Blaisdell.¹ Since then it has been diagnosed more often, and it now appears to be one of the regular causes of conductive deafness. An allergic basis has been suggested for this condition, but the absence of eosinophils in the exudate or of other allergic manifestations makes this unlikely. It may be the result of blockage of the eustachian tube, and in fact some authorities feel that prolonged blockage of the eustachian tube is the most probable cause.

The treatment is removal of the fluid either by needle aspiration through the tympanic membrane or by making a small hole through the tympanic membrane with a paracentesis knife and blowing any fluid out by inflation through the eustachian tube. In some cases one such treatment is sufficient, but not infrequently repeated aspiration will be necessary. Efforts to clear the eustachian tube should not be overlooked. The possibility of mastoid drainage in persistent cases where there is a copious exudate may very occasionally have to be considered.

REFERENCE

¹ *Proc. roy. Soc. Med.*, 1944, 37, 270.

"Once a Caesarean"

Q.—It not infrequently happens that a young healthy primipara with ample pelvic measurements has a caesarean section for a central placenta praevia. At a recent clinical meeting the statement was made that only one vaginal delivery should be allowed after this. What is your expert's opinion?

A.—A similar statement is made by Professor Bruce T. Mayes, who, on page 424 of his *Practical Obstetrics* (Angus and Robertson; Sydney, 1954), writes: "If the patient has already had a vaginal delivery following caesarean I should do another caesarean," his argument being that the second pregnancy and labour may stretch and weaken the scar. Although this teaching may well be applied with profit to individual cases with special circumstances, it is not one which is widely accepted as a general principle. Indeed, if the uterine scar can be depended on to withstand only one labour, it could be argued with some force that it is illogical to allow the patient to risk vaginal delivery even of the second child, and that it is better to adopt the old rule of "Once a caesarean, always a caesarean," and to carry out three successive operations, sterilizing the patient at the third. The whole idea behind allowing the patient to attempt to deliver herself in the second pregnancy is that it will show whether her reproductive function is so unimpaired that she may continue to have a reasonably unrestricted number of further vaginal deliveries in the future if she wishes.

The management of a young woman who has previously had a caesarean section for a non-recurrent indication depends mainly on the details of the operation. If it is carried out through a transverse incision placed so low that it is wholly in the lower segment, and is done by an expert obstetrician working in good surroundings, the risk of the scar rupturing in any subsequent labour is very small. The exact extent of the risk is unknown, most of the published figures applying either to classical caesarean section or to a vertical incision in the lower segment, both of which are considerably more dangerous in this respect. Nevertheless, the transverse scar can rupture, and it may do so in one area only, and so silently that the accident is unrecognized. If this happens in the first labour after caesarean section, then in any subsequent labour, or indeed pregnancy, the defect may extend to involve the whole scar with serious results. Such an occurrence can be avoided by the following procedure.

Assuming the type and circumstances of the original section are favourable, the woman having her second baby should be allowed to deliver it vaginally provided the labour proceeds smoothly. As soon as the placenta is delivered, and before if the third stage is prolonged, the patient should be anaesthetized and a hand inserted into the uterus to examine the scar over its whole length. This is not only the best means of excluding a silent rupture in any part of it, but it allows an assessment of the thinness, width, and irregularity of the scar, which are fairly good guides to its strength from the standpoint of further childbearing. If the scar is found to be defective in any way the next baby should be delivered by caesarean section. If it is sound, and it usually is, there is no reason why future babies should not be delivered vaginally. One precaution which should always be taken, however, is that a woman who has a caesarean scar in the uterus should have every subsequent delivery in a fully equipped maternity hospital unit.

Estimation of Protein-bound Iodine

Q.—Will you kindly give me references to the procedure for estimating protein-bound iodine, and describe the significance of the findings obtained?

A.—Recent descriptions of the procedure will be found in the papers by de Mowbray and Tickner¹ and O'Neal and Simms.² The normal values run from 4 to 8 µg. per 100 ml. of plasma, and the test gives a good general correlation with alterations in thyroid function in both directions. However, high values may be seen without thyrotoxicosis in pregnancy and after previous iodine therapy. Values below normal without myxoedema have been reported in nephrosis. The technique is somewhat laborious and is not easily carried out in a busy routine laboratory.

REFERENCES

¹ *Lancet*, 1952, 2, 511.

² *Amer. J. clin. Path.*, 1953, 23, 493.

Side-effects of "Diamox"

Q.—Two of my patients on the oral diuretic "diamox" developed peripheral neuritis within seven days. Each was having 250 mg. daily. The neuritis disappeared on discontinuing the drug. What are the side-effects of diamox, and is peripheral neuritis one? Is it safe to give diamox to these patients again, perhaps in a lower dosage?

A.—Diamox (acetazolamide) acts therapeutically by inhibiting the reabsorption of bicarbonate in the renal tubules, and so increasing the excretion of bicarbonate which carries with it base (sodium or potassium) into the urine. The most direct "side-effect" of diamox is thus to produce a lowering of the bicarbonate content of plasma—i.e., a metabolic acidosis. In patients on a low salt diet most of the base excreted may be potassium rather than sodium: the drug then fails in its object of reducing oedema, and

some potassium depletion may be induced. In high doses diamox can cause paraesthesiae, and also drowsiness and even psychosis; the mechanism of these neurological disturbances is not established. If the effect in the two patients mentioned is limited to tolerable subjective sensations, and the drug is otherwise effective, it should be continued; but more severe neurological involvement would be an indication for stopping the drug completely and trying other methods of therapeutic sodium depletion.

Acetylcholine in Psychiatry

Q.—*Acetylcholine has been used to treat cases of anxiety or obsessional behaviour. Could you give me further details about the type of case suitable for the treatment and the results obtained?*

A.—Acetylcholine treatment, as the inquirer states, has had its most successful effects in certain obsessional and anxiety states. The obsessional patients who have done best with it are those in whom the symptoms took predominantly the form of compulsive ruminations; patients in whom the ruminative tendency did not bulk large, but who suffered from repetitive routines of behaviour, etc., have not been found to respond nearly so well. Compulsive behaviour is usually little influenced by the treatment. The treatment is certainly worth trying in patients aged from 25 to 50—that is, neither the very young nor the old—and when the illness is not of very long duration. The tendency to rumination is reduced and the associated tension as a rule diminishes to a very satisfactory degree.

In patients suffering from anxiety states it is again the symptom of tension which is most favourably affected by the treatment. Fluctuating tension responds better than persistent tension. Anxiety states in which somatic symptoms, tachycardia, sweating, tremor, etc., are prominent do not do so well.

Persons of athletic build respond better than those of asthenic build. The treatment should not be given where there is any evidence of cardiac disease. Phillips and Hutchinson¹ in a selected series reported 70% improvements.

REFERENCE

¹ *British Medical Journal*, 1954, 1, 1468.

Trace Elements

Q.—*The agricultural community in which I work in Southern Rhodesia is very trace-element conscious, though most farmers lack the facilities and cash for accurate soil analysis. Undoubtedly our soils are poor, and one of the remedies suggested is the application of powdered seaweed. The argument is that dairy and poultry products from stock fed on crops grown with this as fertilizer will contain all the trace elements and be better human food. Is this correct?*

A.—The mineral nutrients essential for man are of two main groups; the first includes iron, calcium, sodium, potassium, phosphorus, and chloride, which are needed in considerably larger amounts than those in the second group, the trace elements proper, which are needed in exceedingly small quantities. The desirable dietary levels of some of these elements—e.g., copper, iodine, and fluorine—are known, but relatively little is known about those for such elements as cobalt, molybdenum, zinc, manganese, and magnesium, all of which are, however, known to be essential components of various biological systems.

It is generally believed that sufficient of each of the trace elements is present in ordinary diets; on the other hand, evidence of deficiency of such elements as cobalt and molybdenum has been recognized clinically in domestic animals. It would seem that the proper treatment of mineral deficiencies in livestock is to apply fertilizers containing the trace elements which are deficient in the soil so that the amounts of those elements in the crops are increased. Not only are adequately fertilized soils important for obtaining

a satisfactory mineral content of the crops raised thereon, but the health and yields of crops and of livestock and the nutritional value of animal food products will be improved, and to the extent to which man obtains his food from such sources his dietary supply of the necessary trace elements will be secured.

The risk inherent in relying on a single source for a group of nutrients is that, in taking the amount necessary to supply some of them, certain other constituents may be taken in the wrong proportion. One example well known to South African farmers is the problem of administering to cattle minerals from certain sources: they are sometimes faced, when providing calcium and phosphorus, with the risk of producing fluorosis. Generally the procedure of choice is to inject the minerals which are in short supply into the biological cycle as a soil fertilizer, but, as in nutritional evaluations of food for man and animals, it is not enough merely to rely on chemical analyses. If indeed facilities for research are limited, it would be preferable to make suitable fertilizer trials rather than chemical analyses when trace-element deficiencies are suspected. As in animal nutrition, the new knowledge of "clinical" signs of malnutrition in plants, as well as yield data, may be used as criteria of the nutritional value of the soil and fertilizer. An outstanding exception to this general procedure is the correction of iodine deficiency by iodization of domestic salt.

Facial Hair in a Girl

Q.—*Have you any information, please, regarding the removal of facial hair in a girl of 18? Her mother asked me about electrolysis, but I think there is bound to be minute scarring after it, and I also understand that there is a general distribution of excess hairiness over the body. Menstruation is normal. I wondered whether there is any hormone treatment available.*

A.—In the great majority of cases no medical treatment is any good. In particular hormone treatment is valueless. However, a small minority of cases of hypertrichosis are due to adrenal hypertrophy, and this diagnosis should be excluded by urinary hormonal estimations.

Electrolysis, skilfully applied, leaves negligible scarring, but of course every hair has to be separately treated, and it is therefore not a very suitable method when the hypertrichosis is very severe or very widely distributed. It is worth noting that the popular view that shaving stimulates the growth of hair is untrue, and in many instances this is the best line of treatment if the patient can be persuaded to adopt it. It has to be admitted that our knowledge of this subject is at the present moment extremely small.

Corrections

In his article entitled "A Purpuric Drug Eruption Caused by Carbromal" (March 12, p. 645), Dr. Peter Borrie mentioned that preparations containing carbromal are being fairly widely advertised to the public. In this connexion CLINICAL PRODUCTS LTD. write: "We wish to avoid any misunderstanding by pointing out that 'persomnia' public advertising was discontinued in June, 1950, and 'dormiprin' has never been advertised to the public."

In the last sentence of the first paragraph of Dr. H. S. Russell's letter (*Journal*, April 9, p. 909) on "Post-maturity and Asphyxia," "intact peritoneum" should have read "intact perineum."

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CROSS-INFECTION OF WOUNDS WITH ANTIBIOTIC-RESISTANT ORGANISMS*

BY

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The dilemma of hospital infection has been complicated rather than solved by chemotherapy. An appraisal of the problem in terms not only of the disease but of the micro-organism (cf. Okell and Elliott, 1936; Wright, 1940) gave promise of a better insight into and control over the transfer of infection. But the bacteriological index is in some respects much more sensitive than the clinical, and its application has revealed surprising weaknesses in the customary routine for control of cross-infection. A special problem to-day is the frustration of chemotherapy by the spread of resistant organisms among the staff and the patients—a possibility forecast by Miles (1944), when he pointed out the errors of excusing perfunctory asepsis on the grounds that the sulphonamides and penicillin were available. This lesson has, however, been fully demonstrated only during the past few years with the arrival of more antibiotics.

It is in surgery that the new dilemma is particularly evident, because the organisms which cause infection of wounds include some that are outstanding in their ability to acquire resistance to chemotherapeutic agents, and some that are insensitive, or relatively insensitive, to all the agents made available so far. I shall consider separately the two basic problems, prevention of the emergence of resistant bacteria and prevention of the transfer of bacteria—especially of resistant strains—from the environment to the patient. In both of these departments, moreover, it is necessary to consider each chemotherapeutic agent and each bacterial species as a separate problem; indeed, within each species fundamental differences of behaviour may be found, and generalizations about cross-infection or acquired resistance referring to all species are almost sure to be wrong.

Prevention of the Emergence of Resistant Bacteria

Briefly, two mechanisms, selection and adaptation, are generally postulated to account for the phenomena of acquired resistance. Selection of resistant organisms may occur in the presence of an antibiotic, either when these are normally present together with sensitive ones—for example, as a very small proportion of the total—or when they emerge independently as mutants from sensitive parent cells. In either case the resistant organism arises independently of the antibiotic, which merely selects it from a mixed flora (Demerec, 1945, 1948). The other mechanism presupposes modification of the bacterial metabolism caused by contact with the chemo-

*Based on a paper read to the Medical Society of the Birmingham Accident Hospital on December 20, 1954.

therapeutic agent, an adaptive change for which evidence has been presented by Hinshelwood (1952), Barber (1953), and others. An additional mechanism may be the transfer of resistance from resistant to sensitive organisms in a mixed culture (see Hotchkiss, 1951). It is probable that resistance may be acquired both by selection and by adaptation, and any controversy on this question is pointless except when it refers to the action of a particular agent on a particular organism.

Special Features of the Commoner Chemotherapeutic Agents

Streptomycin is exceptional among antibiotics in that any (or almost any) bacteria can be rendered resistant to it after relatively short contact *in vitro* or *in vivo* (Florey *et al.*, 1949). Penicillin is also exceptional in that resistance is often due to production of a penicillin inactivator (penicillinase), a property of the organism which may be enhanced by culture in the presence of the antibiotic (e.g., Segalove, 1947). The other antibiotics are not destroyed by organisms resistant to them.

It is of interest that the ease with which an organism may be rendered resistant by subculturing it through media containing an antibiotic is no index of the likelihood that resistant bacteria will emerge during treatment with the antibiotic. For example, it is easy to render staphylococci highly resistant to penicillin *in vitro*, but such resistant strains do not produce penicillinase (cf. Abraham *et al.*, 1941; Bondi and Dietz, 1944). These would seem, therefore, to be different in origin from the penicillin-resistant staphylococci isolated from wounds and from the nares of patients in hospital, which are almost uniformly penicillinase producers (Barber, 1953). We have found it easy, by *in vitro* methods, to produce strains of *Staphylococcus aureus* resistant to neomycin, but such strains have not appeared on burns during a controlled trial of neomycin.

Special Features of the Commoner Wound Bacteria

Streptococcus pyogenes, the most feared of the commoner aerobic organisms, has shown less tendency to acquire resistance to the antibiotics than some of the other pathogens. The successful control of streptococcal infections in recent years must in great measure be attributed to this property. Strains of *Str. pyogenes* resistant to penicillin have not yet been recognized. Resistance to sulphonamides, however, does occur, and strains resistant to the tetracyclines ("aureomycin" and "terramycin") have occasionally been found—for example, on burns (Lowbury and Cason, 1954). Other

streptococci and pneumococci do not share this exceptional vulnerability, and the ubiquitous *Staph. aureus* has, in complete contrast, an exceptional capacity for acquiring resistance to antibiotics and other agents. Phage-typing shows that this property is associated principally with certain phage types and patterns of the species, classified as group III (Williams *et al.*, 1953), which appear to be less stable in their genetic structure than the others (Barber and Whitehead, 1949; Barbour and Edwards, 1953; Lowbury and Hood, 1953), and which have largely replaced the less adaptable members of the species in hospitals, where the use of antibiotics has favoured their survival at the expense of the others.

Among the Gram-negative bacilli, *Ps. pyocyanea* has shown an almost uniform sensitivity to polymyxin, and, surprisingly, no tendency to acquire resistance to this antibiotic either *in vitro* or *in vivo* (Jackson *et al.*, 1951a). This contrasts with its frequent resistance to streptomycin (Seligmann and Wassermann, 1947), and, in smaller measure, to neomycin (Goldin, 1953). Members of the genus *Proteus*, by contrast, are resistant to polymyxin, and not sufficiently or uniformly sensitive to any of the agents at present available (e.g., Poole, 1954). The problem of acquired resistance is therefore relevant only in therapy of individual infections with this organism, not in prophylaxis.

Origin of Reservoirs of Resistant Strains in Hospital

There can be little doubt that cross-infection is the important factor which determines the accumulation of resistant staphylococci in hospitals. This is particularly evident in the case of antibiotics against which the organisms do not readily acquire resistance—for example, chlortetracycline. We used chlortetracycline for several weeks in the treatment of burned patients before resistant staphylococci began to appear in the burns of some of them; not long after this, however, the majority of staphylococci isolated from burns were found to be resistant to chlortetracycline, and most of these were isolated from patients who were not receiving the antibiotic. In treatment with streptomycin, resistance is so likely to be induced in wound bacteria that control of cross-infection is not the crucial factor in determining its continued value as an antibiotic—though cross-infection with such organisms is undoubtedly very common.

The importance of cross-infection in producing reservoirs of resistant bacteria receives further support from our experience with *Str. pyogenes*. In contrast with *Staph. aureus*, cross-infection with this organism can for various reasons be substantially limited, and, although chlortetracycline-resistant streptococci have emerged on several occasions in the burns of patients treated with the antibiotic, no reservoir of such organisms has been built up in the Burns Unit.

Methods of Preventing Emergence of Resistant Bacteria

Three procedures may help to prevent, or at least delay, the emergence of resistant bacteria: (1) economy in the use of chemotherapeutic agents; this implies not only restricting their use for cases in which they are specially indicated, but also giving them in sufficient amount to achieve a complete effect in the shortest possible time—an approach to the *therapia sterilisans magna* of Ehrlich; (2) avoidance of agents which readily induce resistance—especially streptomycin—when other agents will do as well; and (3) the use of two or more agents together. This third method has been vindicated in the treatment of tuberculosis by combinations of streptomycin, para-aminosalicylic acid, and isoniazid (M.R.C., 1949, 1953). If the resistant organisms emerge by selection of mutants, the use of two unrelated antibiotics will provide a barrier against the emergence of

any mutants except those in which resistance to both antibiotics has been acquired at the same time, and the proportion of all divisions which give rise to such double mutation is likely to be exceedingly small. Moreover, two unrelated antibiotics used together will interfere with different metabolic processes and so reduce the chances that the organism will establish an alternative metabolism to the one which has been blocked (Garrod, 1953). If two agents fail to prevent the emergence of resistant strains, three or even four agents may still have this effect (cf. Carpenter *et al.*, 1945).

In addition to its effect in preventing the emergence of resistant bacteria, combined therapy may be associated with synergistic action—enhancement of the bactericidal effects of one agent by combination with other agents (Ungar, 1943; Garrod, 1953). The converse effect—antagonism—may also be found with some combinations (see Jawetz, 1952).

Efforts to Prevent Emergence of Resistant Staphylococci in a Burns Unit

This is essentially a study of *Staph. aureus*, since the other species which have been studied are either resistant to chemotherapy or not liable to become resistant to the chosen antibiotics. Recently in trials of chemoprophylaxis against *Staph. aureus* in burns we have obtained results which give some grounds for hope; but before describing them I must recall some of the earlier hopes which were not fulfilled during studies on burns in the past 12 years.

From the Glasgow burns unit, Colebrook and his colleagues (Clark *et al.*, 1943) reported successful chemotherapy for *Staph. aureus* in burns by local application of a penicillin cream. Five years later this effect was not maintained (Colebrook, Duncan, and Ross, 1948), and when shortly after this we made a controlled prophylactic trial of penicillin cream on burns it showed no prophylaxis whatever against staphylococci, though there was a highly significant effect against *Strep. pyogenes* (Jackson *et al.*, 1951b). During this trial about 70% of the staphylococci isolated from burns were resistant to penicillin. A short trial of dibromopropamide—brought to an end because of local toxic action (Cruickshank *et al.*, 1955)—was accompanied by an increased resistance of staphylococci in the burns to this compound.

Next we made a trial of chlortetracycline, which had recently been introduced and which was apparently active against all the staphylococci from burns in our unit. An assessment of this trial after a few weeks showed a significant prophylactic effect against *Staph. aureus*; but from about the sixth week we began to detect chlortetracycline-resistant staphylococci, which became predominant in the ward soon afterwards. With this emergence of resistance we found that chlortetracycline was no longer protecting burns against *Staph. aureus* (Lowbury, Topley, and Hood, 1952). Staphylococcal phage was then tried, and after showing promise of prophylactic value it selected a breed of phage-resistant staphylococci in the burns (Lowbury and Hood, 1953). Finally, erythromycin, which we were investigating as an antibiotic for streptococcal infections, left us a legacy of resistant staphylococci—after eight months in which no resistant strains appeared (Lowbury and Cason, 1954).

Before embarking on trials of combined prophylaxis we thought it worth while testing the prophylactic value of certain compounds suitable for topical rather than for systemic administration, including neomycin and a synthetic compound, 1:6-di-4'-chlorophenyl-diguandiohexane (I.C.I. 10,040, or "hibitane") (Davies *et al.*, 1954). Our purpose was to use each of these agents for a short time, and switch from one to another after three months, or as soon as resistant strains began to appear; these, it was argued from previous experience, should soon be diluted out of the resident flora when there is nothing to favour them rather than other staphylococci. Moreover, we were anxious to know whether these agents had any value when used alone.

And then, since sensitive strains—for example, of *Str. pyogenes*—not infrequently appear on burns in spite of the presence of penicillin, it seemed to us that combined therapy may perhaps be relatively ineffective in preventing acquired resistance during prophylaxis of burn infection. Finally, we had reasons, from initial laboratory tests, to believe that staphylococci might be rendered resistant to neomycin and to hibitane less readily than to the other chemotherapeutic agents which we had studied.

Preliminary trials—first of neomycin for three months, and then of hibitane for four months—were carried out as follows.

Eligible patients were those who (a) had burns of less than 20% body area, (b) were not given skin grafts on admission, and (c) were regarded as suitable for treatment by the closed method. These patients were allocated by random selection to groups which received local applications either of penicillin cream (controls) or of penicillin cream plus (in the first trial) neomycin (2 mg./g.) or (in the second trial) hibitane (1 mg./g. of the dihydrochloride) on admission and at all dressings till healing, discharge, or operation. Burns were sampled with moistened swabs on admission and at every dressing or operation. The swabs were inoculated on a variety of media and investigated by methods described elsewhere (see Jackson *et al.*, 1951a, 1951b). The results of the trial of neomycin are shown in Table I.

TABLE I.—Neomycin Prophylaxis for *Staphylococcus Aureus* on Burns (During First 14 Days)

Cream Applied at Dressings Containing	Staphylococcus		Total	% Acquired
	Acquired	Not Acquired		
Neomycin	5	28	33	15
No neomycin	18	12	30	60
Total	23	40	63	

$$\chi^2 = 11.59. \quad P < 0.001.$$

TABLE II.—Hibitane Prophylaxis for *Staphylococcus Aureus* on Burns (During First 14 Days)

Cream Applied at Dressings Containing	Staphylococcus		Total	% Acquired
	Acquired	Not Acquired		
Hibitane	6	23	29	21
No hibitane	28	5	33	85
Total	34	28	62	

$$\chi^2 = 23.11. \quad P < 0.001.$$

Whereas 18 out of 30 (60%) burns treated with the control penicillin cream picked up *Staph. aureus* during the first 14 days after admission, only 5 out of 33 (15%) of the burns treated locally with neomycin and penicillin picked up the organism in that period. Table II summarizes the results of the trial of hibitane. Of 33 burns treated with penicillin cream, 28 (85%) picked up *Staph. aureus* during the first 14 days after admission; by contrast, only 6 (21%) of the 29 burns treated with hibitane cream picked up the organism.

None of the staphylococci isolated from burns during this time has been resistant to either agent. This fact is consistent with our failure to induce resistance of staphylococci to hibitane *in vitro*. Neomycin-resistant organisms, which can be obtained by *in vitro* methods, are small colony forms, and we have found that they show a diminished virulence for mice by the intramuscular test (Selbie and Simon, 1952). In this respect they are different from staphylococci in burns resistant to penicillin, chlortetracycline, chloramphenicol, and erythromycin. It is possible that the neomycin-resistant strains are also less well adapted for survival in the mixed flora of wounds and burns, as the non-penicillinase-producing penicillin-resistant staphylococci appear to be (Barber, 1953).

This study of prophylaxis must not, of course, be held to apply also to therapy of established infection. Separate

trials are needed to determine the possible therapeutic value of local applications of neomycin and hibitane. Moreover, three or four months of prophylactic trial is too short a time to justify any confidence that resistant strains may not turn up later.

PREVENTION OF THE TRANSFER OF RESISTANT ORGANISMS

Staph. aureus is the conspicuous organism in this study not only because of its exceptional powers of emerging resistant but also because it occurs normally and abundantly in the nose and on the skin of so many healthy people. The second front of our attack—on the prevention of spread—is therefore again, to a great extent, a problem of *Staph. aureus*.

Barber (1947) and Barber and Rozwadowska-Dowzenko (1948) drew attention to the large and increasing proportion of staphylococci isolated from hospital patients and staff which were resistant to penicillin. These strains were apparently being selected as the result of treating patients with the antibiotic, but their prompt appearance in the nares of nurses and in many patients who had not received the antibiotic showed that cross-infection with resistant strains must be occurring on a large scale. Similar observations in respect of penicillin and of other antibiotics were made by many workers (for example, Rountree and Thomson, 1949; Forbes, 1949; Clarke *et al.*, 1952; Lowbury, Topley, and Hood, 1952), and it is now common knowledge that the classical methods for controlling cross-infection—barrier nursing, cubicle isolation, aseptic techniques—are quite inadequate for the exclusion of resistant staphylococci from susceptible sites of hospital patients.

For the limited objective of preventing cross-infection with resistant, as distinct from sensitive, organisms there is one recommendation—to stop using the antibiotic in question. Resistant strains will then no longer be favoured, and sensitive strains should have an equal opportunity of growing. During a prophylactic trial of chlortetracycline we found that the proportion of resistant staphylococci in the ward tended to fall after use of the antibiotic was discontinued at about the same rate as it increased while the antibiotic was in use, though a residue of resistant organisms persisted in the burns of patients who remained in hospital for many weeks. The dilemma is acute, as we are scarcely justified in withholding an effective antibiotic from a case of severe infection merely in order to preserve its effectiveness, unless equally good alternatives are available. The discovery of new antibiotics is therefore of the highest importance, and there is no pointless redundancy in having half-a-dozen alternative agents for the chemotherapy of *Staph. aureus*, provided that they differ from each other in their mechanism of action and therefore in the pattern of resistance which develops against them.

Prevention of Cross-infection as a General Problem in Surgery

Lister's achievements were apparently so complete that the unsolved problems of cross-infection in surgery were overlooked for some time afterwards, both by surgeons and by bacteriologists. The natural defences of healthy tissues are capable of accounting for many contaminants, and this undoubtedly exaggerated the apparent victory of asepsis. The surgical experience of two world wars and the development of the newer fields of operative surgery, however, revealed that a considerable amount of contamination passed through the aseptic barriers, and gave rise to clinical infection of varying severity (Stokes and Tytler, 1918; Fleming and Porteous, 1919; Miles *et al.*, 1940). But the failure of asepsis was still wider than the clinical data could show, for many wounds in which clinical signs of infection were absent could be found to heal more slowly when certain organisms were present than when they were kept free from those contaminants (Gissane *et al.*, 1944; Clayton-Cooper and Williams, 1945; Jackson *et al.*, 1951b). Such

"silent" infection was demonstrated by controlled study of methods which protected a random selection of the wounds at risk against contamination.

It is well known that transmission of bacteria from the environment to the patient may be through the air (by droplets, droplet-nuclei, or dust) or by contact (immediate or intermediate), but the factors which determine the relative importance of each route are complex and still imperfectly understood. Important factors are the viability of the organism outside the body—for example, Gram-positive cocci in general survive the evaporation of their suspending menstrua better than Gram-negative bacilli (Heller, 1941; Lowbury and Fox, 1953); the presence or absence of organisms in carriers among staff and patients—staphylococci, for instance, are commoner on the hands than streptococci, and therefore more apt to be transmitted by contact; the exposure or protection of the site of entry of organisms—for example, a wound of the hands or feet can be protected against contamination by dressings more easily than one of the trunk or face (Lowbury and Fox, 1954; Lowbury, Crockett, and Jackson, 1954).

Specific recommendations for the elimination of reservoirs of infection, for blocking the routes of transfer, and for increasing the resistance of the patient have been built up piecemeal with our increased knowledge of these mechanisms. After the early development of antiseptics and asepsis in operating theatres, of cubicle isolation, and of barrier nursing, there followed attempts to reduce air contamination by dust-laying with oils (Van den Ende *et al.*, 1940, 1941a, 1941b), by dispersion of chemical disinfectants such as hypochlorites, triethylene glycol, and lactic acid (Douglas *et al.*, 1928; Masterman, 1938; Robertson, 1946; M.R.C., 1948), by ultra-violet irradiation of air or surfaces (Hart, 1936; Hollaender *et al.*, 1944; M.R.C., 1948), and by air-conditioning with filtered air (Bourdillon and Colebrook, 1946).

Some of these methods contributed less than laboratory experiments had led one to expect, particularly ultra-violet irradiation—for example, M.R.C., 1954—and chemical disinfection (for example, Lidwell and Williams, 1954). In these examples the relative failure may have been caused, in part, by the impossibility of sterilizing dust by either of these methods at levels which are safe for the persons exposed (cf. Lidwell and Lowbury, 1950). Even dust-laying and air-conditioning, however—methods which do not depend on the killing of bacteria—achieve only a partial effect, not only because they too are imperfect but because they attack only one of the vectors of cross-infection. The relative importance of this vector probably varies greatly in different kinds of ward and with different organisms; this may explain the conflicting reports on protection against cross-infection by oiling of floors and bedclothes (Wright *et al.*, 1944; Clarke *et al.*, 1954).

The newer methods of combating contact infection involve the extension of aseptic methods beyond the operating theatre to the dressing of wounds in casualty dressing-rooms and wards. The value of no-touch technique was demonstrated in the dressing of neurosurgical wounds (McKissock *et al.*, 1941), and has been further validated in studies on added infection rates of a wider range of wounds in hospital (Williams *et al.*, 1945) and in factory surgeries (Clayton-Cooper and Williams, 1945). Involving no antibiotic barrier, such prophylaxis is equally effective against sensitive and resistant contaminants.

Colebrook's machinery for excluding bacteria from burns also involved the extension of aseptic principles—in this case to a field which Lister had ignored and in which asepsis had been thought unattainable. So, indeed, it remained in all but the smallest burns, if by asepsis was meant the total exclusion of bacteria. But the exclusion of some pathogens from some of the lesions—a lessening of the risks of sepsis—is an end worth attaining. It is the end that was achieved in trials of the no-touch dressing technique. For burns, Colebrook introduced more complex machinery of physical and chemical barriers against contamination by contact and

from the air—the use of no-touch technique in an air-conditioned dressing-station with filters, together with local application of penicillin cream under ample dressings (Colebrook, Duncan, and Ross, 1948; Colebrook, 1950). The one organism which responded to this combined prophylaxis—*Str. pyogenes*—happened to be the most formidable pathogen commonly found on burns. It was also the one which was uniformly sensitive to penicillin. A trial of local penicillin (Jackson *et al.*, 1951a) confirmed the prophylactic effect of penicillin against *Str. pyogenes* and the absence of any effect on the other common flora—for example, *Staph. aureus*, which was predominantly resistant to penicillin at this time, and the coliform bacilli, *Ps. pyocyanea* and *Proteus*, which were uniformly resistant. This aroused a suspicion that the benefits which Colebrook reported after the combined attack on cross-infection with penicillin and dressings under filtered air might be attributable entirely to penicillin.

We found an answer to this question in a controlled trial of the air-conditioned dressing-station in the Burns Unit here (Lowbury, 1954). A significantly smaller proportion of burns dressed in the ventilated room acquired *Ps. pyocyanea*, *Proteus*, and antibiotic-resistant staphylococci than were acquired by the burns treated in the room with the ventilators switched off. *Str. pyogenes* was uncommon in burns during the trial, and the chances for its transfer were small, because burns carrying the organism were dressed at the end of each dressing list. Coliform bacilli appeared on approximately the same number of burns in the two groups—an indication that these organisms were probably acquired by self-contamination. A further point of interest in this trial was the significantly higher proportion of *Staph. aureus* resistant to chlortetracycline and penicillin and showing the "hospital strain" phage patterns (group III) which we found in the nares of patients dressed in the room with the air-conditioning plant switched off. This index of added infection is of special interest, as the patients spent only a small fraction of their total hospital time in the dressing-station.

The benefits of air-conditioning with filters, like those of the no-touch technique and other physical methods, cannot be lost through the emergence of resistant mutants.

Relative Importance of Wards, Dressing-stations, and Operating Theatres as Sites of Cross-infection

The trial which I have just described showed that the frequency of cross-infection could be reduced by changing the dressings, not in the ward but in a special room ventilated by filtered air under positive pressure. In spite of the elimination of this ward risk, however, the opportunities for transfer of infection to patients while they are in the ward must be great. Blankets, sheets, clothing, handkerchiefs, and other fabrics are known to be potential sources of cross-infection (Hare, 1941; Duguid and Wallace, 1948; Dumbell *et al.*, 1948), but soiled dressings must be regarded as a more important reservoir, from which both airborne and contact spread are liable to occur—the latter particularly if the dressings become soaked through with infected exudate. At the receiving end, burns or wounds which are imperfectly covered, and those with dressings that have become soaked with sterile exudate (Colebrook and Hood, 1948), present a good target for contaminants. Exposed burns, before their exudate has dried, are liable to pick up the airborne bacteria, and do in fact show *Str. pyogenes*, *Ps. pyocyanea*, *Staph. aureus*, and other bacteria more often than perfectly covered burns of feet and hands (Lowbury, Crockett, and Jackson, 1954).

Evidence that much of the cross-infection occurs in the ward if dressings are done in a separate room has come to light in recent studies on one organism, *Ps. pyocyanea* (Lowbury and Fox, 1954). For a period of seven months all the *Ps. pyocyanea* from burns in this unit were typed by an agglutination method (Christie, 1948; Fox and Lowbury, 1953). It was possible to divide the strains into three major groups, each consisting of a large number of apparently variable subgroups or patterns. The patients

from whom the strains were isolated were in two wards, E and F, but had their dressings and operations in the same dressing-station and operating theatre. Nevertheless, each ward had for a time its own predominant strain, which was serologically different from the predominant strain of the other ward.

How much added infection occurs in operating theatres? For many years the efficiency of our aseptic drill has been taken for granted, though individual flaws have from time to time been exposed. For example, Devenish and Miles (1939) found that a proportion of rubber gloves used in the operating theatre had minute holes through which skin staphylococci and other organisms could pass into the wounds. Cleansing fluids—for example, 1% cetrimide, 10% "dettol," soap solution—were commonly found to be contaminated with *Ps. pyocyanea* when dispensed in bottles with corks—the organism apparently being protected by the cork (Lowbury, 1951). Reports of tetanus (Sevitt, 1949) and of gas gangrene (Sevitt, 1953) apparently acquired in an operating theatre focused attention on the unsatisfactory air hygiene of the standard operating theatre, which is ventilated by extractor fans over the sterilizers; by this method air is sucked into the theatre through doors, windows, and other apertures, carrying with it a representative selection of hospital and street flora. The need for a new style of operating theatre ventilated with filtered air under positive pressure was demonstrated by Cairns (1939), and more recently, by Girdlestone and Bourdillon (1951), and is now being recognized more widely. Such a theatre should be planned to incorporate other features which are likely to reduce the chances of contamination—for example, designed to minimize movements and personnel in the zone of operation (Gissane *et al.*, 1944). The frequency of wound contamination and infection at operations carried out in theatres of the old and new types is the subject of an extended investigation by Dr. Sevitt and myself in this hospital, to be reported later.

DISCUSSION AND CONCLUSION

Each of the measures found to have some effect in preventing the emergence or the transfer of antibiotic-resistant organisms makes, by itself, only a fractional contribution. Added together they contribute rather more, but still do not nearly solve the problem, which demands an extension and improvement of existing methods and the search for new ones. Elimination of the primary reservoirs of infection (places where pathogens breed) and of the targets for infection are obviously of the first importance. Sometimes—for example, in the primary excision and grafting of burns—both objects may be achieved by the same procedure. Some idea of the difficulty of setting up effective barriers is given by Rogers (1951), who found that cross-infection with infantile gastro-enteritis and the transfer of specific serological types of *Bact. coli* was not prevented by strict cubicle isolation. In open hospital wards, Anderson *et al.* (1954) have shown that the standard of nursing has little influence on the rate of cross-infection with these organisms. Sauer (1935), however, reported success in preventing cross-infection with gastro-enteritis at a special unit for premature infants by an elaborate series of barriers, including ultra-violet screens, special kitchens, and cubicle isolation. This experience suggests that our failures in preventing cross-infection may be due simply to insufficient standards of asepsis—such as might be expected, for example, in operating theatres where rubber gloves or masks were not used.

Whether such elaborate measures for preventing cross-infection (assuming that they work) are justified depends on the clinical hazards of infection in each particular field. In any case, however, it would be of the greatest value to have special units in which a maximum level of asepsis could be assessed for effectiveness in preventing different kinds of infection, and for guidance in planning of hospitals tomorrow. It is not enough (cf. Goodall, 1952) to attribute our failures to faulty nursing or to inadequate fulfilment of

the recommendations laid down in the memoranda of the Medical Research Council (1941, 1951) on control of hospital infection. Scrupulous observance of these recommendations may not, as we have seen, prevent some kinds of cross-infection. If the recommendations are to be saved from merely ritual observance—or uncritical disuse—they must be subjected to a more detailed assessment than has yet been possible.

Even without such elaborate special units, however, there is scope for the investigation of many ideas—for example, the admission of mothers as auxiliary nurses for their own children in hospital (Pickerill and Pickerill, 1954); the use of a disinfectant barrier to prevent contamination through soaked dressings (Lowbury and Hood, 1952); the use of rubber gloves for many duties in hospital wards; the use of chemotherapeutic agents for suppressing the skin carriage (Murray and Calman, 1955), and the nasal carriage (Moss *et al.*, 1948; Valentine and Hall-Smith, 1952) of *Staph. aureus*—methods which may cause some reduction in the cross-infection rate with that organism (Gould and Allan, 1954).

There is some danger that advances in surgery which were made possible by the arrival of antibiotics will be relinquished as the staphylococci surmount each new chemotherapeutic obstacle. The physical obstacles, such as air-conditioning, cannot be surmounted in this way; nor, apparently, can the older chemical obstacles—for example, disinfectants such as phenol and the cresols. Although our attention to-day is drawn to combined chemotherapy as the most hopeful weapon against the emergence of resistant forms, it is too early to assume that no substance will be discovered which is as safe as penicillin and as permanent in its effects against *Staph. aureus* as phenol, and perhaps hibitane.

Summary

The prevalence of antibiotic-resistant organisms—especially staphylococci—causing added infection of wounds in hospital patients has emphasized the limitations of chemotherapy and of hygiene applied in this field.

Emergence and spread of resistant organisms are considered in this paper as separate problems. To combat the former, efficient dosage and a combination of two or more agents has been advocated. In our hands, local application of neomycin and of "hibitane" has had some prophylactic effect against staphylococci in burns, so far not accompanied by the emergence of any resistant strains. Methods to control the spread of bacteria by air and by contact have been considerably developed in recent years, but more knowledge of their performance is needed. Some further improvements are suggested by existing data—for example, the general use of positive-pressure ventilation with filtered air for operating theatres and dressing stations. For the more complex task of limiting the transfer of infection in the ward, many changes (in hospital design and in nursing routine, for example) require investigation.

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Studies on Fertility, edited by R. H. Harrison, is a collection of selected papers read to the Society for the Study of Fertility in 1954, augmented by "papers of high standing" which had not been read. This volume replaces the *Proceedings of the Society*, which had increased in size so rapidly as to become unwieldy. The papers in this present volume do not cover the whole field of fertility, but represent up-to-date opinion on such subjects as the "mechanotherapy of impotence" (i.e., splinting the penis), the management of pregnancy in previously infertile women, gynaecological coelioscopy, enzyme inhibitors in contraception, the aetiology of male subfertility, and testicular biopsy. *Studies on Fertility*, which costs £1 ls., is published by Blackwell Scientific Publications, 24-5, Broad Street, Oxford.

PATHOGENIC STAPHYLOCOCCI IN THE ENVIRONMENT OF THE NEWBORN INFANT

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Improved hygiene and the development of potent antibacterial agents have been responsible over recent years for a considerable reduction in the amount of neonatal infection, particularly infection of the alimentary and respiratory tracts. Staphylococcal infection of the newborn, especially in hospital, is, however, still a problem, and the marked tendency of the staphylococcus to acquire resistance to antibiotics has retarded its control and increased its relative importance.

The objects of the present investigation are to report and compare the carriage rates and antibiotic resistance of staphylococci in three maternity hospital units of different types; to compare these hospital results with corresponding data obtained from domiciliary confinements; to correlate staphylococcal carriage with clinical infection; and to study the mode of spread of the organism between mothers, babies, and hospital staff.

Materials and Methods

The hospital units concerned are (a) a maternity unit adapted from an old building, somewhat crowded and part of a general hospital (hospital W); (b) a newer and more spacious unit, also part of a general hospital, with better facilities for isolating infected patients (hospital E); and (c) a small self-contained maternity hospital with adequate accommodation situated in the country (hospital M). The period of the investigation was from March to July, 1952.

Altogether 608 vaginal swabs and 701 nasal swabs taken on admission from 770 mothers in these three hospital maternity units and 44 nasal and 44 vaginal swabs from mothers confined at home were examined for the presence of pathogenic staphylococci, and their sensitivity to four antibiotics and to sulphonamide was determined. Specimens taken from the offspring of these mothers included 683 conjunctival and 639 umbilical swabs, from a total of 774 babies. Eye swabs (E₄) were taken four days after delivery of the infant, since it has been shown that the carrier rate reaches its maximum about this time (Torrey and Reese, 1945). Umbilical swabs (U₈) were taken as soon as the cord had separated—that is, about the eighth day after birth. From the medical, nursing, and domestic staff attending these cases during the period of the survey, 245 nasal swabs were examined.

In order to ascertain whether mothers acquired pathogenic staphylococci while in hospital, 293 nasal and 297

vaginal swabs taken approximately eight days after admission were examined in addition to those taken on admission.

Swabs were plated out on nutrient agar within 24 hours and the plates incubated at 37° C. for 18 to 24 hours. The resulting growths were tested for coagulase production and if positive were tested by the disk technique of Gould and Bowie (1952), modified as described by Forfar *et al.* (1953), for sensitivity to chlortetracycline ("aureomycin"), chloramphenicol, penicillin, streptomycin, and "sulthiazole" (a soluble derivative of sulphathiazole). Four different possible results were recognized—3 (highly sensitive); 2 (moderately sensitive); 1 (slightly sensitive); 0 (resistant). The approximate relationships between these conventions and (1) the coefficient of resistance, and (2) the minimum inhibitory concentration, are given in the paper by Forfar *et al.* (1953). We used the drug-resistance pattern as a means of identifying or labelling an organism. Because of the margin of error in all sensitivity-testing techniques, however, the following methods were used in labelling organisms according to their reactions to the five drugs concerned:

(1) For the purpose of overall "resistance patterns" as given in Tables II-VI the organisms were labelled as either "sensitive" or "resistant." Thus grades 3 and 2 were grouped together as "sensitive" and grades 1 and 0 as "resistant."

(2) In comparing one individual organism with another, as is done in Table VIII, a difference of more than one grade of sensitivity was required in order to distinguish two strains as different. Thus a strain giving grades 3, 2, 3, 0, 3 for the respective drugs was considered to have the same sensitivity pattern as one giving grades 3, 2, 3, 0, 2, since only one degree of difference was present in respect of the last drug. A strain giving the pattern 3, 2, 3, 0, 1 would, however, be regarded as definitely different from the first-mentioned strain. This differentiation is made on the assumption that only in a very small proportion of strains could mutation occur in the short period during which specimens were taken from a mother and/or baby.

(3) Where comparison with the results of previous workers is involved, resistance rates include only those organisms giving complete *in vitro* resistance—that is grade 0.

While this method of labelling lacks the precision of serological and phage-typing methods, it does enable recognition of different strains to be achieved with a high degree of probability, although two strains giving the same pattern may not necessarily be identical. The disk-diffusion technique has, too, the advantage that it enables a large number of tests to be quickly performed, so that the numbers large enough to give statistically significant results may be readily obtained.

Where two percentages are compared, the difference between them is said to be significant when the observed difference is more than two and a half times the standard error of the difference.

Results

Carriage rates for coagulase-positive staphylococci are given in Table I for the three hospital units and for the domiciliary cases investigated. It will be seen that the carriage rate for the first-day vaginal swabs for the combined hospitals (3.5%) rose by the eighth day of stay in hospital to 10.8%. This is a statistically significant increase, but there is no corresponding rise in the maternal nasal carriage rate, nor is there any significant difference between the nasal carriage rates of mothers at home and in hospital.

The vaginal carriage rate of the mothers at the time of delivery is so low that vaginal contamination cannot be a significant source of infection of the infant.

Both the E₄ and U₈ staphylococcal carriage rates for babies born at home are significantly less than those for hospital-born babies. This is despite the fact that the carriage rate for the domiciliary nursing staff is the same high figure (55 to 56%) as that for the hospital W staff (where in fact the domiciliary nurses are accommodated) and shows that the domiciliary nursing staff did not pass on their staphylococci to any extent to babies born at home.

The highest carriage rate shown in Table I is the hospital staff nasal carrier rate (51% for the combined hospitals), but the U₈ rate approaches nearly to this level.

In Table II, for the combined hospitals, the antibiotic-resistance patterns of staphylococci from various sites on mother, baby, and nursing staff are shown. It will be noted that in parallel with the lower carriage rate for the mothers there is a lower incidence of drug resistance among the staphylococci carried by them. Among the staphylococci isolated from the babies and from the nursing staff penicillin resistance is of a high order. A fairly close resemblance is seen between the antibiotic-resistance patterns of staphylococci from the babies and staff, but there is an obvious difference between these staphylococci on the one hand and those of the mothers on the other.

Table III sets out the consolidated totals of coagulase-positive staphylococci isolated from mothers, from routine carriage swabs from babies (E₄, U₈), from clinical infections of babies, and from nursing staff subgrouped according to

TABLE I.—Carriage Rates for Coagulase-positive Staphylococci

Specimens		Hospital			Total	Domiciliary
		W	E	M		
1st-day swabs from mothers:						
Nasal	C.R. %	30.4	25.6	31.7	28.7	22.8
	N.S.	303	278	120	701	44
Vaginal	C.R. %	2.8	4.0	3.3	3.5	0
	N.S.	214	273	121	608	44
8th-day swabs from mothers:						
Nasal	C.R. %	37.0	27.3	22.2	30.7	
	N.S.	127	121	45	293	
Vaginal	C.R. %	7.8	14.9	8.3	10.8	
	N.S.	128	121	48	297	
Eye swabs from 4-day-old babies	C.R. %	32.8	44.5	16.0	35.3	5.0
	N.S.	262	281	100	643	40
Umbilical swabs from 8-day-old babies	C.R. %	53.5	25.0	52.7	40.1	8.6
	N.S.	226	283	95	604	35
Staff nasal swabs	C.R. %	56.3	51.5	40.4	51.3	55.6
	N.S.	96	93	47	236	9

C.R. = Carriage rate. N.S. = No. of swabs taken.

TABLE II.—Antibiotic-resistance Patterns in Combined Hospitals: W, E, and M

Specimens	% Coagulase-pos. Staph. Resistant to					Total Coag.-pos. Staph.
	Sulphonamide	Chlortetracycline	Chloramphenicol	Penicillin	Streptomycin	
1st-day swabs from mothers:						
Nasal	4.1	1.4	2.7	19.4	0	22.2
Vaginal	14.3	4.8	4.8	28.6	9.5	21
8th-day swabs from mothers:						
Nasal	8.7	1.1	1.1	29.3	2.2	92
Vaginal	11.4	2.9	2.9	51.5	5.7	35
Eye swabs from 4-day-old babies	19.2	3.4	11.7	76.2	12.5	239
Umbilical swabs from 8-day-old babies	27.4	3.8	5.3	80.3	9.9	263
Staff nasal swabs	19.3	2.4	7.3	74.2	4.0	124
Clinical infection swabs from babies	17.0	10.6	8.5	85.0	8.5	47

TABLE III.—Comparison of Resistance Patterns of Staphylococci from Mothers, Babies, and Staff in the Combined Hospitals W, E, and M

	Coagulase-pos. Staph. Resistant to					Total Coag.-pos. Staph.	Total Swabs
	Sulphonamide	Chlortetracycline	Chloramphenicol	Penicillin	Streptomycin		
Mothers	24	6	9	94	6	370	1,899
Babies (carriage)	118	18	42	393	56	502	1,247
Babies (clinical infections)	8	5	4	40	4	47	87
Staff	24	3	9	92	5	124	236

TABLE IV.— χ^2 Analysis of Strains Resistant and Sensitive to Drugs in Left-hand Column, Data Shown in Table III

χ^2	Mothers, Babies (Carr.), Babies (C.I.), Staff	Babies (Carr.), Babies (C.I.), Staff	Mothers, Babies (Carr.)	Mothers, Babies (C.I.)	Mothers, Staff	Babies (Carr.), Babies (C.I.)	Babies (Carr.), Staff	Babies (C.I.), Staff
Sulphonamide P=	42.8 <0.001	1.80 0.42	44.5 <0.001	6.59 0.01	8.9 0.005	1.04 0.30	0.93 0.35	0.13 0.73
Chlortetracycline P=	12.0 0.009	6.58 0.04	2.97 0.09	13.8 <0.001	0.33 0.62	5.30 0.02	0.40 0.53	5.16 0.02
Chloramphenicol P=	14.1 0.005	0.17 0.92	13.8 <0.001	4.76 0.03	6.13 0.01	0.004 0.97	0.16 0.90	0.07 0.80
Penicillin P=	276.7 <0.001	2.47 0.29	242.2 <0.001	68.8 <0.001	94.0 <0.001	0.43 0.15	0.92 0.35	2.28 0.13
Streptomycin P=	33.5 <0.001	5.85 0.06	20.2 <0.001	8.8 0.005	2.9 0.10	0.31 0.60	5.71 0.02	1.32 0.25
$\Sigma\chi^2$	379.1	16.87	323.67	102.75	112.2	7.084	8.12	8.96

their antibiotic resistance. In Table IV the χ^2 test has been applied to these figures, and in each case antibiotic resistance has been the character tested. The test has been applied to the group comprising mothers, babies (carriage), babies (clinical infections), and staff; to this group with the mothers omitted; and to the six possible pairings within the group. It will be seen that with the group comprising mothers, babies (carriage), babies (clinical infections), and staff high χ^2 values are obtained, and there is, therefore, a very low probability of similarity between the members of the group; whereas, when the mothers are left out, relatively low χ^2 values are obtained, hence there is a very much higher probability that the organisms from the group comprising babies (carriage), babies (clinical infections), and staff are similar. This is shown even more clearly when the summed χ^2 from mothers, babies (carriage), babies (clinical infections), and staff is compared with the summed χ^2 from babies (carriage), babies (clinical infections), and staff.

In other words, there is a very close similarity between those staphylococci carried on the baby, those isolated from clinical infections of the baby, and those carried by the staff, but no relationship between the mothers' staphylococci on the one hand, and those from the babies (carriage and clinical infections) and staff on the other. It is thus highly probable that there is a free interchange of staphylococci between the nursing staff and babies, and between one baby and another, but mothers seem not to be a significant source of infection to the infant.

This is further confirmed when the χ^2 test is applied to individual pairs—that is, mothers/babies (carriage), mothers/babies (clinical infections), mothers/staff, staff/babies (carriage), staff/babies (clinical infections), and babies (carriage)/babies (clinical infections). Again the high χ^2 values (and therefore low probability of similarity) obtained on comparing the mothers' organisms with those from the babies and nursing staff contrast with the low χ^2 values (and therefore high probability of similarity) obtained on comparing staff and babies (carriage and clinical infections), and babies (carriage) and babies (clinical infections).

Table V shows no significant difference in drug-resistance patterns between hospitals W, E, and M, but shows that domiciliary staphylococci gave a lower penicillin-resistance rate of 23% as compared with 65 to 76% for the hospitals.

TABLE V.—Comparison of Resistance Patterns in Hospitals W, E, and M, and in the Home (Pooling Hospital Results from Mothers' 8th-day Swabs, Babies' Swabs, and Staff Swabs; and All Domiciliary Swabs)

Hospital	% Coagulase-pos. Staph. Resistant to					Total Coag- pos. Staph.
	Sulphon- amide	Chlortetra- cycline	Chloram- phenicol	Peni- cillin	Strepto- mycin	
W	19.3	3.3	7.9	74.7	8.2	367
E	17.7	3.1	8.1	65.7	9.9	323
M	30.8	6.4	1.8	76.4	6.4	110
Total Home	20.2 23.5	3.6 0	7.1 0	71.3 23.5	8.6 11.8	800 17

Although this is not statistically significant, owing to the small numbers of *Staphylococcus pyogenes* isolated from domiciliary cases in the series, the difference is highly suggestive and reflects the well-known fact that staphylococcal penicillin-resistance rates are much lower among the general population than in hospitals.

Table VI compares the resistance patterns of babies' staphylococci (from E₄ and U₈ swabs) in the three units. Apart from a somewhat higher incidence of sulphonamide

TABLE VI.—Comparison of Resistance Patterns in Hospitals W, E, and M of Babies' Staphylococci (E₄ plus U₈)

Hospital	% Coagulase-pos. Staph. Resistant to					Total Coag- pos. Staph.
	Sulphon- amide	Chlortetra- cycline	Chloram- phenicol	Peni- cillin	Strepto- mycin	
W	20.7	4.0	9.7	77.6	11.0	227
E	22.1	2.0	7.7	77.6	12.8	204
M	38.3	8.8	1.5	86.8	7.4	68

resistance in hospital M than in hospitals W and E, no significant difference is seen between the figures for the three hospitals.

Table VII shows the incidence of septic eye and skin infections in the various hospitals and the combined incidence for the hospitals. There is no significant difference between the total infection rates in the three units, but among these infections eye infections occurred significantly more often in hospital M (92% of infections occurred in the eye) than in hospital W (52% of infections), while, correspondingly, skin sepsis was significantly lower in hospital M (8% of infections) than in hospital W (48% of infections). The proportion of clinical infections in which *Staph. pyogenes* was isolated was lower in hospital M (35%) than in hospital W (59%) or hospital E (50%).

The ratio *Staph. pyogenes* sepsis rate/*Staph. pyogenes* carriage rate was 1/4.6 for hospital W, 1/5.5 for hospital E, and 1/5.8 for hospital M, when E₄ and U₈ swabs and sepsis of the skin and conjunctivae are included. Although hospitals W and E showed similar ratios for eye-sepsis rate/eye-carriage rate and for skin-sepsis rate/umbilical-carriage rate, hospital M showed a relatively high ratio for the former and a relatively low ratio for the latter. Thus the rate of infection and the rate of carriage do not always run parallel to each other.

Table VIII shows the comparison in sensitivity patterns between staphylococci isolated from each member of 125 mother/baby pairs. In 34% of these pairs the two strains concerned had the same patterns of sensitivity to the five drugs used in the tests; that is to say, they could have been the same organism, though it does not necessarily follow that they were; in the remaining 66% the two strains had different sensitivity patterns and were therefore not the same. One can conclude from this that the majority of babies acquire staphylococci from a source other than their mothers. In view of the very much higher carriage rate on

TABLE VII.—Incidence and Bacteriology of Clinically Recognizable Infections in Babies

Hospital	Total Admissions to Baby Nursery During Period of Investigation	Clinical Infections, with Percentage of Total Admissions			Bacteriological Investigation of Clinical Infections, are of Number of Swabs Taken			
		Conjunctivitis	Skin Sepsis	Total	Coag.-pos. Staph. Isolated	Coag.-neg. Staph. or Other Organisms Isolated	No Organisms Isolated	No Swab Taken
W	326	26 (8.0%)	24 (7.4%)	50 (15.4%)	26 (59%)	11 (25%)	7 (16%)	9
E	349	32 (9.2%)	13 (3.7%)	45 (12.9%)	14 (31%)	7 (25%)	7 (25%)	15
M	141	22 (15.6%)	2 (1.4%)	24 (17.0%)	6 (35%)	6 (35%)	5 (29%)	7
Total	816	80 (9.8%)	39 (4.8%)	117 (14.3%)	46 (52%)	24 (27%)	19 (21%)	28

* Two patients had both conjunctivitis and skin sepsis.

TABLE VIII.—Comparison, by Sensitivity Patterns, of Coagulase-positive Staphylococci from Mother and Child, and of Strains From Two Sites in the Same Infant

Hospital	Where 2 Strains Had Same Sensitivity Pattern, i.e., Could be Same	Where 2 Strains Had Different Sensitivity Patterns, i.e., Strains Not Same
Mother/baby pairs where a coag.-pos. staph. was isolated from at least one swab from mother and baby	W E M Total	25 16 2 43 (34%)
Normal babies in whom a coag.-pos. staph. was isolated from both eye and umbilicus	W E M Total	15 19 7 41 (54%)
Babies in whom a coag- pos. staph. was iso- lated both from a septic lesion and from another clinically un- affected site	W E M Total	10 6 1 17 (49%)

baby than on mother, however, it may be that to an appreciable extent the mother acquires her staphylococci from her infant.

Table VIII also shows that, where organisms were isolated from two sites on the same baby, on only half of the occasions could these have been the same organism. This was equally true whether one of the sites was clinically infected or not. One should therefore not assume that a staphylococcus isolated, for example, from the skin is the same as that causing infection elsewhere in the body. Specimens for examination for drug sensitivity should be taken from each available locus and reported on separately.

Discussion

The coagulase-positive staphylococcal carriage rates for mothers' nasal swabs of 28.7% (first day) and 30.7% (eighth day) obtained in this series compare with the rates of 21% given by Torrey and Reese (1945), 28% by Parker and Kennedy (1949), 42.6% by Rountree and Barbour (1950), and 36% by Ludlam (1953). No significant increase occurred either in the carriage rate or the penicillin-resistance rate of staphylococci isolated from the nose between the first and eighth days of the mothers' stay in hospital. There was, however, a significant rise in the vaginal carriage rate during this period. The carriage rate in infants in hospital rose from presumably nil at birth to 35.3% by the fourth day of life (eye swabs), and to 40.1% by the eighth day (umbilical swabs). These are low figures compared with others previously published, yet a comparison with the figures for babies born at home (5% and 8.6% respectively for the fourth- and eighth-day specimens) demonstrates the great importance of the hospital environment in increasing the staphylococcal carriage rate of the newborn.

The low figures for carriage in babies born at home occurred in spite of the fact that they were attended by nurses from hospital W, who had the same high incidence of staphylococcal carriage as other hospital nurses. This shows that the limited contact occurring between domi-

ciliary nursing staff and the babies was relatively ineffective in spreading staphylococcal infection to these infants.

Other authors have given much higher figures for infant carriage of *Staph. pyogenes* after the fourth day of life—for example, 89% (Torrey and Reese, 1945), 100% (Cunliffe, 1949), 88.9% (Rountree and Barbour, 1950), and 75% (Barber *et al.*, 1953). We also gave a higher figure (60%) in a previous publication (Forfar *et al.*, 1953) for umbilical swabs from hospital W in 1951, and it may be that improved medical care and hygiene have contributed to this fall in staphylococcal carriage in infants. This decrease is not due to a reduction in numbers of staphylococci carried by the hospital staff, since their staphylococcal carriage rate has remained practically unchanged. Thus the present average figure of 51.3 for the combined hospitals compares with 64% given by Miles *et al.* (1944), 52% by Williams (1946), 58–68% by Barber *et al.* (1949), 54.5% by Rountree and Barbour (1950), 21–50% by Ludlam (1953), and 53% by Forfar *et al.* (1953).

On the other hand, the combined hospital rates for eye and skin sepsis in the present series (9.8% and 4.8% respectively) are high compared with some recently published figures—for example, 4.2% and 2.3% respectively given by Forfar *et al.* (1953), 9.2% and 3.6% by Barber *et al.* (1949), and 0.61% and 1.58% by Frazer (1948). It must be emphasized that the infections recorded in the present investigation were in the main trivial, and serious infection was entirely absent. The results were therefore similar in this respect to those of Barber *et al.* (1953), who reported high sepsis rates accompanied by an absence of serious infection. The apparent increase in the sepsis rates recorded in this series therefore reflects the increased care with which early mild infections were recognized and treated. We feel that early recognition and early and adequate treatment of all minor staphylococcal infection is an important factor in preventing more serious infection.

The incidence of complete penicillin resistance among hospital strains of *Staph. pyogenes* in the present series was 57.6%* for staff nasal swabs and 64.7%* for babies' fourth- and eighth-day swabs. The figure for nurses compares with 70 to 80% given by Barber *et al.* (1949), 64% by Rountree and Barbour (1950), 56% by Rountree and Barbour (1951), 75 to 85% by Ludlam (1953), and 30.7% by Forfar *et al.* (1953) for hospital W in 1951. The figure for babies compares with 90% given by Barber *et al.* (1953), and 64.4% by Forfar *et al.* (1953).

More than 90% of pathogenic staphylococci were still sensitive to chlortetracycline and chloramphenicol during the period of the present investigation, and almost as great a proportion were sensitive to streptomycin. The mean sulphonamide resistance percentage for all swabs was 16.8%, although in the case of hospital M babies the rate was as high as 38.3%.

Duncan and Walker (1942), Allison and Hobbs (1947), Parker and Kennedy (1949), Barber *et al.* (1949), and other authors, using serological and phage-typing methods, have shown that infection is usually conveyed in hospital maternity units from baby to baby, from staff to baby, or from blankets, dust, etc., to baby. This is borne out by the present investigation, since drug-resistance patterns

*Grade 0 only.

showed a considerable degree of uniformity among staphylococci from babies and staff, but no such uniformity between babies and staff on the one hand and mothers on the other.

The results for mother/baby pairs given in Table VIII are in keeping with the view that few infants are infected from their mothers. The actual proportion infected from this source must be much less even than the 34% of cases in which the two strains infecting mother and child could be the same. Some of these will have been different strains with the same sensitivity patterns, and even if they were identical there remains the likelihood that the mothers were infected from their babies and not vice versa.

The three maternity units W, E, and M were chosen because of the considerable differences between them—the crowded older buildings of hospital W contrasting with the more modern and spacious unit at hospital E and the separate maternity hospital M situated in the country. One would therefore have expected that staphylococcal carriage rates would have been higher in hospital W than in E or M, and that hospital W babies would have acquired more staphylococci from the nursing staff than in hospital E or M. In fact, however, staphylococcal carriage rates were at a similarly high level for the babies of all three units, and the resistance rates against the various drugs were similar for the staphylococci isolated from each of the three hospitals, with the exception of sulphonamide resistance, which occurred significantly more often in hospital M than in hospitals W and E (38.3% as against 20.7% and 22.1% respectively). Another point of similarity between the results from the three units was in respect of the ratio *Staph. pyogenes* sepsis rate/*Staph. pyogenes* carriage rate. Although hospital M showed differences where eye and skin sepsis/carriage ratios were examined individually, the overall ratio of 1/5.8 for hospital M compared with 1/5.5 for hospital E, and 1/4.6 for hospital W. There is thus no evidence in this investigation to show that the nature of the hospital buildings or their proximity or otherwise to other hospital departments had any effect on the spread of staphylococcal infection in the units concerned.

Summary

Over 51% of the members of the nursing, medical, and domestic staff in three Edinburgh maternity units were found to be carrying *Staph. pyogenes* in their anterior nares. Of these staphylococci, 58% were completely resistant to penicillin and nearly 20% were resistant to sulphonamide. Less than 10% were resistant to chloramphenicol, chlortetracycline, and streptomycin.

The staphylococcal carriage rates of the mothers admitted to, and babies delivered in, these units was determined. The mothers' vaginal carriage rate was 3.5% and their nasal carriage rate was 28.7%. Of these, only the vaginal carriage rate rose during an eight-day period.

The babies' eye carriage rate on the fourth day after delivery was 35.3% and the umbilical carriage rate on the eighth day was 40.1%. The corresponding carriage rates for babies born at home were 5% and 8.6%.

As between three different maternity units of different type there was little difference in the mothers, babies, and staff carriage rates.

There was a much higher incidence of penicillin-resistant strains among nurses and babies than among mothers, and among week-old babies born in hospital than among those born at home. Individual hospitals showed little difference in antibiotic-resistance rates.

A relatively high frequency of mild skin and conjunctival sepsis contrasted with a complete absence of serious infection in this series.

The great majority of infants acquired their staphylococci from sources other than their mothers, chiefly from the nursing staff and from other babies. Despite the fact that there was a high carriage rate among the nurses attending babies born at home the carriage rate on these babies remained low.

Where infants carried staphylococci on two different sites (eye and umbilicus), in approximately half the cases the staphylococci had different drug-sensitivity patterns.

On the clinical side we wish to thank the maternity nursing staffs of the Eastern and Western General Hospitals, Edinburgh, and Musselburgh Maternity Hospital for their wholehearted co-operation; the obstetricians of the units concerned; and the general practitioners who gave assistance, particularly Dr. E. V. Kuenssberg. We also wish to thank Dr. Lilli Stein for generous statistical advice and criticism. On the bacteriological side we wish to thank Professor T. J. Mackie and Dr. H. A. Wright for their advice and criticism, and the technical staff of the Department of Bacteriology of Edinburgh University.

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MANAGEMENT AND TREATMENT OF PATIENTS WITH COAL-WORKERS' PNEUMOCONIOSIS

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Coal-workers' pneumoconiosis is an important industrial disease. In 1947 it was estimated that there were about 16,000 certified cases in South Wales and at least an equal number uncertified (Hugh-Jones and Fletcher, 1951). Since then an increasing awareness of the condition and more frequent radiological examinations have led to more cases being revealed in other parts of Great Britain. The number of new cases certified each year in South Wales rose steadily from 44 in 1931 to 5,224 in 1945, but declined to 1,079 in 1953. In the rest of Great Britain the number has been rising steadily, passing the figure for South Wales in 1951, to reach 2,987 by 1953 (Ministry of Fuel and Power, 1954). It is therefore likely that an increasing number of practitioners who have not met the condition before may be asked for advice about it by patients who are or have been miners. Although there is no specific therapy, the reassurance derived from a better understanding of the condition can be a real help, and in the more disabled case treatment of symptoms and complications is both possible and often quite effective.

Questions about re-employment and compensation are likely to arise. This article therefore includes an

outline of the present compensation arrangements and the scheme which enables a miner who is in receipt of disablement benefit to continue working underground under certain safeguards.

Pathogenesis of Coal-workers' Pneumoconiosis

Coal-workers' pneumoconiosis has two distinct but related forms. The first, simple pneumoconiosis, caused by the gradual accumulation of the fine dust (less than 10 μ diameter) in the lungs, is recognized radiologically by the characteristic minute opacities (0.5–1 mm.) which are often best seen in the early stages in the right upper and mid-zones. Its radiological severity is classified into three categories (1, 2, and 3) dependent principally on the profusion of the opacities (Cochrane *et al.*, 1951). The condition advances as such only if the miner continues to work in a dusty environment, but it makes the subject liable to the second form of the disease—complicated pneumoconiosis. In South Wales between 1 and 2% of men with simple pneumoconiosis (category 2 or over) develop complicated pneumoconiosis each year. The figure for other areas is not known, but the prevalence of complicated pneumoconiosis is almost certainly lower in most other coal-fields in this country. The condition is recognized radiologically by the appearance of additional larger localized opacities which correspond to the massive fibrosis found pathologically; it progresses whether or not dust exposure is continued, often develops after cessation of exposure to dust, and is much the more disabling form of the disease. The massive fibrosis is believed to be caused by tuberculosis modified by the presence of coal-dust—a hypothesis based on clinical, radiological, and pathological findings. Tubercle bacilli may be isolated from about 40% of cases at necropsy but in less than 10% of cases coming to hospital.

The prevention of serious disability from pneumoconiosis, therefore, depends both on reducing exposure to coal-dust to a level where simple pneumoconiosis does not occur to an appreciable extent during a working life, and on eliminating the risk of infection by tuberculosis. This can be achieved only by energetic measures to detect and treat all infectious cases both in miners and in the community in which they live (Rogan, 1954). By using full-size films and good radiographic technique it is possible to detect an early stage of simple pneumoconiosis (category 1) at which the risk of developing complicated pneumoconiosis is very small. Thus a system of periodic x-ray examinations (Cochrane *et al.*, 1951) could assist in preventing the more disabling form of the disease by detecting those men who were approaching the dangerous stage of the disease.

Coal-workers' pneumoconiosis is different both pathologically and in its natural history from the classical form of silicosis found in men who have worked in dusts containing a high proportion of silica.

Diagnosis

The symptoms of increasing breathlessness on exertion disproportionate to his age, cough, pain in the chest, and lassitude in a man who has worked in the mines for a number of years should raise the suspicion that he may have pneumoconiosis. The only pathognomonic feature is the expectoration of inky black sputum, but this is likely to occur only when complicated pneumoconiosis is well established.

Physical signs in the chest are of little help in establishing the diagnosis, which can be made with certainty only on the basis of the industrial history and the chest radiograph. The striking radiographs of well-established simple pneumoconiosis and the remarkable appearances of complicated pneumoconiosis may surprise physicians not familiar with the condition, and possibly lead to the assumption that patients are more seriously ill than is in fact the case. The typical formation of the opacities of complicated pneumoconiosis by a process of aggregation on a background of simple pneumoconiosis and their slow progression will usually differentiate the condition from carcinoma or tuberculosis. Extensive cavitation in the massive lesions of complicated pneumoconiosis is common but does not prove the existence of overt tuberculosis or even of an especially poor prognosis (Kilpatrick, Heppleston, and Fletcher, 1954).

Relationship of Radiographic Appearances and Age to Disability

Although simple pneumoconiosis is not, on the average, the cause of serious disability when large and unselected groups of miners are studied, there is of course a tendency for the general practitioner to see only those men who are becoming breathless to an extent which interferes with their work. Age is an important factor. Breathlessness of severe degree on account of simple pneumoconiosis is rare under the age of 50. Complicated pneumoconiosis may be a cause of serious disability at a much earlier age, but, even so, it is not infrequent, at least in South Wales, for men in the forties with quite advanced complicated pneumoconiosis to continue work without serious symptoms.

The term "pneumoconiosis" covers a wide range of conditions, from the man with the earliest detectable category of simple pneumoconiosis to the one with the whole lung destroyed by massive fibrosis. The miner is likely to be more familiar with the effects produced by the latter and may therefore be under a serious misapprehension about the gravity of his condition. An explanation to men with simple pneumoconiosis, who form the majority, that their lungs show evidence of dust accumulation but that it may cause them no more disability than the pigmented coal scars on their hands, often puts their condition in a new perspective. Coal-workers' pneumoconiosis at any stage is a slowly changing condition, and even quite seriously disabled men with complicated pneumoconiosis may be able to look forward to a number of years of useful life provided they find a job within their capacity.

In explaining the condition to men with category 1 simple pneumoconiosis we avoid using the word "pneumoconiosis." We think it is more helpful to tell the man that it is possible to guess by looking at his radiograph that he has worked in the mines and that some of the dust he has breathed has stayed in his lungs. This category can be diagnosed with reasonable certainty only on films of excellent technique. At this stage the miner is not liable to attack by complicated pneumoconiosis, and there is even some evidence that men with this category are less liable to develop infectious tuberculosis than miners with normal films (Cochrane, 1954). They can therefore hardly be said to have a "disease" on the radiological evidence. The earliest x-ray indication of dust retention in the lungs therefore occurs before the prognosis is adversely affected.

To men with category 2 and over, even if there are no symptoms, we think it is wise to explain the position

fully. If nothing is said about their chest radiograph, they will assume that it is normal, but at any time they may be diagnosed as having pneumoconiosis as a result of attending a mass miniature radiography unit or if they apply to the pneumoconiosis panel. A misunderstanding may then arise. The other reason for a full explanation is that under the Industrial Injuries Act any miner with diagnosable disease is eligible for some compensation even though his disability may be very slight.

It may be argued that to encourage a man with minimal disability to apply for compensation may have a bad psychological effect. In our experience this very rarely occurs if the position is fully explained.

Compensation

The various schemes for providing compensation for coal-miners with pneumoconiosis have gradually widened the circle of those eligible. Compensation for silicosis arising in coal-miners was started in 1928, but applied only to those who had worked in specified jobs. The Workmen's Compensation Act (W.C.A.) of 1943 extended the provisions to cover all types of job and forms of pneumoconiosis. Under this scheme the miner certified as having pneumoconiosis was awarded compensation, the amount of which depended on the degree of disability, assessed as either partial or total. He could either claim a weekly benefit or commute his claim for a lump sum. Miners receiving payments under this scheme (including those who commuted their claims) are not in general eligible for benefit under the present National Insurance Industrial Injuries Act (I.I.A.), 1946, which came into force on July 5, 1948, and applies to all miners employed then and since. Under this scheme a miner diagnosed as having pneumoconiosis is eligible for a disablement benefit, which is additional to the sickness benefit obtained under the National Insurance Acts.

In 1951 special arrangements were made to enable certain miners who had been suspended under the W.C.A. but who did not have overt tuberculosis to return to the mines. Those who return come under the I.I.A.

In considering a claim a pneumoconiosis panel* of the Ministry of National Insurance proceeds in two stages. A diagnosis is made first, based on the radiographs and industrial history, and if pneumoconiosis is diagnosed the second stage, assessment of disability, follows. Disability is expressed on a percentage basis and can be as low as 1%, but the payments are graded in steps of 10%. In reaching a decision on the percentage assessment, all the circumstances are taken into account, and, where necessary, pre-existing causes of disability or those unrelated to pneumoconiosis are offset to reach a fair estimate of the loss of faculty caused by pneumoconiosis. The disablement benefit starts at 6s. 9d. weekly for those of 1% to 10% (inclusive), and rises to 67s. 6d. for 100%.

The miner may also be entitled to supplementary weekly benefits which are (1) a special hardship allowance (27s. 6d.); (2) an unemployability supplement (40s.) (with additions for married men, and those with children); and (3) a constant attendance allowance (up to 60s.).† His basic disablement pension is supplemented by about one-third under the Colliery Workers' Supplementary Scheme—a contributory pension scheme supported jointly by the National Coal Board and the colliery workers.

Whereas under the W.C.A. a miner was debarred from returning underground and suffered a reduction of his weekly benefit according to subsequent wages if he obtained a job, under the I.I.A. his benefit is a life pension and is unaffected by his subsequent earnings, and he may if he wishes continue working underground. Most assessments are provisional

*There are ten panels at present, situated in Bristol, Cardiff, Edinburgh, Glasgow, London, Manchester, Newcastle-upon-Tyne, Sheffield, Stoke-on-Trent, and Swansea.

†The rates are those which will come into effect in May, 1955, under the National Insurance Act, 1954.

and miners are recalled for reassessment after a variable period, usually not exceeding three years. A miner who has tuberculosis or pneumoconiosis accompanied by overt tuberculosis may be compulsorily suspended. If the tuberculosis is active he will be given an assessment of 100%.

By a recent amendment of the regulations miners who have not worked in the mines since 1948 and who are not receiving payment under the W.C.A. may now apply for a certificate of partial or total disablement and if certified they may be eligible for supplementary benefits under the I.I.A.

In our experience the commonest misunderstandings which arise in the working of this scheme are as follows:

(1) Miners and others may have only a hazy idea of the meaning of the percentage assessments. Is it the amount of dust in the lungs? Is it a measure of the dust conditions in which the man may safely continue working underground? Is it the amount he is disabled? Therefore, it is hardly surprising that the man, to say nothing of his doctor, may have difficulty in appreciating the meaning of a 1% assessment. It is important that the miner should realize that the assessment is based on disability and that the x-ray film is used solely for establishing the diagnosis.

(2) The need to differentiate between the effects of more than one disease on disability may cause misunderstanding, and is perhaps commonest in men with, for example, hypertension or angina of effort, who may be totally disabled, but eligible only for, say, 40% assessment on account of pneumoconiosis. This problem also arises when a miner who has been assessed at a high percentage of disability in life dies of some cause quite unrelated to pneumoconiosis. A death claim may then be made by the widow and may be turned down. In some of these instances a discussion between the practitioner and the doctor at the pneumoconiosis panel might help to explain the situation to the relatives and avoid the perpetuation of a grievance.

(3) No precise level of radiographic abnormality for diagnosis of pneumoconiosis is laid down in the Act. Even if it were it has been well established (Fletcher and Oldham, 1949) that there is appreciable observer variability in reading films for pneumoconiosis, and thus a film near the borderline might be accepted as showing pneumoconiosis on one occasion and rejected on another. We have been impressed by how readily miners accept this idea of the inevitable uncertainty of reading some films. If a man is rejected at the first application he may apply again within three months, when the new film will be seen by two members of the panel who did not see the first film. To avoid advising men to go to the board when there is a high probability of their being rejected it seems in the best interests of all that consultants and practitioners seeing much of this disease should discover from the members of the local panel by informal discussion what level of abnormality is required for diagnosis. Variations in radiographic technique are an important factor in increasing disagreement in diagnosis. The use of automatic exposure controllers in the x-ray sets would help to reduce but would not eliminate this variation, as it is also due to variations in development technique.

(4) When a miner is recalled for reassessment of disability his benefit may be reduced. As most miners know that pneumoconiosis is not a condition which improves, this reduction may cause a real sense of grievance. In our experience downward assessments have usually resulted from the extreme difficulty of setting uniform standards of disability assessment when the I.I.A. first started. An explanation of this difficulty and of the possibility that assessment may have been made at the time of an acute chest infection is generally accepted by the miner as reasonable. A man may appeal (but in the case of a provisional assessment not normally under two years) and the case then goes to a tribunal.

Advice on Employment

Well-informed advice on problems of employment is of first importance to the miner with pneumoconiosis and is

often of greater value to him than anything else doctors can offer him. The opportunities open to him are now far better than they were under the W.C.A., and the figures for South Wales show the striking change since 1949. In that year there were 4,550 miners with pneumoconiosis unemployed on the Disabled Register; now there are 650.

The largest single factor has been the change of regulation which allows a miner to continue working underground. With the man's approval the pneumoconiosis medical panel informs the colliery manager of its findings, and provision is made to place the man in a job where conditions are "approved." The aim is, of course, to achieve these conditions for all places underground, and many more coal-faces are now "approved" than when the I.I.A. came into force.

The pneumoconiosis panel offers the miner advice on re-employment both at the time of his boarding and by letter. In 1953 75% of letters advised the men to continue in the industry under "approved" dust conditions; 12% recommended work on the surface in dust-free conditions, and about 6% advised leaving or remaining outside the industry; suspension on account of tuberculosis occurred in 2%. Thus a majority are advised to stay in the industry. By the end of 1953, of the 8,200 miners referred for employment under "approved" conditions in the mines, only a little over one-tenth rejected the advice. In over 80% arrangements were made for working in "approved" conditions (Ministry of Fuel and Power, 1954). These figures, however, do not show how many men had to move from better-paid jobs on the coal-face to other parts of the mine in order to work in "approved" conditions. At present the proportion who leave the coal-face varies considerably in different areas.

In the case of the moderately disabled man the combined effect of his disability and a wish to work out of the dust will often lead to his accepting a less strenuous and less remunerative job off the coal-face. The more difficult case is that of the younger man with heavy family financial commitments and only slight disability. If "approved" conditions can be ensured only by leaving the coal-face he may be unwilling to do this, as his small disablement benefit does not compensate for the large reduction in his weekly earnings. In these cases help may be obtained from the area or divisional medical officer of the Coal Board, who will know or can find out more about the dust conditions. Rapid improvements are now being made in the dust conditions, and in many instances face conditions which were recently not "approved" are now within these limits. In cases where difficulty is experienced in bringing one particular face within "approved" conditions the medical officer may be able to arrange employment on another face which is "approved" at the same pit, or in an adjacent one. In general it is usually to the man's financial advantage and not further damaging to his health* to stay in the mine, provided conditions are approved and the job is within his physical capacity. However, each case needs individual assessment, taking into account age, disability, financial and other commitments, x-ray category, and past and present conditions in the mine.

The case for recommending a change of job to one outside mining is strongest in the young man who has shown in serial films rapid progression of simple pneumoconiosis towards category 2, particularly if he is unmarried and there is a reasonable chance of his getting good employment elsewhere. These cases are, however, unlikely to be detected except where periodic x-ray examinations are made. It may also be wise to advise a young man with complicated pneumoconiosis which has shown rapid radiological progression but with little disability to look for another job while he is still young and to get, if possible, one which he can expect to continue even if he becomes short of breath. Those men who are on the Disabled Register at the Labour Exchange can get help in finding a job by discussion with the disablement resettlement officer. A meeting of the almoner, doctor, and D.R.O. can assist the latter to select the most suitable type of employment. It also brings a more personal interest in the man's re-employment.

The commonest and the most difficult cases are the miners of 50 and over, both with and without pneumoconiosis, who have become moderately or severely disabled. The mining industry at present provides employment for many of these men, but there comes a time when they are unable to get to and from the mine and are frequently off work with exacerbations of their chronic chest infections. A few are able to get jobs as caretakers and live near their place of work, but many others are unable to get any work within their capacity, and they fall out of employment at a relatively young age. The men in this group who have normal chest films or pneumoconiosis of a category less than that accepted for diagnosis under the Act, and who have spent many years working underground, not unnaturally sometimes feel they have been treated harshly in not being eligible for compensation. It seems reasonable to explain to them that their disability is not caused by a recognizable form of pneumoconiosis and that they might have developed equally severe breathlessness in any other occupation. It is not yet possible to state whether or not after excluding men with pneumoconiosis there is among miners and ex-miners an unduly high proportion with respiratory disability.

Treatment

Many of the miners seeking advice on account of breathlessness find their symptoms worst in the mornings, in cold weather, and also during bouts of chest infection, especially in the winter months. Alleviation of the distress at these times depends primarily on controlling bronchospasm and chest infection.

Bronchospasm

Bronchospasm is frequently precipitated by sudden changes of temperature—for example, going upstairs to a cold bedroom or bed. We have been impressed by the amount of relief men claim they receive from the equable temperature of the hospital ward without any specific therapy. Some men have gained appreciable relief by moving their bed to a warmer downstairs room and avoiding so far as possible any sudden changes of temperature.

Adrenaline is less dramatic in its effect in most of these men than in a typical asthmatic but is of real use given by injection or inhalation at the time of acute attacks. Many men also find that adrenaline and atropine compound spray (B.P.C.) administered through a hand spray is effective enough to make it worthwhile carrying the spray in their pocket. A hand spray can be prescribed under the National Health Service. In some men a lack of understanding of how to use the spray properly and how to keep it in working order prevents their getting the maximum benefit from this form of therapy. In our experience the more complex and usually more expensive proprietary inhalants rarely give materially greater benefit than the simple B.P.C. preparation.

Of the many other bronchodilator drugs recommended we have found isoprenaline sulphate (isopropylnoradrenaline), ephedrine, aminophylline, hyperduric adrenaline, and occasionally khellin most generally useful. It may take a while to find the dose and timing of the drug or combination of drugs which provide the greatest relief with the minimum side-effects. Patients who respond well to adrenaline or hyperduric adrenaline may be taught to give the injections themselves. They gain considerable benefit physically and psychologically from knowing that they have a powerful remedy at hand when in need. In a very severe attack of bronchospasm, aminophylline (0.25 g.) intravenously has in our experience been the most useful agent and is often dramatically effective, if rather short-lived in effect. The occasional severe case which has failed to respond to other forms of treatment may benefit from cortisone. Atropine is occasionally of use in those with profuse watery expectoration.

Acute Pulmonary Infections

These are a very common cause of increased breathlessness and bronchospasm in winter. The severity of the infection may not be obvious from the temperature chart or the

physical signs in the chest, but the sputum, at least after the first two or three days, will usually show a change of character, becoming more yellow or often black if the miner has complicated pneumoconiosis. Penicillin in large doses—two mega units of combined procaine and crystalline daily—combined with streptomycin, 1–2 g. daily, is usually effective, the sputum changing rapidly in character and the dyspnoea and bronchospasm becoming less severe even if no anti-spasmodic treatment is given at the same time. Because repeated attacks of chest infection are common in this disease we have avoided using chloramphenicol, while chlor-tetracycline ("aureomycin") and oxytetracycline ("terramycin") have been reserved for those cases which fail to respond to penicillin or streptomycin. A full account of the value of different antibiotics in acute chest infections has been given by Stuart-Harris (1953).

When the chemotherapy is stopped the sputum often rapidly reverts to its previous condition, but the bronchospasm and dyspnoea do not usually return, at least for a while, to their previous severity. The benefit seems greatest when chemotherapy has been continued for some period after the patient has apparently improved.

If recurrent chest infections could be prevented much distress and incapacity would be avoided, but no beneficial effect was detected in a trial of the prophylactic value of sulphonamides (Kilpatrick and Oldham, 1954). However, it is our impression that if patients are treated really effectively from the onset with sufficiently large doses of effective antibiotics, the period in bed and of convalescence is considerably reduced. Much may be gained, therefore, by encouraging those who can readily detect the onset of their attacks to seek treatment at the earliest stage.

In men with less obvious infection it is difficult to assess how much this contributes to their breathlessness, and it is therefore worth trying a period of intensive therapy for a week to ten days.

Cough and Sputum

It is usual for dyspnoea to precede cough in men with pneumoconiosis, but in the later stages cough may be very troublesome, particularly early in the morning. When there is much mucoid or purulent sputum, postural drainage, even in the absence of proved bronchiectasis, is of considerable value. If before going to sleep they empty their lungs so far as is possible by lying over the edge of the bed, some men can get a reasonable night's rest. The early-morning cup of tea or glass of hot water to which has been added the simple sodium chloride compound mixture (N.F.) may help to relieve the morning period of acute distress. Full doses of syrup of codeine phosphate are of use in treating an unproductive and irritating cough.

Expectoration of jet black or nearly black sputum indicates necrosis in the centres of the areas of massive fibrosis. The condition is likely to cause alarm but is not of serious import, as it seems to have little effect on the prognosis and certainly does not prove the onset of overt tuberculosis. Reassurance and a precautionary examination of the sputum for tubercle bacilli is all that is required. Small haemoptyses are as common as black sputum in men with complicated pneumoconiosis, and again do not necessarily indicate the presence of tuberculosis. Severe haemoptyses are rare. The presence of frankly malodorous sputum is also rare, and suggests some other underlying disease such as bronchiectasis or lung abscess.

Pain in the Chest

Pain in the chest is a common symptom, but its cause is often obscure. Localized intercostal pain and tenderness may be the principal complaints, which can usually be ameliorated by local radiant heat. The pains are often transient, disappearing in a few weeks or months whatever the treatment. Pleural friction is a fairly frequent physical sign but is often unassociated with pain. However, when persistent pain is also present local injury, such as a cough fracture of the rib, may be suspected. A more central pain or feeling of constriction may arise from cardiac ischaemia

or possibly pulmonary hypertension, both of which are common in men over the age of 55 with pneumoconiosis. Amylnitrite may be of therapeutic and diagnostic value. A marked coincidental increase of pain and breathlessness may be caused by a partial pneumothorax, which may be very difficult to diagnose without a chest film because of the extensive fibrosis and emphysema already present. Reassurance, and an explanation only, may cure the pain of a young man who has recently been told he has pneumoconiosis.

Breathing and General Exercises

During convalescence from an episode of chest infection general and breathing exercises are of help in re-establishing confidence by demonstrating to the man that he is capable of more activity than he supposed. To men who have lived an over-restricted existence since the diagnosis of their condition, exercises are of real benefit in getting back to a more normal life. Objective physiological evidence of improvement by breathing exercises is difficult to detect in pneumoconiosis, but many men claim improvement. Success depends more upon the enthusiasm and skill of the physiotherapist than in the particular set of exercises used.

Complications

Tuberculosis

Men with complicated pneumoconiosis who develop a positive sputum usually react poorly to chemotherapy and rarely survive more than two years (Kilpatrick, Heppleston, and Fletcher, 1954). As the lesions are almost always bilateral and extensive, surgery is of very limited use. It is possible that with initial treatment with streptomycin and P.A.S., followed by intermittent therapy over many years with P.A.S. and isoniazid, the outlook may be better. Young men with advancing complicated pneumoconiosis but a persistently negative sputum are a very difficult therapeutic problem. There is little evidence that antituberculous chemotherapy has any effect (Miall *et al.*, 1954), but long-term therapy over a number of years with isoniazid and P.A.S. while allowing them to continue working seems at present the most logical procedure. There are really no pointers to suggest that these men benefit in health by enforced idleness if they wish to work. As a protection to others, regular sputum examination is desirable.

Cor Pulmonale

In the terminal stages of complicated pneumoconiosis cor pulmonale is common and is often precipitated by an attack of chest infection. Rest in bed, an equable temperature, and large doses of antibiotics will often produce a dramatic improvement in the course of a few days. Mercurial diuretics, digitalis, and a salt-poor diet are beneficial, particularly where there is much oedema. In cases with a marked cyanosis and a very low urine output, aminophylline and oxygen have a useful potentiating effect on the mercurial diuretics.

After a period in bed and when their cardiac failure has been controlled, we encourage patients to be up and about as much as possible. There is usually greater risk of their becoming unnecessarily bedridden than of overexerting themselves.

Oxygen therapy has considerable use in this condition. Men with very severe and limited respiratory reserve get benefit both by relief of the cyanosis and by reduction of pulmonary ventilation. In our experience of these cases oxygen therapy rarely causes sufficient carbon dioxide retention to produce narcosis, so that it can usually be given without risk. Only in very severe and usually terminal attacks of cor pulmonale may it be necessary to use oxygen with caution. Some of the most disabled men also gain benefit from oxygen when up and about. The marked increase in their exercise ability while breathing oxygen suggests that a portable oxygen set might be of real value to them. For the present they can obtain the ordinary oxygen cylinder and mask for use in their homes under the

National Health Service. By taking oxygen after temporary exertion beyond their real capacity, such as going upstairs, they can shorten the period of acute respiratory distress. The cylinder is also useful for operating the nebulizer for the relief of bronchospasm.

Summary

Coal-workers' pneumoconiosis has two forms: simple pneumoconiosis, which is rarely a cause of severe disability except in elderly men; and complicated pneumoconiosis, which may cause severe disability after the age of about 35 and is a modified form of tuberculosis.

Under the present regulations men with either form are eligible for compensation. The number of new cases being certified annually in areas other than South Wales is increasing. The benefit paid is determined by the severity of disability and not by the degree of abnormality of the chest film. Miners receiving compensation may continue to work underground under dust-approved conditions if they wish.

Advice on the nature of the disease, compensation, and re-employment is of special importance in the management of these cases, as misunderstandings are apt to arise. These are discussed in some detail. There is need for more exchange of information between the doctors with whom a miner with pneumoconiosis is likely to consult.

Treatment of the acute pulmonary infections, bronchospasm, and cor pulmonale, and some of the principal symptoms in these cases, is briefly described.

We wish to express our thanks to Dr. J. C. McVittie, of the Ministry of Pensions and National Insurance, for help in preparing the section on compensation. We are grateful to Dr. J. M. Rogan, of the National Coal Board, and to our colleagues in the Pneumoconiosis Research Unit for their helpful criticisms.

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In his annual report for 1954 Dr. J. F. WARIN, the principal school medical officer of the City of Oxford, describes the steps that are being taken to prevent food-poisoning at school canteens. About 200 people are employed in the school canteens in Oxford, and a full medical examination and a chest radiograph have been a condition of employment for the administrative staff for some time. There is a higher labour turn-over among the manual workers in the canteens, and before they are employed they are asked detailed questions about any intestinal illnesses they may have had in the past. If there are reasons for doubts about a prospective employee's freedom from transmissible disease, then a full medical examination is arranged and blood and stool specimens are sent to the laboratory. Manual workers have a chest radiograph as a condition of employment. Posters illustrating the prevention of food-poisoning are on display in the school canteens, and it is intended that members of the chief sanitary inspector's staff will give talks to canteen workers on this important subject. When selected groups of the population in Oxford were offered examination at the miniature camera unit last summer canteen workers were included. The response to this offer was 100%. No case of active tuberculosis was detected.

HAEMATEMESIS

WITH SPECIAL REFERENCE TO PEPTIC ULCER

BY

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Haematemesis (including melaena) is one of the common emergencies met with in hospital practice. The most usual cause of the condition is chronic peptic ulcer, which is on the increase. At the present time the population is becoming increasingly loaded with middle-aged and elderly people, who are both more liable to suffer from chronic peptic ulcer and less able to survive blood loss than are young adults. For these reasons, the methods used in treatment must be kept under continuous review. We have therefore examined the experience of the Radcliffe Infirmary during a recent five-year period (1948–52 inclusive) and compared it with the findings of a similar study made for the previous decade (1938–47) by Lewin and Truelove (1949).

Data

The sources of data of this study are the in-patient notes of the Radcliffe Infirmary, which is the only general hospital taking in emergencies from the City of Oxford and a considerable rural area surrounding it. Hence the patients can reasonably be regarded as an unbiased sample. Case notes of all patients (other than children) presenting as emergencies because of haematemesis or melaena during the five-year period 1948–52 have been examined. Trivial cases in which there was no evidence of serious bleeding have been excluded.

In considering the fatal cases we have adopted the criteria of Avery Jones (1952) in excluding only those deaths due to unrelated diseases or to elective operation after recovery from the bleeding. We have included all other cases with serious complications, among them (1) patients who have haematemesis or melaena following a perforated peptic ulcer, a group excluded by Avery Jones (1947) because of their special nature; and (2) patients who were already in hospital because of a serious disease which terminated in severe gastrointestinal bleeding, sometimes diagnosed only at necropsy.

Results

During the five-year period of 1948–52 there were 540 emergency cases of haematemesis and melaena, compared with 305 during the previous ten years. During the five years under consideration the annual rate of admission for haematemesis and melaena increased steadily from 87 in 1948 to 142 in 1952, a change related to the increasing frequency of peptic ulcer. The cause of the bleeding was classified under the following headings: (1) chronic peptic ulcer (377), (2) acute peptic ulcer (84), (3) oesophageal varices (23), (4) carcinoma of the stomach (20), and (5) other causes (36). The criteria used were the same as those used previously by Lewin and Truelove (1949).

The miscellaneous collection of cases which we have grouped together under "other causes" were as follows: hereditary telangiectasia, 5 (4 admissions were of one patient); hiatus hernia, 5; unknown, 26. Of the unknown group, there was evidence later of a gastric or duodenal ulcer

in nine of the patients. In none of the others was any later diagnosis made to suggest the cause of the bleeding.

The fatality rate of the present series shows a sharp decline from that of the previous ten years. For the total series, the fatality rate has dropped from 19.0% to 8.3%. For the chronic ulcer group, which is the biggest and most

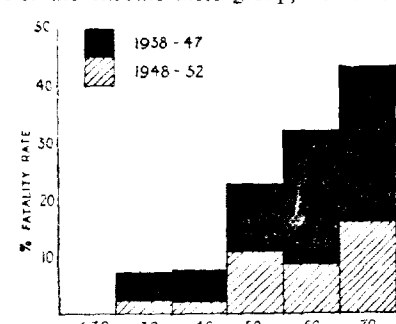


FIG. 1.—Whole series. Fatality rate by age groups.

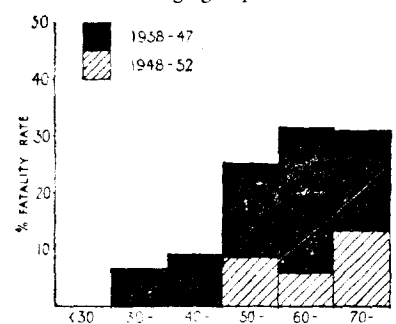


FIG. 2.—Chronic ulcer group. Fatality rate by age groups.

of patients over 50 than the earlier, as shown in Table III. The lowered fatality rate is therefore not due to any favourable change in the age composition of the series. On the contrary, the circumstance that approximately two-thirds of all the patients were over the age of 50 is a striking feature of the present group.

TABLE I.—Fatality Rate from Haematemesis by Age. Total Series

Age Group	1938-47			1948-52		
	No. of Cases	Deaths	Fatality Rate	No. of Cases	Deaths	Fatality Rate
Under 30	26	0	0%	30	0	0%
30-39	42	3	7.1%	45	1	2.2%
40-49	67	5	7.5%	99	2	2.0%
50-59	84	19	22.6%	137	16	11.7%
60-69	56	18	32.1%	141	12	8.5%
Over 70	30	13	43.3%	88	14	15.9%
Total	305	58	19.0%	540	45	8.3%

TABLE II.—Fatality Rate from Haematemesis by Age. Chronic Ulcer Groups

Age Group	1938-47			1948-52		
	No. of Cases	Deaths	Fatality Rate	No. of Cases	Deaths	Fatality Rate
Under 30	18	0	0%	17	0	0%
30-39	30	2	6.6%	35	0	0%
40-49	44	4	9.1%	83	0	0%
50-59	59	15	25.4%	94	8	8.5%
60-69	41	13	31.7%	88	5	5.7%
Over 70	16	5	31.2%	60	8	13.3%
Total	208	39	18.8%	377	21	5.6%

TABLE III.—Percentage of Patients Over the Age of 50 in the Two Consecutive Series

Series	Whole Series	All Peptic Ulcers	Chronic Ulcers
I (1938-47)	55.7	54.4	55.8
II (1948-52)	67.8	65.3	64.2

Effect of Sex

Table IV shows the chronic ulcer group broken down into two main age groups and by sex. It will be seen that the difference in fatality in the two sexes is small, although women may be somewhat less prone to die. Another feature of interest is the different proportion of women in the two age groups. It will be seen that below 50 the male:female ratio is about 4:1, whereas above 50 it is less than 2:1. This is presumably related to the liability of women to develop chronic peptic ulcers after the menopause, although they are relatively free from them before. During these last five years the proportion of women in the over-50 age group is noticeably higher than it was in the earlier series, although the proportion of women in the under-50 age group is the same as it was before.

TABLE IV.—Fatality Rate by Age and Sex. Chronic Ulcer Group

Age Group	Men		Women	
	No. of Patients	Deaths	No. of Patients	Deaths
Under 50	107	0 (0.0%)	28	0 (0.0%)
Over 50	155	16 (10.3%)	87	5 (5.7%)
	262	16 (6.1%)	115	5 (4.3%)

Recurrent Bleeding

The most important single variable other than age which affects prognosis is the liability of a patient to continue to bleed freely or to have recurrent bleeding after admission to hospital, as has been particularly well demonstrated by Avery Jones. In this connexion it is worth mentioning that the proportion of patients who exhibited recurrent bleeding was closely similar in the two Radcliffe Infirmary series. In each series about one-third of the patients had a recurrent haematemesis or other evidence of continued bleeding after admission to hospital.

It is sometimes assumed that the longer an ulcer has existed the more likely it is to give rise to recurrent bleeding. In this series the length of ulcer history had no influence on liability to recurrent bleeding. In 101 patients with a history of chronic ulcer of less than five years the incidence of recurrent bleeding was 35%, while in 207 patients with a history of more than ten years the incidence was 32%.

Likewise, neither a history of previous haematemesis nor the age of the patient has any bearing on the liability to recurrent bleeding, as shown in Tables V and VI, and as previously found by Lewin and Truelove (1949).

TABLE V.—Incidence of Recurrent Bleeding in Patients With and Without a History of Previous Haematemesis. Chronic Ulcer Group

	No. of Patients	No. with Recurrent Bleeding
With previous bleeding	108	37 (34.2%)
No	256	84 (32.8%)

TABLE VI.—Incidence of Recurrent Bleeding in Two Main Age Groups. Chronic Ulcer Group

Age Group	No. of Patients	No. with Recurrent Bleeding
Under 50	135	41 (30.4%)
Over 50	229	80 (34.9%)

Treatment

It has been the practice in the Radcliffe Infirmary for patients with haematemesis to be admitted under the care of a physician and for initial treatment to be medical rather than surgical. About 7 out of every 10 patients in the peptic ulcer group made an uneventful recovery without evidence of recurrent bleeding on orthodox medical treatment—namely, rest, a bland diet, and blood transfusion when indicated. The proportion of patients who made an uneventful recovery on medical treatment is a little higher in

TABLE VII.—Proportion of Patients Making an Uneventful Recovery on Medical Treatment. Peptic Ulcer Group

Age Group	No. of Patients	No. Making Uneventful Recovery
Under 50	160	117 (73.1%)
Over 50	301	196 (65.2%)

the younger than in the older age groups, as shown in Table VII, but the difference is not marked.

Whereas in the previous ten years the part played by surgery was negligible, during the recent five years emergency surgery has often been used. Although there has been no rigid uniformity of policy among the various physicians and surgeons concerned, the usual course of action has been to employ medical treatment and to resort to surgery when there has been evidence of continued or recurrent bleeding and the presence of a peptic ulcer has been known or suspected. In all, 76 out of the 461 patients with chronic or acute peptic ulcer were treated by emergency partial gastrectomy—that is, 1 in 6. We have defined an emergency partial gastrectomy in this context as an operation done for the immediate arrest of dangerous bleeding. A partial gastrectomy carried out after bleeding had stopped for more than 24 hours but less than a week has been classed as an early elective operation; there were 38 such operations, or 1 in 12.

Following the 76 emergency operations there were 7 deaths (9.2%). None of these occurred in the 20 patients who were aged less than 50 years. Hence there were 7 deaths (12.5%) among the 56 patients over 50 years old. The operative fatality among patients over 50 was therefore considerable, but we must remember that the patients selected for emergency operation were those who would have had a high fatality rate with medical treatment, almost certainly much higher than occurred with surgery.

Of the 76 emergency operations, 66 were performed on patients in the chronic ulcer group, with 6 deaths (9.1%). The remaining 10 emergency operations were carried out for acute ulcer, and there was 1 death. Thus there is no obvious difference between the results of surgery in the acute and chronic ulcer groups.

It has already been noted that 20 of the emergency operations were carried out on patients under the age of 50. At the other end of the age scale, 14 emergency operations were carried out on patients over the age of 70 with 2 deaths, a fatality rate not appreciably different from the group between 50 and 70, as will be seen from Table VIII.

TABLE VIII.—Operative Fatality Rate in Relation to Age

Age Group	No. of Cases	No. of Deaths
Under 50	20	0
50-69	41	5 (12.2%)
Over 70	15	2 (13.3%)

It is of some interest that the only emergency operation done in the chronic ulcer group has been partial gastrectomy with excision of the ulcer. Before the start of the present series in 1948 other operations, such as ligation of vessels from within or without the stomach, cauterization, or oversewing of the ulcer had been practised. This change has been due to the individual choice of each surgeon, since uniform lines of treatment for the whole hospital by formal agreement of the staff do not exist at the Radcliffe Infirmary. The completeness of the change is therefore all the more striking.

Deaths

The total number of deaths in the chronic peptic ulcer group (377 admissions) was 21, but this includes 11 deaths which we regard as inevitable because there was some other grave disease in addition to the haematemesis. Many authors exclude such cases from their series. If we had done the same the fatality rate in this group of patients

would be 2.7% instead of the figure of 5.6% referred to in an earlier section. Brief details of the deaths are as follows:

Preventable (10 deaths).—Those deaths which occurred among patients without grave, unrelated, complicating diseases. Four of these patients died without surgical operation, and six died after emergency partial gastrectomy.

Inevitable (11 deaths).—Those deaths occurring in patients who suffered from a grave illness unrelated to the ulcer. In some of these cases the occurrence of massive bleeding was found only at necropsy. The nature of their complicating illnesses was as follows:

(1) Man aged 56. Admitted with coronary thrombosis. Arterial embolism of leg. Amputation and re-amputation. Collapsed and died suddenly. At necropsy, massive bleeding from a large benign gastric ulcer was found.

(2) Man aged 59. Admitted with acute appendicitis and general peritonitis. Developed severe recurrent haematemesis and was too ill for operation.

(3) Man aged 59. Admitted with haematemesis from chronic duodenal ulcer. Suffered from severe chronic tuberculous empyema with multiple sinuses and destruction of right lung.

(4) Woman aged 57. A severe chronic bronchitic admitted with bronchopneumonia and cardiac failure. Developed massive haematemesis from duodenal ulcer.

(5) Man aged 65. Admitted with carcinoma of gall-bladder with multiple metastases. Died suddenly. Necropsy showed two gastric ulcers and a duodenal ulcer with a large amount of fresh blood in stomach and small intestine.

(6) Man aged 68. Had previously had removal of carcinoma of rectum with local metastases. Was ill at home with diagnosis of carcinomatosis until admitted moribund. Died in three hours. Necropsy showed inhaled vomit, gross pyloric stenosis, and a duodenal ulcer which had bled.

(7) Man aged 70. Admitted for prostatectomy. On twelfth day had massive haematemesis and died in three hours in spite of transfusion. Necropsy showed large gastric ulcer which had eroded an artery.

(8) Man aged 75. Admitted with obstructive jaundice due to gallstones. Had suffered from intermittent attacks of jaundice with rigors for four years. Had haematemesis and quickly died. Necropsy showed two duodenal ulcers with fresh blood in intestine, cholelithiasis, and fibrosis of liver.

(9) Man aged 75. Admitted in coma due to metastases from carcinoma of the prostate which had been previously removed. Had recurrent haematemesis and died in four days. Necropsy showed bleeding chronic gastric ulcer and lobar pneumonia in addition to carcinomatosis.

(10) Man aged 81. Had a six-year history of hypertensive cardiac failure with auricular fibrillation. Admitted with haematemesis. Was in heart failure on admission. Had recurrent haematemesis and died on eleventh day. Necropsy showed two large chronic gastric ulcers, one of which had eroded an artery, and an enormous heart with generalized atheroma.

(11) Woman aged 71. Admitted with small intestinal obstruction due to carcinoma of ascending colon. Following a hemicolectomy, had severe recurrent haematemesis and died. Necropsy showed four chronic gastric ulcers.

Discussion

In the present series peptic ulcer was by far the most common cause of haematemesis, accounting for 85.4% of the admissions—that is, about 1 out of every 20. The next most common single cause was bleeding from oesophageal varices due to portal hypertension, which accounted for 4.3% of admissions. In almost all the latter patients the diagnosis was apparent on admission; in fact most of them were already under medical supervision for the underlying cause of their portal hypertension, and splenomegaly was almost invariable. Carcinoma of the stomach is also a fairly common cause of haematemesis, accounting for 3.7% of admissions; if the diagnosis is not obvious it may be confused with simple peptic ulcer, but the initial treatment is the same. The haemorrhagic disorders usually present other signs of the underlying disorder. Other causes are not common but are extremely diverse, and in some cases the diagnosis remains unknown. In such circumstances it is probably best to assume that the bleeding is from a peptic

ulcer, because the odds are in favour of this possibility even in the absence of a history of dyspepsia. Moreover, if the case is managed along lines suitable for peptic ulcer, little harm will usually be done if the source of bleeding proves to be some other lesion.

There is still no general agreement on the best course of treatment for haematemesis in patients with known or suspected peptic ulcer. Three schools of thought exist (Tanner, 1951; Avery Jones, 1952). The "conservative" school believes in treatment on purely medical lines with sedation, bland diet, correction of dehydration, and blood transfusion. Surgery is either not used or resorted to as a final desperate measure. Another group practises "selective surgery" (Tanner, 1950), carrying out emergency partial gastrectomy in those patients with peptic ulcer who are known to be poor risks with medical treatment. These are mostly patients over 50 with continued or recurrent bleeding after admission to hospital, as has been convincingly demonstrated by Avery Jones (1947). The third school of thought, often associated with the names of Finsterer and of Gordon-Taylor (1937), believes in "early surgery as the treatment of choice" (Finsterer, 1939) in all patients in whom there is a previous history suggestive of chronic peptic ulcer and in the absence of serious unrelated disease.

In connexion with these various approaches to treatment, it is of interest that the fatality rate from haematemesis in patients admitted to the Radcliffe Infirmary was much lower during the period covered by the present series (1948-52) than it was during the preceding decade. This fall in fatality has occurred in spite of a bigger proportion of elderly patients and with as big a proportion showing recurrent bleeding after admission. A number of improvements in medical care have doubtless assisted in this change, particularly improvements in blood transfusion and the development of antibiotics. However, we are satisfied that a major cause of the improvement has been the more frequent resort to surgery.

In general, the plan followed has been that of "selective surgery" as defined above, although a number of the patients who fulfilled the criteria for surgery were treated medically throughout, particularly at the beginning of the period under review. However, the age of the patient has not been regarded as an important factor in deciding against surgery. Twenty patients aged less than 50 were treated with emergency partial gastrectomy without a single fatality. It is often taught that emergency operation is inadvisable in patients aged over 70, but in this series there were 15 emergency operations on such patients, with only 2 deaths. The factor of age in deciding on operation is of importance only when there is genuine doubt whether operation is indicated. In such circumstances one can afford to await events if the patient is young, as he will probably survive a further haemorrhage, but if he is over 50 it is probably wiser to decide in favour of emergency surgery without delay.

The present series yields no direct evidence on the value of "early surgery as the treatment of choice" in all patients with known or suspected peptic ulcer. However, it may be relevant that 7 out of every 10 patients in the peptic ulcer group made an uneventful recovery on medical treatment. While early surgery might improve the expectation of the remaining 3 in every 10 who are fated to have recurrent bleeding after admission, it would expose all the peptic ulcer patients to a major operation at a time when they may not be in the best condition for it and when the majority would recover uneventfully from their present haemorrhage without surgery. However, the issue is not entirely straightforward, for many of the patients who are treated medically will need surgical treatment later or may have a further complication of the ulcer, so that a correct comparison of the two methods ("selective surgery" and "early surgery as the method of choice") should include a follow-up study. Even in the brief time between the admission of the patients of this series and the end of 1953 53 of the 258 patients

with chronic ulcer surviving their haematemesis without emergency operation have required surgical treatment in the Radcliffe Infirmary, in some cases because of emergencies due to the ulcer, such as another major bleed or a perforation.

Summary

During the period 1948-52 540 cases of haematemesis or melaena presented as emergencies in the Radcliffe Infirmary. The results of treatment have been compared with those obtained in the previous decade.

Peptic ulcer was the most common cause of bleeding, accounting for 17 out of every 20.

The overall fatality rate was 8.3%. For 377 patients with good evidence of chronic peptic ulcer the rate was 5.6%.

Among the chronic ulcer group, about 1 in 3 suffered from continued or recurrent bleeding after admission to hospital. The chance of recurrent bleeding occurring while still in hospital is not appreciably influenced by age, length of ulcer history, or a past history of haematemesis.

Of the peptic ulcer group, 7 out of every 10 made an uneventful recovery from bleeding on medical treatment. One in every 6 had an emergency partial gastrectomy for bleeding, with a fatality rate of 9.2%.

The scope of emergency surgery in the treatment of haematemesis has been discussed. Nine out of every 10 cases of haematemesis are likely to be due to peptic ulcer or gastric carcinoma, and surgery may be the wisest treatment in any of these who show evidence of continued or recurrent bleeding.

We wish to thank the physicians and surgeons of the Radcliffe Infirmary for permission to make this study. We are also grateful to Miss P. Coombes, the records officer, and Miss B. Merry and Mrs. M. Eastway of her staff, for their assistance.

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"Maggots taken from a dead body are sometimes received with a request for identification and an opinion on their age, in case this may assist in fixing the time of death," writes J. A. Reid in Bulletin No. 7 from the Institute of Medical Research, Federation of Malaya. He explains that it is difficult to deduce precisely from maggots the time of the host's death because of the rapid decay in the Malayan climate. The presence of full-grown maggots of the flesh-fly suggests that death occurred at least three days before, of blow-fly maggots that it occurred at least six days before. But the victim may have had a fly-blown wound before death. The sequence in the processes of decay and the insects associated with them, the lapse of time between death and the laying of the first eggs, and the duration of the various larval stages of the different flies have not been fully worked out in Malaya; consequently the time of death cannot be very accurately gauged. In 1950, however, Dr. H. M. Nevin, a pathologist, examined some young maggots collected from the body of a woman shot by bandits in Penang, and Mr. Reid's identification of them as second-stage larvae of the blow-fly between 16 and 24 hours old agreed with police evidence that the woman had been killed less than 24 hours earlier. For forensic investigation, half the maggots collected from the body should be killed in boiling water and preserved in 70-80% alcohol to show their age at the time of collection, and the other half should be sent alive so that by breeding to maturity the adults may be used to check identification.

A CASE OF SYMPTOMATIC HAEMOLYTIC ANAEMIA IN PREGNANCY

BY

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AND

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This report describes a case of symptomatic haemolytic anaemia occurring during a young woman's first two pregnancies. She gave no previous history of jaundice or anaemia. The haemolytic process on both occasions followed the onset of gestation and ceased spontaneously after delivery.

In the older literature megaloblastic anaemia of pregnancy was often confused with haemolytic anaemia and pernicious anaemia, so the records are unreliable as regards the incidence of the disease. Within the last decade we could find few papers in the English literature specifically devoted to this complication of pregnancy. In our hospital the case described below was the only one which had occurred in over 12,000 pregnancies seen during the past five years. It would therefore appear to be rare.

First Pregnancy

A married woman aged 29 was first seen by one of us (G. A. C.) at St. Luke's Maternity Hospital in October, 1949. She was then in the last trimester of her first pregnancy. She gave a history of being quite well throughout that pregnancy until shortly before admission, when she felt sick and vomited, subsequent to which she became slightly jaundiced. She denied ever having been jaundiced or anaemic before in her life. There was no family history of haemolytic anaemia; her two sisters, both married, had had normal pregnancies. On examination the patient was found to be 32 weeks pregnant. She was clearly anaemic and jaundiced. Her liver and spleen were not enlarged and her body temperature was normal. No other clinical abnormality was found.

Investigations.—Haemoglobin, 8 g. per 100 ml.; red cells, 1,600,000 per c.mm.; reticulocytes, 25%. A marked polychromasia and scanty normoblasts were present in the peripheral film but no microspherocytes were seen. The red-cell-fragility test by the method of Creed gave a normal result. The total white cell count was 7,000 per c.mm., the differential count being normal. Platelets numbered 210,000 per c.mm. The sternal marrow showed a marked normoblastic hyperplasia. Blood chemistry: van den Bergh reaction—direct test negative, indirect test positive; serum bilirubin 3.2 mg. per 100 ml. Urine: bilirubin absent; haemoglobin absent; urobilinogen strongly positive.

A diagnosis of haemolytic anaemia was made. The patient was treated with folic acid and liver preparations, and was given blood transfusions, but did not respond to any of these. In fact, blood transfusion merely seemed to cause increased haemolysis. On December 14, after a surgical induction of labour, the patient delivered herself of a healthy female infant. Two weeks later her haemoglobin had risen for the first time since her admission to hospital, to 10.4 g. per 100 ml., and subsequently the haemolytic process rapidly ceased. The patient and her baby were seen three months after delivery and were then in good health. Laboratory examinations failed to give any evidence of haemolytic anaemia in either the mother or her baby. The mother's haemoglobin was then 15.6 g. per 100 ml.

Second Pregnancy

Clinical Features

The patient came under our care for the second time on December 8, 1952, being again pregnant. Her expected date of delivery was April 2, 1953. On inquiry she said she had been perfectly well since her last pregnancy, and had remained so during the early weeks of this one. In the two weeks prior to attending the antenatal clinic she had again noticed a slight jaundice accompanied by excessive tiredness.

Examination revealed a well-nourished woman aged 32. There was a slight icterus of the sclera and skin. No oedema was present. Her uterine enlargement corresponded to a 26-weeks pregnancy. Physical examination of her cardiovascular, central nervous, and respiratory systems showed no abnormality. Neither the spleen nor the liver was palpably enlarged. Her body temperature was normal.

Laboratory investigations, details of which are given below, showed that she had a recurrence of the haemolytic anaemia experienced during her first pregnancy. It was decided to allow the pregnancy to continue to term if her condition permitted, supporting her when necessary with blood transfusions.

Her progress continued fairly satisfactorily until March 12, when the maturity of her pregnancy was 37 weeks. On that date her haemoglobin level had fallen to 4 g. per 100 ml. Two pints (1,140 ml.) of whole blood was administered. This raised the haemoglobin level to 7.3 g. per 100 ml., but on March 14 it had fallen to 5.3 g. per 100 ml., and a cold agglutinin had appeared in her blood that temporarily rendered cross-matching difficult. As soon as this difficulty had been overcome a surgical induction of labour was performed. This was followed by the delivery of a normal live female child on March 15. The blood loss at delivery was normal.

Following delivery the haemolytic process persisted without apparent abatement for four weeks, and then gradually ceased. By May 20 it had stopped completely, so far as could be determined by laboratory tests.

The patient's clinical condition throughout the second pregnancy was much worse than during the first. The severity of the haemolytic process was evidently increasing with the parity. In view of this, sterilization was advised. For this purpose laparotomy was performed in the puerperium, when the patient was still showing some evidence of increased red-cell destruction.

At operation the abdominal organs, including the liver and the spleen, appeared normal. One ovary showed a number of small cysts, the other appeared atrophic. The genital organs were otherwise normal. Biopsy material was obtained from both ovaries, and a small inguinal lymph node was removed. Since the patient's discharge both she and her two children have been examined from time to time for the presence of haemolytic anaemia with negative results. The last examination of the patient, six months after delivery, showed haemoglobin 15 g. per 100 ml., reticulocytes less than 1%, serum bilirubin 0.8 mg. per 100 ml., and faecal urobilinogen 130 Ehrlich units per 100 g. of faeces. She was symptom-free and in good health.

Laboratory Investigations

Haemoglobin and Red Cells.—At her first attendance the patient's haemoglobin was 7.3 g. per 100 ml. Examination of the stained film showed a moderate degree of polychromasia. Normoblasts constituted 2% of the total nucleated cells present. No microspherocytes were seen, nor were any found in subsequent blood examinations. On February 12, 1953, the mean corpuscular volume was 114 cubic μ and the mean corpuscular haemoglobin concentration 30%. Reticulocyte counts when the haemolytic process was at its height varied from 20 to 32% of the total red-cell count, and normoblasts were found in every stained film examined during this period. The behaviour of the blood counts is given in Table I. The haemoglobin was estimated by the alkaline haematin method of King (1946).

TABLE I.—Chronological Record of Laboratory Studies

Date	R.B.C. mil./ c.mm.	Hb g. 100 ml.	Reticulo- cytes %	Leuco- cytes per c.mm.	Plate- lets per c.mm.	Serum Bilirubin mg. 100 ml.	Faecal Uro- bilinogen Ehrlich Units/ 100 g.
8.12.52	2.4	7.3	21	7,600	196,000	2.2	800
16.12.52		Transfusion 2 pints whole blood					
18.12.52		10.0		8,300		2.1	
23.12.52		9.9		5,100	185,000	1.9	1,200
14.1.53		4.5	30	9,800	250,000	1.7	1,980
12.2.53	1.4	4.4	32	10,200	240,000		
13.2.53		Transfusion 3 pints whole blood					
17.2.53	1.32	4.4	31	10,300	240,000		
2.3.53	1.35	4.4	30	10,300	180,000	2.0	
12.3.53	1.2	4.0	22	5,800			
		Transfusion 2 pints whole blood					
13.3.53		7.4	24	6,700			
14.3.53		5.3		8,100	190,000		
15.3.53		Patient delivered. Blood loss normal					
16.3.53	1.7	5.1	11	9,000	200,000	1.4	
25.3.53	1.6	5.3	25	9,200	251,000	1.3	2,650
30.3.53		Transfusion 2 pints whole blood					
1.4.53	2.6	8.9	27	8,900	196,000	1.3	2,700
8.4.53	2.64	8.8	28	10,100		1.6	
		Transfusion 2 pints whole blood					
10.4.53		10.9	16	9,800	194,000	1.1	980
15.4.53	3.91	12.5	8	7,600	210,000	1.2	670
1.5.53	3.8	13.0	2	10,100		0.9	340
10.5.53	4.02	14.5	0.5	6,700	220,000	0.6	140
20.5.53	5.03						

Red-Cell Fragility.—The patient's red cells were examined, using the combined fragility test of Varadi (1951), on December 23, 1952, and February 24 and May 30, 1953, and no increase in fragility was demonstrated.

Faecal Urobilinogen.—The semi-quantitative method of Watson as described by Wintrobe (1951) was used. The results are summarized in Table I. The upper limit of normal by this method is 350 Ehrlich units per 100 g. of faeces.

Blood Chemistry.—No abnormality was found on estimating the serum proteins and blood urea. Schumm's test for methaemalbumin was negative. Haemoglobinaemia was never demonstrated. The direct van den Bergh reaction was negative, and the indirect strongly positive. Serum bilirubin estimations varied between 1.7 and 2.2 mg. per 100 ml. during pregnancy.

Fractional gastric analysis showed the presence of free hydrochloric acid.

Sternal Marrow.—This was examined on February 12. The myelogram (Table II) showed a richly cellular marrow. There was a marked normoblastic hyperplasia. Apart from the reduction in relative proportions the myeloid series appeared normal.

TABLE II.—The Myelogram

Proerythroblasts	4.0%
Early normoblasts	18.0%
Late and intermediate normoblasts	43.0%
Myeloblasts	0.5%
Premyelocytes	0.5%
Myelocytes	6.0%
Metamyelocytes	10.0%
Polymorphonuclear leucocytes	15.0%
Lymphocytes	1.0%
Normoblasts in mitosis	2.0%
Megakaryocytes	Present
Myeloid erythroid ratio	0.3:1

Leucocytes.—The total white cell counts varied from 5,000 to 10,300 per c.mm. Scanty myelocytes (under 1%) were present from time to time during pregnancy, otherwise the differential count showed no abnormality.

Platelet counts varied between 180,000 and 300,000 per c.mm.

Urine.—Urobilinogen was present in the urine in increased amounts during pregnancy. Its presence was demonstrated by the techniques described by Wintrobe (1951). Tests for haemoglobin, bilirubin, and haemosiderin were negative.

Coombs Test.—The direct and indirect tests were invariably negative during pregnancy and following the patient's recovery. The technique used was that described by Dacie (1950).

Circulating Haemolysins.—The patient's blood was examined, using the presumptive tests described by Wintrobe (1951), for the presence of cold and warm haemolysins on February 12, March 27, and April 20. They were not demonstrated.

In Vitro Erythrophagocytosis.—The method described by Zinkham and Diamond (1952) was used. The index was less than 0.1%—a normal result.

Cold Agglutinins.—On March 13, two days before delivery, a cold agglutinin in low titre (1/32) was noticed in the patient's blood. Its presence had not been detected previously and it disappeared within five days of its first appearance. It may have been due to the transfusion given on March 12.

Serology.—The patient was Group O, Rh positive; no atypical antibodies were present in her serum. The Kahn test was negative.

Baby's Cord Blood.—Blood Group A, Rh positive. No agglutinins active against the mother's cells in saline or albumin or by the Coombs technique were detected in the cord serum. The haemoglobin was 19.3 g. per 100 ml. No evidence of a haemolytic anaemia was found at birth or in subsequent examinations of the baby.

Histology of Biopsy Material.—One ovary showed the presence of multiple small follicular cysts; in the other a corpus albicans was present but no active follicles were seen. The inguinal lymph node showed fibrous scarring due to past attacks of lymphadenitis.

Discussion

O'Grady *et al.* (1953), in a short review of haemolytic anaemia in pregnancy, state: "Although pregnancy does not cause haemolytic anaemia it may be a precipitating factor." In our case, however, the intimate association of the anaemia with the patient's two pregnancies and its cessation following delivery suggest that gestation plays an important part in its causation. The mechanism of the increased red-cell destruction is obscure. The failure to demonstrate either autoagglutinins or haemolysins in the circulating blood indicates that abnormal antibody formation is not a factor. This is in keeping with the findings in cases of symptomatic haemolytic disease due to other causes (Allibone and Collins, 1951). Lescher (1942), in a review of eight cases of haemolytic anaemia in pregnancy, states that there is no evidence of the development of a haemolysin in either the maternal or the foetal structures. He also notes that neither nutrition nor infection seems to play any part in the abnormal haemolysis.

Whitby and Britton (1950) regard the haemolytic anaemia occurring during pregnancy as similar to Lederer's anaemia. Our case differs from the usual description given of the latter condition in that it ran a less fulminating course and, apart from the symptoms due to the low haemoglobin concentration *per se*, there was no constitutional upset. It did not respond dramatically to blood transfusion. The haemolysis, moreover, was not accompanied by pyrexia or leucocytosis.

The failure of the spleen to enlarge and the fact that the process ceased completely after delivery, in the absence of splenectomy, indicates that this organ does not play any dominant part in the production of the disease. The possibility that this was a case of congenital acholuric jaundice can be dismissed in view of the absence of spherocytosis, the negative Varadi test, and the lack of a familial or personal history of such a disease. As the patient belonged to Group O, red-cell-survival studies were not attempted. The very transient rise produced in the haemoglobin concentration by transfusions (see Table I) suggests that the normal transfused cells were eliminated as fast as the patient's own cells. It is unlikely, therefore, that the process was due to any intrinsic effect induced by pregnancy in her red-cell structure.

In this case the haemolytic process seems to be due to overactivity of the normal mechanisms for the removal of red cells from the blood stream. The nature of such mechanisms is at present obscure. It is known, however, that they are influenced by the sex hormones. Hyperhaemolysis has been demonstrated in normal women during the latter part of the menstrual cycle (Ashby, 1921; Berlin, 1951). These authors, while admitting the obscurity of the nature of this hyperhaemolysis, conclude that it is due to hormone influences; Berlin also believes that the spleen plays no part in its production, as he found it to persist after splenectomy. Presumably, during a normal pregnancy the hyperhaemolysis is inhibited, to prevent the increased concentration of sex hormones following gestation from causing a haemolytic anaemia. In our case the inhibitory mechanisms would appear to have failed.

Summary

A case of symptomatic haemolytic anaemia associated with pregnancy is described. The haemolytic process occurred during a young woman's first two pregnancies and ceased spontaneously on both occasions during the puerperium. Neither circulating haemolysins nor atypical agglutinins were demonstrated. The mechanism of the hyperhaemolysis was obscure. We suggest that it may be related to that occurring during the progestational phase of the normal menstrual cycle.

We are indebted to Dr. J. F. Wilkinson for advice and encouragement during the preparation of this paper.

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ROSEOLA INFANTUM

13 CASES SEEN IN GENERAL PRACTICE

BY

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Very little has been published in Britain on this relatively common condition, also known as exanthem subitum or sixth disease. The *British Medical Journal* (1950) draws attention to this "common but little-known infectious disease of young children which has received too little attention in the past."

Nearly all the published accounts of the disease come from the U.S.A., where Zahorsky, of St. Louis, first described it as a clinical entity and gave it the descriptive name in 1910. Up to 1940 he had seen about 300 cases in private practice (Zahorsky, 1940). Cases have been reported from all over the world, including Brazil, Formosa (Itagaki, 1933), Canada, Germany (Fischhof, 1936), South Africa (Witkin, 1937), Sweden, and Australia (Jackson, 1949). In Britain, only Schlesinger (1937) refers to a few cases seen in London.

The purpose of this paper is to show that, despite the paucity of references to it in the journals and textbooks, it arises quite frequently in general practice.

Age Incidence.—The disease affects infants between the ages of 6 months and 2 years. The youngest in Clemens's (1945) series of 80 cases was 5 months old, but he quotes one 2 months old. My youngest patient was 4½ weeks old.

Older children and adults have been involved in other series. The sexes are equally affected.

Aetiology.—Although the infective nature of the disease was accepted, proof was not established until Kempe *et al.* (1950) succeeded in transmitting the disease by injecting serum from an 18-months-old child in the pre-eruptive stage into a 6-months-old susceptible baby kept in isolation, who developed typical roseola infantum on the ninth day. In young apes these workers produced a fever without a rash after a similar period. While they consider the causal agent to be a virus, they have been unable to isolate it or to transmit it through any of the usual media. Hellström and Valquist (1951), at Upsala, have confirmed these findings in a larger series of 14 human cases.

Epidemiology.—Although most cases arise sporadically, epidemics have been reported, and the cases which I noted in my practice presented as a mild epidemic, although I can identify in recollection a number of sporadic cases over the years. American writers believe that it is endemic and almost universal in infancy, but that in favourable circumstances it appears in epidemic form. They find that the highest incidence is in the spring and to a less degree in the autumn.

Pathology.—No deaths have been reported. The blood changes seem to be important—they are a neutrophil leucopenia, appearing during the febrile stage and falling to a total white-cell count as low as 2,000 per c.mm. This process is reversed as soon as the rash appears, and the count returns to normal within a week. The incubation period is 5 to 15 days.

Clinical Course

The individual case presents on the following lines. A call is received to an infant who "has come out in a rash all over. He's been feverish for a few days, and I nearly sent for you yesterday, doctor. When I saw the rash to-day I thought it must be measles, but he seems better now." In fact, the child appears well apart from a rash in the form of discrete rose-coloured macules, most marked on the trunk but spreading on to the thighs and upper arms, up to the neck and often behind the ears. In severe rashes some coalescence may occur.

If the case is seen earlier the child has a fever extending over three to five days, the temperature rising to 101–102° F. (38.3–38.9° C.) or higher, with symptoms of inflammation and congestion of the nose and throat, and frequently of the tympanic membranes. He is restless, may refuse feeds, and is obviously unwell. Examination of the fauces shows redness of the tonsils and pharynx, and of one or both ear-drums. A cough may be present without signs in the chest. With the appearance of the rash the child rapidly improves, the catarrhal signs disappear, and normal lustre returns to the ear-drums. Posterior cervical and occipital lymph-node enlargement can nearly always be found: in my experience this is more obvious when the rash is severe, especially on the neck and behind the ears. The glands in the groins and armpits do not become palpable. All signs disappear in a day or two in most cases, but occasionally congestion of the nose or Eustachian tubes persists and frank otitis media may develop (as in one of the present series).

Clemens (1945), in a series of 80 cases, reports a pre-eruptive enanthem in 87%: this took the form of erythematous specks and streaks on the soft palate which preceded the typical exanthem by 48 hours and coincided with the period of maximum tubotympanitis and faucial congestion. I noted this in one case, but would be inclined to dismiss it as part of the general congestion of the mucous membrane of the palate.

Differential Diagnosis

In a clear-cut case the disease which is most like roseola infantum is rubella. In that condition the pyrexia and malaise coincide with the rash and are usually less pronounced. There is not the three to five days' pre-eruptive

fever and malaise, with a dramatic return to normality invariably found with roseola. In rubella the rash is usually marked on the face, as opposed to roseola infantum, in which the face escapes, apart from a few faint rosy macules on the forehead. The absence of cases of rubella among older children and adults suggests the correct diagnosis.

Scarlet fever may be suspected. The absence of circumoral pallor, strawberry tongue, tonsillar adenitis, and the rapid resolution of the rash in roseola infantum, together with the age incidence, will help to exclude it.

The prodromal rash of measles, or the early stage of the eruption with a post-auricular rash, may also be suggested. Again, this doubt is soon resolved by the absence of Koplik's spots and the course of the illness.

Since I have recognized the disease in practice I am certain that many rashes which were previously dismissed to the parents as "teething" or "stomach upset" or "drug rash" have in fact been roseola. The story of restlessness, fever, and sweating may suggest miliaria, but the rash is quite different. There are, too, the blood changes I have already mentioned.

Complications

Although most observers say that recovery is always complete, Zahorsky reports several cases of suppurative otitis media and rhinitis following the illness, and one case in the present series developed an acute catarrhal otitis media three days after defervescence.

Jackson (1949), in Australia, had two cases in which convulsions occurred in the feverish stage: no changes were found in the C.S.F., and he believes them to have been due to the pyrexia.

It has been suggested that deaths in convulsions may occur before the rash has had time to appear; this is obviously difficult to prove.

Details of Cases

Case	Age in Years	Sex	Date of Rash	Comments
1	3½	M	15/1/54	Cough and cold preceding; cleared rapidly afterwards. Post-auricular glands enlarged
2	10/12	M	23.1.54	Feverish preceding rash—normal afterwards. Lives in adjoining street to Case 1
3	10/12	F	23.1/54	Feverish preceding rash—normal afterwards
4	10/12	F	23.1/54	Typical roseola—had been to same Christmas party as Case 3, on 16/1/54
5	11/12	M	27/1/54	Had tonsillitis 10 days previously—apparent recurrence 3–4 days before rash, but subsided with rash
6	4½/52	F	27.1/54	Adopted sister of Case 1. Cough and nasal catarrh. ? Pain on swallowing; fauces red. Better after eruption
7	11/12	F	4/2/54	Fever preceding—no cough or cold. Better after rash
8	11/12	M	15/2/54	Fever and tonsillar infection preceding eruption. Fine macular rash with some coalescence. Occipital glands enlarged. Brother aged 4 years remained well
9	19/12	M	17.3.54	Rash to-day after 4 days' malaise. Now well
10	23/12	M	21/3/54	Feverish beforehand. Both T.M. very red. Ear infection seemed to be settling when seen again 2 days after rash, but flared up as typical acute catarrhal otitis media after another 48 hours
11	12/12	F	26.3.54	Typical rash with preceding fever
12	4/12	M	27.4.54	
13	9/12	F	25.8.54	Typical rash on trunk—preceded by fretfulness and diarrhoea, which stopped when rash appeared

Present Series

In the brief description of individual cases which follows I have included only the comments which I jotted down in my visiting diary. In view of the youth of the patients and the invariable recovery I did not feel justified in taking blood samples to establish a leucopenia followed by a return to normal. However, during the period discussed, no cases of measles were notified to the medical officer of health and none of my partners in a practice of over 10,000

patients saw any cases of rubella. None of the older members of the families developed rubella, although I watched particularly for it. Cases 1 and 6 demonstrated the infectivity and incubation period. Case 1 was an adopted son aged 3½ years, who developed the rash two days after his adopted sister, aged 18 days, was introduced into the house from a maternity home outside the area. She developed the rash 12 days later. In all cases the rash was typical of roseola infantum. The last patient, whose illness occurred at a much later date, lived out in the country. The mother told me that two babies of about the same age, in near-by cottages, had had a similar rash and fever, but I did not see these cases.

Summary and Conclusion

Roseola infantum is a distinct entity with characteristic age incidence, epidemiology, signs, and symptoms which should be more frequently diagnosed.

It has been obscured in the past by a tendency to dismiss unusual rashes in infants as teething, sweat rash, drug sensitivity, or even "slight measles" or "mild scarlet fever," or, more excusably, German measles.

The alternative name of exanthem subitum—the unexpected rash—should not excuse our failure to think of it in any case of unexplained fever in the critical age groups. I personally prefer the more descriptive name originally bestowed by Zahorsky. Its recognition may prevent the unnecessary use of antibiotics or other drugs, and will certainly give reassurance to anxious parents.

Treatment has not been mentioned, as this is purely symptomatic unless the rare suppurative complications arise.

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The ways in which the two great Asian countries of India and Japan have struggled with their problems of excessive population are reviewed by P. E. P. in "Population Policies in India and Japan" (Planning Broadsheet No. 378). In India the need to feed adequately from domestic sources a population which increases by five million a year has been met by an imaginative series of five-year-plans covering industry, agriculture, and public services. In these, birth control is integrated with a family service including sex education and marriage guidance. In 1951 Dr. Abraham Stone, for W.H.O., organized controlled experiments in the rhythm method, which is in some respects consonant with Indian thought and custom, but the results were disappointing. The Indian Government, however, accepted most of the recommendations of the Family Planning Research and Programme Committee for encouraging clinics, research, and the setting up of voluntary as well as government agencies. In Japan only American financial aid has in recent years buttressed the nation's economy against collapse, says the report. Between 1945 and 1953 Japan's population increased by 15 million. In 1948 a Eugenic Protection Law facilitated the termination of pregnancy for physical and economic reasons, so that now over a million abortions are procured each year; abortion replaces infanticide, the traditional method of population control. Last August, however, the Japanese Minister of Welfare's Advisory Council on Population Problems announced that birth control was preferable to abortion and advocated government sponsored clinics. But these recommendations have not yet been adopted as the official policy.

MITRAL VALVOTOMY FOR DEXTROCARDIA WITH MITRAL STENOSIS

A CASE REPORT

BY

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Rheumatic valvular disease in dextrocardia with situs inversus is said to be rare. Bleyer and Saphir (1953) have reviewed the literature on five hitherto published cases, and reported a sixth. According to them, Owen is credited with the first case report of mitral stenosis in dextrocardia with situs inversus, but since he could not definitely establish the aetiological factor for the mitral stenosis the authors did not include it in the review. Of the six cases reported, two were cases of aortic valvular affection, three of mitral stenosis with insufficiency, and one a case in which both mitral and aortic valves were involved.

The purpose of this paper is to report a seventh case of rheumatic heart disease in a case of dextrocardia with situs inversus, producing pure mitral stenosis, and to record the successful performance of mitral valvotomy on such a case. So far as we are aware, this is the first case of surgical correction of mitral stenosis in dextrocardia to be reported.

Case Report

An Indian labourer aged 19 was admitted to the medical wards of the Christian Medical College Hospital, Vellore, on November 18, 1953. His only complaint was progressively increasing breathlessness with effort, of three years' duration. Until 1950 he could cycle five miles at a stretch, besides carrying on his job of unloading bags of tobacco. But from that time he has felt increasing dyspnoea. In 1952 he had to rest after walking half a mile. Three months prior to admission he was so incapacitated that he voluntarily left his employment. He had no history suggestive of definite rheumatic fever or of nocturnal cough or dyspnoea. He had blood-stained sputum once, two years previously. The family history had nothing significant.

Physical examination showed him to be physically somewhat underdeveloped, moderately anaemic, with no cyanosis and without any clubbing of fingers or toes. His temperature was 98.6° F. (37° C.), pulse 86 a minute, regular, and of normal tension and volume. His respiratory rate was 20 a minute and his blood pressure 110/70. There was no visible venous pulsation in the neck or obvious deformity of the chest. The apical impulse was visible and palpable in the fifth right intercostal space, in the mid-clavicular line. A well-marked presystolic thrill could be felt over the systolic impulse. Auscultation revealed, close to the apex on the right side, a loud first sound, a normal second sound, and a slow rumbling crescendo presystolic murmur in the same area. There was reduplication of the second sound in the pulmonary area, but the reduplication disappeared on deep inspiration—indicating that it was probably due to the opening snap (Mounsey, 1953). The

opening snap of the mitral valve was definitely well heard in this patient, just internal to the right nipple. Examination of the lungs revealed no abnormal physical signs. The liver and spleen were not palpable. There was no peripheral oedema. The central nervous system was normal.

His exercise tolerance was as follows: he was comfortable while walking on level ground for a distance of about 50 yards, but became uncomfortable if he tried to do more, and became acutely distressed on running. He was not able to do any work comfortably. He was classified as Grade 2 on the basis of the criteria laid down by Baker et al. (1952). Fluoroscopy revealed no obvious cardiac enlargement, but the pulmonary artery was somewhat prominent, and the left atrium was moderately enlarged, as observed by barium swallow. There was moderate enlargement of the right ventricle, but no enlargement of the left ventricle. Systolic expansion of the left atrium and calcification of the mitral valve were not visualized on fluoroscopy.

The electrocardiogram showed the standard Lead I to be a mirror image of Lead I in a normal individual, with inversion of all the complexes, which is characteristic of dextrocardia. aVR showed an RS pattern and an upward T wave, which suggests that it is facing the left ventricle in a vertical heart. aVL resembles an aVR tracing of a normally placed heart, showing a downward P and T, and this is pathognomonic of dextrocardia (with situs inversus) (Goldberger, 1950). Chest leads were taken on the right side of the chest as would normally be done on the left chest, and were designated VR₁, VR₂, VR₃, and VR₄. The R wave in VR₁ is suggestive of right ventricular hypertrophy.

The mitral configuration in a dextrocardiac was well seen in a skiagram. It was also noticed that the barium was flowing into a stomach which was placed in the right hypochondrium, thus confirming the diagnosis of situs inversus.

An angiocardigram was done with the patient in the right posterior oblique position. The study of films at 8 and 11 seconds after injection showed an enlarged well-defined left atrium remaining opacified during that period. The small left ventricle remained poorly filled. Cardiac catheterization studies were not done, as the patient was not co-operative.

A diagnosis of mitral stenosis (grade II) in a dextrocardiac, with moderate incapacity of a progressive nature, was made, and as no obvious contraindications to operation were present he was submitted to a mitral valvotomy.

The operation was carried out on December 9 by one of us (T. T.), with endotracheal anaesthesia administered by Dr. K. Blott. The patient was placed on his left side and the thoracic cage was exposed by a right postero-lateral incision. The fifth rib was resected and the pleura was entered through the fifth rib bed. On opening the pericardium it was found that the heart was smaller than normal. The left auricle seemed to be somewhat dilated and there was no adequate ventricular filling. The auricular appendage was nearly 3.5 cm. long, and narrow, and its base was only about 2 cm. broad. It was felt that only the little finger could possibly enter the small auricular appendage. It was accordingly introduced through an opening, controlled both by a purse-string suture and by a Brock clamp. A tight mitral opening, not more than 0.5 cm. in diameter, was felt. A satisfactory commissurotomy was achieved. The finger was withdrawn and the auricular opening repaired. Histological examination of the auricular appendage revealed typical Aschoff bodies, thus establishing the aetiology of acquired mitral stenosis.

A post-operative follow-up study, about four months after operation, revealed that the patient's general condition was better. Whereas he could walk only 50 yards in comfort before operation, he now could walk about a mile. On physical examination the findings were more or less the same, the presystolic murmur being present as before. But there was a significant diminution in the intensity of the opening snap. The pulmonary second sound was reduced

in its intensity. His blood pressure was 108/70. The lungs were clear. He could now be classified as grade I.

Comment

The diagnosis of dextrocardia with mitral stenosis was well established from physical findings, electrocardiographic studies, and angiocardiology. The aetiology of mitral stenosis was only presumptive before operation, but was established beyond doubt from histological study of the atrial wall.

Dextrocardia of the mirror type with situs inversus is probably not as rare as is commonly believed; but unless the condition is associated with other congenital cardiac anomalies or cardiac disease no symptoms are produced. These symptoms, when they do appear, are those of the associated abnormality and not due to the dextrocardia *per se*. The signs in the heart are, of course, found on the right chest instead of on the left.

It is claimed by some workers that the condition is common in white persons. It is worth noting, however, that the case reported prior to this was in a negro (Bleyer and Saphir, 1953), and our case is in an Indian.

Summary

A case of pure mitral stenosis due to rheumatic infection in a true dextrocardiac (with situs inversus) is described.

The successful performance of valvotomy in such a case is reported.

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IDIOPATHIC PULMONARY HAEMOSIDEROSIS IN A YOUNG ADULT

BY

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Idiopathic pulmonary haemosiderosis is being recognized with increasing frequency in recent years. Most of the cases described are in children, and the mortality rate is high. Considered in retrospect, the clinical picture is remarkably uniform, but early diagnosis may be difficult. Several cases of milder forms of the condition in young adults have been reported. In these the outlook is generally good and long remissions may occur. A further adult case is presented in this article.

Case Report

A National Service man aged 19 was first admitted to hospital in October, 1948, when aged 13, with a three-weeks history of intermittent frontal headache, pallor, and weakness. He described about six similar episodes since an attack of chicken-pox a few months previously. There was some dyspnoea on exertion. For four weeks he had been coughing up moderate amounts of brownish-red sputum. Oral iron therapy had had no apparent effect on the pallor. He had four sisters and nine brothers, all well except a brother with pulmonary tuberculosis. There had been no previous illness of significance.

On examination he was quiet and intelligent, and gave a clear story. He was very pale and listless. There were

no signs of cardiac failure or jaundice, and no haemorrhagic manifestations. His tongue was normal. There were no enlarged lymph nodes and the spleen could not be felt, but a sharp rubbery liver edge was palpable 1 in. (2.5 cm.) below the costal margin. The pulse rate was 110 per minute and the blood pressure 120/80 mm. Hg. The heart and chest were normal, as was the central nervous system.

He was transfused immediately after admission to hospital. The haemoglobin level after transfusion was 9 g.%. This rose to 11 g.% after two weeks, and remained at this level until discharge one week later. No iron therapy was given at this time. The E.S.R. and the leucocyte count were normal. No urobilinogen was found in the urine.

The patient did not attend for observation, but was readmitted with severe anaemia six months after leaving hospital. Dark-red sputum was produced during most of the time between the admissions to hospital. There were no new physical signs. The haemoglobin value was 4.1 g.%. The red cells showed anisocytosis and were poorly filled with haemoglobin. The icteric index was 8 units, and no urobilinogen was found in the urine. A red-cell fragility test showed haemolysis from 0.56% to 0.32% saline, almost the same as a control.

After a week, treatment with oral iron was started and the haemoglobin level rose rapidly, reaching 12.4 g.% after four weeks, when the patient was discharged. During this period the chest was x-rayed, but no abnormality was reported. He remained completely free of symptoms from July, 1949, until December, 1953, a period of 4½ years.

In December, 1953, the cough with reddish-brown sputum returned. This attack lasted six weeks. There were several minor recurrences during the next few months. He began his national service in October, 1953, and at the end of April, 1954, he arrived in Singapore; the haemoptyses appeared again a few days later. After three weeks he reported sick and a radiograph of the chest showed miliary mottling of the lung fields.

On admission to hospital his only symptom was a mild frontal headache on exertion. Apart from a slight sternal depression no abnormalities were found on examination. The mucosae were of good colour and there was no cyanosis or jaundice. The mouth and tongue were normal. There was no finger-clubbing. No lymph nodes were enlarged, and the spleen and liver were not palpable.

Investigations.—Several blobs of dark-brown sputum with a little mucus were produced each day. On microscopy numerous macrophages containing haemosiderin granules were seen, and a very few red blood cells. No acid-fast bacilli were found on direct examination or culture of six specimens. X-ray examination of the chest showed a normal cardiac shadow, confirmed on screening. There was diffuse mottling throughout the lung fields, maximal in the middle zones. There was no suggestion of a clear centre in any of the markings. Blood picture: Hb, 14.5 g.%; red cells, 5,000,000 per c.mm.; P.C.V., 45%; E.S.R., 36 mm. in the first hour (Wintrobe). Absolute values: M.C.V., 90 cubic μ ; M.C.H., 29 γ ; M.C.H.C., 32%. Reticulocyte count, 2.5%; leucocyte count, normal; platelet count, 200,000 per c.mm.; bleeding-time, 2 minutes; clotting-time, 4 minutes; prothrombin time, 15 seconds (equal to control). Capillary fragility test, negative. The indirect Coombs test and trypsin cell test showed no antibodies. Cold agglutination was negative at 1 in 4. Red-cell fragility showed haemolysis from 0.52% to 0.28% saline. Blood W.R. and Kahn test were negative; serum bilirubin, 0.5 mg. per 100 ml. on two occasions; serum proteins, 7.5 g.% (albumin 5.5 g.%, globulin 2 g.%). An E.C.G. was normal. The urine was normal on repeated tests, and no urobilinogen was present. The Mantoux test was negative to 1 in 10,000, but positive to 1 in 1,000 O.T. X-ray films of the skull, hands, long bones, and abdomen were normal.

During three months' observation there has been little change in the clinical condition. Daily haemoptyses continue, but the haemoglobin has remained between 13.3 and

14.6 g.%. The reticulocyte count has varied from 2.5 to 0.7%. No iron has been given during this period.

On the first few days in hospital there was a mild evening pyrexia up to 100° F. (37.8° C.), but this quickly disappeared. Slight headache recurs from time to time.

Aetiology

The basic pathological process in idiopathic pulmonary haemosiderosis is repeated intrapulmonary haemorrhage, resulting in deposition of haemosiderin in the lungs.

Pulmonary haemosiderosis also occurs after prolonged pulmonary congestion in mitral stenosis and in chronic left ventricular failure (Lendrum, 1950), and the pathological effects on the lungs are similar to the idiopathic forms. According to Hastings-James (1952), haemosiderosis may follow any form of pulmonary haemorrhage repeated over long periods. In the idiopathic form, however, fresh blood in the sputum is most unusual. It is probable that in these cases haemorrhage occurs diffusely into the alveoli themselves, haemosiderin is formed, and is engulfed by macrophages before the material is produced as sputum. The mechanism differs from the secondary types of pulmonary haemosiderosis in which there is focal bleeding followed by widespread absorption of the pigment.

Three main causative factors have been postulated as the possible fundamental lesions in idiopathic pulmonary haemosiderosis:

Defects in Pulmonary Arterioles and Elastic Tissue.—The extensive changes in the elastic tissue of the lungs seen in most cases at necropsy suggested that a defect in the elastic fibres of the pulmonary arterioles might be the primary lesion in pulmonary haemosiderosis. However, the necropsy assessment of elastic tissue change is difficult owing to the varying effect of distension (Nancekievill, 1949), and it is possible that some of the appearances seen were due to distortion. In some cases with only a short history before death there is no evidence of defect in the elastic tissues. On the whole it appears that these changes are the result, rather than the cause, of haemosiderosis, and the degree of elastic-tissue damage is roughly proportional to the duration and intensity of the disease.

Functional Changes in Pulmonary Capillaries.—Even those cases with a short history and no change in the elastic tissues show capillary stasis at necropsy. It is possible that dilatation of the capillaries in the pulmonary interstitial tissue and changes in the permeability of the capillary walls may lead to diapedesis of red blood cells and subsequent haemosiderosis. Recurrent haemorrhages will initiate fibrosis and destruction of elastic tissue.

Haemolytic Anaemia.—The haematological picture is of recurrent loss of red blood cells in the absence of external haemorrhage, associated with a compensatory increase in erythropoiesis. There is no evidence of decreased stability of the red blood cells or of failure of the blood-clotting mechanism. Cold auto-agglutinins are present in some cases in the acute attack. Wyllie *et al.* (1948) suggest that this is a secondary antibody response to red blood cells destroyed within the body. A positive Coombs test has also been found on occasion. Few cases have been examined in detail for circulating haemolysins, but in one case the haemolytic activity of the serum at body temperature was increased (Wiesmann *et al.*, 1953), and in another the life span of the patient's red blood cells on transfusion was shorter than normal (Jonsson *et al.*, 1951). If a haemolytic process is responsible for idiopathic pulmonary haemosiderosis, it is difficult to see why the lesions should be restricted to the lungs, unless the physiological conditions in the pulmonary capillaries increase the activity of the haemolysin.

From the present evidence it seems most likely that the fundamental lesion in idiopathic pulmonary haemosiderosis is a change in permeability of the pulmonary capillaries. This results in intrapulmonary bleeding, which produces fibrosis and elastic-tissue damage. Erythrocyte destruction within the body may cause the production of antibodies.

Discussion

The occurrence of idiopathic pulmonary haemosiderosis in adult life is rare. Kerley (1951) gives a brief description of five adult cases, and Cliff (1953) describes the case of a man who first had symptoms at the age of 20. After two acute attacks he was under observation for three years, and during this time had no symptoms or anaemia, but haemoptyses continued. This closely resembles the present case.

It seems likely, as Kerley (1951) suggests, that there is a mild form of the disease which persists for many years and may be found in young adults. These subjects may have typical recurrent attacks of severe anaemia in the later years of childhood or young adult life, and later settle down to a steady state with recurrent minor haemoptyses but no anaemia. Similar cases will probably be discovered more frequently with the increasing use of mass miniature radiography, and idiopathic pulmonary haemosiderosis must be considered in the differential diagnosis of miliary x-ray shadows in the chest of a symptomless young adult. Radiological changes may persist for several years after the anaemia and haemoptyses have disappeared. A diagnosis of Lederer's anaemia was made in the present case during the first acute attack. Some cases previously included in this group, which remained well after transfusion, may well be in fact idiopathic pulmonary haemosiderosis.

The diagnosis in the early stages is often difficult, as there may be no radiological changes at first. Walton and Williams (1951) found none for 18 months in their case, and in the patient described in the present article a chest x-ray film was reported as normal during the acute phase of the disease. Young people with anaemia of obscure origin should have sputum or gastric washings examined for macrophages containing haemosiderin. If x-ray changes are present lung puncture must be considered, to confirm the diagnosis. This is not without hazard, as the widespread destruction of elastic tissue that occurs greatly decreases the retractility of the lung, and may possibly prolong bleeding if a large vessel is damaged. It was thought to be inadvisable in the present case.

Summary

A case of idiopathic pulmonary haemosiderosis is described, and the aetiology of the condition is discussed.

The existence of a milder form of idiopathic pulmonary haemosiderosis in young adults is brought to notice.

It is suggested that the disease be more often considered in the differential diagnosis of miliary shadows in the chest x-ray film and of obscure anaemia in young people.

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The Ministry of Health has sent a memorandum to hospital authorities (H.M.(55)35) explaining that notifications of patients diagnosed in hospital as suffering from tuberculosis should usually be sent to the medical officer of health of the district in which the patient normally lives. Where, in the case of long-stay patients, the hospital itself can reasonably be regarded as the patient's place of residence, the notification should be sent to the medical officer of health of the district in which the hospital is situated.

A CASE OF LARGE DIVERTICULUM OF THE EUSTACHIAN TUBE

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Welin (1941a, 1941b, 1948) and Diamant (1941) have demonstrated, by lipiodol injection, the existence of small diverticula in the petrous part of the Eustachian tube, but no other diverticula in the bony portion have been described. The cartilaginous portion is closely related to the antero-medial aspect of the petrous part of temporal bone, and in radiographs is seen to project from the base of the skull. No diverticula have been reported in this portion of the tube. While stenosis of the pharyngeal orifice and hypertrophy of the pharyngeal tonsil might cause stasis in the pharyngeal part of the tube, this would hardly be sufficient to produce pouches in the cartilage; it would more probably lead to perforation of the drum or to the forcing of secretions into the attic or the mastoid cells. Diverticulum formation in the cartilaginous part must therefore be extremely rare, and it is for this reason that a large diverticulum at this site is reported.

Case Report

A man aged 27, with no relevant past history, began his present illness in December, 1953, without any previous malady except a severe coryza. It started with pain in the region of the angle of the left mandible and styloid process,



Lateral view of diverticulum after injection of lipiodol.

aggravated by clenching the jaw, and deafness in the left ear. Two weeks later a copious aural discharge compelled him to consult an otologist. After local and general treatment the discharge diminished slightly, but the pain remained. At that time he complained of crepitation and bubbling in his ear, especially after swallowing and mastication, deafness, and post-nasal discharge. The discharge was abundant at night, irrespective of the side on which he lay.

In September, 1954, we saw him for the first time. His left ear showed a small perforation of Shrapnell's membrane, a mucopurulent discharge, and granulations in the middle ear. The right ear, the nose, and the throat appeared normal. A plain radiograph showed slight opacity of the mastoid cells on the left side, but no abnormality of the petrous bone or the styloid process. Through the perforation 2 ml. of 40% lipiodol was injected, the patient reclining

on the opposite side while his head was rotated so as to fill the epitympanic cavities. A lateral radiograph (see Fig.) now showed retention of lipiodol in two air cells of the petrous bone and a large pouch directly below the base of the skull, in the position of the cartilaginous portion of the Eustachian tube. The lateral oblique view showed that the diverticulum projected postero-anteriorly, and that it was cylindrical in shape. Its volume was about 0.5 ml., and it arose from the lower part of the tube, 3-4 mm. from the pharyngeal opening.

Radical surgery was obviously indicated, and the operation was performed a few days later. With a Hautant transmastoidal approach, the antero-medial aspect of the tympanic cavity was exposed and the granulations were removed. The orifice and isthmus of the Eustachian tube were then enlarged, and the diverticulum was identified without difficulty. Its mucopurulent contents were aspirated and its walls curetted and cauterized. The wound was drained and closed, 250 mg. of oxytetracycline being left in the tympanic cavity. The drain was removed on the fifth day and the wound healed by first intention. The aural discharge dried up, and the pain, crepitation, and post-nasal discharge had all disappeared by the tenth day. The drum perforation was still under treatment at the time of writing, and had nearly closed.

Discussion

It seems most unlikely in this case that the pouch was congenital, as such anomalies are not found in cartilage. A more acceptable theory is that it was the result of degeneration and an inflammatory process secondary to obstruction of the pharyngeal orifice, the perforation of the drum being due to the same cause. Once the diverticulum had formed it became a focus of chronic infection, probably due to the most destructive organism of the middle ear, *Bacillus mucosus capsulatus*. The presence of previously existing air cells can be ruled out, as cartilage never contains them. The subacute course of the infection and the absence of calcification and caseous material in the cartilage are against a tuberculous origin. Once the diverticulum had been obliterated and normal drainage of the tube established, the symptoms disappeared.

Summary

A single large diverticulum of the cartilaginous portion of the Eustachian tube is described. This condition has apparently not been previously reported. The symptoms of pain, aural and post-nasal discharge, and crepitation in the ear were cured after surgical treatment. The aetiology of the condition is discussed.

Our thanks are due to the Director of the hospital, Dr. Abdoul Rassoul Haddad, for his encouragement and help during the preparation of this article.

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A number of rare incunabula, besides medical books of the seventeenth and eighteenth centuries, are to be included in the sale of the late Dr. T. C. P. Kirkpatrick's library at Sotheby's on April 25-27. (Dr. Kirkpatrick was for 44 years registrar of the Royal College of Physicians of Ireland.) Among the incunabula are: Aegidius Corbolicensis: *De Urinis et Pulsibus*, Lyons, 1500?; Philippus Beroaldus: *Declamatio*, Bologna, 1497; Celsus: *De Medicina*, Venice, 1493 and 1497; Bernardus de Gordonio: *Practica sive Liliun Medicinae*, Ferrara, 1486; Lactantius: *Opera*, Venice, 1493; Mesue: *Opera Medicinalia* (a fragment), Venice, 1490; Mesue: *Opera* (incomplete), Venice, 1490-1; Placentinus de Saliceto: *Summa Conservationis et Curationis . . . item Chirurgia*, ms., Italy, 1473; Pliny: *Historia Naturalis*, Parma, 1480; Rhazes: *Liber ad Almansorem*, Venice, 1497.

MIGRAINE AS A SEQUEL TO INFECTION BY L. ICTEROHAEMORRHAGIAE

BY

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Of recent years migraine has been attributed to a bewildering assortment of causes, ranging from heredity (Friedman and Wilson, 1947), through allergy (Crowe, 1946), and personality (Alvarez, 1947), to the comprehensive list drawn up by von Storch (1947). The estimate of Scott (1941) that "much has been written and little has been established as to the aetiology of migraine" seems largely true to-day.

The following observations, which were made in the course of a follow-up study of former cases of Weil's disease in the South Wales coalfield (Atkins *et al.*, to be published), seem worthy of record even at the risk of further complicating the subject.

Method of Study

During 1953 all earlier cases of serologically proved Weil's disease which were known not to have been immediately fatal were traced. Fifty-eight such cases were known to have occurred in the area of the coalfield, but five of the patients were found to have left the area and three had died by 1953. Fifty cases therefore remained for study, and in all but one the specific agglutination reaction remained positive at a titre of 1 in 100 or more in 1953. Each man was questioned about his health both before and after his attack of Weil's disease and clinically examined; in addition to general questions designed to elicit anything thought worth mention by the patient, the questionnaire included specific questions about various symptoms, one of which was headache.

Although estimates are available of the prevalence of migraine among the general population of the United States, it was thought worth while to make use of a control group of South Wales miners known to be serologically negative for *L. icterohaemorrhagiae*. These were also questioned about their experience of headache, and it is hoped that variation in the interpretation of answers, as well as in the definition of migraine, was avoided by the observer's use of similarly phrased questions for both groups.

The definition of migraine which has been adopted is based on that of von Storch, quoted by Marshall (1949). This requires that, to qualify as migrainous, headaches should be recurrent, though not necessarily hemispheric; and they should be accompanied by at least one of the following features: associated visual symptoms—classically scintillating scotomata; temporary gastro-intestinal symptoms—usually nausea or vomiting; or hereditary migraine diathesis, occasionally with an epileptic history. Since the follow-up study had not been designed to investigate the aetiology of migraine, information on the last alternative criterion of von Storch is not available. The diagnosis therefore rests here on a history of recurrent headache with either scotomata or gastro-intestinal disturbance, or both; it can perhaps be said that these criteria are thus more strict than those of von Storch. It may be that opportunity will later occur to study the hereditary factor.

Prevalence of Migraine

Among the 50 men in the control series, 6 (12%) described headaches satisfying the above criteria. This represents a prevalence greater than was to be expected from estimates in America (Scott, 1941; Friedman and Wilson, 1947), where about 7% of the population are said to be affected—the more so as females are said to be two or three times as

often affected as males, and the control series here comprised males only. This point may be borne in mind when considering the prevalence observed in the former cases of Weil's disease.

Among the latter there were 24 men who suffered from migraine by the same criteria—a prevalence of 48%, or nearly half the cases. This difference of prevalence in former cases of Weil's disease and the controls is highly significant ($\chi^2 = 15.4$, $n = 1$, $P < 0.001$). It is clear that had comparison been made with American estimates of prevalence among the general population, instead of with the control series, the prevalence among former cases of Weil's disease would have seemed even more striking.

The prevalence of migraine among former cases of Weil's disease of different ages at the time of their infection is shown in Table I. As the period elapsing since infection might also have influenced the prevalence of migraine, these cases are also broken down into their quinquennia of infection.

TABLE I.—Age at Infection with *L. icterohaemorrhagiae*, and Date of Infection by Quinquennia, of Men in South Wales Surviving Attack. (Numbers Subject to Migraine in Parentheses)

Ages	1935-9	1940-4	1945-9	1950-	Total
11-20	—	—	3 (2)	1 (1)	4 (3)
21-30	5 (3)	5 (3)	3 (1)	1 (1)	14 (8)
31-40	5 (1)	2 (1)	5 (3)	1	13 (5)
41-50	3 (1)	6 (3)	3 (1)	1	13 (5)
51-60	—	2 (2)	4 (1)	—	6 (3)
Total	13 (5)	15 (9)	18 (8)	4 (2)	50 (24)

It will be seen that migraine occurs fairly evenly among these different categories, there being no tendency for a rising prevalence with age. This fact is of importance in establishing the validity of the control series; for this was unavoidably deficient in men above the age of 50, and contained a disproportionate number of middle-aged men (Table II). It seems likely that this lack of correspondence in age composition of the two series has not overestimated the difference in prevalence of migraine between them.

TABLE II.—Ages, in 1953, of Former Cases of Weil's Disease and of Controls. (Numbers Subject to Migraine Shown in Parentheses)

Age	Former Cases	Controls
11-20	1 (1)	0 (0)
21-30	4 (3)	6 (1)
31-40	10 (5)	17 (1)
41-50	12 (5)	22 (3)
51-60	13 (6)	5 (1)
61-70	10 (4)	0 (0)
Total	50 (24)	50 (6)

As might be expected, both the frequency and the severity of attacks were described in most of the former cases of Weil's disease as diminishing with the passage of years, the course of the disorder being similar to that generally seen in ordinary migraine sufferers. On the other hand, as mentioned above, it originated in those of 45 and over nearly as frequently as in those infected at an earlier age.

Among the 24 cases in the Weil's disease group there were 4 individuals whose migraine preceded their infection. The influence of this infection upon established migraine varied, but only one man described aggravation. Subtracting these cases, it will be seen that migraine appeared in 20 cases (40% of those infected) as a sequel to this specific infection, and during convalescence in most cases.

Least suggestion between one case and another might have led to distortion of histories, upon which alone the diagnosis of migraine must be made, care was taken to keep the men separate at the time of interview. Moreover, since Weil's disease had occurred mainly in relatively closed communities, it was possible to analyse results for each of these geographical groups separately. The results of such analysis show

similar prevalence of migraine in each of the four main widely separated areas of the coalfield where cases have occurred.

Allied Vasomotor Disturbances

In view of modern concepts of migraine as a localized cerebral vasomotor disturbance allied to Ménière's disease (Atkinson, 1943) it may be of interest to record the following observations.

Among the 50 men there were eight who described giddy attacks dating from their infection, but none had associated tinnitus or gross deafness for conversational speech. Only one of these had a diastolic blood pressure of over 100 mm. Hg (mean of three readings at rest). All but two of them were migraine sufferers, though the precise chronological relationship between headaches and giddiness was not investigated. Vertigo was thus associated with headache in a quarter of the cases of migraine.

No cases of epilepsy or its equivalents were found among the 50 cases, nor was a family history of such forthcoming in any of them.

In six cases there was complaint of numbness, tingling, and clumsiness of the fingers and hands, often on waking, and usually more severe in cold weather, since the specific infection; but facilities for proper investigation of these phenomena were lacking. A further patient complained of frequent attacks of "cramp" in the legs and hands since his infection.

Significant hypertension, as judged by a mean resting diastolic pressure of over 100 mm. Hg (there were no cases with signs of failure), was found in 6 of the 24 migraine sufferers. Of these, four were over 50 years of age and the youngest was aged 39 at the time of examination. Among the 26 free from migraine only two had significant hypertension. In addition, before this follow-up study was begun, one former patient had died of a stroke at the age of 65, another of cardiac failure following hypertension aged 52, but it is not known whether either of these men suffered from migraine during life.

Discussion

Such a prevalence of hypertension in men of these ages might be found perhaps in 50 men drawn from the general population. However, this finding of hypertension in a quarter of the cases of migraine may be in accord with the views of Gardner *et al.* (1940) that migraine sufferers may become hypertensive in middle life.

The finding of so large a number of cases of migraine among this series, small as it was, does seem to indicate a probable causal relationship between infection with *L. icterohaemorrhagiae* and migraine. There exist other areas of Britain where this infection is not uncommon, and which offer opportunity for confirmation of this point.

It seems that, if such a causal relationship is established, existing views of the aetiology of migraine may need some modification. Such specific infection is not mentioned in the comprehensive list of causes drawn up by von Storch (1947), nor in the secondary "trigger mechanisms" listed by Friedman and Wilson (1947). Moreover, the latter's insistence upon a primary inherited susceptibility to migraine would appear untenable in the face of such a prevalence as the 48% reported above, even though family histories have been neglected in this study.

It seems possible that migraine may result from the meningitis which is so often a feature of infection with *L. icterohaemorrhagiae*. This would account for the occurrence of vasomotor disturbances in other regions, if those were also established as a significant sequel to the infection. It may be that follow-up investigation of other types of meningeal infection would throw light on this possibility.

The onset of migraine regardless of age in this series underlines the possibility of this diagnosis being correct even in those presenting symptoms late in life. In areas where infection with *L. icterohaemorrhagiae* occurs it would certainly seem wise to test the appropriate agglutination reac-

tions before submitting the patient to such procedures as cerebral arteriography.

Summary

The health of 50 men who had formerly been infected with *L. icterohaemorrhagiae* has been studied.

The prevalence among them of cases of hypertension, and of symptoms suggesting various types of vasomotor disturbance, is recorded. Of these former cases of Weil's disease 48% suffered from migraine. In a control group the prevalence of this disorder was 12%. The difference is of high statistical significance.

The literature on the aetiology of migraine is briefly reviewed and discussed in the light of these findings.

Thanks are due to the miners who so readily co-operated in this study; and to Dr. J. C. Broom, of the Wellcome Research Laboratories, and Dr. R. W. S. Harvey, of the Public Health Laboratories, Cardiff, for performing agglutination reactions in these cases and, with Dr. C. R. E. Freezer, of Church Village Hospital, for help in planning the follow-up of them.

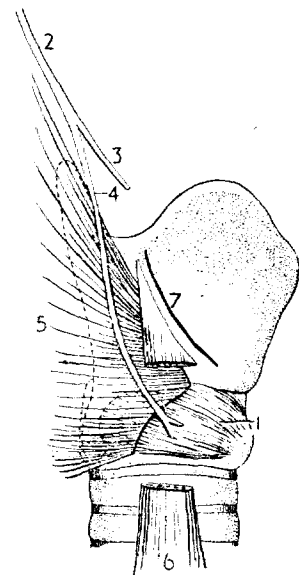
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Medical Memoranda

Thyroid Enlargement and the Crico-thyroid Muscle

The importance of the crico-thyroid muscle has not been stressed in any textbook dealing with diseases of the thyroid gland and the operations carried out for the cure of these diseases. The muscle takes origin from the anterior part of the cricoid cartilage and runs upwards and backwards in two parts—an oblique part inserted into the lower border of the thyroid cartilage in front of the oblique line, and the horizontal part inserted into the inferior cornu and the lower border behind the oblique line. The nerve supply is the external branch of the superior laryngeal nerve, which comes from the vagus. The nerve runs superficial to the inferior constrictor of the pharynx but deep to the sterno-thyroid muscle; both these muscles are attached to the oblique line on the thyroid cartilage. The diagram makes these details clear.



- 1, Crico-thyroid muscle.
2, Superior laryngeal nerve.
3, Internal laryngeal nerve.
4, External laryngeal nerve.
5, Inferior constrictor muscle.
6, Sterno-thyroid muscle.
7, Oblique line.

The function of the crico-thyroid muscle is to tense the vocal cords. Damage to the muscle or its nerve will produce a voice which is incapable of varying its pitch. It can be described as a monotone voice at about F, middle register.

The patients complain that they are unable to sing or alter the pitch of the voice; also, the voice gets tired easily. It is not

husky, but is slightly tremulous. There is no difficulty in breathing. The trouble can arise before any operation on the thyroid gland, especially in a very large thyroid with an isthmus spreading out over the cricoid and lower part of the thyroid, from direct pressure on the muscle or its nerve. The muscle or nerve may be damaged, or even removed, during the freeing of a large isthmus from the underlying structures. There is a third possibility—that the nerve or muscle may be strangled by fibrous tissue following operation, especially if a clot under the infrahyoid muscle has been allowed to organize.

The treatment of a pre-operative case is careful partial thyroidectomy, to give the muscle or nerve a chance of recovering. There is no useful treatment for a post-operative case. From the above remarks it is clear that before partial thyroidectomy the patient's voice should be carefully studied, and if abnormal an examination by a competent laryngologist should be carried out. I feel that when confronted with the crico-thyroid syndrome after operation many surgeons with a limited experience of thyroid surgery have wrongly assumed that the recurrent nerve has been damaged.

Two patients of mine illustrate the mild trouble resulting from crico-thyroid inefficiency. Both had a very large thyroid, with a husky voice, and had some difficulty in breathing. One was a school mistress in a primary school, the other a local manager of an insurance company. After partial thyroidectomy the latter had complete restoration of his voice, while the first had a crico-thyroid syndrome four years later. She has some difficulty in talking to her classes for more than half an hour, but she agrees with me that lectures and talks lasting more than half an hour are rarely appreciated by the audience.

Many people in this country are incapable of altering the pitch of the voice; also many have no appreciation of pitch alteration in a voice or musical instrument. It seems that the former suffer from some congenital trouble in the crico-thyroid, just as the latter suffer from internal ear trouble.

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Ruptured Uterus with Survival of Extrauterine Twin

The following unusual case is thought to be worthy of record.

CASE REPORT

A native woman was admitted to the Zomba African Hospital at 5 p.m. on October 17, 1952. She stated that she had been in labour 32 hours. About midnight on the 16th-17th, during strong contractions with no advance, the pains seemed to cease, being replaced by a continuous pain in the abdomen, especially in the flanks. She was a slim woman in the early thirties, a 2-para. There had been no trouble with the previous labours, although the babies had been large.

On admission she was seen by the sister, who reported that urine had been passed just before examination. The sister carried out a vaginal examination. The vulva was oedematous. What appeared to be a rectocele could be seen in the vaginal orifice. The vertex was felt in mid-cavity. No os could be felt, but the head seemed to be covered by a layer of tissue almost corresponding to a thin well-taken-up cervix. The sister thought this membrane to be part of the "rectocele," although she could not understand why she was unable to pass her fingers between it and the head at a higher level. There was no vaginal bleeding.

The patient was seen by me an hour later. She was ill, but her condition was fair and she was not unduly shocked. The abdomen was distended and tender. There was a visible tumour rising above the pubes, so resembling a distended bladder that I could not accept the African midwife's assurance that the patient had again passed urine, and catheterized her myself. The catheter entered easily, with-

drawing a little urine with no effect on the tumour. It thus became evident that this was the uterus. Above it, foetal parts lay immediately under the abdominal wall. Ruptured uterus was confidently diagnosed, no further vaginal examination being performed. In view of the prominence of the uterus and absence of external bleeding it was expected that the body of the child had passed out of a posterior rent, leaving the head jammed in the pelvis.

After anti-shock therapy, and with intravenous saline running, the abdomen was opened. There was a moderate amount of blood in the peritoneal cavity. A transverse anterior tear of the lower segment of a well-contracted uterus was seen with a T extension through the cervix into the vagina. A small full-term dead foetus was removed from the abdomen complete with placenta and membranes. It was then noticed that there was a large tumour behind the uterus responsible for pushing it forward. This proved to be the back of a second child lying in the occipito-anterior position with the head well down in the pelvis, in an apparently unruptured amnion. The amnion was slit and the child delivered. To our amazement it was alive and cried immediately. The membranes had to be peeled from the rectosigmoid, the left broad ligament, posterior surface of the uterus, the sides of the pelvic cavity, and coils of small intestine, within a mass of fibrinous peritoneal adhesions. The placenta, however, was not adherent. Its amniotic surface was normal, but the decidua surface was covered over by a membrane except along a narrow pedicle, not more than 3 cm. wide, through which the vessels ran into its substance.

It is to be regretted that the origin of the pedicle was not accurately noted owing to the presence of oozing and the necessity for haste. The impression was that it arose from the mesosigmoid, but it may have been from the region of the left broad ligament, which is more likely. It was the only impediment to easy removal of the placenta. Subtotal hysterectomy was performed, with repair of the cervix and vaginal vault. The patient stood the operation well. One pint (570 ml.) of blood was given next morning, and she made a smooth recovery. The baby, a female, was normal in all respects and weighed 5 lb. 2 oz. (2.3 kg.). It was seen at intervals up to three months after leaving hospital and was thriving. Thereafter, as commonly happens in African practice, mother and child were lost sight of.

COMMENT

The probable course of events was that the twin, surviving from a tubal rupture, developed with the head in the pelvis. When labour began, its head prevented entry into the pelvis of the presenting part of the intrauterine twin, with consequent rupture of the overstretched anterior aspect of the lower segment. The abnormal appearance of the placenta of the extrauterine gestation is difficult to explain, except on the basis that at the time of tubal rupture the decidua contact of the foetus with the tube was not entirely lost, and as it grew the placenta was gradually drawn out from the tube *pari passu* with repair and reperitonization of the rent, the process also continuing over the decidua surface, finally forming a pedicle of the remaining contact.

It is a remarkable coincidence that two days later another full-time extrauterine child was delivered alive in this small hospital dealing with about 500 births in a year and with no previous records of such an occurrence. In this case the mother was unfortunately lost owing to severe persistent bleeding from the placental site as a result of possibly unwise separation of its attachments to the viscera, from the shock of which she failed to recover. The infant was a female weighing 4 lb. 2 oz. (1.9 kg.) also without obvious abnormality. It was also thriving on discharge from hospital.

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Reviews

REPRINTING OF A CLASSIC

Atlas of Congenital Cardiac Disease. By Maude E. Abbott, B.A., M.D., F.R.C.P. (Canada). (Pp. 62+x; illustrated. \$5.) New York: American Heart Association. 1936, reprinted August, 1954.

This reprinting of Maude Abbott's well-known monograph will bring great joy to many. When this book was reviewed in these pages on its first appearance in 1936 it was stated that it "must be included among the few modern medical publications destined to become classics." This prediction has proved to be amply justified, for it has been almost impossible to obtain a copy, and many first-class libraries have also been without one. The American Heart Association is to be congratulated, not only on its action in publishing this facsimile, but on the excellence and accuracy of its production. Everyone interested in congenital heart disease from its present manifold aspects will now be able to acquire a copy, and libraries will be able to correct their deficiency. However, those who want the book will have to hurry, as only 1,500 copies have been printed. One would have thought that several times this number will be needed, and we must hope that other impressions will follow.

The *Atlas* is, as is well known, based on a study and analysis of 1,000 cases of congenital heart disease, its statistical analysis being often quoted. It contains an excellent presentation of the development and comparative anatomy of the heart as a basis for the clinical and morbid anatomical presentations, which are profusely and well illustrated, even for to-day with our better radiography and electrocardiography and the revelations of angiocardiology. It is a pity that the author was never able to do what she states in the preface was her intention—namely, to produce a further volume.

The book has only one drawback—its large, awkward size, which makes it difficult to handle and very difficult to find shelf room for. It would have been so much better if it had originally been produced only half the size. No change, of course, was possible in this facsimile.

RUSSELL BROCK.

ENZYME ACTION

A Symposium on the Mechanism of Enzyme Action. Sponsored by the McCollum-Pratt Institute of the Johns Hopkins University. Edited by William D. McElroy and Bentley Glass. (Pp. 819+xvi; illustrated. 88s.) Baltimore: Johns Hopkins Press. 1954.

This volume records the proceedings of a symposium held at the Johns Hopkins University in June, 1953. The papers, with a record of the relevant discussions, are grouped into five main sections: I. Protein configuration and biological activity. II. Kinetics of enzyme-catalysed reactions. III. The function of metals in enzyme catalysis. IV. The mechanism of electron and hydrogen transport. V. The function of enzymes in group transfer. As is natural, Section V is the longest, taking up rather more than one-third of the whole volume. The book concludes with a masterly summary by Bentley Glass of the facts and ideas discussed, which amounts to 65 pages (approximately 8%).

In a hydrolytic reaction the elements of water are added across a chemical linkage to produce its fission. In group-transfer reactions an organic molecule plays the role of the water in a hydrolytic reaction, and as a result synthetic process of great importance can occur. In such group-transfer reactions the enzyme molecule itself enters as a reactant, apparently with the function of preserving energy that might otherwise be lost during the chemical exchanges. The reactions to be studied in detail are therefore often somewhat complex, but an excellent account of most of them is given in Section V of this book.

The book will appeal to the expert, and for the expert it is extremely readable—indeed, absorbingly so. Dr. Fritz

Lipmann, Nobel Laureate in Medicine, puts forward an interestingly new idea about the possible mechanism of protein biosynthesis, a subject of first-rate importance in the study of tissue growth. The accounts of the discussions are good, and are occasionally longer and possibly more interesting than some of the papers themselves.

The volume is well produced, and an adequate index greatly enhances its value. This book of 819 pages, formidable to the non-expert in its size and content, is an indication of the exuberance of biochemical research in the United States—an exuberance which gives birth to an ephemeral volume of such impressiveness. That such exuberance must assist directly or indirectly in the elucidation of many outstanding problems in medicine cannot seriously be doubted.

F. G. YOUNG.

DISEASES OF THE SPLEEN

La Rate et ses Maladies. By Gabriel Gelin. Preface by Professeur Agrégé Jean Bernard. (Pp. 299; illustrated. 2,200 fr.) Paris: Masson et Cie. 1954.

This book on the spleen and its diseases is one of a series by different authors, published by Masson, which now includes "The Spleen as a Reservoir" (1930), "Functional Exploration of the Spleen" (1933), "The Spleen in Haematological Pathology" (1936), "Splenic Puncture" (1936), and "Hypersplenism" (1953). Apart from the work of Barcroft and Knisely on the splenic circulation, no fundamental discoveries in the physiology and pathology of the spleen have been made over this period, and the preoccupation of the French school of haematology with the spleen is to be explained by the frequency of various forms of tropical splenomegaly in their North African possessions and by the occurrence of Cooley's anaemia, with its characteristic splenomegaly, throughout the Mediterranean basin.

The approach of these various monographs is clinical and morbid-anatomical rather than experimental or quantitative, and the present book consists of a series of essays or reviews, each chapter being complete in itself. The main subjects discussed are the structure and function of the spleen, hypersplenism, the parasitic splenomegalies, tuberculosis of the spleen, myeloid metaplasia of the spleen, Gaucher's and Niemann-Pick's diseases, tumours of the spleen, and the various syndromes associated with hypertension and thrombophlebitis of the portal and splenic veins. The material is clearly presented and up to date. The feature of the book of particular value to English readers will be the bibliographies, which are of a richness unusual in French publications and which embrace the Continental as well as the Anglo-American literature. There are, in fact, over 2,300 references. As in many French books, there is a table of contents but no index.

L. J. WITTS.

PSYCHOPHYSIOLOGICAL MEDICINE

Psychophysiologic Medicine. By Eugene Ziskind, M.D. Foreword by John C. Whitehorn, M.D. (Pp. 370. 52s. 6d.) London: Henry Kimpton. 1954.

The application of the methods of medical science to the problems of psychiatry has meant much to the sick in mind, and it is now the turn of mental science to repay some of its debt to medicine by throwing light on those disorders which, while manifest in physical signs and symptoms, have their aetiology to a greater or less degree in psychological maladjustment. Psychological medicine, however, has developed a method of approach of its own which requires a considerable mental effort on the part of the physician if he is to learn enough of it to apply to the psychosomatic aspects of his practice. In order to do this he may have to reverse the process of specialization which threatens to restrict the field of interest of the general physician, and to study the human factors explored by his psychiatric colleague. Dr. Ziskind is an experienced teacher of clinical psychiatry who has maintained contact with the advancing front of medicine. He has paused in his life's work to

write what is, in effect, an intelligent physician's guide to psychological medicine.

Without pandering unduly to the busy doctor's demand for information which will produce quick results, he has tried to thin out the jungle of psychiatric literature and to preserve the more useful and permanent growths. In the first two parts he introduces the reader to simplified principles of psychopathology with which few but the followers of militant and exclusive schools of thought will quarrel. He then shows in some detail how psychiatric methods of clinical investigation can be applied to psychosomatic illness. This is followed by chapters on differential diagnosis, social factors, psychotherapy, and on psychiatric emergencies.

After giving an account of the methods of psychiatry as applied to general medicine, the author proceeds, for the benefit of those whose interest he has aroused, to give a general review of psychological medicine which includes outlines of the contributions made by the principal schools. This section is thoroughly up-to-date and notably free from strong bias. There is also a sound guide to further reading which will be of value to those embarking on a fuller study of the subject. As the book proceeds, the fruits of the author's experience and teaching become evident, and his account of the simple adaptive mechanisms found in the medical patient is readable and clear. Finally he abandons the role of a reporter and ends with a critique of the evidence that certain diseases—asthma, peptic ulcer, essential hypertension, and ulcerative colitis—which have been rather freely labelled as psychosomatic, are in fact of this nature. Here careful arrangement of the conflicting testimony of the psychologizers who have overreached themselves contributes strongly to the author's argument that the evidence is in the main insufficient. This subject serves as a text upon which he bases an exposition of some of the loose thinking and plausible writing which have appeared since psychopathology has been trying to engorge and digest the general adaptation syndrome. It may be that Dr. Ziskind has found a formula for making applied psychology palatable to physicians.

The style of writing is a little bare and technical for British readers, and the pattern of medical practice in the Western United States a little unfamiliar, but the book gives a clarifying account of the psychosomatic approach. In a foreword Dr. Whitehorn, of the Johns Hopkins Hospital, whose own outlook is mainly psychoanalytic, indicates that the author's presentation of this subject may not be seriously irritating either to the busy physician or to the majority of psychiatrists. Rather long for continuous reading in the study, it is well designed for the night-stop bag or the bedside. The price is such that many physicians will prefer to borrow rather than to own this book.

ALEXANDER KENNEDY.

THE STORY OF INFECTIOUS DISEASES

Pomp and Pestilence. Infectious Disease, its Origins and Conquest. By Ronald Hare, M.D. (Pp. 224. 12s. 6d.) London: Victor Gollancz Ltd. 1954.

Medical history has no official status in the training of the doctor, and it is left to individual teachers to indicate, if they please, the great importance of disease on the course of human history, whether it be syphilis or apoplexy or madness in some powerful king or dictator, or great plagues destroying armies and civilizations.

Professor Hare's small book tells the story of the development of parasitic infections in man, and indicates the way in which some of the major pestilences—smallpox, typhus, plague, cholera, dysentery, and in our own time influenza—have had greater victories than kings or conquerors. He goes on to say how many of the infections have been overcome by community or individual effort, but ends on a pessimistic note regarding the effects of the control of infection in allowing growth of populations in backward countries more quickly than there will be the wherewithal to feed them.

The writing of medical history requires much general reading, and the author shows that he has delved well into the literature. He gives at the end various explanatory notes and numerous references for further reading. Let us hope that teachers of bacteriology and others will recommend this book to their students as being at least as important as the orthodox textbook.

R. CRUICKSHANK.

PRISONERS OF THE JAPANESE

Operation Rangoon Jail. By Colonel K. P. MacKenzie, R.A.M.C. (ret.). Foreword by Brigadier J. G. Smyth, V.C., M.C., M.P. (Pp. 201; illustrated. 15s.) London: Christopher Johnson. 1954.

"War," as General Sherman once said, "is hell," and one of its worst manifestations is imprisonment at the mercy of a sadistic enemy. Colonel MacKenzie, who was over 50 at the time, suffered this fate in Rangoon jail at the hands of the Japanese, and he has here set down the plain tale of his sufferings. It is a moving story. Deprived of every amenity, half starved, forced to do menial work though physically unfit, punished brutally for trivialities—in fact, treated as outcasts—Colonel MacKenzie and his 500 fellow-prisoners kept up their morale through three long years and finally won through. On the Colonel's fifty-fifth birthday the Scots in the party organized a parade and inspection in his honour—a magnificent effort. The Colonel addressed them in a humorous manner: "I have never seen a finer body of men. You haven't a decent pair of boots or socks amongst you. I have reason to believe, however, that this is not altogether your fault."

The author can be scathing, as when he comments on the fact that his guardians in Rangoon aped the European, but succeeded only in "being a tenth-rate caricature of a third-rate Continental comedian giving an impression of an Englishman."

The Japanese in Rangoon did not recognize the Geneva Convention, and no Red Cross parcels came through to the prisoners. Even worse was their attempt to break the spirit of their prisoners. In a memorandum given to each prisoner occurred this passage: "Though you might think it enough to lay down your arms, we should never admit those who are not obedient in their thoughts or spirit as a true surrender." Colonel MacKenzie writes, "Perhaps this work of mine will cause some to think again." It has caused at least one person to do so.

ZACHARY COPE.

HAEMATOLOGICAL TECHNIQUE

Haematological Technique for Medical Laboratory Technicians and Medical Students. By F. M. Darmady, M.A., M.D. (Camb.), F.R.C.P., and S. G. T. Davenport, F.I.M.L.T. (Pp. 197+viii; 4 coloured plates, 25 figures. 18s.) London: J. and A. Churchill, Ltd. 1954.

This book was written "for medical laboratory technicians and medical students," but satisfies the needs of neither. The description of technique is too sketchy for the proper training of technicians; for example, the three pages devoted to various methods of visual haemoglobinometry by dilution methods give no description of matching technique. A fourth page describes the expensive and relatively inaccurate M.R.C. grey-wedge photometer, yet there is no description of the photoelectric methods that are the routine in most laboratories. Blood grouping, which constitutes half the work of haematological laboratories, is not mentioned at all.

The sections on clinical haematology are perhaps adequate for technicians—although much space is given to rarities—but are quite inadequate for medical students, who should be taught to think primarily in terms of the whole patient, not of laboratory findings.

Besides some grave errors of fact (iron absorption is ascribed to the gastric mucosa) the book contains a number of errors in technical procedures, suggesting careless revision of the text.

MARTIN HYNES.

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VACCINE AGAINST POLIOMYELITIS

Seldom has an item of scientific news aroused such intense and universal interest as last week's announcement of the successful outcome of the field trials with a poliomyelitis vaccine developed by Dr. Jonas E. Salk and his staff at the University of Michigan. The results, assessed under the expert guidance of Dr. Thomas Francis, jun., were released by the National Foundation for Infantile Paralysis to coincide with the tenth anniversary of the death of President Roosevelt and have been acclaimed as an outstanding achievement. The complete report is not yet available, and only limited accounts have appeared in Britain.¹

Ten years ago there seemed to be little prospect of immunization against poliomyelitis in the immediate future. Previous attempts in the 1930s with vaccines prepared from monkey nervous tissue were abandoned as unsafe.² But latterly the whole outlook changed and a new era in poliomyelitis research started. Four salient points previously reviewed in this *Journal*³⁻⁴ are worth emphasizing now. First and foremost came the discovery by J. F. Enders, T. F. Weller, and F. C. Robbins that poliomyelitis virus could be grown in tissue culture of non-nervous tissue and with it a complete change in experimental methods and outlook.⁵ Secondly, the existence of three distinct strains of virus was definitely established.⁶ In the same year I. M. Morgan showed that in vaccinated monkeys resistance could be correlated with the level of serum antibody.⁷ And lastly it became increasingly clear that the old idea of poliomyelitis as a neurotropic infection was no longer tenable. Following the work of D. M. Horstmann

and others⁸ and D. Bodian,⁹ a new concept of the pathogenesis developed with viraemia as an essential precursor to infection of the central nervous system. On this basis it seemed logical to prevent paralysis by stimulating the production of antibody in the blood stream.

Rapid progress was made in tissue-culture methods.¹⁰ It became clear that high concentrations of virus could be produced in tissue cultures of monkey kidney in a simple medium with a low protein content. Salk developed an experimental vaccine containing a mineral-oil adjuvant, and with it some degree of immunogenic activity was established.¹¹ A number of changes were made before the vaccine used last year was completed. The mineral-oil adjuvant was omitted and the process of inactivation with formaldehyde was changed.¹²⁻¹³ A team of Canadian and British scientists played a substantial part in the preparation of this vaccine at the Connaught Laboratories in Toronto, where methods of mass production had been worked out.¹⁴ The crude vaccine containing live virus was shipped to the U.S.A., where it was inactivated and tested. A leading member of the Anglo-Canadian team is now in charge of vaccine production by a pharmaceutical firm in Britain.

In the U.S.A. field trials last year 440,000 school-children in forty-four States were vaccinated, the children receiving three injections of 1.0 ml. vaccine over a period of five weeks. About half as many were injected with 1.0 ml. of the uninfected culture fluid; a further 1,830,000 schoolchildren served as additional controls.¹⁵ The final figures are not yet available, but Dr. Francis is reported to have stated that the vaccine had proved to be 80-90% effective in preventing paralytic poliomyelitis.¹⁶

Unquestionably this is a tremendous achievement and will become a landmark in preventive medicine. But at the same time it would be unfortunate if, in the first burst of enthusiasm, it was thought to be the final answer to poliomyelitis. Last year's trial established two main facts: the formolized vaccine was safe, and it produced an immune response. What has not been established yet, for obvious reasons, is the duration of the immunity. The question arises whether immunity produced in this way will interfere with reinfection, the natural method by which immunity is maintained, and, if not, how often booster inoculations will be necessary. The possibility of toxic effects from repeated injections with monkey tissue must be considered. Many problems on the general effect of formolized vaccine still remain unanswered, such as improved methods of preparation, quantitative assay, and the timing of vaccinations. At the same time research must go on with alternative

methods of developing an attenuated poliomyelitis vaccine along the lines suggested by A. B. Sabin¹⁷ and H. J. Cox.¹⁸ P. Lépine, of the Pasteur Institute, Paris, has also developed a vaccine which is soon to be tested,¹⁹ and a description of the vaccine manufactured by the Behringwerke in Marburg has already been published.²⁰

These are some of the points being studied in Great Britain. In 1954 the Medical Research Council appointed a committee of experts to advise on laboratory research, and valuable assistance in this direction has been given by the National Fund for Poliomyelitis Research. Vaccination centres have been established in which the serological response in children will be studied. A number of vaccines will be used, including those produced in Britain, attention being paid to the immune response in children from different age groups, with variation in the timing of the three injections. A follow-up of some of these children will be made so that the antibody levels can be studied over a long period. These are important questions, well suited to British research methods; they should be answered before mass immunization is attempted.

HOSPITAL CROSS-INFECTION

Twice in the last twenty years a well-founded hope that the prevention of sepsis could be achieved has been disappointed. For some years the sulphonamides served well for not only the treatment but the prevention of haemolytic streptococcal infections, but during the war resistant strains began to appear on which these compounds had no effect. The advent of penicillin did indeed solve this particular problem, because the haemolytic streptococcus cannot develop resistance to this antibiotic, and has been so suppressed by its use that hospital epidemics of this infection are now almost unknown.¹ It is remarkable that the once most dangerous form of communicable sepsis should now be the most trivial in its consequences if treated in any reasonable way. But penicillin was also confidently expected to deal equally effectively with staphylococci, and at first it did so: now it often fails for this purpose, as may most of the other antibiotics which have followed it. Staphylococci are among the most resourceful of all bacteria: they can acquire resistance to almost any chemotherapeutic agent, and they have a great capacity for epidemic spread and for prolonged survival in any closed environment.

After the use of penicillin had been general for some years it began to be recognized that strains

resistant to it had become established in hospitals, and particularly in surgical and maternity units. A majority of the staff of such units became nasal carriers of a resistant strain, which was sometimes transmitted to patients, causing infections which were usually, but not always, of minor severity. So much more attention has been concentrated lately on this form of cross-infection than in the past that we may be seeing things which escaped attention before, but it is at least a tenable proposition that minor staphylococcal sepsis is actually commoner than it used to be, in spite both of antibiotics and of improved aseptic technique. This is the conclusion reached by Howe,² who gives figures for the incidence of sepsis, usually staphylococcal, in clean operation wounds in the general wards of the Massachusetts Memorial Hospital. Between 1949 and 1953 there was a steady rise from 1.99 to 7.22%, and Howe suggests that these resistant strains—a small and highly selected fraction of the staphylococcal population of ten or more years ago—may be endowed with an epidemic propensity greater than that of the sensitive strains whose place they have taken. Whether or not the increase in such infections is real and general, the situation as seen by anyone who has studied it certainly gives no grounds for complacency.

Two papers in this issue of the *Journal* present the problem as seen in each of the two types of clinical unit in which staphylococcal cross-infection has been most troublesome. Drs. P. N. Edmunds, T. F. Elias-Jones, J. O. Forfar, and C. L. Balf describe at page 990 an epidemiological study pursued in three maternity hospitals in Edinburgh, and in the domiciliary practice of midwifery in that city. Nasal and vaginal swabs were taken from mothers on admission and eight days later, and eye and umbilical swabs from infants on the fourth and eighth day respectively. Pathogenic staphylococci recovered from these sources and from nasal swabs from the nursing staff, of whom slightly over half were carriers, were submitted to sensitivity tests to antibiotics and to a sulphonamide. The results of these tests were the basis for subdividing staphylococci into types. Although this method is not ideal, it serves two purposes at once, and two strains with clearly different sensitivities must be different in identity: the converse, of course, is not necessarily true. The percentages of babies in hospital whose eyes and umbilical stumps yielded pathogenic staphylococci were 35 and 40 respectively. The corresponding figures for those born at home were only 5 and 8.6, despite the fact that these families were attended by nurses from one of the hospitals. The antibiotic resistance patterns of the hospital babies' staphylococci corresponded with

¹ *Manchester Guardian*, April 13, 1955.² Boyd, T. E., *Bact. Rev.*, 1953, 17, 339.³ *British Medical Journal*, 1952, 2, 551.⁴ *Ibid.*, 1954, 2, 259.⁵ Enders, J. F., et al., *Science*, 1949, 109, 85.⁶ *Amer. J. Hyg.*, 1951, 54, 191.⁷ Morgan, I. M., *J. Immunol.*, 1949, 62, 301.⁸ Horstmann, D. M., et al., *J. exp. Med.*, 1954, 99, 355.⁹ Bodian, D., *Amer. J. Hyg.*, 1952, 55, 414.¹⁰ Weller, T. H., *New Engl. J. Med.*, 1953, 249, 186.¹¹ Salk, J. E., et al., *J. Amer. med. Ass.*, 1953, 151, 1081.¹² — et al., *Amer. J. publ. Hlth*, 1953, 43, 1384.¹³ *Ibid.*, 1954, 44, 563.¹⁴ Farrell, H., et al., *Canad. J. publ. Hlth*, 1953, 44, 273.¹⁵ Information Sheet, National Fund for Poliomyelitis Research, Vincent Square, London, S.W.1.¹⁶ *New York Herald Tribune*, European edn., April 13, 1955.¹⁷ Sabin, A. B., *Amer. J. Dis. Child.*, 1953, 80, 301.¹⁸ Cox, H. J., *British Medical Journal*, 1954, 2, 259.¹⁹ *Figaro*, April 14, 1955.²⁰ Haas, R., Keller, W., and Kikuth, W., *Dtsch. med. Wschr.*, 1955, 80, 273.¹ *New Engl. J. Med.*, 1954, 251, 411.

those in the nurses, and bore no relation to those of organisms from mothers. The mothers, indeed, seem to have played a singularly passive role; they usually neither acquired the prevalent organism nor communicated to their babies such staphylococci as they possessed themselves. Actual infections in babies were fairly frequent but of a minor nature. The authors do not mention breast infections in mothers—a more serious manifestation of this form of sepsis which may develop either in the ward or after the mother has left it. The conclusion that babies acquire their staphylococci directly or indirectly from nurses seems inescapable, and accords with the results of earlier studies. What we need to know is why more than half of the staff of such a unit so often become nasal carriers of a staphylococcus which is usually resistant to penicillin. No complete answer to this question has yet been given.

The same problem as it affects a surgical unit—and one doing specialized work in which the liability to sepsis is exceptionally high—is discussed in the paper by Dr. E. J. L. Lowbury in the opening pages of this issue. A series of different applications has been used successively in the Burns Unit of the Birmingham Accident Hospital for the prevention of staphylococcal sepsis. Penicillin failed owing to the appearance of resistant strains, as in turn did chlor-tetracycline and erythromycin, although each succeeded for a time. Dibromopropamide and staphylococcal phage became useless for the same reason (the former was also locally toxic). The latest policy is to combine penicillin with another agent to which resistance is less readily developed, and the two chosen have been neomycin and "hibitane." Both combinations have greatly reduced the frequency of colonization of burns by staphylococci, and no strain resistant to either of the new agents has been recovered. Apparently resistance to hibi-tane cannot be induced, even *in vitro*: to neomycin it can, but the resistant variant is a small-colony form of reduced virulence which might well be eliminated *in vivo*. It is not clear how much of this success was attributable to the penicillin in the combined treatment, and the new agents might well be tried alone—as appears to have been contemplated—or themselves combined.

Dr. Lowbury also reviews at some length the general problem of the erection of barriers to the spread of bacteria in hospitals. There are several new methods available, mainly directed to air hygiene, and the positive pressure ventilation of operating theatres and of rooms used for dressings will no

doubt come to be regarded as essential. Nevertheless "it is now common knowledge that the classical methods for controlling cross-infection—barrier nursing, cubicle isolation, aseptic techniques—are quite inadequate for the exclusion of resistant staphylococci from susceptible sites of hospital patients." If the deductions of Howe, quoted earlier, are correct, it is then indeed true that "the dilemma of hospital infection has been complicated rather than solved by chemotherapy."

MEASLES

The graphs of infectious diseases published in this *Journal* have recently been showing a weekly incidence in England and Wales of between twenty and thirty thousand cases of measles: deaths in the 160 great towns of England have numbered not more than one or two per week. The figures for deaths and the figures for cases are not derived from the same sources or areas and a death rate based on them would be inaccurate, but it is obvious that the present epidemic is one of very low mortality and very high infectivity. This has been the pattern of the disease during the sulphonamide and antibiotic era, and, if mortality alone were considered, it might be concluded that the disease is no longer of great importance. But, especially in younger children, the illness is still often very acute and recovery may depend on skilled nursing and powerful drugs.

The diagnosis of measles in the eruptive stage is usually easy: Koplik's spots are almost always still present on the first day of the rash and frequently on the second day too; their recognition ends all doubts when the rash is a little atypical. Sometimes the rash on the first day is quite discrete and the individual macules are small and pink. If the cervical glands are slightly enlarged, as they often are in measles, the resemblance to rubella is close, and failure to recognize Koplik's spots at this stage is a frequent cause of mistaken diagnosis. By the second day these rashes change to the florid semi-confluent dusky rashes of measles and the diagnosis becomes obvious. A less common cause of difficulty at this stage is the scanty coarse rash sometimes seen in the more "septic" types of scarlet fever: there is little evidence of punctation, the rash consisting of fairly large macules, scanty on the trunk but more numerous on the limbs, especially around the elbows and knees. The fauces in these cases are usually acutely inflamed and covered with exudate, the tongue is stripped, and the cervical glands are

enlarged and tender. The diagnosis can usually be made on careful clinical examination, but sometimes a white-cell count is necessary. A polymorph leucocytosis will be found in scarlet fever; in measles the count is nearer normal, with an increase in Türk cells and a decrease in small lymphocytes. Croup is a common symptom in the pre-eruptive stage of measles, when it is so desirable to diagnose and isolate the case: Koplik's spots can usually be seen and the disease diagnosed two or three days before the rash appears.

Bronchopneumonia is the commonest complication. Its presence can scarcely be missed, but it is often diagnosed when not present, especially in the first day or two of the rash. A child at this stage may have a temperature of 103–105° F. (39.4–40.6° C.) and there may be some moist sounds in the chest. But most cases of measles have moist sounds in the chest in the eruptive stage, and often the early, rather alarming temperature falls to normal within twenty-four hours without any treatment. A child with bronchopneumonia is a very distressed child, with grunting respiration, often a little cyanosed, frequently very restless, sometimes with slight neck stiffness, often with twitchings. It is desirable to try to make an accurate diagnosis in these cases, often not easy, rather than to administer antibiotics to every case with a high temperature and a few moist sounds. Most cases of measles recover with no specific treatment. Haemolytic streptococci are common causes of the bronchopneumonia of measles, and penicillin should always be given first: one injection of 100,000 units followed by oral doses of 300,000 units every four hours will give therapeutic serum levels. The routine use of penicillin to prevent complications of measles has been recommended, but careful observation of the individual patient is sounder and certainly more economic practice. In ward or institutional outbreaks, where cross-infection with secondary organisms may be expected, some such routine may be justified.

Otitis media is a fairly common complication of measles. It should be looked for with the auriscope and treated in the early stage with sulphonamides or penicillin, when it will usually resolve. Prophylaxis by routine drugs has been advocated for this complication too, but there is little to justify it. Enteritis occasionally accompanies the eruptive stage of the disease, especially in babies. It is usually non-specific in character and subsides in a day or two; no antibiotic treatment should be given unless the condition fails to settle, and only then if a specific organism is isolated. Encephalitis is the rarest and

most serious complication: there is no specific therapy. Cortisone has been advocated, but no convincing results have been published. Gamma globulin has been given in large doses, but the results have been disappointing; nor has concentrated plasma injected intravenously given much benefit. The only reassuring feature is that often the prognosis is not so grave as the symptoms suggest, and apparently complete recovery may occur after several weeks of coma. Patients with the paralytic type, if they recover, usually do so completely.

Measles is an acute and sometimes a serious disease. The onset of complications should be detected by careful observation of the patient, and treatment prescribed early. Indiscriminate dosing with antibiotics for a disease capable of causing twenty thousand cases a week has nothing to recommend it.

HYPNOTISM

There will be a warm welcome among medical men and women for the report on the "Medical Use of Hypnotism" which was approved at last week's Council meeting of the British Medical Association (see *Supplement*, page 190). The subcommittee of the Psychological Medicine Group Committee of the B.M.A.—under the chairmanship of Professor T. Ferguson Rodger—is to be congratulated on producing not only a very readable report but also one which is much to the point. For the past hundred years there has been an abundance of evidence that psychological and physiological changes could be produced by hypnotism which were worth study on their own account, and also that such changes might be of great service in the treatment of patients. Nevertheless, the profession as a whole has kept aloof, and the feeling has persisted that hypnotism was not respectable. There were sufficient reasons why this should be so. The mechanism of hypnosis could not be satisfactorily explained by any current theory on either a psychological or a physiological basis, while the observations which could be made often partook of the startling and spectacular; the patients who would naturally be selected for hypnotic treatment would consist largely of those suffering from what were often regarded as "imaginary" ailments; the practitioners of the art included a large proportion of charlatans and showmen with whom medical men would dislike being associated; and, finally, the actual method of treatment seemed to entail an element of wilful deception—for example, in persuading the patient of something which was not yet true—which doctors would regard with some repugnance.

Nevertheless medical interest in hypnotism has returned again and again, especially when stimulated by the widespread occurrence of acute neurotic illness. Such a wave of interest developed after the first

world war, though not after the last war, presumably because other methods of treatment—such as continuous narcosis and drug-aided abreaction—served the same purpose as hypnotism. However, public recognition of the need to curb the use of hypnotism as a spectacle has once more turned the spotlight in that direction, and the B.M.A. properly decided that the time had come to redefine the medical attitude. If, as the subcommittee recommends, the use of hypnotism is to be confined to those who will be governed by medical standards and ethics, the way will be thrown open to doctors to give the subject the attention it deserves.

The report lays great stress on the need for research, and, first among the subheadings, mention is made of neurophysiological and psychological observation under controlled conditions. In the final paragraph it is recommended that work of this kind should be sponsored by university departments and research foundations. Both of these points are of cardinal importance. Hypnotism has its physiological and its psychological aspects, and its central problems lie in the nebulous and difficult border country between the two disciplinary fields. In its operation there appears to be an interaction of psyche and soma which it is impossible to explain, in any satisfying way, with the aid of current concepts. Fundamental scientific work will require, and will be likely to lead to, new ideas, which may well prove to be of a revolutionary kind. For these reasons it is greatly to be hoped that fully trained research workers will be attracted to the investigation of hypnotism, and that they will be provided with all the facilities they need. Work with animals, in which the phenomena of hypnotism can be observed in a relatively simple form, should not be neglected. It will only be when we know and understand a great deal more about hypnotism than we do now that we shall be able to make the best use of its therapeutic potentialities. Meanwhile, even with our present inadequate theoretical understanding, it should be fairly easy to carry out, as the report recommends, the statistical investigation of its uses in treatment. Anaesthesia is one of the most obvious and important fields of study; and another would be among such common though varied disorders as stammers and tics, migraine, disturbances of sleep, and so on. The report rightly rejects the idea of there being a special "gift" for hypnosis, but doctors will undoubtedly vary in their aptitude for this as for every other form of specialized work. Those who feel the call to use hypnotism in therapy, and have the opportunity to do so, will hardly object if scrutiny is made, by statistical methods, of the results they obtain.

In 1831 the French Royal Academy of Sciences affirmed their belief that with hypnotism a new field of physiological science had been opened up; and this view has now been reaffirmed. It is to be hoped that the scientists will at last make use of their opportunity, and find out just how much, or how little, this field contains.

THE DISEASED DISK

Clinical interest in the "disk syndrome" and the diagnosis of it have increased in recent years, yet it remains a subject of some mystery and unfamiliarity. We are told¹ that H. von Luschka observed posterior prolapse of the intervertebral disk so long ago as 1859, but it remained until G. Schmorl's detailed study² of the spine in routine necropsies in Dresden during 1927 to 1931 for any proper assessment of the nature and the frequency of pathological lesions in these structures. Schmorl's work, part of which was also described by O. A. Beadle in a Medical Research Council report,³ established a number of different types of change in the contour of the intervertebral disk. When the bone tissue adjacent to its upper and lower surfaces becomes weakened, the disk tissue can expand diffusely, resulting in the "ballooned" intervertebral disk of advanced osteoporosis or osteomalacia. Under other—incompletely understood—circumstances, the nucleus pulposus may herniate through its fibrous capsule into the cancellous bone of the vertebral body; in fact in Schmorl's material this change (forming the lesions we now describe as "Schmorl's nodes") had occurred in 38% of adult spines. Finally, and of greatest clinical importance, posterior herniation of the nucleus pulposus into the spinal canal may occur. In Schmorl's series this posterior herniation was present in 15% of adult spines, and occurred most frequently in the lower dorsal and upper lumbar regions. These processes of diffuse expansion and herniation of the intervertebral disks result from the semi-fluid nature of the normal nucleus pulposus, the considerable compression to which these structures are subjected by the stresses of weight-bearing, and the osmotic factors⁴ which are responsible for their residual turgescence under resting conditions. Although intervertebral disks can undergo certain degenerative changes, including calcification, it is of interest that they can become herniated without any histological abnormality being present—or even developing—in the herniated tissue.

While Schmorl's studies were progressing, clinical awareness was developing of the sensory and motor changes resulting from compression of nerve roots by the same posterior herniation of intervertebral disk tissue into the spinal canal. The accounts of W. E. Dandy⁵ and of W. J. Mixter and J. S. Barr⁶ were illuminating, though back in 1911 G. S. Middleton and J. H. Teacher⁷ had described a case where paraplegia had resulted from "rupture" of an intervertebral disk during muscular effort. It became apparent that the

¹ Collins, D. H., *The Pathology of Articular and Spinal Diseases*, 1949, London.

² Schmorl, G., and Junghanns, H., *Die gesunde und kranke Wirbelsäule im Röntgenbild*, 1932, Leipzig.

³ Beadle, O. A., *The Intervertebral Discs. Observations on their Normal and Morbid Anatomy in Relation to Certain Spinal Deformities*, Spec. Rep. Ser. med. Res. Coun. (Lond.), 1931, No. 161.

⁴ Charnley, J., *J. Bone Jt. Surg.*, 1951, 33, 472.

⁵ Dandy, W. E., *Arch. Surg. (Chicago)*, 1929, 19, 660.

⁶ Mixter, W. J., and Barr, J. S., *New Engl. J. Med.*, 1934, 211, 210.

⁷ Middleton, G. S., and Teacher, J. H., *Glasg. med. J.*, 1911, 76, 1.

⁸ Stookey, B., *Arch. Surg. (Chicago)*, 1940, 46, 417.

⁹ Armstrong, J. R., *Lumbar Disc Lesions*, 1952, Edinburgh and London.

¹⁰ Spurling, R. G., *Lesions of the Lumbar Intervertebral Discs*, 1953, U.S.A.

¹¹ Mair, W. G. P., and Druckman, P., *Brain*, 1953, 76, 70.

"cartilaginous" masses sometimes observed at operation in the spinal canal were prolapsed intervertebral disk tissue and not tumours, and that clinical symptoms of sciatica from nerve root compression were commonly produced by such lesions in the lower lumbar region. More recently it has become clear from the work of B. Stookey⁸ and of others that symptoms referable to the arm and neck are occasionally produced by lesions in the cervical region of the spine. From the absence of clinical manifestations it would appear that the herniations observed by Schmorl and others in the dorsal and upper lumbar region do not usually produce nerve compression. The general accounts of J. R. Armstrong⁹ and of R. G. Spurling¹⁰ summarize the clinical aspects of the "lumbar disk syndrome" and discuss in some detail the problems of clinical recognition and treatment.

As to disk herniation in the cervical region, evidence has recently been brought forward in an important paper by W. G. P. Mair and P. Druckman¹¹ to confirm the idea that compression of the anterior spinal artery, with the secondary production of ischaemic damage in affected parts of the spinal cord, may play a large part in the production of symptoms. Such a mechanism is not possible in the lumbar region, where the clinically frequent sites of disk protrusion (L.4, L.5) are some distance caudal to the lower end of the spinal cord.

PORTAL VENOUS PRESSURE

By means of hepatic vein catheterization the portal venous pressure may be assessed indirectly. The technique is to block a hepatic vein by wedging the tip of the catheter into it and then to record the resulting pressure.¹ Investigations on man at laparotomy and on animals have shown that the pressure recorded in the blocked hepatic vein closely parallels that recorded directly in the portal vein.² The principle is similar to that used in assessing pulmonary venous pressure from measurements of the pressure in a blocked pulmonary arteriole—the so-called pulmonary capillary pressure.³

The pressure recorded in a blocked hepatic vein has been shown by this technique to be greater than normal in patients with cirrhosis of the liver, indicating the presence of portal hypertension.^{4,5} By this technique also it is possible to distinguish between intrahepatic portal hypertension in portal cirrhosis and extrahepatic portal hypertension resulting from portal venous thrombosis or congenital vascular anomalies, since in the extrahepatic group the blocked hepatic venous pressure is not raised. When vascular surgery for the relief of portal hypertension is considered, this test may therefore be of practical value in confirming the diagnosis of portal hypertension and in distinguishing the site of portal venous obstruction. It may also help in assessing the efficacy of the shunt after porto-caval anastomosis has been performed, if catheterization repeated after operation shows a significant fall in portal venous pressure.

¹ Myers, J. D., and Taylor, W. J., *J. clin. Invest.*, 1951, 30, 662.

² Friedman, E. W., and Weiner, R. S., *Amer. J. Physiol.*, 1951, 165, 527.

³ Hellem, H. K., et al., *ibid.*, 1948, 155, 98.

⁴ Paton, A., et al., *Lancet*, 1953, 1, 918.

⁵ Myhre, J. R., *Acta med. scand.*, 1954, 150, 281.

MEDICINE ON TELEVISION

As the honorary secretaries of B.M.A. Divisions well know, it requires prodigious efforts to gather together more than two or three dozen doctors at a local meeting. Whether they would turn out in greater number to watch medical television programmes in a closed circuit remains to be seen. Meanwhile, such "telecasts" in the U.S.A. and Canada are drawing audiences of 20,000 doctors and upwards. Last week, for instance, Dr. Thomas Francis, jun., and Dr. Jonas Salk spoke about the new poliomyelitis vaccine (see p. 1016) on a television programme sponsored by the National Foundation for Infantile Paralysis. In 63 cities in North America medical audiences—comprising, it is reported,¹ 54,000 doctors—met in halls specially equipped to receive the programme, which, being transmitted in a closed circuit, could not be picked up on ordinary domestic television screens. Earlier this year "two of the world's greatest medical extravaganzas"² had already been staged, the first on the management of coronary thrombosis and the second on the management and elimination of streptococcal infections. The importance attached to these programmes can be judged from the fact that the first—produced and sponsored by Smith, Kline, and French under the aegis of the American Medical Association and local and State medical societies—was introduced to the medical profession by the President of the United States. The second closed-circuit transmission was sponsored jointly by the American Academy of General Practice and Wyeth Laboratories. Presumably the three programmes already produced this year will be the forerunners of many more, and perhaps of similar programmes in Britain. Commenting on the value of these "ethereal pageants" (or "videoclinics"), the *New England Journal of Medicine*³ takes a cautious line and wonders whether the money might not be better spent on other educational needs. While there may be a place for the occasional "super" production designed for an audience of thousands of doctors, the small medical meeting, with its free and easy atmosphere and often keen discussion, is certainly not to be despised either for its educational or for its social advantages.

The Queen has approved the appointment of Professor G. W. Pickering as Regius Professor of Medicine at Oxford. Professor Pickering has been director of the medical unit at St. Mary's Hospital, London, since 1939, and he will take up his new appointment next year.

The Council of the British Medical Association has approved a proposal to award the Gold Medal of the Association to Sir Henry Simpson Newland, a past-president of the Royal Australasian College of Surgeons and of the Federal Council of the B.M.A. in Australia, in recognition of his outstanding services to the Association and to the profession.

¹ *Manchester Guardian*, April 16.

² *New Engl. J. Med.*, 1955, 252, 407.

EMERGENCIES IN GENERAL PRACTICE

BARBITURATE AND ASPIRIN POISONING

BY

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AND

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The summons, "Come at once: Mr. Smith has poisoned himself," may be the prelude to a medical emergency. How to deal with it depends to a large extent on circumstances of time and place. For example, Mr. Smith is, in fact, an employee of a general hospital, and, being on duty when the incident occurred, he is already on his way to a well-staffed and well-equipped medical ward. On the other hand, Mr. Smith may be a crofter 20 miles from the doctor's house and 100 miles from the nearest hospital. Most cases of poisoning, however, are seen in town practices, and it is against this background that the general practitioner is called upon to deal with the emergency.

The management of such a patient is likely to make excessive demands on the time and resources of the doctor who has innumerable commitments. It is therefore in the best interests of all concerned that steps should be taken to have the patient removed to hospital if the journey is not likely to prejudice his chance of recovery. However, even if transfer is practicable, the immediate treatment given by the general practitioner is infinitely more important than anything that can be done some hours later.

If the patient survives it will often be because the doctor or the relatives did the right thing at the outset; if, in the hospital ward, elaborate methods of resuscitation are needed it may well be because the simple forms of treatment were neglected while the patient was still at home. The general management is the same in nearly all the common types of drug poisoning, including acute intoxication by barbiturates and aspirin.

Removal of the Poison

The relative who telephones for the doctor must be told how to give first aid. This consists in making the patient vomit. If the patient is conscious—even though drowsiness is developing—vomiting can nearly always be induced by boldly thrusting a finger down the patient's throat. The vomitus should be collected in a clean pail for examination later. After vomiting has occurred the patient should be made to drink two cupfuls of warm water and then digital stimulation of the fauces should be repeated. This simple procedure carried out three or four times is invaluable. It is much more rapid and reliable than the use of reflex emetics; among these are common salt (a dessertspoonful in a tumblerful of tepid water) and mustard (a teaspoonful mixed into a thin paste with cold water and then diluted with tepid water to make a tumblerful); ipecacuanha wine (tinct. ipecac. B.P.—a tablespoonful) is even less reliable, and salts of the heavy metals (copper sulphate, zinc sulphate, etc.) should not be used because they are likely to damage the stomach and may even poison the patient, especially when they fail to cause vomiting.

The most reliable of all the drugs used as emetics is apomorphine hydrochloride. It acts centrally, but it is apt to fail if the brain is depressed by narcotics and other drugs such as barbiturates and salicylates, and for this reason the

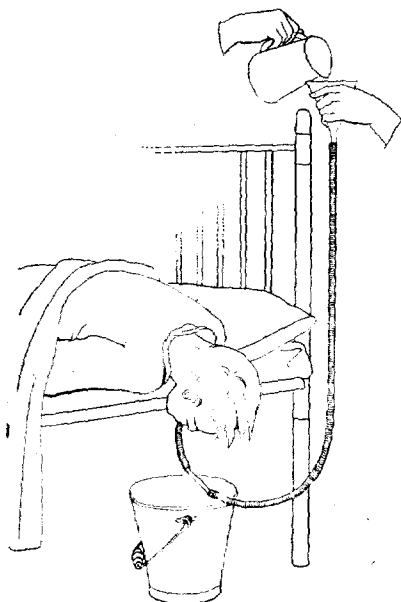
administration of this drug to the comatose patient is a waste of time. On first seeing the patient the doctor will decide whether it is worth while to give apomorphine. If there is reasonable likelihood of success—as judged by the degree of consciousness and the state of the corneal reflex—a dose of 6 mg. (1/10 gr.) should be given intravenously at once. It usually acts within two minutes, but if given subcutaneously it may take five minutes. Emesis is more likely to occur if the patient is sitting or standing, rather than lying down (B. Isaacs, personal communication). Occasionally circulatory collapse occurs following the use of apomorphine. Further, when vomiting is induced in a patient already ill from poisoning, special care is needed to prevent aspiration of vomitus. These, however, are hazards which must be accepted when dealing with this kind of emergency.

No matter what may be the outcome of treatment with emetics the stomach must be washed out. And even when it seems virtually certain that the poison has passed into the intestine gastric lavage should not be omitted; experience shows that when suicide is attempted by rapidly swallowing a large number of tablets, many of them may become impacted at the lower end of the oesophagus and remain there until they are removed by the physician—or by the pathologist at necropsy.

Gastric Lavage

It is reasonable to assume that when the general practitioner accepts responsibility for the treatment of a patient suffering from poisoning he has had considerable experience

of the routine procedure of washing out the stomach. The stomach tube proper (not to be confused with Ryle's tube), the glass connexion, the main length of rubber tubing, and the funnel are shown in the diagram. The total length of tubing should be about 5 ft. (1.5 m.) and its diameter rather less than $\frac{1}{2}$ in. (1 cm.). There should be two or three apertures in the side of the tube near the tip to minimize the risk of blocking by debris in the stomach. A suitable funnel which is readily available has a diameter of $4\frac{1}{2}$ in. (11.5 cm.). If the stomach tube is first dipped into water no other lubrication will be needed. The rounded end of the



Gastric lavage. Note position of the head.

rounded end of the tube is guided to the back of the pharynx, taking care to avoid the trachea, and is passed down the oesophagus. It is convenient to mark the tube 20 in. (50 cm.) from the tip: when this mark passes the lips it may be assumed that the free end of the tube is lying in the stomach an inch or two beyond the cardiac orifice. The doctor's poisons bag should also contain a smaller stomach tube and accessories suitable for use in children. The prone position of the patient minimizes the risk of inhalation of gastric contents in the event of regurgitation of fluid alongside the tube. About one gallon (4.5 litres) of tepid water is needed for lavage. In cases of barbiturate poisoning sodium bicarbonate should not be used, as it promotes conversion of insoluble barbiturates to their soluble sodium salts. The stomach is emptied repeatedly by siphonage. Not more than half a pint (300 ml.) should be poured into the funnel at a time, because large volumes of fluid rapidly entering the stomach tend to drive the gastric contents through the pylorus. The washings should be set aside for analysis. The biochemist's problem is made easier if the first few ounces of the vomitus or stomach washings is kept separate for examination; the rest of the material—much more bulky and dilute—can be sent in a separate vessel.

Before withdrawing the tube a solution of magnesium sulphate (two tablespoonfuls of the crystals in half a pint (300 ml.) of warm water) should be run into the stomach and left there. This hinders the absorption of water from the intestine, and if the toxæmia has not resulted in intestinal stasis a liquid motion may be passed within a couple of hours; bowel activity can be further assisted by giving a simple enema. Drastic purgation is undesirable because it exposes the patient to the hazards of dehydration; and where easily absorbed drugs are concerned purgation is unlikely to be an important method of elimination after the first few hours have elapsed.

General Supportive Measures

Once the poison has entered the body tissues there is little or nothing to be done to prevent its characteristic action. Nevertheless, much remains to be done for the unconscious patient: he requires food and water, otherwise there will be serious metabolic complications; he must be protected from bacteria which are capable of invading many parts of the body; and he must be saved, if possible, from the dangers which threaten life when the vital centres in the medulla are depressed, with consequent respiratory failure and signs of anoxia, and cardiovascular paresis with falling blood pressure. The services of experienced nurses are indispensable: the hygiene of the mouth, the skin, and the bladder calls for special care, and charting of all treatment is highly desirable. Recognition of these requirements underlines the importance of early admission to hospital. When this is impossible, the general practitioner is obliged to make such arrangements as may be practicable to provide some of the amenities of a hospital. The problems are complex, and in trying to solve them the close collaboration of the district nurse, the medical officer of health, and the ambulance service will be invaluable.

Four or five pints (2.5 litres) of fluid may be required daily. The intragastric drip is the best method for giving fluid and nourishment. With the patient in the supine position a Ryle's tube, lubricated with water, is directed into one nostril, pointing the tip backwards but not upwards. If it passes down the oesophagus, then when the single mark on the tube reaches the nostril the free end should be in the stomach. A few drops of water are passed through the tube to exclude the possibility that it is lying in the respiratory tract. After administering milk or other fluids the tube should be occluded with a spring clip, pressure forceps, or spigot and fixed to the side of the face with adhesive tape. If, however, intra-gastric administration is impracticable, fluid should be given parenterally—glucose solution (5%) or 5% glucose in normal saline intravenously. Water can be given by rectal drip. This method, however, is not unreservedly recommended: trouble may arise from block-

ing of the tube, or it may be pulled out inadvertently while the patient is being moved in the course of routine nursing care.

The daily intake of fluid varies according to such factors as the degree of dehydration and the activity of the skin, but the amount should suffice to ensure an adequate daily output of urine (say 1.5 litres). The onset of infection, especially at the bases of the lungs, must be anticipated by giving soluble penicillin intramuscularly—500,000 units followed by 100,000 units six-hourly. Incontinence of urine is inevitable and calls for the insertion of a self-retaining catheter; infection of the urinary tract, which almost invariably supervenes, necessitates the prophylactic administration of small doses of a sulphonamide—sulphadimidine 0.5 g. four-hourly injected through gastric drip tube.

Barbiturate Poisoning

In barbiturate poisoning respiratory failure is the chief danger. Serious prognostic signs are profound coma and the absence of poison in the gastric washings. Also, there may have been long delay in starting treatment. In such cases respiratory failure is almost certain to occur and this provides an urgent indication for transfer to hospital. The doctor should travel in the ambulance with the patient and be prepared to give artificial respiration *en route* if necessary. He should never leave the patient until his colleagues in the hospital have assumed responsibility; this is important, because in barbiturate poisoning respiratory failure often comes on suddenly.

In hospital the anaesthetist should be invited to supervise oxygen therapy and prepare appropriate apparatus to maintain a free airway and a satisfactory respiratory rhythm. Oxygen should be given without waiting for signs of anoxæmia, such as cyanosis of the extremities and the lobes of the ears. It is best administered by means of the B.L.B. mask or a special polythene bag at the rate of 6 to 8 litres a minute. If breathing becomes shallow artificial respiration must be started at once. The choice of method lies with the anaesthetist: bag ventilation of the lungs may be achieved manually or by a machine which ensures mechanical compression of the bag. The circumstances may warrant transferring the patient to the Drinker respirator and calling on a specially trained nursing staff. Artificial respiration and adequate oxygenation may maintain life until most of the barbiturate in the tissues has been either excreted or destroyed. The patient then gradually emerges from coma and normal breathing is resumed.

This phase of treatment, however, can often be shortened by giving analeptics. The two drugs most widely used are amphetamine sulphate and picrotoxin. Amphetamine sulphate is a safer drug than picrotoxin. The initial dose is 50 mg. intravenously, and this may be repeated after one hour if there is no obvious improvement—judged by recovery of the corneal reflex. If recovery is incomplete further doses of 25 mg. are given hourly. In severe cases a total dosage of 0.5 to 1 g. is not unusual. Picrotoxin is injected intravenously in 0.3% aqueous solution. The initial dose is 6 mg. (2 ml.), and this is followed by doses of 3 mg. (1 ml.) every three minutes until there is evidence of return of consciousness; but administration should not be pursued after slight twitching of the muscles occurs—for example, flickering of the eyelids. At this point caution is indicated: no more should be given for about 15 minutes, and then only if the twitching has ceased and the patient is relapsing into coma. If too much is injected there is a risk of causing convulsions, and these may be so persistent that intravenous injection of sodium thiopentone (0.1 to 0.5 g.) may be required to control them.

Interesting reports* have recently appeared on the actions of a new barbiturate antagonist called "NP 13" (β -methyl-ethylglutarimide), but it would be premature at the moment to offer an assessment of its value in general practice.

*Shaw, F. H., Simon, S. E., Cass, N., Shulman, A., Anstee, J. R., and Nelson, E. R. (1954). *Nature (Lond.)*, 174, 402. Harris, T. A. B. (1955). *Lancet*, i, 181.

Aspirin Poisoning

The toxicity of aspirin is much less than that of the barbiturates. If the patient's stomach can be washed out within an hour of his swallowing the tablets the chances of serious constitutional upset are negligible. Absorption of a large quantity of aspirin usually produces an acidotic state with noisy hyperpnoea. This is easily identified as a sign of acute salicylism because of the other characteristic manifestations—tinnitus, deafness, congestion of the skin, sweating, mental confusion, and muscular twitchings.

The acidosis of aspirin poisoning is best treated by giving Ringer-lactate solution *B.P.* intravenously. One pint (570 ml.) can be given in the first hour, a second pint in the next two hours, and thereafter one pint every four hours. This relieves the acidosis without exposing the patient to the risk of developing alkalosis. At the same time, if the patient is co-operative and can tolerate fluids by mouth he should be encouraged to drink water, tea, and coffee. Two teaspoonfuls of baking soda, in divided doses, can be given during the first two or three hours of treatment.

Next article on Emergencies in General Practice.—
"The Bleeder," by Dr. R. G. Macfarlane.

Refresher Course Books.—Copies of the first two volumes of collected articles from the Refresher Course for General Practitioners published in the *Journal* are still available at 25s. (postage 1s.) each. The first volume contains 55 articles and the second 60. Each article has been revised and brought up to date by its author.

These books may be obtained from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or through any bookseller.

THE FUNCTION OF HISTAMINE**REPORT OF A SYMPOSIUM IN LONDON**

On April 6 and 7 the Ciba Foundation held a symposium on histamine in honour of Sir Henry Dale, O.M., F.R.S., whose work with Laidlaw, and later Richards, laid the foundations of our knowledge of this substance. In conjunction with this symposium, on the preceding two days, April 4 and 5, the Physiological Society and the British Pharmacological Society held another symposium on histamine. This was at the Wellcome Foundation, London, and our correspondent's impressions of it are given below.

[FROM A SPECIAL CORRESPONDENT]

What is the function of histamine in man? No doubt the desire to find this out was one of the main reasons for the large attendance of scientists of different disciplines and from various countries at the recent symposium in London, arranged by the Physiological Society and the British Pharmacological Society.

Gastric Secretion

However, it is likely that most of the scientists were disappointed in their quest, for only C. F. CODE (Rochester) had sufficient of both knowledge and courage to claim for histamine a definite role in normal bodily function and to defend his claim against considerable criticism. Code holds that histamine is the normal direct stimulus for the secretion of gastric juice, and that all other stimuli—nervous or humoral—exert their effect by activating this histamine mechanism. His case is based on the local high concentrations of histamine found in the stomach and duodenum, on the presence of histamine in gastric juice in amounts closely correlated to the volume and acidity of the juice itself, and, of course, on the fact that injected histamine provokes gastric secretion. Support

for Code's conclusions was also to be found in the comments of R. A. GREGORY (Liverpool), who has shown that histamine potentiators will increase gastric secretion in response to a number of different stimuli.

Nerve Transmission and Vasomotor Control

No other definite claim for a physiological function of histamine was put forward. There was, on the other hand, quite a lot of evidence about what histamine does not do. U. S. VON EULER (Stockholm) drew attention to the large amounts of histamine found in some peripheral nerves, especially in post-ganglionic sympathetic nerves (adrenergic), but no explanation for its presence there was offered. Section of such nerves is followed sometimes, though not always, by a reduction in the histamine content of the organ they supply; but no experiments on the effect of tetanic stimulation of these nerves on their histamine content have been carried out. One is consequently unable to judge whether the histamine is actually present in the nerve fibres themselves or not, and, if it is so located, whether it plays a part in nervous transmission. R. F. WHELAN (Belfast), from studies of blood-flow under a variety of experimental conditions, came to the conclusion—based solely on evidence of resistance to block by antihistamines (always a doubtful criterion)—that there is no evidence that histamine plays any part in vasomotor control.

Allergy and Anaphylaxis

W. L. M. PERRY (London) discussed the role of histamine in skin allergies and thought that histamine was not involved in the direct pathway leading from the antigen-antibody reaction to the skin lesion. He suggested, however, that the fraction of skin histamine located in mast cells might have a defensive action in causing oedema and thus diluting and washing out foreign materials; and that the fact that large amounts of histamine in mast cells are found in the skins of only those animal species which do not easily form fixed-tissue antibodies in the skin might be because this histamine is a substitute for the antibody defence mechanism.

H. O. SCHILD (London) reviewed the role of histamine in anaphylaxis. Large amounts of histamine are known to be released during an anaphylactic reaction, both *in vivo* and *in vitro*; but Schild pointed out that other substances are also formed. This point was taken up by several others, notably by D. F. HAWKINS (London), who showed that, in anaphylaxis in the isolated smooth muscle of bronchi, a slow-reacting substance is released as well as histamine; and by W. E. BROCKLEHURST (London), whose demonstration of the release by the specific antigen of a similar substance from both sensitized guinea-pig lung and from human asthmatic lung was coupled with evidence of its power to contract human bronchial muscle. All these contributions suggest that histamine may not be the most important or the most direct cause of the symptoms of anaphylaxis and allergy in man; and Brocklehurst's work especially may have considerable importance in our understanding of the nature of asthma and the well-known failure of antihistamines in the treatment and prevention of asthmatic attacks.

Thus, on balance, there was a general concurrence of opinion that histamine is of less importance than previously thought in anaphylaxis and in allergies of various kinds; and that there is as yet no evidence that it has any physiological function in the peripheral nervous or vascular systems—a depressingly negative series of conclusions.

Patterns of Histamine Distribution

We may not have much idea why histamine is present in the body; we may know only an increasing number of things with which it appears to have little to do; we do know, however, a very considerable amount about where it is, how it gets there, and how it is released and excreted,

and it was in dealing with these aspects of the problem that this symposium was most successful. W. FELDBERG (London), in an opening review of the distribution of histamine in various species and various tissues, brought vague impression to vivid realization of the almost incredible diversity in the patterns of histamine distribution. Why should rabbit liver contain twenty or more times the concentration of histamine found in guinea-pig liver? Why should ox lung contain ten times more histamine than rat lung? Why should there be a high local concentration of histamine in the skin of the ear, nose, feet, and nipples of the guinea-pig? And why should rat skin have more than ten times the histamine content of guinea-pig skin? These are the questions that come spontaneously to mind, bringing with them no clear answer. Nearly all tissues contain some histamine, and the universal presence of small amounts does not occasion much speculation; its formation may well be associated with the metabolism of all types of cell. It is the strikingly high local concentrations, varying in locality from species to species, that cry out for a teleological explanation.

Role of the Mast Cell

G. B. WEST (Dundee) reminded us of the role of the mast cell. His work with Riley has established the extraordinary concentration of histamine in those cells (1 in 1,000 or more). Riley and West have demonstrated convincing correlations between tissue contents of histamine and of mast cells respectively, and offer this as one major factor in accounting for the diversity in histamine distribution. But, so long as the function of the mast cells themselves remains obscure, acceptance of these workers' views does not help in deciding the functional significance of the diversity. F. C. MACINTOSH (Montreal) continued the story of the location of histamine in the mast cells by reviewing the evidence which suggests that histamine is held in their characteristic metachromatic granules. These granules, which behave in many respects like mitochondria, can be separated by differential centrifugation, and histamine can be released from them by a variety of physiological and chemical stimuli, but not by specific antigens.

Since antigen-antibody reactions almost certainly do liberate histamine from intact mast cells, as pointed out for skin by W. L. M. PERRY, it may be that such reactions produce a change at the membrane of the mast cell, this change being responsible for the release of histamine from the granules. A similar mechanism for the release of histamine was postulated by B. N. HALPERN (Paris) to account for the action of the large-molecule histamine liberators (dextran and polyvinyl-pyrrolidone) which must produce their effects without entering tissue cells, the membrane of which would be wholly impermeable to them.

W. T. BERALDO (São Paulo) produced further evidence of the correlation between mast cell populations in tissues and their histamine contents before and after depletion by histamine liberators. He found one striking discrepancy, however, in the high local concentration of histamine found in the stomach and duodenum of the rat; this histamine is not released by histamine liberators and there are few mast cells in this region. It might be reasonable to suppose that this particular histamine is specifically concerned with gastric secretion.

Release of Histamine

W. D. M. PATON (London) reviewed the various classes of substance which release histamine and discussed possible mechanisms by which they might act. The list of substances known to release histamine is now formidable, and includes, apart from specific antigens, compounds which cause tissue damage, proteolytic enzymes, surface-active agents, large molecular compounds such as dextran, and dibasic and monobasic histamine liberators. J. L. MONGAR (London) described the various ways in which histamine-releasing activity can be estimated, and in this connexion

H. O. J. COLLIER (London) put forward some evidence to suggest that, in screening drugs for subsequent use in man, it is safer to test for histamine liberation by intradermal injection into a human volunteer than to rely on laboratory tests on animals.

M. ROCHA E SILVA (São Paulo) discussed the release of histamine by naturally occurring substances. He reviewed current thinking about anaphylatoxin and discussed the release of histamine by trypsin.

The whole question of the method or methods of release proved a controversial one. On the one hand, G. UNGAR (New York) presented his recent work on the activation of proteases by the antigen-antibody reaction, the resulting proteolytic activity going in parallel with histamine release, and C. G. HAINING (Birmingham) found that histamine release by dextran sulphate also ran parallel to protease activation. On the other hand, F. C. MCINTIRE (Chicago) pointed out that most tissue histamine could be released by boiling water, and all of it by cold extraction with basic lead acetate; trypsin did not release any additional histamine. McIntire considers that this is proof that the binding of histamine must be relatively loose and that the proteolytic activity cannot be necessary for its release. In view of the diversity of tissues and species which served as test objects this controversy may well be one of those in which there is much to be said on both sides.

Destruction of Histamine in the Body

The fate of histamine was another subject which provoked some controversial opinions. R. W. SCHAYER (Chicago), in reviewing his own recent and elegant experimental results, obtained using C^{14} -labelled histidine, showed that histamine is excreted in three forms. The first of them, he suggests, is the result of breakdown of histamine by diamino-oxidase to the riboside of imidazole acetic acid; the second, the result of breakdown by an unknown methylating enzyme, is methylimidazole acetic acid; and the third is free histamine mixed, perhaps, with N-methyl histamine. J. H. GADDUM (Edinburgh) disposed of acetyl-histamine, found in the urine sometimes in considerable quantities, as being of importance only in so far as it confused the picture of histamine metabolism as a whole.

G. KAHLSON (Lund) discussed the significance of histaminase in the body, and among other matters suggested that the exceptionally high histaminase content of the placenta is a defence mechanism to protect both the uterus and the foetus from histamine produced by the mother. E. A. ZELLER (Chicago) mentioned difficulties encountered in the nomenclature of the histamine-destroying enzymes, criticizing that used by R. KAPFELER-ADLER (Edinburgh), who did not, however, rise to the bait but dealt instead with the potentiating effect of oestrogens on histaminase activity, suggesting that determination of the latter might serve as a useful clinical test for hormonal imbalance in pregnancy.

Conclusion

One left with the feeling that, although there are still few known physiological functions of histamine, we are beginning to have a clearer idea of its dynamics and that perhaps further clarity in this respect may help to solve the teleological problem.

Sir HENRY DALE, who presided over the final session, confessed to embarrassment that a chance observation many years previously should have had such influence on the interests and endeavours of so many people. Few would agree that he has cause for embarrassment. All who attended must be grateful to him and to Dr. W. FELDBERG and Professor F. C. MACINTOSH, the chairmen of the two other sessions; to the Physiological Society and the British Pharmacological Society, who organized the symposium; and to the Wellcome Foundation, our most hospitable hosts for the occasion.

MEDICAL ASPECTS OF ATHLETICS

A meeting of the Harveian Society of London, with Mr. A. DICKSON WRIGHT presiding, was held on April 13 for a discussion on the medical aspects of athletics.

The Role of the Doctor

Sir ADOLPHE ABRAHAMS said that the criticism was made that the doctor could not be much of an authority on athletics because his preoccupation was with diseased not with healthy people. Superficially that was true, but only superficially. The doctor had played a great part in athletic training; he had rescued it from its extraordinary former state when athletes were advised to eat huge quantities of half-raw meat and to reduce their liquid consumption until they became dehydrated. As for injuries in athletics, in major injuries the general principles of surgery obtained, but minor injuries were a different matter. The athlete regarded himself as a privileged person. The ordinary patient might be satisfied to get away with a 10% disability, but the athlete expected complete restoration and in the shortest time. On the medical side much was said formerly about the dangers which schoolboys incurred by strenuous exercise and about the "athlete's heart." To-day he doubted whether any authority would agree that there was such a thing as a "strained heart" in the case of a healthy heart. A word should be said in warning against taking any violent exercise while in a pyrexial condition. In the case of poliomyelitis the danger was serious. All vital processes were affected by a rise in temperature—an engine worked best when hot—but there were dangers above a certain temperature limit. He had always protested against marathon races being run in the heat of the day.

In conclusion he paid a tribute to the work of British physiologists. Nearly 40 years ago Professor F. A. Bainbridge wrote his book on *The Physiology of Muscular Exercise*. It had been re-written and edited by others since then, but the basic principles there set out remained for all time. Such names as Joseph Barcroft, Martin Flack, A. V. Hill, and many others proved that this country was a pioneer in this field.

The Needs of the Runner

Dr. ROGER BANNISTER declared that athletes were essentially hypochondriacs, almost superstitious about health, and likely to consider themselves and their training methods much too seriously. These matters had been dealt with empirically in the past, and he did not think that physiology had yet got to the state at which it could make accurate predictions of a man's achievements. Dr. Bannister went on to speak in detail of three types of runners—the sprinter, the middle-distance runner, and the marathon runner. The sprinter was in a situation in which he was unable to make full use of the existing supplies of oxygen in the air, and was dependent on the extent of his lactic acid tolerance. His speed of movement was limited also by muscle viscosity, an innate property which could be influenced little, if at all, by training. The sprinter could by taking thought improve by a fraction his starting time and bring about an improved tolerance to some extent by practice, but an improvement of, say, 1% in his performance would barely be reflected in present methods of timing.

With middle-distance runners the problem was different. They could greatly improve their oxygen uptake by training. The oxygen uptake depended on many factors: cardiac output, ventilation rate, speed of diffusion in the lung, and the rate of oxygen uptake in the muscles themselves. If it were made possible for such a runner to breathe a higher percentage of oxygen there was no doubt that all distance records would be broken. Dr. Bannister showed diagrammatic curves which had been worked out to illustrate, in the example given, how subjects breathing

ordinary air reached breaking point within six or eight minutes, whereas others, subjected to the same strain but breathing a higher percentage of oxygen, were able to carry on for 16 minutes, and in some cases much longer. Whether it was practicable to breathe oxygen in high concentrations while running a race it was difficult to say. If it were, no middle-distance records would be beyond the runner's grasp, but whether this was desirable in what was after all only a sport was highly questionable.

The same phenomenon of oxygen lack was met with in mountain climbers, although there, of course, the trouble arose from deficiency of oxygen in the outside air. But in climbers at altitude the same mental changes and changes in vision and consciousness occurred as in distance runners. The problem of the distance runner was one of distribution of effort with a view to maximum economy. At certain parts of the race he might save oxygen and use it advantageously at others. As for the marathon runner, here the essential limiting factor might be not oxygen uptake but exhaustion of the carbohydrate reserves of the body. In conclusion Dr. Bannister said that the various physiological studies were undoubtedly a help to athletics, but the main thing was the athlete's enjoyment of his performance irrespective of the standard.

Dangerous Games

Sir ARTHUR PORRITT said that sport and medicine had always been linked together even from distant times, as was suggested by such hackneyed phrases as *Mens sana in corpore sano*. The problem of medicine in athletics was twofold. There was first the therapeutic problem, which had both its physical and its psychological components, and then the research problem, which was immensely stimulating. How many athletes in that company when running had had a "stitch," and who could explain it? What was the position of young women in regard to athletics from the gynaecological point of view? These and many other questions remained. In view of the number of people in this country who went in for some form of sport, sport medicine was as much a social service as industrial medicine. One had only to think of the vast number of work days and school days lost owing to injuries sustained in playing games. But the only people who took an interest in such matters were the insurance companies.

Games from the point of view of liability to injury fell into three categories: hazardous, medium risky, and safe. The most hazardous was rugby, 10% of whose players received injuries; the corresponding figure in soccer was 8%. Other hazardous sports were polo and lacrosse. Medium-risk sports included boxing and hockey. Safe sports were swimming, athletics, golf, tennis, and so forth, in which the players did not come into bodily contact. Sir Arthur Porritt concluded his remarks by describing the varied work of the sports doctor.

HUMAN REACTIONS TO DANGER

In an address to the Alfred Adler Medical Society on April 7 in London, Professor ALEXANDER KENNEDY, President of the Society, spoke on "Human Reactions to Danger." He described his observations on the effects of training on individuals already known to be capable of efficient performance under conditions of danger and stress, and their actual responses in the field.

It was always the hope of Science, he said, after the initial period of observation and record, to reduce a problem to as simple a form as possible and to put any preliminary conclusions to the test of experiment. Situations involving fear and danger were of particular interest to

Adlerians, as they represented the struggle to adapt to circumstance in its simplest form. In observing the natural experiments seen in time of war or where man chose to pit himself against the forces of nature in sport and in the pursuit of knowledge, it was essential to record events as they occurred, and not in terms of any preconceived theory. In studying psychological reactions and the subjective aspects of physiological changes it was necessary to minimize the effects of interpretation on the part both of the observed and of the observer. The hesitation to discuss fear and personal aims in warfare was at least as great as the inhibitions about descriptions of sexual matters in the normal citizen. In the constitutionally well-endowed, operating at their peak of efficiency, however, stress sometimes produced clear insights which were expressed in almost poetic language. The accounts given by trained observers of their own sensations and thoughts under stress were of value, if they retained their objectivity.

Professor Kennedy said that his work was based on the behaviour of individuals who had been examined in some detail previously, when not under stress. While most of the observations were made in time of war, he had found that the observation of athletes in training for major events also contributed useful material.

Survival Value of Fear

The general concept of danger and the emotion of fear had survival value. Foolhardiness was as pathological as neurotic breakdown. Individuals varied very greatly in their capacity to realize their full potential under stress, whether this was a matter of making the instantaneous decisions necessary in combat, or of straining the organism to a calculated degree of cardiac decompensation in athletics. Certain short-term mental mechanisms were employed to ensure, firstly that the individual prepared himself for danger, and secondly that under stress he simplified his mental operations in the interests of efficiency. Many of the features of breakdown showed as inefficient caricatures of these protective mechanisms.

The response to danger was a psychosomatic one in which the whole organism was involved, and variations in the individual response to the same situation were dependent on the previous make-up and on the efficiency of preparation. In both spheres there were alarm or short-term reactions and training or long-term reactions. Cannon had shown the way to understanding the immediate physiological responses, and Selye's work had great bearing on training and the building up of resistance to stress.

Professor Kennedy said that his own results indicated that the psychological responses showed a similar division into emergency and training responses. "Wind-up" or tension served a useful preparatory purpose, as did the mental mechanisms which concentrated the attention on essentials and allowed calculated risks to be taken instantly and without retrospect. He gave illustrations of the purpose of diversion, humour, anger, loyalty, and the reversion to simple and almost childish values in the interests of efficiency at the critical moments, and of the great vulnerability of the highly trained if compensatory mechanisms were upset by the unexpected. He also described the effects of drugs such as adrenaline, noradrenaline, amphetamines, and A.C.T.H. on the alarm and training reactions. Their actions had thrown a great deal of light on the optimum length of training as opposed to practice, on staleness in athletes, and on the relative place of thought and effort in preparation for stress.

Very simple theoretical conclusions could be drawn from these observations which, he thought, had a bearing on the more complicated stresses of adaptation to life and work in a civilized community. They might be of assistance in understanding the ways in which normal individuals adapted themselves to less acute stresses and how that adaptation might be threatened.

THE DOCTOR'S APPROACH TO PAINTING EXHIBITION OF THE MEDICAL ART SOCIETY

A professional artist reviews below the thirteenth exhibition* of paintings and drawings by members of the Medical Art Society.

This year's exhibition at Walker's Galleries shows the high standard of the Medical Art Society. The Society consists entirely of doctors who are also amateur painters, and it is interesting to see how painting is for them an escape from their daily lives. For instance, their professional life is largely concerned with people; yet these are almost wholly absent from the paintings. The subjects are generally remote rural scenes or deserted seascapes. Doctors work in houses or hospitals, but these pictures are mainly painted in the open air. There are few concerned with the objects and places of the doctor's work.

In general the paintings are objective and cheerful impressions of places visited in moments of relaxation. There is no hint of the anxieties of the everyday life of the doctor. This is strange, for the professional painter is often attracted to hospitals for material. Barbara Hepworth, for example, exhibited recently a collection of drawings of operations; and most painters are constantly using their immediate surroundings and the people near them as subjects for pictures.

As a profession, doctors have eyes trained to observe detail carefully, active and cultivated minds, and hands sensitive and deft. This is apparent in the paintings. The materials, whether oil, pastel, or water-colour, are skilfully handled; and observation is acute. Compositions are also well-planned, space and depth being admirably suggested.

Another interesting feature of the exhibition is that there is no apparent sign of influence by the dominant figures of contemporary painting. There seems to be no interest in the sources where Picasso and Klee, Sutherland and Moore, find their inspiration. The Medical Art Society seem to be escaping from the Atom Age and space travel in the same way as they are escaping from their clinics and operating theatres. This is not a wholly bad state, as it leaves the painter an open mind to record the facts in front of him without striving to fit them into a preconceived idiom—a fault so often found in the professional student of painting.

Landscapes and Still Life

The work in this exhibition is mostly a personal record of places, things, and people seen by the painter. Only occasionally is an echo of another painter's work to be found in such a picture as No. 37 by R. A. BEAVER (London), which reminds one a little of the work of Lowry, though Lowry's paintings have Midland industrial areas as their settings. R. A. Beaver has admirably adapted the style to portray a particular part of London. His other painting, *Cold Hampstead*, though different in style, also achieves this. Both are most interesting compositions.

No. 47, *Station Approach*, by A. B. HEWLETT (London), is also a painting that reminds one of another artist, in this case Charles Ginner, and the influence may be quite unconscious. The meticulous observation used by both painters excludes a feeling of light and shade and heightens the grey leaden atmosphere of this very English scene. To capture the character and "feel" of a particular scene is surely the object of all landscape painting; Claude and Turner were both masters in this way. A show of virtuosity in painting windswept clouds and sea foam can never compensate for a lack of atmosphere. That is why *South Downs*, No. 172, by R. OGIER WARD (London), is a good painting; it achieves the character of a particular place at a particular time and in this contains more than others which are executed with greater skill. Another painting

* The exhibition is on show at Walker's Galleries, 118, New Bond Street, London, until April 30 (hours 10 a.m. to 5 p.m.; Saturdays 10 a.m. to 1 p.m.).

which successfully creates a quite different atmosphere is No. 22, *Fortaleza de Sao Joao de Estoril*. FRANK FORTY (London) has achieved this by precisely opposite means to those used by A. B. Hewlett in No. 47. By selecting the minimum of shapes and colours and presenting them with complete simplicity, he obtains a feeling of sunlight and immense heat.

Three modest but successful landscapes are No. 43, *Amalfi*, and No. 52, *Yarmouth, Isle of Wight*, by D. N. MATTHEWS (London), and No. 65, *Barges on a Canal*, by C. VER HEYDEN DE LANCEY (Jersey). In No. 52 it is interesting to see how the painter has taken a mass of small boats and a large area of landscape and reduced them to a beautifully ordered composition.

The few still lifes differed greatly in character. No. 56, by NORMAN ASHTON (London), has its roots in Flemish painting. It shows an interest in the surface qualities of the different objects, which are skilfully represented. The cabbage was plainly a savoy. N. NEWMAN'S (London) interest in still life is quite different. It is in colour and form rather than surface texture. His painting, No. 82, has made full use of rich colour. Next to this painting is another still life by A. PHILLIPS (London); this has a most interesting composition and is sensitively handled.

In this exhibition of amateurs' paintings there are very few that are completely unsophisticated and unhampered by knowledge of academic painting. Exceptions are the three paintings by S. LEONARD SIMPSON (London), Nos. 85, 100, and 184, which have a directness of vision and are charmingly painted, especially No. 100, *Play Time*, which is really delightful.

Water-colours and Drawings

The water-colour paintings and the drawings are on the whole a little unadventurous, relying too much on the traditional and academic handling of this very difficult medium. No. 155, *St. Mawes, February*, by T. HOLMES SELLORS (London), and No. 149, *November in Barking Park*, by G. H. ROSE, are two paintings that use the medium well and imaginatively to express the season at which they were painted. No. 131, *Colherne Road*, by ISABEL WILSON (London), and No. 142, *From the Kitchen Window*, by CONSTANCE APPLETON (Inverness), are two other paintings fresh in technique and interesting in detail.

Among the drawings there are six portrait heads drawn with considerable skill. These are much more successful than the painted portraits. No. 116, by RENÉ MICHELMORE (London), has a fine feeling for the character of the little girl portrayed. The sculptured head in bronze, No. 19, by DAVID I. FINER (Kent), is also an accomplished piece of work having great solidity.

Final Impressions

The exhibition leaves one with the impression that, although the intelligence and skill of the medical profession can readily master the craft of painting, most doctors are reluctant to treat painting as more than a relaxation. If the painters had tried to communicate something of their special experience as doctors the exhibition could have had deeper significance.

And again, most doctors must be acquainted with art-therapy as used in tuberculosis and mental hospitals to reveal the buried thoughts and problems of their patients. It seems a little strange, therefore, that some of the exhibitors were not tempted to use the methods of art-therapy in their own painting.

A new half-yearly journal, *Veterinary Reviews and Annotations*, issued by the Commonwealth Bureau of Animal Health, Weybridge, has commenced publication. It consists of reviews of topical veterinary subjects and is obtainable from the Commonwealth Agricultural Bureaux, Farnham House, Farnham Royal, Bucks, price 25s. per annum. The first issue discusses intestinal diseases of young calves, parasites of poultry, and euthanasia for animals.

Correspondence

Management of Brain Abscess

SIR,—I felt sure that Mr. Walpole Lewin's article on this topic (*Journal*, March 12, p. 631) would provoke an otological protest about the route via which such abscesses should be approached, and my friend Maxwell Ellis (*Journal*, April 2, p. 848) has not disappointed me. It is perfectly true that in well-established cases where the brain abscess already is well localized simple drainage via the mastoid has often proved to be entirely satisfactory. But this presupposes a mastoidectomy, which may in fact not be needed in the early stage, if at all.

Otogenic brain abscess can arise in relation with acute or chronic otitis. In both cases the condition which may kill the patient is the intracranial complication, and this must take pride of place in regard to treatment. The underlying ear condition must have whatever treatment it merits, irrespective of the complication, but this should not be undertaken until the dangerous factor is controlled. In the acute case the chances are that adequate antibiotics will cure it without operation, or if operation be needed this can be done at leisure. In the chronic case otologists should not be stampeded into doing radical operations until the optimum moment, which will be determined by friendly consultation. We otologists should be invited to see these cases, and we should expect that our opinion on what should be done should carry weight, but in the last analysis our contribution should be secondary to that of the neurosurgeons.

If an otologist is faced with the possibility of doing something in a hurry for such patients miles away from neurosurgical help, he would do well to learn the simple technique of making a burrhole and needling the abscess. Close association with a neurosurgical unit for 18 years has made me realize that the best results are in fact obtained when the neurosurgeon operates through a clean field. Maxwell Ellis is fighting a gallant rearguard action, but I fancy he has reached the last ditch.—I am, etc.,

Oxford.

RONALD MACBETH.

Salicylates and Anticoagulant Therapy

SIR,—I was interested to read Dr. M. H. Singer's letter (*Journal*, April 2, p. 851). I would refer him to my paper on "Aspirin in the Treatment of Vascular Diseases," the correspondence preceding it, and a leading article¹ on the subject, all in the *Lancet*. There is also a paper by Lovibond² in the proceedings of the British Cardiac Society.

For the past five years aspirin in suspension has been used at the Torbay Hospital as a routine treatment for coronary thrombosis, pulmonary embolism, and thrombophlebitis. It is widely used in this area by many doctors who prefer it to the better-known anticoagulants for domiciliary use, for it is not only a safe anticoagulant but it often relieves anginal pain as effectively as nitroglycerol. I have not yet had time to assess the results during this five-year period, but I hope to do so shortly. The fact that so simple and ancient a remedy has maintained its popularity in this area for five years speaks well for its value.—I am, etc.,

Torquay.

PAUL C. GIBSON.

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- ² Ibid., 1949, 1, 189.
- ³ Lovibond, J. L., *Brit. Heart J.*, 1950, 12, 429.

Doctors and the Press

SIR,—I had not intended to enter this correspondence, but the letter of Dr. Alfred Byrne, Medical Correspondent of the *Manchester Guardian* (*Journal*, March 26, p. 791), requires a certain amount of annotation, for it attempts to suggest that Press attention was of benefit to the mother of the Nigerian twins.

Before the operation on the children, and for a couple of weeks after it, their mother showed the greatest possible emotional disturbance at the very mention of the word reporter and insisted on not meeting any. Furthermore, at one point in this period she had to be persuaded not to withdraw her permission for operation and not to return to Africa with the children unseparated; discussion in the Press of the prognosis had led her to believe that the operation could not succeed. She was particularly upset not only at attempts to obtain unofficial photographs of the babies through the ward windows, but was even alarmed for the survivor's safety when the official flashlight photographs were taken. She particularly refused to receive those persistent representatives of certain Sunday newspapers who insisted on bargaining with each other in attempts to buy an "exclusive interview" for large sums of money. Mrs. Davies's permission for interview was not "forthcoming." After a couple of weeks had passed, when she was convalescent from her anxiety and grief, she was persuaded by me to attend an official interview with a representative number of reporters, and I have no doubt it was this occasion to which Dr. Byrne refers as "a lengthy interview." This interview was trying. Nevertheless, the mother of the twins, who is a gentle, kind, and courteous person with a short memory for evil things, told the collected reporters, when directly interrogated, that she had found them all nice except two. This exception number would have been much larger if she had not enjoyed special protection. On balance, Press attention was harmful to the mother of these children, and if access to her had been freer it might have been harmful in an extreme and long-standing degree.

The distribution of news to the Press had to be meagre rather than "adroit," because even before the children arrived in England their identity had been disclosed to the public. Intimate anatomical and pathological details cannot be supplied about an individual whose identity is known unless that individual or his or her guardian gives permission, which in this case was not obtainable. Dr. Byrne refers to the "large business house which had a finger in the pie." The use of this last term nearly always implies rancour, which in this connexion is not dissipated by Dr. Byrne's failure to mention that the company in question, the United Africa Company, had not only been officially responsible, without any wish for publicity or profit, for bringing the mother, the twins, and a nurse to England, but was regarded by the lady in question as her protector, and its Press representative her nearest friend, adviser, and confidant in this country. The Press representative of that company, Mr. Dennis Buckle, handled the whole situation extremely "adroitly" in my opinion, and the actions of the company were uniformly responsible, honourable, and humane.

Dr. Byrne mentions an article in a weekly magazine and appears to be resentful also about its appearance. I would refer him to the article again and he will find that no part, internal or external, of either baby appears in any part of the illustrations except for one picture which had already appeared in the public press; in the illustrations shown none of the doctors concerned could be identified by his closest friend; no fact appeared in the article which had not previously appeared, or at least been deducible from facts previously published, officially or unofficially, in the public press. Some of these facts had appeared exclusively in the *Manchester Guardian*.

The help of the Public Relations Officer of the British Medical Association, Mr. John Pringle, was refused in the case of the recent twins because the relatives of the twins had made secrecy an absolute condition. To my mind, if a doctor has given his word specifically not to disclose some particular secret he is not at liberty to disclose it in any circumstances. I think any man of honour would agree with this principle even in a non-medical connexion. Dr. Byrne quotes Mr. Pringle in writing that, if the help of the British Medical Association had been accepted, the two cases of the twins would "have had the courteous co-operation of all but the less reputable elements of the Press." The answer to this argument is implicit in the last six words. It is precisely the less reputable elements of the Press whose attention most people hope to escape. The only way to escape it is to achieve secrecy. Although we have since been told by a person of responsibility in newspaper work

that secrecy in such cases is unobtainable because of the wide network of paid Press informers throughout all the hospitals of the land, secrecy was in fact obtained in the case of the recent twins, at least for the period covering their investigation and operation.—I am, etc.,

London, W. 12.

IAN AIRD.

Winter Coughs

SIR,—Apropos of your leading article on winter coughs (*Journal*, March 12, p. 651) in which you rather tend to depreciate paregoric, may I remind you of your own annotation (*Journal*, September 30, 1944, p. 441) wherein you summarize the experimental results of some Canadian workers, which I in turn may sum up in brief by quoting Quincy's¹ opinion—that is, that opium procures a truce with the cough and so provides opportunity for the other ingredients to rarefy and thin the viscid cohesions in the vessels, etc.? Certainly Boyd and MacLachlan² show most clearly that paregoric, especially when matured by keeping, increases the respiratory tract secretion of experimental animals, in the case of albino rats by as much as 300%.—I am, etc.,

South Molton, Devon.

R. A. NASH.

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- ¹ Quincy, J., *Pharmacopoeia Coll. Reg. Med. London*, 1724.
- ² Boyd, E. M., and MacLachlan, M. L., *Canad. med. Ass. J.*, 1944, 50, 338.

Night Cramps

SIR,—Night cramps have, during the last few years, rather interested me, as I have seen about a dozen cases of this unfortunate complaint in general practice, and in each instance the patient has merely mentioned it *en passant*, as "one of those things." Quinine tablets have given relief in a number of cases, but in none have I found anything to compare with mephenesin elixir given last thing at night *in water*, since taken neat it does cause a burning sensation.

I have actually been able to experiment on my own family, since my wife had paralytic poliomyelitis four years ago and, although she has only very slight residual weakness in one leg, when she is tired this one leg is very liable to cramp at night especially when lying in certain positions. Mephenesin was given by me over a period of three months and the terrifying cramps were definitely improved. I also found that, if one can elicit which muscles are cramped, putting the limb in the opposite position by forcing it against the affected muscle—that is, flexing forcibly the leg at the knee when the quadriceps are in spasm—will break the attack. I have endeavoured to teach my patients a little basic anatomy so that they may gain relief from this manoeuvre should mephenesin not be 100% efficient.—I am, etc.,

London, W. 6.

DAVID JACKSON.

The Metric System

SIR,—We are all intellectually convinced that advantages would accrue if we could convert our system of weights and measures and our mental concepts to a metric system. Not everyone is convinced that the benefits would be worth the not inconsiderable effort of making the change. Clinicians all require to be familiar with both systems, but most people have two distinct mental compartments for things like body-weight, which are kept in the British unit compartment, and those like doses of sulphonamides, which live in the metric compartment. The two mental compartments are usually highly exclusive: any transference requires a complicated administrative process reminiscent of a civil service office. Who, for example, could quote the usual dose of sulphaguanidine in grains or his own height in metres without recourse to paper and pencil if not to a reference table?

One of the many ways in which this schizophrenic thinking inhibits good work is in prescribing fluid or electrolyte replacement. The tradition of ordering "a pint of 5% glucose-saline" or "a pint of blood and a pint of half-

strength saline" dies hard. It is based on rule-of-thumb therapy which clinicians have learned by experience to be appropriate in certain conditions, but it is rarely the result of logical thinking. The importance of reasonable precision in adjustment of body fluids is becoming increasingly apparent. Most who have some years of experience behind them can think back to patients whose death was probably due to imbalance of their internal body fluids. There is no doubt that the only satisfactory way to record concentrations of these ionic solutes of the body and the amounts lost in excreta and effluents is in milli-equivalents per litre. To calculate how much should be put back when transfusion solutions are marked in per cent by weight and in ounces and pints is most laborious; it is usually not attempted or is thrown back to the "lab. man." Let anyone who is in doubt calculate how many ounces of 5% sodium lactate and of half-strength saline are required to make good a deficit of 47 mEq. sodium and 32 mEq. chloride, and if he is still in doubt let him make the necessary adjustment if it is also necessary to give 15 mEq. potassium as KCl. If people could be persuaded to accept transfusion fluids marked in mEq./litre of each ion and the volumes in litres and half-litres the necessary calculation could be done mentally in ten seconds. The arithmetic required under the present system is such that the majority refuse to attempt it and continue to give fluid by "blind experience." There are those who would maintain that blind experience is an oxymoron and that they can get on well without milli-equivalents and analyses of body fluids; similar statements have been made about antiseptics, x-rays, and anaesthetic machines. There are many cases where plasma and urine analyses are unnecessary, but there are also many cases where they would have led to life-saving measures.

The obvious conclusion is to have transfusion fluids marked in both systems for the present. The intelligent use of such fluids would be greatly promoted, the not inconsiderable danger of mistakes in calculation would be eliminated, and lives would be saved.—I am, etc.,

Glasgow, C.4.

JAS. C. EATON.

Chicken-pox Quarantine

SIR,—Most of us will agree with Dr. M. Curwen (*Journal*, March 19, p. 727) and Dr. J. F. Warin (*Journal*, April 9, p. 908) that too much fuss is made about chicken-pox in schools. Certainly the adult with, for example, painful herpes ophthalmicus, complicated perhaps with iritis, may find it difficult to be grateful to the school doctor for the zeal with which he prevented him from acquiring immunity at the expense of a trivial illness involving a few days in bed. On the other hand, severe cases of chicken-pox do exceptionally occur, and if one were to connive at the infection of a child who subsequently developed chicken-pox complicated by encephalitis one would scarcely feel very happy about it nor would one's medico-legal position be very secure.

I agree that the segregation period for chicken-pox is also very much over-done. For many years in hospital I have worked on the assumption that as soon as the last lesion has well scabbed the risk of transmission is negligible, and it has so far never let me down. This period usually coincides with Dr. Warin's "five or six days after the appearance of the rash," though occasionally if there are several crops it may take a little longer.—I am, etc.,

Isleworth, Middlesex.

G. E. BREEN.

SIR,—Recent correspondence in the *Journal* on the subject of chicken-pox prompts me to report the following case.

On January 31, 1955, I was asked to see a girl of 8 years, whom I found to be suffering from chicken-pox. Her mother was on that actual date due for delivery of another child, and as she was quite positive that she had had the disease in infancy the arrangements made for home confinement were allowed to stand. The baby, a girl, was born spontaneously on February 2, but ten days later the

remaining child, a boy aged 2 years, developed typical chicken-pox. On February 17 the baby, now aged 15 days, developed a similar rash, which responded well to treatment with an ichthyol-calamine lotion, and had cleared away completely by early March.

From those textbooks which I have been able to consult I find that chicken-pox is a distinct rarity in the neonatal period. I would be interested to learn if any readers have seen other cases as young as mine.—I am, etc.,

Glasgow, N.2.

NEIL McDUGALL.

Ban on Heroin

SIR,—The relief of severe pain, especially in those dying of incurable malignant disease, is surely the moral duty of every doctor. If therefore heroin is required, as it certainly is, for those patients who have become resistant to the less potent analgesics, then no effort should be spared to ensure its legitimate supply, regardless of the administrative inconvenience it may cause a government.—I am, etc.,

Ipswich.

JAMES WIGDAHL.

SIR,—We were astonished to learn from Dr. A. H. Douthwaite's letter (*Journal*, April 9, p. 907) that the Government has decided to ban heroin. We would like to add our protest. Quite apart from the usefulness of the drug, it seems to us an intolerable interference with our liberties, which should not be borne by the medical profession without objection.—We are, etc.,

Winchester.

F. C. HEATLEY.
H. J. BLISS.
G. H. FISHER.

Hypodermic Injection Technique

SIR,—Being to-day mainly concerned with the immunization of young children against diphtheria and whooping-cough, I would like to comment on Dr. K. D. Salzmann's letter (*Journal*, April 9, p. 909). I have for a long time applied his principle without, I admit, defining, as he has so ably done, the factors responsible for its undoubted success. All my injections are given in the deltoid region, and the very great majority are subcutaneous. When inoculating babies and very young children, and especially when the victim insists on watching what is going on, I find that stroking the skin gently two or three times with the back of the needle before inserting the point often allays suspicion. Yet more important, having punctured the skin—the critical point in the operation—I hold the syringe absolutely still for a second or two before pressing the piston, using meanwhile every available device for distracting the child's attention. Incidentally, a slight protrusion and side-to-side movement of the tip of one's tongue will often so astonish the patient that a ml. more or less no longer matters. A No. 20 needle is an ideal weapon of attack; and it must be remembered that adsorbed antigens with a mineral carrier cause, *per se*, more pain on injection than do the newer suspended vaccines.—I am, etc.,

Cross-in-Hand, Sussex.

H. L. DUKE.

Hot-water Bottle Burns

SIR,—Yet another case of burning by hot-water bottles has been recorded in your columns (*Journal*, April 2, p. 856). It seems reasonable to call for a critical review of the use of hot-water bottles, at least in the care of the severely injured.

Recent work has shown that it is more important to prevent further loss of heat from a shocked patient than to add heat. When the circulation of the skin is depressed the heat added to it from without tends to accumulate and cause a rise in temperature which may reach locally lethal levels. Some years ago Sheehan¹ reported the case of a woman who died following obstetric shock. A hot-water bottle had been applied to her side, and although its temperature was not very high the underlying tissues, including the surface of the liver, were found at necropsy

to have been partly cooked. Even in a fully conscious patient the pain of a burn quickly passes away after the full thickness of the skin has been destroyed. If the burning agent remains after the pain has disappeared a very serious burn can result.

These facts leave no doubt that deliberate warming of patients should be completely abandoned and that reliance should be placed upon reducing loss of heat by careful wrapping in blankets; even in the freezing conditions of the Italian campaign during the war this was found adequate. The old campaigner's advice about having as many blankets under the patient as over is particularly important in this connexion.—I am, etc.,

Birmingham, 15.

P. S. LONDON.

REFERENCE

Sheehan, H. L., *Lancet*, 1948, 1, 1.

Castration of Sex Offenders

SIR.—It is an axiom of moral philosophy that the moral law must be supreme. Expressed more explicitly, this means that if an action is condemned by the moral law then no reasoning, medical, sociological, or scientific, can justify that action.

A few years ago the Church of England Moral Welfare Council issued a booklet on sterilization,¹ in which it stated there appear to be no circumstances in which it would be legitimate for the State to exercise the right of punitive sterilization. The reasoning behind this statement is fully set out in the booklet. It further pointed out that as regards therapeutic sterilization properly so-called (to be distinguished from operations necessary to the welfare of the body as a whole which involve sterilization as an indirect effect—for example, hysterectomy), the rule is that an operation is only morally justified when it is the only means of securing the welfare of the body as a whole. In the cases quoted from the Danish experience, vasectomy or castration were not the only means of treating the delinquents.

As far as practising Anglicans are concerned, procedures such as the Danish castration one you commented on in your leading article (*Journal*, April 9, p. 897) can be of only academic interest.—I am, etc.,

Bath.

J. H. WHITTLES.

REFERENCE

¹ *Human Sterilization*, 1951, Church of England Moral Welfare Council, London.

A Simple Method of Performing Bronchography

SIR,—Standard methods of bronchography are apt to cause great discomfort to the nervous patient, and the following method, dispensing almost entirely with local analgesia, has been carried out at the London Chest Hospital, Country Branch, in the past few months on a series of adults with excellent results. If the patients are producing copious sputum postural drainage is instituted under the guidance of a physiotherapist for several days prior to the investigation. As most of the patients have been tuberculous, with upper lobe bronchiectasis and little sputum, this has seldom been required. It has not been found necessary to provide antibiotic cover—for example, penicillin—and sensitivity tests have been discarded, as there is no release of iodine or iodides from the opaque medium used. Methylpentynol, two 250-mg. capsules, and atropine, 1/100 gr. (0.65 mg.), are given half an hour in advance, and have been satisfactory as a premedication.

The method of endotracheal intubation is used with the patient sitting up, and a Jacques No. 9 E.G. rubber catheter, smeared with 2% lignocaine ointment, is inserted into the right or left nostril according to patency. When it reaches the level of the posterior nares the patient is asked to put out his tongue, which is covered with a gauze swab. He is then instructed to pull his tongue forwards and downwards with either hand, and at the same time to protrude his chin forwards and slightly upwards. The catheter is slowly pushed onwards and the tip drops naturally into the larynx and trachea, causing a momentary tendency to cough, which soon passes. The basal and apical lower segments are filled by injecting 4–6 ml. of "dionosil oily" into the tube, after shaking the bottle, with the patient sitting up and leaning

backwards and to the side to be filled, and with the shoulders rotated towards the same side. The middle or lingular segments are filled with a further 3–5 ml. while the patient bends forward and to the side to be filled, with the opposite shoulder raised and tilted forwards. The upper lobe is filled with the patient lying on his side with the head supported on two pillows to prevent the medium from running backwards up the trachea, using another 6 ml. Each of these three positions is maintained for one minute. X-ray films are then taken in full inspiration with the patient recumbent in the lateral or oblique and antero-posterior positions. It has been customary with tuberculous patients only to carry out bronchograms on one side at a time.

It will be noted that no local analgesic, apart from the 2% lignocaine ointment smeared on the catheter, is used throughout the investigation, the latter being used mainly for its lubricant value. This reduces the time factor so that it is possible to complete the bronchogram in an average time of 15 minutes, including developing the films. Toxic reactions to local analgesia are thus avoided, and the patient is able to eat his next meal without fear of food going "down the wrong way." Careful spraying of local analgesic into the back of the mouth and into the larynx has been found to be time-consuming and completely unnecessary. Indeed, it provokes coughing and laryngeal spasm so that it may not be possible to pass the tube beyond the patient's cords at all, and adds considerably to his discomfort. With this method laryngeal irritation is avoided and the tube slips easily into the trachea in a matter of seconds. Also it is of such a diameter that it is unlikely to be coughed up.

Patients subjected to this method of bronchography, and who have had bronchograms by other methods, have all been impressed by the small amount of discomfort caused and by the speed of the investigation. I would like to thank Mr. L. H. Porter, Chief Radiographer at the London Chest Hospital, Country Branch, Arlesey, Beds, for his co-operation with me in this work.—I am, etc.,

Frimley, Hants.

JOHN C. BARKER.

Recovery from Chronic Lymphocytic Leukaemia

SIR,—May I add another case of 10-year recovery from lymphocytic leukaemia to those noted by Dr. Max Schott (*Journal*, April 9, p. 877)? In 1933 I was asked to see a well-known American aged 73 who was suffering from a mild attack of bronchitis. After a few days his general condition deteriorated and I noticed a few enlarged lymph nodes in various parts of his body. A blood count showed a typical lymphatic leukaemia. I told his wife a former nurse—that he was suffering from something more serious than bronchitis. She replied: "Oh, has his leukaemia come back?" She then told me that her husband had been desperately ill for many weeks in 1923 with leukaemia, and indeed had been ill for some six months before making a complete recovery. He was very ill for some weeks, under my care, but finally insisted on making the attempt to return home. He died at sea. On her return home his widow sent me the report on his 1923 illness, by Dr. Gutmann,¹ of New Brunswick.—I am, etc.,

Buxton.

F. A. BEARN.

REFERENCE

¹ Gutmann, B., *Amer. J. med. Sci.*, 1924, 167, 718.

Tropical Pulmonary Eosinophilia

SIR.—I have read Dr. James A. McFadzean's account (*Journal*, March 26, p. 771) with great interest, and wish to record my findings during 1943–4 at the Indian Military Hospital, Bangalore. During that period five cases of pulmonary eosinophilia were diagnosed and confirmed by the Army medical specialist. The signs and symptoms were as those described by Dr. McFadzean, and the x-ray findings in all cases were similar. The lungs showed a general woolly appearance, in fact one would mistake the x-ray for pulmonary tuberculosis. Treatment in those days was with N.A.B. and the response was very satisfactory, the whole condition clearing in about 12 weeks.

Two of the above cases were invalided from the Army, even though they showed great improvement, but psychological and malingering elements predominated, hence the reason for invaliding from the Army. The N.A.B. treatment was started at that time, as we had very good results

from N.A.B. in two cases of asthma. The course was bi-weekly injections starting with 0.15 g. and increasing to 0.45 g. The condition cleared, showing an x-ray of the lungs with clear fields, and W.B.C. within normal limits. In all cases the predominant signs were a very high W.B.C. count and the very typical x-ray findings.—I am, etc.,

Bagdad, Iraq.

E. D. DE KELAITA.

Cancer Education

SIR,—The letters of Mr. Malcolm Donaldson and Dr. W. A. Ball (*Journal*, April 2, p. 849) criticizing our article (*Journal*, March 12, p. 627) call for brief replies. Mr. Donaldson is distressed by our "appalling" mistake in not mentioning and emphasizing "cancer." We admire his own pioneer work in the field of cancer education, and wish him all success. However, had we adopted his method our task would have been much more difficult than it was, and the problem of recalling patients for follow-up examination after doubtful or suspicious findings would in many cases have been insuperable. When the pioneers, such as Mr. Donaldson, have done their own important educational task on a really large scale, it may be possible to talk freely of cancer at medical overhauls. But that day has not yet come, at least in this district.

Dr. Ball's thesis, of a psychological-hormonal upset caused by our campaign and leading to an increase in cancer, is interesting, but not supported by figures. We have analysed the number of cancer cases in the practice (excluding the skin) over the last seven years, and there is no obvious effect of our campaign in the numbers recorded. In fact, there was a temporary increase that began six months before the outset of our investigation. It might well be that an intensive educational campaign would be accompanied by an increased incidence of recorded cancer, but this would more probably be accounted for by an ageing population, improvement in diagnosis and certification, etc. Such factors would at least have to be ruled out first.—We are, etc.,

J. WALTER.

Sheffield, 10.

E. C. ATKINSON.

Post-puerperal Recurrent Depression

SIR,—I have been interested in Dr. R. Greene's comments (*Journal*, April 9, p. 909) on my article (*Journal*, March 12, p. 637). It was not my intention to review the entire literature on the premenstrual tension syndrome. In the patients whom I described a state of chronic ill-health had existed since a childbirth some years earlier, with symptoms which were by no means confined to the premenstrual or ovulatory phases of the menstrual cycle. On the basis of the history I am much more inclined to look on these patients as suffering from a sequela of puerperal depression. The main practical point, however, is the profound alteration which has occurred at the puerperium in these women and which has persisted chronically. They and their families do not enjoy three weeks of normality every month as occurs in the premenstrual syndrome in its typical form. The history is so characteristic that I do feel most strongly that the post-puerperal group deserves separate consideration.

Dr. Greene and Dr. Dalton¹ have noted that, "in all cases in which the [premenstrual] syndrome had existed before pregnancy, the attacks occurred with increased severity at the first menstruation after childbirth . . . 15 dated the onset of regular attacks from childbirth. In severe cases, childbirth was followed by increasing weight and lethargy in addition to the premenstrual syndrome" (my italics). Clearly I should have referred to these observations, and I apologize to Dr. Greene and Dr. Dalton for not doing so.

In addition I should like to cite an interesting paper by Dr. Joan Malleon² in which an attempt is made to find a common factor linking premenstrual disturbance, menopausal upset, puerperal depression, and involutional melancholia. Under the heading of puerperal depression, she writes: "It is commonly found that, if menstruation returns

before the psychosis is resolved, exacerbations occur repeatedly in the premenstrual phase." This is much nearer to what I intended to convey, but again I must stress that symptoms are not confined to the premenstrual phase.—I am, etc.,

Birmingham.

A. B. HEGARTY.

REFERENCES

- ¹ Greene, R., and Dalton, K., *British Medical Journal*, 1953, 1, 1007.
- ² Malleon, J., *Lancet*, 1953, 2, 158.

The "Nape" Naevus

SIR,—In this corner of Berkshire we have never heard of the Sturge-Weber-Kalischer syndrome, but we frequently see a nape naevus on newly born infants. Any midwife will tell Drs. J. Shafar and A. Doig (*Journal*, April 9, p. 913)—and I pass this information on to them—that it is caused by an affectionate peck from the stork who delivers the child before taking final leave of its charge.—I am, etc.,

Streatley, Berks.

J. R. B. DIXEY.

SIR,—Drs. J. Shafar and A. Doig (*Journal*, April 9, p. 913) have found that a superficial vascular naevus in the nuchal region is much commoner than most doctors had supposed, and that its presence is not generally associated with other congenital abnormalities. Its situation over the upper (cephalic) level of the spinal cord may perhaps be compared to the presence of so-called "mongolian" pigmentary naevi in the sacro-gluteal region at the lower (caudal) end of the spinal cord. Another type of superficial naevus near the lower end of the spinal cord is the multiple angiokeratoma (haemangiokeratoma) of the scrotum. This latter must, I think, be regarded as a mild local form of the rare condition of "angiokeratoma corporis diffusum," which, according to J. H. Price,¹ may possibly constitute part of a very rare inborn metabolic lipid storage disease.—I am, etc.,

London, N.W.1.

F. PARKES WEBER.

REFERENCE

- ¹ Price, J. H., *Brit. J. Derm.*, 1955, 67, 105.

Low Back Pain Treated by Manipulation

SIR,—The recent article on "Low Back Pain Treated by Manipulation" (Dr. A. B. Coyer and Dr. I. H. M. Curwen) (*Journal*, March 19, p. 705) comes opportunely at a time when there is considerable discussion on this form of treatment in the correspondence columns of the *Journal*.

Controlled clinical experiments are unfortunately rare in physical medicine. When studying a controversial form of treatment for a symptom complex rather than a definitive diagnosis the standard of "control" needs to be of the highest order, and it is unfortunate that we are not convinced of the validity of the design of this particular experiment. Tegner¹ has said: "We should be aware that the classical attack of lumbago usually clears up of itself in the majority of cases after a comparatively short period, and we should not blindly accept the disappearance of symptoms to be the result of whatever treatment has been ordered. Long before we knew about prolapse of the intervertebral disk we treated lumbago and sciatica with considerable success. And what is more, many sufferers from these conditions were treated successfully and safely with rest and analgesics alone, and the patients got better. Such facts cry aloud for proper controlled experiment in our evaluation of the results of the treatment we prescribe."

The snares of "historical controls" have been forcibly emphasized,² and the "controls" for this series can hardly be called more than "historical." The key to clinical investigations must lie in the criteria for diagnosis, and the more detailed the criteria the more comparable will be the groups of patients. In this series no diagnoses are recorded, and detailed criteria for selection are not specified. For example, it is stated that 50% of the patients manipulated were free of signs and symptoms at the end of one week compared with 27% of the controls. This is an impressive result, but it would have been more logical to compare the patients with limitation of straight-leg raising. If this is done we find that 20 of 39 (51%) patients with limitation of straight-leg raising were free of signs and symptoms at the end of one

week compared with 10 of 26 (38%) of similar controls (much less impressive, but more logical). The Chi-square test applied to these figures gives $\chi^2 \approx 1.1$, and $P < 0.2$. The difference between the groups is not statistically significant. Limitation of straight-leg raising may be used to separate between two clinically distinguishable types of patient with low backache or sciatica.³ Thus in this series under discussion three clinically distinct groups of patients are being lumped together (those with a severely limited S.L.R., those with slightly limited S.L.R., and those with no limitation of S.L.R.). Is the thesis held that these clinically separate and probably pathologically different groups are all amenable equally to one form of treatment?

Many cases of derangements of intervertebral joints, and lesions of the supporting ligaments of the spine, may give rise to referred sciatica.⁴⁻⁶ These cases have been excluded, for no patients with radiation below the buttock were selected. There has been no selection, for example, according to mode of onset, surely most important in relation to reaction to treatment. Although site of pain, presence of congenital defects, and recurrences and other factors have been recorded these have not been separately analysed, so the unwary reader is led to the conclusion that, having excluded "rarer and more serious causes," manipulation is the treatment of choice whatever the diagnosis. As many cases of derangement and prolapse are excluded, as indicated above, then what was the pathological lesion in most of the patients in this series? It is felt that many may have been postural defects, muscular lesions and similar disabilities in which rest and sedation were in fact contraindicated.

Without a detailed analysis allowing for the study of strictly comparable groups of patients, this series does not help in the elucidation of the part that manipulation has to play in the relief of backache.—We are, etc.,

P. J. R. NICHOLS.

D. J. E. CHESHIRE.

Yealmpton, Devon.

REFERENCES

- ¹ Tegner, W. S., *Proc. roy. Soc. Med.*, 1954, 47, 389.
- ² Reid, D. D., *Lancet*, 1954, 2, 1293.
- ³ Charnley, J., *ibid.*, 1951, 1, 186.
- ⁴ Kellgren, J. H., *Clin. Sci.*, 1939, 4, 35.
- ⁵ ———, *Lancet*, 1941, 1, 561.
- ⁶ Newman, P. H., *J. Bone Jt. Surg.*, 1952, 34B, 30.

Boxing Injuries

SIR,—I hasten to reassure Dr. H. Simon (*Journal*, April 2, p. 853) about albuminuria in boxers. I have frequently examined the urine of boxers after training and sparring in the gymnasium without any exchange of blows, and have found albumin and sometimes blood present. The urine becomes clear in three to four hours. Albuminuria and haematuria are quite frequent after violent physical exercise and leave no after effects. All boxers under the control of the London Amateur Boxing Association have their urine tested in their routine examination on joining a club.—I am, etc.,

London, W.1.

J. L. BLONSTEIN.

Oxygenation by Needle Puncture in Asphyxia

SIR,—In connexion with Mr. N. A. Jory's article on "Acute Respiratory Obstruction" (*Journal*, March 26, p. 781) I would like to suggest the following method of giving oxygen as possibly being a useful measure in the treatment of some of the cases discussed.

The method consists in the administration of oxygen via a fine cannula, such as is used in "lipiodol" bronchography, which is passed through the crico-thyroid membrane. The cannula is attached by a suitable mount to the delivery tube from an oxygen cylinder. Dr. G. M. Willey and I have demonstrated that this method is quite adequate to restore quickly full oxygenation in anoxaemia during general anaesthesia.

In passing the trocar and cannula through the crico-thyroid membrane the use of a tenotome for skin-puncture makes the procedure easier, as the skin in this region may be very tough. When the cannula has been inserted, the preliminary passage of a fine polythene tube well down into the trachea will indicate that the end of the cannula is free within the lumen of the trachea, thereby obviating the risk of surgical emphysema. Indeed, oxygen may be

administered through the fine polythene tube introduced in this manner, but not of course so freely as through the lipiodol cannula itself. I have found Forestier's trocar and cannula suitable for the purpose.

Apart from laryngeal obstruction, the method might very well be found useful in cases of drowning and coal-gas poisoning, and the polythene tubing method of administering oxygen in cases of clinical anoxaemia. A convenient pack containing a baby oxygen cylinder, trocar and cannula and fine polythene tubing, etc., could easily be assembled for first-aid work.—I am, etc.,

London, W.1.

W. H. B. MAGAURAN.

Fluoridation of Water Supplies

SIR,—I have been interested in this subject for some years, and it is extremely difficult to be certain that it is quite safe for every individual to have 1 p.p.m. of fluoride added to the water supply in an endeavour to reduce the incidence of dental decay.

It is surprising that, in the midst of the discussions in connexion with the improvement of the dental condition of schoolchildren, little is said of the great need for improved oral hygiene. The oral condition of many of our schoolchildren is really alarming, and an intensive campaign to encourage the use of the tooth-brush would be a valuable and safe contribution towards a very considerable reduction in dental caries and improved oral health. Local authorities might well direct their energies in this direction as a first step.—I am, etc.,

Dundee.

DAVID A. FINLAYSON.

SIR,—The Delaney Committee, which investigated this matter in 1952, correctly stated in its report¹ to the U.S. Congress: "It is safe to say that fluoridation is mass medication without parallel in the history of medicine." Even if its effects were less controversial than they appear to be, it is clear that this method of wholesale, indiscriminate administration of what is undoubtedly a highly toxic substance is improper, and constitutes a complete break with the medical tradition of individual care and responsibility.—I am, etc.,

London, W.1.

A. RUGG-GUNN.

REFERENCE

- ¹ *Fluoridation of Public Drinking Water*, Report of the House Select Committee to Investigate the Use of Chemicals in Foods and Cosmetics, No. 2500, Eighty-second Congress, Second Session, 1952.

Speaking Up

SIR,—In reply to Dr. J. Hamilton McIlroy's letter (*Journal*, April 2, p. 853) on the subject of the inaudibility of medical lecturers, I would like to suggest the following "prescription" which I found written in large letters in a pulpit in a Methodist church in Halifax: "Speak up, the deaf aid is not working."—I am, etc.,

London, S.E.1.

D. G. BATES.

Hazards of Electric Razors

SIR,—Dr. A. S. Porter's letter (*Journal*, April 2, p. 854) mentions a condition to which referral is surely overdue in your columns. That modern, and otherwise invaluable, instrument, the electric razor, is an undoubted potential cause of sneezing attacks in the morning and of painful snippets of hair in the eye.

Most of the trouble is due to its use whilst lying supine in bed, a device adopted by poor risers not only to keep the legs warm but to save having to clean out the appliance after use. So far as the eyes are concerned, they can be covered with spectacles; the nostrils can likewise be packed loosely with cotton-wool; but, in any case, the tendency is for a recumbent shave to drag on in time, with the weight of the appliance resting heavily upon the cheek of the same side as the dominant hand. This leads to a further hazard of the electric razor, which is traumatic neuritis of one or more of the cutaneous sensory filaments where they

cross bone to reach the temporal fossa. The vulnerable sites appear to be either far forward over the malar bone, where injury leads to pain in screwing up the eye; or again just above the mandibular point, where the condition might have to be distinguished from temporal arteritis.—I am, etc.,

Richmond.

JOHN DANCY.

Natural Childbirth

SIR.—I was sorry to read of Mrs. Constance Lynn's painful and disappointing experience (*Journal*, April 2, p. 851), but, for fear that it should prove discouraging to others, I should like to put it in perspective, comparing it with my own experience in dealing with some 4,000 deliveries at Stonefield Maternity Home (Blackheath) over the period 1920-54. From the first my late partner and I worked for "natural childbirth," and in the last 20 years developed our methods considerably and along very similar lines to those used by Dr. Dick Read. We had a unique opportunity of observing, for the antenatal work, the delivery, and the puerperium were conducted under our own roof, and we remained in touch with most of the mothers for a year and often longer.

Results were most encouraging. A large proportion of our later patients suffered no more pain than they were able to bear without distress; labours tended to be short and without fatigue with its risk of haemorrhage and shock. Our forceps rate dropped from about 12% to 3%. We used pethidine freely, and occasionally gas and air as well. But perhaps the most striking result was the great happiness of many women during the birth. We never promised a painless birth, and I always impressed on my patients that the physical effort of the second stage was probably greater than any they had ever been asked to make. We found the presence of husbands in this stage to be a great encouragement. (One of them, after a long journey, fainted, but his wife immediately rose to the occasion and encouraged him so that five minutes later he was able to witness the birth.) While sympathizing with the disappointment of Mrs. Lynn and "quite a few recent mothers" of her acquaintance, I submit that her claim to "give a true and tried viewpoint" is not justified.

Dr. Dick Read and I, and many others whose enthusiasm has been kindled by results, realize that we are up against a fearful attitude of mind in the expectant mother, which has existed for centuries, and which tends to be both hereditary and infectious, so we cannot expect 100% success in 30 years' work; but even so, the successes we do achieve provide our patients, their husbands, the doctor, and the nurse with the happiest moments of our lives.—I am, etc.,

Bristol, 9.

CYRIL V. PINK.

SIR.—For evidence of better results from preparation for natural childbirth I would refer those interested to an article by Dr. Henderson in the *New Zealand Medical Journal* in which 300 cases are compared. The 150 prepared cases show fewer complications and shorter duration of labour. Indeed, it is this very shortening of labour of which some doctors complain, saying that women have been so relaxed that the attendants were unaware that full dilatation had occurred.

Commenting on Mrs. Constance Lynn's letter (*Journal*, April 2, p. 851), I would suggest that too much enthusiasm is often followed by a sense of guilt over personal failure to achieve perfection, and that post-partum depression is a common state for which women should also be prepared. These personal reactions do not lessen the validity of Dr. G. D. Read's theories. High morale during pregnancy is certainly preferable to "a disease of nine months' duration," which was an earlier definition of pregnancy. Many women I know in New Zealand are greatly indebted to Dr. Read for a changed attitude, and some keen mothers have established a Wellington Parents' Centre in order to propagate the principles.

Dr. Dick Read has not deleted the word "labour" from the experience of childbirth, but has emphasized the sequence of fear-tension-pain which is an incontrovertible fact, and remains of lasting significance.—I am, etc.,

London, S.E.5.

ENID F. COOK.

REFERENCE

¹ Henderson, A. J., *N.Z. med. J.*, 1954, 53, 511.

Chlorpromazine

SIR.—Few will doubt the wisdom of the cautionary note sounded by the leading article (*Journal*, February 5, p. 338) which stressed the desirability of using chlorpromazine with caution.

The reason for this communication is to record the use of chlorpromazine in a few cases of intractable vomiting in whooping-cough. Few conditions can be more frustrating to treat, and frequently alarming to observe, in general practice. The results when chlorpromazine is used are dramatically gratifying, both to patient and parents. Its use for the condition, so far as I am aware, does not appear in the literature of the drug. My first case, in a child aged 3 years, required 10 mg. to control a situation that had led to ketosis and dehydration. The youngest case, aged 7 months, responded to 5 mg. My instructions to parents are to repeat the dose twice daily if required. Repeated doses to prevent recurrences have been only exceptionally required. In this clinical situation, and with the dose described, nothing but benefit to the patient has resulted, and with no insidious sequelae.—I am, etc.,

London, S.E.13.

HOWARD REEVE.

Advertising by Post

SIR.—Like many of your readers I was at one time plagued by unsolicited and unwanted trade advertisements. I have largely overcome the problem, but it was a long battle. I started by sending to each firm in turn a brief but bold request asking for my name and all my addresses, past and present, to be removed from the mailing lists (except for any list devoted to my particular specialty—namely, radiological diagnosis). My postage expenses were high, particularly as it was soon apparent that in many cases my requests were not being heeded. Perhaps the manufacturers have a similar problem, that of receiving unsolicited and unwanted correspondence, and maybe my letters were going straight into the waste-paper basket. Be that as it may, I did obtain a response in these cases by returning the literature in its original envelope with the flap stuck, addressed back to the sender, and without any stamp. I saw no reason why I should be put to postage expenditure in respect of literature which I had never requested in the first place.

Mr. James H. Clayton (*Journal*, April 2, p. 854) states that "many manufacturers are constantly adopting more original techniques of getting their information over to the doctor in the hope that such will be amongst the favoured proportion singled out for detailed study." One of these methods is to use plain envelopes. These may be sealed at ordinary postal rates. They are more difficult to sort out from one's own mail. I have even had advertisements in envelopes marked "Personal" and containing only the trade circulars. This I regard as an impertinence, and I would have no hesitation at all in asking for a visit from the manufacturers' representative so that I may tell him in person that I do not wish to hear from his firm. At present more than nine-tenths of the mail which I receive is mail which interests me personally, and it does get read properly. There is therefore very little risk of important personal letters getting mixed up in a large pile of highly coloured glossy literature destined for the waste-paper basket.—I am, etc.,

Worcester.

ANTHONY A. VICKERS.

SIR.—While I agree with Dr. Claud C. M. Watson (*Journal*, April 2, p. 854) that the representatives of the manufacturers are always most polite, I cannot agree that they are unnecessary. In the course of years I have learnt a good deal from these representatives and only wish that they came more often.

I receive about twenty advertisements a week. Having looked to see what the drugs advertised are for, I then look for the price. If it is not there the advertisement goes into the waste-paper basket without more ado. I always doubt the excuse proffered by the manufacturers—namely, that it is not possible to give the price, as it is liable to frequent fluctuations. Could not the profession take it that any price quoted was the price at the time of going to press?

I deplore the complete lack of dignity of many advertisements. Is it necessary to send to a "learned profession" circulars clad in all colours of the rainbow and armed with cupid's armamentarium?—I am, etc.,

Exeter.

F. E. GRAHAM-BONNALIE.

SIR.—None of your correspondents has drawn attention to one great inconvenience caused by all these unsolicited free samples and circulars. Many doctors live at the beginning of a postal round and are therefore called out of bed at an early hour to receive these things. This, to me, seems an intolerable abuse, but doubtless the advertising firms would state that arrangements could be made with the post office for later delivery. This is undoubtedly true, but how many of us know this? I have only just found it out after 17 years in practice.—I am, etc.,

Reading.

P. W. F. MCILVENNA.

Treatment of Vaginal Discharges

SIR.—May one of the "well-meaning travellers" to whom Dr. Elizabeth Gourlay refers (*Journal*, April 9, p. 912) be permitted to reply?

I think that it is true to say that very few, if any, firms claim to have found cures for vaginitis or any other condition. Initially treatments are suggested and trials carried out by practising specialists, where possible under controlled conditions. It is the duty of a traveller (or, as some of us style ourselves, medical representative) to pass on this information to as large a number of medical men as possible, and of their employers to market the products in an as efficient and economical form as possible.

During the course of some years' experience as a traveller, the products of my company have met with both praise and criticism, and it has always been my endeavour to present the doctors who grant me the privilege of an interview with a balanced view. When I meet with criticism I make a point of asking a number of other doctors whether they have had similar experiences, and by so doing sometimes get somewhere near the truth. A traveller's existence can only be justified by his products doing the job for which their manufacturers claim they are suitable.

The cynical observation, sometimes made to us, that we are all only concerned with £ s. d., is untenable, for the medical profession is the most discerning of all professions, and unless results are forthcoming all the travellers (no matter how well-meaning) and all the publicity in the world will avail us nothing.—I am, etc.,

Chichester.

C. H. J. BISHOP.

Fibrositis

SIR.—Whatever fibrositis may mean, it is surely a matter of common observation that repeated local chilling may produce symptoms resembling those of grossly excessive use of a muscle or muscle group. Presumably the symptoms are in each case due to circulatory disturbance and with this a piling up of waste products.

I remember a patient whose constant pain in the side ceased when he was advised to discontinue sitting in a direct line from window to fire. A case quoted in the *Journal* many years ago described pain in the point of the shoulder of a lorry driver, relieved by providing a washleather lining to the shoulder of the coat. The windscreen was too narrow to keep the draught off the extremity of the shoulder. In his case many treatments and investigations had led nowhere. Faulty posture, possibly due to badly

designed equipment, is a common cause of pain. I can remember backaches caused by the club chair, the feather bed, and the bucket seat of cars; also from a scullery sink too low for the housewife to use while erect.

A short haircut or a shampoo followed by inadequate drying of the hair sometimes gives me a headache. As cold without short hair, as when gardening without a hat, does the same thing, I wonder if a postural explanation is entirely adequate. It seems doubtful. But the neck pain of shorthand-typists occurs without cold and is surely postural, aggravated particularly by looking at work on the table and then at the typewriter at another level.—I am, etc.,

Hitchin, Herts.

G. C. PETHER.

Bleaching of Hair by Chloroquine

SIR.—Chloroquine is now widely used in the treatment of chronic discoid lupus erythematosus, because it appears to be at least as effective as mepacrine without producing discoloration of the skin. Numerous toxic effects, mostly reversible, are described, but bleaching of the hair is one not widely known in this country; awareness of this seems desirable, as it might cause embarrassment. Aiving *et al.*¹ studied the toxic effects of chloroquine given over long periods to inmates of a penitentiary; 300 mg. daily followed by 500 mg. weekly for a year bleached the hair of all blondes studied. Tye *et al.*² treated 48 patients suffering from lupus erythematosus with a loading dose followed by 250 mg. daily; in one redhead and one blonde the hair "was made lighter." The following case is of interest.

A married woman had suffered from very extensive chronic scaly lupus erythematosus of the whole face for 13 years; during six years I had given all the usual treatments, including mepacrine, without much benefit. On May 8, 1954, I started "nivaquine," one tablet daily (200 mg. of chloroquine sulphate); this brought about considerable improvement, but not complete clearing, so on June 26 the dose was increased to two tablets daily. On July 17 the eruption was clearer than it had ever been; a month later I went on holiday, and in my absence the dose was continued at this level until September 10, when I observed that the eyebrows were white and the scalp hair, normally a medium brown, was white for its proximal 20 mm. The patient told me that during a recent holiday the sunshine, instead of bronzing her as usual, had caused severe erythema not followed by pigmentation. Chloroquine was stopped on September 10; by September 25 the lupus was obviously active again. On October 23 her eyebrows had regained their usual colour. The scalp hairs showed normal pigmentation of their proximal 10-15 mm. separated by white bands of 25 mm. from the distal normal portions. This appearance was much more evident under Wood's light, the bleached areas showing a bluish-white fluorescence, as did a tablet of nivaquine suspended in water. At this time the patient asked for nivaquine to be resumed, as she considered the white hair more attractive than the lupus. Accordingly one tablet daily was given and continued until the present time (March 29).

The eruption is at present almost completely controlled. The bleached areas are still evident in the distal portions of the longer scalp hairs, and these still fluoresce, although the proximal portions do not do so.—I am, etc.,

London, S.E.5.

D. E. SHARVILL.

REFERENCES

- ¹ Aiving, A. S., *et al.*, *J. clin. Invest.*, 1948, 27, Suppl. p. 60.
- ² Tye, M. J., *et al.*, *New Engl. J. Med.*, 1954, 251, 52.

Society for Endocrinology

SIR.—Dr. P. M. F. Bishop's article on "The Development of British Endocrinology" (*Journal*, April 9, p. 865) was interesting and valuable as a record of events in this field. For the sake of accuracy I think I should point out that Dr. Bishop has overlooked a factual error. The two present secretaries of the Society for Endocrinology are, in fact, Professor C. H. Gray and myself. This statement does not, of course, in any way alter the intention of Dr. Bishop in referring to Professors Gray and MacLagan in the way that he does.—I am, etc.,

London, S.E.1.

F. T. G. PRINTY.

Obituary

A. D. SHARP, C.B., C.M.G., M.D., F.R.C.S.Ed.

The death occurred at Leeds on March 18 of Colonel A. D. Sharp, consulting ear, nose, and throat surgeon to the Leeds Public Dispensary and to Dewsbury Infirmary. He was 84 years of age.

Born at Keith, Banffshire, on November 6, 1870, Alexander Dunstan Sharp received his medical training in Edinburgh and took the Scottish triple qualification in 1900, being awarded four medals and three prizes during the course of his student career. After qualification he held the appointments of resident surgeon and house-surgeon to the ear, nose, and throat department at Edinburgh Royal Infirmary and resident physician at the Royal Maternity Hospital, Edinburgh. In 1901-2 he was on active service in the South African war as a surgeon with the 1st battalion of the King's Royal Rifles, being awarded the medal and four clasps. Sharp was elected F.R.C.S.Ed. in 1903, and in the following year he obtained the Brussels M.D. with distinction. After postgraduate study in London and in several European capitals he was appointed honorary aural surgeon to the Leeds Public Dispensary in 1906, an appointment which he was to hold for the next 43 years. He also became honorary aural surgeon to Dewsbury Infirmary, the Leeds Education Committee, and to Noble's Isle of Man Hospital, Douglas. Always keenly interested in the Volunteer movement, he was commissioned in the Leeds detachment of the R.A.M.C. in 1905, and on the outbreak of the first world war in 1914 held the rank of major. Later in the same year he was promoted lieutenant-colonel with command of the 1st West Riding Field Ambulance, taking the unit to France with the 49th West Riding Division in 1915. He was appointed A.D.M.S. of the division in 1916, by which time he had attained the rank of full colonel, and held the position until 1925. For his war services he was four times mentioned in dispatches, being appointed C.M.G. in 1916 and C.B. two years later. The honour of Commander of the Military Order of Aviz of Portugal was conferred on him in 1919, and in 1926 he received the Médaille de la Reconnaissance Française. He was awarded the Territorial Decoration in 1921, and from 1922 to 1927 was an Honorary Surgeon to King George V. A member of the British Medical Association for many years, he was chairman of the Leeds Division in 1928-9.

In 1909 he married Miss Amelia Sutcliffe, a medical graduate of Edinburgh University, and she survives him together with two sons and one daughter, to whom we extend our sympathy in their loss. One son is consulting aural surgeon to Charing Cross Hospital and to the Hospital for Sick Children, Great Ormond Street, and the other a barrister-at-law practising on the North-Eastern circuit.—G. A.

Mr. GEORGE SEED writes: For nearly half a century the name of Alexander Sharp has been prominent among medical circles in the West Riding of Yorkshire. He studied laryngology in Edinburgh and in the main European cities, and was the only ear, nose, and throat surgeon, until his retirement in 1949, at the Leeds Public Dispensary. This hospital, situated in the centre of Leeds, serves a densely populated area, and Colonel Sharp visited and operated at

the hospital daily for many years, in addition to having a busy consulting practice. His out-patient clinics were huge and his operating sessions long. His commanding figure combined with his striking personality, and kindly disposition, were well known in the hospital. In spite of his training, Colonel Sharp was a strictly conservative surgeon, disliking any radical measures. He was one of the last physician-laryngologists, preferring nasal medication to drastic surgery. Many house-surgeons will remember his kindness. He was a keen supporter of the Leeds and West Riding Medico-Chirurgical Society and the section meetings of the Royal Society of Medicine.

Dr. W. D. CHAPMAN died at his home at Windermere, where he had lived for over half a century, on October 20, 1954, at the age of 83. William Daniel Chapman was born at Wanstead, Essex, on March 27, 1871, the son of Captain W. D. Chapman, of the Madras Staff Corps, and was educated at Trent College and at Corpus Christi College, Cambridge, receiving his clinical training at the London Hospital. He qualified M.R.C.S., L.R.C.P. in 1899, and took the M.B., B.Chir. degrees four years later. At Windermere, where he settled in practice, he soon entered into all aspects of the life of the district. He took an active interest in the work of the Windermere District Nursing Association and of the Windermere Lecture Association, being chairman of both bodies for many years, and of the Nurse Cavell Home, of which he was a trustee. From 1934 to 1949 he was a member of the urban district council, vice-chairman in 1947, and chairman of the health committee over a long period. It was the work of the council's library committee, perhaps, which gave him the greatest pleasure after his retirement from practice, and he continued to serve on it, as a co-opted member, for some time after he had resigned from the council. He was also a justice of the peace. A member of the British Medical Association for over 50 years, he was president of the old North Lancashire and South Westmorland Branch in 1922-3. Although he retired from practice some 20 years ago he continued to live at Windermere, and there to enjoy the lovely countryside and the companionship of old friends. For recreation he enjoyed a round of golf—he was a skilful player—and did not give up the game until some three years ago. In 1904 he married Miss Norah Moss, by whom he had two sons and one daughter, and in 1930 Miss Edith Barton, who survives him, together with the children of the first marriage.

Lieutenant-Colonel J. S. DUNNE died in hospital at Winchester on March 4 at the age of 77. After his retirement from the R.A.M.C., in which he had a distinguished career, he was for some years county director of the Hertfordshire Branch of the British Red Cross Society, and for a short time before the outbreak of the last war he was county A.R.P. controller. James Stuart Dunne was born at Edenderry, King's County, on November 2, 1877. He studied medicine in Dublin, taking the Irish conjoint diploma in 1905. In the same year he became a Fellow of the Royal College of Surgeons in Ireland, being awarded the gold medal for operative surgery and silver medals for theoretical surgery and midwifery. He then entered the R.A.M.C. and went to India as medical officer with the Royal Irish Regiment, being placed in charge of a cantonment hospital. Returning to the United Kingdom, he became medical officer at Woolwich, where he claimed to have the largest midwifery practice in the country. On the outbreak of the first world war in 1914 Dunne went to France with the Dragoon Guards, and later the same year was awarded the D.S.O. for heroism in the following circumstances: "During a German attack on the night of October 31, near Messines, he established a dressing station just behind the trenches, and was the means of saving many lives, he himself going several times into the trenches to

Medico-Legal

ACTION AGAINST HONG KONG DOCTORS FAILS

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

On February 11, 1955, in the Supreme Court of Hong Kong the trial was concluded before the Acting Chief Justice, Mr. Justice T. J. Gould, and a jury, of an action brought by Mr. Joseph Leslie Quie, a merchant, against three Government doctors for negligence in connexion with his certification as of unsound mind and his detention in a mental hospital. The defendants were Professor A. J. S. McFadzean, of Queen Mary Hospital, Dr. P. M. Yap, of the Mental Hospital, and Dr. S. H. Moore, of the Colonial Medical Department. Mr. Quie claimed \$130,831.88 general and \$119,168.12 special damages.

The plaintiff's case was that on March 12, 1952, Professor McFadzean was called in by his doctor, Dr. Yang, to examine him in consultation, and confirmed that he was suffering from cirrhosis of the liver. On the professor's advice he went into Queen Mary Hospital next day to try a new treatment, which he was told would last for two or three weeks, and there he was seen by Dr. Yap. On the evening of March 14 he was told that Professor McFadzean wished to examine him at the Matilda Hospital, and he went into the ambulance in his dressing-gown. He was taken to the Mental Hospital, seen by Dr. Yap, detained there in spite of his protests, and put in a padded cell. Some hours later he was moved to a private room. The diagnosis was manic elation, and Dr. Yap said in evidence that the patient seemed to have the appearance of an advanced chronic alcoholic or a person with general paralysis of the insane.

On March 19 Mr. Quie agreed to stay as a voluntary patient, but on March 22 gave seven days' notice that he wished to be released. Dr. Yap persuaded him to stay for a full three weeks, to which he agreed. On March 28 Dr. Yap applied under s.7 of the Mental Hospital Ordinance for an order that Mr. Quie should be conveyed to the Mental Hospital and detained for observation, and Dr. Moore signed the order, and on March 31 signed a certificate that he was of unsound mind.

On April 26, after a visit on April 10 from his lawyers, Mr. Quie was let out of the mental hospital and flew to England. There he was treated as a voluntary patient at St. Andrew's Hospital, Northampton, until May 20, and was discharged with a certificate that he was not certifiable as of unsound mind.

Mr. Quie's case that Professor McFadzean, Dr. Yap, and Dr. Moore had been negligent was supported by the expert evidence of Dr. Ellis Stungo, of London, who gave evidence that he had practised as a psychiatrist during 25 of the 29 years he had been qualified. He had seen Mr. Quie in England on July 23, 1952, and later, and said that not only was he not certifiable as insane, but that his certification and detention had been made on wholly inadequate grounds.

The case for the defendants was that not only had Professor McFadzean, Dr. Yap, and Dr. Moore exercised proper care and done their best in diagnosing Mr. Quie's condition, but also that their diagnosis had been correct and was supported by all the information which they had received in answer to the proper inquiries which they had made. Dr. Desmond Curran, senior consultant psychiatrist of St. George's Hospital, was called as expert witness for the defence, being flown from London for the purpose at the Hong Kong Government's expense. In his opinion, Professor McFadzean would have laid himself open to the severest criticism if he had not acted as he did. Dr. Curran used very strong expressions about some of the definitions given by Dr. Stungo in his evidence on behalf of the plaintiff, and declined to withdraw them when invited to do so by the plaintiff's counsel.

attend to wounded men who could not be moved." He was also mentioned in dispatches. Promoted to major in 1917, he was employed as embarkation staff officer at Le Havre towards the end of the war, and, after the Armistice in 1918, at Marseilles. From then until he retired under the age limit in 1932 he spent a good deal of time abroad. For three years he worked as a senior medical officer in Turkey, and later he was in charge of military hospitals at Cairo and Alexandria, being also senior medical officer for Northern Egypt. He attained the rank of lieutenant-colonel in 1930, and returned to England in the following year to become director of the surgical division at Woolwich. After his retirement from the R.A.M.C., Dunne settled, first at Welwyn Garden City, and later at Digswell, both in Hertfordshire, where his work for the British Red Cross Society was greatly appreciated. When the second world war broke out in 1939 he was recalled to the Army and was a member of a medical board from then until he left Hertfordshire towards the end of 1951 to live in permanent, but all too short, retirement at Whitchurch, in Hampshire. He married Catharine, daughter of Admiral Sir William Henderson, in 1920.

By the death of Dr. ROBERT McLAREN on March 14, at the age of 83, less than a year after the death of his brother, Dr. JOHN McLAREN, on July 16 last year, at the age of 89, Edinburgh has lost two examples of a fast-disappearing race of beloved general practitioners. The brothers lived lives based on the solid foundation of their religion; both at one time sang in church choirs; and in later life John McLaren was the senior elder of Christ's Kirk at the Tron for many years, while Robert McLaren became a well-beloved pillar of the Methodist Church at the Central Halls, Edinburgh. John McLaren graduated M.B., C.M. at Edinburgh University in 1889 and Robert McLaren took the Scottish triple qualification in 1900. Eventually both engaged in general practice in Edinburgh, each in his own practice, from which Robert McLaren retired in 1946. John McLaren became a district medical officer under the old parish council and was also medical officer for the Trinity Pensioners, while Robert McLaren was medical officer to the Edinburgh Skin Dispensary for 43 years, and during the first world war served in the R.A.M.C., both in this country and in Salonika. In their practices the brothers were more than just doctors. They were the friends and confidants of their patients, and their presence and personalities will be sadly missed. We may not meet their like again.—J. G. S.

Dr. HARRY SUGARÉ writes: I can fully bear out Dr. Walter Pagel's remarks (March 26, p. 793) about Professor MAX NEUBURGER's privations after the first world war. On the back of a large visiting-card dated April 11, 1921, was written in English, "I am sorry that I don't possess a photograph of myself, and under the present conditions it costs too much, but I send you enclosed a very good copy and hope you will be satisfied with it." The excellent copy, with his characteristic signature, was taken from a scientific magazine.

Dr. ROBERT CHISHOLM died after a short illness on April 1 at the age of 80. Born in Assam, India, on March 10, 1875, Robert Chisholm studied medicine at Edinburgh and qualified by taking the Scottish triple qualification in 1902. He first practised in Pelton Fell, Co. Durham, where he gained a varied experience in a mining community. In 1915 he moved to Cambridge, where he was in practice until an accident forced him to give up medical work in 1920. Since then he had spent his retirement at Bedford, where he was a councillor, serving on the public assistance committee, and at Mill Hill, London. He had been a member of the B.M.A. for over 50 years.

A memorial service for the late Mr. R. DAVIES-COLLEY, who died on April 16, will be held in Guy's Hospital Chapel on Wednesday, April 27, at 1.45 p.m.

In his summing-up, Mr. Justice Gould said that the jury had to decide whether the defendants were negligent in expressing the belief that Mr. Quie was of unsound mind. Had they exercised reasonable care in making inquiries and in coming to their conclusions as a result of their examination of Mr. Quie and the information they had received? It was for the jury to consider whether these three medical men, not one of whom had any financial interest in the matter, had been negligent or acted in bad faith in this matter or not.

The jury, after an absence of one hour, returned unanimous verdicts in favour of the three doctors.

FINED FOR FORGERY

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

Reginald Morgan Ford, of Bedminster, Bristol, after obtaining a Swedish diploma in chiropody and physiotherapy, set up in practice as a physiotherapist in Bristol. He then entered Bristol University as a medical student, but a year later was expelled for breaches of discipline. He thereupon erased the central portion of a letter he had received from the General Medical Council, and inserted in its place a paragraph saying that he was a graduate in medicine and held the Bristol University degrees of M.B. and Ch.B.

Armed with this letter Ford got employment with several local doctors, and finally became locumtenent to Dr. W. B. Williams, of Knowle, during an illness. It was only when Dr. Williams decided to keep him on as assistant and wrote to the Bristol Executive Council that it was discovered that Ford's name was not on the *Medical Register*. Ford at first asserted that his name had been left out by mistake, but when taxed a second time by Dr. Williams admitted the truth.

Ford was indicted at Bristol Quarter Sessions for forging a letter from the chief clerk to the General Medical Council purporting to show that he was a qualified doctor. Sentencing him to a fine of £100, the Recorder said that it was an exceptional case with startling mitigating features. Ford had possessed sufficient skill to satisfy those who had become his patients, and had been careful during his employment as assistant not in any way to abuse the professional position he had wrongly assumed. Apart from the bad example, he did not appear to have done any harm. He was given three months in which to pay the fine.

OPERATION ON WRONG KNEE

Damages of £40 and costs were awarded to a 5-year-old boy by Judge Allan Walmsley at Blackpool county court on March 30 for pain and suffering caused after a surgical registrar at Blackpool Victoria Hospital had operated by mistake on the wrong knee to remove a broken needle. The boy, Anthony John Sargeant, of Newcastle-under-Lyme, was awarded damages against the Blackpool and Fylde Hospital Management Committee.

The plaintiff's case was that he was admitted to the hospital with a piece of broken sewing-machine needle in his left knee. The surgeon, Mr. F. Galea, was apparently misled by the little boy and operated on the right knee. The mistake was realized, and after another operation the needle was removed from the other knee. There was no complaint of permanent disability to the right knee, but negligence was admitted by the hospital.

The boy's mother said the surgeon had told her he had made an incision into the boy's right knee because the boy insisted that that was where pain was. Later she took the boy to her own doctor, and on both wounds there was yellow pus. He could only walk stiff-legged. After visiting the doctor on about six occasions the boy was discharged. Following the first visit the doctor told her to keep the boy off his feet for fourteen days. She admitted that when the stitches were removed at the hospital there was no sign of sepsis on either of the wounds.

¹ *Bristol Evening News*, April 4, 1955.

Mr. William Lamont, consultant orthopaedic surgeon, said that having examined the boy he was not satisfied that the knee had been septic, because the sores on the knees were not thick and did not indicate previous infection. The scars would always be visible but not noticeable. Mr. Lamont added that the needle had penetrated just under the surface of the skin. A 1½-in. (3.8-cm.) incision was necessary to remove it, but it was not necessary to cut beyond ½ in. (1.2 cm.) deep.

Summing up, Judge Walmsley said the boy must have suffered additional pain by having a second operation and must have suffered handicap in moving about and playing. He also had the further handicap of a second scar. There appeared to have been a clerical error at the hospital which had an effect on the mistake. The judge stressed, however, that the mistake should not reflect on the surgeon's professional skill or competence, but he should have examined the radiograph with more "scrutinious care."

The Medical Defence Union instructed Messrs. Hempsons, solicitors, to act for Mr. Galea.

DANGEROUS DRIVING CONVICTION

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

Defending himself on summonses² for dangerous driving contrary to s. 11 of the Road Traffic Act, 1930, and for exceeding the 30 m.p.h. speed limit, Dr. P. J. Moriarty, of Bradford, suggested to the magistrates that as he was driving a midwife in his car to an urgent case his car had become an ambulance and that accordingly he was privileged under the Highway Code to exceed the speed limit like the police, firemen, and ambulance drivers. The evidence was that Dr. Moriarty had received an urgent evening call and was taking a district midwife with him to the case. His car was followed by two police officers along a road at 35 to 47 m.p.h. through two lots of traffic lights into another road, where it overtook two lines of traffic in some places and went through traffic lights at a road junction with its headlights flashing at 40 m.p.h., so that a woman who was crossing the road had to run to avoid being knocked down. After the clerk to the justices had pointed out that any privileges which police, firemen, or ambulance drivers might have under the Highway Code must be exercised consistently with safe driving, the chairman said that he disagreed with the suggestion that Dr. Moriarty's car had become for the time being an ambulance. The case of dangerous driving was found proved and a fine of £25 imposed, and a further fine of £5 was imposed for exceeding the speed limit.

Dr. Moriarty indicated that he would consider an appeal.

Universities and Colleges

UNIVERSITY OF OXFORD

The Gotch Memorial Prize for 1955 has been awarded to George Jamieson Ross McHardy, B.A., of Brasenose College.

UNIVERSITY OF CAMBRIDGE

In Congregation on January 22 the following medical degrees were conferred:

M.B., B.Chir.—J. T. N. Williams, J. H. C. Hunt, J. B. Pond, J. D. Ellis, *R. A. Carpenter, *P. A. Eckstein.
M.B.—J. N. Godlee, *P. J. D. Kirk, *I. McL. Flowers, *T. D. Carter, L. H. Blonstein, G. J. M. Milton-Thompson, C. B. Mortimer, G. C. Spackman, *A. H. Labrum, *J. N. Bodger, *C. F. Ridley, J. W. Blaxill, L. H. Hurrell, J. N. Rea, *D. H. Cameron, *R. Schram, Claudia M. B. Grigson.

*By proxy.

UNIVERSITY OF DUBLIN

SCHOOL OF PHYSIC, TRINITY COLLEGE

The following candidates have been awarded the Diploma in Gynaecology and Obstetrics:

S. K. Chattopadhyay, N. J. Choksey, Rosalie J. Gollan, Sister Mary Hyacinthe, M. A. J. Khan, E. S. Linton, S. Malhotra, P. O'Shea, H. B. Perera, Olga M. Rampersaud, A. Rosin, B. Saha, Ma Khin Aye Si, Eunice S. Simon, M. El K. A. Tarshouby.

² *Yorkshire Observer*, March 26, 1955.

UNIVERSITY OF LONDON

Mr. A. C. H. Bell has been appointed part-time Director of the Department of Obstetrics and Gynaecology at the Westminster Medical School from October 1, 1954.

The following have been recognized as teachers of the University in the subjects indicated in parentheses: *University College Hospital Medical School*: Dr. R. E. Bonham Carter (Children's Diseases); Dr. R. W. Cope (Anaesthetics); Mr. B. J. Harries (Surgery); Dr. R. F. Tredgold (Mental Diseases (Psychological Medicine)). *King's College Hospital Medical School*: Dr. B. S. Cardell (Pathology). *Westminster Medical School*: Mr. C. E. Drew and Mr. J. P. Reidy (Surgery); Dr. R. D. Tonkin (Medicine).

Dr. P. D. Samman has been granted probationary recognition as a teacher of dermatology at Westminster Medical School for two years from February, 1955.

UNIVERSITY OF MANCHESTER

The following candidates have satisfied the examiners at the examination indicated:

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—Part II: H. L. English, P. A. L. Scott, B. F. Whitehead. Part I: L. Grimshaw, E. Howarth, D. F. Potter, K. E. Schmidt, Mrs. Irene Waga.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examinations indicated:

CH.M.—L. F. Tinckler.
DIPLOMA IN RADIOLOGY (RADIODIAGNOSIS).—Part I: R. S. Miller, F. P. Peach, V. Rogers, M. C. Winter.
DIPLOMA IN RADIOLOGY (RADIOTHERAPY).—Part I: B. Lall, S. H. M. Zaidi.

UNIVERSITY OF LEEDS

Dr. J. R. Fountain has been appointed Senior Registrar and Tutor in General Medicine and Mr. F. G. Smiddy Senior Registrar and Tutor in General Surgery at the United Leeds Hospitals for an initial period from a date to be decided until March 31, 1956.

UNIVERSITY OF SHEFFIELD

Dr. W. Whitaker has been appointed full-time Senior Lecturer in Medicine and Mr. D. H. Randall and Mr. D. J. Robertson part-time Clinical Teachers in Surgery.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College held on January 13, with Sir Harry Platt, President, in the chair, the deaths of Sir Arthur Keith (Past Conservator of the Museum and Master of the Buckston Browne Farm) and Mr. R. J. Willan (Past Member of Council) were reported and the Council unanimously adopted resolutions of condolence.

A Moynihan Lectureship was awarded to Professor H. Olivecrona, of Stockholm.

Diplomas of Fellowship of the Faculty of Anaesthetists were granted to Sheila McC. Wilson and A. H. Kasasian.

Diplomas were granted, jointly with the Royal College of Physicians of London, as follows:

DIPLOMA IN LARYNGOLOGY AND OTOLGY.—S. E. M. Bates, C. Chowdhary, A. R. N. Dhanji, D. A. T. Farrar, G. F. Fennell, A. N. Griffith, G. M. Homan, B. Jha, M. S. Khan, P. M. Kothary, M. V. Kurian, J. T. Lees, J. A. M. Martin, N. G. McGuire, J. R. Purvis, D. Russell, J. R. Samuel, S. D. Sethi, T. M. Srinivasan, M. M. Wain, W. M. K. Wijetunga.

DIPLOMA IN ANAESTHETICS.—Catherine K. Adam, R. D. Allan, H. B. Aronson, A. C. Ashton, L. M. V. Attygalle, P. S. Barclay, K. W. Baruch, K. Biss, J. A. Blundell, Janet C. Brash, June E. Brett, H. D. Browne, Mavis Buck, Fodda B. K. Burnell, Anthea M. Bushby, P. R. Chaik, Peggy J. Clark-Roberts, Sheila R. Clarke, J. A. Cluver, I. McL. Cochran, A. R. Cohen, Phyllis Connor, C. M. Conway, H. M. C. Corfield, L. G. B. Cumpston, P. N. Cunliffe, Muriel D. Dauby, Margaret C. D. Daniel, W. R. Daniel, E. J. D'Arcy, J. Davenport, J. W. Desmond, J. D. Dickson, Maria T. D'Ocon Asensi, B. A. Dowdell, H. D. Doyle, Winifred B. Drew, Beatrice M. Evans, Rosemary A. Faulk, L. Feldman, P. Flintan, B. G. Francis, J. E. S. Gould, Elizabeth Green, J. Greenan, N. R. Gupta, S. J. Halkett, I. M. Hallack, G. G. Harrison, H. I. Heffernan, R. S. T. Hey, J. R. E. Jenkins, E. G. R. Jones, K. Kennedy, A. R. Kerr, A. Kilpatrick, D. W. King, M. Lauchlan, Lucy T. Lee, Heather J. Loper, Dorothy J. Lucas, G. F. Lynam, I. Macphail, Esme D. Martin, P. M. Mehta, Catherine H. McK. Mellen, Morag J. R. Miller, W. More, B. D. Morison, Annie Mortell, S. M. MacD. O'Brien-Moran, Helen B. O'Hea, R. H. Oram, Buddug Phillips, A. P. Poole, Freda E. Prince-White, T. C. Probyn, K. R. Rama Rao, Stella J. E. Randall, M. V. Rao, J. T. Russell, Yvonne K. Russell, D. K. Sen, Margaret H. N. Smith, B. Solomon, Jean P. Spalding, H. Stable, H. W. Stanley, A. Thorogood, J. N. Thorpe, F. Turrettini, C. H. van Hasselt, I. R. Verner, N. A. Vincent, Betty R. Warltier, A. N. E. Watt, R. P. Wise, W. S. Wren, T. M. Young.

DIPLOMA IN OPHTHALMOLOGY.—C. Chowdhary.
DIPLOMA IN MEDICAL RADIOLOGY.—J. W. Logan.
DIPLOMA IN CHILD HEALTH.—J. A. Kay.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending April 2 (No. 13) and corresponding week 1954.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1955					1954				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	9	1	3	0		22	1	11	1	1
Dysentery ..	1,869	120	417	26	3	1,642	266	438	3	5
Encephalitis, acute ..	4	0		0		6	0			
Enteric fever: Typhoid ..	2	0	0	0		1	0	4	0	1
Paratyphoid ..	17	4	2	0		11	2	1	1	0
Food-poisoning ..	186	14		0		178	18			0
Infective enteritis or diarrhoea under 2 years ..				14	12					7
Measles*	32,324	4103	505	498	125	2,330	45	161	55	498
Meningococcal infection ..	41	1	13	1	3	39	5	17	2	2
Ophthalmia neonatorum ..	43	2	8	0		30	5	5	0	
Pneumonia†	1,050	72	338	18	27	529	29	250	12	2
Poliomyelitis, acute: Paralytic ..	5	2				14	0		2	1
Non-paralytic ..	1	1	3	0		7	0			
Puerperal fever‡	224	41	17	1		245	42	16	0	
Scarlet fever ..	822	49	97	55	29	1,474	76	153	40	43
Tuberculosis: Respiratory ..	704	75	133	15		777	85	144	34	
Non-respiratory ..	78	1	25	5		103	7	19	5	
Whooping-cough ..	1,849	156	115	43	36	2,546	105	400	45	42

DEATHS In Great Towns	1955					1954				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	1	0	0	0	0	0
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute ..		0			0		0			0
Enteric fever ..	1	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	7	0	2	1	2	11	1	0	2	0
Influenza ..	59	5	2	1	9	6	1	0	0	0
Measles ..		0	0	0	1		0	0	0	1
Meningococcal infection ..		1	0				0	0		
Pneumonia ..	398	60	30	19	22	235	28	25	9	7
Poliomyelitis, acute ..	1	0		0	0	0	0			0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory ..	89	15	21	2	10	99	10	6	5	8
Non-respiratory ..	1	1	1	0	0	2	2	0	0	0
Whooping-cough ..	1	0	1	0	0	2	0	1	0	0
Deaths 0-1 year ..	239	35	34	3	11	212	17	26	8	30
Deaths (excluding stillbirths) ..	6,840	1025	703	153	266	5,438	720	721	125	211
LIVE BIRTHS ..	8,129	1181	1009	236	478	8,231	1227	982	217	448
STILLBIRTHS ..	189	32	23			218	23	26		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Vital Statistics

Infectious Diseases during First Quarter in England and Wales

After the very poor summer of 1954 the popular belief was that resistance to disease might be lowered and a large amount of sickness result in the winter. The vital statistics of the fourth quarter did not support this theory, and the notifications of infectious diseases during the first quarter of this year also fail to support such a hypothesis.

During the first quarter of 1955 in England and Wales the notifications of scarlet fever and diphtheria reached record low levels. The notifications of diphtheria were only 1/120 of those in the first quarter of 1938. The notifications of acute poliomyelitis were the lowest for any first quarter since the disease appeared in epidemic form in 1947. The incidence of measles was slightly lower than usual in a year of epidemic incidence, but this was due to the fact that the maximum appeared about a month later than usual, and the epidemic will probably reach the same size as those in 1951 and 1953. Deaths from influenza have followed the pattern of recent years of a diminishing peak in the epidemic year. Dysentery provided the only exception to a low or moderate incidence, and the number of notifications from this cause reached a record high level. The numbers of notifications of infectious diseases for the first quarters of the past five years are as follows:

	1951	1952	1953	1954	1955
England and Wales:					
Scarlet fever	12,088	18,013	20,550	15,868	9,121
Whooping-cough	66,865	35,042	34,207	28,985	25,020
Measles	311,709	64,596	350,836	23,340	251,486
Acute poliomyelitis	339	288	345	332	208
Diphtheria	572	456	264	246	173
Meningococcal infections	662	562	595	515	499
Dysentery	13,995	6,936	4,449	10,808	14,551
Acute pneumonia	26,536	12,960	20,005	10,507	13,430
Enteric fever	149	126	123	244	113
Great Towns:					
Influenza deaths	7,448	496	2,995	398	1,181

Infectious Diseases

The only variations of note in the trends of the notifications of infectious diseases in England and Wales during the week ending April 2 were increases of 3,642 for measles, from 28,682 to 32,324, 66 for acute pneumonia, from 984 to 1,050, and 54 for dysentery, from 1,815 to 1,869.

With the exception of the 1953 epidemic the number of notifications of measles was the largest since this disease was made notifiable. The largest rises in the incidence of measles during the week were 766 in London, from 3,337 to 4,103, 496 in Warwickshire, from 2,910 to 3,406, 424 in Middlesex, from 1,574 to 1,998, 233 in Buckinghamshire, from 272 to 505, 256 in Derbyshire, from 814 to 1,070, 175 in Southampton county, from 373 to 548, 157 in Durham, from 841 to 998, 152 in Sussex from 277 to 429, 144 in Glamorganshire, from 376 to 520, 142 in Kent, from 1,081 to 1,223, 128 in Worcestershire, from 364 to 492, 111 in Gloucestershire, from 279 to 390, 109 in Staffordshire, from 1,017 to 1,126, and 109 in Wiltshire, from 137 to 246, while the only large fall was 102 in Surrey, from 1,393 to 1,291. 822 cases of scarlet fever, 7 more than in the preceding week, were notified, and the largest rise was 25 in Essex, from 40 to 65. 1,849 cases of whooping-cough, 18 fewer than in the preceding week, were notified, and the largest fluctuations were a rise of 47 in Warwickshire, from 83 to 130, and a fall of 32 in Cheshire, from 73 to 41. 9 cases of diphtheria were notified, being 2 fewer than in the previous week; 2 cases of diphtheria were notified in Birmingham C.B. and in Manchester C.B. The rise in the number of notifications of paratyphoid fever from 4 to 12 was due to cases scattered throughout 11 counties.

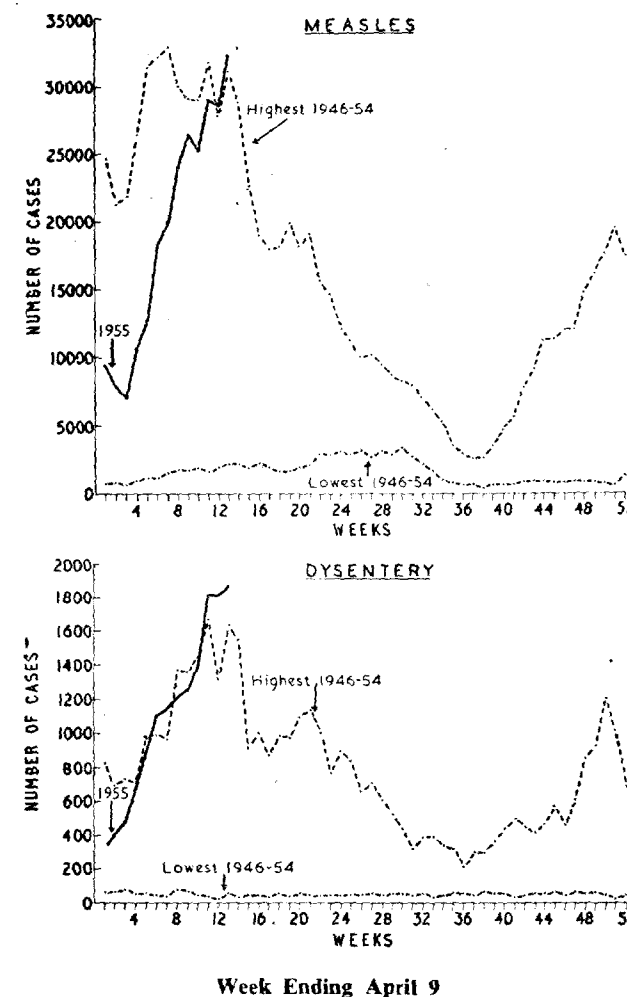
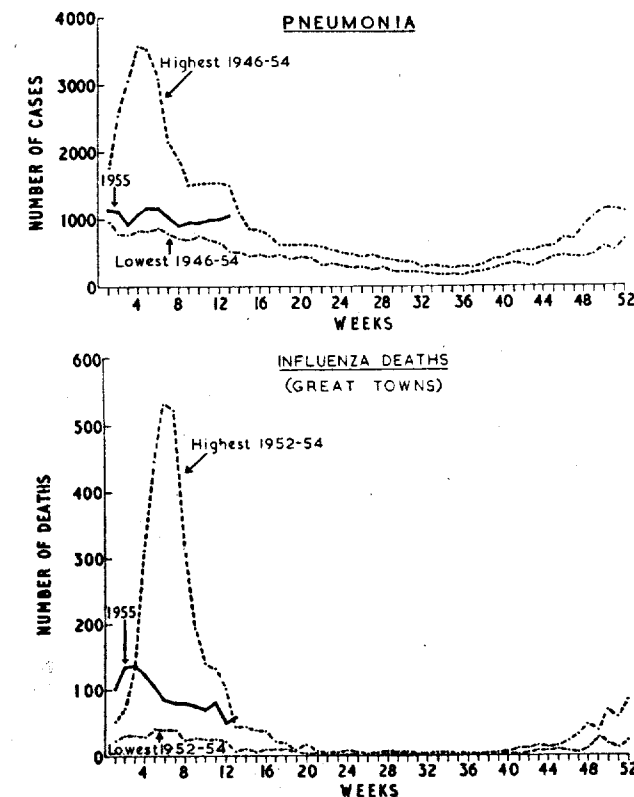
6 cases of acute poliomyelitis were notified. These were 1 fewer for paralytic and 3 fewer for non-paralytic cases than in the preceding week. 3 of the 6 cases were notified in London (Holborn 2).

The number of notifications of dysentery was the largest ever recorded. The chief centres of infection were Lancashire 624 (Blackpool C.B. 135, Oldham C.B. 113, Blackburn C.B. 69, Manchester C.B. 63, St. Helens C.B. 40, Chadderton U.D. 33, Middleton M.B. 25, Royton U.D. 22, Liverpool C.B. 19, Lytham St. Anne's M.B. 16, St. Helens C.B. 14, Kirkham U.D. 13, Failsworth U.D. 11), Durham 241 (Seaham U.D. 72, Darlington R.D. 49, Easington R.D. 30, South Shields C.B. 22, Felling U.D. 20, Stanley U.D. 17, Gateshead C.B. 16), Yorkshire West Riding 144 (Huddersfield C.B. 41, Leeds C.B. 35, Castleford U.D. 20, Sheffield C.B. 13), Northumberland 130 (Newcastle-upon-Tyne C.B. 30, Whitley Bay M.B. 27, Bedlingtonshire U.D. 23, Blyth M.B. 20), London 120 (Shoreditch 23, Hackney 20, Islington 20, Southwark 10), Leicestershire 77 (Leicester C.B. 60), Norfolk 66 (Norwich C.B. 39), Yorkshire North Riding 49 (Middlesbrough C.B. 46), Surrey 46 (Carshalton U.D. 16, Woking U.D. 11), Warwickshire 45 (Nuneaton M.B. 27, Birmingham C.B. 12), Cheshire 39 (Stockport C.B. 26), Southampton county 25 (Droxford R.D. 14), Lincolnshire 25 (Scunthorpe M.B. 21), and Nottinghamshire 24.

In Scotland an increasing incidence of dysentery has been recorded during recent weeks. 417 cases, an increase of 83 on the preceding week, were notified during the week. The largest returns were Glasgow 176, Dundee 50, Lanark county 47, Edinburgh 33, and Stirling county 32.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the nine years 1946-54 (influenza, 1952-4) are shown thus ----, the figures for 1955 thus ———. Except for the curves showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



The notifications of infectious diseases in England and Wales during the week included: scarlet fever 665, whooping-cough 1,310, diphtheria 5, measles 26,833, acute pneumonia 872, acute poliomyelitis 7, dysentery 1,454, paratyphoid 13, and typhoid fever 4.

Medical News

Medical Illustration.—In the Old Library at B.M.A. House the Medical Artists' Association of Great Britain has staged a small exhibition of its members' work. There are paintings and drawings of operations and dissections, suitable for the illustration of books or papers; visual records of endoscopic and ophthalmoscopic appearances; models in resins and wax; composite panels illustrating clinical syndromes; slides; and other aids to the medical teacher. The work is of a remarkably high quality. Opening the exhibition on April 15, Sir CECIL WAKELEY, the association's honorary president, said he was keen to see the medical artist become established as an essential member of the staff of every hospital in the country, especially the teaching hospitals. Illustrations before and after operation were invaluable, he said; more so, in some cases, than pages of medical notes. The exhibition will remain open until April 30 from 10 a.m. to 5 p.m. (on Wednesday until 8 p.m.). A list of members of the Medical Artists' Association is available at the exhibition, giving their addresses and appointments. This should prove most useful to medical authors and teachers.

Royal Northern Hospital.—In place of the old North London Medical and Chirurgical Society, it is intended to hold open monthly meetings for postgraduates and general practitioners at the Royal Northern Hospital, Holloway. These meetings will usually be held at 2.30 p.m. on the last Thursday of the month, and their chief aim will be discussion of clinical subjects by both hospital staff and general practitioners. The first meeting will be held at 2.30 p.m. on April 28 (in St. David's Wing) when Dr. J. F. BUCHAN will speak on "The Relief of Pain by Physical Methods" followed by a demonstration and discussion. Local general practitioners are particularly welcome.

Grey Turner Lectures.—Sir ZACHARY COPE will deliver the first annual Grey Turner Lecture at Newcastle-upon-Tyne on May 19. His subject will be "Some Early Medical Museums." The Grey Turner lectures are endowed by a bequest to King's College, University of Durham, by the late Professor George Grey Turner, and in accordance with his wishes their subject will be some aspect of the history of surgery. Before the lecture, at 5 p.m., a memorial plaque to Professor Grey Turner will be unveiled in the Royal Victoria Infirmary.

Hunterian Society's Gold Medal Essays.—The winner of last year's gold medal, for an essay on the "Management of the Climacteric in General Practice," is Dr. PHILIP HOPKINS, of Hampstead. He will receive the medal at the annual meeting of the society at the Talbot Restaurant, London, on April 25. The subject for the 1955 essay is "Headache," and the competition is open to all general practitioners. Further details from Mr. R. S. MURLEY, 95, Harley Street, London, W.1.

Ames Awards in Gastroenterology.—The American College of Gastroenterology and the Ames Company of Elkhart, Indiana, announce prizes of \$250, \$100, and \$50, with a year's free subscription to the *American Journal of Gastroenterology*, for the best papers submitted before September 1 on original work in gastroenterology. The competition is open to any doctor irrespective of nationality. Further details may be obtained from the American College of Gastroenterology, 33, West 60th Street, New York, 23.

Honorary Freeman of Barbers' Company.—At a meeting of the Court of the Worshipful Company of Barbers of London at Tallow Chandlers' Hall on April 5, the Master, Sir CECIL WAKELEY, admitted Sir JAMES PATERSON ROSS as an Honorary Freeman.

Dr. Charles Hill, the new Postmaster-General, was sworn a member of the Privy Council on April 12.

Helms Trophy for Dr. Bannister.—On April 12 Dr. ROGER BANNISTER was presented with the Helms Trophy of the Helms Athletic Foundation of America, as being Europe's leading athlete in 1954. The presentation was made in London by Mr. HAROLD ABRAHAMS, honorary treasurer of the British Amateur Athletic Board. It commemorates the first mile under 4 minutes (3 minutes 59.4 seconds at Oxford on May 6, 1954) and the mile of 3 minutes 58.8 seconds in the British Empire Games.

Sir Cecil Wakeley received the honorary D.Sc. of Delhi University last month. He is the first member of the medical profession to have this honour.

Professor Ian Aird will deliver the Edward Starr Judd Memorial lecture at Minnesota University on May 26. He will then conduct short postgraduate courses in surgery at Minneapolis and Vancouver, and engage in a lecture tour of Western Canada and the United States. He expects to leave England on May 23 and return on July 7.

Dr. Wilfrid Sheldon, physician-paediatrician to the Queen, is on a lecture tour in Cyprus and Turkey arranged by the British Council. The tour ends on May 6.

COMING EVENTS

The Montreal Conference.—"Medical Aspects of Traffic Accidents," May 4 and 5. Invitations and details from Dr. HAROLD ELLIOTT, Queen Mary Veterans Hospital, 4565, Queen Mary Road, Montreal.

International Hospital Federation.—The Ninth International Hospital Congress will be held at Lucerne from May 29 to June 3. The central theme will be "The Mental Well-being of Patients in the General Hospital." Details from the Federation, 10, Old Jewry, London, E.C.2.

Canadian Neurological Society.—The seventh annual meeting will be held in Toronto, June 16-19. Visiting physicians and scientists are welcome at scientific sessions. Details from office of the secretary, 730, Medical Arts Building, Toronto.

NEW ISSUES

Annals of the Rheumatic Diseases.—The new issue (Vol. 14, No. 1) is now available. The contents include:

HEBERDEN ORATION. Robert M. Stecher.
CARDIAC CHANGES IN RHEUMATOID ARTHRITIS. Nils Egelius, Olie Göhle, Eric Jonsson, and Fredrik Wahlgren.
HUMAN SKIN COLLAGEN FROM DIFFERENT AGE GROUPS BEFORE AND AFTER COLLAGENASE DIGESTION. Madeline E. Keoch.
RHEUMATOID ARTHRITIS: DYE RETENTION STUDIES AND COMPARISON OF DYE AND RADIOACTIVELY LABELLED RED CELL METHODS FOR MEASUREMENT OF BLOOD VOLUME. Allan St. John Dixon, Savitri Ramcharan, and Marion W. Ropes.
NATURE OF ANEMIA IN RHEUMATOID ARTHRITIS. I. METABOLISM OF IRON. L. M. H. Roy, W. R. M. Alexander, and J. J. R. Duthie.
ACTION OF HYPOPHYSAL GROWTH AND THYROTROPIC HORMONES IN THYROIDECTOMIZED RATS. E. Salgado.
ANKYLOSING SPONDYLITIS. F. Dudley Hart. With an Appendix by N. F. MacLagan.
THERAPY OF "FELTY'S SYNDROME." Philip Ellman, Leon Cadkowitz, and J. Stanley Elwood.
A SIMPLE POSTURE METER. R. Harris.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

British Heart Journal.—The next issue (Vol. 12, No. 2) is now available. The contents include:

PATENT DUCTUS ARTERIOSUS WITH PULMONARY HYPERTENSION. William Whitaker, Donald Heath, and James W. Brown.
CALIBRATION OF AN ELECTRONIC PHONOCARDIOGRAPH. By A. W. Sloan and J. R. Greer.
THE EARLY DIASTOLIC SOUND OF CONSTRICTIVE PERICARDITIS. Patrick Mounsey.
THE RESTING HYPERVENTILATION OF CONGENITAL HEART DISEASE. R. J. Shephard.
THE BLOOD FLOW IN THE RIGHT ATRIUM AND SUPERIOR VENA CAVA IN TRICUSPID INCOMPETENCE. Otar Müller and John Shillingford.
A PHOTOMETRIC METHOD FOR ESTIMATING THE OXYGEN SATURATION OF SMALL BLOOD SAMPLES. L. Molyneux and E. A. Pask.
SOME VARIATIONS IN THE SHAPE OF THE PRESSURE CURVE IN THE HUMAN RIGHT VENTRICLE. Peter Harris.
SECONDARY TUMOURS OF THE HEART AND PERICARDIUM. Robert B. Goudie.
THE ELECTROCARDIOGRAM IN PRIMARY ENDOCARDIAL FIBROELASTOSIS. Peter Vlad, Richard D. Rowe, and John D. Keith.
AORTIC VALVULAR STENOSIS WITH COARCTATION OF THE AORTA. D. E. Smith and M. B. Matthews.
THROMBOSIS OF THE MAIN PULMONARY ARTERIES. Oscar Magidson and George Jacobson.
THE INTRACARDIAC ELECTROGRAM AS AN AID IN CARDIAC CATHETERIZATION. D. Emslie-Smith.
THE ATRIAL PRESSURE TRACING IN CONGENITAL HEART DISEASE. R. J. Shephard.
THE RESULTS OF VALVOTOMY FOR SIMPLE PULMONARY STENOSIS. Maurice Campbell and Sir Russell Brock.
UPPER ATRIO-VENTRICULAR NODAL BEATS PRECIPITATED BY VENTRICULAR EXTRASYSTOLES WITH RETROGRADE CONDUCTION. A. Schott.
PATENT DUCTUS ARTERIOSUS WITH AN ABNORMAL AORTIC VALVE. R. E. Bonham-Carter, C. H. M. Walker, R. Daley, M. B. Matthews, and W. E. Medd.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

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

Saturday, April 23

KENT PAEDIATRIC AND CHILD HEALTH SOCIETY.—At Queen's Head Hotel, Maidstone, 3 p.m., eighth annual general meeting.

Monday, April 25

● HUNTERIAN SOCIETY.—At Talbot Restaurant, 64, London Wall, E.C.4, 7 for 7.30 p.m., annual general (dinner) meeting. Professor E. N. da C. Andrade, F.R.S.: Isotopes.

MEDICAL SOCIETY OF LONDON.—8.30 p.m., Second Lettsomian Lecture by Dr. J. G. Scadding: Treatment of Pulmonary Tuberculosis.
NATIONAL SPASTICS SOCIETY.—At Old Council Hall, Bromley Road, Beckenham, 8 p.m., Dr. and Mrs. K. Bobath: Working Methods of Treatment in the Field of Cerebral Palsy.

Tuesday, April 26

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Arnott Demonstration by Professor R. J. Lasi: Form and Structure of Muscles.
ROYAL STATISTICAL SOCIETY: STUDY CIRCLE ON MEDICAL STATISTICS.—At Westminster Medical School, 6 p.m., Dr. J. N. Morris: Some Hypotheses on Coronary Artery Disease.
WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., neurological demonstration by Dr. B. G. Parsons-Smith.

Wednesday, April 27

BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—At Queen Elizabeth Hospital, Birmingham, 8 p.m., clinical meeting.
LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—At Royal Free Hospital School of Medicine, 8.30 p.m., short papers and discussion: Some Obstetric Problems in General Practice. Short papers by Dr. Dorothy M. Parkin: The Rh Factor; Dr. Helen Payling Wright: Thrombosis; Miss Josephine Barnes: Toxicemia.
MEDICAL SOCIETY OF LONDON.—8.30 p.m., Third Lettsomian Lecture by Dr. J. G. Scadding: Treatment of Pulmonary Tuberculosis.
OSLER CLUB OF LONDON.—At 1, Wimpole Street, W., 8.15 p.m., meeting in honour of Anthele Brillat-Savarin (born April 1, 1755). J. I. M. Jones, D.Sc.: Savour, Science, and Brillat-Savarin. Discussion, Professor S. J. Cowell and Mr. L. R. Ring.
ROYAL SOCIETY OF ARTS.—2.30 p.m., Peter Le Neve Foster Lecture by Sir Basil Henriques, J.P.: Detection and Prevention of Anti-social Behaviour in Young Persons.
ST. MARLYBONE HOSPITAL FOR PSYCHIATRY AND CHILD GUIDANCE.—5.30 p.m., Dr. A. F. McGlashan: Principles in Psychotherapy.
SOCIETY OF CHEMICAL INDUSTRY: FOOD GROUP.—At the Town Hall, Bournemouth, 10 a.m., joint meeting with Royal Sanitary Institute. Subject: Contribution of Processing Techniques to the Nutritional Value of Food. Professor J. Yudkin: Normal Processing Techniques; Dr. A. J. Amos, Ph.D.: Fortification.

Thursday, April 28

HONYMAN GILLESPIE LECTURE.—At University New Buildings, Edinburgh, 5 p.m., Professor G. J. Romanes: Motor Cells of the Spinal Cord.
LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of London, 8.30 p.m., Dr. I. R. Maric: Common Skin Diseases.
LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., special university lecture in pathology by Professor R. J. Dubos (Rockefeller Institute for Medical Research): Micro-environment of Inflammation or Metchnikoff Revisited.
NUFFIELD ORTHOPAEDIC CENTRE.—At Wingfield-Morris Orthopaedic Hospital, 8.30 p.m., Mr. R. G. Taylor: Brown-Séquard Syndrome following Trauma.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor W. T. Cooke: Nutritional and Metabolic Factors in the Aetiology and Treatment of Regional Ileitis.
ROYAL SOCIETY.—4.30 p.m., Bakerian Lecture by Professor M. L. E. Oliphant, F.R.S. (Australia): Acceleration of Charged Particles to Very High Energies.
ST. ANDREWS UNIVERSITY.—At Physiology Department, Medical School, Small's Wynd, Dundee, 5 p.m., Dr. W. Feldberg: A New Experimental Approach to the Pharmacology of the Central Nervous System.
SURREY INTER-HOSPITAL PSYCHIATRIC ASSOCIATION.—At Netherne Hospital, Coudson, Surrey, 8 p.m., clinical meeting. Papers by Dr. I. C. White, Dr. J. P. S. Robertson, and Dr. R. K. Freudenberg.

Friday, April 29

CAMBRIDGE MEDICAL SOCIETY.—At Addenbrooke's Hospital, 3 p.m., Dr. J. D. Spillane: Neurology in General Practice.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Dr. J. G. Scadding.
INSTITUTE OF LARYNGOLOGY AND OTOLGY.—3.30 p.m., Mr. J. C. Ballantyne: Use of Hearing-aids.
MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.—At 11, Chandos Street, W., 7.30 p.m., short papers by Surgeon Lieutenant P. R. Oliver, R.N., Dr. G. W. Czomka, and Dr. R. S. Morton.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Mr. I. M. Jackson: Ectopic Gestation.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, W.C., 5.15 p.m., Cushny Memorial Lecture by Dr. S. E. Dicker: Renal Clearances in Mammalian Kidneys.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Carter.—On April 7, 1955, to June, wife of Dr. J. K. Carter, Redhill County Hospital, Surrey, a daughter—Heather.
Clarke.—On April 14, 1955, at Gosforth, Newcastle-upon-Tyne, to Catherine, wife of Mr. Patrick Clarke, F.R.C.S., a son.
MacLeod.—On April 14, 1955, at Nuffield House, Guy's Hospital, London, S.E., to Joan, wife of Dr. Ian S. MacLeod, a son—Hamish.
Turner Warwick.—On March 25, 1955, to Margaret (formerly Harvey Moore), M.R.C.P., wife of Richard Trevor Turner Warwick, F.R.C.S., M.R.C.P., a sister for Gillian—Lynne Frances.
Vowles.—On April 9, 1955, at Cardiff, to Mary, wife of Mr. Keith Vowles, M.B., F.R.C.S., a daughter—Susan Jane.
Wilkinson.—On April 12, 1955, at St. Mary's Hospital, Paddington, London, W., to Patricia (formerly Pipet), wife of Dr. A. P. H. Wilkinson, a brother for Timothy and Robia—Nicholas Simon John.

MARRIAGES

Davis—Liddle.—On April 2, 1955, at Beverley Minster, Yorks, Leslie Russell Davis, M.D., of the Royal Free Hospital, London, W.C., to Margaret Jean Liddle, S.R.N., of Cottingham, Yorkshire.
Trigg—Jordan.—On April 16, 1955, at St. Barnabas' Church, Dulwich Village, London, S.E., Kenneth H. Trigg, M.B., B.S., of Surbiton, Surrey, to Sylvia Jordan, M.B., B.S., of Herne Hill, London, S.E.

DEATHS

Barbour.—On April 12, 1955, at 97, Alleen Park, Dulwich, London, S.E., Thomas Barbour, M.B., Ch.B., D.P.H., aged 75.
Mitchell.—On April 9, 1955, at The Mount, Topcliffe, near Thirsk, Yorks, Talbot Carter Mitchell, M.R.C.S., L.R.C.P., aged 78.
Roche.—On April 7, 1955, Alfred Reginald Roche, M.C., M.R.C.S., L.R.C.P., of 13, North Park Avenue, Leeds, Yorks, aged 79.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Prognosis after One Epileptic Child

Q.—A young couple have an epileptic child aged 2½ years. Contraceptive measures have failed, and the wife is now pregnant. They are fearful that a second child will also be epileptic. The wife's mother had fits as a child and after the menopause. Can one reassure them that the chances of a second child being epileptic are very faint, and that another pregnancy is really desirable?

A.—In this case there is a chance of approximately one in twenty that the second child will in due course develop epilepsy like the elder sib, as it is to be assumed that the epilepsy in the cases of the elder child and the grandmother was "idiopathic" or cryptogenic. However, if the epileptic child only developed the trouble after possible or probable damage to the brain—for example, birth injury or a febrile illness—then there would be no increased tendency for the second sib to be epileptic too, and the probability which obtains for the general population—that is, approximately 1 in 200—would hold.

Clearly, the parents can be emphatically reassured, as at the worst there is only a small chance that the second child will not be normal.

Hereditary Factors in Endogenous Depression

Q.—To what extent is endogenous depression hereditary? A patient of mine wishes to marry a man whose mother suffers from attacks of endogenous depression about twice a year, when she gets so agitated that she has to retire to a mental home for several weeks. It is not known whether other members of the family have suffered from mental disorders. The son appears quite normal.

A.—The hereditary factor in the predisposition to endogenous depression is quite strong. If any single gene can be held responsible, it would probably be an irregular dominant. If a parent is liable to recurrent manic or depressive states of such severity as to require hospital treatment, then one in five (approximately) of the children can be expected to show signs of a similar disposition. However, more often than not the mood swings in the child will never be so severe as to need treatment in hospital.

In the case quoted a great deal depends on the present age of the son. If he is still in his early twenties, then his present normality does not preclude the possibility that he will develop a cyclothymic temperament, and still less the possibility that he may one day have an endogenous depression. Even then, however, the chances are rather remote that he will develop the very disabling pattern of recurrence shown by the mother. If the son is well into the thirties, and shows no sign of a tendency to spontaneous mood swings, it is exceedingly improbable that he will have anything worse than one or two isolated depressive illnesses late on in life; and the chances are about 9 to 1 that he will go through the rest of his life without trouble.

Persons with a tendency to endogenous mood swings very rarely indeed become chronic psychiatric invalids. If they have an illness, they nearly always get over it satisfactorily, and rarely have difficulty in maintaining their social level. Numbers of them are socially more than averagely successful, and as a class they tend to be rather easy to get on with.

The inquirer's patient should feel no very great apprehension in deciding to marry the man described, unless he also shows defects of character or personality of other kinds.

Provocative Androgen in the Acid Phosphatase Test

Q.—Can you give me any details about a test for determining the acid phosphatase level in cases with a doubtful positive result by the ordinary methods? I believe this test is concerned with giving a provocative dose of testosterone to activate the output of acid phosphatase by the prostate in cases of carcinoma.

A.—Under physiological conditions, no acid phosphatase can be detected in the plasma, but in the presence of a carcinoma of the prostate, and especially when there is metastasis to bone, this enzyme passes into the blood stream, and its detection has proved a valuable diagnostic aid. The administration of androgen in these cases increases the plasma acid phosphatase level, and so could be used as a provocative test where doubt exists; the administration of oestrogens diminishes the plasma level.

Toxic Hazards of Aniline and Benzene Compounds

Q.—What routine supervision should be given to workers dealing with aniline and benzene compounds with a view to the prevention and early detection of toxic effects?

A.—Under the Chemical Works Regulations (1922) all persons engaged in any "nitro" or "amido" process (which includes the nitro- and amide (amino) compounds of benzene) shall be examined by a doctor once a month (or at other such intervals as may be prescribed) (Reg. 30(c)), and the results entered in a health register. Other provisions of these regulations are that no person under 18 years of age should be employed in such a process (Reg. 24); that protective clothing, such as overalls and protective footwear, shall be provided—the overalls to be washed or renewed at least once a week (Reg. 25). A cloakroom has also to be provided for the working and other clothes, as well as storage space for the protective clothing (Reg. 26). So that meals shall not be taken in the workroom a mess room must be provided for the workers (Reg. 27), and not only must good washing facilities be provided (Reg. 28) but also bathing accommodation, with hot and cold water, with soap and towels (Reg. 29). A bath register must be kept containing a list of all people employed in contact with the chemicals, and the date on which each person takes a bath must be entered. By regulation all persons employed in the processes must carefully wash the hands and face before taking food or leaving the factory.

These regulations recognized that aniline (aminobenzene) and most of the nitro-compounds of benzene (e.g., nitrobenzene) are absorbed by the unbroken skin, as well as the fact that most of them are volatile and the vapours can be inhaled. In general, therefore, preventive measures should consist in keeping the chemicals off the skin, and, if splashes on the skin do occur, their rapid removal by washing in cold water. Exhaust ventilation should be applied to the processes to keep the vapours out of the air of the workroom.

The compounds of benzene are numerous, but aniline and nitrobenzene can be taken as good examples. Both are tissue asphyxiants and narcotics, and the common early presenting sign of poisoning is cyanosis of the skin, due to the formation of methaemoglobinemia. This sign may be detected by an experienced foreman, who should be instructed to send a cyanosed worker immediately to the doctor. Further information about the signs and symptoms of poisoning can be obtained from the standard textbooks on industrial toxicology. Aniline poisoning is notifiable under the Factories Act.

Stramonium Leaves and Smoker's Cough

Q.—Would the addition of stramonium leaves to tobacco benefit smoker's cough?

A.—The addition of stramonium leaves to tobacco would certainly not benefit smoker's cough. Stramonium leaves contain both hyoscyamine and hyoscyne, and these substances

greatly diminish or arrest ciliary movement. This movement normally removes the tarry deposits from tobacco smoke which are formed in the bronchioles. The tar is transported from the respiratory passages into the oesophagus. The cough probably arises from the irritation caused by the tarry deposits, and would be made worse if the removal of these deposits were impeded.

Circumcision and Sexual Satisfaction

Q.—I have heard it said on various occasions, sometimes by men and sometimes by women, that women prefer coitus with a circumcised male because he takes longer to reach orgasm than one who is uncircumcised. Is this a statement of fact or merely an expression of opinion?

A.—This is a belief rather than a fact, but it is one which has been firmly held by certain races from earliest times. Ancient as well as modern literature contains accounts of women who, after failing to satisfy their sexual desires elsewhere, turned ultimately to a man who had been circumcised. The idea is widely accepted and discussed amongst the more primitive peoples to-day.

It is said that removal of the prepuce results in the glans penis becoming less sensitive to touch, and more stimulus is therefore required to produce an emission. The coital act is thus prolonged, and this tends to ensure that the woman always reaches orgasm. The same objective can be achieved by other means, so that the reputation enjoyed by circumcision is traditional rather than proved, and it remains to be shown that any success which a circumcised lover may have is "based not on artistry but on anatomy" (R. L. Dickinson). It may be added that ejaculation is not dependent only on the tactile sensitivity of the glans, and it is not uncommon to hear circumcised men complaining of premature ejaculation.

Circumcision does not necessarily make the act more pleasurable for the male, but the men of Eastern races tend in any case to set great store on mere prolongation of coitus—with or without the interests of the female partner in mind. Some authorities hold that this is the original motive for ritual circumcision as practised by certain primitive communities.

Plastic Ring Pessaries

Q.—What advantages have plastic ring pessaries over vulcanite and rubber ones?

A.—Although they can be moulded by heat, the only plastic rings of which the writer has knowledge are rigid in use and therefore a little more difficult to insert than pliable rubber or rubber-covered pessaries. Their great advantage is that they do not irritate the vaginal wall, so the patient remains free from offensive odour and discharge. They therefore require changing only at relatively infrequent intervals, and douching is usually unnecessary. They are not, of course, free from the risk of producing pressure necrosis. Vulcanite pessaries are also much less irritating than rubber-covered ones, although they may not be quite so good in this respect as those made of plastic material.

All ring pessaries, irrespective of their material, are only efficient if the perineum is strong enough to hold them. As a rule, they support the uterus better than the vaginal walls.

Nylon Toothbrushes

Q.—Are toothbrushes made from nylon or other synthetic fibres better than those made of bristle? What are their advantages and disadvantages?

A.—Toothbrushes made from nylon or synthetic fibres usually have a longer life than those made of natural bristle. The pattern of wear is also different, as nylon fibres tend to bend, producing a splayed brush (particularly if used with hot water), whereas natural bristle tends to break.

The main disadvantage of nylon toothbrushes is that most are too hard and are liable to damage the gums and teeth. Natural bristle brushes may be hard at first, but soften rapidly with use. As an alternative soft nylon brushes are now available and would appear to clean the teeth and gums adequately without causing damage. However, there is some evidence¹ that brushes made from natural bristles are more efficient cleansers. Unfortunately the supply of first-quality bristle available in this country is at present limited, as this grows on the backs of Siberian hogs.

REFERENCE

¹ J. Periodont., 1954, 25, 183.

NOTES AND COMMENTS

Wet Clothes.—Colonel L. W. HARRISON (London, S.W.1) writes: Your expert's answer on this subject ("Any Questions?", April 9, p. 923) reminds me of an experience during the South African War of 1899-2 which may help to supplement his remarks usefully. For many months during that war I trekked with an infantry battalion, and on very many days we marched through a steady drizzle in which the soldiers' clothes were wet through. To my surprise at first, the soldiers kept their greatcoats rolled—in those days they carried them "banderole"—that is, rolled and supported on one shoulder whilst hanging diagonally across the body—and they did not put them on until the rain had ceased, in the evening. How they had learnt the tip I did not know. Perhaps it was from some Scot who had condescended to soldier with this "Manchester" battalion; perhaps it had been handed down in the regiment from experience in earlier campaigns. Your expert says, "The more clothing worn, within limits, the warmer the skin." The words "within limits" should be emphasized. For the three years I was in South Africa, during the war and immediately thereafter, except for three days in Lydenburg and two days in Johannesburg, I slept under tent or bivouac, mostly the latter, and in the cold season it was at first a problem to keep warm: it was quite usual then to find the water in one's hand-basin frozen pretty hard. At first I piled on clothing and seemed to become colder and colder, so one night I took off my greatcoat and laid it loosely over me, having concluded that the tightness of the clothing was responsible for the feeling of chilliness. The experiment was a success, and I learnt thereby that for warmth the clothing should not be too tight. In spite of the many days spent in saturated clothing nobody in my medical charge caught cold, so far as I knew.

A Commonwealth Tour.—Mr. D. D. BROWNE (Wangaratta, Victoria, Australia) writes: Mr. A. Lawrence Abel (*Journal*, December 25, 1954, p. 1540) refers to Wangaratta as a town of 16,000 people that has doubled in five years. Actually, the population is a little over 10,000 and has increased 64% in the last seven years. He refers to Dr. Phillips as the local senior surgeon with two partners, and as a member of the Commonwealth B.M.A. Council. None of these statements is correct. . . . In Dr. Phillip's own interest and in justice to his fellow practitioners in this town and surrounding country, among whom your *Journal* circulates, it seems fair to ask that these errors be corrected.

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Correction.—In Dr. A. T. Mennie's letter on tetracycline (*Journal*, April 16, p. 973) the statement in the last paragraph that "tetracycline produces fewer side-effects . . ." should have read that "tetracycline produces fewer side-effects."

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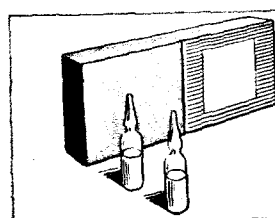
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BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 30 1955

THE CHANGING FACE OF MEDICINE*

BY

CLIFFORD KENNEDY, M.B., Ch.B., F.R.C.Sed., F.R.C.O.G.

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To the layman reading his daily paper, and in particular the ponderous and often pontifical pronouncements of our politicians, must come the belief that he lives in an era when all is well with medicine. I wonder if he is right. Why so often is the medical father of to-day relieved when his son, sometimes perhaps with a little persuasion, chooses a different career? The reason is that in this age of rapid transformation medicine has not escaped. The foundations upon which our work was built have been rudely shaken, and I sometimes wonder whether the structure above is beginning to totter. I would like to draw attention to several of the factors which I think may be playing their part in this change so far as it affects specialist practice, for I would not presume to speak of the worries which attend the general practitioner. Some of the causes are naturally of our own making; others have been thrust upon us through this new health service under which we work. I propose to treat my subject under four main headings: (1) undergraduate training; (2) registrar appointments and training; (3) changes in consultant practice; and (4) the law and medicine.

1. Undergraduate Training

It is always a good thing to raise the standard of anything, and with that end in view the course in medicine has been increased to one of six years. This step—I think an unnecessary one—might have been excusable had the extra year been devoted to clinical study rather than to the basic sciences. It was thought that by giving more time to the subjects at the beginning of the medical course the boy or girl in the last year of school might benefit from a broader education at that stage. The opposite result has, however, obtained, in so far as the schoolmaster, hearing of this additional year spent on the basic sciences at the university, has got the idea that still more attention should be given to those subjects at school, and as a result the whole idea has been nullified. It was interesting to hear some two years ago, from one vitally concerned in this change at the University of Edinburgh, an admission that a mistake had been made and that this further year of study should have been devoted to the end of the course rather than the beginning, and yet this mistake is apparently allowed to be perpetuated indefinitely.

I think it is true to say that Edinburgh, unlike some medical schools in the south, has always laid stress on

providing the undergraduate with a solid foundation of theory on which to build his clinical study. There may be great value in this—indeed, it may be the correct approach and the best method of ensuring a sound training. But are we satisfied that this is not being overdone, that the medical undergraduate course is not too intense, too overcrowded? With increasing knowledge and an ever-widening research it is inevitable that there is nowadays more to learn; but, even allowing for this, there is sometimes the feeling that there is too much teaching, too much spoon-feeding, and that more good might derive from a less concentrated course of lectures and tutorials which would leave the student a little precious time to think for himself. Again, I would say there is an element of danger in instruction which lays too much emphasis on diagnosis made by the "back-room boys of medicine." How often, on asking a simple clinical question requiring an equally simple and straightforward clinical answer, are we advised, in a pitying sort of way, to have some fantastic biochemical investigation carried out; or, if it be a question of the head going through the pelvic brim, to have the patient x-rayed! It is singularly unfortunate that an assessment of the patient by the bedside appears nowadays to be deemed less essential and is becoming more carefree and haphazard. At the end of university training there is an invaluable year in hospital and then two years in the Services, when the mind of the doctor, so far as things medical are concerned, might in the average case be a complete vacuum. Postgraduate courses are nowadays popular and are an essential stimulant to the general practitioner, who, overburdened by the trivialities of present-day routine—trivialities encouraged by the attitude of the Welfare State mentality—has little time to keep abreast with advances in his subject. It is a sad reflection, though, that so many young men take those courses simply because during two years of Service life they have forgotten much of the teaching of their undergraduate days.

2. Registrar Appointments and Training

Suppose now that one of those doctors, finished with his National Service, wishes to specialize in obstetrics and gynaecology. At this stage he does three things. Assuming that he has done six months' medicine and six months' surgery in his year in hospital following graduation, he now spends another two years as house-surgeon in obstetrics and gynaecology. Then he becomes a registrar, and finally he prepares for the special examinations which are necessary. This last phase of

*The Presidential Address read to the Edinburgh Obstetrical Society on November 10, 1954.

specialization takes up another five or six years at least, so from the day he started medicine he will have spent some fifteen years in preparing for his specialty. But his programme is not yet complete—there is often a dreary wait before a suitable and congenial consultant post offers; indeed, the wait may prove too long and he may eventually be offered, and forced to accept on economic grounds, some junior post where he may carry out efficiently and conscientiously the work of a consultant without being granted the title. Is there any other profession which calls for such a prolonged period of preparation and apprenticeship? I wonder whether the layman, still reading about the improved status of the specialist, realizes all this.

Some will say, "But look—nowadays the resident appointments are associated with more adequate remuneration than in the past," and will remind me that, as compared with the honorarium of £25, raised ultimately to £40, which a clinical tutor of my time received in the gynaecological wards of the Edinburgh Royal Infirmary, his counterpart, the registrar of to-day, receives a princely salary and his financial position is secure so long as he holds his appointment. I wonder if this security is altogether a good thing and whether registrar appointments should be whole-time.

In the old days a clinical tutor's hospital appointment was part-time. To close the financial gap between starvation and a moderate degree of comfort he gave private tuition to the Fellowship candidate, to the final-year student, and on occasion even to the nurse. He might also conduct special classes for the various examinations. It was his privilege to assist his chief in private, and in addition he began to get the occasional private case himself, very often the obstetric patient unable to afford the fee of a more senior man. From all this the clinical tutor derived much benefit and a much wider experience. To-day the registrar appointment is whole-time; an introduction to private practice is therefore not possible, and even the assisting of his chief outside of hospital has on occasion been questioned.

The present-day system breeds a mentality whose horizon is bounded by the hospital walls. There is little awareness of the world outside, and the young registrar often has little or no desire to go through the monotonous routine of private tuition. The whole approach has tended to become more lethargic and more lackadaisical. The younger folk may not approve of this observation, but it is true nevertheless. They are losing some of the greatest thrills which we who were fortunate enough to work under another system experienced: the enormous satisfaction of making headway—financial headway, to take it at its lowest value, for I would not underrate the importance of that for one moment; making headway, then, by our own initiative, ability, and "private enterprise." There is no doubt whatever that almost any nationalized industry which lacks competition to keep it on its toes goes downhill—one does not need to look far to see that—and medicine will be no exception if a whole-time salaried service comes to pass. Already there is a levelling-up process taking place whereby the unsuccessful specialist of the past, through his hospital remuneration and the decline in private practice, will be on almost equal terms with his more able and more capable colleague. Once that happens and there is no real reward for merit, something will have gone out of the profession.

Now, I consider this to be of tremendous importance to the future of medicine. There is no doubt that a section of our politicians wish private practice to die out, and the quicker the better. They want instead a whole-time salaried State service. To my mind this would be a disaster of the first magnitude for the doctors and for the country. Rather should an active and virile private practice in friendly rivalry with the Health Service be our safeguard. I am quite sure that this system of whole-time registrar appointments, in so far as it denies the right to carry out, and finally kills any desire to take part in, private practice, is playing into the

hands of the politicians. There is, too, another point. Whereas the clinical tutor of bygone days had his introduction to private practice during his five years of appointment, and therefore had something to fall back on when his tutorship expired and before he gained a position on the honorary staff, the registrar of to-day has no such introduction, and may well find himself in dire straits in the gap between.

May I digress for a moment to venture comment on the question of research, upon which ever-increasing stress is being laid. It is well known that nowadays, when applicants for a specialist post are being considered, first importance is given to any research that the individual may have carried out and the number of publications to which his name may be attached. Indeed, it is the advice of the senior consultants to the very junior that they must write and write and keep on writing if they want their application to be successful. It sometimes, nay quite frequently, matters naught, when the candidates are being discussed, whether the research was of practical worth, of particular brilliance, or, on the other hand, of no value whatever; it counts for nothing that, to many members of a varied appointing body, the publications might as well have been written in a foreign language with which they have become somewhat out of touch. The articles may be so much rubbish—they often are; the important point is that one very special candidate may have written more or is thought to be potentially a more likely research worker than another, and he is invariably the successful applicant. There is no doubt whatever that that is the position to-day, and it applies to most specialties. We have come to a pretty pass when such a situation can obtain that a first-rate clinician and a sound and experienced operator may be passed over just because he has not put pen to paper as often as another.

It must be obvious to the meanest intelligence that everyone who makes the decision to specialize is not destined to carry out original work or even to be a low-grade author. It has been said that a man should be given a taste for research before he is thirty or it may be difficult to get him started. This may be the grand ideal, but in actual fact the trainee of that age has already an overloaded plate and there may be no more space left for the non-essential trimmings. Do not therefore be too ready to condemn the young man as lazy; do not damn him just because he cannot write something "original." Let him work out his salvation in other ways—he will if he is given a sympathetic chance. Surely there is a place for both types in the scheme of things—the clinician and the research worker. After all, the main function of the average physician, surgeon, or gynaecologist is to alleviate suffering and heal the sick so far as lies in his power, and I would maintain that this should be the first concern of the vast majority. It seems rather dreadful that we have in these days to remind ourselves from time to time of our primary role. It is sad that in this present age of experiment we are sometimes apt to lose sight of the fundamentals of our calling.

3. The Changes in Consultant Practice

Now let us look for a moment at those of consultant status. Partly because of a changing outlook and partly as the result of this new system under which we work, we have been, as a class, divided and subdivided, and it is all-important to bear this in mind in the years to come if we are to present a solid front on matters of policy and on the improvement of the National Health Service. Most important of all, it would appear to me, is the chasm—unfortunately an ever-widening chasm—which divides whole-time and part-time appointments. I do not propose to discuss the relative merits of those appointments, for obvious reasons. Each has its own peculiar advantages. Let us all recognize those advantages and leave it at that—that would be the solution, but I am afraid it is not quite so easy. A year or two ago sarcastic, and indeed bitter, criticism was levelled at the part-time consultant. It is, of course, inevitable that we should criticize one another, but let such criticism not be tainted, let it be free of rancour.

In discussing this question with a general practitioner a month or two ago I was rather surprised when he said there would soon be a place for the general practitioner in the teaching of the undergraduate. He believed that if the whole-time specialist idea were to go on growing there would come a time when no consultant had contact with the patient outside of hospital, and something would be lost to teaching on that account. I sometimes wonder whether the influence of the whole-time teacher is not a little responsible for the too academic outlook of the present-day undergraduate. I am quite certain of this: the more we lose touch with the general practitioner—and the whole-time is doing that now—the more will something vital depart from a valuable relationship. We need each other, we should get to know each other, and we should wish to help each other without hindrance of any kind.

We are divided again into four groups according to whether we have one of three grades of merit award or none at all. Following a letter to the *British Medical Journal** from Mr. John Simons on the subject of merit awards and stating that there was "considerable disquiet," Lord Moran replied in the same *Journal*† that this was "diametrically opposed to our experience." He describes in that letter the machinery involved in this labelling process—how, to begin with, in some areas small bodies advised the Awards Committee, and in other areas, notably "some of the London teaching hospitals," the task of recommendation was handled, at the request of the staff, by some of the senior members, who reported directly to the Awards Committee.

"There was a feeling that it was not fair to ask those who had been given this difficult task to submit their conclusions, which were obviously of a confidential nature, in open committee to perhaps as many as thirty members, for they were asked not merely to submit a list of names to fill vacancies; it was necessary to supply the Awards Committee with the reasons which had led to the choice of those names. And it was found that many consultants were not prepared to furnish these reasons save to the Awards Committee, where they could feel assured that the confidential nature of their report would be respected."

Lord Moran goes on to say that the "master principle" which has guided them from the beginning in their selection for awards has been to tap as many sources of information as possible. "So only," he continues, "can we hope to eliminate prejudice and attain to some degree of accurate appraisal." He speaks of the successful working of the awards system, asks the question whether he is entitled to make any such claim, and concludes his letter thus: "It is indeed a remarkable achievement, which has its roots in the good sense of our people—an achievement, I think, beyond the reach of more selfish countries." It did not occasion much surprise to find in the next few weeks replies of very contrary opinion to this letter in both the *British Medical Journal* and the *Lancet*.

Cloaked in such diabolical secrecy as those awards are, it is often difficult to get at the truth, and, not unnaturally, the wildest rumours run riot, but enough is known to say that wrongful decisions have been made. There are three questions I would ask Lord Moran: (1) Is the original percentage of awards in the three grades being adhered to? (2) What is the number of consultants in the teaching schools of England and Scotland, and how many awards in each grade have been given to the men in those schools? (3) What is the number of consultants in the teaching schools of London, and how many awards in each grade have been given to the men in those schools? The answer to those three questions would be more than interesting. The suggestion is often made that certain regions—and now I refer particularly to the larger medical schools—have been dealt with more generously than others, implying that the standard of the specialists and of medicine in one area is infinitely

superior to that in another. This I do not accept. We have no grouse whatever against the individual who is deemed worthy of a top-class award either by himself or by his fellows—let him have it by all means and good luck to him; our grouse is against a system which works so ineffectively and, so often, quite unfairly. The problem of improving this system is indeed a difficult one, because it is often impossible to get at the truth; the individual is afraid to complain—he feels that by so doing he makes his colleagues aware that he is a disappointed man; he is afraid also that by open complaint he may prejudice his chances for the future. Our national reserve and upbringing are no doubt responsible for the feeling that it is bad form to discuss this subject labelled "confidential," and so we tend to keep quiet about it. Silence therefore has been wrongly taken as approval of, and acquiescence in, the whole idea. It is unfortunate that it should be so. There is indeed grave disquiet in regard to the mechanism by which the awards are made, and unless we air our grievance openly and in a sufficiently large body there is little chance of having this part of our house put in order.

I gather that in Scotland there is a committee with representatives from different regions and from different specialties. Their opinions go to headquarters in London, where, I suppose, the recommendations are confirmed or rejected. Now, I would ask, what does the surgeon or physician on the committee know of the relative merits of one obstetrician as against another? The answer is, very little or nothing at all. They therefore have to be guided by their obstetric colleague, for I believe there is only one on the committee, and what can he know about the relative merits of his colleagues in regions far removed from his own? Again the answer is, very little or nothing at all. This whole question—a very vital question to most of us, for it affects not only our annual income but, what is more important, our pension—therefore is decided on hearsay and vague impressions—surely a Gilbertian situation.

What is the solution to all this? So far as I see it there are three alternatives. The first is that the whole scheme, born of unimaginative and insensitive mortal, be cast out and the money saved added to the consultants' ordinary salaries. I don't suppose that this is possible. The second is that a merit award should really be a merit award, and given from time to time—on the basis of an annual award—for particularly good work done in a single year. As things are at present, a man who has been given a top or even a second grade merit award is apt for the remainder of his active professional life to sit back and lose any desire to repeat his epic performance. The third possibility is that the mechanism by which these awards are made be radically changed. This could be done in many ways, but here is one method which, I think, is worthy of attention. Considering Scotland only, I would suggest that every year two or three representatives from each specialty in each of the four teaching schools be chosen. In obstetrics, for example, that would mean eight or twelve consultants, as senior as possible, getting together annually. They would discuss the various candidates in their own specialty and forward to the committee the names suggested. The claims from the various specialties could then be settled on a seniority basis. If the present Scottish committee is to remain, with important function, then there should be more than one representative for the major specialties. This enormous and onerous task is quite outside the capability and compass of one individual no matter how extraordinary he may be.

4. The Law and Medicine

I am quite prepared for criticism of, and even open disagreement with, much that I have said. I would be surprised, however, were there not unanimous approval of my final remarks, for an exposition of the changing face of medicine would not be complete without mention of the changed relationship between doctor and patient and between patient and hospital.

* June 26, 1954, *Supplement*, p. 359.

† July 17, 1954, *Supplement*, p. 69.

The compensation payments made by National Health Hospital Authorities, largely resulting from claims for damages by patients, have risen from £7,560 in the period July, 1948–March, 1949, to £152,590 in 1953. This startling information was given in the House of Commons in answer to a question asking how much money the Ministry of Health had paid each year “in damages for neglect or inefficient medical or nursing treatment.” Commenting on the figures, the questioner went on: “Is this not further evidence that the Health Service under State control breaks down when individuals are relieved of personal responsibility?” That question, of course, comes from a man who has no knowledge and less understanding of the doctor's worries and anxieties for his patient which are part of his heritage and his tradition. It is good to know that the Minister of Health replied: “Personally I both resent and repudiate that,” and continued that he was certain that there had been absolutely no deterioration in care since the start of the National Health Service. Why then, if this be true—and I am sure it is—do we find headlines in the daily press featuring with ever-increasing frequency the actions brought by patients against the surgeon or against the hospital? I would say the main reasons are three in number.

(1) Free legal aid enables the individual to bring an action without risk of financial loss. If he loses his action the expense is borne by the State; if he wins he stands to gain. There is therefore no deterrent, and he probably gives little thought to the possible effect of such an action on the future of the unfortunate doctor. For, make no mistake, even should he lose his action and the doctor be vindicated, some of the mud which has been flung is liable to stick.

(2) There is the idea, all too prevalent, that nowadays it is the Government—the State if you like—that is being sued, not the doctor, for after all the doctor is merely the servant. This may in part be true, and where some doubt exists the jury may well take the line of reasoning that the State is wealthy and can well afford to pay the poor claimant something. What the jury, and, I fear, sometimes the more learned judge, are apt to leave out of reckoning is that the State is big enough to surmount and quickly forget such unpleasantness, but the poor doctor is damned for all time.

(3) In this present age, and in every walk of life, there is prevalent a desire to get something for nothing. One can hardly blame the man in the street for this, for such an outlook is being bred and fostered by the ideas behind the Welfare State, giving rise to a new mentality.

These are the factors which are responsible for this never-ending litigation. We must therefore ask ourselves, “What is the effect of all this?” and “What is the solution?” The effect is seen at all levels of hospital staff appointment from the most junior to the most senior. The young resident is often unwilling to undertake the responsibility of a casualty department because he is only too well aware of the pitfalls and dangers which may crowd the very beginning of his medical adventure. His more senior colleague, the anaesthetist, is burdened down by the fear of “death on the table,” and anaesthetics suffer as a result. The surgeon finds that he is loath to undertake the “risky” case. In former days he would have gone ahead and in all probability done enough to make the last days of a patient's life more comfortable and more bearable. Now he is apt to adopt the attitude that as “something may happen” it would be safer to do nothing at all, and he sends the patient home to end his or her days in misery and pain. There is no doubt that this is happening to-day; I have done it myself. Again, he feels that by making a wide resection to eradicate disease and cure the patient some important structure may be subjected to trauma. And so he pulls up short; his work is rendered incomplete and the disease remains. On occasion in the old days there was a spirit of adventure about some surgical operation: some new procedure “came off” and a great advance was made. Now the surgeon may be unwilling to take this risk: he has to think of his own safety too. The advance of medical science will never be

stopped, but initiative is being stifled, and the advance may well be slowed down if the surgeon is forced to work under the continual threat of retribution.

The solution is more difficult. The first essential is mutual trust and confidence between patient and doctor. The second is a change of outlook on this matter by the legal profession. The law has not been very helpful or sympathetic to us in those trying years, and expert evidence by eminent medical men would appear sometimes to have counted for nothing. The judgment has sometimes seemed harsh and bitter. A different attitude from our legal friends is of first importance, and I would go so far as to submit that many cases should be flung out at the beginning and never allowed to be heard in open court.

In a letter to *The Times* of October 26, 1954, S. Cochrane Shanks, President of the Medical Defence Union, stated that the number of claims for alleged medical negligence submitted to them in 1953 had increased by 80% as compared with 1947. He goes on:

“Of the total claims during this period only one-third were justified, in that the union settled without going to court or lost the action in the courts. In the remaining two-thirds the plaintiff either abandoned the claim or lost it in the courts. Of the cases coming to court the same ratio obtains: the union successfully defended two-thirds and lost one-third.

“It is evident from the above figures that many of these claims are unjustified, and as the plaintiff is now legally aided in about 80% of all cases the successful defendant is usually unable to recover any of his costs. In two recent cases, successfully defended by the Medical Defence Union, the union's costs exceeded £10,000, none of which was recoverable. The legal aid scheme makes proper and desirable provision for the impecunious plaintiff, but the question arises whether it should not be extended to cover the taxed costs of a successful defendant when the plaintiff is legally aided. Alternatively, there might be adopted in England the practice which already obtains in Scotland of allowing a prospective defendant, through his solicitor, to submit evidence as to why a certificate of legal aid should not be granted to the plaintiff. . . .

“All three defence societies accept it as their duty to pay proper compensation for real negligence on the part of their members. Equally they feel concerned at the drain on their funds, and even more so at the damage to the good name of their members, by unjustified claims and legal actions.”

In a magnificent article* on this subject Bryan McFarland, Professor of Orthopaedic Surgery at Liverpool University, has written:

“No one is suggesting that the doctors should be immune from criticism or protected from retribution when they have erred. No one is suggesting that an injured person should be denied the right to proper compensation. What is suggested is that the machinery for settling these issues should be such that the doctor should only be put ‘on the spot’ if in the minds of responsible members of the legal and medical professions he has been negligent.

“It would not be difficult, for instance, for the merits of a case to be judged by a tribunal such as deals with appeals under the National Insurance Scheme—a tribunal nominated by high authority and consisting of two medical men with a lawyer as chairman. If such a tribunal were to decide that there was a case to answer then the doctor should have to answer it. If on the other hand it was thought that no particular doctor had been negligent but that the hospital system or arrangements or staffing as a whole had behaved inadequately, then the hospital would have to answer. If it was thought that the damage resulted from something ‘going wrong’ in which no negligence was involved, then neither doctor nor hospital would have to answer.”

* *Liverpool Daily Post*, May 6, 1954.

This solution might not be acceptable to the law, but I feel sure the medical profession would welcome such a compromise.

I have but touched the fringe of the subject. One could ask whether, with the enormous cost to the country which this new service entails, the patient has benefited in the essentials of treatment; whether the vast administrative wheel, which often grinds so slowly, might be made smaller and yet more effective; whether the endless committees, which force the public-spirited to spend almost as much time in the train as in the hospital, are so necessary; and whether great power and influence vested in the hands of a few satisfies our democratic ideals. Those are but a few of the problems.

It has fallen to our generation to work out and put into practice this new regime in medicine. Changes, whether we like them or not, are taking place around us all the time and we have to make the best of them: but, with the highest ideals ever before us, let us see that it is the best. Let there be honesty and frankness among us and let us frown on intrigue—for there is much of that in medicine at the present day—and cast it out. Let gentle suasion never steer us away from a true sense of values, and, above all, let us never forget that our first aim should be to heal and cure the sick.

YOUTH LOOKS AT GENERAL PRACTICE*

BY

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It might be of interest to the profession to know what a recently qualified doctor, and therefore one without specialist training and with only a short experience as a practitioner, thinks of some aspects of general practice to-day. The views I express are my own and not necessarily those of the younger generation as a whole. Furthermore, if any of my comments appear unduly critical of those older and wiser than myself, they are in no way intended as an impertinence, and I hope will not be so regarded.

The student of to-day working for his “finals,” and faced with a compulsory year in hospital followed by two years' National Service, probably does not give much thought to general practice, though he may well be thinking of it rather vaguely as a future career. In fact I would suggest that many final-year students and “neo-graduates” rather tend to have a leaning towards some specialty. This is not unnatural, since the training is almost entirely in the hands of specialists, and this despite the fact that many of the students are destined to become general practitioners. The year of compulsory internship may accentuate any specialist leaning, as by now the young doctor is even more closely bound by the hospital tie. However, it is not easy to become a consultant these days, and, if a man is contemplating taking a wife, it is difficult to marry on a resident's or S.H.O.'s salary. Furthermore, the thought of the high failure rate in the F.R.C.S., M.R.C.P., and other specialist examinations may deter him from pursuing his choice. So, rather unwillingly perhaps, he plunges into the unknown and looks for a job in practice, leaving behind him, probably for good, the world

*An address given to the Southern Medical Society of Glasgow on November 25, 1954.

of starched aprons and white coats. His idea of what is involved is, more than likely, rather vague, since he has had no specific training for general practice. I myself had had the advantage of being reared in a medical household, but despite this my knowledge of the job to be tackled was far from clear. I cannot say I was very enthusiastic. I had been told by friends with some slight experience that all was not well. The hospital swallowed all the clinical interest. The hours were long and tedious, and the day was spent coping with queues of “not-so-very-sick” but demanding people out to see what they could get for nothing. And so, by now not quite so confident, I crossed the threshold with a background of three residencies and National Service completed.

Initial Difficulties

What were my initial difficulties and worries?

First, I think, would my knowledge be sufficient? I had no idea what measles looked like, or mumps. When I was a resident there had always been someone else to take the ultimate responsibility of the patient. Now it was to be my turn. How would I fare? What on earth would I prescribe? I realized with horror I could not really write a prescription. I imagined that I would meet with much more of the hospital type of illness than I actually did. However, with this kind of illness I found that my knowledge was sufficient; but when it came to bronchitis, influenza, childish febrile conditions, rheumatism, tonsillitis, old age and its problems, and so on, I discovered I was not so clever. Their mysteries were all contained in a closed book which had to be opened and studied closely page by page, and yet this was to be the bulk of my everyday work.

Prescribing turned out to be easier than I had anticipated. The local chemist proved a great help, and there was always the *National Formulary*. However, the temptation to prescribe proprietaries with their easily remembered names was the severest trial. Furthermore, the persistent pestering of the drug firms via the post and the traveller would break down the ideals of all but the very righteous. Nowadays there seems to be no need to write an old-fashioned prescription at all: there usually turns out to be a proprietary equivalent, which is supposed to be as cheap and equally efficacious. At least, so say the manufacturers' travellers.

Restrictions Imposed by the N.H.S.

My early reaction to the volume of trivial complaints brought to me was. This is not medicine at all: a fourth-year medical student could cope. There seemed to be so many people to be seen that even when one had separated the wheat from the chaff there was not time to deal properly with the wheat.

The cessation of clinical control of patients removed to hospital under the National Health Service seemed to me a great loss. On the other hand, it was often not a bad thing to be relieved of the responsibility and worry, allowing one to concentrate on the ordinary run of everyday work. The fact that it was found necessary to refer to hospital anyone requiring even a simple diagnostic investigation proved a great irritation to the late house officer who had so recently himself had the power to order many of these investigations. And the delay in waiting for out-patient appointments was most frustrating. Often weeks would elapse before the answer to a clinical problem arrived by post on one's desk.

In many cases it appeared to me superfluous for the hospital officer to enter into the picture at all. He merely seemed to act as a middleman anyway. Why should I personally not have more direct access to such investigations as “x-ray chest,” “straight x-ray abdomen,” blood counts, and minor biochemical and pathological investigations? More important still, it appeared to me that the patient must think that, because he has been sent to hospital for all but the very trivial, the G.P. is only good for this. I

am sure this has done much to lower the general practitioner's standing in the public eye. This is borne out by the fact that even when the general practitioner may himself wish to carry out certain investigations or try out this or that treatment, patients are often better pleased if sent direct to see "the Professor." They demand specialist opinion and x-rays as a right for which they have paid.

The fact that the numbers the G.P. must care for in order to earn a living wage to-day inevitably result in crowded surgeries does not help either. The G.P. with a large list, who has to cope with a multitude of trivial complaints, will have to resist very strongly the temptation to refer to hospital; the easiest way to satisfy a hungry public is to pass the clinical buck. The system seems designed to undermine incentive and initiative. It is too easy to cultivate a *laissez-faire* attitude of "we are paid anyway." Loss of interest in the practice of clinical medicine as such may soon follow, and the way is wide open for the habit of practising slovenly medicine. The G.P. can very easily degenerate into a rather apathetic kind of sorting clerk, doing very slipshod work. What a system!

In this connexion it might be interesting to quote a passage from a letter I received recently from a friend now in practice in Canada. "After working for eighteen months with a socialized medical scheme run by . . . Corporation," he writes, "I quit . . . due to the fact that I felt I was on a large treadmill which went round faster the harder you climbed. I knew that if I did not get out I would lapse into the easy-going way some of the older men had developed over the years—namely, they are company patients. They do not expect exotic medicine. I had enough drive and belief in medicine to feel I could not go on this way. I tried hard to do good work, but woke up one morning to the terrible sensation of defeat, knowing I was slipping. So I got out into private practice, where I am much happier." The tragedy is that he might well have been talking about National Health Service practice in Britain to-day. Here, however, we have no such escape into private practice.

A Comparison

I should like to say a word about Canadian practice, which I had the good fortune to see for myself a year or two ago. A New World general practitioner would be aghast if he were asked to work under our system. To him it is fundamental to the practice of good medicine that he personally looks after his patients in hospital and supervises the various investigations which may be necessary. He often works from a rented office in what is called a Medical Arts Building—rather similar to the health centre envisaged in this country. His consulting-rooms are almost invariably more elaborate than ours. He normally employs a nurse, and often also a laboratory technician who is frequently trained to do x-ray work and electrocardiography as well. But the Canadian is remunerated on a basis of fee for services rendered, which makes all this possible. Unfortunately, from the patient's point of view an illness is a very expensive calamity, even though the type of service is of a very high order. More important than this is the fact that, if he is to give the patient of his best, he must keep up to date with medical advances. In this country, with the attitude tending towards hospital referral for all but the trivial, there is no such pressing need. This, I feel, inevitably lowers the standard of general medical practice, and incidentally the prestige of the practitioner.

Learning the Job

But I have wandered from my story, which was beginning to show how general practice was not all it might be. After a few months I paused to reflect. I had had to work harder than I had ever done before, mentally and physically (all my patients seem to live in a top flat). I had had to learn to control a temper, which I had not realized existed, when malingers wanted certificates and ignorant people called

me out needlessly in the small hours. Although in partnership practice, and despite the fact that I was seeing people all day, I felt rather lonely. I longed to be back in the hospital atmosphere.

However, by this time I was beginning to learn a little about my new job—such things as how to get a home help and how to diagnose measles before the spots came. Then very gradually, just when I was getting rather despondent, it began to dawn on me that there was more to general practice than met the eye. The drama of the operating theatre and the brilliant diagnosis of difficult cases was not my province at all. Here was to be found a different type of satisfaction where, as Osler said, "your heart will be exercised equally with your head." The sea of faces which initially presented in the waiting-room was, at the outset, very like that met with in any hospital out-patient department, but gradually the faces began to take on a familiar pattern and to develop personalities. I began to see that my job was mainly people—people as personalities, as human beings, who had families and worries; girls who got married and had babies. More time went by, and by now I had quite a family of babies, the oldest of whom was nearly two and a half.

Again I paused to reflect. My hospital outlook was beginning to recede. I had almost forgotten such things as the 17-ketosteroids. Instead I had learned a great deal about people, how to handle them, how to reassure them, and how to talk to them in simple language. It appalled me to see how much social conditions had to do with illness—such things as overcrowding and living with in-laws. I had learned that most working-class patients expect a bottle and are not content with advice only; that an illness must be labelled, confidently (whether the label is right or wrong does not always seem to matter); that the stethoscope still has a magic power psychologically despite its many failings in the light of modern x-ray technique and the remark of a specialist overheard recently that there are two methods of examining the chest—percussion and x-ray.

By now I realized I was beginning to learn a little about how to be a general practitioner. I began to appreciate the full meaning of Osler's words when he said, "The practice of medicine is an art, not a trade; a calling, not a business." In fact, by this time, somewhat to my own surprise, I began to like general practice.

The Personal Touch

We are living in a scientific age. Medicine has not escaped, but sometimes I feel we get carried away by mechanical devices and forget that primarily our job is people. Fortunately I realized that I was interested in people, which was just as well, because without that interest I should be lost. Something else struck me rather forcibly: in hospital I had been a cog in a machine; now I was very largely my own master. Furthermore, so far as my patients were concerned, and despite their readiness and willingness to be sent to hospital, I was still *their doctor*. All this I found very satisfying. But for all this new-found satisfaction I still missed hospital. It did not seem natural to one who had spent nearly six years therein that its doors should now be closed. It seemed to me nonsensical that, once the choice of general practice or a specialty had been made, the decision should be binding and irreversible. Unfortunately to-day there is a widening gap between hospital staff and general practitioners. This, I feel, is a great pity, but not unnatural since they now really do two very different kinds of job. It apparently takes years and years to train a specialist these days. Furthermore, there is a feeling current that hospital work is very arduous. Be that as it may, much of hospital work is routine and does not need very advanced or specialized knowledge. It does not seem unreasonable to suggest that G.P.s should be attached to hospitals as clinical assistants doing much of the work at present done by registrars. This would add greatly to the interest of the G.P.s concerned, and incidentally might go a long way towards solving the present registrar problem.

I should like here to say a word or two about present-day hospital staff. Many of them, bubbling over with scientific facts, tend to lack the human touch. Too often they think of their patients as cases rather than as people. The patient of to-day frequently complains that he is told nothing in hospital. Perhaps it is just as well for the nursing staff or the G.P. to be left to explain some things, but it would appear to have gone too far when the patient recently discharged from hospital has to ask his G.P. what was removed at operation and why. Incidentally it adds to the confusion of the practitioner, not to mention the patient, when the hospital letter is not forthcoming for a further week.

In my opinion the trainee consultant, as well as mastering his specialty, must also learn how to handle people. I feel that he can best learn this in general practice; only there can he appreciate the individual as a whole. Goodness knows, the medical training is long enough to-day. But for all this, I cannot help thinking that it would be a good idea to make a period in practice as essential a qualification to the aspiring consultant as the year in hospital is to the prospective general practitioner.

Midwifery and Obstetrics

Midwifery used to be so much the concern of the family doctor. Nowadays, for social and other reasons, more mothers are opting to be confined in hospital and the average practitioner is doing less and less midwifery. In one way this is not a bad thing, for equipment is at hand for dealing with any emergency that may arise. However, there is at present in Glasgow a regulation in force which I would like to quote without further comment: "Unless a woman attends an antenatal or local authority clinic she cannot have an assurance that she will get a hospital bed." I do not see why G.P.s should not look after their own antenatal patients if they should so desire, even those women who intend to have a hospital confinement. It would greatly add to the practitioner's interest and provide an admirable opportunity for establishing a good doctor-patient relationship. The mother, too, would generally rather attend her own doctor than an impersonal clinic, but is afraid to do so because she may not get into hospital. In any event, the general practitioner is the one who has to deal with an antenatal emergency when it arises, not the clinic.

Our Patients

And now what about our patients themselves? I have found the vast majority very considerate and appreciative of what is done for them; but then I am fortunate to be dealing with a decent working-class type of patient, most of them ex-panel patients, those for whom the service should have been primarily designed. Ex-private patients tend to be somewhat demanding. The fact that they can read a clinical thermometer more readily and have a telephone in their house may sometimes be a nuisance. They are more prone to call one out needlessly on a wet night than those who have to find three pennies and go and brave the storm to find a public call-box. Broadly speaking, the younger generation take very little responsibility on their own shoulders and often tend to call the doctor at the least provocation. They have no idea of the cost of drugs and hospital investigations and could not care less. Their elders, on the other hand, frequently apologize for sending and often wait longer than they should before doing so.

There is no doubt that the established young general practitioner in partnership practice to-day has a much easier time of it than had his predecessors. His nights are less frequently disturbed, mainly because there is now less domiciliary midwifery, and his off-duty time is much more regular with the inception of the rota system. Finally he has a secure, pensionable job. So far as his patients are concerned, there is greater continuity of care and incidentally of clinical records, since patients are now on a list and do not often change their doctor. There is no longer

a financial barrier between patient and doctor, who can prescribe freely without fear that the patient may not be able to afford his treatment. But at the same time removal of this barrier lets in the malingers and neurotics—the pests, the 10% hard core of every doctor's list who are never far away from the surgery door.

I would like to stress that there is a very real danger that the young practitioner, excluded from the hospital and committed to his desk by the system, may become apathetic, especially since it no longer seems to be worth while building up a good class of practice: one only ends up with more trouble and less money. The politicians seem to be doing their best to discourage private practice, which to many doctors and patients is a far more satisfactory method of rendering service, despite the fact that it is often more wearing and not necessarily any more lucrative. I feel that private practice provides an opportunity for rewarding incentive and initiative, and is good for one inasmuch as it keeps one on one's toes and guards against the development of slovenly habits. The next step may well be that of a State-salaried service. This would indeed be a tragedy.

Teaching General Practice

But to revert to the student. What should he be taught about general practice? I think that the training of the general practitioner is largely a postgraduate affair; but the student must be taught more about practice than at present, if only to encourage greater numbers to enter this field and with more enthusiasm. A series of lectures by general practitioners interspersed throughout the final two student years might maintain a proper balance, because too often the specialist teacher tends to exaggerate the importance of his own subject.

What, then, are the prerequisites for entering general practice? First, knowledge; the student should concentrate on seeing as much as he possibly can in the out-patient department, because never again will he meet such a wealth of clinical material. If time permits, and he does not want to get married, he should hold three house appointments, possibly in medicine, surgery, and obstetrics and gynaecology. If he can find time to do a bit of dermatology and casualty work, so much the better. Secondly—and this is very important—he must have a liking for people, particularly children.

If the young general practitioner refers everything in sight to hospital, then naturally the aura of omniscience which surrounds the hospital officer in the public eye will be magnified. The status of the general practitioner is still what he himself makes it. Despite its many present-day failings, general practice remains a branch of medicine in which is to be found a great deal of satisfaction. I believe that, taken seriously and practised conscientiously, it is the most difficult specialty of all.

Plans for reorganizing medical teaching departments on more modern lines are set out in part 5, *Medical Sciences*, of Volume III of the Unesco series *Inventories of Apparatus and Materials for Teaching Science*. Prepared jointly with W.H.O., the book is chiefly intended for use in new medical schools. It contains lists of equipment needed for the instruction of medical students in anatomy, bacteriology, biochemistry, histology, morbid anatomy (pathology), pharmacology, physiology, and preventive and social medicine (hygiene and public health), and gives rough indications of prices. Each list is preceded by a short discussion of teaching methods with special reference to the organization of practical work. The English edition may be obtained through the national distributors of Unesco publications or the Sales and Distribution Division of Unesco, Paris. The price is 15s. 6d.

DECOMPRESSION TREATMENT OF WHOOPIING-COUGH

A CLINICAL SURVEY OF 903 CASES

BY

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Weekly or twice-weekly clinic sessions for the treatment of whooping-cough by low air-pressure in a decompression chamber have been held in this hospital since May, 1949, except for short periods when the prevalence of the disease was very low. The chamber was purchased from the Royal Air Force by the Ministry of Health in 1948, was conveyed to its present site by the London County Council, and was reconditioned and refitted by the Lewisham Group Hospital Management Committee. At that time considerable public interest had been aroused in high flying and decompression treatment, and, by request, I published a brief preliminary account of it with illustrations of the chamber in action (Banks, 1949).

Selection and Examination of Patients

During the five and a half years 903 patients were treated, but the results could be assessed in only 782, of whom 686 were out-patients and 96 in-patients. The out-patients were sent by their doctors by arrangement with the Emergency Bed Service, and in accordance with a simple plan. Patients were generally accepted only if they had been coughing for about three weeks or more, and the doctor was asked to instruct the parent to take to the clinic a record of the number of coughs, whoops, and vomits observed during the 48 hours before attendance. Every case was personally interviewed and examined by me or by my colleague Dr. L. J. M. Laurent. The history was checked and the estimated day of disease recorded. The record of coughs and vomits of food day and night for two days was verified; particulars of appetite, activity, lethargy, fretfulness, or loss of weight were noted; and the parent was asked whether she thought the condition was stationary, improving, or getting worse. The faeces, tympanic membranes, and chest were examined, the temperature was taken, any cyanosis or tachypnoea was noted, and in a very large proportion of cases the chest was radiographed.

I soon learned to reject the more acutely ill cases, especially those with pyrexia, or cyanosis, or with more than a minimal degree of pulmonary collapse as shown radiographically, usually by shadows filling the cardiophrenic angles. The cases deemed too ill for decompression were either admitted to hospital or sent home with a letter to the doctor advising rest in bed and, if necessary, treatment later for pulmonary collapse. Minimal atelectasis in a bright, active, afebrile child was not regarded as a contraindication, nor were rhonchi and other signs of bronchitis without fever.

Decompression Treatment

The selected cases, up to six or eight at a time, went into the chamber accompanied by a nurse or ward orderly, or by the parent in the case of some infants or a young frightened child. In cold weather the children were kept warm by hot bottles and blankets, the chamber itself having been pre-heated by an electric radiator. Picture books and toys were provided and stories were read to the younger children, usually until they fell asleep lulled by the hum of the motor. Oxygen was laid on inside the chamber, but was used only once in five and a half years. A telephone connected the occupants of the chamber with the porter-operator, who watched them through a porthole window during the whole

course of the treatment. The pressure of air in the chamber was reduced progressively for about 20 minutes until the equivalent of a height of 12,000 feet (3,660 metres) was reached. This low pressure was maintained for 45 minutes, and then gradually increased during the 20 to 25 minutes "descent." The treatment thus lasted about 90 minutes. Some pain in the ears and deafness were commonly experienced during the "descent" and for a short time thereafter. In this routine a hitch occurred only on two occasions, once when a woman in the chamber became hysterical, and once when the motor failed. In both cases "ground level" was regained without incident.

Assessment of Results

A form was provided upon which the parent or ward staff was asked to record the time and character of each cough and food vomit during a period of 48 hours commencing one week after the treatment; in addition they were asked to report in a few words their impressions of the progress or otherwise of the child from the date of treatment until the date of the report. The completed forms were sent to me generally about the tenth day after decompression. They were delayed for two weeks or so in a small proportion and occasionally a reminder had to be sent out after about two weeks. The factual report on coughs and vomits, and the mother's or ward sister's statement of her impressions of the result of the treatment, taken in conjunction with the recorded data before treatment and the stage of the disease, formed the basis upon which the assessment of the results was made. The factual report on coughs and vomits was usually far better done by the parent than by the ward staff, although the "summing up" by the ward staff after a week was quite good. A feature of this work, however, was the obvious care taken by most of the parents to produce an accurate factual record of coughs and vomits for the 48-hour period. Sometimes the statement of their impressions seemed unduly optimistic in view of the factual report, and in such cases it was treated with reserve.

The assessment of the results on this basis was usually not difficult. It was made by me personally in the great majority of cases, and by Dr. Laurent in my absence. Our marking was conservative and showed almost complete agreement. A sample series of 462 cases was assessed by Dr. Laurent independently, without knowledge of the marking which had already been given by me. His marking turned out to be the same as mine except in 14 cases—a difference of assessment of only 3% between two observers working independently.

The following classification of results was adopted:

XX=Improvement marked and rapid in four to seven days or less, with virtual cessation of the paroxysmal cough.

X=Improvement more gradual over seven to ten days, but probably significant.

X-=Improvement likely to be attributable to the natural progress of the disease at that stage.

O=No improvement in 10 days.

OO=Worse. (Cases excepted in which increased cough and expectoration was limited to 24-48 hours; this was not uncommon.)

TABLE I.—Cases Treated but Not Assessed

	1949	1950	1951	1952	1953	1954	Total
Disease too mild	1	7	7	6	5	—	26
" " acute	2	5	1	1	—	—	9
" " early*	—	8	1	1	2	1	13
No report	—	12	9	12	25	15	73
Total	3	32	18	20	32	16	121

* Less than 2½ weeks of disease.

Cases Excluded from Assessment (Table I)

Mild Cases.—Twenty-six cases, though treated, were so mild that no accurate assessment of the result was possible.

Acutely Ill Cases.—Nine cases with mild pyrexia or cyanosis and atelectasis were treated by decompression

experimentally in the first year or two. Such cases were thereafter excluded, as this was found to be wrong practice.

Early Cases.—Decompression is a physical treatment which cannot be expected to stem the advance of the disease in the first two and a half to three weeks. Although there was an occasional apparent exception to this rule the assessment of results probably gained in precision by the exclusion of the 13 cases treated at a stage of the disease earlier than two and a half weeks.

No Report.—Seventy-three treated cases had to be excluded because no report on the results was received.

Results

Effect on Cough, Vomiting, and General Conditions.—Table II indicates that marked rapid improvement with virtual cessation of paroxysmal cough (XX) occurred in

TABLE II.—Cases Treated by Decompression and Assessed Results

Classified Result*	1949	1950	1951	1952	1953	1954	Total	%
XX	20	68	55	30	26	21	220	28.2
X	21	93	60	33	36	23	266	34.1
X-	15	48	34	17	16	11	141	18.0
O	18	36	37	18	29	13	151	19.2
OO	—	3	—	1	—	—	4	0.5
Total assessed	74	248	186	99	107	68	782	100.0

* See text.

28.2% of the assessed cases, and slower but probably significant improvement (X) in a further 34.1%; while in 37.7% the treatment appeared to have no effect.

Effect on Vomiting.—A particularly valuable sequel to the treatment in many cases was the relief of vomiting (Table III). Among the 427 children who were vomiting

TABLE III.—Cases Vomiting Food (more than once daily)

	1949	1950	1951	1952	1953	1954	Total	%
Vomiting stopped	18	84	60	33	30	21	246	57.7
reduced	10	30	22	7	10	6	85	20.0
unre-	—	—	—	—	—	—	—	—
lieved	9	34	22	12	15	4	96	22.3
Total	37	148	104	52	55	31	427	100.0

food more than once daily just before treatment, the vomiting stopped fairly abruptly in 57.7%, was reduced in a further 20%, and was unrelieved in 22.3%. This was something for which the parents were especially grateful.

Influence of Sex.—Table IV shows the sex incidence of the assessed cases. There is a considerable preponderance of females, as in all statistics of whooping-cough. This

TABLE IV.—Sex Incidence of Assessed Cases

	1949	1950	1951	1952	1953	1954	Total
Males	36	112	80	41	44	28	341
Females	38	136	106	58	63	40	441

is an unexplained feature of the disease. The assessed results showed no relation to sex. To category XX, 26% males and 28.5% females were assigned; and to category X; 37.5% males and 30.8% females.

Influence of Age.—Table V shows that 63 of the assessed cases were infants under 12 months, 454 were children aged

TABLE V.—Age Groups of Assessed Cases

Age:	Under 1 Year	1-4	5-9	10-15	15+	Total
No. of cases	63	454	244	7	14	782

1-4 years, 244 were 5-9 years, 7 were 10-15 years, and 14 were over 15 years. Table VI suggests that results may be best in the age group 5-9 years, with 34.4% assessed as XX and 36% assessed as X. Results in the 1-4 years group were about average, while those in infants under 12 months

were possibly slightly inferior (19% assessed as XX and 35% as X); the number in this group, however, was rather small for comparison. Most observers have concluded that the results of decompression treatment are independent of

TABLE VI.—Results in Relation to Age

Assessment	Under 1 Year		1-4		5-9		10-15	15+
	Cases	%	Cases	%	Cases	%	Cases	Cases
XX	12	19	117	25.8	84	34.4	—	2
X	22	35	156	34.1	87	36	2	6
X-	15	—	85	—	37	—	—	2
O and OO	14	—	96	—	36	—	5	4
	63		454		244		7	14

age, but there is a suggestion in Table VI that results in babies and adults may not be quite so good as in children aged 1-9 years and especially in those aged 5-9 years.

Second Decompression.—Although the figures are small, Table VII suggests that a second treatment did not often yield good results when the first treatment failed, except,

TABLE VII.—Results After a Second Decompression Treatment

Assessment:	XX	X	X-	O and OO	Total
All cases	5	6	8	5	24
First decompression too early	2	2	1	1	6
Net No. of second decompression cases	3	4	7	4	18

perhaps, when the first treatment was given too early (before two and a half weeks of the disease). When the latter subgroup was excluded, a second decompression yielded results only about half as good as the average for all cases.

Results of Other Observers

Treatment of whooping-cough by high flying began in Strasbourg in 1927, when air pilots took children in the paroxysmal stage up to a height of 10,000 feet (3,050 metres). From 1937 to 1939 small-scale trials were carried out in Strasbourg, Switzerland, Germany, Holland, Poland, Spain, Uruguay, Chile, and a very few in England. Not all were favourable. In 1943 open aeroplanes were used in Strasbourg and Switzerland, a dangerous practice which was soon abandoned. Matter (1946) reported on high-flying treatment in 100 patients between the ages of 2 months and 40 years. He concluded that cases over three weeks from onset of the disease profited most, that vomiting stopped in one to two days, appetite returned, sleep improved, and convalescence was shortened.

Baldy and Richou (1946), employing the decompression chamber in Paris, treated 275 children and 21 adults, of whom, however, only 128 were followed up for 21 days. Of the latter group, 22% were reported as practically cured in less than five days, 51% frankly improved, and 4% had paroxysms and vomiting temporarily aggravated. They concluded that the third to fourth week of the disease was the best time for treatment and that repetition of the treatment did not materially increase successes. Contraindications to the treatment were fever, respiratory and cardiac complications, epistaxis and other haemorrhage, acute nasopharyngeal or ear infections, hernia, surgical emphysema, and malnutrition (conditions which I have grouped together generally as the "acutely ill patient").

Lauener and Maeder (1942), in Berne, treated 256 cases by flights to a height of 12,000 ft. (3,660 metres), each lasting one and a half hours. They reported "abrupt cure" after one flight in 57 (22.8%) and slower cure over about eight days in 80 (32%). They also took 24 cases up the Jungfrau to an altitude of 10,000 ft. (3,050 metres) and kept them there three hours with results that were disappointing. There may have been a counteracting effect here of cold and other factors. A trial of low-pressure chamber treatment, however, in 65 cases taken to the equivalent of 14,000 ft. (4,270 metres) yielded "rapid cure" in 31%, "undoubted

improvement" in 50%, no improvement in 16%, and 3% were made worse. Clantour (1946), in Paris, treated 127 cases by high flying with somewhat similar results. Bergquist (1948) treated 45 children in Stockholm—20 by high flying for 45 minutes and 25 in the low-pressure chamber for 45 minutes. On the basis of this very small experience and the very short period of low-pressure treatment he condemned both methods.

Harpoth (1949), in Denmark, compared 101 cases treated by high flying with 59 cases treated by decompression to the equivalent of 3,500 metres (11,500 ft.) for 90 minutes. Other smaller groups were put in the decompression chamber without adequate decompression. The difference in results obtained in the various subgroups of decompression cases was said to be negligible and on this basis he concluded that decompression *per se* had no effect. High flying, however, was thought to be effective. Lalli (1949), of the Italian Air Force, treated 476 cases with three to six flights of 20 to 30 minutes' duration every three or four days for about 15 days. This is quite a different technique from that of most other observers and the very favourable results reported are difficult to assess considering the length of time that must have elapsed from the start of treatment to the date of assessment of the results.

Discussion

The results which I report here conform reasonably well with those of Matter (1946), Baldy and Richou (1946), and Lauener and Maeder (1942), but the number of cases and the duration of the experiment have considerably exceeded those of any other observer. The method of selection of the cases, the chest radiography, the careful recording of paroxysms and vomits just before and a week after treatment, and the conservative assessment of results by two independent observers may be considered favourable points in this investigation. Nevertheless the results reported are largely derived from subjective assessment. The subjective element in the assessment of results of whooping-cough cannot be wholly avoided but it should be limited, if possible, by the use of controls. I have failed, however, to find a way of conducting a controlled investigation and I see no present prospect of achieving this aim.

It would be quite possible to make controls of each alternate batch of patients by running the motor without producing decompression of any significant amount. The patients might thus be deceived into thinking that they had had the treatment. But such deception would be unlikely to remain long undiscovered. The entire absence of ear symptoms in whole batches of patients would almost certainly arouse suspicion. The net effect would probably be to spoil the existing good relationship with patients and doctors and to stop the flow of patients to the clinic. It might also be possible to conduct a controlled experiment in the same way but with the knowledge and consent of doctors and patients. However, the local practitioners when consulted did not favour this suggestion. All hope of a controlled experiment with the present set-up had therefore to be reluctantly abandoned; and this applied also to in-patients, relatively few of whom are suitable for decompression.

The mechanism of action of the treatment has been the subject of much speculation, but is still unexplained. The low pressure of the air breathed seems to be the essential factor, since results seem to be practically similar whether high flying or the decompression chamber is used. The deeper breathing induced may help to clear mucus from the bronchi and perhaps to aerate small collapsed areas in some yet undetermined way. It is conceivable that molecular release of blood gases may be favoured, both because of the lowered pressure of the alveolar air and because of the trend to alkalosis produced by the increased pulmonary ventilation. Blood CO₂ might thus diffuse more freely through alveolar walls and help to expand collapsed alveoli and to loosen exudate in the bronchioles; this in turn could

render cough more productive. A study of the composition of the alveolar air combined with estimations of the blood gases, alkali reserve, blood pH, blood pressure, and urinary chlorides of patients while in the chamber might throw some light on the mechanism involved. But these matters are still undetermined largely because of the practical difficulties of obtaining the data in out-patients who are nearly all young children.

Leucocyte counts shed no light on the problem. A transfer of oxidase from neutrophils to red cells was observed by Seabra (1947) in men accustomed to flying at high altitudes. Rats which were decompressed for six days exhibited this transfer and resisted infection better than non-decompressed controls. These facts, however, seem to have little bearing on the effect of a single decompression.

Credit for the apparent good results has been attributed to psychological factors. Many parents certainly come with high expectations and there is a certain amount of emotion aroused in the patients by the novelty of the treatment. But after the start any excitement present soon evaporates. The children tend to become bored and the younger ones usually drop off to sleep. The mothers were warned against extravagant expectations and told categorically that the treatment had a good effect in some cases but in others had no effect at all. This warning was indeed reflected in the statement of their impressions of the result, some asserting roundly that they could see no difference after the treatment. Psychological factors in this series can, I think, be discounted.

Which cases are likely to be successful and which to be failures? It is clear that the treatment is nearly always useless at a stage of the disease earlier than two and a half weeks, that after the sixth week the percentage of apparent successes is apt to drop, and that the "acutely ill" patient is almost certain to be made worse by decompression. But when the cases are properly selected, I can answer this question no better now than I could five and a half years ago. I look upon decompression as a physical treatment which may exert a favourable influence in some unknown way on the course of the disease in a proportion of carefully selected cases. Such a favourable influence may be partially or completely counteracted by other unfavourable influences, such as "catching a cold" or poor environmental domestic circumstances. Whooping-cough not infrequently pursues an erratic course, exacerbation occurring after periods of improvement. In these circumstances the relative uniformity of the results of decompression treatment reported in the more important papers published on the subject is rather remarkable and may be thought to constitute a *prima facie* case in its favour.

A decompression clinic for whooping-cough has outstanding advantages beyond the mere question of decompression treatment. When conducted by an experienced physician it acts as a valuable centre of advice for practitioners in their difficult cases, especially those in which pulmonary collapse is found. The running costs are not high when the staff of the hospital is used, but ambulance transport may be a costly item. This has usually to be provided as a routine on grounds of the infectivity of the patient, at least in the first five weeks of the disease.

Summary

A decompression clinic for the treatment of whooping-cough by means of low air-pressures is described and incidental advantages of such a clinic are suggested.

Of 782 carefully selected and assessed cases, 28.2% were reported to show marked rapid improvement in some four to seven days following decompression, and 34.1% to show more gradual but probably significant improvement. The remainder showed no more than the expected change at that stage of the disease, or no improvement at all.

Of the children who were vomiting food more than once daily 57.7% stopped vomiting within a few days after the treatment, and in another 20% vomiting was relieved.

Decompression treatment is usually unsuccessful at a stage of the disease earlier than two and a half weeks and is harmful to the acutely ill case with pyrexia, cyanosis, or appreciable atelectasis.

The results reported are based on careful selection of cases and combined assessment by parents and doctors. An adequate controlled experiment has not yet been done but should be attempted when opportunity offers.

The mechanism of the action of decompression in whooping-cough has not been elucidated. Further trials should preferably include biochemical studies.

I thank my colleague Dr. L. J. M. Laurent for his valuable co-operation throughout, for reporting on a visit to Dr. Richou and others in Paris in 1948, for his part in the conduct of the clinic, and particularly in the assessment of the results.

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CEREBRAL CYSTICERCOSIS

COMMON BUT UNFAMILIAR MANIFESTATIONS

BY

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Though cerebral infestation with the larval stage of the *Taenia solium* has been recognized since the middle of the last century, it was after the extensive work of MacArthur (1934), Dixon and Smithers (1934), Brailsford (1941), and Dixon and Hargreaves (1944) that cysticercosis was given an important place among the conditions causing epilepsy. So well known is this that the diagnosis is unlikely to escape consideration in a patient suffering convulsions who has lived or served in India or the Far East.

It is the purpose of this paper to emphasize the clinical manifestations of this disease, other than epileptic convulsions, which, though both important and common, have received scant attention in this country. At the same time it will be seen that India and the Far East are not the only, nor even the main, areas where the condition may easily be acquired. Brief illustrative case histories are given, grouped under appropriate sub-headings, but, as will be evident, the same patient may show several different features.

Periods of Disordered Behaviour

This group includes a wide variety of abnormal manifestations, unassociated with any true convulsion, but occurring during periods of disturbed consciousness, accompanied sometimes by involuntary micturition, and often consisting of bizarre or violent behaviour.

Case 1.—A Polish male aged 41 was examined on May 28, 1954. Since 1945 he had been subject to frequent attacks of

violent behaviour, lasting three to five minutes, accompanied occasionally by involuntary micturition, stopping suddenly, and followed by several hours' deep sleep. The day before examination he had, without warning or provocation, attacked a friend with a chair, resisted the restraint of five men, and then suddenly passed into a deep sleep, having no memory of the incident on waking. Physical examination was negative, but a white blood count showed an eosinophilia of 800 to 950 per c.mm. Skull x-ray films were normal, but x-ray films of the thigh muscles showed typical calcified cysticerci. The attacks were greatly improved by the use of primidone.

Case 2.—This patient, a Polish boy aged 11, was born in Austria and had lived five years in the Ukraine. Since early 1954 he had been subject to attacks, usually during breakfast, in which he would make grimacing movements of the face for one minute, then sit quite still staring into space for two or three minutes, then repeat several numbers, and suddenly return to normal, though sometimes a little drowsy afterwards and with slight headache. Physical examination on September 17, 1954, was negative, but a white blood count showed a constant eosinophilia of about 1,000 per c.mm. Stools were normal. X-ray films of the thighs showed calcified cysticerci.

These probably represent attacks of psychomotor epilepsy, and it is remarkable how infrequently the standard leads of the electroencephalogram are of help in cysticercosis. It is possible that the lesions are situated in areas of the temporal lobes which would require more elaborate techniques to demonstrate.

Transient Loss of Function

The sudden loss of use of, or of sensation in, a limb, or the sudden loss of speech, with subsequent rapid recovery, is not uncommon in the early stages of a cerebral neoplasm and in cerebrovascular disease. Episodes of this type are often seen in cerebral cysticercosis, and have on occasion, in apparently healthy young soldiers, been regarded as hysterical.

Case 3.—A British man aged 20 was admitted to the Queen Elizabeth Hospital, Birmingham, on November 10, 1953, complaining of three episodes, in the previous five years, of sudden loss of use of the left hand, with numbness of the hand, rapidly recovering. One attack lasted several hours. He had in addition, and at separate times, had several episodes of unexplained loss of consciousness. He lived the first ten years of his life in India. Physical examination was negative and a full blood count normal. The cerebrospinal fluid contained two mononuclear and one polymorphonuclear cells per c.mm., with 132 mg of protein per 100 ml., and a paretic Lange curve. The electroencephalogram showed only very occasional 5-6 c/sec. waves occurring synchronously in all leads. X-ray examination of the skull showed a number of small foci of intracerebral calcification, and x-ray films of the thigh muscles showed numerous calcified cysticerci.

Case 4.—A British ex-Regular-Army soldier aged 32 who had spent two periods of service in India and China was admitted to the Queen Elizabeth Hospital, Birmingham, on October 23, 1941, complaining of periods of sudden onset of loss of speech during the previous six years, usually lasting several hours, but on one occasion lasting three days. The most recent attack was accompanied by paralysis of the right arm and leg for several hours, recovery being very rapid. In addition, and at separate times, he had had periods of unexplained loss of consciousness, during one of which he had passed urine, and during another had fought off those who had come to his assistance. Physical examination was negative apart from two small subcutaneous nodules in the left arm and the left thigh. A full blood count and x-ray examination of the skull were normal, but x-ray films of the thigh muscles showed numerous calcified cysticerci. Biopsy showed the subcutaneous nodule from the arm to be a lipoma, but that from the thigh proved to be a cysticercus.

Acute Intermittent Obstructive Hydrocephalus

This, though one of the longest-known non-epileptic manifestations of intracranial cysticercosis, is one of the least well recognized in England. Bruns's symptom-complex (Bruns, 1906) consisted of the sudden onset of violent headache, vomiting, tinnitus, and vertigo, passing on in the more severe attacks to deep coma and even death, and often precipitated by sudden movements of the head. It was considered to be diagnostic of a solitary cysticercus in the fourth ventricle.

Case 5.*—A Polish woman aged 54 was admitted to the Midland Centre for Neurosurgery on October 1, 1954, having suffered for two years from episodes of sudden onset of severe headache, vomiting, and ataxia, passing on to a stupor lasting 24–48 hours, and recovering spontaneously. She was normal between attacks, but a C.S.F. pleocytosis had been demonstrated elsewhere. Shortly after admission she became rapidly comatose and despite surgical decompression died in a few hours, with signs suggestive of a medullary pressure cone. Necropsy confirmed this, and revealed a solitary cysticercus impacted in the fourth ventricle and numerous cysticerci in the substance of the hemispheres.

The solitary intraventricular cysticercus is, however, not the only cause of acute obstructive hydrocephalus. Some years ago my colleagues and I drew attention in this country to the racemose form of cysticercosis which is particularly apt to form at the base of the brain, and, being a mobile structure, sometimes with a long pedicle, is capable of intermittent blocking of the roof foramina of the fourth ventricle (Bickerstaff *et al.*, 1952).

Case 6.—We described the case of the wife, aged 50, of an ex-Indian Army soldier who for ten years had suffered attacks of headache, each of which increased in severity over several hours, accompanied by vomiting, and culminating in drowsiness and finally coma, but recovering spontaneously within 24 hours. She had had an intermittent blood eosinophilia over many years. Exploration of the posterior fossa revealed a delicate irregular elongated cystic structure, resembling a bunch of grapes, lying over and around the lower brain stem and fourth ventricle and hanging into the upper cervical region. The patient died some weeks after the operation, and necropsy revealed numerous encysted cysticerci in the hemispheres and basal ganglia. Histological examination of the wall of the racemose structure showed it to consist of three distinct cellular layers identical with the lining of the walls of the intracerebral cysts.

Since then I have investigated in the Midland Centre for Neurosurgery two further cases of this type, both Polish and both having attacks of intermittent hydrocephalus. One showed Bruns's symptom-complex, and had a solitary cysticercus in the aqueduct and a racemose structure in the left cerebello-pontine angle; the other had a racemose cysticercus extending from the third ventricle, through the aqueduct and into the fourth ventricle. This contained one large degenerating larva. These cases will be published in full clinical and pathological detail later.

Disturbance of Equilibrium

Though spasmodic ataxia may accompany the attacks of obstructive hydrocephalus, a more progressive disturbance of equilibrium, without marked ataxia of the limbs when supine, frequently accompanies the posterior fossa racemose cysticercosis, the clinical picture simulating that of a tumour of the vermis of the cerebellum.

In Case 6 the patient had in the last four years of her life become increasingly, and finally completely, incapacitated by a gross ataxia of gait, but only in the last few weeks had she demonstrable ataxia on the usual bedside tests.

Of the important series of 13 cases of racemose cysticercosis described by Arana and Asenjo (1945), 7 presented first in this manner.

Meningo-encephalitis

Attacks of meningo-encephalitis, usually self-limiting, the cerebrospinal fluid containing both lymphocytes and polymorphonuclear cells, occur not infrequently throughout the course of the disease (Schmite and Lemoyne, 1932; Dolgopol and Neustaedter, 1935; Felici, 1938; Obrador, 1948).

Our Case 6 had three episodes of headache, with meningism, vomiting, confusion, and drowsiness, lasting several days and clearing up through a period of noisy and aggressive behaviour. Her cerebrospinal fluid was grossly abnormal on each occasion—for example, 270 cells (90% mononuclear), with a protein of 150 mg. per 100 ml. and a Lange curve of 5433221000.

*This case will be published in full clinical and pathological detail elsewhere.

It is during episodes of this nature that the diagnosis, if suspected, will receive great support from the demonstration by special stains of eosinophils in the cerebrospinal fluid.

One further patient, following surgical intervention with a racemose cysticercus, developed the clinical signs of an intense meningo-encephalitis, the cerebrospinal fluid containing over 1,000 eosinophils per c.mm.

Failing Vision

Cysticerci may lodge in the eye, the orbit, or at the chiasma. Such direct local effects are, however, not always the cause of visual failure, for it may be due to the consecutive optic atrophy which follows long-standing and perhaps unsuspected papilloedema, the site of the lesion being either in the ventricular system or in the posterior fossa.

Case 7.—A 35-year-old ex-Indian Army soldier complained in 1945 of failing vision over the previous two years. He had a past history of fits, and examination revealed a chronic papilloedema which had progressed to a consecutive atrophy. His cerebrospinal fluid contained 33 mononuclear cells, 92 mg. of protein per 100 ml., and a paretic Lange curve. X-ray films of the muscles showed numerous calcified cysticerci, and an air encephalogram showed dilatation of the third ventricle, and forward displacement of the fourth ventricle. It is probable that there was a racemose cysticercus in the posterior fossa, but proof was not obtained.

Case 6 also had severe consecutive atrophy of the optic disks, with gross loss of vision, following long-standing raised intracranial pressure. Necropsy confirmed that there were no cysts in relation to the eyes or chiasma.

Involuntary Movements

Very rarely, cysts in the basal nuclei, or secondary degenerative changes in this region, may be associated with involuntary movements. Meyer (1906) described tremor of the right side; Felici (1938) described Parkinsonism, and Broughton-Alcock *et al.* (1928) and others refer to involuntary movements.

Our Case 6, for the last four years of her life, showed at first a constant restlessness which, as it increased, developed into frank bilateral choreic movements of considerable amplitude, affecting all four limbs and the face, and with the associated mental impairment the clinical picture resembled Huntington's chorea. At necropsy a large cysticercus was found in the left caudate nucleus, and seven smaller cysts in both the caudate and the lentiform nuclei.

Mental Disturbances

Personal experience of this aspect has been limited to the development of mental deterioration in patients predominantly displaying other manifestations of the disease. Stepien and Chorobski (1949) and Pinto Pupo *et al.* (1945–6) stress mental disturbance as a presenting symptom, as did MacArthur (1934).

In the present series, Case 1 was showing increasing aggressiveness, irritability, and unreliability of behaviour quite apart from his psychomotor attacks, and Case 6 for several years had had memory impairment, irritability, and mood swings, and her hospital investigations were hampered by a series of self-discharges.

One further Polish patient has recently been seen, presenting a purely psychotic state, but having scattered flecks of intracranial calcification, and a high blood eosinophilia. Cysticercosis was suspected, but so far has not been proved.

Discussion

The incidence of human cysticercosis is of course related to the amount and mode of pork consumption in a given area rather than to any local variant of the *Taenia solium*. Inhabitants of a country in which pork is often consumed in a raw or partially cooked state are constantly exposed to the danger of contracting a tapeworm, and any carrier of

an intestinal tapeworm is a potential danger to himself and others. Any fault in personal cleanliness may cause contamination of food with ova, and subsequent development of cysticercosis in the consumer's muscles or brain. It must be remembered that it is not eating measly pork which results in human cysticercosis, but the ingestion of tapeworm ova as a result of contamination of food by human faeces—a danger over which any given individual has much less control.

The number of cases found in Army personnel returning from India has fostered the view in this country that India is the most likely area where infestation may occur. Cases have, however, been reported from a great number of countries, and a good review of the geographical incidence is given by Trelles and Lazarte (1941). The ease with which now attends world travel, and the great movements of populations during the war and the post-war period, have resulted, and will continue to result, in the natives of many countries making their homes in Great Britain. There are thought to be about 600,000 natives of Poland, the Ukraine, and neighbouring countries living in this country at the present time and coming under our medical care. When one considers that in Warsaw, at the Neurological Institute, between 1926 and 1936, cerebral cysticercosis formed 1.25% of all admissions—1 in 80 patients (Stepien and Chorobski, 1949)—it would be surprising if among such a community one did not encounter many examples.

Southern Italy and Portugal provide a number of cases, and it was at one time very much more common in Germany than it is now. Surprisingly few have come from the north of Africa and Egypt, but Dixon and Smithers (1934) recorded several from South Africa. It is very uncommon in the United States, but in South America, on the other hand, some of the most extensive work on the subject has been carried out—notably the detailed review and description of 26 new cases from Brazil by Pinto Pupo *et al.* (1945–6) and the monograph by Trelles and Lazarte (1941) of Peru. It is common in Colombia; and in Chile cerebral cysticercosis formed 12½% of all suspected cases of cerebral tumour during a two-and-a-half year period (Arana and Asenjo, 1945).

The pathology of the intracerebral encysted cysticercus is well known, but in this country insufficient attention has been paid to the effects of the infestation of the cerebrovascular system. Post-mortem examinations have shown a constant periarthritis and endarteritis in both the meningeal and the smaller cerebral vessels, particularly in the vicinity of the cysts. These vascular changes may be most important in the production of transient or permanent ischaemic lesions in the brain. The sudden attacks of loss of function of a limb or of speech lasting several hours and then recovering seem more likely to be due to transient ischaemia than to be epileptic manifestations. Again, the cerebral atrophy which may develop is probably secondary to long-standing vascular insufficiency, and the mental changes and some of the degenerative basal ganglia lesions may well be of similar origin. The late clinical picture in some patients is that of a crippling hemiplegia, and it is more probable that this is due to occlusion of a major vessel than to the mere presence of cortical or subcortical cysts.

It is in South America that the major work of recent years has been carried out in connexion with cysticercosis of the posterior fossa—the solitary intraventricular cyst, the racemose variety, and the basal meningo-encephalitis. A given patient may have one of these types, or any combination of the three, and each is capable of giving a clinical picture resembling a posterior fossa tumour with increased intracranial pressure—the first by blocking cerebrospinal fluid flow through the ventricular system, the second and third by obstructing the roof foramina of the fourth ventricle.

It is important to recognize the solitary intraventricular cyst, because its successful removal will relieve the patient of his symptoms referable to C.S.F. obstruction. This has

often been done—for example, Arana and Asenjo (1945)—and, even if removal is impossible, Forkildsen's procedure may give considerable relief.

Basal meningo-encephalitis is a more serious condition, as the consequence of recurrent attacks is a chronic arachnoiditis around the base of the brain, which can cause permanent interference with C.S.F. circulation and also with blood flow within the basilar system. Relief of this surgically is rarely possible, and, though short-circuiting operations may give temporary relief, the prognosis is bad. It is interesting that during this stage eosinophils may be found in the C.S.F. if special stains are used, and it is possible that it represents an allergic response to some allergen liberated from the parasite rather than a direct result of irritation. Some support was gained for this view by a recent experience of treating such a case with antihistamines, with rapid improvement in pyrexia, the general condition of the patient, and the C.S.F. reaction.

The so-called racemose cysticercus is an elongated sac-like structure, varying greatly in size, having a central cavity from which grow many cystic projections, each having a delicate translucent wall, and the whole, though occasionally lying free in the ventricles, usually being lightly attached to the basal meninges by a long pedicle. The structure so formed resembles a bunch of grapes, and by virtue of its mobility is capable of causing intermittent C.S.F. obstruction and interference with vascular supply to the brain stem and cerebellum. The wall is histologically the same as the lining membrane of the intracerebral cysts, but the structure usually contains no hooklets or scolices.

We suggested previously (Bickerstaff *et al.*, 1952) that this structure was a reaction of the meninges to the presence of a parasite, and that its particular type of development was due to the constant flow of C.S.F. and the space allowed by the cisterns for expansion; we also thought that this received support from the fact that the other site of development was in the cavity of the lateral ventricles. As stated earlier, however, a larva was discovered in one of these racemose structures, and I now feel that they represent an actual cysticercus about which there has failed to form the host tissue reaction which completes the encirclement of the better-known intracerebral cysts, thus limiting their growth.

A similar racemose structure is formed by the larval stage of the dog tapeworm *Multiceps multiceps*, but in this case it is a coenurus and not a cysticercus which is formed—that is, a cyst containing numerous invaginated scolices, as opposed to the single scolex of a cysticercus. When a racemose body is formed in cerebral coenuriasis, several hundred scolices may be discovered (Johnstone and Jones, 1950; Becker and Jacobson, 1951). This difference in the number of scolices is important, for while several score of scolices may die in a coenurus and still many remain, the death of the single scolex in a cysticercus will result in a sterile cyst. Trelles *et al.* (1952) believe that death of the parasite disturbs a balance existing between it and the cyst wall, and disorderly proliferation follows, forming this remarkable racemose structure.

The diagnosis of these posterior fossa forms of cysticercosis is of more than just academic interest, for here there is offered a practical chance of alleviating symptoms by surgical means, which in the other forms of cerebral cysticercosis have been disappointing. Diagnosis will be made only if the possibility is always at the back of one's mind when faced by intermittent obstructive hydrocephalus, and in the differential diagnosis of posterior fossa lesions—for the confirmatory signs of cysticercosis (calcification in muscles or brain and eosinophilia in blood or C.S.F.) may all be absent. The possibility must assume greater prominence when the patient comes from, or has been in, one of the areas where the condition is frequently acquired, and attempts should then be made to obtain confirmatory evidence.

It should be remembered (a) that calcification in the brain is much less common than in the muscles of thighs

or pelvis; (b) that blood eosinophilia is often intermittent, and may be absent on any particular examination; and (c) that a pleocytosis in the cerebrospinal fluid may not only show eosinophils, if a suitable stain is used, but is often associated with a paretic Lange curve.

Finally recourse must be made to ventriculography, using air or opaque contrast media, which may not only define the site of the obstruction but also outline the shape and size of the cysts responsible, and give valuable information about the possibility of surgical removal.

Summary

Attention is drawn to clinical manifestations other than epileptic convulsions which frequently occur in cerebral cysticercosis, and to the countries other than India where infestation is often acquired.

Cases are described illustrating periods of disordered behaviour, transient pareses, intermittent obstructive hydrocephalus, dysequilibrium, meningo-encephalitis, involuntary movements, failing vision, and mental disturbances.

Stress is laid on the cerebrovascular lesions, and on the importance of the posterior fossa forms of the disease.

I wish to thank the medical staff of the Polish General Hospital, Penley, for referring to me Cases 1, 2, and 5; to Professor P. C. Cloake for permitting me to investigate Case 3; to Professor W. H. Wynn for allowing me to include Case 4; and to Sir Russell Brain for permission to use brief extracts from *Brain* (Case 6).

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"The whole emphasis to-day is on drawing as little difference as possible between the handicapped child and the normal child," said Mr. DENNIS VOSPER, Parliamentary Secretary to the Ministry of Education, at a conference of the College of Teachers of the Blind at Matlock on April 22. Between 1945 and the end of 1954, he said, 256 new special schools, with 18,000 new places, had been established, but there were still considerable waiting-lists, and careful selection was essential. Only when ordinary day-school education had proved impossible was special training considered. Teaching handicapped children was onerous, and it reflected credit on the profession that there had been sufficient teachers coming forward to fill the posts in the new schools. A few handicapped children would never become self-supporting, continued Mr. Vosper, "but education will help to make them all better members of the family circle, and to make the majority more likely to take their place as worthy and self-supporting citizens in the world."

SPONTANEOUS HAEMOPNEUMOTHORAX

A SURGICAL EMERGENCY

BY

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Spontaneous haemopneumothorax is a comparatively rare condition. A review by Borrie (1953) showed the recorded total to be 93 cases with 19 deaths. Subsequently McGown (1954) has reported another case. The source of bleeding and air escape is usually a ruptured bulla with or without a torn adhesion. Sometimes a torn adhesion alone is found; sometimes there is no demonstrable lesion, which means that the breach in the lung surface, from which so much blood and air escapes, is either so small as to be missed or has already healed so far as naked-eye examination can detect. Although the precipitating factor is apparently traumatic, a history of trauma, beyond ordinary everyday activity, is usually absent, the causal episode being so mild in type as to be overlooked. The important features, for both prognosis and management, are not so much the cause and source of the bleeding as its extent, the tendency to clot earlier than in ordinary traumatic haemothorax, and the fate and subsequent effects of this clot if it remains in the pleural cavity.

The traditional method of management in medical wards, on the principle of minimum interference, has carried in the past a high mortality. In 18 fatal cases death followed conservative treatment. In the remaining case (Hansen, 1949) the patient died after delayed thoracotomy. Conservative treatment, the difficulties of which are well put in Hartzell's (1942) paper, has been challenged by several writers. Myers *et al.* (1951) recommended emergency thoracotomy if bleeding could not be controlled, and reported a successful case. Ross (1952) regards the condition as a surgical emergency, requiring urgent blood replacement and early evacuation of the intrapleural blood before it clots. This he did by underwater intercostal drainage, recommending thoracotomy if there were evidence that bleeding was continuing. He reported six cases, one of which required emergency thoracotomy, the remainder being treated by aspiration or drainage, but of these only two gained full re-expansion this way, the remainder requiring decortication. Borrie (1953) recommends immediate thoracotomy, after resuscitation, as the treatment of choice for all cases of spontaneous haemopneumothorax in which bleeding has been considerable, and he regards the condition as an acute thoracic emergency. He reports three cases—two treated by emergency thoracotomy for uncontrolled bleeding with complete success and early full expansion, and the third requiring decortication after failure to obtain re-expansion by repeated aspiration.

The object of treatment is to resuscitate the patient and replace blood loss, to arrest the bleeding and to prevent its recurrence, to remove all air, blood, and clot from the pleural cavity, and to obtain and maintain full lung expansion, so that there is a return to full normal function in a minimum of time.

Case 1

An aircraftman of the Royal Australian Air Force, aged 28, was admitted to the British Military Hospital, Singapore, in the evening of May 3, 1954, with an eight-hour history of severe epigastric pain of fairly sudden onset. There was no history of trauma, although he had played golf some hours before. He complained of severe pain radiating from a point just below the xiphisternum, up behind the sternum, and in both directions across the epigastrium. It was worse during inspiration. He was collapsed and shocked, with a pulse of 110 and a blood pressure of 115/85. The provisional diagnosis had been perforated peptic ulcer, and he was admitted to the acute surgical ward, where examination revealed an extensive left pleural effusion with an overlying pneumothorax. Exploratory needling showed the fluid to be blood. Blood transfusion was started and thoracentesis performed. Approximately two pints (1,140 ml.) of blood was aspirated from the pleural cavity, at the end of which there was clinical evidence, confirmed by x-ray examination, that at least a pint (570 ml.) of blood remained, but this would not come out through the cannula and had presumably clotted. Two pints of blood was given intravenously, by which time he had recovered from his acute respiratory distress and shock.

The patient was first seen by one of us (A. J. C.) on the morning of May 4. It was obvious that blood loss had been considerable and was possibly still occurring. It was equally obvious that there was an extensive intrapleural clot which, unless removed, would prevent lung re-expansion and require pulmonary decortication at a later date. Emergency thoracotomy was performed 22 hours after the onset of symptoms. A further three pints (1,700 ml.) of blood was given during and after operation. A careful search of the lung and of the parietal and mediastinal pleura failed to reveal any source of bleeding. There was no evidence of lung disease, nor were there any adhesions. The only departure from normal seen was a small haemorrhagic patch, about $\frac{1}{2}$ in. (1.3 cm.) in diameter, immediately beneath the pleura on the upper part of the lower lobe. The pleura here was intact. Adherent fibrin clot had already covered most of the collapsed lung, and approximately two pints (1,140 ml.) of blood, mostly clotted, occupied the pleural cavity. After removing all clot the lung was fully re-expanded and the chest closed without drainage. Convalescence was uneventful, full lung expansion being maintained. He was returned to his unit after four weeks.

Case 2

An officer of the Royal Air Force, aged 32, was admitted to the R.A.F. Hospital, Changi, on May 13, 1954, with a history of pain in the left lower chest of six hours' duration, starting as a slight pain, but becoming increasingly severe during the night. It was intensified by inspiration and by movement. There was no history of any traumatic incident. He was admitted to a medical ward and found on examination to have a left pneumothorax.

X-ray examination confirmed a large left pneumothorax and showed a small amount of fluid. By the next day his condition had deteriorated, with pallor, sweating, and dyspnoea, and severe left-sided chest pain. X-ray films showed an increase in the pneumothorax and a rise in the fluid level. Thoracentesis was performed and the fluid found to be blood, of which 100 ml. was withdrawn. Then 600 ml. of air was also aspirated, after which his general condition improved. He was kept well sedated and put on penicillin.

On May 15 his general condition was unchanged, but there was a considerable rise in the fluid level. 15 oz. (425 ml.) of blood was aspirated and more air withdrawn. Blood haemoglobin was 11.5 g. per 100 ml. On the next two days 6 oz. (170 ml.) and 12 oz. (340 ml.) of blood was aspirated, but x-ray examination showed, from a maintained high fluid level, that bleeding was continuing.

On May 18 there was no improvement, and the patient was seen in consultation by Lieutenant-Colonel W. G. Macfie, senior physician at the British Military Hospital, Singapore, who, following the recent experience with Case 1, recommended immediate blood replacement, followed by thoracotomy. The blood haemoglobin had fallen by now to 8 g. per 100 ml. Three pints (1,700 ml.) of blood was given overnight, and a thoracotomy was performed (F. H. D. H.), on May 19. Four pints (2,300 ml.) of blood and clot was removed from the pleural cavity, extensive clotting having occurred, although fibrin deposition on the lung was not a feature in this case. No actual bleeding point was found, but there were several torn adhesions, one of which, at the apex, appeared to have been bleeding recently. After removal of all clot the chest was closed with an intercostal underwater drain. Three more pints (1,700 ml.) of blood was given during and after operation.

Post-operative progress was uneventful, with progressive lung re-expansion. By June 1 full re-expansion had occurred, the drainage-tube was removed, and the patient, now allowed up most of the day, was returned to a medical ward. Repeated attempts to find any focus of tuberculosis were negative.

Case 3

A British lance-corporal aged 19 was admitted to No. 33 General Hospital, Hong Kong, on July 2, 1954, with a history of the sudden onset of a stabbing pain in the left lower chest on the previous day. This was worse on inspiration, was intensified by any form of movement, and had been gradually increasing in severity. There was a past history of occasional attacks of pain of pleuritic type, one such attack having lasted as long as two weeks. He was admitted to a medical ward.

Examination showed a pale shocked young man, with panting shallow respirations and obviously in severe pain. The blood pressure was 100/60 and the pulse rate 120. Chest examination revealed the trachea deviated to the right, with the left upper zone tympanitic and the lower zone flat dull. No breath sounds were heard on the left side. The right lung appeared to be normal. Exploratory aspiration showed that the fluid was blood and that the overlying pneumothorax was under some tension. A diagnosis of spontaneous haemopneumothorax was made.

The patient was given 100 mg. of pethidine, which was repeated at six-hourly intervals, blood and air were aspirated from the left pleural cavity, and he was started on penicillin. He was blood-grouped and cross-matched, but not transfused. We are indebted to Lieutenant D. Benazon, medical officer in charge of the patient, for the following progress report.

"He rapidly improved with pethidine and further improved when one pint (570 ml.) of blood was removed at once, and again later in the day. The pulse returned to normal and the blood pressure was 125/70. The haemoglobin next day was 58%. His pulse was taken half-hourly, and then one-hourly, and frequent blood-pressure recordings were made. Aspiration of blood was continued; at no time did it clot, and thus practically every drop could be removed over the next 14 days. It became increasingly serous, though at the start it was pure blood. The lung is now (August 13) almost completely re-expanded, and in about another week should be fully out to the chest wall. There is minimal thickening at the left costophrenic angle. Movement is good on the affected side, and breath sounds, except at the apex posteriorly where there is still a tiny pneumothorax, are as good as on the other side. The patient is feeling very well. The haemoglobin, which fell to 58%, is now back to normal with ferrous sulphate therapy. He was given plenty of breathing exercise after about 10 days, by which time it was hoped the ruptured vessels would have healed. He was covered during the first 10 days with penicillin while chest manipulations were going on and infection of the atelectatic lung was a risk.

Air continued to be troublesome, and I think has taken longer to remove than it should have done, because of the inefficient artificial-pneumothorax apparatus. We were fortunate that there was no recurrence, or perhaps at most only a slight recurrence, of bleeding. If this had occurred again I think transfusion and surgical treatment would have been needed."

Full re-expansion occurred during the following 10 days, and he returned to his unit for duty.

Comment

Although at the time unaware of Borrie's (1953) paper, we had already, from experience with traumatic haemothorax and penetrating chest wounds, appreciated the need for early exploration of the chest if there is evidence of continuing intrathoracic bleeding or if clotting has occurred. It is a life-saving procedure, and is essential if the lung is ever fully to expand again without later decortication.

In this respect the three cases reported make an interesting comparison. Case 1 was admitted initially to a surgical ward, where, on general surgical principles, the need for early exploration was appreciated. He was operated on within 24 hours, had full lung re-expansion from the time of operation, and was up fully convalescent within two weeks. Case 2 was admitted to a medical ward and treated expectantly on conventional lines for six days, during which he continued to bleed and to deteriorate progressively. Although after operation he never looked back, the delay lengthened the time required for full lung re-expansion and convalescence generally. Case 3 was treated by the traditional medical methods, surgery at no time being even considered. This case can be regarded as a successful result of conservative treatment, giving no cause for anxiety after the first few days. Nevertheless, full lung re-expansion took seven weeks. We feel that it was the layer of fibrin coating his pulmonary pleura rather than the defective aspirating syringe which was the real cause of difficulty in removing air from the pleural cavity.

We are in full agreement with Borrie that spontaneous haemopneumothorax is a surgical emergency demanding thoracotomy whenever bleeding is serious. We would go further and recommend emergency thoracotomy, after resuscitation, as the treatment of choice for all cases. At this stage it is a straightforward surgical procedure which, provided anaesthetic and surgical facilities are adequate, carries very little risk and permits direct access to the bleeding point, evacuation of all clot and air, and immediate lung re-expansion. Reluctance to operate has led to a high mortality, with a chest disability in survivors which at best results in slow convalescence with probably some permanent pleural thickening, while less fortunate cases will require the major procedure of pulmonary decortication to correct a crippling chest condition. In at least one case in five, spontaneous arrest of bleeding does not seem to occur, and these cases have contributed most of the fatalities in the past. In the remainder the chances of evacuating all blood and exudate before the occurrence of clotting or fibrin deposition sufficient to prevent ultimate full expansion appear to be less than even. It is important to remember that after initial resuscitation the patient, a healthy young adult, is fitter for surgery than he is likely to be for a long time if operation is delayed, and that the real risk in these cases lies not in operating but in not operating.

Summary

Three cases of spontaneous haemopneumothorax are reported, two of which were treated by emergency thoracotomy.

The condition should be regarded as an acute thoracic surgical emergency for which immediate thoracotomy is indicated.

We are indebted to Brigadier Douglas Bluet, Director of Medical Services, Far East Land Forces, for permission to report

Cases 1 and 3 and to Air Commodore G. P. O'Connell, Principal Medical Officer, Far East Air Force, for permission to report Case 2.

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ULCERATIVE COLITIS TREATED BY TOTAL COLECTOMY AND ILEO-RECTAL ANASTOMOSIS

BY

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In a preliminary communication (Aylett, 1953) I described an operation of ileo-rectal anastomosis with colectomy as a possible treatment of cases suffering from diffuse ulcerative colitis. The reasons for suggesting that it was possible to retain the rectum, thus avoiding a permanent ileostomy with its aesthetic and practical disadvantages, were detailed. In a further communication (Aylett, 1954) the types of cases in which the operation was indicated and in which ileo-rectal anastomosis could be achieved were described. Briefly, the operation can be carried out in all cases of ulcerative colitis in which surgery is indicated, with the exception of those in which the rectum has already been irretrievably damaged by gross fibrosis or by perirectal suppurative and fistula formation. The presence of pseudopolypi is not a contraindication for its performance.

The purpose of this short paper is to indicate certain modifications of surgical technique that experience has indicated to be desirable and to record the progress of the patients upon whom the operation has been carried out.

Modifications of Technique

Although in the first few cases the ileum was anastomosed to the rectum in its upper third the establishment of a safety-valve opening in the left iliac fossa necessitated the retention of the lowermost portion of the pelvic colon. This severely diseased portion of the large intestine may be included in the excision if the rectum is mobilized as an initial stage in the operation by division of the upper part of its lateral ligaments and of its posterior attachments. After the ileo-rectal anastomosis has been carried out the colectomy is completed by transecting the rectum through its upper part about 2 cm. above this anastomosis. It is then possible, as a result of the mobilization of the rectum, to exteriorize its open upper end through the lowermost part of the paramedian incision to act as a safety valve. The reasons for considering that such a safety valve minimizes the danger of a breakdown of the line of anastomosis, made as it is through a diseased rectal wall, have also been described previously. Moreover, this proctostomy tends to undergo spontaneous closure more readily than a colostomy in the left iliac fossa, so that the necessity for its closure by operation is required less often.

The large majority of patients are now operated upon in one stage, and in only one of the last 10 has an anastomosis and total colectomy not been effected in one operation. In this very gravely ill acute case the colon was excised and an ileostomy established as an initial stage of treatment, the upper end of the rectum being exteriorized

and restoration of continuity being delayed until the patient had been restored to good health. It is essential in the fulminating case, the case with uncontrollable haemorrhage, or the desperately ill patient to remove the colon as the first stage in operative procedure, leaving the patient with a temporary ileostomy. Subsequently the anastomosis between ileum and rectum is undertaken.

Results of Operation

The results are summarized in the accompanying table. There was no mortality in the series.

In a further two cases not included in the table the caecum seemed at operation to be so little diseased that in each it was retained and the anastomosis was effected

between it and the rectum. One of these patients has remained perfectly well over a period of 18 months, and her bowels are opened only twice in each 24 hours. The other case remained well for four months and then suffered a severe and uncontrollable haemorrhage. Operation was undertaken for this and the caecum was found to be acutely inflamed. It was resected, continuity of the bowel being re-established by an anastomosis between the terminal ileum and the rectum. On opening the caecum subsequently the whole of its mucosal lining was seen to be ulcerated and the site of multiple points of haemorrhage. The patient ultimately died. It would appear, therefore, that unless the caecum is absolutely normal no attempt should be made to retain it.

Summary of Results

Case No.	Age and Sex	Duration of Disease	Reason for Operation	Weight Before Operation	Date of Operation	Weight Dec., 1954	No. of Bowel Actions Dec., 1954		General Remarks	Result
							Day	Night		
1	30 F	12 years	Uncontrollable haemorrhage	st. lb. kg. 6 5 40.4	14/3/52	st. lb. kg. 7 11 49.4	6-7	1-2	Working normally as housewife. Developed intestinal obstruction, July, 1954. Post-operative recovery satisfactory. Prior to this episode bowels open 4-5 times in 24 hours	Good
2	44 M	7 "	Chronic ill-health. Diarrhoea, with blood and mucus	10 10 68	6/6/52	10 9 67.6	8-9	2-3	Majority of bowel actions occur after breakfast and supper. Patient works in heavy steel industry	Satisfactory (not classed as good on account of number of bowel actions)
3	10 F	2 "	Acute exacerbation with gross toxæmia	3 6 21.8	3/10/52	4 2 26.3	6	Slight faecal incontinence 1-2	Frail and physique poor	Fair
4	37 F	10 "	Chronic ill-health. Anaemia; diarrhoea with blood and mucus	8 50.8	10/10/52	9 11 62.1	6-7		Back to normal work as Civil Servant	Good
5	30 M	3 weeks	Fulminating type with perforation of colon	9 5 59.4	20/11/52	12 76.2	6	0	In excellent health. Previously professional footballer, is now on administrative side	"
6	29 F	1½ years	Severe toxæmia and subacute obstruction due to pericolic abscess	7 13 50.3	1/12/52	9 12 62.6	5-6	0-1	Working normally as housewife with one child	"
7	29 M	9 "	Patient treated by ileostomy in 1949 elsewhere	13 82.6	30/1/53	13 82.6	5-6	0	Working normally as electrician	"
8	40 F	11 "	Chronic ill-health. Severe diarrhoea, 14 times each 24 hours, with blood and mucus	9 3 58.5	5/12/53	11 69.9	5-6	1	Working normally as housewife with two children	"
9	31 M	5 "	Chronic ill-health. Severe diarrhoea, 16 times each 24 hours, with blood and mucus	9 7 60.3	11/1/54	11 69.9	5	3	Back to full work as motor mechanic	"
10	45 F	14 "	Chronic ill-health. Severe diarrhoea, 20 times each 24 hours, with blood and mucus	7 44.5	1/2/54	7 8 48.1	4-5	1	Patient back to work as clerk	"
11	20 F	6 months	Severe toxæmia—acute case	8 2 51.7	22/2/54	9 57.2	5-6	2	Back to normal work in city. Travels 50 miles by train each day	"
12	38 F	2 years	Chronic ill-health. Severe diarrhoea, 20 times each 24 hours, with blood and mucus	6 6 40.8	1/3/54	7 8 48.1	4-5	4	Back to work as shop assistant. Feels "wonderful"	Satisfactory (not classified as good on account of number of bowel actions)
13	30 F	10 "	Chronic ill-health. Anaemia; diarrhoea with blood and mucus	7 7 47.6	26/7/54	8 10 55.3	6-7	3	In excellent health. Bowels have not yet completely settled down	" "
14	49 M	9 "	Chronic ill-health and diarrhoea	10 2 64.4	17/9/54	10 5 65.8	5-6	0-1	Back to work as driver's mate	Good
15	43 M	2 "	Chronic ill-health. Diarrhoea, with blood and mucus	9 8 60.8	11/10/54	10 7 66.7	5	3	Now convalescing	"
16	51 M	2 "	Chronic ill-health and development of carcinoma in transverse colon	10 10 68	25/10/54	10 7 66.7	3	1	" "	"
17	26 F	3 months	Acute case progressing to fulminating state with peritonitis	5 12 37.2	19/7/54 (total colectomy, ileostomy, and proctostomy). 22/11/54 (ileo-rectal anastomosis)	7 44.5	6	4	Almost in extremis before operation. Bowels have not yet settled down after the anastomosis. Feels fit and well	"

Comment

The satisfactory progress of all but one of these severely and sometimes desperately ill patients, and their return to good health and to full work, seem to indicate that the method of treatment described is a satisfactory one. The follow-up is admittedly a short one and the series is not large. Nevertheless in no case has the disease flared up in the remaining rectum, and regular proctoscopic examination has shown that resolution of the inflammatory changes existing before the operation has taken place.

Addendum.—Since this article was compiled six other cases have been operated upon. Of these, two have returned to good health and three are convalescing. The sixth patient died during the fourth post-operative week following a burst abdomen. Of the patients reported on in the table, Nos. 11, 13, and 17 now have only one to two bowel actions at night.

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ANXIETY NEUROSIS: TREATMENT BY THE GENERAL PRACTITIONER*

BY

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Between the world wars attention was drawn to the fact that a large proportion of chronic sickness was due to the neuroses. Gillespie (1933), while on the subject of psychotherapy in general practice, mentions the fact that, of 600 cases referred to a special clinic, 436 were diagnosed as neuroses. Halliday (1935) found that psychoneuroses accounted for as much as 30% of the sickness of insured persons in Glasgow, and there is no reason to think that this proportion has since diminished. These figures are borne out by the report of the British Medical Association (1941).

The family doctor, while he has unique opportunities for studying the factors that bear on a case, through lack of training has not the knowledge, and too often not the inclination, to attempt to deal with the obviously neurotic patient. At out-patient clinics one often hears the story that "my doctor says it is just nerves, and gives me phenobarbitone."

The palpitations, choking sensations, and innumerable phobias of the anxiety neurotic are all too real to the sufferer, and can incapacitate him totally for work. The man cannot face the bus journey to work, and, once there, has to leave the crowded workshop because of intense feelings of apprehension. The woman is unable to leave home to shop unaccompanied, and cannot attend church or go to the cinema. In face of the exhortations of the family and friends to "pull themselves together," these patients rapidly lose heart; fears of insanity follow, with suicidal impulses which may have fatal consequences.

During the last decade the general practitioner has become aware that a large part of his time is taken up by patients suffering from psychoneuroses. The coming of the National Health Service Act, leading as it has to

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a reduction in the time available per patient, has tended to make it difficult for the practitioner to do more than pass the case on to the specialist, with the result that only a small minority, and only the most patent cases, get treatment at all. The majority, of lesser degree, struggle along unhappily, treated by sedative. A recent analysis of prescriptions issued by practitioners under the National Health Service Act shows that the commonest by far is for sedative (Dunlop *et al.*, 1952).

Before the second world war the neurotic could expect to be treated in one of two ways. By the older school, in whom there persisted a moral disapproval of anyone suffering from a neurosis, he would be dismissed as lacking in moral fibre or as malingering. By the inter-war generations, who, while admitting the existence of an illness in such cases, could do little through lack of training, he would be given sedatives and allowed to drift.

I qualified in 1938 and do not remember ever being shown an anxiety neurosis as such during my training in mental diseases. From contact with colleagues during the war, I found that this did not simply reflect on my medical school as compared with others.

The tendency persists to diagnose neurosis in a negative manner, by exclusion of organic disorder, rather than in a positive recognition of the various neurotic syndromes. This leads to much waste of time and effort on the part of other specialists. It is as though one was afraid to admit that the complaint was functional. In practice even to-day, if a diagnosis of neurosis is made, it is necessary to explain that it implies no derogation or criticism of the patient. Even so, many patients feel insulted by such a diagnosis.

In spite of the community's increasing interest in mental illness, as shown by Press, popular fiction, theatre, and cinema, there still persists the Victorian disapproval of a subject which lays such emphasis on the emotional aspect of man's life. It is partly this disapproval which discourages general practitioners from facing and attempting to treat the vast number of minor neuroses they meet every day.

In this paper an attempt is made to describe the treatment of the commonest of the neuroses—the anxiety neurosis—from the general practitioner's point of view.

The Physician's Reaction

It is obvious that if the general practitioner refuses, consciously or otherwise, to face and treat the neurotic, and depends on the specialist, the vast majority of cases will go untreated.

When he is confronted with the anxiety neurotic, what is the physician's reaction? The complaints are indefinite but insistent; a physical examination is negative; a placebo, usually in the form of phenobarbitone, is prescribed, the only psychotherapy being a word of encouragement. If a diagnosis is requested, too often a hint of an organic condition is given—"a nervous stomach," "a tired heart," "overwork," etc. The patient is unrelieved, and on persistence is referred to one specialty after another, with negative findings. The psychiatrist is often the last consultant called in.

Two factors contribute to this maltreatment of the neurotic. The first is lack of time for proper history-taking and evaluation of the symptoms. Ross (1937), discussing the treatment of such cases, states that at least an hour should be set aside for the initial examination. It is a reflection on the conditions of service under the National Health Service Act that few general practitioners could find this easy to-day. The second factor is the blind spot

that so many practitioners retain for neurotic symptoms. One hears of the busy family doctor who proudly states that he never sees a neurosis.

Choice of Case

Before attempting treatment of an established anxiety neurosis it is necessary to decide whether the case is one that can be dealt with by the general practitioner or one for immediate referral to the specialist. Several factors bear on this decision.

The age of the patient is one such factor. With increasing age the personality becomes more rigid, and is less open to suggestion and persuasion than in the younger years. Rarely is a neurosis of recent onset encountered at this time, and the symptoms are usually complicated by involutional changes.

A certain degree of intelligence is necessary in the patient for any psychotherapy beyond suggestion and persuasion. As one proceeds to explanation of symptoms and discussion of possible causation a higher intelligence is required, and if anything of a psycho-analytical nature is attempted a higher than average intellect is essential. In an average working-class practice few patients are encountered who could benefit from such advanced treatment.

The nature of the illness itself may decide whether it should be handled by the general practitioner or by the specialist. The illnesses of long duration call for expert handling if more than temporary relief is aimed at. Patients with an apparently stable previous personality may be handled by the non-specialist, while personalities showing any marked degree of deviation from the normal should be avoided.

Probable aetiological factors should be considered before deciding to treat an anxiety neurotic. Deep-seated constitutional abnormalities such as homosexuality, if they are the basis of anxiety reactions, should be referred for specialist treatment. The general practitioner can handle with ease the anxieties resulting from sexual malpractice, domestic stress of all kinds, and marital difficulties. The illnesses resulting from war stress are probably within the specialist's sphere, as they are now of more than five years' duration, and the majority have received some form of treatment in the past and are likely to prove chronic.

A further point to be decided in the treatment of the neurotic is the ultimate aim of the treatment. This has been described as "to cure sometimes, relieve often, and comfort always." Some personalities have been anxious for a lifetime, and it is over-optimistic to promise them more than relief. The obsessional personality cannot be changed to a happy carefree nature. Similarly with the constitutional deviations, relief of the disabling anxiety symptoms should be the aim; whether or not the invert can be re-adjusted to a normal pattern of sexual behaviour is debatable; some authorities are optimistic (Allen, 1940), but Curran (1938, 1947) is of the opinion that few are desirous of cure. The latter states that the aim of treatment should be to make the congenital homosexual a better-adjusted homosexual.

Prophylaxis

The treatment of the anxiety neuroses is both prophylactic and curative, and the general practitioner's role is important in both. In aetiology, the main factors are found to be emotional stress of various kinds in the sexual, social, domestic, and other spheres, and also the stress of war service. While the stresses themselves can rarely be modified or avoided, with the exception of the last, which can be avoided by psychiatric examination on enlistment, the personal reaction to them can be modified by education and instruction.

Any general practitioner of experience knows the immense amount of ignorance that exists among patients of all classes, not only of sexual matters but of all matters affecting their general health. The effects of this ignorance are often aggravated by false enlightenment from parents, Press,

and well-meaning religious instructors. This is often the starting-point of needless anxiety and doubts about health. The family physician has unique opportunities of preventing this ignorance. In childhood he can modify the over-emphasis on health impressed by anxiety-ridden parents. He should do his utmost to prevent the unnecessary branding of a child as "delicate." Many a child is forbidden to take part in games and recreation because of some doubtful illness in earlier years. As time passes it becomes more and more difficult to remove this belief that he is not as strong as his playmates.

Careless talk by the practitioner in front of the young patient is very easy. It should be remembered that many an intelligent child in the early teens has just as much interest in its illness as the parents have, and is quick to pick up vague suggestions of "a scarred heart valve" or "a spot on the lung." Reassurance should be given in a simple manner by the doctor and not be left to the anxious parent. The handling of proved organic disorders requires fine judgment of the restrictions necessary: Menninger (1945) describes the way in which overemphasis on rest can lay the foundations of neurotic reaction, and states: "The treatment by rest originated with Weir Mitchell, but, according to modern psychiatry, is entirely false in theory and unsound in practice. It aggravates fears of disease and does not cure neuroses."

In adolescence and early adult life every opportunity should be taken to dispel ignorance and resulting worry about normal sexual manifestations such as masturbation and nocturnal emissions in males and menstruation in females. One still encounters surprising superstitions on these subjects, passed on from parent to child.

Similarly when it comes to marriage, the young couple, even of the educated classes, embark on this phase of life in a discouraging state of ignorance. Few ask spontaneously for advice, and the family physician could prevent an immense amount of unhappiness and anxiety by asking the engaged couple what they know, and correcting any misapprehensions. Marriage guidance clinics are still very few, and until these are developed the role of adviser must fall on the general practitioner.

In a discussion of the treatment of the neuroses in general practice, Guirham (1947) points out the common errors of approach, the danger of excessive physical investigation, and states his belief that "80% of married couples below the level of the petit bourgeoisie use coitus interruptus as a means of contraception." He states that "there is more to be gained in correcting patients' views on these matters than there is in studies of Freudian symbolism." From experience in general practice I am in complete agreement with both these statements.

In practice it is very easy to follow inquiries about the family with a question on what the couple are doing to prevent further additions. When these matters are brought up patients are usually very willing to discuss them, but hesitate to do so spontaneously. As Culpin (1935), however, points out, some doctors are temperamentally unable to talk about details of sex life, and simply turn a blind eye to it.

Mace (1947) discusses the problem of marriage guidance, emphasizing the importance of the general practitioner in the treatment of sexual disorders and his lack of training in such matters.

In these fields the general practitioner has great scope for the prevention of anxiety reactions. Little can be done to prevent interpersonality tension, which is the result of modern social conditions, but he can do much to prevent its development into an established anxiety neurosis.

Treatment

Psychotherapy alone can produce lasting benefit in an established neurosis. In the first place this need be only of a superficial nature, and is quite within the scope of the general practitioner. The best approach is a simple

explanation of the bodily symptoms. The familiar elements of the emotion of fear should be pointed out, with its dryness of the mouth, palpitations, nausea, tremors, weakness of the knees, headache, etc. The effects of over-attention to bodily functions should be illustrated by the difficulties in swallowing pills consciously, and breathing consciously, as compared with the ease with which these functions are carried out when the attention is diverted. The reality of emotional "lumps in the throat," "heartaches," "headaches," "butterflies in the stomach," etc., should be pointed out.

When this is accepted the next step is to explain how this emotional dysfunction has come about. Occasionally a patient will volunteer immediately where the emotional stress lies, but it is perhaps easier to give instances of the common factors in interpersonality stresses within the family, sexual stresses in adolescence, courtship, marriage, etc. Stress of work is often proffered as a cause, but it is usually found that the stress lies not in work itself but in emotional relationship between the sufferer and his fellow workers. One does not work with one's emotions.

Admission of such factors need not be insisted on, but if the patient is allowed to go home and think things over he often returns and admits them spontaneously. I used this type of discussion on one patient, but failed to get any response. Finally homosexuality was mentioned—one naturally does not begin with this suggestion—and, although strongly denied at the time, the patient returned several weeks later to admit that this was the prime cause of his anxiety.

As psychotherapy proceeds the technique varies according to the individual case. The lower intelligence group require more persuasion and suggestion to help them regain their confidence. The higher intelligence group may be allowed to talk themselves out of their troubles: any subject with a strong emotional tone should be encouraged, and the patient should be urged to face the reality of his feelings towards his environment.

Every patient wants reassurance that his symptoms are not those of insanity. Many are afraid to ask this question. The differentiation must be quite clear and definite. Confirmation that efforts of will alone are ineffectual in cure is essential. It is often necessary also to point out that in neurotic illness there is nothing to justify shame. Many sufferers are pathetically relieved to find someone who does not describe his complaints as imaginary.

After such simple discussion and reassurance many patients admit spontaneously that they feel better for days afterwards.

In the general handling of the anxiety neurosis the environmental stresses must not be neglected. These may be modified to some degree. The relatives of the patient must be interviewed and instructed concerning their correct attitude to the sufferer. It should be explained to them that the symptoms are real, and that well-meaning advice on their part may only serve to increase the patient's tension. Holidays are often suggested, but these help only if they lead to a removal of aggravating factors. A claustrophobic will feel better after a holiday in the country, but his symptoms will reappear when he returns to his previous environment. When anxiety symptoms are the result of an unsatisfactory sexual relationship, intramarital or extramarital, there will be temporary improvement during separation. In unsatisfactory marriage relationships, either physical or temperamental, both parties must be interviewed and the difficulties discussed.

While the somatic symptoms of anxiety can be expected to abate with such reassurance and discussion, the mental symptoms need special attention. The degree of depression requires careful assessment, as in any depression there is always some risk of suicide. The practitioner need not fear asking the patient if any such ideas are present. They are commonly admitted. What is the best course here? It should be realized that the only effective safeguard against such attempts is certification, but very few neurotics are

certifiable. The relatives should be informed that a certain risk is present, even though small; they would be advised to maintain a certain supervision over the patient, and so far as possible he should not be left for long periods alone. This usually leads to difficulties in the working-class home, as it is not easy to find a relative who can spare the time to supervise the invalid. When sedatives are prescribed they should not be given in excessive quantities. It must be remembered, of course, that any patient can hoard small quantities. In cases of doubt sedatives should be given only to relatives who can be responsible for their administration.

An attempt at suicide, however half-hearted, should be an indication for admission to hospital. Many of these potential suicides would be willing to enter a general hospital, but such hospitals are loath to accept mental cases, and the suggestion of admission to a mental hospital, though theoretically correct, leads to a grave exacerbation of anxiety. Suitable neurosis centres with in-patient facilities are still few and far between. Unfortunately on recovery the uncertifiable patient is returned home and if the neurosis is untreated the danger of further attempts remains.

Of the other mental symptoms the handling of the phobia presents some difficulty. The patient realizes that his fears are unjustified and fights continually against them. This fight should not be encouraged. The fears will diminish gradually with psychotherapy, and until they do the best course is to advise the patient to avoid, so far as possible, circumstances that induce them. As discussed below, sedatives can be used during this stage. Sometimes during treatment the phobia becomes attached to some comparatively non-disabling object, which can be avoided with ease.

Medical Treatment

There is no doubt that the temptation to dispose of a neurosis by prescribing sedatives is great, but in reality they play a very small part in treatment from a curative point of view.

Insomnia must be treated initially by hypnotics. Of these, phenobarbitone, though by far the most popular amongst general practitioners, is not the most useful. Neurotic insomnia usually takes the form of difficulty in falling asleep, and phenobarbitone is a slowly acting sedative. Barbitone sodium in doses of 5-10 gr. (325-650 mg.) is more useful; butobarbitone and cyclobarbitone are also useful quick-acting hypnotics. Phenobarbitone has its place in easing general tension by day in doses of 4-2 gr. (32-130 mg.).

In the treatment of anxiety symptoms amylobarbitone sodium deserves special mention. In general practice it can be given by mouth both in diagnosis and as treatment. The use of small doses of amylobarbitone sodium in diagnosis is worthy of note: 1 gr. (65 mg.) is not enough to relieve anything but emotional stress. It is the most efficacious drug for relieving anxiety, both generalized and phobic. The patient can go to church or the cinema, or undertake journeys that would otherwise be impossible or extremely uncomfortable. The student can attend classes in comparative ease.

Sedatives play an essential part in the treatment of panic states. Here the patient is quite inaccessible to psychotherapy, and the only course open is prolonged sedation with amylobarbitone sodium, intramuscularly or intravenously, combined if necessary with paraldehyde. Sargent and Slater (1944) describe the various uses of these drugs in detail.

Relaxation

In all cases both mental and physical tension may be greatly relieved by instruction in methods of relaxation. A suitable form of relaxation exercise is one devised by Dick Read (1943). Many of the more intelligent patients benefit from this: muscular tension is reduced and a calm

state of mind induced which often leads to sleep. A summary of instructions to be given to the patient is reproduced below. That this falls within the general practitioner's realm is emphasized by the fact that these exercises are taken from a work on the management of pregnancy, being used to reduce muscular and mental tension in childbirth.

Position.—The patient should lie on the back on a wide couch or fairly hard bed with a small bolster under the head and shoulders, and a smaller pillow or cushion under the knees; arms by the side, elbows half bent, hands half closed, knees slightly separated—that is, all joints so far as possible in semiflexion. Relaxation is obtained as follows: (1) shoulders, by thinking of them "opening outwards"; (2) arms, by imagining them falling out of the shoulder-girdle "as though they did not belong to you"; (3) back—sinking through couch on to the floor; (4) legs, knees, and feet—falling outwards by their own weight; (5) head—making a dent in the pillow; (6) eyelids—half closing by their own weight; (7) face—as though hanging from the cheek-bones; (8) jaw—hanging loose. Give about two minutes to each group, and take them in the same order each time.

Breathing.—Let the chest wall collapse with its own weight on expiration, and pause for two seconds (or until the need for a new breath) at the end of expiration. Get a feeling of general relaxation, letting all the joints give a little more with each outgoing breath. This should be done six times. Note the train of sensation in the limbs—usually heaviness followed by lightness or "floating"; faint, transient pins-and-needles in the hands; feeling of warmth passing up from the extremities. A pleasant, torpid, day-dreaming state generally ensues (as in sunbathing), and any tendency to direct thinking should be deliberately diverted into a day-dream.

Duration.—Half to one hour (the sense of the passage of time is often lost or blunted).

Exercises for the Neurasthenic

Exercises of a different nature are to be recommended for the "neurasthenic" type of anxiety neurosis. Many of these patients believe themselves so incapacitated that they take to bed. Graduated physical exercise is required in such cases. It should be clearly explained to the patient that he must not expect to leave bed and feel absolutely fit. Hill and Dewar (1945), in a survey of effort syndrome, mention that graduated exercise is easily arranged in the armed Services, but in civilian practice such procedures are not possible. However, it is sufficient to get the patient to take gradually increasing daily walks, starting with a few hundred yards, and increasing slowly until he finds himself walking several miles without any discomfort.

It is customary to advise special diets and other measures to improve the general health in all neuroses. In domiciliary practice under present-day conditions this is extremely difficult, but it is important to keep in mind the possibility of avitaminosis. In case of doubt it is advisable to administer vitamins, especially those of the B complex, as psychotherapy proceeds.

It might be objected that the practitioner to-day does not have time to carry out the above treatment. Watts and Watts (1952) give a very good reply to this, showing that the time involved is no more than that necessary for the conduction of midwifery practice. As a result of experience in general practice and in out-patient psychotherapeutic clinics I find that, in suitable cases, six interviews of half an hour each suffice to relieve the sufferer of disabling symptoms.

Hospital Treatment

The treatment so far described is that within the scope of the general practitioner. What symptoms raise the question of admission to hospital?

In the first place, depression of suicidal degree makes it necessary for this to be considered. If home supervision is adequate it is possible to treat the case there, but in the average middle- and working-class home it is difficult to find a responsible relative who can spare the time for constant watch on the patient. The depressed anxiety neurotic living alone can cause more concern to the practitioner than

the flagrant psychotic. The latter can be certified with little difficulty, whereas it is often impossible in the case of the former.

A second group that often require admission to hospital are the cases of extreme agitation. The patient is restless, tearful, and wears out herself, her relatives, and her medical adviser with her demands.

Thirdly, admission to hospital may be necessary in the treatment of the anxiety neurosis with symptoms of anorexia, with or without vomiting. Such symptoms can eventually endanger the life of even a young and physically healthy girl.

Lastly, the phobias can restrict the patient's activities to such an extent that he is unable to undertake out-patient treatment even if he were willing. Cases can be recalled in which the sufferer was completely confined to his house by panics which overwhelmed him at every endeavour to leave.

In all these cases the choice lies between admission to a psychiatric unit of a general hospital or to a mental hospital. In either case admission should be on a voluntary basis; but it rarely happens, in cases which cannot be supervised at home, that the sufferer can endanger his or her life and, being uncooperative, make certification unavoidable.

Out-patient psychiatric clinics have been developing rapidly during the past five years, commonly associated with a general hospital. These help in the diagnosis and treatment of early psychiatric illness. In chronic deep-seated anxiety neuroses, prolonged specialist psychotherapy is often required, lasting several months or even years.

Of the various methods of psychotherapy there is no end. From a continuation of superficial explanation, reassurance, and discussion, methods vary through free association, modified analysis, to full analytical methods. As stated previously, the scope for the latter is very small indeed. The growing numbers of cases referred for treatment have now led to a development of group methods of therapy, in which the patients are instructed as a group in the nature of their troubles, and are encouraged to work their way out of them in the group, by various means.

Various abreactive techniques can be carried out on an out-patient basis, using hypnosis, intravenous barbiturates, ether, carbon dioxide, and other aids. These methods were of particular use in the treatment of traumatic war neuroses; the patient is encouraged to work off his previously repressed emotions.

Out-patient electric convulsion therapy, although primarily of use in the treatment of psychotic depressions, has a place in the treatment of anxiety neuroses. It is almost essential in the case of the depressed suicidal neurotic. Although it may increase agitation while it is being applied, the effect is to lessen the depression and to relieve insomnia, and often an increase in appetite and physical well-being is achieved.

In-patient treatment for neuroses still presents great difficulty. The fear of the neurotic that he might be sent to a mental hospital is quite understandable: in practice a relatively small proportion enter such a hospital on a voluntary basis, and they rarely stay long enough to benefit. While a large percentage of neurotic cases are admitted to general wards, they are discharged as soon as such a diagnosis is made. Few hospitals for purely neurotic patients exist. In hospital, further treatment is available for the anxiety neuroses. Modified insulin therapy can be applied to selected cases. It is specially indicated in the agitated and physically debilitated case. Anxiety can lead to profound loss of weight, and this can be replaced rapidly by the use of insulin in dosage sufficient to induce varying degrees of hypoglycaemia. It also acts as a sedative, and psychotherapy can be carried out concurrently.

Continuous narcosis is of use in the case of the acute anxiety state, and is possible only in hospital. The patient is kept continuously under the influence of hypnotics for a period of a week or more, being roused only for nourishment,

which is given in the form of fluids. This method is of little use in the case of the chronic anxiety state, the patient usually returning to his previous broodings on his health when sedation is stopped.

Conclusion

When the above methods have failed, one is tempted to consider the problem of leucotomy for the sufferer from chronic anxiety. The place of this treatment in the case of the neurotic is still a matter of argument. Although spectacular successes have been reported (Sargant and Stewart, 1947), the result must always be unpredictable. While anxiety is usually relieved and intelligence is rarely impaired, the effects of treatment cannot be undone. The result of the operation might be a bigger social problem than the original illness.

There is a very strong case for a small psychiatric unit in all general hospitals, to provide the above out-patient and in-patient treatments, without the "stigma" of visiting a mental hospital, which deters so many sufferers from seeking help.

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THE NEURASTHENIC PSYCHOPATH

BY

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Full social participation is now commonly regarded not only as a sign of health but as an essential for its achievement. Interest is therefore aroused by those who do not participate in the activity, basic to our society, of work. The findings of a survey and follow-up of a group of psychiatrically disabled men, both employed and unemployed, have previously been reported (Markowe *et al.*, 1955). In the course of the investigation some of the subjects with long-term unemployment asked for psychiatric help, and 28 of these attended a special clinic for twelve months. The present paper offers a discussion of the clinical patterns of these patients.

Clinical Report

In every diagnostic clinic it is often difficult to draw a formal distinction between the illness and the personality from which it springs. The syndromes presented by these patients can be seen in any psychiatric clinic; in the earlier report also it was noted that employed and unemployed subjects had similar symptoms. Twenty patients complained of neurotic symptoms, of which excessive tiredness, back-

ache and headache, hypochondriasis, and a varying mood of anxiousness or mild depression were predominant. Plainly hysterical symptoms and signs were observed in only three patients, but physical symptoms of anxiety were found rather more often. Three patients had major epileptic fits, three were defective, two suffered from involutional depression complicated by organic disease, one developed a mixed depressive psychosis, one was a chronic schizophrenic, and one developed a reactive paranoid state.

These summary diagnostic labels fail to explain the interest provoked by these patients, for they provided a clinical experience of disorders and anomalies of personality not easily gained in out-patient departments, and they afforded a more precise description of the term "inadequate psychopath." The following case history is illustrative.

A man aged 39 when first seen had had neurotic symptoms in his childhood, but did not admit to a family history of psychiatric illness. He served as a regular soldier before the war, but was invalided in 1941. He had several unskilled jobs on leaving the Army, but for the past four or five years had been almost consistently out of work, holding one job for about a month every year or so. He married in 1939 and had one son, but his wife refused to leave her mother to live with him. He was contemplating divorce proceedings when his wife sued him for desertion. He denied any other sexual activity. He lived on his own in lodgings, cooking his own meals, and had no friends. His weekly income from all sources was 69s., of which he paid 25s. for his room and 10s. maintenance for his son. He complained of attacks of anxiety, palpitations, depressions, and dizzy spells since his marriage. He was apathetic and resigned in mood. There were no physical abnormalities. In spite of his poverty he could not get work, although opportunities for employment were excellent in that area. He attempted to get in touch again with his parents: an aunt told him they had removed, but apparently he could not discover their new address.

The ineffectiveness these patients displayed in all aspects of life was also apparent on interview. They waited upon the words of their interlocutor, and rarely ventured to put forward what they wanted in life or what they would like to do. Although some might fairly be described as retarded in speech, they varied in their verbal facility; but when the interview touched on topics which, it might be supposed, would awaken their self-interest, their talk became vague. Their complaints and dissatisfactions, their present difficulties or previous happiness, their hopes and fears for the future, whatever was in question, would arouse no definite affect or point of view which could be seized upon and discussed. A striking feature was their tolerance of the worst conditions and their seeming inability not only to obtain satisfactions but even to desire them. In the case just cited the patient had given up his family and son and had no friends; with the money at his disposal he lived virtually in penury, and must at times have gone hungry. His symptoms were by no means severe, yet he was unable to earn even that little money which he would have found so helpful. With all these troubles he was only vaguely distressed. The lack of a serious disturbance of mood and the long-standing nature of his condition made it unlikely that he was suffering from a chronic depression. None of the basic signs of schizophrenia were present, nor was he cold and unfeeling; on the contrary, he maintained quite a strong affective rapport with the doctor in a dependent and pathetic way.

This lack of drive was well shown by another patient who later developed a reactive paranoid state. He managed to hold a job for a few weeks, and when asked on what he spent his money he replied that he was "putting it by." On being pressed further, he said it was to buy clothes. He neither smoked, drank, nor went to any entertainments, and had no friends of either sex. On giving up his job he forfeited the help of the National Assistance Board and went to live with an uncle, who kept him in the bare essentials of life only.

Apart from defectives, who might be expected to show some degree of inadequacy, this type of personality anomaly was observed in 18 of the remaining 25 patients in varying degrees of severity.

Other types of psychopathy were also observed. Two patients could be classed as contentious and emotionally unstable. One, a qualified laboratory technician, became aggressive and abusive whenever attempts were made to find work for him. He complained that the clinic misrepresented him to prospective employers and prevented their engaging him. He claimed to have many influential friends, but nevertheless he was living in the poorest circumstances. He alleged that a high-level inquiry had been made by the Ministry of Labour into the handling of his employment problems, which had disclosed "inefficiency and muddle all around." The other patient, no less aggressive and paranoid, attempted to borrow £50 at the first interview. At times he showed a hypomanic pressure of talk. While these patients resembled the inadequate personalities in their poor work record and history of failure, yet they were by no means ineffectual in the part they had chosen of acting out a pathological sense of grievance against official bodies.

Another patient, neither inadequate nor querulous, was yet emotionally immature, while the patients with involutional illnesses and schizophrenia had the personalities characteristic of those conditions.

Treatment and Outcome

It is hardly surprising that in face of such difficulties these patients failed to improve their adaptation as judged by their work record during the time they attended the clinic (Markowe *et al.*, 1955). The progress of some individual cases is, however, worth discussing.

One patient with an involutional depression complicated by pernicious anaemia was admitted to hospital. Adequate treatment of the anaemia and rest in hospital, without further physical treatment, restored a normal mental state, and this patient is now working. Supportive psychotherapy, while available to all patients, was in particular successful in the case of the patient who was emotionally immature. He had found work for himself, but was crippled by heavy debts. With the encouragement of the clinic he succeeded in satisfying a court order and made good progress in straightening out his affairs. A patient who had reached retiring age was settled happily in an old people's home, and a place was found for one of the defectives in an occupation centre. Although this could not be counted as rehabilitation, it represented a much more satisfactory disposal than their previous way of life.

When patients were successfully placed in jobs, this was almost always done by the local disablement resettlement officers, but there were some problems which could not be solved through the good offices of the employment exchanges. One patient, an undischarged bankrupt, was by temperament more fitted to work on his own account. He had trained himself as a french-polisher, and by borrowing money from various sources it was found possible to set him up in business again.

For many patients, however, with the gross deficits of personality already described, treatment was unrewarding. Attempts to place them in suitable employment failed, as their ineffectiveness could not long be hidden from their employers. Vacancies in Remploy were too scarce to be of practical value, but one patient was accepted by an industrial rehabilitation unit. Physical treatments were inappropriate and supportive psychotherapy was without effect. In three instances, where patients presented particularly difficult problems of adjustment, arrangements were made for their admission to the Social Rehabilitation Unit at Belmont Hospital under the care of Dr. Maxwell Jones, in the hope that vigorous social therapy would be more effective than out-patient treatment. The remainder, on the other hand, provided ample opportunities for welfare work. Those without friends were encouraged to join a social club for out-patients. In spite of National Assistance, there were some who lacked clothing and other necessities, and these patients were grateful for being put in touch with charitable organizations which could relieve their needs.

At the end of twelve months four patients had either recovered or were much improved and were back at work. Four others showed symptomatic improvement. In three cases the improvement in health preceded the return to work, in four it followed a return to work or the taking up of an occupation. Relief of financial anxiety, the feeling of again being useful, and occupation in itself were reasons given by these patients for their later improvement. One patient received symptomatic relief from sedatives without any improvement in his work record.

Two patients deteriorated while attending the clinic. One, having developed a mixed depressive psychosis with marked hysterical features soon after his first attendance, was admitted to a mental hospital. The other was an extremely inadequate man who was advised to attend out-patient occupational therapy. After some weeks his behaviour at the occupational therapy centre became disturbed, and he felt that the staff were against him. Later he believed he heard the voice of a neighbour talking about him: she knew all the details of his life and was in touch with the occupational therapy centre. He ceased attending the centre and resumed his solitary existence with his uncle. His delusions still remain, but he does not act upon them, and remains an isolated and eccentric figure.

Comment

In spite of the serious unemployment two decades ago, there are surprisingly few clinical reports of the psychiatric disturbances of the unemployed. Lewis (1935) reported on 52 such patients and found a uniform clinical picture in which hysteria was predominant. In the present series the predominant symptomatology may fairly be described as "neurasthenia." This change in the form of neurotic illness is now a commonplace observation; Mayer-Gross *et al.* (1954) attribute it in part to changing fashions in diagnosis, but Lewis noted gross hysterical phenomena in 23 of his 52 patients, which is to be compared with only 3 out of 28 patients in the present follow-up study. It is possible that the increasing sophistication and self-respect which has accompanied a rising standing of living tends to inhibit the cruder forms of hysterical response: it is of interest that Kalinowski (1950), in his review of psychiatry in the last war, comments that gross hysterical conditions, so common in the first world war, were reported as frequent only in the Yugoslav partisans.

Although the symptoms were plainly neurotic, the gross anomalies of personality suggested the possibility of more serious psychotic disorders, in particular mild chronic endogenous depression or simple schizophrenia. In almost all cases this could be discounted. Except for the one case of declared schizophrenia, thought disorder was entirely lacking and good rapport was obtained. Secondary symptoms were absent, except for the patient who developed paranoid delusions, but this could more accurately be described as a reactive paranoid state, the basic signs of schizophrenia being lacking. Similarly, the cardinal features of depressive psychosis were absent in all except the patient admitted to a mental hospital; one other patient who had lost weight and was slightly retarded was also suspected of suffering from a mild depression. Signs of an organic dementia were not found in any patient. In almost all cases, therefore, a supporting diagnosis of constitutional personality disorder had to be made.

The term "inadequate personality" has come to be widely used, and is now included in the *International Classification of Diseases*. Published descriptions of this condition are not, however, entirely applicable to the cases here described. Henderson (1939) notes that such patients "may show a condition approaching apathy, but it is not so much an apathy as a self-centredness which takes no thought of others, and has for its aim the individual's self-gratification and glorification." Mayer-Gross *et al.* (1954) describe the "unstable drifter" (*Haltlosigkeit*) in similar terms: "His immediate wishes, affections, or disgruntlements rule him completely, and he is indifferent about the future and never

considers the past." These are descriptions of the typical psychopath, unable to steer a steady course, seduced by each passing temptation, and certainly apply to two patients in the present series. No doubt this type of behaviour also occurs in the remaining patients to some extent, but the heart of the matter lies elsewhere. Their characteristic and common feature is lack of drive; the pattern of repeated failure is to be seen as due, not to lack of control, but to a profound enfeeblement.

Janet's (1903) words are more apt: "Presque toutes ces personnes présentent quelquefois depuis leur première enfance un caractère bien reconnaissable: ce sont des mous, des indolents, des paresseux." Janet distinguished his concept of psychasthenia, with obsession and rumination, from neurasthenia: "Certains malades sont très abouliques, ne peuvent plus faire attention et présentent de l'amnésie continue... chez ceux-là les troubles de l'obsession sont peu à redouter." He writes of mental sickness in a context where the term personality disorder is now preferred, but the point to be made is that the ineffectiveness of the patients here described is closer to the older concept of neurasthenia than to that of psychopathy, as now generally understood. Schneider, too, included asthenia in his list of psychopathies.

It is hardly surprising that this type of personality disorder has not caught the attention of writers to the same extent as the more troublesome unstable psychopath: it is of their nature to pass unnoticed. When, however, there is a strong social pressure to work, as in the present period of full employment or in times of war, their disability becomes apparent. The clinical impression of these patients upon me could be compared only with my experience of Army psychiatry, and in both instances patients were often referred for administrative reasons. In discussing the effort syndrome Lewis and Jones (1941) pointed out that symptoms were of little consequence in a man's decision to soldier on; more important was his attitude to military service. This is patently the same problem of adjustment as is presented by the present unemployed.

If, as I am inclined to believe, it is this type of personality disorder which forms the core of the disabled unemployed and not the "unstable drifter," the question of treatment remains. In the Army, group techniques tended to be developed (Foulkes, 1948; Maxwell Jones, 1952), which have since been continued by the Social Rehabilitation Unit at Belmont Hospital. Promising results are claimed—44% satisfactory adjustment on follow-up (Maxwell Jones, 1952)—in patients for whom the criterion for admission was social failure; but it is uncertain whether this outcome applies equally to the type of patient here discussed. By the showing of the present clinic, out-patient attendance alone is not sufficient to improve their level of adjustment. Rehabilitation may even be ill-advised for some patients at particular stages of their illness. Attempts to break down the defensive social isolation were found intolerable by the patient quoted above, who developed a reactive paranoid state when he was exposed to the stimulation of an occupational therapy centre.

The discussion of the differential diagnosis should perhaps have included the lay interpretation of laziness, as a description not of behaviour (as with Janet) but of motive. Nothing could be farther from the truth. The economic sanction of withdrawal of National Assistance benefit did not change the adjustment of the patient concerned, and, even if by these harsh means some were induced to re-enter employment, there is some evidence that they do not become productive workers (Markowe *et al.*, 1955).

When such conditions occur in wealthy men they are regarded as amusing eccentrics, like Goncharov's Oblomov; in poorer men, however, our society takes a sterner view. The possibility remains that, like Oblomov, these unhappy people can be neither treated nor coerced into becoming more productive citizens, but remain a charge on the kindly employer or the welfare services, even requiring the more

able to search them out, for they are as ineffectual in seeking help as in all other things.

Summary

Attention is drawn to a type of personality disorder which was observed in patients attending a clinic for unemployed psychiatrically disabled men. This disorder is characterized by absence of drive and irresolution rather than by emotional instability as in other forms of psychopathy.

The response to out-patient treatment both in occupational adjustment and in mental health was unrewarding.

It is considered that, although these patients may not often be suitable for rehabilitation, they are almost always in great need of social welfare services.

I wish to thank Professor A. J. Lewis, honorary director of the unit, for his advice and stimulating criticisms, and Dr. M. Markowe and Dr. G. M. Carstairs for making available to me observations on patients under their care.

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THE FOOT AS A HALF-DOME

BY

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Although the foot is usually described as having medial and lateral longitudinal arches and a transverse arch, a few writers—for example, Ellis (1889) and Wood Jones (1949)—have compared the foot to a half-dome, the weight being transmitted from the talus to the periphery of the foot, which forms more or less a half-circle as seen in the footprint.

There are three sound reasons why this latter method of regarding the foot should be more widely taught.

(1) The trabeculae within the bones indicate the direction of weight transmission, and in radiographs of the individual bones of the tarsus the fan-like arrangement of the trabeculae in the navicular and their downwards and lateral direction in the cuboid are particularly noticeable. Sections through the bones show the pattern even better; in a longitudinal section through the calcaneum the trabeculae radiate forwards, backwards, and downwards, while in a cross-section of the calcaneum through the sustentaculum tali they splay downwards and laterally. If these trabeculae are projected on to the surface of the bones and the bones then articulated (Fig. 1), a picture is formed of a series of "half-arches" or "quarter-meridians" radiating from the talus to all the peripheral weight-bearing part of the foot (Fig. 2). Naturally there are still longitudinal and transverse arches, depending on how the foot is sectioned, but these arches are of no significance in the function of the foot unless the sections coincide with bony trabeculae.

(2) Most students have obviously, and unfortunately, obtained the ridiculous impression that a person uses only the longitudinal arches when walking, whereas between coming down on the heel and pushing off with the toes a

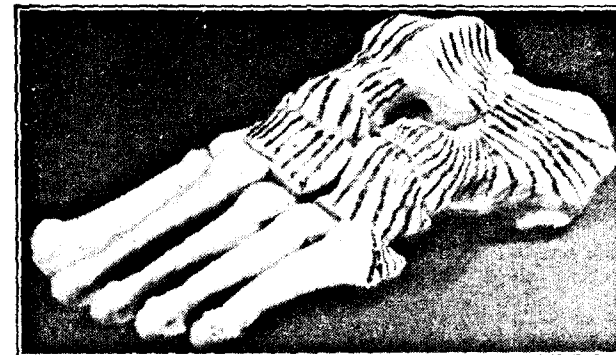


FIG. 1.—The trabeculae projected on to the surfaces of the articulated foot-bones.

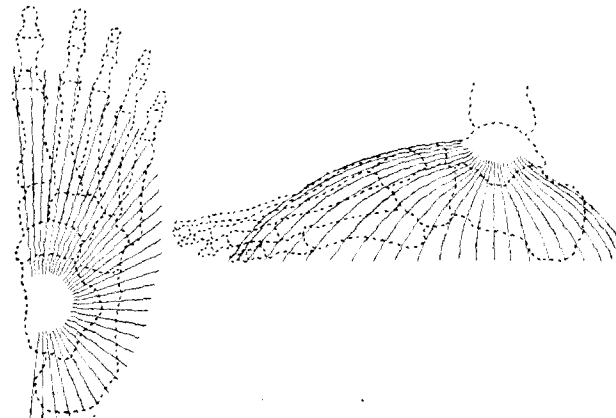


FIG. 2.—Diagrams to illustrate the relations of the half-arches to the bones of the foot.

walker bears weight, in turn from behind forwards, on all the half-arches. In fact, in the case of an in-toeing walker, who does not push off with his big toe (he uses the lateral toes), most of the strain is put on arches running neither longitudinally nor transversely, but obliquely. To describe the foot as having longitudinal and transverse arches only, simply does not cover this type of case.

(3) By comparing the foot to a half-dome, we get a better understanding of the deformities seen in flat-foot (or weak-foot). When a normal foot takes the weight of the body there is the well-known but variable elongation of the foot, because the half-arches, reaching anteriorly and posteriorly, have flattened or yielded under the strain. But what happens to the transverse and oblique half-arches? When they yield under the body weight they throw the summit of the half-dome—namely, the talus—medially. Fig. 3 shows a person sitting with his feet just a little apart; when he stands up without shifting his feet (Fig. 4), notice how the medial malleoli come together. In a case of flat-foot which is the result of faulty posture or weakness of muscles and ligaments, one obvious feature is the low medial border of the foot; but it is well known that in the normal foot the arching or doming may be very high or very low, so this feature is no criterion. If, however (Fig. 5), the talus and medial malleolus have been pushed medially and downwards to a marked degree (or, as it is sometimes expressed, have "rolled-in"), thereby giving pronation of the fore-foot and valgus deformity of the heel (Fig. 6), then there is no doubt that we are dealing with a foot whose doming or arching has collapsed.

Look again at the diagrams (Fig. 2) and the positions of the bony trabeculae in the foot (Fig. 1) and it becomes obvious that this is the only way in which a foot can possibly flatten out—that is, for the summit of the dome to be pushed medially as well as downwards. The alternative, were it possible, would be the summit sinking straight downwards, requiring a splaying out of the transverse and oblique half-

arches at their peripheral weight-bearing ends, thereby producing a longer lateral border to the foot: but these half-arches, with a few exceptions, are contained within the calcaneum and therefore cannot separate from one another. Even if the calcaneo-cuboid and cubo-metatarsal joints were to open out (and there is no attempt at this in flat-foot), it would not be sufficient, because most of the transverse and oblique half-arches are behind these joints.

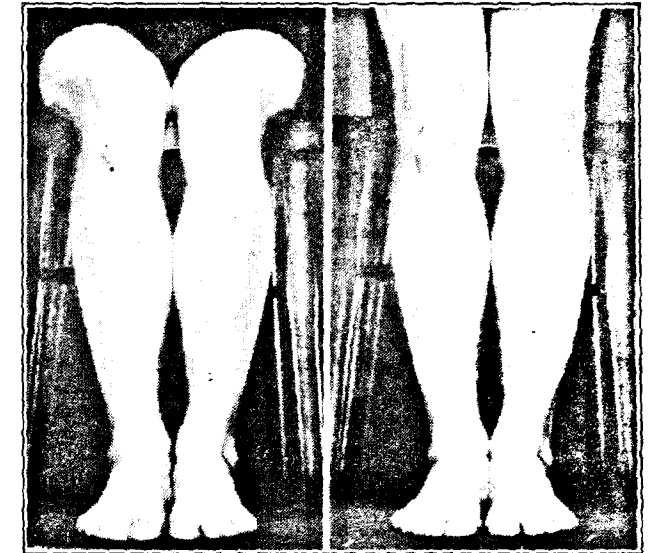


FIG. 3.—Feet bearing no weight: medial malleoli just a little apart. FIG. 4.—Same feet as in Fig. 3, and in same position but bearing body weight: medial malleoli now in contact.

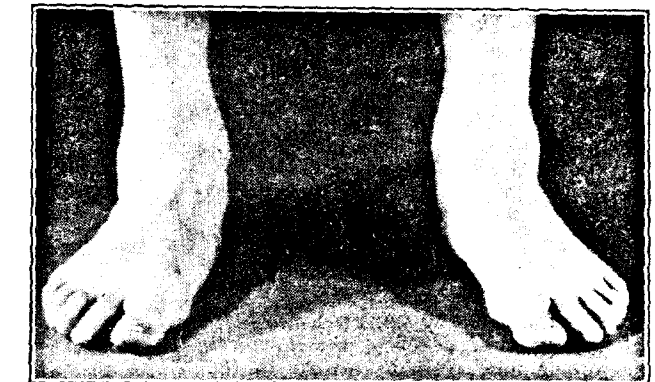


FIG. 5.—Flat-foot, showing pronation of forefoot.

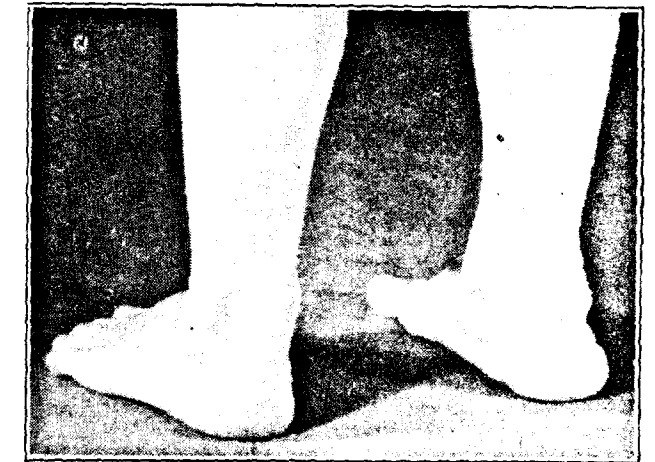


FIG. 6.—Flat-foot, showing valgus deformity of heel.

Summary

Comparing the foot to a half-dome has these three advantages over the older description: (1) It gives a true picture of how the weight is transmitted through the foot. (2) It forbids false impressions of how the foot is used in walking. (3) It allows of a better understanding of the deformities seen in flat-foot.

I am indebted to Professor R. D. Lockhart for his helpful criticism in the preparation of the paper; to Mr. A. Cain, A.R.P.S., for the photographs; and to Mr. W. Cruickshank for the diagrams.

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Medical Memoranda

Anorectal Ulcer in Chicken-pox

Chicken-pox lesions situated on uncommon sites such as the conjunctiva, prepuce, vulva, larynx, and trachea often give rise to symptoms. This report presents a case of chicken-pox, with constipation and a severe bearing-down pain, in which proctoscopy showed an ulcer of the anorectal region.

CASE REPORT

A boy of 12 was referred to the casualty department on April 7, 1953, as a possible abdominal emergency. He had previously been well, and his family and detailed past history was not significant. Six days before admission a skin lesion appeared on the left hip, and crops of lesions erupted each day during the next three days, the general order of spread of the rash being from hip to abdomen and back, to lower limbs, and to head and scalp. This chicken-pox eruption was heavy and generalized. The temperature rose to 38.5° C. on the second day of illness.

On the fourth day of the eruption, two days before admission, the boy complained of pressure in the lower abdomen and a desire to defaecate. This increased on the following day, but he was unable to pass a motion because of the onset of a severe sharp pain in his rectum on attempting this. Periodic attacks of the pain even woke him at night. As these pains increased in severity and frequency, he was referred to hospital. Micturition also became painful.

On admission he was rolling about and complaining of severe pain in the lower abdomen; physical examination was therefore difficult. He was an intelligent and well-nourished boy. The temperature was 37.7° C. The scalp, face, trunk, and lower limbs showed numerous scabbing chicken-pox lesions. The tongue was coated with a yellow fur, but the edges were moist. On palpation a fullness of the lower abdomen and the possible presence of a mass on the left side were noted. Rectal examination was not successful, since the boy resisted the procedure and the sphincter was in marked spasm. During a barium enema x-ray examination shortly after admission, the medium was seen to enter the descending colon, and soon afterwards a large soft faecal stool was passed, free from blood and scybala. Analgesics were given during the day, in the course of which three more bulky motions were passed. The next day he was still in pain, and sigmoidoscopy was performed under thiopentone anaesthesia. The presence of faeces prevented adequate inspection of the mucosa. Following this

examination, apparently because of the dilatation of the anal sphincter, the patient experienced much relief, and it was possible to give cleansing enemata. On the third day of hospitalization proctoscopy showed a yellowish-grey ulcer about 8 mm. in diameter situated 2.5 cm. from the anal margin at about 2 o'clock, the surrounding mucosa being redder than elsewhere. The anal sphincter was then well stretched.

Much relief followed this second endoscopic examination, although he still complained of some pain during defaecation, and the sphincter remained in spasm. He was discharged on a regime of liquid paraffin by mouth and suppositories. Follow-up proctoscopy on April 13 showed the ulcer to be shallower with a clean base, and sigmoidoscopy to a depth of 10 cm. revealed no abnormality. On April 23 proctoscopy showed complete disappearance of the ulcer and a normal mucosa. The patient had no complaints. Full examinations of faeces and urine had been repeatedly negative.

COMMENT

The symptoms referable to the anorectal region appeared during the eruption of successive crops of chicken-pox lesions, and there was no other known cause for the ulcer, such as scybala, a generalized proctitis, or any trauma. It is almost certain, therefore, that this ulcer developed from a chicken-pox lesion. It was not possible to locate the site of the lesion in relation to the pectinate line, but the symptoms, the severe spasm of the sphincter, and the relief following stretching of the anus suggest that the ulcer was within the upper limits of the anal canal. This point is relevant because of the difference in histology between the rectum and the anal canal, the lining of the latter being transitional epithelium.

Although vesicles of the buccal mucosa are quite common in chicken-pox, there are few records of lesions in other parts of the alimentary tract. The usual clinical examination naturally does not reveal such lesions, and so benign a disease rarely yields necropsy material. Mitchell and Fletcher (1927) note two patients with "ileo-colitis" among 775 cases of chicken-pox. Bullowa and Wishik (1935) list appendicitis in five patients and intestinal intoxication in three among the complications in 2,534 cases of chicken-pox. It is probable that the above were unrelated to the initial illness. Dr. H. Stanley Banks (personal communication, 1953) has not encountered intestinal ulceration in chicken-pox.

Post-mortem reports on patients dying with chicken-pox occasionally refer to gastro-intestinal findings. Johnson (1940) described five small shallow ulcerations of the oesophagus in an infant of 7 months, the lesions showing areas of focal degeneration similar to those in the skin. Oppenheimer (1944) reported a premature infant dying at 11 days who showed disseminated necroses and intranuclear inclusions in the oesophagus, stomach, and intestines. Lucchesi *et al.* (1947) noted that the stomach of an infant of 12 days showed hyperplasia and hypertrophy of the surface epithelium and a few tiny scattered areas of necrosis associated with intranuclear inclusions. In a woman aged 32, whose case is described by Claudy (1947), the sole abnormality in the digestive tract was a few small haemorrhages in the crests of the intestinal folds. Numerous shallow ulcers of the oesophageal mucosa with chronic inflammation of the submucosa were noted by Frank (1950) in a woman of 34. Eisenbud (1952), in a necropsy on a woman aged 71, found a few small haemorrhages in the wall of the small intestine extending through the entire thickness of the gut. Hackel (1953) studied the necropsy findings in 11 patients who died with active chicken-pox and (personal communication, 1953) found no lesion of the gastro-intestinal tract.

The reports of visceral involvement in chicken-pox support the view of Scott (1951) that the virus is carried via the blood stream. There seems no reason, therefore, why

any part of the body should not occasionally show localization of the virus, which, furthermore, has a predilection for epithelial structures.

I wish to thank Dr. W. Falk for permission to report this case and Mr. T. J. Shields, B.M.A. Librarian, for help with one of the references.

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Asphyxia Pallida Responding to Endotracheal Insufflation after 140 Minutes

Much interest has been aroused by recent publications on the treatment of asphyxia neonatorum by endotracheal insufflation and intragastric oxygen. Little mention is made, however, of how long these measures should be continued when there is no response. This case is of interest because the infant made a dramatic recovery after complete absence of spontaneous respiration for two hours and twenty minutes.

CASE REPORT

The mother was a primigravida aged 32. She was booked for hospital confinement and attended the antenatal clinic regularly. Her general condition was excellent throughout. Her blood was Group O, Rh positive; haemoglobin 84%. The W.R. and Kahn test were negative. Breech presentation was diagnosed at 36 weeks and external cephalic version was attempted but was not successful. X-ray pelvimetry showed the pelvis to be of good shape and ample dimensions.

Labour was induced at 39 weeks, this being the customary treatment of breech presentation in a primigravida at this hospital. Medicinal induction consisting of castor oil, 2 oz. (60 ml.) by mouth, followed by an enema and a hot bath, was first given. This was followed by surgical induction with a solid rubber bougie. Labour pains began two hours after the latter procedure. The first stage of labour was uneventful and lasted 24 hours. The membranes ruptured after 16 hours. Sedatives given were syrup of chloral, 30 gr. (2 g.), at 12 hours, and pethidine, 100 mg., at 20 hours. The second stage lasted 30 minutes. Spontaneous breech delivery followed under pudendal block anaesthesia. A liberal episiotomy was performed and the head was delivered easily with Wrigley's forceps. The foetal heart was regular throughout. There was no cord anomaly.

The infant gave one gasp after delivery but made no further attempt at respiration. The nostrils, mouth, and pharynx were sucked clear of mucus and liquor, and the infant was placed in a warm cot in an inverted position. After five minutes there was still no attempt at respiration, and the infant had the classical appearance of asphyxia pallida. The heart was beating regularly at 110 a minute. After 10 minutes intragastric oxygen was begun with Akerrén's method. This treatment was continued for a further 10 minutes, but the infant remained pale and was flaccid and inert. The heart rate dropped to 100. In view of this, endotracheal intubation was carried out with a Magill infant laryngoscope and a Magill No. 3 endotracheal catheter. Laryngoscopy showed that the larynx and pharynx were patent and clear of mucus. Insufflation was started with a Gibberd insufflator. Pure oxygen was delivered from the bag 30 times a minute at a pressure of 20 mm. Hg. After

five minutes the infant became pink but remained atonic. The heart rate rose to 120. The only evidence of spontaneous respiration was isolated gasps occurring at half-minute intervals.

For the next 90 minutes insufflation was continued. The state of the baby remained unaltered and shallow gasps continued to occur at the rate of two a minute. Resuscitating measures had now been in progress for 110 minutes. After two hours signs of improvement appeared. There was a deepening in the respiratory gasps and the infant gave a feeble cry. During the next 20 minutes there was a rapid recovery of muscle tone, with deepening and quickening of respirations, culminating in normal spontaneous respiration after 140 minutes. The endotracheal tube was then removed. One hour later the infant was breathing normally and crying lustily.

The birth weight was 6 lb. 6 oz. (2,890 g.). The infant was vigorous and normal in every way. The grasp and Moro reflexes were present and the muscle tone was good. Its cry was quite normal. It was breast-fed without difficulty and weighed 6 lb. 7 oz. (2,920 g.) when discharged after 14 days.

Stimulant drugs given during the period of asphyxia were as follows: lobeline into the umbilical vein, 3 mg., at 10 and at 60 minutes; nikethamide, 0.5 ml. intramuscularly, at 15 and at 40 minutes.

COMMENT

Recovery, as judged by spontaneous respiration, is recorded by Lord *et al.* (1953) as having occurred two hours after delivery in a child treated by endotracheal insufflation of oxygen. This is the longest interval that we have been able to find recorded between delivery of an asphyxiated child and the initiation of respiration. The asphyxia in this case was severe, and was due to the inhalation of large quantities of blood and liquor. Gibberd and Blaikley (1935) state that recovery occurs a few minutes after beginning insufflation. Akerrén and Fürstenberg (1950), describing the treatment of asphyxia by intestinal oxygen, record no cases in which recovery did not occur within ten minutes.

The change in colour which followed immediately after starting endotracheal insufflation is evidence of the superiority, in our case, of this method over that of the relatively more simple one of gastric oxygen. The cause of the asphyxia in our case is not clear. Although a breech delivery, no undue difficulty was encountered. We can assume that the usual doses of sedation employed did not depress the respiratory centre to a dangerous degree, and that, in view of ultimate recovery, cerebral haemorrhage was unlikely.

It will be necessary to observe this child over a period of years to be certain that no lasting damage has been sustained. We have taken the normal appearance of the child and its capacity for suckling as evidence of an intact nervous system. In view of the importance attached at present to birth asphyxia as a cause of neurological and psychiatric disturbance later in childhood, the follow-up in this case should prove of some interest.

Finally, in view of the successful outcome it is worth stressing that the resuscitating team must be prepared to persevere as long as the heart beat is maintained.

We wish to thank Mr. Rufus C. Thomas and Mr. K. G. Seager for permission to publish this case and for their help and encouragement in preparing the case report.

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Reviews

ARTHRITIS AND RHEUMATISM

Arthritis and Rheumatism: The Diseases and Their Treatment. By Charles LeRoy Steinberg, M.D., with five contributors. (Pp. 326+ix; illustrated. 70s.) New York: Springer Publishing Company Inc. London: Lange, Maxwell and Springer Ltd. 1954.

During recent years there have been considerable advances in our understanding of the rheumatic diseases, and many arthritic conditions have been more accurately described and more precisely defined. This has led to considerable improvements in the diagnosis and management of patients suffering from polyarthritis and rheumatic disorders. At the same time there have been great advances in our understanding of the nature and behaviour of the connective tissues. It would be most valuable to the general practitioner and the medical student if this new information could be clearly and concisely summarized in book form.

At first sight Dr. Steinberg's book would appear to fulfil this need. It is about the right size, is well illustrated and produced in an attractive, readable form, and contains a useful bibliography after most chapters. But the text is disappointing. For example, the chapter on rheumatoid arthritis does not give a clearer picture of this important disease than can be obtained from any textbook of general medicine. Some statements are definitely misleading. Thus, in describing the treatment of spondylitis the authors state that "rest is important for these patients," whereas most British rheumatologists would agree that exercise was all-important and rest deleterious for patients with this condition. The section on Reiter's disease gives a very full account of Reiter's original paper, which was both a misleading and unimportant contribution to this subject, whereas it fails to mention the important accounts of the epidemics of this condition which have occurred in Eastern Europe and does not even consider the possibility of venereal transmission of the disease. Under the heading "Hypertrophic Pulmonary Osteoarthropathy" the authors state: "These changes are limited to the soft-tissue structures and are associated with curved or parrot-beaked nails," no mention at all being made of the important bone and joint changes. And a little later they reproduce a radiograph of a hand in which the only abnormality that can be seen is minimal osteoarthritis of the terminal interphalangeal joints, though the figure carries the caption of "Acromegaly showing tufting of the phalanges. This may easily be confused with osteoarthritis of the hands." In the bibliography, however, the authors quote papers in which the joint changes in hypertrophic pulmonary osteoarthropathy and acromegaly joint disease are described in great detail.

These may be minor points, but they do not suggest that this book provides either a useful or an accurate account of recent work.

J. H. KELLGREN.

PAEDIATRIC DIAGNOSIS

Pediatric Diagnosis. By Morris Green, M.D., and Julius B. Richmond, M.D. (Pp. 436+xvii; 50s.) Philadelphia and London: W. B. Saunders Company. 1954.

The authors of this book feel that the significant decrease in morbidity in childhood, coupled with a growing parental regard for the maintenance of their children's health, has changed and broadened the scope of the work of paediatricians to-day.

The book is divided into four sections, with an appendix of percentiles. The first section deals with history-taking, and this is full of good practical advice. The second deals with the physical examination, arranged anatomically, from above downwards, and this part, too, is well set out. The third section is concerned with common signs and symptoms and their significance, and this is perhaps the least valuable part of the book, for it consists to a large extent in lists

of causes—as, for example, of constipation, diarrhoea, pleurisy, and cyanosis—and short paragraphs in the nature of synopses on various subjects. However, many references are given, both interspersed in the text and at the end of sections. These are well chosen, up-to-date, and generally accessible.

The fourth section is on health supervision, considered under the headings prenatal, infancy, pre-school, school years, and adolescence—in each group the physical and psychological development being considered separately. The authors stress that the evaluation of a healthy child requires the same considered diagnostic approach as that applied to the evaluation of symptoms related to disease. Certain self-evident statements in diagnosis might have been omitted—for example, that testicular function may be impaired after surgical castration, and that pruritus may be marked in patients with infantile eczema and scabies; and certain other statements are doubtful—for example, that kernicterus may be a complication of severe diarrhoea, that anal fissure is the commonest cause of melaena in young infants, and that bow-legs are a cause of leg pains.

The book follows the modern trend of stressing the importance of the psyche in child health; indeed, there seems to be an undue stress on this aspect—as, for example, the parents' psychological instability in their anxiety about premature and malformed infants and their worry about the irregularities of respiration in early life, the authors saying that referral for psychiatric help may be considered in such cases.

The book is well produced; the printing is good and the text singularly free from typographical errors. Much of it may be read with interest and profit by child psychiatrists: paediatricians too may be interested in this method of presentation of paediatric diagnostic methods.

WILFRID GAISFORD.

PHYSICAL TREATMENT IN PSYCHIATRY

An Introduction to Physical Methods of Treatment in Psychiatry. By William Sargent, Eliot Slater, and Denis Hill. Third edition. (Pp. 352. 20s.) Edinburgh and London: E. and S. Livingstone Ltd. 1954.

This book has already earned general acceptance in this country as a practical and readable guide to physical methods of treatment, and in the third edition the authors have succeeded in bringing each section up to date while preserving the character of the book as a whole. The radical changes made in the selective bibliography bear witness to the volume of recent literature from which they have had to pick out reliable improvements in method. The book has now reached an ideal length for the psychiatrist in training or in hospital practice, and its arrangement is such that it can be used for reference by the undergraduate medical student and the harassed nurse who is trying to keep up with an ambitious syllabus.

The present edition follows the previous plan by which, after a short but penetrating account of the general principles of treatment, the rationale of each method is discussed before a detailed account is given of its practical application. The authors are able from their own personal experience to illustrate and comment on the methods described, and are, in fact, rather loath to present methods with which they have not full practical acquaintance. Their coverage of the subject does not include hydrotherapy, physiotherapy, methods of physical rehabilitation, or occupational therapy.

The attitude to physical treatment is throughout that of the well-informed optimism with which any method of treatment must be approached once it has been decided to carry it out. In discussing the choice of treatment, time, even in small doses, is not perhaps given the credit it deserves as a healer.

There is a new chapter on the treatment of alcoholic addiction, and the section on the effects of leucotomy operations has been entirely revised in the light of the longer follow-up studies and the results of accurately localized

operations that have become available since the last edition. A reasonable and restrained attitude to the numerous new drugs has been maintained, and, while all are mentioned, the tendency is to recommend the tried remedy until there is adequate experience of the new preparation under controlled conditions.

This is likely to be the accepted text in this country for some time to come.

ALEXANDER KENNEDY.

CORONARY DISEASE IN YOUNG ADULTS

Coronary Heart Disease in Young Adults: A Multidisciplinary Study. By Menard M. Gertler, M.D., and Paul D. White, M.D., with the aid and advice of seven editorial assistants. (Pp. 218; illustrated. 40s.) Cambridge, Mass.: Harvard University Press. London: Oxford University Press. 1954.

By its increasing frequency and as a leading cause of death, obliterative coronary disease has become in the last ten or twenty years the outstanding malady of our time. The problem not only concerns the individual and his treatment, it also has widespread economic repercussions on the family, on industrial efficiency, and ultimately on the welfare of the State itself. Yet what is known of the aetiology of coronary atherosclerosis, and what can be done to prevent its development, check its progress, or arrest its ravages, now so prevalent in middle life at the peak of a man's powers?

This monograph, which emanates from the Harvard Medical School, presents a summary of an intensive search for significant aetiological clues. The work has been conducted by a team whose contributions are summarized by Gertler and White. The topics considered range widely from the clinical to the genetic, morphological, hormonal, psychological, and biochemical aspects—truly an ambitious undertaking. With the intention of investigating the uncomplicated disease the authors have wisely restricted their inquiries to 100 patients surviving a myocardial infarct sustained before 40 years of age. For each aspect of the investigation a "matched-pair" control composed of healthy individuals was made available for comparison. Had a third group consisting of some other form of vascular disease with a predilection for the male been available—say thromboangiitis obliterans—it would have enhanced the value of the authors' findings.

Among many aetiological clues it is certainly an outstanding fact that below the age of 40 acute myocardial infarction—the hall-mark of coronary disease—is 20 to 30 times more frequent in males than in females. With successive decades the ratio declines until in the age group 60 to 69 years there are two males for every female. After age 70 the sexes are equally affected. The relative immunity of premenopausal women, which has its counterpart in the experimental work of Katz on the protective influence of oestrogens on the cholesterol-fed cockerel, opens a line of inquiry which calls for further study.

One virtue of this book, which deals with so many aetiological considerations, is that it points the way for further clinical and biochemical investigations. It makes a distinct contribution to a perplexing subject, provides a rich store of information, confirms and extends our knowledge of the problem, and will long prove a source of reference for workers in this field. Unfortunately, the English at times is disjointed and jarring, lacking that free flowing style which holds the reader's attention and facilitates ready assimilation of the facts.

A. RAE GILCHRIST.

MEASUREMENT OF UTERINE ACTION

Clinical Measurement of Uterine Forces in Pregnancy and Labor. By S. R. M. Reynolds, Ph.D., D.Sc., Jerome S. Harris, M.D., and Irwin H. Kaiser, M.D., Ph.D. (Pp. 328+xiv; illustrated. 69s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1954.

The important work of Reynolds, the physiologist, is well known to those clinicians who take an active interest in uterine physiology. In recent years he has collaborated

with several practising obstetricians in developing an apparatus for recording uterine action in late pregnancy and labour. This instrument, the multichannel strain-gauge tokodynamometer, is a mechano-electrical device based on the familiar principle of a "button and ring," measuring and recording movements of the abdominal wall caused by the anterior displacement of the uterus which occurs during contractions. Unlike some of its forerunners, Reynolds's tokodynamometer is simple to use. It thus has found wide application in extensive clinical surveys and has been the basis of a long series of publications on uterine action.

This new book now brings together in one convenient volume the results of the authors' earlier work, hitherto only accessible in the many original papers. Early chapters include a comprehensive review of the history of the subject, including the recent developments with internal methods by Alvarez and Caldeyro of South America and by Karlson of Sweden. As to the authors' own work, the theory of the normal "gradient of activity" from fundus to lower segment is described in detail together with methods of mathematical analysis of the tokodynamometric records. The action of commonly used drugs is discussed, and studies of the emotional control of uterine activity indicate the necessity for having adequate controls in any clinical trial of new drugs when the measure of effect is a subjective one.

This book will be welcomed by obstetricians and physiologists alike as providing a useful summary of the studies of human uterine action to date—studies which, in the future, may yet provide the key to the unsolved problems of aetiology and ideal treatment of inefficient uterine action in labour.

W. J. GARRETT.

ARTIFICIAL RESPIRATION

Artificial Respiration: With Special Emphasis on the Holger-Nielsen Method. By T. O. Garland, M.A., M.D., D.P.H. (Pp. 60; illustrated. 6s. 6d.) London: Faber and Faber, Ltd. 1955.

This is a book which should be read by every doctor, whether or not he is engaged in teaching first-aid methods. The production is excellent and the text is illustrated with eminently practical photographs and diagrams. Using simple language, the author combines clarity of expression and explanation of technical data, which makes the subject easily understood by doctors and laymen alike. After a concise account of the mechanics of breathing there is a brief review of artificial respiration from earliest times up to the Pask experiment in 1943. This is rightly described as being of great historical importance, leading as it did to the American experiments in 1950 and 1951, in which the effectiveness of the various procedures was evaluated. This integrated research at certain American medical schools proved conclusively that the tidal air flow and blood-oxygen saturation in the Holger-Nielsen method were immensely greater than in the Schäfer, and furthermore that this arm lift-back pressure procedure was easy to learn and only slightly more fatiguing. Stress is rightly laid on the vital importance of a prompt start of artificial respiration and on methods which can be applied in difficult circumstances—for example, in a small boat, or at the top of a pole when a man is hanging in his safety-belt after electrocution. The latter certainly requires very special training and practice. Eve's rocking method is fully described and illustrated, mention being made of one possible serious drawback to this procedure—the regurgitation of stomach contents into the mouth, whence they may be inhaled into the lung. The author advises that artificial respiration should be maintained for two hours while the patient is kept warm and oxygen administered, though he adds a note of caution on the possibility of over-ventilation.

This admirable book makes it clear that as soon as the Holger-Nielsen method has become widely known the Schäfer method should be dropped altogether.

E. J. GORDON WALLACE.

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U.S.A. TRIALS OF POLIOMYELITIS VACCINE

A report of the field trial of poliomyelitis vaccine whose outcome was announced and discussed in these columns last week has now become available and a summary appears at page 1083 of this issue of the *Journal*. In any piece of research the validity of the results depends on the method of investigation, which in this study was of necessity complex. A vaccine evaluation centre established under the directorship of Dr. Thomas Francis, jun., at the University of Michigan, and sponsored by the National Foundation for Infantile Paralysis, co-ordinated the work of about 150,000 people. Study areas were chosen in counties where high incidence of poliomyelitis had been experienced in recent years and where local conditions were suitable.

Two distinct plans were adopted, called the "observed control study" and the "placebo control study." In the first, children in the second grade of school, mainly 7 years old, were to be vaccinated and their subsequent experience of poliomyelitis compared with that of children in the first and third grades of the same schools. This plan was adopted in 127 areas of 33 States. The parents of just under 70% of children in the second grade agreed to let their children take part, and subsequently 221,998 children, 62.4% of the total in the grade, received the complete course of three injections. These were completed between late April and mid-June, 1954. In the report the results are given of the incidence of poliomyelitis in this vaccinated group between two weeks after vaccination and December 31, 1954, compared with the incidence in the 725,173 unvaccinated children in the first and third grades. Unfortunately this procedure is open to criticism. It may not be a fair assumption, for instance, that the experience of second-grade children would be the average of that for first and third grades in the absence of vaccination. A more serious bias lies in the selection of the children in the second grade whose parents agreed to have them vaccinated. Confirmation of this comes from an ancillary study conducted by the survey research centre of the University of Michigan in areas in which the alternative, placebo control study, was adopted.

¹ *Amer. J. Hyg.*, 1954, 60, 371.

Here, in a sample of 1,300 families, they found that the second-grade children whose parents agreed to their taking part had been more frequently vaccinated against smallpox, diphtheria, and whooping-cough, that their mothers were as a group better educated, and that the families were better housed and came from higher income groups than the second-grade children whose parents did not agree to their taking part in the trial. Therefore, if the vaccinated children were not representative of all second-grade children, it is not a fair comparison to use all first- and third-grade children as controls. A better control group would have been those first- and third-grade children who would have participated if vaccination had been offered to them, but these could not be determined from the records. Alternatively, the experience of all second-grade children, vaccinated and unvaccinated, should be taken against that of all in the first and third grades, and the watering down of any protective effect accepted. This is to be done in a subsequent report, and until this alternative analysis is available it would be unwise to draw conclusions from the observed control study.

In the placebo control study half the participating children in first, second, and third grades of public schools were to be given the three injections of vaccine, while the other half were to be given three injections of a material similar in appearance but containing no vaccine. The identity of the vaccine and of the placebo was concealed by the use of code numbers. This plan was adopted in 84 areas of 11 States. Just over 60% of this group agreed to take part in the trial, and subsequently 57.7% of the total in the three grades received the complete course of three injections; the numbers of children completing the course of vaccine and placebo were 200,745 and 201,229 respectively. In these groups, virtually identical in size, there were 57 cases of all types of poliomyelitis among the vaccinated and 142 among the controls. Of these, paralytic cases were 33 and 115 respectively, giving rates of 16 and 57 per 100,000. The vaccinated group therefore experienced only 28% of the poliomyelitis of this type seen in controls, a difference which was highly significant. Spinal paralytic cases numbered 28 in the vaccinated and 70 in the controls, bulbar cases 3 and 5, and bulbo-spinal 2 and 36; the 4 fatal cases (undefined) were all in controls. The greatest difference lies therefore in the bulbo-spinal type, but this is difficult to interpret in view of the small difference in pure bulbar cases. Within the spinal group the records revealed little difference in the severity of paralysis between vaccinated and control children who developed this type of disease. Non-paralytic cases numbered 24 in

the vaccinated and 27 in the controls, so that here no difference was observed.

The report puts emphasis on the laboratory-confirmed cases and on virus-positive cases, the incidence of these categories in the vaccinated group being a fifth or less of that in the controls. The criterion for a serologically positive result was a fourfold rise in titre to one type of virus only—or to the homologous type if virus was isolated in the stools—observed between the first and second specimens. The report includes evidence that the frequency of a fourfold rise in titre is dependent on the level of antibody in the serum before vaccination. As the prime effect of vaccination is to raise the level of antibody above that in the controls, it would seem that the criterion of serological positive would operate unequally between the two groups. The comparison by means of serologically positive cases only may not be so good, therefore, as reliance on paralytic cases, which were in any case fully investigated and reported. A similar argument applies to virus isolation as a standard for comparing vaccinated and controls. H. A. Howe¹ has shown that alimentary infection in chimpanzees given Type I virus orally is of shorter duration in vaccinated animals than in similar controls. If this result is applicable to man, it might account for the relative difficulty of virus isolation in a vaccinated group, and once again insistence on such a criterion would give a biased comparison. In practical terms a vaccine is wanted which will prevent paralytic poliomyelitis, and this effect is ably demonstrated in this study without reference to laboratory confirmation of diagnosis.

Several batches of vaccine had to be used in the study, and in some areas several lots were used in combination. Their antigenic potency was found to vary widely. Lots, or combinations of lots, were graded, "good," "moderate," "low moderate," and "poor" in antigenic potency. The difference in incidence of paralytic poliomyelitis between vaccines graded "poor" and their corresponding controls was as great as that between vaccines graded "good" and their controls. This may be partly because the grading depended largely on the response to Type I virus, and one lot producing little antibody to Type I was antigenic for Type III, the strain which, by chance, predominated in the epidemic seen in the area in which it was distributed. Even so, the lack of correlation between serological and field trial results is interesting. Special attention was paid to reactions to vaccination. No difference was observed in the frequency, nature, and severity of reactions between vaccine and placebo groups, and in particular kidney disease was equally rare in both. No localization of

paralysis to the limb of inoculation was seen in children who developed poliomyelitis within one month of vaccination.

The report seems to establish clearly from the placebo control study that the vaccine prepared by Dr. Jonas E. Salk is safe and protects against paralytic poliomyelitis. Such a report, produced with admirable promptness, is bound to raise problems and leave questions unanswered. The antibody titres have been observed for a relatively short time in vaccinated children, and it is too early to say whether the fall in the levels seen in samples taken in November, 1954 (about six months after vaccination), is significant and indicates that the duration of protection without reinforcement will be short. The relation between antigenic potency and field response requires detailed study, particularly in other epidemiological environments. The extent of the protection is far from absolute, but again it is too soon to say whether it might not be adequate if most of the community at risk were vaccinated. The authors of the report and their many collaborators are to be congratulated on this enormous and important undertaking, and in Britain this preliminary publication will be received as a challenge and as a stimulus to important work still to be done.

CRITICS OF THE N.H.S.

The worst that could happen to medicine in this country would be an apathetic acquiescence in the working of the National Health Service. We are all caught up in its mechanism, a mechanism of forms and administration, committees and reports of committees, ministries and Civil Servants and their endless stream of regulations—and with it all there is the temptation to believe it is all for the best, that the right formula for a health service has been found. The two opening articles in this week's *Journal*—one by a middle-aged consultant and the other by a young general practitioner—should shatter this illusion, if indeed anyone holds it. Neither author complains of poor remuneration. Neither complains of overwork. "There is no doubt," writes Dr. Grant, "that the established young general practitioner in partnership practice to-day has a much easier time of it than his predecessors. . . . Finally, he has a secure pensionable job." Comparing the present with the past position of registrars Dr. Kennedy asks: "I wonder if this security is altogether a good thing. . . . The present-day system breeds a mentality whose horizon is bounded by the hospital walls." And within the hospitals walls he observes the evil effects of the fear of litigation with its stifling of the initiative and enterprise that have prompted so much of the advance

of medical, and especially surgical, treatment. Dr. Kennedy and Dr. Grant both see apathy creeping in, with the inevitable deterioration of standards. If they are right in the observations they make and the conclusions they draw then neither public nor profession can remain indifferent.

"What a system!" says Dr. Grant: a system "designed to undermine incentive and initiative," a system in which a list of "heads" has to be built up to provide a living wage, a system in which "the G.P. can very easily degenerate into a rather apathetic kind of sorting clerk." And Dr. Grant finds himself cut off from the hospital in which he spent six of the best years of his life. He finds "a widening gap between hospital staff and general practitioners." He finds in the city in which he practises that his obstetric patients must attend an antenatal or local authority clinic if they want to be assured of a hospital bed. He finds a "very real danger that the young practitioner, excluded from the hospital and committed to his desk *by the system* [our italics], may become apathetic. . . ." The reader of Dr. Grant's article will probably conclude that it is not written by someone who feels himself miscast as a general practitioner: it is clearly in the work of a general practice that he sees the opportunity of fulfilling his sense of vocation—if it were not for "the system."

Dr. Kennedy qualified twenty-five years before Dr. Grant, and with the disillusionment of middle-age approaches his selected topics in a more prosaic fashion, stirred out of this by his indignation, shared by so many, over the merit awards: "Cloaked in such diabolical secrecy as these awards are, it is often difficult to get at the truth, and not unnaturally the wildest rumours run riot, but enough is known to say that wrongful decisions have been made." Dr. Kennedy looks back with nostalgia to the days when he and his generation had the thrill of the struggle to make headway by their own ability and initiative, a struggle not for security but for advancement. Both he and Dr. Grant see in the private practice of medicine a liberation from the trammels of "the system," and it is of interest to note that the young general practitioner sees in this a stimulus to practising better medicine, not to earning a better living. But whatever changes may yet take place it would seem safe to say that some nine-tenths of the population will always take advantage of the publicly provided service. It is perhaps for this reason that Dr. Grant appears to advocate one characteristic of private practice—fee for item of service in place of the capitation fee.

"I began to see," writes Dr. Grant, "that my job was mainly people—people as personalities, as

human beings, who had families and worries. . . ." "Let us never forget that our first aim should be to heal and cure the sick," writes Dr. Kennedy. This job and this aim are the focus of the practising doctor's work. Does the National Health Service provide "a system" which, with minor imperfections inseparable from any activity, enable the job to be done and the aim to be fulfilled in the best way possible? Dr. Kennedy and Dr. Grant have doubts which probably others share.

TUBERCULOSIS AFTER B.C.G. VACCINATION

Progressive tuberculosis can certainly occur in previously tuberculin-negative persons who have been recently vaccinated with B.C.G. with apparent success, as judged by tuberculin conversion and sizable vaccination lesions. Sporadic local complications due to the B.C.G. infection, even including regional glandular abscesses (occasionally erroneously diagnosed as due to Koch's bacillus by an observer unaware of the facts), should be excluded from consideration of how such a progressive infection develops; so should disease that follows a natural infection occurring just before vaccination or a few weeks afterwards during the "pre-allergic" phase, and also disease due to reinfection occurring some years later when protection may be expected to have waned. The following remarks are thus mainly concerned with exogenously caused tuberculosis due to inadequacy of protection, and with progressive lesions apparently due to the B.C.G. itself.

No one now believes that B.C.G. vaccine gives complete protection, and a study of tuberculosis from human or bovine sources in the vaccinated has little statistical meaning unless the number observed is related to the number vaccinated, and unless this proportion is further seen in relation to similar observations on comparable unvaccinated persons. However, even the bare description of tuberculous manifestations in those known to have been recently and successfully vaccinated can provide information on

two points—the frequency of different types of case and the time of their onset. When tuberculin sensitivity due to B.C.G. has developed (usually about two months after vaccination), clinical primary tuberculosis is much reduced in frequency, though a primary focus can still result from superinfection.¹ If Dahlström and Dif's² figures for 36,000 B.C.G.-vaccinated Swedish soldiers are broken down so as to show tuberculosis with onset between 6 and 12 months after vaccination—when protection might be expected to be maximal—the number of all cases was 39 (but there were 105 at a corresponding time among the 25,000 unvaccinated in their series). Of these 39 cases, 10 were classified as of primary tuberculosis (as against 42 of the 105) and 29 as of post-primary tuberculosis. The primary forms were composed of primary complexes, hilar tuberculosis, and erythema nodosum; while the post-primary cases—following the conceptions in Wallgren's³ "time-table" of tuberculosis—consisted of pleurisy (21), pulmonary tuberculosis (6), and other types (2). There were no cases of meningeal or miliary tuberculosis during this period among the vaccinated (but 11 in the unvaccinated). The prognosis of some forms of tuberculosis—for example, of primary disease and pleurisy, but not of post-primary pulmonary tuberculosis—was better when they occurred in vaccinated than in unvaccinated individuals in this series.⁴ Differentiation between primary and post-primary pulmonary tuberculosis, however, is often difficult and may be of doubtful value.

Simon⁵ obtained somewhat different results, for in a German children's clinic he saw 13 children who developed tuberculosis between 3 and 24 months after apparently satisfactory vaccination accompanied by proved tuberculin conversion. These 13 included 2 cases of hilar adenitis, 1 of pleurisy, 6 of pulmonary tuberculosis (4 with cavitation), 1 of miliary tuberculosis, and 2 of meningeal tuberculosis. Simon concluded that almost all forms of tuberculosis can appear after B.C.G. vaccination, even when immunity can definitely be postulated. The proportion of his cases with pulmonary tuberculosis is higher than in some series; and the occurrence of miliary and meningeal disease is of unusual interest, since, as Ustvedt¹ remarks, although indirect evidence suggests that the frequency of these forms in particular is reduced by B.C.G. vaccination, this has not yet been shown statistically in a convincing way. The clinical onset of meningitis in Simon's two cases was 16 and 24 months after vaccination, and it is therefore unlikely that the children were infected before the effect of vaccination had developed. The author attributes

the failures of protection by vaccination to various factors, including constitutional defects, coexisting other infections or metabolic disorders, and, particularly, to massive reinfection. The progress of the tuberculous disease was similar to that expected in unvaccinated children.

As anticipated by Jensen⁶—who pointed out that B.C.G. has the same order of virulence as some strains isolated from natural lupus vulgaris—B.C.G. has been reported, though very rarely, to produce lupus in and around the vaccination site. Marcussen⁷ has reviewed the three previous cases in the literature and added three more of his own; he believes these infections to have been caused by the B.C.G. and not by superinfection from man or milk. A seventh case has since been described by Ødegaard,⁸ who suggests that revaccination at the original site of vaccination may be a predisposing factor. Response to treatment is similar to that of natural lupus. Progressive systemic lesions caused by B.C.G. through haematogenous or lymphatic spread have also been reported, again rarely; these include abscess of the knee-joint,⁹ multiple bone lesions with lupus vulgaris,¹⁰ and three fatal cases of generalized B.C.G. tuberculosis.^{11 12 13 14} That most of these more recent cases come from Scandinavia must be ascribed to the large numbers vaccinated there and the thoroughness of observation and documentation. The reason for their occurrence has been speculatively attributed to poor individual resistance—for instance, from transient causes such as measles¹⁰ or from constitutional deficiency.^{11 12} As James¹⁵ points out, the old fear that the attenuated B.C.G. might regain the virulence of its ancestral bovine strain is not supported, for no ill effect was seen in other children receiving the same batch as did Meyer's^{11 12} patient, and the tubercle bacilli recovered from the latter showed the same low virulence as B.C.G. when tested in guinea-pigs. The production of progressive lesions by B.C.G. has its experimental counterpart. Thus in silicotic guinea-pigs infected with B.C.G. the organisms were rendered pathogenic and the animals died with silico-tuberculosis, but it is significant that here too the virulence of the B.C.G. when recovered was unaltered.¹⁶ More recently Dubos¹⁷ has shown that experimental B.C.G. infection could become generalized and fatal in mice whose resistance was reduced by dietetic means. The fact that B.C.G.-produced tuberculosis can occur in man is clearly of great interest, but the danger is too remote to be alarming. Nevertheless, while apparently rare, these cases are likely to be noted more frequently now that attention has been drawn to their existence.

¹ Ustvedt, H. J., *Bull. Wild Hlth Org.*, 1950, 2, 469.
² *Acta tuberc. scand.*, 1951, Suppl. No. 27. See *British Medical Journal*, 1952, 1, 147.
³ *Tubercle (Lond.)*, 1948, 29, 245.
⁴ Dahlström, G., *Acta tuberc. scand.*, 1953, Suppl. No. 32.
⁵ *Ärzt. Wschr.*, 1954, 38, 893.
⁶ *Acta tuberc. scand.*, 1936, 10, 83; 1937, 11, 257; 1946, 20, 1.
⁷ *Brit. J. Derm.*, 1954, 68, 121.
⁸ *J. Amer. med. Ass.*, 1954, 155, 61.
⁹ Øster, R., *Ugeskr. Læg.*, 1953, 115, 342.
¹⁰ Imerlund, O., and Jonsen, T., *Acta tuberc. scand.*, 1954, 30, 116.
¹¹ Meyer, J., *Ugeskr. Læg.*, 1953, 115, 1024.
¹² Meyer, J., and Jensen, K. A., *Amer. Rev. Tuberc.*, 1954, 70, 402.
¹³ Thrapp-Meyer, H., et al., *Acta tuberc. scand.*, 1954, 29, 173, 180, 188.
¹⁴ Hollström, V. E., and Hård, S., *Acta derm-venereol. (Stockh.)*, 1953, 33, 159.
¹⁵ *Amer. Rev. Tuberc.*, 1955, 71, 321.
¹⁶ Vorwald, A. J., et al., *ibid.*, 1950, 62, 455.
¹⁷ *J. exp. Med.*, 1955, 101, 59.

WORLD FIGHT AGAINST DISEASE

In the world political situation, oppressed and threatening, full of antagonisms and mistrust, the Annual Report of the Director-General to the World Health Assembly and to the United Nations¹ comes as a cool refreshment. It is as though the word "international" had been taken out of its murky context and given a thorough cleaning. The report (which unfortunately has no index) contains a list of over three hundred major health projects being carried out in 1954—20 of them in Africa (the continent in which the work of W.H.O. seems to have been least developed), 58 in the Americas, 66 in south-east Asia, 62 in Europe, 72 in the eastern Mediterranean, and 51 in the western Pacific. They include surveys, seminars, the founding of institutes and schools, field missions, control measures, and much else, many of the projects lasting over several years. It is not difficult to illustrate from them the imaginative help that W.H.O. gives—a quarantine station for pilgrims at Jeddah, a five-year project in Tokyo to investigate the causes of prematurity and devise methods of preventing it, the control of bejel and syphilis in Syria, the teaching of pharmacy in the Sudan, the extension of mental health services in Jerusalem and Bethlehem, a midwifery school at Teheran, fellowships for training in cardiology in Yugoslavia, postgraduate education in public health in Athens, the establishment of a physiotherapy centre in Bombay, a school for male nurses in Afghanistan—all these together with innumerable operations to control disease, such as anti-malaria schemes, which were current in 20 countries in 1954, and assistance towards combating tuberculosis in 28.

Nevertheless, the aim of W.H.O. is not short-term campaigns, although many of its projects are in that category, but to strengthen the permanent structure of public health services in its eighty-three member-states. One encouraging feature, noted by Dr. Candau, the Director-General, is the growing acceptance of the idea of joint action between neighbouring countries. Regional efforts covering several countries are not only more effective as such but promote good relations. An instance of such co-operation is the establishment of an Inter-American centre of biostatistics at Santiago to serve the whole of Latin America, and another is a regional college of nursing in association with the University of Alexandria to raise the level of nursing in the Eastern Mediterranean area. The most outstanding co-ordination of national efforts last year was the campaign of the American countries represented at the Fourteenth Pan-American Sanitary Congress (which served also as the sixth session of the W.H.O. Regional Committee for the Americas) for a five-year plan to eradicate malaria for good and all from the Western Hemisphere.

Not only is W.H.O., with its panels of experts in thirty-three subjects, a complete organization in itself—a full-bodied one beside which the admirable Health Organization of the League of Nations appears in retrospect a mere wraith—but it works in collaboration with

many other bodies. These include the Economic and Social Council and other branches of the United Nations, and non-governmental agencies, twenty-five in all. Among them is the World Medical Association, which is co-operating with W.H.O. in questions concerning the preparation of the *Pharmacopoea Internationalis*. Another is the Council for International Organizations of Medical Sciences; this has been making a critical assessment of the usefulness and potentialities of large international congresses and other types of scientific meetings.

W.H.O. looks back on six years' experience during which public health has covered the world map in a way it has never done before. This raises some wider problems of ecology. Much has been said about the possibility of contamination of air, soil, and water owing to the increased use of atomic energy. But that, if it is occurring, is only one of the obscure changes which may be working themselves out. To what extent may the balance of nature be subject to interference by the wholesale destruction of insects? Dozens of the projects which W.H.O. is sponsoring in various parts of the world have to do with insect control. Again, what will be the long-term results of the extensive use of antibiotics? How will the trends of disease in whole populations be influenced by the intense efforts to raise the standards of environmental sanitation? These are new questions, and only an organization of the compass and equipment of W.H.O. can in due course answer them and meet the challenge which some of them may make.

GIANT CELLS IN MEASLES

The presence of giant cells in measles cases was first reported by C. Ciaccio¹ in 1910 and by G. Alagna² in 1911. Little interest was aroused until A. S. Warthin³ in 1931 and W. Finkeldey⁴ in the same year reported independently on a peculiar type of giant cell which they had found in the tissues of patients in the prodromal stage of the disease. Warthin, having noted these cells in tonsils removed at operation in one case, was able successfully to predict the onset of measles in three later cases in which he found the same type of cell. Since these reports the cells have often been described, and they are now generally known as Warthin-Finkeldey cells. They have been seen in tonsils, adenoids, lymph nodes, spleen, thymus, and appendix. They occur in the germinal centres of lymphoid tissue, and in the tonsil they have been found especially just beneath the surface of the crypts, where they can occur in very large numbers. Their appearance is so striking that Warthin suspected that his first case might be one of Hodgkin's disease or lymphoblastoma. The cells are round or irregularly lobed, and they have a variable number of nuclei, sometimes as many as 100. The nuclei never show a peripheral distribution and they

¹ Ciaccio, C., *Virchows Arch. path. Anat.*, 1910, 199, 378.

² Alagna, G., *Arch. Laryng. Rhin. (Berl.)*, 1911, 25, 527.

³ Warthin, A. S., *Arch. Path. (Chicago)*, 1931, 11, 864.

⁴ Finkeldey, W., *Virchows Arch. path. Anat.*, 1931, 281, 321.

Denton, J., *Amer. J. med. Sci.*, 1925, 169, 531.

⁶ Bunting, C. H., *Yale J. Biol. Med.*, 1950, 22, 513.

⁷ Tompkins, M. D., and Macaulay, J. C., *J. Amer. med. Ass.*, 1955, 157, 711.

COUGH SYNCOPE

In 1876 J. M. Charcot first drew attention to the transient loss of consciousness which sometimes follows severe bouts of coughing in patients afflicted with paroxysmal cough.¹ He thought they were induced by irritation of the laryngeal nerves during cough, and, from analogy with Ménière's syndrome, called the attacks "laryngeal vertigo." Subsequently the condition has been described under a variety of different titles, and it has been a popular diagnosis on the Continent for many years. It has not been so widely recognized in Britain, but, as C. Baker affirmed in describing nine cases, it is as common here.² The attacks usually afflict middle-aged men suffering from chronic bronchitis; thick-set people addicted to tobacco and alcohol are particularly prone. After a bout of severe unproductive coughing the patient momentarily loses consciousness; he may fall to the ground and perhaps twitch. Full consciousness quickly returns and the patient carries on as though nothing untoward had happened. In less severe attacks the patient experiences dizziness or temporary mental clouding but does not become unconscious. The mechanism of syncope after coughing was studied by E. P. Sharpey-Schafer.³ He found that unconsciousness occurred at the end of the coughing attacks just when the arterial blood pressure was at its lowest and the intrathoracic (and therefore the venous) pressure at its highest. Thus he concluded that syncope resulted from cerebral anoxia due to diminished blood flow through the brain. In some patients, however, syncope is preceded by only a single short cough, and it seems likely that these are cases of primary epilepsy having cough as an epileptic aura.⁴

The importance of recognizing this benign disorder is to exclude more serious causes of loss of consciousness. Once the characteristic clinical history is known, diagnosis is a simple matter, but the patients are not always aware of the association between coughing and syncope until closely questioned. Although cough syncope is almost confined to middle-aged men, it may sometimes present a difficult diagnostic problem in childhood, and J. M. Sutherland⁵ has recently described the disorder in a child of 9 years.

Treatment should aim at preventing the paroxysms of cough. Reduction of smoking and carrying out breathing exercises are sufficient in some cases; sometimes a clear explanation that coughing is the direct cause of the attacks will encourage patients to change their bad habits. Weight reduction and sedatives are also of some help. Nevertheless, many patients continue to have attacks in spite of treatment, and the loss of consciousness is not only distressing but may also be a source of danger both to the patients and to others.

We record with deep regret the death on April 26 of Dr. Egbert Coleby Morland, who joined the staff of the *Lancet* in 1915 and was its editor from 1937 to 1944. He was 80 years of age.

¹ Charcot, J. M., *Gaz. méd. Paris*, 1876, 5, 588.

² Baker, C., *Guy's Hosp. Rep.*, 1949, 98, 132.

³ Sharpey-Schafer, E. P., *British Medical Journal*, 1953, 2, 860.

⁴ Whitty, C. W. M., *ibid.*, 1949, 2, 311.

⁵ Sutherland, J. M., *Glasg. med. J.*, 1954, 35, 335.

are said to be commonly found as grape-like clusters in the centre of the cell. Often the cells are found in a degenerate stage, when they show strongly eosinophilic cytoplasm and pyknotic nuclei. The time of their appearance and disappearance is not known with certainty; they have been reported as early as four days after exposure to infection, and it seems certain that they will be present five days before the onset of the rash and that they persist for one or more days after the rash appears. Many views have been expressed about their origin—that they are formed by fusion of lymphocytes, that they originate by amitotic division of cells of the lymphocyte series, that they come from the reticulo-endothelial system, and that they are macrophages which have phagocytosed lymphocytes attacked by the measles virus. There is, however, general agreement about their specificity, and their appearance in lymphoid tissue has been used as a criterion of a successful experiment in the inoculation of monkeys with measles material.

Another type of giant cell has been described in measles, this time in respiratory epithelium, but the specificity of this cell is still under discussion. J. Denton⁵ in 1925, in a report of a series of necropsies on fatal cases of measles, drew attention to a giant cell which he found in the bronchial epithelium; it had 5 to 20 nuclei, and cytoplasm which might be well preserved or might be degenerate. Other observers have confirmed his findings. In appearance these cells are usually stated to resemble fused epithelial masses in the earlier stages, and sometimes the normal cilia are retained. The presence of inclusion bodies in the cells has been reported, but not by all observers. At a later stage they become eosinophilic and the nuclei shrunken and pyknotic. Sometimes in these cases epithelial cells become fused into large sheets rather than into small syncytial masses, and such sheets have often been found lying free in the bronchi. A similar fusion of epithelial cells has also been noted in the intestinal mucosa. The specificity of this type of cell has often been questioned, and its relationship to the giant cells which may occur in other virus infections is not clear. Possibly these cells are identical with the giant cells found in so-called giant cell pneumonia, which itself can be associated with measles. C. H. Bunting⁶ in 1950 found such cells lying free in the bronchi, and interest in them has been revived recently by M. D. Tompkins and J. C. Macaulay.⁷ They have confirmed the finding of these cells in the bronchi in a fatal case and have also demonstrated them in smears made by the Papanicolaou technique from sputum obtained from children in the prodromal stage. Having found sputum difficult to obtain from children, they examined nasal secretion by the same technique, and found that the cells were regularly present in ten cases ranging from five days prodromal to the day of the appearance of the rash. If their findings are confirmed they will constitute an interesting application of diagnostic cytological methods, and the possibility of diagnosis in the prodromal stage might be of some importance in children's institutions and hospitals. It is probable, however, that as with other cytological methods only the positive results will be significant.

¹ *The Work of WHO 1954. Annual Report of the Director-General. World Health Organization, Geneva*, 10s. (82).

EMERGENCIES IN GENERAL PRACTICE

"THE BLEEDER"

BY

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The first experience of bleeding which cannot be controlled by conventional treatment is alarming for both patient and doctor. This alarm, which is seldom justified by any immediate danger of exsanguination, is largely due to what seems an unnatural occurrence. We are so used to the fact that minor injuries stop bleeding spontaneously that automatic haemostasis is taken for granted. Yet, since the circulating blood is subject to the ordinary laws of hydrostatics, it is actually one of the many biological mysteries.

The mechanism responsible is only partly understood and is of great complexity. Its components are the coagulation of the blood, the contraction of injured vessels, and the adhesion of the platelets, these events being probably closely integrated and to some extent interdependent. The important fact is that any serious defect in their operation will result in prolonged bleeding from even trivial injuries, and only when attempts are made to arrest this is it realized how dependent we are upon the normal mechanism. Dressings, tight bandages, plugging, and sutures are all useless; the blood seeps through them as if it were water, or, worse, if its free escape is prevented it infiltrates the tissues. Bleeding can be arrested by the application of pressure to cut off the blood supply to the injured area, but this cannot be maintained for long without causing necrosis and an extension of the area of bleeding. The usual methods for arresting haemorrhage act only by assisting the physiological mechanism; they cannot replace it.

Temporary pressure is normally useful, as it allows time for vessels to contract and for a firm clot to form. Dressings accelerate normal clotting by providing a large surface and also reinforce the clot; sutures close a wound cavity, so that the clot has the greatest occlusive effect. But if the clot fails to form, or the vessels to contract, these measures are ineffective and may be positively dangerous. It is therefore important for the doctor to recognize when he is dealing with haemorrhage due to these failures, and it must be emphasized that, unless the bleeding can be readily controlled by the methods described in this article, the patient should be transferred to hospital without delay. The recent establishment of regional "haemophilia centres" for the diagnosis and treatment of the haemorrhagic states is likely to assist greatly in the efficient hospital treatment of these conditions.*

Diagnosis

Fortunately, bleeders, or those of them who bleed dangerously on slight provocation, are rare. Haemophilic subjects, who, because of the severity of their disability, form the most important group, occur in the proportion of only 1 or 2 per 100,000 of the population of this country. But there are other conditions which cause abnormal bleeding, and, since their appropriate treatment differs, the doctor should know what sort of case he has to deal with.

*See *British Medical Journal*, 1954, 2, 1287.

Briefly, the haemorrhagic states can be divided into those due to defective coagulation and those due to abnormalities involving the vessels or platelets; these two groups can each be subdivided into constitutional conditions, often hereditary, and acquired conditions, often secondary to some underlying disease.

It must be first decided whether excessive bleeding is merely due to a locally overtaxed but otherwise normal haemostatic system or to one of these haemorrhagic states. Persistent bleeding may occasionally occur in normal people; after tooth extraction, for example, it may go on for perhaps 24 hours; epistaxis due to local vascular erosion may be prolonged or frequently repeated; secondary haemorrhage from infected wounds is due to proteolytic digestion of blood clot and tissues; and in uterine bleeding the bounds of normal are notoriously hard to define. But these episodes can usually be distinguished from the bleeding of the haemorrhagic states by the patient's history, and from certain features of the bleeding itself. If the patient has experienced previous injuries or operations such as tonsillectomy without serious haemorrhage, he is unlikely to have a constitutional haemorrhagic state.

The genuine bleeder almost always has a long history, often going back to infancy, of prolonged bleeding not limited to one particular part of the body, but from any minor injury or operation site, and in the form of epistaxis, gastro-intestinal bleeding, easy bruising, purpura, or the formation of haematomas and swellings of the deep tissues and joints, and so on. A point of diagnostic value is the occurrence of similar troubles in other members of the family. Symptoms which might be equivocal by themselves become significant if they also occur in blood relations.

The bleeding itself may give information on the type of defect which has caused it. In cases of defective clotting the vessels are usually normal, and bleeding does not occur unless they have been damaged. In such cases, following an injury which might have been thought trivial by ordinary standards, there is often only slight bleeding at first which may even cease for some hours; it then begins again and becomes uncontrollable, sometimes continuing for days and even weeks. Haemorrhage into the tissues occurs usually after a blow or strain, producing massive haematomata involving any part of the body, particularly the muscles and joint cavities.

Bleeding due to vascular or platelet abnormalities, on the other hand, is often spontaneous and is mainly limited to the skin and mucous membranes. Petechiae and ecchymoses appear without obvious cause; bleeding from the nose and gums is common, being a diffuse oozing without any definite bleeding point; gastro-intestinal bleeding and menorrhagia may be dangerously profuse. It is characteristic of these purpuric conditions that even small needle punctures bleed persistently.

Further differentiation may be obtained by considering the characteristics of some of the different members of the two groups of haemorrhagic conditions, but only the commoner conditions are described here.

All types of clotting disorders tend to produce a similar symptomatology. In the constitutional group both haemophilia and Christmas disease (also called haemophilia A and haemophilia B respectively) are inherited as sex-linked

recessive conditions, affecting only males and being transmitted through apparently normal females. They cannot be distinguished by clinical findings alone.

In the group of acquired clotting defects there is a haemophilia-like state occurring in females which is due to an anticoagulant in the blood, developed during or after pregnancy, perhaps as an immune reaction. An acute fibrinogen deficiency may also occur with disastrous rapidity in some cases of premature detachment of the placenta, with uncontrollable uterine and sometimes generalized bleeding. It is due to the intravascular entry of placental fragments which cause the removal of fibrinogen from the circulating blood. Lastly, the widespread use of the coumarin drugs in the treatment of thrombosis produces a few cases of overdosage, with external and internal haemorrhage due to factor 7 and prothrombin deficiency.

Of the purpuric conditions the commonest is secondary thrombocytopenic purpura, which is often due to drug sensitivity, leukaemia, aplastic anaemia, or carcinomatosis. In a smaller group of cases the thrombocytopenia is apparently essential.

Principles of Local Treatment of External Bleeding

When the bleeding point is accessible local attempts can be made to produce a firm clot. However, even the most rapid clotting cannot extend against a flow of blood, since the fibrin will be washed away from the bleeding point. It is therefore essential to arrest the blood flow by pressure or by stimulating vascular contraction. If clotting is defective it will also be necessary to apply a coagulant, of which the best is thrombin. If used in sufficient concentration, solutions of thrombin will clot in a few seconds any blood that contains fibrinogen. Another useful coagulant is Russell's viper venom. It is more active than thrombin in low concentrations, except in cases of prothrombin deficiency, but like thrombin will not clot blood lacking fibrinogen.

The best way of applying these coagulants is by means of a dressing saturated with the solution. But as ordinary gauze or cotton-wool packs have eventually to be removed and this often restarts the bleeding, an absorbable dressing such as "oxycel" or "calgitex" should be used. These become pliable and adhesive when moistened, and can be accurately moulded to the bleeding point and left in position until digested.

Treatment of Specific Haemorrhages

Epistaxis

Since epistaxis often stops spontaneously drastic measures should not be undertaken unless the blood loss is serious. In cases of defective clotting the bleeding point is likely to be on the anterior part of the septum, where it may be seen and dealt with directly. A pad of oxycel or calgitex gauze, a few millimetres square, should be soaked with thrombin or viper venom, applied to the bleeding area, and held there by the gentle pressure of the flat handle of a scalpel or some similar instrument. After four to five minutes the instrument is removed, leaving the dressing adhering to the bleeding site. If this is effective the dressing should be left alone until it comes away naturally. If it fails, the process should be repeated, but great care should be taken not to damage the membranes of the nose and start new areas of bleeding. Thermal or chemical cauterization should never be used in these cases. If the bleeding point cannot be seen, a mixture of thrombin solution and 1/1,000 adrenaline in equal parts can be sprayed into the nose with an ordinary atomizer; the anterior nares are then plugged with gauze and the patient holds his head forward, so that a firm clot forms in the nasal cavity. He should refrain from swallowing during this proceeding, or the clot may be dislodged. No attempt should be made to plug the posterior nares. If bleeding is not stopped further local treatment should be abandoned, since it is likely to do more harm than good. The patient should lie so that the blood does not run back into his throat and cause vomiting, and often bleed-

ing will cease before a dangerous amount of blood has been lost. If it still continues, arrangements should be made for transfer to hospital.

Epistaxis in the purpuric conditions is usually a diffuse oozing which is difficult to control but seldom profuse enough to be dangerous. Plugging is often useless, and fresh bleeding points may be started at the slightest touch. A thrombin-adrenaline spray may be effective, and an ice pack applied to the nose may also be tried.

Bleeding Tooth Sockets

Dental extraction occasionally reveals for the first time that the patient is a bleeder. It need hardly be emphasized that good conservative dentistry is particularly important for such patients: unfortunately their teeth are often grossly and needlessly neglected.

In dealing with tooth sockets the object is not merely to stop the bleeding but to avoid delaying healing, since haemorrhage is likely to recur until this is complete. Tight plugging should not be used, therefore, as it causes eversion of the socket, nor clamping of the jaw with tight bandages, which may cause necrosis of the gum, nor caustics and styptics, as they destroy the tissues. In cases of defective clotting the gum margins should never be sewn together, since the blood, unable to escape, may infiltrate the tissues of the tongue and throat and cause fatal asphyxia.

A method which is applicable to almost all haemorrhagic states is as follows. A pledget of oxycel or calgitex, about the size of a marble, is soaked with thrombin or venom solution, and moulded into the shape of a mushroom. Any loose blood clots are washed away from the socket and the stalk of the "mushroom" is lightly pressed down into the cavity, the head fitting over the edges of the socket. A cotton-gauze swab or pack of the size required to fill the gap between the socket and the opposing teeth is then applied over the dressing and firmly pressed into position by the thumb and forefinger, which should also squeeze the edges of the socket together. This pressure must be maintained for at least five minutes and relaxed without dislodging the cotton pack. The patient can then close his jaws and if the pack is properly placed the bite should hold it in position without excessive pressure. In almost every case this procedure will stop the bleeding for several hours at least, though it is then apt to restart owing to digestion of the clot. It is a great advantage to have a small dental splint made which, better than the cotton pack, will hold the coagulant dressing firmly in place. Dressing with new applications of coagulant can be repeated once or twice in the 24 hours as required, but no attempts more drastic than these should be undertaken to control the bleeding. If it becomes dangerous the patient will require admission to hospital and transfusion.

Open Wounds

In cases of defective clotting, an open wound should be treated in much the same way as a tooth socket. It should be cleaned carefully and, if the edges fall together naturally, irrigated with thrombin or venom solution, and a pad of oxycel or calgitex, soaked with coagulant, laid over it. This is then covered with cotton gauze bandaged firmly in place, and manual pressure applied for five minutes. If bleeding recurs a repetition of the process should be carried out. If the edges of the wound tend to gape they can be partly drawn together by strapping, after lightly packing and covering with absorbable dressing and coagulant. The strapping should not be so tight as to prevent the escape of blood to the surface. When healing is complete the strapping can be removed without damaging the skin, by soaking it in a mixture of equal parts of liquid paraffin and petroleum ether. Wounds should not be stitched in cases of haemophilia or Christmas disease, though it may be necessary to ligate large bleeding vessels. Prolonged pressure, cauterization, or diathermy should never be employed, as subsequent sloughing inevitably causes bleeding from a larger area than before. If injections of tetanus antitoxin or antibiotics are

considered essential they should not be given intramuscularly since they may cause serious local haemorrhage. Intravenous injections can be made with less risk of bleeding, but the danger of anaphylaxis must always be remembered.

In the purpuric conditions bleeding from skin wounds can usually be controlled by temporary pressure and a firm dressing. There is not the same danger of haematoma formation in these states, so that suturing is not contraindicated.

Internal Bleeding: Deep-Tissue Haemorrhages

Extensive bleeding into the tissues is common in haemophilia and its related conditions, and may involve a whole limb or half the trunk. Serious pressure effects and dangerous loss of blood may therefore occur. Unfortunately little can be done to limit these haemorrhages. As soon as it becomes obvious that bleeding is taking place the part should be put at rest and elevated if possible; local application of ice packs has been recommended. Pressure dressings are not of much use unless the haematoma is small and is overlying bone; a haematoma of the scalp can be restricted, for instance, by a pad of "sorbo" rubber and a firm bandage. Haematomata should never be incised; the blood is almost always interstitial and cannot be evacuated by surgical means, and the incision itself becomes a new source of bleeding.

The most dangerous site for tissue bleeding is into the tongue and throat, because any swelling here interferes with the airway, sometimes with devastating rapidity. As soon as it is diagnosed arrangements should be made for the immediate transfer of the patient to hospital, where facilities are available to pass an endotracheal tube. The doctor must travel with him and be ready to pass an oral airway (as used by anaesthetists) to separate the tongue from the posterior pharyngeal wall, or failing this to pass a shortened rubber endotracheal tube through the nose, so that the tip passes beyond the obstruction and lodges at the level of the entrance to the larynx. If respiratory obstruction threatens it is a misplaced kindness to give morphine to relieve the patient's distress. His survival for the time being depends on vigorous respiratory efforts on his part, and the administration of any respiratory depressant can have fatal results.

Bleeding into the spinal cord, with signs of increasing compression, may occur, and demands immediate admission of the patient to hospital. Diagnostic difficulties are produced by retroperitoneal haemorrhages which may cause abdominal pain, tenderness, rigidity, vomiting, and fever. Such cases have been frequently misdiagnosed as appendicitis or a perforated ulcer, and the significance of abdominal symptoms in a patient known to be suffering from a haemorrhagic state has therefore to be considered with great care. Operation is justified only if it is certain the patient will die without it.

Haematemesis should be treated in the normal way. Haematuria, which may sometimes be prolonged for many days in patients with haemophilia and Christmas disease, can be treated only by rest and transfusions.

Haemarthroses are frequent in haemophilia and its related conditions, and the joint destruction which follows is the cause of much disability. In the acute phase the joint is extremely painful and morphine may have to be given, although non-habit-forming analgesics are preferable. The affected joint should be elevated and immobilized in a slightly flexed position. Ice packs are sometimes comforting.

General Treatment

Haemophilia and Related Conditions

Correction of the specific clotting defects cannot easily be carried out in the patient's own home. In haemophilia the blood defect can be temporarily corrected by transfusions of several pints of normal blood or plasma, which must be given within a few hours of its collection from the donor, as the active factor is very labile. Concentrated preparations derived from human and, quite recently, from bovine blood are being tested clinically, and it may be that in the near

future they may be made generally available. If this hope is fulfilled then many of the local measures described here for the treatment of haemophilia will happily become obsolete.

In other clotting defects it is probable that amounts of fresh blood similar to those now necessary in haemophilia are required for efficient treatment; a possible exception is Christmas disease, in which it appears that stored blood or serum may be effective and that relatively smaller amounts are needed.

Apart from its effect on clotting, the patient may need a transfusion to restore a dangerously depleted blood volume, possibly before removal to hospital. If the blood pressure is falling alarmingly, the practitioner himself may be able to give a transfusion of 1 or 2 pints (about a litre) of reconstituted dried human plasma, or 1 or 2 pints of dextran solution, neither of which involves grouping or cross-matching, but a blood sample for grouping and cross-matching must be taken before giving dextran, as this substance interferes with grouping technique. Cutting down on a vein must be avoided if humanly possible; destruction of available veins by irresponsible transfusion technique may cost the patient his life when another transfusion is needed. No general treatment of the constitutional clotting defects other than blood transfusion or the injection of the specific blood fractions has been found to be effective.

Acquired Clotting Defects

In cases of haemorrhage due to overdosage of one of the dicoumarin group of drugs, immediate contact should be made with the hospital which is undertaking laboratory control of the patient's treatment. An adequate dose of vitamin K₁ should be given as soon as possible. An oral preparation is "konakion," which acts in a few hours. If the doctor is in the habit of collecting blood samples for prothrombin determination he should take a sample before giving the vitamin K₁.

Bleeding due to fibrinogen deficiency or the acute defibrination syndrome which may rarely complicate cases of premature detachment of the placenta must be treated with massive blood transfusion and, if it can be obtained, by injecting intravenously about 2 g. of human fibrinogen in solution.

The Purpura Group

In thrombocytopenic purpura the first essential to general treatment is diagnosis, which in most cases requires laboratory investigation. Leukaemia, aplastic anaemia, sensitivity to drugs such as "sedormid," quinine, or even aspirin, or to certain chemicals, are the commonest causes, and these, when identified, must be treated by the appropriate means. In idiopathic thrombocytopenic purpura splenectomy gives the best chances of recovery. If splenectomy fails, or as a preparation for operation, a course of cortisone sometimes leads to considerable clinical improvement. Purpuric bleeding may occasionally be arrested by transfusion of fresh blood.

I have discussed the relevant parts of the treatment described in this article with Sir Robert Macintosh and Mr. G. Livingstone, of the Departments of Anaesthetics and Otolaryngology, Radcliffe Infirmary, and Dr. J. Grant, of the Oxford Regional Blood Transfusion Centre. I am most grateful for the advice they have given me.

Next article on Emergencies in General Practice.—"Antepartum Haemorrhage," by Mr. F. Stabler.

Refresher Course Book.—Copies of the second volume of collected articles from the Refresher Course for General Practitioners published in the *Journal* are still available at 25s. (postage 1s.) each. The volume contains 60 articles, all of which were revised by their authors for publication in the book. The first volume is now sold out and out of print. Copies of the second volume may be obtained from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or through any bookseller.

SIGNIFICANCE OF SYMPTOMLESS HYPERTENSION

A CIBA FOUNDATION CLINICAL FORUM

[FROM A SPECIAL CORRESPONDENT]

"Symptomless Hypertension" was the subject of the Ciba Foundation's fourth Quarterly Clinical Forum last month, held under the chairmanship of Lord HORDER. In his introduction Lord Horder made a plea for the suppression of the word "malignant" as a description for certain forms of hypertension. He suggested also that the use of the term "essential," by concealing ignorance of the subject, might of itself constitute a possible bar to progress. The four main speakers were a cardiologist (Dr. PAUL WOOD), a clinical scientist (Professor G. W. PICKERING), a general practitioner (Dr. M. D. RAWKINS), and a doctor concerned with life insurance (Dr. T. W. PRESTON).

High blood pressure by itself results, as Dr. PAUL WOOD pointed out, in few or no symptoms, and it is only when neurological, retinal, cardiac, or renal complications supervene that symptoms appear. In that sense uncomplicated hypertension is always symptomless. The problem which faced the Clinical Forum was the assessment of the prognosis and need for treatment in patients found to have raised blood pressure at the time of a routine examination or when being examined for some unrelated disability. The controversial issue of what level of systolic or diastolic blood pressure merits a diagnosis of hypertension was not raised.

Prognosis

Professor PICKERING stressed that the level of blood pressure was progressively graded throughout the population in all age groups, and therefore no dividing line could be drawn between normal and pathological levels. The prognosis in patients with symptomless hypertension taken as a group is undoubtedly poorer than in the population as a whole, as has been demonstrated by Bechgaard's series in Sweden and the figures of the Actuarial Society of America. The prognosis declines progressively as the level of blood pressure rises. Although this generalization applies to the group taken as a whole, there is great individual variation in prognosis within the group. Thus, attention was drawn to the well-recognized fact that the prognosis for a given level of blood pressure is better in older than in younger people, and best of all in post-menopausal women.

Even in patients of similar age, sex, and blood-pressure level the prognosis may be widely different. In explaining the actuarial standpoint, Dr. PRESTON made it clear that no allowance in loading could be made for these individual variations in future behaviour, since at any given stage there was no known way of forecasting how the process would develop in the individual. However, actuaries were prepared to accept as "good risks" older people with a level of blood pressure in the presence of which, if occurring in younger people, they would have insisted on loading the premiums or rejecting altogether.

No conclusions were reached on the importance of transient rises in blood pressure observed particularly in younger people at the time of the first examination. The attitude of insurance doctors to these fluctuations is variable and the proposer may be accepted at normal rates. However, there is evidence that these cases taken as a group are more likely to develop sustained hypertension, although, as Dr. RAWKINS remarked, general practitioners are well aware that there are individuals within this group who show no rise in blood pressure when followed for very many years. Dr. Rawkins drew attention to the great importance of excluding underlying and possibly remediable causes for hypertension occurring in the younger age groups.

Two problems under the heading of prognosis are outstanding. Firstly, how can the course of the blood-pressure changes be predicted in the individual? No answer to this was forthcoming from the Forum. Secondly, why is

it that some people develop symptoms when others do not at the same level of blood pressure? Since the symptoms of the complications of hypertension depend, with the possible exception of heart failure, on vascular degenerative processes, Dr. H. DE WARDENER suggested in the discussion that emphasis might well be shifted away from the concept of the primacy of the level of blood pressure in hypertension towards the study of the behaviour of arteriolar wall under the stresses of hypertension. Professor K. J. FRANKLIN also advocated a further study of arteriolar smooth muscle and of the peripheral nervous system in relation to hypertension. If some way could be found of determining experimentally how arterioles would withstand raised intravascular pressure, it is possible that this might provide a clue to the liability of complications in an individual developing a raised blood pressure.

Selection of Cases for Active Treatment

The problem of the treatment of symptomless hypertension is still a vexed one. The life insurance doctors had naturally little to say about this, but it was cheering to hear that they realized how often they were the unwilling beggars of many anxiety states in patients who for the first time were made aware that their blood pressures were elevated. In the great majority of cases of symptomless hypertension the prognosis is to be measured in years or decades, and a decision whether or not to treat with active vasodepressor drugs may be extremely difficult. Such treatment has to be continued indefinitely, and in view of its inherent side-effects the patient may be handicapped for years, at the end of which time the clinician may be in doubt about whether the survival has been longer than it would have been without treatment. Both Professor J. McMICHAEL and Professor M. L. ROSENHEIM expressed the view that patients with symptomless hypertension should not be treated, for there is no evidence at present that this improves the prognosis. On the other hand, Dr. PAUL WOOD advocated treatment if the E.C.G. indicated myocardial involvement. The Forum was certainly not prepared to lay down any general rules for the selection of patients with symptomless hypertension for treatment, and for the time being it is clear that each case must be judged on its own merits after an adequate period of observation. A carefully controlled clinical trial of vasodepressor drugs in this type of case was called for by Professor PICKERING. Such a trial would be most difficult to conduct, since it would extend over many years, during which time patients would have to be under constant supervision.

POLIOMYELITIS VACCINE

AMERICAN TRIALS IN 1954

The Salk vaccine tested in the U.S.A. by means of clinical trials in 1954 was found to have been about 60-90% effective against paralytic poliomyelitis. While it is not possible to give simple numerical expression to the effectiveness of the vaccine, the report,* published in the U.S.A. on April 12, suggests these figures as an estimate of the vaccine's success.

Plans for Tests

Cases of poliomyelitis appeared with greater frequency in some areas of the U.S.A. than in others during recent years. Therefore, as a preliminary to testing the Salk vaccine, areas with a consistently high incidence of poliomyelitis were noted, and in these areas two distinct but concurrent trials were carried out. In one of them uninoculated children were used as controls; in the other the controls were children inoculated with a substance other than the vaccine and having "no influence on immunity to poliomyelitis." The "observed control study," as the first was

*Evaluation of 1954 Field Trial of Poliomyelitis Vaccine. Vaccine Evaluation Centre, University of Michigan, U.S.A., April 12, 1955.

called, covered 127 areas of 33 states, and the other, the "placebo control study," covered 84 areas of 11 states.

In the observed control study children in the first, second, and third grades of the public (state) schools were identified, and 221,998 children in the second grade received complete vaccinations. These comprised 62.4% of the second grade, and 20.5% of the children in all three grades. As controls, 725,173 children of the first and third grades were used. Certain statistically significant differences were noted between the vaccinated and the unvaccinated in the second grade. For instance, frequency of vaccination against other diseases was strongly correlated with participation in this trial, and the families of those participating were on the average better off financially than those not participating.

In the placebo control study the children in grades one, two, and three were taken together, numbering 749,236, and, of this number, 200,745 received the complete series of vaccine injections and 201,229 complete placebo injections.

Three injections of 1 ml. were given intramuscularly, the second a week after the first and the third four weeks after the second. Vaccinations took place during April 26-June 17, 1954. Elaborate arrangements were made for reporting cases and virological testing. As soon as possible after a case was diagnosed a summary of the clinical history and signs (including the state of the cerebrospinal fluid) was entered on a special form, which was sent to an evaluation centre. No case was admitted to the study unless the form was duly completed and the diagnosis acceptable at that stage. As early as possible a specimen of stool (or two) and a specimen of blood were sent promptly to the designated laboratory in the patient's area; the blood and a second specimen taken three to four weeks later were used for antibody titrations. The stools were studied for presence of poliomyelitis or other virus. Virus isolation, from stool specimens chiefly, was attempted in monkey kidney cells or HeLa cells. A negative specimen was retested at least once. Some specimens were also tested by inoculation of monkeys. Ten to twenty days after the onset of illness a physiotherapist examined the patient, and recorded in a predetermined classification any muscle disability found. The examination was repeated 50-70 days after onset. Post-mortem examination was held on patients who died.

These arrangements were not fully carried out: in the placebo control study, for instance, 13.1% of cases did not have their stools tested, while the figure was 17.3% for the observed control study. Likewise, serological tests were not done in 18.7% of patients in the placebo control study and 15.7% in the observed control study.

Incidence of Poliomyelitis in Study Areas

The number of cases of poliomyelitis reported in the U.S.A. in 1954 was about the same as the average of the previous five years. In the trial areas, which had been selected because the incidence had previously been higher there than elsewhere, the attack rates exceeded those of the rest of the country by 11% in the placebo control areas and 36% in the observed control areas, respectively, or 26% in all trial areas combined. Even so, this percentage was 18% below the previous five-years average for these areas. In the areas excluded from the study the incidence was 4% higher than the five-years average. The following table from the report (here Table I) compares the incidence of poliomyelitis in the trial and the non-trial areas.

TABLE I.—Comparative Incidence of Poliomyelitis in Trial and Non-trial Areas, 1954

Area	Reported Cases—All Ages			Case Rate per 100,000 Population	
	Average 1949-53	1954	% Change	Average 1949-53	1954
U.S. total	39,468	38,768	-1.8	25.7	24.1
All study areas	10,199	8,341	-18.2	33.2	28.9
Placebo control	4,293	3,133	-27.0	28.9	25.6
Observed	5,906	5,208	-11.8	37.3	31.3
Non-study areas	29,269	30,427	+4.0	23.9	23.0

Paralysis Closely Following Vaccination

The data were examined to see whether it was probable that vaccination itself had given rise to poliomyelitis. In all, 129 cases of presumed poliomyelitis were reported during the vaccination period or up to four weeks after vaccination. There was "no evidence of disproportionate frequency of paralytic poliomyelitis in vaccinated or inoculated children up to four weeks after the completion of vaccinations, nor was there any indication of selective localization of paralysis when present."

Effect on Kidneys

The report states that data collected during the trial failed to indicate any apparent relationship between vaccination and kidney disease, and "there are a few additional data derived from studies of other groups which tend to confirm the lack of any such association." Nor was rhesus sensitization detected in 32 Rh-negative children who were among those immunized.

Results

During the study period from two weeks after vaccination to December 31, 1954, a total of 1,013 cases were reported as poliomyelitis. Of these, 14.8% were finally classified as doubtful or not poliomyelitis, 67.6% as paralytic poliomyelitis, and 17.6% as non-paralytic poliomyelitis. Of those classified as poliomyelitis, 79% were paralytic cases. In the placebo control areas the ratio among patients with poliomyelitis of those who received placebo to those who received vaccine was about 2 to 1; for paralytic cases only the ratio was 3.5 to 1. On the other hand, there was no difference in the attack rate of non-paralytic poliomyelitis between vaccine and placebo groups. The number attacked and the attack rates in the various groups are shown in Table II (Table 2b in the report).

Examination of the data in greater detail showed that the differences between vaccination and control groups tended to increase with the severity of the disease. For example, in the placebo control trial "33% of the spinal paralytic cases in the two lowest grades of paralysis occurred in the vaccinated, but only 23% of cases in the three higher grades were vaccinated, and only 2 of the 38 bulbo-spinal cases received vaccine. The four fatal cases of poliomyelitis occurred among children in the placebo control group." In the observed control trial all 11 fatal cases of poliomyelitis were in the control population (a case fatality rate of 2.5% among the controls).

The distribution of the cases by age, sex, and vaccination status is recorded for the placebo control areas in Table III and for the observed control areas in Table IV (Tables III and IV of the appendix in the report).

The cases in which positive diagnostic tests were obtained are analysed separately. In the placebo control areas 198 cases were reported, comprising 170 in which virus was isolated, 23 in which there was no virus but a fourfold or greater rise of antibody in paired sera, and 5 cases in which the virus was recovered from a family member. The following cases were found in the various groups (with the rate per 100,000 in parentheses): vaccinated cases 18 (9), placebo cases 86 (43). The difference between the two groups is statistically significant ($P = 0.001$). Of 53 paralytic cases (excluding bulbar) the vaccinated numbered 8 (4) and the placebo cases 45 (22). This difference is also significant ($P = 0.001$). Among 17 non-paralytic cases the vaccinated numbered 6 (3) and the placebo cases 11 (5). This difference is not statistically significant. In the observed control areas 300 cases were found with positive laboratory evidence of infection. Among these cases the vaccinated numbered 25 (11) and the controls 248 (35). This difference is statistically significant ($P = 0.001$). Among 134 paralytic cases (excluding bulbar) the vaccinated numbered 7 (3) and the control cases 127 (18). This difference is statistically significant ($P = 0.001$). Among 39 non-paralytic cases the vaccinated numbered 8 (4) and the control cases 31 (4).

TABLE II.—Summary of Study Cases by Diagnostic Class and Vaccination Status (Rates per 100,000)

Study Group	Study Population	All Reported Cases		Poliomyelitis Cases						Not Poliomyelitis	
				Total		Paralytic		Non-paralytic			
		No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
All areas—total ..	1,829,916	1,013	55	863	47	685	37	178	10	150	8
Placebo areas—total ..	749,236	428	57	358	48	270	36	88	12	70	9
Vaccinated ..	200,745	82	41	57	28	33	16	24	12	25	12
Placebo ..	201,229	162	81	142	71	115	57	27	13	20	10
Not inoculated*	338,778	182	54	157	46	121	36	36	11	25	7
Incomplete vaccinations	8,484	2	24	2	24	1	12	1	12	—	—
Observed areas—total ..	1,080,680	585	54	505	47	415	38	90	8	80	7
Vaccinated ..	221,998	76	34	56	25	38	17	18	8	20	9
Control†	725,173	439	61	391	54	330	46	61	8	48	6
2nd grade not inoculated	123,605	66	53	54	44	43	35	11	9	12	10
Incomplete vaccinations	9,904	4	40	4	40	4	40	—	—	—	—

* Includes 8,577 children who received one or two injections of placebo. † First and third grade total population.

TABLE III.—Distribution of Study Cases by Age and Sex, by Vaccination Status, and by Diagnostic Classification—Placebo Areas

Diagnostic Classification	Total Both Sexes	Total Male	Total Female	Distribution of Total, Both Sexes by Age					
				Under 6 Years	6 Years	7 Years	8 Years	9 Years	10 Years and Over
Paralytic	270	165	105	2	70	102	76	18	2
Vaccinated cases	33	19	14	—	16	12	4	1	—
Rate per 100,000	16	18	15	—	37	16	7	4	—
Placebo cases	115	68	47	1	23	51	29	9	2
Rate per 100,000	57	65	48	187	53	69	53	37	57
Not inoculated cases*	122	78	44	1	31	39	43	8	—
Rate per 100,000	35	43	26	99	44	32	46	18	—
Non-paralytic	88	63	25	—	21	40	20	6	1
Vaccinated cases	24	16	8	—	5	13	6	—	—
Rate per 100,000	12	15	8	—	12	18	11	—	—
Placebo cases	27	18	9	—	9	9	7	2	—
Rate per 100,000	13	17	9	—	12	13	13	8	—
Not inoculated cases*	37	29	8	—	7	18	7	4	1
Rate per 100,000	11	16	5	—	10	15	7	9	12
Not poliomyelitis	70	51	19	—	15	35	16	3	1
Vaccinated cases	25	18	7	—	3	13	7	1	1
Rate per 100,000	12	17	7	—	7	18	13	4	29
Placebo cases	20	12	8	—	4	10	5	1	—
Rate per 100,000	10	12	8	—	9	13	9	4	—
Not inoculated cases	25	21	4	—	8	12	4	1	—
Rate per 100,000	7	12	2	—	11	10	4	2	—
Study population	749,236	387,949	361,287	2,088	156,584	270,246	203,810	94,431	15,609
Vaccinated	200,745	104,194	96,551	547	42,991	73,758	54,982	24,736	3,441
Control	201,229	104,170	97,059	535	43,056	74,447	55,133	24,281	3,479
Not inoculated	347,262	179,585	167,677	1,006	70,537	122,041	93,695	45,414	8,689

* Includes one case with incomplete injections.

TABLE IV.—Distribution of Study Cases by Age and Sex, by Vaccination Status, and by Diagnostic Classification—Observed Areas

Diagnostic Classification	Total Both Sexes	Total Male	Total Female	Distribution of Total, Both Sexes by Age					
				Under 6 Years	6 Years	7 Years	8 Years	9 Years	10 Years and Over
Paralytic	415	254	161	—	122	143	89	53	6
Vaccinated cases	38	29	9	—	—	24	13	—	1
Rate per 100,000	17	25	8	—	—	18	17	—	47
Control cases	330	203	127	—	122	91	60	50	5
Rate per 100,000	46	54	37	—	56	39	39	42	17
Not inoculated cases*	47	22	25	—	—	28	16	3	—
Rate per 100,000	35	32	39	—	—	41	33	30	—
Non-paralytic	90	55	35	—	25	36	17	8	3
Vaccinated cases	18	15	3	—	—	12	5	1	—
Rate per 100,000	8	13	3	—	—	9	7	12	—
Control cases	61	31	30	—	25	16	9	7	3
Rate per 100,000	8	8	9	—	11	9	6	6	10
Not inoculated cases	11	9	2	—	—	8	3	—	—
Rate per 100,000	8	13	3	—	—	12	6	—	—
Not poliomyelitis	80	49	31	1	22	36	14	6	1
Vaccinated cases	20	15	5	—	—	14	5	—	—
Rate per 100,000	9	13	5	—	—	10	7	—	—
Control cases	48	29	19	1	20	13	7	6	1
Rate per 100,000	7	8	7	40	9	7	5	5	3
Not inoculated cases	12	5	7	—	—	1	—	—	—
Rate per 100,000	9	7	11	—	80	377,913	4	—	—
Study population	1,080,680	560,373	520,307	2,677	222,749	377,913	275,255	136,833	34,687
Vaccinated	221,998	113,837	108,161	106	1,963	134,404	74,291	8,627	2,128
Control	725,173	377,474	347,699	2,476	219,534	175,669	152,469	118,141	29,015
Not inoculated	133,509	69,162	64,447	75	1,252	67,840	48,495	10,065	3,544

* Includes four cases with incomplete injections.

Effect on 6-year-olds

The analysis shows that "the protective effect with respect to paralytic poliomyelitis is significant for each year of age except for the 6-year-olds, where, based on 16 and 23 paralytic cases, the attack rates are 37 and 53 per 100,000 of the population in vaccinated and placebo controls respectively." The protective effectiveness apparently increased with increasing age. A careful comparison of the serology and other data for the 6-year-olds and the rest of the children showed no discrepancy that could account for the difference in protection conferred by the vaccine, and "the data available are inadequate to allow further speculation on the difference."

Trials in Canada and Finland

Placebo control trials were also carried out with the same vaccine in Canada—in the province of Manitoba, the province of Alberta, and Halifax, Nova Scotia—and also in Helsinki, Finland. Although the number of cases admitted to these trials was small, the attack rate, when they are combined, was found to be significantly lower in the vaccinated children than in those who received placebo ($P = 0.035$). Only Type I virus was recovered from study cases in Canada and Finland.

Final Estimate

Among non-paralytic cases there was no significant numerical difference between vaccinated and control patients. When paralytic cases are considered, an estimate of 72% effectiveness for the vaccine was obtained in the placebo areas and 62% in the observed control areas. The effectiveness of the vaccine measured against the incidence of spinal-paralytic cases was nearly the same in the placebo control areas and the observed control areas—82 and 83% respectively—and the corresponding lower limits of estimated effectiveness were 65 and 64% respectively. Its effectiveness against bulbo-spinal cases was estimated at 91% in placebo control areas and 60% in observed control areas; these figures are unreliable because of the small numbers concerned. The effectiveness of the vaccine in placebo areas was 68% against Type I virus, 100% against Type II, and 99% against Type III. Some differences were noted between different lots of vaccine. The same trend was noted in the observed control areas, but "the calculated effectiveness was less than in the placebo areas." The report concludes: "It may be suggested that vaccination was 80–90% effective against paralytic poliomyelitis; that it was 60–70% effective against disease caused by Type I virus, and 90% or more effective against that of Type II and Type III virus. The estimate would be more secure had larger number of cases been available."

BLAND-SUTTON CENTENARY

The Middlesex Hospital and Medical School commemorated on April 22 the centenary of the birth of Sir John Bland-Sutton, who was born at Enfield in 1855. In the school in which he served and the Institute of Pathology which he created, visitors were able to see the latest scientific developments, such as the manipulation and dispensing of radioactive materials, and also some Bland-Sutton personal relics. These last included a photograph of his characteristic last message to the nurses tending him: "I feel too sad to talk, so write my thoughts in chalk on this wall. Nurses well train'd and kind, better no man can find. Farewell."

Tributes from his Friends

In the school library, under the presidency of Professor Sir CHARLES DODDS, F.R.S., who acted as dresser at Sir John Bland-Sutton's last operation at the Middlesex, three former associates of the great surgeon paid delightful personal tributes. Sir Gordon Gordon-Taylor, Sir William

Gilliatt, and Lord Webb-Johnson each approached the subject from a different angle, but all threw new light upon it.

Sir GORDON GORDON-TAYLOR recalled that Bland-Sutton's ashes in a Burmese urn still reposed in the Middlesex Hospital Medical School, where he had spent so many years teaching on the dead the better to serve the living. From the very first he had determined to be a surgeon. Perhaps fortune brushed him with her wings in the time at which he came into surgery. The abdominal surgeon at the end of the last century "graduated along the pathway of the female pelvis." The scene was set for Bland-Sutton. The abdomen was a territory of vast possibilities for the removal of the gigantic tumours to be found at that time.

As a surgeon Bland-Sutton worked at incredible speed, but without the appearance of haste. He came into the theatre with a certain air. He did not wear a mask—such would have covered his Napoleonic features. But he also came in with the assurance of a Field-Marshal Montgomery. There was no loss of self-control, no flurry. No matter what the urgency, all that was audible was, "It's all right. It's all right." He was the first surgeon in this country to excise a duodenal ulcer. As a writer he was as tireless with his pen as he was indefatigable with his dissecting knife and scalpel. Bland-Sutton's operating theatre was the Mecca to which surgeons came from all over the world. He approached more nearly to John Hunter than any other surgeon who had ever lived.

Birth of the Gynaecological Surgeon

Sir WILLIAM GILLIATT pointed out that Bland-Sutton transformed the gynaecological physician into the gynaecological surgeon. He performed some vaginal operations, but he was essentially an abdominal surgeon. In the face of his success, opposition to the operative treatment of ovarian fibroids died down. Soon every gynaecologist was adopting removal by hysterectomy. At the Chelsea Hospital for Women Bland-Sutton had his assistant surgeon to help him, instead of his house-surgeon, and Sir William Gilliatt thought this might be regarded as the beginning of surgical team-work in operations. Bland-Sutton was well aware of his rapidity in operating, and as an example of just how rapid he was the speaker instanced three subtotal hysterectomies completed within an hour. He used fewer instruments than most surgeons, and these he carried in a small case which resembled the jewel case of the Edwardian era. He disliked rubber gloves because he thought they reduced his tactile sense, although in his books he made a plea for them. A chance encounter with Victor Bonney caused the latter to be become a gynaecologist, and the making of a gynaecologist of Bonney might be regarded as the greatest of the great contributions which Bland-Sutton made to gynaecology. He added that one could not be in Bland-Sutton's presence without learning from him. Especially did one learn, when working with him, to avoid unnecessary detail.

LORD WEBB-JOHNSON mentioned that punctuality was an outstanding characteristic of Bland-Sutton. As a surgeon he was a prima donna; he was not only a master surgeon, but basically a master anatomist. Lord Webb-Johnson went on to speak of Bland-Sutton's connexions with the Royal College of Surgeons. One president remonstrated with him for not giving a full hour's lecture. At his next lecture Bland-Sutton arranged for an attendant to put the clock on a quarter of an hour at an interesting point, and the same president congratulated him on a lecture so absorbing that the time had simply flown. Bland-Sutton tried six times in ten years for a seat on the College Council. After his defeat in 1909 Lord Webb-Johnson asked someone the reason, and was told that it was because Bland-Sutton was on the staff of the Chelsea Hospital for Women. In those days there was a prejudice against specialists, particularly gynaecologists. When the remark was repeated to him, Bland-Sutton resigned his appointment. "Hang it all, he was a surgeon at heart, not a gynaecologist." In the following year—1910—he was elected.

Nova et Vetera**ONE HUNDRED YEARS OF ARMY PATHOLOGY**

One hundred years ago the British troops who had wintered in the Crimea were falling sick and dying in such numbers that public opinion at home was greatly disturbed. One of the consequences of this was that Lord Panmure, the Secretary of State for War, appointed an Irish physician, Dr. R. S. D. Lyons, and "two able assistants," Dr. William Aitken and Dr. Doyle—"both accustomed to and versed in the operations of the dead house"—to investigate, especially in the hospitals at Scutari, the nature of the diseases from which the troops were suffering. Dr. Lyons received his instructions relating to the "pathological researches" he was to make in a letter from the War Office dated April 27, 1855, and it is interesting that the following cautionary note was contained therein: "As the office to which you are appointed is new in the Medical Department of the Army, it is possible, although not probable, that some difficulties may arise in the prosecution of your researches." The three pathologists sailed for the Crimea shortly afterwards; and the report of their researches was published in a Blue Book which was presented to Parliament in 1857. Such was the firm foundation on which military pathology was established a century ago.

Inquiries into military medicine in the Crimea revealed the inadequacy of the instruction given to probationers of the Army Medical Department; and this resulted in the establishment of the Practical Army Medical School at Fort Pitt, Chatham, in October, 1860. It is to the credit of the War Office that the importance of pathology was recognized at that early date, and Dr. William Aitken was selected by Mr. Sidney Herbert, Secretary for War, to be the first to fill the chair of pathology at the new Army medical school—an apt tribute to the excellence of his work in the Crimea. The school moved to Netley three years later and remained there until it was transferred to London in 1903.

William Aitken

William Aitken had a long and distinguished career, holding the professorship of pathology for thirty-two years; he was elected F.R.S. in 1873 and knighted in 1877. His success as a teacher was linked with his skill at correlating morbid appearances with clinical findings. As the father of military pathology he was in a position to stimulate the interest of medical officers into research, and the rising generation of young Army pathologists felt his influence—men like Lewis, Bruce, Leishman, Semple, and others who were to contribute so much to unravelling the mysteries of tropical medicine. Almoth Wright succeeded Aitken in 1892 and held the chair of pathology at Netley until his resignation, in 1902, to become pathologist to St. Mary's Hospital. The work of Wright, Semple, and Leishman laid the foundations for prophylactic immunization on the scale we know it to-day. The third professor of pathology at the Army Medical School was William Leishman, who held the appointment until the outbreak of the first world war.

Research which had been previously individual, or encouraged through voluntary association of kindred minds, was now to be replaced by organized directed research—such as the Anti-typhoid Committee, the Sleeping Sickness and Malta Fever Commissions, the Medical Research Committee (later the Medical Research Council). After the war various wartime consultative committees were merged to form the Army Pathology Advisory Committee, and the Pathology Directorate was established at the War Office in 1919, with Major-General Sir William Leishman, first Director of Pathology, as chairman.

Wartime Achievements

The mobile bacteriological laboratory came into use for the first time during the war of 1914–18, and in no previous war had investigations been carried out so near the front line. Pathologists, collaborating with physiologists, also

investigated the mode of action of chemical warfare agents, and in the past forty years their responsibilities in this respect have increased rather than diminished. During the interwar years Brigadier J. S. K. Boyd's classical work did much to place our knowledge of the dysenteric group of diseases on a firm basis. Investigations carried out by him at the Royal Army Medical College led to the introduction of active immunization against tetanus in the British Army before the outbreak of the second world war, and this was undoubtedly responsible for the low incidence of tetanus among the wounded. Another outstanding medical achievement of the second world war was the development of the Army Blood Transfusion Service under the direction of Sir Lionel Whitby.

The influence of the Army Pathology Service on the course of tropical pathology and medicine, and on bacteriology and immunology, can be judged from the numerous eponyms in the nomenclature—*T. lewisi*, *T. brucei*, the Brucella group, the Flexner-Boyd group, Leishman stain, and Leishman-Donovan bodies. The names of Lewis, Bruce, Leishman, Semple, Cummins, Boyd, and many others will always remain an inspiration to those who continue the work.

A. SACHS,
Major-General, A.M.S.

Reports of Societies**UNSOLVED PROBLEMS IN THE BODY'S REACTION TO BURNS**

The extent of present-day research into problems associated with severe burns, and some of the fields needing further investigation, were indicated at a meeting of the Basingstoke Plastic Centre Medical Society at Rooksdown House on April 14.

The chairman, Mr. PATRICK CLARKSON (casualty surgeon, Guy's Hospital), explained that the programme had been arranged with special emphasis on basic questions of pathology and metabolism in burns. It was significant, he said, that there had been no dramatic improvement in the mortality of burns (within burns centres) during the last five to eight years. Nor, indeed, since the three important developments of the middle 1940s, which had been: an understanding of the early colloid and electrolyte needs of severely burnt patients; the effective use of antibiotics; and prompt, more radical surgery in the removal of sloughs and in grafting. What was now needed were new therapeutic developments based on fuller knowledge of the enzyme chemistry and electrolyte and colloid exchanges in the early stages, on better understanding of the later metabolic and endocrine factors, and on improvements in homo-graft techniques.

Skin Enzymes

Professor R. H. S. THOMPSON (Department of Chemical Pathology, Guy's Hospital) submitted evidence for the view that altered enzyme action occurred in the peripheral parts of burned areas, and discussed briefly the part enzymes might play in some of the local and general effects seen in burns. There were two possible modes of action, he said: there might be abnormal local cell metabolism as a result of the inactivation of enzymes by heat; or the release of active enzymes from damaged cells into the general circulation. That selective skin enzyme inhibition could cause local redness and blistering was clear from knowledge of the action of lewisite. By combination with certain enzymes this arsenical inhibited cell oxidation systems in varying degrees, and dimercaprol, which prevented the development of the lewisite blister, acted by reversing these changes. It could be accepted, then, that redness and blistering could result from selective enzyme inhibition by a chemical factor. Though further investigation was needed, thermal sensitivities of skin enzymes were known to vary very much, and therefore, in the peripheral zone of a burned area, conditions were present which might cause selective enzyme inhibition.

It was less certain that enzyme systems released from burned tissue played a significant part, but it had been suggested that liberated proteinase, acting outside the cell, could contribute to such serious effects as vasodilatation and loosening of the epidermis prior to blister formation.

Professor Thompson finally considered histamine and acetylcholine, two vasodilators present in skin. With Dr. I. A. Magnus, he had found the level of cholinesterase in the skin lower in sufferers from heat urticaria than in normal subjects, and there was the possibility, therefore, that this factor played a part in the wealing tendency. Cholinesterase was heat-sensitive, and if it were reduced in amount in burned skin acetylcholine might act unchecked and contribute to the production of blisters.

Abnormal Carbohydrate Metabolism

Dr. W. J. H. BUTTERFIELD (M.R.C. Clinical Research Unit, Guy's Hospital) read a paper describing his investigations of deranged carbohydrate metabolism in burned patients, made whilst working in America in the burns unit directed by the late Everett Evans. It was the practice there, as soon as the patient had been adequately resuscitated, to begin feeding with a very rich diet with the object of preventing the usual loss of weight during the period of reparative surgery. The diets contained much carbohydrate, liberal protein, and ample fat. There was a standard intake of 50-60 calories per kilogram of body-weight per day. Beginning with the observation of glycosuria in a patient so fed, Dr. Butterfield found a similar abnormality of metabolism in 14 of 140 consecutive admissions to the unit. This abnormality consisted of glycosuria without acetonuria, a high fasting blood-sugar level, and an elevated glucose tolerance curve. It began, as a rule, during the first week and lasted for periods of days, weeks, or months, but was usually briefest in children. When long-lasting, the glycosuria waxed and waned and was aggravated by plastic surgical operations. This diabetic state did not occur in controls given the same diet; they simply gained weight. It seemed that, in the group of burned patients, carbohydrate could not be used as a protein sparer, and it banked up in the blood. The aggravation of the condition by operations, the absence of acetonuria, and a negative nitrogen balance were all in accord with adrenocortical overactivity as the basis for the diabetes. This possibility was supported by the finding of high urinary corticoids and low eosinophil counts in the diabetic cases and by the production of similar metabolic patterns in volunteers following the administration of A.C.T.H. and hydrocortisone.

Dr. Butterfield then found that in its earlier phase this diabetic state showed insulin resistance. Further investigations led him to believe that the adrenocortical response disturbed carbohydrate metabolism at the pyruvate level through interference with SH metabolism. An SH donor, dimercaprol, appeared temporarily to correct this disturbance at the pyruvate level.

Research on Homografting

Dr. P. A. GORER (Department of Pathology, Guy's Hospital) spoke on the serological approach to the homograft problem. There was general agreement, he said, that the destruction of the graft was due to an antigen-antibody reaction, and he gave a brief account of current ideas concerning its nature. Damping down the antibody response by such agents as x rays and cortisone had obvious disadvantages. Improved results might be obtained if skins could be typed. Skin itself was hardly suitable for serological work, but the following methods could be applied to man: (1) tests with soluble extracts, (2) tests with small particles derived from skin, and (3) a search for antigens shared by skin and free cells such as leucocytes or erythrocytes. Shared antigens had actually been demonstrated in man. A great deal of further work was needed, and volunteers would have to be used if progress was to be accelerated. However, women below the menopausal age could not be used owing to possible dangers to the foetus, and even with men there was some risk of causing later difficulties in matching them for blood transfusion.

Fluid and Electrolyte Problems

Dr. J. P. BULL (M.R.C. Industrial Injuries and Burns Unit, Birmingham Accident Hospital) dealt with early electrolyte and fluid balances in burned patients. The total amount of plasma loss had been measured experimentally: it was approximately 1 ml. for each 1% of the body surface burned per kilogram of body-weight; but these estimates were made on untreated animals and treatment might influence the results.

Dr. Bull then described findings in 33 patients on the fate of administered sodium and water. Beginning soon after burning, there was a period of marked retention of these substances by the kidney, and it was greatest in the more extensive burns despite the replacement of sufficient colloid fluid to correct the haematocrit reading. During this time it was possible to raise the excretion of sodium and water to some extent by giving further quantities, but only a small proportion was excreted and greater positive balances occurred. Pulmonary oedema might follow the resulting increase of the extracellular fluid volume, and it was unwise in otherwise adequately treated cases to attempt to increase the urinary output by increasing the fluid intake. The plasma sodium level also was low temporarily, but he had not seen symptoms which could be attributed to it. On the other hand, in the early stages after burning, potassium excretion was increased, and unless the potassium was replaced there was a danger of abnormally low serum levels after a few days.

Whether a kidney lesion played a part in these exchanges remained an open question. There was some histological evidence of tubular damage in severe burns, but, unlike the excretion in tubular necrosis, in burned patients total anuria was rare, the urine could be moderately concentrated, and there was sodium retention. It was likely that adrenal cortical activity was a factor, but the finding that severe injuries of other types did not develop sodium and water retention if given adequate blood and colloid fluid suggested that the retention syndrome might be determined by circulatory dynamics.

Early Primary Surgery

Mr. A. J. EVANS (Plastic and Jaw Unit, Rooksdon House) described the treatment practised in the Basingstoke Burns Centre, and some of the lessons learned in treating 500 cases during the past five years. The exposure method was introduced at the beginning of this period, and they had been pleased with the results. Infection, especially with *Ps. pyocyanea*, was less common, the general condition of severely burned patients was better, and excision of the slough on or about the 14th day left a good surface for immediate skin cover. Primary excision was the ideal, but, owing to the difficulty of assessing the depth of many burns, it had only a limited application. It was their practice to use the method only when the area was restricted and the depth certain.

In cases of extensive burns it was important to remove sloughs early, and most had been excised by the 14th day. The operation was a formidable one, but had been shortened by using the Humby knife or by the electric dermatome to remove adherent sloughs and by developing better teamwork in the theatre. With at least two surgeons and two sisters scrubbed up, adequate dressings prepared beforehand, and the help of an anaesthetist experienced in this work, it was possible to complete the operation in 45 minutes.

Homografts had been used only in widespread burns as a life-saving measure, and it was their practice to use grafts, from relatives or the skin bank, placed alternately with autografts. With this technique, regrafting had often been found unnecessary.

In conclusion, Mr. Evans said that the exposure method had given satisfactory results in cases with hand burns. It allowed active movements to be commenced on the third or fourth day, and encouragement of this was important.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Exchange Transfusion in Haemolytic Disease of the Newborn

SIR.—In the interesting article by Drs. W. Walker and G. A. Neligan (*Journal*, March 19, p. 681), they point out that a biochemical investigation of the effects of exchange transfusion in the newborn infant might help to explain the deterioration in the clinical condition which sometimes occurs. In a study of the electrolyte changes involved during exchange transfusion in infants suffering from erythroblastosis foetalis, I have been able to make the following conclusions from a series of 20 cases.

Serum collected as the transfusion progressed had a marked inhibitory effect upon the amphibian heart, and since this corresponded to high serum citrate concentrations it is not unreasonable to assume the presence of a citrate-induced hypocalcaemia. Serum ionized calcium was estimated to be well below levels associated with active tetany at some stages in the transfusion, yet none of these infants showed recognized signs of tetany. Increased pulse rate and signs of irritability were observed in some of the infants, but these could have been due to discomfort, circulatory failure, or shock. The absence of tetany is not easy to explain. It may be that muscle in the newborn responds differently from that in the adult, or that serum ionized calcium under such acute conditions is not necessarily an indication of the concentration of ionized calcium in the interstitial fluid.

Calcium gluconate (1 ml. of 10%) administered for every 100 ml. of blood exchanged had little effect upon the level of serum ionized calcium, probably because the amount of ionized calcium actually injected was very small relative to the high serum citrate concentration. E.C.G. changes consistent with hypocalcaemia have been recorded in the literature. Gustafson¹ noticed irregularities in the isoelectric line which he attributed to muscle tremor, although tetany was not apparent. The E.C.G. reverted to normal after calcium gluconate, which tends to substantiate the use of calcium gluconate in contrast to the biochemical findings above. I was also able to demonstrate that hyperkalaemia can develop during the transfusion, and, since some infants have a pretransfusion hyperkalaemia, the desirability of using fresh donor blood cannot be too strongly emphasized. The one fatal case of the series showed a simultaneous hyperkalaemia and hypocalcaemia at the time of death. The existence of pretransfusion hyperkalaemia might well increase the incidence of heart failure, since the physiological effects of a high potassium and a low calcium potentiate each other. The results of this investigation will be published in due course.—I am, etc.,

Edinburgh.

HYLTON SMITH.

REFERENCES

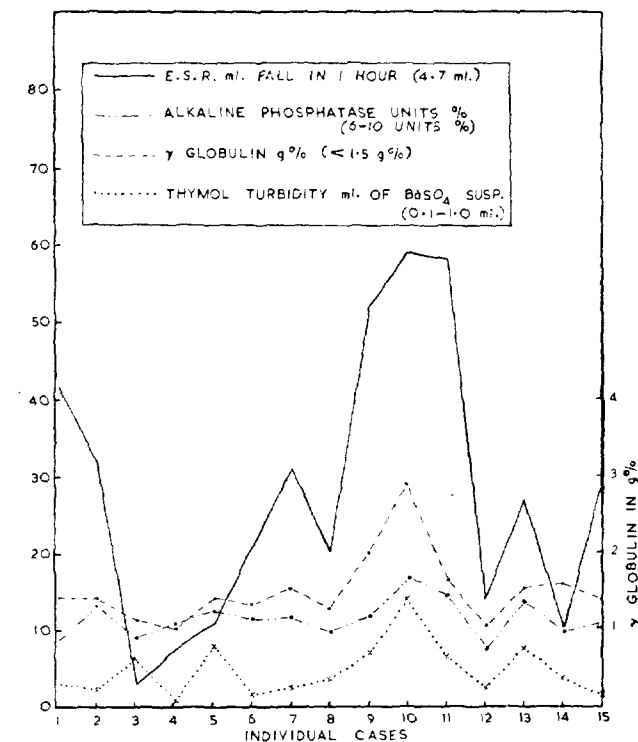
- 1 Gustafson, J. E., *J. Pediat.*, 1951, 39, 593.

E.S.R. at Low Temperature

SIR.—It was with some considerable interest that we read Dr. K. D. Gupta's article (*Journal*, March 19, p. 703) on the rise of the erythrocyte sedimentation rate at low laboratory temperature, and in which he suggested that this phenomenon might prove to be indicative of parenchymatous liver damage. While we have not estimated the E.S.R. at various temperatures, we have noted a definite correlation between the height of the E.S.R. and the extent of liver damage as indicated by three separate tests of liver function—all of these being performed at about 60° F. (15.5° C.) room temperature.

Our observations were made in a group of 15 cases of Sjögren's syndrome, in none of whom was there any obvious

clinical sign of liver dysfunction. The liver function tests were carried out as part of a general investigation of the function of the secreting glands of the body. Two empirical tests were employed—the thymol turbidity and the alkaline phosphatase, since they are considered to be the most sensitive means of detecting subclinical impairment of hepatic function.¹ The thymol turbidity test was above the normal value (1.00) in 14 cases, while the alkaline phosphatase test was above the upper limit of normal (6-10 units) in 10 cases. A third test, based on the synthetic function of the



The relationship between thymol turbidity, alkaline phosphatase, and γ globulin in serum and the erythrocyte sedimentation rate in 15 cases of Sjögren's syndrome.

liver, was carried out—that is, the estimation and fractionation of serum proteins by electrophoresis² and by chemical estimation.³ In all cases the serum albumin was low, and the globulin fraction, in particular the gamma globulin, was raised. In contradiction to the generally accepted view that a high E.S.R. is accompanied by a raised blood fibrinogen, the latter was found to be low in each of the six cases in which it was estimated.

The accompanying graph shows that in 13 out of the 15 cases quite a close correlation exists between these tests of liver function and the height of the E.S.R.—We are, etc.,

JOHN MCLENACHAN,
E. L. TONKS.

Birmingham, 3.

REFERENCES

- 1 MacLagan, N. F., *Brit. J. exp. Path.*, 1944, 25, 234.
- 2 Flynn, F. V., and De Mayo, P., *Lancet*, 1951, 2, 235.
- 3 Wolfson, W. Q., et al., *Amer. J. clin. Path.*, 1948, 18, 723.

Immunological Concept of Cancer

SIR.—Professor H. N. Green, in a footnote to his admirable article (*Journal*, December 11, 1954, p. 1374), says that "recent findings indicate that serum antibodies disappear when the skin carcinomata appear." Does this apply to human cancer? Apparently the homologous antibody to human cancer is still hypothetical. In support of his concept, there is evidence of cancer influencing non-specific immunity mechanisms. Cancer interferes with the hyper-sensitive skin reaction to the mumps virus.¹ In the malignant lymphomas, anergy develops to tuberculin, mumps virus, and other antigens which produce delayed reactions.²

The defect in the skin reactions is presumably due to interference with the cellular mechanism of the reticulum cell and its derivatives, rather than to pure antibody deficiency. In my experience patients with chronic lymphatic leukaemia react normally to the mumps virus and also to tuberculin,³ possibly due to the free circulation of lymphocytes. Human carcinomas, but not sarcomas, progressively inhibit the mumps virus skin test as neoplasia advances, a finding which does not apply to the tuberculin reaction. In these skin tests, human cancer depresses tissue reactions not directly concerned with homologous tumour immunity. Is the immune reaction to cancer also depressed as cancer develops?—I am, etc.,

Wellington, New Zealand.

J. LOGAN.

REFERENCES

- ¹ Logan, J., *N.Z. med. J.*, 1953, 52, 400.
² Schier, W., *New Engl. J. Med.*, 1954, 250, 353.
³ Rostenberg, A., et al., *Arch. Derm. Syph. (Chicago)*, 1954, 69, 195.

Malignant Melanoma and Pregnancy

SIR.—Perhaps I may add another case of malignant melanoma complicating pregnancy to the list which is growing in your columns. In 1941 I saw such a case in a patient aged 27 who was eight weeks pregnant. There was a firm pedunculated swelling on the right labium majus which had been present for many years without alteration. It was about 4 cm. in diameter, and without evident pigmentation. It was thought to be a fibroma, but on section some of the cells were found to contain melanin. Section of the pedicle suggested that removal had been complete; in view of this fact, and because of the pregnancy, no more was done and she had an uneventful delivery. Two years later an enlarged inguinal gland was observed in another hospital. Bilateral dissection of the inguinal glands was performed, and two glands were found to contain growth. The patient died in 1945 with widespread deposits. An almost identical case was reported by Curtis.¹—I am, etc.,

London, W.1.

S. G. CLAYTON.

REFERENCE

- ¹ Curtis, A. H., Editor, *Obstetrics and Gynaecology*, 1933, Vol. 3, p. 594. Philadelphia.

Meningo-encephalitis in Mumps

SIR.—Mumps is said to be increasing in severity, but three cases of definite meningo-encephalitis in an outbreak of 29 cases of mumps in a school is, happily, unusual. The boys affected were aged 9, 9, and 10 years respectively and had nothing of importance in their previous histories, except that the most severe case had had migraine.

The outbreak of mumps was started by one boy. The first case of meningo-encephalitis occurred in the first wave on the 22nd day, the second in the second wave on the 33rd day, and the third on the 49th day. The cerebral complications began with headache, vomiting, photophobia and drowsiness, a sharp rise in temperature—102° F. (38.9° C.) or 103° F. (39.4° C.)—and slight stiffness of neck and back. This stiffness of neck and back and Kernig's sign increased on the second day. There were never any other signs in the C.N.S. or macular signs of increased intracranial pressure. The onset of this complication occurred on the third, second, and first days respectively of the parotitis, which was less marked than usual, and it lasted for four, three, and six days respectively.

The pyrexia was higher than in the uncomplicated cases of mumps and for a longer period—that is, between 100° F. (37.8° C.) and 103° F. (39.4° C.) for five, seven, and six days respectively—and the temperature did not become normal for twelve, ten, and seven days, whereas amongst the uncomplicated cases the temperature rarely rose to 100° F. (37.8° C.) or above, and never lasted for more than three days, and the average duration of pyrexia was five days and the maximum eight. The patients with meningo-encephalitis in this outbreak of mumps were certainly more ill than the uncomplicated cases. They all made complete recoveries. Dr. J. O. Terry examined the first and third cases and confirmed the diagnosis.

Injection of the parotid duct has often been mentioned as a diagnostic sign in mumps, and most practitioners have found it quite unreliable. However, in this epidemic it was noticed that the parotid duct was injected the day before the parotid gland enlarged, but became normal as soon as the gland enlarged. It may therefore be a little help in diagnosis if this time relationship is remembered.—I am, etc.,

Colwall, Malvern.

J. RICHARDSON.

Encephalitis After Yellow Fever Vaccination

SIR.—I would like to endorse, with great conviction, the views put forward by Dr. Leonard Roodyn (*Journal*, November 20, 1954, p. 1226) on the subject of the vaccination of infants against yellow fever. In recent weeks four cases have been reported in which, in infants between the ages of 5 and 13 weeks, signs of a meningo-encephalitis have followed vaccination with 17D yellow fever vaccine in England. There is, however, no evidence of any kind that this meningo-encephalitic syndrome was necessarily due to the 17D yellow fever virus; it is certainly possible that it could have been, if only from the fact that the incubation period in three of the four cases was 9–11 days. In the fourth case, that of Dr. L. G. Scott (*Journal*, November 6, 1954, p. 1108), the incubation period was 12–16 days—that is, if the date of admission to hospital was September 29, and not September 9 as printed. But, as Dr. Roodyn points out, cases exactly similar to those reported occur frequently in infants who have received no injections.

Of the four cases reported, the first (that of Dr. J. Hewgill Smith (*Journal*, October 9, 1954, p. 852)) had a lesion in the chest, sufficient in a child of five weeks to produce a meningeal syndrome. The third case (that of Dr. Leslie G. Scott (*Journal*, November 6, 1954, p. 1108)) had virulent organisms in the throat, while the fourth case (that of Dr. E. A. Beet (*Journal*, January 22, p. 226)) was possibly a result of a double vaccination against yellow fever and smallpox. The clinical details of the second case are scanty (case of Dr. L. Haas (*Journal*, October 23, 1954, p. 992)) and the meningeal irritation disappeared after 24 hours.

It is my submission that there is little or no evidence in any of these four cases to incriminate the yellow fever vaccine. The figures given by Dr. Roodyn on the numbers both of vaccinations given and of reactions reported are sufficient to warrant a very careful assessment of the implications in incriminating the yellow fever vaccine. In Lagos, during the past fifteen years, some 35,000 vaccinations against yellow fever have been given; many of these have been given to infants; both Rockefeller Foundation and Burroughs Wellcome vaccine has been used; no case of reaction in an infant has been reported. It would be well, I think, to reserve judgment on the four reported cases in England. There can be no doubt that the expert virologists who produce yellow fever vaccines are continually on the look-out for reactions, and are competent and honest enough to state forthrightly whenever a vaccine has become dangerous. The important point, so well put by Dr. Roodyn, is that such meningo-encephalitic reactions in infants are so rare that it would be quite wrong to withhold vaccination from an infant who is proceeding to an area where endemic yellow fever exists. The risk of an infection with yellow fever in such an area is very much greater than the risk of a reaction to the vaccine.—I am, etc.,

Yaba, Nigeria.

D. A. CANNON.

Salicylates in Anticoagulant Therapy

SIR.—Dr. M. H. Singer's suggestions (*Journal*, April 2, p. 851) regarding the use of salicylates as anticoagulants do not seem practicable from the pharmacological point of view. Salicylates have one-twentieth the prothrombinopenic effect of dicoumarol, and this effect, which is more marked with fever and a high metabolic rate as in acute rheumatism, tends not to persist with continued exhibition.

To produce an effect anywhere near the "therapeutic" about 6 g. a day would have to be given and this would be

quite likely to produce salicylism in a high proportion of cases.¹ Although a patient who has recovered from the initial shock of a myocardial infarction might justifiably be exposed to this high dose of salicylate, it is not for just this type of patient that he suggests this line of treatment. Further, such prothrombinopenic effect as would be obtained would not appear for 36–48 hours, and by this time the patient would be fit for transfer to hospital.—I am, etc.,

Edinburgh, 10.

M. DALES.

REFERENCE

- ¹ Goodman, L. S., and Gilman, A., *The Pharmacological Basis of Medical Practice*, 1955, 2nd ed., p. 286. New York.

Natural Childbirth

SIR.—As a general practitioner doing midwifery, and trying to carry out the principles of natural childbirth, I have followed this correspondence with great interest. I have never quite understood the opposition to Dr. Grantly Dick Read's methods, which, it seems to me, can at the worst do no harm and at the best promote truly painless labour. The letter from Mrs. Constance Lynn (*Journal*, April 2, p. 851) does give an apparently reasonable argument, though I do not feel her one experience gives her the right to condemn natural childbirth methods in quite such a wholesale fashion. She says, in the light of her experience, "is it worth having one's morale high in pregnancy, only to be battered in labour, and very low post-natally?", and goes on to say that all other recent mothers she talked to felt the same. I have the greatest sympathy with Mrs. Lynn, for I have had cases of my own who appeared to derive little or no benefit, but I think she is wrong to condemn a technique that did not work for her. I honestly believe that the majority of mothers are helped by their antenatal training to a greater or lesser extent. Why then does it sometimes fail?

Although we do not know the medical details of Mrs. Lynn's case, I think a study of her experience is revealing. She says, "... a great deal of what I was taught to do was physically impossible in labour." I find it hard to believe that something a woman has done easily in late pregnancy is "physically impossible," though I realize it may be very hard. I believe the clue to what happened may lie in her next words, "much of what was possible one hadn't the inclination to do at the time." This admission makes me wonder whether the medical and nursing staff who helped her in her labour were fully conversant with and used to relaxation methods, for even the best and most enthusiastic patient needs considerable help and encouragement from the beginning of labour (a point Dr. Dick Read has made again and again in his writing). If she did not get this help, and her confidence waned as labour progressed, then I can well believe that she was worse off than the unprepared patient. As she says, "... so becalmed and relaxed and optimistic had I become that I was totally unprepared for the really serious and hard business involved." Here again, if she was totally unprepared for it, then her antenatal teaching was at fault. I have found it necessary on occasion to caution the over-enthusiastic patient not to expect complete painlessness, and to point out that, pain apart, the physical stress and effort attendant on labour are considerable. If a woman understands this, and is properly helped throughout labour, then she will surely, I believe, be helped by her training. I would add that she will be helped the more if the staff assisting her in her labour are people she has seen throughout the antenatal routine, for I am sure this is an important factor in the promotion of natural childbirth, and that if she sees no one she knows in the labour-room, as is the case in most hospital practice, she will be less likely to succeed in her efforts. To sum up, I say, with Dr. Anthony Ryle (*Journal*, March 19, p. 725), that I feel justified in promising mothers treated this way that their pain will be diminished considerably in nearly all cases, and entirely abolished in some.—I am, etc.,

Bristol, 3.

MICHAEL B. LENNARD.

SIR.—One salient point arises from this interesting correspondence: the mother must produce her own baby. Doctors, nurses, midwives, physiotherapists, analgesics, and anaesthetics may help or hinder her, may make labour more pleasant or more fearful, but the mother is the key figure.

If a mother is to obtain maximum help from the galaxy anxious to assist her, she must (1) be in harmony with her surroundings and (2) have complete faith in her attendant. Many mothers are forced into hospital who would rather be delivered at home, and vice versa. The domestic cat has more choice of place and arrangement of her confinement basket than the modern mother. In our organized maternity service how can a mother acquire faith in her attendant? During the course of her pregnancy, delivery, and post-natal care she may see four or five doctors, eight or ten nurses, one or two physiotherapists. It is very difficult to attract the attention of any individual in this throng. If the mother does have faith in someone at the fourth month, there is no guarantee that that person will conduct her confinement.

I witnessed my first delivery in an isolated Red Cross hospital in French Canada when I was a student. An elderly primipara, with a flat pelvis, lay quietly on the bed. Beside her sat a doctor she knew well and trusted. Only his eyes were visible behind the "Ku-Klux-Klan" garb worn for deliveries. His gloved hands were folded loosely in his sterilized lap. There was an anaesthetic machine and a trolley laden with drugs and instruments, but nothing seemed to be needed. At each contraction the doctor's voice, soft but firm, reiterated, "*Fermez la bouche, madame, et poussez, longtemps, longtemps.*" Presently a 9 lb. (4 kg.) baby was eased over the perineum. The mother was weary but triumphant. In the efficient tension of the modern well-equipped labour ward I have often longed for the absolute peace of that truly natural childbirth.—I am, etc.,

London, W.8.

ROSAMOND BISCHOFF.

SIR.—I was interested to read the letter of Mrs. Constance Lynn on natural childbirth (*Journal*, April 2, p. 851). Before the birth of my first baby two years ago, I also attended weekly relaxation classes, but found to my dismay (being naturally of an athletic and energetic disposition, and having been taught the benefits of Dr. Grantly Dick Read's theories) that it seemed a tremendous effort to have to do any exercises whatsoever (albeit for relaxation), and my natural inclinations at the time were to be completely lazy. During the latter months of this pregnancy I stopped attending the classes and instead substituted for the daily exercises a daily rest and sleep. My labour was short and uncomplicated, and certainly far less painful than I had ever imagined. Before the birth of my second baby, born six months ago, I did no exercises whatsoever. I was in the labour ward for only ten minutes during this second birth.

This might illustrate that to have completely natural childbirth one should follow the natural demands of one's own body. I have known so many mothers whose labours have been long and difficult, and yet who have most faithfully attended these relaxation classes. Most of them were women who in the normal state of affairs took no exercise nor played any games, and yet whilst pregnant flung themselves into these exercises.—I am, etc.,

Gibraltar.

DIANA CAMPBELL.

Diabetic and Insulin Coma

SIR.—In his most interesting and instructive article on the above subject, Dr. J. D. N. Nabarro (*Journal*, April 9, p. 902) omits to mention a very swift but effective treatment for hypoglycaemic coma—that is, the subcutaneous injection of 0.5 to 1.0 ml. of liquor adrenalin. 1:1,000. I have proved the efficacy of this procedure in a recent case, the patient rousing sufficiently after about five minutes to take sweetened drinks by mouth; moreover, it is much easier than giving large quantities of intravenous glucose solution.

Incidentally, I feel that many consultants are too ready to advise intravenous medication, which may possibly be the ideal treatment in the hospital ward, but which may be difficult and even dangerous when one is working single-handed in the patient's bedroom, often with inadequate lighting. I shall quote only two examples from personal experience. The drug aminophylline I have found to be quite effective and reasonably speedy when given by deep intramuscular injection rather than intravenously. For some years now I have carried in my bag ampoules of digoxin for intravenous injection, but I have never used one, as I have yet to meet a case requiring such urgent digitalization that oral digoxin with suitable sedation is not sufficient.

I shall be most interested to hear the views of other general practitioners and consultants on the points I have raised.—I am, etc.,

Birmingham.

H. JOSEPHS.

Eclampsia

SIR,—Dr. A. W. Bauer (*Journal*, April 2, p. 848) in his reply to my letter (*Journal*, March 12, p. 666) has incorrectly assumed that I attributed the authorship of the thesis under review to him. I stated that he had invoked it.

In his original communication (*Journal*, February 19, p. 481) he adduced certain data which presumably were offered for corroboration, and certain hypotheses for integration into the aetiology. It was this latter that appeared impossible to effect. For, even admitting that abnormal reactions can continue after the "focus" (presumably the placenta in this case) had ceased to act, and accepting this in explanation of the occurrence of post-partum eclampsia, it would be impossible to reconcile such a process with the regression of the signs in certain cases of intragestational eclampsia—coincident with the death of the foetus—followed by their eventual recrudescence in labour a week or more thereafter.

The determinate role of sodium in the aetiology of toxæmia is supported by much evidence from animal experiment,^{1,2} from the effects of sodium on the toxæmic³ and the anuric,^{4,5} and from the beneficial action of cation exchange resins.⁶ Consonant with this evidence it is salt restriction that must be accorded paramount importance in the diet advocated by Dr. Bauer. Thus resolved the thesis invoked is not a conflict with the concept that renal ischaemia is responsible for the syndrome. Elsewhere I have shown⁷ that myometrial resistance to stretch can effect this change in the kidney and afford the aetiological explanation.—I am, etc.,

London, W.1.

JOHN SOPHIAN.

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2. Renzi, A. A., and Gaunt, R., *Ciba clin. Symp.*, 1954, 6, 30.
3. Page, E. W., and Glendening, M. B., *Amer. J. Obstet. Gynec.*, 1955, 69, 666.
4. Dieckmann, W., *Toxaemias of Pregnancy*, 2nd ed., p. 347. Kimpton, London.
5. Bull, G. M., et al., *Lancet*, 1949, 2, 229.
6. Carey, H. M., *J. Obstet. Gynaec. Brit. Emp.*, 1952, 59, 67.
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Hypodermic Injection Technique

SIR,—Dr. K. D. Salzmann (*Journal*, April 9, p. 909) describes a technique for painless hypodermic injections, supported by sound physiological reasons. May I add a footnote on a further modification of technique, based, I think, upon equally sound anatomical grounds? As a student I was taught that sensory nerve endings, responding according to their type to stimuli of pain, touch, stretch, or temperature, were scattered comparatively sparsely in any one area of skin. When as a newly qualified "locum" in general practice during a particularly busy winter I was in danger of being myself laid low, the remaining principal in the practice ensured my useful survival with penicillin injections which, as far as the actual injections were concerned, were completely painless. His technique was to grasp the upper arm with his left hand, exerting downward pressure with the thumb so that the skin was stretched and

unable to recede or roll under the pressure of the needle-point. Since that time I have always used the same technique myself, with most satisfactory results; and I have always found that the immediate pain of an injection is in direct proportion to the area of skin "displaced" by the procedure. I am sure that injections given through loose skin stimulate nerve endings sensitive to stretching which would be completely unaffected if the skin under the needle-point were prevented from dimpling. The gauge of the needle used is of less importance than the possession of a sharp point and a long bevel; a short-bevelled needle pushes rather than penetrates the skin; so, of course, does a long-bevelled needle which has been allowed to acquire a "hook." In my part-time appointment as medical officer to the local Army unit I always use my own 22 standard wire gauge needles for routine inoculations because the 26 S.W.G. Army issue needles have a 45° bevel which will not penetrate without pushing and hence causing pain.—I am, etc.,

Chieveley, Berks.

JOHN RICHARDS.

SIR,—One way to make injections less painful, as now generally used in Sweden, is the combination with a local analgesic. The diphtheria toxoid is especially difficult, the intense burning sensation several minutes after the injection making it very unpopular among the children. About a ¼ volume of lignocaine 1% is enough, either mixed with the toxoid, or better still, if there is no hurry, separately. This is done by drawing into the syringe first the toxoid and then carefully the lignocaine, giving two separate layers. Inject slowly, make a pause of a few seconds after the lignocaine, and let the toxoid follow. This procedure does not affect the immunization process.—I am, etc.,

Gothenburg, Sweden.

N. R. BLUME.

The Ban on Heroin

SIR,—Dr. A. H. Douthwaite has done a great service in drawing attention to the ban on heroin (*Journal*, April 9, p. 907). I am appalled by the way in which this valuable drug is being taken from us, for valuable it undoubtedly is. Whether or not there have been any consultations with the profession on this matter I do not know, but, if there have, such consultations have clearly not been with the right people. It is notorious that the more eminent a man is the less he is in touch with the art of day-to-day general practice. In this I do not include therapeutics by means of whatever happens to have come through the letter-box most recently, but treatment by well-tried and reliable methods. As Dr. Douthwaite says, heroin is very useful in the treatment of tracheitis. A host of other preparations are available, many of them in proprietary form. I have used most of these myself. Some of them are satisfactory, while others produce undesirable symptoms. Some patients' tracheitis seems to be resistant to them all. In such cases linctus heroin, often produces relief.

There are, of course, many other conditions besides tracheitis in which heroin is a most useful drug. Many of these have been mentioned by Dr. Douthwaite. Even had the profession been well advised of the possible withdrawal of this drug, and had they considered all the possible drawbacks inherent in such withdrawal, yet they might have agreed to its loss if they were persuaded that the sacrifice was made for a good reason. But, so far as I can see, this is certainly not the case. We are told that it is to ease the situation of drug addiction not in this country but in the United States. There is a lot to be said for nations helping each other in medical matters, but how can the ban on its manufacture here possibly help the situation in the U.S.A.? Does the World Health Organization really believe in its own name? Has it forgotten the U.S.S.R. and China? These countries will clearly continue to manufacture heroin, and undoubtedly they are at least as well versed as ourselves in the art of surreptitious export. The more one looks into the argument, the less water it appears to hold. Alcohol addiction is not uncommon in the United

States—can we expect that the World Health Organization has sufficient confidence in its reasoning to attempt the treatment of this problem the same way?

I only mention these obvious matters to show how the whole situation seems to be clouded by woolly thinking. As a result of this so-called thought, and without the general practitioners having been consulted, the general public is to be robbed of a most useful drug.—I am, etc.,

London, N.W.1.

R. HALE-WHITE.

SIR,—Dr. A. H. Douthwaite's letter (*Journal*, April 9, p. 907) is a timely reminder of a Governmental act which cannot but have adverse effects on patients with disease of the brain calling for surgical treatment. For many years now it has been the custom in neurological departments, both medical and surgical, to use for the relief of intolerable headache due to cerebral tumour ½ gr. (11 mg.) heroin given in powder form with phenacetin by mouth. This type of analgesia is not associated with the risk of the development of a marked rise in intracranial pressure which is liable to occur when morphine and pethidine are exhibited in such cases.

It is now established that satisfactory anaesthesia for neurosurgery demands immediate recovery of consciousness on withdrawing the anaesthetic, combined with the maximum possible depression of the cough reflex during operation, yet minimal accompanying respiratory depression. With this in view a large number of analgesic drugs have been tested as premedication, and as supplements to nitrous oxide and oxygen, in the course of the last few years. Pethidine, methadone, and L-methorphan have all been found wanting mainly because it proved impossible to obtain the necessary depression of the cough reflex without simultaneously reducing respiratory displacement to the point at which serious rise in intracranial pressure occurred. Heroin alone has stood the test of time in these cases, and its withdrawal from the *Pharmacopoeia* cannot but result in hardship, suffering, and, it may be, fatalities.

There seems little hope that the use of "nalorphine" to antagonize respiratory depression will make the previously rejected drugs any more acceptable; for Payne¹ has shown that the effect of this drug, although initially stimulating, is subsequently depressant. Perhaps N-allyl-nor-dromoran will be a little more satisfactory in this respect, but, even so, the lack of heroin can only be made good by months, or it may be years, of searching for another agent with the same properties. It seems a pity that some patients should suffer unless it can be conclusively demonstrated that the result is really going to benefit a vastly greater number of potential addicts. An embargo on the import and manufacture of heroin, confined to this and a few other countries, is obviously insufficient to attain this end. Indeed, unless the manufacture of the drug is discontinued everywhere there will be no gain to offset the suffering of these patients whose pain cannot otherwise be satisfactorily relieved.—We are, etc.,

A. R. HUNTER.

R. T. JOHNSON.

Manchester, 13.

REFERENCE

1. Payne, J. P., *Brit. J. Anaesth.*, 1954, 26, 22.

The Aftermath of Hysterectomy

SIR,—In support of Dr. Winifred Coppard's letter on "The Aftermath of Hysterectomy" (*Journal*, April 2, p. 852) may I make some observations? About four months ago I underwent a total hysterectomy for a large fibroid of long standing, my ovaries being left *in situ*. For several years the thought of a hysterectomy had loomed towards me, and in November last a bad uterine haemorrhage was the final thing which made me agree, at the age of 42, to get on with it. At the time of operation I was fortunate in having a married woman surgeon of great wisdom, understanding, and humour, and her remark to me in discussing my forthcoming operation, "Some

women have such a sentimental attachment to their uterus," put the whole affair into the right perspective. That, coupled with being married and having three children, helped a lot. All went well, I was up on the third day after operation, walked out of hospital on the tenth, and after a further five weeks of gradual resumption of normal activities I returned to my usual full domestic and public life. Now, after four months, I feel very fit, and able to plan my days without the tiresome worry of heavy periods every 3½ weeks. In addition, after 20 years of contraceptives, married life is now unhampered and happy.

Having seen other women in a similar position to myself during the past few months, but without the help and support of a married woman medical adviser, and making slow and anxious recoveries, might I suggest that when a hysterectomy is advised it is to the gynaecologist of her own sex that a woman can turn with advantage?—I am, etc.,

DOCTOR'S WIFE.

SIR,—I wish to congratulate Dr. Winifred Coppard on her letter (*Journal*, April 2, p. 852) drawing the attention of our profession to the aftermath of hysterectomy. Many general practitioners are aware that those who have undergone this mutilating operation are among the most regular attenders at the surgery, for not only do cyclical attacks of depression occur as mentioned by Dr. Coppard, but also attacks of headache, backache, nausea, and blackout.

Since 1952 I have collected records of 30 women who underwent hysterectomy for non-malignant conditions some 2–12 years previously. Of these, 15 women considered their general health had deteriorated since operation, 5 considered their health was about the same, and only 10 women appreciated the benefit this major operation had brought to their general health. In reply to a question on marital happiness, 3 of the 19 married women stated that they had divorced since operation, and a further 8 reported deterioration in their marital harmony, leaving only 8 women who reported no change in their marital happiness. Intercourse had not been attempted since operation by 9 women, because of lack of knowledge or lack of desire, 4 women complained of dyspareunia which made intercourse a rare event, and only 6 women reported normal intercourse. This legacy of marital problems stresses the need for trial of alternative treatment in preference to the easy policy of "If thy womb offend thee, cut it out." Too few hospitals call the husband into consultation or ask his permission before the decision to operate is made. In the past twelve months I have referred two patients to different gynaecologists for investigation into infertility, and on both occasions the consultants advised hysterectomy for small symptomless fibroids. I consider it my duty in general practice to protect the patient from an unnecessary hysterectomy, and where this is inevitable to discuss the operation with both marriage partners, advising on subsequent intercourse and the probable need for hormone therapy.

At the Royal Society of Medicine recently I remarked that "hysterectomy does not cure premenstrual syndrome, but it does transfer the patient from the gynaecologist's wing to a specialty dictated by the site of the symptoms." The same may be said of other functional disorders for which hysterectomy is to-day practised. One may well ask the gynaecologist, "Is your operation really necessary?"—I am, etc.,

London, N.18.

KATHARINA DALTON.

Neon Lighting in Hospitals

SIR,—Dr. William B. Bacon's letter (*Journal*, March 12, p. 666) contains statements which cannot go unchallenged. Presumably your correspondent is referring to fluorescent and not to neon tubes, since the latter are never used for lighting purposes. Fluorescent tubes operate on the mercury discharge principle and are fundamentally different from neon tubes, which are used in advertising signs.

While it is true that some types of fluorescent tubes have, in the past, over-emphasized the blues and greens, and so could give rise to danger to which Dr. Bacon refers, during recent years there have been great improvements in colour-rendering properties, and modern installations are completely satisfactory. From the wide range available tubes may be chosen to give almost any desired colour rendering, including that of tungsten, and if the installation is designed by a competent lighting engineer there need be no fear of a patient becoming cyanosed and escaping attention due to poor lighting.

Fluorescent tubes have been used in the lighting of the surgical corridor of this hospital, which includes a thoracic surgical unit, with perfectly satisfactory results, following conversations with the consultant surgical staff, who were naturally interested in the points now raised by your correspondent.—I am, etc.,

Churchill Hospital, Oxford.

C. F. SHARE,
Assistant Administrator.

Medical Numismatics

SIR,—Your reader Dr. G. E. B. Payne (*Journal*, March 19, p. 729) might be interested to know that the full name of Dr. Eady was Samuel Phillips Eady, and (according to records preserved at the Westminster Public Library at Buckingham Palace Road) he lived at 38, Dean Street, Soho, from 1820 until 1825.

There is a reference in the *Gentleman's Magazine*¹ which might well refer to him. In describing a book intended for purchase the writer says, "The work contains 24 leaves somewhat broader and handsomer than the soft sybilline effusions in which Dr. Eady's merits are recorded." This might suggest that Dr. Eady (if, indeed, it is the same man) used other forms of advertisement than the token, and was, therefore, presumably not a professional man.—I am, etc.,

C. J. CITRON,
Chairman,
Public Libraries Committee.
London, W.C.2.

REFERENCE

¹ *Gentleman's Magazine*, 1825, 95, 22.

Tropical Pulmonary Eosinophilia in a West African

SIR,—Contrary to Dr. James A. McFadzean's belief (*Journal*, March 26, p. 771), eosinophil counts of the order mentioned by him are by no means unusual in persons with Calabar swellings due to loiasis. In our view his patient presented the ordinary features of this common West African disease, and we regard his diagnosis of tropical pulmonary eosinophilia as mistaken.—We are, etc.,

A. R. D. ADAMS.
D. R. SEATON.
W. E. KERSHAW.
Liverpool, 3.

Recognition of Dental Fluorosis

SIR,—With regard to Mr. N. J. Ainsworth's reference to his visit to an Oxfordshire village in 1939 (*Journal*, April 9, p. 911), may I refer him to the reprint, which was sent to him that year, of the first published description of dental fluorosis at Bampton,¹ in which I stated: "I noticed dental fluorosis in adults and children in different parts of the village, and Mr. Ainsworth very kindly came to Bampton and has confirmed my findings"? There was no implication in this statement or in the quotation from it (*Journal*, March 26, p. 789), which Mr. Ainsworth mentions, that dental fluorosis was present in every one of a group of villagers who were collected for his diagnosis. Later that summer a number of Bampton inhabitants with severe dental fluorosis were demonstrated at the meeting of the Physiological Society held at Oxford.—I am, etc.,

Oxford.

DAGMAR C. WILSON.

REFERENCE

¹ Wilson, D. C., *Nature*, 1939, 144, 155.

Dermatomyositis

SIR,—I cannot agree with Dr. Allan Bigham (*Journal*, April 9, p. 909) that there is any doubt about the diagnosis of the case of dermatomyositis described by me (*Journal*, March 26, p. 770). Dr. Bigham's chief doubts seem to arise from the fact that there was painful joint swelling, and that the orbital tissues were not involved. I agree with him that the presence of painful joints is against the diagnosis of dermatomyositis, and it was this very fact which led me to make the original erroneous diagnosis of acute rheumatism. Furthermore, as the case progressed it became clear that skin and muscle swelling and tenderness were the major features, whereas joint tenderness had been present in the initial stages. My description did not perhaps make this sufficiently clear.

While agreeing with Dr. Bigham's description of a typical case of acute dermatomyositis, which includes swelling of the infra-orbital tissues, the absence of facial swelling in my case in no way invalidates the diagnosis. Few diseases present all the features of their classic descriptions.

Finally, the histological findings of round-cell infiltration with fragmentation of muscle bundles and proliferation of their nuclei, which were present in my case, may not be regarded as specific of dermatomyositis, but these are the findings which have been present in most recorded cases.—I am, etc.,

Richmond, Yorks.

HILLAS G. SMITH.

Chlorpromazine in Mental Disease

SIR,—Miskolczy¹ in 1938 suggested that only those parts of the brain which reached their fullest development in man were affected in schizophrenia, and I believe much evidence has accumulated since then to support the view that schizophrenia is a phylogenetically and otogenetically determined encephalopathy with disordered action of brain cells in the frontal lobes and hypothalamus particularly, and, to a lesser extent, in the parietal and temporal lobes. Further, that the affected cells may recover or become inactive, so that the process may be arrested at any level, but that fully developed cases go on to functional loss of much of the frontal lobes and of the lateral and posterior hypothalamus. I hope you will allow me to comment on the possible incidental light thrown on this hypothesis by the article on the use of chlorpromazine in mental hospital patients by Dr. J. Lomas (*Journal*, April 9, p. 879).

The information supplied by Dr. Lomas confirms what has been stated several times before, that the chief effect of chlorpromazine is on the diencephalon and not on the cortex; in fact, that it is a partial chemical hypothalamectomy which is achieved and not a chemical leucotomy, as suggested by Delay and Deniker.² Bearing this in mind, and the hypothesis which has been briefly stated, one should not be surprised if (1) chronic, emotionless schizophrenics are little affected and can tolerate large doses, (2) schizophrenics with emotional disturbances are helped most, and this applies whether leucotomy has been performed or not, (3) some patients—those, I suggest, with either an intact hypothalamus or in whom the hypothalamic disease process is inactive—may fail to improve with chlorpromazine and yet benefit by leucotomy.—I am, etc.,

Canford Cliffs, Dorset.

REFERENCES

¹ Miskolczy, D., and Schaffer, K., *Histopathologie des Neurons*, 1938, Leipzig.
² Delay, J., and Deniker, F., *Thérapie*, 1953, 8, 347.

D. N. PARFITT.

Benzene Hexachloride Nomenclature

SIR,—There would appear to be a widespread misunderstanding which has even appeared in government publications such as *Memorandum on Measures for the Control of Mosquito Nuisances in Great Britain, 1954*, as to the correct description of the insecticidal material known as benzene hexachloride, or, as it is commonly termed, B.H.C.

(gamma isomer). Your leading article (*Journal*, April 2, p. 836) and the refresher course article by Dr. E. F. Edson (p. 841) emphasize the necessity of describing the active constituent by its proper term.

Benzene hexachloride is in strict chemical terminology 1:2:3:4:5:6-hexachlorocyclohexane, and this correct chemical description is commonly used on the Continent. B.H.C. as primarily produced is a mixture of numerous isomers of which the gamma isomer is outstandingly the most active, and it is on the content of this isomer that standardization is carried out. The term "gammexane" is the registered trade mark of one producing company of B.H.C. and for products manufactured by them containing it, and therefore the name gammexane applies only to those products produced by the owners of that trade mark and is not standardized. B.H.C. is now produced almost all over the world in various concentrations of the gamma isomer, and manufactured products containing the insecticide are also widely produced. The pure gamma isomer is now known fairly generally by the term lindane, although this term is not included yet in the British Standard Recommendation for common names for insecticides. None of the names recommended by the British Standards Institution have any proprietary implication, neither has lindane. It is therefore only necessary to indicate the content of gamma isomer B.H.C. in recommendations unless one is anxious to describe the material in the strict chemical form. While there are notable differences in effectiveness between compounded preparations, the use in literature of a proprietary trade mark to describe an insecticidal substance in world-wide manufacture and use is liable to cause confusion and lead to misapprehension, and should be avoided.—I am, etc.,

London, W.C.1.

KARL B. EDWARDS.

Night Cramps

SIR,—Your annotation (*Journal*, March 12, p. 653) and Dr. H. R. Odum's letter (*Journal*, April 2, p. 848) on the above subject encourage me to add some further observations on a condition which may cause much distress. The circumstances under which the cramps show themselves are not at all what might have been expected, for they usually occur after a period of repose, and when the feet are comfortably warm; the early morning hours, after the night's rest, are usually the worst time.

Cold feet in bed are in themselves an affliction, but they have one advantage in that they do not occur simultaneously with cramps. Cold may also be employed to alleviate the cramps when they occur. For this purpose, the bed-clothes should be turned back at the foot of the bed, thus forming a kind of potential tunnel or passageway. When cramps occur, the feet should be pushed through this tunnel and the bare soles pressed against the cold varnished surface of the foot-board of the bedstead or of some improvised substitute. The feet should be moved about from one cold surface to another, and movements should be performed stretching the affected muscles. A few moments usually elapse before the cramps disappear, suggesting the effects of a neurovascular reflex, whereby the excitability of the diverse muscle groups is reduced, thus restoring their balance. To obviate recurrence, bedsocks should be removed after an attack and the feet kept cool. Patients sometimes obtain relief by walking about barefoot on a cold surface, but the methods described may be equally effective while causing less disturbance.—I am, etc.,

Sheffield, 10.

R. G. ABERCROMBIE.

Manipulation and Low Back Pain

SIR,—In your correspondence column Mr. W. D. Coltart and Mr. H. Osmond-Clarke (*Journal*, March 26, p. 790) and Professor J. H. Kellgren (*Journal*, April 9, p. 910) have not unnaturally inquired as to the progress and ultimate fate of the "missing" 16 patients in our recently published series of patients with low back pain (*Journal*, March 19, p. 705).

These 16 patients consisted of 10 males and 6 females. Ten of this group, dissatisfied and unhappy at our apparent policy of *laissez aller*, sought advice and treatment elsewhere. This consisted of manipulations (usually by private osteopaths), various heat treatments, and occasionally traction of the lumbar spine, so that, although seen for examination, they obviously could not be included in the final figures. Three patients developed signs and symptoms of sciatica with severe pain at rest within three weeks, and were placed in plaster lumbar corsets. The final three, of itinerant habits, have returned to Ireland, and we cannot determine how they fared over the vital six weeks. With regard to patients who were using sagging beds, part of our postural instructions ensured that they used a better mattress or employed plaster boards beneath the faulty mattress whilst under treatment during the period in question.

Drs. P. J. R. Nichols and D. J. E. Cheshire (*Journal*, April 23, p. 1032) write about "historical controls" and the fact that we recorded no accurate diagnosis. For the type of case considered (see "Method"), and the as yet unknown pathology of many such cases (see introduction), we consider that our series was controlled as well as possible. After all, what better end-point than full painless lumbar range of movement and full straight-leg raising? We have simply sought to establish whether or not manipulation has a place in the treatment of recent low backache, and, as our results have shown, we are perfectly aware that treatment by rest and analgesics alone is a very good one indeed. We realize that there is yet a tremendous amount of work to be done on the accurate elucidation of the pathology in all cases of low lumbar pain, with or without sciatica, and sincerely trust that our paper will stimulate interested workers to try and gain further insight into this very controversial subject.—We are, etc.,

London, W.C.2.

A. B. COYER.

I. H. M. CURWEN.

Alcohol and Road Accidents

SIR,—As the new *Highway Code* has just been issued with its warning, "Alcohol, even in quite small amounts, makes you less safe on the roads," it seems an appropriate time to call the attention of the profession to a grave defect in all official statistics of road accidents, whether published by the Ministry of Transport, the Registrar-General, or by one of the various accident prevention societies. They all minimize (or omit) the role of alcohol in the causation of such accidents. For instance, in the latest Ministry figures¹ of personal injury accidents (in 1952) out of a total of 114,000 "drivers" accidents only 870 were attributed to motorists and cyclists who were "under the influence." In many reports of local accident prevention societies alcohol is not mentioned, nor does it appear in the Registrar-General's statistics of deaths by violence, and yet, in the opinion of all who have studied the subject, thousands of accidents (and probably hundreds of deaths) are caused annually by intoxicated drivers, pedestrians, and cyclists. The B.M.A. Committee on the recognition of intoxication says "several thousands."²

The police reports of all the fatal road accidents in Leicestershire and Rutland for 1953 make a sad catalogue of carelessness and needless deaths: There were 77 fatalities, about one-third of them being old people or children carelessly on the road. In only one case was the condition of the road the main cause of the accident; in one sudden illness; and in two cases a burst tyre. All the rest were due to the personal element—carelessness in drivers, cyclists, or pedestrians, in some cases attributable to alcohol. Between 8 and 10 p.m. there were four fatalities, none due to alcohol, whereas between 10 and 12 p.m. there were thirteen, three of them being drunken pedestrians on the road. The other ten were due to drivers, of whom two as I think were certainly intoxicated, one probably so, and three possibly. Between 12 p.m. and 2 a.m. there was only one accident, early on Christmas morning, and due to drink; but it resulted in the death of three youths. My opinion, from

the above small survey, which I hope to supplement, is that at least half the fatal accidents occurring after 10 p.m. in this area in 1953 were due to intoxication in motorists, cyclists, or pedestrians.

None of the above fatalities will be recorded in the official statistics as having any connexion with alcohol, the verdicts being "accidental death" (with a note of the chief injury), even in those cases where the driver was almost certainly drunk. Unless a driver is examined at once and is very obviously drunk, no conviction of intoxication can usually be obtained. In night accidents he seldom is seen at once. The certificate which is sent by the coroner to the registrar of deaths is based on anatomy and according to the chief injury—for example, fracture of skull—and there is no place for "conditions contributing to the death" such as is provided in the ordinary G.P.'s death certificate. The Ministry of Transport's Report also does not get to the root of the matter. It lists over 30 "contributory factors" to "drivers" accidents, but these so-called factors really are the manoeuvres or mistakes which lead to the accident, such as "cutting in" or "speeding," the real "contributory factor" at the back of many of them being slight intoxication. In fact, official statistics support the pretence that a drinking driver is only a small danger.

No test for carelessness has ever been devised, other than by numbering the mistakes or accidents resulting, and by this test there is conclusive evidence that slight intoxication makes a man "accident-prone," and that the accident rate rises proportionately to the alcohol in his tissues. For this reason I think that chemical tests as well as clinical tests should be authorized as a routine in the examination of intoxicated persons.—I am, etc.,

N. I. SPRIGGS.

Leicester.

REFERENCES

- ¹ Road Accidents, 1952, p. 56, H.M.S.O., London.
- ² The Recognition of Intoxication, 1954, B.M.A., London.

Difficulties of Child Adoption

SIR,—I know two patients, a childless married couple aged 49 and 48, who have for the last four years been trying to adopt a girl of about 5 years old from anywhere. After strenuous efforts by myself and their solicitor, they have just been bitterly disappointed for the last time. They have given up in despair because the societies say they have no children available. This I cannot believe, judging from the agonizing letters which we receive from these societies through the post.

I can only attribute the shortage of children to the ridiculously jealous restrictions hedged around the children by the societies, and to an unfounded suspicion of those kindly disposed couples who wish to adopt, and of the medical profession, who often try to bring a child into a home in order to preserve the happiness of that home. The societies will reply "Aha! a child must be required for its own sake, and not in order to bolster up an unhappy home." But why? I should have thought that an otherwise unwanted child which could make an unhappy couple happy would more than justify its existence, and be far better off doing this than merely being an inmate of a home.

My object in asking you to print this letter is to find out if other general practitioners have had similar experiences, or if my problem is an isolated one.—I am, etc.,

North Walsham.

P. M. FEA.

Cricket

SIR,—The B.M.A. v. Law Society Cricket Match takes place on Sunday, May 29, at Hurlingham Club, London, at 11.30 a.m. I have been asked by Council to make the necessary arrangements on behalf of the Association, so will any members who are active cricketers and who wish to have their names considered please get in touch with me as soon as possible, stating their "potentialities"?—I am, etc.,

The Little House,
Broadwater Down,
Tanbridge Wells.

R. PROSPER LISTON.

POINTS FROM LETTERS

Postcards for In-patients

Dr. R. DOUGLAS HOWAT (London, S.E.24) writes: One of my friends, who has been an invalid, has made out a scheme which, in my opinion, will save money and also undue anxiety, besides easing the calls made upon the overworked members of hospital staffs. The suggestion is that all hospitals should offer their in-patients printed prepaid postcards which they can send to their next of kin. Briefly, such cards would have a list of questions requiring only a "yes" or "no," or, where it is not possible for the patient to do this, a plus or minus sign can be substituted for "yes" and "no." The following questions are suggested: (1) Do you feel better? (2) Are you sleeping better? (3) Do you require any cash? (4) Do you require any cigarettes? Fruit? Chocolates? (5) Do you require any underclothes? (here specify type required); etc. A space would be left at the foot of the card for any additional wants by the patient, also a space for comments by the doctor, sister, or staff nurse. . . . Consider also the enormous saving of unnecessary telephone calls such a system would ensure, also the saving of unnecessary anxiety both on the part of the patient and the relative. Such cards would, of course, require to be of three types—namely, for men, women, and children.

"Topical"

Surgeon-Commander C. J. ROBERTS (B.F.P.O. 51) writes: Is the use of this word in relation to analgesia of the urethra really necessary? Most laymen and at least one doctor understand "topical" to mean "in the news." If your correspondent Dr. B. G. Forrest (*Journal*, March 12, p. 665) used the word "surface," his meaning would be almost as clear to the learned and far clearer to the unlettered.

Night Cramps

Dr. H. ANGELL LANE (Battle, Sussex) writes: Dr. H. R. Odum's letter (*Journal*, April 2, p. 848) suggests one unusual cause of night cramps, which I observed in my own case. I suffered practically every night for four years from severe cramps, chiefly in the calf muscles. This was during the war. No treatment suggested was of any value. I was 75 years of age and to keep going in my job I took daily amphetamine. I discontinued this in 1946. I also discontinued the cramps. They return only after I take amphetamine again for two or more consecutive days.

Infected Clothing

Dr. G. C. PETHER (Hitchin) writes: When I have a cold my germ-laden handkerchiefs go into one pocket and then another. It is true that the tailors do provide what is known as a handkerchief pocket, but this receptacle, in an inconvenient position and badly designed, cannot hold many handkerchiefs when I have a streaming cold. They wander uneasily from place to place and, presumably, infect my clothes in the process. Would it not be sound to have at least two of our larger pockets lined with a washable material and designed to hold our handkerchiefs and nothing else? They could be wiped out with disinfectants, and presumably our germs would not wander along our waistcoats, braces, and other fittings. Has any work been done to discover what pathogens, if any, are put away with our winter clothes in the spring, to emerge, after a good rest, eager for the fray in the autumn? It would be reassuring to know that this cannot happen. If it can, then some sterilization of the clothes before storage would seem wise.

Tetanus Immunization

Dr. D. N. EVERINGHAM (Guildford, N.S.W., Australia) writes: Your annotation (*Journal*, January 29, p. 278) suggests that active immunization may be preferable in combined vaccines or in armed forces, in view of the risks of horse serum. The main risk of giving serum routinely is that there is less protection, in the event of delayed sporulation, than from toxoid. In any case most patients will have several gravel grazes, punctures by thorns, and contaminated cuts for every major injury which takes them to a doctor, and often they will be more at risk from these than from the "major" injury. This is confirmed by two simple facts: (1) most patients who ask for an anti-tetanus injection have clean or well-opened wounds, or slightly contaminated wounds well flushed by bleeding, or (in this country) dog bites, cuts of a thumb web or other interdigital cleft, or open laceration by a rusty nail (all of which are thought to be tetanus risks); (2) most people to whom anti-tetanus injection is given do not come for that purpose. Therefore I consider I am giving longer, more comprehensive protection by giving toxoid routinely, and recommending a return for a booster on each occasion of a soil-contaminated injury until three injections are given, then a booster for such injuries at three- to five-year intervals.

Obituary

R. DAVIES-COLLEY, C.M.G., M.Ch., F.R.C.S.

We record with regret the death on April 16 of Mr. R. Davies-Colley, which took place at Guy's Hospital, the hospital with which he had been associated as a student and as a member of the staff throughout his professional life. He was 73 years of age.

Robert Davies-Colley was born at Petworth, in Sussex, on August 8, 1881. His father, the late Mr. J. N. C. Davies-Colley, was also on the senior surgical staff at Guy's Hospital. Surgery ran in the family, for Robert's elder brother, Hugh, who died in 1938, was chief surgeon to the Cambridge Military Hospital, Aldershot; and his sister, Eleanor, who died in 1934, was the first woman to obtain the F.R.C.S. of England. From Westminster School Robert Davies-Colley went on to Emmanuel College, Cambridge, taking his B.A. (Natural Sciences Tripos) in 1902. He then continued his medical education at Guy's, qualifying in 1906, taking his F.R.C.S. in 1908 and the M.Chir. the following year. After junior house posts he became obstetric registrar at Guy's, and then demonstrator in anatomy. In 1912 he was appointed to the surgical staff. Among other posts he held at Guy's during the early part of his career were the lectureship in surgical pathology and the curatorship of the museum of the medical school. In due course he became senior surgeon at the hospital, and, on his retirement, consulting surgeon. He was also on the staff of the Florence Nightingale Hospital and the Kent County Hospital, Farnborough, and he acted as consulting surgeon to the London County Council.

During the first world war Mr. Davies-Colley served in France and afterwards as consulting surgeon to the Mesopotamian Expeditionary Force, when he was mentioned in dispatches, and was made Commander of the Order of St. Michael and St. George. After demobilization he was granted the rank of honorary colonel of the Army Medical Services. In the following years he became as well known a London surgeon as his father had been before him, and was appointed examiner in surgery to the University of London and to the Society of Apothecaries. He was also a member of the court of examiners of the Royal College of Surgeons, and Erasmus Wilson lecturer from 1939 to 1946. His contributions to the literature were on general subjects as well as on the subject of surgical pathology, in which he was always keenly interested.

He married in 1908 Emily Crosby Jones, who was a nurse at Guy's and had previously worked at Great Ormond Street Hospital. After her marriage she continued for many years her active voluntary work on behalf of Guy's. Mrs. Davies-Colley died in 1953. They are survived by two daughters.

T. B. L. writes: Everybody called Robert Davies-Colley "Bobby" or "D.C." rather than by his full name, which came to him from his grandfather, a doctor in Shropshire who inherited some mountain land in Montgomeryshire. His family was a good example of the hereditary principle in medicine, for I think it went back at least one generation further. In his own time there were three Fellows of the Royal College of Surgeons in the family at once. His father had faced a carcinoma of the gall-bladder with stern heroism in 1900, going on with his work as a surgeon at Guy's until his jaundice began to distress his patients. Bobby came up to us from Cambridge three years later,

his first task being to work for the Primary Fellowship, which we took together when Arthur Keith was examining for it. He got on the junior staff as obstetric registrar a year before I did; and then we started together the St. Thomas's and Guy's section of the O.T.C., and got up early to learn horsemanship at the riding school in Regency Street. I think his disappointment at not getting on to the staff as an obstetrician lasted, to some extent, all his life, but at that time it looked as though there would be no vacancy for many years. So Bobby slipped over from obstetric registrar to the dissecting-room, as the routine pathway to the surgical staff, and we taught anatomy together till we both were elected to the staff when Charters Symonds went off—the rise of specialism making two vacancies, and these almost at once.

With the war we both found our ways to different parts of the Middle East, and five years later assumed the positions of friendly colleagues with work that no longer brought us together. His great friends were A. S. Blundell Bankart and G. W. Nicholson, and together they formed a trio of intellectual attainment outstanding in the junior staff of the time. D.C.'s work under Targett and his friendship with Nicholson enabled him to step into the former's place as the leading opinion in the surgical work on the microscopical appearance of a slide, while he was the only man at Guy's who could discuss with Nicholson microscopical pathological anatomy once there had arisen the new cytology which was developing at the end of the first decade of this century. Bankart left us early to become a great orthopaedic surgeon; but D.C.'s friendship with Nicholson was close and devoted and passed on to the next generation. All three of them came from Cambridge at a time when it was the thing there to suppress all evidence of emotion, including enthusiasm (not that they did not have this). But there were always some who saw through this seeming pose and recognized that in him were high-minded principles upon which there was no weakening; and these men were always in the higher ranks of thinking persons. In this I think he was like his father, for there are still some Guy's men of the 'nineties who have the same high opinion of Mr. J. N. C. Davies-Colley as men of the late 'twenties and 'thirties have of his son Robert. Bobby Colley was capable of great generousities and of small kindnesses, both of which he kept to himself, and of which, as a recipient, I have grateful memories.

W. ARTHUR YOUNG, M.B., D.T.M.&H.

Dr. W. Arthur Young, for many years Rockefeller professor of bacteriology at the King Edward VII College of Medicine, Singapore, died at his home at Westcott, near Dorking, on April 3, a little more than a fortnight before his 65th birthday.

William Arthur Young was born at Blackheath, London, on April 18, 1890, the second son of Mr. H. R. Young. From University College, London—where he graduated B.Sc., with honours, in 1911—he gained an entrance scholarship to Guy's Hospital Medical School, qualifying M.R.C.S., L.R.C.P. in 1914 and winning the Golding-Bird gold medal in bacteriology. He then entered the R.A.M.C. to serve in the first world war as medical officer in charge of a mobile laboratory with the British Expeditionary Force in France and later as director of the pathological department at the Royal Herbert Hospital, Woolwich. After the war he took the London degrees of M.B., B.S., and became pathologist to the Royal Chest Hospital, St. John's Hospital for Diseases of the Skin, and the Grosvenor Hospital for Women.

In 1927—the year in which he obtained the D.T.M.&H.—he was appointed Rockefeller professor of bacteriology at Singapore, becoming also curator of the Keith museum in the King Edward VII College of Medicine.

While at Singapore he devoted all his energies towards creating an efficient department of bacteriology, by training laboratory technicians and by raising the teaching of the students to a much higher standard in both practical and theoretical work. He also took immense pains to help his students solve their difficulties. His laboratory was excellently equipped and always in perfect order, and he was most scrupulous about the way the work of the laboratory was done. Although he carried out many investigations, he published very little; it seemed sometimes that the possibility that some unrecognized error might have influenced his results discouraged him from describing his work in print. He completely reorganized the Keith museum on modern lines and spent much time and hard work investigating the best methods of mounting specimens in the Tropics and in cataloguing exhibits for the benefit of students and visitors. During the second world war he served first in the Royal West Africa Frontier Force and later as lecturer and examiner in pathology at the Royal Army Medical College, Millbank, with the rank of major in the R.A.M.C. After the war he returned to Singapore and in 1946 gave great help in restoring the medical college after the Japanese occupation had virtually destroyed everything except the building. In 1948 he took up the appointment of director of medical laboratories, Western Australia, and retired to this country only last year. He is survived by his widow, formerly Miss Ina Heslop, and a son, who is lecturer in Slavonic studies at Cambridge, and a daughter, a teacher of physiology at St. Thomas's Hospital Medical School.—R. B. H.

R. H. SANKEY, B.M., F.F.R.

Dr. R. H. Sankey, honorary consulting radiologist to the Radcliffe Infirmary, died at his home at Oxford on April 6. He was in his 81st year.

Richard Harvey Sankey was born at Littlemore, Oxford, on June 11, 1874, the son of Dr. R. H. H. Sankey. From Radley College he entered Christ Church, Oxford, in 1893, and received his clinical training at St. Bartholomew's Hospital. He qualified M.R.C.S., L.R.C.P. in 1902 and two years later obtained the degrees of B.M., B.Ch. From 1903-4 he held house appointments at the Radcliffe Infirmary and then settled in general practice at Oxford, where his services were soon much in demand, for he achieved early in his career a reputation both as an obstetrician and as an anaesthetist. In 1908 he became public vaccinator for the city, holding the appointment until 1923, and from 1905 to 1909 he was clinical assistant at the Oxford Eye Hospital, becoming anaesthetist to the hospital in 1909.

Sankey will always be remembered as the pioneer of x-ray work in Oxford. In 1907 he was appointed the first radiologist to the Radcliffe Infirmary, where the x-ray department began in a very small hut. Later it extended to two small rooms. In the first world war he was radiologist, with the rank of captain in the R.A.M.C., to the military hospital established in the examination schools. After the war the work of the x-ray department increased, but not the allotted space, until, in 1933, he planned a new building which forms the present department. He intended to retire in 1939, but on the outbreak of the second world war he agreed to carry on his work, which he did until 1945. In addition to his appointment at the Radcliffe Infirmary, he was also consultant radiologist to Horton Infirmary, Banbury, and to the Oxford County and City Mental Hospital.

A very careful and conscientious worker, Sankey was much interested and particularly skillful in skin therapy, as well as in x-ray diagnosis. A very likable man, with a shy and retiring disposition, he was popular with his patients and very considerate to them. He was a long-standing member of the British Institute of Radiology, and in 1936 was awarded the Fellowship of the British Association of Radiologists, now merged in the Faculty of Radiologists. A past-president of the Oxford Medical Society, he served as president of the Section of Radiology when the British Medical Association held its Annual Meeting at Oxford in 1936.

For relaxation Sankey enjoyed shooting: he was also an expert designer and carpenter, and in the summer term he always liked to have a look at the cricket in the University Parks. His well-earned retirement was marred by severe arthritis, which in time prevented him from getting about. He had a host of friends who will treasure his memory, and their sympathy goes to his widow and two sons, one of whom is a doctor.—D. T. B.

Dr. P. S. MARTIN died at Weston-super-Mare on February 20 after a long illness. He was 69 years of age. Philip Stanley Martin was born on January 7, 1886, the son of Dr. E. F. Martin, who died in 1936, and the grandson of Dr. Edward Martin. He studied medicine at University College, London, and at University College Hospital Medical School, qualifying M.R.C.S., L.R.C.P. in 1909. After holding a number of appointments at University College Hospital and a clinical assistantship at The Hospital for Sick Children, he joined his father in practice at Weston-super-Mare in 1912. As a Territorial officer in the R.A.M.C. he was mobilized on the outbreak of the first world war and served in France and in Egypt, in the Dardanelles landings, and in Palestine, where he won the Military Cross at Beersheba in 1918. After the war he took over the practice at Weston-super-Mare, becoming the third generation of his family to practise in the town. He was appointed to the surgical staff of Weston General Hospital in 1919 and worked there until his retirement in 1952, being chiefly interested in orthopaedics. He was a keen supporter of the work of the St. John Ambulance Brigade, being an exceptionally good lecturer himself, and for some years held the post of county surgeon. For his services he was appointed a serving brother of the Venerable Order of St. John of Jerusalem. He was a great family man, and his hobbies included sailing and carpentry. A member of the British Medical Association for 44 years, he was chairman of the East Somerset Division in 1946-7. He will be remembered as an able and kindly doctor, and as one who was always ready to help a younger man. His son, Dr. L. T. Martin, succeeds him in general practice.

The death occurred on April 4 of Dr. A. T. WOOLWARD at his home at Bishopsteignton, South Devon, at the age of 64. Arthur Trevor Woolward was born at Totterhoe vicarage, near Dunstaple, on February 13, 1891, and was educated at Haileybury and at Caius College, Cambridge. His medical studies at the London Hospital were interrupted by combatant service in France during the first world war, when he was a lieutenant in the Royal Field Artillery from 1914-16. Returning to the London to finish his medical training, he qualified M.R.C.S., L.R.C.P. in 1917. He then entered the R.A.M.C. and was sent to Mesopotamia, returning home at the end of the war with the rank of captain. Dr. Woolward was resident medical officer at the old Baschurch Home for a time and moved with it to Gobowen, when it became known as the Shropshire Orthopaedic Hospital. In 1923 he returned to practise at Baschurch and afterwards moved to Colston Basset, Nottinghamshire. Ten years later he went back to Shropshire and

practised at Grinshill until 1946, when he retired owing to ill-health. In 1937-8 he was president of the Shropshire and Mid-Wales Branch of the British Medical Association. After the last war he lived at All Stretton, where he was chairman of the local Conservative Association for two years. In 1953 he moved to Devonshire, where it was hoped the milder climate would restore his health. He is survived by his widow, formerly Miss Hilda W. Hunt, of Baschurch, whom he married in 1915.

Dr. R. D. MOORE died on April 8 at Platt, Borough Green, Kent, where he had been living with his married daughter for the past two or three years. He was 88 years of age. Reginald Devereux Moore was born on June 5, 1866, and was educated at King Edward's School, Birmingham, and at St. Mary's Hospital, London, qualifying L.S.A. in 1894. After qualification he served as a ship surgeon on the South African run and then held the appointment of house-surgeon at the North Lonsdale Hospital, Barrow-in-Furness, before entering general practice at Stoney Stanton, near Hinckley, Leicestershire, in 1897. Three years later he moved to Churchdown, Gloucestershire, and there he remained for just over fifty years, some thirty-five of them in general practice. During the first world war he served in the R.A.M.C. and was in his 52nd year when, in 1918, he was awarded the Military Cross for "working continuously for eight days attending to the wounded at an advanced dressing station, often under shell fire. His organization of the work was excellent, and by his courage and cheerfulness he inspired all ranks with confidence, which assisted them materially in the performance of their duties." He was demobilized in 1919, by which time he had attained the rank of major, and returned to his beloved Churchdown, near Gloucester, and not far from his native Tewkesbury, to rejoin his partner, Dr. J. J. Foster. Later, they were joined by Dr. H. S. K. Lowry. The end of the first world war saw the establishment of a number of ex-Servicemen's organizations, and Dr. Moore was chiefly responsible for the foundation of the Churchdown and District United Services Club and was its joint honorary secretary for more than a quarter of a century. Similarly, he encouraged the formation of a local branch of the British Legion, being its president for many years, and for a time he was vice-president of the Legion's East Gloucestershire district. He was also an honorary life member of the British Red Cross Society and the first honorary treasurer of the Churchdown Nursing Association. He held the appointment, rare among rural practitioners, of honorary governor of St. Mary's, his old teaching hospital. He always followed the fortunes of the Gloucestershire Cricket Club with keen interest, particularly the performances of his nephew, Mr. D. N. Moore, the former Oxford captain, who also played for the county. A widower since 1930, Dr. Moore is survived by his younger son and a daughter, his elder son having been killed in action in Flanders in 1917.

Medico-Legal

DEATH FROM MERSALYL INJECTION

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

In October, 1951, Albert William Howse, a warehouse manager, aged 43, was in the Maida Vale Hospital for Nervous Diseases for myelographic x-ray investigation for unexplained attacks of sciatica. While there he was given an intrathecal injection of mersalyl in error for "myodil," a lipoid iodine compound. At that time such injections were given in the wards, but subsequently they have been given in the theatre. Both drugs were made up in small capsules.

Mr. Howse was unconscious for five days after the injection, was completely paralysed for some time, and remained in hospital until March, 1954, when he was discharged

paralysed below the waist, but able to get about on two sticks. His bowel control was not good, and he was always left with residual urine causing recurrent infection.

In October, 1954, he was readmitted and a left nephrectomy was performed for stones. Efforts to preserve his right kidney were successful until March, 1955. On March 29 he was readmitted with an acute uraemia and pyelonephritis, which did not respond to antibiotics, and of which he died.

At the inquest held at the St. Pancras Coroners' Court on April 6 Dr. Arnold Levene, pathologist of University College Hospital, who carried out the necropsy, gave evidence that death was due to the urinary infection following the paraplegia caused by the intrathecal mersalyl injection nearly three and a half years before.

A verdict of accidental death was returned accordingly.

Medical Notes in Parliament

THE SALK VACCINE IN BRITAIN

THE MINISTER OF HEALTH made a statement to Parliament on April 25 about British intentions for the manufacture, testing, and use of the Salk vaccine for poliomyelitis. He said the whole House would wish to congratulate Dr. Salk on what was clearly a momentous and historic advance in the protection of human well-being. The Health Department and the Medical Research Council had been in close touch with these developments in the United States.

For our part, he continued, we shall go ahead with the increased production of the new vaccine in this country. Two important firms were already arranging to do this as fast as possible, and it was the Government's intention to ask these firms to sell to the Government their whole output, and in due course a Supplementary Estimate will have to be submitted to the House for that purpose. No supplies, in any material quantity, were at present obtainable from the United States. Home production should assume really useful dimensions by the late autumn, and he was advised that in any case it would be medically unwise—even if it were possible—to embark on any large-scale vaccination during the peak season of the disease, which began to end about then.

This new vaccine involved inoculating our children at repeated intervals with a preparation derived from the kidneys of dead monkeys. The House and the country will surely agree that they must carry out intensive tests as to the exact effects so that they could eliminate any possible dangers from it. They were already doing this. They must also make sure that it was effective against the particular strains of the virus most commonly found in this country; indeed, it was not sure yet that it was fully effective in the case of children of about 4 or under, where the incidence of the disease was highest in Britain, and it seemed it might be less than normally effective against Type I of the virus, the commonest type over here. But these reservations did not affect their determination that the people of this country shall benefit from it to the fullest possible extent.

Mr. WALTER ELLIOT (Glasgow, Kelvingrove, Con.) said the whole House would support the decision to have this tested before embarking on large-scale treatment of children. Mr. MACLEOD said that the question of research was one for the Lord President of the Council. He understood that the Medical Research Council was carrying out trials in Southend, Manchester, Sheffield, Belfast, and Glasgow.

Mr. G. DARLING (Sheffield, Hillsborough, Lab.) asked if it was the Minister's view that research should be encouraged in this country to find a more suitable vaccine for our circumstances. Mr. MACLEOD said: "Certainly. This is an important and exciting discovery. It is not necessarily the end of the story. Many people think a killed virus will not prove the most effective. Research on that and other matters is going on."

Mr. H. MARQUAND (Middlesbrough, East, Lab.) said the Opposition would be ready to support a Supplementary Estimate in view of the fact that this was being kept under Government control. He asked if by late autumn the tests would have reached such a stage that inoculation could begin. Mr. MACLEOD said that pilot batches of the vaccine were already available. One would hope that testing would have been finished by autumn, and that substantial quantities of the vaccine—it was difficult to estimate, but perhaps between 500 and 1,000 l.—would be available by the end of the year.

Lady TWEEDSMUIR (Aberdeen, South, Con.) asked if British vaccine would be available for the Commonwealth. Mr. MACLEOD told her that even though supplies were small the House would wish that some of our resources should be sent to other parts of the Commonwealth if required, even if only pilot batches in the first instance.

Mr. SOMERVILLE HASTINGS (Barking, Lab.) asked why the Minister had decided that manufacture should be undertaken by two private firms instead of in national laboratories. Mr. MACLEOD said that he had not decided that. These two firms were going ahead, and it might be that other firms might take it up in due course. He could not think that the Ministry was centrally equipped to undertake the work.

Mr. R. FORT (Clitheroe, Con.) asked for an assurance that the programme would not be held up by a shortage of monkeys. Mr. MACLEOD replied that the major limiting factor for some time, unless a new medium could be discovered, might be a shortage of monkeys. They had taken action to make contact with the Government of India, and the M.R.C. had already sent representatives to Africa to study the possibility of further supplies from there.

Blood Tests for Motorists

Sir HUGH LUCAS-TOOTH, Under Secretary, Home Office, informed Mr. SOMERVILLE HASTINGS (Barking, Lab.) on April 21 that on no occasion last year did a motorist charged by the Metropolitan Police with being under the influence of drink while in charge of a car ask for a blood test. In one case samples of blood and urine were taken by a doctor called on behalf of a person who had been arrested for such an offence. Mr. HASTINGS suggested that this test, which had been largely used in other countries, might usefully be tried out here so that some idea could be obtained of its real value. At present its value seemed to be somewhat uncertain. Would the Minister make this test possible for those who applied for it? Sir HUGH LUCAS-TOOTH said that opinion about the value of blood tests was sharply divided.

Malaria Control in Hong Kong

Mr. LENNOX-BOYD, Secretary of State for the Colonies, replying to Mr. J. RANKIN (Glasgow, Tradeston, Lab.) on April 20, stated that there had been no reduction this year in the medical and health department estimates in Hong Kong. The total medical department estimates for 1955-6 showed an increase of 2m. dollars over 1954-5, and the malaria control vote showed an increase of 12,000 dollars. Mr. RANKIN asked that careful thought should be given to malaria control.

Lead Glazes in Pottery Making

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) asked the Minister of Education on April 21 whether he was aware that although raw lead glazes had been forbidden in the manufacture of pottery made in factories, and that specific restrictions applied to low-solubility glazes, there was no such control when pottery was made in schools or adult education classes. In view of the danger of lead-poisoning to teachers and children, he asked the Minister to ensure that all glazes should be of the leadless type. After 100 years of constant effort the pottery industry had

succeeded in getting rid of lead-poisoning. It seemed incredible that raw lead glazes and metallic poisons so dangerous to human beings should be creeping into schools and adult classes. Mr. D. VOSPER, the Parliamentary Secretary, said the Minister was grateful to Dr. Stross for bringing the question to his notice. He was looking into it.

Medical Attention in the Army

Mr. SOMERVILLE HASTINGS (Barking, Lab.) on April 19 asked the Secretary of State for War whether he was aware that on occasions non-commissioned officers refused to allow men in their charge to apply to a medical officer for examination or treatment; and what right of appeal the men had against such refusals. Mr. F. MACLEAN, the Under Secretary, replied that he was satisfied that, in general, no obstacle was put in the way of men wishing to report sick. Every soldier had a statutory right by s. 43 of the Army Act to make a complaint to his platoon or company commander in such a case.

Dentists' Remuneration

The MINISTER OF HEALTH stated on April 21 that he and the Secretary of State for Scotland, after a full investigation into earnings and practice expenses of dentists, had agreed with the British Dental Association on an increase in the present remuneration. The new scale would be designed to give dentists a net income comparable, having regard to the volume of work done, with what they would have received in the period covered by the investigation had the 10% reduction not then been in force. They had also agreed, as an interim measure while the new scale was being worked out, to cancel the 10% reduction in the present scale. It was estimated that the cost of these changes would be about £4.1m. in a full year.

Principals and Assistants

Miss PAT HORNSBY-SMITH, Parliamentary Secretary, Ministry of Health, informed Mr. SOMERVILLE HASTINGS (Barking, Lab.) on April 25 that on July 1 last year 19,300 general practitioners were practising in the Health Service. Altogether 837 doctors practised single-handed, and 614 partnerships employed assistants other than trainees.

Mr. HASTINGS asked whether, in view of the exploitation of assistants by general practitioners under the Health Service Act which had occurred in certain cases, the Minister would limit the increased number on a list to a maximum of 1,500 when an assistant was employed. Miss HORNSBY-SMITH replied "No." The relationship of principals and their assistants could not readily be regulated by statute. In any event the Minister did not think that reducing by 500 the number of additional patients a principal with an assistant might accept on his list would have the effect Mr. Hastings seemed to anticipate.

Mr. HASTINGS said that many doctors had great difficulty in getting the necessary capital to start in practice, and were therefore liable to be exploited by those who employed them as assistants. The figures that had been given showed there was some evidence of that. What was the Minister going to do about it? Miss HORNSBY-SMITH replied that the number had been decreasing, and was not now unduly high. The matter had been considered by the British Medical Association and the Medical Practitioners' Union, but the Ministry had had no decision from them.

Mr. H. A. MARQUAND (Middlesbrough, East, Lab.) said there had been a definite promise by the profession that they would seek to reduce the number of assistants and increase the number of principals. Was the Parliamentary Secretary satisfied that the profession was giving real co-operation? Miss HORNSBY-SMITH said she thought they were co-operating where they felt there was hardship. There had been an increase in partnerships, and a reduction in the number of those who had spent a long period as assistants. Mr. HASTINGS said the B.M.A. were by no means happy about the situation.

Miss HORNSBY-SMITH also told Mr. Hastings that information was not available about the number of doctors or partnerships who had employed the same assistant for five or more years; but on July 1 last year 131 assistants were still in posts which they had taken up before July 1, 1949. Mr. HASTINGS described this as a very serious matter. The figures showed that doctors might derive a good deal of benefit from paying assistants to go on year after year. Miss HORNSBY-SMITH replied that the matter must be kept in proportion. There were 1,504 assistants in July, 1954, and of that number 131 had been in their posts since 1949. On the other side 320 assistants were taken into partnership during last year, and there was a steady increase in the trend towards partnerships.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The following degrees were conferred in Congregation on March 5:

M.CHIR.—G. R. C. Peatfield.
M.B., B.CHIR.—G. Verbury, A. M. Freeman.
M.B.—Inez R. Aldous, R. J. C. Pearson, J. A. Dryden.

Professor O. L. Zangwill has been elected into a Professorial Fellowship of King's College.

In Congregation on March 19 the following degrees were conferred:

M.D.—J. R. Smythies, G. P. Blanshard, and R. Hodgkinson.
M.CHIR.—P. F. Boreham.

*By proxy.

UNIVERSITY OF LONDON

The degree of M.S. was awarded to D. J. Robertson on March 23. The degree of Ph.D. in the Faculty of Medicine was awarded to K. C. Basu Mallik on March 16 and to T. W. A. Glenister, M.B., B.S., and M. C. Lancaster on March 25.

UNIVERSITY OF BIRMINGHAM

Professor Solly Zuckerman, F.R.S., will represent the University at the sixth International Congress of Anatomy to be held in Paris in July, 1955.

The title of University Research Fellow in Anatomy has been given to Dr. A. B. Kar, of the Central Research Institute, Lucknow, and in Pathology to Dr. J. S. Howell, who is working for the Birmingham branch of the British Empire Cancer Campaign Committee, the title to be held during the tenure of their present posts.

Mr. A. J. H. Rains, Mr. P. G. Bevan, and Mr. G. Slaney have been appointed Lecturers in Surgery.

UNIVERSITY OF LIVERPOOL

Mr. C. H. de Boer has been appointed a part-time Assistant Lecturer in Clinical Obstetrics and Gynaecology.

UNIVERSITY OF LEEDS

The following candidates have been approved at the examinations indicated:

M.D.—R. Burwell (with distinction).
PH.D. IN MEDICINE.—R. S. Edmundson.
M.B., CH.B.—B. Dawson and M. S. Losowsky (both with second-class honours and distinction in surgery). J. D. Atwell, P. M. Binns, J. M. Challinor, Aileen A. R. Collinson, Patricia J. Corley, R. C. Cotton, A. D. Crew, D. W. Daly, D. De Souza, Jean McG. Exley, R. F. Folkes, Margaret E. Hall, B. McKibbin, Dorothy Mainwaring, D. B. Marshall, G. Mitchell, M. J. Oldroyd, J. F. Poppleton, Ethel A. Richardson, J. B. Richmond, June M. Roberts, Heather Sanderson, D. R. M. Stuart, P. H. Tattersall, C. M. Tonks, P. J. Truesdale, Evelyn Walker, Jean L. Ward, G. Warnes, D. A. Youdale.
DIPLOMA IN PUBLIC HEALTH.—R. Barnes, Mrs. Ruth M. Bowker, E. P. Griffiths, Diana J. Haiste, I. H. Lewis, J. P. Neylon, A. R. Robertson.
DIPLOMA IN PSYCHOLOGICAL MEDICINE.—H. Ellett-Brown, D. McC. MacGregor, A. H. Moyes, N. C. Surya, R. W. Whiteley.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

On April 1 the following candidates were admitted to the Licence of Medicine and Midwifery of the College: C. M. Bahemia, M. J. Doyle, J. B. Fanibunda, M. H. Heller, J. S. P. MacGill, Cecilia M. McMorrow, B. M. Rosovske, Muriel M. Tynan.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending April 9 (No. 14) and corresponding week 1954.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1955					1954				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria ..	5	0	0	0	3	12	0	3	0	0
Dysentery ..	1,454	97	330	17	10	1,554	230	399	3	6
Encephalitis, acute	4	0		0		7	0	0	0	
Enteric fever: Typhoid ..	4	0	0	0		6	2	0	0	0
Paratyphoid ..	13	0	2	0		10	0	4	0	0
Food-poisoning ..	186	14		1		107	16		1	
Infective enteritis or diarrhoea under 2 years ..				13	3				13	19
Measles*	26,833	3089	248	389	184	2,293	67	175	61	420
Meningococcal infection ..	30	5	17	1	2	43	3	12	3	3
Ophthalmia neonatorum ..	46	3	6	0		36	4	7	1	
Pneumonia†	872	70	170	21	17	516	29	220	4	1
Poliomyelitis, acute: Paralytic ..	3	1				7	0		0	
Non-paralytic ..	4	0	2	0		3	0		0	1
Puerperal fever‡	213	43	11	0		272	26	10	2	
Scarlet fever ..	665	29	71	51	12	1,374	76	157	35	43
Tuberculosis: Respiratory ..	613	80	130	33		787	80	110	39	
Non-respiratory ..	75	6	16	2		112	10	20	5	
Whooping-cough ..	1,310	75	96	40	45	2,462	102	432	46	23

DEATHS in Great Towns	1955					1954				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	1	0	0	0	0	0
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute		0			0		0			0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	8	0	3	1	0	5	1	1	0	1
Influenza ..	64	4	5	1	10	12	0	1	3	1
Measles ..		1	0	0	0			0	0	1
Meningococcal infection ..		1	0				0	0		
Pneumonia ..	395	45	38	18	13	203	22	27	9	8
Poliomyelitis, acute	1	0			0	0	0			0
Scarlet fever ..	0	0	0	0	0	0	0	0	0	0
Tuberculosis: Respiratory ..	75	7	12	0	3	96	12	13	0	8
Non-respiratory ..		0	1	0	0					1
Whooping-cough ..	3	0	0	0	1	3	0	1	0	0
Deaths 0-1 year ..	278	33	37	9	11	232	22	29	7	15
Deaths (excluding stillbirths) ..	6,468	825	701	133	200	5,517	758	669	127	186
LIVE BIRTHS ..	6,934	1053	879	236	263	7,663	1188	930	219	406
STILLBIRTHS ..	186	19	30			211	28	23		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenzal pneumonia.

‡ Includes puerperal pyrexia.

Vital Statistics

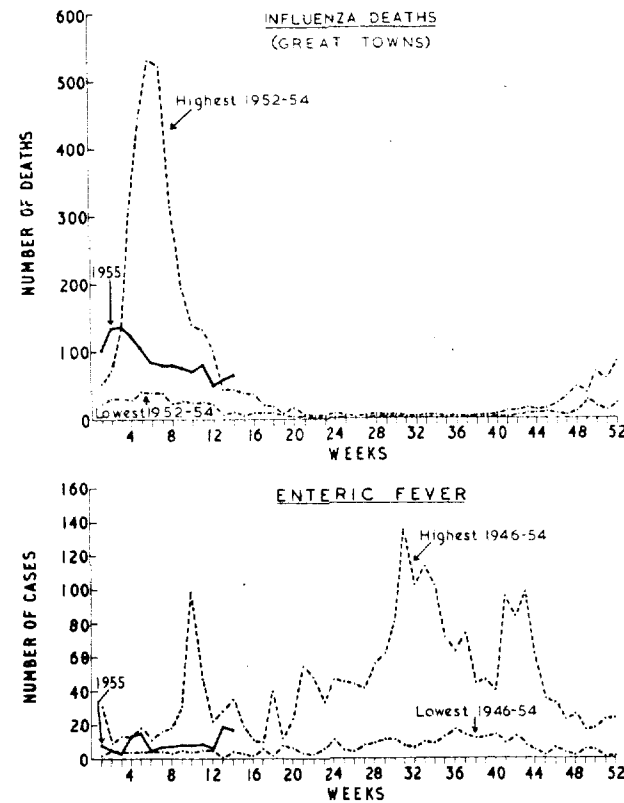
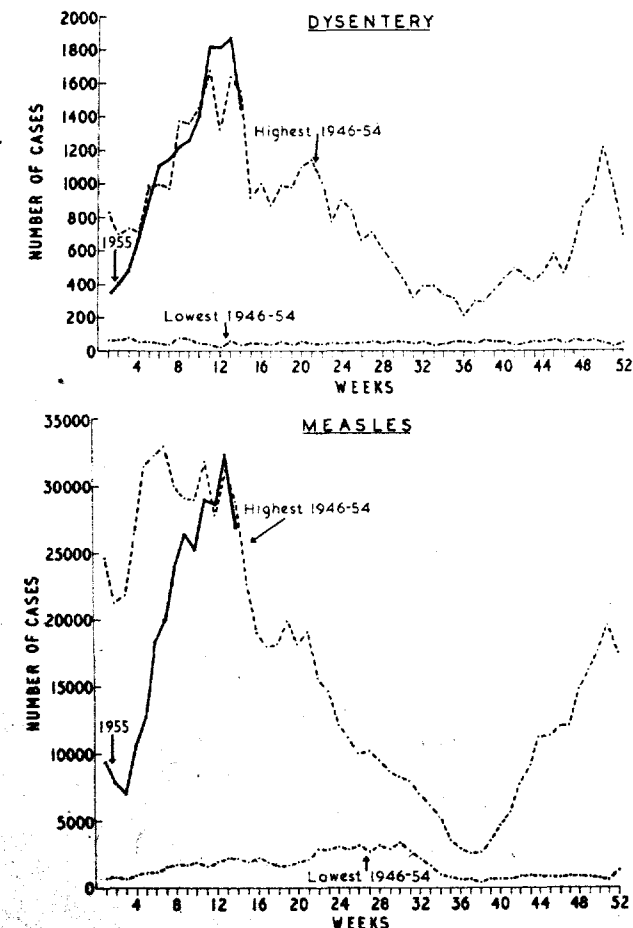
England and Wales in First Quarter

Deaths of children under 1 year of age numbered 4,824, giving a record low infant mortality rate for a March quarter of 29.0 per 1,000 related live births, compared with 31.0 in the first quarter of 1954 (the previous record). In 1938 the corresponding rate was 69.3. Live births numbered 169,361, giving a rate of 15.5 per 1,000 population. Comparable rates for the first quarters of 1954 and 1953 were 15.9 and 15.8. Deaths numbered 168,637, giving a rate of 15.4 per 1,000 population, compared with 14.0 in the first quarter of 1954 and 15.8 in the first quarter of 1953. 3,997 stillbirths were registered, giving a rate of 23.1 per 1,000 live and stillbirths, compared with 23.7 in the corresponding quarter of 1954. The rate for the first quarter of 1938 was 38.3.

Neonatal Mortality in 1954.—Deaths of infants aged under 4 weeks during 1954 numbered 11,944, giving a rate of 17.7 per 1,000 related live births. This is the same as in 1953 and is the lowest annual rate recorded.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the nine years 1946-54 (influenza, 1952-4) are shown thus ———, the figures for 1955 thus ———. Except for the curves showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

A large decline was recorded in the incidence of infectious diseases in England and Wales during the week ending April 9. The falls in the number of notifications included 5,491 for measles, from 32,324 to 26,833, 539 for whooping-cough, from 1,849 to 1,310, 415 for dysentery, from 1,869 to 1,454, 178 for acute pneumonia, from 1,050 to 872, and 157 for scarlet fever, from 822 to 665.

The largest falls in the incidence of measles were 1,014 in London, from 4,103 to 3,089, 551 in Lancashire, from 1,849 to 1,298, 468 in Essex, from 2,157 to 1,689, 375 in Kent, from 1,223 to 848, 339 in Surrey, from 1,291 to 952, 322 in Derbyshire, from 1,070 to 748, 308 in Yorkshire West Riding, from 4,115 to 3,807, 293 in Middlesex, from 1,998 to 1,705, 258 in Durham, from 998 to 740, 238 in Cheshire, from 812 to 574, 207 in Warwickshire, from 3,406 to 3,199, 201 in Northumberland, from 846 to 645. The only fall of any size in the trends of scarlet fever was 26 in Lancashire, from 119 to 93. The largest declines in the number of notifications of whooping-cough were 94 in Warwickshire, from 130 to 36, and 81 in London, from 156 to 75. 5 cases of diphtheria were notified, being 4 fewer than in the preceding week; 3 of these cases were notified in Liverpool C.B.

9 of the 13 cases of paratyphoid fever were notified in Lincolnshire (Sleaford U.D. 7, Bourne U.D. 2).

7 cases of acute poliomyelitis were notified, and these were 2 fewer for paralytic and 3 more for non-paralytic cases than in the preceding week. No area had more than one case.

The largest returns of dysentery were Lancashire 479 (Oldham C.B. 117, Manchester C.B. 62, Blackpool C.B. 55, Blackburn C.B. 37, St. Helens C.B. 29, Liverpool C.B. 28, Royton U.D. 22, Chadderton U.D. 21, Salford C.B. 18, Middleton M.B. 16, Lytham St. Anne's M.B. 10), Durham 224 (Easington R.D. 71, Seaham U.D. 54, Felling U.D. 25, Gateshead C.B. 23, South Shields C.B. 22), London 97 (Hackney 23, Shoreditch 23, Islington 17, Camberwell 11), Yorkshire West Riding 92 (Leeds C.B. 44, Huddersfield C.B. 14), Northumberland 90 (Bedlingtonshire U.D. 22, Newcastle-upon-Tyne C.B. 14, Blyth M.B. 13, Ashington U.D. 12,

Newburn U.D. 10), Leicestershire 60 (Leicester C.B. 49), Norfolk 52 (Norwich C.B. 27), Surrey 43 (Banstead U.D. 15, Woking U.D. 15), Yorkshire North Riding 39 (Middlesbrough C.B. 35), Cheshire 36 (Stockport C.B. 25), Warwickshire 34 (Nuneaton M.B. 30), Glamorganshire 23 (Cardiff C.B. 14, Swansea C.B. 9), and Middlesex 20.

Venereal Diseases

In England and Wales during the quarter ending December 31, 1954, 1,360 new cases of syphilis were reported as attending the clinics. Of these 187 were classified as primary, secondary, or latent in the first year of infection. 16 cases of congenital syphilis in children aged under 1 year were reported, and 141 cases in persons over that age. New cases of gonorrhoea numbered 4,419, of chancroid 75, and of non-gonococcal urethritis (males only), 3,374.—*Monthly Bulletin of the Ministry of Health*, April, 1955.

Week Ending April 16

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 597, whooping-cough 1,474, diphtheria 7, measles 32,969, acute pneumonia 804, acute poliomyelitis 20, dysentery 1,191, paratyphoid fever 2, and typhoid fever 2.

Medical News

British Trial of Poliomyelitis Vaccine.—As announced by the Minister of Health in Parliament this week (see p. 1099), there are now sufficient supplies of home-produced poliomyelitis vaccine for a small clinical trial of the vaccine to start in Britain. The centres will be London (St. George's Hospital Group and Southend), Manchester, Sheffield, Glasgow, and Belfast. The arrangements for the trial, due to begin next month, are local, but an M.R.C. committee is co-ordinating the work of the various centres. At each centre, it is understood, two batches of vaccine will be tested, each on 100 to 200 children between the ages of 1 and 12 years. The size of the trial is too small to allow a useful appraisal of the clinical protection afforded by the vaccines: the object is simply to study the antibody response to the three inoculations the children will receive. It is therefore important that those included in the trial should have little or no previous natural immunity to any of the three types of poliomyelitis virus. To check this, antibody titres will be estimated before any child is accepted for the trials; then, if little or no immunity is found, three injections of vaccine will be given, probably the second injection one week after the first, and the third four weeks after that. At the time of the second inoculation the antibody status will again be checked, and the final blood sample taken two weeks after the last inoculation. This will give the immediate antibody response to inoculation. It is possible that later studies of the antibody levels will also be made. Each centre is based on a virus laboratory. The speed and scope of the trials are likely to be governed partly by the availability of non-immune children, partly by vaccine supplies, and partly by the numbers of monkeys available to the laboratories. All parents will be fully informed about the trial beforehand, and only volunteers taken. In view of the nature of the trial no dummy vaccine will be needed for control purposes.

Association of British Pharmaceutical Industry.—The annual dinner was held at the Dorchester Hotel on April 20, and Sir RUSSELL BRAIN, President of the Royal College of Physicians, proposed the toast to the pharmaceutical industry. He spoke of the debt owed by the medical profession to the industry—for the magnificent research which all hoped would increase and prosper; for the day-to-day services provided for the medical profession; and for the kindnesses received by individual doctors and never-failing help to the profession as a whole. The pharma-

ceutical industry, he emphasized, had the full backing of the medical profession. Mr. J. F. BOUCHER, President of the Association of British Pharmaceutical Industry, proposing the health of the guests, paid a tribute to the research done in university departments and research institutes—work which helped to lay the foundations for new drugs. Referring to pharmaceutical exports, Mr. Boucher said the efforts of the industry were phenomenal considering its size: out of a total annual production worth £120m., no less than £33m. worth of drugs was exported. Replying to the toast, Professor A. ROBERTSON, President of the British Veterinary Association, spoke in lighter vein with overwhelming success.

British Association of Physical Medicine.—The annual dinner was held on April 22 at the Royal College of Surgeons, with Lord HORDER presiding. In proposing the main toast of the evening, Sir JOHN CHARLES, Chief Medical Officer to the Ministry of Health, spoke of the importance of physical medicine in helping to reduce the costs of medical care: it encouraged the patient's recovery and early return to work—for which there was reduced incentive these days. Rehabilitation should be an integral part of all medical practice. "The march of science has varied your armamentarium," Sir John concluded. "Every man is a potential claimant for your skill." Lord HORDER, in reply, emphasized that physical medicine should infiltrate the general practice of medicine much earlier and more deeply than hitherto—long before the point at which rehabilitation began. Physical medicine was not concerned only with certain residues in the population. The British Association of Physical Medicine should have the onus of determining the criteria on which consultant status in physical medicine should be based. Lord Horder added, "I think one of the criteria should be the diploma in physical medicine." Sir WILLIAM GILLIATT responded to Dr. HUGH BURT's genial speech of welcome to the guests, and made the point that specialists in different branches of medicine often knew all too little about the work of their colleagues in different fields. He recommended, particularly for the older man, a visit to a modern department of physical medicine so as to see the work in progress.

New Antibiotic.—A letter to *Nature* (April 23, p. 722) from Dr. A. T. FULLER of the National Institute for Medical Research, Mill Hill, reports the successful trial of a new antibiotic against haemolytic streptococcal infections in mice. The report says that larger quantities are now being prepared for therapeutic and chemical investigation. The antibiotic is derived from a spore-bearing bacillus isolated from soil from East Africa. It is non-toxic and inhibits *in vitro* the growth of *Staph. aureus*, *Pasteurella muriseptica*, and *Str. haemolyticus* (Group A) in dilutions, respectively, of 1 in 20, 1 in 50, and 1 in 18 millions.

Opening of Rheumatism Research Unit in Edinburgh.—On April 23 Commander T. D. GALBRAITH, Minister of State for Scotland, opened new buildings to extend the Rheumatic Diseases Research Unit, directed by Dr. J. J. R. DUTHIE, at the Northern General Hospital, Edinburgh. The cost of the buildings (£27,000) has been provided by the Nuffield Foundation from the Oliver Bird Fund, a fund of some £450,000 established by the gift of Captain Oliver Bird for research on the prevention and treatment of rheumatism. In addition, since 1949 the Nuffield Foundation has given £12,000 in grants from the Oliver Bird Fund to support the Unit, and has promised a further £38,000 to meet its running costs during the next five years. The new buildings, which are close to the existing rheumatism beds in the main hospital block, consist of two single-storied units linked by an all-glass entrance hall. They provide accommodation for six consulting-rooms, treatment rooms, laboratories, an animal house, offices, and a conference room. Captain OLIVER BIRD, who is himself severely crippled, was present at the opening ceremony, which was presided over by the chairman of the Managing Trustees of the Nuffield Foundation, the hon. GEOFFREY C. GIBBS.

U.K. Delegation to World Health Assembly.—The United Kingdom delegates and advisers to the eighth World Health Assembly, which opens in Mexico City on May 10, will be: Sir JOHN CHARLES, Chief Medical Officer, Ministry of Health; Sir ERIC PRIDIE, Chief Medical Officer, Colonial Office; Mr. W. H. BOUCHER, Ministry of Health; Mr. J. F. HUNT, Ministry of Health; Dr. M. T. MORGAN, Ministry of Transport and Civil Aviation; Mr. A. E. JOLL, General Register Office; Mr. H. T. MORGAN, H.M. Embassy, Mexico City; Dr. A. A. PEAT, Director of Medical Services, Trinidad; and Dr. J. W. P. HARKNESS, Medical Adviser to the Development and Welfare Organization, West Indies.

Central Midwives Board.—On April 1 a new Board took office for the three-year period until March 31, 1958. At the first meeting, on April 14, Mr. ARNOLD WALKER was elected chairman and Professor A. A. MONCRIEFF deputy chairman. The members of the new Board are: Miss G. M. GODDEN, Dr. I. G. INNES, Mr. G. T. MILNE, Dr. J. A. SCOTT, Miss V. R. SHAND, and Mr. ARNOLD WALKER (appointed by the Ministry of Health); Professor A. A. MONCRIEFF (appointed by the Royal College of Physicians); Professor A. M. CLAYE (appointed by the Royal College of Surgeons); Mr. VICTOR LACK (appointed by the Royal College of Obstetricians and Gynaecologists); Dr. JEAN MACKINTOSH (appointed by the Society of Medical Officers of Health); Miss E. K. BALLY, Miss M. I. FARRER, Miss E. J. MERRY, and Miss M. WILLIAMS (appointed by the Royal College of Midwives); Dr. A. ELLIOTT (appointed by the County Councils Association); and Professor F. E. TYLECOTE (appointed by the Association of Municipal Corporations).

Conference on Psychosomatic Research.—The first European Conference on Psychosomatic Research was held at the Maudsley Hospital on April 22 and 23. Workers from Belgium, Denmark, Finland, France, the Netherlands, Portugal, Spain, Germany, and the United Kingdom attended. It was decided to hold a further meeting in 1956 in Amsterdam. Details of the programme will be announced later.

Honorary Degrees at Glasgow.—At the Commemoration Day celebration on June 21 the honorary degree of LL.D. will be conferred on Dr. R. A. LENNIE, formerly Regius Professor of Midwifery at Glasgow University, and on Professor R. T. LEIPER, F.R.S., Professor Emeritus of Helminthology, London University.

Consultant Pathologist to the Army.—Professor R. J. V. PULVERTAFT, professor of clinical pathology at Westminster Hospital Medical School, has succeeded Professor GEOFFREY HADFIELD as honorary consultant in pathology to the Army at Home.

"Family Doctor."—The May issue, which includes an article by Dr. F. H. K. GREEN on the work of the Medical Research Council, is now available. Among the medical subjects discussed are "Anxiety" (Dr. F. R. C. CASSON) and "Caesarean Births" (Professor J. C. McCLEURE BROWNE).

COMING EVENTS

Institute of Dermatology.—Exhibition on "Cutaneous Reactions Associated with Visceral Malignancy," May 5–25.

Royal Society of Medicine.—150th anniversary dinner at the Dorchester Hotel, London, on June 7. Single ticket 45s. (excluding wines).

Royal Free Hospital Ball.—On June 10 at the Park Lane Hotel, London. Double tickets (including refreshments) £2 15s.

Croonian Lecture.—Professor C. H. BEST, F.R.S., of Toronto University, will deliver this year's Croonian Lecture to the Royal Society, London, on June 16. His subject is "Dietary Factors in the Protection of the Liver, Kidneys, Heart, and Other Organs in Experimental Animals—the Lipotropic Agents."

SOCIETIES AND LECTURES

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

Saturday, April 30

ASSOCIATION OF CLINICAL BIOCHEMISTS (SOUTHERN REGION).—At Radcliffe Infirmary, Oxford, 2 p.m., meeting. Scientific papers.

Monday, May 2

EDINBURGH UNIVERSITY.—At West Lecture Theatre, University New Buildings, 5 p.m., Dr. D. J. Guthrie: Magic, Witchcraft, and Medicine.

Tuesday, May 3

INSTITUTE OF CHILD HEALTH.—5 p.m., Dr. Bronson Crothers (Boston, Mass.): Methods of Neurological Appraisal in Childhood.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. F. R. Bettley: Eczema-Asthma Syndrome.

OXFORD UNIVERSITY MEDICAL SOCIETY.—At Radcliffe Infirmary, Oxford, 8.15 p.m., Dr. J. Tarsh: The Negligent Doctor.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Croonian Lecture by Sir Horace Evans: Significance of Certain Symptoms and Signs in Disease of the Kidneys.

UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, W.C., 5.15 p.m., Cushny Memorial Lecture by Dr. M. Grace Eggleston: Tubular Reabsorption and Secretion.
WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Mr. I. R. McCaul: Intracranial Aneurysm.

WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY.—5 p.m., Altmouth Wright Lecture by Sir Zachary Cope: Some Peculiarities of the Clinical Pathology of Actinomyces.

Wednesday, May 4

EUGENICS SOCIETY.—At 26, Portland Place, W., 5 p.m., Galfon Lecture by Sir Cyril Burt, D.Sc.: Meaning and Assessment of Intelligence.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Disinfection and Sterilization.

OXFORD UNIVERSITY.—At Radcliffe Infirmary, 5 p.m., Litchfield Lecture by Professor B. G. Macgregor: On the Importance of Having a Circulation.

ST. MARKLEBONE HOSPITAL FOR PSYCHIATRY AND CHILD GUIDANCE.—5.30 p.m., Dr. Colman Kenton: Management of the Psychiatric Emergency.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., lecture-demonstration in psychiatry by Dr. J. A. Hobson.

Thursday, May 5

● FACULTY OF HOMOEOPATHY.—At the Barnes Hall, Royal Society of Medicine, 3 p.m., Hahnemann's 200th Birthday Celebration. Oration by Dr. F. H. Bodman: Hahnemann and His Patients; Dr. T. D. Ross: Homoeopathy's Heritage and Outlook To-day.

HONYMAN GILLESPIE LECTURE.—At University New Buildings, Edinburgh, 5 p.m., Mr. E. L. Farquharson: Early Ambulation and its Contribution to Surgery.

INSTITUTE OF NEUROLOGY.—5 p.m., Dr. Bronson Crothers (U.S.A.): Adaptation of the Patient and the Family in Cases with Severe Extrapyramidal Disturbance in Cerebral Palsy.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Croonian Lecture by Sir Horace Evans: Significance of Certain Symptoms and Signs in Disease of the Kidneys.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.30 p.m., Otolaryngology Lecture by Sir Clement Price Thomas: Some Aspects of Suppurative Disease of the Lungs.

ST. ANDREW'S UNIVERSITY.—At Physiology Department, Medical School, Small's Wynd, Dundee, 5 p.m., Dr. A. H. T. Robb-Smith: Extracellular Tissue in Health and Disease.

Friday, May 6

● INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. R. T. Brain: Skin Diseases in Children.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Dr. J. G. Scadding.

NEWCASTLE REGIONAL CHEST SURGERY CENTRE.—At New Lecture Theatre, Royal Victoria Infirmary, Newcastle-upon-Tyne, 5.30 p.m., 15th Rutherford Morison Lecture by Professor C. Crafoord (Stockholm): Diagnosis and Surgical Treatment of Inter-Atrial Septal Defects. (Illustrated by a film.)

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Dr. Reginald Lightwood: Care of the Premature Baby.

UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, W.C., 5.15 p.m., Cushny Memorial Lecture by Professor F. R. Winton: Physical Factors Affecting Renal Function.

Saturday, May 7

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—12 noon, special lecture by Professor Fritz Zöllner: Diagnosis and Treatment of Tympano-sclerosis.

WEST MIDLANDS PHYSICIANS ASSOCIATION.—At Warneford General Hospital, Leamington Spa, 11 a.m., spring meeting.

Sunday, May 8

SIGERIST SOCIETY.—At 45, Russell Square, W.C., 3 p.m., debate between Dr. Stephen Taylor and Dr. Hugh Faulkner: Health Centres and the Future of General Practice.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Crawford.—On April 8, 1955, to Jeanne, wife of Dr. I. B. Crawford, a brother for Belinda Jane—Steven Andrew.

Dunn.—On April 18, 1955, at Birmingham Maternity Hospital, to Sylvia (formerly Matheson), M.B., B.S., wife of Andrew Dunn, L.D.S., Flight Lieutenant, R.A.F., a daughter—Ailsa Margaret.

Hetherington.—On April 17, 1955, at St. Mary's Hospital, Manchester, to Pamela Marjorie (formerly Baird) and Dr. Harold Dudley Grindley Hetherington, a son—Hugh Vincent Grindley.

McEwen.—On April 18, 1955, at Redlands Hospital, Glasgow, to Dr. Jean (formerly Mann), wife of Dr. Malcolm McEwen, twin sisters for Alasdair—Fiona and Morna.

Tasker.—On April 14, 1955, at Northampton, to Anita, wife of Dr. J. R. Tasker, a daughter.

DEATHS

Moore.—On April 8, 1955, at Pigeons Green, Platt, Borough Green, Kent, Reginald Devereux Moore, M.C., L.S.A., L.M.S.S.A., formerly of Churchdown, Cheltenham, Glos, aged 88.

Any Questions ?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Appendicitis at Sea

Q.—How should a single-handed ship surgeon deal with acute appendicitis?

A.—The management of appendicitis by a single-handed ship surgeon would depend very much upon circumstances—for example, if the ship is in port, or if there is a surgeon among the ship's passengers, it would be easy for him to arrange an immediate consultation or operation. A decision to treat appendicitis conservatively in the first 48 hours of the disease must always involve some risk that the peritonitis will spread. This risk is commonly, and I think correctly, regarded as greater in children, undernourished adults, and old people than it is in healthy adults. An age limit below which the risk is prohibitive cannot be stated. In every case the risk of operation performed by an unskilled single-handed practitioner.

The question suggests that the ship is some distance from port, and that professional help is not available. Under such circumstances the patient should be kept propped up in bed, without food or fluid by the mouth, and should be given repeated small doses of morphine—1/6 gr. (10 mg.) four hourly for a previously healthy adult. Morphine may be used in the conservative method of treatment at any age provided the dose is carefully regulated, the most important evidence of over-dosage being slowing of the respiratory rate. Between the ages of 1 and 3 years the dose of morphine sulphate is from 1/48–1/24 gr. (1–2.5 mg.); between 3 and 6 years 1/24–1/12 gr. (2.5–5 mg.); between 6 and 12 years 1/12–1/6 gr. (5–10 mg.). Water should be administered by rectal drip, a small quantity of salt (to make a solution of 0.18% NaCl) being added if the patient is sweating; by this method he may be kept sufficiently hydrated until signs and symptoms indicate that feeding may be commenced by the mouth. Though I do not regard antibiotics as an essential element in the conservative regime, intramuscular injections of penicillin and streptomycin are generally regarded as being of value in combating such an intestinal infection, and could be given during the period when nothing is allowed by the mouth.

Under this treatment the attack is likely to subside completely; or an abscess may form in the neighbourhood of the appendix which may rupture into the bowel, or may require simple drainage. On most voyages this operation can be delayed till port is reached, but if it became a matter of necessity it could be undertaken with very little skilled assistance.

Toxic Dose of Methylpentynol

Q.—A patient is to my knowledge obtaining seventy-five 250-mg. capsules of methylpentynol a week. What are the immediate and long-term dangers of excessive dosage? Does addiction occur? What control is there over the dispensing of the drug?

A.—The patient is obtaining a total of 18.75 g. of methylpentynol a week, and therefore takes from 2.5 to 3 g. each day. Doses up to 2 g. a day have been taken for long periods without harm, but doses above 4 g. daily may be toxic, and 10 g. a day has caused severe poisoning. In one case death may have been caused by an amount between 4 and 6 g.

Toxic symptoms disappear completely within 48 hours after discontinuing the drug. May and Ebaugh¹ say that the total dose in 24 hours should be kept below 5 g., and

that toxic effects are likely to develop if doses between 5 and 6 g. are given for more than two or three days.

The Council of the Pharmaceutical Society has advised pharmacists not to supply methylpentynol without a doctor's prescription (July 31, 1954), but a recent letter to the medical press² states that the drug is still widely used without a prescription. Neurotic patients and alcoholics often take excessive amounts which produce a confused and highly emotional state with slurring of speech and ataxic gait, but there is no evidence of true addiction. In a case described by Schaffarzick and Brown³ methylpentynol was given as an anticonvulsant in epilepsy for six weeks; this resulted in impaired liver function as shown by a positive cephalin flocculation test.

REFERENCES

- ¹ Amer. J. Psychiat., 1953, 109, 887.
- ² Lancet, 1955, 1, 308.
- ³ Science, 1942, 116, 663.

Mumps in Early Pregnancy

Q.—What increased risk is there of a deformed or blind baby following mumps in the early months of pregnancy? What is the generally accepted attitude to-day towards termination of pregnancy in such a case?

A.—Foetal malformation, abortion, intrauterine death, and premature labour are ascribed to mumps as well as to other virus diseases, provided they occur within the first 12 weeks of pregnancy. The situation in regard to rubella is fairly well established and is not considered here. In regard to other virus infections the number of cases in individual reports is small and the evidence is not of statistical significance. A review of the literature on this subject was published by B. M. Kaye, D. C. Rösner, and I. F. Stein,¹ and they concluded that there is a 20% risk of foetal malformation among mothers contracting virus diseases other than rubella in the first trimester of pregnancy. When they considered mumps alone the risk was similar. So far as this country is concerned there is as yet no evidence which permits a firm conclusion that mumps is a cause of foetal malformation.

Even if it is believed that mumps can impair foetal development it still remains doubtful whether it constitutes an indication for therapeutic abortion. As the law stands in this country abortion is not justified in the interests of the foetus, but only in the interests of the mother. There might be an indication if the expectation of foetal malformation were so high as to cause the mother such anxiety as to threaten her health, but each case would have to be judged separately.

REFERENCE

- ¹ Amer. J. Obstet. Gynec., 1953, 65, 109.

Myoclonus on Falling Asleep

Q.—What is the likely cause, significance, and treatment in a woman of 55 of kicking and twitching movements of the legs on falling asleep? They go on for half an hour to an hour. There have been no painful cramps in the legs. Treatment with sodium phenobarbitone 1 gr. (65 mg.) at night has not been very successful in controlling them.

A.—The condition of myoclonus occurring as a person is falling asleep is one of the hypnagogic experiences that are common in normal people. These may also take the form of visual or auditory hallucinations, and the experience may sometimes be multisensorial, so that a loud bang is both heard and felt. These phenomena usually occur only once and then the person falls asleep. At times, and particularly during stress or as an accompaniment of a neurosis, they may be repetitive and totally prevent sleep.

These disturbances of the central nervous system are not epileptic in nature but fall into the group of disorders of which narcolepsy, cataplexy, and sleep paralysis are components. They are most difficult to treat apart from the relief of the overlying nervous state, and I usually give a large dose of a short-acting barbiturate half an hour before the patient intends to retire so that sleep rapidly supervenes. Once the patient is asleep, he is safe from the myoclonus.

Sulphone Poisoning

Q.—What are the symptoms of poisoning by swallowing an overdose of one of the sulphone group of drugs? Is there any specific antidote? Apart from the usual emergency measures of giving emetics and gastric lavage, what should be the general treatment of such a case?

A.—The symptoms of sulphone toxæmia are varied. The chief toxic effects are anaemia, dermatitis, hepatitis, and psychosis.

Anaemia is detected in the usual way, but it must be remembered that the anaemia which is produced by sulphone therapy, particularly by the oral administration of the tablets, may be very sudden, and therefore if the weekly dose is above 800 mg. a week regular haemoglobin estimations should be done at least every fortnight. With lower doses this is not so necessary. In any case it is wise to combine oral sulphone with iron in some form or other and also with a preparation of vitamin B complex. If anaemia is severe, sulphone therapy must be stopped at once. If it is not severe and there is only a comparatively small drop in the haemoglobin index, the sulphone doses should be reduced and iron and vitamin B complex should be supplemented.

Dermatitis starts as a general itchiness of the skin, followed by a slight scaling. Sometimes there are rashes which are usually papular. If this is not noticed the condition may go on to an exfoliative dermatitis and the patient becomes seriously ill and his life endangered. On any symptom of itchiness or irritation of the skin, particularly if there is any observable lesion noticed, sulphone should be stopped at once and antihistamines given. In very severe dermatitis, where the patient's life is in balance, cortisone has been a life-saving measure, but this must be used very cautiously and with due consideration to all the other factors.

The first symptom of hepatitis is usually that the patient feels unwell and is unable to take his food. There is also nausea. If the hepatitis goes on to the more severe forms, urobilin appears in the urine and there may be liver tenderness and actual jaundice. The remedy is to stop sulphones at once and treat as for any acute hepatitis due to a toxin.

Psychosis is not common, but it starts with sleeplessness, and if a patient who is taking sulphone is complaining of sleeplessness then sulphones should be stopped and sedatives given.

Once there have been any manifestations of a severe toxæmia due to sulphone therapy D.D.S. orally should be stopped, and personally I prefer the patient to receive a 50% solution of solapson ("sulphetron") parenterally, starting at 0.25 ml. once a fortnight and increasing by 0.25 ml. each fortnight until 1 ml. a fortnight is reached. Then increase by 1 ml. at monthly intervals until 3 ml. twice a week is given. Solapson should not be given by mouth, as it is expensive and is only broken down to the parent substance. Solapson when injected as the 50% solution is broken down to a mono-substituted sulphone, and therefore is not so toxic as the mother substance.

There is no antidote for sulphone poisoning so far as I know. It should be treated on general lines with eliminative treatment and stoppage of the drug. The golden rule in sulphone therapy is to remember to start at a very low dose and increase very gradually. The optimum dose is about 400 mg. twice a week, and ordinarily should not be exceeded.

Effects of Prolonged Thyroid Administration

Q.—I often find that depressed elderly women are helped by small regular doses of thyroid. How rapidly is thyroid metabolized in the body? Is there any danger of depressing pituitary thyrotrophic activity after prolonged dosage, with consequent rebound phenomena on withdrawing treatment?

A.—The duration of action of a single dose of thyroid hormone occupies a period of 50 to 70 days, this being the

time taken for the metabolism and complete elimination of the hormone. Since the patients in question are benefited by small doses of thyroid, it may be concluded that they are slightly hypothyroid. The small doses given will therefore replace the amount in which they are deficient, bringing the blood thyroxine up to the normal level. This will cause depression of pituitary thyrotrophic activity to normal limits, for prior to the administration of thyroid the secretion of thyrotrophin would have been somewhat increased as a result of the lowered blood level of thyroxine. If too large a dose of thyroid is given abnormal depression of thyrotrophic secretion will take place and the patient's thyroid gland will produce correspondingly less thyroid hormone. In these circumstances sudden withdrawal of thyroid after a prolonged period of administration will result in a temporary increase in the hypothyroidism.

Risk of Fire During Oxygen Therapy

Q.—Is there any danger of explosion or fire when oxygen is administered by means of the usual sort of equipment to a patient at his home or in a hospital ward?

A.—Oxygen itself does not burn, but in its presence any inflammable object burns more readily and with more vigour. Oxygen therapy should therefore not be conducted in the presence of any source of ignition. Smoking, open fires, gas rings, and so forth should all be prohibited in a room where oxygen therapy is being administered. A spark from a cigarette or fire, in the presence of oxygen, might easily set fire to bedclothes or to the material of an oxygen tent. It is a wise precaution to exhibit a notice, such as "Danger—Fire. Smoking Forbidden," in the vicinity of a patient receiving oxygen therapy.

NOTES AND COMMENTS

Prognosis and Treatment of Asthma in Children.—Mr. T. S. ALLEN (Hove) writes: In answering this question ("Any Questions?" March 26, p. 801) your expert did not comment upon one very important point in the history: this child had whooping-cough at the age of 2. He should certainly be seen by an otolaryngologist, since chronic tonsil sepsis is an almost invariable legacy of whooping-cough in early life.

OUR EXPERT writes: Although it is not my experience that there is an invariable relationship between whooping-cough and tonsil sepsis in early life, the answer included the suggestion (to a doctor regarding his son) that "the advice of an ear, nose, and throat specialist might be obtained." The role of whooping-cough as a causative factor in asthma has long been the subject of conjecture and controversy. In a study of 250 asthmatics and 250 controls the writer (with colleagues) found a previous history of whooping-cough in 80 (32%) of the asthmatics and 73 (29%) of the controls. The controls were matched for age and sex and were questioned regarding illnesses they had experienced before the date of onset of asthma for the patient with whom each was matched. There appears to be no significant difference.

Correction.—Dr. Jonas E. Salk and his staff developed the poliomyelitis vaccine at the University of Pittsburgh, not Michigan (*Journal*, April 23, p. 1016).

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BRITISH MEDICAL JOURNAL

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SOME PROBLEMS IN THE STUDY OF CANCER IN MAN

BY

Sir ERNEST KENNAWAY, D.M., D.Sc., F.R.C.P., F.R.S.

From the Department of Pathology, St. Bartholomew's Hospital, London

Cancer research is now unavoidably divided into two sections: (a) *fundamental*, which looks for an answer to the question "Why, and how, does a cell divide?"; and (b) *empirical*, which seeks to identify carcinogenic factors which we can avoid. The first of these has passed wholly into the field of physics and chemistry and requires the most refined methods, both technical and theoretical, of those subjects. To many persons, distressed by the mortality from cancer, progress may seem very slow, but they should remember that the full application of biophysics to the problem is of very recent growth, and that whole areas of knowledge which we do not yet possess may be required for success. No doubt Wellington could have saved a great number of British lives at Waterloo by the discreet use of an atomic bomb of very modest dimensions before the armies engaged, but the requisite technique simply did not exist.

The present paper brings together some of those questions in purely empirical cancer research which seem to be ready for further inquiry. However anxious we may be to simplify the problem of cancer, we must recognize that it is inherently complex because the animal body itself is complex. Even when a reasonably satisfactory answer can be given to the fundamental question "Why, and how, does a cell divide?" the application of this knowledge to the very peculiar distribution of cancer by sex and organ must present many problems.

Cancer of the Cervix and Circumcision

The view is now advocated that the association between cancer of the cervix and non-circumcision of the male (Wynder *et al.*, 1954; Wynder, 1955) is due to transference of carcinogenic smegma in the act of intercourse, a process which would be identical in nature with a mouse-painting experiment. Whatever one may think of the likelihood of this explanation, it certainly offers a remarkable instance of the specificity of carcinogens for different tissues. In England and Wales in 1945 there were 4,039 deaths attributed to cancer of the uterus other than of the corpus; if any large fraction of these was due to application of smegma it is remarkable that in the males, where the contact of this material with the epithelium is intimate and continuous, there were only 132 deaths from cancer of the penis, though some other cases may have been cured by surgery.

A causal connexion between cancer of the cervix and non-circumcision was suggested first by W. Sampson Handley (1936), who wrote of "marital infection with the sub-preputial flora" and seemed to think of this factor as sufficient in itself and as already proved. Such certainty is quite unwarranted, because we do not know (1) that the

vaginal flora is in fact altered, although this question is quite accessible to investigation; or (2) whether any such alteration is pro- or anti-carcinogenic.

The use of a condom protects the cervix from any transfer of carcinogenic material from the male more effectually than does any other method, and in theory provides the ideal experiment for settling this question, but actually it is difficult to ascertain the constancy of the practice over a number of years.

Cancer of the Cervix in Jewish Women

The low incidence of cancer of the cervix in Jewish women is established by a number of investigations. The literature up to 1947 was summarized (Kennaway, 1948) and much confirmatory material has been published since then (Wynder *et al.*, 1954).

Various possible explanations have been suggested, of which one is the Jewish law relating to menstruation. A section (Niddah) of the Talmud, consisting of 10 chapters, forbids coitus during the flow, and for not less than five days, and for seven days afterwards, hence the whole period of abstention is $n+7$ days and n is never less than 5. Under normal conditions, abstention for 12 days would allow resumption near the time of ovulation, of which process those who laid down this rule of course knew nothing (for further details see Kennaway, 1948).

To assume that the law of Niddah is, for all practical purposes, obsolete, is easy, and this solution of the question is often put forward and sometimes seems to be welcome. But such matters of purely private conduct need very careful inquiry. The lack of any adequate investigation from Jewish sources is perhaps not very surprising. To the orthodox believer all such laws are the direct expression of God's wisdom, and human approval or disapproval of them is wholly irrelevant, while to one of the modern school they are elements of a primitive religion with which he may not wish to be associated. But any attempt to gain from this source more knowledge is surely in no way inconsistent with the belief that the practice is of Divine institution. All recent work upon cancer of the cervix (the literature is reviewed by Wynder *et al.*, 1954) indicates that marriage, apart from child-bearing, and especially early marriage, increases the liability, while the celibate life of nuns (Gagnon, 1950) gives protection. By "marriage" in this sense one means, not any civil or religious state, but coitus. Between these two extreme conditions of early marriage and virginity there is surely the bare possibility that the partial abstention enjoined by the law of Niddah gives partial immunity. At any rate, the question is worth investigation; and why can it not be settled one way or the other in the next year or two?

Any idea that the law of Niddah is now an almost forgotten matter, of merely antiquarian interest, is simply

untrue. In London, at any rate, a Jewish girl whose engagement is announced in the Press receives from one or other of certain Jewish societies a simple, practical, and forcible statement of the law, and often this is her first acquaintance with it. How far these instructions are obeyed is of course another matter altogether, but those to whom they are of most concern cannot be ignorant of them even here at the present day.

There are at least two methods of investigating this question—namely, to ascertain (1) the proportion of women who obey any part of the relevant law in a Jewish community in which the incidence of cancer of the cervix can be ascertained, but the inquiry about obedience to the law must be a genuine one, not mixed up with any assumptions or general impressions; (2) the personal history of any Jewish woman who develops cancer of the cervix. This would appear to be the simplest and quickest method of approach, because the results in, say, a dozen cases might show whether this line was worth following, although such a number would be considered quite inadequate statistically. This method has been applied by Wynder *et al.* (1954), who obtained the following result (Table I).

TABLE I.—Observance of Talmudic Law in 20 Cases of Cancer of the Cervix in Jewish Women (Wynder *et al.*)

	Days' Abstinence after Menses
Class A: In 10 women	0
" B: " 5 "	5, 4, 3, 3, 2
" C: " 5 "	7

One may suggest that the value of these 20 cases as evidence is not uniform. Of the 10 women who practised no abstinence, 7 had intercourse with more than one partner, and hence one can believe that they were not scrupulous in obeying any part of the Talmudic law; whether the statements of the 5 women of Class C, that they observed the seven-days rule, are equally convincing, may be a matter of opinion. All the women in C and 3 of the 5 in Class B had one partner only. Wynder *et al.* (1954) ignore this aspect of the matter altogether and discuss only the data relating to age and circumcision, while Wynder (1955), in his most recent paper, says, without quoting any tabulated data, "Twenty Jewish cervical cancer cases do not suffice for statistical comparison, but they seem to be in line with the controls. Five of the 20 patients in this group did not abstain after menses." He does not explain the reduction from 10 to 5 of the non-abstaining cases. The relevant passage in his summary, "The abstinence period practised by orthodox Jewish women after the end of menses is not believed to be the basic factor accounting for the low incidence of cervical cancer among Jewish women," does not encourage further investigation.

Table I certainly indicates that further inquiry is very desirable. After all, one may not get a quite clear-cut result because all cases of cancer of the cervix may not have the same cause, just as all cases of cancer of the lung are not due to smoking. In any case, this one series of 20 cases cannot be held to settle the matter, and material for further inquiry must be available in Jewish practice in London. In both inquiries, (1) and (2) above, the truthfulness of the replies is, of course, vital, and it is therefore all-important that the women should not regard the questions as a moral inquisition. Probably the best interviewer would be a Jewish woman doctor.

Cancer of the Lung in Non-smokers

This process is of great importance as the background upon which the effects of smoking are superimposed. The number of deaths in both sexes attributed to cancer of the lung in England and Wales annually is now about 15,000. Doll (1953) considers that about one-fifth of these deaths—that is, about 3,000—are not due to tobacco. The consumption of tobacco, especially in the form of cigarettes, has increased considerably in the last 30 years, and hence any form of cancer due to smoking would be expected to

increase also at some later period. We do not know the cause, or causes, of the 3,000 cases independent of tobacco, and therefore we have no reason to think that this factor has increased. Even if it has increased, it is extremely unlikely that it has done so in close parallelism to the increase in the consumption of tobacco. As we know nothing to the contrary, we may assume for the moment that this factor has not altered in, say, the last 30 years.

If this were so, the unknown factor would have produced about 3,000 cases every year during this period. But as recently as 1935, when the number of deaths was 3,195, this source would have supplied the whole number which occurred, and, proceeding backwards, the total falls to 612 in 1922 at the beginning of the 30-year period (Fig. 1). It is

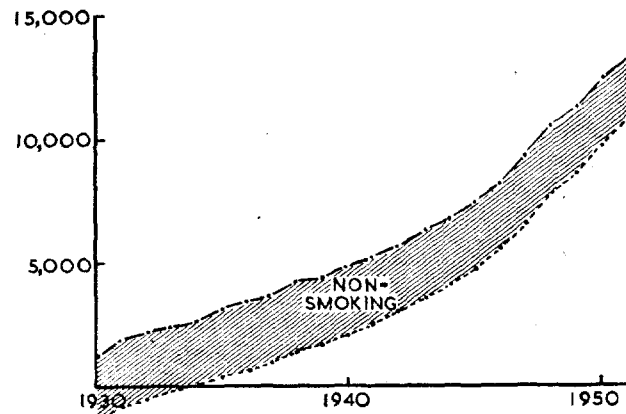


FIG. 1.—Deaths from cancer of lung. Males and females. England and Wales.

of course quite easy to invoke "defective diagnosis" as the sole explanation of any such process, whatever its magnitude or time-relations may be, and to attempt no further investigation, but any assumption that such errors are exactly adequate numerically for this purpose is purely arbitrary. The unknown factor may be (a) extrinsic or (b) intrinsic. (a) It is unlikely to be one of the known occupational factors which are carcinogenic to the lung (chromates, arsenic, nickel, asbestos, radioactivity), because these affect only small numbers of persons, chiefly of the male sex. (b) The absence of any sexual difference and the lack of any correlation with density of population suggest an intrinsic factor. The identification of this factor would be of very great interest.

No doubt the crude data shown in Fig. 1 require careful analysis in view of the considerable changes in the age structure of the population which have taken place in the last 30 years, but that is a matter for statisticians.

The proportion of non-smokers is important when the consumption of tobacco in different classes or countries—for example, Britain and Finland—is being compared. Thus in the latter country women appear to smoke very little, and hence the consumption "per head" falls very largely upon only one-half of the population.

In the long run it may appear that this sorting out of the cases not due to tobacco is the most valuable part of the immensely important contribution of Doll and Bradford Hill, and others, to cancer research; this same unknown factor may be the cause of malignant growth in other organs also. We can avoid the one factor, tobacco, if we wish, because we know what it is; we cannot avoid the other.

Deaths Attributed to Cancer of the Lung in Women

In England and Wales the increase in 1953 amounted to only 11 cases (Registrar-General, 1954), whereas the deaths of males showed an increase of the usual amount (891 cases). Of course, this halt may not persist, but, if it does so, the problem of the factors, perhaps first active many years ago,

which are concerned in this change will be very attractive, or, if one is then still expected to think that a very large part of the increase in deaths attributed to cancer of the lung is due to improved diagnosis, an explanation of this sexual difference must be found.

Histological Characters of Cancer of the Lung

These cancers show about five different types, which may differ in aetiology. Hence when one compares the total incidence of cancer of the lung upon different populations and countries one may be concealing important differences in the proportions of these types. Recently Kreyberg (1954) has emphasized the importance of this question. The practical difficulty is to obtain data from large numbers of unselected cases in which the diagnosis has been made by competent histologists, and some experienced observers are doubtful about the value of such classifications on the ground that more than one type may occur in the same lung.

Systemic Effects of Tobacco

The obvious method by which tobacco smoke can have a carcinogenic effect is by the arrest of the droplets of which it is composed upon the bronchial mucous membrane. But the inspiration of this smoke has such powerful systemic effects that one wonders whether these may possibly play a part also. The discharge from the posterior pituitary has so strong an antidiuretic effect (Walker, 1949) that the comment has often been made that one wonders how some cigarette smokers pass any urine at all (Fig. 2).

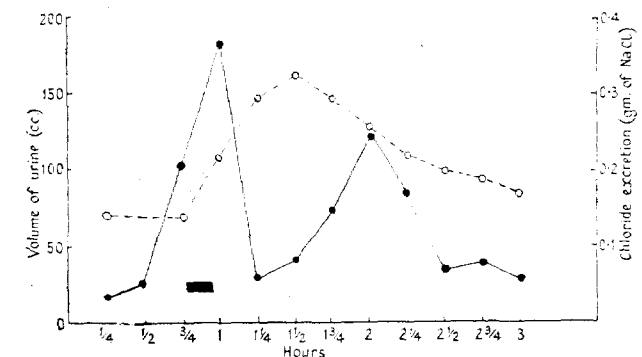


FIG. 2.—Systemic effect of tobacco. The subject drank 900 ml. of water at zero. He emptied his bladder at 15-minute intervals. The continuous line shows the volume of urine excreted. After 45 minutes he smoked one cigarette, which produced the inhibition shown in the graph. The broken line shows the total chloride excretion. Note the rise in total chloride coincident with the inhibition (Walker, 1949). Reproduced by permission of Dr. Walker and the *Quarterly Journal of Medicine*.

This secretion of the posterior pituitary is also bronchoconstrictor, and this action might slow down the inspiratory current and thus favour the deposition of particles, but so far no such effect of smoking has been demonstrated. Dr. H. G. J. Herxheimer, of University College Hospital, London, very kindly subjected two smokers to a test with his apparatus which measures resistance to expiration, and could find no effect. But possibly other systemic effects might be worth consideration.

Amount of Cancer

When the occurrence of cancer in different populations is compared, the incidence may be found to fall more or less upon one or another organ, while the total number of individuals remains about the same whatever the organ or organs chiefly affected. There seems in these cases to be something that may be regarded provisionally as an "amount" of cancer, and the anatomical distribution of this "amount" is variable (E. L. and N. M. Kennaway, 1937).

"There appears to be a general law that when in a given population the incidence of cancer in one particular organ

is markedly increased as compared with another population, there is then a compensating decrease in the incidence of cancer in a number of other organs. As a result, the incidence of cancer in different populations, whether of the same sex or not, may represent a very different distribution over the various organs or tissues, but the sum total—the total incidence of cancer—remains on an even level. This phenomenon shows that the development of malignancy in a given site, although in itself a strictly localized process, is conditioned by factors lying outside the site, which may therefore be called 'general' or 'systemic' factors" (Cramer, 1931).

This phenomenon was described first by Snijders and Straub (1924) in Sumatra; a small selection from their results is given in Table II.

TABLE II.—Incidence of Primary Cancer of the Liver in Sumatra, and in England and Wales (Snijders and Straub)

	Javanese Men	Corresponding Group from Dutch Statistics	Javanese Women	Corresponding Group from Dutch Statistics
Mortality from cancer per 100,000 per year	26.6	24.3	25.4	24.5
Primary cancer of liver % of all cancers	84	4.8	22.2	4.7

Perhaps the simplest instance of the "amount" of cancer is afforded by a comparison of cancers in the two sexes in the same country (Table III).

TABLE III.—Deaths from Carcinoma, 1940-2, England and Wales (General Register Office)

Males		Females	
Cancers of male reproductive organs	7,172	Cancers of female reproductive organs	38,916
Scrotum, prostate, testis, penis, etc. 7,009		Uterus, ovary, tubes, vulva, vagina, etc. 18,867	
Breast	163	Breast	20,049
Other organs	82,730	Other organs	58,090
Total	89,902	Total	97,006
Excess of cancers in females			7,104

For instance (Table III), the total deaths from carcinoma in males (89,902) and females (97,006) show a difference of only about 7%, yet the latter total includes 38,916 deaths, or 40% of the whole, from carcinoma of organs peculiar to the female, among which organs the female breast, being capable of lactation, must for the present purpose be reckoned.

One wishes that statisticians would some day examine this matter and tell us to what extent the figures merely illustrate the fact that a person who dies of a disease A does not die of a disease B. But it is difficult to believe that that is all that can be said about it.

Localization of Malignant Growth

This extremely important subject seems to attract very few investigators, probably because it does not promise to yield quickly that "something to publish" which assures renewal of annual grants and is the bane of cancer research.

Cancer of the breast causes the death of about 7,300 women in England and Wales per annum. If one omits the other cases cured by surgery and divides this number by 365, one finds that every day only about 20 of the 13½ million women aged 30 and over begin to develop this form of cancer. Moreover, in the great majority of these, the disease begins in one of the two breasts, and at one small area in this glandular organ of considerable size. Hence the importance of localizing factors is obvious, but we know hardly anything about them. In recent years much has been learned about hormonal factors in relation

to the breast, but these are distributed in the blood stream and there is no apparent reason why their action should be localized. Such considerations apply also to some forms of cancer of the lung where substances introduced and dispersed with the inspired air represent the hormonal factors in the case of the breast.

Possibly every case of cancer arises from the conjunction of a number of factors, as yet unknown to us, at one spot. Those who think that the carcinogenic action of, for instance, cholesterol (Hieger and Orr, 1954) can be ignored because this compound is "a normal constituent of the body" show little comprehension of biochemical matters. The highly dangerous properties of another normal constituent—namely, potassium—are kept under control only by the balance of other factors.

Incidence of Cancer in Town and Country

A number of investigations have shown, with varying degrees of distinctness, a higher incidence of various forms of cancer among town dwellers. In seeking for a reason, the fact that better methods of diagnosis are more accessible in towns is always easy to invoke and difficult to assess. Where the respiratory tract is concerned one must of course consider atmospheric pollution and exposure to soot containing at least one carcinogen—namely, 3:4-benzpyrene (Stocks, 1936, 1953; E. L. and N. M. Kennaway, 1951; Curwen *et al.*, 1954). But does this latter factor affect any other parts of the body? Cancer of the scrotum is rare in agricultural workers and is almost unknown in those social classes who wash most (E. L. and N. M. Kennaway, 1946). Thirty years ago the suggestion was made that "it would seem possible that cancer of the scrotum is influenced by exposure to coal-smoke—in other words, possibly all town dwellers are in some very slight degree liable to "chimney-sweep's cancer" (Kennaway, 1925). A complete survey is required of the incidence of every form of cancer upon dwellers in rural districts, and in the various grades of urban areas, in which every effort is made to discriminate between the effects of better diagnosis, and of town smoke; the latter factor is remediable by methods already in existence. Probably various carcinogens, with the exception of sunlight, are more abundant in towns and their actions may summate, a process about which we know very little; the latest contribution on this question is that of Cloudman *et al.* (1955).

Cancer and the Consumption of Milk

Cow's milk contains a carcinogenic factor in the non-saponifiable fraction, as do various human organs (Hieger, 1949), and, as a constituent of diet, has a protective action against some forms of cancer (Hoch-Ligeti, 1952). The consumption of milk by man shows great differences in different countries, dependent upon a variety of factors such as the character of pasture, the tsetse fly, sexual and social taboos and conventions, and so on. In some parts of Africa the numerous cattle are not regarded as sources of milk, nor of meat, but as currency, especially for the purchase of wives. In some areas milk is taboo for men, as it was in effect in this country not very long ago (Kennaway, 1951). The numerous travellers in Tibet who write books always emphasize the abundance of Yak butter, while Australasia had no source of milk until the nineteenth century. Even countries in Europe show considerable differences in this respect; thus the daily consumption of milk is high in Finland (Kennaway, 1954), being about 1.34 pints per head as against 0.72 pint in the United Kingdom.

Anyone wishing to make a literary investigation of this matter would find a great quantity of data scattered through official and other publications; the results might or might not show any correlation with any forms of cancer, and could of course be used in the study of any other diseases also. Two valuable publications are those of the Food and Agriculture Organization of the United Nations (1952, 1953).

A Suggestion

Cancer research, like other branches of science, is tending to be buried under its own literature. Those whose business it is to attempt to keep a watch upon this literature know that many investigations are reported which appear to promise further results, and yet, in say ten years' time, if they are remembered at all, they are found to have had no progeny. This may be because they are inherently infertile, or because the investigator has been diverted to other matters which appear more productive of results and annual grants: these forgotten researches are hidden, like coelacanths, beneath an ocean filled by other developments. Surely some persons should be appointed to pick over the literature of, say, the last 25 years in the light of later knowledge and to seek for anything worthy of resuscitation; they should hold a quite definite appointment with good remuneration, should be under no obligation to produce anything, and should be trusted to carry on their work efficiently without any compulsion to write endless reports about it. They will reject many researches because the technique was inadequate at the time or is shown by our later knowledge to have been so; but now and then something useful may be disinterred.

In 1945 J. C. Mottram described a greater yield of tumours of the skin of mice from 3:4-benzpyrene when applied at midnight than when applied at midday; he attributed this difference to greater mitotic activity at night, and did not consider any other possible diurnal differences in metabolism. This result indicates that the conditions during the first few hours after application determine the yield of tumours during the second and later months. At the present time research on cancer is much concerned with such periods of incubation. Thus, Nielsen and Clemmesen (1954), in a very short paper of great interest, have plotted figures for the mortality from cancer of the lung in 1950 against those for the consumption of cigarettes in 1930. Mottram's result is of such importance that one wonders whether the experiment has ever been repeated. He used only 6, and 24, mice in his two experiments, and made the day, and night, paintings on opposite sides of the same mouse, which is not the only possible, and perhaps not the best, procedure. A very experienced worker with whom I have discussed the result is very dubious about it. Those who knew Mottram, who died in 1945, will agree that, though he was far from infallible, his numerous ideas were always interesting; at heart he was much more a zoologist than a pathologist.

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SMOKING AND CHEWING OF TOBACCO IN RELATION TO CANCER OF THE UPPER ALIMENTARY TRACT

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There is accumulating reliable and well-sifted evidence to suggest that the tendency for cancer generally to grow in man is about the same in most parts of the world. On the other hand, the "organ distribution" of cancer is often strikingly dissimilar in different groups of population, varies greatly from one country to another, and differs in different communities in the same geographical region. Thus, for instance, an earlier study (Khanolkar, 1950) showed that intraoral cancer was relatively more prevalent in Bombay than in New York or London. It accounted for 35.9% of all cancer cases at the Tata Memorial Hospital, Bombay, as against 16% of cancer cases in the New York and 6.7% in London hospitals. Further, even as regards the commonest site for the occurrence of oral cancer there is a noticeable difference in various localities in India. Cancer of the lip is the commonest type of oral cancer in Bihar, of the buccal mucosa and alveolar margin in Travancore and some parts of Madras, of the base of the tongue in

During recent years a large number of studies have demonstrated that there is an association between lung cancer and the amount of tobacco smoked (Doll and Hill, 1950, 1952, 1954; Levin *et al.*, 1950; Mills and Porter, 1950; Schrek *et al.*, 1950; Wynder and Graham, 1950; McConnell *et al.*, 1952; Koulumies, 1953; Sadowsky *et al.*, 1953; Wynder and Cornfield, 1953; Breslow *et al.*, 1954; Watson and Conte, 1954). So far as mouth cancer was concerned, it became evident that the habit of smoking and chewing tobacco, with or without other ingredients, called for a special investigation.

The Investigation

In Western India the chewing of betel nut, betel leaf, and tobacco, and the smoking of locally prepared cigarettes ("bidis") are common habits.* It was therefore decided to collect and analyse the information available in this respect in the records of the Tata Memorial Hospital. The routine form to be filled up for every patient who is registered in the hospital contains under the head "Personal History" an item "Habits (alcohol, tobacco, etc.)." In 1952 an analysis was carried out of the information collected in this column of the cases registered during the period 1941-9. The information was scanty in the case sheets of patients with cancer other than intraoral, and those suffering from non-neoplastic conditions. This circumstance did not permit a comparison of oral cancer cases with a control group. Even in intraoral cancer, information concerning these habits was not available in as many as 19.1% of cases. Nevertheless, an analysis of the available information on the habits of patients with

TABLE 1.—Data on the Habits of Smoking and Chewing of Tobacco in Relation to Cancer of the Upper Alimentary Tract

	Men					Women				
	Smoking and Chewing	Smoking Only	Chewing Only	No Habit	Total	Smoking and Chewing	Smoking Only	Chewing Only	No Habit	Total
Control: Non-cancer	69 (24.0%)	144 (50.0%)	25 (8.7%)	50 (17.3%)	288	—	7 (6.3%)	26 (23.2%)	79 (70.5%)	112
I: Buccal mucosa	42 (44.2%)	18 (18.9%)	28 (29.5%)	7 (7.4%)	95	—	—	19	5	24
II: Oral cavity (excl. group I)	58 (40.9%)	57 (40.1%)	23 (16.2%)	4 (2.8%)	142	1	2	19	6	28
III: Oesophagus	29 (39.7%)	33 (45.2%)	7 (9.6%)	4 (5.5%)	73	2	4	9	14	29
IV: Hypopharynx	56 (38.9%)	73 (50.7%)	11 (7.6%)	4 (2.8%)	144	1	1	4	2	8
V: Base of tongue	73 (38.2%)	105 (55.0%)	11 (5.8%)	2 (1.0%)	191	1	1	6	4	12
VI: Oropharynx	26 (30.6%)	54 (63.5%)	4 (4.7%)	1 (1.2%)	85	—	1	4	4	9
I-VI: Total	284 (38.9%)	340 (46.6%)	84 (11.5%)	22 (3.0%)	730	5 (4.5%)	9 (8.2%)	61 (55.5%)	35 (31.8%)	110
Misc.: Other cancer	28 (26.2%)	49 (45.8%)	14 (13.1%)	16 (14.9%)	107	3 (2.7%)	4 (3.5%)	24 (21.2%)	82 (72.6%)	113

Bombay, of the oral surface of the palate in Andhra, and of the hypopharynx in Assam. In Bombay, cancer of the inner lining of the cheek was four times more common among Deccani (Marathi-speaking) Hindus than among Gujarati Hindus, though their total attendance at the hospital was in the ratio of 3:2. Cancer of the base of the tongue and tonsils was more than twice as common among Gujaratis than among Deccanis, and more than 9 out of 10 cases occurred in men, although the male to female ratio of attendance of Gujaratis was roughly 3:1.

A study of these relative differences revealed several facts of considerable interest, particularly as the communities under investigation showed notable differences in habits, customs, occupations, and nutritional status. It was therefore felt that a detailed analysis of such data may yield valuable information. It may also help in assessing the contributory role of hereditary and environmental factors in the production of cancer in man.

intraoral cancer at three different sites—namely, (1) buccal mucosa, (2) anterior third of the tongue, and (3) base of the tongue—seemed to indicate that the habit of chewing tobacco was more common in persons with cancer of the buccal mucosa and that the habit of smoking was more common among cases of cancer of the base of the tongue.

These tentative inferences obviously suggested that a systematic investigation of the chewing and smoking habits of patients with cancer of the upper alimentary tract, if it was carried out along with a corresponding control series of "no cancer" and "other cancer," was worth while. A detailed questionnaire was therefore drawn up and filled in for 1,460 new patients who attended the clinic during the years 1952-4. The present paper deals with an analysis of the data collected for the purpose of this investigation.

*A short note on the substances used for chewing and smoking in Western India is given in the Appendix.

Data

Table I contains the data on smoking and chewing of tobacco. Patients who were referred to the cancer clinic for a "check-up" and who showed no evidence of neoplastic disease were taken as the "control group." Cases of cancer of the upper alimentary canal in men were numerous enough for further analysis. There was a sufficient number of cases of cancer of the buccal mucosa to treat these as a single group (Group I). The rest of the cases of oral cancer (Group II) included: cancer of anterior tongue, 56; cancer of alveolus, 39; cancer of palate, 37; cancer of lip, 6; and cancer of floor of mouth, 4. Group VI (cancer of oropharynx) included 54 cases of cancer of the tonsil. Further analysis was not possible for women, owing to the small number of cases. The "other cancer" group consisted of cancer at sites other than the upper alimentary canal, and cancer of the breast and cervix uteri predominated in women.

The data in Table I are graphically presented in Fig. 1, which shows the percentages of smoking and chewing of tobacco in cancer cases. In Fig. 2 the percentages of men

addicted to smoking and chewing are added to those accustomed to smoking only, so as to obtain the total percentages of "all smokers." Similarly, those smoking and chewing are added to persons accustomed to chewing tobacco to give the percentage of "all chewers."

The figures show that for both men and women the "non-cancer" group is similar to the "other cancer" group in smoking and chewing habits. Women with cancer of the upper alimentary tract show a higher incidence of smoking and about two and a half times the incidence of chewing compared with the control group. In men the results are more striking. It is possible to see several gradients in the incidence of habits among the different types of cancer. The proportion of men with "smoking and chewing" habits is higher in all the six groups compared with the control group, showing a diminishing proportion from group I to group VI. Similar gradients are also seen with "no habit" and the habit of "chewing only"; whereas a reverse gradient is seen with the habit of "smoking only." Fig. 2 shows the gradients of smoking and chewing separately for groups I to VI and for the control group.

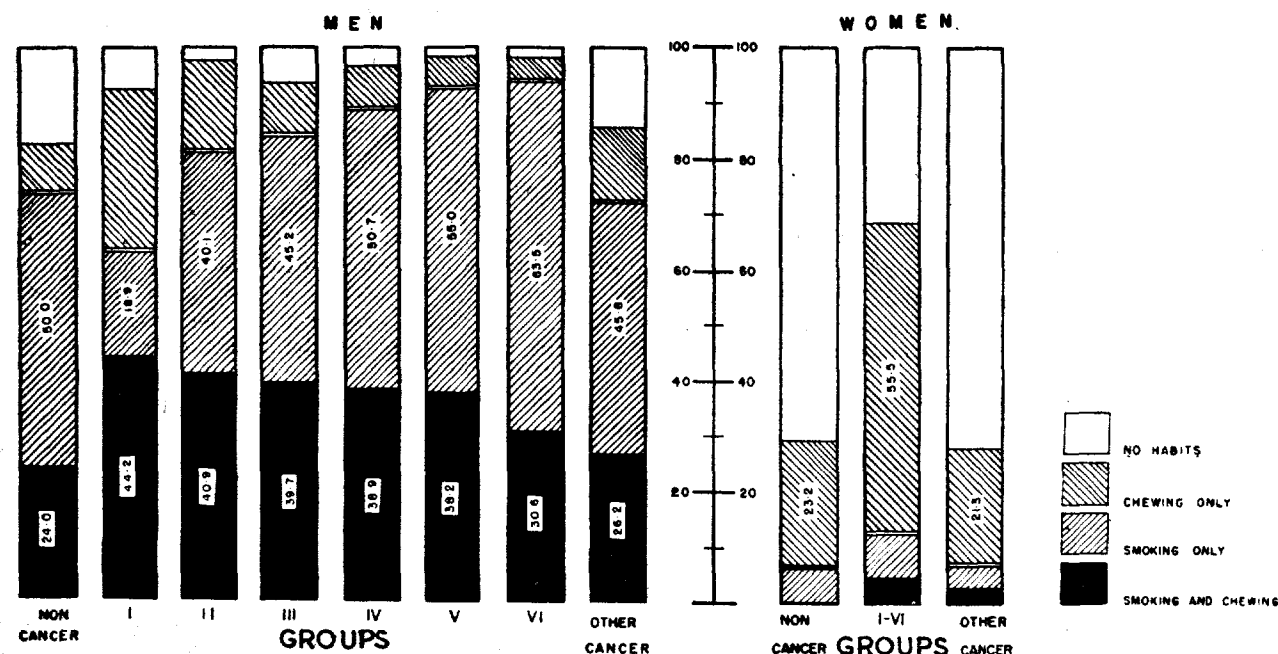


FIG. 1.—Analysis of cases of cancer of upper alimentary tract in relation to tobacco habit.

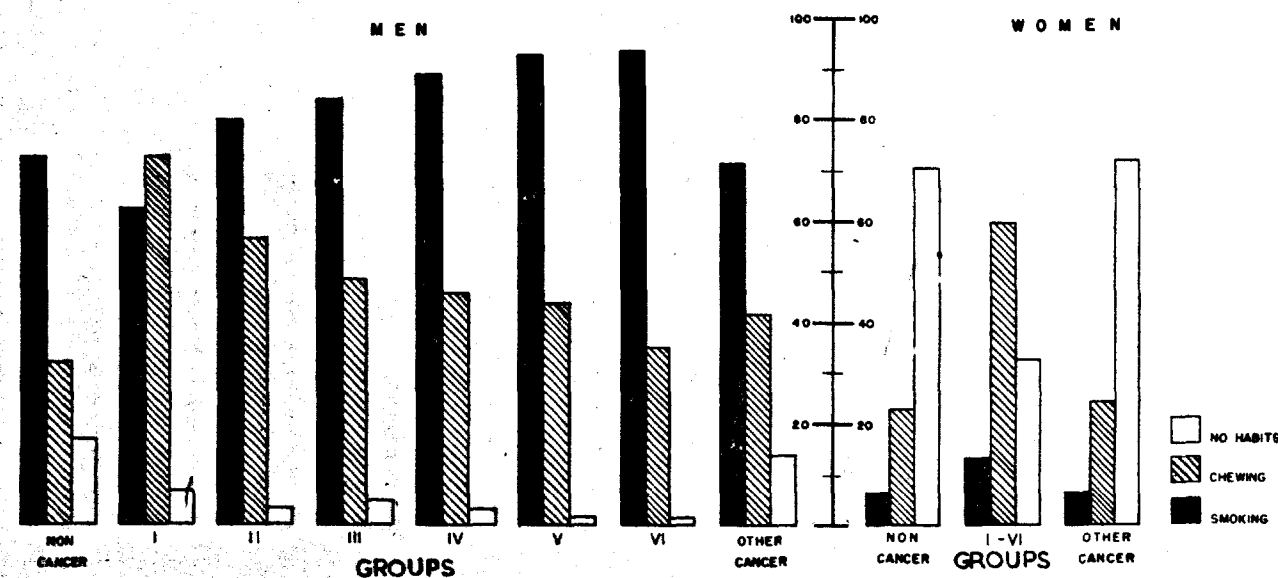


FIG. 2.—Percentage of "all smokers" ("smoking and chewing" plus "smoking only"), "all chewers" ("smoking and chewing" plus "chewing only"), and of those with no habits.

Statistical Analysis

It was necessary to take into account four variables—community, age, occupation, and sex—for purposes of evaluating the statistical significance of the smoking and chewing of tobacco in relation to cancer of the upper alimentary tract. As the two sexes presented very different patterns in habits, they were treated separately. No further analysis was carried out on the data on women owing to the small number of cases. For men, the data concerning community and age could be broken down into well-defined classes. Table II shows the differences in the smoking and chewing habits in the "non-cancer" group with respect to these two variables.

TABLE II.—Percentage of Smokers and Chewers Among Non-cancer Men Classified According to Community and Age

	Smoking and Chewing	Smoking Only	Chewing Only	No Habit	No. of Persons
Community:					
Hindu Deccani	31.9	39.8	12.4	15.9	113
— Gujarati	9.2	70.4	—	20.4	54
Muslim	27.3	43.6	10.9	18.2	55
Other	19.7	56.0	7.6	16.7	66
Age:					
Less than 50	21.7	50.2	10.2	17.9	207
50 to 60	30.9	45.5	5.4	18.2	55
More than 60	26.9	57.7	3.9	11.5	26

An attempt to subdivide data dealing with occupation in different classes turned out to be unprofitable. It was necessary to introduce so many groupings that finally it was difficult to justify them. Moreover, an analysis carried out on such groupings did not change the significance pattern of the types under consideration.

Dr. C. A. B. Smith, of the Galton Laboratory, London, suggested a method of analysis suitable for the present purpose. The method in essence consisted in breaking down the cancer and control cases into a number of cells for which it could reasonably be assumed that the internal variability had been substantially reduced and studying the difference and its variance for each cell. Such differences and variances could then be weighted and added to give the significance for the whole group.

Consider the following cell:

	With Habit	Without Habit	Total
Cancer cases	a_r	b_r	$a_r + b_r$
Control "	c_r	d_r	$c_r + d_r$
Total	$a_r + c_r$	$b_r + d_r$	$a_r + b_r + c_r + d_r = n_r$

$$\text{Difference } D_r = \frac{a_r}{a_r + b_r} - \frac{c_r}{c_r + d_r}$$

$$\text{Variance of difference } D_r = \frac{(a_r + c_r)(b_r + d_r)}{(a_r + b_r)(c_r + d_r)(n_r - 1)}$$

This variance is calculated on the basis of the exact distribution, keeping the marginal totals fixed.

The weighted combination of differences $D = \sum W_r D_r$, summed over all the cells, accordingly has the variance $V = \sum W_r^2 \text{var } D_r$.

The weights W_r can be chosen arbitrarily, provided that, of course, they are decided upon previously and not in-

TABLE III.—Statistical Significance of the Differences in Smoking and Chewing Habits in Patients (Men) with Different Types of Cancer Compared with the "Non-cancer" Group

Group	Smoking and Chewing	Smoking Only	Chewing Only	No Habit	Total Smokers	Total Chewers
I: Buccal mucosa	$0.133 \pm 0.057^*$	$-0.233 \pm 0.071^+$	$0.175 \pm 0.040^+$	-0.075 ± 0.058	-0.100 ± 0.066	$0.308 \pm 0.061^+$
II: Oral cavity (excl. group I)	$0.200 \pm 0.048^+$	$-0.157 \pm 0.051^+$	$0.100 \pm 0.034^+$	$-0.143 \pm 0.036^+$	0.043 ± 0.046	$0.300 \pm 0.050^+$
III: Oesophagus	$0.137 \pm 0.066^*$	0.017 ± 0.076	-0.014 ± 0.041	$-0.140 \pm 0.055^*$	$0.154 \pm 0.065^*$	0.123 ± 0.070
IV: Hypopharynx	$0.160 \pm 0.046^+$	-0.021 ± 0.052	0.000 ± 0.030	$-0.139 \pm 0.036^+$	$0.139 \pm 0.044^+$	$0.160 \pm 0.049^+$
V: Base of tongue	$0.200 \pm 0.046^+$	-0.040 ± 0.049	-0.005 ± 0.027	$-0.155 \pm 0.032^+$	$0.160 \pm 0.040^+$	$0.195 \pm 0.048^+$
VI: Oropharynx	0.109 ± 0.062	0.083 ± 0.070	-0.030 ± 0.041	$-0.162 \pm 0.050^+$	$0.192 \pm 0.061^+$	0.079 ± 0.067
Misc.: Other cancer	-0.023 ± 0.051	-0.006 ± 0.059	0.051 ± 0.036	-0.022 ± 0.046	-0.029 ± 0.054	0.028 ± 0.055

* Shows significance at 5% level. † Shows significance at 1% level.

fluenced by the observed experimental results. Since the larger cells will give more reliable information than the smaller ones, it seems reasonable to take the weight W_r to be proportional to the total number n_r of observations in the cell. That is, we can take $W_r = \frac{n_r}{N}$, where $N = \sum n_r$.

It is obvious that the method will fail if there are no cases, either cancer or control, in any particular cell. This limitation made it necessary to restrict the analysis to three age groups—namely, under 50, 50 to 60, and over 60. Table III gives the weighted differences, and their standard errors.

This analysis shows that the habit of chewing is associated with cancer of the oral cavity (groups I and II). It shows that the combined habit of smoking and chewing is associated with cancer of the hypopharynx (group IV) and of the base of the tongue (group V). Finally, only smoking is associated with cancer of the oropharynx (group VI) and of the oesophagus (group III). There is no significant difference in smoking and chewing habits in patients with other cancers compared with the "non-cancer" group.

It was possible to make a further analysis of the smoking habit. Of the persons who smoked, 88.7% smoked bidis. During the course of the investigation, information was collected about the number of cigarettes (bidis) smoked by the patients. This information must admittedly be approximate because, even if the exact number smoked could be ascertained, there is bound to be a variability in the length of the bidis smoked by different persons. Table IV gives the average number of bidis smoked by the men in the various groups.

TABLE IV.—Number of Bidis Smoked Daily by Patients (Men) With Different Types of Cancer of the Upper Alimentary Tract

Control group.	Non-cancer	14.1 ± 0.6
Group I.	Buccal mucosa	12.5 ± 1.1
„ II.	Oral cavity (excluding group I)	14.6 ± 0.8
„ III.	Oesophagus	15.3 ± 1.2
„ IV.	Hypopharynx	16.9 ± 0.8
„ V.	Base of tongue	17.4 ± 0.7
„ VI.	Oropharynx	18.5 ± 1.0

It is interesting to note that the percentage of smokers and the average number of bidis smoked show a similar trend in groups I to VI. It was not possible to carry out a further analysis of the chewing habit, as the quantities reported were often unreliable. Information regarding the duration of smoking and chewing was also unreliable.

Discussion

Experimental work on cancer has made it clear that to resort to a single or a simple explanation for the aetiology of cancer, however tempting it may be, is likely to result in failure. The contributory factors may be broadly grouped as hereditary and environmental. Such a classification is probably arbitrary, but it satisfies the needs of the present discussion.

The present study indicates that tobacco may be one of the environmental factors responsible for a large number of cases of cancer of the upper alimentary tract seen at the Tata Memorial Hospital. These populations differ sharply from other populations in their habits of tobacco chewing. The habit of chewing tobacco and the associated types of cancer lead to an assumption of the existence of a sub-

stance or substances in tobacco which may initiate or promote the production of cancer at the sites of prolonged contact.

The marked differences in the chewing and smoking habits among the Deccanis and the Gujaratis partly explain the differences in the incidence of cancer of the buccal mucosa and of the base of the tongue in these two communities. They also presumably explain the striking difference in the incidence of base of tongue cancer in the two sexes.

It is, however, not possible to explain all the differences on the basis of the habit of smoking and chewing of tobacco, as in all the types of cancer of the upper alimentary tract there were some persons who did not smoke or chew tobacco at all. Therefore it is necessary to explore other environmental and hereditary factors.

Sanghvi and Khanolkar (1949) encountered striking differences in the distribution of seven genetical characters among the six endogamous groups in Bombay. Data were obtained on the ABO, A₁A₂, MN, P, and Rh blood groups, taste reactions to phenylthiocarbamide, and colour vision. One endogamous group belonged to the Gujarati Hindu community, and the rest to the Deccani Hindu community. No information is available about the association of susceptibility to cancer of the upper alimentary tract with genes responsible for the above characters. It may, however, be suggested that similar differences exist for many of those genes responsible for susceptibility to cancer among different communities in India as well as in the rest of the world.

Strong and Sanghvi (1951), as a result of their study on the effects of selection on chemically induced tumours in mice, suggested tentatively that the control of tissue susceptibility to cancer might be at a different level in the mechanism of heredity than total susceptibility to cancer. They found that in mice, by selecting breeders with a longer and longer latent period (time between the injection of carcinogen and development of tumour), large variations could be brought about in the sites at which the two sexes of mice developed tumours during the course of 16 generations, without affecting to any appreciable extent the total incidence of cancer. The net result of the experiment was to increase considerably the latent period and hence the life-span of the mice which developed tumours. The mice therefore developed tumours at the sites which took an increasingly longer time interval to develop them. Such differences in the tissue susceptibility may offer one of the reasons for the habit of smoking affecting the mucosa of the upper alimentary tract in one population and the lung in another. There exists a possibility that the physical state and internal dispersal of smoke particles from bidis might differ from those of ordinary cigarettes.

Summary

The 1,460 patients who attended the cancer clinic during 1952-4 were questioned regarding the habit of smoking and chewing of tobacco in relation to cancers of the upper alimentary tract. Results of the statistical analysis showed that the habit of chewing was associated with cancer of the oral cavity; that the combined habit of smoking and chewing was associated with cancer of the hypopharynx and base of the tongue; and that only smoking was associated with cancer of the oropharynx and oesophagus. These findings are discussed.

APPENDIX

The Indian form of cigarette is known as bidi, a smoke for the common man in the country. It is made by rolling with the fingers 0.25 to 0.5 g. of tobacco flakes in a rectangular piece of dried leaf of temburni (*Diospyros melanoxylon*). Leaves of other genera and species such as *Bauhinia racemosa*, *Bauhinia vahlii*, *Butea frondosa*, and *Castanopsis indica* are also used for wrapping the tobacco. Out of about 50 known species of tobacco, only two are

grown in India—namely, *Nicotiana tabacum* and *Nicotiana rustica*. Both types are used for making bidi, as well as for chewing. The tobacco is usually sun dried and cured. Bidis vary in length from 5 to 8 cm. (Fig. 3). They are conical in shape, with the tucked end (the end which is lighted) broader than the end which is held between the incisor teeth. This end is tied with a thread and flattened by pressing.

In Western India the common ingredients used for chewing are betel nut, betel leaf, and tobacco. The betel nut is the fruit of the areca or betel palm (*Areca catechu*). The betel leaf is the leaf of the betel vine (*Piper betle*). Cracked or powdered dried betel nut, or slices, may be chewed alone along with a preparation of betel leaf, known as pān. Pān is prepared by applying slaked stone or shell lime and catechu to a betel leaf, and wrapping it around pieces of betel nut, with spices like the cardamom, cloves, aniseed, and several others. Catechu is an extract obtained from the wood of two species of acacia (*Acacia catechu* and *A. suma*). In Gujarat, plain tobacco is sometimes added in the preparation of a pān, whereas in the Deccan the dried and cured tobacco is commonly chewed along with betel nut and lime.

The active co-operation of our clinical colleagues at the Tata Memorial Hospital, particularly Drs. J. C. Paymaster and P. D. Schroff, made it possible for us to collect the data which have been analysed above. We should like to record our gratitude to our colleagues and to Dr. C. A. B. Smith, of the Galton Laboratory, London, for his suggestion of an appropriate statistical method.

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Mr. KENNETH PICKTHORN speaking on April 26 in a Parliamentary debate on education: "Everyone goes on repeating the stuff about science getting more and more specialized, technicalized, departmentalized, compartmentalized, and my impression, not as a scientist but as a man who has spent his life partly in intimate conversations with many of the greatest and best-informed scientists, is that the opposite has been the fact for some considerable time: the sciences have all tended more and more, during the last 20 years especially, to approximate to mathematics, and to need mathematics for any understanding of them. In that sense they have come together again."



FIG. 3.—Indian cigarette (bidi).

CIGARETTE SMOKING AND BRONCHIAL CARCINOMA

EFFECT OF THE ASSOCIATION UPON SMOKING HABITS OF A GROUP OF DOCTORS

BY

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Doll and Bradford Hill (1950) demonstrated a significantly higher incidence of carcinoma of the bronchus among those who smoked cigarettes than among those who did not. This finding has been confirmed and amplified here and in America, and public endorsement has been given by the Minister of Health and the Secretary of the Medical Research Council.

What effects have these statements had? Do people now smoke less?

In an attempt to answer these questions a small inquiry has been made of 217 doctors. It was thought that doctors would be sensitive to scientific argument and might be among the first to reduce their smoking in the face of evidence of its danger; they are more likely to be familiar with the facts making up this evidence and with the character of the disease.

Material and Methods

All the 217 doctors working in the hospitals in Oxford were sent a short questionnaire. Nine-tenths of them were men; their ages ranged from about 24 to 65, about two-thirds were under 40.

DO YOU SMOKE CIGARETTES?

If "Yes," for how many years have you smoked?

Do any of these statements represent your views?

(i) I am not satisfied with the evidence linking cigarette smoking with carcinoma of the bronchus.

(ii) I am satisfied with the evidence and hope to give up smoking, but have not yet been able to bring myself to do so.

(iii) I am satisfied with the evidence but do not intend to give up smoking.

(iv) Other.

If "No," have you ever smoked (by which is meant at least one cigarette a day for a year or more)?

If you have once smoked but have given it up, can you give the date (as precise as possible) of stopping?

What was your reason for stopping?

Non-smokers were also asked to say whether they were satisfied or not with the evidence linking smoking with carcinoma of the bronchus.

Pipe and cigar smoking was not considered, nor was the number of cigarettes smoked. Figures of the national consumption of cigarette tobacco and of the number of smokers in the country were also obtained.

Results

Replies were received from 211 (97%) doctors. Less than half of them smoked cigarettes. About a quarter had discontinued the practice, and another quarter had never smoked (Table I).

TABLE I

	211 Doctors	General Population (U.K.)*
Smoke now	47.4% (100)	57% (men 72%, women 42%)
Once smoked	25.1% (53)	43% (men 28%, women 58%)
Never	27.5% (58)	

* Figures calculated from the Hulton Readership Survey and the 1% sample of the 1951 census.

Changes in the Number of Smokers

Smoking Begun.—In the last eight years 11 of the 211 doctors have started to smoke cigarettes. Five began to do so eight years ago, one seven years ago, two six years ago, one five years ago, one four years ago, one two years ago.

Smoking Stopped.—In the last eight years 40 of the doctors have stopped smoking. The dates of stopping were: Before September, 1946, 13; September–December, 1946, 1; 1947, 6; 1948, 6; 1949, 2; January–September, 1950, 3; October–December, 1950, 2; 1951, 3; 1952, 3; 1953, 5; 1954, 9. In the four years immediately before the publication of Doll and Bradford Hill's first paper (September, 1946, to September, 1950), 18 persons stopped smoking. In the next four years, ending at the time of the survey (October, 1954), the number was 22.

Reasons for Stopping Smoking.—The 53 members of this group gave 63 reasons for having stopped smoking (Table II).

TABLE II

Minor ill-health (e.g., cough, sore throat)	15
Expense	13
Lack of desire	8
Risk of carcinoma	8
After or during an illness	6
Unclassified	13

The 13 doctors giving expense as a main reason had stopped smoking in 1947 (2), 1948 (1), 1950 (2), 1951 (1), 1952 (2), 1953 (1), 1954 (4).

National Figures.—The decline in the number of smokers among this group of doctors is not reflected in the national figures (Table III).

TABLE III.—Number of Cigarette Smokers and Their Weekly Consumption per Head (United Kingdom)*

	No. of Cigarette Smokers (Millions)			Average No. of Cigarettes Consumed Weekly per Cigarette Smoker		
	Males	Females	Total	Males	Females	Total
1947	11.7	8.4	20.1	113	49	97.9
1948	11.8	7.8	19.6	105	42	79.9
1949	11.8	7.6	19.4	99.4	45.5	78.3
1950	11.9	7.3	19.2	100.1	45.5	79.3
1951	11.8	7.3	19.1			
1952	11.4	7.5	18.9	105	46.9	81.9
1953	11.2	7.5	18.7	100.8	49.7	80.3
1954	11.4	7.9	19.3	102.9	51.1	81.7

* Based on the Hulton Readership Survey. Figures are not available for the years before 1947 and only abbreviated ones for the year 1951.

The fall in the number of cigarettes smoked, but only slightly in the number of smokers, between 1947 and 1948 may have been due to the large tax increase in the budget of 1947. Since then, and during the time when an association between smoking and carcinoma has been known, there has been very little change. Figures of the total cigarette tobacco consumption (in lb. per annum per head of the population of the United Kingdom)† show the same steadiness in recent years (Table IV).

TABLE IV

1946	1947	1948	1949	1950	1951	1952	1953	1954
4.6	4.0	3.7	3.6	3.6	3.8	3.8	3.9	4.0

Opinion of the Evidence Linking Smoking and Bronchial Carcinoma

Opinions of the validity of this evidence were given by 193 doctors. Rather more than half were satisfied with the evidence of an association between smoking and carcinoma of the bronchus, but the figures differ considerably among the smokers, non-smokers, and former smokers (Table V).

If the 193 are divided into (1) present and past smokers and (2) non-smokers, and their opinions examined separately it is seen that in group (1) 76 were satisfied and 57

† Based on estimates provided by the Board of Trade.

TABLE V

Opinion of the Evidence	Smokers	Former Smokers	Non-smokers	Total
Satisfied	46	30	34	110 (56.5%)
Not satisfied	45	12	5	62 (32.5%)
Undecided	9	3	9	21 (11.0%)

unsatisfied with the evidence, a ratio of 1.3 to 1. In group (2) the figures are 34 and 5, a ratio of 6.8 to 1 in favour of accepting the evidence. Thus, excluding those who were undecided, over five times as many non-smokers as present and former smokers accepted the evidence.

Of the 46 smokers who do accept the evidence 14 hope to discontinue smoking and 32 do not intend doing so.

Discussion and Conclusions

Less than half of this small group of doctors smoke cigarettes, a lower proportion than among the general population. The proportion of those who have never smoked (27.6%) corresponds closely to Doll and Bradford Hill's (1954) finding of 28.5% of non-cigarette smokers among male doctors aged 35-44.

In the present group of 211 doctors the number who smoke cigarettes is gradually declining. Eight years ago it was 129, now it is 100.

To judge from the reasons which those who have discontinued smoking give for doing so and from figures of national tobacco consumption it appears that increased cost is a considerable factor in reducing cigarette smoking, but that the risk of cancer is not (although it may be a deterrent to starting the habit). This is supported by the fact that the number of doctors giving up smoking since an association with bronchial carcinoma was discovered has not increased. It seems, therefore, that further demonstration of this association will not lead to many more doctors stopping smoking.

The proportion of those who accept the evidence of an association between smoking and carcinoma of the bronchus is so much higher among the non-smokers than among the smokers, present and past, that personal prejudice may have played some part in shaping these opinions. Possibly the pleasures of tobacco addiction persuaded some of the smokers to discount the evidence of its dangers.

Summary

The 217 doctors working in the hospitals of Oxford were questioned about their cigarette-smoking habits, and 211 (97%) replied: 47.4% smoke cigarettes, 25.1% once smoked, and 27.5% have never done so. The proportion who smoke is gradually declining, but the number of doctors giving up smoking has not increased since the discovery of an association between smoking and carcinoma of the bronchus. Figures for national tobacco consumption and number of smokers have shown no decline since 1950, when Doll and Bradford Hill's first paper appeared.

Only a little over half (56.5%) of the doctors were satisfied with the evidence linking carcinoma of the bronchus and smoking; but the proportion was more than five times higher among the non-smokers than among the smokers. Perhaps the smokers were persuaded by their fondness for tobacco to discount unpalatable evidence.

I am most grateful to the 211 doctors for their co-operation and to Dr. A. M. Cooke for his criticisms.

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PHYSIOLOGICAL PRINCIPLES IN THE TREATMENT OF THE UNCONSCIOUS PATIENT*

BY

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The title of this paper crystallizes the main concern of the anaesthetist so far as the administration of general anaesthesia is concerned. He deliberately administers combinations of powerful drugs to produce unconsciousness of varying depth. His skill lies not only in the administration of these drugs, but in the treatment of the resulting unconscious state. The essential problems attendant on unconsciousness *per se* are the same whatever the cause, be it anaesthesia or head injury or barbiturate overdose. There therefore seems to be some justification for extending the discussion beyond the confines of anaesthesia to include unconsciousness in general. As for the physiological principles which underlie the treatment of the unconscious state, the need for them here is no less than in the treatment of other pathological states—indeed more, since a disregard of such principles so easily leads to permanent damage or death.

What is Unconsciousness?

"Unconsciousness" is a term applied to three separate states which have much in common with each other and yet differ fundamentally in their aetiology and prognosis. They are natural sleep, anaesthesia, and coma. In each of these the patient loses his power of perception of the world in which he lives, and on recovery has no memory of events which took place during that time. Though he may respond in a reflex manner to stimuli, such reflex activity leaves no trace in his conscious memory. Natural sleep is distinguished by the fact that it occurs in the absence of disease or the administration of drugs. It terminates spontaneously after a varying interval, but in any case is easily interrupted by the application of external stimuli of very moderate intensity. Anaesthesia differs from coma only in the fact that it is to a great extent reversible and controllable by the anaesthetist. It is the result of the deliberate administration of drugs or of physical agencies such as cold or electrical currents. The term "coma" is best reserved for states of unconsciousness associated with disease, injury, or overdose with certain drugs. It may on occasion be reversible, but it is generally not controllable. The two differ little so far as the physical state of the patient is concerned, and it would be generally impossible on clinical examination alone, and without knowing the circumstances, to say whether the state is one of anaesthesia or of coma.

The depth of unconsciousness may vary widely from patient to patient, and is determined by the individual ability to respond to stimuli of varying intensity. When a patient responds reflexly to mild painful stimuli his unconsciousness is said to be light, but in profound unconsciousness it may be that no stimulus of any kind produces a response and only a beating heart and active respiration show that the patient is still alive.

*Based on a lecture given before the Royal Faculty of Physicians and Surgeons of Glasgow on January 19, 1955.

Why Treatment is Needed

It might appear that the unconscious patient needs no treatment apart from the removal of the causes of his unconsciousness, whereupon he would return to consciousness and recover. This is certainly true in a number of instances, but there is a great risk that in the absence of positive treatment certain complications may arise which may be fatal or leave permanent effects.

Respiratory Depression

The very state of unconsciousness is outward evidence of a depressed activity of the cerebral cortex. Concomitant with this there is always depression of the rest of the brain, including the medullary centres. Respiration is therefore also depressed. Even more important than the reduction in the total minute volume of respiration is the reduction in tidal volume. When the size of the latter approaches that of the physiological dead space, hypoxia is present in some degree and the patient becomes cyanosed. This is because, in these circumstances, at each breath exchange of air takes place only between the dead space and the outer air. A good example of this is the patient who has tachypnoea due to an overdose of trichlorethylene. The respiratory rate may be 40-50 per minute, but, since at each breath no more than perhaps 200 ml. of air is inhaled, cyanosis is present, even though the minute volume of respiration is high—10 litres or more per minute. Another example is the depression that occurs after overdosage with morphine or a barbiturate drug. Not only is the respiratory rate slowed, but the breathing is very shallow. When the volume of each inspiration is reduced to 150-200 ml. the patient usually becomes cyanosed. This explains why there is a limit to the slowing of respiration before death supervenes. Even were the patient taking good-sized breaths of 500 ml., at least three or four of them every minute would be required to give him enough oxygen. It is therefore impossible for such a patient to breathe at less than, say, four times a minute and live. Periodic breathing is common in unconscious patients, and is further evidence, if such were needed, of suboxygenation of the medulla.

Respiratory Obstruction

The respiratory depression of the unconscious patient may be, and often is, complicated by obstruction of the airway, either by a relaxed tongue and pharynx or by secretions or vomit. Secretion in the respiratory tract appears very quickly in the presence of respiratory obstruction, and such fluid is not salivary in origin. In these circumstances the secretion is generally the result of some degree of what is known, for want of a better term, as pulmonary oedema. The high intrapulmonary negative pressure consequent on respiratory obstruction upsets the delicate equilibrium at the alveolar membrane which keeps fluid from entering the alveoli from the blood stream. Liquid then easily passes from the blood stream into the alveoli and thence into the respiratory tract. (See under "Complications.")

Circulatory Depression

Treatment is also needed because of the disturbances of circulation. Particularly in anaesthesia, but also in many other states, the heart muscle itself is depressed, and in any case will soon become so when hypoxia develops. The action of the heart is further hindered by the depressed breathing. The "thoracic pump" effect of breathing on the venous return of blood is lessened, the output of the heart is reduced, and the blood pressure tends to fall. At the other end of the circulatory system the capillaries are affected by hypoxia and by the accumulation of metabolic products, which quickly follow in the train of depressed breathing. Peripheral resistance is lowered and the blood pressure tends to fall still further. A vicious circle is started: poor cardiac output and low blood pressure mean poor pulmonary circulation and poorer oxygenation; the lower blood pressure ultimately means less coronary flow and still further depression of the heart muscle.

Other Effects

Metabolism is generally lowered during unconsciousness. Water loss, too, occurs continuously, and ultimately with the passage of time the problem of water balance and nutrition arises. There are certain other problems, minor if guarded against, but major in their possible ill-effects. Two examples are the possibility of the inhalation of vomit and the possible development of nerve palsies through malposture.

If untreated, therefore, the unconscious patient develops increasing hypoxia, with tissue and pulmonary oedema and circulatory failure. His metabolism is lowered and his fluid balance disturbed; secretions and vomit may be inhaled and postural palsies develop.

Treatment of the Unconscious State

The first principle of treatment of the unconscious patient, and one on which all else depends, is the maintenance of an adequate supply of oxygen to the tissues. Air or oxygen must first reach the alveoli in sufficient amount, and then enter the blood stream. I am sometimes shocked that this elementary fact is not appreciated outside the field of anaesthesia. My last experience of this was in connexion with a case labelled "cerebral malaria," to which I had been called because an oxygen regulator was out of action. The toothless patient, with a hanging lower jaw, was propped up in bed, unconscious, cyanosed, and clearly dying. Each breath was made with effort, and the sucking-in of his chest was striking. I immediately held up the patient's jaw, and to the amazement of those present the stertor disappeared, the patient became pink, and within a few hours was fully conscious. He ultimately left hospital a fit man.

If the jaw cannot be held in such a way that breathing is free for long periods of time, or if the unconsciousness is profound, an endotracheal tube should be inserted without hesitation. The insertion of a tube into the trachea should no longer be regarded as requiring unusual skill or as carrying great hazard. The manoeuvre is performed daily by anaesthetists, and is a life-saving measure when the patency of the airway cannot be maintained by other means. The introduction of the practice of intubating seriously ill patients with respiratory insufficiency in spinobulbar poliomyelitis, and more recently in tetanus, has had a dramatic effect on the prognosis of these diseases. I believe that a more widespread appreciation of the importance of a perfect airway will lead to a greater use of tracheal intubation with good results. If the unconsciousness is likely to persist for more than one or two days a tracheostomy is preferable to an endotracheal tube, since trauma to the cords is avoided and the respiratory tract is more easily kept free of secretions.

Suction

An important accessory aid to a clear airway is the use of mechanical suction. There can be few hospitals without a suction apparatus, and one of these instruments must also be regarded as essential for domiciliary use. Without going too deeply into mechanical matters, I would like to point out that the "power" or "strength" of the apparatus refers to the rate at which it removes fluid. The negative pressure indicated on a manometer is by itself of little interest. A good hypodermic syringe can produce almost a vacuum, but is useless as a "sucker" because its liquid removal rate is maintained for only a brief moment. The accompanying chart gives the results of some experiments with a piped suction installation, and illustrates some further points. For the removal of vomit or secretion a mechanical sucker is unequalled. Even with an efficient sucker, and certainly in its absence, gravity can still save life. A head-down position allows vomit to fall to the floor and prevents its accumulation in the pharynx, whence it may be inhaled.

Carbon Dioxide

Even when the airway is perfectly clear hypoxia may still be present owing to shallow breathing. The administration

of oxygen helps in these cases, but until ventilation has increased and tidal exchange become larger inadequacy of oxygenation may persist. Shallow breathing is a temptation to use carbon dioxide. But poor ventilation itself results in an accumulation of carbon dioxide, and the depressant effects of this gas on the central nervous system and the myocardium are now being appreciated to a much greater degree than formerly. The carbon-dioxide content of the blood of a depressed unconscious patient is generally high,

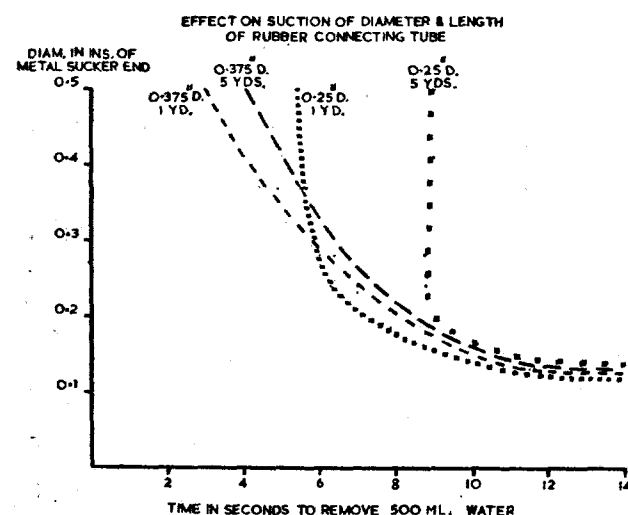


Chart showing the results of experiments with a piped suction installation. In the case of small-bore tubing, increasing the diameter of the metal sucker end has little effect in improving the fluid-removal rate. Improvement is effected by shortening the connecting tubing. The best results are obtained with large-bore connecting tubing and large-bore metal sucker end.

and more than enough to stimulate the respiratory centre if only the sensitivity of the centre is restored by an adequate supply of oxygen. Carbon dioxide from a cylinder plays little or no part in the treatment of respiratory depression. There is, indeed, a grave danger attached to its use, since a concentration above 7% has a powerful depressant effect on the central nervous system; in fact a high concentration was at one time deliberately used as an anaesthetic.

Oxygen

The average patient produces between 200 and 300 ml. of carbon dioxide per minute, and this must be expelled through the respiratory tract. At least 5 to 6 litres of other gases is required if this amount of carbon dioxide is to be diluted to 5%, the normal concentration in the alveoli. If oxygen therapy is instituted, at least 6 litres of oxygen must flow into the bag or tent. A smaller amount than this cannot possibly produce a sufficient partial-pressure differential of carbon dioxide across the alveolar membrane for the expulsion of the full amount of the gas.

Analeptics

An old-fashioned way of treating narcotic poisoning was to slap the patient's face and drag him round the room; another was to dilate the anal sphincter. The aim of these and similar methods, including the injection of analeptics, is to stimulate breathing reflexly. I cannot, however, support or encourage such methods. When a patient is deeply depressed, only oxygenation of his vital organs, particularly the brain, could keep him alive. Analeptics and physical stimuli are generally useless in such cases. Their continued administration when they fail to produce response is usually evidence of lack of appreciation of the depth of depression of the patient's central nervous system. It should be borne in mind, however, that spontaneous respiration in the presence of anoxia may be largely the result of stimulation of the carotid body by anoxia. Oxygen overcomes this, but if the respiratory centre is too depressed for carbon-dioxide

stimulation to be continued apnoea may result. Such a patient may need assisted respiration until his respiratory centre recovers sufficiently from its depression.

Artificial Respiration

An excellent method of maintaining artificial ventilation of a depressed patient for long periods of time is the box or cabinet respirator. The fact that a sub-atmospheric pressure is produced round the body with this type of apparatus should not obscure the similarity between it and rhythmic positive-pressure ventilation. In both the essential feature is the creation of a differential between the pressure at the lips and that in the chest. It makes little gross difference to the respiratory or circulatory mechanics whether that differential is produced by raising the air pressure round the head or by lowering it round the body.

Of the numerous methods of artificial respiration that are still in common use, the only one suitable for emergency clinical use is inflation of the lungs. There was at one time among physicians a general suspicion of inflation of the lungs with air or oxygen at a pressure above that of the atmosphere, on the ground that such a pressure may injure the alveoli. It should be remembered in this connexion that when the procedure is carried out with a thin rubber bag the maximum pressure attainable is of the order of 30-40 cm. of water. This is far below the intrapulmonary pressure of over 100 cm. of water which can be voluntarily generated by closing the larynx and forcefully expiring. It is likely that a pressure much in excess of 150 cm. of water is required before alveolar damage occurs. None of the foregoing would, of course, exclude the risk of rupturing an unsuspected subpleural bulla, but this risk is present in everyday life quite apart from artificial respiration. There are, however, certain disadvantages of positive-pressure inflation of the lungs which should be known, though they are generally insignificant as compared to the advantages. There is, first, a possibility of occluding the alveolar vessels at the peak of each inflation. To avoid this the mean inflation pressure should be as low as possible, with peaks not in excess of 15-20 cm. of water, and even this pressure should not be maintained for more than a fraction of the cycle. A sharp peak to the pressure curve rather than a plateau is the objective. The other risk is that too vigorous, and particularly too frequent, a rhythm of positive pressure may so tamponade the heart and impede the normal return of venous blood by the thoracic pump that the cardiac output is impaired. Prophylaxis here consists in applying a slow rhythm and allowing a rapid return of the intrapulmonary pressure to that of the atmosphere at the end of each inflation. These measures ensure that the mean intrapulmonary pressure is low and the circulatory impedance as low as possible.

Posture

The common practice of placing an unconscious patient flat on his back exposes him to the hazards of respiratory obstruction and of inhaling vomit and secretions. A better posture, and one which to a large extent overcomes these risks, is to place him on his side. Vomit and secretions collect in the cheek and, if there is a slight head-down tilt, will run out, while the flaccid tongue falls to one side and the airway does not become obstructed. At regular intervals, say once an hour, the patient should be turned to the other side to encourage good circulation on the two sides of the body to improve venous return.

Maintenance of Fluid Balance

In an unconscious patient it is essential that the fluid and electrolyte balance be maintained. Only losses should be replaced. The accurate and careful charting of fluid balance should be started at the earliest moment, regard being paid to the importance of vomit and sweating as sources of fluid loss. Nutrition becomes a problem only in unconsciousness lasting more than a couple of days; owing to the low metabolism in such cases a daily intake of about 1,500 calories is generally adequate.

Complications

Resistance to Breathing

In discussing the treatment of unconsciousness attention should be drawn to the importance of minimizing the resistance to breathing imposed by the use of such devices as endotracheal tubes and oxygen-therapy apparatus. It is essential that a patient, particularly one whose respiration is depressed, should not be required to make more effort to breathe than is necessary. If such effort is called for the patient becomes physically exhausted, and if the effort required is too great he may be incapable of making it. As a result the lungs are not filled quickly enough and oxygen intake is lowered. In addition, the intrapulmonary negative pressure at the height of inspiration may be greatly increased and the path prepared for pulmonary oedema. With an endotracheal tube, or any other gas pathway through which the patient is made to breathe, the factors which influence resistance are the diameter and length of the instrument and the presence of sharp corners—all being equally important. In any case, the use of endotracheal tubes, invaluable though it is in preventing respiratory obstruction, does not mean that further obstruction cannot occur. Kinking at the back of the pharynx and the passage of a tube into one bronchus are not infrequent and must be watched for.

Pulmonary Oedema

A common complication of the altered mechanics of respiration in the unconscious patient is pulmonary oedema. Most physicians and anaesthetists have had experience of the speed with which moist sounds, and even frothy sputum, appear in the respiratory tract of such a patient. To understand why pulmonary oedema readily appears in these circumstances it is necessary to indicate briefly the normal equilibrium across the alveolar membrane which keeps liquid within the circulatory system. This consists of a balance of forces. On the one hand there is the pressure within the alveoli, falling a little at each inspiration and returning to atmospheric pressure during expiration; on the other side of the membrane is the vascular system. A filtration force of 10 mm. Hg, the systolic pressure, tries to force fluid out into the alveoli, while the osmotic pressure of the blood proteins, of about 20-25 mm. Hg, acts in the reverse direction. When respiratory obstruction is present the intra-alveolar pressure falls unduly at each inspiration, tending to expel fluid. This is further enhanced if the patient has a right heart failure of any degree, leading to a high pulmonary arterial pressure, or has been injudiciously given blood transfusion or saline infusion. If in addition there is a general anoxia, the alveolar cells and the alveolar vessels also become anoxic, their permeability is increased, and a vicious circle created. Suction can clear fluid only from the trachea and main bronchi; it cannot empty the alveoli. Positive-pressure ventilation with an unobstructed airway can reverse this process. Confirmation of this view may be found in the growing practice nowadays of treating the respiratory depression of barbiturate overdose, the respiratory paralysis of poliomyelitis, and also the paralysis induced by curare in cases of tetanus, by means of tracheostomy, positive-pressure ventilation, and frequent suction. In these instances oxygenation is ensured, the respiratory tract kept clear, and pulmonary oedema prevented.

Summary

An outline is given of the main physiological problems common to unconscious patients whatever may be the underlying cause, and in particular those of interest to an anaesthetist.

Treatment resolves itself into ensuring adequate oxygenation by means of a clear airway, with some form of assisted or artificial respiration where indicated. The improved circulation, with fluid loss made good, combines with the improved oxygenation and respiratory

mechanics to prevent the altered dynamics across the alveolar membrane which leads to pulmonary oedema and may prove fatal. Many an unconscious patient who has been adequately treated for the underlying cause dies unnecessarily because these fundamental physiological requirements are not met.

TREATMENT OF LEUKAEMIA AND ALLIED DISORDERS WITH 6-MERCAPTOPURINE

BY

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Within the past ten years a number of chemical agents which produce temporary beneficial effects in leukaemia and allied diseases have been discovered. Their introduction has usually come about in one of three ways: (a) the observation that a compound being investigated for other reasons has a depressant effect on haemopoietic tissues—for example, nitrogen mustard and urethane; (b) the synthesis of compounds related chemically to substances already known to be effective, such as in the case of triethylene melamine, triethylene phosphoramide, and naphthyl-di-2-chlorethylamine (R.48); and (c) the synthesis of analogues of nucleic-acid precursors. It is on the last group that so much attention is now being focused. Undoubtedly the observation by Farber *et al.* (1948) that two folic-acid conjugates, pteroyl-diglutamic acid and pteroyl-triglutamic acid when given to children with acute leukaemia resulted in an acceleration of the leukaemic process gave considerable impetus to research in this particular field. The sequel was the synthesis of the 4-amino analogues of folic acid, aminopterin and amethopterin, which were found to suppress the growth of leukaemic tissue and produce temporary remissions in some children with acute leukaemia (*Proceedings of the Second Conference on Folic Acid Antagonists*, 1952).

With the knowledge that folic acid was essential for the synthesis of nucleic acid, antagonists of other nucleic-acid precursors have been prepared and tested for antileukaemic activity. 2:6-Diaminopurine, an analogue of adenine, has been shown (Burchenal, Bendich, *et al.*, 1949; Burchenal, Johnston, *et al.*, 1949) to prolong the survival time of mice with transplanted leukaemia. Burchenal, Karnofsky, *et al.* (1951) reported remissions in five of a series of 25 patients with acute leukaemia treated with this compound. Compounds containing the 2:4-diamino-pyrimidine moiety, including those with antimalarial activity (Falco *et al.*, 1949), were shown to be competitive antagonists of folic acid in the growth of *Lactobacillus casei* (Hitchings *et al.*, 1952), and in animals states indicative of folic-acid deficiency were observed. These findings suggested that such compounds might be effective in acute leukaemia, and it has been shown (Burchenal, 1954) that one such pyrimidine analogue, 2:4-diamino-5(3'4'-dichlorophenyl)-6-methylpyrimidine, produced occasional remissions in children with this disease. Farber, Foley, *et al.* (1953) have shown that a related series of compounds, the dihydrotriazines, have the property of temporarily inhibiting the growth of the leukaemic process in children.

Of the purine and pyrimidine derivatives discovered to date, the most effective in the treatment of leukaemia is the analogue of adenine and hypoxanthine, 6-mercaptopurine (6-MP). This substance, known by the proprietary name "purinethol," has been shown by Burchenal, Murphy, *et al.* (1953) to have produced good clinical and haematological remissions in 15 out of 45 children with acute leukaemia, and in another 10 patients partial remissions and clinical improvement. The same authors described occasional remissions in adult patients with the disease, and encouraging results in patients with chronic myeloid leukaemia.

The present study is based on experience gained in the treatment of 26 patients since June, 1953. Of these, 13 had acute leukaemia, 7 chronic myeloid leukaemia, 2 chronic lymphatic leukaemia, 2 multiple myeloma, 1 mycosis fungoides, and 1 erythroderma secondary to an underlying reticulosis of undetermined type.

PLAN OF TREATMENT

Patients were unselected and none received other forms of chemotherapy previous to, or as a supplement to, treatment with 6-MP. Blood transfusions and antibiotics were prescribed as the need arose. All patients received the initial course in hospital, and clinical and haematological examinations were performed daily or on alternate days. The bone marrow was examined at intervals, generally of two weeks, in cases of acute leukaemia. Patients who improved sufficiently were later followed up in the out-patient department and had blood examinations at weekly or fortnightly intervals.

The dosage of 6-MP was based on that suggested by Burchenal, the initial dose being approximately 2.5 mg. per kg. body weight. Thus a 5-year-old child was started on 50 mg. and an adult on 150–200 mg. per day, measured to the nearest 25 mg. The same dosage scheme was used both for patients with acute and those with chronic leukaemia, and in all instances the daily amount was divided into doses of 25 or 50 mg. given over the 24-hour period.

RESULTS OF TREATMENT

A. Acute Leukaemia

The criteria for a complete remission were strict and consisted of: (a) disappearance of all clinical evidence of disease and return of patient to full activity; (b) return of peripheral blood picture to normal; and (c) return of bone marrow to apparent normality with disappearance of blast cells or reduction to less than 10% of total cell count. A partial remission was said to be present when clinical and haematological improvement was considerable but fell short of the criteria of a complete remission.

Of 13 patients, seven responded to treatment. Five (two children and one adult with acute lymphoblastic leukaemia, and two adults with acute myeloblastic and acute monocytic leukaemia respectively) developed a complete clinical and haematological remission lasting from seven weeks to seven months. One patient, a child aged 3½ years, relapsed after remission lasting three months, but further treatment resulted in a second remission of four months' duration. Resistance to therapy has been observed following relapse, and in only one case has 6-MP been effective a second time. One adult and one child showed temporary, partial clinical and haematological improvement, while six patients (three adults and three children) failed to respond to treatment, four dying within the first week.

Illustrative Cases

CASE 1: ACUTE LYMPHOBLASTIC LEUKAEMIA.—A boy aged 3½ years was admitted to the General Infirmary at Leeds on June 20, 1953. Five weeks previously mumps had been diagnosed, and he then got rapidly worse. He lost appetite and pain in the legs prevented him from walking. Increased pallor was noticed and the temperature was at times raised.

On admission he was anaemic, and there were enlarged lymph nodes in the cervical, axillary, and inguinal regions, also numerous small scalp tumours. The skin, throat, and mouth appeared healthy; the liver and spleen were not palpable. There was no pyrexia.

Blood studies supported a diagnosis of acute lymphoblastic leukaemia. On June 26 blood findings were: Hb, 6 g. per 100 ml.; R.B.C., 1,900,000 per c.mm.; reticulocytes, 1.9%; platelets, 60,000 per c.mm.; W.B.C., 4,800 per c.mm. (blast cells 17%, lymphocytes 83%). The tibial bone marrow was highly cellular and replaced by lymphoid cells, of which 56% were primitive cells with the characteristics of lymphoblasts, while the rest were more or less mature lymphocytes. Packed red cells were immediately transfused, raising the haemoglobin level to 13.5 g. On the same day 6-MP therapy, 50 mg. by mouth daily for nine days, was started. On July 5 this was increased to 75 mg. daily for five days, and during the next two days a further 75 mg. was given. 6-MP was stopped on July 11, after a total of 0.9 g. had been given. During treatment the child's condition remained good, pain in the legs was moderate, and he was afebrile. On July 14 the lymph nodes and scalp tumours were palpable, and the white cell count had fallen to 850 per c.mm. and the haemoglobin to 9.6 g. Leucopenia persisted for three weeks and was followed by haematological remission.

On August 1 the leucocyte count was 4,000 (polymorphs 55%, lymphocytes 45%) and the platelet count 169,000 per c.mm. Blast cells in the tibial bone marrow had decreased to 6.4%; lymphocytes were 17.2%, myeloid cells 46.4%, and erythroid cells 30.0%, and the marrow was less cellular. The presence of erythroid elements was reflected in the rising haemoglobin level and red cell count, which on August 5 were 12.2 g. per 100 ml. and 4,000,000 per c.mm. respectively.

The patient was discharged on August 11. Physical examination revealed no abnormality, his appetite was good, and he regained full activity. Full clinical and haematological remission continued for three months, when relapse occurred. He was readmitted to hospital, and a second course of treatment with 6-MP for seven weeks again led to a complete remission lasting four months, during which a daily maintenance dose of 25 mg. 6-MP was prescribed. He had now become resistant to 6-MP, and A.C.T.H. was substituted. Although he has since been persistently leukaemic, his clinical condition has been fairly good. He has now survived over a year since the disease was diagnosed.

CASE 2: MONOCYTIC LEUKAEMIA (NAEGELI TYPE).—A 44-year-old baker was admitted to St. James's Hospital, Leeds, on June 9, 1953, with a four-weeks history of lumbar pain and of sweating and dyspnoea on exertion. Examination showed widespread ecchymoses, and two small skin tumours in the xiphisternal region. Sacral oedema was present; the liver was palpable 6 cm., and the spleen 5 cm., below the costal margin. The temperature was normal; no other physical abnormalities were found. A chest radiograph was normal. Biopsy showed the skin tumours to be due to leukaemic infiltration. The blood count on June 11 was: Hb, 8.5 g.; R.B.C., 2,800,000 per c.mm.; reticulocytes, 1%; platelets, 66,000 per c.mm.; W.B.C., 6,800 per c.mm. (blast cells 11%, myelocytes 11%, neutrophils 30%, eosinophils 11%, basophils 1%, lymphocytes 22%, monocytes 14%). The sternal bone marrow showed: blast cells, 59%; myeloid cells, 12%; erythroid cells, 8.5%; lymphocytes, 15%; other cell types, 5.5%. Megakaryocytes were scanty. Many of the primitive blast cells were monocytoïd, the appearance suggesting a Naegeli-type monocytic leukaemia.

Treatment with 6-MP, 100 mg. daily by mouth for seven days, was begun on June 15. On June 22 the patient had severe dyspnoea owing to a large left-sided pleural effusion, and 2 pints (1.1 litres) of haemorrhagic fluid was removed. The dose was then increased to 200 mg. daily. Whole blood was transfused on the fifth day of treatment, raising the haemoglobin level to 10.5 g. No clinical or haematological change occurred during the first three weeks of treatment. On July 8 the patient felt much better, the lumbar pain had disappeared, and his appetite improved. The size of the liver

and spleen had not changed, however, and a large pleural effusion was still present. The haemoglobin level had fallen and more whole blood was transfused. The leucocyte count was 4,200 and the platelet count 85,000 per c.mm. The leucocyte count continued to fall, and treatment was stopped on July 14, when leucocytes numbered 1,200 per c.mm.; a total dose of 5.3 g. of 6-MP had been given. He was now symptom-free; the liver was palpable, and the lower pole of the spleen could be felt only on deep inspiration. The remaining skin tumour had disappeared, but fluid was present in the left pleural cavity and a further 2 pints was removed on July 13. On July 14 the sternal bone marrow was hypocellular and blast cells had decreased to 10%.

The platelet count three days after stopping treatment rose to 192,000 per c.mm., and thereafter remained normal. Leucopenia persisted for two weeks, the leucocyte count then rising to normal. On July 29 findings on physical examination were normal and the blood picture was as follows: Hb, 11.5 g.; R.B.C., 3,800,000 per c.mm.; reticulocytes, 1%; platelets, 250,000 per c.mm.; W.B.C., 5,700 per c.mm. (neutrophils 78%, eosinophils 2%, lymphocytes 16%, monocytes 4%). The sternal bone marrow was still hypocellular, but the differential count was much improved: blast cells, 3.6%; myeloid cells, 47.6%; erythroid cells, 16.4%; lymphocytes, 13.6%; degenerate cells, 18.8%.

The patient was discharged on August 1 without maintenance therapy. For seven weeks after cessation of treatment he was symptom-free and carried out normal activities. A chest radiograph one week after discharge was normal. In early September relapse occurred and treatment with 6-MP was restarted. The disease was now, however, completely refractory to therapy and the patient died on October 8, 1953. A graphic record of the patient's progress is shown in Fig. 1.

CASE 3: ALEUKAEMIC LYMPHATIC LEUKAEMIA.—A 62-year-old housewife was admitted to the General Infirmary at Leeds on July 23, 1953, with a ten-weeks history of increasing pallor, lassitude, loss of appetite, and dyspnoea on exertion. Temperature 100.4° F. (38° C.). She was anaemic, with large lymph nodes in axillae and groins. The liver was palpable 5 cm., and the spleen 12 cm., below the costal margin. Slight sacral oedema and crepitations at both lung bases were detected. There were no other physical abnormalities. Blood findings were: Hb, 7.8 g.; R.B.C., 2,800,000 per c.mm.; platelets, 119,000 per c.mm.; W.B.C., 1,900 per c.mm. (polymorphs 36%, monocytes 2%, lymphocytes 62%). A percentage of the lymphocytes had nucleoli. Sternal bone marrow was moderately cellular; 66.4% of cells were of the lymphoid series, about half being lymphoblasts. The rest were equally divided between the myeloid and erythroid series. The picture was that of aleukaemic lymphatic leukaemia.

Packed red cells were transfused on July 26, and treatment with 6-MP, 200 mg. daily, was begun on August 7. On August 17 she felt better and her appetite improved. No change was seen on physical examination, but four days later the liver, spleen, and lymph nodes began to get smaller. Dosage was reduced to 100 mg. daily on August 24, and discontinued seven days later, a total of 4.2 g. having been given. Now the spleen was palpable and the liver edge could be felt only on deep inspiration. A few small, fleshy lymph nodes remained in the axillae. Physical examination was otherwise negative, temperature was normal, and the patient symptom-free.

Unlike in the first two cases, no significant reduction in white cell count followed treatment, and at no stage did it

fall below the initial figure. Improved distribution of leucocytes in the peripheral blood was, however, seen within ten days of the start of therapy. The haemoglobin level rose steadily, but there was little increase in platelets. At the end of treatment blood findings were: Hb, 11.2 g.; R.B.C., 3,700,000 per c.mm.; platelets, 100,000 per c.mm.; W.B.C., 3,100 per c.mm. (polymorphs 65%). The bone marrow was less cellular; few lymphoblasts (1.2%) were seen, and 33.6% of the cells were lymphocytes. Erythropoiesis was active and normoblastic, 34.0% of the cells being of this series, and the rest developing granulocytes.

The patient was discharged on September 5 feeling well. When seen ten days later improvement was maintained. The haemoglobin had risen to 12 g. and the platelet count to 275,000 per c.mm. She remained well, with a normal peripheral and bone-marrow blood picture, for seven months, being fully active and living a normal life. Maintenance therapy was not given during the remission, and since relapse in April, 1954, the disease has been refractory to further treatment with 6-MP.

CASE 4.—A man aged 41 was admitted to the General Infirmary at Leeds on April 7, 1954, with widespread purpura, epistaxis, and a large left pleural effusion. The liver and spleen were not enlarged. The blood picture was typical of acute myeloblastic leukaemia, with a total leucocyte count of 129,000 per c.mm., the majority blast cells. As he was very ill an attempt was made to induce an early response to 6-MP by a large initial dose (1 g. over the 24 hours) on April 8, followed by 200 mg. daily thereafter. The leucocyte count fell to 4,800 per c.mm. in four days with much clinical improvement. Treatment was stopped on April 14, when the leucocyte count was 2,000 per c.mm. Improvement continued, the pleural effusion cleared without paracentesis, and the enlarged lymph nodes receded. On May 1 blood findings were Hb, 12.2 g.; W.B.C., 5,400 per c.mm. (polymorphs 65%, lymphocytes 34%, monocytes 1%); platelets, 450,000 per c.mm. Sternal bone marrow: blast cells, 3.2%; myeloid cells, 43.4%; lymphocytes, 12%; erythroid cells, 39.2%; other cell types, 2.2%.

He was discharged on May 8 on a daily maintenance dose of 100 mg. of 6-MP. The remission has now lasted two months.

B. Chronic Myeloid Leukaemia

Of seven patients at different stages of the disease, including one in the acute phase, a varying response was observed in six; the other patient died of cerebral thrombosis a week after starting treatment. Improvement was

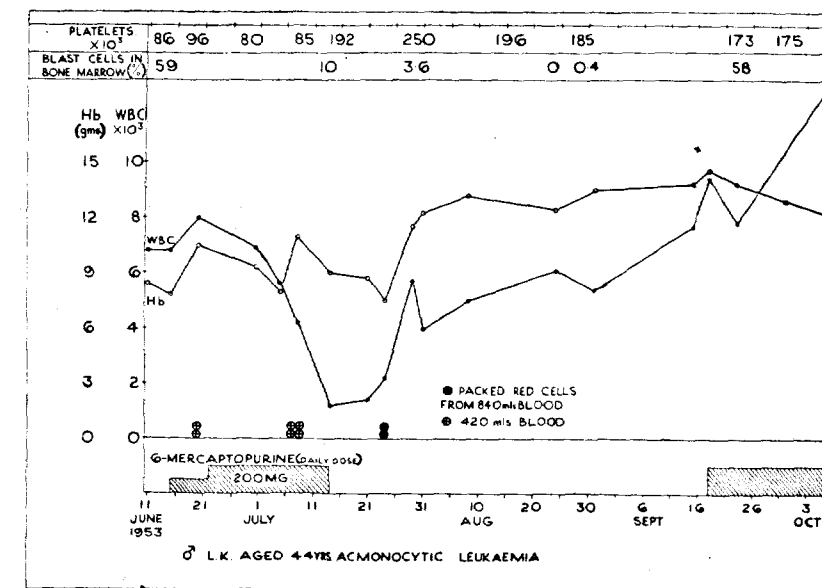


FIG. 1.

assessed on subjective, objective, and haematological changes following treatment.

Subjective improvement—increase in well-being, activity, appetite, and weight—was observed in four cases. Two others showed little subjective improvement, but there were a reduction in size of spleen and a fall in leucocyte count.

Objective improvement—diminution in size of spleen, lymph nodes, etc.—was observed in five cases. In only one case did the spleen fail to regress after prolonged treatment.

The leucocyte count fell in all six cases. In two cases erythropoiesis improved, but in another two no rise in haemoglobin level or red cell count occurred. Two patients had no significant anaemia.

Illustrative Cases

CASE 5.—A 49-year-old man had been well up to the day preceding his admission to the General Infirmary at Leeds on September 25, 1953, when he had a sudden attack of left abdominal pain with vomiting. He had a history of perforated peptic ulcer in 1945 and of partial gastrectomy in 1949. He was a pale, thin man, in obvious pain, and vomited repeatedly during examination. A large, rubbery, mobile lymph node was felt in the left axilla, and the spleen was palpable 8 cm. below the left costal margin. No other clinical abnormalities were found. Blood findings indicated chronic myeloid leukaemia and were as follows: Hb, 9.0 g.; R.B.C., 3,300,000 per c.mm.; reticulocytes, 2%; platelets, 300,000 per c.mm.; W.B.C., 128,000 per c.mm. (myelocytes 2%, metamyelocytes 17%, neutrophils 79%, eosinophils 1%, lymphocytes 1%). An occasional nucleated red cell was seen in the peripheral blood film. The sternal bone marrow was hypercellular with a marked preponderance of granular cells.

Treatment with 6-MP was begun on September 28. Within 48 hours of admission the abdominal pain and vomiting ceased, but tenderness of the left upper abdomen persisted for a week. The blood picture was unaltered until October 21, when the leucocyte count fell to 60,000 per c.mm. Two days later it was 44,000 per c.mm., and treatment was stopped, a total dose of 4.4 g. having been given. The spleen, which during the first three weeks had enlarged, became smaller. The patient was discharged on October 28, his progress being regularly followed. His condition remained satisfactory, with a rise in haemoglobin to 11.2 g., and he returned to work the following month. On November 30 the spleen was much larger and the leucocyte count had risen to 56,000 per c.mm. Treatment with 6-MP was restarted in a dose of 100 mg. daily, and after three weeks clinical and haematological improvement was again observed.

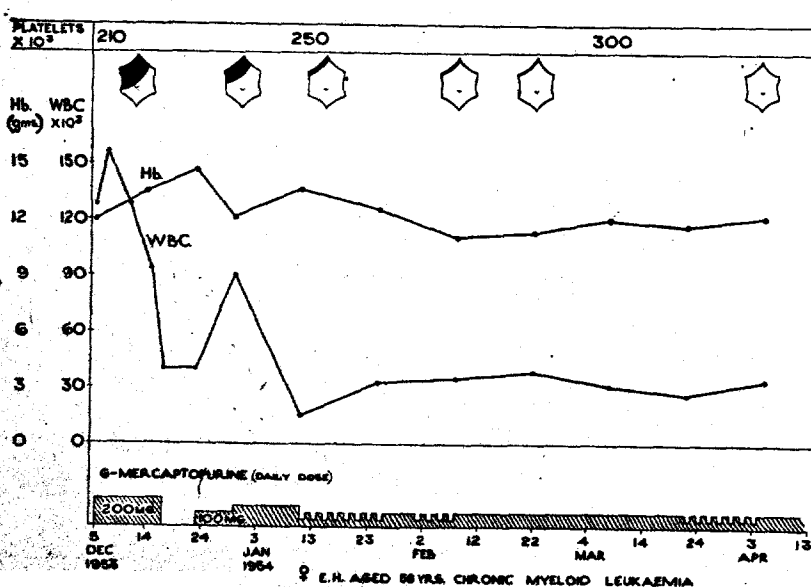


FIG. 2.

In view of previous experience and that of others a maintenance dose of 6-MP seemed necessary if a satisfactory clinical and haematological state was to continue for any length of time, therefore a dosage of 100 mg. and 50 mg. on alternate days was prescribed. On this the patient has remained well, the spleen and lymph nodes have been palpable and leucocytes and haemoglobin have been kept at normal levels for six months, during which time he has been fully active and doing a normal day's work.

CASE 6.—In a spinster aged 58 chronic myeloid leukaemia was diagnosed in March, 1952. She had no treatment during the following year, but owing to splenic enlargement and discomfort a splenectomy was performed in April, 1953. Deep x-ray therapy was then given with temporary improvement. On December 4, 1953, she was admitted to the General Infirmary at Leeds complaining of tiredness, loss of appetite, abdominal pain and distension, and swollen ankles. The liver was enlarged 12 cm. below the right costal margin, and small discrete lymph nodes were felt in the axillae and inguinal regions. Anaemia was not clinically evident. Blood examination revealed: Hb, 12.0 g.; R.B.C., 3,700,000 per c.mm.; platelets, 210,000 per c.mm.; W.B.C., 128,000 per c.mm. (myelocytes 3%, metamyelocytes 12%, neutrophils 84%, lymphocytes 1%).

Treatment with 6-MP, 200 mg. daily, was begun on December 5, but there was a delay of nine days before it took effect. After 12 days the leucocyte count had fallen to 39,600 per c.mm., the patient felt better, and the liver was smaller, being palpable 6 cm. below the right costal margin. Treatment was now stopped, a total of 2.6 g. having been given, and she was discharged with instructions to attend for follow-up. No further improvement occurred during the following week, and treatment with 6-MP was restarted in a dose of 100 mg. daily. On December 30 she felt much better and had gained 7 lb. (3.175 kg.) in weight. The liver was, however, still 6 cm. below the right costal margin, and the leucocyte count had risen to 91,200 per c.mm. Increasing the dose to 150 mg. resulted in a fall in leucocyte count to 15,400 by January 11, when the liver edge was just palpable and she was symptom-free; haemoglobin was 13.5 g. and platelets 250,000 per c.mm.

This patient has been maintained on a daily dose of 50 or 100 mg. of 6-MP for six months, during which time she has been symptom-free and fully active. No objective signs of disease have reappeared and the blood picture has remained satisfactory. The patient's progress is shown graphically in Fig. 2.

CASE 7.—A 56-year-old housewife was admitted to St. James's Hospital, Leeds, on December 18, 1953, with a seven-years history of myeloid leukaemia treated by several courses of deep x-ray therapy, the last in October, 1953. Her main complaints were repeated vomiting, a dragging sensation in the left abdomen, loss of weight, sweating, and epistaxis. The spleen was firm and tender and extended to 15 cm. below the left costal margin, and the liver was palpable 2 cm. below the right costal margin. Blood examination showed the following: Hb, 8.2 g.; R.B.C., 2,300,000 per c.mm.; platelets, 225,000 per c.mm.; W.B.C., 152,000 per c.mm. (blast cells 8.5%, myelocytes 25.5%, metamyelocytes 8.0%, polymorphs 35.8%, lymphocytes 17.5%, monocytes 2%). Sternal bone marrow was hypercellular, with blast cells 74.0%, myeloid cells 21.6%, erythroid cells 3.2%, lymphocytes 0.8%, and other cells 0.4%. The findings were characteristic of the acute terminal phase of chronic myeloid leukaemia.

Treatment with 6-MP, 200 mg. daily, was started on December 18, and on December 23 blood was transfused,

raising the haemoglobin level to 11.3 g. per 100 ml. The leucocyte count fell after three days' treatment, and by two weeks had reached 13,000 per c.mm.; the patient felt stronger, vomiting and sweating had ceased, the liver was palpable, and the spleen 9 cm. below the left costal margin. The dose of 6-MP was reduced to 100 mg. daily on January 2, and this was continued until January 14, when treatment was stopped, a total of 4.1 g. having been given in 27 days. By now the leucocyte count had fallen to 300 per c.mm., and the haemoglobin to 7.5 g., and the spleen was just palpable. More blood was transfused on January 22, and this raised the haemoglobin level to 11.7 g. The bone-marrow picture was also much improved: blast cells, 8.5%; myeloid cells, 47.5%; erythroid cells, 18.5%; lymphocytes, 24%; other cells, 1.5%. She was now well enough to get up, and although the leucopenia persisted for a month no complications resulted. The haemoglobin level was maintained without further blood transfusion, and clinical examination failed to reveal any of the usual findings of leukaemia. On February 2 she was discharged, and when next seen two weeks later she was symptom-free and doing a full day's domestic duties. Blood examination showed: Hb, 12.0 g.; R.B.C., 4,000,000 per c.mm.; platelets, 200,000 per c.mm.; W.B.C., 4,400 per c.mm. (polymorphs 80%, lymphocytes 20%). She was put on a daily maintenance dose of 50 mg. of 6-MP, and remained in good health for four and half months after completing the initial course of treatment. Relapse then occurred, and the disease was found to be resistant to further treatment with 6-MP. She died on June 26, 1954.

C. Chronic Lymphatic Leukaemia

Two patients (aged 73 and 56 years) with chronic lymphatic leukaemia showed no clinical or haematological evidence of improvement after one month's treatment with 6-MP.

D. Miscellaneous Group

Two patients with multiple myeloma, and one with erythroderma considered to be due to a reticulosis of undetermined type, failed to benefit from a month's treatment with 6-MP. One patient with mycosis fungoides appeared to be temporarily improved.

TOXICITY

An important property of 6-MP is its low toxicity. Apart from depressing bone-marrow function it has not resulted in any definite toxic side-effects in the present series. Burchenal has stated (Burchenal, Murphy, *et al.*, 1953) that gastro-intestinal symptoms may occur; but, whereas there has been vomiting in some of the cases now reported, on no occasion was it definitely attributable to the drug, nor did it necessitate interrupting treatment. Ulceration of the mouth, which is so common after treatment with aminopterin or amethopterin, was not observed. Severe thrombocytopenia attributable to 6-MP occurred in only one case—of multiple myeloma—but on no occasion was there haemorrhage. Haemorrhage due to overdosage with 6-MP has, however, been described by Burchenal and his co-workers, and must always be considered as a possible complication. Leucopenia is expected to follow treatment of acute leukaemia, and should not give rise to undue anxiety. No evidence was seen of megaloblastic erythropoiesis, which is an occasional sequel of anti-folate acid treatment.

DISCUSSION

A study of the results obtained in this limited series supports the finding of Burchenal and others that 6-MP may produce temporary remissions in a percentage of cases of acute leukaemia and modify the course of chronic myeloid leukaemia. Chronic lymphatic leukaemia, however, appears to be unaffected by it.

Until a much larger number of patients have been treated no definite information can be obtained as to age group and morphological type of acute leukaemia likely to be most responsive to treatment with 6-MP. All that can be

said is that adults as well as children have had remissions following treatment, and that remissions have been noted in the lymphoblastic, myeloblastic, and myelo-monocytic types of acute leukaemia. Thus 6-MP may be more versatile in its action than aminopterin and amethopterin, which are generally accepted as ineffective in adults and most effective in acute lymphoblastic leukaemia. As with other chemotherapeutic agents used in the management of acute leukaemia (Fountain, 1954), the remissions in patients who respond are only temporary, and, although a second response may occur, the disease gradually becomes resistant to further treatment.

A delay of 7 to 28 days was usual before the drug took effect, which suggests that four patients who died within the first week of treatment had received an inadequate therapeutic trial. In two cases a fall in leucocyte count with clinical improvement occurred, however, within a few days of starting treatment. One patient (Case 7), in the acute terminal phase of chronic myeloid leukaemia, received a routine course of treatment. The other (Case 4) had an extremely acute form of myeloblastic leukaemia with considerable haemorrhagic manifestations. In the hope that the rate of action of the drug would be increased an initial "loading" dose of 1 g. in the first 24 hours was given. Dramatic clinical and haematological improvement followed within the next four days. Although its value remains to be proved—another patient failed to respond rapidly to large doses—such a dosage scheme seems worth trying, as it is obvious that with such a disease as acute leukaemia the rapidity of action of the therapeutic agent is of prime importance. It may be of interest that both patients who responded rapidly to 6-MP had a high initial leucocyte count (over 100,000 per c.mm.), the predominant cell in each case being the primitive blast cell.

Whether patients who experience a complete remission should receive a daily maintenance dose of 6-MP remains to be answered, but from the limited data in this series it seems likely that maintenance therapy may not greatly prolong the remission. Continuous therapy seems essential in chronic myeloid leukaemia if the beneficial effect of the drug is to be maintained, for it has been my experience that in its absence clinical and haematological relapse may follow within a month of stopping treatment.

CONCLUSION

It has been shown that a new compound, 6-mercaptopurine, allied to the folic-acid analogues has been discovered with which dramatic remissions may be obtained in a percentage of cases of acute leukaemia. Unlike aminopterin and amethopterin, 6-MP has a low toxicity and can be used with little danger of added discomfort to the patient—an important consideration in the management of cases of leukaemia. That the remissions are only temporary suggests that the value of 6-MP as a research compound will at present outweigh its clinical usefulness. However, with the knowledge that aminopterin and amethopterin, A.C.T.H. and cortisone, and 6-MP may all produce clinical and haematological remissions in acute leukaemia, it seems desirable to give patients the advantage of such chemotherapy. Symptomatic relief may be obtained, and by sequential use these drugs may offer several months of useful life.

Although more patients with chronic myeloid leukaemia must be treated before the ultimate value of 6-MP is known, initial observations suggest that it will have its place in the management of this disease. The experience of Burchenal and his colleagues that 6-MP benefited two patients in the acute terminal phase of the disease has been supported by a case in this series, and it may be that one of its main uses in chronic myeloid leukaemia will be in the later acute stage of the disease.

SUMMARY

A purine antagonist, 6-mercaptopurine, has been shown to produce complete clinical and haematological

remissions in five out of thirteen patients, of various ages, with acute leukaemia, and partial remissions in two others. The remissions were only temporary, and resistance to further therapy with 6-MP eventually resulted.

Six patients with chronic myeloid leukaemia showed a varying response. One patient in the acute terminal phase had a remission lasting four and a half months.

Two patients with chronic lymphatic leukaemia, two with multiple myeloma, and one with reticulosis of the skin did not respond, while one patient with mycosis fungoides obtained some improvement.

6-MP is of low toxicity and no serious complications have followed its use.

I wish to thank the consultant physicians of the Leeds Hospitals for permission to study patients under their care, and also Dr. D. H. Collins and Dr. W. Goldie and the staff of their laboratories at the General Infirmary and St. James's Hospital, Leeds. I am indebted to Professor R. E. Tunbridge for his advice and criticism.

6-Mercaptopurine was initially supplied through the kindness of Dr. D. S. Searle, Medical Director, Burroughs Wellcome & Co. Inc., Tuckahoe, New York, U.S.A., and later by Dr. F. Prescott, Clinical Research Director, Burroughs Wellcome, London, England.

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ERYTHRAEMIC MYELOSIS TERMINATING IN ERYTHROLEUKAEMIA

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Malignant hyperplasia of the erythron, analogous to leucoblastic proliferation in leukaemia, was first described by Copelli (1912) and later defined as a pathological entity by Di Guglielmo (1923, 1926, 1937) when he recorded three cases as examples of true "erythraemic myelosis." These cases, with others published on the Continent, have been exhaustively reviewed by Di Guglielmo (1945, 1946) and Leitner (1949).

As with leukaemias, acute and chronic forms are recognized. Acute erythraemic myelosis (Di Guglielmo, 1945), pursuing a fatal course of one or two months, presents with severe anaemia, irregular fever, splenomegaly, slight hepatomegaly, and erythroid hyperplasia, with atypical erythroblasts in the blood, many of which

fail to mature. The chronic form (Duesberg, 1940; Heilmeyer and Schöner, 1941; Di Guglielmo and Quattrin, 1942) runs a longer course, up to two years, and the circulating erythroblasts are orthochromatic and less atypical.

In this country four examples of the chronic form appear to have been recognized, three of which have been published in Britain (Israëls, 1939; Neumark, 1948; Emery, 1951; Mackenzie and Stephenson, in *Blood*, 1952). A subacute form, terminating in acute granulocytic leukaemia, has also been recorded (Discombe and Nickol, 1954).

If in the case described below the patient had died within the first two months a diagnosis of acute erythraemic myelosis would have been accepted, but repeated blood transfusions sustained life for a further four months, during which the erythroleukaemic nature of the disease became manifest. In this respect our case closely resembles those of Verloop, Deenstra, and van der Hoeven (1952) and Discombe and Nickol (1954), lending support to the theory that erythraemic myelosis and erythroleukaemia are probably unusual variants in the onset of acute leukaemia.

Case Report

A single woman aged 30 gave up work in a soda-water factory early in August, 1953, because she felt very tired and breathless on the slightest exertion. Two weeks later she developed lumbar pain, headache, and nausea with vomiting.

On admission on August 25 she was very pale, had a temperature of 102° F. (38.9° C.) and fetid breath but no ulceration of the gums or fauces. The liver was palpable and the spleen descended five fingerbreadths in inspiration. There was no relevant personal or family history. Clinically she was considered to be a case of leukaemia, but subsequent blood and marrow pictures (see below) indicated erythraemic myelosis.

Owing to the severe anaemia she was given repeated blood transfusions, 26 pints (14.8 litres) in all, over a period of six months, the highest haemoglobin achieved being 78% (12.4 g.). Transient improvement followed each transfusion; vomiting ceased, the appetite returned, and the temperature subsided.

As her condition could not be maintained despite transfusions, liver, cyanocobalamin ("cytamen"), iron, vitamins, folic antagonists, and corticotrophin, it was decided to remove her spleen. This was done without incident on December 18. Improvement followed splenectomy, the haemoglobin remaining at 66% (10.5 g.), and in January, 1954, she was sent home on corticotrophin. She was now apyrexial, eating well, and gaining weight.

She was readmitted on February 19, 1954, with recurrent vomiting and pyrexia and the haemoglobin had now fallen to 42% (5.7 g.). Further transfusions had little effect and she continued to go downhill. Early in March a large gluteal abscess, following an injection of corticotrophin, was evacuated and 11 oz. (320 ml.) of pus obtained. The wound continued to discharge, and shortly before death on March 23 the haemoglobin had fallen to 16% (2.5 g.). Transfusions were now withheld, as she was obviously in the terminal stages of her illness.

Investigations

General.—Histamine-fast achlorhydria. Urobilinogen excess in urine but no haemosiderin in centrifuged deposit. Bile pigments scanty. Serum bilirubin, 1.2 mg. per 100 ml.

Blood.—Three representative blood counts are set out in the Table. Red cells showed marked anisocytosis, poikilocytosis, and moderate polychromasia. Platelets were scanty

Peripheral Blood

	Week of Admission	Week after Splenectomy	Week before Death
Haemoglobin	5.4 g. (34%)	10.5 g. (66%)	2.5 g. (16%)
Erythroblasts	15,370	21,000	100,600
Leucocytes	2,400	18,800	117,000
Myelocytes	1%	8%	5%
Metamyelocytes ..	4%	11%	7%
Polymorphs	29%	51%	19%
Eosinophils	1%	2%	1%
Lymphocytes	53%	20%	2%
Monocytes	12%	3%	23%
Promonocytes	—	—	34%
Stem cells	—	5%	9%

at all times. Reticulocytes 5.5% during cyanocobalamin therapy. Red-cell fragility was not significantly increased and tests for underlying haemolytic mechanisms were negative. Cold agglutinins were absent.

Sternal Marrow Punctures.—September 11, 1953 :—Easily aspirated, densely cellular, hyperplastic marrow—over 95% of the nucleated cells being erythrocyte precursors in which megaloblastic, macronormoblastic, and normoblastic erythropoiesis were evenly represented. Multipolar mitoses and nuclear-cytoplasmic "ripening" dissociation were present in minor degree. November 22 :—Same dense cellularity, but granulocytes now numbered 24.5% and red-cell precursors had fallen to 60%. As before, megakaryocytes were very scanty. Erythroid mitoses were still plentiful, but there appeared to be fewer mitotic abnormalities. An increase in megaloblasts was attributed to antifolic therapy. February 23, 1954 :—A hypocellular marrow aspirated with difficulty. Monocytes and their precursors now predominated. Some of the mature forms contained red cells.

Splenectomy.—December 18, 1953 :—The spleen weighed 41 oz. (1,120 g.). It was flabby, bright red in colour, and contained three recent infarcts. Histologically the Malpighian bodies were small and widely separated. The sinuses were filled with erythroblasts, but the reticulo-endothelial lining appeared to be normal and unproliferative. A few iron-laden macrophages and small foci of granulopoiesis were present.

Liver Biopsy.—December 18, 1953 :—Small centres of granulopoiesis, normoblasts in the portal tracts, and a sprinkling of haemosiderin in the periphery of the lobules.

Necropsy Report

Necropsy performed 16 hours after death. Several greyish macules on trunk and a few petechiae on forearms. The heart was slightly enlarged, very pale and flabby, and contained greyish-pink creamy blood. The liver (2,621 g.) was pale and yellowish grey. Two enlarged, soft, greyish lymph nodes were found at the hilum. The kidneys were enlarged and showed scattered wedges of homogeneous yellowish-grey colour with little demarcation between cortex and medulla. The marrow of sternum, ribs, vertebral bodies, and left femoral shaft was uniformly grey in colour. Several pea-sized cherry-red nodules were found in the dura over the left cerebral vertex but the brain was normal. Apart from bloodlessness the other organs appeared normal.

Histology.—The bone marrow showed a dense uniform cellularity with a few widely scattered islands of erythroblasts. The predominating cell had a round or oval vesicular nucleus with a thin rim of cytoplasm. Mitoses were scanty. Lymph-node architecture was partially disorganized, the surviving follicles at the periphery being small and devoid of germinal centres. The invading cells were a mixture of those seen in the marrow and normoblasts. The liver cells were compressed and loaded with haemosiderin in the outer and middle zones of the lobules and there were numerous monocytoïd cells and normoblasts in the portal tracts.

The dural nodules, skin, stomach, intestines, heart, kidney, adrenals, thyroid, pituitary, uterus, and ovaries all showed infiltration in varying degree by cells indistinguishable from those in the marrow.

Discussion

In the evaluation of this and other cases presented as acute erythraemic myelosis the greatest difficulty lies in excluding various forms of haemolytic anaemia. The presence of atypical erythroblasts with abnormal nuclei is among the features characteristic of the disease (Di Guglielmo, 1946), the typical failure of maturation in the erythroblasts of our cases being evidenced by the low reticulocyte counts.

Although deaths from erythraemic myelosis still occur (Emery, 1951; Schwartz and Critchlow, 1952) evidence accumulates to suggest that the longer the patient lives the more likely is acute leukaemia to develop. Gradations and transitions between erythraemic myelosis, erythroleukaemia, and myeloid leukaemia have been noted by Blackburn and Lajtha (1951) and by Martin and Bayrd (1954). Our case, in developing a monocytic element, constitutes a departure from the usual myeloblastic finale, but this may have been of Naegeli type, the so-called "monocytic phase of myeloid leukaemia." However, in describing the Schilling type, Wintrobe (1951) states that some of the cases have shown a widespread hyperplasia of monocytic cells in the connective tissue, especially about the blood vessels. It is of interest that the same perivascular reticulo-endothelial hyperplasia has been noted in several cases of erythraemic myelosis. Di Guglielmo himself describing transitional forms between reticulum cells and erythroblasts as a feature of the disease. Moreover, many cases, critically reviewed and accepted as erythraemic myelosis, have shown a frank monocytosis.

If we accept Dameshek's view that marrow reaction may be non-specific and provoke response along multiple channels, or Downey's modification of the neo-unitarian theory, ascribing toti-potentiality to the reticulo-endothelial cell, then we may conveniently regard erythraemic myelosis, erythroleukaemias, and leukaemias as manifestations of a fundamental "stem-cell" derangement and satisfactorily group them together as a reticulo-endotheliosis.

Summary

A woman aged 30 died six months after the onset of a profound resistant anaemia characterized, in the early stages, by erythroblastaemia, leucopenia, and erythroid hyperplasia in the marrow. A diagnosis of acute erythraemic myelosis (Di Guglielmo's disease) was made.

Following splenectomy the picture changed to one of erythroleukaemia, the leukaemic element being monocytic and probably of Naegeli type.

The relationship between erythraemic myelosis, erythroleukaemia, and leukaemia is briefly discussed.

We wish to thank Mr. F. P. Forrest, surgeon, Poole General Hospital, for performing the splenectomy and liver biopsy; Dr. C. H. D. Bartley, Wimborne, for tending the patient during her brief period at home after splenectomy; and Messrs. C. J. Cooper and J. Power for technical assistance.

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large part or almost the whole of the stomach may be displaced into the chest, while the cardia remains in its normal position, will not affect the sphincter, and consequently oesophagitis is not produced. A combination of these two types occurs, known as a rolling hernia, in which the oesophagitis is a frequent complication (Fig. 3).

Results of Regurgitation of Gastric Juice

Superficial ulceration takes place which tends to heal and break down again. This ulceration produces spasm in the muscular coats of the oesophagus and later cicatricial contraction. Both processes lead to a gradual shortening of the oesophagus and to stricture formation.

Symptoms

Pain, dysphagia, and symptoms due to haemorrhage may all occur, together or separately, and the severity of each symptom may vary from a slight disturbance to a major illness. The pain is characteristically retrosternal and is produced by any posture or movement which encourages regurgitation. Movements such as stooping down to tie up the shoes or lying flat in bed will all tend to aggravate the pain. Besides being felt as a heartburn or retrosternal pain, radiation often occurs down one or both arms and up into the angle of the jaw. When this happens a diagnosis of cardiac pain is sometimes made, or if the distribution is very extensive the symptoms are often attributed to necrosis. The spastic contractions of the circular muscle and later the cicatricial changes will each produce dysphagia, although the spastic element will tend to improve spontaneously if the oesophagitis becomes less. The dysphagia varies from a subjective feeling of food sticking to inability to take any food whatsoever. The bleeding is usually intermittent and insidious, and in fact is suspected only when the patient is found to be grossly anaemic. Massive haemorrhage occurs occasionally in these patients, and is usually due to the fact that the stomach has been drawn up into the chest as part of the pathological process and a chronic gastric ulcer has developed in the thoracic stomach.

The diagnosis of the condition is made by x-ray and oesophagoscopy examination. It may be confused on occasion with carcinoma on the one hand and true cardio-spasm or achalasia on the other.

Treatment

The heartburn from which these patients suffer is often attributed to duodenal ulceration, and the treatment prescribed may be sufficient to relieve the symptoms. In any event, the duodenal ulcer patient who has a high gastric acidity and whose stomach possibly empties slowly owing to spasm at the pylorus will also suffer from reflux oesophagitis should his cardiac sphincter be incompetent. Where pain and anaemia are the most marked features medical management should be given in the first instance. The regime adopted should be exactly that used in treating a duodenal ulcer, with the difference that great emphasis must be placed on avoiding all postures and movements which encourage regurgitation. This regime is sufficient to improve a considerable number of patients. Even if there is some degree of stricture formation, a strict medical regime together with dilatation of the oesophagus may prove effective, but dilatation by itself must never be used in these patients because the result will be fresh stricture formation at a higher level.

If simple measures fail or severe stricture formation is present, or the presence of an ulcer in a thoracic stomach is proved or suspected, operation must be undertaken. The nature of the operation depends on the changes which have occurred in the oesophagus and whether it is possible to restore the anatomical arrangement at the hiatus to normal. If this is the case an operation aimed at replacing the stomach in the abdomen and retaining it there by suturing the phrenico-oesophageal ligament to the undersurface of the diaphragm is the basis of the procedure. This ligament,

described by Allison (1951), is not recognized by some surgeons, but there is usually no difficulty in demonstrating its presence and using it in the manner described. Decreasing the size of the actual hiatus is of little importance, because the opening in any event is an elastic one and its increase in size is brought about by the cone of stomach forcing its way upwards. If the stomach is kept down, the crus of the diaphragm will conform to the lower end of the oesophagus. As an adjunct to this form of repair I make a point of dividing both vagi to decrease the gastric secretion. To overcome the ill effects of the vagotomy the pyloric sphincter is divided. This procedure may disclose a number of cases of unsuspected duodenal ulcer.

If there is a long stricture present or a chronic ulcer has formed in the thoracic stomach, simple restoration of the anatomy is no longer effective and resection must be undertaken. The extent of the resection and the method of restoring continuity will vary according to the particular circumstances.

Hiatal Hernia and Reflux Oesophagitis in Infants

Infants present a difficult problem in that the symptoms of reflux oesophagitis may be confused with those of pyloric obstruction, and an operation for the latter condition is sometimes carried out. In some patients there seems no doubt that pyloric spasm makes the symptoms of reflux oesophagitis more apparent. The cardiac sphincter in infants is not well developed, and if too large a feed is given regurgitation will take place without any difficulty. It seems that in certain circumstances ulceration is produced either because the gastric contents are more irritating than usual or because the oesophageal epithelium is unduly sensitive. Once oesophagitis has started a vicious circle is set up and spasm and actual cicatricial contraction may occur, producing shortening of the oesophagus and stricture formation. It seems that the process can be arrested and reversed and the stomach may return to its normal abdominal position.

Treatment for these infants should again be medical in the first instance, posture being of great importance. Occasionally a gastrostomy may be called for. Anatomical repair of the hernia in the sense that the stomach is held down in its proper position, as has already been described, may be required, but it is often difficult to decide when this should be done. If the condition has been neglected or misdiagnosed, the destruction of the lining of the oesophagus and the surrounding fibrosis may be so severe that resection has to be carried out. For this reason, if a conservative or an expectant line of treatment is adopted in the early stages, a careful watch must be kept on the child and repeated x-ray examinations made so that any deterioration in the oesophageal condition can be dealt with at once. The management of these small patients sometimes presents very great difficulty.

Simple Strictures due to the Swallowing of Corrosives

The swallowing of corrosives, either accidentally or with suicidal intent, may result in the production of severe strictures, and recently there has been a tendency to treat these strictures by resection because of the supposed difficulty of carrying out dilatation effectively. The management of these strictures calls for painstaking care. After preliminary x-ray examination, oesophagoscopy is carried out, and it is sometimes found that an unsuspected foreign body lies above the stricture. Oesophagoscopy is seldom successful, because the interval between the dilations is bound to be considerable, and the presence of the rigid instrument in the gullet interrupts normal peristaltic waves which help in the swallowing of the bougie. For these reasons "auto-dilatation" is to be preferred. The method is quite safe provided no force is used, and it is successful in nearly every case. When the stricture is so severe that a preliminary gastrostomy is called for the patient is encouraged to swallow a ureteric catheter, which is then recovered through

the gastrostomy opening and utilized as a guide for introducing a rubber tube and eventually a series of bougies of increasing size. By one or other of these methods dilatation has been successfully carried out in every case.

It is noteworthy that one patient, who had been burnt with nitric acid, had a fistula into the trachea and false passages in his oesophagus, the results of attempts at oesophagoscopy dilatation. Another patient, who had swallowed hydrochloric acid, had burnt the lower end of the oesophagus and also the pylorus, producing a stricture at each site. Yet another patient had had what appeared to be complete obliteration of his oesophagus for a period of 19 years. Patience is required in treating strictures of this nature by autodilatation, and the treatment must be continued for several years, but the final result should be a complete return to normal. Ten patients have been treated in this way in the past 20 years.

Congenital Atresia of the Oesophagus

It is very pleasant to finish my address by mentioning the great progress which has been made in the treatment of this anomaly. The condition was described by Gibson in 1697 and again by Sir Arthur Keith (1910) and others, but no patient was successfully operated upon until 1939, when a staged operation was carried out by Ladd (1944). The first completely successful operation of direct anastomosis was carried out in 1941 and reported by Haight and Towsley in 1943.

The commonest type of deformity is an atresia of the oesophagus at the level of the vena azygos arch, with the lower segment of the oesophagus arising from the trachea. This type of deformity accounts for 80% of the patients,



FIG. 4.—Radiological appearance of congenital atresia of the oesophagus with fistula. The blind upper segment can be seen, and the fact that air is present in the stomach and intestines shows that there is a fistula between the lower segment and the trachea.

and in most of the others there is an upper and lower blind segment without any communication with the trachea. It is difficult to estimate the frequency of this anomaly because even now many infants die from what is attributed to pulmonary or cerebral conditions and the true diagnosis is not suspected. Similarly death may be attributed to an imperforate anus when the real cause is an oesophageal anomaly. Cyanosis and attacks of choking in the newborn infant should at once suggest the possibility of an atresia of the oesophagus, and if a well-lubricated catheter, passed down the oesophagus via the mouth, is arrested at a point 10 cm. from the alveolar margin it is almost certain that the condition exists. The infant should then be transferred to a centre where x-ray confirmation and operation can be carried out (Fig. 4).

Both the operation and the anaesthesia require special experience and must be carried out very delicately. The subsequent nursing is of equal importance, and unless experienced and conscientious nursing is available it is useless to attempt the surgical treatment of these patients.

In my own first successful case the patient is now 7 years old, and altogether I have 17 patients who have recovered from the operation.

Conclusion

Many of the procedures in oesophageal surgery have now passed the pioneer stage and taken their place amongst the accepted operations. Some of them will always carry a very great risk, and for this reason it is essential that diagnosis should be accurate and that due consideration is given to the problem before embarking on this form of surgery. The treatment of cancer is still largely palliative but is none the less well worth while carrying out. Reflux oesophagitis presents a complex problem affecting patients of all ages. The symptoms may vary from a minor disturbance to a crippling or killing disease, and much work is needed to elucidate the underlying causes. The gastric secretion in infants requires further investigation and in adults there is scope for the simultaneous estimation of gastric and oesophageal pressures. The association of duodenal ulcer with reflux oesophagitis demands close study, always bearing in mind the possibility that in some patients at least the reflux oesophagitis appears to precede the formation of the hernia.

The problems connected with the diagnosis and treatment of oesophageal conditions require special methods and technique. This does not imply still narrower specialization, and in fact a broad approach is needed, because to understand and appreciate the various conditions affecting the oesophagus it is essential to have a knowledge of abdominal conditions in general and peptic ulceration and its complications in particular. Familiarity with the oesophagoscope and experience in paediatric surgery are also required. In fact the narrower the field the more general must be the approach.

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AMYLOIDOSIS IN RHEUMATOID ARTHRITIS, AND SIGNIFICANCE OF "UNEXPLAINED" ALBUMINURIA

A REPORT OF EIGHT CASES

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The complication of rheumatoid arthritis by amyloidosis is more often diagnosed by the pathologist than by the clinician. Fingerman and Andrus (1943) found amyloid deposition in 13 of 61 (21%) necropsied cases of rheumatoid arthritis. Teilum and Lindahl (1954) have reported an instance of 60%. By contrast, Hench and co-workers (1948) have stated that "the association of amyloidosis and rheumatoid arthritis rarely occurs, and then only in severe cases of long duration." On the clinical side, reports have been for the most part confined to single or at most two cases. The only clinical investigation of a population of rheumatoid arthritis for amyloidosis has been that of Unger *et al.* (1948).

who studied 52 rheumatoid patients by means of a modified Congo-red test, and found the complication to be present in six. Reece and Reynolds (1954) found five instances of amyloidosis with rheumatoid arthritis when all patients with the latter condition who attended their hospital from 1935 onwards were reviewed.

Our interest in the association of these two conditions was aroused when a patient with mild rheumatoid arthritis of about four years' duration died of renal failure. The ante-mortem diagnosis was chronic nephritis; at necropsy the cause of the renal failure was found to be amyloidosis, a possibility not entertained because the arthritis was so mild and of such short duration. We therefore decided to find out whether this complication could be recognized during life with greater certainty than previously. The initial problem was to find a clinical pointer. Splenomegaly and sometimes hepatomegaly occur not infrequently in uncomplicated rheumatoid arthritis and therefore cannot be taken to indicate the presence of amyloidosis. Since the essential morbidity of the complication is due to renal involvement, it seemed likely, that the most reliable guide would be albuminuria. We therefore screened all patients with rheumatoid arthritis seen by us over a one-year period (July, 1953, to July, 1954) for albuminuria, and investigated its cause when found.

Clinical Material

A total of 183 cases, both in-patients and out-patients, were seen by us. Each of these patients had, in our opinion, unequivocal rheumatoid arthritis; patients whose diagnosis was doubtful were not included. Fig. 1 shows the age and sex distribution of the patients. Fig. 2 shows the duration of their rheumatoid arthritis. It can be seen that there was a fairly high proportion of patients whose disease was of short duration.

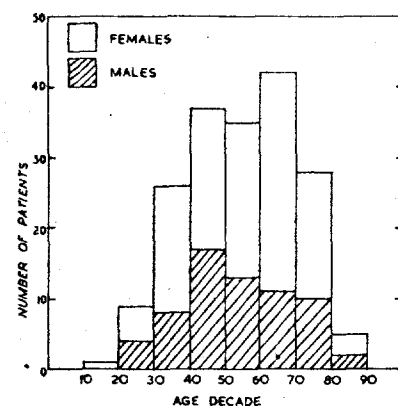


FIG. 1.—Age distribution of 183 patients with rheumatoid arthritis.

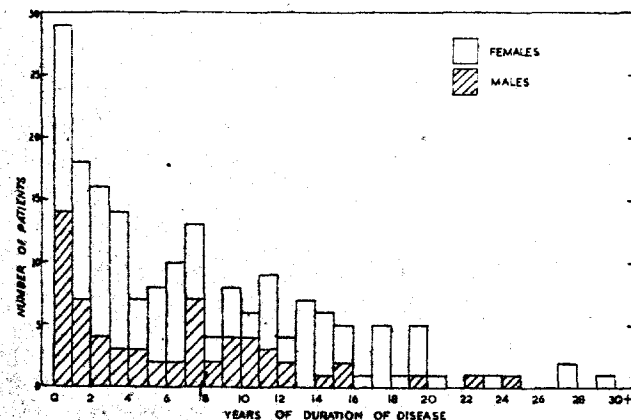


FIG. 2.—Duration of disease in 183 patients with rheumatoid arthritis.

a week. The number of tests per patient varied from 1 to 25, depending on the number of out-patient attendances or the duration of stay in hospital, or a combination of both. A trace of albumin on only one occasion was disregarded. Those patients who showed a more persistent albuminuria were further investigated; a catheter or mid-stream specimen was taken and, where necessary, the appropriate urological investigation made. Of the 183 patients, 24 were found to have significant albuminuria: 5 of the 24 had urinary infection, 2 G.U. tuberculosis, 3 congestive heart failure, 1 chronic nephritis, 1 drug reaction, and 12 cases were unexplained. Of the latter 12 patients, one (F.P.) died of an acute surgical emergency before she could be further investigated, and at necropsy extensive amyloidosis with renal involvement was found. For various reasons it was not possible to investigate a further four of these patients. The seven remaining cases were investigated by the modified Congo-red test of Unger *et al.* (1948) or by liver biopsy, or by both methods.

Modified Congo-Red Test of Unger

Unger *et al.* have introduced a modification of the Congo-red absorption test, which we believe to be greatly superior to the test as usually performed. In brief, their modification consists in obtaining frequent samples during the first ten minutes after the injection of the dye, so that a zero time concentration can be obtained by extrapolation. The advantages over the standard Congo-red test in which a two- or four-minute sample is taken and the absorption calculated at one hour are as follows: errors due to incomplete mixing, which may take up to ten minutes or longer, are avoided; false-negative results due to very rapid fixation of the dye by massive amyloid deposits are also avoided. With the standard Congo-red test at least 90% absorption at one hour is required to constitute a positive result: Unger *et al.* believe that 35% or greater absorption at 30 minutes is good evidence of amyloidosis when their method is used: we have no reason to differ from their conclusion.

We modified the method slightly in that we set up a slow saline drip (10 drops a minute) which could be discontinued for the obtaining of blood samples, thus avoiding the discomfort to the patient of frequent venepunctures. Before each sample was obtained about 5 ml. of blood was aspirated and discarded in order to avoid error from saline dilution. Where necessary the volume of blood removed during the test was replaced by cross-matched bank blood.

Results

Fig. 3 shows the data obtained when the Congo-red test, as described above, was performed on three patients. The logarithm of Congo-red concentration is plotted against time, and then the theoretical zero time concentration is obtained by extrapolation from the readings made during the first 10 minutes after injection.

Patient A.H.—Rheumatoid arthritis with splenomegaly

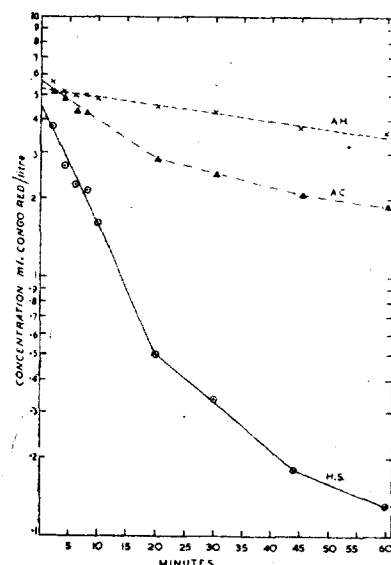


FIG. 3.—Congo-red absorption curves in three patients.

and hepatomegaly, but without albuminuria. The test was negative, there being only 19% absorption at 0-30 minutes. The test was also negative when the absorption at 60 minutes was calculated from the two-minute or four-minute sample (36% and 31% respectively), as is done with the standard Congo-red absorption test.

Patient A.C.—Rheumatoid arthritis with albuminuria. The test was positive, there being 55.7% absorption at 0-30 minutes. Note that when the absorption at 60 minutes was calculated from the two-minute or the four-minute sample, as in the standard test, the result was negative.

Patient H.S.—Rheumatoid arthritis, splenomegaly, hepatomegaly, and albuminuria. The test at 0-30 minutes was strongly positive (92%), as was also the absorption at 60 minutes calculated from either the two-minute or four-minute sample (97% and 95% respectively).

The table shows the data of the seven patients investigated and of the patient who showed amyloidosis at necropsy. Albuminuria was constant in every case except the latter, who showed only two positive tests out of five. The diagnosis was confirmed by liver biopsy in the first four patients

Case	Sex and Age	Duration	Liver	Spleen	No. of Urine Tests	Positive Albumin Tests	Congo Red 0-30 min. Absorption	Liver Biopsy
H.S.	M 30	1 yr.	+	+	25	25	92%	+
J.L.	M 74	8 "	+	0	10	10	90.9%	+
W.R.	F 38	16 "	+	0	12	12	77.9%	+
A.S.	F 61	11 "	+	0	13	13	53.5%	+
F.L.	F 67	18 "	0	+	13	12	Not done	+
A.C.	M 39	12 "	0	+	15	15	28.5% 55.7% 77%	Not done
N.B.	M 55	15 "	0	+	3	3	P.m. confirmation extensive amyloidosis	+
F.P.	F 69	18 "	+	0	5	2		+

of the table. In Case F.L. severe flexion contractions of the elbows made it impracticable to perform the Congo-red test, and the diagnosis was made by liver biopsy alone. A liver biopsy was considered to be unnecessary for the next two patients. In Case A.C. the Congo-red test two months after the onset of albuminuria was negative. The albuminuria persisted, and when the test was repeated ten months later it had become positive with 55.7% absorption from

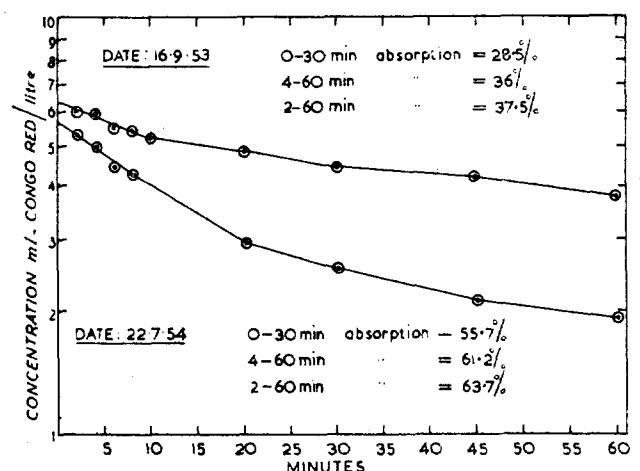


FIG. 4.—Data of Case A.C.

0-30 minutes (see Fig. 4). In Case N.B. 77% absorption from 0-30 minutes was considered to be sufficiently good evidence of amyloidosis.

The duration of rheumatoid arthritis in these patients at the time the diagnosis of amyloidosis was made ranged from one to eighteen years, and six of the eight patients had had their disease for more than ten years. Both liver and spleen were palpably enlarged in only one patient, H.S. Hepatomegaly alone was present in four patients, and splenomegaly alone in three. This confirms that amyloidosis may be present without enlargement of both the liver and spleen,

and, conversely, both these organs may be palpable when the quantitative Congo-red test is strictly negative (Case A.H., Fig. 3).

In two patients, H.S. and W.R., there was a past history of tuberculosis. Patient W.R. had had pulmonary tuberculosis some twenty years previously, complicated by tuberculous involvement of one knee-joint, for which arthrodesis had been performed. Her rheumatoid arthritis is relatively mild, and there is no evidence of active tuberculosis. Case H.S. is described briefly below.

This patient was aged 28 on his first admission to Hammersmith Hospital in July, 1952. In 1948 bilateral pulmonary tuberculosis had been diagnosed. Chemotherapy and a right pneumothorax failed to control the disease in the right lung, although the lesions in the left lung became inactive. In May, 1950, a right thoracoplasty was done, since when to the time of writing there has been no evidence of active tuberculosis. In July, 1952, he was admitted to Hammersmith Hospital with fever, tachycardia, and flitting polyarthritides, the onset of which was preceded by a sore throat three weeks before. A diagnosis of rheumatic fever was made, and sodium salicylate, 120 gr. (8 g.) a day, was given. At first his fever and joint symptoms responded, but, in spite of continued salicylate therapy, both fever and joint involvement reappeared a fortnight later. Gradually over the next three months the picture of rheumatoid arthritis appeared, with symmetrical involvement of hands, elbows, knees, and feet. Until May, 1953, the urine was free from albumin, and in that month albuminuria first appeared. Albuminuria (4.6 g. a day) then became persistent. In July, 1953, he was readmitted for further investigation. At that time the spleen but not the liver was palpably enlarged. Congo-red absorption and liver biopsy were as shown in the table. Subsequently the liver enlarged 6 in. (15 cm.) below the costal margin.

It should be noted that this patient had a past history of extensive tuberculosis, and it is entirely probable that this may have contributed to the development of amyloidosis. That the rheumatoid arthritis played a part, however, is indicated by the absence of the albuminuria until the arthritis had been present for a year, and by the subsequent rapid enlargement of the liver—all in the absence of any evidence of tuberculous reactivation.

Comment

Amyloidosis is one of the few potentially fatal complications of rheumatoid arthritis. Its recognition is therefore of some importance for prognosis. The finding of eight patients with this complication out of 183 patients with rheumatoid arthritis seen throughout a year suggests that amyloidosis in this disease is by no means rare. Since rheumatoid arthritis is extremely common, and since conditions which in the past produced amyloid deposition are now largely controlled by chemotherapy, it seems probable that rheumatoid arthritis may come to be the principal cause of amyloidosis. Missen and Taylor (1955), in a survey of necropsy material at the Postgraduate Medical School, found amyloidosis to be present in 8 of 48 patients with rheumatoid arthritis; each of these cases had shown proteinuria during life. We believe that attention to the presence of albumin in the urine of patients with rheumatoid arthritis would bring to light more of these cases.

Summary

Out of 183 patients with rheumatoid arthritis seen throughout a one-year period, eight were found to be suffering from amyloidosis.

The clinical pointer to the complication was albuminuria, unexplained by routine investigations.

The modified Congo-red test of Unger *et al.* was found to be more reliable than the standard Congo-red test in making the diagnosis.

In all patients the rheumatoid arthritis could be held responsible for the complication; in one, pre-existing tuberculosis may have played a part.

We wish to thank Dr. Sheila Sherlock and members of her firm for the liver biopsies; our colleagues, especially Dr. E. G. L. Bywaters, for permission to study their patients; and Miss Jeanette Pirkis for very efficient technical assistance and for drawing the illustrations.

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MALARIAL THERAPY IN THE NEPHROTIC SYNDROME

BY

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The effect of infection on the nephrotic syndrome has long been known, and massive diuresis with disappearance of oedema and great diminution in proteinuria has been observed to follow a variety of agents, including measles, chicken-pox, pneumonia, infusions of plasma or dextran, large doses of urea, or corticotrophin. The occasional dramatic response elicited by one or other of these agents has led several physicians to the use of malaria, as this was an acute fever that could be easily induced and readily controlled. The reasons for using malaria as a therapeutic agent have varied from that of Gairdner (1952), who considered that there was sufficient clinical evidence for the empirical use of acute febrile infections, to that of Byrne (1952), who holds that the response shown is due to stimulation of the acute defence phase of the adaptation syndrome of Selye. In conditions such as the nephrotic syndrome, where treatment after treatment may follow with no sign of symptomatic relief, "it behoves the physician to attempt in turn those agents which are known to have initiated remissions, as, in the earliest stages at least, this condition may be reversible" (Gairdner, 1952).

There is still much discussion and dispute regarding the nomenclature and classification of renal disease, and for the purpose of this report the term "nephrotic syndrome" is used. This term (Squire, 1953) is applied to those cases with oedema, proteinuria, and hypoalbuminaemia, but without hypertension, nitrogen retention, or electrolyte disorder, and without an appreciable excess of red blood cells in the urine. The majority of cases in this series can be regarded as Ellis Type II nephritis, but as this description implies the presence of particular pathological changes, and as in so many patients with renal disease the essential pathology is not known, it is justifiable to use a wider descriptive term.

Malarial therapy has been used over a period of several years in the Tropical Diseases Centre, using strains of benign tertian malaria, and occasionally *Plasmodium ovale*, in patients with the nephrotic syndrome. In some it was used as a primary procedure, in others as a last resort after many varied and unsuccessful forms of therapy. Brief clinical reports are given of seven patients in whom the infection had been sufficiently severe and long-continued to regard them as having undergone "malarial therapy." The methods of infection and the management of induced malaria are dealt with by Shute (1952).

Method

Selection of Cases.—There are no precise indications for the use of malarial therapy. It is usually reserved for patients with a nephrotic syndrome which has failed to respond to more conservative forms of treatment.

Duration of Treatment.—The patient should be allowed to have as many rigors as he is capable of withstanding. The indications for cutting short the treatment are a marked deterioration in general condition, sustained fever, or severe oliguria.

Interruption of Quotidian Fever.—In most cases the fever initially assumes a quotidian periodicity but then settles down to a tertian periodicity. In some the quotidian fever persists, and in order to procure relief from the daily paroxysm a single dose of bismuth sodium thioglycollate ("thio-bismol"), 0.2 g. intramuscularly, may be given. This will usually cause the fever to become tertian in periodicity. Alternatively, small doses of quinine may be given for one day. This may stop the fever, but it will relapse in a week or two.

Method of Eradication of Malarial Infection.—In all patients the fever can rapidly be terminated by giving full doses of chloroquine, mepacrine, or quinine for a few days. In those infected by blood inoculation from other patients suffering from malaria this will eradicate the infection. In patients infected by parenteral injection of sporozoites, or by feeding infected anopheline mosquitoes, the treatment must be continued with a ten-day course of pamaquin, 10 mg. three times a day (Adams and Maegraith, 1953), to sterilize the exo-erythrocytic cycle of parasite development which results from this mode of infection, or a relapse will occur.

Case 1

The patient, a man aged 29, had a history of oedema of the lower limbs and puffiness of the face, associated with some lumbar backache over a period of six weeks. On admission there was pitting oedema of the lower limbs of moderate severity and the urine contained a moderate amount of protein, granular casts, and a few red blood cells. The blood pressure was 130/80 mm. Hg; the retinal vessels were normal. Other findings were: haemoglobin, 100%; serum proteins, 2.45 g.%, with reversal of the albumin/globulin ratio; blood urea, 28 mg. per 100 ml. and serum cholesterol, 262 mg. per 100 ml. The patient was observed for three months, during which time he was treated with a high-protein salt-free diet; although the serum protein level rose to 5.67 g.% the oedema gradually increased in severity until it was generalized and extreme.

Malarial Therapy.—He was infected with a strain of *P. vivax*, using infected anopheline mosquitoes. After a short initial period of irregular fever the temperature assumed the usual tertian periodicity. After four pyrexial episodes associated with severe rigors, his oedema had further increased, so that even in the sitting position it extended to his cervical region. There was a marked reduction in urinary output, accompanied by gross haematuria. The fever was stopped with chloroquine.

Four days after the subsidence of fever his urinary output increased to 80–100 fl. oz. (2,270–2,840 ml.) daily, on an intake of 40–50 fl. oz. (1,140–1,420 ml.). This diuresis continued for four weeks, leaving only minor residual oedema of the legs and sacrum. The diuresis then ceased, and over the next two weeks there was a slight increase in the oedema. As a relapse had not occurred the patient was reinfected with benign tertian malaria, and developed a gross haematuria, followed after 24 hours by a temperature rise and a rigor. After four pyrexial episodes, the haematuria was still present and the oedema was more marked. The fever was interrupted for one week with bismuth sodium thioglycollate, and its reappearance was again preceded by gross haematuria, followed by increasing oedema. After a further five pyrexial episodes the fever was arrested with chloroquine. During the next eleven days

there was a moderate diuresis, the urinary output exceeding fluid intake by an average of 10 fl. oz. (284 ml.) daily. At this stage the general condition was very good, there was minimal oedema of the ankles on walking, and the urine showed a trace of protein but no blood or casts.

Frequent estimations of the blood urea during the course of the malaria showed fluctuations up to 50 mg. per 100 ml. The serum protein fell to 3.77 g.% in the first week of fever, rising after two weeks to 5.02 g.% and falling to 4.7 g.% at the termination of the infection six weeks after commencement. There was constant reversal of the A/G ratio.

Six months later the patient was readmitted, having suffered a relapse of his initial sporozoite infection. This had again been heralded by haematuria, followed two days later by fever. In the interim he had remained extremely well, with only slight swelling of the ankles on moderate exercise—for example, dancing. On examination he had no oedema, and his blood pressure was 110/65 mm. Hg. The serum proteins were 6.79 g.% (albumin 2.54 g., globulin 4.25 g.), and the blood urea 25 mg. per 100 ml.; the urine contained a moderate amount of protein, a few granular casts, and a small number of red blood cells. During the ten days over which the patient was observed during treatment with quinine and pamaquin his urinary output exceeded his intake by an average of 19 fl. oz. (540 ml.) daily.

Subsequent History.—Eighteen months after the start of malarial treatment the patient remained well and was carrying on his employment as a travelling salesman. He felt tired occasionally, but had no swelling of the legs even on continued exercise. There was no sacral or limb oedema, the fundi were normal, and the blood pressure was 130/90 mm. Hg. The urine contained a small amount of protein, a few granular casts, and some red blood cells. The serum proteins were 7.1 g.% (albumin 4.04 g., globulin 3.06 g.); serum cholesterol, 274 mg. per 100 ml.; and blood urea, 25 mg. per 100 ml.

Case 2

The patient, a man aged 47, had suffered from swelling of the lower limbs, which slowly increased over the 20 months prior to his admission. On admission there was marked pitting oedema of the lower limbs, scrotum, and sacrum, with ascites and oedema of the lower abdominal wall. The blood pressure was 180/95 mm. Hg; blood urea 54 mg. per 100 ml.; and serum cholesterol, 199 mg. per 100 ml.; the urine contained a trace of protein, with granular casts and a few red blood cells. Abdominal paracentesis was done on several occasions.

Malarial Therapy.—The patient was infected intravenously with sporozoites of benign tertian malaria, and became febrile after 12 days; he subsequently had eight severe paroxysms with rigors. During this period his oedema and ascites increased, his haemoglobin level dropped from 85% to 37%, and there was a marked reduction in his urinary output. The blood urea rose to 60 mg. per 100 ml., and on account of his poor general condition the malaria was stopped with chloroquine. The plasma proteins after malaria therapy were 4 g.% (albumin 2.53 g., globulin 1.47 g.). In the next four weeks no diuresis occurred and abdominal paracentesis had to be repeated on several occasions. The patient returned home and remained in bed, taking a self-prescribed remedy of lemon-juice, tartaric acid, and magnesium sulphate. After three weeks at home he noticed an obvious increase in his daily urinary output, and one week later his sporozoite-induced malaria relapsed. He continued to have paroxysms for three weeks before he returned to hospital. He then had no ascites or oedema of the abdominal wall, and there was only minimal pitting oedema of the lower limbs. After two further rigors in hospital the malarial infection was eradicated with a course of quinine and pamaquin. The blood pressure was 130/80 mm. Hg; blood urea, 60 mg. per 100 ml.; and the urine showed a heavy albumin deposit, with granular casts and occasional red blood cells. No estimation of serum proteins was made.

Subsequent History.—One year later he was back at work as a lorry driver. He had had no swelling of his legs, but there was slight breathlessness on exertion. There was no anaemia or oedema of his lower limbs, and his fundi were normal. The blood pressure was 180/100 mm. Hg, and the urine contained a large amount of protein but no casts or blood cells. Serum proteins were 5.4 g.% (albumin 4.2 g., globulin 1.2 g.); serum cholesterol, 187 mg. per 100 ml.; and blood urea, 138 mg. per 100 ml.

Case 3

A man aged 52 complained of increasing swelling of the lower limbs, puffiness of the face, and dyspnoea on exertion over the two months prior to admission. On admission there was moderately severe oedema of the lower limbs and sacrum, the blood pressure was 160/95 mm. Hg and the urine contained protein and hyaline and granular casts. The serum proteins were 4.56 g.%, with a reversed A/G ratio; blood urea, 32 mg. per 100 ml. and serum cholesterol, 250 mg. per 100 ml.

Malarial Therapy.—The patient was infected with benign tertian malaria by intravenous blood inoculation; after seven days his temperature rose sharply, and he had malarial paroxysms on 14 successive days. A small dose of quinine was given, and this produced an apyrexial period of seven days, which was followed by a further five rigors before the malaria was arrested therapeutically. Over this period the haemoglobin dropped from 85% to 30%, the blood urea rose to 54 mg. per 100 ml., and the serum proteins fell to 4.04 g.% (albumin 1.41 g., globulin 2.63 g.).

During the 24 days of malarial treatment the urinary output varied from 20 to 50 fl. oz. (570 to 1,420 ml.), but at no time did the output exceed the fluid intake. Two days after the malaria had been treated a diuresis began; this persisted for three weeks, during which the patient remained in hospital. The average daily excess of output over intake was 20 fl. oz. (570 ml.), no allowance being made in this calculation for the fluid loss via skin, respiration, and stools. On discharge the patient still had a moderate degree of pitting oedema of the lower limbs, but the diuresis did not seem to be diminishing. The urine still contained protein and casts.

Subsequent History.—For one year after discharge he led a sedentary life and had not returned to work. He remained dyspnoeic on exertion, and noticed slight swelling of his ankles on moderate exercise, but there had been no marked oedema. On examination his general condition was good, but there was a small left pleural effusion. His blood pressure was 200/120 mm. Hg; blood urea, 64 mg. per 100 ml.; serum cholesterol, 350 mg. per 100 ml.; and serum proteins, 5.21 g.% (albumin 2.9 g., globulin 2.31 g.). The urine contained a moderate amount of protein, granular and epithelial casts, and a few red blood cells.

Case 4

This patient, a youth of 18, was admitted three months after the gradual onset of swelling of the legs and face, associated with a feeling of tiredness. He had been treated with antibiotics, mersalyl, ion-exchange resins, and dietary measures, all without success. On admission there was marked ascites with oedema of the lower limbs, sacrum, genitalia, and arms, and in addition there were bilateral pleural effusions. The blood pressure was 135/90 mm. Hg; serum proteins, 4.18 g.% (albumin 1.11 g., globulin 3.07 g.); serum cholesterol, 395 mg. per 100 ml.; and blood urea 68 mg. per 100 ml. The urine contained protein, many granular casts, a few hyaline casts, and a few red blood cells.

Malarial Therapy.—He was infected with *P. vivax* by intravenous blood inoculation, and within a period of four days (April 26) developed gross haematuria, followed by pyrexia, and a sudden increase in the oedema. He then suffered nine malarial paroxysms, and during this period showed no tendency to diuresis. His urinary output fell

gradually to about 15 fl. oz. (420 ml.) daily, his haemoglobin dropped from 80% to 30%, and there was a marked deterioration in his general condition. The malaria was interrupted by subcurative quinine treatment (May 11), and an abdominal paracentesis relieved his distress. Twelve days (May 23) later fever recommenced, and he suffered a further nine paroxysms. There was no diuresis during this time, and further abdominal paracentesis was required. The malarial infection was then eradicated with chloroquine (June 4). During the next three months no diuresis occurred. Details of the blood chemistry are set out in the Table.

Blood Chemistry at Intervals During the Malarial Fever in Case 4

	April 29	May 4	May 9	May 14	May 24	June 1	July 31
Total protein (g.%)	4.91	4.46	3.79	4.30	3.46	3.26	2.96
Albumin (g.%)	1.61	2.24	1.46	1.63	1.45	1.41	1.52
Globulin (g.%)	3.92	2.22	2.46	2.67	2.01	1.85	1.44
Blood urea (mg. per 100 ml.)	80	68	60	61	46	53	51
Cholesterol (mg. per 100 ml.)							543

Subsequent History.—Over a period of four months following malarial therapy he remained on a high-protein diet with gradual decrease in the oedema. He has been discharged from hospital with pitting oedema of a moderate degree.

Case 5

A woman aged 25 had noticed a gradual swelling of the lower limbs, with progressive increase in weight over a period of eight months. On admission she had gross oedema of the lower limbs and thighs. The blood pressure was 140/95 mm. Hg, and the urine contained protein, granular casts, and an occasional red blood corpuscle. The blood urea was 32 mg. per 100 ml.; cholesterol, 696 mg. per 100 ml.; and total serum proteins 5.01 g.%.

Malarial Therapy.—The patient was infected by blood inoculation with benign tertian malaria, and after ten days' incubation had nine paroxysms. There was marked constitutional upset with an increase in the proteinuria and she became very distressed. The malarial infection was stopped. She was observed for a further two months, during which time there was no diuresis or improvement in her clinical condition. At this stage the serum proteins were 4.9 g.%, the blood urea was 27 mg. per 100 ml., and the serum cholesterol had dropped to 350 mg. per 100 ml. Two months later the oedema had increased considerably, and the serum cholesterol had risen to 530 mg. per 100 ml. The patient has been watched for a further two years; although there has been a gradual improvement in her physical condition, she still has protein and casts in the urine. Her blood pressure has remained at normal levels, and she has slight oedema on exercise only.

Case 6

The patient, a woman aged 52, was admitted with oedema of the lower limbs, abdominal wall, and arms, and some puffiness of the face of two weeks' duration. There had been no preceding acute infection, and she was considered to be suffering from an exacerbation of a latent nephritis. On admission she had bilateral pleural effusions, the blood pressure was 180/100 mm. Hg, and the urine contained protein, granular casts, and a few red blood cells. The serum proteins were 4.56 g.%; blood urea, 50 mg. per 100 ml.; and serum cholesterol 127 mg. per 100 ml. There was no response to infusions of dextran or to high-protein salt-free diet.

Malarial Therapy.—The patient was infected with benign tertian malaria by intravenous blood inoculation, and became pyrexial after two weeks; she was allowed to have five paroxysms of fever. She was very exhausted and cyanosed during each attack, so the fever was discontinued by chloroquine treatment. Four days later there was a slight increase in the urinary output, but this moderate diuresis

was sustained for only 48 hours, and it made no clinical difference to her oedema. Her condition one month after malarial therapy was slightly worse than initially, her protein level was 5.46 g.%, and her blood urea was 52 mg. per 100 ml. Two months later she died from pulmonary oedema and generalized oedema due to chronic nephritis.

Case 7

A woman aged 22 had suffered a gradual onset of generalized oedema, thought to be due to Ellis Type II nephritis, for which she had been treated for nine months. On admission she had marked oedema of the lower limbs, gross ascites and oedema of the abdominal wall, and a large right pleural effusion. The blood pressure was 120/90 mm. Hg, the urine contained protein, granular and epithelial casts, and red blood cells. The blood urea was 34 mg. per 100 ml. and the serum cholesterol 214 mg. per 100 ml. She was observed for a further four months on various treatments, during which time there was a gradual deterioration in her condition, with increase in the oedema.

Malarial Therapy.—The patient was infected by blood inoculation with *P. ovale*, and after eight days she became pyrexial. There was a sudden and marked increase in the amount of oedema and ascites, and she thereafter suffered seven very mild paroxysms, with only minor fever, and at times no rigors. At no period did she show any clinical signs of improvement in her renal condition, and there was no diuresis. Her haemoglobin fell from 80% to 50%, her blood urea rose to 52 mg. per 100 ml., and repeated abdominal paracenteses were necessary. The malaria remitted spontaneously at this stage, and she remained apyrexial for two weeks. She then relapsed, but, apart from two or three minor pyrexial episodes, the presence of malaria parasites in the blood was not associated with any marked constitutional effects. The infection was eradicated with proguanil. One month later her condition was still unchanged, so she was reinfected, this time with benign tertian malaria by intravenous blood inoculation. After two minor pyrexial episodes her physical condition began to deteriorate rapidly, so the infection was stopped. Two weeks later she died.

Comment

Of these seven nephrotic patients treated by malarial infection three have had a marked remission of symptoms. Case 1 showed a most dramatic response, which has been well sustained. Cases 2 and 3 have been free of symptoms for a year, and the former, despite a high blood urea level, is working full time and feels well. The improvement shown in Case 4 cannot be closely associated with the malarial therapy—it is probably due to the high-protein diet—while the improvement in Case 5 cannot be associated with malarial therapy. The last two patients (Cases 6 and 7) died of their basic condition, but as they were both severely ill and the malarial paroxysms were poor or curtailed in number it would be unfair to say that malarial therapy had failed. Since the aetiology of the renal condition in these seven patients is not known, one can but speculate on the mechanisms by which the improvement has been initiated in Cases 1, 2, and 3. These cases do, however, encourage the continued trial of malarial therapy in this type of renal disease.

In Cases 1 and 4 the onset of malarial fever was preceded by macroscopic haematuria; this may have been an indication of increased damage to the renal tissues. In malaria the serum proteins, particularly the serum albumin, are usually reduced and there may be considerable increase in the serum globulin. Blood urea levels were not raised to any significant extent, despite pre-existing renal damage. The behaviour of serum cholesterol is extremely important, as it has been postulated by Gairdner that the beneficial effects of malarial therapy may be due to reduction in the serum cholesterol level. Most workers have reported a reduction in the cholesterol concentration at some time during the course of the malarial attack. Crespin and Zaky (1919) showed that the level fell to below normal values

just before the onset of a paroxysm, became normal or slightly raised in the pyrexial period, and fell to normal in the latent periods between attacks. Fairley and Bromfield (1933) in cases of induced malaria, showed that although hypocholesterolaemia occurred in some cases of well-established malaria, the levels rose to normal upon the termination of the attack.

A point in assessing the effects of malarial therapy is to preclude any diuretic action on the part of the drugs used to terminate or eradicate the infection. To this end fluid-balance charts were examined from 20 National Service men admitted to the Tropical Diseases Centre suffering from acute benign tertian malaria. They were all treated with chloroquine, quinine, and pamaquin; in none of them was any significant or prolonged diuresis noted as a consequence. It was therefore concluded that if a diuresis did occur following the use of antimalarial drugs in patients with the nephrotic syndrome it was in no way related to the action of these drugs.

Summary

Seven cases of the "nephrotic syndrome" have been treated by malarial therapy.

Three cases have had marked remission of symptoms lasting over one year.

It is considered that there is an indication for the continued use of malarial treatment in nephrotic patients who do not respond to more conservative treatment.

I wish to thank Dr. A. R. D. Adams, Professor B. G. Macgrath, and Dr. C. S. McKendrick, under whose care these patients were admitted. I am grateful to Dr. A. R. D. Adams for his advice and assistance in preparing this paper.

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Medical Memoranda

A Fatal Case of Pernicious Anaemia Associated with Chloramphenicol Treatment

An increasing number of deaths from aplastic anaemia after treatment with chloramphenicol are being reported. A case of pernicious anaemia is described below which, on account of numerous intercurrent infections, was treated with two courses of chloramphenicol. Subsequently the patient developed an aplastic anaemia and died five months after the second course.

CASE HISTORY

A married woman aged 65 was admitted to hospital on August 1, 1952, with a six-months history of dyspnoea on exertion, swelling of the ankles, and increasing pallor.

On examination there was extreme pallor with a lemon-yellow tint. The tongue was smooth and she had a pyrexia of 99 to 100° F. (37.2 to 37.8° C.). There were signs of congestive cardiac failure, with normal heart sounds, and a blood pressure of 130/50 mm. Hg. No abnormalities were found in the chest, abdomen, or central nervous system. A catheter specimen of urine showed a heavy pyuria with a growth of *Bact. coli* organisms. A blood count gave: Hb, 2.5 g. (14.8 g. = 100%); red cells, 570,000 per c.mm.; C.I., 1.5; M.C.V., 123 cubic μ ; M.C.H.C., 35.7%; white cells, 4,950 per c.mm. (polymorphs 57%, lymphocytes 43%). Nucleated red cells were seen in the peripheral blood films.

The serum bilirubin was 0.9 mg. per 100 ml. Histamine-fast achlorhydria was present. Iliac bone puncture revealed a megaloblastic marrow. A diagnosis of pernicious anaemia was made on the above findings.

After an initial transfusion of $\frac{1}{2}$ pint (280 ml.) of packed red cells, treatment with vitamin B₁₂ was begun on August 5. For the first fortnight she was given 100 μ g. weekly, and thereafter until she left hospital on September 10 she had 100 μ g. fortnightly. A maximum reticulocyte response of 11% occurred five days after the onset of specific treatment. Although the response seemed a low one in view of the initial red cell count, it is known that intercurrent infections will considerably modify the reticulocyte peak, and at this stage the patient had a heavy urinary infection. Furthermore, a reticulocyte crisis may be reduced if specific treatment is preceded, as in this case, by a blood transfusion. The blood count on August 23 was: Hb, 6.5 g.%; red cells, 2,220,000 per c.mm.; C.I., 1. On August 25 it was: Hb, 10.7 g.%; red cells, 3,820,000 per c.mm.; C.I., 0.9; white cells, 22,400 per c.mm. (polymorphs 82%). By September 16, when she left hospital, the blood count was: Hb, 11.7 g.%; red cells, 4,100,000 per c.mm.; C.I., 0.96.

In the meantime, starting on August 3, a five-day course of "sulphatriad" (8 g.) was given for the urinary infection. By August 9 the urine was sterile. On the 10th a ten-day course of 19 g. of chloramphenicol was started on account of a left basal pneumonia. By the end of August frequency and dysuria had returned, and a further catheter specimen on September 8 showed a heavy growth of *Bact. coli*, which *in vitro* tests showed to be sensitive only to chloramphenicol. A further course of 9 g. of this drug was therefore given between September 10 and 15. The urine again became sterile, but before leaving hospital a further reinfection with *Bact. coli* was treated with 12 g. of chlor-tetracycline. During all this time the blood urea was never higher than 50 mg. per 100 ml.

On September 16 the patient left hospital symptom-free on a maintenance dose of 100 μ g. of vitamin B₁₂ fortnightly. She was next seen on November 28, when the blood count was: Hb, 6.5 g.%; red cells, 2,360,000 per c.mm.; C.I., 0.90. At this stage the amount of vitamin B₁₂ was increased to 100 μ g. twice weekly. A fortnight later the blood count was approximately unchanged, but by December 19 it had fallen to: Hb, 5.6 g.%; red cells, 2,100,000 per c.mm.; platelets, 62,000 per c.mm. She had had numerous epistaxes during the previous three weeks.

She was readmitted on December 20 and given a small blood transfusion. Also liver treatment consisting of "hepastab," 2 ml. on alternate days, was started. On January 2, 1953, a blood count showed Hb, 6.8 g.%; red cells, 2,350,000 per c.mm.; C.I., 1; white cells, 2,600 per c.mm. (polymorphs 37%, lymphocytes 63%). On the same day an iliac puncture suggested an aplastic anaemia. The total nucleated count was 7,600 per c.mm. and myeloid hypoplasia together with a relative erythroid hyperplasia was present, giving a total myeloid-erythroid ratio of 2:1 respectively. Ten days later, in spite of a further transfusion, the blood count was Hb, 7.04 g.%; red cells, 2,270,000 per c.mm.; C.I., 1; platelets, 41,000 per c.mm. Thereafter she developed numerous petechial haemorrhages and died on February 19.

Necropsy.—The body was that of a thin woman with numerous petechial haemorrhages in the skin and subcutaneous tissue. The lungs were pale but otherwise normal. The myocardium showed fatty degeneration and numerous haemorrhages. The gastro-intestinal mucous membrane was congested and haemorrhagic, the stomach otherwise appearing normal. The liver showed fatty degeneration, and the spleen numerous old infarctions. The kidneys showed bilateral arteriosclerosis with disruption of the renal pattern. The ureters and bladder were normal. The bone marrow of the sternum and iliac bones and femur were pale and fatty. The pancreas and adrenals appeared normal.

Histology.—There was fatty degeneration of the liver, and the splenic pulp showed poorly defined Malpighian

corpuscles and excess of reticulum cells. Bone-marrow sections cut from the ilium showed hypoplasia affecting granulopoiesis more than erythropoiesis. The number of mature granulocytes was greatly reduced and very few megakaryocytes were seen. The number of reticulum cells was increased. The lymphocytes appeared to be normal. As regards the red-cell series, there seemed to be a maturation defect at the normoblast stage.

COMMENT

It is known that untreated cases of pernicious anaemia may terminate spontaneously in aplastic anaemia. Blackburn *et al.* (1952) recommended a maintenance dose of at least 50 µg. of vitamin B₁₂ a fortnight for patients with pernicious anaemia uncomplicated by neurological involvement. In the above case the maintenance dose was never less than 100 µg. fortnightly.

Sulphonamides are occasionally responsible for the development of aplastic anaemia (Strauss, 1943). Usually only the white-cell series is affected, and granulopenia develops within a month. However, in the above case the white cells numbered 22,400 per c.mm. (polymorphs 81%) seven weeks after the end of the sulphonamide course, and three weeks later, when the patient left hospital, there was still no evidence of aplastic anaemia. Nevertheless, as Hodgkinson (1954) states, sulphonamides may have an additive effect in cases of aplastic anaemia primarily due to chloramphenicol.

In the above case two courses of chloramphenicol of 19 and 9 g. respectively were given. Judged by the standards of Hodgkinson (1954) the dosage of the individual courses was not heavy, although the total dosage was high.

In conclusion it is submitted that any drug that is known to be able to cause marrow aplasia, such as chloramphenicol, should be used with the greatest caution, if at all, in pernicious anaemia. In this respect Witts (1941) reported a relapse in a case of pernicious anaemia, after a good response to treatment, upon the administration of "allonal." The latter contains amidopyrine, which, like chloramphenicol, belongs to the benzamine group of drugs. It is probable that similar care should be taken in using chloramphenicol in other blood diseases in which the bone marrow already shows a disturbance of its normal function and appearance.

I am indebted to Dr. J. H. Cobb, of the Royal Surrey County Hospital, Guildford, for permission to publish this case. I wish to thank Dr. S. Keys for his reports on the pathological investigations.

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Accidental Poisoning with Tetrachlorethane

Three cases of accidental poisoning with tetrachlorethane are reported, it having been given in mistake for tetrachlorethylene.

Normally, owing to its cheapness, I treat cases of hook-worm disease with carbon tetrachloride, but in children and adults who are underweight tetrachlorethylene is given owing to less risk of toxic effects.

CASE REPORTS

Ancylostoma duodenale ova were isolated from the faeces of all three patients, who were admitted for starvation followed by tetrachlorethylene. The patients were a young African man, weight 102 lb. (46.3 kg.), a young African woman, weight 108 lb. (49 kg.), and an African girl aged about 12 years, weight 60 lb. (27.2 kg.). The doses of tetrachlorethylene were 3 ml., 3 ml., and 2 ml. respectively,

and were given at 7.15 a.m. An hour and a half later an orderly noticed that the man appeared to be sleeping, and that he could not be roused. Shortly afterwards a nurse reported that the woman was in exactly the same state.

On examination the man was deeply unconscious and both corneal and pupil reflexes were absent; the pupils were moderately contracted. The limbs were flaccid and the breathing was shallow; the respiratory rate was 12 a minute. Gastric lavage was started immediately and 20 mg. of amphetamine sulphate was left in the stomach. The pulse rate was 90 and the volume poor; blood pressure 60/46 mm. Hg. Nikethamide, 5 ml., was injected intravenously, following which the systolic pressure rose to over 80 and the breathing improved.

The woman was also deeply unconscious, and the findings were essentially the same as in the man; she was treated in a similar way. Meanwhile the child, who seemed unaffected, was given a strong emetic with very good effect, for she did not lose consciousness or suffer any other ill effect.

During the course of the next two hours a close watch was kept on them, and the adults each had to have further doses of nikethamide owing to the falling blood pressure and reduced respiratory excursions. However, the depth of unconsciousness became less and both were able to respond to the spoken word at about 11.15 a.m.—that is, some four hours after the administration of the doses. They seemed euphoric for a few hours but suffered no harm from their experience; however, as a precaution they were kept in hospital for a week on high glucose intake, "casilan," and injections of crude liver extract and vitamin B complex.

A month later the man could not be traced as he had been discharged from his work, but the other two were in excellent health, and microscopical examination revealed that there were no ova in the stools.

At the first indication of trouble I sent for the bottle, which was a new one and seemed to be in order, but it was only when I mentally spelt the word that I saw it was tetrachlorethane and not tetrachlorethylene which had been requested from the suppliers.

COMMENT

Tetrachlorethane is a colourless liquid with an odour resembling carbon tetrachloride. It is used in many industrial processes as a solvent for cellulose acetate and nitrate, bitumin, waxes, resins, pitch, tar, sulphur, rubber, and oils. It is the most toxic of the chlorinated hydrocarbons, exerting a narcotic effect and causing profound metabolic injury, especially liver atrophy. It has been the cause of many cases of poisoning when its vapour has been inhaled: in 1914 and 1915 there were at least 70 cases of jaundice, with 12 deaths, among workers using aeroplane "dope" (Willcox *et al.*, 1915).

Only two cases of poisoning following its ingestion have been reported (Hepple, 1927; Elliott, 1933). Both these men became deeply unconscious and cyanosed with loss of reflexes and died. Post-mortem findings were chiefly of congestion of the respiratory and gastric mucosae, although one case also showed marked cloudy swelling of the cells of the liver and convoluted tubules of the kidney.

In Hepple's case 12 ml. was distilled from the stomach contents after death, so the amount must have been much greater, as gastric lavage had been performed. It must have considerably exceeded the lethal dose, which cannot be very much more than 3 ml. Gastric lavage should be thorough and persistent, as tetrachlorethane has a higher specific gravity than water and is not miscible with it, and so may defy efforts to remove it.

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Reviews

MEDICAL EDUCATION IN BRITAIN AND THE U.S.A.

Medical Students and Medical Sciences: Some Problems of Education in Britain and the United States. By D. C. Sinclair, M.A., M.D. (Pp. 154+x. 25s.) London, New York, Toronto: Oxford University Press, 1955.

Dr. Sinclair, who has frequently published articles on medical education in this country and in America, has had the advantage of a Rockefeller Foundation grant enabling him to spend three months in the U.S.A., where he made a study of education in the "medical sciences." This has allowed him to produce an admirable book concerning medical education in Britain and the United States, the two countries in which the subject can be said to be most advanced. He draws a lively contrast between the requirements and the practices of the two countries, and shrewdly analyses the approach of each towards its own particular problems, which, indeed, are not identical.

The title "Medical Sciences" restricts the author, by his own definition, to what is often referred to as the pre-clinical stage of medical education—namely, anatomy, physiology, biochemistry, pharmacology, pathology, bacteriology, and a number of other subjects which vary from one school to another. The book, in four sections, deals with the student himself, his selection, and his problems in general; with the teacher (as distinct from the research worker), his teaching, and the methods for assessing the knowledge of the teacher's pupils; with the material which is taught; and with present-day educational experiments. One is left with the impression that the author believes that the present curriculum for the medical sciences has no glaring faults when presented by competent teachers, but that it could with advantage be reasonably pruned of late nineteenth and early twentieth century shibboleths and be (sacred word) "integrated" for the benefit of the student. It is easier to advocate this than to effect it, since heads of departments are often allergic even to the idea, and how much more to its execution. One has to admit, also, that whatever reforms are made in individual schools must necessarily be uncontrolled experiments, even as the "vertical teaching" at Western Reserve University must be so regarded.

This book can be read with considerable profit, much enjoyment, and with many a quiet chuckle, since the author has an attractive style, a dry, even pungent wit, a gift of phrase, and an aptitude for making his points. It can be commended to all, but especially to those who feel that medical education is a dull subject or one which can look after itself.

LIONEL WHITBY.

OBSTETRIC PROBLEMS

Practical Obstetric Problems. By Ian Donald, M.B.E., M.D., B.S., B.A., M.R.C.S., L.R.C.P., M.R.C.O.G. (Pp. 578; illustrated. 45s.) London: Lloyd-Luke (Medical Books) Ltd. 1955.

The author's warning (or promise) that his natural exuberance may bubble into the text, and the dust-cover comment that there should be no place for dullness in textbooks, arouse expectation of fireworks. Nor is the reader disappointed, though the display is one of roman candles which emit bright lights of knowledge interrupted by good illustrations and occasional sparks rather than one of breath-taking jet-propelled rockets. Anatomy, physiology, and the routine clinical aspects of normal pregnancy and labour are excluded as "dreary irrelevance"; and so they are—to those who already know them, as should the post-graduate students for whom this book must be intended. Professor Donald shows admirable courage in other ways too, and so far as possible shuns qualifying phrases. So aetiology and pathology are clearly stated and there are delightfully dogmatic accounts of treatment. Take, for example, puerperal deep thrombosis and embolism, con-

ditions on which there still remains much vacillation on the part of clinicians: for these there is only one treatment—heparin intravenously in adequate doses accompanied by active movement of the patient; other anticoagulants, and even heparin intramuscularly, are condemned. By and large each chapter deals with a clinical problem—prolonged labour, antepartum haemorrhage, heart disease, symptom complexes, and the like. Recent authoritative articles on the various subjects have evidently been abstracted and combined to make a rational picture, due acknowledgments being given in short bibliographies. Contributors of chapters are H. M. Carey (toxaemia of pregnancy), G. W. Garland (malpresentations), Hilda Roberts (obstetric analgesia), and William Hayes (use and misuse of antibiotics). The contribution of the last-named calls for special commendation.

One striking and pleasing feature which reflects modern obstetric practice is the omission of any chapter on destructive operations on the foetus. Indeed, craniotomy is mentioned only twice—once in the treatment of hydrocephaly, and again (to be dismissed) in relation to outlet contraction.

The more one reads and re-reads various sections the more valuable this book appears to be for those who are regularly engaged in caring for pregnant and parturient women. There is no better concise yet reasonable statement of the modern practice of obstetrics. If there are too few frills for the embryo consultant, there are enough for the established one, and perhaps more than enough for the general-practitioner obstetrician. It is natural to wonder why Professor Donald has added to the very large number of works on obstetrics, and it is difficult not to conclude that he wrote this book for the fun of doing it. What better reason could there be, and what better guarantee of quality?

T. N. A. JEFFCOATE.

ARTERIAL THROMBOSIS

Congrès International de la Thrombose Artérielle. Organisé par la Station de Royat à l'occasion du Centenaire de son Établissement Thermal, 6-7-8 Juin, 1953. Rapports et Discussions. (Pp. 320; illustrated. No price.) Paris: J. B. Baillière et Fils, Éditeurs. 1954.

The *Reports and Discussions* of the International Congress on Arterial Thrombosis, which was held in June, 1953, at Royat, is now available. It covers a fairly wide field, and reflects very well the current opinion in France on this subject. As the title would indicate, the whole of the arterial system comes under consideration. Naturally a good number of the reports are concerned with the effects of thrombosis on the coronary arteries. To begin with there are three papers on the problems of the causes of unusual blood coagulation. The investigation of the lipoproteins by electrophoresis and the effects of infarction of the septum on the conducting tissues also receive consideration. Two papers deal with vectorcardiography, and there are two more on the surgical treatment of arterial thrombosis in the limbs. Some of the papers have references and some have summaries in English. The reports of the discussions are fairly short.

This book is a good summary of present-day views on arterial thrombosis in France and is well worth looking into. The paper is good and the illustrations are clear.

TERENCE EAST.

TECHNIQUES IN CLINICAL CHEMISTRY

Techniques in Clinical Chemistry: A Handbook for Medical Laboratory Technicians. By Frederick N. Bullock, F.I.M.L.T., F.R.M.S., F.C.S. (Pp. 171+ix; illustrated. 16s. 6d.) Bristol: John Wright and Sons, Ltd. 1954.

In *Techniques in Clinical Chemistry* the author has produced a useful book, more especially for the student and junior technician. This value is well shown in the first chapter, devoted to fundamentals, as even more advanced technicians often spend years carrying out complex biochemical investigations without any real knowledge of the

basic principles involved in the test, and more advanced and complete textbooks cannot spare the space for these very necessary explanations.

The chapter on specimen collection is clear in its instructions, but the suggestion that the measurement of 24-hour specimens of urine be carried out in the wards is a very retrograde step and would inevitably result in error. The instructions on the collection of faeces have one important omission—namely, the precise procedure in their collection over a measured period by using markers such as carmine or charcoal at the beginning and end of the test period. Most nursing staffs have, very naturally, great difficulty in grasping the principles of this procedure unless it is given in detail. In the chapters on blood analysis the methods are well described and alternative procedures given.

In the determination of blood chlorides, most workers have experienced difficulty in obtaining a sharp end-point with thiocyanate titration owing to the interaction of the silver chloride and iron thiocyanate. This can easily be avoided by making the silver-nitrate-blood-filtrate mixture up to a known volume, filtering, and titrating an aliquot of this filtrate, now free from silver chloride. The end-point is then sharp and persistent. The method of determining serum chlorides by direct titration with mercuric nitrate (Schaes and Schaes) should be included in another edition, as this is a great time-saver in a busy routine laboratory. Direct titration of the chlorides of cerebrospinal fluid with a chromate indicator has many advantages. In the section on phosphatases there might be more emphasis on the high levels of alkaline phosphatase in all forms of obstructive jaundice.

The urine section is well done, but some tests of rather doubtful value are included. Bence Jones protein is best identified by its low coagulation temperature and re-solution on boiling, or alternatively the procedure of Osgood and Haskins may be used. The salicyl-sulphonic acid and Bradshaw tests described are of no real value.

The author is to be congratulated on producing a very useful contribution to the routine chemical pathological laboratory equipment.

H. E. ARCHER.

FORENSIC PATHOLOGY AND TOXICOLOGY

Legal Medicine: Pathology and Toxicology. By Thomas A. Gonzales, M.D., Morgan Vance, M.D., Milton Helsen, M.D., and Charles J. Umberger, Ph.D. Introduction by Harrison S. Martland. Second edition. (Pp. 1349+xii; illustrated. \$22.) New York: Appleton-Century-Crofts, Inc. 1954.

The second edition of this authoritative volume by the Medical Examiners of the City of New York adds the experience of another 14 years of active practice and greatly increases the scope of the book. Its great virtue lies in the fact that it is based almost entirely on the personal experience of the authors, whose views are amply supported by an extensive bibliography which is completely up-to-date.

The Medical Examiners in New York are responsible for the investigation of deaths which in this country might be styled "coroners' cases." The investigation of some 20,000 deaths annually in the city is centralized and conducted by medical officers actively practising pathology, serology, and toxicology. While necropsies are conducted at several mortuaries, the actual statistical material is correlated in the Chief Medical Examiner's office, and the data so obtained between 1918 and 1951 have been incorporated in various chapters to indicate the frequency of deaths from natural and violent causes.

Since the edition of 1940 new chapters have been added on the necropsy findings on embalmed bodies—a difficulty not entirely confined to the United States—cardiac contusion, traumatic cerebral oedema, injuries in sport, the Rh factor, pathological findings in poison cases, uranium compounds, the recent organic drugs, and anaesthetic and operative deaths, while in the last six chapters a fresh approach has

been made to the identification of poisons. This exhaustive analysis must be of great interest, not only to the forensic toxicologist but also to the hospital biochemist. Similarly the chapters on sudden and unexpected death contain much material of great value to the hospital pathologist.

The book is profusely illustrated with first-hand and first-class material, though some of the black-and-white reproductions of photographs are indistinct and require a more descriptive caption. It is expensive and essentially a book of reference, but as an exposition of modern knowledge of legal medicine it is without equal.

DONALD TEARE.

MOSQUITO BIONOMICS

Mosquitoes: Their Bionomics and Relation to Disease. By William R. Horsfall. (Pp. 723+viii. \$16.) New York: The Ronald Press Company. 1955.

In preparing this work the author, himself a well-known authority on mosquito bionomics, has undertaken the formidable task of summarizing in a single volume all available information relating to this important subject. Preliminary consideration is given to the characteristics common to the sub-family as a whole and to those peculiar to each genus. Each individual species is thereafter treated separately in respect of nomenclature, subspecific variants, and synonyms, number of generations, and any known data regarding hybridization. The bionomics of the egg, larva, pupa, and adult insect are dealt with under separate headings, and the importance of each species in relation to the transmission of disease is fully discussed.

The bibliography contains references to more than 4,000 scientific works. To consult all these in the original would be beyond the capacity of any single individual, and the author has had perforce to rely in some cases on citations made by others. In such circumstances errors are unavoidable, as, for instance, where Natvig is quoted as stating that the work of Shute indicated that *Aedes cantans* produces several generations every year; whereas in point of fact the latter author emphasized that this species, in common with *Aedes punctator* and *rusticus*, has only a single brood each year. Such errors will no doubt be corrected in subsequent editions.

The general format of the volume is excellent; the mass of material is well arranged and clearly presented, data relating to lesser-known species being set out in tabular form. With the introduction of modern methods of mosquito control a detailed knowledge of the life history of each insect vector has become more essential than ever. The book will prove an invaluable work of reference, especially to those actively engaged in the control of mosquito-borne diseases.

GORDON COVELL.

Some years ago King George's Jubilee Trust instituted an inquiry into "the causes of wastage from youth organizations and to throw light on the problems of attracting to them boys and girls in the changed conditions of to-day, and of recruiting to their service men and women with the generosity and capacity to lead and inspire youth." The result has recently been published as *Some Young People*, compiled by Pearl Jephcott. The survey was conducted in several different areas: two in London, one in Nottingham, and two in Oxfordshire villages. The book gives a brief glimpse of some of the adolescents between 14 and 17 years of age who were interviewed; their backgrounds, interests, and forms of entertainment. It provides statistics of education and numbers in youth organizations. The report brings out the general apathy of adolescents towards a creative use of their leisure time. Various reasons are given for the lack of response to the aims of youth organizations: shyness; dislike of further control and discipline; the number of young members; the fact that the leaders are often middle-aged and possibly out of touch with the ideas of youth—to name only a few. In conclusion the report stresses the importance to the adolescent of personal contacts and the example of adults in their daily lives. *Some Young People*, which is published by George Allen and Unwin Ltd., 40, Museum Street, W.C.1, costs 12s. 6d.

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NEW WORK ON TRANSPLANTATION

The likelihood of surgery making another great step forward—on the same scale as the advances resulting from the discoveries of anaesthesia and asepsis—may depend on finding a solution of the homograft problem, so making it possible for surgeons to transplant skin grafts, kidneys, and other tissues and organs from one individual to another. This would be a great accomplishment, not all the benefits of which can at present be foreseen. Research on the problem is not lacking. Three symposia¹ have been devoted to it in recent years and more are planned. Indeed, in the laboratory the problem has already been solved, but in a way that does not lend itself to clinical application. R. E. Billingham, L. Brent, and P. B. Medawar^{2,3} have shown that skin homografts (the most intractable of all) can be successfully exchanged between adult mammals or birds by taking advantage of the phenomenon which they call actively acquired tolerance. The principle underlying it is simple. It is a commonplace of immunology that embryos and very young animals cannot form antibodies, and that their only defences against infection are those which have been acquired at second hand. The novelty of the concept of tolerance lies in the demonstration that an animal's power to react against a specific antigen may be permanently impaired and perhaps completely abolished by exposing it to that antigen before its immunological faculties have matured. Thus a skin graft can be successfully transplanted from one adult to another, A to B, if B was injected in foetal life with cells derived from A. The embryos so treated not only fail to react against the tissue antigens: they may never acquire the capacity to do so in later life. The inhibition is highly specific; animal B becomes tolerant of tissues grafted

from A, but remains as intolerant as ever to tissues grafted from another donor, C. Acquired tolerance may not be a general phenomenon in immunology, though both theory⁴ and practice,⁵ so far as they go at present, suggest that it probably is. Its theoretical importance is obvious. Biochemistry would not be the science it is if there were no specific inhibitors, but only substrates, to work with. Immunology has hitherto had no specific inhibitors in its armoury: "tolerance" may fill the gap.

A second important contribution has been made by N. A. Mitchison,⁶ who found that transplantation immunity could be passively transferred from an immunized to a normal animal. He removed the regional lymph nodes—those which drained the grafted areas—from an actively immunized mouse and transplanted them into a second mouse belonging to the same strain. This second host thereupon behaved exactly as if it had itself been actively immunized—and so, in a certain sense, it had been. The transfer could not be carried out in the orthodox way by serum, nor by nodes other than those draining the grafted area, nor by dead cells of any kind. Mitchison's work has been fully confirmed by Billingham, Brent, and Medawar,⁷ and both parties are agreed that the transfer is not brought about by preformed antibodies or by antigens carried over from the donor of the lymph nodes to their recipient. The term "passive immunity" is therefore inappropriate or misleading, and "adoptive immunity" has accordingly been proposed.⁷ Mitchison's work shows that transplantation immunity is orthodox enough in one sense—namely, that the seat of the host's reaction against homografts is the regional node.

In one other respect it is clearly unorthodox, at least when judged by the standards of bacterial immunology. Free serum antibodies are exceedingly difficult to detect, and the homograft reaction cannot be reproduced *in vitro*. It seems to be necessary that the antibodies should attack the homograft *in vivo*, in a vascular situation, and it is at the vascular frontiers of the graft that the first signs of distress are revealed.⁸ By complex and indirect means, protective antibodies have nevertheless been demonstrated by P. A. Gorer⁹ and by R. E. Billingham and E. M. Sparrow¹⁰; agglutinating antibodies are also formed, as Gorer has long since demonstrated, and may agglutinate leucocytes¹¹ as well as red blood cells. Unfortunately, there are grounds for reasonable doubt about the effectiveness of agglutinins in the homograft reaction, and until these doubts have been cleared up their status will remain obscure.

The reaction against homografts has every distinguishing mark of an immunological process. At one

¹ Tissue Transplantation Conference, Arden House, 1952; see *J. nat. Cancer Inst.*, 1953, 14, 667-767. Ciba Foundation, 1953: *Preservation and Transplantation of Normal Tissues*, 1954, London. *Ann. N.Y. Acad. Sci.*, 1955, 59, 277-466.

² Billingham, R. E., et al., *Nature, Lond.*, 1953, 172, 603.

³ — et al., *Ann. N.Y. Acad. Sci.*, 1955, 59, 409.

⁴ Burnet, F. M., and Fenner, F., *The Production of Antibodies*, 1949, Melbourne.

⁵ Buxton, A. J. *gen. Microbiol.*, 1954, 10, 398. Kerr, W. R., and Robertson, M., *J. Hyg. (Lond.)*, 1954, 52, 253. Hanan, R., and Oyama, J., *J. Immunol.*, 1954, 73, 49.

⁶ Mitchison, N. A., *Proc. roy. Soc. B.*, 1954, 142, 72.

⁷ Billingham, R. E., et al., *ibid.*, 1954, 143, 58.

⁸ Taylor, A. C., and Lehrfeld, J. W., *Plast. reconstr. Surg.*, 1953, 12, 423.

⁹ Gorer, P. A., *J. path. Bact.*, 1942, 54, 51.

¹⁰ Billingham, R. E., and Sparrow, E. M., *J. exp. Biol.*, 1954, 31, 16.

¹¹ Amos, D. B., *Brit. J. exp. Path.*, 1953, 34, 464.

¹² Schinkel, P. G., and Ferguson, K. A., *Aust. J. biol. Sci.*, 1953, 6, 533.

¹³ Good, R. A., and Varco, R. L., *J. Amer. med. Ass.*, 1955, 157, 713.

time, when the modern study of homografts was only beginning, evidence of conformity to the orthodox pattern was eagerly sought, and duly found. Departures from orthodoxy can now be looked for with an easy conscience, and it is quite possible that an entirely new kind of immunological response may be found. There is some evidence, for example, that immunity against homografts can develop long before immunity against bacterial antigens and distantly foreign proteins. Sheep are already able to react against homografts when only two-thirds of the way through foetal life (though already more highly developed, in an anatomical sense, than a newborn mouse).¹² This is a remarkable fact, for foetal sheep, like other foetal ungulates, are—in a literal but not clinical sense—agammaglobulinaemic: they acquire their gamma globulins, with their antibodies, after birth, and only later on do they begin to make their own. R. A. Good and R. L. Varco's recent demonstration¹³ that an agammaglobulinaemic boy had no power to react against skin homografts is good evidence that the reaction against homografts is immunological; but it is not (and does not purport to be) evidence that the reaction is mediated by orthodox antibodies present in the gamma globulin fraction of blood. The cautious inference is that the failure of immunological mechanisms which has agammaglobulinaemia as one of its symptoms has tolerance of homografts as another.

CYCLOSERINE

The daily press on both sides of the Atlantic reported last February the discovery of a new antibiotic for the treatment of tuberculosis. The basis of the report was a paper read to the 14th Veterans Administration Conference on the Chemotherapy of Tuberculosis held at Atlanta last February. This paper, by I. G. Epstein, K. G. S. Nair, and L. J. Boyd¹ has now appeared in print, following another by H. Welch, L. E. Putnam, and W. A. Randall² of the Food and Drug Administration, Washington, which gives a little more information about this antibiotic. It appears to have very unusual properties, and some surprise may be felt that it should have had fairly extensive clinical trial before any announcement had been made of the results of such laboratory studies as usually precede this. The information about these studies is still very scanty—it is merely stated, for instance, that the antibiotic has "an extremely low toxicity," a future paper in confirmation being promised—and on what seems a slender basis some speculative ideas are put forward about its mode of action.

¹ *Antibiot. Med.*, 1955, 1, 83.
² *Ibid.*, 1955, 1, 72.

Cycloserine is produced by *Streptomyces orchidaceus* and was discovered by members of the staff of the Commercial Solvents Corporation. Eli Lilly and Co. have collaborated in its study and their trade name for it is "seromycin." It is water-soluble, has a molecular weight of only 102, and, as would be expected from so small a molecule, appears to be freely diffusible: the concentrations attained by the drug in the cerebrospinal fluid, pleural fluid, and sputum are said to be approximately equal to those in the blood, though the published papers give no detailed particulars. Minimum inhibitory concentrations for various bacteria as determined by Welch and his colleagues were mostly from 50 to 250 µg./ml., Gram-positive and Gram-negative species being about equally susceptible. There is no description of how these tests were done; hence it remains possible that by varying some factor, such as inoculum size or the composition of the medium, a degree of *in vitro* activity might be demonstrated which would accord more closely with that thought to have been observed *in vivo*. The list of species tested does not include *Myco. tuberculosis*, and indeed there is no information at all in either paper about the *in vitro* activity of cycloserine against this organism except in a footnote giving the findings of two other workers, between which there is a twelve-fold discrepancy. Presumably much more extensive and positive information on this vital matter will be forthcoming shortly. The paper by Welch and his colleagues also reproduces some of the data in personal communications from two surgeons who have used cycloserine for the treatment of urinary tract infections with some success: not enough information is given to judge the degree of this. It finally records the results of a pharmacological study in 40 normal subjects given single and repeated doses in oral capsules. The blood and urine concentrations attained were high and remarkably sustained, and repeated doses had a cumulative effect, reaching a maximum in three days of about 50 and 1,000 µg./ml. in the blood and urine respectively. It seems, therefore, that part of what cycloserine lacks in antibacterial activity it compensates for by the high concentrations attained in the body. Nevertheless these authors think these concentrations inadequate to explain the therapeutic effect, and speculate on other possible modes of action—"... the production of physiologic conditions in the host, resulting in a more unfavourable environment for multiplication or survival of micro-organisms," or "the production of humoral factors that act with the drug in combating infections."

The paper by Epstein and his colleagues, which deals exclusively with the treatment of pulmonary tuberculosis, is strongly reminiscent of the enthusiastic

first reports on the effects of isoniazid in 1952. Even patients with far advanced disease unresponsive to previous chemotherapy began to gain weight and had less cough and sputum: of 29 such patients, 22 became sputum-negative and 20 showed radiological improvement. Eight further patients with more recent and previously untreated, though extensive, disease, classified as moderately advanced in four and far advanced in four, were treated with evidently more dramatic results: fever abated promptly and weight gains were up to 23 lb. (11.5 kg.). All showed radiological improvement and all became sputum-negative. There is no information about any tests of the sensitivity of these patients' tubercle bacilli to cycloserine, though it is said that "an extensive study is now under way" to obtain data on the emergence of resistant organisms. Yet the authors subscribe to the idea in the previous paper that "cycloserine owes its salutary effects *in vivo* to factors not directly connected with its *in vitro* antibiotic activity." There seems to be no need for this assumption if one of the two discrepant figures obtained by other workers is accepted as the minimum inhibitory concentration of cycloserine for *Myco. tuberculosis*. This, obtained with the H37Rv strain, was 2.5-5.0 µg./ml., well below the concentration maintainable in the blood. It has also to be remembered that so diffusible a substance may penetrate infected cells and perhaps avascular lesions much more readily than other drugs. It is profitless to speculate further on fragmentary data, and the process of filling the gaps in this story will be watched attentively.

HEALTH SERVICES IN INDIA

A Health Survey and Development Committee was set up by the Government of India about fifteen years ago and reported in 1946, with blueprints for future health activities. At that time the maternal mortality rate was 20 for every 1,000 live births; the expectation of life for the Indian was 27 years; the proportion of qualified doctors to the population was one in 6,300; and the average population served by a hospital or dispensary in rural areas was 50,000, and in urban areas 30,000. The *India 1954 Annual Review*¹ does not contain up-to-date figures, but even by 1951 all the mortality rates seem to have fallen (the infant mortality rate from 158 to 124.4), and the expectation of life had risen to 32 years. The number of medical colleges had increased by 50%, and the annual admissions of students had almost doubled. There was a recession in deaths from infectious diseases, plague was on the wane, and malaria was

¹ Published by the Information Service, India House, Aldwych, London, W.C.2.

less of a scourge. The health section of the *Annual Review* is written by Rajkumari Amit Kaur, the Minister of Health. She mentions that one of her first acts as Minister was to end the dichotomy between curative and preventive health services by combining the functions, discharged hitherto by separate bodies, of medical and public health advisers, and to commend similar action to the States, nearly all of which followed the central example. The result has been greater co-ordination and team-work. The comparative isolation of the independent medical profession from the official health "hierarchy" is also being ended.

A state health insurance scheme for industrial labour has been started during the last three years. At present it embraces only 60,000 workers, but with its extension to Bombay it will cover half a million. Another health insurance scheme has been started by the central Government for its staff in the capital city and covers a quarter of a million persons for general practitioner, specialist, and hospital services. These efforts touch only the fringe of the problem, but the Minister says they are indications of the trend. A national malaria control programme was launched two years ago and is making rapid strides against a disease which in 1946 was estimated to affect 100 million people and to cause two million deaths. Nearly 90 antimalarial units, each covering a population of one million, are already in operation, and another 35 are coming into existence shortly. By the end of the second five-year plan (1961) it is hoped that malaria will be under control. Tuberculosis, too—with an average number of deaths in a year amounting to 500,000—is being actively combated. A mass B.C.G. vaccination scheme has 120 teams in the field, and they have tested 33 million persons and vaccinated one in three. An All-India Institute of Medical Sciences—costing about £3,750,000—is expected to be inaugurated within the next two or three years. It will combine undergraduate and postgraduate education with research, and will turn out, it is hoped, an increasingly large number of well-trained teachers for the medical colleges. Acts relating to the professions of pharmacy, nursing, and dentistry have recently been passed, and legislation is being considered for the prevention of practice by unqualified and unregistered persons, and for the regulation of the training which is given in indigenous systems of medicine.

Family planning movements are gradually taking shape, assisted by many independent and voluntary organizations. This has a direct bearing on the food problem of India, and here again progress is being

made. The five-year plan fixed an increase of 7.6 million tons in cereal output by 1955-6, and already the estimated increase in 1953-4 is 9.5 million tons. Before the relaxation of controls in the middle of 1952, 108 million people were subject to rationing. A year ago the number had dropped to 44 million, and to-day rationing is only a memory. These are all encouraging signs that the Government of India is grappling successfully with health and social problems which, in spite of recent efforts, remain of enormous complexity, for the inhabitants of India number about one-seventh of mankind.

PUBLIC HEALTH SALARIES

It is four and a half years since the salaries of medical men and women in the public health service were raised in accordance with the terms of the award¹ of the Industrial Court, to which, in 1950, the staff and management sides of Whitley Council Committee C agreed to submit their differences. Although the staff side did not get all it wanted from that award, there was satisfaction that substantial gains had been made. Nevertheless the award to assistant medical officers was disappointingly small—the salary being on a scale from £850 to £1,150 per annum. The staff side made persistent efforts to have this improved without success, and again, in 1953, the differences between staff and management on this point had to be resolved by the Industrial Court. The salary awarded² this time to assistant medical officers was £950 rising to £1,300. Meanwhile all the other medical officers in the public health service have been paid salaries at the rates awarded in 1950.

The case for improving these salaries has been overwhelming for some time past, for not only has there been a great rise in the cost of living, but members of the public health service have seen their colleagues in general practice benefit from the Danckwerts award in 1952 and their colleagues in the hospital service from the increases negotiated last year. But once again the two sides of Whitley Committee C failed to agree on the amounts by which public health salaries should be increased and once again the differences were laid before the Industrial Court. The dispute was clear cut. The staff side urged the Court to take into account the salaries being paid to doctors in other branches of the Health Service; whereas the management side "felt that it would be right to give increases of such an amount as would bring the salaries of medical officers of health into line with those of the other professional officers (in local government) of comparable status" (who, it may be said, had negotiated certain percentage increases to take effect from January 1 this year). The award announced last week and published in the *Supplement* this

week (p. 214) shows that the Court has favoured the management side's view, though this result cannot have been due to any fault in presentation of the staff side's case: scrutiny of the minutes of the proceedings of the Court shows how cogently this was argued by counsel briefed by the Public Health Service Defence Trust.

The immediate effect of the award will be some disappointment that the staff side's reasonable requests have not been met, but also some satisfaction that the increases which have been granted will help to ease the financial burdens that fall particularly heavily on salaried medical men and women whose earnings are definitely on the low side for highly trained professional people. These increases, as can be seen from the details in the *Supplement*, amount to about £175 a year for medical officers of health in areas with a population not exceeding 100,000 and about £200 a year in areas where the population is over that figure; senior medical officers obtain a rise of £165 per annum at the minimum of the scale and £180 at the maximum; and assistant medical officers (who, as stated above, had the minimum of their salaries raised by £100 and the maximum by £150 under the 1953 award) go up another £25 at the minimum end of the scale and £75 at the maximum (£1,375 under the new award). Under a previous agreement³ the salaries of deputies are linked with those of their chiefs (66½% of the minimum scale adopted by the employing authority for the post of medical officer of health, with annual increments equivalent to those of the M.O.H.); and the staff and management sides had already announced that, when an award was made in respect of the three groups of officers specifically dealt with, they would be able to reach agreement on the salaries of the remaining categories of medical officers of health. In so far as they go, then, these awards will bring public health salaries nearer to the incomes of doctors in other branches of medicine. But the long-term effect on the National Health Service of the management side's obstinate resolve to keep the salaries of medical officers of health linked with those of other chief officers in the local government service is difficult to foresee, for, as one observer⁴ has put it, "One of the chief failures in co-operation between the hospital and local health authority service lies in the division of the medical profession into two salaried camps of grossly unequal status."

CANCER AND THYROID ACTIVITY

The discovery that the incidence of a disease corresponds with that of some social, physiological, or other peculiarity in the population or milieu is sometimes a first step towards learning how to overcome the disease or unravel its aetiology. Sceptics may say that many statistical correlations of this kind have been found in the past which seem to have led nowhere—but that may be because the story is not yet finished. Cancer research has shown several times that many years may elapse between the discovery of a correlation and the beginning of any serious attempt to explain it. In 1844

R. Stern¹ found from a study of Verona's statistics that breast cancer was more frequent in single than in married women, but 70 years passed before his observation was confirmed and its important implications began to be considered. In 1868 A. Haviland² addressed the Medical Society of London on the relationship between cancer death rates and geology in the registration districts of England and Wales, but only recently has serious research begun on soil in connexion with certain forms of cancer.

Another example concerns a statistical association between cancer and hypothyroidism, for which evidence was produced by Percy Stocks³ in 1924, following a suggestion by Bayard, of Zermatt, in 1919. By dividing Switzerland into 31 areas and correlating standardized death rates for cancer of the digestive tract in 1920 with the goitre frequencies in army recruits in 1921-2, Stocks obtained a coefficient of +0.636. He also found that the proportion of malignant growths comprised by cases of stomach cancer was positively related to the frequency of goitre in the U.S.A. and parts of Norway as well as in Switzerland. This was supported by the finding that thyroid anomalies were recorded in 21% of necropsies on cancer patients at the Middlesex Hospital, whereas the same pathologist had recorded them in only 4% of patients who had died from diseases other than cancer. A comment in this *Journal*⁴ on that paper remarked that "the refined analysis of cancer rates is an arduous task; he who undertakes it must be prepared for many disappointments." Thirty years have been a long time to wait for any direct follow-up of these findings, but now J. G. C. Spencer⁵ has re-examined the problem and produces confirmatory data of an association between cancer and goitre frequencies in other countries. He gathers together recent clinical, experimental, and pathological observations suggesting that the thyroid has some influence on the development of cancer.

O. Bayard⁶ thought that deficiency in the supply of thyro-iodine to cells might cause premature ageing of the tissues, and Spencer mentions the lower metabolic rate in diabetics as perhaps accounting for their raised liability to cancer, as found by Joslin. He suggests that the increased demand for iodine at puberty and during pregnancy may account for the greater likelihood of melanomata developing at those times. Animal experiments, cited by Spencer, have shown that administration of thyroxine in the diet is prejudicial to successful grafting of certain tumours from one mouse to another, and that simultaneous thyroxine injection reduces the tumour response to injection of dibenzanthracene, whereas feeding with thiouracil enhances the response. Regression of rat tumours has been brought about by natural thyroxine; and the increased rate of development of spon-

taneous mammary tumours in mice during pregnancy might, he thinks, be due to thyroid deficiency.

The therapeutic administration of oestrogens is believed to influence cancer growth indirectly by suppressing pituitary activity. Spencer argues that a high thyroxine level in the blood produces a similar effect and that thyroxine has advantages over oestrogens in that it is not carcinogenic, the pituitary is not known to become indifferent to it in time, and thyroxine in the tissues makes an environment unfavourable to tumour growth. The author is careful to point out: "A low metabolic rate or an insufficiency of thyroid substance can in no way be considered as a primary cause of cancer. Thyroid and related substances cannot therefore be considered as a cure for cancer. It is, however, suggested that thyroid function (or dysfunction) may be associated with the susceptibility or immunity to cancer." A. A. Loeser⁷ has advocated the administration of thyroid as an ancillary to the surgical and other treatment of cancer; and he and Spencer also suggest that, as a preventive measure, maintenance of a good level of thyroid activity during middle life might increase immunity to the action of carcinogenic substances. It is good news that long-term research on this important matter has been started at the Frenchay Hospital, Bristol, and that further papers may be expected when data become available.

NOMENCLATURE AND MORBIDITY SURVEYS

Team-work in medical research has a long history, as was made clear at a recent meeting of the Section of General Practice at the Royal Society of Medicine, when Dr. R. M. S. McConaghey¹ gave a historical review of collective medical investigations in this country based on observations and records of individual practitioners during the eighteenth and nineteenth centuries. Moving forward to a much more recent period, there has been the exploratory study by the General Register Office² in which about ten practitioners took part for several years: this has formed the basis for a much expanded twelve-month survey of morbidity in general practice which has started this month, organized jointly by the College of General Practitioners and the General Register Office, and in which over 100 general practitioners are taking part. As the latest Research Newsletter³ of the College observes, those taking part in the inquiry are going to face various difficulties, and one of these will be the nomenclature of the minor complaints seen so frequently in general practice, for which each doctor has his own favourite label and which may mean something quite different to his colleagues.

Medical statisticians make a clear distinction between "nomenclature" and "statistical classification" of

¹ Meeting of Section of General Practice on April 20, 1955.

² Logan, W. P. D., *General Practitioners' Records*, General Register Office Studies on Medical and Population Subjects, No. 7, 1953, H.M.S.O., London.

³ *Practitioner*, 1955, 174, 601 (College of General Practitioners Research Newsletter No. 6).

⁴ *The Nomenclature of Disease*, 1948, H.M.S.O., London.

⁵ *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death*, 1948, W.H.O., Geneva.

⁶ *Standard Nomenclature of Diseases and Operations*, 1952, New York.

¹ *British Medical Journal Supplement*, 1950, 2, 255.

² *Ibid.*, 1953, 1, 278.

³ *Ibid.*, 1951, 1, 209.

⁴ Dr. W. G. Patterson, speaking at the Royal Sanitary Institute in London on March 9, 1955.

¹ Stern, R., *Ann. univ. di Medicina*, 1844, 110, 444.

² Haviland, A., Lecture to Medical Society of London, Nov. 30, 1868. Privately published, London, 1869.

³ Stocks, P., *Biometrika*, 1924, 16, 364.

⁴ *British Medical Journal*, 1925, 1, 85.

⁵ Spencer, J. G. C., *Brit. J. Cancer*, 1954, 8, 393.

⁶ Bayard, O., *Beiträge zur Schilddrüsenfrage*, 1919, Basel.

⁷ Loeser, A. A., *British Medical Journal*, 1954, 2, 1380.

diseases. Basically, a medical nomenclature is a catalogue of approved terms, which has to be extensive so that every morbid condition that can be specifically described has its specific designation recorded. On the other hand, a statistical classification is intended for a quite different purpose—namely, to group diseases together that have something in common, so that their statistical study will be facilitated. The complete specificity of a nomenclature limits its suitability for use as a statistical classification, whereas a classification is not designed to guide doctors in their choice of the most acceptable medical terms. There is therefore a very clear difference, both in purpose and in content, between the *Nomenclature of Disease*⁴ of the Royal College of Physicians and the World Health Organization's *International Statistical Classification of Diseases, Injuries, and Causes of Death*,⁵ the seventh revision of which is now in course of preparation after the customary international revision conference in Paris in February of this year. Another important and well-known work is the *American Standard Nomenclature of Diseases and Operations*,⁶ which is primarily a nomenclature, as its title indicates, but contains cross references to corresponding categories in the *International Classification* and has been so constructed as to serve certain classificational purposes such as the indexing of hospital clinical records. Opinions differ about its advantages for this purpose over the *International Classification*, which, with appropriate *ad hoc* expansions, is being used successfully as a diagnostic index in a number of hospitals in this country.

The special problems of nomenclature and classification of minor symptomatic conditions will no doubt be engaging the minds of those responsible for the new morbidity survey in general practice, and it will be seen in due course whether the chosen methods of classifying disease will be adequate to cope with the vagaries of diagnostic terminology that the survey will encounter. It may be, as the College's Newsletter suggests, that a completely new approach to the nosology of the minor maladies met with in general practice is long overdue.

PARALYSIS FOLLOWING POLIOMYELITIS VACCINATION

Current reports that a number of children in the United States inoculated with the new poliomyelitis vaccine have since developed paralysis have come as an unwelcome shock after the exciting news of a fortnight ago. The present situation is obscure owing to a virtual absence of any concrete facts, but it would appear from reports in the American and British press that between 29 and 35 inoculated children have developed paralytic poliomyelitis. Two deaths are reported.

After the news of last year's vaccine trials, a large quantity of vaccine was released for use in the United States. The U.S. Public Health Service states that so far 2,270,000 children have been vaccinated in 42 states. Of these, 300,000 have received a vaccine prepared by

the Cutter Laboratories, Berkeley, California, and it would appear from press reports that 26 of the 29 paralytic cases were vaccinated with material from this source. A further report states that at least 10 of these 26 cases received vaccine from the same batch.

This is disquieting news. With the facts available three main possibilities for such an incident must be considered. First, it could be chance, the vaccine having been given just prior to the onset of poliomyelitis which would have developed in any case. Again, if the facts are correct, 26 cases from one source is rather too large a number for coincidence, and the figures for the weekly incidence of poliomyelitis (106) in 42 states do not suggest any major prevalence at present. The second possibility is the association between paralytic poliomyelitis and parenteral injections first described in this country by Martin,¹ and in Australia by McClosky.² In these cases paralysis followed immunization with diphtheria, pertussis, and combined prophylactics. These findings have been confirmed,³ but the onset of paralysis nearly always seems to occur between 8 and 28 days after inoculation. Bodian⁴ has provided experimental evidence to support the idea of the "provoking action" of trauma. In these recent reports from the U.S.A. the time interval appeared to be less than a week in some cases. What is not known is how many injections had been received. The third possibility is that live virus was present in a proportion of the formalized vaccine. This is the crucial consideration. Twenty years ago Leake⁵ reported a series of 12 cases of poliomyelitis in children receiving a chemically treated anti-poliomyelitis vaccine. Six children died. All 12 children had had an injection between 8 and 27 days before symptoms, and of these 8 had had a second injection between 1 and 6 days before symptoms. It is possible that if live virus were present the time interval between injection and the onset of paralysis might be shorter than in those cases already referred to following parenteral injection.

From the report in last week's *Journal* of the preliminary finding of the 1954 trials it appeared that the vaccine used in the trials was safe, and there is no cause to alter that opinion. It is by no means clear whether the same safety tests apply to-day. Unquestionably the most important requirement of a vaccine is its safety, and the tests to ensure this must be strict indeed. Meanwhile the general vaccination programme in the U.S.A. is continuing. Let us hope that before long the answer to the problems posed by the recent events in the United States will be forthcoming.

The next session of the General Medical Council will open on Tuesday, May 24, at 2 p.m., when the President, Sir David Campbell, will take the chair and deliver an address.

¹ Martin, J. K., *Arch. Dis. Childh.*, 1950, 25, 1.

² McClosky, B. P., *Lancet*, 1950, 1, 659.

³ Hill, A. B., and Knowlton, J., *British Medical Journal*, 1950, 2, 1.

⁴ Bodian, D., *Amer. J. Hyg.*, 60, 1954, 358.

⁵ Leake, J. P., *J. Amer. med. Ass.*, 1935, 105, 2152.

EMERGENCIES IN GENERAL PRACTICE

ANTE-PARTUM HAEMORRHAGE

BY

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It is proposed to discuss ante-partum haemorrhage not from the aspect of its types and their subdivisions, nor from that of its operative treatment, but from the aspect of the family doctor called to a patient's house in the later months of pregnancy because there is bleeding from the vagina.

The term "ante-partum haemorrhage" is restricted to bleeding after the twenty-eighth week of pregnancy. Its pathology is no different from bleeding earlier in pregnancy, but its consequences are likely to be more serious to the mother and management may need to take into consideration the life of the foetus. That it may be a serious condition is shown by the fact that it is still the fourth commonest cause of maternal death in England and Wales. The early management of these cases is of critical importance, and I hope to make it evident that what is *not* done is as important as what is done. The practitioner's first concern when called to his patient will not be whether she has placenta praevia, accidental haemorrhage, cervical polypus, carcinoma of the cervix, or a ruptured vaginal varix, but how much blood has been lost and what is her general condition.

Slight Haemorrhage

Slight haemorrhage has occurred and there is no disturbance of the woman's general condition.—To attempt to make an exact diagnosis is dangerous and unnecessary. Overshadowing all the management is the fact that the bleeding may be the first warning haemorrhage of placenta praevia. It is possible that vaginal examination will bring on profuse and dangerous bleeding. Even rough abdominal examination might lead to further bleeding. Gentle abdominal examination may show that the presenting part is in the pelvis. In this case, though placenta praevia is not excluded, one can say that a dangerous degree of praevia is not present and that the urgency is not great. If the presenting part is not engaged the diagnosis is not helped. If a high head or any malpresentation is found it is likely that a dangerous degree of placenta praevia is present. An unusual feature is that the primigravida is likely to be safer than the multigravida. Very seldom does the primigravida go on to profuse and alarming haemorrhage after the first show. The multigravida with her slacker, more accommodating uterus may have a drenching loss as the first evidence of the condition. If the foetal heart rate is altered the case is more likely to be one of accidental haemorrhage.

Without further ado every one of these patients should be referred to hospital for admission. There are many maternity units and nursing-homes staffed by general practitioners, and with his patient admitted the doctor may permit himself a further examination. He might examine with a Sims speculum to exclude polypus, carcinoma, and ruptured vaginal varix. Expert assistance is needed for the treatment of each of these. The removal of polypi from the cervix in pregnancy may lead to severe bleeding needing cautery or suture. The mattress suture needed for ruptured varices may bleed severely from the needle punctures. Carcinoma is of course a rare and dangerous problem.

A woman at the thirty-seventh week of her second pregnancy had a slight, painless loss. Without attempting to make a diagnosis her doctor sent her into hospital. She arrived in perfect

condition. After a week in bed in hospital there had been no further bleeding. The baby was lying somewhat obliquely with the head in the left iliac region. It was decided to examine her vaginally in the operating theatre, with everything set ready for caesarean section. A postgraduate class was invited to attend this examination. The apparently normal cervix was inspected and through the fornices a boggy mass could be felt. In order to press home the lesson that these cases should not be examined vaginally except under these special circumstances I passed a finger through the os, expecting a trickle of blood to ensue. When the finger was withdrawn a cascade of blood followed and soon began to form a steadily enlarging pool on the table. A rapid caesarean section ensued that neither mother nor baby came to any harm, but the class, and I, received a smart lesson.

Moderate Haemorrhage

Haemorrhage sufficient to affect the woman's general condition has occurred.—Here the practitioner's dilemma is not which cases should be sent to hospital (all should) but whether preliminary treatment is necessary before doing so. Let it be said at once that no woman who is still bleeding should be sent on an ambulance journey without some method of stopping the haemorrhage or of making up for what is lost. If pain is present, and especially if there are some evidences of toxæmia, the bleeding is likely to be due to accidental haemorrhage, but this does not affect the management. In all cases an intramuscular injection of $\frac{1}{4}$ gr. (16 mg.) of morphine should be given. The attendant should then consider such factors as the distance from the hospital, whether labour pains have started, the parity of the patient, how much blood has been lost, whether bleeding is still going on, and the aspect of the patient. I write "aspect," for one glance at a woman's face tells more than exact measurements of blood pressure and pulse rate. Indeed the blood pressure may be gravely misleading because of previously present hypertension.

He will lean towards immediate dispatch to hospital in those patients whose loss has not been excessive, those who have pain, and in primigravidae, but will not send in one who is still bleeding. For the rest there should be no woman in Great Britain beyond the reach of a domiciliary emergency service (the flying squad), or at least of a resuscitation organization. Whilst awaiting the arrival of the squad the patient should be induced to lie still and quiet. A tight binder may be applied. No doctor should ever feel at all guilty of having made a fuss if the squad arrives and finds the patient in quite good condition: he should feel proud. The converse is dreadful. An alarmed doctor makes hurried arrangements to bundle his patient into an ambulance and so out of his responsibility. One still hears of these patients arriving at hospital dead or expiring. In the experience of the Newcastle Obstetric Emergency Service all cases of accidental haemorrhage will need to be transported to hospital, but many of them will need transfusion of blood before the journey is made. Certainly all patients with placenta praevia will need admission. These emergency cases should all be given Group O rhesus-negative blood, for even if their grouping has been tested there are possibilities of error, technical and clerical. Once Group O rhesus-negative blood has been transfused it is best to continue with this even if the correct blood group has been ascertained.

A doctor's wife had been quite well in her fourth pregnancy until at the thirty-second week she awoke at 4 a.m. to find herself wet. Her husband found her to be in a pool of blood. He called his partner, who gave her morphine, sent for the flying

squad, and did no more. On the arrival of the squad her blood pressure was 60/40, pulse rate 82, and she had fainted twice. By 5.10 a.m. the second pint of blood was running in rapidly. A tight binder was applied and by 6 a.m. she was in hospital with a blood pressure of 100/70 and a pulse rate of 100. There was a stage IV placenta praevia. At 9 a.m. a caesarean section was done. In all 5 pints (2.8 litres) of blood was transfused. She left hospital with a haemoglobin of 82% and a baby thriving on the breast.

Alarming Haemorrhage or Severe Shock

The haemorrhage is alarmingly severe or the patient shows severe shock or pain.—There may again be placenta praevia, or there may be concealed accidental haemorrhage or, rarely, a true couvelaire uterus ("apoplexie utero-placentaire"). According to the degree of unexpelled blood so will be the degree of shock, until in the worst cases one finds a woman with ashen lips, dilated pupils, collapsed or anxiously restless, with hard tender uterus and in severe pain. All of these patients should be given an intramuscular injection of $\frac{1}{4}$ gr. (16 mg.) of morphine as a first step. None of them should be packed into an ambulance forthwith. Raising the foot of the bed is an ineffective procedure. To have any effect on the circulation the feet need to be 18 in. (45 cm.) above the head, and if this is done any benefit is counteracted by the repeated disturbance necessary to prevent the patient sliding into the bed-head. Overheating should be avoided. The cold skin is an evidence that the body is withdrawing blood to more vital parts. Heat will cause skin vasodilatation and lower the blood pressure further. Blood transfusion is imperative and should precede the ambulance journey or be given during it. If she is left quiet very seldom will a woman fail to improve. The initial catastrophe is usually followed by a rebound. It takes time for the body to muster its resources of hypotension and vasoconstriction, and once these are in action a temporary improvement sets in. By then the squad should have arrived. Manipulations and intervention can only add to the seriousness of the condition unless and until an improvement has been achieved by natural or surgical means.

What should be done if the patient is remote from help and transfusion is not available for at least an hour? To stand idle for longer than this may seem to imperil the patient's life. Many doctors keep a flask of dextran solution and a giving set ready for these emergencies. They should certainly be employed. The solution keeps indefinitely and will maintain blood volume effectively until such time as blood is available. The membranes may be ruptured artificially under certain circumstances: when one is sure that a placenta praevia of severe degree is not present (for example, when the presenting part is well engaged in the pelvis), when recurring labour pains are present, when the woman is a multipara, and especially if labour is premature. The first condition is the most difficult to fulfil, but it is the most important, for to attempt to rupture membranes when the placenta covers the os is dangerous.

Vaginal Plugging and Bimanual Compression

What is the attendant to do with a patient steadily bleeding and deteriorating and help is to be long in coming? Is there no means of staunching the flow as a first-aid, temporary measure? The old-fashioned vaginal plug is an effective means of stopping any ante-partum bleeding, but it was abandoned because it was almost never applied efficiently in domiciliary practice. To apply it certainly needs a general anaesthetic. Up to half a pound (0.22 kg.) of cotton-wool will be needed, and this, soaked in saline, will half fill a bucket. Each pledget when wrung out is packed into the vagina until it is distended to the pelvic walls. The final result will be a hard bolus the size of a foetal head completely filling the pelvic cavity. A tight binder and firm perineal band are then applied. Anything short of this would be useless. One or two sanitary towels placed in the vagina would be more likely to increase bleeding than to stop it. Vaginal plugging is a serious undertaking; never-

theless it is effective as a first-aid measure to stop the bleeding. It could be employed in special circumstances such as in a ship at sea or in a remote area.

A more readily applicable though short-term first-aid measure that can be used during the hour awaiting the arrival of help is bimanual compression. This has always been taught as a means of controlling post-partum haemorrhage, but many are unaware that ante-partum haemorrhage can be stopped by this means. In the desperate case that would decide the attendant to adopt this procedure an anaesthetic is not given. The operator lubricates his right hand (soap will do), forms it into a cone, and by pronating and supinating inserts the whole hand into the vagina. The vaginal vault will be found readily capacious and there a fist is made. The left hand presses on the fundus uteri and so the uterus is squeezed between the two hands.

Twenty-five years ago, when I was district obstetric officer to the Princess Mary Maternity Hospital, it was my duty to call daily on a woman 36 weeks pregnant who had been allowed home from the hospital after one or two small ante-partum haemorrhages because she lived near the hospital and beds were needed. One morning just as I walked in she began a dangerously profuse loss. I was alone and had no materials with me. Bimanual compression was applied and the attention of the neighbours attracted by kicking on the floor. It was an hour before help and an ambulance arrived, but during the whole of that time the bleeding, which was from central placenta praevia, was fully controlled and the patient arrived at hospital in good condition.

Subsequent Management

What is done for the patient after she arrives in hospital is less a matter for this article than for hospital staffs, but as any one of us may be called on to cope with these patients there are one or two principles that should be laid down. There is little room for definitive treatment between simple rupture of the membranes and caesarean section. A great deal of mismanagement has been occasioned by careless reading of Professor Macafee's admirable article on placenta praevia.* It has been asserted that he was against vaginal examination in cases of ante-partum haemorrhage for fear of inducing bleeding in a patient with placenta praevia. The fact is that Professor Macafee wrote, "A vaginal examination should be made in all cases of suspected placenta praevia," but he emphasized that that examination should never be undertaken anywhere but in hospital, and then only if one is prepared for an immediate caesarean section and that the choosing of the time of this examination is a matter for careful thought. There are few obstetricians who would disagree with these dicta. Another misinterpretation is that conservative treatment of placenta praevia can be carried to the extent of allowing patients with this condition to go home until they are nearer term. Such vagueness is perilous. Macafee restricts this licence decidedly to primigravidae who live near and who have been warned not to permit vaginal examination. It is safest never to allow a woman with any degree of placenta praevia to go home. There is strong evidence that many of the severe haemorrhages in placenta praevia have been precipitated by sexual intercourse.

Simple rupture of the membranes may be employed for placenta praevia type I and for most of type II, or for accidental haemorrhage revealed or mixed. On the other hand, lower segment caesarean section is best suited for placenta praevia types III and IV, and for some of type II in which the placenta is situated posteriorly. These are not clear-cut rules and other factors such as the viability of the child, degree of maturity, and parity may alter the decision. A few cases of concealed accidental haemorrhage may need caesarean section or even caesarean hysterectomy. Bringing down a leg in a breech or transverse lie and permitting spontaneous expulsion are still occasionally employed for either variety of ante-partum haemorrhage, notably in patients who are multigravid and in whom the foetus is dead or so premature that its life is valueless.

*J. Obstet. Gynaec. Brit. Emp., 1945, 52, 313.

Bipolar version, which carries such a high foetal mortality, is now little employed except in multiparae when foetal survival is unlikely, and then usually well before term. In any event it is doubtful whether it achieves anything more than to ensure thorough rupture of the membranes and escape of liquor amnii.

Conclusion

All cases of ante-partum haemorrhage are cases for hospital. Accurate diagnosis should not be attempted unless the patient is in hospital. In some cases restoration of the patient's general condition is advisable before she is sent in. If in doubt err on the side of safety, and call the obstetric emergency service. In grave and severe cases restorative measures should always be taken before an ambulance journey. If help is delayed there are first-aid measures that will stop the bleeding, but they should be used only in special circumstances.

Next article on Emergencies in General Practice.—"Acute Food-poisoning," by Dr. C. Hardwick.

PUBLIC HEALTH AND PREVENTIVE MEDICINE

ROYAL SANITARY INSTITUTE CONGRESS AT BOURNEMOUTH

About 2,500 delegates assembled at the annual health congress of the Royal Sanitary Institute, which was held at Bournemouth from April 26 to 29 under the presidency of the Duke of Wellington, Lord Lieutenant of Hampshire. The congress met in ten sections, and in addition there were five special conferences for different categories of workers in the public health service. Representatives from more than forty other countries attended, among them three professors from Moscow.

In his address from the chair of the congress the DUKE OF WELLINGTON said that although great improvement in hygiene had taken place during the eighty years of the Institute's existence, much still remained to be done. Visitors from Northern Europe were shocked at the open food shops still to be seen in this country. He wondered whether the rising incidence of cancer might be attributed to the enormously increased consumption of sterilized foods and the use in agriculture of chemical fertilizers. He knew that these possibilities were scouted by many eminent authorities, but every medical discovery had found many people who were unwilling to believe in it at first. He also criticized the pollution of rivers by industrial waste. Another outstanding problem concerned feeble-minded old people. A kind of institution between a mental home and an old people's home was wanted; it was one of the most difficult problems of local government.

The problem of the ageing population was also the theme of the presidential address in the Preventive Medicine Section by Dr. ARTHUR MASSEY, chief medical officer to the Ministry of Pensions and National Insurance. But he thought they were now beginning to see this problem in better perspective, and the idea that future workers would have increasing difficulty in supporting their aged community was becoming less insistent than in the recent past.

Training for Public Health

In the Preventive Medicine Section Professor R. H. PARRY (Bristol) called for closer integration of undergraduate medical training with the public health department and the general practitioner, so that the student might learn more about conditions in home, school, and factory. He believed that in time the general practitioner would be able to take over medical responsibilities at the health clinics and work in close association with the public health staff; but there

would always remain the need for certain full-time medical officers to be specially trained for other important duties of the health department.

While it was generally agreed that it was better to prevent than to cure, why was it, asked Professor THOMAS MCKEOWN (Birmingham), that when the opportunity was presented, as in the N.H.S., to plan a service on a national scale all the resources were devoted to the treatment of established disease? It was the result of a widespread belief that health depended mainly upon medical services and particularly upon the hospital service. Yet the improvement in health to-day, as compared with the previous century, was due primarily to the fact that people did not become ill rather than to the treatment they received when they were ill. Disease prevention deserved a higher priority than it was given.

Widening Horizons of Preventive Medicine

In their own special conference the medical officers of health discussed the widening horizons of preventive medicine. Dr. A. L. COCHRANE, after describing the work of the pneumoconiosis unit of the Medical Research Council, operating mainly in a Welsh mining area, said that the diseases which were likely to be important in the future were the chronic disabling diseases with a low case-mortality rate, of which rheumatoid arthritis was an example. The long-term programme of preventive medicine was to investigate the causes of these diseases in order to learn what could be done to prevent them. The first step was to measure the disease prevalence, and for this purpose he described how a representative sample of the community might be taken for survey. Then, with the help of different specialists for each disease, the prevalence in a complete population of bronchitis, diabetes, pulmonary disability, and so on could be estimated. Most techniques for this purpose were now sufficiently far advanced to enable medical officers of health to make a start in measuring the prevalence of some of these diseases in their own area.

Dr. J. H. F. BROTHERTON (London School of Hygiene and Tropical Medicine) said that the care of the elderly sick was in many ways the most challenging problem facing the health service to-day. The question must be considered in triple terms: (1) in clinical terms, because efficient diagnosis and treatment shortened the problem of care, reduced disability, and lessened the strain imposed on the social situation; (2) in terms of prevention, for every success in this direction prolonged the period of the old person's independence; and (3) in terms of the social background. In any foreseeable future there must remain limitations on the availability of hospital beds for old people, and methods must be found of increasing the contribution of the out-patient department by making it an institution which old people could use in comfort. But the general practitioner must always bear the main burden of looking after old people in their homes, and the elderly were becoming an increasing proportion of the responsibility. There was every reason why supporting services should be brought to his aid in the patient's home. Why should the services of physiotherapy, dietetics, social work, and the like be available only if the patient happened to go to hospital? "It is the extent to which the public health services are able to underpin the home situation which will determine the strength of that situation as a place where more extensive clinical care of old people can be carried out."

Noise at Work

One symposium at the Congress was devoted to the subject of noise at work, its effect on auditory acuity and on behaviour. Air Vice-Marshal E. D. D. DICKSON, consultant in otorhinolaryngology to the R.A.F., said that there was no doubt that, in occupations associated with continual exposure to loud noise, hearing impairment would result. In its early stages this impairment was in the little-used higher-pitch range and did not obviously manifest itself as a disability. An ear which had been exposed to intense noise was seriously injured in the organ of Corti. The

primary lesion was in the destruction of the outer hair cells of that organ. The organ might be ruptured and released from the basilar membrane. A sudden loud sound might cause immediate destruction, whereas a continuance of noise might bring about the process gradually. It was generally recognized that noise which exceeded in intensity a level of 90 decibels was responsible for acoustic trauma. The earliest onset of hearing loss would be detected by audiometry and appear as a dip or notch in the hearing range in the region of 4,000 cycles per second.

Air Vice-Marshal Dickson stressed the need for pre-employment evaluation of auditory function. In claims for compensation in respect of hearing impairment the difficulty was to eliminate that portion of the worker's deafness, if any, which was not due to his occupation, so that compensation was not paid for something which the work had not caused. Specifically to identify the acquired loss without pre-employment audiometric examination and careful history was often impossible. Equally difficult was the assessment of that portion of deafness which came with advancing age and its separation from the deafness caused by occupational impairment. On the question of protection against noise he urged that the planning and lay-out of factories from this point of view should receive more attention.

Two research workers from the Medical Research Council contributed to the symposium. One of them, Mr. T. S. LITTLE, suggested various methods for reducing or suppressing noise. The only way of ensuring sound insulation from the noise of aircraft and machinery was by building screening partitions of sufficient mass. Thick and heavy walls were the only effective insulators. Concerning the protection of the ear by earplugs and earcaps, he said that when the ear meatus was fitted with an efficient earplug there was a limit to the amount of noise reduction it produced, because quite an appreciable amount of sound by-passed the plugs and got into the ear through the cartilage of the meatus and the bones of the skull. When the noise hazard was still great, even after the use of a well-fitting plug, further protection could be obtained by the additional use of a noise-excluding pad, earcap, or helmet effectively covering the auricle.

Mr. D. E. BROADBENT, of the Applied Psychology Unit, Cambridge, discussed the effect of noise on behaviour. The result of such investigations as he had undertaken was that noise did not produce dramatic permanent change in mental health or behaviour; there might conceivably be subtle changes difficult to detect, but there was no convincing evidence either way. The question most urgently requiring an answer was whether noise produced temporary effects on work which did not involve hearing. His experiments had led him to the conclusion that noises did cause brief shifts of attention from the work in hand, and that such momentary shifts became more frequent in the presence of a high intensity noise.

Child Psychiatry

Several meetings during the Congress were devoted to maternal and child health, and the section on mental health was concerned with the child. Dr. KENNETH SODDY (Child Guidance Training Centre, London) discussed the promotion of mental health in the very early years, the first steps of the infant in adaptation to environment, the first relationship formations, the first steps in instinct modification. An important thing in the child's development was the formation of substitute relationships, for which home gave him the opportunity, the father to some extent replacing the mother, so that the child no longer entirely depended upon her, and grandparents and others coming into the picture and preparing the child for relationships with teachers and other adults who would figure in his later life. He spoke also of the influence of the nursery school in making the child a sociable being.

The child guidance clinics, when they came into being a quarter of a century ago, were looked upon as denoting a real advance in preventive psychiatry, but, said Dr. F. H. STONE, consultant in child psychiatry to the Royal Hospital

for Sick Children, Glasgow, subsequent events had been rather disappointing. It was true that a traditional team of psychiatrist, psychologist, and psychiatric social worker had elucidated a great deal about the aetiology of childhood emotional disorders. But the children who were referred to the clinics were already emotionally disturbed to such a degree that for treatment to be effective it must be intensive and prolonged. The dream of concentrating on very early and minor disorders had evaporated in the face of hard reality.

There was much still to be learned about disturbed parent-child relationships, about the influence of community stress upon inter-family relationships, about the conflict between child-rearing practice as propagated by newspaper articles or radio talks on the one hand and family tradition on the other. Surprisingly little was known about the mutual influences of physical and emotional growth. It was one thing to collect information about incomes, size of family, and so on, and quite another to investigate the personal and intimate feelings and attitudes which were the only available guides to the emotional lives of human beings. Dr. Stone suggested certain ways in which such research might proceed. The psychiatrist and psychiatric social worker should collaborate with the family doctor and health visitor, who were in a strong strategic position for reaching the parents or the parent-substitutes. They were the first-line forces. He also pointed out the need for maturity and sensitivity on the part of those engaging in this work.

Miss ELIZABETH IRVINE (Tavistock Clinic) spoke of the value of staff consultations, not so much because of what was said or done at them, but because of their effect in relieving the anxiety which any professional group was likely to feel in view of the vital responsibilities it carried in the mental health field.

The Health Visitor

Other discussions at the Congress concerned the contribution of processing techniques to the nutritional value of food, child health in the Tropics, and the health and welfare of the office worker. At a conference of health visitors Dr. H. D. CHALKE declared that health visiting was passing through the most important phase in its history. Already there was a noticeable change of attitude in the hospital service, which was using health visitors to an increasing extent. The position, he said, was not so good in the general-practitioner field, where fusion of interests seemed some way off yet and the old vendetta lingered in many places. It was the health visitor herself who could do most to break down old prejudices. A new generation of doctors and health visitors might achieve greater success than the present, and the coming of group practice might alter the picture.

EMPIRE RHEUMATISM COUNCIL

PLANS FOR A MOBILE RESEARCH UNIT

At the annual meeting of the Empire Rheumatism Council at the Royal College of Surgeons on April 27, Dr. W. S. C. COPEMAN, who was re-elected chairman of the Council, announced that it was proposed to establish a mobile field unit for research into aetiological and environmental factors in rheumatic disease. It would probably follow the pattern of the mobile unit being used to study pneumoconiosis among miners. Enlarging on the unit at a subsequent press conference, Dr. Copeman said it would be available for work in any part of the country and in any industrial setting, and possibly later in any part of the Commonwealth. The Council was prepared to put down £30,000 to complete the project, but support would also be needed from industry, which stood directly to benefit from the research. The running cost would be about £7,000 a year. The team would consist of a medical director, a radiographer, and a social worker, and the backing of a university department would be needed; probably Manchester would be asked to provide this. A medical director for the unit was now being sought. The unit would investigate any

kind of rheumatism, but it was thought that a start should be made with osteoarthritis, which was so widespread in industry.

Other Activities

Referring to the Chair of Rheumatology at Manchester University, which the Council had largely financed, Dr. Copeman said that the Nuffield Foundation had offered the University a further grant of £70,000 to develop research in rheumatism, thus providing the professor with the assurance of a well-endowed department. Two E.R.C. Fellows were at work—Dr. Norymberski at Sheffield, who was engaged in research on steroid chemistry, and Miss Muir at St. Mary's Hospital, Paddington, who was studying connective tissue polysaccharides. The Council had also decided to continue to support Dr. E. Wittkower's study at McGill University of rheumatoid arthritis in two contrasting communities. Dr. Copeman added that he himself had been invited to visit Australia in the autumn to help reorganize the Australian Rheumatism Council, and he had also been invited by the Minister of Health of the Dominion to visit New Zealand.

Mr. W. R. C. HALPIN, chairman of the Finance Committee of the Council, said that the total income for the year, exclusive of legacies, amounted to £19,091, compared with £13,775 in the previous year, and legacies had increased by over £3,000.

GENERAL ELECTION

MEDICAL CANDIDATES

On April 15 it was announced that a General Election would be held on May 26. At the last General Election, in 1951, 14 medical men and women stood as candidates and 10 were elected, the same number as in 1950. According to the information at present obtainable the following 14 members of the medical profession will be standing for Parliament at the forthcoming General Election.

The names of those who were Members of the last Parliament are indicated by an asterisk. It is not possible in all cases to give the age of the candidate, but the year of their qualification affords some guidance, and this has been given in parentheses.

*REGINALD FREDERICK BRITAIN BENNETT, V.R.D., Gosport and Fareham, Conservative. (1937.)

M.P. for Gosport and Fareham since February, 1950; Parliamentary Private Secretary to the Home Secretary, 1951-4, and to the Minister of Fuel and Power since November, 1954; secretary of the Conservative Parliamentary Committees on Air and Civil Aviation since 1951; psychiatrist to the Institute for the Study and Treatment of Delinquency since 1950; member of the South-west Metropolitan Regional Hospital Board since 1953; member of Steering Committee of Parliamentary and Scientific Committee, 1952-4; member, Inner Temple; surgeon lieutenant-commander, R.N.V.R.

*ALFRED DAVIES DEVONSHIRE BROUGHTON, Batley and Morley, Labour. (1929.)

M.P. for Batley and Morley since February, 1949; medical practitioner at Batley, 1932-40 and 1945-50; member of Batley Borough Council, 1946-9; former chairman of Dewsbury Division of B.M.A.; squadron leader, R.A.F.V.R.

*Rt. Hon. WALTER ELLIOT ELLIOT, P.C., M.C., Kelvingrove, Glasgow, Conservative. (1913.)

M.P. for Lanark, 1918-23; Kelvingrove, 1924-5; Scottish Universities, 1946-50; and Kelvingrove since 1950; Minister of Health, 1938-40; previously Secretary of State for Scotland and Minister of Agriculture; rector of Aberdeen University, 1933-6, and of Glasgow University, 1946-50.

*SOMERVILLE HASTINGS, Barking, Labour. (1902.)

M.P. for Reading, 1923-4 and 1929-31, and for Barking since 1945. Consulting surgeon and lecturer to ear and throat department, Middlesex Hospital; member of the North-east Metropolitan Regional Hospital Board; Past President, Socialist Medical Association; member of

London County Council for Mile End, 1932-46; chairman of Hospitals and Medical Services Committee of L.C.C., 1934-44; Chairman of London County Council, 1944-5.

*Rt. Hon. CHARLES HILL, P.C., Luton, Liberal and Conservative. (1927.)

M.P. for Luton since February, 1950; Parliamentary Secretary to the Ministry of Food, 1951-5; Postmaster-General since April 7 this year; Secretary, British Medical Association, 1944-50; President, World Medical Association, 1949-50; vice-president, and formerly chairman, Central Council for Health Education.

BERNARD HOMA, Hendon South, Labour. (1922.)

In general practice. Member of London County Council for over 20 years; member of board of governors of Charing Cross Hospital.

DONALD MCINTOSH JOHNSON, Carlisle, Conservative. (1926.)

Contested Chippenham Division of Wiltshire as a Liberal at the General Election in July, 1945; medical officer with East Greenland expedition in 1926 and, later, medical officer in Grenfell Mission to Labrador; left general practice to serve in the R.A.M.C. in the second world war; since founded publishing firm; member of Sutton and Cheam Borough Council.

ROBERT DOUGLAS MCINTYRE, Perth and East Perthshire, Perthshire and Kinross-shire, Scottish Nationalist. (1938.)

M.P. for Motherwell and Wishaw, April-July, 1945; chairman, Scottish National Party, consultant chest physician and supervising tuberculosis physician, Stirlingshire and Clackmannan since 1948.

CATHERINE EDITH ORR-EWING, Bermondsey, Conservative. (1926.)

Senior hospital medical officer, Royal Eye Hospital; school ophthalmologist, Southall, Heston, and Isleworth.

DOUGLAS RENE LOUIS MARCEL POIRIER, Louth, Lincolnshire, Labour. (1943.)

In general practice at Winterton, near Scunthorpe; appointed factory doctor; medical officer under the Ministry of Pensions and National Insurance.

FRANCIS REGINALD ROBERTS, Walsall, North, Conservative. (1928.)

In general practice; member since 1940, and chairman in 1949-50, Brownhills Urban District Council, and chairman of health committee for many years; recently elected to Staffordshire County Council.

*MALCOLM STODDART-SCOTT, O.B.E., T.D., Ripon, West Riding, Conservative. (1926.)

M.P. for Pudsey and Otley, 1945-50, and for Ripon since February, 1950; chairman of British Group of the Inter-Parliamentary Union since 1951; on medical staff of General Infirmary at Leeds, 1929-39; A.D.M.S., 48th Division, 1943-5; chairman, British Rheumatic Association.

*BARNET STROSS, Stoke-on-Trent Central, Labour. (1925.)

M.P. for Hanley Division of Stoke-on-Trent, 1945-50, and Central Division since 1950; formerly in general practice at Stoke-on-Trent.

*Rt. Hon. EDITH CLARA SUMMERSKILL, P.C., Warrington, Labour. (1924.)

M.P. for Fulham West since 1938; Parliamentary Secretary to the Ministry of Food, 1945-50; Minister of National Insurance, 1950-1; Chairman of Labour Party since September, 1954.

The Medical Sickness, Annuity and Life Assurance Society, Ltd., celebrated its recent move into larger premises at No. 3, Cavendish Square, by holding a reception there on April 26. Mr. R. J. MCNEILL LOVE and Sir CECIL WAKELEY, the chairman and vice-chairman of the Society, received the guests. The new offices are needed to cope with the expanding business of the Society, which now has a membership of over 15,000 doctors and dentists.

HEALTH AND POLITICS

The Conservative Party's general election manifesto¹ contains a section entitled "Home and Family," and the following appears under the heading "Good Health":

New hospital building was completely neglected by the Socialist Government. A start is now being made. Plans have been announced and will be carried out over the next few years for the building of new hospitals, both general and mental, and for the extension and modernization of many existing hospitals. We are making special arrangements to replace worn out and obsolete hospital plant and equipment. We shall seek to open new beds where they are most needed, to recruit extra staff and to provide better facilities. We desire to see steady progress in all forms of preventive work. These are our priorities: we rank them higher than free wigs or free aspirins.

We believe that private practice and contributory schemes have a part to play with the National Health Service and we shall therefore maintain the system of hospital amenity and hospital pay beds. We have cut away restrictions on voluntary effort in the hospital service. We shall continue to give every encouragement to voluntary work.

We welcome the increase in the provision of dental treatment, especially for mothers, children and young people, and we wish in co-operation with the profession to push forward with preventive measures.

The problems of the elderly must concern us all. In particular we shall encourage local health authorities to build up their home help services and to provide "half-way houses" for the old.

We shall introduce legislation to give effective status to those, known as medical auxiliaries, who assist doctors in investigation and treatment.

We are anxious to provide the best National Health Service the country can afford. We set up the Guillebaud Committee to study the problems involved and await its recommendations.

The steady fall in infant and maternal mortality rates is a wonderful measure of the nation's better health. Quarter by quarter the records are being broken. We are winning the fight against tuberculosis. Still a great challenge remains for all concerned with the prevention and cure of disease. We shall make sure that adequate funds are available for medical research, and in particular that hopeful lines of inquiry into cancer and polio are urgently pursued.

Air pollution is an enemy to good health, and can cause death. We wholeheartedly accept the need for a national "clean air" policy. The use of smokeless fuels must be encouraged wherever they can readily be made available, and comprehensive legislation on smoke abatement will be introduced.

The section in the Labour Party's manifesto² about "Helping the Family" include the following paragraphs under the heading "Health and Old Age."

Through the National Health Service and National Insurance, the Labour Government began to abolish the fear of old age, sickness and disablement which haunted working-class life before the war. We shall go forward with the job.

In order to restore a free Health Service, we shall abolish all charges, including those on teeth, spectacles and prescriptions. We shall stop queue-jumping by ensuring that the need for treatment and not ability to pay shall be the test for obtaining a bed in National Health Service hospitals.

Now social security must be carried one stage further. In order to remove the last taint of "public assistance," a Ministry of Social Welfare will be established to take over the work not only of the Ministry of Pensions and National Insurance, but also of the National Assistance Board.

To maintain the real purchasing power of these benefits, pensions and allowances, we shall institute an annual review, and in any year in which there has been an increase in the cost of living, the scale of payments will be increased accordingly.

One of the first acts of the next Labour Government will be to improve the rates of National Assistance fixed last February by the Tory Government, an increase which we regard as quite inadequate. We shall also deal with the anomalies of the National Insurance and Industrial Injuries schemes.

Also in the Labour Party's manifesto are promises to enforce clean food standards in shops and restaurants, and greatly to extend water supplies and bring them under public ownership.

¹ "United for Peace and Progress": The Conservative and Unionist Party's Policy, General Election, 1955.

² "Forward with Labour": Labour's Policy for the Consideration of the Nation, 1955.

IMPERIAL CANCER RESEARCH FUND

The 16th annual general meeting of the governors of the Imperial Cancer Research Fund was held at the Royal College of Surgeons on April 28, with Professor H. R. DEAN, chairman of the Council, in the chair. In presenting the annual report, which chiefly summarized the work of the central (Mill Hill) laboratory and the clinico-pathological laboratories at Lincoln's Inn Fields, Professor Dean said that the histo-pathological resources had been considerably augmented during the past year, and numerous minor alterations had been carried out and equipment added to facilitate the scientific work. Cancer research had grown to include every branch of chemistry and biology. As the report stated, a few years ago the Fund decided to open another laboratory for clinico-pathological studies, and for this the Royal College of Surgeons offered facilities and members of the staffs of London hospitals gave their assistance. An offer from the Royal College for the use of two adjacent sites in Lincoln's Inn Fields had been accepted, and as soon as the College was able to vacate these buildings—probably in the latter half of next year—the sites would be let to the Fund on a 99 years' lease, with the right to demolish the existing houses and rebuild in such a way as would give the clinico-pathological unit greatly increased space.

Latent Cancer

Professor Dean went on to say that it had long been known that the growth of cancer was not continuous, but that intervals might occur during which the tumour remained dormant, sometimes for many years, after which it resumed an active progress often terminating fatally. Recent research had shown that cancers might arise within the human body so small as to cause no symptoms or inconvenience, remaining dormant throughout the life of the individual. Of 220 men who had died from various causes, and whose organs were examined after death by Dr. L. M. Franks, a member of the scientific staff of the Fund, microscopic evidence of cancer of the prostate was found in 36%, and yet in all these cases the local and general effects associated with the presence of cancer were absent. Few were found in men under 50 years of age; with men in the sixties and seventies the tumours were found in about one-third of all cases; in men over 70 in nearly half; in men over 80 in three-quarters; and in nonagenarians in practically all cases. An investigation of latent cancer in other organs was being carried out by Dr. Franks and Dr. F. C. Chesterman in the thyroid, and by Dr. J. Stretton Young in the breast. The work involved a thorough survey of these organs and the use of large sections. A similar problem, investigated by Dr. J. Bamforth, concerned the relationship between hyperplasia of the endometrium and the occurrence of cancer in the uterine body. Dr. E. F. Scowen and his surgical colleagues at St. Bartholomew's Hospital, with the help of the Fund's laboratories, were making a combined clinico-pathological investigation into the human "soil" in which breast cancer flourishes.

Speaking of the work of Dr. James Craigie, director of the central laboratories, on the preservation of tumours by freezing, Professor Dean said that this allowed further study to be made of these tumours after months or years, and their comparison with other tumours. This work had shown that there were two distinct types of cells concerned in carcinoma. The investigations now in progress in the laboratories, varied as their objectives might appear, and varied as were the methods employed, were all in fact closely related to the advancement of knowledge of the cause, progress, and consequence of cancer.

Financial Position

The accounts of the Fund, presented by Mr. DICKSON WRIGHT, the honorary treasurer, showed an improvement in income from all sources, and the number of subscribers to

the Fund had again been much increased. The expenditure for the first time had exceeded £100,000, of which total only £6,582 had been spent on administration and £6,436 on publicity. The number of full-time people employed in the service of the Fund was eighty, and expenditure was always rising. The public had always been conscious of the claim that cancer research made upon their purses and the need for bringing nearer the day when the cause and cure of cancer were discovered.

Viscount Halifax was re-elected President of the Fund, and Mr. Dickson Wright treasurer. The two retiring governors, Lord Amulree and Sir Henry Dale, were re-elected, and the following were approved as "appointed members" of the Council representing the branch of science indicated: Professor H. R. Dean (pathology), Sir Charles Lovatt Evans (physiology), Dr. Cuthbert Dukes (pathology), and Sir Cecil Wakeley (surgery). A vote of thanks to the Chairman was moved by Sir Arthur MacNalty.

Reports of Societies

OUTLOOK FOR THE HYDROCEPHALIC INFANT

"Hydrocephalus of Infancy" was discussed at a meeting of the Paediatric Section of the Royal Society of Medicine on March 30, to which were invited members of the Section of Neurology.

Importance of Early Recognition

Dr. HUGH JOLLY (Plymouth) defined the subject of the meeting as internal hydrocephalus affecting children in the first year of life. Its incidence, he said, seemed to be about 0.2%. It was somewhat commoner among boys than girls, and increasing age of the mother made greater the risk of a child being hydrocephalic. Early diagnosis was essential. Hydrocephalus was suggested by a large globular head with relatively small features, in distinction to the flat top and relatively large features of a child with a large, but not hydrocephalic, head. The latter condition was sometimes familial. The size of the fontanelle was of little value in diagnosis, but a raised tension was of great importance. The eyes characteristically turned downwards in developing hydrocephalus, and might become central after tapping the ventricles. Irritability, spasticity, and decerebrate rigidity were terminal signs, continued Dr. Jolly, and papilloedema was not a feature, except in those cases where the hydrocephalus had been caused by a tumour. Loss of intelligence varied with loss of brain substance.

Investigations should include a radiograph of the skull to rule out intracranial calcification due to toxoplasmosis; routine examination of the cerebrospinal fluid, including a Wassermann reaction; and bilateral subdural taps to exclude subdural haematoma. These should be followed by a dye test, using indigo-carmin, to establish the site of obstruction, and by ventricular air studies, using not more than 50 ml. of air.

The choice of patient for treatment was determined by obvious lack of spontaneous arrest. Poor intellect was not necessarily a contraindication to operation, especially as the degree of attainable intelligence was most difficult to determine. Measurement of the thickness of the cerebral cortex provided some guide to this, and if it was less than 1 cm. mental deficiency was certain. The operation of lumbar arachnoid-peritoneostomy, as performed by Spitz, of Philadelphia, had been used successfully in Plymouth on three out of four recent cases by his surgical colleagues.

Dr. Jolly ended with a plea for more clinical research on hydrocephalus. Little was known of the natural history of the condition, and it was still impossible to forecast those cases which were likely to undergo spontaneous arrest. In view of the fact that the condition was less often fatal than

commonly believed, he felt that more cases should be offered surgery and that many of the children so treated would have an improved mentality, even if they could not become altogether normal.

Increased Formation of C.S.F. an Unlikely Cause

Professor DOROTHY RUSSELL (London) opened her communication by recapitulating the principal obstructive lesions that may be responsible for hydrocephalus in infancy. She criticized the hypothesis that increased formation of cerebrospinal fluid is a cause of this condition. In recent years it had been suggested that both vitamin-A deficiency and hypervitaminosis A produced hydrocephalus in this way. The repeated injection of trypan blue into female rats during pregnancy had a similar effect upon the offspring. The mechanism in these forms of disease had yet to be demonstrated.

The production of hydrocephalus from impaired absorption of cerebrospinal fluid remained a problem, went on Professor Russell. Sinus thrombosis might be associated with a variety of cerebral complications, and the factors responsible for these required further clinical investigation.

Results of Surgery

Mr. GEORGE MACNAB (London), the president of the Section of Paediatrics, discussed observations he had made during the study of 160 infants with hydrocephalus, of whom 105 had been submitted to operation. The first point in the distinction between an infant with a large head and one with hydrocephalus was the turning down of the eyes in progressive hydrocephalus; the eyes returned to the natural position when the hydrocephalus was arrested. The second point was that clinical estimation of tension in the anterior fontanelle as a sign of progressive hydrocephalus was unreliable. Tension was not clinically recognizable until the ventricular pressure in the horizontal position was around 250 mm., yet many cases of progressive hydrocephalus with rapid enlargement of the head had pressures of only 110 to 180 mm. The ventricular pressure ranged between 50 and 180 mm. where there was free communication between ventricular and spinal fluid, compared with pressures of 250 to 300 mm. in cases of intraventricular block.

In progressive hydrocephalus, continued Mr. Macnab, the average increase in the size of the head in the first three months of life was 3 in. (7.6 cm.); a similar increase was seen in the size of the head of a 30-week premature baby, as compared with an increase of 1.2 in. (3 cm.) in the normal full-term infant. In his series papilloedema was not seen, although excessive pallor of the disks was always present. Blindness, however, was a sudden and terminal event, and did not occur early.

A small group of cases had large, flat-topped heads and a wide anterior fontanelle. Air encephalograms showed air passing over the cortex and some dilatation of the ventricular system, with a ventricular pressure as high as 240 mm. These cases were probably due to a relative impairment of absorption, balance occurring at a higher pressure level than normal.

Out of the whole series 57 of the 160 cases became arrested. Five of these were of the type with a flat top to the head; 19 underwent natural arrest, and 33 following operative procedures.

Forty out of the 160 cases were due to the Arnold-Chiari malformation. Dr. A. H. Cameron had shown, said Mr. Macnab, that hydrocephalus at birth in association with the Arnold-Chiari malformation might be due to obstruction at the aqueduct of Sylvius or at the foramina of Magendie and Luschka, and that the cerebellum might obstruct the cerebrospinal fluid circulation by herniation through the tentorial notch. Dr. Cameron had also shown that venous congestion over the malformation might be followed by arachnoiditis leading to the late development of hydrocephalus.

Operative Procedures

Various operative procedures had been used in the 105 cases, went on Mr. Macnab, beginning in 1929 with bilateral ligation of the common carotid arteries with the object of reducing the rate of C.S.F. secretion. Neither this nor diathermy of the choroid plexuses caused any improvement. McNickle's blind third ventriculostomy for aqueduct stenosis had proved unsatisfactory, as had also a similar open operation. Ventriculo-pharyngostomy, by the insertion of a polythene tube into the temporal horn of the lateral ventricle and drainage into the aditus of the mastoid antrum, produced arrest in six out of fifteen cases, but eight cases had died some months after operation.

In lumbar myelomeningocele, drainage of the sac into the peritoneal cavity through a polythene tube was unsuccessful because of loculation inside the sac. A polythene tube passed into the spinal canal above the sac and threaded into the ureter produced some variation in tension in the sac, but two cases had died in uraemia some months after operation. A modification in which the kidney was removed and the polythene tube passed direct into the ureter allowed drainage to take place when the cerebrospinal pressure was high, but eventually blockage or reflux infection occurred.

Drainage by polythene tube from the temporal horn of the lateral ventricle into the transverse sinus had proved unsuccessful in most of the cases so treated, as had also drainage of the ventricle into the peritoneal cavity or the ureter.

New Drainage Device

The current method of treatment, said Mr. Macnab, was drainage of the lateral ventricle directly into the subarachnoid space by the use of a double nylon disk lying in the subarachnoid space. From the disk led a tube which coiled into a spiral after its introduction into the ventricle. This apparatus had been devised by Mr. D. M. Forrest, registrar at the Westminster Children's Hospital. Sixteen cases had been operated on, and at the end of three months they showed a big drop in ventricular pressure, but two post-meningitic cases were not arrested.

In the discussion which followed, Dr. J. E. SCARFF (New York) said that he thought that tension of the anterior fontanelle was the most useful sign of developing hydrocephalus. If there was no obstruction the level of the fontanelle should slowly fall if the child were held up by supporting it under the armpits. In respect to surgical measures, he was using the operation of opening the floor of the third ventricle, as described by Dandy; out of 34 cases 15% had died at operation, in 30% the operative results were unsatisfactory, and 54% had returned to normal.

Mr. A. N. GUTHKELCH (Manchester) said that he had seen 160 cases in seven years. He had operated upon 90. Twenty were too severe, 20 too mild, and 30 (all associated with myelomeningocele) were complicated by complete paraplegia. In cases of internal obstruction, especially anomalies of the iter of Sylvius, he had used Torkildsen's operation for draining the ventricle into the cisterna magna with good results. In communicating hydrocephalus he had had 12 successes for periods of up to 18 months with spino-peritoneal drainage. Spino-ureteric drainage had been as successful in relieving pressure, but there was a morbidity from chloride loss and urinary infection.

Mr. DENIS BROWNE (London) discussed his theory of the production of the Arnold-Chiari malformation by intra-uterine compression.

Mr. D. M. FORREST (London) then demonstrated the disk he had devised and which was being used by Mr. Macnab for draining the ventricle.

Necropsy Evidence

Dr. A. H. CAMERON (Sheffield) described his necropsy findings on 42 cases of hydrocephalus, of which 23 had been investigated at the Hospital for Sick Children, Great Ormond Street, whilst he was Hydrocephalus Research Fellow there. Post-inflammatory stenosis of the aqueduct

was present in seven cases with spina bifida, four cases of post-haemorrhagic hydrocephalus, and two cases of meningo-encephalitis. Congenital stenosis was present in one case with spina bifida and one case with encephalocele. Forking was present in five cases, all with spina bifida; in two of these there was superadded inflammatory stenosis, and in one of the other three the aqueduct, though forked, was not abnormally narrow. Congenital stenosis or forking was not found in any of the cases without spina bifida or encephalocele.

There was conclusive evidence that the spina bifida lesion was in each case a myelocoele. In the six neonatal cases dying within two weeks of birth the cord tissue presented on the surface of the sac as an unclosed neural groove; this was covered over by fibrogranulation tissue in the four cases dying within the first two months of life; and in the remainder it was in much the same superficial position but covered over by fibrous scar-tissue and squamous epithelium. In the cases of spina bifida there was a high incidence of diastematomyelia, rib deformities, deformities of the vertebral column underlying the sac and at higher levels, and of congenital abnormalities of the urogenital tract. This was considered to be the result of inhibition of Hensen's node during early embryonic life. Attention was drawn to the similarities between spina bifida in the human and experimentally induced spina bifida in amphibia.

Three cases of duodenal ulceration, all with gross internal haemorrhage, were encountered. In each case there was a suppurative inflammation of the meninges and ventricular lining involving the attenuated floor of the third ventricle. This was considered to support the neurogenic hypothesis developed by Harvey Cushing.

LOCAL MEDICAL SOCIETIES**Devon and Exeter Medico-Chirurgical Society**

It was salutary to remember that doctors were unnecessary, said Dr. FRANGCON ROBERTS when addressing the Devon and Exeter Medico-Chirurgical Society on April 14. He was speaking on the historical relation between preventive and curative medicine. Many civilizations had flourished without doctors, he said. What had influenced population growth was not medical progress but food and epidemics. Since 1801 the population of Britain had increased fivefold, and thirty-fold since Domesday. From the dim past to the nineteenth century the birth rate had been high, about 35-40 per thousand, but the death rate was only slightly lower, so that only two children per family could be expected to survive. In the fifteenth century the towns became graveyards, and the country areas only a little less so. The Great Plague was not much greater than some previous epidemics; for some obscure reason it was the last. London's population was constantly recruited from the country, but had the plague victims remained in the country they would have died, just as inevitably, of starvation. Eighteenth-century enterprise caused the growth of towns, more food production, and increased population. But sanitation was still bad. Civil engineering was not understood and Roman teaching had been forgotten. The fall in the death rate from 35 per thousand in 1750 to 20.5 in 1815 was not due to medical progress. Vaccination and improved midwifery—due to the decline in rickets owing to better feeding as much as to Smellie's work—were the only purely medical factors contributing to this improvement. Much more was it due to increased cleanliness and sobriety. The industrial revolution was accompanied by an agricultural revolution as a result of which beasts could be fattened and kept throughout the year and winter milk became available. Only recently had curative medicine begun to reinforce preventive medicine, thus creating an entirely new kind of civilization in which, medically speaking, the individual had come into his own. Living longer, he experienced more diseases, many of which required expensive investigation and treatment; hence the great and increasing cost of the Health Service, which must be paid for by the labours of the community, not assumed as a right or a gift from heaven.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Youth Looks at General Practice

SIR,—The article "Youth Looks at General Practice," by Dr. C. P. D. Grant (*Journal*, April 30, p. 1049), should be read by every medical practitioner and senior medical student, for it expresses the views of the majority of young general practitioners. In a short space Dr. Grant reviews comprehensively the fears, problems, hopes, and subsequent thrill of success that result from the efforts of the general practitioner. I should like to stress several of his points and elaborate them.

It is true that many of us on qualifying set as our ideal a specialty and rather unwillingly later turn to general practice as the permanent sphere of our work. Having arrived in general practice it is found that we are lacking in many of the essentials which are necessary to make a success of the job. We do not know what measles is like, and have never seen a patient suffering from diphtheria. In fact, many of us have never even seen a sore throat; and we certainly have never tried to treat one before. Neither do we appreciate the differences in approach which are necessary in the surgery and home, as compared to the hospital. We have not access to white cell counts and endless x-rays to aid our diagnosis. We have to diagnose perforated ulcers immediately after perforation and not six hours later, as the hospital staff can do.

These defects show a grave lack of foresight in our medical education which is partly administrative and partly due to the teaching clinician. Those who arrange our curriculum and timetables have not yet fully appreciated the ever-widening gulf between hospital practice and general practice, which has become so pronounced since the end of the war. Our teaching clinicians are composed more and more of younger men who, though brilliant in their own sphere, have little, if any, personal experience of general practice. As a result, they do not know what the medical student needs to be taught. The uses of cortisone and intravenous terramycin are of no great importance to the general practitioner; but which student has been taught how to treat influenza?

Learning the job takes time, but if we are willing and humble a great deal can be learnt quickly. Like Dr. Grant, I have had to learn to try to control a temper which I had not realized existed. But we must learn to endure fools; and also eccentric hospital consultants. There are consultants who will only do domiciliary visits on a Sunday afternoon, and those who will not do them outside a town except under pressure. These are a minority, granted, but one cannot always do without their services. The majority fortunately are on extremely good terms with the general practitioner and are only too willing to help at any time.

The greatest satisfaction comes from being accepted as a family doctor, and as such I consider it is my duty to provide full maternity services to all my patients who request such services; and the majority prefer their own doctor to the clinics. I am glad we have no regulation in force in this part of the world like there is in Glasgow controlling admission to maternity beds. Here the general practitioner has equal access to beds as do the local authority clinics and those who attend the hospital clinics entirely. It seems to me that the local authority clinics for maternity care have largely outworn their usefulness in many areas, and could be dispensed with or curtailed. As Dr. Grant says, it is the general practitioner who has to deal with the antenatal emergencies, and not the clinic.

Finally, let us realize that the patients themselves are mostly considerate and appreciative, often out of all pro-

portion to the services rendered to them. But a word of advice to those who have not yet settled in practice—get out of the seaside resorts and wealthy residential areas, and practise in an honest-to-goodness working-class area, where there is more work, more appreciation, and more satisfaction to be gained.—I am, etc.,

Rossington, Doncaster.

G. F. G. MARSHALL.

Clinical Staging of Cancer of the Breast

SIR,—Mr. Michael Harmer's letter (*Journal*, March 26, p. 790) is timely in calling attention to the need for a method of staging breast cancer which is recognized internationally. Many methods of treatment are now being practised, and it is therefore important to be able to compare the results from different centres. At present, there are at least ten different methods of staging the disease, which makes a comparison between results difficult and often impossible, and has prevented a proper evaluation of some of the results published in the past. The need for an international method of staging breast cancer such as exists for cancer of the cervix is well recognized, and the problem of finding a method acceptable to the majority of workers has already been discussed at several cancer congresses. If a simple method of staging cannot be agreed upon, it would still be possible to present the results in such a way as to enable the work of different centres to be compared.

The features which influence the prognosis and on which most methods of staging are based are the fixation of the primary tumour to skin, pectoralis major, and chest wall; the presence of enlarged axillary nodes and their fixation; the presence of supraclavicular nodes and distant metastases. Cases would be placed into various groups according to which of these structures was involved at the first clinical examination. If distant metastases were present, however, further subgrouping according to the local condition of the primary tumour would seem unnecessary. In the same way, one group would suffice for cases having supraclavicular node involvement and one group for cases with fixed axillary nodes. For the less advanced disease, a number of groups would be required, depending on the state of the primary tumour and the axillary nodes. For example, a suggested arrangement of groups might be:

- Visceral Metastases Present:
Group A.
No Visceral Metastases, Supraclavicular Nodes Present:
Group B.
No Visceral Metastases, no Supraclavicular Nodes:
Group C. Fixed axillary nodes.
Group D. Mobile axillary nodes—primary fixed to chest wall.
Group E. " " " —primary fixed to pectoralis major.
Group F. " " " —primary fixed to skin.
Group G. " " " —primary mobile.
Group H. No axillary nodes—primary fixed to chest wall.
Group I. " " " —primary fixed to pectoralis major.
Group J. " " " —primary fixed to skin.
Group K. " " " —primary mobile.

Other groups might have to be added to include certain clinical features considered to be of importance in prognosis such as overlying skin nodules, *peau d'orange*, etc. Of necessity, the number of groups would be rather large and this would mean that only a few cases would be included in some groups. When results were being compared, however, it is likely that several groups would be considered together, and the small numbers in some groups would therefore not be a disadvantage. Individual groups could be rearranged according to any method of staging, and it would thus be possible not only to compare the results published by different workers but also to make a comparison with previously published figures where the method of staging was known.—I am, etc.,

London, W. 12.

ROBERT MORRISON.

Carcinoma of Bronchus and Pulmonary Tuberculosis

SIR,—I was very interested to read Dr. A. Sakula's article (*Journal*, March 26, p. 759) on this subject. He is quite right in stating that this combined condition is not uncommon. During the years 1951–4 I have seen nine cases, all male, occurring in Birkenhead and Wallasey—a total population of 244,000—in which the adult male pulmonary cases on the tuberculosis register at the end of the four years in question were: 1951, 985; 1952, 937; 1953, 1,027; 1954, 1,115; and the cases of carcinoma occurring in the lung in men were: 1951, 43; 1952, 50; 1953, 49; 1954, 54. I realize that the total number of cases involved cannot possibly be statistically significant, but I feel that these background figures are worth recording.

In addition to these cases, I have seen two other cases during this period in which it was quite likely that the same two conditions coexisted, but the proof is not sufficient to record them as definite. All but one of the cases have been proved histologically or by post-mortem examination, and in the other the x-ray and clinical evidence was such as to make the diagnosis certain. Two cases did not show any tubercle bacilli in the sputum, but the laryngeal biopsy in one and the tuberculous epididymo-orchitis in the other indicated that the infiltration in the lungs was definitely tuberculous. I have not the exact details of the smoking habits of all the patients, but they all certainly smoked, and at least four of them were heavy smokers. The site of the carcinoma did not appear to be related in any way to the site of the tuberculosis. In six cases the carcinoma appeared to supervene on established pulmonary tuberculosis, while in three others the two conditions appeared to occur more or less simultaneously.

As we go on keeping our patients with active pulmonary tuberculosis alive, so, I think, we must be on the constant look out for a carcinoma supervening on the pulmonary tuberculosis, though many cases seem to be the sort in which it is unlikely there will be much in the way of successful treatment, partly because of their age and partly because of the rather extensive nature of the tuberculosis. If one of my cases had been diagnosed earlier, he might possibly have been treatable by pneumonectomy, and so I think it is important that we should bear the combined diagnosis in mind should a case of pulmonary tuberculosis fail to respond to treatment within the first three months. The other important point is that any small rounded nodule appearing in routine serial x-ray follow-up of patients with pulmonary tuberculosis should be regarded as a potential carcinoma, and, should the local chest condition permit it, early resection should be seriously considered.

I should like to acknowledge the help of the pathologists who carried out the post-mortem and histological examinations; of Mr. Ronald Edwards, who carried out the bronchoscopies; and of Dr. Fulton, medical director of the Liverpool Radium Institute, who supplied the figures for the incidence of carcinoma of the lung in the area.—I am, etc.,

Liverpool, 1.

DAVID L. CALDWELL.

Natural Childbirth

SIR,—Although at one time I was an ardent follower of Dr. Dick Read I came to feel that for a function that was meant to be "natural" elaborate instruction and exercises in class twice a week and alone twice a day seemed unnecessary. I developed a routine in practice that seemed satisfactory. At the first visit I gave a little explanatory talk on pregnancy and labour accompanied by diagrams on the blotter, and explained a simple exercise for the abdominal muscles (this is more diligently practised if it is explained that it will help the figure return to normal after the baby arrives). At about 36 weeks I gave a slightly more detailed description of labour and the gas and air machine. I tried to be present very early in labour to show the woman how to put into practice what I had told her about relaxing. I then visited her frequently to keep up

her morale, and towards the end of the first stage stayed. Relaxation achieved in this way is just as good as that much practised beforehand, and apprehension is less. After labour I gave further exercises for the abdominal muscles and for the perineum. I have never used exercises designed to increase pelvic capacity during pregnancy. They may add to the prevalent low backache due to sacro-iliac strain.

It is a mistake to tell a primipara that labour should be painless. In animals, where it is all perfectly natural, first labours appear to be accompanied by considerable pain (cats and cows). With complete relaxation I fail to see why the end of the first stage should be painful, as your correspondents seem to think. I personally have never found it so, but I think the final stretching of the perineum as the head crowns with a first baby is nearly always painful. It is for this that the gas and air is invaluable. It need not cause lack of co-ordination with subsequent loss of control as stated by Mrs. Alison Duddington (*Journal*, April 16, p. 971). It will do this if it is not started till the woman is distressed and not in a mood to use it calmly. She should be taught to use it in the painless contractions at the beginning of the second stage; it will then prove invaluable both to the woman in relief from pain and to the attendant in increased co-operation from a calm patient at the end. When properly used it causes no clouding of consciousness.

One thing that is not fully realized is that this type of instruction can only be given to patients willing to receive it. The majority of women are much too shy of these matters to attend classes or even tolerate private instruction. They prefer to keep it all wrapped up in mystery and old wives' tales. The beginning of a first pregnancy is the wrong time to radically alter an outlook, and most women will not take kindly to a doctor who tramples on her prejudices at this time. Much might be done by health education to change the attitude of young people before they start on their families.—I am, etc.,

Wednesbury.

HAZEL B. BAKER.

SIR,—As another doctor's wife whose 3-weeks-old daughter was born in hospital, I should like to comment upon Mrs. Constance Lynn's letter (*Journal*, April 2, p. 851). While in the maternity ward I was struck by the great difference in behaviour and attitude of mind between the mothers who had attended classes and those who hadn't, and which affected at least the first part of their labour. I remember in particular one woman who confided in me her absolute dread of being wheeled to the labour ward—she lay in bed tense with fear and not through the pain of contractions. I thought then that if only she had attended the voluntary lectures and classes and visited the labour ward she would have realized there was nothing to be afraid of. Was it only coincidence, I wonder, that eventually she had a caesarean section, as labour was not progressing satisfactorily?

I am sure, however, that understanding the natural process of labour is as beneficial as exercises and relaxation. A woman is much more likely to remain co-operative—particularly towards the end of the first stage when relaxation is very hard—if she understands what is happening. As to my own application of exercises and relaxation, I did find the latter helpful, although I found it impossible to maintain complete relaxation towards the end of the first stage.—I am, etc.,

London, S.W.11.

RACHEL LITTLEWOOD.

Salk Vaccine

SIR,—The Salk anti-poliomyelitis vaccine is prepared from monkey tissue cultures. Is it certain that injection of this preparation will not produce rhesus antibodies when injected into susceptible human subjects, most especially those already sensitized?—I am, etc.,

London, S.W.1.

J. G. HUMBLE.*

The Aftermath of Hysterectomy

SIR,—The letter of Dr. Winifred Coppard (*Journal*, April 2, p. 852) raises two separate issues. She suggests that gynaecologists may advise the performance of hysterectomy without ascertaining that their patients appreciate what that operation involves. This failure to inform the patient is always reprehensible, although it may sometimes be difficult to give an elementary lecture in the anatomy of the genital tract to a patient whose mind is hopelessly disoriented by hearing the word "operation."

The second implication is that patients may not be warned in advance of the changes (anatomical, hormonal, psychic, and domestic) that may follow in the wake of that operation. The reason that this warning is not given lies surely in the extreme variation of individual response and the difficulty in assessing how far that response is functional or organic. It is common experience that symptoms of the climacteric will rapidly occur in many women from whom both ovaries have been removed, yet in some cases there will be no such symptoms and a vaginal smear will show evidence of oestrogen activity. Conversely, failure of ovarian function may be established within three years in a significant percentage of women in whom one or both ovaries have been retained. The age of the patient and the operative technique may both be important.

The follow-up of these cases is not an easy matter, for the personality of the investigator may easily cause symptoms to be suppressed or exaggerated. The attitude of the surgeon before operation and during convalescence is also of great importance, and the conservative operator who rarely removes an ovary will get wonderful results from the assurance that "the womb is of no value, but of course the ovaries which make you womanly will be saved." It must be admitted that the radiotherapist can do an equally good line with his remark, "Just a small dose of rays to damp things down, and of course nothing need be removed." It is, however, my personal opinion that, with careful pre-operative reassurance, early return to normal domestic life, including intercourse, and an operation that preserves the maximum ovarian function, any unpleasant aftermath is extremely rare; when it does occur it will usually be in a patient whose operation has been occasioned by a psychosomatic disorder.—I am, etc.,

Birmingham

W. G. MILLS.

SIR,—Although one agrees with Mr. V. B. Green-Armytage's contention (*Journal*, April 16, p. 971) that disastrous results may follow the total ablation of both ovaries when performing a hysterectomy for non-malignant disease of the uterus such as fibroids, one cannot agree with his suggestion that the same results may follow treatment by irradiation.

In reviewing my own 990 cases¹ of metropathia haemorrhagica, fibrosis uteri, and fibromyomata of the uterus, I find that I performed myomectomy or hysterectomy in 502 cases and irradiation in 488—namely, deep x-ray therapy in 314 and radium treatment in 174. I reserved irradiation for all cases of metropathia, and x-ray therapy for metropathia and fibroid uteri not larger than a four-month pregnancy where the fibroid was interstitial and not undergoing degeneration, there was no other pelvic abnormality, and malignancy was not suspected.² Owing to the war I had to treat some cases of metropathia with radium for which otherwise I should have preferred x-ray therapy. The latter can now be done in one sitting lasting 64 minutes, and is, in my opinion, an ideal treatment for patients over the age of 40–45, for one can guarantee a permanent amenorrhoea and a reduction in the size of the uterus to one-third its original size, thus eliminating pressure symptoms. According to my follow up there is no loss of libido and no psychological disturbance.³ In younger patients undergoing x-ray treatment the amenorrhoea lasts only about two years, and in two of my cases the patients later produced healthy babies.

In the case of radium treatment it is difficult to believe that the usual intrauterine dose could have any effect on the ovaries, considering their distance from the radium and the thickness of the uterine wall. I certainly have not encountered disastrous results following irradiation, such as have recently been described in your columns following the total ablation of both ovaries, and the consequent break-up of hitherto happy marriages.—I am, etc.,

London, N.W.8.

L. MARTINDALE.

REFERENCES

- ¹ Martindale, L., *Proc. roy. Soc. Med.*, 1948, 42, 319.
- ² ———, *ibid.*, 1938, 31, 1010.
- ³ *J. Obstet. Gynaec. Brit. Emp.*, 1937, 44, 109.

Chlorpromazine for Mental Hospital Patients

SIR,—It is always gratifying to hear of psychiatrists in mental hospitals taking an interest in those of their patients who have been ill for a long time. One cannot conceive any treatment, provided it does not produce irreversible structural damage, failing to be of benefit to these patients, because it would mean that during the period of treatment they will receive the observation and interest of the psychiatrist and his nurses, which they otherwise generally fail to receive. One has little doubt that chlorpromazine has indeed some effect in psychiatric illness, but one cannot believe that anyone will be favourably impressed by the accounts of it given in the *Journal* of April 9 by Dr. J. Lomas (p. 879) and Dr. C. P. Seager (p. 882). These two articles reveal what would be a quite astonishing state of affairs were it not so widespread. Those of your readers who are not psychiatrists should realize that the state of so-called improvement produced in the patients in these two hospitals which the authors allege was due to the drug was a state less good than that which can easily be produced by nothing more dramatic or expensive than a liberal regime.

One does not wish to say the drugs should not be tried out, but one cannot emphasize sufficiently that until psychiatrists are aware of the natural course of the diseases which they treat they should beware of attributing improvement to the drugs they are employing. Patients described in these articles have improved concurrently with the administration of chlorpromazine, but their final state is not as good as that found in many hospitals in this country who are without this drug.

The nursing problems which one of the authors describes are, one thinks, man-made, and if these patients were treated liberally then they would show an even greater improvement than that which he ascribes to the drug he employs.—I am, etc.,

Wallerby, E. Yorks.

J. A. R. BICKFORD.

Toxicity of Chlorpromazine

SIR,—I read with interest Dr. J. R. Tasker's paper on a case of fatal agranulocytosis (*Journal*, April 16, p. 950). Agranulocytosis is a complication of chlorpromazine that is not widely known, and, with the increasing use of this drug in general practice and other fields, it certainly must join the ranks of such drugs as thiouracil and phenylbutazone as a potential inhibitor of leucopoiesis, so that the possibility may be borne in mind (especially during the sixth week of treatment).

On referring to the manufacturer's booklet on chlorpromazine (first edition, undated like most of these booklets unfortunately are) I find that minor variations in the white cell count, either way, have been noted but "there has been no evidence of depression of leucopoiesis." The sex incidence of agranulocytosis attributable to chlorpromazine is interesting, although not altogether unexpected, as agranulocytosis from all causes is said to be two or three times more frequently encountered in females than in males.¹ Amidopyrine was at one time the outstanding toxic or sensitizing agent, and the inclusion of this drug (in the past) in pain-relieving tablets may, I suppose, partly account for the predominance of the disease in women. The mortality

rate is high, being in the region of 70% to 90%,¹ and it is therefore encouraging to know that three out of the four cases mentioned by Dr. Tasker recovered, in spite of their age (when leucopoiesis in any case is not at its best). Antibiotics were given to them all as prophylactic treatment; the three that recovered also received either cortisone, blood transfusion, or a combination of blood transfusion and folic acid (other lines of treatment suggested in the textbooks are: "pentnucleotide," leucocytic cream, and pyridoxine). As Dr. Tasker only mentions antibiotic treatment in his case, and as Dr. J. Lomas (*Journal*, August 7, 1954, p. 358) treated his patient purely on penicillin for ten days before resorting to cortisone, I wonder if there is any contra-indication to carrying out these "curative" methods, such as blood transfusion, immediately agranulocytosis is diagnosed?

It is wise to heed Dr. Tasker's warning that evidence of sensitivity to chlorpromazine, such as fever, jaundice, and skin eruptions during the early weeks of treatment, should be treated with respect, and should call for regular blood counts, especially in the light of the fatal case of jaundice reported by Dr. R. H. Boardman (*Journal*, September 4, 1954, p. 579), be this toxic or obstructive (see the letter by Drs. J. G. Macarthur and B. Isaacs, *Journal*, September 25, 1954, p. 754). In your leading article on September 4 (p. 581) you advise that if big doses are to be used a liver function test should be performed beforehand and the urine tested for bile while treatment goes on. Pallor of faeces must also be a warning sign. In a further leading article on chlorpromazine (*Journal*, February 5, p. 338) you conclude that as the effects of this drug are prolonged and for the most part irreversible, together with evidence of toxic action on the liver, great caution must be exercised in its use. In Dr. Tasker's article we have yet another reason for caution.

I doubt the advisability of using it for treating children suffering from intractable vomiting following whooping-cough (Dr. Howard Reeve, *Journal*, April 23, p. 1034), especially when ketosis and dehydration were probably accompanied by some impairment of liver function. With so many new drugs of considerable potency and toxicity available, it will be wise, especially for the general practitioner, to exercise great care and discrimination in using them, and, until we have better knowledge of their more remote effects, to confine their use to a carefully selected series in which constant supervision is possible.—I am, etc.,

Penygroes, N. Wales.

REFERENCE

¹ Wilkinson, J., in *British Encyclopaedia of Medical Practice*, vol. 1, p. 261. London.

SIR,—I was interested to read the account of chlorpromazine jaundice by Dr. A. G. W. Whitfield (*Journal*, March 26, p. 784). I have recently had a similar case.

A housewife aged 74 was admitted to hospital on February 16, 1954, with mental confusion and loss of memory. In October, 1954, she became restless and agitated. Chlorpromazine (200 mg. daily) was started on November 25, the dosage being increased to 300 mg. daily on December 2. Since admission she had vomited small quantities of food from time to time, but on December 6 copious vomiting began and the chlorpromazine was discontinued. On December 9 jaundice was first noticed. The jaundice steadily increased. It was accompanied by pale stools and bile in the urine. Her general condition deteriorated progressively and she died on January 25, 1955.

In brief, the post-mortem findings were as follows: external examination: thin, deeply jaundiced, with slight oedema of the ankles; respiratory system: lungs congested with oedematous lower lobes; cardiovascular system: normal, apart from a flabby myocardium and some old thickening of the mitral valve; abdomen: liver atrophic (880 g.) and firm, surface bile-stained with a fine nutmeg surface; gall-bladder shrunken; biliary tracts all free of obstruction; other viscera not significantly abnormal; central nervous system: C.S.F. jaundiced, brain rather atrophic with area of softening 2 cm. in diameter in the right temporal lobe.

Histologically, the liver showed severe centrilobular degeneration of the parenchymal cells with well-marked fatty change and deposition of bile. The appearance suggested a toxic change superimposed on mild chronic congestion. In sections of the myocardium there was some hypertrophy of the muscle fibres and a little interstitial fibrosis.

In common with other cases reported the clinical picture was one of obstructive jaundice, and the pattern of the liver function tests carried out supported this conclusion. The post-mortem findings suggested that the liver had already suffered mild damage as a result of anoxaemia due to heart failure. In life heart failure had not been apparent clinically, but her extremely restless condition made proper examination difficult. The total dosage of chlorpromazine (2.6 g.) was small, but the initial dosage (200 mg. daily) probably rather high. This is the first case of jaundice in over 100 cases treated with chlorpromazine by the present writer. Although a valuable drug in the treatment of certain psychiatric disorders, it should not be used unless definitely indicated and is probably dangerous in the presence of any liver damage already present.

I would like to thank Dr. J. O. P. Edgumbe for the pathological reports.—I am, etc.,

Exeter.

B. V. EARLE.

Cyst Formation Following Hernia Repair

SIR,—I was interested in the article by Mr. A. G. Rutter (*Journal*, April 16, p. 951) on the formation of a cyst following dermal implant repair of a hernia. Actually, in our experience at the Birmingham General Hospital this is more common than his article would suggest. We have now seen half a dozen of these, one of them five inches in length. Another contained large amounts of golden hair. Another complication we have observed is complete disappearance of the grafts. We have now completely abandoned the operation owing to these complications, and also to the fact that sepsis is not an infrequent occurrence. All these complications are, of course, not surprising in view of the completely unphysiological nature of the operation.—I am, etc.,

Birmingham, 4.

G. T. WATTS.

Chicken-pox Quarantine

SIR,—Dr. Neil McDougall's letter (*Journal*, April 23, p. 1030) is interesting. In 1922 a patient aged 55 paid several visits to his brother, who had herpes zoster in a severe form. My patient developed herpes. His daughter, living with her parents and near full term in her third pregnancy, developed chicken-pox. Three days after the appearance of the rash she gave birth to a healthy boy, who developed the rash of chicken-pox at the age of 14 days. Mother and son did very well.

In the case of a mother suffering from small-pox at her confinement, the infant usually has the disease at the same stage as the mother.—I am, etc.,

London, S.W.12.

S. G. ASKEY.

SIR,—I was surprised to read the suggestion in Dr. G. E. Breen's letter (*Journal*, April 23, p. 1030) that an attack of chicken-pox might be beneficial in protecting the patient from a subsequent attack of herpes ophthalmicus with concomitant iritis. Surely this view is contrary to observed fact. Thus, McNair Scott,¹ in a full discussion of the association of chicken-pox with herpes zoster, states that "it is very common for a person with herpes zoster to have a previous history of chicken-pox; about 70% of cases were found to have such a history in a recent survey of epidemic diseases in schools." In fact the author suggests the hypothesis that herpes zoster is a response of an immune person to an overwhelming dose of varicella-zoster virus. Likewise, Ker² states that "it is undoubtedly the fact that many adult patients suffering from herpes zoster are able to give a definite history of chicken-pox in childhood." It would seem more germane to the argument concerning the quarantine of chicken-pox to point out that exposure to chicken-pox can in an adult result in herpes ophthalmicus with risk of damage to the eye.

I would support Dr. Breen's statement that severe complications of chicken-pox do, exceptionally, occur. Besides

encephalitis, I have also seen as complications staphylococcal septicaemia, a gangrenous lesion of the anterior abdominal wall giving rise to peritonitis, and a few severe cases of pneumonia. I also know of a colleague who had a case in which perforation of the oesophagus occurred with fatal results. Even uncomplicated chicken-pox in the adult is generally quite an unpleasant experience, and in the female there is the risk of a residual facial scar being regarded as a disfigurement. I feel, therefore, that the doctor advocating indiscriminate and avoidable exposure to chicken-pox might ultimately find himself in difficulties.—I am, etc.,

Croydon.

J. J. LINEHAN.

REFERENCES

¹ Scott, McNair, in *Modern Practice in Infectious Fevers*, 1951, edited by H. Stanley Banks, p. 584. London.

² Ker's *Infectious Diseases*, revised by C. Rundle, 1929, p. 222. London.

Corrosive Poisoning

SIR,—The article on corrosive poisoning (*Journal*, April 16, p. 962) cannot pass without comment. Under "Chemical Burns of the Skin," it is said: "These are usually due to strong acid or alkali spilled or splashed at work. They are seldom severe, as the substance is easily washed off." My criticism is directed only to the statement so far as it relates to sodium hydrate, commonly known as caustic soda, of which I have had many years' experience, and I have to say that burns from this cause may be very severe and that the substance is not easily washed off.

In 1930 at the alkali works with which I became connected there were 26 men off work with caustic burns. The treatment in vogue was copious washing with water and then application of bicarbonate of soda. The result was a burn which looked like an inlay of black leather in the skin; this took several weeks to heal, the gangrenous skin having to separate, leaving a granulating area, slow to heal. There is a latent period of 20 to 30 seconds after the contact of the caustic with the skin. If within this time a stream of 5% solution of ammonium chloride is directed on to the affected skin, no burn will take place: so that wherever there is a caustic soda risk that solution ought to be at hand for instant use. Caustic burns of the skin are almost unknown at the present day at these works, although the exposure is greater than it was then.

In the case of splashes in the eye the results are very serious with inadequate treatment: symblepharon, ectropion, intropion, corneal ulcer, corneal opacity, even loss of vision. All these have been abolished. I dare not trespass any further on your tolerance. The way that these eye risks were abolished was described in the *Journal* of June 19, 1943.—I am, etc.,

Bunbury, Cheshire.

HERBERT TERRY.

REFERENCE

¹ Terry, H., *British Medical Journal*, 1943, 1, 756.

Agricultural Pesticides

SIR,—I was surprised to see aldrin and dieldrin in Dr. E. F. Edson's paper (*Journal*, April 2, p. 841) under the "Comparatively Safe" heading. These compounds were introduced to Britain some four or five years ago, and Messrs. Shell Chemicals Ltd. issued special instructions to insecticide manufacturers regarding the handling of aldrin and dieldrin in the production of typical insecticide mixtures—sprays, powders, and the like. The oral toxicity of dieldrin was quoted as eight times that of D.D.T. However, it appears that aldrin and dieldrin can be absorbed through the skin to a much greater extent than D.D.T., and that it is dangerous to walk across a floor carrying the dust of these chemicals, as the shoe soles would become contaminated and ultimately lead to absorption into the feet. Masks and special washable clothing—including rubber footwear—would have to be worn by workers.

While recognizing that preparations containing these compounds in dilute form may not be nearly as dangerous as the pure substances, considerable risk appears to attach to aldrin and dieldrin. The control of insects resistant to

D.D.T. has led to the introduction of chemicals more and more toxic to human beings, the deadliest being the organic phosphorus compounds. Aldrin and its companion are not comparable with the latter, but are nerve poisons and could probably lead to chronic poisoning from contaminated clothing unless the worker at least uses rubber gloves, apron, and boots, and washes these thoroughly after use.—I am, etc.,

Walton-on-Thames.

A. F. MCK. JACKSON.

Nocturnal Enuresis

SIR,—I have for some time past treated all cases of non-organic nocturnal enuresis by suggestive therapy to the child and varying doses of amphetamine. I have insisted on the children drinking not only their usual drinks but greatly increased quantities irrespective of the nearness to bedtime. Explanation is given to the child and the parents that the enuresis is a failure on the part of the bladder of remembering how much fluid it can take during the day when volition is brought into play. By its ability to hold urine for longer periods and by increasing amounts during the day does the child relearn control by night. The amphetamine in the first few nights of treatment keeps the child from sleeping and sends the child on many "excursions," increasing the child's confidence that at last it can be trusted at night.

I am unable to claim 100% cures as do the advocates of conditioning, but find the results excellent and certainly better than when the fluid intake is restricted. The child is more co-operative and helpful, feeling "grown up" because he is trusted and treated normally. I put forward this letter not to establish any new theory or more modern concept of treatment of enuresis but to remove ancient prejudices and injunctions not only from medical practice but from medical textbooks.—I am, etc.,

Sidcup, Kent.

L. A. NICHOLS.

E.C.T. in Pregnancy

SIR,—With reference to the annotation on E.C.T. in pregnancy (*Journal*, April 16, p. 958) we would like to confirm the safety of this procedure.

During the last seven years we have successfully administered E.C.T. in 10 cases of pregnancy with no ill effects. The pregnancies have been between 3 and 8½ months' gestation. We do, however, deprecate the use of anaesthetics and muscle relaxants in these cases, as they involve an additional complication and risk. They are unnecessary when the new ectonus technique of E.C.T. is used, in which there is no sudden muscle contraction, and the clonic movements are eliminated. With the ectonus technique we do not consider any stage of pregnancy a contraindication to E.C.T.—We are, etc.,

R. J. RUSSELL.

L. G. M. PAGE.

Arlesey, Beds.

Speaking Up

SIR,—Your correspondents blamed only the speakers at meetings for lack of intelligibility. The acoustic properties of lecture-rooms, often quite atrocious, should be also taken into account. Many amplification systems, installed to improve acoustics, are ineffective, or make things worse by increasing the effects of reverberation. The microphone provided for the speaker is usually strongly directional, and as soon as the lecturer turns his head a little (for instance, when trying to point out certain things on the blackboard or screen) amplification ceases, and intelligibility is reduced to the minimum. Also one must consider that a large proportion of the audience at medical meetings consists of elderly gentlemen, and a good number of them already suffer from more or less impaired hearing for high frequencies. Consequently their discrimination of speech in unfavourable circumstances is reduced. This is made worse when the lecture is read, because the audience is then deprived of a valuable aid to intelligibility—that is,

lip-reading. One should not deliver a lecture in a darkened room, and the lecturer should be positioned in a favourable light and favourable position from the point of view of the audience, so that listeners should be able to lip-read as much as possible.

Undoubtedly many speakers could improve their technique. Some would benefit from a little rehearsal with the aid of a tape recorder. Many would get such a shock from hearing a record of their own speech that they would change their mind and decide not to deliver the lecture. This is of course not necessary. A little practice could make a great difference. For instance, the lecturer could practise keeping his voice as low as possible. The higher the pitch of the voice the smaller the degree of intelligibility. Excitement, which is difficult to suppress, causes tension of the vocal cords and this raises the pitch of the voice. Practice can lessen this unpleasant effect.

Speakers who have doubts about their voice and intelligibility of their speech should not hesitate to take professional advice. For instance, speech therapists, employed in so many hospitals, could be very helpful, and it should not be below the dignity of the lecturer to ask for such advice. Perhaps some experts could produce a little booklet for medical speakers on the technique of delivering a scientific lecture.—I am, etc.,

London, W.C.1.

L. FISCH.

An Occupational Hazard

SIR,—During the past year in casualty I have come across the following similar cases—which might be described as an occupational hazard. Each was a healthy young man in the butchery trade, presenting with a $\frac{1}{4}$ -1 in. (6.4 mm.-2.5 cm.) long stab wound of right groin over the femoral canal, and the wounds lying in a transverse direction. All the patients were right-handed, and each stated they were boning frozen meat when the knife accidentally slipped through a part of the meat which had thawed out. The first case was in a 29-year-old butcher, who was brought in moribund although still just conscious. He had a 1 in. (2.5 cm.) stab wound over the right femoral canal. It was not bleeding when I saw him, but he had obviously lost pints of blood. An intravenous drip was put up immediately, but after 10 minutes, when only $\frac{1}{4}$ pint (0.2 l.) of blood had gone into the patient, he began to bleed from the wound again, and collapsed and died in one minute. A post-mortem examination was not carried out, but I feel that as the wound measured exactly the same as the widest part of the 4-in. (10.2-cm.) long knife—that is, 1 in. (2.5 cm.) at the hilt—the knife probably penetrated the abdominal aorta. The other three cases were more fortunate in that the femoral vein was cut on one occasion, and only the skin and superficial tissue in the remaining two. All three were sutured after the bleeding vessels had been ligated, and made an uneventful recovery.

A master butcher present at the inquest on the first case stated that this was not the first fatal case he had come across. Still no protective clothing or shield fixed to the near edge of the table is yet adopted in this dangerous occupation.—I am, etc.,

Nottingham.

EDITH FAULKNER.

Swallowed Hair-grips

SIR,—During recent weeks several articles and letters have been written concerning the fate of swallowed "kirbigrips." Opinions appear to be divided as to the treatment, particularly in small children. In the last week we have had to deal with such a case. The method used differed from those already described in the recent *British Medical Journals*, and is therefore being reported.

A small girl, aged 12 months, was admitted to the ward having swallowed a kirbigrip five hours previously. X-rays taken on admission and during the following week showed that it had not passed from the stomach. The child remained quite well. On the seventh day a James's magnetic tube (similar to a Ryle tube with a magnet being substituted for the usual metal tip) was

passed through the mouth into an empty stomach. Under x-ray screening the grip was seen to become attached to the magnet. After several attempts it was manoeuvred through the cardia and drawn into the oesophagus. Then the child was held upside down, and after gentle traction the kirbigrip was felt in the laryngopharynx and removed digitally. No anaesthetic was given. The whole procedure lasted 30 minutes. The child recovered rapidly, and was discharged after 24 hours' observation. She suffered no ill effects.

This is a simple way of removing a potentially dangerous object from the stomach without adding the hazards of surgical intervention. Perhaps we were lucky. It would be of interest to know if others have tried this method and have any improvements to suggest.—I am, etc.,

Old Windsor.

MARGARET S. I. WILLIAMS.

Psychosomatic Appendicitis?

SIR,—I have read the annotation on "Psychosomatic Appendicitis?" (*Journal*, April 16, p. 960) with great interest. The suggestion was made that "perhaps the answer will be found when surgeons take psychosomatic histories from all their patients." I do not think this is a very practical suggestion—everyone knows that surgeons' notes on patients are necessarily brief, by reason of the comparatively large number of patients they see in a very short period.

I would be interested to know whether the writer of this annotation excludes so-called obstructive or recurrent appendicular colic. Superadded muscular spasm induced by overaction of the sympathetic would account for these recurrent attacks of pain far more than in the case of acute appendicitis, which is a pathological phenomenon. The fact that countless appendices which have been removed show no pathological lesion seems to me to support the psychosomatic theory.

It might interest readers to know I have had recurrent attacks of mild appendicular colic, which only occurs when I am driving a car and when I am under certain tension. For example, while driving to Edinburgh to sit an examination, I was seized with sharp stabbing pain localized to the right iliac fossa, which disappeared as rapidly as it came when I reached my destination. Whenever these attacks occur, I anxiously wonder if it will be necessary for me to have an operation.

One wonders if the condition is allied to "spastic colon." Perhaps a drug such as chlorpromazine would be indicated.—I am, etc.,

Halifax.

J. W. WESTON.

"Half-minute" Thermometers

SIR,—I recently purchased a "half-minute" clinical thermometer of reputable manufacture which takes a full five minutes to register. Would it not be possible for thermometers to have issued with them not only a certificate of accuracy but also a certificate of time?—I am, etc.,

London, W.1.

PETER GILBERT.

Anonymous Anaesthetists

SIR,—At the end of his most interesting account of "Recovery after Penetrating Wound of the Heart" (*Journal*, April 16, p. 952), Dr. R. W. Lawrie thanks "Mr. P. W. Bleasdale for permission to publish this case; also the anaesthetist, without whom the operation would have been impossible." Dr. Lawrie's tribute is just, because it is largely due to the advances in anaesthesia and the co-operation of the anaesthetists that a modern surgical procedure such as he describes can now be carried out. Anaesthetists are modest men, and not so much in the limelight as surgeons; but credit should be given where credit is due. Could Dr. Lawrie take off therefore the mask of anonymity and let us have the name of his anaesthetist, so that we can congratulate him, as well as his colleagues, on their brilliant success?—I am, etc.,

Edinburgh.

JAMES A. ROSS.

Obituary

EGBERT MORLAND, M.D., F.R.C.P., F.R.C.S.

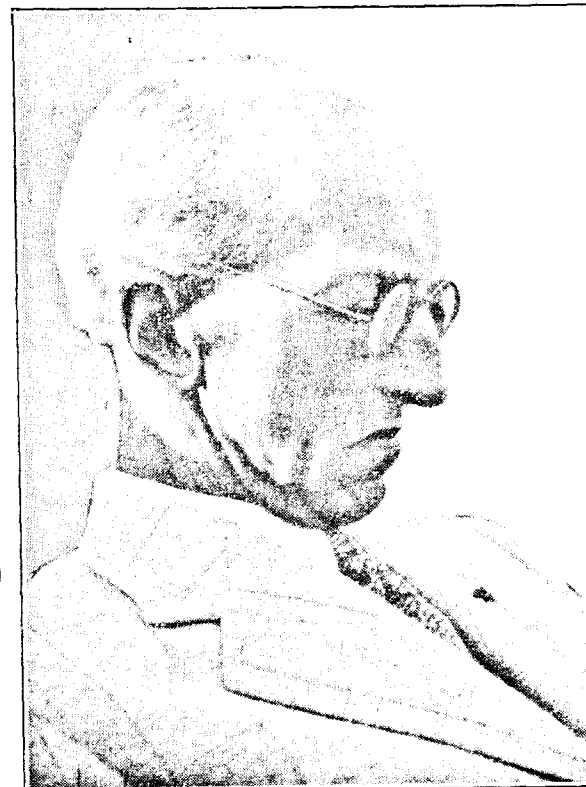
Dr. E. G. Morland, formerly Editor of the *Lancet*, died on April 26 in a nursing-home at York, aged 80 years.

Egbert Coleby Morland, fifth son of the fourteen children of Charles Coleby Morland, J.P., was born on September 3, 1874, at Croydon, and was educated first at the Whitgift School there and later at the Friends' School at Bootham, York. As a schoolboy he was

something of an infant prodigy, showing an equal facility for languages and science. It was said that at the age of 14, his brother Harold, a recent senior wrangler, was the only member of the staff capable of teaching him mathematics; be that as it may, he left school with the Gilchrist Scholarship in the London matriculation examination too young to start the study of medicine. Proceeding to Owens College, Manchester, he took the London B.Sc. in biology, with first-class honours, in 1893. Still only 19 years of age, he started on his medical career at St. Bartholomew's Hospital, to which he won an entrance scholarship. He qualified in 1897 and graduated M.B. in the following year, winning the gold medal in physiology. Then followed a series of house appointments and a tendency to specialize in

diseases of the eye, but his ambitions were frustrated by a severe haemoptysis and a long period of treatment in Switzerland. The severity of the catastrophe was mitigated by the loyalty of his fiancée, Mary Latchmore, who insisted on marrying the patient (in 1903) and devotedly nursed him back to health.

Egbert Morland's constitution was too frail and his tuberculosis too severe for him to return to specialist training and practice in London. He therefore decided to remain in Switzerland and to specialize in tuberculosis. That decision involved going back to school at Schiers College in the valley below Davos to pass the Swiss matriculation examination. A period of medical study at Berne under Kocher and Sahli ended with the acquisition in 1907 of the M.D., and, more important, the Federal Diploma, which gave him the right to practise in Switzerland. It was at about this time that Egbert Morland, with his architect brother, Geoffrey, entered the competition for the design and equipment of the King Edward VII Sanatorium for Consumption at Midhurst. Their essay was awarded the second prize, and some of their suggested features were incorporated in the final plan.



At that time the climatic treatment of tuberculosis was at its zenith and Davos was its Mecca, but in that centre competition from English and Swiss colleagues was sufficiently severe to make the prospects of a newcomer uncertain and arduous. After much consideration Egbert Morland decided to settle at Arosa, then a comparatively small resort separated from the railhead at Chur by a six-hour coach or sleigh drive. The choice was a good one, as the high altitude (6,000 feet) and its sheltered, sunny position soon made Arosa one of the leading centres in the Alps. A small sanatorium, the Villa Gentiana, was acquired, and the number of patients living in hotels and pensions grew so rapidly that Morland was soon overworked during the winter season. In an Alpine resort summers are always slack, and so he found time to write several original articles, and, in conjunction with the late Dr. Clive Riviere, an excellent little book on *Tuberculin Treatment*, which was so clearly written and so moderate in its claims that it remained the most reliable textbook on the subject for as long as tuberculin continued to be used as a therapeutic agent. Artificial pneumothorax was only just becoming established at that time, and Morland, although he never used it extensively, was one of the first British doctors to practise that form of treatment.

Morland took no part in winter sports and had no interest in mountain climbing; but he was a great walker, and his extensive knowledge of Alpine flowers, animals, people, and history made him a delightful companion. During the summer months he would take his turn to deputize for Swiss colleagues who looked after the population of the surrounding villages, some of which were very isolated and could be reached on foot only after five or six hours' walking. The villagers were too considerate to send so far for a doctor for normal events such as birth and death, and it was only the mysterious illness that called for a doctor's visit. Morland always considered his most profitable consultation to have been one involving ten hours' walking, a history taken from a small boy in a dialect which taxed Morland's linguistic powers to the utmost, a diagnosis (subsequently confirmed by the patient) of unripe apples, and a fee of two francs.

In 1914 the railway, which had taken several years to build, was completed, but by the time the first train had arrived war had broken out and the flow of British patients had stopped abruptly. By 1915 there was virtually no practice left, and Morland had no option but to return to England to try to make a living by private consulting practice, helped by the writing of occasional articles for the medical press. The latter

activity brought him into contact with Dr. (later Sir) Squire Sprigge, who liked his literary style, and it was not long before he received an invitation to become assistant editor of the *Lancet*, a post he held from 1915 until he succeeded Sir Squire Sprigge as editor in 1937 at the age of 63. Morland soon made his mark as a medical journalist; by vigorous pruning of all unnecessary words and by careful polishing he achieved a lucid, apparently effortless style in which no word was wasted. The somewhat austere effect of his prose contrasted with the frequently Puckish, almost Chestertonian, context of many of his leading articles. His private correspondence was almost confined to the postcard, a scanty plot on which he contrived to cultivate both substance and wit.

In 1936 Morland was elected a Fellow of the Royal College of Surgeons, and in 1941 a Fellow of the Royal College of Physicians. The field of medicine now covered by the term social medicine always interested him, particularly the problems of old age, and he served as vice-president of the Section of Medical Sociology at the Annual Meeting of the B.M.A. at Plymouth in 1938. He retired from the editorial chair of the *Lancet* in 1944 and went to live near his married daughter and her young family in the Yorkshire Pennines, where he combined free-lance journalism with gardening. His later years were saddened by the loss of his wife, who died suddenly in 1948, and shortly afterwards by blindness, which became almost complete, and by a fractured femur. He remained mentally alert, however, and derived much consolation from the wireless, especially from the Third Programme.

Egbert Morland was born a Friend, and was throughout his life an active member of the Society. He was one of the founders of the Quaker Medical Society, which came into being shortly after the war of 1914-18. Unlike many Quakers, he was fond of music and the visual arts, and it was characteristic of him in his later years that he made a weekly practice of brightening the austere seventeenth-century Meeting House at Wooldale with flowers from his garden.

We are indebted to our colleagues on the staff of the *Lancet* for the following composite pen picture of their former chief:

One week in February, 1915, when the *Lancet* was going to press, its editor, Squire Sprigge, stopped the printing machines so that he could include a summary of a German pamphlet describing the food resources of the German nation. This uninvited article, which had come unexpectedly from Switzerland, was Egbert Morland's introduction to the *Lancet* editorial circle. At once intrusive and appropriate, it was not uncharacteristic. Lucid, accurate, and highly topical, it arrived at an awkward moment and yet was too important to be ignored. For the first time the *Lancet* was exposed to Morland's sense for exciting news or significant principles hidden behind an apparently dull collection of facts and figures, printed perhaps in small type in a foreign language. Later in 1915, on his way through London after a tour of duty with a Friends' relief unit on the Marne, he dropped in at the *Lancet* offices on the corner of the Strand and Bedford Street. Dr. Sprigge, who was short-handed, suggested that he should "stay and help." What began as a casual afternoon call endured as an association of over 30 years.

Morland's career had been twice checked—once by illness and again by war—but in the *Lancet* office he found congenial scope for his talents. His experience as a clinician, his interest in tuberculosis, his concern for the new science of social medicine, his facility for languages, and his knowledge of Europe were all assets to the journal. His lack

of journalistic experience mattered less than might have been expected, for it was his set technique to tackle even the familiar by unfamiliar methods. He had not been long at the *Lancet* before problems of printing, make-up, and editorial administration had captured his interest and engaged his ingenuity. For the arrangement and selection of illustrations he had both skill and taste, and even as editor he occasionally indulged his enjoyment of his craftsman's aptitude. The *Lancet* traditions held in bounds the overzealousness and exaggeration which were the reverse of his brilliance and driving power. If Morland got things done, Sprigge was able to restrain him from overdoing things. And if this restraint sometimes irked Morland, who had after all started a new career in middle age, he soon found in the editorship of *Maternity and Child Welfare*, to which he was appointed in 1917, an opportunity to try his independent wings.

As the years between the two wars passed, the staff and scope of the *Lancet* broadened. But when, in 1937, Dr. Morland succeeded Sir Squire Sprigge, a dubious peace was already giving way to an uncertain war, and he had had little time to settle in the editorial chair before the *Lancet* was evacuated to Aylesbury in 1939.

For the next five years he edited the journal from what he called his "pocket office" in an old-fashioned dwelling-house in Temple Street, and lived "above the shop." If he regretted the limitations imposed on his work by war he never said so. Instead of repining for the opportunities and contacts of London, he joined with zest in the busy life of a market town. He quickly made friends with the local hospitals and doctors; he attended the meetings of local societies; and he took a benevolent interest in civic problems. Being Morland, he could not live a country life without dressing for the part; and his highly individual version of the formal clothes of an editor-about-town now gave way to rough tweeds, a beret, and, latterly, even a beard.

As the war went on it became clear that, though Aylesbury itself was nowhere in particular, it was on the way to several other places; and people began to drop in at the *Lancet* office. It might be an Oxford don, a Cambridge professor, a general in battle-dress, an admiral in gold braid, an American colonel, or a Quaker neighbour with a basket of apples from a Buckinghamshire orchard. Morland offered them all the same sincere if astringent welcome, and they all found his conversation stimulating if sometimes puzzling; for his passion for lucidity was sporadic and always stopped short at print. To the reader he was usually considerate; but his correspondents and callers had to fend for themselves. On a postcard—in his view the ideal vehicle for correspondence—he was oracular, and in conversation cryptic. But what he said, and didn't say, was usually worth pondering. As one of his staff once pointed out:

"He seldom asked a question directly or answered one comprehensibly, but by a series of hints, sniffs, and silences spurred others into spirited performances, which he managed by only the lightest of guiding reins. He was not only a good journalist, but a cause of journalism in others."

E.C.-J., who so largely shared the anxieties and difficulties of the war years with him, also found him a congenial chief.

"Egbert Morland was nearly the ideal editor for the newcomer to journalism. He could assess in an instant the shadowy ideas that keep floating up when one lacks confidence and experience, and if one of them seemed potentially valuable he would imperceptibly add the deft touches it needed and guide one's hand so tactfully that one forgot how much of the finished article was a result of his skill."

"His conversation was unique. Strangers often found it incomprehensible, for he assumed that his hearers' lines

of thought must run parallel with his own. After five minutes' silence he would break in with a terse comment that seemed wholly irrelevant except to his intimates who had learnt the technique—to link it not with the last remark made but with Egbert's own last contribution to the conversation, which had been exercising his astute mind ever since.

"On tuberculosis and child welfare he was an authority—and on these subjects he could write and speak with brilliant originality. In other branches of medicine he may have seemed to take disproportionately little interest; yet when brought a newly written paper to judge nobody would grasp its significance more quickly and accurately, and few could spot snags and fallacies in its conclusions so surely and certainly."

In the later years of the war Morland's disabilities forced him to leave an increasing amount of routine to his staff; and when at the end of 1944 the editorial office was moved back to London he felt free to remain behind in active retirement.

D. T. BARRY, M.D., D.Sc., F.R.C.S.

The death occurred in London on April 15, after a short illness, of Professor D. T. Barry, for 35 years professor of physiology at Queen's (now University) College, Cork. He was 84 years of age.

David Thomas Barry was born at Ballyannahan, Co. Cork, in 1870. He received his medical education at Queen's College, Cork, and graduated M.B., B.Ch. at the old Royal University of Ireland in 1894. He then spent some years in general practice in England, and took the D.P.H. of Liverpool University in 1904, having proceeded to the M.D. in the previous year. It was about this time that he decided to return to the study of physiology, and he spent some years in London, working with Starling, and at the Universities of Berlin and Heidelberg.

Barry obtained the Fellowship of the Royal College of Surgeons of England in 1907, and in the same year was appointed to the newly created chair of physiology at Queen's College, Cork, a position he was to fill until 1942, when he retired as emeritus professor. One of the first tasks in his new appointment was to create a separate department of physiology, which, up to 1907, had been linked with anatomy, and within a few years he had the satisfaction of seeing a physiological laboratory established and in use. Later a histological laboratory was added, and this was soon followed by the provision of similar accommodation for biochemistry and experimental physiology. When he retired Barry estimated that during the 35 years he was professor at Cork over 2,000 students had passed through his hands. In him they had a teacher who was also an enthusiastic investigator: his inspiration turned the thoughts and endeavours of many of his pupils to original research. As one of his colleagues wrote of him some years ago: "To hear him talk about the central nervous system, to watch him draw cross-sections of the brain and cord at various levels, to see him doing heart-lung perfusions, demonstrating the electrocardiograph, and illustrating the action of curare—in 1917—was to be given a preview of the influence of applied physiology on the clinical practice of the 1930's and 1940's. Barry was a forthright teacher, as all great teachers are. Someone said of him that he spoke English quite as well as he did French; the remark was meant to imply Barry's many contacts with the French school of physiology."

Barry was deeply influenced by the teachings of Claude Bernard, and after the first world war paid frequent visits to France and carried out research with Gley at the Collège de France in Paris, at the Sorbonne, with A. and B. Chauchard, and with the Lapiques at the Institut Marey and at the Laboratoires Maritimes de Dinard. He was appointed a Chevalier of the Legion of Honour in 1928 in recognition of this work.

His writings, numbering over 50 papers, appeared in the *Journal of Physiology* and other journals, and, while he covered a wide range of subjects in these communications, he wrote frequently on heart perfusion and electrocardiography. He also translated and condensed numerous papers for *Physiological Abstracts*. For many years he was an external examiner in physiology, in particular for the colleges of veterinary surgeons. In 1918 the National University of Ireland conferred on him the honorary degree of D.Sc.; he was a member of the Senate of the University from 1915 to 1919. He is survived by his widow, formerly Mlle. Marie Yvonne Boiret, whom he married in 1908, and two sons, Claude Thomas Barry, an anaesthetist, and Declan René Barry, a pathologist.

Dr. E. F. McCARTHY writes: The announcement of Professor Barry's death must have aroused vivid memories in the minds of the many Cork doctors who were privileged to be his students. A surgeon with the best qualifications, he was appointed to the chair of physiology in Cork in 1909 during the presidency of Sir Bertram Windle. He was a worker in Starling's laboratory before this, and his subsequent development was greatly influenced by his training in University College, London. His interests ranged widely in the field of physiology, as the titles of his papers in the British and French physiological literature show, but he was mainly concerned with the cardiovascular and respiratory systems. During his long tenure of the chair in Cork he published continuously. His family connexions with Paris induced him to spend his holidays there, where he worked with different French physiologists and where he was well known and very friendly with such scientists as Lapicque. French art and history attracted him strongly, and he was known to lecture and write very competently on such diverse subjects as the Valois monarchs and pointillism. His command of the French language was quite remarkable, and physiologists in general are familiar with his many excellent abstracts of French scientific literature. Professor Barry was a most conscientious and up-to-date teacher who was more conversant with current physiological literature than most physiologists. A strictly self-disciplined and hard worker, his example has a very salutary effect on his students, who greatly respected his detachment, fairness, and personal dignity and the fact that he treated them as grown-up individuals with a fully developed sense of responsibility. His apparent aloofness frequently hid a deep concern for their welfare and a respect and liking for their qualities, of which they can have had little awareness.

D. W. HOODLESS, O.B.E., B.Sc., L.M.S.S.A.

We record with regret the death on April 15 of Dr. D. W. Hoodless, who for over forty years was a much-loved figure in Fiji, where he rendered invaluable service first as a teacher and later as principal of the Central Medical School at Suva. He and Mrs. Hoodless were on holiday in England when he was taken ill and admitted to Addenbrooke's Hospital, Cambridge, where he died at the age of 67.

David Winn Hoodless was born at Walkeringham, Nottinghamshire, on May 16, 1887, and was educated at Sheffield and at King's College, London, graduating

B.Sc. with honours at London University in 1910. He went to Fiji in 1912 as headmaster of the first provincial school for native boys, and later he was appointed headmaster of Queen Victoria School. From 1919 to 1921 he studied medicine at Charing Cross Hospital, but went back to Fiji to become, first, inspector of schools, and then director of education. Resuming his medical studies in England in 1928, while on two years' leave, he again returned to Fiji to become the first principal of the Central Medical School for South Pacific natives, which was opened in 1930. Five years later, when he was well into middle age, he qualified in medicine by taking the diploma of L.M.S.S.A., illness having prevented him from taking the final examinations in 1929. Since 1953 he had been *The Times* correspondent in Fiji.

As principal of the medical school Hoodless helped hundreds of natives of the South-west Pacific territories administered by five Colonial powers to embark on careers useful to their home communities, where they provided a medical service which would have been beyond the means of their respective governments if all posts had been filled by European practitioners. His work in Fiji was always in great part with the Fijian, for whom he had a real affection. He was honorary secretary of the Fiji Branch of the British Medical Association from 1937 to 1940 and president of the Branch from 1941 to 1943. Retiring from the post of principal in January, 1947, he was appointed O.B.E. in the Birthday Honours of that year. He was also an Associate of King's College, London. He leaves a widow, formerly Miss Hilda J. Adlington, of New Zealand, whom he married in 1923, and one daughter, to whom the deep sympathy of all his friends is extended.

A colleague writes: Throughout the island territories of the South-west Pacific, as in a much wider field, the name of Hoodless was well known as the principal of the Central Medical School in Suva, a post he had held for 16 years and from which he retired in 1947. By his death many hundreds of graduates from this well-known school have lost a real friend and a personal adviser. They, and the peoples of the South Pacific generally, owe him a very great debt because he was a teacher to whom family problems and the guidance of youth through the inevitable difficulties of adolescence were as real, or more so, than mere academic learning. The Central Medical School in Fiji draws its students from many groups of islands, and the personal friendship he extended to them all during the formative years of their lives, and while they were in surroundings strange to many of them, had a lasting effect on their character, and it is to his guidance and teaching that the high professional standard and traditions of the assistant-medical-practitioner system in the South Pacific is largely due. Apart from his professional work, Hoodless was a man with many human interests. He had an intimate knowledge of the Fijian language, and of Polynesian and Melanesian customs, and he had a multitude of friends among all races and all strata of society, by all of whom his passing will be deeply mourned.

Dr. J. C. PEARCE, who practised in Norfolk and was well known for his keen interest in local affairs as well as for his work for the B.M.A., died suddenly in a Norwich nursing-home on March 31, nine days after his 73rd birthday. John Cuthbert Pearce was the younger son of Canon R. J. Pearce, vicar of Bedlington, Northumberland, and honorary canon and rural dean of Newcastle. He was educated at Durham School, where he was King's Scholar, Durham University, and the College of Medicine, Newcastle-upon-Tyne, graduating M.B., B.S. in 1906. Two years later he

proceeded to the M.D., being awarded the gold medal for his thesis. After graduation he held the appointments of assistant demonstrator of anatomy and physiology in the Durham College of Medicine, and assistant medical officer at St. Marylebone Infirmary. Subsequently he went into general practice as assistant to Mr. William Robinson at Sunderland, and was appointed honorary assistant physician to the Royal Infirmary and honorary assistant surgeon to the Sunderland and Durham County Eye Infirmary. In 1912 he entered into partnership with the late Dr. A. L. Vaughan, who died on the 28th of last month, at Diss, Norfolk, where he soon identified himself with the life of the community, and where he lived and worked for the next 43 years, except for his period of service in the first world war. Attaining the rank of captain in the R.A.M.C., he was first attached to the King's Own Yorkshire Light Infantry, and was wounded while serving in the line, and later worked in a Red Cross hospital, being awarded the Red Cross medal. After the war he became more and more absorbed in local affairs. Elected to the Norfolk County Council in 1922, he remained a member until 1930, and four years later he became chairman of the Diss Urban District Council, being also chairman of the governors of the local secondary school and of the county ambulance committee. He gave a good deal of his spare time, such as it was, to further the work of the British Medical Association. Chairman of the East Norfolk Division in 1946-7, he was a member of the old Insurance Acts Committee and its successor, the General Medical Services Committee, from 1943 to 1951, and of the Rural Practitioners Subcommittee over the same period. Another committee on which he served was the Central Medical War Committee, from 1944 to 1950. He was also a member of the Council of the B.M.A. for two sessions from 1948 to 1950. For some years he was a member of the local panel committee and, after the inception of the National Health Service, of the Norfolk Executive Council and the local medical committee. Until about a year ago he was a member of the Medical Practices Committee. Between 1920 and 1930 he was chairman of the Diss branch of the South Norfolk Unionist Association. A keen and active member of the Manchester Unity of Independent Oddfellows for about 30 years, he was a past provincial grand master of the Bury St. Edmunds district. He often deplored the fact that the ideals of the friendly societies were disappearing under the impact of organized charity and the welfare state. He was also a justice of the peace and deputy chairman of the Diss bench. A keen golfer, he was responsible for the revival of the Diss club after the first world war, and presented the club with its first cup when he was captain in 1925, winning the trophy himself three years later. Dr. Pearce believed in service to his fellow men and in the ideals of practical Christianity, which found further expression in his work for the British and Foreign Bible Society. He leaves a widow, formerly Miss Victoria Helen Bisset, whom he married in 1909, and one son, Dr. Ian C. B. Pearce.

Dr. J. A. PRIDHAM writes: The sudden death of Dr. J. C. Pearce has removed from the profession a fine example of the best type of general practitioner. He was a good doctor held in high regard and indeed affection by his patients, and greatly respected by his medical colleagues. Though he had a busy practice he found time for a multitude of activities of service to the community in which he lived, and to help the organized medical profession both locally and nationally. Those who had the privilege of his friendship knew him to have a fine sense of humour, and his conversation was illumined with wit. His courtesy and consideration were a part of the man. Perhaps his character can be summed up by saying that he was, in the best sense of the word, a gentleman. Last year, when he left the Medical Practices Committee, of which he had been a member since 1948, his colleagues gave him a farewell luncheon to show their appreciation of one whom they would always remember with esteem and affection. March 31 saw the end of a life of service.

Medical Notes in Parliament

BAN ON HEROIN

The manufacture and export of heroin will not be permitted after December 31, 1955, except for small quantities for purely scientific purposes. The Government's decision to this effect was announced in the House of Lords on April 28 by Lord MANCROFT, Under Secretary, Home Office. He said that, as adequate supplies had hitherto been manufactured in this country, imports had not been authorized for many years. It was intended to maintain the ban on importation.

The Government had taken the decision to give effect to a resolution adopted by the U.N. Economic and Social Council at its 18th session urging that all governments should prohibit the manufacture, export, and import of the drug, except for scientific purposes. The advice of the appropriate statutory advisory bodies had been taken.

Viscount ELIBANK said that Dr. Arthur Douthwaite, senior physician at Guy's Hospital, had stated in the *British Medical Journal* (April 9, p. 907) that the banning of this pain-killing drug was an astonishing move that would inflict much hardship on a multitude of patients. One of the best-known physicians in Edinburgh, Dr. A. B. Flett, had also written to him saying it was iniquitous that this most useful and often necessary drug should be banned. Lord MANCROFT said the Government was aware of these opinions. On the other hand, adequate supplies of a perfectly good substitute were now available. The purpose of the Government's action was to facilitate the world-wide banning of the traffic in this extremely dangerous drug. They had taken the opinion of the statutory bodies they were under obligation to consult—the Central Health Services Council, the standing medical advisory committee, and the appropriate bodies in Scotland and Northern Ireland. The Government could not do more than follow the technical advice and guidance given by them.

Viscount ELIBANK said it appeared from the information given to him that there was no satisfactory substitute for the drug. Lord HADEN-GUEST asked whether it was not a fact that the whole medical profession, so far as could be ascertained, was behind the order. Lord MANCROFT replied that that was the information available to him. The vast weight of evidence was in favour of the move.

Treatment at Broadmoor

Mr. T. DRIEBERG (Maldon, Lab.) asked the Home Secretary if he was aware that a medical report by the Principal Medical Officer of Brixton Prison, dated February 14, 1953, stated that a prisoner (whose name has been given) was sane and fit to stand trial on a charge of attempting to murder his wife, and recommended him as suitable for voluntary treatment in a mental hospital; that, at his trial five days later, this man was found guilty but insane, and ordered to be detained during Her Majesty's pleasure, and that he was still detained at Broadmoor, where his wife and other relatives had found him in apparently normal health; and if, in these circumstances, he would allow an independent medical examination of this patient.

Major G. LLOYD-GEORGE, replying on April 28, stated that the responsibility for deciding when a Broadmoor patient was fit to be transferred or discharged rested on the Home Secretary; and his predecessors and he had consistently taken the view that the expert staff of psychiatrists at Broadmoor, who had the patient under constant observation, were in a better position than an outside doctor to advise the Home Secretary on the patient's mental state and future prospects. The answer was, therefore, "No."

Mr. DRIEBERG said that Dr. Mathieson, of Brixton, had also said that the man was suffering simply from a mild anxiety neurosis, which should yield to psychiatric treat-

ment, but since he had been in Broadmoor he had had no such treatment. It was obviously impossible for the efficient and conscientious staff at Broadmoor to give proper psychiatric treatment to the large number of patients with whom they had to deal. In these circumstances, would the Home Secretary consider getting an independent opinion or transferring the man to a mental hospital, where he could be treated? Major LLOYD-GEORGE said he was aware of the opinion Mr. Driberg had referred to, and he had gone into the case himself with great care. On the information he had he did not think anything could be done, but he was prepared to look at the matter again.

Tuberculosis in Malaya

Mr. H. HOPKINSON, Minister of State for Colonial Affairs, in a statement on April 26 about the incidence and treatment of tuberculosis in Malaya, said that no detailed survey on a sufficiently large and representative section of the population had been carried out, and an accurate guess was further hampered by the fact that many deaths were certified by non-medical persons, and no clear indication could be obtained from the figures given as death from tuberculosis. Local surveys on specially selected groups had disclosed an incidence of between 5 and 6 active cases of pulmonary tuberculosis per 1,000. It was considered that, if a survey were taken of all sections of the community, the figure would be somewhat higher. The new Lady Templer Tuberculosis Hospital was expected to be opened this year and would provide further beds for treatment of cases that were likely to improve. It would also provide an opportunity for research work into this disease in Malaya.

Food Hygiene Council Formed

The membership of the Food Hygiene Advisory Council has been completed, and was announced by the MINISTER OF AGRICULTURE, FISHERIES, AND FOOD on May 2. The chairman is Lord Strang, and the 17 members are:

Mr. S. W. Barnes, secretary to Board of Governors, King's College Hospital; Hon. Daphne Courthope, councillor, Battle Rural District Council; Mr. H. Crane, national industrial officer, National Union of General and Municipal Workers; Mrs. J. H. Engwell, Alderman of Barking Borough Council; Mr. C. W. Fulker, secretary, Parliamentary Committee, Co-operative Union Ltd.; Mr. J. Fuller, principal, Catering Department, Battersea Polytechnic; Mr. C. Leslie Gillitt, past president, National Federation of Grocers' and Provision Dealers' Associations; Dame Florence Hancock, member, General Council, T.U.C.; Mr. J. D. Hiscock, assistant general secretary, Union of Shop, Distributive and Allied Workers; Alderman F. J. Jackson, chairman, Clean Food Guild, Leicester; Miss A. Lumby, chairman, Food Hygiene Committee of Women's Group on Public Welfare; Mr. K. McCullum, director of Trust Houses, Ltd.; Sir Frank Shires, past president, Food Manufacturers' Federation; Sir Harry Sinderson, county director for Sussex of the St. John Ambulance Association; Mr. G. Squire, past president, National Federation of Meat Traders' Associations; Mrs. James Tweed, chairman, House Committee, St. James' Hospital, Balham; Mr. D. T. Williams, Alderman of Cardiff Borough Council.

The Salk Vaccine

Mr. ERIC FLETCHER (Islington, East, Lab.) asked the Minister of Health for a further statement about poliomyelitis vaccine in view of the decision taken in the United States to suspend all injections of Salk vaccine made by the Cutter Laboratories. Mr. IAN MACLEOD stated on May 2 that he was aware of the Press reports of action by the American authorities. A small field trial was being carried out by the Medical Research Council. All vaccine used in this trial, whether imported or manufactured here, would first have been the subject of rigorous tests by the M.R.C. Plans for large-scale immunization were dependent on the Minister of Health being satisfied, so far as was humanly possible as a result of these tests and trials, that the vaccine to be used was both efficient and free from danger.

Mr. FLETCHER asked whether any supplies of Salk vaccine from the Cutter Laboratories had been received in this country, and whether the Minister was satisfied that all

possible information from the United States would be received to enable the Ministry's experiments to be continued. Mr. MACLEOD said that no Cutter vaccine had been received in this country. The Ministry was in close touch with the American authorities on all aspects of the problem.

Mr. R. W. SORESEN (Leyton, Lab.) asked whether the Minister had yet had information from America or elsewhere about the cause of the deleterious effect of what might be a very beneficial vaccine and whether, when he was assured that no further deleterious effect was likely to arise, progress would be made in distributing the vaccine. Mr. MACLEOD said he had no information so far beyond the Press reports. As soon as the Ministry was absolutely satisfied that the vaccines were safe as they could humanly be made there would be no delay in going ahead.

Lists of Patients for Voting

Mrs. B. CASTLE (Blackburn, East, Lab.) asked the Minister of Health whether he was aware that political party organizations were asking doctors for lists of patients for the purpose of the postal vote at the General Election; and if he would instruct N.H.S. doctors to refuse to give this information in respect of N.H.S. patients.

Miss PAT HORNSBY-SMITH stated that the Minister was certainly not aware of any such arrangements, and if Mrs. Castle would supply the Minister with the evidence she had he would investigate. The vote was secret, and in an individual capacity it was certainly helpful to see that as many people as possible voted.

Mr. HERBERT MORRISON (Lewisham, South, Lab.) asked for an assurance that neither directly nor indirectly would those associated with the Health Service co-operate with any political party association in the forthcoming General Election. There was the strongest impression in the last election that such malpractices did take place.

Miss HORNSBY-SMITH gave an assurance that the Health Service would not be used that way. Mr. MORRISON asked if, in view of the allegations, the Minister would make a statement later in the week. Mr. IAIN MACLEOD said he would look into it at once. Whether he made a statement depended on what he found.

Medico-Legal

DEATH FROM CHLORAMPHENICOL

A death from aplastic anaemia due to chloramphenicol was the subject of an inquest before Dr. H. N. Stafford, coroner, at Hammersmith on March 21. The patient, a 5-year-old girl, developed bronchitis in April, 1954, and her medical attendant, Dr. F. T. F. Lutter, prescribed "chloromycetin" in a dosage of "one teaspoonful three times a day." She was on this dosage for about three days, and the bronchitis cleared up very quickly. On November 24 the child was again brought to her doctor. She had a rash on her face and legs, not purpuric, and enlarged tonsils. The doctor thought it might be a toxic rash. He did not connect it with the administration of chloramphenicol. Later a blood count was taken, and on December 1 the child was admitted to the Victoria Hospital for Children, Tite Street, Chelsea, with a diagnosis of aplastic anaemia. Treatment by blood transfusion was without avail, and the patient died on March 3, 1955. Dr. F. E. Camps, consultant pathologist, conducted the post-mortem examination and confirmed the cause of death as aplastic anaemia. This condition, he said, was an extremely rare complication following the use of chloramphenicol, and he observed that the drug ought to be used with discretion. He did not think a doctor could forecast the condition, and blood counts were not practicable in every case. The coroner recorded a verdict of death from misadventure.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending April 16 (No. 15) and corresponding week 1954.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1955					1954				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	7	2	3	0	3	14	1	3	1	0
Dysentery ..	1,191	87	328	9		919	121	273	4	3
Encephalitis, acute	6	1		0		2	0	0	0	
Enteric fever: Typhoid ..	2	0	1	0		1	1	0	0	0
Paratyphoid ..	2	0	1	0		5	0	0	0	0
Food-poisoning ..	156	17		0		88	9		6	
Infective enteritis or diarrhoea under 2 years ..				8	10				12	14
Measles*	32,969	3,291	270	454	304	1,912	67	144	92	281
Meningococcal infection ..	28	3	18	1	1	24	1	18	1	2
Ophthalmia neonatorum ..	39	1	7	0		35	4	12	0	
Pneumonia†	804	45	282	13	6	451	17	185	10	0
Poliomyelitis, acute: Paralytic ..	14	1		1	2	10	0		3	0
Non-paralytic ..	6	0				7	1			3
Puerperal fever§	253	25	9	0	1	185	24	14	0	
Scarlet fever ..	597	38	67	48	27	994	60	137	38	29
Tuberculosis: Respiratory ..	609	50	132	20		751	95	168	32	
Non-respiratory ..	67	3	28	1		111	9	20	2	
Whooping-cough ..	1,474	88	102	30	30	1,980	69	248	37	19

DEATHS in Great Towns	1955					1954				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	1	0	0	0	0	0
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute		0			0		0		0	
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	10	0	3	0	0	7	0	0	2	3
Influenza ..	30	0	2	0	6	6	1	1	1	0
Measles ..		0	0	0	0		0	0	0	1
Meningococcal infection ..		1	1				0	2		
Pneumonia ..	315	46	30	14	10	189	26	22	8	4
Poliomyelitis, acute	2	1			0	0	0			0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory ..	87	11	9	4	5	90	10	10	0	6
Non-respiratory ..		0	2	0	0		1	0	0	3
Whooping-cough ..	1	1	0	0	0	2	0	0	0	1
Deaths 0-1 year ..	213	23	40	7	12	218	29	42	8	10
Deaths (excluding stillbirths) ..	5,913	864	616	125	210	5,092	703	577	129	178
LIVE BIRTHS ..	7,103	1,065	1,034	223	400	6,339	955	769	261	311
STILLBIRTHS ..	203	28	22			206	21	24		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenzal pneumonia.

§ Includes puerperal pyrexia.

Vital Statistics

Infectious Diseases

In England and Wales during the week ending April 16 the largest rises in the number of notifications of infectious diseases were 6,136 for measles, from 26,833 to 32,969, and 164 for whooping-cough, from 1,310 to 1,474, and the largest falls were 263 for dysentery, from 1,454 to 1,191, 68 for scarlet fever, from 665 to 597, and 68 for acute pneumonia, from 872 to 804.

The number of notifications of measles was the largest in any week since this disease was made notifiable. The largest increases during the week were 892 in Middlesex, from 1,705 to 2,597, 518 in Surrey, from 952 to 1,470, 480 in Essex, from 1,689 to 2,169, 423 in Southampton County, from 553 to 976, 404 in Kent, from 848 to 1,252, 366 in Warwickshire, from 3,199 to 3,565, 328 in Leicestershire, from 280 to 608, 275 in Lancashire, from 1,298 to 1,573, 263 in Buckinghamshire, from 389 to 652, 260 in Cheshire, from 574 to 834, 239 in Sussex, from 205 to 444, and 202 in London, from 3,089 to 3,291, and the largest exceptions to the general rise were decreases of 139 in Nottinghamshire, from 881 to 742, and 81 in Yorkshire West Riding, from 3,807 to 3,726. Only small variations occurred in the local trends of scarlet fever and whooping-cough. 7 cases of diphtheria were notified, being 2 more than in the preceding week.

20 cases of acute poliomyelitis were notified; these were 11 more for paralytic and 2 more for non-paralytic cases than in the preceding week. The largest returns were Lancashire 4, Yorkshire West Riding 3 (Leeds C.B. 2).

The largest centres of dysentery were Lancashire 451 (Oldham C.B. 81, Manchester C.B. 55, Blackburn C.B. 52, Blackpool C.B. 43, Liverpool C.B. 30, Royton U.D. 27, Chadderton U.D. 25, Whiston R.D. 18, Leyland U.D. 12, Stretford M.B. 11, Salford C.B. 10, Middleton M.B. 10), Durham 193 (Easington R.D. 89, South Shields C.B. 30, Seaham U.D. 26, Gateshead C.B. 21), London 87 (Hackney 35, Southwark 10), Yorkshire West Riding 85 (Pontefract M.B. 43, Castleford U.D. 14, Leeds C.B. 13), Northumberland 50 (Bedlingtonshire U.D. 16), Surrey 49 (Banstead U.D. 26), Leicestershire 40 (Leicester C.B. 27), Norfolk 31 (Ipswich C.B. 16), Glamorganshire 29 (Cowbridge R.D. 24), Cheshire 20 (Stockport C.B. 16), and Yorkshire North Riding (Middlesbrough C.B. 19).

Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in March was 114, compared with 117 (revised figure) in the previous month and 118 in March, 1954.

The numbers of cases of industrial diseases in the United Kingdom reported during March, 1955, were as follows: lead-poisoning 8, compressed air illness 2, anthrax 3, epitheliomatous ulceration 13, chrome ulceration 16; total 42. There was 1 death due to compressed air illness.—*Ministry of Labour Gazette*, April, 1955.

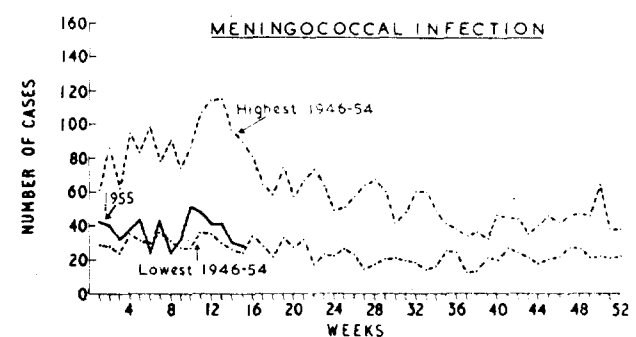
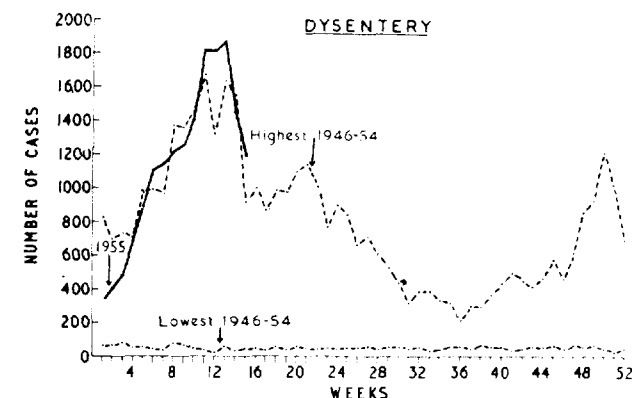
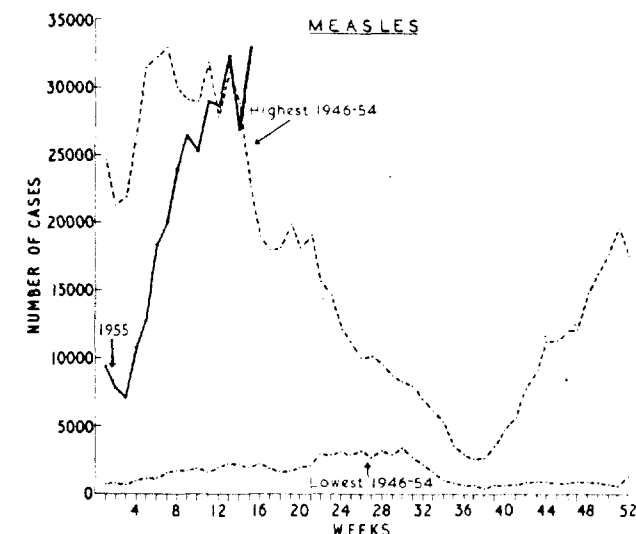
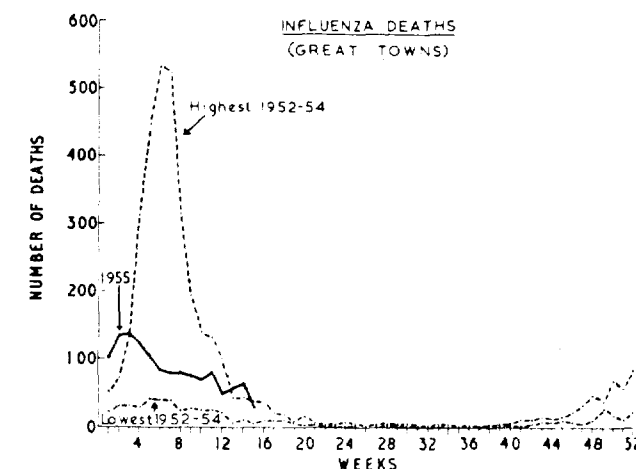
Week Ending April 23

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 467, whooping-cough 1,658, diphtheria 14, measles 28,425, acute pneumonia 688, acute poliomyelitis 6, dysentery 1,053, paratyphoid 15, and typhoid fever 3.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the nine years 1946-54 (influenza, 1952-4) are shown thus -----, the figures for 1955 thus ———. Except for the curves

showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Medical News

British Trial of Poliomyelitis Vaccine.—Preparations for the British trial of poliomyelitis vaccine (see *Journal*, April 30, p. 1103) are continuing pending further information from America about the cases of poliomyelitis in children inoculated with Salk vaccine. In a Press statement on May 4 the Medical Research Council stated that a member of the Council's staff was proceeding immediately to the U.S.A. to obtain first-hand information. This should be available before the routine safety tests on the present batches of vaccine in Britain are completed, and therefore before the proposed British trial is due to begin. A dispatch from the New York correspondent of *The Times*, dated May 1, states that 29 cases of poliomyelitis occurred last week in the United States in persons inoculated with Salk vaccine, all but three of whom had received the vaccine prepared by the Cutter laboratories of Berkeley, California. As a result, the use of the Cutter vaccine has been banned and California has suspended its inoculation programme until the investigation of the cases is complete. The possible causes of the American setback are discussed elsewhere in the *Journal* (p. 1144). Meanwhile in Britain negotiations continue with the Government of India to relax the ban on the export of monkeys. The M.R.C. has also sent a member of its staff, Dr. F. KINGSLEY SANDERS, to the M.R.C. field station at Fajara in the Gambia to investigate the possibility of arranging regular supplies of monkey kidneys from there. The financial implications of the American demand for the Salk vaccine have been agitating Wall Street, according to reports of an article in the *New York Post*. This source says that the American firms producing the vaccine are expected to make \$20m. profit this year, and is quoted as saying, "Sharp-eyed investors already have made an impressive killing on the vaccine." The report adds that Dr. Salk draws no royalties.

Edinburgh Medical Exhibition.—Declaring open the "Edinburgh Medical Exhibition" at the Assembly Rooms, Edinburgh, on April 25, Professor D. M. DUNLOP reminded his audience that the remarkable therapeutic advances of the past 50 years had been largely due to the close co-operation between the medical profession and the pharmaceutical industry. Not only had the industry developed the fundamental discoveries of university research workers such as Ehrlich, Minot, and Fleming, but it had itself contributed many discoveries such as cyanocobalamin and the new anti-malarials. Professor Dunlop complimented the industry on marketing drugs which are amongst the lowest-priced in Europe, despite rising wages, the increased cost of plant and buildings, and an annual expenditure on research estimated to exceed £3m. Too rigid a bureaucratic control on the price of drugs might prove disastrous to the pursuit of pharmaceutical research and to the industry's exports, which had increased in value from under £2m. in 1938 to over £33m. in 1954. The manufacturers of "ethical" products, continued Professor Dunlop, had through their advertising an influence on medical practice much more potent than that of "the bleatings of professors of therapeutics." Such an influence carried with it great responsibilities. It was not particularly ethical, he thought, to market, for example, expensive tonics, capsules of the vitamin-B complex in a country where beriberi and pellagra are practically unknown, and polyglandular pills. The last was a return to the medicine of savages "who believe that if you eat the heart of a lion you will grow strong." Professor Dunlop concluded by declaring it a privilege to open an exhibition of great interest and educational value, an expression of the splendour of modern therapeutic advance.

Bart's Linear Accelerator.—Last October we reported the completion of the Mullard 15 million volt linear accelerator

at St. Bartholomew's Hospital, London (see *Journal* of October 2, 1954, p. 819). On April 27 the accelerator was officially inaugurated by the DUKE OF GLOUCESTER, president of the hospital. The machine, costing over £50,000 and paid for from the hospital's endowment funds, with its combination of high energy and high intensity of radiation is the most powerful therapeutic apparatus to be installed in any hospital in Britain. The accelerator will be used primarily for fundamental research on the action of radiations on living tissue, and secondly for treatment. For the latter, besides high energy x rays, the machine can produce electrons and also, by bombarding uranium, neutrons. It is proposed to investigate the possibilities of both electron and neutron therapy. Electron therapy has the advantage of limited penetration (about 3 in.—7.6 cm.), while neutron therapy may differ entirely from conventional x-ray therapy. For the present, the accelerator is being housed near the physics department under the direction of Professor J. ROTBLAT.

Dr. G. W. Corner, director of the department of embryology at the Carnegie Institute of Washington, has been elected a Foreign Member of the Royal Society "for his work on the endocrine control of gestation, and especially on the function of the corpus luteum in mammals."

Royal College of Surgeons.—At the Council meeting on April 21 Mr. WILLIAM DOOLIN (Dublin) and Professor ROBERT JANES (Toronto) were admitted Honorary Fellows, and Professor G. J. CUNNINGHAM (London) Sir William Collins Professor of Human and Comparative Pathology and Conservator of the Pathological Museum. *Jacksonian Prize.*—Last year's prize was awarded to Mr. CECIL W. D. LEWIS (Cardiff) and a certificate of honourable mention to Dr. OLIVER C. LLOYD (Bristol) for their essays on "Melanomas and Melanosis." The subject for the 1956 prize will be "Portal Hypertension." *John Hunter Medal and Triennial Prize.*—These were awarded to Professor STEPHEN L. BAKER (Manchester) "for his outstanding contributions to the study of bone structure and disease." *Mitchiner Medal.*—The 1955 medal was awarded to Colonel W. R. M. DREW, late R.A.M.C., "for his distinguished contributions to medicine in the Army, with special relation to the teaching of tropical medicine."

Jessie Macgregor Prize.—The Royal College of Physicians of Edinburgh announces that an award of the Dr. Jessie Macgregor Prize for Medical Women (value £75) will be made in July to the applicant presenting "the best record of original work in the science of medicine." Applicants must be medical graduates of Edinburgh University or holders of the Scottish Triple Qualification, and applications, marked "Dr. Jessie Macgregor Prize," must reach the Convener of Trustees, Royal College of Physicians of Edinburgh, 9, Queen Street, Edinburgh, 2, not later than June 30.

Clinical Evening for G.P.s.—The London Hospital held its second clinical evening for local general practitioners on April 27, when cases were demonstrated by members of the medical and surgical staff. A large number of practitioners took advantage of the opportunity to meet their hospital colleagues and attend the clinical demonstrations. Light refreshments were provided beforehand. The evening was an obvious success: as a member of the staff put it, "I don't know why we didn't do this years ago." The guest practitioners, for their part, were clearly most appreciative of the teaching hospital's gesture.

Agricultural Pesticides.—The spraying season is now in full swing. An article describing the toxic hazards of the more dangerous selective weed-killers and insecticides was printed in the *Journal* of April 2 (p. 841). Treatment was fully discussed and an appendix stated where samples of oxalated blood should be sent for D.N.C. and cholinesterase estimations, and gave technical details of their collection. In addition to certain named laboratories in Lewisham, Portsmouth, Peterborough, and Worcester, specimens may be

sent to the hospital laboratory normally used for pathological tests of any kind.

British Association of Physical Medicine.—The following officers for 1955-6 were elected at the annual meeting on April 23: *President*, LORD HORDER; *vice-president*, Dr. W. S. TEGNER; *hon. treasurer*, Dr. A. C. BOYLE; *hon. secretary*, Dr. G. O. STOREY; *hon. editor*, Dr. H. A. BURT.

COMING EVENTS

Society for Endocrinology.—Dr. A. LACASSAGNE (Paris) will lecture on "Endocrine Factors Concerned in the Genesis of Experimental Mammary Carcinoma" at the Royal Society of Medicine, May 24, at 5 p.m. Non-members welcomed. Admission free, without ticket.

Institute of Hospital Administrators.—Annual Conference at the Caxton Hall, Westminster, May 12-14. Details from the secretary of the Institute, 75, Portland Place, London, W.1.

Society for Applied Bacteriology.—Summer conference and annual meeting at Cambridge, July 4-6, open to non-members. Symposium on "Food Microbiology and Public Health." Details from Mr. G. SYKES, Boots Pure Drug Co., Ltd., Microbiology Division, Nottingham.

NEW ISSUES

Medical and Biological Illustration.—The next issue (Vol. 5, No. 2) is now available. The contents include:

DIRECT KINERADIOGRAPHY ON 35 MM. FILM AND ONE APPLICATION IN BIOLOGICAL RESEARCH. P. Thevenard.
CAMERA LUCIDA TRACINGS IN MEDICAL RESEARCH. S. Enzel.
THE PHOTOGRAPHY OF GROSS SPECIMENS WITH FLUORESCENT LIGHTING. T. N. Salthouse.
A NEW MUSEUM OF CARDIAC PATHOLOGY. Reginald Hudson.
THE CYCLOSTEREOSCOPE. Francois Savoye.
A SIMPLE LIGHT INTEGRATING METER FOR USE WITH FLASH TUBES. R. D. Moore.
EQUIPMENT AND METHODS.

Issued quarterly: annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

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

Monday, May 9

EDINBURGH UNIVERSITY.—At West Lecture Theatre, University New Buildings, 5 p.m., Dr. D. J. Guthrie: Medicine Becomes Anatomical.
INSTITUTE OF CARDIOLOGY.—9.30 a.m., Sir John Parkinson: Diseases of the Aorta.
LONDON UNIVERSITY.—At Wright-Fleming Institute Lecture Theatre, St. Mary's Hospital Medical School, 5 p.m., special university lecture in medicine by Professor F. D. Moore (Harvard): Endocrinology and Metabolism in Surgical Care: (1) Metabolic Observations.
MEDICAL SOCIETY OF LONDON.—8.30 p.m., second general meeting: 8.45 p.m., Annual Oration by Dr. Macdonald Critchley: Verbal Symbols in Thought.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. R. I. S. Bayliss: Infantism and Dwarfism.
ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Dr. DeWitt H. Smith: Ballistocardiography.

Tuesday, May 10

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. G. C. Wells: Disorders in Pigmentation.
LONDON UNIVERSITY.—At King's College, 5.30 p.m., special university lecture in biophysics and microbiology by Dr. Harriett Ephrussi-Taylor (Paris): Induced Transformations of Bacteria: The Nature of Transformation and the Factors Involved.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Arnold Demonstration by Dr. H. J. Hoffmann: Innervation of Voluntary Muscle.
ST. ANDREWS UNIVERSITY.—At Department of Medicine, Queen's College, Dundee, 2.30 p.m., discussion to be opened by Mr. A. Logan, Dr. R. D. Marquis, and Professor D. M. Douglas: Consideration of Aortic Stenosis and its Surgical Treatment.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, W.C.1, 5.15 p.m., Cushny Memorial Lecture by Dr. Mary Pickford: Antidiuresis.
WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., neurological demonstration by Dr. T. Rowland Hill.
WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY.—5 p.m., Almroth Wright Lecture by Dr. D. A. Long: Response of the Host to Bacterial Infection.

Wednesday, May 11

BIRMINGHAM UNIVERSITY: FACULTY OF MEDICINE.—At Large Anatomy Theatre, 4 p.m., Leonard Parsons Memorial Lecture by Professor Wilfrid Gaisford: Protection of Infants Against Tuberculosis.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Pathogenesis of Fungous Infections of the Skin.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. F. P. Lee Lander: Prognosis in Bronchiectasis.

LONDON UNIVERSITY.—(1) At Wright-Fleming Institute Lecture Theatre, St. Mary's Hospital Medical School, 5 p.m., special university lecture in medicine by Professor F. D. Moore (Harvard): Endocrinology and Metabolism in Surgical Care: Application in Daily Care. (2) At King's College, 5.30 p.m., special university lecture in biophysics and microbiology by Dr. Harriett Ephrussi-Taylor (Paris): Induced Transformations of Bacteria: Kinetic Study of the Transformation Process.
MEDICAL RESEARCH COUNCIL.—At National Institute for Medical Research, The Ridgeway, Mill Hill, N.W.1, 5 p.m., Dr. Emil L. Smith (University of Utah): Chemistry of Antibodies and Gamma Globulins.
MIDDLESEX COUNTY MEDICAL SOCIETY.—At Harefield Hospital, 3 p.m., Mr. T. Holmes Sellers: Cardiac Surgery To-day; Dr. E. Idris Jones: Emphysema and Bronchiectasis; Mr. J. W. Jackson: Modified Thoracoplasty.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Professor G. Payling Wright: General Pathology of Tuberculosis (II).

Thursday, May 12

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, W.1, 8 p.m., Dr. W. P. Berrington: Fugue States.
BIRMINGHAM UNIVERSITY: FACULTY OF MEDICINE.—At Large Anatomy Theatre, 4 p.m., Leonard Parsons Memorial Lecture by Professor Wilfrid Gaisford: Protection of Infants Against Tuberculosis.
DUBLIN UNIVERSITY: SCHOOL OF PHYSIC, TRINITY COLLEGE.—At Physiology Theatre, 4.30 p.m., John Mallet Purser Lecture by Professor G. R. Cameron, F.R.S.: New Fields in Cell Pathology.
EDINBURGH UNIVERSITY.—At West Lecture Theatre, University New Buildings, 5 p.m., Dr. D. J. Guthrie: Classic Literature of Medicine.
HOSYMAN GILLESPIE LECTURE.—At University New Buildings, Edinburgh, 5 p.m., Mr. G. H. Macnab: Malescent of the Testicle.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Antibiotics.
LONDON UNIVERSITY.—At King's College, 5.15 p.m., Halliburton Lecture by Professor Irino Spadolini (Florence): Effects of the Acetylcholinesterase System on the Heart.
NUFFIELD ORTHOPAEDIC CENTRE.—At Wingfield-Morris Orthopaedic Hospital, 8.30 p.m., Dr. A. B. Kinnier Wilson: New Approach to Respiratory Poliomyelitis.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. C. L. Cope: Cortisone and A.C.T.H.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor R. V. Cooke: Advanced Carcinoma of the Colon, with particular reference to the Inflammatory Factor.
ROYAL SOCIETY.—4.30 p.m., film illustrating research activities of Istituto Superiore di Sanità, Rome, with introductory address by Director-General, Professor D. Marotta, followed by talk by Professor E. B. Chain, F.R.S.: Some Recent Advances in Carbohydrate Metabolism.
ST. ANDREWS UNIVERSITY.—At Physiology Department, Medical School, Small's Wynd, Dundee, 5 p.m., Dr. H. Payling Wright: Thrombosis and Some Less Recognized Aspects of Anticoagulant Therapy.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., postgraduate demonstration in Psychiatry.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, Gower Street, W.C.1, 4.45 p.m., Professor Emil L. Smith (University of Utah): Mode of Action of Proteolytic Enzymes.

Friday, May 13

HARVEY SOCIETY OF LONDON.—At Royal College of Surgeons of England, 8.15 p.m., Buckton Browne Dinner.
● INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. B. F. Russell.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Dr. J. G. Scadding.
INSTITUTE OF LARYNGOLOGY AND OTOLARYNGOLOGY.—3.30 p.m., Mr. A. R. Dingley: Tonsillectomy in Children and Adults.
LONDON UNIVERSITY.—At King's College, 5.30 p.m., special university lecture in biophysics and microbiology by Dr. Harriett Ephrussi-Taylor (Paris): Induced Transformations of Bacteria: Confrontation of Genetic and Physico-chemical Data.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. J. H. Middlemiss: Radiology of the Acute Abdomen.
ST. ANDREWS UNIVERSITY.—At Department of Medicine, Queen's College, Dundee, 2.30 p.m., discussion to be opened by Professor E. J. Wayne and Dr. C. Pickard: Angiocardiography in Congenital Heart Disease.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Sir Heneage Ogilvie: Shock (with coloured film and sound track).
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, W.C.1, 5.15 p.m., Cushny Memorial Lecture by Dr. L. E. Bayliss: Process of Secretion.
WHITTINGTON HOSPITAL.—At St. Mary's Wing (Ward D.6), 5.15 p.m., clinical pathological conference. Dr. C. G. Whiteside: Aortography in Urology.

Saturday, May 14

BIOCHEMICAL SOCIETY.—At Reading University, 11 a.m., scientific papers.
CAMBRIDGE UNIVERSITY MEDICAL SCHOOL.—10.30 a.m., Symposium: Paediatrics.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Campbell.—On April 14, 1955, at Harbour Breton, Newfoundland, to Dr. Margaret (formerly Kennedy), wife of Dr. Ronald W. Campbell, a son—David Alexander Young.
Ellison.—On April 10, 1955, to Jean, wife of Dr. Stanley Ellison, of 79, Fortnum Green Road, London, N.W.1, a sister for Beverly.
Luntz.—On April 25, 1955, at Sorrento Maternity Hospital, Birmingham, to Pamela, wife of George Richard William Neal Luntz, M.R.C.P., a daughter—Verity Anne.
McCracken.—On April 28, 1955, at St. Mary's Hospital, Manchester, to Dr. Margaret (formerly Laycock) and Dr. Dermot McCracken, a son—James Justin.

DEATHS

Sankey.—On April 6, 1955, at 16, Crick Road, Oxford, Richard Harvey Sankey, M.B., B.Ch., F.F.R., aged 80.
Shafto.—On April 12, 1955, at Edinburgh, William Alexander Shafto, M.D., D.P.H., of Craigdarroch, Bo'ness, West Lothian.
Young.—On April 3, 1955, at his home, Sandrock Cottage, Westcott, near Dorking, Surrey, William Arthur Young, M.B., B.S., D.T.M.&H., formerly of Singapore, and Perth, Western Australia.

Any Questions?

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

Inoculations and Poliomyelitis

Q.—What is thought to be the mechanism by which certain inoculations predispose to the development of paralytic poliomyelitis? Is it due to a direct transfer of virus during the inoculation procedure, similar to a streptococcal cellulitis following inoculation, or is there some other mechanism?

A.—Firstly, there is no evidence to support the view that poliomyelitis virus is transferred to the tissues from needle or syringe during the inoculation of whatever prophylactic or other substance is being injected. The evidence rather indicates that virus already present in the host is activated and localized by tissue trauma. It is known, for example, that the performance of tonsillectomies in an area where poliomyelitis is prevalent may be followed by cases of bulbar poliomyelitis, and that excessive exercise and fatigue of certain muscle groups may be associated with paralytic poliomyelitis in these muscles. The injection of a substance likely to cause local tissue trauma and reaction—and this is most common with alum-containing prophylactics—may for the same reason help to localize poliomyelitis virus, already present in the host, to the motor cells of the central nervous system associated with the traumatized area. Therefore the intramuscular injection of prophylactics likely to cause some degree of local reaction may have to be temporarily discontinued in an area where poliomyelitis has become prevalent.

Neurological Effects of Chronic Carbon Monoxide Poisoning

Q.—I have a patient who has been diagnosed as suffering from disseminated sclerosis. For a long time prior to and during the early part of his illness he was employed at a gas works, and several doctors have expressed the opinion that chronic carbon monoxide poisoning might have initiated the disease. Another person working in the same place for a time exhibited, broadly speaking, the same symptoms. Is it thought that continual exposure to carbon monoxide can ultimately produce sclerotic lesions in the nervous system, and, if so, where are references to be found in medical literature?

A.—There is no evidence that chronic carbon monoxide poisoning can lead either to the clinical manifestations or to the histological changes of disseminated sclerosis. From experimental data it appears that the chronic stages of degeneration are of the same order and situation as those found in acute poisoning, and principally affect the neurones of the cerebral cortex and corpus striatum. While variable degrees of Parkinsonism may be observed clinically, a wide variety of minor neurological disturbances have also been recorded in numerous reports. These, and a detailed personal investigation into the problem of chronic carbon monoxide poisoning as an industrial hazard, have been published as a monograph by Aage Grut (Copenhagen, 1949). Two cases in which cerebral subcortical myelinopathy was attributed to carbon monoxide poisoning have been reported also by Hsü and Ch'eng.¹ Since the lesions here involved the white matter these cases are of greater interest in relation to the present query. But neither the histology nor the recorded neurological disturbances in these two subjects suggest any affinity with disseminated sclerosis. It seems most likely that the cases mentioned in the question were coincidental.

REFERENCE

¹ *Brain*, 1938, 61, 384.

Dreams

Q.—What is the cause of excessive dreaming? Can any treatment be given to prevent it? Is it true that dreaming occurs in the penultimate seconds of sleep? A patient of mine, aged 28, is pregnant for the second time. She has always had vivid dreams, but during her first pregnancy, and so far during her second, she has dreamt every night, and her dreams have been of such startling reality and apparently of such great length that she wakes up unrefreshed from her night's sleep. There is no evidence of any psychiatric abnormality.

A.—Excessive dreaming—that is, dreaming more than is customary for a particular individual—comes from unconscious—that is, unrecognized—emotional stress. The already vivid dreams of this patient may well have been intensified in consequence of emotions associated with her pregnancy. Dreams are the experience of everyone and are not symptoms of a disorder. Their vehemence can best be modified by discussing them with a psychotherapist, as the appreciation of a dream's significance renders its repetition unlikely. Dream activity can be reduced and often eliminated by the use of hypnotics.

There is no evidence that dreaming always occurs just before waking. Thus sleep-walkers and talkers may subside into tranquil slumber without waking up. Probably we dream all night, but remember only fragments; thus the train of thought during the day will often revive a forgotten dream.

Aetiology of Peptic Ulcer

Q.—What are the latest views on the aetiology of peptic ulceration?

A.—The short answer, and probably the most correct one, is that we do not know the cause of peptic ulceration. There are, however, a few clues to the aetiology which may prove to be of value.

In the first place, it is probably necessary to consider gastric ulcer and duodenal ulcer separately. Although the two types of ulcer are practically indistinguishable clinically and are treated in much the same way, and although they are found in association with one another more often than would be expected by chance, there are many reasons for thinking that their causes are not identical. Both types of ulcer are to some extent hereditary—that is to say, they occur more commonly among members of the families of ulcer subjects than in the general population—but the hereditary susceptibility is expressed relatively seldom, and the environmental factors which determine whether or not a person has an ulcer are extremely important. (See *British Medical Journal*, 1954, 2, 315.)

Recent evidence bearing out the role of heredity has been obtained by Professor Aird and his colleagues at the British Postgraduate Medical School who have shown that both types of ulcer—but perhaps more particularly duodenal ulcer—are commoner in persons of Blood Group O. This is not surprising when it is recalled that blood group substances occur in the gastro-intestinal secretions, and it is therefore understandable that they may play a part in protection against autodigestion.

The importance of environmental factors is shown by the great changes in prevalence which have taken place over the last half-century. Duodenal ulcer has become much commoner, while gastric ulcer, which was characteristically a disease of young women, is now predominantly a disease of the middle-aged.

Duodenal ulcer is rare in childhood, but when it occurs it affects both sexes equally. It begins to be common after puberty, and subsequently is four to six times commoner in men than in women. It is approximately equally distributed among all sections of the community. Duodenal ulcers nearly always occur in association with an increased amount of gastric secretion, which would appear to be the result of an increased number of oxyntic cells in the mucosa. Why there should be more oxyntic cells is not known; one theory is that they reflect a work hypertrophy,

in which the stimulating factor is a food substance or chemical added in food processing. Psychological factors are probably of less importance than was thought 10 years ago. There is no doubt that anxiety or mental conflict may exacerbate symptoms of ulcer or bring on a complication; but the evidence that a particular personality, or type of emotional stress, is the primary cause of duodenal ulcer is not impressive.

Gastric ulcer shows a less marked male preponderance and it does not become common until later—that is, until after the age of 35 years. It is rare among the wealthy and becomes increasingly common as the social scale is descended. In this its distribution is reminiscent of gastric cancer. Gastric ulcer occurs characteristically in persons whose gastric secretion is normal or diminished, but it is doubtful if it ever occurs in persons whose stomachs are persistently achlorhydric. In the light of present knowledge it may be thought of as due to "wear and tear."

Nausea after Morphine

Q.—What is the best way of dealing with nausea and vomiting following the administration of morphine for pain relief? Are nalorphine, antihistamines, or sedatives helpful?

A.—There are two ways of dealing with the nausea and vomiting. When the morphine has been given and has produced these symptoms they can be arrested by the administration of nalorphine. This will, however, abolish the analgesia also. The better method is to try a different analgesic, for there are great variations in the way they are tolerated. Amidone is rather stronger than morphine, and is given in about three-quarters the dose. Pethidine is weaker and is given in about eight times the dose. Phenadoxone (by injection) is stronger and is given in three-fifths the dose. In using analgesics the attempt should be made to find which suits the patient best: what suits one may not suit another. On the whole it seems to be true that morphine produces nausea and vomiting more often than the other analgesics mentioned. The article by P. W. Nathan¹ should be consulted.

REFERENCE

¹ *British Medical Journal*, 1952, 2, 903.

Epidermolysis Bullosa

Q.—Would you please tell me if there is any efficient form of treatment for epidermolysis bullosa in an 8-months-old infant? The symptoms, affecting her buttocks, shoulders, back of neck and head, finger-tips, and centre of upper lip, appeared soon after birth.

A.—The baby is probably suffering from the recessive hypoplastic type of epidermolysis bullosa which appears at birth or soon after. Bullae may arise spontaneously on any part of the skin, but especially at the sites of pressure or trauma. The mucous membranes are usually affected.

The outlook is gloomy and few patients reach puberty. If they do it is possible that some improvement may take place, but it is likely that treatment with plastic surgery will be required, such as to correct the binding together of the fingers. No treatment is known which affects the condition, and this, of course, is true of most congenital defects. Cortisone is not beneficial. Antibiotics are only helpful in the treatment of secondary infection of the raw areas. It is necessary to wrap the baby in cotton-wool so that all surfaces liable to injury are protected.

Cyanosis of Lips in Acrocyanosis

Q.—Is cyanosis of the lips a common concomitant of acrocyanosis? My patient, a little girl aged 4½, shows a constant bluish tinge of her lips, summer and winter. She appears to be perfectly healthy, and, apart from the fact that she tends to suffer from acrocyanosis in the winter, shows no evidence of organic disease on clinical examination. What might be the aetiology of this condition, and what possibilities ought one to exclude?

A.—Hands and feet are dominantly affected by acrocyanosis. The condition is due to dilatation and sluggish

circulation in the small vessels and venules, and cyanosis is exaggerated in cold weather. The lips are not involved. In judging cyanosis of the lips it should be remembered that there is often some pigmentation on the outer edge of the lips, which may be deceptive. When the interior of the lip is inspected in such cases no cyanosis is seen.

Cyanosis due to congenital heart disease is accompanied by some degree of polycythaemia and finger-clubbing, and it should be remembered that the cardiac physical signs of congenital cyanotic heart disease may be minimal. Methaemoglobinemia gives a leaden hue to those parts of the skin and mucous membranes where the colour of the blood is visible. Remarkable improvements in colour may follow the oral administration of a large dose of ascorbic acid. Methaemoglobin is recognized by spectroscopic examination of the blood.

Frigidity after a Difficult Labour

Q.—A young married couple are worried by frigidity in the wife since the birth of their first child after a difficult labour. Previously the wife was passionate and achieved orgasm easily, but now, although allowing intercourse, she is not roused by it. She realizes that fear of another difficult labour may have played a part in the first few months after the birth of the baby, but that was two years ago, and she thinks that she has now got over this. The couple practise contraception with a Dutch cap, and owing to the husband being away at sea intercourse is necessarily infrequent.

A.—An organic basis for the frigidity is unlikely, although overstretching or tearing of the vagina during delivery could diminish stimulation and therefore satisfaction during coitus. However, reduction in sexual feelings after pregnancy, and especially the first pregnancy, is the experience of most women. The fact that a fundamental objective of coitus has been achieved; the awakening of mother love with some readjustment of the affections; the extra work, anxiety, and responsibility of looking after the child—all play a part. This reaction, however, is usually only temporary and clears up as the period of nervous strain passes, as physical well-being returns, and as the baby begins to show signs of independence. Two years is rather long for this mechanism to continue to operate, although in this case it may be fostered and extended by the frequent and prolonged absences of the husband. Separation means that the woman must deliberately stifle her sex feelings and learn to live without coitus. She may therefore look more and more to the child as an outlet for her emotions and affection, and this is even more likely if she has decided not to conceive again because of her previous obstetrical experience. Despite the passage of time, fear of another pregnancy must also rank high in the list of possible causes of frigidity. The woman might also have a fundamental objection to contraception, and this could arouse an inner conflict between desire for, and fear of, pregnancy. Is it not possible for the difficulty which occurred in the last pregnancy to be avoided in the next, and could the couple be reassured on this point with a hope of them then being able to take a more normal outlook on married life and the production of a family?

Treatment of Diverticulosis

Q.—What dietetic or other regime is indicated in a case of diverticulosis of the transverse colon discovered by barium follow-through? The patient was referred to the radiologist on account of occasional discomfort around the left costal margin.

A.—It is customary in cases of diverticulosis to prescribe a diet from which articles of food known to leave a high residue are excluded, the so-called non-roughage diet. Cellulose residues from green leafy vegetables and fruits, especially uncooked, wholemeal bread, and so on are the chief offenders. The absence of roughage tends to induce constipation which can to some extent be overcome by an adequate fluid intake and by the administration of plain "petrolagar emulsion" in small doses with each meal. It

must be remembered that there is no musculature in the wall of the diverticulum, so that if it becomes filled with inspissated faecal material it cannot empty itself: the colonic contents should therefore be kept, so far as possible, soft and moist.

In the absence of inflammation pain is due to the associated colonic spasm, so in an attack the administration of bowel antispasmodics is often valuable. Ordinary purges should be avoided, since they tend to increase spasm, but an occasional Studa chair colonic wash-out, say once a month, may be well worth a trial. On a simple regime such as this many cases of diverticulosis carry on for a great number of years without any serious complication arising.

Shoes for Patients with Pes Cavus

Q.—I think that those who suffer from the common condition of pes cavus are less disabled if they can obtain shoes that fit. Do you agree? If so, can you tell me of any firm that provides suitable shoes? Hand-made shoes are too expensive for most patients, and I do not think every patient is willing to get his shoes through an orthopaedic clinic. So far as I can tell the local shops can only provide shoes for "standard" feet.

A.—I entirely agree that to be comfortable with pes cavus shoes must fit. Unfortunately no firm provides suitable shoes. There are no alternatives to having hand-made shoes or surgical shoes obtained from the National Health Service.

Sometimes such people can get along with wide toe-capped shoes and a firm pad under the arch.

Sulphathiazole

Q.—According to certain publications, principally North American, sulphathiazole should not be used on account of its greater toxicity; according to others sulphathiazole is still a useful drug in many cases, as it is the most active of the sulphonamides and in certain cases the toxic effects are insignificant. What are your expert's views on this?

A.—Although sulphathiazole is a highly active sulphonamide it is a very insoluble one and is particularly likely to cause renal irritation, and even in some cases urinary suppression. Such dangers can usually be easily guarded against in temperate and cold climates, where most of the fluid output is through the kidneys, by ensuring a really adequate intake of fluid whenever sulphathiazole is given; but in warm climates, where perspiration may be excessive and where even with care the urinary output may not be adequate in febrile conditions, sulphathiazole undoubtedly possesses serious drawbacks. It is very doubtful if the more modern and much more soluble sulphonamides such as sulphadimidine are any less active than sulphathiazole.

Epilation

Q.—Which method of epilation of facial and body hair is preferable—galvanic or diathermy—and why? Should a local analgesic be used before epilation? Does the epilation leave any scarring afterwards and, if so, can it be prevented?

A.—The choice between electrolysis and diathermy is a matter of personal preference, and in the opinion of the writer, who has used both, there is really little to choose between the two. The apparatus for electrolysis is less expensive, and it is probably easier through faulty technique to cause scarring with diathermy than it is with electrolysis. For these two reasons electrolysis is perhaps preferable. Local analgesia is not usually given; some patients complain of pain, and a local analgesic is then advisable provided the area to be treated is not too large.

Of course, the object of epilation is to destroy the hair follicle permanently without the production of a scar, and the skill in treatment lies in passing the current for the right length of time and at the right intensity. When the current has passed long enough the hair will come out with very gentle traction, and there may be a slight white opacity of the skin extending for a distance of a fraction of a millimetre

around the follicle. Any area of necrosis which is wider than this is excessive and is liable to be followed by visible scarring. It is, of course, better to err on the side of under-treatment rather than over-treatment, which would result in scarring; the operator soon gets to know how long to leave the current on in the precise conditions in which he is working. A practical demonstration with the apparatus to be used would be very valuable for anybody intending to undertake this treatment for the first time.

"Cracking in the Head"

Q.—I should be grateful if you could kindly throw a little light on the following case. The patient is a rather senile lady of 77 who has a well-compensated mitral valvular disease. Her principal complaint is of a "cracking in the head" which is accompanied by a sudden severe pain and often followed by flushing of the face. She has phases when she is withdrawn and others when she is full of complaint and worrying about herself, and in the absence of physical findings I was inclined to the view that the "crackings" were neurotic in origin. However, recently both her husband and her daughter have heard the cracks, though they have not told her so. Her daughter, who is a very sensible and competent woman, likens the sound exactly to that of "knuckle cracking." The attacks occur many times a day and are very distressing.

A.—Audible cracking like knuckle cracking is almost certainly produced in a joint. Cracking in the temporomandibular joint is a very familiar phenomenon. In elderly and particularly edentulous patients the chewing movements may force the head of the mandible back on to the anterior surface of the external meatus, and pressure here may produce pain referred to the face.

Chronic Alcoholism and Fertility

Q.—What effect has chronic alcoholism on fertility? What is the mechanism for any adverse effect?

A.—It is generally accepted that chronic alcoholism can lead to male infertility by interfering with sperm production. It is most probable that the effect is a direct toxic one on the germinal epithelium, leading to partial or complete failure of spermatogenesis. Since chronic alcoholism is a good deal less frequent in women than in men, its effects on female infertility are less well recognized. It can, however, bring about amenorrhoea, either as a result of a direct toxic action on the ovaries or perhaps more likely through disturbance of the pituitary-ovarian relationship.

Correction.—The penultimate sentence in the first paragraph on p. 871 of the paper by Dr. C. D. R. Pengelly on "Pneumococcal Meningitis" (*British Medical Journal*, April 9, p. 870) should have read, "Only three recoveries occurred in 16 patients in the latter group (81% mortality)." Later on the same page the paragraph beginning "The additional therapy in Group 3 . . ." should have had the words "with chloramphenicol (orally) in two and" inserted before the words "with intrathecal streptomycin in one."

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BRITISH MEDICAL JOURNAL

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OPPORTUNITIES FOR MEDICAL PRACTICE AT HOME AND ABROAD

BY

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The news that a Government committee has been set up to consider the intake of students into the medical schools has made me decide to publish certain pertinent data which were collected for a lecture entitled "Medical Research and Medical Practice at Home and Abroad." Since I have spent my life as a teacher in Scottish medical schools, it is natural that I should consider the problem under discussion mainly from the Scottish angle. Nevertheless, many of the collected data are of equal importance to the young English graduate.

I have approached this problem in the first instance by considering the composition of the class of medicine in Edinburgh graduating in 1912, the year in which I started my academic career as a medical student. Table I compares the sex distribution and country of origin of

University has occurred, as can be seen from Table I. The overseas students now take their medical degrees in their own institutions, which is as it should be, and the 175 students beginning medicine in Edinburgh every year are selected from the hundreds of applicants mainly domiciled in Great Britain, a small number of places being reserved for students living in those Colonies in which there are no medical schools. Edinburgh has always been a popular choice for English students wishing to study medicine, and in 1954 there were some 333 English applicants for entry to the medical school, of whom 63 were accepted.

I believe it is a sound policy to encourage undergraduate students in the Dominions to undertake their medical studies in their own universities and to fill our quota mainly from the long list of British applicants. In contrast to undergraduate education I believe that the British universities should cater especially for post-graduate education for students from overseas. In this respect Edinburgh has been very successful, since approximately 600 doctors per annum attend the various courses of instruction arranged by the Edinburgh Post-graduate Board. In summary, the points of particular interest in Table I are: (1) The great increase in women medical students: they now comprise approximately 25% of the class. (2) The increase of Scottish students from 40% to 70% of the class. (3) The great reduction in the number of students from Ireland, from Wales, and from overseas.

At this point it is appropriate to consider what happened to the Edinburgh medical students who qualified 40 years ago. Only a small percentage remain to practise in Scotland. What that figure was cannot be ascertained, but I doubt if it was 25% of those who qualified annually as doctors. The great majority of the students from England, the Dominions, and the Colonies who came to Edinburgh for their training returned to their native countries to undertake medical practice. Their example was followed by many Scottish medical graduates, who saw a brighter future in England and overseas than existed for them in Scotland at that time. The Indian Medical Service was a popular choice for many doctors, as were the Sudan Medical Service and the Colonial Medical Service. There appeared to be ample opportunities for every medical graduate of Scottish birth who was prepared to leave Scotland to obtain the type of work which he desired if this was not available to him in his native country.

Opportunities for Practice

Detailed consideration may now be given to the opportunities for practice available at the present time to British graduates in general and Scottish graduates in particular.

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TABLE I.—Numbers Graduating M.B., Ch.B. in Edinburgh in 1912 and 1952

Country of Origin	Men		Women		Total	
	1912	1952	1912	1952	1912	1952
Scotland ..	75	103	7	39	82	142
England ..	38	31	2	3	40	34
Ireland ..	15	0	1	0	16	0
Wales ..	4	2	0	0	4	2
India ..	15	0	0	0	15	0
Commonwealth	39	15	0	0	39	15
Foreign ..	4	0	2	0	6	0
Total ..	190	151	12	42	202	193

the graduates in medicine in 1912 and in 1952 in Edinburgh. Prior to the first world war, Edinburgh was a medical centre which drew its student population not only from Great Britain but from all parts of the British Commonwealth. At that time some of the medical schools in the Dominions which are now flourishing institutions either did not exist at all or taught medical students only up to the standard of the first or second M.B. (anatomy and physiology). Accordingly large numbers of Colonial and Dominion students came to Britain for their clinical teaching and to obtain a British qualification in medicine. Scottish medical schools were frequently selected by these overseas students for their medical studies. This is perhaps not surprising, since at that time a very large number of Scottish graduates practised medicine in the Dominions and Colonies, and naturally they recommended Scottish educational facilities to potential students. When the new medical schools were created in the Dominions before and after the first world war, many professors of the faculties of medicine were Edinburgh graduates, and so it was only to be expected that Scotland's capital would be a popular choice for overseas students.

During the last 25 years a complete change in the source of origin of medical students in Edinburgh

During the past 20 years the population of Great Britain has increased by approximately 10%, while the number of doctors on the *Medical Register* has increased by no fewer than 25,594—that is, 45%. The number of persons per doctor in England has fallen from 1,250 in 1930 to 900 in 1953 and in Scotland from approximately 800 to 570 during the same period (*British Medical Journal*, 1955). Even if it were conceded that 20 years ago Great Britain was under-doctored as estimated by modern standards, such a disproportionate increase in the number of doctors compared with the increase of the population would inevitably make it much more difficult for recent medical graduates to obtain suitable posts. The position is particularly serious for Scottish graduates, for not only is the ratio of persons per doctor lower in Scotland than in England but the opportunities for entering practice in England are becoming increasingly difficult. The reason for this is clearly indicated in Table II, which shows that the output of doctors by

TABLE II.—Great Britain: Increase in Numbers of Medical Students Graduating in Selected Years

Year	England	% Increase	Scotland	% Increase	Ireland	% Increase
1934	847		471		154	
1937	1,096		593		239	
1940	1,323	56	673	43	315	105
1945	1,268		581		428	
1949	1,436		589		452	
1952	1,848	118	673	43	506	228

the four Scottish medical centres in 1952 has remained the same as it was in 1940, while the annual production of doctors in England has increased from 1,323 to 1,848 during that same period. This has resulted mainly from the expansion of the English provincial medical schools. Attention is also drawn to the great increase in production of doctors which has taken place in Ireland in recent years. The majority of these Irish graduates are unable to obtain work in their own country and accordingly seek employment in Great Britain or the Dominions and Colonies.

It is only natural that preference should be given to local graduates by regional appointment boards in England, provided that the applicants' qualifications are satisfactory. Under these circumstances the young Scottish graduate looking for work will turn his eyes to lands overseas, where so many of his predecessors made such a success of their professional careers. India, Pakistan, Burma, and Ceylon are independent nations with their own medical schools, which are being rapidly expanded so that the medical services of these countries can be staffed by their own graduates. The Indian Medical Service is no longer open to our graduates, and the Sudan Medical Service is now at an end so far as European doctors are concerned. A small number of posts in these countries are advertised from time to time by British commercial firms who want British medical officers to be responsible for the care of their employees, but the number of such posts is so small as to make no difference to the overall picture. When I was in Ceylon four years ago I was told that only three European doctors were practising medicine in Colombo, a city of 425,000 inhabitants.

TABLE III.—British Dominions: Increase in Total Number of Registered Practitioners Compared with Increase in Population (data obtained from the Dominions Offices)

Country	Year	Approximate Population in Millions		Approximate % Increase		Total No. of Registered Practitioners	% Increase	Approximate No. of Persons per Doctor	
		European	Non-European	European	Non-European			European	Non-European
South Africa	1934 1953	2.0 2.75	7.5 10			2,609 6,437	147	766 427	2,875 1,553
New Zealand	1934 1953		1.6 2.1		31	1,410 2,800	100	1,135 750	
Canada	1931 1951		10.4 14.0		36	10,020 14,325	43	1,028 977	

Practice in the Colonies and Dominions

With regard to the opportunities for British doctors wishing to practise in the Colonies, the medical schools in Hong Kong, Singapore, and the West Indies will presumably be able to meet the medical requirements of these regions in the near future. The University of Ibadan, Nigeria, and Makerere College, Uganda, each have flourishing medical faculties, but for a long time to come the Colonial medical services will require medical officers to carry on the excellent work being done in the African Colonies. The opportunity for private practice in Tanganyika, Uganda, and Kenya is small, since the total European population of British East Africa is only about 60,000 persons, many of whom are Civil Servants who receive free medical care. It should also be remembered that there are a large number of Indian doctors practising in these territories. Two-thirds of the European population of British East Africa is concentrated in Nairobi and the adjacent White Highlands. It is my belief that the number of doctors practising in this region already exceeds the regional requirements. This belief is equally applicable to Salisbury and Bulawayo, in Southern Rhodesia.

As the Colonies can absorb only a small proportion of the British doctors wishing to emigrate, what opportunities exist for them in the great Dominions of Australia, New Zealand, South Africa, and Canada? I have visited all these countries during the past five years, and it seemed to me that the competition for practice was extremely severe, at any rate in the big cities. This impression would appear to be fully justified by the data shown in Table III. During the past 20 years there has been a most remarkable increase in the number of practitioners registered in Australia, New Zealand, South Africa, and Canada. With the exception of Canada, this increase is out of all proportion to the increase in the size of the population that has occurred during the same period. Table IV clearly shows that the reason for this great expansion is the increase in production of doctors by the Dominion medical schools. I have not been able to obtain the figures for the total medical man-power registered in Australia, as medical registers are kept only by each State. I am informed that such registers may be somewhat inaccurate, for the same doctor may be registered in more than one State. The number of doctors registered in Victoria has risen from 2,498 in 1934 to 4,207 in 1954, while in South Australia the comparable figures are 484 and 1,202 respectively. There is ample evidence to suggest that the production of doctors in Australia by the Australian medical schools exceeds the national requirements without including the doctors of British and foreign nationality who have emigrated there in considerable numbers since the war and who will wish to continue to do so in the future.

This matter is well reviewed by Sir Hugh Poate (1953) in an article entitled "The Capacity of the Medical Profession in Australia to Absorb New Doctors." Sir Hugh calculates that the number of new graduates required annually for Australia as a whole is approximately 486. The number of Australians graduating in medicine in Australia in 1948 was 297, but by 1951 and 1952 it had reached the

huge figure of approximately 650 per annum. In addition to local graduates, some 585 doctors from Great Britain and Ireland and from foreign countries have emigrated to Australia between 1948 and 1952. There can be little doubt, therefore, that Australia is rapidly becoming over-doctored.

TABLE IV.—British Dominions: Increase in Number of Medical Students Graduating in Selected Years Compared with Increase of Population (data obtained from the "Year Book of the Universities of the Commonwealth")

Country	Year	Approximate Population in Millions		Approximate % Increase		No. of Students Graduating Annually	% Increase
		European	Non-European	European	Non-European		
South Africa	1938 1951	2.05 2.65	8.0 10.0	29	25	134 435	224
New Zealand	1936 1951		1.65 2.05		24	39 112	187
Canada	1938 1951		11.5 14.0		22	492 791	62
Australia	1934 1952		6.6 8.8		33	175 635	263

Conclusion

Sufficient has been said to make it clear that opportunities for medical practice in the Dominions and Colonies for British graduates wishing to emigrate overseas are much fewer to-day than they were 40 years ago. Owing to the overcrowding of the profession and the preference given to local graduates, it is my opinion that it would be unwise for a British graduate in medicine to proceed overseas without first having obtained a salaried appointment in a commercial firm, in a university, in a research institute, or in H.M. Overseas Service, or without having obtained a legal contract safeguarding an offer of an assistantship or partnership in private practice. It is also clear that in Great Britain at the present time the chance of becoming a consultant in hospital practice or a principal or partner in general practice is too difficult and too uncertain. In short, there seems to be an over-production of doctors both in Great Britain and in the Dominions.

Unless reasonable opportunities for employment are going to be made available to potential graduates, not only will the numbers entering medical schools fall, according to the laws of supply and demand, but so will the quality of the entrants. The Government Committee appointed to study this important problem will have to consider whether it is better to allow the laws of supply and demand to operate or whether restriction of entry to medical schools should be enforced. That the former mechanism is already operating would appear to be the case, since the number of students starting medicine in Great Britain and Ireland has declined from 2,725 in 1949–50 to 2,280 in 1953–4 (*Lancet*, 1955). On the other hand, it may be felt that the second course is preferable, as it is obviously a wasteful and expensive business to produce more doctors than are required. The question will then arise whether medical schools should be ordered to reduce their annual intake of medical students by a certain quota or whether they should merely be recommended to do so. In this connexion the problem of the excessive production of doctors by the Irish medical schools will require particular attention. Lastly, it will be necessary to decide whether any proposed reduction in intake should be proportionally the same for every medical school in Great Britain or whether medical centres with a long-established international reputation for medical education should receive special consideration.

My thanks are due to Mr. Jolley, Librarian of the Royal College of Physicians, Edinburgh, for the help he has given me in collecting the data for Tables III and IV.

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DIVERSITIES OF SEX*

BY

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Diversities of sex can be divided into: (1) hermaphroditism, in which the gonads are of both sexes and the external sexual appearances may be male or female or a mixture of both; (2) pseudohermaphroditism, in which the external sexual characteristics are more or less characteristic of the sex opposite to that of the gonads; and (3) homosexuality, a state of affairs in which the libido and sexual urge is directed towards the same anatomical sex and may or may not be associated with recognizable endocrine abnormality.

Hermaphroditism

True hermaphroditism is rare: there is a separate ovary and testis, or an ovo-testis.

Case 1: Woman aged 66.—Her mother died when the patient was 8 years old. She looked after six other children and received no proper schooling. During this period she regarded herself as a woman and wore women's dress, but at the age of 18 realized there was some doubt about her sex and tried to commit suicide on this account. Subsequently she led a vagabond life doing farm work and hawking. She shaved about once a week. For some years she has been becoming progressively bald on the top of the head, after the manner of a man. In May, 1952, she was

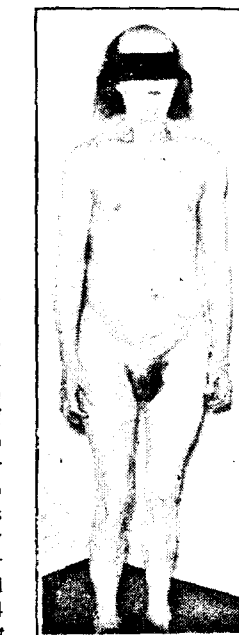


FIG. 1



FIG. 2

FIG. 1.—Case 1. True hermaphroditism. Sex regarded as female; has lived as a female, although general appearance rather masculine. One gonad a testis; the other an ovary. Ketosteroids, 3.8 mg.
FIG. 2.—Case 1. True hermaphroditism. Scrotum on right containing a hydrocele; short phallus with hypospadias orifice on the perineum; no vagina. Testis in the right inguinal canal.

taken to a welfare institution and transferred to Bensham General Hospital for investigation.

On examination the skin and hair distribution were seen to be those of a man. She had a short stubble of beard, long unclipped hair, but central baldness (Fig. 1). The external genitalia also looked masculine, there being a well-formed scrotum on the right containing a hydrocele, a short penis with a hypospadias orifice on the perineum, and no vagina (Fig. 2). An organ in the right inguinal canal was considered to be an undescended testicle. On closer examination the skin fold on the left side appeared like a labium. The urethra opened on the perineum and there was a slight opening $\frac{1}{2}$ in. (1.9 cm.) long at the end of

*A paper read to Newcastle-upon-Tyne Obstetrical and Gynaecological Society on March 4, 1955.

the penis, but the scrotum was empty apart from the hydrocele. Urinary 17-ketosteroid estimation was 3.8 mg. per 24 hours.

Laparotomy was performed on June 20 by Mr. David Smith. There was a small uterus with broad ligament and left ovary. No right ovary could be seen. A rudimentary right tube disappeared into the inguinal canal. The gonad was removed from the right inguinal canal for section. Histological examination showed a rudimentary uterus; a Fallopian tube; an ovary with numerous corpora albicantia and calcified vessels, showing in its mesentery large clumps of interstitial cells; a testis with fibrosed seminiferous tubules and grossly increased numbers of Leydig cells. On this side there was in addition a structure which might be a tube of a ductus deferens. Unfortunately it has not been possible to obtain skin or a blood film for determination of chromosomal sex because the patient has been transferred to another hospital.

Pseudohermaphroditism

Pseudohermaphroditism, male and female, is much more common, and is a condition in which the gonads are of one type—testes or ovaries. There are two varieties of male pseudohermaphroditism.

Male Pseudohermaphroditism

(1) Cases with testes and general male external characteristics with the exception of the external genitalia: undescended testes and hypospadias.

Case 2: A girl aged 13.—This girl's mother consulted her home doctor because it was noticed that the child had enlarged genitalia.

Otherwise she was very healthy, a good scholar, active, and good at games.

On examination she was tall for her age and thin, with a deep voice; pubic hair was present (Fig. 3) and the clitoris was enlarged. A swelling in the right inguinal region felt like a testis. She had an infantile vagina with no evidence of cervix or uterus; no breast development. Urinary 17-ketosteroid estimation, 9.6 mg. per 24 hours.

Laparotomy was carried out by Professor Bentley. The right inguinal canal was opened, and what appeared to be a normal testicle for a child of this age was delivered; a biopsy specimen was taken: on microscopy the testicle tissue looked normal. The inguinal canal was then closed. A midline subumbilical incision was made and the pelvis explored. There was no evidence of any rudimentary female viscera. The midline incision was then closed in layers without drainage.

Histologically the specimen was morphologically testis, with well-formed tubules and considerable aggregation of interstitial cells. There was no evident spermatogenesis. The results of the operation suggested, therefore, that this child was essentially a male.

A plastic operation was carried out by Mr. Fenton Braithwaite and the patient has assumed the male sex very successfully.

(2) These are cases with external female characteristics and absence of internal female organs, and in which the gonads are testes and the chromosomal sex is male. This type of male pseudohermaphroditism is commonly mistaken for female, but should always be suspected in a female of adult age who has never menstruated, has no pubic hair, and is without signs of hypopituitarism. Cases have been published by Armstrong (1953) and Beatty, Champ, and Swyer (1953).

Case 3: Girl aged 17.—This patient was referred to hospital on April 22, 1952, because she had never menstruated. She was a twin—the other twin died *in utero*. There was a family history of late menarche. She was of normal stature with well-developed breasts and a normal head of hair. There was no axillary or pubic hair, and her skin was generally somewhat hairless (Fig. 4). The vulva was infantile but otherwise appeared normal. The vagina was only $\frac{1}{4}$ in. (1.3 cm.) in length. On rectal examination no internal female organs were palpated. No abnormal signs were found in the heart, lungs, abdomen, and central nervous system; blood pressure 130/90; urine normal; x-ray examination of sella turcica, normal; urinary 17-ketosteroid estimation, 8.9 mg. per 24 hours.

She had the mental attitude of a girl. Socially and occupationally, the adaptation is that of a girl of 17 of rather above average intelligence. Sexually she is a little immature, but her inclinations are entirely female. She has had girl's toys, has female daydreams, reads love stories, and identifies herself with

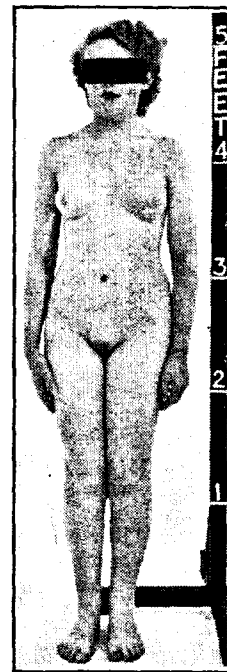


FIG. 4

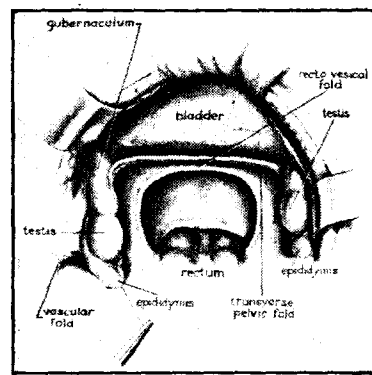


FIG. 5

FIG. 4.—Case 3. Male pseudohermaphroditism. "Girl" aged 17: external feminine characteristics; breasts developed, no pubic hair, infantile female vulva. Gonads undescended testes; no female internal organs and no vagina. Chromosomal sex, male. Ketosteroids, 8.9 mg. Oestrogen excretion in urine: oestriol 2 μ g., oestrone 2.4 μ g., and oestradiol 0.5 μ g., which are at male level. **FIG. 5.**—Case 3. Drawing showing appearance of pelvic organs at laparotomy: undescended testes and no female organs.

female fictional and film characters; she hopes to marry and is fond of babies.

At laparotomy there was no uterus, but a broad fold of peritoneum ran across the pelvis in the corresponding position. On the left side, lying on the psoas muscle, was a gonad anatomically resembling a testis. On the right side a similar structure was found, but more inferiorly placed so that it was lying right at the internal ring (Fig. 5). The arrangement was quite consistent with undescended testes. Both inguinal regions were bimanually palpated and no swelling was noted in either groin. The broad fold of peritoneum running across the pelvis is the transverse pelvic fold, a remnant of the uro-rectal septum or genital fold, and its attachment to inguinal fold (gubernaculum) appears almost ligamentous and may well have been a factor in checking the descent of the testis. Such an attachment as this occurs in the female from the lateral aspect of the body of the uterus to the ovary, to form the ligament of the ovary.

Material from each gonad was identical histologically and consisted of testicular tissue. There were numerous immature seminiferous tubules which showed no evidence of spermatogenesis. Numerous and increased numbers of interstitial cells were present.

17-Ketosteroid fractionation carried out by Professor Charles H. Gray gave the following results. Total excretion of 17-ketosteroids, 8.8 mg. a day. The 17-ketosteroids could be separated into eight fractions, as follows:

I	Containing mainly artefacts of fraction	19%
II	Transdehydroisoandrosterone	0%
III	Containing mainly androsterone	13%
IV	" " acetocholanolone	18%
V	" " " "	33%
VI	" " 11-oxygenated 17-ketosteroids	11%
VII	" " unknown artefacts	0%
VIII	" " " "	6%

This fractionation is within normal limits.

Adrenocortical Steroid Analysis (all figures in μ g. per 24 hours)

	Δ^4 -3-Ketosteroids			Reducing Steroids		
	Free			Glucuronide-conjugated		
	Comp. E	Comp. F	Comp. X ₄	Comp. X ₅	Tetrahydro-Comp. E	Unidentified Comps
Normal range:	20	20	60	80	1,200	240
Male	20-200	10-80	20-120	0-200	240-3,000	0-1,500
Female	30-110	10-120	10-320	10-4,000	160-4,000	0-2,200

X₄ and X₅ are unidentified Δ^4 -3-ketosteroids with R_F values of 0.24 and 0.39 in benzene:50% methanol system. Excretion of free compound E of 20 μ g. a day is within normal limits for males.

Dr. J. E. Gray was of the opinion that the chromosome content of the skin was male.

Professor G. F. Marrian estimated the oestrogen excretion in the urine, and reported the following results:

	1st Week	2nd Week
Oestriol	2.0 μ g.	1.6 μ g.
Oestrone	2.4 "	3.1 "
Oestradiol	0.5 "	1.4 "

These figures are at male level.

The patient whose case was reported by Beatty *et al.* (1953) was admitted to the Royal Victoria Infirmary on December 1, 1954, as an emergency under my care because of haematemesis. Dr. G. I. M. Swyer reported on the oestrogens as follows: oestriol, 2.1 μ g. in 24 hours; oestrone, 1.5 μ g.; oestradiol, 2.6 μ g. This patient intends to marry in the near future.

In both these cases the oestrogen excretion in the urine is at the male level, which suggests enhanced response of target organ to oestrogen or that there is another oestrogen not yet determined.

Female Pseudohermaphroditism

Female pseudohermaphroditism is a condition in which the gonads are ovaries, the chromosomal sex is female, but the external appearance is more or less masculine. Usually there is lack of breast development, with a male type of hair distribution, and the clitoris is enlarged to a degree which resembles a penis but micturition is feminine in type. The condition either is of genetic determination or is due to adrenal hypersecretion, starting in foetal life. These subjects are seldom brought up as boys, and such a case is reported here.

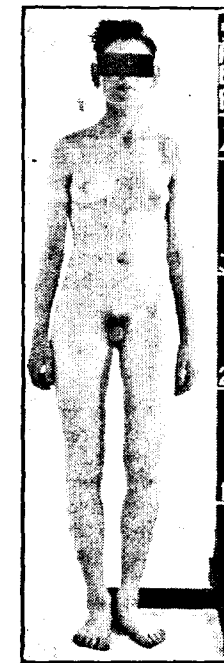


FIG. 6

FIG. 6.—Case 4. Female pseudohermaphroditism. "Boy" aged 16; external genitalia: phallus with appearance of a penis, and urethral opening on the ventral surface. In perineum, two sinuses, from one of which menstrual bleeding occurred. Ketosteroids, 6.3 mg. **FIG. 7.**—Female pseudohermaphroditism. Photograph shows appearance of external genitalia.

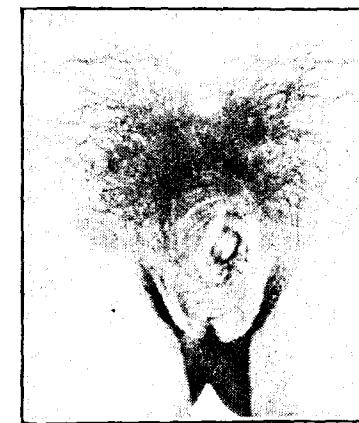


FIG. 7

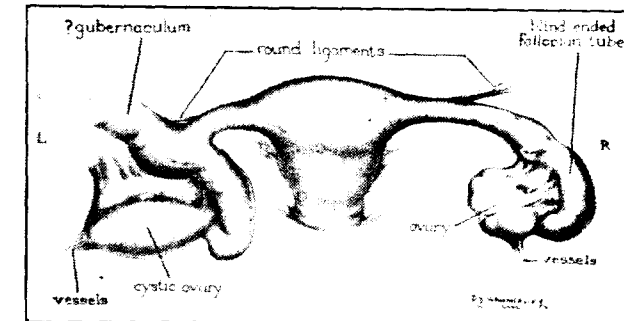


FIG. 8.—Case 4. Female pseudohermaphroditism. Drawing illustrating pelvis at laparotomy; uterus and ovaries present; no male organs.

surface (Fig. 7). In the perineum there were two sinuses, from one of which periodic bleeding occurred. Lipiodol injection showed it to have a connexion with the urethra. Ketosteroids were 6.3 mg. per 24 hours.

Laparotomy, carried out by Mr. D. J. Tibbs, revealed a normal adolescent uterus which connected by a rudimentary vaginal canal with the perineal sinus (Fig. 8). Gonads were present in the position of normal ovaries. Biopsy showed them both to contain ovarian tissue histologically. Fallopian tubes were malformed.

This patient has refused to assume female sex.

The more common type of female pseudohermaphroditism has enlarged clitoris, male type of hair distribution, no breast development, and non-establishment of menstruation. These cases of adreno-genital syndrome respond to treatment with cortisone.



FIG. 9

FIG. 9.—Case 5. Female pseudohermaphroditism. Girl aged 14. Enlarged clitoris; thick pubic hair, no breast development and no menstruation. Ketosteroids, 23.0 mg. Since above photograph was taken has been treated with cortisone: ketosteroids have dropped to 6 mg., breasts have developed, and menstruation established. **FIG. 10.**—Case 5. Female pseudohermaphroditism. Photograph showing enlarged clitoris.

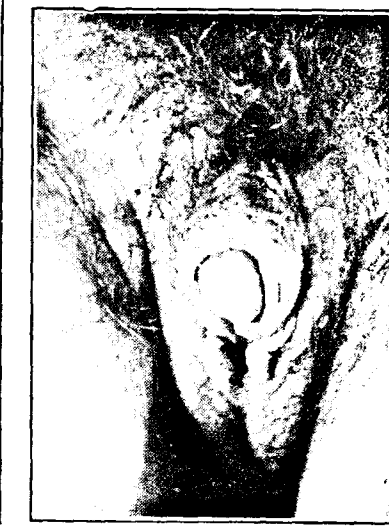


FIG. 10

Case 5: Girl aged 14.—This patient was referred to me at 11 years of age with the complaint that she was changing her sex. The history was that at 1 year the clitoris was found to be enlarged and at 2½ years pubic hair began to grow. At 4 years laparotomy had demonstrated a normal uterus and ovaries, with histological confirmation. Examination confirmed the presence of a small vagina and separate urethral passage (Fig. 9). The urethral opening is set very far back (Fig. 10). Ketosteroids were 23 mg. The condition in this case was considered to be adrenal hyperplasia. She has continued to be successfully treated with cortisone: the breasts have developed and menstruation has been established.

Homosexuality

In both sexes there are two types, active homosexuals and the passive homosexuals—the active assuming the male role and the passive the female role. It is as yet indefinite whether homosexuality—the libido, emotional attraction to another individual, and urge of sexual expression being to a member of the same sex—is inborn and of genetic determination or due to acquired environmental psychological factors. Because of the law in regard to homosexuality in males, research into this problem is urgent. The only contribution I have to make is that recently I have had several passive male homosexuals referred to me for an endocrine opinion, and in each instance I have been able to recognize certain female characteristics.

Case 6: Man aged 22.—This patient was referred to me at Royal Victoria Infirmary in September, 1954. He had previously been admitted to the Department of Psychological Medicine, where it was thought that little could be done to help him. He volunteered the information that he was of the opinion that from very early childhood he had had female tendencies and female habits, and at the age of 13 a neighbour had had homosexual activities with him. Later he used to be called a "cissy." He joined the Royal Navy for his National Service at 18 and was immediately recognized by active homosexuals, which led to frequent physical homosexual practices taking place to a degree which eventually led to his seeking the advice of the padre, who recommended his discharge from the Navy. Since leaving the



FIG. 11



FIG. 12

Fig. 11.—Case 6. Passive male homosexual, aged 22. Somewhat general feminine appearance and contours; deficient beard—can go without shaving for two weeks without being noticeable; level pubic hair; well-developed genitalia; ketosteroids high normal, 22.2 mg.; and high sperm count, 110 millions per ml. **Fig. 12.**—Case 7. Passive male homosexual, aged 17. Rather eunuchoid appearance with feminine voice, small penis, level pubic hair, scanty axillary hair, and no facial hair—he does not shave. Ketosteroids, 8.5 mg.

Royal Navy homosexual intercourse has continued, and he sought the advice of his doctor, who referred him to hospital at the age of 22.

On examination his general appearance had undoubtedly certain feminine characteristics in general contour (Fig. 11). His head hair was male pattern in distribution, but his beard was deficient, and he required to shave only once in three days, and can go as long as two weeks without it being hardly noticeable. Pubic hair was level. Genitalia were well developed. There was no gynaecomastia. Legs were of feminine contour. Urinary 17-ketosteroids were 22.2 mg. per 24 hours. Semen analysis: count, 110,000,000 spermatozoa per ml.; 90% of the normal spermatozoa highly motile and normal in appearance.

There are undoubted feminine endocrine features in this case, together with a high urinary 17-ketosteroid excretion and a high sperm count.

Case 7: Youth aged 17.—This patient wrote direct to me, and the following is an extract from his letter. "I have seen my doctor because ever since I was young I have always felt like a girl and I've always wanted to show I am one. I played with dolls and girls instead of boys. I detest boys' games, but have loved to play girls' games. I love girls' clothes and look into every clothes shop in town. I am now nearly 18, and for just over a year I have been in love with a man, and it grows more sincere as the months go by. I love little children, and some day hope to have some of my own; but I don't want to be a father—a mother is more in my line. I think like a girl, act like one. I've been told I look and try to dress like one; of course I do—anything that makes me look feminine I'll wear. I blush when a handsome man looks at me, and am embarrassed when they start talking about male subjects. My mother and family know about this; I thought it best to tell them. Well, my doctor sent me to a psychiatrist, who asked me everything. She sent me to another; after going five times he sent me to another, who asked the same questions as the others. It started all over again, but none of them have done anything for me; the last one said if I go on like this I will be a homosexual, yet I have done nothing sexual or ever suggested doing it."

On examination he was tall, slender in build and contours, with a rather feminine voice and small penis; testes were descended, pubic hair was level; axillary hair was scanty, and facial hair was absent—he does not shave. Head hair was of male pattern but worn rather long. Urinary 17-ketosteroids were 8.5 mg. per 24 hours. X-ray examination of the sella turcica showed nothing abnormal. Semen analysis:—Wet film: The majority of the spermatozoa were actively motile, but several abnormal and immature forms were seen; no pus cells, red blood cells, or crystals present. Count, 21,200,000 per ml. Stained film. Approximately 60% of the spermatozoa showed no morphological abnormalities, but the remaining 40% showed immaturity—swollen or pyknotic heads or other aberrations. There are also an excessive number of spermatids and spermatocytes.

This case is of interest because the patient has always felt that his outlook was female. He has never had any physical homosexual contacts, and there are features—small genitalia, level pubic hair, and absence of beard—that would suggest masculine deficiency amounting to eunuchoidism.

The general form, contours, and appearance, together with deficiency of male type of hair, are easily recognizable in these cases. The ketosteroid excretion in Case 6 is high and in Case 7 low.

Discussion

I should like to draw attention to the fact that there is as yet no precise definition in law or in medicine of what really constitutes male or female sex. I have expressed the opinion (Armstrong, 1953) that the legal sex of an individual is the anatomical structure of the gonads irrespective of the external appearance or social or sexual inclinations. Although most legal authorities would accept this, it is not in fact a true legal definition (*British Medical Journal*, 1954). So far the law has never defined sex, which is extraordinary in view of the homosexual laws in this country, and it is sometimes very difficult to say to which sex an individual belongs. Histological examination of the skin and of the polymorphs will reveal the chromosomal sex of the individual, which corresponds to the gonad sex, but this is not definite proof of the genetic sex. With the exception of the cases of female pseudohermaphroditism the hormone secretion estimations are not what one would have expected.

In Case 3 and in Dr. Swyer's case the oestrogen excretion in the urine is male level, which suggests enhanced response of the target organ to oestrogen or that there is another oestrogen not yet determined. In one of the female-role homosexuals with some signs of feminization the ketosteroid excretion and the sperm count are high. All of this goes to suggest that external sexual characteristics are dependent upon factors other than the level of hormone secretion.

It is obvious from the cases illustrated that it is sometimes not easy to draw a hard-and-fast line between the sexes and define exactly to which sex an individual belongs. In Case 3 the gonads are male and the chromosomal sex is male, and this patient might have a good case in claiming sex as male if the question of legacy, etc., in law arose, but would hardly be likely to be prosecuted for practising female-role intercourse with a male. On the other hand, Case 6 would be liable to be prosecuted, although I submit there are endocrine signs present suggesting a mild degree of feminization: such signs might pass unrecognized by the normal individual, but they are recognized amazingly easily by active male homosexuals. Such passive homosexuals have told me that at boarding school and in the Forces they are pestered by active male homosexuals, even by those they dislike and to whom they give no encouragement. One boy knew all his life that his outlook was female, but he had high moral principles and managed to steer himself through his public school life without physical contact in spite of the fact that he was attacked by the active homosexuals and his life made miserable. These active homosexuals were able to recognize what to me was not clinically obvious, yet I was interested to find that androgen excretion was low in this particular case. There is no doubt that active male homosexuals recognize passive male homosexuals by some means unknown. Is there a sixth sense?

In my experience these passive male homosexuals have really known all their lives that their outlook is female, and if when young they are subjected to interference by adult males this experience is not the initiating cause although often blamed as such.

It seems to me extremely likely that these homosexual characteristics are inborn and of genetic determination; this is supported by the research carried out by Kallmann (1952) on identical twins—both homosexual, although brought up in totally different environments. If this is so, psychoanalysis is a waste of time.

Active male homosexuals may be a different problem: I have had insufficient experience on which to express an opinion.

If passive (female-role) male homosexuality is of genetic determination it is open to consideration whether homosexuals should be subject to prosecution for physical expression of an inborn and genetic characteristic, an urge so strong that some individuals are unable to control it. In spite of the legal attitude towards homosexuality, society regards it as quite in order for a boy visiting a respectable household to have to occupy the same bedroom or even the same bed as the son of the house, for boys' boarding schools to sleep several boys in the same room, for hotels to accommodate two men in the same bedroom, or for British Railways to put two men alone in the same sleeper. The natural sexual urge must obviously be very strong: persons will go through fire and water and put themselves to all manner of hardships to achieve gratification. Nature has to make the instinctive urge strong or the human race would die out. The perverted urge may be no less strong. This is a legal problem, as also is the definition of sex. The medical profession also has a problem in its attitude to these diversities of sex. I think, so far as Cases 2 and 4 are concerned, it should be our duty as medical practitioners to repair physical abnormality and advise the patient to assume his or her true sex.

Case 3 is more difficult; it is obvious that it would be impossible to make the external appearances male. My advice would be to leave alone. I would not advise a plastic

vagina and be party to promoting relationships or a marriage which may well end in disaster. I do not consider the medical profession should further pathology. For the same reason I should consider it also wrong for physicians and surgeons to administer hormones and carry out plastic operations on homosexuals with the object of making homosexual transvestists appear more like the opposite sex—converting males into pseudofemales and females into pseudomales.

Summary

Diversities of sex are divided into hermaphroditism, pseudohermaphroditism, and homosexuality, and cases are described illustrating the different types. Attention is drawn to the fact that sex of gonads, chromosomal sex, and hormone excretion may not correspond to the external physical appearances. Passive (female-role) male homosexuals may present certain physical feminine characteristics and, whether this is obvious or not, active (male-role) male homosexuals can readily recognize female-role homosexuals. It is suggested that passive male homosexuality is of physical origin rather than due to psychological environmental circumstances. There is no definition of what constitutes male or female sex in medicine or in law.

The problem of what should be the attitude of the medical profession to this problem is discussed. The opinion is expressed that in cases of pseudohermaphroditism in which the patient's sex is anatomically obvious, with corresponding external characteristics excepting minor abnormality, treatment should be by hormones or plastic surgery and the patient assume the correct sex, but in all other cases of pseudohermaphroditism or homosexuality the medical profession should leave alone and not administer hormones and carry out plastic operations to further an already pathological condition.

I should like to thank Professor Charles Gray for the adrenocortical steroid analysis and Professor Marrian for estimating the oestrogen excretion in Case 3; Dr. J. E. Gray for determining the chromosomal sex; my surgical colleagues, Professor F. H. Bentley, Mr. David Smith, Mr. D. J. Tibbs, and Mr. Fenton Braithwaite, for their help; Professor Alexander Kennedy and Dr. Robert Orton for the psychological investigation of some of the cases; Dr. D. W. R. Ashby for asking me to see Case 1 when under his care; Mr. C. J. Duncan for the photographs; and Mr. D. P. Hammersley for the drawings.

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The possibility of using sulphate-reducing bacteria for the production of hydrogen sulphide, and hence sulphur, is being studied at the Chemistry Research Laboratory of the Department of Scientific and Industrial Research (*Chemistry Research 1954*, H.M.S.O., London). Significant progress has been made, but industrial application is unlikely to be economically attractive under existing conditions. However, the method might well be useful should there be the threat of another sulphur shortage. Sewage sludge is the most promising raw material for sulphide production that has been examined. Three problems have been investigated during the year—the rate of sulphide production in sulphated sludges, the inhibition of methane production, and the possible use of two reactors producing methane and sulphide separately to give a gas mixture from which sulphur could be recovered. Experiments indicate that under certain conditions it may be possible to produce both methane and hydrogen sulphide simultaneously from raw sludge.

TUBERCULIN-TESTING OF A SCHOOL POPULATION (MUSSELBURGH, 1953)

BY

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In recent years the results of tuberculin surveys in England and Wales have been published, and have shown differing degrees of tuberculous infection in different areas of these countries.

The unenviable post-war record of tuberculosis in Scotland is well known. Even after the belated downward trend in mortality had occurred, the notifications continued to increase, a trend which still persists. In view of this alarming situation, it seemed to us that a survey of tuberculin sensitivity in a Scottish area was overdue. It was thought possible that such a survey might show significant differences from the English and Welsh ones, and might conceivably shed some light on the perplexing problem of why the Scottish notification rate has remained proportionately high. No survey of this type has been published from Scotland, and the need to rectify this situation seemed to us to have some urgency, as it is obvious that the impending use of B.C.G. on a wider scale in school-leavers and in tuberculosis contacts will rapidly obscure the true picture of natural tuberculin sensitivity.

Musselburgh can be taken to be a representative Scottish burgh, with a population, including the surrounding area, of 21,800. It lies near Edinburgh, and, while there is a good deal of daily migration to this city, this is not so great as it might be, because there is adequate scope for employment in the town itself. In no sense can it be regarded as merely a dormitory for Edinburgh.

It is not thought that milk-borne bovine tuberculous infection has influenced our results to any great extent. The milk supply has been almost entirely heat-treated for the past ten years, and for some years before that the bulk of the milk sold in the town was retailed from a few dairies which employed heat treatment.

Housing in Musselburgh had been unsatisfactory until the last five or six years, since when much has been done to rehouse the overcrowded slum and tenement dwellers. The housing conditions can be taken to represent a typical picture of Scottish urban life, where overcrowding and poor conditions are commoner and more severe problems than in England.

Methods Used in the Survey

Propaganda was thought to be of great importance in order to secure the co-operation of the parents of the schoolchildren. The local newspaper generously gave space to the subject, and for several weeks before the campaign began articles were published explaining the objects of the scheme and describing the performance of the tests. Various organizations, town council, churches, and political clubs gave valuable support. All

the general practitioners were informed of the plan and asked to lend their weight to it.

Each schoolchild was given a leaflet to take home. This explained the tests and contained a consent form which the parent was requested to sign. If consent was not given at the earliest opportunity the child involved was shown the test being carried out and asked to tell his parents how simple it seemed. Thereafter, remarkably few parents withheld their sanction.

The positive reactors were x-rayed by the mass radiography unit at school, or in near-by convenient centres. The negative reactors who were within two years of school-leaving age were offered B.C.G. vaccination.

The positive reactors were given letters of explanation to their parents. In these, the significance of the positive test was briefly explained and the parent was given an appointment for interview. This interview was conducted by one of the doctors or by a health visitor, and details were obtained of the child's previous health, the housing conditions, and the home contacts, with their ages and occupations. Time-tables of available x-ray sessions in the town were given to the representatives of the family, and they were asked to try to ensure that all the people in the house were x-rayed. The response to the invitation to be interviewed was astonishing: 95% of those invited were seen and questioned. The response to the invitation to be x-rayed was less impressive, partly because not enough sessions of the mass unit could be secured at hours which did not clash with work.

Skin Tests Employed

The first test was a modified tuberculin jelly test. The skin between the scapulae was cleansed with acetone, six light strokes with flourpaper were given, and the jelly was applied in the form of a T. Control jelly was applied near by and the whole area was then covered by adhesive, which was removed at 48 hours (Dick, 1950). The test was finally read on the fifth day (Lendrum, 1951).

The criteria for acceptance of a test as positive were: (1) erythema and/or induration in the shape of the original application; (2) at least six papules or vesicles in the shape of the original application; and (3) no reaction at the site of application of the control jelly.

In negative reactors to this test a Mantoux test was carried out on the skin of the forearm, using 0.1 ml. of 1 in 100 old tuberculin (1 mg. O.T.). The test was read on the third day, which is thought to exclude some false-positive reactions seen if the tests are read on the second day. The criterion used for a positive reaction was palpable induration 5 mm. or more in diameter.

All the tests were performed and read by a small team of doctors and one experienced tuberculosis health visitor. Where any doubt existed in the interpretation of these tests, consultation between several observers took place.

Statistical Criteria.—Differences are not held to be significant if they are less than three times the standard error of the difference.

An Analysis of the Completeness of the Survey

An attempt was made to determine the tuberculin sensitivity of every schoolchild between the ages of 5 and 15 years in the local authority schools of the Musselburgh area.

Table I examines the success of this attempt by age groups and sets out the lapses by cause. The three age groups chosen correspond as nearly as possible to the three types of school: infants 5 to 7, primary scholars 8 to 11, and secondary scholars 12 to 15.

The total number of children tested (3,282) is 98.2% of the 3,342 children whose parents consented to testing (93.5%

of all the children on the school rolls). This compares favourably with the figures for the Calder Valley (Keidan *et al.*, 1952) and the Rhondda Fach (Jarman, 1953) surveys. The figures for these surveys are set alongside those for Musselburgh in Table II.

In the Rhondda Fach Jarman (1953) found that most of the lapses occurred in the younger age groups. He thought that "the refusal of parents to have their children skin-tested is mainly determined by the age of the child." Our experience on this point is quite strikingly different from his, and to bring this out the Musselburgh figures have been superimposed on Jarman's graphs (Fig. 1).

Effect of Previous Tuberculosis Prevention Work on the Present Survey.—Of the children who were found to be tuberculin-positive during the survey, 101 (64 males and

TABLE I.—Acceptances and Lapses in Musselburgh Schoolchildren by Age Groups

Group	Age*	Total No. on School Rolls	No. Completing the Tests	No. of Lapses, with Reasons			
				Consent Withheld	Absent from All Tests	Consent Received but Test Incomplete	
						1st Test Not Read	1st Test Neg. 2nd Test Not Read
Infants ..	5-7	1,097	1,004	59	18	7	9
Primary scholars	8-11	1,349	1,257	59	23	6	4
Secondary scholars	12-15	1,064	1,021	35	8	0	0
All groups		3,510	3,282	153	49	13	13

* Age is here reckoned as the age of the child on the day of the administration of the first test or, where no tests were given, on the day when the first test was performed on the child's classmates.

TABLE II.—Response of Schoolchildren in Three Different Tuberculin Surveys

Area	% on School Rolls Who Completed Tests	% Present at First Test Who Completed Tests	% Whose Parents Consented Who Completed Tests
Calder Valley ..	85	Not recorded	95.6
Rhondda Fach ..	71.9	76.0*	85.1*
Musselburgh ..	93.5	95.4	98.2

* These percentages are calculated from the published figures 3,410 of 4,484 and 3,410 of 4,004 respectively.

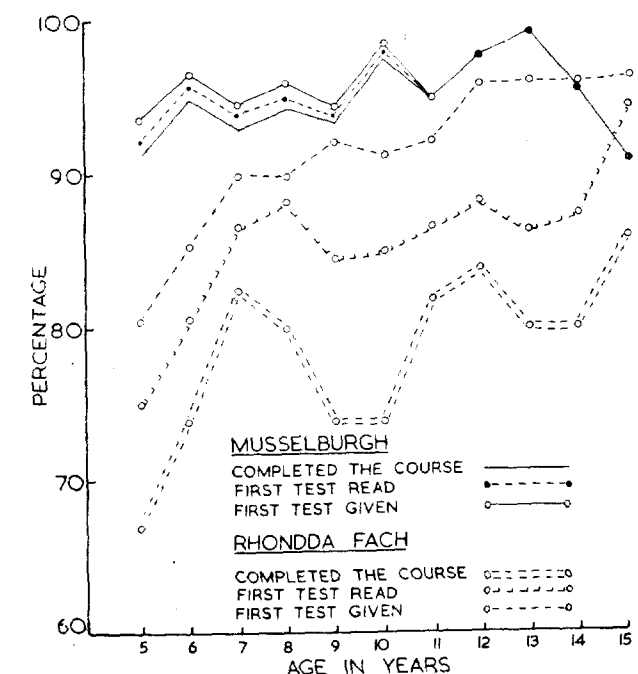


FIG. 1.—Percentage of children present on first day of test who completed each stage of course.

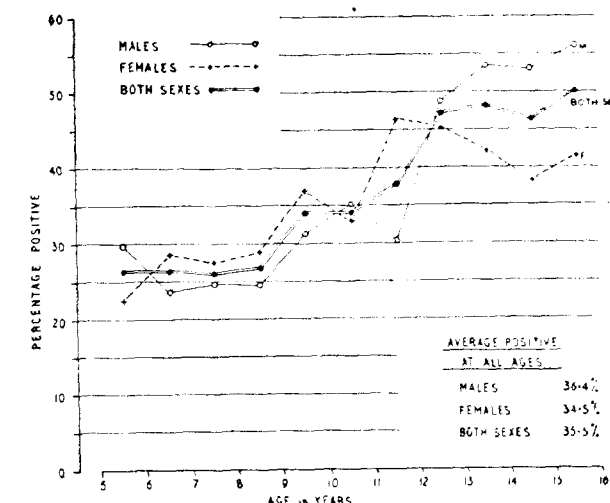


FIG. 2.—Percentage of tuberculin-positive male and female schoolchildren in the area.

TABLE III.—Sex Variations in the Tuberculin-positive Rate by Year of Age

Age	Males			Females		
	No. Tested	Tub. Pos.		No. Tested	Tub. Pos.	
		No.	%		No.	%
5	161	48	29.8	155	35	22.6
6	173	41	23.7	192	55	28.1
7	146	36	24.7	146	40	27.4
8	139	34	24.5	159	46	28.9
9	157	49	31.2	146	54	37.0
10	171	60	35.1	164	54	32.9
11	160	50	31.3	123	57	46.3
12	186	91	48.9	155	70	45.2
13	129	69	53.3	116	49	42.2
14	166	88	53.0	139	53	38.1
15	57	32	56.1	41	17	41.5
Total	1,645	598	36.4	1,536	530	34.5

37 females) were known to have been tuberculin-negative when seen as contacts and to have converted to positive after B.C.G. vaccination. Since we cannot estimate how many of these children would have become positive without B.C.G. vaccination they are excluded from the main analysis of results. The difference this makes to the percentage who were positive was fairly evenly distributed over the age groups.*

Results of the Tuberculin Tests

The results of the tests are considered by year of age in three different ways: first by sex, then as a whole and in comparison with other areas surveyed, and finally to compare two districts within our own survey area.

(a) Sex Variations in the Tuberculin-positive Rates by Year of Age

The sex variations are graphically represented in Fig. 2, and are set out in Table III. There is no significant difference between the percentage positive in the two sexes for all ages. Taking the ages individually it will be seen that the rates correspond very closely up to the age of 10. Thereafter the differences are in some cases greater, but only at two points do these differences approach significance—at 11 years $t=2.6$ and, again, at 14 years $t=2.6$ —but these differences are in opposite directions and we attach no importance to them.

Our results here correspond quite closely with the findings of the National Survey of the Medical Research Council (1952).

*This can be seen by comparing the total percentage positive in each year group in Fig. 4 with the percentages positive for Musselburgh in Table IV. In Fig. 4 the calculations are based on the inclusive figures, which include the 101 children who had had B.C.G. These children were excluded from the figures used for Table IV.

(b) Variations in Tuberculin-positive Rates by Year of Age in Musselburgh and Three Other Areas

In Musselburgh the ages of the 3,181 children tested varied from 5 to 15 years old. From 5 to 14 years the age groups are reasonably comparable so far as numbers are concerned, and only the 13-year group at 245 falls below the standard of "250 persons at each year of age" recommended by the M.R.C. (1952). The 15-year group contains only 98 children, and is relatively much smaller. This is explained by the fact that most children in Musselburgh leave school at the end of the term in which they reach their 15th birthday.

Of the 3,181 Musselburgh schoolchildren tested, 1,128 were tuberculin-positive and 2,053 tuberculin-negative. This 35.5% tuberculin-positive rate compares with 27.7% for the whole of England and Wales, 24.0% for the Rhondda Fach, and 39.0% for Calder Valley.

The Calder Valley results differ from ours and the other two in that children negative to the first test and failing to attend for the reading of the second test were counted as negative. If, as is done in the other surveys, these children are excluded so that the remaining population at risk can be related to the number definitely positive the overall tuberculin-positive rate for the Calder Valley recalculated from the published figure is 40.9%.

The results of the Musselburgh survey are set out in Table IV by age and the results of the other surveys put alongside for comparison. These are also illustrated in Fig. 3.

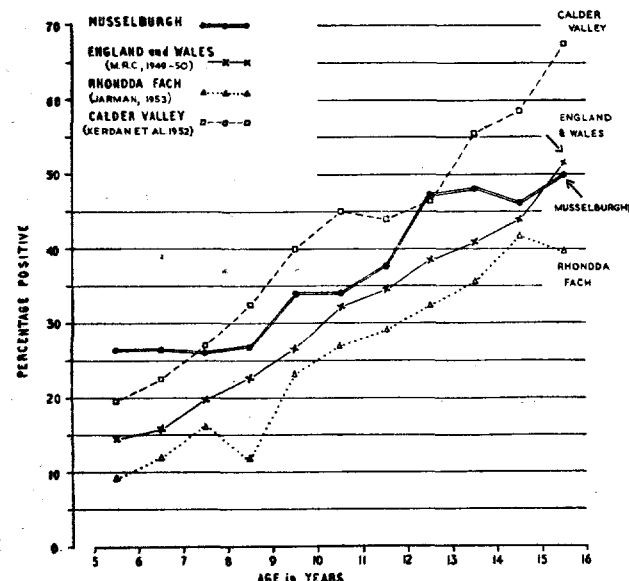


FIG. 3.—Tuberculin-positive rates of Musselburgh schoolchildren compared with those of other areas.

An examination of these figures and graphs shows that Musselburgh differs from the others in three respects. (1) The starting-point (26.3%) is higher than in any of the other areas. In the Calder Valley, which has the next highest starting-point (19.7%), the high initial figure was attributed to milk infection. In Musselburgh the milk is all "designated" milk* and we assume that we are dealing almost entirely with human tuberculosis. (2) The amplitude (26.3% to 50.0%) is smaller than in the other areas. (3) The rise with age occurs in stages in Musselburgh, whereas in the other areas the rise year by year tends to occur more smoothly.

In Musselburgh there would appear to be three quite distinct stages, 5 to 8, 9 to 11, and 12 to 15. Within each group there is no significant difference between the percentage positives from year to year (t is less than 1 in all

*Musselburgh is a "designated area." Most of the milk is "pasteurized," some is "tuberculin-tested," and a small amount is "certified."

TABLE IV.—Variations in Tuberculin-positive Rates by Year of Age in Musselburgh, England and Wales, Rhondda Fach, and Calder Valley

Age	No. Tested	Musselburgh		% Positive in Other Areas		
		No.	%	England and Wales (M.R.C.)	Calder Valley	Rhondda Fach
5	316	83	26.3	14.5	19.7	9.1
6	365	96	26.3	15.8	22.5	11.9
7	292	76	26.0	19.9	27.1	16.1
8	298	80	26.8	22.6	32.5	11.8
9	303	103	34.0	26.6	40.0	23.1
10	335	114	34.0	32.1	45.0	27.0
11	283	107	37.8	34.5	44.0	29.1
12	341	161	47.2	38.5	46.6	32.3
13	245	118	48.2	40.9	55.5	35.7
14	305	141	46.2	43.9	58.7	41.8
15	98	49	50.0	51.5	67.7	39.7
Total	3,181	1,128	35.5	27.7	39.0	24.0

TABLE V.—Tuberculin-positive Rates in Musselburgh Schoolchildren in Three Age Groups

Age Group	No. Tested	Tuberculin-positive			Value of t
		No.	%	S.E.	
5-8	1,271	335	26.36	± 1.24	—
9-11	921	324	35.18	± 1.57	4.41
12-15	989	469	47.42	± 1.61	5.48

cases), while between the groups the differences are well marked and are significant.

It may be worthy of comment that in the Rhondda Fach the results in the 5 to 8 group seem to form a consistent group, although in the later years the Rhondda Fach pattern conforms more to that of the other areas, where the percentage positive rate rises steadily from year to year.

The three age groups representing the rising stages in the tuberculin-positive rates correspond fairly nearly to the scholastic grouping into infant, primary, and secondary scholars (5 to 7, 8 to 11, and 12 to 15), only the one year, 8, being displaced into the younger age group. Table V sets out this grouping and gives the t values for the difference between the infant and primary and between the primary and secondary scholars.

(c) Variations in the Tuberculin-positive Rates by Year of Age in Two Districts Within the Surveyed Area

In an attempt to relate tuberculin-positive rates in schoolchildren to environment certain data relating to social conditions were obtained. These may be fully examined at a later date. It is, however, possible now to compare the results in two quite distinct districts of our survey area—namely, the mining villages of Wallyford and Whitecraig on the one hand and the town of Musselburgh itself on the other.

In Wallyford and Whitecraig 85% of the houses are of recent construction. They are local authority houses of three or more rooms, laid out according to modern housing standards, and having a bathroom and proper sanitary accommodation for each house.

Housing in Musselburgh is in sharp contrast to Wallyford and Whitecraig. Musselburgh Town Council has its new housing schemes, but most of the houses in Musselburgh are still old. Some fall below accepted housing standards; many houses are of one or two rooms, and there are tenements which have no baths and in which the sanitary accommodation is shared. In addition to the unsatisfactory nature of the actual houses, parts of the town are congested and the houses are cramped together. The two districts have a common milk supply.

Of the children tested 2,442 were from the town of Musselburgh and 739 from Wallyford and Whitecraig. Of the town children 37.7% ± 0.98 were tuberculin-positive, and of the village children 27.9% ± 1.65 . This is a significant difference ($t=5.2$).

The results by year of age in the two areas separately are set out in Table VI.

TABLE VI.—Comparison of Tuberculin-positive Rates in the Town of Musselburgh with Those in the Neighbouring Villages—by Year of Age

Age	No. Tested	Town		Villages		
		Tub. Pos.		No. Tested	Tub. Pos.	
		No.	%		No.	%
5	248	70	28.2	68	13	19.1
6	298	81	27.2	67	15	22.4
7	221	62	28.1	71	14	19.4
8	226	68	30.1	72	12	16.7
9	219	81	37.0	84	22	26.2
10	258	94	36.4	77	20	26.0
11	226	91	40.3	57	16	28.1
12	254	128	50.4	87	33	37.9
13	190	91	47.9	55	27	49.1
14	218	113	51.8	87	28	32.2
15	84	43	51.2	14	6	42.9
Total	2,442	922	37.7	739	206	27.9

Relationship Between the Jelly Test and the Mantoux Test

The jelly test is simple to administer and was used as a screen before giving the 100 T.U. Mantoux test. The alternative would be to use a preliminary Mantoux test of 1 T.U. or 10 T.U. The advantage of the jelly test as the first test is that it is easier to secure the co-operation of both parents and children when no initial needle-prick is involved and where at most there will, for the complete test, be only one needle-prick.

Objections to the use of the jelly test have been made because its reliability was said to vary with the age of the child. It was thought that because younger children have clearer skins the test is easier to read in them than in older children who may have a tendency towards acne.

On the other hand, the test has sometimes been described as inconclusive in younger children because of a larger number of non-specific reactions. We feel that by reading the test on the fifth day this risk was reduced to a minimum.

Our experience with the test bears this out. Fig. 4 shows the percentage positive for each year of age divided into "jelly-positive" and "additional" positive discovered by the Mantoux 100 T.U. test. The parallelism between the two sets of readings is quite striking and shows no consistent variation with age.

Jelly-test Results in Musselburgh Compared with those in Wallyford and Whitecraig

In the M.R.C. survey of England and Wales the jelly test gave a higher proportion of the total positives in the rural children. This was attributed to repeated reinfection from milk.

In our survey area there is no difference between the milk supply of Musselburgh on the one hand and Wallyford and Whitecraig on the other, and there is no significant difference between the percentage of total positives detected by the jelly test in the two districts (83.2% ± 1.2 in Musselburgh and 79.8% ± 2.1 in Wallyford and Whitecraig).

Our experience where there is no difference in the milk supplies and no difference in the proportion detected by jelly would seem to be a reasonable corollary to the M.R.C. findings.

Tuberculin Testing of Schoolchildren as a Case-finding Measure

Of the positive reactors in the schoolchildren 95.8% were x-rayed by the mobile mass radiography

unit visiting the schools. Six children were subsequently notified as having active pulmonary tuberculosis and three others remain under observation because of minimal radiological abnormalities. (Rate of confirmed cases 5.5 per 1,000.)

The contacts of the children with positive reactions were offered x-ray examination, and of those who came forward five were found to have abnormalities warranting notification. Six other cases have been placed under observation. Quite a number of other people availed themselves of the chance to be x-rayed while the units were in the district. Five other cases were notified from this group and six have been put on the observation list. Thus a total of 10 adult cases of tuberculosis were discovered among the contact group and the casual group, giving a rate of 2.5 cases per 1,000 x-rayed.

Discussion

As was hoped, the results in this survey provide an interesting comparison with recent surveys from England and Wales. It is fairly safe to make these comparisons because the tests used were similar. The accuracy and reliability of the tuberculin jelly test have recently been questioned, and we are well aware that it is by no means satisfactory in all respects. By adhering strictly to our criteria for reading a test as positive and by carrying out an intradermal test where any doubt existed, we feel that we have enhanced the validity of our results. Fig. 4 shows that the proportion at each age positive only to the intradermal test is constant at all ages, and this is additional evidence that our reading of the tests has been consistent. By reading the jelly test on the fifth day, we think that we have reduced the likelihood of false-positive readings, and our results are therefore at least as reliable as surveys in which this test was read at an earlier stage. It is now our view that the jelly test gives a sufficient number of doubtful readings to lead us to recommend that its use be avoided where the main purpose is scientific accuracy. On the other hand, for such purposes as the tuberculin-testing of young children where the acceptance rate might be adversely affected by the necessity for injection, we still feel that the jelly test has considerable advantages, especially when used by experienced observers. More recent experience suggests that a suitable compromise is available in the Heaf multipuncture test (Heaf, 1951).

Completeness and Losses

It will be seen from Table I and Fig. 1 that a very high consent rate was obtained to the performance of the tests, and a very high proportion of the children completed them.

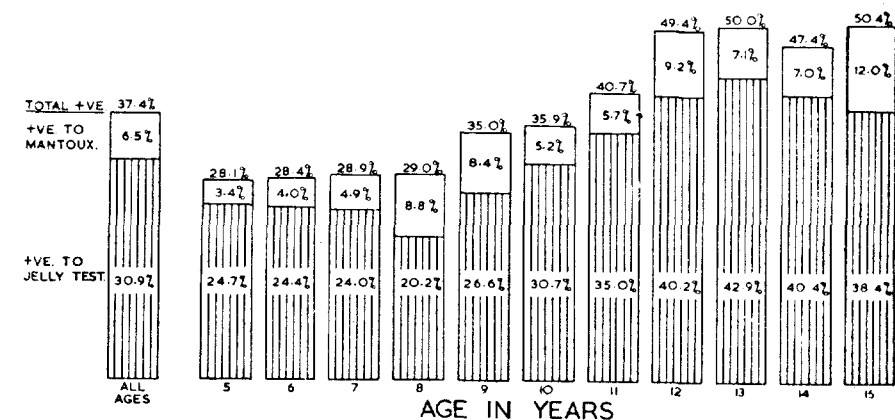


FIG. 4.—Musselburgh children. Percentage tuberculin-positive at each stage. The shaded area represents the percentage of children in that age group who were positive to the jelly test. The unshaded area represents the percentage negative to jelly test but positive to Mantoux test (1 mg. old tuberculin). The total percentage positive is given at top of each rectangle. The reasons given for excluding the 101 children who had had B.C.G. are not relevant to the subject matter of this chart. The percentages shown here are therefore calculated from the results of tests on all the children examined in each age group—a total for all age groups of 3,282.

This satisfactory response is ascribed to the harmonious co-operation of the public health staff and the hospital and clinic staff. In particular the availability of the facilities of the school health service gave us an instrument already geared for this type of work, and the cordial co-operation of the director of education, headmasters, schoolteachers, and school nurses did a great deal to secure the trust and co-operation of the parents. Other helpful influences were the support of the general practitioners, the town council, and local youth clubs. This survey demonstrates that practically complete acceptance of a public health or preventive measure can be carried out by the enthusiastic co-operation of all the interested authorities, when enlightened propaganda has paved the way. It is probable that this is one of the most important lessons to be drawn from the survey—that large surveys can be made acceptable to the general public by painstaking preparation and using only existing machinery and staff.

Comparison with Other Surveys

Several interesting points arise in the comparison of our results with other surveys. The average number positive at all ages (5 to 15) in Musselburgh was 35.5%, with no significant sex differences. The comparable figure for England and Wales was 27.7% (M.R.C., 1952).

The graphs giving the percentage of positives with increasing age show that in Musselburgh the graph starts at a singularly high level when compared with the National Tuberculin Survey, and yet it ends at the same level at age 15. Thus in Musselburgh 26.3% were positive at 5 years, and yet this only goes up to 50% at age 15 years, whereas in the Calder Valley the comparable figures are 19.7% and 67.7%. These figures suggest that children in the 5 to 8 age group in Musselburgh have been exposed in an unusual degree to tuberculous infection. Could this be a reflection on the post-war increase in respiratory tuberculosis in Scotland? It may be that the children who were tiny in the peak years 1945 to 1949 would be most affected by this phenomenon, since they were mainly the children of young adults on whom the brunt of the increase fell.

One interesting feature is the comparison between the positive rates at different ages in the areas we have designated urban and rural. There was a significantly lower level of positives at all ages in the rural population. We feel that milk supplies cannot be held responsible for this difference, because in both areas practically all milk comes from the same sources. It is conceivable that the main cause for this difference is to be found in the fact that almost all the families designated rural lived in relatively new houses. There is, however, no evidence that overcrowding was any less severe or less frequent in the rural families than in the urban, but there is no doubt that the building sites were much less overcrowded, giving the children more scope for playing-spaces. Also the newer houses were of a very much higher structural standard and much better from the point of view of sanitation, lighting, and ventilation. Likewise, none of the new buildings had common entries and none had shared sanitary facilities.

The fact that 50% of children of school-leaving age had negative reactions is support for the B.C.G. vaccination of this group, and it is satisfactory to note that such a scheme has since started.

Examination of Contacts of Tuberculin-Positive Schoolchildren as a Case-finding Measure

As regards the efficacy of this type of survey as a case-finding manoeuvre, it is apparent from our figures that six cases of active tuberculosis were found among the schoolchildren. This was a valuable diagnostic procedure. Most of these cases would, however, have been detected by the school-leavers' B.C.G. campaign now in action, since they nearly all occurred in the older children.

It is, however, equally apparent that the examination of home contacts of children with positive reactions was not a very useful way of finding cases, since only five notifica-

tions resulted. It is advisable to remember that the amount of work expended on detecting these five cases was very considerable. It is indeed a fact that an equal number of cases came to light through x-ray examination of the general public, who came to the units simply because they had heard they were in the district. In this way five notifiable cases were detected. While we cannot claim that these five cases were diagnosed as a direct result of our survey, yet our propaganda undoubtedly had an effect in bringing them to the x-ray unit.

Summary

In Musselburgh 3,282 children between the ages of 5 and 15 years were tested for sensitivity to tuberculin. This figure represented 93.5% of the total school population. Consent had been obtained for the testing of 98.2% of all the children.

Of the youngest group 26.3% were positive, and of the 15 years age group 50% were positive.

Six cases of active pulmonary tuberculosis were found in the schoolchildren and five cases among the home contacts of the children with positive reactions. Thus examination of contacts of these children with positive reactions did not seem to be a very good case-finding measure.

We are greatly indebted to Dr. John Riddell, Medical Officer of Health for the County of Midlothian, for his co-operation and advice at every stage of this survey and for his permission to publish the material here presented. The Secretary of State for Scotland, on the recommendation of the Advisory Committee for Medical Research, made us a grant which we gratefully acknowledge. The grant covered the modest costs of the survey that are not covered by the normal Health Services—this included the employment of one extra female clerk. For the office work we would particularly like to thank Mr. B. Murray, Tuberculosis Clerk for the Midlothian Health Department, whose untiring energy did much to keep the clerical work abreast of the field work. To the Director of Education and his staff, the Nursing Supervisor and her staff, to general practitioners and clergy, members of the Town Council, and many members of the general public who helped in various ways our thanks are also due.

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In the latest annual review of the Rockefeller Foundation's programme, Mr. DEAN RUSK, the president, has this to say about the Congressional investigation of tax-exempt foundations last August. "If the Congress determines that it wishes a special Committee to look into tax exemption problems, our view is that we have an obligation to co-operate by furnishing the information desired. Unfortunately, that is not the end of the matter; the validity of the investigative process is affected by the sense of responsibility with which it is used. Repetitious investigation imposes unnecessary burdens upon those under scrutiny and adds little, if anything, to the information of the Congress. Investigations which are basically accusatory in character may, in the absence of great care, exceed the proper role of legislative investigation and infringe the established rights and privileges of those being investigated. Charges loosely framed or unsupported by facts offer no ascertainable issues on which to make reply and yet may damage reputable citizens and institutions. If fact-finding is distorted by partisan considerations, innocent bystanders are injured in the fray. If the same individuals act in both accusatory and adjudicative roles, injustice is the almost inevitable result. That the Congress itself is concerned about investigative procedures is a hopeful sign that common sense and the traditional concepts of government by law will be sustained."

VAGOTOMY WITH GASTRO-ENTEROSTOMY FOR DUODENAL ULCER

BY

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In the past few years there has been increasing agreement that a Billroth I partial gastrectomy alone is the most satisfactory surgical treatment for chronic gastric ulcer which is not associated with a duodenal ulcer or a high acid curve, and that this operation in a modified form can be used for ulcers very high up on the lesser curvature of the stomach. Only when the ulcer is high and posterior, adjacent to the oesophagus, is it necessary to use a transthoracic approach and perform an upper partial gastrectomy. For the more common case of duodenal ulcer, with its wider age incidence, which fails to respond to medical treatment there is much less agreement. Some surgeons—for example, Ogilvie (1953)—would not, in the absence of complications, advise an operation below the age of 40, but there are many cases in which a dangerous and incapacitating illness had started at least 20 years previously. It has been found impossible to be completely successful, by removing enough stomach to prevent further ulceration, without producing disturbances due to an insufficient organ. A subtotal gastrectomy cures duodenal ulcer, with only about 2% of proved recurrences, but about 10% of cases subsequently suffer from unpleasant symptoms and nutritional defects which at least make one hesitate to advise a high gastrectomy for young patients. There is much truth in Napoleon's saying that an army marches on its stomach.

Since 1948 one of us has submitted 269 cases of duodenal ulcer to vagotomy. It was quickly realized that if vagotomy was performed alone the result was usually unsatisfactory owing to gastric retention. Ulcer pain was relieved, but this was replaced by foul eructations, diarrhoea, and loss of weight. A barium-meal x-ray examination often showed a large 24-hour gastric residue even though the patients had no stenosis of the duodenum at the time of the vagotomy. The earlier a gastro-enterostomy is performed on these patients the better will be the permanent result. It was then decided to try vagotomy combined with posterior gastro-jejunostomy. Schindler (1937), from gastroscopic observations, found that a gastro-jejunostomy was more satisfactory if placed as near the pylorus as possible. It was considered even more important to drain the lowest part of the stomach when atonic following vagotomy. Incidentally, a low posterior gastro-jejunostomy is more easily converted to any form of partial gastrectomy than a high vertical one, should this prove necessary.

The vagotomy was always performed through the abdomen after mobilizing the left lobe of the liver. This latter procedure makes the operation easier, safer, and more certain. We also consider that Somervell clamps, which are non-crushing and yet non-slipping, contribute to the absence of complications in both gastro-jeuno-

stomy and partial gastrectomy. Convalescence is usually uneventful: most of the patients can dispense with the Ryle tube in 48 hours. A post-operative chest complication was the commonest cause of a delay in recovery, but many of the patients suffered from chronic bronchitis. The operation is very safe; only one patient died in the post-operative period: a week after his operation he developed bronchopneumonia during the onset of a severe influenza epidemic. He died 48 hours later, and a post-mortem examination confirmed the diagnosis, but no cause for his death was found in the abdomen.

According to Johnson and Orr (1953), G. Crile, jun., and his colleagues have used this operation over 400 times, with a mortality less than $\frac{1}{2}\%$. His recurrence rate was 6%, but this was regarded as better than radical gastrectomy, with an operative mortality of 4% and a recurrence rate of 1%. Series of gastrectomies have been performed with a mortality under 2% (Tanner, 1954), but Johnson and Orr found a 4% mortality in a collected series of 3,000 post-war gastrectomies.

Illingworth (1953) has drawn attention to the comments of Jordan (1952) in her exhaustive report for the American Gastroenterological Association on the various surgical procedures. She compared the results of 842 cases of gastric resection with 633 cases of vagotomy plus gastro-jejunostomy (see Table):

Gastric Resection Compared with Vagotomy plus Gastro-jejunostomy

	Gastric Resection	Vagotomy + Gastro-jejunostomy
No. of cases	842	633
Primary mortality	3%	1.3%
Recurrent ulceration	1.7%	2.7%
Freedom from symptoms, return to work, and absence of post-operative haemorrhage	86.4%	78.8%

In this country, Pollock (1952) has reviewed 1,524 cases of vagotomy used alone and with other procedures. He found 12% of unsatisfactory results in a collected series of 511 cases of vagotomy combined with gastro-jejunostomy: 8% had recurrent ulcer pain, but in only 1% was there a proved recurrence. The follow-up, however, was for more than three years in only 7%. Hand and Patey (1953) have been disappointed in their results of vagotomy, but they combined it with gastro-jejunostomy in only eight cases, with one relapse. They combined vagotomy with hemi-gastrectomy in 17 cases and no recurrence of ulceration has occurred so far.

Late Results

Tanner (1954) has stated that no definite conclusions can be drawn from anything less than a five-year follow-up for an operation performed for peptic ulcer. We agree with that policy, but it becomes progressively more difficult to trace old patients, and an increasing number will die of unrelated diseases. We therefore decided to examine and fill in a questionnaire for all those patients who had been operated on between six and four years previously. Ninety-five patients were in this category, and with persistence it has been possible to follow up all of them.

Five male patients had died in the intervening years. The deaths were due to carcinoma of the bronchus, coronary thrombosis, influenza, and intestinal obstruction with a lung abscess due to peritonitis from appendicitis in earlier life. These four patients were apparently cured of their duodenal ulcer, which gave no further symptoms; three of them died in hospital, and a post-mortem examination revealed no active ulcer. The fifth non-survivor was an early case: a man aged 67, who had a gastro-jejunostomy 10 months after his vagotomy, at first progressed favourably, with gain in weight. Later he developed pain in the left iliac fossa, with radiological evidence of extensive

diverticulitis. A rapidly progressive psychosis caused his death in a mental hospital. There was never any definite evidence that this man's later abdominal symptoms were due to his duodenal ulcer or to the surgical treatment. It has, however, been found by others that, if the "drainage" operation on the stomach is not performed at the time of the vagotomy, symptoms presumably due to gastritis are more likely to occur.

Seven of the 95 patients developed symptoms of recurrent ulceration—six had recurrent pain, while one developed melaena; all these were submitted to a further operation. It is noteworthy that in two of these cases, both early ones, the operation notes stated that the vagotomy was probably incomplete. An insulin test meal confirmed the incompleteness of the vagotomy. A further four patients had slight attacks of pain, probably due to recurrent ulceration. One of these had a small haematemesis, so there was no doubt about the presence of at least a temporary ulcer in this case.

We are very pleased with the result in the remaining 79 cases with no history of recurrent ulceration. Some of them, especially the older ones, have other diseases, with chronic bronchitis heading the list, which are not directly related to the duodenal ulcer. The majority have no symptoms whatsoever, and all display no nutritional defect. It is usual for the patient to retain his or her occupation, or even to obtain a better and more strenuous one, without losing weight. One young man has resumed playing Rugby football, which is not usual after a high partial gastrectomy. Serious diarrhoea was seen only after vagotomy without a "drainage" operation. Constipation is common among patients with duodenal ulcer who are chosen for operation chiefly because they are eating so little: a return to a normal daily evacuation was the most common post-operative result. It has already been recorded that an afferent-loop syndrome is rare after this operation compared with a high Polya partial gastrectomy (Wells and MacPhee, 1952). It was more likely to occur if vagotomy was performed on a patient who already had a high rather than a low gastro-jejunostomy.

Secondary Operations on the 4- to 6-year-old Cases

It is appropriate here to discuss the fate of the 7 patients of the 95 who were submitted to further operative procedures for recurrent symptoms. The two cases in which the vagotomy was incomplete were submitted to a Polya partial gastrectomy. The result was excellent in one patient and fairly good in the other, who has some dumping and occasional vomiting. Removal of the pyloric antrum below the stoma, with closure of the duodenum, was performed in four cases, with a satisfactory result in two. The two failures were both in women, who complained of symptoms suggesting an afferent-loop syndrome. A Billroth I conversion of both of these unsuccessful pylorotomies has resulted in cure of one, but it failed to relieve the other of attacks of pain and vomiting. With these symptoms she still looks well and has not lost weight. In spite of cancer-phobia and an unsuccessful second marriage, it is thought that her symptoms are genuine. Professor Wells has recently converted her gastrectomy to the Roux-en-Y type, so we await the final result with interest.

Findings at the Secondary Operations

So far as we know, no case of perforated ulcer has occurred in the 240 cases after the operation of vagotomy and gastro-jejunostomy. Out of this total, 17 patients have undergone a secondary operation with no mortality. No jejunal ulcer was seen and a stomal ulcer was found in only two cases. One of these followed incomplete vagotomy performed on a patient who had already had an operation for a perforated duodenal ulcer, and a subsequent posterior and an anterior gastro-jejunostomy performed by various surgeons. A partial gastrectomy had been contemplated on two of these occasions, but the extensive peritoneal adhesions dating from the perforation had caused each surgeon to

retreat from his original plan. After partial gastrectomy, finally performed with great difficulty, and a convalescence marred by jaundice due to incompatible blood transfusion, the patient made a good recovery. He has now been working at the coalface for some years, with no dyspepsia.

In those cases with symptoms—for example, haematemesis—suggestive or conclusive of recurrent ulcer the original duodenal ulcer appeared to be the cause, but at the second operation the oedema and crater had always disappeared; in fact, the ulcer seemed to be healed. A recurrent gastric ulcer has been found on only one occasion. This patient, a young woman, had already had two perforated duodenal ulcer closures when submitted to vagotomy and gastro-jejunostomy. A Billroth I partial gastrectomy has now apparently cured her. It is interesting that a fractional test meal examination just before her third operation showed a low acid curve, so it is possible that her gastric ulcer either was missed at this time or was too small to feel.

Type of Secondary Operation

Nine of the earlier failures of vagotomy with gastro-jejunostomy were submitted to either pylorotomy or a Polya partial gastrectomy, just over half the stomach being removed if there was evidence that the vagotomy was incomplete. Two of these cases, already mentioned, have been converted to Billroth I anastomoses. In addition eight further cases have been converted to a Billroth I partial gastrectomy, all with an excellent result. This means that there has been only one failure out of 15 secondary cases, and even this case might be finally cured.

A peritoneal adhesion occluding the efferent loop of the gastro-jejunostomy once made it necessary to reopen the abdomen 10 days later: no further trouble occurred in this case.

Jaundice due to a large duodenal ulcer is rare. Three such cases have been encountered, requiring in addition cholecystenterostomy: two of these have been successful, one for six years, but the third later developed fatal ascending cholangitis due to stenosis of the biliary anastomosis.

Discussion

Vagotomy, including attempted vagotomy, combined with a low gastro-jejunostomy, has given a very satisfactory result for duodenal ulcer, lasting between four and six years in 88%. The operation is very safe and has not caused any reactivation of phthisis in four patients with major quiescent lung lesions. A secondary operation was required in 7.4%, and a Billroth I conversion has been found to be the most satisfactory way to relieve the failures, which are not all due to recurrent ulceration. In view of the further 5% of patients with slight symptoms who must be regarded as unstable, and the success obtained with a Billroth I conversion, it was obvious that we should try vagotomy combined with a Billroth I resection as a primary operation wherever possible. This has now been done in 30 cases. At first only those with a wide duodenum were regarded as suitable. The operation is now considered possible in all cases (Schmitz *et al.*, 1954) by splitting the anterior wall of the duodenum. There has been no mortality so far, but we feel that in poor-risk patients, especially if there is a large oedematous ulcer, it may still be wiser to perform vagotomy with gastro-jejunostomy, which allows a Billroth I resection later if necessary, when the duodenum will take more kindly to sutures.

The immediate post-operative recovery has been satisfactory apart from two cases which had excessive intra-gastric bleeding. One of them had to be reopened 10 hours later, when a bleeding artery was found near the lesser curvature of the stomach. The whole anastomosis was resutured and the patient made a good recovery. The early results after leaving hospital, including gain in weight, appear satisfactory, but a few years must elapse before they can be truly assessed. Wells and MacPhee (1954) and R. Welbourn (1954, personal communication), by different

routes, have come to the same conclusion—that vagotomy and Billroth I resection should be tried further. Vagotomy and limited partial gastrectomy has been very successful in the hands of Johnson and Orr (1953).

Summary

For duodenal ulcer, excluding cases of acute bleeding but including a few perforated cases which required more than simple closure, the operation of abdominal vagotomy combined with a low gastro-jejunostomy is a very safe procedure and appears to produce good results lasting four to six years in 88%.

The failures (7%) were submitted to a further operation without mortality: all except one case have been relieved.

A Billroth I conversion was the most satisfactory secondary procedure; also, vagotomy combined with a Billroth I partial gastrectomy may prove to be the best primary procedure.

Vagotomy should be included in the treatment of duodenal ulcer because only 50% of permanent good results can be expected from gastro-enterostomy alone.

We now regard vagotomy combined with gastro-jejunostomy to be at least the best second-choice operation.

Most of the follow-up work was done by S. O'D., but we are indebted to Mr. Harrah Thompson for following up the cases at the Royal Southern Hospital during his tenure of the post of surgical registrar.

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EFFECTS OF DORSO-LUMBAR SYMPATHECTOMY ON PEPTIC ULCERATION

BY

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Extensive dorso-lumbar ganglionectomy and splanchnicectomy as carried out from the treatment of hypertension interrupts the sympathetic nerve supply to the stomach (Bingham *et al.*, 1950); by masking symptoms it may have a harmful effect on the course of peptic ulcer. Frequently it is only by complications such as pyloric obstruction, perforation, or haemorrhage that the ulcer announces its presence. The following case illustrates these features.

Case Report

A male shipping clerk aged 38 was admitted in April, 1949, suffering from angina of effort. This had started six months previously, when he had breathlessness and pain

down the inner side of the left arm on exertion; a week later the pain became substernal and compelled him to stop when walking. During the six weeks before admission pain had come on at rest and had lasted about five minutes. He gave a previous history of an appendicectomy for vague dyspeptic symptoms in 1930; the operation had given him relief, but at intervals he had continued to have mild epigastric discomfort. There was no history of nephritis or other renal lesion. The family history was indefinite; his mother had died in childbirth and his father died suddenly at age 40, cause unknown.

He was a moderately well nourished man whose blood pressure remained between 230/130 and 220/130 during his stay in the medical ward. The fundi showed early vascular changes but no haemorrhages, exudates, or papilloedema. Clinical examination of the heart, lungs, abdomen, and central nervous system was negative and there was no albuminuria. A cardiogram taken in March, when he was an out-patient, had shown evidence of ischaemia in the shape of terminal inversion of the T waves in lead V₄; but on admission the cardiogram at rest was normal. Radiologically the heart shadow was normal and the lung fields were clear. Intravenous pyelography showed normal concentration and excretion of the dye, and no abnormality was demonstrated in either kidney. Urea clearance was 74%, maximum urea concentration 2.3 g. per 100 ml., and blood urea 36 mg. per 100 ml.

In May, 1949, a left dorso-lumbar ganglionectomy and splanchnicectomy was performed by the transpleural route, the ganglia from D6 to L1 being removed. After this he had complete relief from angina of effort. His blood pressure remained in the region of 155/110 until the beginning of October, when it began to rise again. During this period, however, he complained of vague epigastric discomfort and distension with occasional slight nausea.

He was readmitted in November, 1949, with a blood pressure of 198/118, and a right dorso-lumbar ganglionectomy and splanchnicectomy was performed, the ganglia from D6 to L1 being removed. After this operation he remained completely free from angina, and his own doctor never found his systolic blood pressure higher than 180. However, he began to have attacks of epigastric distension and vomiting. At first these attacks occurred at intervals of several months, but later the intervals shortened to two or three weeks. During the attacks vomiting was profuse and continued at 24 hours or more until the stomach was completely emptied; food taken the previous day was sometimes recognized. His appetite failed, he lost weight, and he experienced increasing constipation. Pain was absent throughout. He was seen in consultation on July 25, 1951, when a diagnosis of pyloric stenosis was made; at that time his blood pressure was ranging between 160/100 and 140/90. A barium-meal examination showed a large resting content in the stomach and a marked degree of pyloric stenosis, which was not lessened after treatment with atropine. He was admitted once more in August, and laparotomy was performed in September. There was a large active chronic ulcer of the anterior duodenal wall, covered by omental adhesions; the stomach was dilated and its muscular wall was much hypertrophied. A posterior (no-loop antiperistaltic) gastro-jejunostomy was performed.

He remained well for eight months, then began to have a sense of fullness after meals with anorexia but no pain. On August 24, 1952, he was awakened with sudden severe pain radiating over the whole abdomen and accompanied by tenderness and rigidity. A laparotomy was carried out (Mr. J. Hinton Robertson); after evacuation of a considerable quantity of gas and fluid, a perforated jejunal ulcer was located diametrically opposite the stoma of the gastro-jejunostomy. This was closed by suture. During convalescence a fractional test meal showed total acidity of 48 units and free HCl 22 units. Two months later the gastro-jejunostomy was undone and a partial gastrectomy was

carried out, four-fifths of the stomach being removed; continuity was restored by an anterior Polya with Hofmeister valve anastomosis.

When last seen (November 15, 1954) he was working again and doing more than he had been able to do for many years, but had given up sport. He has remained completely free from angina of effort, despite the fact that his blood pressure has returned to the pre-operative level; recent readings have been 220/130 (October 30, 1953); 200/110 (September 3, 1954); 240/134 lying, 220/130 standing (November 15, 1954). Changes in the retinal arterioles have advanced, but the heart shadow remains normal radiologically, and the cardiogram was still physiological. During the past year he has from time to time had pain in the left upper abdomen, sometimes three hours after food, sometimes waking him at night. A barium-meal examination showed normal progress from the remaining portion of the stomach to the jejunum, and no evidence of ulcer was seen: progress through the small bowel was accelerated.

Discussion

Painful sensations arising in the abdominal viscera are transmitted by afferent fibres which accompany the sympathetic nerves and pass uninterruptedly through the sympathetic ganglia to enter the spinal cord by the posterior nerve roots. Dorso-lumbar ganglionectomy will abolish those forms of abdominal visceral pain which are normally transmitted through the sympathetic. When perforation occurs structures supplied by other afferents are involved, including the parietal peritoneum; pain from here reaches the spinal cord by way of the peripheral nerves and is not abolished by dorso-lumbar ganglionectomy.

Froehlich *et al.* (1942) reported four cases in which sympathectomy was performed as treatment for gastric ulcer. In all of them the distress was relieved and the ulcer craters showed radiographic evidence of healing. Sicard *et al.* (1945) carried out splanchnicectomy in eight cases of gastroduodenal ulcer. Although there was some relief of ulcer pain, cure was not complete. Five required gastric resection within 18 months.

Harkins and Willard (1950) speak of the relief of pain as "a Pyrrhic victory" in reporting a case of peptic ulcer in which sympathectomy had adverse effects. Weeks *et al.* (1946) describe the case of a man with duodenal ulcer and malignant hypertension. A transthoracic vagotomy was performed and at the same time the left thoracic-lumbar sympathetic chain was removed from D5 and L2. Two weeks later the second-stage sympathectomy was carried out on the right side from D5 and L2, after which the patient became extremely ill and died on the 15th post-operative day. Necropsy revealed a perforated duodenal ulcer with general peritonitis. An interesting feature was the absence of abdominal pain in the presence of a perforated ulcer and peritonitis. The authors state: "His absence of pain may have been due to the removal of the viscerosensory fibres associated with the sympathetic side of the autonomic nervous system." Blegen and Kintner (1947) describe a case with gastric ulcer which had three massive haemorrhages following extensive unilateral sympathectomy, and point out that the sympathectomy relieved the pain but the ulcer progressed.

Mason and Pollard (1949) found 13 instances of peptic ulcer in a group of 1,498 patients who underwent splanchnicectomy for hypertension during an 11-year period. They point out that frequent and severe complications developed in 12 because the normal epigastric pain sensation was either abolished or greatly reduced so that ulcers were permitted to advance without giving the usual warning.

The present case illustrates progression of a duodenal ulcer and development of pyloric stenosis after bilateral dorso-lumbar ganglionectomy and splanchnicectomy carried out for hypertension; a jejunal ulcer subsequently developed and later perforated. Pain was conspicuous by its absence while the original ulcer was progressing and while the jejunal

ulcer was developing, but severe pain occurred when the latter perforated. After dorso-lumbar ganglionectomy and splanchnicectomy the pain which characterizes exacerbations of a peptic ulcer is abolished; it is therefore suggested that in such cases more attention should be paid to vague abdominal symptoms which may take the form merely of slight epigastric discomfort or fullness.

It is well known that the lowering of blood pressure which results from sympathectomy has often been transient. Hypertension has recurred within 5 to 10 years in a high percentage of cases (Smithwick, 1948). In the present instance hypertension was abolished for three years but had returned by the end of the fifth year. The mechanism underlying recurrence of hypertension after sympathectomy is not fully understood. During the fifth year abdominal visceral pain returned; but it may well have arisen in the colon. The sympathetic nerve supply from the colon was not interrupted by the original operations.

Summary

A case is presented showing the progression of a duodenal ulcer following bilateral dorso-lumbar sympathectomy and splanchnicectomy, the subsequent development of a jejunal ulcer, and its ultimate perforation. The effect of sympathectomy on the pain of peptic ulcer is described and its mechanism is discussed.

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MALARIA AND THE SICKLING TRAIT

BY

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This paper reports confirmation of Allison's (1954) conclusion that the possession of the sickling trait confers some protection against *P. falciparum* malaria, but it presents somewhat different views on the nature and extent of this protection.

Of the two experiments performed by Allison, one determined the parasite rates in children under 5 years of age in the Kampala region, mostly (Allison, personal communication) in the out-patient department of Mulago Hospital. Forty-three sickling children showed a parasite rate of 27.9%, and 247 non-sicklers a rate of 45.7%. This difference seemed so striking that it was reasonable to wonder why it had not already been noticed, or whether some feature of the experiment had accentuated a difference that was real, but actually of lesser magnitude. Indeed, since *P. falciparum* clearly can establish itself in the peripheral blood of sicklers, and can even multiply in the erythrocytes of cases of sickle-cell anaemia (in which there is no normal adult haemoglobin), it seemed reasonable to suppose that the effect of the presence of sickle-cell haemoglobin could not be to prevent an infection, though it might well limit the extent to which an infection could develop. If this were confirmed, quite sufficient explanation would have been given of the way in which *P. falciparum* infection could act as a selective agent in preserving high sickle-cell gene frequencies in endemic malarial regions, because it is

well known (Field, 1949) that the mortality from falciparum malaria is related to the height of the parasite count. But in that case some explanation would have to be found for the apparent difference in parasite rates observed by Allison in sicklers and non-sicklers respectively. And, since the results of Allison's inoculation experiments do not fully accord with the view advanced above, this view would have to be reconsidered if confirmation of his results should be obtained. This last question is not considered further here.

It was decided to repeat Allison's first experiment on the same type of patient, with the addition that parasite counts should be performed on all falciparum infections encountered, and to continue certain other observations that were already in progress.

Malaria Infection in Relation to Sickling

Three groups formed the basis for this study—two of children and one of adult women.

Group I

The subjects examined were 1,200 children under the age of 10 years presenting for any reason (very often "fever") at the medical out-patient department of Mulago Hospital, Kampala. They were taken without selection during a two-to three-hour visit by a native laboratory assistant, who recorded their personal details, and collected from each a thick and a thin blood film and a few drops of blood in saline. All the specimens were examined by me. Sickling was tested for in a 24-hour culture of *Bact. coli* and read at two to four hours, and paper electrophoresis was performed if necessary. Malarial species diagnosis was made on thick blood films, but the thin films were used if any doubt existed.

Malaria was detected in 638 of the children—90 times in 191 sicklers (47.1%), and 548 times in 1,009 non-sicklers (54.3%). For this difference in favour of sicklers, $\chi^2 = 2.65$, $n = 1$, $0.2 > P > 0.1$, and thus the possibility that the difference had arisen by chance was rather high. But this does not take account of the species of parasite present. If we exclude the *P. ovale* infections (7 in number), and 11 cases in which the species could not be determined with accuracy (there were no *P. vivax* infections), and consider only infections with *P. falciparum* and *P. malariae*, a different picture emerges. In compiling Table I, cases in

TABLE I.—Incidence of *P. malariae* and *P. falciparum* Infections in Sicklers and Non-sicklers, Among 1,200 Children under 10 years of Age at a Medical Out-patient Department

Age in Years	Sickling State	No. of Cases	<i>P. malariae</i>		<i>P. falciparum</i>		χ^2 (n.d.)
			No.	%	No.	%	
Under 1	Positive	68	7	10.3	32	47	1.15 (P > 0.2)
	Negative	325	15	4.6	130	40	
1-2	Positive	59	6	10.2	20	34.4	10.13 (P < 0.01)
	Negative	288	21	7.3	163	56.5	
2-10	Positive	64	3	4.7	21	32.8	7.11 (P < 0.01)
	Negative	396	37	9.3	201	50.8	
Total	Positive	191	16	8.4	73	38.2	7.4 (P < 0.01)
	Negative	1,009	73	7.3	494	49.3	

which these two species were present together have been counted as separate infections (in 36 children). In the whole 1,200 children there was no indication that the incidence of *P. malariae* was affected by the sickling state of its hosts, but the numbers showing this parasite were not great. *P. falciparum*, however, was very noticeably commoner in non-sicklers, except in the first year of life. It will be noticed that the apparent protection against all forms of malaria, and even against *P. falciparum*, is much less in this series than in Allison's (1954). It may be added that the two main tribal groups covered by this survey had closely similar sickle-cell frequencies: the largely rural Baganda

showed a higher malaria rate than the urban and suburban Nilotics, but the apparent protection against *P. falciparum* was present in each to a significant degree.

Group II

Long before the above investigation was started, however, data were being collected from another group. These were children under the age of 5 years, attending child welfare clinics in and around Kampala, under the care of Dr. H. F. Welbourn, to whom I am indebted for permission to quote the following facts. At these clinics the children attend as families for general supervision, and not primarily because they are ill, though illness may often determine the first attendance of a family. A laboratory assistant attended all the clinics, and specimens were brought to the laboratory and examined in the same way as for the hospital series. Sickling and malaria were tested for on the first attendance of each child, and the results given below refer only to the first attendances, or to the first occasion when the tests were performed—in any case, before any antimalarial treatment had been given. Malarial species diagnosis was not quite so certain as in Group I, and the figures quoted here are for all species, though of course *P. falciparum* predominated.

From April, 1952, to October, 1954, 1,194 children were tested on first attendance; of 192 sicklers, 58 (30%) showed malarial parasitaemia, while of 1,002 non-sicklers 334 (33.4%) did so—a difference that is quite insignificant, but of the same nature as that for gross malarial parasitaemia in Group I. Among these children the malaria rate was lower, and the proportion of Nilotics higher, than in the hospital series, but again the two main tribal groups gave closely similar results. The apparent protection against malaria in the sicklers was less in this group than in Group I, and a possible reason for this is suggested below.

Group III

One other group of persons was examined in the same way as the preceding: this was a consecutive series of 663 mothers of some of the children in Group I. They were not ill, and they were selected only in the sense that they had brought their sick children to hospital. Practically all would possess a considerable acquired immunity to the effects of malaria. All the 91 infections detected in them were of mild degree (only 5 showed more than about 1,000 parasites per c.mm.), and all were considered to be of *P. falciparum*, though proof was not always absolute when the parasites were very scanty. In the 135 mothers who were carriers of the sickle-cell trait there were 24 (18%) who showed parasites in the blood; in the 528 non-sicklers there were 67 (12.7%). These findings are the reverse of those for the children in Group I, but the difference is of about the same order of magnitude, and might with equal likelihood have arisen by chance ($\chi^2 = 2.35$, $n = 1$, $0.2 > P > 0.1$).

Parasite Count in Relation to Sickling

The following findings refer only to the *P. falciparum* infections encountered in Group I and to the counts determined, for each child, only on the day on which it first attended hospital. Parasite counts were performed on 558 consecutive falciparum infections (they were omitted in the first nine cases). Counts were made against leucocytes in parts of the field where the distribution was even, and the result was recorded on the assumption that the leucocyte count was 5,000 per c.mm. Noticeable leucocytosis was very rare in malarial children.

Table II shows that more than half the falciparum infections in the sickling children were of low intensity, while non-sickling children showed predominantly heavy infections. It may be added that the highest count found in a sickler was 160,000 per c.mm., whereas counts up to 800,000 per c.mm. were not unusual in non-sicklers. For this analysis, grouping by parasite density has been made on a logarithmic basis (in powers of 10) for convenience, and because this accords with the process of multiplication of an

TABLE II—Distribution of Parasite Densities in 558 Consecutive Infections with *P. falciparum* in Children under 10 years, in Sicklers and Non-sicklers

Parasite Count per c.mm.	Sicklers (72 Cases)		Non-sicklers (486 Cases)	
	No.	% of Total	No.	% of Total
Under 100	20	27.8	55	11.3
100–	17	23.5	57	11.7
1,000–	14	19.5	147	30.2
10,000–	18	25.0	182	37.4
100,000+	3	4.2	45	9.4

TABLE III—Comparison of the Incidence of Parasite Counts under 1,000 per c.mm. in Sicklers and Non-sicklers at Various Ages, in 558 Children Infected with *P. falciparum*

Age in Years	Sickling State	No. of Cases	Cases with Counts under 1,000/cmm.		
			No.	%	χ^2 (n=1)
Under 1	Positive	30	16	53.3	11.99 (P<0.01)
	Negative	132	29	29.5	
1–	Positive	20	12	60.0	14.5 (P<0.01)
	Negative	162	34	20.9	
2–10	Positive	22	9	40.9	2.36 (0.2>P>0.1)
	Negative	192	49	25.5	
Total	Positive	72	37	51.4	21.94 (P<0.01)
	Negative	486	112	23.04	

organism. In this arbitrary scale a figure of 1,000 per c.mm. represents a point in the Table about which the difference between sicklers and non-sicklers is most pronounced, and Table III shows how a grouping of cases into those with counts of less than 1,000 per c.mm. and those with over 1,000 reveals a striking difference between sicklers and non-sicklers at all ages—least amongst the older children, but remarkable even in those under 1 year, in whom (Table I) *falciparum* infections were commoner in sicklers. Again, it may be added that these differences were as marked for the Baganda as for the Nilotic children.

Nature of the "Protection" Enjoyed by Sicklers

The view put forward here is that the presence of sickle-cell haemoglobin in a person's erythrocytes does not prevent his infection with plasmodia, but does limit the extent to which at least a *falciparum* infection may develop. This probably means also that attacks of *falciparum* malaria will be on the whole briefer and less disabling among sicklers, and that, in them, dangerous attacks will be rare. This view is derived from the observations of parasite counts in a certain group of children, and therefore the validity of this experiment must be discussed.

The present experiment was not designed to detect the highest extent to which parasitaemia could develop in sicklers and non-sicklers respectively, nor was it possible to record the duration of each attack at the time the examination was made—and very marked changes are to be expected in the count as an attack develops and recedes. In this locality a visit to hospital is likely to be considered for some time before it is decided upon, and thus low counts are extremely unlikely to represent attendance early in an attack of malaria; they represent either the possession of immunity or attendance towards the end of an attack. Significant immunity can be excluded in practically all these children. If, therefore, we are to draw conclusions from the greater frequency of low parasite counts in sickling children, we must be assured that they attended, on the average, at about the same stage of the attack as did the non-sicklers; or if they attended at a somewhat later stage of their attacks than the non-sicklers did we must find an explanation for this. In spite of the lack of clinical data, there is some evidence on this point.

Three features were encountered rather more often in the blood films of sicklers than in the rest—signs of erythropoietic activity (Raper, 1954a), well-grown trophozoites, and gametocytes. The latter were found in 31% of *falciparum* infections in sicklers, and in 21% of these infections in non-

sicklers. None of these features can be ascribed directly to sicklaemia, but they are all indications of the early recovery phase of malaria. The experiment, therefore, had admitted a slight excess of sicklers in the early stages of recovery from malaria, and the reason for this must be sought. In this area, sicklers are not more common in the more remote population than in that close to the hospital, nor in the lower social classes than in the higher; indeed, they are less common in the more primitive tribes included in this experiment. Thus social and educational factors, producing different attitudes to the use of a hospital, are unlikely to have determined the later attendance of sicklers. The only explanation likely to account for all the observed facts is that *falciparum* attacks in sicklers are unusually mild and brief. This is the hypothesis advanced here; the low counts observed in sicklers are a feature of the kind of malarial attacks they experience, and, though the present results may slightly exaggerate this feature, they could not have been produced unless it existed.

The establishment of this point makes it possible to offer an explanation for the inconclusive reports regarding gross parasite rates in sicklers and non-sicklers, both among those recorded here and among those of Beet (1946, 1947), Brain (1952), Edington (1954), and Moore *et al.* (1954). All but the last of these referred to hospital patients, most included adults as well as children, and none except the last distinguished between the species of parasite. Among such non-immunes as were included, the sicklers would attend hospital less often because of their milder attacks, and so would form a smaller proportion of all malaria cases diagnosed, thus accounting for the general tendency to record fewer malarial attacks among sicklers. There must have been less selection of this sort in the child welfare clinic children recorded here (Group II), and in them the apparent protection against all forms of malaria was somewhat less than in the hospital series (Group I). Where no selection whatever is employed, as in the field survey of Moore *et al.* (1954), a very small difference between the two groups could be expected to arise from the probability that sampling at any moment would detect slightly fewer infections in sicklers, simply because their attacks are rather briefer than in non-sicklers. But the number to be sampled before this difference appeared significant would be very great, certainly several times 2,394, which is the number of partially selected cases recorded here.

In this connexion it may be remarked that since attacks of quartan malaria are normally of long duration, and on the whole mild, the results recorded here for *P. malariae* are quite inadequate in number to decide whether sicklers do or do not enjoy any protection against this species.

If the subjects of a survey possess any other means of resisting the growth of plasmodia, this must affect the degree of protection they exhibit from possessing or lacking the sickle-cell trait. In a region of heavy malarial endemicity adults possess this protection by reason of their acquired immunity (or "premunition"). How far this operates in sicklers and non-sicklers respectively is not revealed by the results quoted above for the 663 mothers (Group II), because they were neither selected by illness nor distinguished by the degree of their parasitaemia. But all experience suggests that acquired immunity is at least as potent a protection as the possession of the sickling trait. Hence the inclusion of adults in a survey in an endemic malarial region will obscure any protection that the sicklaemic children may enjoy.

It has been mentioned above that the relative protection of sicklaemic children against heavy *falciparum* infections is enough to account for that increased chance of survival that is required to explain the persistence, or the building up, of high frequencies of the sickling gene in parts of Africa. I have emphasized elsewhere (Raper, 1954b) that the process is a dynamic one, and that the present situation in that continent need not be treated as static. Field (1949) saw very few deaths from *falciparum* malaria in Malaya in persons whose parasite counts were under 10,000 per c.mm., and no death with a parasite count of fewer than 2,300 per c.mm.

It has been remarked above that the difference between sickling and non-sickling children is particularly marked at about this level of parasitaemia. It is important to notice that for natural selection to operate in favour of heterozygous sicklers it must exert its effect before reproductive age; the view advanced here is that it can operate only in the absence of acquired immunity, and in an endemic area it is precisely those below reproductive age who lack effective immunity.

All this evidence is of course indirect; the decisive information—accurate mortality statistics for sicklers and non-sicklers before puberty—is nowhere available, and will be difficult to collect. Nevertheless, there is enough evidence to give support to Allison's (1954) hypothesis, and to justify attempts to show exactly how the metabolism of the various species of plasmodia is affected by the molecular structure of the haemoglobin in the erythrocytes that they invade.

Summary

In two large series of children living in the vicinity of Kampala, Uganda, the gross malarial parasite rate was found to be lower in those carrying the sickle-cell trait than in others, but not significantly so.

In a series of 1,200 children attending hospital the *P. falciparum* rate was significantly lower in sicklers than in non-sicklers.

Parasite counts in *P. falciparum* infections were very much lower in sickling than in non-sickling children.

It is maintained that the presence of sickle-cell haemoglobin in erythrocytes does not prevent, but limits, the severity of *P. falciparum* infections in non-immune subjects. Insufficient data are available to assess the effect of sickle-cell haemoglobin on other species of plasmodia.

I am indebted to the medical superintendent and physicians of Mulago Hospital and to Dr. H. F. We'bourn for access to cases under their care, and to the D.M.S. Uganda for permission to publish.

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Television has been used by the American Medical Association since 1946 for health education, either in broadcasts to the public or on closed circuit to the medical profession, and the A.M.A. has recently published a handbook, *Television in Medical Education*, to give doctors guidance on the techniques of successful televising. The first part is devoted to the workings of television, which are clearly explained with the aid of photographs and diagrams. The second part gives practical help in producing a medical programme, suggesting ways in which information can be given, such as by monologue, interview, or documentary. Two scripts are reproduced, one for a public and one for a specialist audience. The reader is reminded that television is a visual medium, and he is shown how to include graphic and visual devices such as charts and sectional cut-outs in his programmes. Advice on dress, voice production, and approach is also given. The last section of the handbook describes what has already been achieved by this medium in medical education, and ends with a glossary of television terms. While, as the foreword points out, "learning by active participation has no peer," this publication is intended to enable doctors to make television a useful adjunct to their teaching programmes.

EFFECT OF SICKLE-CELL TRAIT ON RESISTANCE TO MALARIA*

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Type S (sickle) haemoglobin is present in the red cells of a sizable percentage of members of the negro race. The presence or absence of this abnormal haemoglobin type is genetically determined. Heterozygous individuals, whose red cells also contain type A (normal) haemoglobin, suffer no ill effects from the presence of the abnormal haemoglobin, although sickling of the cells may be demonstrated when the oxygen tension is greatly reduced. Such individuals are said to have the sickle-cell trait. When, on the other hand, type S haemoglobin is inherited in the homozygous form, sickle-cell disease, a severe chronic haemolytic anaemia, results (Pauling *et al.*, 1949; Neel, 1951). Thus, unless individuals with the sickle-cell trait possessed some selective advantage, the gene for sickle haemoglobin would gradually be eliminated from the population by the early death of those with sickle-cell disease.

Allison (1954) has suggested that an increased resistance to infection with malaria may be such an advantage. He reviewed evidence that the incidence of malaria in endemic areas was lower in those individuals with the sickle-cell trait than in those without the trait. He also noted that the incidence of the sickle-cell trait was highest in those areas in which malaria was prevalent. Upon inoculation of a series of highly immune subjects with an African or a Malayan strain of *P. falciparum* intravenously and, in some cases, also with infected mosquitoes, Allison found that only 2 out of 15 "sicklers" (sickle-cell trait) developed malaria, while 14 out of 15 "non-sicklers" developed malaria. In the present study we have attempted to evaluate the effect of sickle haemoglobin on resistance to malaria under carefully controlled conditions.

Materials and Methods

All subjects were inmate volunteers from the Stateville Branch of the Illinois State Penitentiary at Joliet, Illinois. Sixteen American negroes who had never previously had malaria were inoculated. Erythrocytes were examined for sickling by the 2% sodium metabisulphite method (Daland and Castle, 1948). In addition, haemoglobin from each volunteer was examined by filter-paper electrophoresis. Each of the eight "sicklers" had both type A and type S haemoglobin; each of the eight "non-sicklers" had only type A haemoglobin. In each of the three studies all subjects were inoculated with aliquots of a single freshly drawn

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TABLE I.—Parasite Counts per c.mm. in 5 "Sicklers" and 5 "Non-Sicklers", after Inoculation with 500,000 Trophozoites of *P. falciparum*.

Day After Inoculation	" Sicklers "					" Non-sicklers "				
	S1	S2	S3	S4	S5	N1	N2	N3	N4	N5
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	20	10	30	40	50	20	20	90	20	68
5	10	10	10	10	0	0	10	50	10	0
6	460	810	930	443	1,049	740	840	3,620	1,380	1,860
7	270	140	10	240	30	210	70	830	290	380
8	2,720	2,640	13,980	4,520	17,720	6,140	26,280	63,360	12,420	23,920
9	110	380	80	690	180	1,260	40	1,260	6,040	4,420
10	6,120	6,940	14,280	15,780	16,040	10,920	12,540	100	23,720	18,540
11	210	1,280	1,460	2,640	570	10,820	560	20	1,500	17,400
12	16,740	19,520	36,120	34,840	25,380	7,860	18,180	10	8,820	8,640
13	180	740	380	4,520	6,510	660	1,980	0	640	150
14	40 (25%)	60	40 (25%)	290	60	0	10	0	100 (25%)	0
15	20 (100%)	30	0	10	0	0	0	0	40 (100%)	0
16	50 (100%)	10	0	100 (100%)	0	0	0	0	40 (100%)	0
17	0	0	0	20 (100%)	0	0	0	0	0	0
18	0	0	0	10 (100%)	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0

* Chloroquine therapy instituted. Figures in parentheses represent percentage of gametocytes. Unless otherwise indicated, all parasites were trophozoites.

TABLE II.—Parasite Counts per c.mm. in 3 "Sicklers" and 3 "Non-sicklers" After Inoculation with 50,000 Trophozoites of *P. falciparum*

Day After Inoculation	" Sicklers "			" Non-Sicklers "		
	S6	S7	S8	N6	N7	N8
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	10	0	0	0	30
4	10	0	10	0	0	0
5	20	70	280	20	30	60
6	700	80	60	40	160	240
7	480	820	1,960	180	1,700	2,340
8	12,900	320	9,760	240	3,980	3,720
9	2,040	4,280	3,920	2,320	11,320	11,800
10	27,600	780	3,760	2,540	3,370	3,100
11	4,540	13,380	5,760	8,160	710	420
12	65,400	1,780	2,720	17,300	40	280
13	4,600	23,120	14,380	34,260	0	0
14	720 (1%)	4,480	6,480	8,340	0	0
15	200 (50%)	12,620	10,620	4,480	0	0
16	90 (100%)	9,080	6,160	70	0	0
17	50 (50%)	1,680	6,540	0	0	0
18	90 (100%)	2,360 (20%)	7,220	0	0	0
19	90 (100%)	1,180 (50%)	4,420	0	0	0
20	90 (100%)	820 (50%)	1,740	0	0	0
21	920 (40%)	1,200	1,200	0	0	0
22	1,060 (50%)	1,460	1,460	0	0	0
23	820 (15%)	1,620	1,620	0	0	0

* Chloroquine therapy instituted. Figures in parentheses represent percentage of gametocytes. Unless otherwise indicated, all parasites were trophozoites.

TABLE III.—Parasite Counts per c.mm. of 5 "Sicklers" and 5 "Non-Sicklers" (same subject as in Table I) after Re-inoculation with 50,000 Trophozoites of *P. falciparum*.

Day After Inoculation	" Sicklers "					" Non-sicklers "				
	S1	S2	S3	S4	S5	N1	N2	N3	N4	N5
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	30	0	0
6	50	30	20	60	20	30	10	150	30	20
7	0	0	0	0	0	0	0	10	10	10
8	380	220	150	340	390	30	320	7,380	130	1,450
9	20	30	10	20	20	10	10	380	10	30
10	7,240	4,020	3,260	8,740	7,240	380	6,680	130,050	5,440	28,200
11	110	70	60	270	450	30	90	3,640	210	200
12	11,800	39,600	30,200	57,480	84,640	1,800	12,040	680	7,460	57,600
13	90	320	380	460	90	10	70	140	40	170
14	9,920	20,520	9,760	90	20	880	3,540	0	1,640	470
15	70	2,360	1,640	20	0	30	150	0	40	220
16	2,860	90	70	10	0	510	7,500	0	1,820	20
17	190	0	0	0	0	30 (50%)	150	0	70	100
18	1,540 (20%)	0	0	0	0	170 (50%)	2,260 (50%)	0	2,200 (25%)	30
19	250 (95%)	0	0	0	0	110 (100%)	1,440 (100%)	0	530 (100%)	0
20	2,960 (13%)	0	0	0	0	270 (100%)	2,100 (80%)	0	1,780 (75%)	0
21	510 (70%)	0	0	0	0	360 (100%)	1,380 (99%)	0	1,080 (99%)	0
22	4,720 (5%)	0	0	0	0	480 (98%)	2,180 (50%)	0	3,620 (80%)	0
23	780 (50%)	0	0	0	0	440 (100%)	1,200 (99%)	0	920 (99%)	0

* Chloroquine therapy instituted. Figures in parentheses represent percentage of gametocytes. Unless otherwise indicated, all parasites were trophozoites.

sample of heparinized, Group O, Rh-negative blood infected with trophozoites of the El Limon, Panama strain PF 6 (Jeffery and Eyles, 1954) of falciparum malaria. In studies 2 and 3 the donor's blood was diluted in his own plasma, so that the injected volume could be measured more accurately. The parasites in 0.1 c.mm. of blood were counted directly on stained thick smears (Earle and Perez, 1932). The infection was terminated with chloroquine whenever it was considered necessary to do so for the patient's safety; the decision whether or not to interrupt the infection in any given case was based on the course of the parasite count and on the clinical condition of the patient. All patients remaining in the study for 23 days after inoculation were cured at that time.

Results

Study 1.—Ten volunteers, five "sicklers" and five "non-sicklers," were inoculated with 500,000 parasites each. The parasite counts of these 10 men are presented in Table I. As this table indicates, it was necessary to interrupt the infections of three of the "non-sicklers" before it was necessary to interrupt the infections of any of the "sicklers." The parasite counts of the "non-sicklers" tended to be somewhat higher. On day 8 the difference between the means of the logarithms of the counts of the two groups slightly exceeded two standard errors, and may therefore be regarded as statistically significant at the 0.05 level. Earlier

differences did not reach this level of significance; later comparisons were not valid because of the interposition of treatment of some of the volunteers.

Study 2.—Because it was thought that 500,000 parasites might have been an overwhelming inoculum, six other volunteers, three "sicklers" and three "non-sicklers," were given an injection of only 50,000 parasites. The parasite counts of these subjects are presented in Table II. It was necessary to interrupt the infection in two of the three "non-sicklers" before it was necessary to interrupt the infections of any of the "sicklers."

Study 3.—In an attempt to determine the effect of acquired immunity on the resistance of "sicklers" and "non-sicklers" to malaria, the same 10 volunteers who had been inoculated with 500,000 parasites in study 1 were reinoculated with 50,000 parasites after a lapse of four months. The parasite counts during this study are presented in Table III. Up to and including day 10, when treatment was started on subject N3, the means of the logarithms of the parasite counts of the "sicklers" and "non-sicklers" never differed to a statistically significant degree. Although it was necessary to treat two of the five "non-sicklers" relatively early in the course of their infection, the other three were able to continue for the remainder of the study, while only one of the "sicklers" was able to do so.

Discussion

In comparing the resistance of individuals with and without sickle-cell trait to malaria, we have been able to demonstrate only unimpressive differences of questionable significance. These findings differ from those of Allison (1954). There are several possible explanations for this difference in results. While Allison used an African and a Malayan strain of falciparum malaria, we used a Panamanian strain. It is conceivable, although it does not appear very likely, that strain differences between the parasites used were sufficient to account for the different results. His subjects were highly immune; ours were non-immune in studies 1 and 2, and only slightly immune in study 3. It is also possible that any advantage which sickle-cell haemoglobin gives an individual infected with malaria is so slight in itself as to become manifest only when a high degree of acquired immunity already exists.

It would appear that further work is necessary to evaluate conclusively the role of sickle-cell haemoglobin in resistance to malaria.

Summary

Eight non-immune men with sickle-cell trait and eight non-immune men whose red cells contained only normal haemoglobin were inoculated with *P. falciparum* intravenously. Ten of these men were reinoculated four months after their initial course of malaria. The resulting parasitaemias tended to be somewhat less marked in the men with the sickle trait than in those without the trait, but the difference observed was unimpressive and of questionable significance.

We acknowledge the helpful advice of Dr. Alf S. Alving, of the Department of Medicine, University of Chicago, Illinois. The investigations reported in this paper would not have been possible except for the co-operation of the inmates and the administrative staff of Stateville Penitentiary, Joliet, Illinois, U.S.A.

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EMERGENCY MITRAL VALVOTOMY AT FULL TERM

REPORT OF A CASE

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Several reports have appeared in recent literature on the value of mitral valvotomy during pregnancy (Baker *et al.*, 1952; Logan and Turner, 1952; Sellors *et al.*, 1953; Mulcahy, 1954). These emphasize that, in a limited and properly selected group of cases, this procedure may play an effective part in lessening disability, and thus help to reduce the maternal mortality rate due to heart disease. These reports advise that, when indicated, operation should take place during the first trimester or as early in pregnancy as possible, and most of the recorded valvotomies in pregnant women have been done during these early months.

We here record the case history of a patient with pure mitral stenosis who had a valvotomy performed at full term, ten hours before the birth of her ninth child. No such case has so far been recorded, though the feasibility of this procedure at all stages of pregnancy has been suggested previously (Mulcahy, 1954).

Case Report

A married woman aged 35 was admitted to the Coombe Maternity Hospital on November 29, 1954, in the early stages of labour. She had been a "defaulter" from the antenatal clinic. Apart from the normal labour pains, she was observed to be considerably distressed with dyspnoea, orthopnoea, cough, and cyanosis. On examination she was found to have pure mitral stenosis. She was in regular rhythm, and, though there was no evidence of heart failure, she was regarded at the time as a likely subject for a later pulmonary oedema. This impression was supported by the tachycardia, the loud slapping first sound following the unusually harsh mid-diastolic and presystolic murmur, the easily palpable right ventricle and pulmonary artery, and the evidence of early pulmonary venous congestion on the skiagram taken twenty-four hours after admission. The film also revealed a large left auricle and pulmonary artery, but only minimal cardiac enlargement. Further factors, obviously important in her case, were the six-weeks history of persistent non-productive cough and the presence of anaemia, her haemoglobin being 55%.

This patient had attended the antenatal clinic beforehand, but, despite a history of increasing distress on exertion and of a long-standing cough, she had failed to report anything abnormal. At no time had she complained of haemoptysis. During her earlier pregnancies, the last having been 22 months previously, she recalled no notable symptoms, nor was she informed of any abnormality in the heart. There was no previous history of rheumatic fever.

Treatment was started at once. It included penicillin, 500,000 units twice daily, digoxin, 0.25 mg. eight-hourly, sedation, and efforts to suppress the cough. Notwithstanding these measures and despite the cessation of labour pains a few hours after admission, her condition showed little or no improvement. Morphine, $\frac{1}{2}$ gr. (10 mg.) six-hourly, intravenous aminophylline, and streptomycin were added

48 hours later, but next day (December 2) the probability of pulmonary oedema was more apparent. The heart sounds were now loudly slapping and the presystolic murmur was unusually harsh. A most noticeable feature was the obvious pulsation of the right ventricle and pulmonary artery, causing a parasternal lift of exceptional degree. This was a warning of the likelihood of pulmonary oedema—particularly, we believed, in the event of the resumption of labour. Some impairment of air entry in the base of the left lung was obvious for about two days, but by now increasing consolidation was apparent. This was an added complication and appeared to be uninfluenced by the antibiotics administered. In view of the patient's steady deterioration valvotomy as an urgent measure was advised.

The operation was performed uneventfully three days after admission. The lower lobe of the left lung showed considerable congestion when the thorax was opened, but this did not interfere with the surgical manipulations. The left auricular appendage was large and free of clot, and was dealt with in the routine manner. As expected, the valve was tight, but both commissures separated without difficulty. The pulmonary artery was large and tense at first, but less so towards the end of the operation. The patient was returned to the ward in a satisfactory condition, and after a short labour a live infant, weighing 8 lb. 4 oz. (3.7 kg.), was born 10 hours later without difficulty or distress to the mother.

She had more than the usual post-operative cough and sputum from the residual congestion and atelectasis of the left lower lobe. These symptoms, however, responded within a few weeks to antibiotics and symptomatic treatment. Her convalescence was otherwise quite uneventful, and she was discharged on December 31.

She has since been seen by us. Her general condition seems to be quite good, and there is considerable modification of the physical signs in her heart, the mid-diastolic bruit being shorter and audible only when she is lying on her left side. She is leading a normal active life, as she was before the start of her last pregnancy.

Comment

This case history illustrates the value of mitral valvotomy as an emergency procedure during the later months of pregnancy. The presence of moderate anaemia and of long-standing persistent coughing undoubtedly played an important part in this patient's final and irreversible deterioration. It is unlikely that valvotomy at this stage would have been necessary in the absence of these influences, and we are of the opinion that the avoidance of such important aggravating factors during pregnancy should almost preclude the necessity for operation at such a late stage. There is, however, still a definite indication for valvotomy in the early months of pregnancy in properly selected patients.

We are indebted to Dr. J. K. Feeney, Master of the Coombe Lying-in Hospital, under whose care this patient was admitted, for his advice on the obstetrical problem, and for the facilities afforded in his hospital; to Dr. M. I. Drury, consulting cardiologist, National Maternity Hospital, Dr. R. Davys, anaesthetist, and Mr. J. G. Maher, assistant surgeon, St. Vincent's Hospital, Dublin, for their invaluable assistance.

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"When should baby wear shoes?" This is typical of the questions answered in *Our Children's Feet*, a pamphlet for parents issued by the Foot Health Educational Bureau of the Central Council for Health Education, Tavistock House, Tavistock Square, London, W.C.1 (price 6d.).

RESERPINE IN TREATMENT OF CHRONIC PSYCHOTICS PRELIMINARY OBSERVATIONS

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Recent work in America (Kline, 1954) on the treatment of psychotics with rauwolfia and its alkaloids suggests that the ancient Indian belief in the value of this root in the treatment of mental illness was well based. In view of that work it was decided to try the effect of this drug on a group of chronically mentally ill patients. The group, a small one of 32 male patients, consisted of 26 schizophrenics, 4 cases of schizophrenia superimposed on basic mental defectiveness, 1 chronic melancholic, and 1 with arrested G.P.I. The patients varied in the date of their admission to hospital from 1912 to 1952, all but six having been in this hospital for over five years.

They were segregated into a section of one of the wards for mentally disturbed males under a senior nurse, and it was arranged that their nursing care should be, so far as possible, maintained by the same nurses.

In choosing the patients for this test, only those in a satisfactory physical state were included, and all showed behaviour problems. Thus 11 were noted to be destructive, 13 were faulty in their habits, 11 were liable to impulsive violence, 4 required regular spoon-feeding, and others needed considerable prompting and occasional spoon-feeding with their meals. All 32 were unoccupiable. The degree of destructiveness among these patients was great. One of them, the most destructive in the hospital, destroyed on an average one blanket a night and one mattress a week, and had started to gnaw the wood on his bed.

Procedure

Initially, six patients were treated with reserpine ("serpasil"), being given 1 mg. four times a day, which seemed to be the dose most commonly used by the American authorities. In view of its known hypotensive effect, daily blood-pressure readings were taken on all patients for the five-months period of the trial. In addition four-hourly temperature and pulse rates were charted at first, but, as no significant findings were noted, these were later reduced to morning and evening readings. The hypotensive effect was variable: whereas most patients showed an initial small drop, in one or two the blood pressure fell considerably. Readings of 60/50 and 64/46 were obtained in two cases. These low blood-pressure readings were not found until the patients had been on reserpine for more than two weeks, and in both cases they were symptomless. Their occurrence, however, suggests the importance of regular blood-pressure readings when patients are first treated with this drug. The blood pressure in both these cases later returned to normal on a slightly smaller dose. Following this, it was decided to start with smaller amounts, and 0.5 mg. three times a day became the initial dose. The dose was constantly under review in all cases, and from the experience gained it seems that there is no fixed dose, though it was found that the effective dose varied from 0.5 to 1 mg. four times a day. In all cases the drug was administered by mouth.

Results

In one case the maximum improvement was noted when one dose was given during the night. Without this dose the patient's condition relapsed during the night, but he rapidly

improved after his morning dose. In the cases that responded to reserpine some sign of improvement was usually noted between the first and second weeks of treatment, but several showed definite improvement within three days, while others were unchanged for three months and then improved.

The results of the treatment in the first small group of six patients were most encouraging. The highly destructive and degraded patient mentioned above became clean and tidy, and lost his destructive habits within four days of being put on reserpine; and others of this group showed comparable improvement.

Other patients suffering from chronic psychosis were added to the series, and the effect of the drug on them compared with the rest of the ward was most marked. The reserpine patients became quiet and co-operative; impulsive actions and destructiveness disappeared; they fed themselves at meals, and helped each other at the table, in marked contrast to their former habits and those of the untreated patients in the ward. Occupational therapy classes were started, and 20 of the 32 patients were regularly employed in these sessions; 12 of these also did some form of useful work in tidying the ward, etc.

The main difference in the patients under reserpine, apart from the disappearance of the antisocial behaviour, was their receptivity to ideas and suggestions, whereas previously such suggestions had had no effect. Considerable prompting was needed to start occupational therapy and to improve table manners, but, once accepted by the patient, they were maintained.

Appetite was greatly increased and difficulties with feeding disappeared. The dietary had to be increased, as the normal amount did not satisfy their appetites. One patient, who used to stick his fingers down his throat and vomit after food, completely lost this habit and took his meals normally. Weight increase was variable, but the 32 patients, who were all weighed weekly, gained an average of 6 lb. (2.7 kg.).

Many patients now enjoy cinema shows, patients' dances, and other recreations, whereas previously they were not thought suitable for such activities.

Of the 32 patients, 4 were regarded as greatly improved, 14 much improved, 9 slightly improved, 3 not improved, and 2 worse. (The 5 patients who did not improve were 3 schizophrenics, 1 chronic-melancholic, and 1 G.P.I.)

Combination with other Forms of Therapy

One schizophrenic of five years' standing, who had been mute, hallucinated, incontinent, and utterly detached, became more alert, tidy in appearance, but still would not speak. He was given a short course of electric convulsion therapy, and promptly spoke normally and rationally, and for a time appeared to be making an amazing remission. This remission was, however, only temporary, and he again became mute and withdrawn. He was then started on insulin therapy, the reserpine being maintained while he was receiving subcoma doses of insulin. Some response has been noted, but not to a degree comparable to that previously found.

Side-Effects

Some drowsiness was noted with the higher doses, but this could be successfully combated by small doses of amphetamine sulphate. Little difficulty was experienced with looseness of the bowels, which was only transient when it did occur. Stiffness of the nose was noted in a few cases, but caused no great inconvenience.

Three cases developed oedema—in two, of the legs only, but in one of the face as well as the legs. These cases were carefully investigated. A cardiovascular or renal origin for the oedema was excluded. Estimation of blood urea, protein, albumin, globulin, thymol turbidity, alkaline phosphatase, van den Bergh, bile, serum sodium, serum potassium, and serum chlorides, together with complete blood counts, gave normal results. The occurrence of

oedema has been noted in Switzerland (C. Dale Falconer, personal communication). Gaunt *et al.* (1954), writing on the endocrine aspects of the pharmacology of reserpine, suggest that the drug stimulates the release of an anti-diuretic hormone in the posterior pituitary in rats, and this may possibly be the mechanism of the oedema production in these cases.

Opinion

While this group is too small to allow of a dogmatic opinion, the results obtained strongly suggest that reserpine has brought about a marked change in a ward consisting mainly of long-standing schizophrenic patients with gross behaviour disorders. The change in the nursing staff's work is most pronounced. Instead of custodial care, there is now considerable scope for active rehabilitation, with, as a result, increasing interest and enthusiasm in the work. Another striking point is the reduction in the amount of bed-linen and clothing destroyed by patients. Finally, the disappearance of incontinence among this group has been most dramatic; and this, combined with improvements in behaviour, encourages one to hope that such patients may in future be nursed in better wards, with greater amenities.

Summary

Thirty-two chronic mentally disturbed patients were treated with reserpine for periods of up to five months.

In the great majority, considerable improvement was noted in their habits and personal appearance and in their ability to occupy themselves. Impulsiveness and incontinence disappeared. A marked quietening effect was noted. Even those patients showing definite signs of dementia were superficially improved. Side-effects were slight, and occurred in only a few cases. Most patients who are going to respond show signs of this within a week or two, but some were on the drug for three months before definite improvement was noted. It is therefore suggested that, unless the patient's condition deteriorates, the method should be given at least a three-months trial.

The promising results obtained in this small sample of mentally disturbed patients suggest that an extensive trial of reserpine in psychotics of more recent onset should be made.

It seems to be important to make full use of occupational and recreational therapy so as to provide the stimulus for activities which the drug appears to permit.

I would like to thank Dr. A. C. Sinclair, medical superintendent of Herrison Hospital, for permission to publish this report; Ciba Laboratories Limited for a generous supply of serpasil; Dr. T. V. Cooper, of the Dorset County Laboratory, for carrying out the special investigations on the oedematous cases; and, finally, the nursing staff for their help and co-operation.

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The Annual Report for 1954 of the department of rheumatology at the Royal Free Hospital comments on the reduction in the length of stay in hospital of patients who are admitted for the treatment of rheumatic diseases. This applies to all the disorders in the rheumatic group of diseases except osteoarthritis. In the case of rheumatoid arthritis, for instance, the average stay in 1954 was 48 days, compared with 61 days in 1953, and for ankylosing spondylitis the average stay in hospital was reduced from 63 in 1953 to 35 days in 1954. This reduction in hospitalization, the report remarks, is largely due to the more plentiful supply of hydrocortisone, which has enabled the department to treat isolated peripheral joints more effectively, and to the policy of using long-term hormone therapy in those cases which have failed to respond to other available forms of treatment.

POSTERIOR PITUITARY SNUFF TREATMENT OF NOCTURNAL ENURESIS

BY

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It is not proposed to review the vast literature dealing with the causation and treatment of nocturnal enuresis. For the purpose of this article it will suffice to state that adolescent and adult sufferers exist in whom no obvious psychiatric or physical disorder can be found, and in whom accepted measures of treatment are of little value. Many such patients also suffer nocturnal frequency, and it is apparent that they have either relative nocturnal polyuria or that their bladders have a subnormal capacity. Such patients might be expected to benefit by a reduction in urine formation during sleep. The use of pituitrin snuff in cases of diabetes insipidus was first reported in 1924 by Choay and Choay; and Vidgoff (1932) and Smith (1934) reported full control of this condition by the use of snuff at eight to ten-hour intervals. It is well known that pituitrin has a similar depressant effect on the urine flow in normal persons (Gutmann, 1928).

Bonacorsi (1925), Blau (1926), and Jacobs (1930) reported the use of pituitrin in the treatment of nocturnal enuresis in children. It is difficult to understand the mode of action of the drug in these cases, as good results were stated to have followed short courses of injections of the drug. More recently, Hansen (1954) has reported satisfactory treatment of nocturnal enuresis by nightly administration of posterior pituitary snuff ("di-sipidin"). He found the results less satisfactory in small children. In none of these reports has the effect of pituitrin been contrasted with placebo therapy, and thus the possibility of a psychotherapeutic effect has not been excluded.

In the present study, four adolescent patients have been treated with pituitrin snuff or placebo snuff over periods of seven to eleven months. They are a special group in that each patient had persistent and frequent nocturnal enuresis, was normal on physical examination, appeared on general assessment to be of normal intelligence, and showed no marked psychiatric disorder. Throughout the period of study the patients kept a strict chart showing each night when enuresis or frequency occurred. The patients were seen every two to four weeks, and at each visit they received a sealed prescription for either pituitrin or placebo snuff, and this was dispensed at the hospital pharmacy. The patients were informed that different types of snuff would be prescribed, but did not know when a change was made or that placebo snuff was being given. The placebo snuff was identical in appearance to the pituitrin snuff. Each patient was instructed to avoid fluids within three hours of sleep, and immediately before retiring to bed a large pinch of snuff was inserted well into each nostril. (The dose was approximately 100 mg.)

Case 1

A sensitive and intelligent girl aged 19, a printer, was first seen on April 26, 1954. She complained of lifelong bed-wetting, usually occurring one to three times a week. The longest remission prior to present treatment had been for six weeks, and occurred three years previously. A large

quantity of urine was voided when enuresis occurred. She had always been a very deep sleeper and was never awakened by the discomfort of a full bladder or by incontinence. She had received various forms of medical treatment in the past without effect. She had tried avoiding fluids for four hours before sleep, but this measure was ineffective. There was no history of serious illnesses or any family history of enuresis. The prospect of enuresis persisting into adult life naturally caused considerable anxiety to the patient, but she was otherwise free from worries and enjoyed a happy social background. She normally slept from 10.30 p.m. until 6.30 a.m. On examination there were no abnormal physical findings. The urine was free from sugar and contained a trace of albumin. Microscopy of the urine was normal, as was an intravenous pyelogram.

No fluids were taken after 6 p.m. Within the period April 26 to December 5, 1954, pituitrin snuff was administered intermittently for a total of 26 weeks (182 days); during this time nocturnal enuresis did not occur on a single occasion. She received placebo snuff during six weeks (June 14 to July 5 and October 18 to November 8), and during these periods nocturnal enuresis occurred on 21 occasions (50% nights).

Case 2

A girl aged 15, a factory worker, was first seen on November 23, 1953. She complained of lifelong bed-wetting, usually occurring five or six times a week, a large quantity of urine being voided. She had always been a very deep sleeper and could not be awakened by a loud alarm clock. During a period in which she received amphetamine sulphate in a dosage sufficient to cause insomnia, the enuresis had been largely replaced by nocturnal frequency. Apart from this she had never experienced a remission for longer than two days. She had also suffered from lifelong diurnal frequency, which had been an embarrassment to her at school. There was a previous history of pink disease in the first year, attacks of migraine since the age of 4, and a mastoidectomy at 11. There was no family history of enuresis. She confessed to a certain amount of friction between her mother and herself, no doubt accentuated by the frequent bed-wetting, but was otherwise a happy person with enuresis as her only serious worry. She normally slept from 10.30 p.m. to 7 a.m. Examination revealed a small girl of average intelligence. There were no abnormal physical findings. The urine was free from albumin and sugar, and on microscopy was normal.

No fluids were taken after 7.30 p.m. Within the period November 23, 1953, to November 1, 1954, pituitrin snuff was administered for a total of 37 weeks (259 days); during this time nocturnal enuresis occurred on 10 occasions (3.9% total nights). On four of these occasions the patient had a coryza with profuse nasal discharge and she was unable to retain the snuff properly. She received placebo snuff for a total of nine weeks (January 18 to 25, 1954; May 17 to June 14; and November 1 to 29); during this time, when no coryza occurred, she had nocturnal enuresis on 19 occasions (30.2% nights).

Case 3

A youth aged 18, a fitter, was first seen on April 5, 1954. He complained of lifelong bed-wetting, which usually occurred from two to seven times a week, a large quantity of urine being voided. His longest remission had been for ten days. He had always been a very deep sleeper. The avoidance of fluids for four hours before sleep had proved ineffective. There was no history of serious illnesses or any family history of enuresis. Apart from the enuresis the patient said that he was free from worries and had a happy home background. He normally slept from 11.15 p.m. to 6 a.m. On examination there were no abnormal physical findings. The urine was free from albumin and sugar.

No fluids were taken after 7 p.m. Within the period April 5 to November 29, 1954, pituitrin snuff was administered

for a total of 30 weeks (210 days): during this time nocturnal enuresis occurred on 10 occasions (4.8% total nights). The patient volunteered that the quantity of urine voided into the bed was much diminished. He received placebo snuff during six weeks (May 10 to 24 and October 4 to November 1), and during this period nocturnal enuresis occurred on 10 occasions (23.8% nights). After both periods when placebo snuff had been given the patient remarked, "This last snuff was not as good as the previous stuff." He based this upon the increased frequency of enuresis and the quantity of urine passed.

Case 4

A youth aged 16, a clothing warehouse assistant, was first seen on April 12, 1954. He complained of lifelong enuresis, usually occurring once or twice a week, the longest remission having been for two weeks. He had also suffered from lifelong nocturnal frequency, which occurred once or twice nightly, except when replaced by enuresis. If, however, he did not awaken during the night there would be an even chance of enuresis occurring. There was no past history of serious illness and no family history of nocturnal enuresis. While naturally perturbed by the persistent bed-wetting, he was otherwise free from worries and had a happy social background. He normally slept from 10.30 p.m. to 6.30 a.m. Examination revealed a boy of average intelligence and asthenic build. There were no abnormal physical findings. The urine was free from albumin and sugar. An intravenous pyelogram was normal.

No fluids were taken after 7 p.m. Within the period April 12 to November 29, 1954, pituitrin snuff was taken

TABLE 1.—Incidence of Nocturnal Enuresis and Nocturnal Frequency during Administration of Pituitrin Snuff and Placebo Snuff in Case 4

Snuff	Duration in Days	Nocturnal Enuresis		Nocturnal Frequency		No Incident	
		Nights	%	Nights	%	Nights	%
Pituitrin	182	10	5.5	81	44.5	91	50.0
Placebo	49	9	18.4	31	63.2	9	18.4

for a total of 26 weeks (182 days); during this time nocturnal enuresis occurred on 10 occasions (5.5% total nights), nocturnal frequency on 81 nights (44.5% total), and on the remaining nights (50%) he slept without incident (see Table 1). He received placebo snuff for seven weeks (July 19 to September 6), and during this period nocturnal enuresis occurred on nine occasions (18.4% total nights), nocturnal frequency on 31 nights (63.2% total), and he slept without incident on nine nights (18.4% total).

Analysis of Results

The difference in frequencies of nocturnal enuresis during administration of pituitrin and placebo snuff were worked out by "2 x 2" tables, making use of χ^2 method (Fisher, 1946). Table II shows the results. In Cases 1, 2, and 3, $P < 0.001$, which indicates that the possibility of the results being a chance finding is less than one in a thousand. In Case 4 $P < 0.01$, indicating that the possibility of a chance finding is less than one in a hundred. It is clear that in

TABLE II.—Analysis of Incidence of Nocturnal Enuresis in Four Adolescent Patients during Total Period in which they Received either Pituitrin or Placebo Snuff

Case No.	Snuff	Wet Nights	Dry Nights	χ^2	P
1	Pituitrin	0	182	100.4	<0.001
	Placebo	21	21		
2	Pituitrin	10	249	42.8	<0.001
	Placebo	19	44		
3	Pituitrin	10	200	17.38	<0.001
	Placebo	10	32		
4	Pituitrin	10	172	8.48	<0.01
	Placebo	9	40		

all four cases there is a marked reduction in the incidence of enuresis during pituitrin treatment, the reduction being very highly significant in the first three patients.

Discussion

The list of therapeutic measures—medical, surgical, and psychiatric—bears witness to the relative inefficacy of any one of them in the treatment of nocturnal enuresis. Although first suggested by Bonacorsi (1925), the use of pituitrin in the relief of this condition has received scant attention in the literature. This is surprising, as the well-known effect of pituitrin in reducing the urine output might reasonably be expected to benefit certain patients. Hansen (1954), has reported satisfactory results with pituitrin snuff in older children and adults, and cites one case in which the incidence of nocturnal enuresis was reduced from nightly to once or twice a month.

This present study has been limited to four adolescent patients, comprising a selected group in that they were all of average intelligence, had a satisfactory social background, and were free from obvious physical or psychiatric defect. The possibility of a psychotherapeutic effect has been excluded by comparing the results obtained with pituitrin snuff with those during placebo administration. A reduced incidence of enuresis occurred in each patient during the periods in which pituitrin snuff was taken each night. The most favourable response (Case 1) consisted in complete relief from nocturnal enuresis during 23 weeks in which pituitrin snuff was taken, enuresis occurring frequently during the two periods in which placebo snuff was substituted. One patient suffered nocturnal frequency as well as enuresis, and a reduced incidence of both symptoms was observed during pituitrin therapy (see Table 1). No untoward effects were experienced during this study, and the only difficulty in administration was observed in the one patient who was unable to retain snuff completely in the presence of a coryza.

Pituitrin snuff is variously reported as acting for five to ten hours, and the shorter the period of sleep the more effective cover it should give. It may well prove of little value in children requiring upwards of 12 hours' sleep, but in adolescents and adults sleeping for eight to nine hours its effect is likely to persist for most of this time and should thereby effect an overall reduction in urine production during the period of sleep.

The results leave little doubt about the effectiveness of this form of treatment in the cases studied. They support Hansen's findings and suggest that pituitrin snuff therapy deserves a full trial in any adolescent or adult patient failing to respond to other forms of treatment.

Summary

Four adolescent patients with nocturnal enuresis have been treated with pituitrin snuff for six to nine months, and the results have been compared with those observed during the administration of a placebo snuff. Although obtained from a small series of selected cases, the results suggest that pituitrin snuff will prove of great value in the treatment of certain adolescent and adult cases of nocturnal enuresis.

I wish to thank Dr. W. MacAdam for referring Case 1; Dr. J. G. Dare for advice on the statistical analysis, and Professor R. E. Tunbridge for his helpful criticism in the preparation of this paper. I am indebted to Messrs. Paines and Byrnie Ltd. for the supplies of "di-sipidin" and the placebo snuff.

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Medical Memorandum

Anaphylactic and Purpuric Manifestations due to Procaine Penicillin G in Aqueous Suspension

Although many millions of penicillin injections are given each year in almost every corner of the globe, the incidence of reported serious reactions is amazingly low. With its indiscriminate use, many of the drug's serious potentialities have often been overlooked, and it may be with surprise that one reads of 15 reported deaths in a period of 18 months from March, 1952 (Kern and Wimberly, 1953), and of a series of 20 unreported deaths collected by Welch and his co-workers (1953) by sending questionnaires to 95 large general hospitals in the country. Other serious reactions that have been reported include anaphylactic shock (Pick and Patterson, 1953), peripheral neuritis (Kolb and Gray, 1946), convulsions (Talbot, 1948), exfoliative dermatitis (Langdon, 1950), and severe serum-sickness type of reactions (Keefer *et al.*, 1943). Mention, too, has been made of the possible relationship of penicillin reactions to the later development of periarteritis (Harkavy, 1952) and lupus erythematosus (Gold, 1951).

A case of unusual penicillin sensitivity manifested by purpura and anaphylactoid type of reaction is here reported. Purpura (Crip and Cohen, 1951) is not a particularly common complication of penicillin administration, and its association with anaphylaxis is even less common. However, there have been reports of fatal reactions involving purpuric manifestations (Welch *et al.*, 1953). Cases have been reported of purpura as the sole manifestation, of purpura associated with other skin lesions or with serum-sickness type of reactions. Anderson (1947) reports a case of purpura associated with melaena and hematuria. In all cases so far the platelet count has been reported as normal.

CASE REPORT

A healthy white man of 28, with no past or family history of allergy, had always been in good health and to his knowledge had never received penicillin in any form. He had received procaine for dental work on several occasions without untoward reaction. His only complaint was that since serving in the second world war he had had a persistent mild recurrent epidermophytosis.

For a month before his hospital visit he had had a mild folliculitis of one buttock, which in the last two days had begun to spread so that he had developed an area of cellulitis with a fluctuant centre. There were no constitutional symptoms.

Prior to incision he was given 600,000 units of procaine penicillin G in aqueous suspension into the gluteal region. There was no immediate reaction, but four hours later he developed a generalized burning of the skin of the legs and trunk, and about an hour later, while urinating, noticed the development of a purpuric rash on his legs and in his groin. On examining himself further, he noticed that the rash was also present in his antecubital fossae and around the neck band. He was not alarmed, as he assumed that he was having a reaction to penicillin, having heard of and seen this type of thing before. He kept on working at his job as a truck helper. However, nine and a half hours after the injection he very suddenly felt quite ill and became apprehensive, pale, dizzy, and nauseated. His bowels moved and he had profuse watery stools.

On physical examination the patient was well nourished and well developed. He was pale, anxious, and sweating. His temperature was 97.6° F. (36.4° C.), pulse 120, and blood pressure 84/60 (usual blood pressure 120/75). Examination of his heart, lungs, and abdomen was unremarkable, but all over the body were scattered petechiae. These were widely scattered on the arms and upper trunk, but were marked, confluent, and ecchymotic on the legs and in the groin. There was no unusually severe reaction at the site

of the injection. The rash was also confluent in the antecubital fossae and around the neck. No petechiae were noted on the mucosal surfaces. At this time the hands and feet were slightly swollen. The tourniquet test (80 mm. for five minutes) was strongly positive.

He was immediately treated with adrenaline, ephedrine, and tripeleminamine, and his anaphylactic symptoms regressed rapidly, his pulse and blood pressure returning to normal. Although for the next eight hours he kept on with the ephedrine and tripeleminamine, his rash continued to spread. At the end of this time the rash no longer spread and he retired to bed, spending a restless night. There was minimal itching of the affected areas. At the height of the rash he showed 10 to 15 red blood cells per high-power field in his centrifuged urine specimen.

Next day he was taken off all medications. He was kept in bed for a week, making an uninterrupted clinical recovery, the skin lesions fading, with desquamation over the affected areas. Laboratory studies 24 hours after the onset of symptoms showed:—Blood: haematocrit, 48%; red cells, 5,610,000 per c.mm.; white cells, 14,200 per c.mm.; differential count normal except for 6% eosinophilia; red cells normal on smear; platelets, 202,000 per c.mm.; bleeding-time, clotting-time, and clot retraction were all within normal limits. The tourniquet test (five minutes at 80 mm. Hg) was positive. Urinalysis showed a trace of albumin and 10 to 15 red blood cells per h.p.f. Culture of pus taken from abscess at time of incision showed *Staphylococcus albus* resistant to penicillin.

Five days after onset the laboratory findings had returned to normal with the exception of the leucocytosis, which had risen to 23,000 with a shift to the left, and 4% eosinophils. The leucocytosis gradually subsided, so that within three weeks after the onset of the illness it was 10,000, with a normal differential.

Scratch tests to penicillin G solution and to procaine were negative, but there was a slight weal when using the procaine and penicillin G in aqueous suspension. Permission to inject intradermally dilutions of this was refused. Subsequent patients were given injections from the same bottle that was used on this patient without adverse effects.

COMMENT

It would seem that this was a case of severe reaction to procaine penicillin G in aqueous suspension in a patient in whom there was no knowledge that he had ever received penicillin before. However, it may be that he actually had had it prescribed for a minor laceration or skin lesion in the past without his knowledge when this type of medication was used locally rather extensively, or he may have had a cross-sensitivity with one of the fungi which had caused his athlete's foot, for this cross-sensitivity has been reported (Peck *et al.*, 1948). Although prior skin testing and questioning probably would not have helped in the decision to administer the penicillin, this case emphasizes the caution necessary in giving this drug, especially in combination with another foreign substance such as procaine. As it turned out, the organism was insensitive to the drug, and the only potentialities procaine penicillin had were for harm in this case, and time alone will tell whether any more serious manifestations are likely to follow these immediate severe anaphylactoid reactions.

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Reviews

CLINICAL BACTERIOLOGY

Clinical Bacteriology. By E. Joan Stokes, M.B., B.S., M.R.C.P., M.R.C.S. Foreword by A. A. Miles, C.B.E., M.D., F.R.C.P. (Pp. 288+vi; illustrated, 20s.) London: Edward Arnold Ltd. 1955.

The methods used in different laboratories for bacteriological diagnosis are more diverse than in any other branch of applied pathology. The value of the results obtained depends not only on the methods used but on a high degree of technical skill in their application, and on a capacity for distinguishing between grain and chaff which only comes with experience. An account of how to do such work well is therefore a welcome addition to medical literature. Dr. Stokes's book centres round two chapters on how to isolate bacteria from various types of specimen, but others follow on the identification of species, on serological tests, on work involving antibiotics, and on the study of cross-infection. There is also a separate chapter on the investigation of tuberculosis and mycoses, and a final purely technical one dealing chiefly with the composition of culture media.

If the admirable methods advocated were generally followed, the standard of work in clinical laboratories would be greatly improved. They are perhaps a little idealistic and lavish: thus it is often said that three separate cultures should be made for incubation under different atmospheric conditions, whereas it can often be confidently anticipated that one will serve. It is rightly insisted that direct stained films should be made from specimens before cultivation as a guide to their bacterial content, and, indeed, to the cultural methods required. Oddly enough, this is said to be unnecessary for urine; if the author had made a practice of doing this she might be less sceptical about the frequency of mixed infections of the urinary tract. A healthy common sense is displayed in advocating that cultures consisting of saprophytes should be discarded: clinicians are being misled wholesale by detailed reports enumerating species of no consequence. Interesting methods advocated are the anaerobic incubation of all cultures for the identification of haemolytic streptococci, and an "optochin" sensitivity test for identifying pneumococci; the similar use of bacitracin for Group A *Streptococcus pyogenes* might have been mentioned. A little more might with advantage be included about simple technique: there are no instructions about how to spread a plate, and two useful tricks which have been devised for the direct demonstration of tubercle bacilli in cerebrospinal fluid are not mentioned.

This book sets a very high standard, particularly in insisting on full species identification, and in the principles laid down in an introductory chapter on the interpretation of results. It is much to be hoped that it will become a recognized guide to the practice of clinical bacteriology.

L. P. GARROD.

DISSEMINATED SCLEROSIS

Multiple Sclerosis. By Douglas McAlpine, M.D., F.R.C.P., Nigel D. Compston, M.A., M.D., M.R.C.P., and Charles E. Lumsden, M.D. (Pp. 304+viii; illustrated, 35s.) Edinburgh and London: E. and S. Livingstone Ltd. 1955.

The title of this book is perhaps unfortunate. "Disseminated sclerosis" is a term familiar to all medical practitioners and many laymen in Great Britain, but it is conceivable that some will not realize that "multiple sclerosis" is synonymous. The first eleven chapters discuss aetiological factors, clinical and laboratory investigations, and problems of prognosis, diagnosis, and treatment. Aetiology makes an unexpected reappearance in Chapter 13. Most neurologists have taken the view in the past that when disseminated sclerosis is diagnosed in two or more members of one family the probability is that the diagnosis

is incorrect and that the patients will, in fact, be found to be suffering from a different condition genetically determined. These authors take the opposite view and think the incidence of "familial" (though this does not necessarily mean "hereditary") examples is so considerable as to be of diagnostic significance. Their observations show that trauma is an aetiological factor in no less than 14%; the history of trauma was allowed to extend back for three months and even included such minor injury as dental extraction. It is strange that aggravation by pregnancy and parturition are largely discounted; it would seem not unreasonable to assume that, if extraction of a tooth can aggravate this disease, the trauma of parturition might well do so, quite apart from its psychological effects. Many neurologists believe that the disease does not occur in those of inferior intelligence, and some think there is a clear-cut pre-sclerotic personality; here these views are not mentioned, even to be discarded. Although emotional factors are accepted as being of some importance, no word with the prefix "psych-" appears in the index.

It is unfortunate that the important suggestions of Professor Platt (*British Medical Journal*, 1955, 1, 179) were not available before the book went to print. He suggests that artificial feeding in infancy may sow the seeds of this disease, and advances impeccable, if theoretical, biochemical arguments; such a view might well provide the answer to the curious geographical distribution of the disease.

Chapters 12 and 13 bring the problems of neuropathology completely up to date, and include a detailed review of the world's literature on this subject, together with many other possibly related, though rare, conditions, and for the specialist these two chapters must be considered to constitute the most authoritative article at present available.

HUGH GARLAND.

PSYCHOSOMATIC MEDICINE

Modern Trends in Psychosomatic Medicine. Edited by Desmond O'Neill. (Pp. 375; illustrated, 55s.) London: Butterworth and Co., Ltd. 1955.

This book of twenty-one chapters by numerous contributors constitutes a comprehensive survey of the field of psychosomatic medicine. The subject is of immense importance to both general practitioners and specialists; it is to the former that this book may make a particular appeal. Most of the chapters are written in a straightforward manner, are practical, and are concerned especially with the problem of aetiology and treatment. I am glad that this is so, because every day it is becoming more important that the doctor of the future should be a man who has been adequately and fully trained. That, of course, means that the more subjective side of medical work should have as much attention as the objective, and that the integration of mind and body should be in the forefront of medical practice. It is really a question of undergraduate training. Every successful general practitioner knows that that must be so, and the articles in this book written by Hopkins, Todd, and O'Neill respectively make that position abundantly clear. Todd emphasizes the position especially when he points out that the most ordinary case with the most ordinary signs and symptoms can still be an interesting person. The accurate recognition of the person back of the disease is the important issue. The doctor who knows that is the one who will obtain real satisfaction out of his work and will be of immeasurable help to those who consult him.

While this book serves an important purpose, yet it could easily have reached a much higher level. It is very uneven in its presentation. Some chapters can be highly recommended; others have little or no justification for their inclusion. It seems almost as if a certain amount of needless padding had been indulged in. The editor might, in case of another edition, give serious consideration to a reconstitution of this volume.

D. K. HENDERSON.

RORSCHACH TESTING

Psycho-analytic Interpretation in Rorschach Testing: Theory and Application. By Roy Schafer, Ph.D. (Pp. 446+xiv. \$8.75.) New York: Grune and Stratton. 1954.

To psychologist and psycho-analyst alike it is a truism that the value of any psychological test depends on the degree to which it is capable of correlation with a coherent theory of mental function. To which generalization the psycho-analyst naturally adds, *ex parte*, that the quiddity of psychological data, whether these be gathered from spontaneous introspections or, as in the Rorschach test, evoked by the application of set stimuli, can be appreciated only after they have been interpreted, preferably by a Freudian. It was in fact inevitable that the Rorschach test, which at first had only slender association with psycho-analytic thinking, should sooner or later be correlated with Freudian theory.

Dr. Schafer has made a conscientious attempt to effect this correlation. Starting with a careful survey of the "test situation" from both subjective and objective standpoints, he examines the "response process," "thematic analysis," and the criteria for judging the adequacy of interpretations. Having produced a mainly psycho-analytical classification of themes and variations, he then proceeds to examine the Rorschach test in terms of the psycho-analytical concept of mental "defence" and considers in series the processes of repression, denial, projection, and "obsessive-compulsive" mechanisms.

The book is one that calls for a specialized knowledge of both the Rorschach and the Freudian approach—a fact which might seem to limit its appeal to general clinicians. Despite this disadvantage it can be read with profit by those—and there are many—who have recourse to the test without knowing very much about it. Its main flaws are a verbosity which, in the case of terminology, borders on verbigeration, and, despite the assurances of the author, a rather naive belief that modern psycho-analytical constructs (narcissism, for example) are adequately defined. Incidentally some important, if rather diffuse, psycho-analytical concepts—for example, "introjection" and "sublimation"—have been left severely alone; and there are no parallel (control) correlations with other theories of mind. Perhaps some Jungian will remedy this omission.

EDWARD GLOVER.

TUMOURS OF LYMPHOID TISSUE

Tumours of Lymphoid Tissue. By George Lumb, M.D. Foreword by Sir Stanford Cade, K.B.E., C.B., D.Sc., F.R.C.S., M.R.C.P., F.F.R. (Pp. 203+viii; illustrated. 37s. 6d.) Edinburgh and London: E. and S. Livingstone Ltd. 1954.

This monograph is based on a clinical and pathological study of 410 patients with primary tumours of lymphoid tissue seen at the Westminster Hospital between 1940 and 1952. The tumours are classified under the headings follicular lymphoma, lymphosarcoma, reticular lymphoma, Hodgkin's disease, reticulum-cell sarcoma, and anaplastic tumours of lymphoid tissue, and the pathology of each is described along conventional lines, with special emphasis on the natural history of the disease. Chapters are included on problems of diagnosis and the effects of therapy, and 19 illustrative case histories are given in detail.

This is a simple and straightforward account of a difficult subject, but it says nothing that has not been said before. The many tables are unnecessarily bulky, and some of them could with advantage be omitted and their contents included in the text. The book is lavishly illustrated; 84 whole pages are devoted to illustrations, as well as many half-pages. While most of the photographs are excellent, some—notably Figs 9 and 11, 1, 2, 3, and 4—are poorly defined. There is much unnecessary repetition in the illustrations; in the chapter on Hodgkin's disease, for example, there are six very similar photomicrographs of abnormal reticulum cells and three of fibrosis in a gland. In the chapter on

effects of therapy there are four illustrations of collagen formation in a gland; and in the section on problems of diagnosis nine illustrations from the case of torulosis previously described by Galton and Whittick seems excessive. The index consists largely of a list of chapter headings and subheadings, and omits many of the subjects mentioned in the text.

If Dr. Lumb has added nothing new or original to our knowledge, we should at least be grateful that he does not still further confuse it.

W. GOLDIE.

CRIME COMICS AND JUVENILE DELINQUENCY

Seduction of the Innocent. By Fredric Wertham, M.D. (Pp. 397+x; illustrated. 21s.) London: Museum Press Ltd. 1955.

The traffic in crime comics in the United States has grown rapidly in recent years. In 1947 they represented about one-tenth of the total of all comic books, in 1949 one-third, in 1954 "the vast majority." About 90 million copies are now sold every month, and a million dollars a week are taken from the pockets of children. Copies pass from hand to hand in a brisk second-hand trade and are read by many children. Dr. Wertham estimates that the average American child reads over 14 comic books a week. The publishers, usually subsidiaries of big firms, constantly change their names and are, in effect, anonymous.

The trade is horrifyingly evil. Turning over the 16 pages of photographic reproduction in Dr. Wertham's book, one sees baseball played with a man's head; a close-up of the face of a hanged man (cover picture); two men tied to the back of a speeding car, their faces being "erased" in the grit; a girl screaming while her right eye is held open and a hand approaches it with a stiletto. Advertisements offer the child, for money sent through the post, switchknives, throwing knives, pistols shooting steel darts. To quote the author, "The cover of the comic book draws the child's attention to a crime, the text describes one, the pictures show how it's done, and the advertisements provide the means to carry it out."

It would seem self-evident that such a pabulum must have a debasing and demoralizing effect. This is, however, not the established psychiatric view in the U.S.A. Psychiatrists of repute can be hired by publishers to endorse the harmlessness of their products; and the child-guidance experts think the causation of juvenile delinquency is so complex that it would be altogether too "simple" to suppose that crime comics had anything to do with it. Psycho-analysis teaches us that the foundations of personality are laid down in the first six months, so that by the time he comes to read these books the child is already predestined to delinquency or to sanity.

Dr. Wertham's book is all too readable, and should be widely read; but it is not a satisfactory presentation of his powerful case. Facts and arguments are not marshalled in an orderly way, and the book badly needs a good index.

ELIOT SLATER.

Though he has seen much of the world, Dr. Harry R. Lillie reserves his most cordial enthusiasm for the glittering wastes of the polar regions in *The Path Through Penguin City* (Ernest Benn, 25s.), and he succeeds in communicating to the reader his love of the animals that are too often slaughtered there with needless or careless cruelty. "Whaling and sealing, written and talked about in the past as sagas of heroism and adventure, I had found to be largely sagas of brutality." His story makes a curiously personal travel book. Against a background of unusual voyages and places, the description of which he supplements with clear photographs, he sets his forceful plea for more kindness in man's treatment of wild animals. Certainly many medical men could only regard as abhorrent the manner in which the commercial exploitation of whales and seals is sometimes carried on. The author has himself had some success in encouraging the whalers to adopt more humane techniques, though the problem of excessive fishing has not been solved.

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PROGNOSIS IN CANCER OF LARGE INTESTINE

In England and Wales in 1953 cancer of the large intestine caused 15,395 deaths.¹ Cancer of the rectum was responsible for 5,676 of this total, or 1 out of every 90 deaths from all causes, and cancer of the colon for 9,719, or 1 out of every 52. Figures obtained by the General Register Office show that, of the cases of cancer of the rectum registered in 1945 and 1946 at their initial hospital attendance, only 11% of the males and 17% of the females are alive at the end of five years. For cancer of the colon the comparable figures are 10% and 14%. Referring to the prognosis of cancer of the large bowel in the population of Detroit, D. A. Cameron, H. A. Chapnick, and D. W. McLean² conclude their analysis by stating: "Our study indicated that out of every 100 admissions for cancer of the large bowel 40 patients will leave hospital presumably cured, but only 15 will be alive and well five years later." These two series of statistics, the one concerning a population of 44 millions on this side of the Atlantic and the other one of over 1½ millions on the other side, are strikingly similar and represent the true overall prognosis of the disease.

Many workers have recorded the prognosis in operated cases which, since secondary deposits were absent from the liver, the surgeon had hoped to cure. Typical of the larger series is that of R. S. Grinnell,³ in the U.S.A., who analysed 521 such cases of cancer of the colon and 366 of cancer of the rectum. Of the colon cases 45.5% were alive at the end of five years (operative deaths being taken into account) and of the rectum cases 46.4%. On separating the survivors into those whose lymph glands were involved at the time of operation and those who had no metastases, the survival figures were approximately 37% and 68% for both cancer of the colon and cancer of the rectum. In Britain Gabriel's figures⁴ for the rectum of approxi-

mately 34% and 68% are closely similar. These figures suffice to show that the prognosis of cancer of the large intestine is lamentably poor and that the results of surgery depend largely for their success on the absence of affected lymph nodes at operation, or, if they are involved, on the possibility of their excision.

How may the prognosis be improved? First, by earlier diagnosis. In the anaplastic type of growth the lymph nodes may be infiltrated while the primary is still small and has only recently caused symptoms. At the other end of the scale, in the case of well-differentiated cancer, the lymph nodes may not be involved in spite of the fact that the growth is bulky and has caused symptoms for many months. Nevertheless these types of case are in the minority and in most the presence of metastases seems directly related to the duration of the symptoms of the disease. Diagnosis may be delayed by the patient not consulting his doctor when symptoms first appear or by the doctor not appreciating the significance of the symptoms and such signs as may be present. Since one out of every six deaths are attributable to cancer of all types, it is surely time the public were better informed about the early symptoms of the disease, for only thus can the main source of delay be reduced. The second source should serve as a challenge to the teachers at undergraduate hospitals. The earliest symptoms, not only of cancer of the large intestine but of all cancers, are perhaps apt to be forgotten by students because of the emphasis often placed on surgical technique and the biochemistry of post-operative care. Too little time is still spent at the bedside and too much in the operating-theatre. It is an unfortunate fact that in a series reported by S. O. Aylett⁵ 30% of cases of cancer of the rectum experienced an average delay of three months between first attendance on the doctor and reference to hospital. This delay would be minimized if, in particular, alterations of bowel habit, however small, and minor bleedings, even in young patients, were always thought of as being due to cancer of the large intestine until this cause was disproved by further investigation—and if a rectal examination was carried out in all such cases.

Developments in surgical techniques have their part to play in improving the prognosis of cancer of the large intestine. In 1938-9 the resectability rate of cancer of the colon was, according to the British Empire Cancer Campaign's figures, only 34.8%. In a series operated on between 1945 and 1953 by various surgeons and reported by Lawrence Abel at the combined meeting of the Association of Surgeons and the American College of Surgeons in the summer of 1954 the resectability rate was 67.3%. While the

¹ Registrar-General's Statistical Review of England and Wales for the Year 1953, Tables, Pt. I, Medical, 1954, H.M.S.O.

² Cameron, D. A., et al., *Arch. Surg. (Chicago)*, 1954, 88, 242.

³ Grinnell, R. S., *Surg. Gynec. Obstet.*, 1953, 96, 31.

⁴ Gabriel, W. B., *The Principles and Practice of Rectal Surgery*, 1948, London.

⁵ Aylett, S. O., *Practitioner*, 1949, 162, 502.

⁶ Deddish, M. R., *Proc. roy. Soc. Med.*, 1950, 43, 1075.

⁷ Ault, G. W., et al., *Surg. Gynec. Obstet.*, 1952, 94, 223.

⁸ Grinnell, R. S., and Hiatt, R. B., *ibid.*, 1952, 94, 526.

⁹ Goligher, J. C., *Brit. J. Surg.*, 1954, 168, 351.

¹⁰ Aylett, S. O., *Surgery of the Caecum and Colon*, 1954, Edinburgh.

¹¹ Wangenstein, O. H., et al., *Surg. Gynec. Obstet.*, 1954, 99, 257.

resectability rate had nearly doubled, the operative mortality had been halved from 18.3% to 9.2%. These latter figures will probably be improved on again with recent advances in pre- and post-operative care and anaesthetic and operative techniques, permitting a more favourable prognosis. Many authors have drawn attention to the need for the widest possible excision of the areas of lymphatic drainage in treating cancer of the large intestine.⁶⁻¹⁰ These extensive operations, when carried out on reasonably fit patients by surgeons trained in colonic surgery, have a low mortality rate and should help to improve the prognosis. Another recently developed surgical concept is the "second look" procedure described by O. H. Wangenstein.¹¹ He advocates, in those cases in which at the first operation lymphatic metastases are found, reopening the abdomen six months after the initial excision. If the disease has recurred, resection is again carried out, and the abdomen is explored at six-month intervals until one operation is completed at which no cancer is discovered. It may certainly be a procedure worth undertaking for those cases in which the pathological examination of the specimen excised at the first operation shows lymphatic involvement as far as the ligature round the main vascular pedicle. The prognosis in this group of patients is particularly poor, and in Gabriel's series only 11% were alive at the end of five years.⁶ Earlier diagnosis and the most radical excisions undertaken by surgeons trained in colonic surgery offer at present the only hopes of diminishing the high mortality of this disease. Both hopes are, with high endeavour, attainable.

TREATMENT OF TUBERCULOUS MENINGITIS

A recent leading article in a contemporary on tuberculous meningitis contained the statement, "attempts to eliminate intrathecal therapy—are justified only if undertaken cautiously in specialized units."¹ Dr. Douglas Hubble² later contested this, referring to treatment without intrathecal injections as "nearly universal practice." No one will deny the introduction of isoniazid has greatly improved the prognosis in this disease, but it is only about three years since it was first generally used, and a survey of the experience gained is appropriate at this stage. There has been some diversity in the methods used, and it is interesting to see how the results and conclusions bear on the difference of opinion to which we refer.

Clark and his colleagues³ contributed the first enthusiastic report on the effect of isoniazid in both

meningeal and miliary tuberculosis. Many of their patients were Navajo Indians: fifteen had meningitis, and with the exception of two of them, who at one stage had intrathecal streptomycin, they were given either isoniazid alone or isoniazid and intramuscular streptomycin. It is now generally believed that treatment with any single drug is a mistake, but Appelbaum and Anderson⁴ report 7 recoveries in 10 cases treated only with isoniazid or iproniazid (1-isonicotinyl-2-isopropyl hydrazide). Torres-Gost,⁵ of Madrid, reported on an unusual method of treatment in 100 patients, among whom there had been only six deaths: this was intramuscular streptomycin together with both oral and intrathecal isoniazid. An accompanying paper by Fletcher⁶ reports that oral administration of isoniazid produces adequate concentrations of the drug in the cerebrospinal fluid, and it thus seems clear that intrathecal administration of this drug is superfluous.

Intrathecal administration of streptomycin, despite the advent of isoniazid, has been continued in several centres in Great Britain. Anderson and his colleagues⁷ treated seven patients, all of whom survived, one being given isoniazid only and the remainder also both intramuscular and intrathecal streptomycin, in four for only one week and in two for four weeks. Lorber⁸ gave streptomycin by both routes to 22 patients, of whom 12, with 11 survivals, also received oral isoniazid, and 10, with 8 survivals, did not. The former group needed fewer intrathecal injections, the average being 65, whereas in the group not receiving isoniazid it was 90. Lorber discussed the necessity for intrathecal streptomycin, and, having failed to find any record of a comparative trial of treatments with and without it, decided that there was insufficient evidence to justify its abandonment. The series of 60 patients at the Hospital for Head Injuries at Oxford described by Taylor⁹ is larger, and the verdict from such a source that "intrathecal streptomycin is considered to be the *sine qua non* of satisfactory therapy" must command respect. On the other hand, this paper does not discuss any improvement which may have resulted from the introduction of isoniazid, or indeed even state the number of

¹ *Lancet*, 1954, 2, 797.

² Hubble, D., *ibid.*, 1954, 2, 1076.

³ *Amer. Rev. Tuberc.*, 1952, 66, 391.

⁴ *J. Amer. med. Ass.*, 1954, 156, 673.

⁵ *Lancet*, 1953, 2, 693.

⁶ *Ibid.*, 1953, 2, 694.

⁷ *Ibid.*, 1953, 2, 691.

⁸ *Ibid.*, 1954, 1, 1149.

⁹ *Tubercle (Lond.)*, 1954, 35, 126.

¹⁰ *British Medical Journal*, 1953, 2, 1127.

¹¹ *Amer. J. Dis. Child.*, 1954, 87, 273.

¹² *Amer. Rev. Tuberc.*, 1954, 69, 192.

¹³ *Ibid.*, 1954, 69, 370.

¹⁴ *Proc. Mayo Clin.*, 1953, 28, 381.

¹⁵ *Transactions of the 13th Conference on the Chemotherapy of Tuberculosis* 1954. Veterans Administration, Washington.

patients to whom this drug was given: it is concerned rather with the improvement in results attributed to intrathecal tuberculin.

A number of other authors have either reached or incline to the opposite conclusion. Bulkeley,¹⁰ of Durban, having treated in a variety of ways a long series of patients, nearly all children, finally adopted as a standard treatment intramuscular streptomycin with oral isoniazid and P.A.S., together with A.C.T.H. to prevent arteritis and the formation of organizing exudates. The last 17 patients in the series received this treatment, and among them there have been three deaths. It is stated that "intrathecal streptomycin is now a thing of the past in this hospital." Waddell and his colleagues¹¹ contrast the poor results previously obtained in children with those now given by intramuscular streptomycin and oral isoniazid and P.A.S., but the number of cases they treated was small. Spies and his colleagues¹² present a similar contrast on a larger scale: of their 61 pre-isoniazid patients only 11 survived, but of 26 treated with isoniazid 14 have survived. Half of this group were also given streptomycin by both routes, but the survivors were equally divided between these and the remainder. Spies *et al.* think it "likely that the penetration of isoniazid into the cerebrospinal fluid . . . will obviate the necessity for intrathecal streptomycin therapy in the future." Fitzpatrick,¹³ on the other hand, reached and acted on this conclusion some time ago: of four systems successively used in treating his series of 46 patients at Denver, the last and most successful consisted of oral isoniazid and P.A.S. and streptomycin by the intramuscular route only. He notes that the cerebrospinal fluid became normal during this treatment after an average of 6.1 months, compared with 11 months or more after all previous forms of treatment. An author who also commends this system of treatment, but without citing clinical evidence in support of it, is B. E. Douglass,¹⁴ of the Mayo Clinic. Perhaps the most striking, because graphically presented, evidence of the altered outlook in this disease is that furnished by the large-scale Veterans Administration study in the U.S.A.¹⁵ In the graphs of survival of 287 cases given four different systems of treatment, that for "isoniazid in combination" soars above all the rest. Most of the 8 deaths in the 39 patients so treated occurred early. It was elicited in the discussion on these findings that only 6 of these 39 patients were given streptomycin intrathecally. This is perhaps the most solid piece of evidence that the intrathecal injection of streptomycin may no longer be necessary, but the weight of other published American opinion also seems to favour this view.

SALICYLATE INTOXICATION IN CHILDREN

Salicylates have long been used in the treatment of acute rheumatism, and their toxic qualities are well understood. Lees,¹ who was one of the first to recommend large doses of sodium salicylate in the treatment of rheumatic fever—he prescribed 180 gr. (12 g.) daily—recognized in 1903 that hyperpnoea was the important symptom indicating intoxication. This hyperventilation was assumed to be due to acidosis, but Graham and Parker² in 1948 showed that it was the result of reflex stimulation of the respiratory centre by the high concentration of salicylate in the plasma, and therefore that its first biochemical sequel was a respiratory alkalosis. The kidney then allows bicarbonate to escape, while retaining chloride; so the plasma bicarbonate falls and plasma chloride rises.³ In those suffering from intoxication by salicylates alkalosis is therefore the first state, and acidosis the second but not final state if treatment is prompt and correct.

Accidental aspirin-poisoning apart, salicylate intoxication would probably be a rarity if Coburn⁴ had not suggested that it was necessary to achieve a salicylate level of 35–50 mg. per 100 ml. of plasma in acute rheumatism in order to obtain optimal therapeutic results. Subsequent investigations have established that, if blood concentrations of this degree are to be maintained, many patients will be poisoned. For example, Holt,⁵ in treating 52 children with acute rheumatism, tried to keep the concentration of salicylate at 30–40 mg. per 100 ml. of plasma, and 17 of his patients developed hyperpnoea. He concluded from this experience that if children are to be treated with salicylates in high dosage admission to hospital will usually be required. The question then immediately arises: are smaller doses of the drug and lower amounts of salicylate in the plasma equally effective in the treatment of acute rheumatism? The same group of Sheffield paediatricians⁶ has done something to answer this question. Acute rheumatism in 10 children treated by high doses of salicylate remitted in an average of 39 days, and a similar group treated with much smaller doses of salicylate remitted in an average of 50 days. The dose of salicylate was 1½ gr. (100 mg.) per lb. (0.45 kg.) of body weight—say, 60–120 gr. (4–8 g.) daily—in the

¹ *British Medical Journal*, 1903, 2, 1318.

² *Quart. J. Med.*, 1948, 17, 153.

³ Singer, R. B., *Medicine (Baltimore)*, 1954, 33, 1.

⁴ *Bull. Johns-Hopk. Hosp.*, 1943, 73, 435.

⁵ *Lancet*, 1954, 2, 1144.

⁶ Holt, K. S., *ibid.*, 1954, 2, 1197.

⁷ *Textbook of Paediatrics*, edited by Nelson, W. E., 1954. Philadelphia.

⁸ Joint Report Medical Research Council and American Heart Association, *British Medical Journal*, 1955, 1, 555.

⁹ Heymann, S., Javett, S. N., and Rudolph, A. M., *S. Afr. med. J.*, 1954, 28, 1092.

first group, and only 20–30 gr. (1.3–2 g.) daily in the second group. Would a more moderate commencing dose of 1 gr. (65 mg.) per lb. of body weight per day—say, 40–80 gr. (2.5–5 g.) daily—with a gradual reduction in dosage after two days, as usually recommended,^{7,8} achieve an optimal result with a negligible risk of intoxication? This is as yet uncertain, but it would be as well not to exceed this dosage as a general rule nor to neglect the first appearance of hyperpnoea.

Since acute rheumatism is uncommon under the age of 4, and aspirin is not a drug which is much used in this country either in the treatment of disease or for the relief of pain in the very young, therapeutic salicylate poisoning in infancy is rare. This is fortunate, for South African experience⁹ suggests that infants are especially liable to salicylate poisoning. In one year 15 infants were admitted to a Johannesburg children's hospital suffering from therapeutic salicylism, and 7 of them died. Two circumstances appeared to have enhanced the toxic properties of the salicylate. The children were usually suffering from pyrexial diseases likely to be accompanied by oliguria; and most of them had received a sulphonamide-aspirin mixture which was at that time (1951) a popular prescription in South Africa, and the sulphonamide may itself have interfered with renal tubular function. No similar mixture has been widely used in this country (it was popular in Sweden in 1947), and the cases of salicylate poisoning in infants admitted to hospitals in Britain are usually the result of accidental ingestion of the drug. The South African report is a reminder that aspirin has little place in the treatment of sick infants.

Gastric lavage should be used promptly in treatment if a large single dose has been taken; if the child's condition is not serious, this, and a high fluid intake, may be sufficient. Intravenous fluids will be required if the child is ill, both to ensure the rapid elimination of the drug through the kidney and to correct electrolyte disturbances. Heyman and his colleagues⁹ recommend that Ringer lactate solution should be used for intravenous infusion, followed by 5% dextrose-water solution. In one patient an exchange transfusion was probably life-saving, and the level of salicylate in the blood was reduced by this means from 53 mg. to 28 mg. per 100 ml.

INSECTICIDE VAPORIZERS

One advantage of the English climate, especially in a summer such as we experienced in 1954, is that flies are rarely such a nuisance as they are in warmer lands. Less fortunately, perhaps, standards of hygiene are not so high as they should be, and access to food by flies is

often lamentably easy. In many parts of the U.S.A. warm summers encourage fly breeding, and this fact, coupled with a higher general awareness of the risks of poor hygiene, has inspired a more concerted attack on flies at as many points as possible. Active sales-promotion methods there have led to the widespread use of insecticide vaporizers, and they are also on sale in Britain. The principle of these devices is the volatilization of substances like D.D.T. or, more commonly, gamma B.H.C. (lindane). The solid insecticides are vaporized from some heat source which may or may not be thermostatically controlled to regulate the rate of evaporation. Such devices are intended to maintain a constant concentration of insecticide in the air, though this is difficult in a normally ventilated room, where the air may change completely from five to several hundred times a day. Much of the insecticidal effect of the vaporizers is probably due to residues which they deposit on adjacent parts of walls and ceiling. Indeed, there seems to be little evidence that these machines, even if operating under optimum conditions, are more effective in killing flies than residual films of insecticide deposited by spraying. Nevertheless the idea of a continuous, virtually effortless control of flying insects in closed spaces by means of these vaporizing devices has obviously made an appeal in the U.S.A. that has led the public health authorities to feel considerable concern about the possible health hazards incurred. The A.M.A. Committee on Pesticides has issued three warnings within three years about the dangers from these machines.¹⁻³ An interdepartmental committee on pest control laid down performance standards for acceptable machines. The maximum output should not exceed 1 g. per 15,000 cubic ft. (425 cubic m.) per 24 hours, which gives a concentration of about 0.2 mg. per cubic metre. The committee noted that few machines conformed to what was considered to be a reasonably safe design. It has been observed that a vaporizer adjusted to emit 1 g. per 24 hours varied from $\frac{1}{2}$ to 2 $\frac{1}{2}$ g. according to prevalence of local air currents.⁴ They advised against their use in private houses or in premises where food was prepared or eaten. Exposed food can pick up 0.1–1 p.p.m. gamma B.H.C. each day of exposure in rooms where the vaporizers are used.

The Pesticides Committee has had its attention drawn to a number of cases of illness attributed to exposure to these vapours. Most are cases of irritation of the eyes and respiratory tract and dermatitis. Their occurrence clearly illustrates the selection of the few hypersensitive individuals from a large exposed population. More questionable is the association between a case of peripheral neuritis, one of anuria, and several of anaemia with exposure to these insecticides as vapours. Although gamma B.H.C. is generally regarded as relatively non-toxic, the committee records the case of a baby having convulsions within an hour of swallowing a tablet of gamma B.H.C., giving a dose

¹ *J. Amer. med. Ass.*, 1952, 149, 367.

² *Ibid.*, 1953, 152, 1232.

³ *Ibid.*, 1954, 156, 607.

⁴ Spear, P. J., *Soap*, 1952, No. 8, 147.

⁵ McNamara, P. B., and Krop, S., *J. Pharmacol.*, 1948, 82, 140.

equivalent to 45 mg. per kg. But, if relatively non-toxic by mouth, gamma B.H.C. is very toxic when injected intravenously, and a dose of 5 mg. per kg. will cause convulsions in dogs.⁵ Inhalation of the vapour of gamma B.H.C. obviously more nearly approximates to an intravenous than to an oral route of administration. Reference is made in the A.M.A. Committee's report to observations that rats are affected by the continuous inhalation of 0.7 mg. of gamma B.H.C. per cubic m. of air seven hours a day for months and that the compound can accumulate in the brain.

Whether or not the use of these devices presents a real hazard to the majority of healthy people exposed to them, the hypersensitive minority are clearly going to suffer. In the absence of any good evidence of their value in insect control—an absence that may account for some of the sales-promotion methods used in America—it is to be hoped that their use will not become widespread in Britain. The prevention of breeding is the most satisfactory method of insect control when it can be effectively carried out. All flying insects alight sometimes, and the insecticide should be selectively deposited in such places by spray or a more permanent type of application. Widespread diffusion in the air of probably ineffective concentrations of insecticide is followed by a haphazard distribution of the condensed solid in the vicinity of the vaporizer.

ISONIAZID AND PYRIDOXINE METABOLISM

After the introduction of isoniazid for the treatment of tuberculosis, many workers reported that prolonged administration of the drug gave rise to unpleasant side effects, some of which resembled those due to vitamin deficiencies. Thus J. S. Pegum¹ described a patient who suffered from the "burning feet" syndrome after treatment with isoniazid, suggestive of a pantothenic acid or nicotinic acid deficiency. R. B. McConnell and H. D. Cheetham² refer to a patient receiving the drug who developed acute pellagra, and who recovered on treatment with the vitamin-B complex. During studies on the effect of high doses of isoniazid J. P. Biehl and R. W. Vilter^{3,4} noted that peripheral neuritis was a fairly common side effect, occurring in about 40% of their patients. The similarity of the neuritis to that caused by the pyridoxine (vitamin B₆) antagonist, desoxypyridoxine,⁵ led them to investigate pyridoxine metabolism in tuberculosis patients receiving isoniazid. Seventy-four patients were given isoniazid in doses ranging from 6 to 24 mg. per kilogram of body weight a day for periods of two to twelve months. The incidence of peripheral neuritis was greatest in those patients receiving the higher doses of the drug. Those given the standard dose showed no symptoms until six months had elapsed, but patients on high doses frequently developed neuritis in five weeks.

¹ Pegum, J. S., *Lancet*, 1952, 2, 536.

² McConnell, R. B., and Cheetham, H. D., *ibid.*, 1952, 2, 959.

³ Biehl, J. P., and Vilter, R. W., *Proc. Soc. exp. Biol. (N.Y.)*, 1954, 85, 389.

⁴ *J. Amer. med. Ass.*, 1954, 156, 1549.

⁵ Vilter, R. W., et al., *J. Lab. clin. Med.*, 1953, 42, 335.

⁶ Ungar, J., et al., *Lancet*, 1954, 2, 220.

When the isoniazid was withdrawn, symptoms disappeared in a few weeks, although residual effects persisted for a year or more in those patients receiving treatment for more than a few weeks after the onset of symptoms. When pyridoxine was given with large doses of isoniazid, neuritis did not appear, although it did in 40% of the patients receiving isoniazid without pyridoxine. It is of considerable interest that this drug-induced neuritis has not been reported in children or monkeys receiving high doses of isoniazid.

Biehl and Vilter followed the effect of the drug on pyridoxine and nicotinic acid metabolism by examining the urinary excretion of pyridoxine, pyridoxic acid (an inactive metabolite), and N'-methylnicotinamide, which is the normal excretion product of nicotinic acid. They also tested for pyridoxine deficiency. Since pyridoxine is essential for the normal metabolic breakdown of the amino-acid tryptophan, a deficiency of pyridoxine results in an abnormal breakdown of tryptophan to xanthurenic acid. Biehl and Vilter therefore gave test doses of tryptophan and interpreted the appearance of xanthurenic acid in the urine in high quantities as a sign of pyridoxine deficiency. After high doses of isoniazid the excretion of pyridoxine and xanthurenic acid was increased, but that of pyridoxic acid and the nicotinic acid metabolite was normal in all patients. The pyridoxine did not interfere with the antituberculous activity of the isoniazid. J. Ungar and his co-workers⁶ have shown that the toxic effects of isoniazid in mice, manifested by retardation of weight and involution of the testes and thymus, can be prevented by pyridoxine, which does not interfere with the antituberculous activity of isoniazid *in vitro* or *in vivo* in mice.

It has been assumed that isoniazid exerts an anti-vitamin effect by blocking the action of nicotinic acid and pyridoxine by competitive inhibition, just as the sulphonamides block the action of *para*-aminobenzoic acid.¹ Biehl and Vilter do not accept this view. They consider that isoniazid depletes the tissues of pyridoxine, and so causes a deficiency of this vitamin by the formation and excretion of the isonicotinyl hydrazone of pyridoxal, the formation of which can be demonstrated in the test-tube. If this explanation is correct, is it possible that other drugs with a hydrazide grouping, such as hydralazine (apresoline), might behave in a similar way?

HEART BEATS OFF THE MAINS

Treatment of the syncopal attacks of Stokes-Adams disease presents difficulties, especially when episodes of cardiac arrest become frequent and severe. Zoll and his colleagues¹ have used an external cardiac pacemaker to maintain adequate cardiac contractions until spontaneous ventricular rhythm reappeared. This instrument produces monophasic, rounded electric impulses, with an average duration of 2 to 3 milliseconds. The frequency of the shocks may be adjusted from 30 to 180 stimuli per minute and the amplitude from 0 to 150 volts.

¹ *Circulation*, 1954, 9, 482.

² *J. Amer. med. Ass.*, 1955, 157, 444.

The cardiac pacemaker is attached to the patient by two leads, which are connected to circular chest electrodes so placed upon the chest that the current flows across the heart. The instrument may be operated either from the mains or from a battery. Zoll and his colleagues report its use in fourteen patients with Stokes-Adams disease. Their patients were mostly in the seventh and eighth decades of life and were brought into hospital because of increasingly severe and frequent attacks of cardiac arrest. Treatment by the cardiac pacemaker was given either for short periods in individual Stokes-Adams attacks or for more prolonged periods during frequently recurring attacks, stimulation being maintained sometimes for as long as one hundred hours. In all patients except one sustained beats finally reappeared and stimulation was then stopped. Adrenergic drugs were given simultaneously as required. Of the fourteen patients treated thirteen responded satisfactorily to the cardiac pacemaker and five had survived for about a year; but the remaining eight, although temporarily improved, died within a few weeks of treatment. In another recent report Douglas and Wagner² describe how a 72-year-old man who was having frequent Stokes-Adams attacks, finally becoming deeply comatose, recovered after seven days' continuous treatment with the cardiac pacemaker and was asymptomatic on leaving hospital. The cardiac pacemaker appears therefore to be useful, and indeed life-saving, during an exacerbation of Stokes-Adams disease, but it affects only slightly the final prognosis in the majority of these elderly patients. Troublesome complications of this treatment are painful contractions of the intercostal and pectoral muscles and irritation of the skin by the electrodes: pethidine or paraldehyde have been given to relieve discomfort.

It is possible that the external cardiac pacemaker may be of practical use in the immediate treatment of unexpected circulatory arrest during anaesthesia. The method has the advantage that it is safe and easily applied, and if circulatory arrest were due to ventricular standstill the cardiac pacemaker would probably resuscitate the patient. Should it fail, however, much valuable time would have been lost unless simultaneous preparations for an immediate thoracotomy had been made, so that cardiac massage could be carried out at once and, if necessary, electric defibrillation across the heart attempted.

ASSAY OF POLIOMYELITIS VACCINES

It is of paramount importance that methods of assaying a vaccine be standardized before it passes from experimental to general use, and the recent news from the U.S.A. that cases of paralytic poliomyelitis have been diagnosed following vaccination¹ has drawn attention to the need for strict control of biological products. An American public health officer is reported² to have predicted the "revival of the double and triple checking done in the Salk field trials last year."

The formalized poliomyelitis vaccine is an aqueous suspension of killed poliomyelitis viruses of Types I, II,

and III in approximately equal proportions. In Britain manufacture is governed by the Therapeutic Substances Act, and tests for safety and potency are carried out, first by the manufacturer, and then by the Biological Standards Division at the National Institute for Medical Research.

The methods of assay and safety testing in general use (and they may be altered in the light of experience) can be considered under four main headings. First, tests are carried out for bacterial sterility, including *Mycobacterium tuberculosis*, before inactivation with formaldehyde. Secondly, tests for viruses other than poliomyelitis, particularly B virus and lymphocytic choriomeningitis virus, are performed by subculture into animals (rabbits and mice) and into tissue culture. Thirdly, and after inactivation, tests for live poliomyelitis virus are made by subculture into tissue culture. If these tests are satisfactory, the batches of vaccine made from each of the three types of virus are pooled, and more safety tests of the same kind are carried out on the pooled vaccine. At this stage special tests are made to detect minimal quantities of live poliomyelitis virus. Samples of vaccine are inoculated into monkeys and into tissue culture, which are then carefully observed for signs of infection, and histological examination of the central nervous system is carried out for minimal lesions of poliomyelitis infection. Fourthly comes the quantitative assay, the level of the immune response that a given vaccine batch will produce. Again, animal inoculations are necessary and the results are compared with those obtained with a reference or standard vaccine. Finally, a suitable preservative is added, and if all conditions are satisfied the product is released for use.

GOLDEN JUBILEE OF THE "NURSING TIMES"

When the *Nursing Times* first appeared fifty years ago nursing was still a comparatively young profession, as distinct from a vocation or occupation, and there were still some years to run before the Nurses' Registration Act of 1919 established a General Nursing Council to make rules for the training, examination, and registration of nurses. The golden jubilee number of the *Nursing Times*, published last week, contains articles reviewing some of the changes which nurses have seen in the last fifty years, changes reflecting the technical advances in medicine as well as the political trend towards the welfare state. As the official journal of the Royal College of Nursing since 1926, the *Nursing Times* has played an influential part in improving the professional status of nurses and in advancing their education. It is a journal edited by nurses for nurses, though medical men and women have always been among its prominent contributors. Nurses are fortunate in having such a live and successful journal to keep them informed about the progress of their own profession and of the closely related profession of medicine, and we are glad to add our congratulations to the many received by the *Nursing Times* on its fiftieth birthday, a birthday most happily celebrated by a luncheon given last week by the publishers, Macmillan and Co., Ltd.

¹ *British Medical Journal*, May 7, p. 1144.
² *New York Times*, May 8.

EMERGENCIES IN GENERAL PRACTICE

ACUTE FOOD-POISONING

BY

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Single cases and outbreaks of food-poisoning still occur with some frequency, especially in the holiday season. If the general level of personal and public hygiene was high enough no doubt these infections would cease, but it will be a very long time before this desirable state is reached. We must therefore continue to recognize and treat each case as it occurs.

Aetiology

The symptoms in all patients are very similar, but aetiological two types can be recognized. In *toxic food-poisoning* the food is either poisonous in itself and is eaten by mistake, or the food is heavily contaminated by a poison, usually a bacterial toxin. Thus the toadstool fly agaric (*Amanita phalloides*) may be eaten instead of field mushrooms (*Agaricus campestris*), or the food may be infected with bacteria, especially staphylococci, which multiply and produce an exotoxin. Subsequent cooking may kill the bacteria but their poisons remain.

In *infective food-poisoning* the food is heavily infected by pathogenic organisms of the salmonella group, and it is the multiplication of these within the patient which gives rise to the illness. Typhoid and paratyphoid fevers come into this category, but as there is a long incubation period between the ingestion of the bacilli and the development of the disease they do not concern us here.

Protein is essential for bacterial growth, and so meat, fish, and milk are particularly likely to cause trouble. Sausages and any processed meats rightly have bad reputations as vectors of food-poisoning. Their preparation gives room for infection by cooks who may be carriers, and the mixing required makes it very easy for an unscrupulous maker to introduce cheap tainted meat into them. After they are made the sausages may only be smoked or very inadequately cooked before they are eaten. An outbreak of trichiniasis at the start of the second world war was attributed to the practice which was common amongst work-people of a midland town of taking sandwiches to work which were filled with raw sausage-meat. Tinned foods did have a bad reputation, but with modern methods of canning the danger has largely gone; infection of the meat after a tin has been opened may, however, still occur. Recently duck eggs have come under a cloud; organisms of the salmonella group may infect the birds or may penetrate the eggs after they have been laid.

Symptomatology

Abdominal pain, vomiting, and diarrhoea occur in both types of food-poisoning. In the toxic form these symptoms may occur within a few hours of the food having been eaten. In the infective type some time must elapse before the bacteria, growing within the host, cause trouble, and so symptoms may be delayed for two or three days.

Although several people may have eaten the tainted food only one may develop symptoms of food-poisoning. The occurrence of the illness in a single member of a family does not therefore exclude the diagnosis. Children are particularly likely to be affected. Amongst adults those who have eaten the contaminated food on an empty stomach will suffer the worst. It is possible to see all gradations of the disease in the members of a family. The younger children may have a severe gastro-enteritis whilst the elder children may only vomit a few times. The parents may have a few hours of abdominal colic with one or two loose stools.

Vomiting is usually the first symptom. It occurs frequently and after a time streaks of bright blood may be brought up. Anything taken by mouth is immediately returned, and in a severe case the patient may become shocked and collapsed. The abdominal pain is colicky in nature and is usually situated in the centre of the abdomen. If vomiting is severe there will in time be soreness in the epigastrium. Similarly, when diarrhoea is frequent there may be pain and tenderness over the colon. Diarrhoea usually starts a little after these two symptoms. Frequent watery stools may be passed and in a severe case blood and mucus.

The general disturbance will vary in degree. It is usually most pronounced in children, but in a severe infection even adults may become acutely ill. The temperature rises to about 100° F. (37.8° C.), and there may be headache and pains in the limbs. Frequent vomiting and the passage of many watery stools can easily lead to dehydration. The patient's pulse rate rises, he becomes increasingly restless, and finally collapses with a rapid thready pulse, cold extremities, and ashen-grey colour.

Differential Diagnosis

When there is an outbreak of food-poisoning the diagnosis in each sufferer should not be difficult. In isolated cases, however, there may be considerable difficulty in diagnosis, particularly before diarrhoea has started. Acute intestinal obstruction and acute appendicitis must both be excluded. The rare possibility that the patient is not suffering from food-poisoning but from the effects of some irritant poison, such as arsenic, deliberately introduced in the food must also be remembered.

Outbreaks of bacillary dysentery, the infecting organism being *Shigella sonnei*, occur occasionally. Mental hospitals and, less often, children's homes still provide the bulk of these cases, but workers in such institutions may carry the infection to their homes. Adults are seldom very ill with *Sonne* dysentery, but babies and toddlers suffer severely.

Treatment

Acute food-poisoning may be of varying severity even though the patients are infected at the same time. For purposes of treatment it is useful to regard the cases as falling into two groups—mild or severe. Mild cases recover rapidly and need only symptomatic measures. Severe cases require urgent treatment, and the patient may die despite everything that is done for him. Such a division is not rigid, for a patient who is seen early may be thought to have only a mild infection, whereas a few hours later it may be obvious that the infection is severe.

Previously healthy adults will usually withstand even a severe attack of food-poisoning successfully. In elderly people, however, particularly if they have disabilities such as coronary atherosclerosis or nephritis, the outlook may not be so good and their admission to hospital may be advisable. This is also true for children, particularly below the age of 2 years. At this age the reserves of body fluids are small and the margin between hydration and dehydration is narrow. A few hours of vomiting may be enough to cause severe symptoms. If, therefore, the practitioner is in any doubt about the severity of an attack of food-poisoning in a child, it is best to recommend its immediate removal to hospital.

Mild Cases

Mild cases of acute food-poisoning recover most quickly if the patient is in bed. If there are children in the house-

hold, rest in bed should be insisted upon, especially if there is any suspicion that the infection might be dysenteric. A hot-water bottle, wrapped in a piece of flannel or put inside an old sweater, will relieve the abdominal pain. Despite his vomiting, the patient should take warm drinks as often as possible. These may consist of water, milk and water, or fruit juice with added sugar. An alkali which will not cause alkalosis, such as aluminium hydroxide or magnesium trisilicate in doses of 2 dr. (8 g.), will help if the gastritis is extensive. The former has the advantage that it is constipating and so will help to relieve the diarrhoea. Other mixtures which may be used include: mist. kaolin, B.P.C., $\frac{1}{2}$ oz. (14 ml.) four-hourly; or mist. kaolin. et morph., B.P.C., $\frac{1}{2}$ oz. 14 ml.) eight-hourly; this contains approximately 1/65 gr. (1 mg.) of anhydrous morphine. Mist. cret. aromat. c. opio, B.P.C., $\frac{1}{2}$ oz. (14 ml.) eight-hourly, is another useful mixture; this contains 10 min. (0.6 m.) of tincture of opium in each dose, which is equivalent to about 1/9 gr. (7 mg.) of anhydrous morphine.

Even though the headache and the generalized pains may be severe, aspirin is best avoided, for it is known to be a gastric irritant, especially when taken on an empty stomach. In its place Dover's powder (pulv. ipecac. et opii), 10 gr. (0.65 g.), may be given.

Severe Cases

In severe food-poisoning symptomatic measures will still be required, but, in addition, dehydration and shock as well as bacterial infection may have to be dealt with. Rest and warmth should be given, with full nursing care. The chalk and opium mixture will be required, to try to quieten the intestinal unrest. Owing to the excessive vomiting, feeding by mouth may be very difficult, but if possible the patient should be given small quantities of boiled water, to each pint (say half a litre) of which has been added $\frac{1}{2}$ oz. (15 g.) of castor sugar and $\frac{1}{2}$ dr. (4 g.) of salt.

Dehydration and the consequent shock are shown by a diminishing output of urine, a rising pulse rate, and a falling blood pressure. All these can be measured, so that the appropriate steps can be taken before the patient becomes grey and sunken, with cold extremities and delirium. Intravenous infusion will be required to replace the water and chlorides which have been lost in the faeces and the vomit. In the absence of laboratory facilities, a mixture of equal quantities of normal saline and isotonic glucose solution should be used, in quantities sufficient to enable the patient to pass a pint of urine in every eight hours.

Intravenous infusion is a rapid and effective way of restoring body fluids. It is, however, a very artificial method and both the quantity and the rate of infusion must be carefully controlled. When fluid is given by mouth the patient can regulate its absorption and excretion so that the circulation is not overloaded. When the intravenous route is used the volume of circulating fluid is immediately increased. If this goes too far, then the patient will become waterlogged, the heart will suffer, and his condition may be as bad or even worse than when he was dehydrated. This will be especially so in children, in whom the volumes of fluid required are less, and in old people, whose myocardium may be unhealthy.

It is impossible to give a definite figure for the quantity of fluid that may be needed. In a severe case 3 to 4 pints (1.5 to 2 litres) may have to be given as quickly as possible to combat the acute symptoms. Once these have been overcome the infusion can be given more slowly, say a pint (0.5 litre) every four hours. The aim should be to correct the acute symptoms and then to give the patient enough fluid to replace that lost during the previous 24 hours in the vomit, urine, and faeces, with the addition of 2 pints (1 litre) to make up for the fluid lost through the skin and lungs. As soon as the patient has ceased to vomit the infusion should be stopped and feeding by mouth begun again. Overloading of the circulation is shown by restlessness, increasing pulse rate, and finally by the appearance of moist sounds at the lung bases.

If the food-poisoning is of the toxic variety then chemotherapy can be of no help. If the disease is infective one of the sulphonamides which are poorly absorbed and which will remain in the intestine to deal with the salmonella organisms should be used. At least 18 g. of sulphaguanidine a day should be given: an initial dose of 6 g. and then 3 g. four-hourly for three or four days. If succinylsulphathiazole is used the dose can be less, but at least 10 g. should be given each day: an initial dose of 4 g., then 2 g. every four hours for four days.

Next article on Emergencies in General Practice.—"Severe Asthma," by Dr. A. Margaret C. Macpherson.

Refresher Course Book.—Copies of the second volume of collected articles from the Refresher Course for General Practitioners published in the *Journal* are still available at 25s. (postage 1s.) each. The volume contains 60 articles, all of which were revised by their authors for publication in the book. The first volume is now sold out and out of print. Copies of the second volume may be obtained from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or through any bookseller.

Nova et Vetera

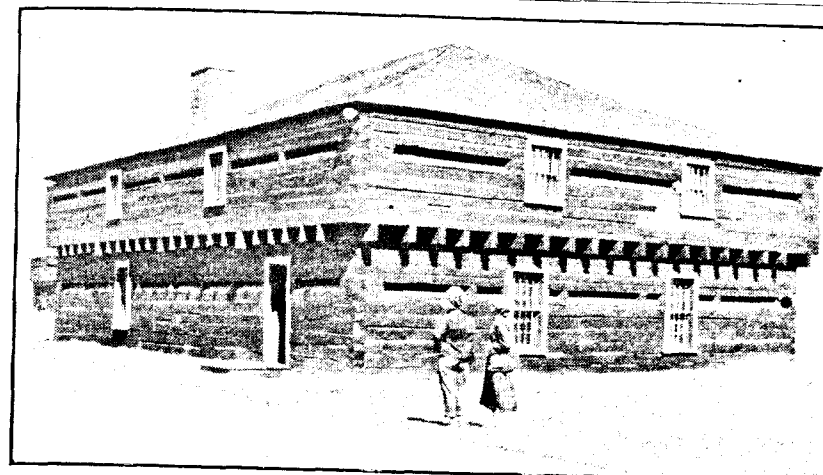
A POST-MORTEM POPULATION SURVEY FOR ARTHRITIS

Surveys to discover the incidence of certain disease groups in selected samples of the population are becoming increasingly popular, and an investigation of this kind was recently conducted in a Midland town to estimate the frequency of osteoarthritis. The unique opportunity has recently been taken of carrying out a survey for a similar purpose on the skeletons of the entire male population of the town and region of Visby, which is situated on the island of Gotland, off the coast of Sweden. The population in question was slaughtered by invading Danes in the year A.D. 1361, the bodies being thrown into a common grave, which was recently opened and examined by Dr. Bo. E. Ingemark, of the Department of Anatomy of the University of Upsala.

A detailed examination was made of the 1,085 skeletons which were found in this common grave at the site of the slaughter (later dignified with the name of a battle).^{*} It was reported that "a good many morbid processes could be established in this material. Thus many of the vertebrae showed more or less pronounced spondylosis deformans," occurring mostly in the spines of middle-aged and elderly victims. Pott's disease was found in four cases, and some other joints were also found to have been the site of a tuberculous infection, and Dr. Ingemark gives a photograph of a knee-joint ankylosed as the result of this process. There also occurred "a fairly large number" of degenerative osteoarthritic joints. Hip-joints were affected in this way in 20 cases—"malum coxae senilis"—and one advanced case is illustrated. This disease had also occurred in about 25 cases in the elbows and wrist-joints. He points out that these people were obviously quite unfit for war service, and suggests that the cause of this rather high incidence of arthritic change may perhaps have been due to the hard work which they had to perform on the land, as they were mostly feudal peasants.

W. S. C. COPEMAN.

^{*}Dr. Ingemark's findings are published as chapter 4 (pp. 149-209) of *Armour from the Battle of Wisby* (1939), vol. 1, by Bengt Thordeman.



Old Fort York. This fort housed the Queen's Rangers in 1793, when the building of Toronto was begun.

TORONTO, THE MEETING-PLACE

BY

S. S. B. GILDER, M.B., B.S., B.Sc.
Toronto

Tradition has it that the name Toronto comes from an old Indian word meaning a meeting-place. Here, at the mouth of the Humber River—now the site of the biggest traffic jams in the city—the red men coming south from Lake Simcoe met their brothers on the lakeshore trail. Here, close to a site now occupied in summer by an amusement park reminiscent of Blackpool or Southend, the French built a small fort in 1749, and called it Fort Rouille, in honour of the then Colonial Minister of France. When the Seven Years' War brought English troops up from Fort Niagara, the tiny garrison burnt their fort and left the future site of Toronto to the wilderness and the Indians for the next twenty-five years.

Early History

With the close of the American War of Independence, thousands of United Empire Loyalists were expelled from the United States for their allegiance to King George III. From 1783 their migration northward into Nova Scotia and Quebec began, and it was an overflow from these who began the colonization of a new province known as Upper Canada and later as Ontario.

The site of Toronto, which lies on gently rising ground above a natural harbour, was evidently considered favourable for development, for in 1787 government agents negotiated with the Mississauga Indians for its purchase for a sum of £1,700 in cash and kind, thus obtaining a quarter of a million acres at a bargain rate. Oddly enough, the sale was not completed until 1805.

In 1788 Captain Gother Mann of the Royal Engineers was instructed to survey the area, and drew up a plan of the proposed town and harbour. Toronto has in fact been a planned city right from the start—there were 16 different plans in 66 years.

In 1793 Governor John Graves Simcoe, first Governor of the new province, came with his lady by lake to Toronto and said, "Here will be built a great

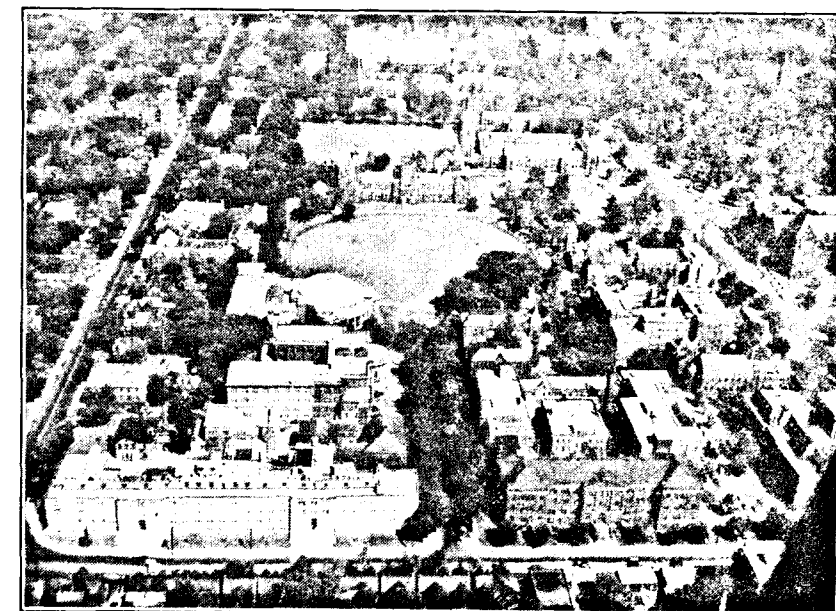
city in the spring." The great city took much longer than that to materialize, but otherwise the command was obeyed to the full. At this point the new city was named York in honour of Frederick, Duke of York, who was then enjoying a sporadic success against the French. York it remained until 1834, when the little town incorporated all the small adjacent communities to form the city of Toronto.

Progress was slow at first. For two years there were only log cabins, and the first white baby was born only in 1800, but there was no major setback until April, 1813, when an American fleet of 14 sail came in and took and burnt the town after heavy fighting. In this engagement Dr. William Beaumont, the father of gastric physiology, served as surgeon to the Americans. At the end of July the Americans paid

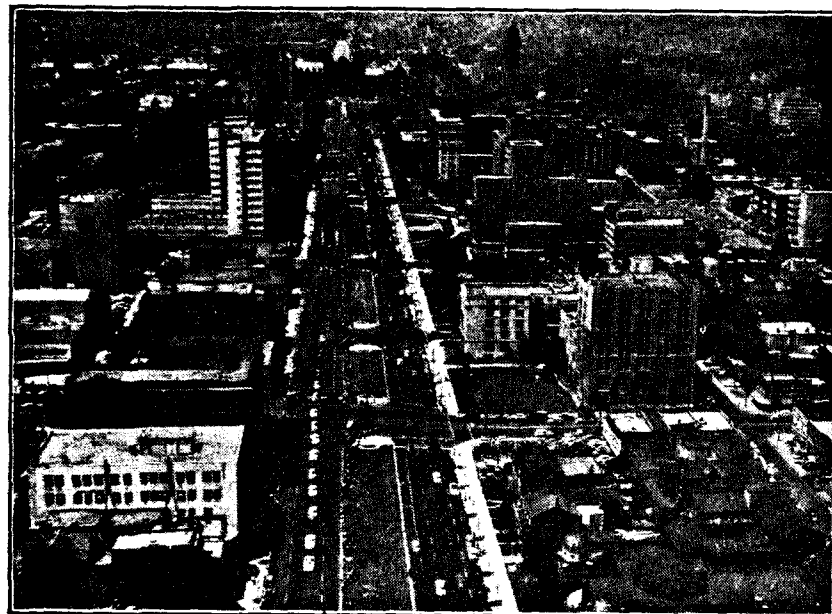
another brief visit, contenting themselves this time with burning a few buildings and looting stores.

From then on Toronto enjoyed a peaceful development until 1837, a year in which political feeling was running high between the Family Compact or Tory oligarchy and the reform party, whose Toronto leader was a former mayor, William Lyon Mackenzie. Mackenzie, an indifferent and indecisive commander, made an attempt to take the city in a rebellion doomed to failure from the start. He was outlawed for some years, but eventually returned from the States and ended his days in Toronto. The only significance of this rebellion is that it is still said to divide certain Toronto citizens whose ancestors took part on one side or the other.

From 1837 on, there was no major excitement in Toronto life. One author speaks of its enviable history and pictures the city "wearing with embarrassed rectitude the title of Toronto the Good." The focal points of city life seem to have been the churches, of which Toronto still possesses a phenomenal number. A Toronto historian, writing some 50 years ago, says: "The stern discountenance of any and every form of recreation [on Sundays] is said to be the cause of so many people going to church." The Sabbath is still kept to an extent now unfamiliar in England, in marked contrast to the rival city of Montreal.



The University of Toronto. Most of the buildings in this picture belong to the University, including the stadium in the background, behind which runs Bloor Street.



University Avenue, Toronto, leading up to the Parliament Buildings. Half-way up on the left is the Mount Sinai Hospital. Facing this is the Sick Children's Hospital, and further up the Avenue is the Toronto General Hospital.

We are left, then, with the picture of a solid, prosperous, conservative city of about the size of Birmingham and with an atmosphere of stability such as we associate with Edwardian England. But this atmosphere is rapidly changing. Recent years have brought in a flow of immigrants from all over Europe, so that the older predominantly Anglo-Saxon population, mentioned at the last B.M.A. meeting in Toronto in 1906, is now well diluted with other races. All the tongues of Europe are to be heard on the street-car, and there are a number of "colonies." On College Street there is a German sector; immediately west of this is a small Italian sector with two Italian cinemas. Around Spadina Avenue is a Hungarian colony; on Queen Street are the Poles, and up Bathurst Street the Ukrainians; on Elizabeth Street are the Chinese citizens.

What does all this imply? What sort of city is this to live and work in? Toronto lies in a climatically favoured part of Canada; winters are neither so severe nor so prolonged as elsewhere. From the business point of view, it is the capital of a province tremendously rich in agriculture and industry. The coming of the St. Lawrence Seaway will make it richer still. If its cultural and educational amenities were compared point by point with those of a city of similar size in the United Kingdom, Toronto would almost certainly emerge as victor. On the point of cleanliness it would win hands down.

Medicine in Toronto

In its early years the town depended on military surgeons for its medical care. The identity of the first civilian doctor is doubtful. A Dr. Glennon, "formerly at one of the finest colleges in Europe," started business in a baker's shop in 1807, but the first comer is usually acknowledged to have been an Edinburgh graduate, Dr. W. W. Baldwin, who found so little work to do that he doubled the parts of lawyer and physician, on one occasion interrupting his pleading to deliver a woman in labour. They were healthy folk

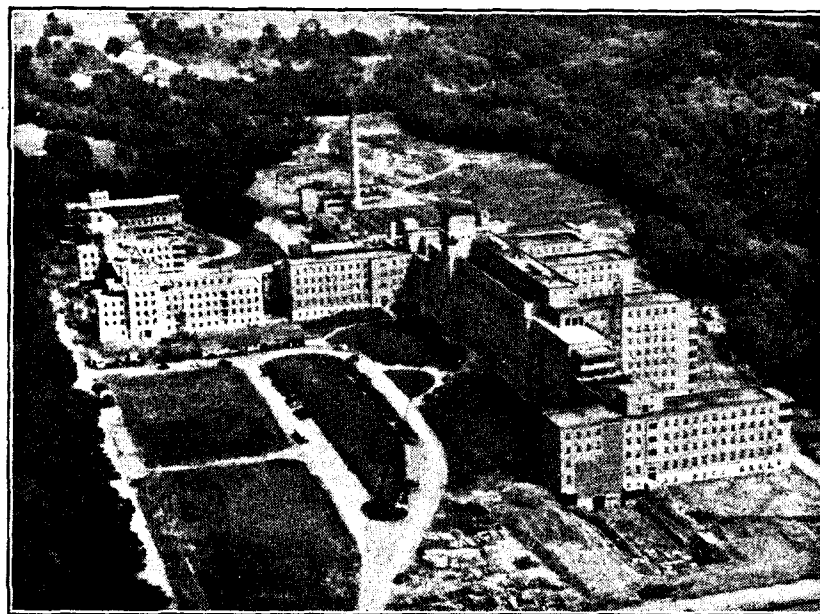
in those days. A contemporary Toronto poet, A. J. Williamson, says:

The doctor only pines an' dees
For want o' wark in Canadie.

The first to practise full-time in York seems to have been the Hon. Christopher Widmer, the father of surgery in Upper Canada, who came in 1816 and had a finger in every pie. He and other ex-military surgeons from the medical schools of Edinburgh, Dublin, and London laid the foundations of medical practice in Toronto. Their first hospital, now the fine Toronto General Hospital, was started in 1820 with money originally intended to provide medals for loyalists. Their first students appeared in the early 'thirties, and the first of these qualified in medicine in 1836.

The history of organized medical education, and indeed of higher education in general, in Toronto is a complicated one. The University of Toronto, which always has been a provincial rather than a municipal university, began as King's College in 1843, as a result of the exertions of a formidable Aberdonian, Bishop John Strachan, who came to Canada as a

Presbyterian schoolmaster and ended up as an Anglican Bishop, having founded a university, an English-pattern public school (Upper Canada College), and a cathedral *en route*. His Anglican University became secularized in 1849; but, nothing daunted, Bishop Strachan founded a rival establishment, Trinity College, in 1851, and this has remained true to the Anglican faith ever since. Visitors this year will have occasion to admire its lovely new chapel, at present under construction. By the 'fifties there were three medical schools, one for each of the universities and a third founded by a brilliant teacher, Dr. John Rolph, who had spent six years in exile for his assistance to Mackenzie in 1837. The resulting chaos was not sorted out completely until the final fusion of all existing establishments in 1903 to form the huge University of Toronto. This university's outstanding contribution to medicine was, of course, the discovery of insulin by Drs. Banting and Best. Their names are now commemorated in the Banting and Best Institutes



Sunnybrook Hospital, on the north-east fringe of Toronto, cares for sick veterans of the world wars.



The Royal York Hotel, the largest in the Commonwealth, where the conjoint B.M.A.-C.M.A. meeting will be held.

for medical research. The university medical faculty has all of the advantages to offer that could be found in any major school in the world. One unusual feature is a department of art as applied to medicine, for the training of medical illustrators.

The university occupies a central and spacious site in the city; it has many fine buildings, notably a gem of a Georgian hall of residence and Hart House, the finest academic club-house in North America, which has to be seen to be believed.

In Toronto, the counterpart of the Royal Society of Medicine is the Toronto Academy of Medicine, formed in 1907 by the fusion of four existing societies—the Medical Society, the Pathological Society, the Clinical Society, and the Ontario Medical Library Association. The Academy has the second best medical library in Canada (McGill, in Montreal, comes first) and a good auditorium, Osler Hall. It lies next door to the Medical Arts Building and close to the offices of the Canadian Medical Association.

The Sights

As Toronto grows, the number of shopping centres grows with it. The original main down-town shopping area lies close to the City Hall, an odd tall Victorian structure about which various opinions have been expressed. Here are the two rival department stores, Eaton's and Simpson's, across the street from each other, with a policeman controlling the surge of shoppers who rush across Queen Street from one store to the other. Why they do so is a mystery, since both stores seem to sell everything one could possibly want to buy. The main stem from this area north is Yonge Street, originally laid out by Governor Simcoe, and now roofing over Toronto's new and efficient underground railway. A mile or so north lies Bloor Street, at right angles to Yonge and just north of the university. If Yonge Street is the Oxford Street of Toronto, Bloor is the Bond Street, full of tempting little shops to delight the womenfolk.

The Royal Ontario Museum lies on Bloor Street, and is well worth a visit by even the most blasé. It is particularly strong in Chinese exhibits. The Art Gallery, opened in

1910 in The Grange, one of Toronto's older houses, is also recommended to visitors. It houses an interesting permanent collection, with good representation of Canadian artists, including the Group of Seven, who established a national school of painting. In addition, the Gallery is most progressive in arranging loan exhibitions. The highlight in 1955 has been the exhibition of paintings by Dutch masters, brought together from Europe and the U.S.A. The Public Library is excellent by any standards. It has a collection of Canadiana and the biggest circulation of foreign-language books to be found anywhere.

The historically minded will not fail to visit Old Fort York, down near the Exhibition Grounds, where it was established in 1793 by Governor Simcoe to protect a town that existed only in Captain Gother Mann's plans. A little to the west, along the lake-shore, lie the grounds of the Canadian National Exhibition, the largest annual exhibition in the world, held each year at the end of the summer. This is also the site of Fort Rouille, now marked only by a plaque. Across the harbour from the waterfront lies the Island, which is really a series of islands cut off from the mainland by east and west channels. This is a favourite spot for picnics, and a pleasant place to spend a peaceful time in. It can be reached by ferry from the waterfront.

No sight-seeing tour of Toronto would be complete without a visit to its fantastic twentieth-century castle, Casa Loma, perched on a hillside and about as incongruous a building as anyone could imagine. It is as if someone had dumped down a Moorish palace in Kensington.

Eating and Drinking

Gastronomes will have no difficulty in obtaining in Toronto the cuisine to which they are accustomed. A word about the drinking customs of the town may be helpful, however. It must be remembered that the battle for temperance rages more fiercely in Ontario than it has for many a year in Britain. To obtain spirits it is necessary to buy a liquor licence at a Government liquor store, and any liquor bought must be taken straight home (that is, for visitors, to the hotel bedroom) and not consumed outside. This applies to wines and beer as well (obtained from wine stores or brewers' retail stores). It is a serious offence to have opened bottles in a car. Cocktail bars exist in certain hotels and restaurants where alcoholic drinks may legally be consumed.

The Arts and Sport

Toronto is noted for its music. The Conservatory, started in 1886, has a proud history of achievement, and now has associated with it the well-known conductor Dr. Boyd Neel, once a medical practitioner in London. The Toronto Symphony Orchestra and the Mendelssohn Choir, with their conductor Sir Ernest MacMillan, are also well known outside Canada.

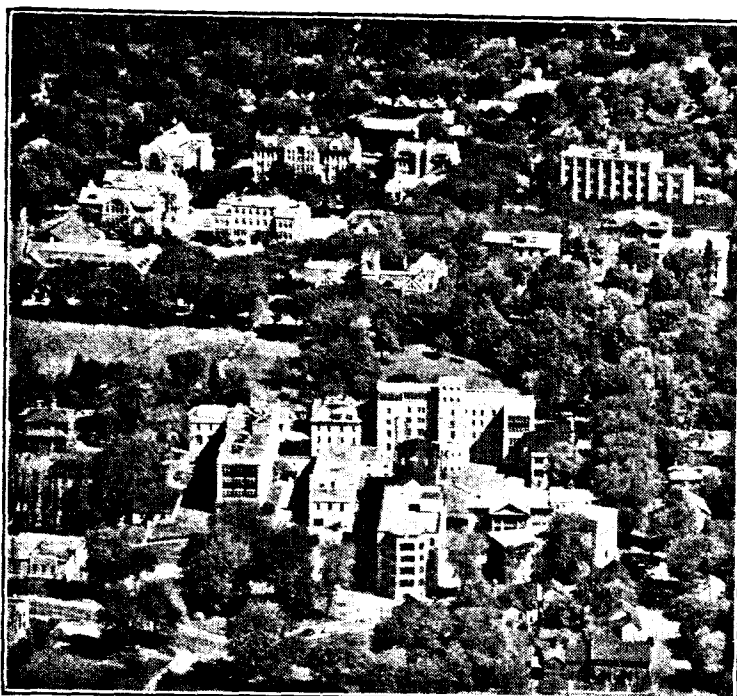
In Canada the theatre suffers from the enormous distances which touring companies must travel between cities, but there is a professional theatre, the Royal Alexandra, in Toronto, and a repertory unit, the Crest Theatre. To make up for the lack of professional shows there are thriving amateur groups in and around Toronto, including those who perform in the delightful little theatre in Hart House.

There is no need to comment on the cinema, save to mention that the democratic Canadian has one, and only one, price of admission.

Every summer sport practised in the United Kingdom has also its devotees in Toronto—even cricket, which has been edged out in the popular esteem by baseball, played at the Maple Leaf Stadium. Golf courses abound.

Warm Welcome

A warm welcome awaits the visitors from the United Kingdom in Toronto. Let them come with the resolve to enjoy Canada and to learn something of the country and its dynamic, friendly people. From my own experience, I can assure them that they will not be disappointed.



Queen's University, Kingston. Photo by the Photographic Survey Corporation Ltd., Toronto, Canada.

TOURS FROM TORONTO

[FROM A SPECIAL CORRESPONDENT]

It would be a pity to travel all the way to Canada without seeing more than Toronto. Restrictions unfortunately preclude free indulgence in the type of tour advertised in connexion with former B.M.A. meetings in Canada, such as the trip to Vancouver through the Rockies or the digression into the northern United States. It is not too much to hope, however, that a number of participants will find it possible to spend a few more days in Canada after the meeting and make some modest excursions into the beauty spots of Ontario. It is also hoped that the following brief outline of possibilities for such excursions may prove helpful to prospective tourists.

There are, of course, many other delightful holiday areas in Eastern Canada, both in Quebec and in the Maritime Provinces, and visitors may, for example, prefer to go direct to Montreal or Quebec and use either of these cities as a touring centre, in which case a fascinating introduction to French Canadian culture awaits them. It is nevertheless assumed that visitors with only a few days to spare will not wish to spend much time on travel, but will concentrate on areas within, at the most, 300 miles of Toronto. It should be emphasized that the Province of Ontario has an enthusiastic and efficient touring service, of a scope almost unknown in Britain, and is prepared to give very detailed advice on all tourist requirements. Prospective tourists should write to the Department of Travel and Publicity, Province of Ontario, Queen's Park, Toronto, Ontario, for information on such matters as accommodation.

Visitors from Britain may find themselves somewhat handicapped in touring Canada, since much holiday travel on the American continent is based on the assumption that the tourist has a car. Most tourists

nowadays used roadside motels rather than the older type of hotel, and, whereas accommodation in the centre of a town is likely to be difficult and perhaps even primitive, clean and highly satisfactory motel cabins are seldom lacking along the more-travelled highways. If, therefore, the visitor can beg, borrow, or hire a car (there are several car-hire organizations in Toronto, and the rates are not too ruinous if several people share a car), his way will be made much easier. If not, he must rely on the train and the long-distance bus. All the areas mentioned below can be reached by public transport, and it should be remembered that the express motor coach in Canada really is an express (the Toronto-Barrie bus covers 55 miles in 1 hour 20 minutes).

Two more points should be noted in connexion with this article. Firstly, the reader should have a map of Ontario beside him. Incidentally, no one buys road maps in Canada: the filling stations give them away on request. Secondly, it is not proposed to devote much space to cities. The scenic glory of Canada is the work of nature, not of man. For those who must have a sight of bricks and mortar, however, there are suggestions below, such as visits to Ottawa, Kingston, and London (as a handy headquarters for one or more evenings at the Stratford Festival).

Ottawa and Kingston

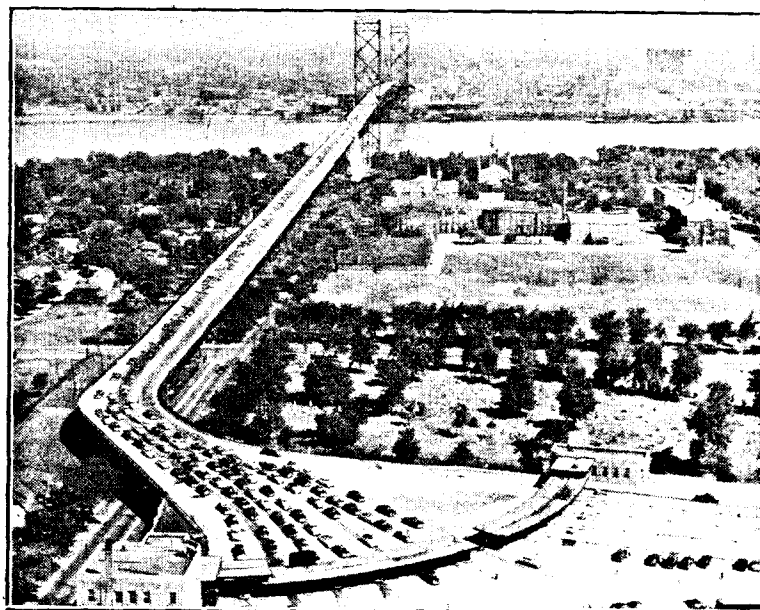
Ottawa, the federal capital, is 280 miles by road from Toronto, and accessible by plane, rail, or bus. It stands on the Ontario bank of the Ottawa River, facing the province of Quebec, and owes its existence, like Canberra in Australia, to inter-city rivalry. Queen Victoria chose the then small town for the federal capital in 1857 to put



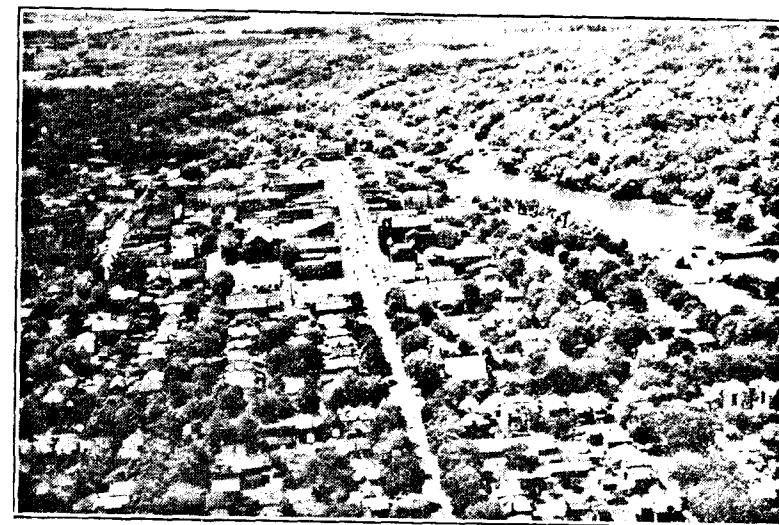
The mouth of the St. Lawrence, showing Old Fort Henry in the foreground and the city of Kingston in the background. Photo by Dick Herrington.

an end to the rival claims of Montreal, Kingston, and Toronto; hence all that is worth seeing in Ottawa is comparatively modern. The chief showplace is the group of Gothic buildings on Parliament Hill which house the Federal Parliament. Visitors are conducted through the building and up to the top of the Peace Tower, which commands a very fine view of the city and its beautiful setting, rich in parkland. There is a tourist bureau in the city, at which information on other sights can be obtained. The latter include the public archives, the Royal Mint, the National War Memorial, and the National Art Gallery, which has a good collection of Canadian paintings. The leading hotel is the Château Laurier, which sets a very high standard. Visitors are warned, however, that Ottawa is notorious for the scarcity of hotel accommodation, and booking well in advance is essential. A four- or five-day tour might be arranged from Toronto, with a first stop at Peterborough, as a centre for the Kawartha lakes (q.v.), and a second at Ottawa. The Peterborough-Ottawa road passes through some lovely and slightly wild country, and runs close to at least one little town worth an hour's visit. Perth, 58 miles from Ottawa, looks exactly like a small and neat Scottish town in pleasing grey stone set down in the midst of gentle countryside, which might also be Scottish. As might be expected, the town was settled by Scots, who have kept up the traditions of their native land. Although the Scot is ubiquitous in Ontario, there are certain enclaves where he is openly dominant, as in the little town of Fergus, in Western Ontario, where Highland Games are an annual event.

The return journey from Ottawa to Toronto might be made via Brockville, on the St. Lawrence. There are direct rail and motor-coach services between these towns, and Brockville, a pleasant and prosperous-looking town, is a centre for the Thousand Islands area (q.v.). The Peterborough-Ottawa highway and the Ottawa-Smith's Falls-Brockville highway both skirt the Rideau Lake district, a fine centre for fishing, swimming, or canoeing. The Rideau Lake district is traversed by the 126-mile Rideau Canal, completed in 1832 and linking Ottawa with Kingston. A six-day canoe trip along this canal is a possibility. The whole area is quiet and unspoiled.



Ambassador Bridge, linking Windsor, Ontario, and Detroit and Canada's greatest border point of entry.



Aerial view of Stratford, Ontario.

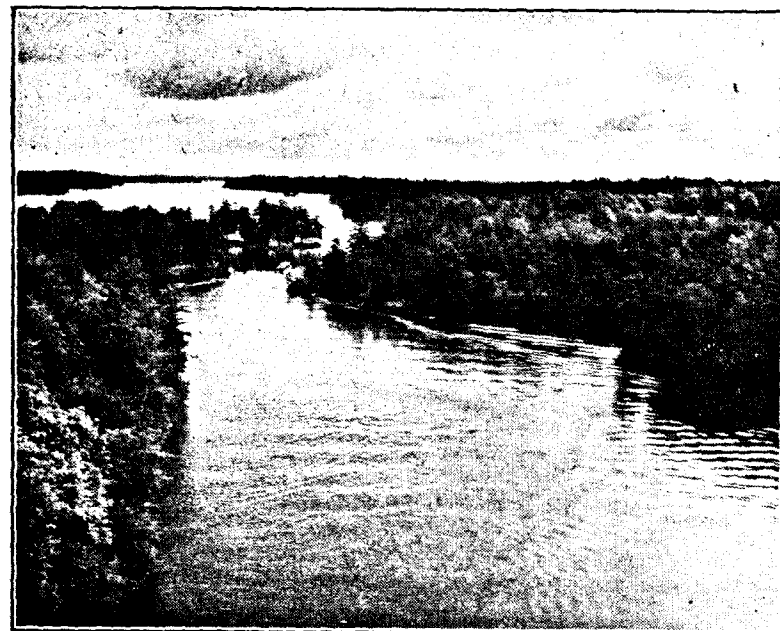
There is a charming road from Brockville to Kingston (about 50 miles); about 17 miles from Kingston the road forks, and the left-hand route runs through lovely scenery close to the point where the St. Lawrence leaves Lake Ontario. Kingston itself is an old university and military town dating from 1784, on to which a modern and unpleasing industrial area has been grafted. To appreciate the city it is necessary to turn aside from the completely characterless main street and look at the campus of Queen's University (1841), St. George's Cathedral (1825 on), and City Hall (1843). To the east, across the winding Cataraqui River, lies Old Fort Henry, built in 1832 and much visited by tourists.

The 165-mile road between Kingston and Toronto is pleasant enough, and is punctuated by a number of mellow small towns, of which Port Hope has perhaps the most character; but anyone finishing this trip by rail will have missed little.

London and Stratford

The opening of the current Shakespearean Festival at Stratford, now well known and well established, follows closely on the end of the B.M.A.-C.M.A. Annual Meeting. Tyrone Guthrie is sharing the direction this year with Michael Langham. The opening dates are: *Julius Caesar*, June 27 and 30; *Oedipus Rex*, June 28; *Merchant of Venice*, June 29 and July 1. A musical festival with Boyd Neel as conductor and internationally famous soloists begins on July 9. Festival information is obtainable from Stratford Shakespearean Festival, 109, Erie Street, Stratford, Ont.

Stratford is a small town 100 miles west of Toronto, of no particular cultural significance until, a few years ago, a local citizen had the inspiration to start an annual Shakespearean Festival, and the wit to see that nothing less than the best would prosper. Alec Guinness and James Mason are among those who have crossed the Atlantic to lend a hand in this commendable venture. While it is possible to visit the festival from Toronto, it would be much less fatiguing to make the city of London, 40 miles away, a headquarters. London, which lies on the little River Thames (as Stratford does on the Avon), was originally intended to be the capital of Upper Canada, but Toronto somehow displaced it. The city has on its north side the University of Western Ontario, including one of Ontario's



Some of the thousand islands of the St. Lawrence. Photo by Clint Melville.

four medical schools (the others are at Toronto, Ottawa, and Kingston), and offers the best accommodation and shopping facilities in the area. Pleasant bathing beaches on Lake Erie are to be found at Port Stanley, only 25 miles south of London.

The Muskoka Area

It is not until you fly over Canada that you realize how much of the country is under water, and why the birch-bark canoe is particularly associated in the mind with Canadian travel. It has been estimated, for example, that there are two million lakes in Ontario alone, so that it is hard to find a holiday resort that is not associated with a lake. To the north and north-west of Toronto there is a sort of horseshoe of lakes. Starting about 60 miles north of Toronto, the western end of the horseshoe begins at Lake Simcoe and its northern continuation, Lake Couchiching. Their close proximity to the city means that most of the shore has now been bought up for summer cottages, and the visitor will probably be better advised to continue north to Gravenhurst, just over 100 miles north of Toronto, easily reached by rail or bus, and the gateway to the next part of the horseshoe, the Muskoka Lakes. The top of the horseshoe lies north-east of Gravenhurst and is known as the Lake of Bays area; the horseshoe then sweeps down to the south-east through the Haliburton Highlands area (the best choice for those wanting to get off the beateh track) to the Kawartha Lakes area, more or less ending at the Toronto-Ottawa highway.

The Muskoka area is perhaps the most popular of these playgrounds for Torontonians, and the most developed. Lying at an altitude of about 1,000 ft. above sea level, there is a chain of three lakes with small resorts all round, and lovely scenery everywhere. It is possible to take a 100-mile steamer trip through the lakes, beginning and ending at Gravenhurst, and lasting all day. It is also possible to find most other forms of enjoyment somewhere in the area, such as swimming, boating, fishing, golf, tennis, and riding.

Lake of Bays

This area takes its name from the largest of the lakes it contains. To reach it the visitor must continue north by road or rail from Gravenhurst for 35 miles to Huntsville, the only town in the area, from which hotels of varying degrees of seclusion can be reached by taxi. The recreations are, as in the Muskoka area, fishing for bass and trout (perhaps with better success than in the more heavily fished south), boating and canoeing, and swimming.

Just south of the Lake of Bays there is one phenomenon much frequented by medical associations—indeed, some of the more rurally minded societies will be meeting there this June. This is the smart and luxurious Bigwin Inn, with 300 rooms and all indoor and outdoor amenities. Bigwin is on an island, and has to be reached by car and ferryboat from Bracebridge, a small town between Gravenhurst and Huntsville. For those who do not want to wear formal clothes in the evening, there are many simple hotels in the area, offering peace without dance bands.

Algonquin Park

The visitor who has got as far as Huntsville now has two alternatives (indeed, three, if he wants to extend his trip still further north, into the wilder country near Lake Nipissing). He may swing round to the east and then south to the Highlands of Haliburton as a preliminary to returning to Toronto via the Kawartha Lakes, or he may go somewhat north and east to Algonquin Provincial Park. This is a Government game reserve, containing 2,700 sq. miles of wilderness in its natural state, and a wonderful area for the photographer. Fishing is permitted but not hunting, so that deer, bear, moose, and beaver go about their business without fear. A railway line and one highway run through the southern tip of the Park. There are hotels and cabin accommodation in this southern strip. If you want to explore the Park there are only two ways of doing so—by canoe or on foot. It is possible to hire a canoe and all the necessities for camping at the Park Headquarters. It is also possible to hire a guide, and have a canoeing trip with portages from lake to lake planned for you. The most venturesome are not likely to come to harm without a guide, for maps are available and portages clearly marked, and in July the wilderness is by no means solitary.



Scene typical of the Muskoka area. Photo by Ontario Department of Lands and Forests.

Haliburton Highlands

The Highlands of Haliburton, which contain another 500 lakes or so, lie south of Algonquin Park and are worth a visit for three good reasons: there are even fewer people about than in the areas mentioned above; the scenery is, if anything, lovelier than anywhere else in Ontario; and the climate is invigorating. All this, it should be added, within 100 miles or so of Toronto. There are only two villages in the area—Haliburton and Minden—and everything is still very unsophisticated. The Highlands are recommended for the walker, the photographer, and the fisherman; swimming, sailing, and canoeing are also available. Lack of sophistication does not mean lack of accommodation, and there is a Highlands of Haliburton Tourist Association to help.

The Kawartha Lakes

South of the Highlands of Haliburton lies yet another lake area, the Kawartha Lakes, on an old Iroquois trail. This area is more developed than the Highlands and has two fair-sized towns—Peterborough (on the Toronto-Ottawa highway) and Lindsay—on its doorstep. In its centre lies the village of Bobcaygeon, with good accommodation and a very fishing-minded community. The lakes are connected by the Trent Canal, making canoe trips easier for the lazy. The scenery is well up to standard, and not as wild as further north. The main road south from Haliburton Highlands runs through this district to Lindsay, which is about 80 miles from Toronto by good roads. All these places mentioned are also accessible by rail.

The Thousand Islands

This area was mentioned in connexion with the return journey from Ottawa to Toronto via Brockville and Kingston. The thousand islands of the St. Lawrence are scattered through the river from Kingston to Brockville. Some are privately owned and have houses on them; some are mere tufts of grass sticking out of the river; some have fortunately been acquired by the Provincial Government as a national park and may be camped and picnicked upon. Their presence confers an exceptional beauty upon the river, and the occasional appearance of rapids adds to the attraction. The islands may be visited by one of the innumerable boats plying for hire either from Brockville or from Gananoque, a little holiday resort about halfway between Brockville and Kingston which lives for and on the river.

Conclusion

If any of the areas mentioned above seem particularly attractive to a prospective visitor, fuller information about it and a list of accommodation can be obtained from the Public Relations Officer, Ontario House, Charles II Street, London, S.W.1, or Department of Travel and Publicity, Province of Ontario, Queen's Park, Toronto, who are ready to advise on anything to do with holidays, from canoeing routes to non-allergenic areas. Fishermen in particular will be glad of the guidance this department can give.

INTERNATIONAL SOCIETY OF UROLOGY TENTH CONGRESS

[FROM A SPECIAL CORRESPONDENT]

The tenth Congress of the International Society of Urology was held at Athens from April 10 to 18, under the presidency of Professor OECONOMOS. The subjects for discussion were the treatment of carcinoma of the prostate, renal angiography, and the post-operative management of urinary lithiasis.

Prostatic Cancer

The discussion on carcinoma of the prostate revealed a cleavage of opinion between those who advocated radical

surgery and those who supported oestrogen therapy. It was agreed by all that the correct diagnosis in the early stages of the disease was difficult and that surgical intervention was likely to be successful only when the growth was mobile. There were some speakers who stated that they treated their cases in the first instance with hormones, and it was only when these failed they resorted to prostatectomy. Others pointed out that prostatic carcinoma was a chronic disease, and even without any treatment patients would live many years. There was no known cure for cancer of this organ, and both surgery and hormone therapy, though prolonging life, were palliative methods. FISH, of New York, claimed good results with massive doses of oestrogen, 500 mg. per day. MIGLIARDI, of Turin, considered that castration was a humiliating operation even in the elderly, and that synthetic hormone therapy had taken its place. Two British members, H. P. WINSBURY WHITE and J. D. FERGUSON, made important communications. The latter described the results of adrenalectomy followed by cortisone therapy. This was one of the best scientific papers presented to the congress. There was no support for radiotherapy in cancer of the prostate, and treatment by isotopes was considered to be still in the experimental stage.

Renal Angiography

The reporters on renal angiography were J. C. DOS SANTOS (Lisbon); E. W. RICHES and I. H. GRIFFITHS (London); OLSSON, LINDBLOM, and SELDINGER (Sweden); and FABRE (Toulouse). All of them produced excellent papers. DOS SANTOS, the son of the first surgeon to introduce arteriography, claimed that complications could be avoided and were entirely due to errors of technique. RICHES and GRIFFITHS considered renal angiography a safe and simple procedure, but only an accessory method of diagnosis. It did not involve the use of costly apparatus. They preferred the lumbar route to the femoral, and advocated for the contrast medium 70% diodone, an organic iodine solution, whereas Dos Santos favoured 100% "shiodan." OLSSON preferred diodone. His paper should be read by all interested in this subject. LINDBLOM and SELDINGER pointed out that renal angiography had its limitations even in differentiating between renal cysts and tumours. FABRE stressed the importance of team-work. In the subsequent discussion the consensus of opinion was that the procedure is comparatively safe, and there was general agreement with the views expressed by Lindblom and Seldinger. N. OECONOMOS, in a thoughtful paper, stated there were only two indications for renal angiography: as an aid to the diagnosis of tumour, and to determine renal function.

Urinary Calculus and Other Subjects

The discussion on the post-operative treatment of urinary lithiasis was disappointing. There was a repetition of all the well-known methods which have been tried to prevent the recurrence of stones. Nothing new emerged from the various papers presented by urologists from all parts of the world. LEWICKI, of Poland, stated that he could control proteus infection of the urinary tract by sulphafurazole ("gantrisin"). TAYLOR, of New York, claimed that with "solution G" most phosphatic stones could be dissolved. On the other hand L. N. PYRAH, of Leeds, got good results with aluminium hydroxide. His paper was an interesting one. The other British urologist to take part in the discussion was H. P. WINSBURY WHITE. FEY, of Paris, in his communication pointed out that the calculus was not the primary condition, and that, apart from sepsis, mechanical obstruction, and parathyroid disease, we did not know the origin of the illness.

On the fourth day various short papers were read and a number of films shown. This in some respects was the most instructive session of all, the films in particular being excellent. T. I. CHAPMAN (Glasgow) showed his film, already known to British audiences, of the punch operation for prostatic obstruction. His running commentary was excellent, and that and the film were well received. SERRALLACK'S

(Barcelona) film of perineal prostatectomy caused much amusement, as the speed of its presentation was such that the whole operation appeared to be completed in five minutes, but every detail of it could be easily followed.

Fey (Paris) and H. G. HANLEY and J. J. STEVENSON (London) demonstrated the use of the image intensifier in urology. Hanley and Stevenson's film was outstanding and was one of the highlights of the congress. It gave a remarkable picture of the movements of both the normal and the diseased ureter.

For the first time since the war representatives of Russia, Czechoslovakia, Poland, and West Germany were present at the congress. Your correspondent was informed by the President of the Polish Society of Urology that in his country specialists are allowed to accept fees for private consultations, but all operations are free and have to be performed in the State hospitals. No drugs other than streptomycin are available from Russia.

Following the resignation of Dr. GEORGE GILBERT SMITH (Boston, U.S.A.), Mr. A. CLIFFORD MORSON (London) was elected President of the International Society of Urology.

During the congress there were the usual social engagements for the members and their ladies. About 300 were present at the banquet. Professor OECONOMOS presided, and in his speech paid tribute to British urology. Mr. CLIFFORD MORSON proposed his health. After the congress there were visits to islands in the Aegean, and a few hours were spent at Crete, Rhodes, Cos, Delos, and Mykonos. The meeting was well organized by our Greek colleagues, to whom the thanks of all members are due for their hospitality and unflinching courtesy.

Future Arrangements

At the meeting of the general assembly it was agreed that the congress in 1958 should be held in Stockholm under the presidency of Professor Hellström and that the following subjects should be discussed: the bladder in neurology; the use of intestinal grafts in urology; and essential haematuria.

HYPNOTISM IN DERMATOLOGY

DERMATOLOGISTS GROUP DISCUSSION

A meeting of the Dermatologists Group of the Association was held at B.M.A. House on April 21, when a brief discussion took place on the impact of psychiatry on dermatology, with special reference to hypnotism. Dr. D. I. WILLIAMS was voted to the chair.

The discussion was opened by Dr. E. A. BENNET, speaking as a psychiatrist and a member of the subcommittee which produced the recent B.M.A. report on hypnotism (see *Supplement*, April 23, p. 190). The subcommittee, he said, was appointed following considerable publicity, in the press and elsewhere, concerning hypnotism. Medical men were being asked questions by their patients about the efficacy of hypnotism, and they sought guidance from the Association as to the correct attitude towards hypnotic treatment and its applications. The subject was regarded as mysterious by some; others looked askance at it—not without reason, as hypnotism had hovered for years on the borderline of medical respectability.

The B.M.A. Report

The subcommittee had examined the past and, in particular, the recent history of hypnotism, and discussed its use with physicians who had observed hypnotic treatment and with psychiatrists who had personal experience of its clinical applications. They reached the conclusion that no one—not even enthusiastic hypnotists—knew exactly what hypnotism was. Nevertheless, it was clear that a great deal was known of its value and limitations in medical practice and in dentistry. It seemed clear, moreover, that the doctor-patient relation in hypnotic therapy was of special importance—as it was in other forms of psychological treatment.

Further, suggestion was known to play a part, and often a decisive one, in certain types of medical treatment, perhaps despite the doctor's intention. Certainly a common element in different and even in apparently opposite methods of psychological treatment was the relation formed between doctor and patient.

Dermatology was no exception to this common experience, said Dr. Bennet, and suggestion, wittingly or unwittingly, was an element in treatment. Hypnosis was an extension of suggestion, and in no essential way did it differ from it. It had been used with success in the treatment of skin complaints. The direct (as opposed to the indirect) use of suggestion was often ineffective because the therapist gave the suggestion in an expectant but haphazard fashion. Suggestions, he continued, should always be spontaneous, and set phrases were best avoided. The therapist must be sincere: it was worse than useless to give suggestion whose value was doubted. And concrete suggestion was far more valuable than abstract suggestion, as it enabled the patient to form a mental picture, for example, of the disturbed or diseased part of his body.

An opinion widely held but without foundation was that the hypnotist possessed a special "gift"—the hypnotic eye or some esoteric endowment withheld from lesser mortals. There was no mystery about the induction of hypnosis and no special skill was required. Indeed, one of the dangers of hypnotism lay in the fact that it was so simple. Consequently it was seized on by charlatans who had no sense of responsibility for the patient and no regard for the medical code of ethics. The report on hypnotism advised that hypnosis should be in the hands of medical men trained to recognize the characteristics of over-dependence. Research on this topic was required. The subcommittee had no clear evidence upon the extent of the danger or the quality of the danger to a patient which some psychiatrists claimed inevitably followed the induction of hypnosis.

Psychiatry in the Skin Department

Dr. HUGH GORDON, physician in charge of the skin department at St. George's Hospital, described a psychiatric attack on skin patients, mostly chronic, conducted from June, 1951, for roughly 2½ years. The work resulted from Dr. Kathryn Cohen's experience in her appointment as junior registrar. By taking more time and showing more interest in the chronic patients she came to the conclusion that many of the cases were primarily skin reactions to emotional stress. It was determined to collect 100 or so cases, keep careful records, and follow them up. Altogether records had been obtained of 144 patients. Hypnosis was started in the form of simple suggestion. Varying degrees of hypnotic trance were obtained, and during the hypnotic state the suggestion was given that the skin condition would resolve and return to normal and that irritation, if present, would go. In most of the conditions treated pruritus was a marked feature, and it was certainly found that the anti-pruritic effect of simple hypnosis was often very striking.

It soon became apparent that under hypnosis the doctor-patient rapport was considerably enhanced. Patients became much more willing, so to speak, to "let their hair down." Consequently psychotherapy was added to hypnosis. The largest group of cases was atopic eczema, and at the outset they had one of those possibly therapeutic freaks in which the direct effect of hypnosis was surprisingly good. A boy of 12, a constant sufferer from eczema and asthma from the age of 2, was completely cured of both in about six sessions, and had remained clear for 2½ years. Later a number of cases were encountered which had proved extremely resistant.

During the last 18 months, continued Dr. Gordon, Dr. Cohen had felt that in many cases the underlying psychosis required lengthy treatment, and such patients had been referred to the Cassel Hospital.

It was too early as yet to assess the results. Two cases, however, had taught them an important lesson. An exacerbation of the skin condition was expected during therapy,

but it occurred so drastically that these two patients had to be readmitted to the general wards. The raised temperature and grave superficial sepsis did, in fact, clear up very quickly. But this incident illustrated the necessity of one department being able to tackle the patient throughout.

There were four cases of dermatitis herpetiformis among those treated. Two were described as failures, but in fact broke off treatment for other reasons. In the other two very striking successes were obtained, said Dr. Gordon. One of them with a 10-years history was controlled by arsenic, but developed severe and obscure retinal lesions. On stopping the arsenic the latter improved, but the dermatitis herpetiformis relapsed. Both skin and eye lesions cleared up rapidly under hypnosis and psychotherapy, and had remained so for two years.

What part did hypnosis *per se* play in achieving these results in dermatological cases, such as they were? Had the results obtained been due to a combined dermatological-psychiatric approach with perhaps a slightly new slant? He himself saw the patients before, during, and after treatment. He did practically none of the treatment himself, and he had tried so far as possible to play the part of an unprejudiced observer. He believed it was possible—indeed probable—that the psychiatric factor was of aetiological importance in varying degrees from 100% down to 50% in a wide range of common skin disorders. In the so-called frictional type he thought it might well be 100%. But even if it was felt that the psychological factor was likely to be a high percentage, most dermatologists would agree that they were justified in trying purely symptomatic treatment, such as local applications, sedation, x rays, or hydrocortisone, which last had certainly proved to be sometimes extremely effective in cases of localized neurodermatitis.

If it was felt that cases must be treated from the psychiatric angle, then there were two alternatives for the dermatologist: either to refer the patient to the psychiatrist or to attempt the treatment himself. They would all choose to refer the patient, but this might mean an undue influx in the psychiatric department. Dr. Gordon concluded that hypnosis appeared to be of value in treating these skin patients, and he felt that dermatologists should undertake a greater part of the psychiatric treatment themselves.

In the course of a very brief general discussion—brief because of the imminence of another meeting—Dr. KATHRYN COHEN gave some details of her experience at St. George's, bearing out Dr. Hugh Gordon's statements.

In reply to Dr. C. H. WHITTLE, Dr. BENNET said that transference inevitably occurred, but that something similar to it occurred in every relationship of a confidential nature, medical or lay.

Dr. WHITTLE said that a great deal of the difficulty of getting patients into the mood to be approached by a psychiatrist might be overcome by having the psychiatrist in the room at the same time as the patient was being seen by the dermatologist. This double approach had worked well, but was time-consuming.

Reports of Societies

DISEASES FROM PETS

On April 20 the Section of Comparative Medicine of the Royal Society of Medicine met to discuss "Some Diseases of Pets Transmissible to Man."

Psittacosis

Professor S. P. BEDSON, F.R.S., opened the meeting with an account of psittacosis. Although, he said, it had been recognized for eighty years that parrots suffered from a disease to which man was susceptible, it was not until the investigations of the pandemic of 1930 that the connexion was firmly established by the isolation of the same virus from human and psittacine cases. It was now known that

there was a group of psittacosis viruses with similar morphological and staining characteristics and sharing an antigen. A wide variety of avian species were naturally susceptible, and both domestic and wild birds had been found to harbour the virus. Atypical pneumonia in the Faroe Islands had been shown to be due to psittacosis virus, the infection coming from fulmar petrels, and many human infections originating in pigeons, turkeys, ducks, domestic fowls, pheasants, and other birds were on record. Mammals, such as the cat, sheep, cattle, and laboratory mice, had also been shown to be the natural hosts of related viruses, but these mammalian viruses appeared to be less closely related to the avian strains than the latter were to one another. There was no good evidence that these mammalian viruses produced infections in man, though outbreaks of a febrile exanthema among natives in the Belgian Congo seemed to be connected with an infectious disease in cattle, sheep, and goats often resulting in abortion, and a psittacosis-like virus seemed to be responsible for both.

All the avian strains seemed capable of producing disease in man, went on Professor Bedson. As a source of human infection psittacine birds were of more importance than the non-psittacine. There were several reasons for this. For one thing parrots and their like lived in closer association with man than do the other avian hosts of the virus. Psittacine birds responsible for human cases were usually recently imported birds suffering from acute disease as a result of the conditions under which they were transported, and acutely ill birds excreted vastly more virus than healthy carriers. Lastly the strains of virus from psittacine birds seemed more virulent for man than the so-called ornithosis strains. Laboratory infections had been numerous and passage from man to man occurred occasionally; a number of cases gave no history of even remote contact with an infected bird. Under natural conditions infection in the bird was nearly always silent, though occasional outbreaks of disease did occur. The young birds were infected by their parents whilst in the nest, and the virus was excreted in the droppings. Spread of infection to man was through the air in the form of dried droppings, though direct contact with infected birds was occasionally responsible.

Attempts had been made in this and other countries to protect man against psittacosis by imposing controls on the importation of parrots, but realization that non-psittacine birds harboured the virus resulted in the ban being lifted in some countries. As a consequence there was a sharp increase within a few months in the number of human cases of psittacosis in England, and the disease appeared for the first time in New Zealand, a country which had previously been free. The ban was soon reimposed.

Salmonellosis

Dr. A. BUXTON discussed the incidence of salmonellosis among pets. The organisms were widely distributed among animals, and surveys had shown an infection rate of about 1.5% among domestic dogs and cats. As many as 18% of the animals in kennels might be found to be infected, probably owing to the presence of salmonella organisms in their food. For example, 26 out of 98 samples of a proprietary preparation of dog food containing meat had proved to be infected. Children were particularly liable to infection because they tended to handle and fondle pets more than adults.

In America many salmonella types had been recovered from animals, but in England only a few had been identified, of which *S. typhi-murium* was the most important. Dogs might carry several different types without showing symptoms, while in contrast over 40% of clinical infections were due to *S. typhi-murium*. Pigeons were salmonella carriers, and occasional human cases had been traced to this source. Tortoises were also known to be infected, but the danger of human infection was probably slight. There was little evidence available about other pets, but all were probably susceptible.

The danger of human infection must not be over-emphasized, said Dr. Buxton in conclusion, but it was necessary

to stress the importance of hygiene when dealing with pets, especially during epidemics, and the need for eradicating salmonella from their food.

Parasitic and Fungal Diseases

The last contribution was by Mr. G. C. BRANDER, who spoke on parasitic and fungal infections. The development of insecticides and fungicides had done much to reduce the incidence of infection, he said, but there was still need for liaison between the doctor and the veterinary surgeon. It was often easy to overlook the animal while treating the infected child. Immunity to parasites undoubtedly increased with age, but host resistance could be lowered by other infections and there were considerable individual variations in response. Parasitic infections were liable to become eczematized if not treated early, and, in the case of mange, irritation might remain for a considerable time after the mite had been eradicated. Individual lesions due to fungi were often difficult to spot in animals, and tended to be situated deep in the hair follicle. Thorough treatment of the whole animal was important, but it should be borne in mind that cats were particularly sensitive to many types of drug.

In the discussion which followed it was stressed that, with the possible exception of fungal and leptospiral infections, human infection from pets was relatively infrequent, even when attendants were in contact with outbreaks of disease among such animals as monkeys and poultry.

RESISTANCE TO INFECTION

Metabolic and Other Factors

Dr. RENÉ DUBOS, of the Rockefeller Institute, New York, was the guest speaker at a meeting of the Section of Pathology at the Royal Society of Medicine on April 25. After welcoming him, Professor L. P. GARROD, president of the Section, invited Dr. Dubos to open the meeting with a paper entitled "The Effects of Metabolic Factors on the Infectious Process."

Starvation and Susceptibility

Dr. DUBOS began by describing variations in the rate of growth of *Mycobacterium tuberculosis* in mice whose metabolism had been artificially disturbed. Dr. Dubos said that he had produced metabolic changes in the following ways: by giving thyroxine and dinitrophenol in doses sufficient to prevent weight gain; by adding sodium citrate and hexabutyrate to the standard diet; and, lastly, by depriving the mice of food for 36 hours at a time. All these measures had increased the susceptibility of the mice to tuberculosis as well as to other bacterial infections.

The effect produced by fasting was not merely due to diminution of caloric intake. It was rapidly reversible: within 48 hours of giving the full diet, resistance returned to the normal level. Neither was it due to loss of weight, since diets partly deficient in protein which prevented weight gain did not affect resistance. All the experiments using *M. tuberculosis* were measured by means of survival times.

Mice starved for 36 hours before injection were more susceptible to a heat-killed suspension of Gram-negative bacilli or a toxin derived from *M. tuberculosis* than were normal mice. By starving for 48 hours and subsequently feeding on a protein-free diet the susceptibility was increased tenfold. From this Dr. Dubos concluded that altered tissue metabolism enhanced susceptibility.

In one experiment, using *Klebsiella pneumoniae* Group C, there were two groups of mice. One, the control group, was fed on the standard Sherman diet. The other group was fed for seven days on a protein-free diet and was completely starved for 24 hours before the intravenous injection of the organism. Recovery rates of the organism ten hours after injection were several thousand times greater in the test than in the control group. This type of experiment was repeated in many circumstances in an attempt to find a direct cause in the diet.

In most of these experiments, staphylococci were the organisms used. If, 48 hours after injection, food was withdrawn for a period of 36 hours rapid multiplication of the organisms took place. Substitution of carbohydrates for the normal diet also hastened death of the animal. Where normal mice showed a steady decline in the number of recoverable organisms, mice whose weight gain was retarded by thyroxine showed a rapid rise in the number of organisms and subsequent death. Dr. Dubos interpreted this as an interference with the metabolism of the cells of the reticulo-endothelial system.

The standard Sherman diet restored resistance in 48 hours. However, diets containing vitamins, minerals, amino-acids, carbohydrates, and fats, but deficient in a "complete" protein were found to be inadequate. Not every protein was found to restore resistance, but casein did so in every case.

Possible Mechanisms

Dr. Dubos had confirmed previous work showing that mice were rendered more susceptible to infection by the use of "Krebs cycle poisons." Susceptibility to infection was increased by procedures resulting in at least three metabolic disorders—depletion of intracellular glycogen, reduction in the glycolytic activity of inflammatory cells, or an increase in the tissue levels of certain polycarboxylic acids and ketones. Interference with ordinary antibody responses could not account for the increased susceptibility of the mice, as the huge differences in tissue bacterial population were evident long before any immune response could have occurred. Furthermore, starvation did not lessen the immunity of vaccinated mice.

In conclusion, Dr. Dubos expressed his belief that some of his findings might have a wider epidemiological bearing. His experiments illustrated, for example, that susceptibility to infection could change rapidly and reversibly, independently of the immunological state, merely in response to physiological stresses of the kind encountered in everyday life. The findings in mice also suggested that the sugar-vitamin-amino-acid mixtures so commonly given to patients in emergency situations might not be the best for restoring resistance. Nor were the food factors essential for growth, reproduction, and other normal physiological processes necessarily the most important in promoting resistance to infection.

The Immediate Vascular Reaction

Professor A. A. MILES, director of the Lister Institute, London, said he proposed to discuss an earlier stage of infection, more physiological than biochemical. In an attempt to assess the value of the defence reaction, using guinea-pig skin, he injected a known dose of organism and assessed the effect of local modifiers by the subsequent size of the lesion. The most useful modifier was found to be adrenaline in a dose whose sole effect was two to three hours' local ischaemia.

Arguing from the degree of enhancement of infection produced by the adrenaline, the early vascular reactions inhibited by the adrenaline were responsible for a 99% to 99.9999% kill of the injected bacteria, according to the species of pathogen used. Moreover, this defence reaction, which determined the maximum size of the lesions in the skin, could be shown with many organisms to be complete within a decisive period of four hours. In infections with slower-growing mycobacteria, as might be expected, this decisive period was much longer.

Professor Miles also produced evidence suggesting that in allergic animals, though delayed allergy promoted infection with tubercle bacilli, the early exudation resulting from the anaphylactic element of tuberculin allergy might have survival value for the animal.

Importance of Insulin

Dr. D. A. LONG, of the National Institute for Medical Research, Mill Hill, said that bacterial infection was a cause

of "stress" which induced a profound change in hormone balance in the rat and adrenocortical stimulation in man. The guinea-pig, went on Dr. Long, responded to "stress" like man, was readily sensitized to tuberculin, and produced antitoxin that quantitatively and qualitatively resembled that produced by man. Also, loss of body weight, and suppression of gamma globulin and antitoxin synthesis, were not induced by large doses of cortisone in man or guinea-pig, although observed in the rat, rabbit, mouse, and ferret.

Dr. Long said that he had shown thyroxine-treated guinea-pigs to be more sensitive to intradermally injected tuberculin and to produce more diphtheria antitoxin than control animals. Cortisone depressed sensitivity to tuberculin in both thyroxine-treated and control guinea-pigs, but was without significant effect on antitoxin synthesis. Insulin increased sensitivity to tuberculin, but, owing to the compensatory phenomenon induced, a direct study of the effect of insulin on antitoxin production could not easily be made. However, partial pancreatectomy abolished both hypersensitivity and hyperimmunity resulting from treatment with thyroxine.

From a study of the interrelationships of these effects, Dr. Long concluded that insulin output was the most important single hormonal factor that influenced immune and allergic responses of the guinea-pig to bacterial infection.

Role of the Gut Flora

Dr. G. G. MEYNELL (Postgraduate Medical School) discussed two factors influencing the dose of a highly streptomycin-resistant strain of *Salm. typhi-murium* required to infect mice by the oral route. The acidity of the gastric contents did not always play an important part under experimental conditions. By giving 50–1.6 mg. streptomycin to mice 24 hours before challenge by this strain of *Salm. typhi-murium* he found a great increase in the subsequent numbers of the organism in all parts of the gut. He also found that 50 mg. streptomycin greatly increased the susceptibility of mice to infection, the LD50 being reduced from $>10^8$ to two organisms, so confirming the work of Bohndorff and her colleagues. Both findings were presumably due to the action of streptomycin on the normal gut flora. Dr. Meynell also described a spontaneous epidemic due to an oxytetracycline-resistant strain of *Proteus* which occurred in a mouse stock under treatment with oxytetracycline and which was ended by withdrawing the antibiotic.

In the discussion Dr. DUBOS criticized Dr. Meynell's use of hydrochloric and citric acid as a suspending medium, suggesting that citric acid had a protective action on the organism. He quoted experiments showing that pH, *per se*, was of only relative importance and it was the anion which exerted a specific effect. He suggested that the resistance was due to the metabolic state at the site of infection. Accumulation of carboxylic, keto- or lactic acids could completely change the environment. Immunity processes could not be independent of the metabolic state. They acted by accelerating and focusing the inflammatory state at the site of infection.

Professor GARROD pointed out that gastric acidity was of importance in the destruction of organisms given by the oral route. Professor CRICKSHANK agreed, and suggested that in view of this the assessment of infection was more easily controlled by using the conjunctiva as the site of infection.

Dr. DUBOS regarded the actual dose as of less importance than the nutritional state of the mouse, which he claimed varied greatly in a short time. Some discussion followed about the suitability of the mouse as an experimental animal. When asked if he considered that one common factor was operating at the site of infection, Dr. Dubos said that indeed many apparently unrelated stresses might operate through only one or a very few essential mechanisms. For example, many various types of metabolic or toxic disturbances could cause a depletion of glycogen followed by failure of phagocytosis and loss of lactic acid production leading to a decrease in resistance.

Correspondence

Tuberculosis After B.C.G. Vaccination

SIR,—In your leading article on tuberculosis after B.C.G. vaccination (*Journal*, April 30, p. 1076) you quote Ustvedt as saying that a primary focus can result from the superinfection of a person successfully vaccinated with B.C.G. This statement is so self-contradictory that I consulted the report to see if you had misquoted it, but I found that your quotation was accurate. I then consulted the full report of the Conference on European B.C.G. Programmes¹ (on which the *Bulletin of the World Health Organization* concerned appears to have been based), and on page 271 the following statement by Ustvedt appears: "There is no reason to doubt that a lung focus develops on superinfection (cf. the investigations in guinea-pigs by K. A. Jensen), but this focus does not usually seem to reach such an extent that it becomes visible on the chest film. The disappearance of the manifestations of primary tuberculosis seem [sic] to a high degree to characterize most of the groups of B.C.G. vaccinated individuals studied." I have no doubt that this statement is the correct expression of Ustvedt's views. The other statement may have suffered by mistranslation.

As regards the occurrence of tuberculous meningitis and miliary disease in vaccinated persons, Ustvedt² states that, from the work of the Joint Enterprise in various European countries (6 million vaccinations), the Danish campaign in Germany, and the Norwegian campaign in Italy, 21 cases of tuberculous meningitis and miliary disease had been reported. Many of these occurred within two months of vaccination, and by your own terms these are excluded ("disease that follows a natural infection occurring just before vaccination or a few weeks afterwards during the pre-allergic phase"). This may not be convincing statistical evidence, but it is impressive.

The occurrence of fatal tuberculosis due to the vaccine itself is, as you say, of great interest, and the findings presented in some of the original reports are difficult to interpret. In the case reported by Meyer and Jensen³ the post-mortem findings showed "a peculiar picture of atypical tuberculosis." The pathologist who made the post-mortem examination reported that he could not categorize the findings and had no explanation to offer for the atypical pathological condition. In Thrap-Meyer's⁴ case the patient was known to have had a raised erythrocyte sedimentation rate (40 mm.) for many years before vaccination, and although there was an interval of 4½ years between vaccination and death from generalized tuberculosis histological examination of lungs, spleen, urinary bladder, rectum, and bone failed to reveal any tubercles. The failure of the patient's tissues to react to the infection with B.C.G. was not explained. Your conclusion that the danger of B.C.G.-produced tuberculosis is too remote to be alarming is justified by the facts. —I am, etc.,

Whitehead, Belfast.

H. G. CALWELL.

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- 4 Thrap-Meyer, H., et al., *Acta tuberc. scand.*, 1954, 29, 173, 180, 188.

Non-virilizing Androgens

SIR,—Substances like methylandrostenediol and methyl-androstan 17ol-3-one are being presented by the makers to medical men as "non-virilizing androgens" and "free from the side-effect of virilization in the recommended dosage." These statements are true relative to testosterone and methyl testosterone, with which these substances are compared. The statements may even be absolutely true for the majority of patients. However, in my clinical experience, although these substances may not produce true virilism, they may produce some growth of facial hair and even some deepening of the voice when given over prolonged periods in the

"recommended dosage." Since they are easily taken by mouth, and since they are advocated in a large number of conditions for "adults (both sexes) and children (boys and girls)," I think it prudent for practitioners to be aware that these substances are mildly androgenic, especially if they are prescribed for patients who are not seen for long intervals. The androgenic effects may be disconcerting, but tend to disappear on ceasing the "therapy."

In animals, immature rats,¹ taking the weight of the seminal vesicles as a criterion, "the compound (methylandrostenediol) was found to have about one-third the androgenic action of testosterone, subcutaneously, and about the same activity as methyl testosterone, orally." Although other tests—e.g., capons—indicate only one-fiftieth the activity of testosterone, and although the anti-oestrogenic and nitrogen anabolic activity are undoubtedly greater than the androgenic action, comparing methyl androstenediol with methyl testosterone, the experimental evidence does not permit one to ignore that methylandrostenediol and methylandrostenolone are potentially androgenic, even if feebly so. This letter is not, of course, an attempt to assess usefulness in appropriate cases.—I am, etc.,

London, W.1.

S. LEONARD SIMPSON.

REFERENCE

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Measurement of Cholinesterase Activity of Whole Blood

SIR,—The periodic measurement of blood cholinesterase activity provides a valuable guide in the protection of spraying operators and other users against the risk of cumulative over-exposure to anticholinesterase organic phosphorus insecticides.¹ Unfortunately, the methods until recently available, as reviewed by Aldridge,² prove somewhat demanding as regards laboratory time, trouble, equipment, or experience, and in this country few laboratories are able to provide the prompt routine testing service really needed. However, in 1953 Limperos and Ranta³ described a simple and speedy colorimetric method which has already been successfully used in North America.⁴

The principle of Limperos' method is that the cholinesterase activity of the whole blood sample determines the rate of colour change in a system comprising the enzyme (blood sample), substrate (acetylcholine), and indicator solution (soluble bromthymol blue, green-blue at pH 7.2, continuously changing to orange-brown at pH 6.2). Blood samples of unknown cholinesterase activity can thus be compared with normal control samples from healthy unexposed persons, either by measuring the time needed for the full colour change to be completed under standard conditions, or by measuring the amount of colour change occurring in the unknown samples when a normal sample has just completed the colour change, or after some arbitrary incubation time. The latter approach seemed to offer certain advantages in practice, and has led to the development of a series of permanent coloured glass standards calibrated at intervals of 12.5% normal cholinesterase activity, permitting the use of a visual comparator to ensure consistent readings in successive tests.

The method described, therefore, consists of pipetting 0.01 ml. whole blood from a normal unexposed person, and then from each worker to be tested, into clean reaction tubes each containing 0.5 ml. of an 0.044% aqueous solution of the bromthymol blue. The substrate, 0.5 ml. of an 0.5% solution of acetylcholine perchlorate, is then added to each reaction tube at a convenient time interval—for example, 1 minute. All tubes are allowed to stand at room temperature, the progressive colour changes occurring in the "control" tube being followed by periodically decanting the solution into the comparator cell, and matching with the series of calibrated disks. When the control tube contents just attain "100% activity," usually within 25 to 30 minutes at temperatures in the 15 to 20° C. range, the unknown samples are successively matched against the disks, again at 1 minute intervals, and the per cent whole blood cholinesterase activity read off. Precautions must be taken against acid or alkaline contamination (even by respiratory CO₂), against residual insecticide on the worker's skin, and against deterioration of the substrate solution. With those precautions, we have found the method very satisfactory in its speed and simplicity, the results obtained agreeing very well (within one disk, or 12.5%) with the

correct activity of normal and low-activity samples, as measured by the Michel electrometric method.⁵

The main advantages of the colorimetric method using comparator and calibrated disks are that it can be carried out on very small samples of blood, with simple equipment, reasonable accuracy, and good reproducibility, away from the laboratory if and when necessary. The degree of error of the method is considered acceptable for both routine and emergency estimations. The 95% range of normal whole blood activity extends from 80% to 120% of the mean value, while major anticholinesterase intoxication is most unlikely at blood activities above 25% normal. Between 25% and 75% normality, symptomless over-exposure to an anticholinesterase may recur.

The visual comparator, calibrated "cholinesterase disk," and full technical details of the method are now available from Messrs. Tintometer Limited, Waterloc Road, Salisbury, for whose collaboration we are most indebted. The early work on this modification was carried out by Mr. K. P. Fellowes.—We are, etc.,

E. F. EDSON,

M. L. FENWICK,

Medical Department,
Fisons Pest Control Limited.

Cambridge.

REFERENCES

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² Aldridge, W. N., and Davies, D. R., *ibid.*, 1952, 1, 945.
³ Limperos, G., and Ranta, K. E., *Science*, 1953, 117, 453.
⁴ Wolfst, J. H., and Winter, G. D., *Arch. Industr. Hyg.*, 1954, 9, 396.
⁵ Michel, H. O., *J. Lab. clin. Med.*, 1949, 34, 1564.

Intramuscular Chloroquine

SIR,—There has been much criticism on the intramuscular use of quinine for the reason that such method had on occasions developed localized necrosis of the muscular fibres with subsequent abscess formation, thus creating a favourable cultural medium for tetanus and other organisms. In addition to the abscess formation, gas gangrene and streptococcal septicaemia may ensue. Intramuscular quinine injections have also been known to produce very painful fibrous nodules which after many years may break down and give rise to suppurating sinuses.

To obviate such potential complications, I have started to use intramuscular chloroquine injections for my malarial cases. The site chosen was the anterolateral aspect of the middle part of the thighs. Since May, 1953, intramuscular injections of chloroquine have been given to 617 cases of malaria, mostly of cerebral type, with temperatures ranging from 101° F. to 105° F. (38.3° C. to 40.6° C.). The cases included mostly infants and children under conditions where the oral route was found impracticable. The figure 617 included 415 cases under 1 year, 130 cases under 6 months, 80 cases under 3 months, and 27 cases under 1 month. The youngest infant to receive the injection was 3 days old.

Not a single case showed any local abscess formation or other complications. It is hoped that the observations made will be of much guidance to those who have abandoned the intramuscular use of quinine among their patients, especially the infants and children, for fear of abscess formation.—I am, etc.,

Pertis, Malaya.

ABDUL WAHAB ARIFF.

Chlorpromazine in E.C.T.

SIR,—In a small series of in-patients receiving modified electroplexy we have been impressed by the value of chlorpromazine as a pre-operative sedative. The average dosage of the drug which we employ is 50 mg., given by mouth two hours before treatment; this is followed by a hypodermic injection of scopolamine 1/150 gr. (0.43 mg.), or atropine 1/75 gr. (0.86 mg.) one hour before treatment. Anaesthesia is induced with a sleep-dose of thiopentone followed by succinylcholine 50–75 mg.

We have found that this use of chlorpromazine gives the following results: (1) A markedly tranquillizing effect (most welcome in the agitated depressive types, so often resistant to repeated treatment); (2) venous dilatation accompanying an increase in the warmth of the extremities. This latter

feature has greatly facilitated venepuncture in patients in whom the extremities were habitually cold, the veins contracted and impalpable, even in warm surroundings.

Since the exhibition of chlorpromazine considerably reduces the amount of thiopentone required to abolish consciousness, recovery time is not significantly retarded; this would suggest that, in suitably selected cases, the drug could be used safely in this way for ambulant patients.—We are, etc.,

J. D. W. PEARCE.

H. L. THORNTON.

London, W.2.

Measles

SIR,—In your leading article (*Journal*, April 23, p. 1018) I was interested that the occasional difficulty in distinguishing between measles and the early stages of scarlet fever should have been mentioned at a time when I was about to report the following rather unusual case.

A boy, aged 2½ years, had scarlet fever in January, 1955. On April 1 he had a running nose, a hard, dry cough, and Koplik's spots so typical that they were demonstrated to his mother. By April 7 he had the typical rash of measles, and his sister, aged 5½, who slept in the same bed, was found by the mother to have Koplik's spots, and when seen by me the same evening looked miserable, with a temperature of 102° F. (38.9° C.), a hard cough, running eyes and nose, and photophobia. The following day a colleague saw the sister and confirmed the diagnosis of measles from the typical rash, which was becoming confluent when seen by me the next day. By April 10 the boy was much better, but the girl had striking circumoral pallor with the beginning of desquamation on the cheeks: her temperature was still raised to 102° F. (38.9° C.); she had a strawberry tongue, injected fauces, and enlarged cervical glands. On April 11 her measles rash was still present, but the fingers, palms, soles, and cheeks were now peeling, and superimposed on the measles rash was a typical scarlatiniform eruption. Granny, who had raised 16 children through every infectious fever without the help of a doctor, confidently diagnosed a combination of measles and scarlet fever—a diagnosis with which I concurred. On April 13 the boy was completely better, but the girl still had a temperature of 102° F. (38.9° C.) despite having started sulphonamides two days before. On April 15 she was much better and both rashes were fading.—I am, etc.,

London, W.6.

DAVID JACKSON.

Roseola Infantum

SIR,—Dr. E. L. McQuitty's article on roseola infantum (*Journal*, April 23, p. 1005) wisely draws attention to the most commonly occurring member of the exanthemata in infants under the age of 2. I have been noticing sporadic cases in my practice ever since the annotation in the *Journal* in 1950.¹ Dr. McQuitty mentions the paucity of references to the condition in the literature, but his most recent reference is 1950. Almost a page is given to it in my book² in the chapter on "Common Disorders Recently Recognized." In my opinion the importance of the recognition of this, and of other mild disorders encountered mainly in general practice, lies in the fact that exact diagnosis increases a general practitioner's confidence in himself and thus his patients' confidence in him.—I am, etc.,

Plymouth, Devon.

DENIS CRADDOCK.

REFERENCES

- ¹ *British Medical Journal*, 1950, 2, 876.
² Craddock, D., *An Introduction to General Practice*, 1953, p. 480. H. K. Lewis, London.

SIR,—In his paper on "Roseola Infantum" (*Journal*, April 23, p. 1005) Dr. E. L. McQuitty states: "In Britain, only Schlesinger (1937) refers to a few cases seen in London." That is not accurate. An outbreak in a maternity hospital was described in this country in 1949,¹ and was subsequently referred to in an annotation in your *Journal*.²—I am, etc.,

London, E.3.

REFERENCES

- ¹ James, U., and Freier, A., *Arch. Dis. Childh.*, 1949, 24, 54.
² *British Medical Journal*, 1950, 2, 876.

Cross-infection in Hospital

SIR,—I have read with interest the articles by Dr. E. J. L. Lowbury (*Journal*, April 23, p. 985) and Dr. P. N. Edmunds and his colleagues (p. 990).

The reservoirs of antibiotic-resistant pathogenic staphylococci are: (1) Blankets on ward beds and waiting-room or casualty couches, or on theatre trolleys: these blankets should be washed every month in a solution of "lissapol" and then soaked in "fixanol" solution, and dried without further rinsing. (2) Pillows and mattresses: these should be treated with hot, moist, gaseous formalin in the hospital sterilizer every 10 days or every time the bed has a new occupant, whichever time is the shorter. (3) Floors, ledges, shelves, locker tops, table tops, etc., should be treated every day with the M.R.C. urea ninol mixture. (4) Hands: nurses' hands should be protected by thin rubber gloves when the napkins of infants are being changed, bedpans carried about or cleaned, dressings changed, etc. The "washing" of a nurse's hands is a farce. Gloved hands, however, can be "washed" effectively in water containing a substance like "milton." A nurse should wash up, dry her hands on a sterile towel, and then apply sterile powder to her hands and don dry thin sterile rubber gloves. Whilst wearing her gloves she can wash her hands dozens of times, with effect each time. (5) Nurses should wear an efficient mask and a sterile overall when at work. (6) All plates, cups, saucers, and other crockery, including drinking-glasses, knives, forks, and spoons, and any other cutlery should be boiled after every meal, in addition to ordinary cleansing procedures. (7) In addition to the above measures, the M.R.C. technique for dressing wounds should be adopted and strictly enforced. Septic plasters, septic burn wounds, and septic surgical cases should be segregated from clean cases; and these septic cases should not have their dressings changed or removed in an open ward or theatre used also for clean cases. A special theatre and ward should be kept for septic cases, and attendants working there should have their noses and throats swabbed at frequent intervals. If the attendants are found to be infected, the organism should be examined bacteriologically to find an antibiotic to which it is sensitive; the attendants should then be treated with this particular antibiotic until nose and throat swabs are clear. Emergency admissions and infectious cases should not be admitted to an open ward but placed in cubicles for 48 hours: the disposal of the case should then be reviewed.

Many of the measures recommended are described in an article in the *Lancet*, 1954,¹ and can be seen in action in a hospital in greater London.—I am, etc.,

Epping, Essex.

FRANK MARSH.

REFERENCE

- ¹ Marsh, F., and Rodway, H. E., *Lancet*, 1954, 1, 125.

The Changing Face of Medicine

SIR,—Mr. Clifford Kennedy's stimulating address (*Journal*, April 30, p. 1045) contains ideas of great importance, as well as a few crusty notions belonging to an age now departed and never likely to return. When, however, he says that the surgeon finds he is loath to undertake the risky case, I feel a challenge to be essential. If this is true the state of the profession is indeed inglorious. I don't believe it. Nor do I believe Mr. Clifford Kennedy when he says, "I have done it myself."

The responsibility of the doctor, physician or surgeon, is to make up his mind on the ascertainable facts and to take the action best suited to the patient under his care. No fear of possible legal consequences can alter that. The alternative is to resign and take up a job in a less responsible occupation. It is the hallmark of the doctor that he must decide. On his decision his own actions and those of many other persons—medical auxiliaries of all varieties—depend. The idea that the younger generation lacks courage and a spirit of adventure is common to all ages of history, and it is almost always untrue. The fact is that adventure

to-day is found on different pathways than in the first decade of the century because the history of our country and our calling has moved on in time.

As to the recent litigation, we are all concerned about it, and it behoves us to so order our affairs that negligent actions are as far as humanly possible eliminated. But the doctor who fails to act in the way he believes to be right when confronted with a patient needing his help, because of the fear of some unfortunate consequence to himself, should never have taken his medical diplomas in the first place. That is the central question. The case of the young resident who does not readily apply for a casualty post is in some respects not typical. Some courageous young doctors do undertake this type of post, but if others are more cautious there is reason in their position. For many years now we have been told that casualty cases should be seen by a competent accident surgeon having the F.R.C.S., and there are still hospitals where this arrangement has not yet been made. Perhaps one useful by-product of the recent High Court decisions is to compel hospital authorities to develop a more modern policy for their accident departments.

As for the attitude of the legal profession, doubtless relations could be improved. I feel, however, that there is a great deal to be said for their side of the story. High Court judges are usually men with great objectivity of mind and a sense of fairness. Perhaps they have their blind spots, but it would be presumptuous to suggest that their recent decisions were influenced by some lack of sympathy with the profession of medicine rather than a full consideration of the ascertainable facts laid before them. We must at all costs avoid an attitude which might suggest that we hold the view that the profession of medicine should stand above the law.—I am, etc.,

Bushey, Herts.

PETER ROE.

Natural Childbirth

SIR,—I have read with interest the recent correspondence on natural childbirth. Being a mother who was considerably helped by this method, I feel that it cannot be encouraged enough in order that the next generation will not grow up with the tales of agony and suffering which used to surround childbirth. From the attitude of the previous generation, the result for me was a great fear of childbirth and the associated agony which I believed it to be (and I know I am not alone in this). I attended antenatal classes and practised relaxation throughout pregnancy, and together with the other mothers-to-be was told of the events of labour and the signs to look for through each stage. It was explained that labour was, as the word implies, very hard work. I must say I am surprised indeed that Mrs. Constance Lynn (*Journal*, April 2, p. 851) was not told to expect this. Through this education in the events of labour I entered into this great job of work free from the dreadful fear that had been with me since adolescence.

As we were told, less fear—less tension—less pain. Therefore my labour was by no means as painful as it would have been if I had not been instructed beforehand. Toward the end of a seemingly endless first stage, with fairly severe contractions, I found myself unable to relax. However, my husband (himself a doctor), who had practised natural childbirth with me, was able to remind me of the type of breathing I should be using. This was the greatest help to me at this difficult time of labour, and I feel that a woman in labour should be attended by some person experienced in natural childbirth. The father-to-be is generally considered to be a nuisance to all concerned; but if husband and wife have read and followed together the breathing and relaxation—as is often the case in natural childbirth—then he can be of considerable help to both mother and staff. A woman in labour should not be left alone to “get on with it”; and the midwife rarely has time to spare. Would not the husband be better employed in helping his wife than pacing the corridor outside?

I would be interested to know what Dr. Constance Beynon (*Journal*, April 9, p. 908) calls a normal birth. Is it one

free from “abnormalities,” in which the mother is unconscious at the moment of birth, and is introduced to her baby a half-hour or more later; or is it one in which the mother is conscious (remembering that the gas and air machine is at hand if required), feels her baby born, hears its first cry, and holds her baby a few moments after birth? For me, personally, the latter was possible; although the birth of my daughter—9 lb. (4 kg.)—was not completely normal owing to the necessity for an episiotomy. I was completely conscious throughout, and the knowledge that I was actually assisting when the moment of birth arrived is a joy I shall never forget. None of this would have been possible for me had it not been for the instruction I received beforehand in natural childbirth. I believe that, for this generation to have its babies naturally in the true meaning of the word, education during pregnancy is essential. Then, perhaps, the coming generation will grow up to know only tales of joy, instead of pain and agony. Surely natural childbirth must be encouraged.—I am, etc.,

Woking, Surrey.

MARGARET McLAREN.

SIR,—I have been following the correspondence on natural childbirth. My first child was born nine weeks ago, and as a member of a hospital staff I had attended all antenatal clinics, including classes for exercises. I had read widely around the subject of childbirth, and knew exactly what to expect in theory. I certainly had no fears, especially as I knew well the staff who would assist me in labour. I had also watched a normal delivery.

The onset of labour came suddenly, and the pain was so intense that within half an hour I was completely incapacitated. I was given trichlorethylene, which gave no relief, and subsequently gas and air, which was more helpful. Labour was short, under four hours, and uncomplicated, but it was from beginning to end so intensely painful that all my preconceived ideas on how I should assist were abandoned. Afterwards I felt, apart from physical exhaustion, an extreme disappointment that I had not been able to participate in the experience as I expected I should be able to. I hope I am the exception.—I am, etc.,

London, S.W.3.

MARY B. DEW-JONES.

Aftermath of Hysterectomy

SIR,—With reference to the letters by “Doctor’s Wife” and Dr. Katharina Dalton (*Journal*, April 30, p. 1093). I have had the opportunity to treat some 900 women suffering from uterine fibroids with haemorrhage since 1939. I used intrauterine radium for approximately three days. Apart from the rare submucous fibroids, treatment stopped bleeding at the following period or the period after.

Dyspareunia was the only ill-effect following the radium treatment. And the dyspareunia disappeared within six months on its own, and sooner when treated with vitamin E, which was better tolerated in these cases than artificial female hormones. The treatment needs only three days of immobilization in bed after a short anaesthetic, followed by no recovery period, so that the patient can return to her duties almost immediately. There were no other ill-effects, apart from temporary dyspareunia, and I wonder why this is not the treatment of choice in cases of subserous and intramural fibroids.—I am, etc.,

London, S.W.3.

E. F. BLUMBERG.

Ban on Heroin

SIR,—I must join in the protest at the ban on the manufacture of heroin. We are only too familiar with the phrase “just as good” applied to substitute products—but who chooses the *ersatz* when he can obtain the genuine product? Clinical experience teaches, beyond the power of contradiction by laboratory experiments, that there is no satisfactory substitute for heroin in certain cases where pain relief is required. Surely, if abuse of a valuable drug by a small section of the community (and not even the British

community) is to be considered an adequate reason for imposing a ban on its manufacture, then both alcohol and tobacco should have gone long ago, whereas—quite properly—they have not been banned.—I am, etc.,

Aberdeen.

C. D. NEEDHAM.

SIR,—I fully concur with the opinions of your correspondents in the great disaster that would result by the imposition of a ban on heroin. This drug is the only effective weapon that the general practitioner possesses in combating the agonizing pain of patients suffering from advanced malignant disease. There are, of course, many other preparations on the market, but despite the claims of the manufacturers they are in no way so effective. Presumably the Government may have a very good reason for restricting the circulation of this drug, but surely a compromise could be reached whereby the procurement of heroin could be tightened up—for example, such as a consultant’s signature on the prescription in addition to that of a registered general practitioner. The advisers of the Government on this matter are shouldering a heavy responsibility should this advice be implemented.—I am, etc.,

London, W.1.

D. K. MULVANY.

Alcoholic Addiction

SIR,—I have recently been consulted by general practitioners concerning the treatment of three cases of alcoholic addiction. The patients were ruining the family finances and causing great suffering to all those around them, but they refused to be admitted to hospital for treatment. I am writing this letter in the hope that those in power will be stimulated to recommend some form of legally compulsive treatment in such cases.

I am aware that it is against our tradition to interfere with the “private lives” of citizens, and I can well imagine people arguing that if a person wishes to drink himself to death he should have the right to do so. Others may argue that playing at roulette, betting on horses, and gambling on the Stock Exchange can equally ruin family finances and happiness. And yet I think most of us will agree that alcoholic addiction, both because of the size of its problem and of the peculiarly unpleasant suffering it causes in the family circle, stands in a class by itself.—I am, etc.,

Basingstoke.

I. ATKIN.

Telangiectatic (“Nape”) Naevi

SIR,—The “nape” naevus (*Journal*, April 9, p. 913) is so extremely frequent that the question of heredity seems to be of no significance. This kind of naevus is known on the Continent as naevus telangiectaticus nuchae Unna, who in his *Histopathology of the Diseases of the Skin*¹ dealt extensively with this subject. He regarded these lesions as due to intrauterine pressure, and rejected Virchow’s branchial fissure theory and the possibility that they may be connected with irregularities in the embryonic development.

These telangiectatic naevi are of what one could term an ontogenetic character, whilst other naevus forms—e.g., the blue, the “mongolian” naevi, and the face moles representing rudimentary sensory organs^{2,3}—are of a distinctly phylogenetic nature.—I am, etc.,

London, W.1.

ERNST SKLARZ.

REFERENCES

- 1 Unna, P. G., *Histopathology of the Diseases of the Skin*, 1896. William F. Clay, Edinburgh.
- 2 Sklarz, E., *Derm. Wschr.*, 1926, 82, 462.
- 3 *British Medical Journal*, 1938, 1, 1164.

Hypodermic Injection Technique

SIR,—I have found the letters on the above subject both stimulating and helpful, especially when applied to injections of A.P.T. in small children where a painful episode with the doctor may give rise to a long-lasting aversion. I am not ashamed to confess that my own routine starts with a small bribe. I keep a stock of small, soft, brightly coloured sweets, and the health visitor who assists me distributes one to each mother. The mother holds the child on her lap and as I approach she pops the sweet into the open-

ing provided for it. I grasp the upper arm gently at first with my left hand, then I increase the strength of my grip nearly to the point of producing pain and at this moment the needle is swiftly inserted. In future I shall combine this with Dr. John Richards’s stretching technique (*Journal*, April 30, p. 1092). Between the pleasurable sensation of the sweet taste and the near-painful sensation of the firm grip the penetration of the sharp point is almost lost sight of. In most cases the episode passes without a cry and the small patient receives his meed of congratulation.—I am, etc.,

Birmingham, 33.

H. J. HOYLE.

Noradrenaline

SIR,—Your leading article on noradrenaline (*Journal*, April 9, p. 896) has the following sentence: “The greater pressor action of noradrenaline is explained by the fact that it constricts the vessels in the muscles as well as those in the skin and viscera, whereas adrenaline dilates those in the muscles.”

This makes strange reading for any anaesthetist, even though he may be aware that similar observations, at least with regard to the action of adrenaline, have been made regularly by physiologists since Hoskins, Gunning, and Berry first made them in 1916.¹ An anaesthetist well knows that if, prior to such an operation as a thoracotomy, he infiltrates the heavy muscles which are to be cut with, say, 200 ml. of sterile water to which has been added 1 ml. of 1/1,000 adrenaline, bleeding will be greatly reduced. Again, those anaesthetists who, like myself, have attempted to reduce bleeding by infiltrating these muscles with 200 ml. of sterile water to which has been added 1 ml. of noradrenaline will know, from what they see and what they hear from the unhappy surgeon, that bleeding is greatly increased.

Perhaps the answer to this riddle lies in the dosage of these drugs; that a fairly high concentration of adrenaline such as that mentioned above will cause not dilatation but constriction of the vessels of skeletal muscles; and that the rise in blood pressure which resulted from infiltration of the noradrenaline solution was sufficient to increase muscular bleeding in spite of any constriction of the vessels which may have occurred.—I am, etc.,

Worcester.

W. N. VELLACOTT.

REFERENCE

- 1 Hoskins, R. G., et al., *Amer. J. Physiol.*, 1916, 41, 513.

Recovery from Chronic Lymphocytic Leukaemia

SIR,—In reply to Dr. F. A. Bearn’s letter (*Journal*, April 23, p. 1031). I have looked up Gutmann’s paper.¹ This seems to be one of the many doubtful cases in which the literature abounds. At no time was there any anaemia, and the highest number of white cells was 11,000. No myeloblasts were present, and the diagnosis of aleukaemic leukaemia would seem to require marrow biopsy for confirmation. No enlargement of liver or spleen was found clinically. The patient was followed up for two years only, and all the blood pictures except the last one were abnormal. Eleven years later Dr. Bearn found the patient to be suffering from “a typical lymphatic leukaemia.” It would be interesting to have details of the blood picture.—I am, etc.,

Bradford.

MAX SCHOTT.

REFERENCE

- 1 Gutmann, B., *Amer. J. med. Sci.*, 1924, 167, 718.

Spontaneous Haemopneumothorax

SIR,—The most interesting account of spontaneous haemopneumothorax by Colonel A. J. Clyne and Wing-Commander F. H. D. Hutter (*Journal*, April 30, p. 1058) recalled to my mind the only case I ever saw in almost 20 years of general practice. This occurred early in 1946 when I was a medical officer attached to a field dressing station in Germany.

The patient was a private soldier whom I admitted to our casualty reception station in a state of near collapse, and who complained of sudden onset of severe pain in the right side of the chest. There was no history of injury, nor

indeed of any previous illness. The pain rapidly increased in intensity and was accompanied by dyspnoea, pyrexia, and rapid pulse. It was most severe even on slight movement and on inspiration. I made a tentative diagnosis of spontaneous pneumothorax, but soon after decided that it must be a haemopneumothorax on account of increasing restlessness, pallor, air hunger, and other phenomena of shock. He was too ill to be moved, so, employing the limited facilities at my disposal for treatment of such a case, I fitted up an underwater intercostal drainage apparatus. With the help of this and with the administration of a continuous intravenous saline drip, together with adequate sedation and penicillin cover, the patient improved dramatically and out of all recognition from day to day. As a result I was able to transfer him (in accordance with Army regulations) on the fourth day to a Canadian general hospital in Holland.

I visited him on two occasions there, and found that the diagnosis had been confirmed radiologically, that several pints of blood had been aspirated, and that he was greatly improved. It was thought that the tubercle bacillus was the causative agent in this case. He was later drafted back to England and unfortunately I lost trace of his subsequent progress on account of my own demobilization.—I am, etc.,

Glasgow, S.1.

M. FREEDMAN.

Cyst Formation

SIR,—I was interested to read Mr. A. G. Rutter's report (*Journal*, April 16, p. 951) of another case of gross cyst formation following cutis graft repair of an inguinal hernia. During and shortly after the war a series of inguinal herniorrhaphies was performed by this method in this hospital, and in 1952 we reported two cases of gross cyst formation with survival of hair follicles and sweat glands.¹ Since that time the total number of our cases in which this complication has occurred has risen to over half a dozen, including one in which the cyst formation was bilateral. It is worthy of note that in none of these patients was there any recurrence of the hernia. We have therefore been encouraged to carry out preliminary experiments in freeze-drying redundant skin taken from patients undergoing umbilical herniorrhaphy with the object of killing the epithelial elements and enabling the cutis to be stored and used safely for hernial repair in other patients.

Specimens have been taken with aseptic precautions and cultures have been negative after the freeze-drying process. We have found, however, that the cornified layers of the skin assume a rather unpleasant white appearance, and it may be that the superficial layers should be removed with a dermatome before processing. The process of rehydration is also rather tedious. If these problems could be overcome it might be possible to obtain all the advantages of cutis grafting without the disadvantages which are becoming increasingly obvious.—I am, etc.,

Liverpool, 9.

NORMAN GIBBON.

REFERENCE

¹ Gibbon, N. O. K., and Lothian, K. R., *Brit. J. Surg.*, 1952, 39, 501.

Coal-workers' Pneumoconiosis

SIR,—The article by Drs. J. C. Gilson and G. S. Kilpatrick (*Journal*, April 23, p. 994) is extremely informative and will be helpful to those attempting to deal with respiratory cripples from the coalfields. There are thousands of ex-miners in London who left the pits during the great mining depressions, and many of these are slowly dying, often without compensation, from the effects of dust inhalation. It would be helpful to those doctors who have to urge men to continue working to know the exact definition of "dust-approved conditions." Can we know the scientific evidence on which it is asserted that men can work, for many years, without harm in such an atmosphere?

As far as I can discover from clinical observation there is little difference in symptoms from pneumoconiosis and bronchitis and emphysema. Certainly few miners would

know the difference, and they believe the cause is the same. A practitioner relative of mine found that in his colliery practice, since the war, over 40 miners and ex-miners had died from chronic chest disease; of these, two only had been certified as having dust disease. National statistics are now available for the morbidity from chronic bronchitis. The National Coal Board must know the incidence in the mining community. Can these figures be published so that we can have realistic discussions on the effect of work on the miners' respiratory capacity?

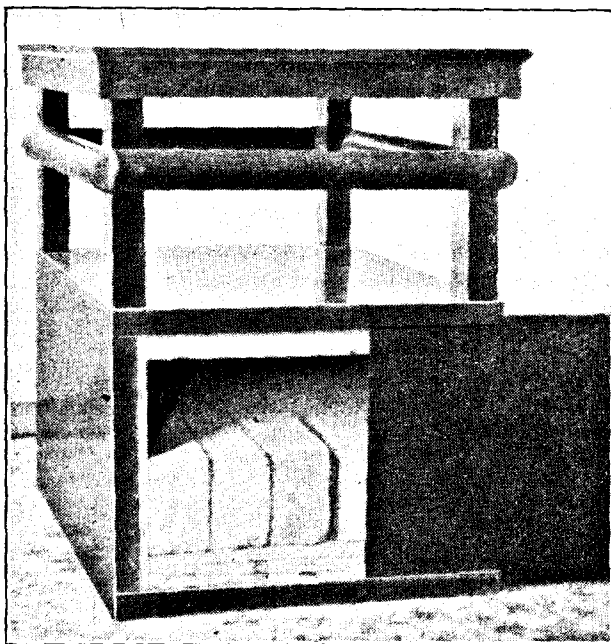
Finally, Sir, may I urge that, since complicated pneumoconiosis is almost certainly due to dust and tuberculosis, we eliminate tuberculosis from our coalfields forthwith. Mass radiography, annually, of miners and relatives, as in the Rhondda, would discover infectious cases. Treatment can now be made available universally and one at least of the miners' hazards would be abolished. Knowledge comes, but application lingers.—I am, etc.,

London, N.W.10.

HORACE JOULES.

An Aid for Parkinsonism

SIR,—This is a photograph of an appliance I had made for a case of post-encephalitic parkinsonism, and it may be of interest to others. The lady had reached the stage in which she could sit down, but was unable to get off her chair without assistance. She lives at home with a sister who is out all day. Consequently she had to sit by herself from morning to night, and her muscles were becoming stiffer and weaker. She was unable to go out by herself, and had to be pushed in a bath-chair.



The appliance consists of a box, closed except at one end, which has a sliding panel. The box is filled with bricks to make it immovable. Above the box is a banister rail. By hooking her fingers around the rail the patient can pull herself on to her feet with ease, and, after steadying herself, can walk without any trouble. She has been using the appliance for the past three months, and is now more active than she has been for the last seven years. She goes out walking by herself, and says she can manage a quarter of a mile without distress. She is much more confident and self-reliant, goes shopping and to church, and is very much less dependent on her sister.

She uses the tray on top for her meals and the top of the box as a container for books, newspapers, etc. The box measures 3 ft. by 2 ft. at the sides and 2 ft. by 2 ft. at the ends. The superstructure is 1 ft. in height.—I am, etc.,

London, N.14.

W. SIMPSON.

Coma Following Dental "Gas"

SIR,—In a questionnaire that I recently sent to a random sample of the dental surgeons of the United Kingdom I asked: "Have you ever known a patient who did not immediately regain consciousness after gas but remained unconscious or stuporous for half an hour or more?" From the replies so far received I feel able to report that at least one in three of all dental surgeons who make extractions under nitrous oxide would answer "yes" to this question; many could relate several such cases, and the coma often lasts longer than half an hour. The nitrous oxide is almost always given with oxygen, though, of course, the oxygen is very much restricted.

One report tells of a child of 6 who was anaesthetized for the extraction of a single deciduous tooth. The anaesthetist was a doctor of outstanding ability, experienced in this kind of work. This child took the gas well and the extraction was quickly made. Apart from the restriction of oxygen that is always a feature of this method, it is impossible to suppose that there was any fault or lack of skill in the way in which the anaesthetic was given. Yet the child went into coma and remained unconscious for several days. After this, cerebral function returned very gradually so that it was many weeks before the child could be discharged from hospital.

It is possible that such desperate examples of this syndrome are very rare, but in view of the apparent frequency of its occurrence in lesser degree, and in the hope of discovering its cause, nature, and incidence, I think it worth while to direct the attention of your readers to it.—I am, etc.,

London, S.E.1.

J. G. BOURNE.

POINTS FROM LETTERS

Damages for Hot-water Bottle Burns

Dr. F. E. GRAHAM-BONNALIE (Exeter) writes: With reference to your medico-legal report (*Journal*, April 2, p. 856), now that it is taught that coolness and not heat is the better treatment for shock, could not hot-water bottles be dispensed with altogether?

Hospital Improvements

Miss OLIVE MATTHEWS (The Old Forge, Coaley, near Dursley, Glos.) writes: A few years ago I brought out a booklet called *Hospital Improvements*—how to improve the daily life of the patient in the ward. This is illustrated, and deals with topics like the early morning wash, noise, visiting hours, and bedside lockers. It received many kindly reviews, including your own (*Journal*, October 14, 1950, p. 879), and since then has reached hospitals in at least 32 different countries and colonies of the world—more than 2,000 copies have gone, but over 300 remain. I am now willing to give them away to the reader who will send me fourpence to cover the cost of postage and envelope.

Night Cramps

Mr. RICHARD WARREN (Weston-super-Mare) writes: I have lately seen a good many letters in your *Journal* on the subject of cramps. I have had attacks of cramp far too often for my liking during the past 60 years or more, sometimes very painful indeed, until I learned how to cope with them. It occurred to me that contraction was reported to produce sarcolactic acid in muscle. I wondered in my simple brain if excess of sarcolactic acid might be the cause of cramp. If so, the obvious course was to neutralize the acid *quam celerrime*. The most rapidly diffusing alkali I knew was ammonia, which I took in the form of sal-volatile, or later, because they were more easy to carry, soda-mint tablets, which contain a small amount of ammonium carbonate. The effect on me was magical, complete relief in a very few minutes or even seconds. You may say psychical, or wishful thinking, but it has never failed in my case, and has saved me hundreds of attacks of severe pain. I have put many friends and patients up to this little tip, usually, so far as I remember, with success. Several indeed carry some tablets with them habitually.

Hair-grips

Dr. IVOR HOOPER (Dublin) writes: In my opinion hair-grips should have metallic blunt ends for better usefulness and greater safety, and I hope that this suggestion will catch the eye of the appropriate manufacturers.

Obituary

W. G. MUMFORD, O.B.E., M.B., F.R.C.S.

Mr. W. G. Mumford, consulting surgeon to the Royal United Hospital and the Royal Mineral Water Hospital, Bath, died at Eastbourne on April 27. He was 84 years of age.

Wilfred George Mumford, who was born on June 14, 1870, was a medical student at Guy's Hospital, where he qualified M.R.C.S., L.R.C.P. in 1895. For the next few years he remained in London, studying for the M.B., which he obtained in 1902, passing the final examination with honours in medicine. By this time he had decided on a surgical career and in 1903 he took the diploma of F.R.C.S. Mumford elected to settle in practice at Bath, which he did soon after obtaining his Fellowship. His connexion with the Royal United Hospital began in 1905, when he was appointed anaesthetist, and five years later he became assistant surgeon. The status of full surgeon followed in due course, and when he retired he was appointed consulting surgeon. During the first world war he served in the R.A.M.C. and for some time was employed as a surgical specialist at the military orthopaedic hospital at Southmeads, Bristol. He attained the rank of major, and was appointed O.B.E. in 1919 for his war services. After the war his surgical practice in Bath became a large one and he was appointed surgeon to the Royal Mineral Water Hospital, to the Ministry of Pensions orthopaedic hospital at Bath, and to the Bath and Wessex Children's Orthopaedic Hospital at Combe Park.

When the Annual Meeting of the B.M.A. was held in Bath, Mumford, who was honorary secretary of the Bath Division at the time, was appointed local general secretary of the meeting. It so happened that the incoming President, Dr. F. G. Thomson, was prevented by illness from attending the various functions, and the local executive committee appointed Mumford to take his place. Mumford rose to the occasion with conspicuous success and enhanced his already high reputation. In the following year he served as one of the vice-presidents of the Section of Surgery at the Annual Meeting at Nottingham, and he was also elected president of the Bath Division. In 1931-2 he was president of the Bath and Bristol Branch. His great characteristics were conscientiousness and scrupulous attention to detail, and these, added to his striking and handsome presence, made him an impressive figure.

Mumford moved to Willingdon, in Sussex, in 1934, when he retired from active surgical work. He is survived by his widow and one son and two daughters.

P. K. DIXON, M.D., F.R.C.S.I.

Dr. P. K. Dixon, surgical specialist at the Government African Hospital, Lusaka, Northern Rhodesia, and lecturer in surgery in the African Medical School, died at Lusaka on April 21 at the age of 56. Before taking up these appointments early in 1953 he had done outstanding work as a medical missionary in the Luapula valley of the Belgian Congo for over a quarter of a century, work which he gave up only on account of ill-health.

Patrick Kerr Dixon was born on September 21, 1898, the son of the late Professor A. Francis Dixon, who was dean of the Faculty of Physic at Trinity College, Dublin, from 1924 until his death in 1936. From St. Andrew's

College, Dublin, Patrick Dixon entered Trinity College in 1916, but he interrupted his studies there to serve with the Royal Garrison Artillery in France, being mentioned in dispatches. He returned to Trinity College in 1919 and graduated in science in 1922, being awarded first-class honours in mathematics and experimental science and a gold medal in natural science (his father as a student also won the gold medal). In 1924 he obtained his medical degrees, with honours, and in the same year took the D.T.M.&H. of the English Royal Colleges. He proceeded to the M.D. in 1925, and became a Fellow of the Royal College of Surgeons in Ireland in 1934. After graduating in medicine he held house appointments at the Royal Alexandra Hospital for Sick Children, Brighton, and Hove General Hospital, and then, in 1926, he joined the Garenganze Evangelical Mission in the Belgian Congo. He was twice married: first, in 1926, to Miss Olive Archer, who died in 1927, and second, in 1934, to Miss I. H. Russell, who, with one daughter, survives him.

G. P. N. writes: Dr. P. K. Dixon was a man of outstanding ability, and this was coupled with a humility and charm of character which made him many lifelong friends. He had many severe trials. He lost his first wife soon after her arrival in the Congo; he was severely mauled by a lion; and subsequently he suffered prolonged illness. In spite of these misfortunes he did magnificent work in the Congo over a period of nearly 30 years, work which included the founding of a hospital at Chibambo, on Luapula river, a hospital which now stands as a monument to his labours. Trachoma and eye diseases in general are among the main problems of the Luapula valley: in order to fit himself to deal with these Dixon spent six months studying ophthalmic diseases under Sir Henry Holland in India in 1929, and later his own hospital became a renowned centre for the treatment of eye diseases. In recognition of his long and meritorious services he was decorated by the King of the Belgians.

WILLIAM BURRIDGE, D.M.

Dr. William BurrIDGE, who was professor of physiology in Lucknow University for many years, and later dean of the faculty of medicine and principal of King George's Medical College, died at Dartford, Kent, on April 21. He was 69 years of age.

William BurrIDGE was born on July 1, 1885, the son of Mr. John BurrIDGE. He entered Christ Church, Oxford, as an exhibitioner in 1904, and continued to study and teach physiology after taking his B.A. degree. He added to the brilliance of his scholastic record by winning the Dixon Research Scholarship and the Mark Quedstedt exhibition in 1909. The award of the Rolleston Memorial Prize for original research in physiology and pathology followed in 1912 and the Radcliffe Prize in 1917. Receiving his clinical training at Guy's Hospital, he graduated B.M., B.Ch. in 1916, and some twelve months later entered the R.A.M.C. for service in the first world war, in the course of which he was employed at Malta—an island to which he was attracted more than once after his return to civilian life—and at the Swanage military hospital.

In 1922 BurrIDGE proceeded to the D.M., and went to King George's Medical College, Lucknow, as professor of physiology. Later he became principal of the college and dean of the faculty of medicine, and he served also as a member of the United Provinces Medical Council. In 1933-4 he was president of the United Provinces Branch of the British Medical Association. He left India in 1938, and since the end of the second world

war had spent his life almost equally between Malta and Oxford. He had a brief term of office as dean of the faculty of medicine in Rangoon University in 1946-7, and in 1954 he obtained an appointment at Liaquat Medical College, Hyderabad. Besides contributing many short papers to scientific journals, Professor BurrIDGE was the author of *Excitability: a Cardiac Study* (1932); *The New Physiology of Sensation* (1932); and *A New Physiological Psychology* (1933).

GEORGE DOUGAN, M.D., D.P.H., M.P.

The death took place on April 7 at his home at Portadown of Dr. George Dougan, Member of the Parliament of Northern Ireland since 1941. He was 73 years of age.

The son of the late Dr. G. Dougan, of Portadown, George Dougan studied medicine at Trinity College, Dublin, where he graduated M.B., B.Ch. in 1906. He proceeded to the M.D. in the following year and took the D.P.H. of the Irish Royal Colleges in 1908. After graduation he joined his father in practice and soon established himself in the confidence of his patients, who came to love him and to have absolute faith in his efficiency as a doctor. After service with the R.A.M.C. in the first world war he returned to Portadown, where he became an enthusiastic member of the British Medical Association, seldom missing a meeting of the Portadown and West Down Division, of which he was chairman in 1922. He also represented his constituency at five Annual Representative Meetings from 1931 to 1941. His colleagues, by whom he was held in very high esteem, often sought his opinion on every kind of medico-political problem and highly valued his advice. In 1941 Dr. Dougan was returned unopposed as the Member of the Northern Ireland Parliament for Central Armagh, and he continued to hold the seat until his death, having defeated his Commonwealth Labour opponent at the 1945 General Election. He was also a deputy lieutenant for Co. Armagh, coroner for northern Armagh, and a member of the General Synod of the Church of Ireland. In the world of sport, too, he was a prominent figure. At the time of his death he was the oldest member of the Portadown Boat Club, and he was a past captain of the golf club. He was a Serving Brother in the Venerable Order of St. John of Jerusalem, and a foundation member and president of the local Rotary Club. By his passing Portadown has lost a fine doctor and a noble character who will be long remembered by his patients and fellow doctors alike. He is survived by his widow, formerly Miss Mary McDonald, and two sons, Dr. George Dougan, junior, who has been associated with him for some years in the practice, and Dr. Donald Dougan, who lives in Canada. A third son, Lieutenant-Colonel Hampton A. Dougan, died on active service in the second world war.—D. L. H.

Dr. G. A. RORIE, who was in practice in Dundee for more than 40 years until his retirement in 1952, died at Broughty Ferry on March 23 at the age of 78. George Arthur Rorie was born on August 2, 1876, the son of Dr. James Rorie, physician-superintendent of Dundee Royal Asylum. He was educated at Dundee High School and at Edinburgh University, where he graduated M.B., Ch.B., with distinction, in 1898. Developing his father's interest in mental health work, he held the post of assistant medical officer at Edinburgh Royal Asylum under Dr. T. S. Clouston, and later gained further experience as clinical assistant to

Dr. Hughlings Jackson at the National Hospital for Nervous Diseases, London. In 1898 he obtained the certificate of the Royal Medico-Psychological Association, and thereafter held posts at the Cumberland and Westmorland Mental Hospital, Carlisle, and at Herrison Hospital, near Dorchester, where he worked for ten years. He proceeded to the M.D. in 1906. In 1912 he decided that general practice held more interest for him and he returned to Dundee, obtaining the D.P.H. of St. Andrews in the following year. He soon attracted a large practice, which he conducted for the next forty years, broken only by service in Egypt in the first world war, when he held a temporary commission in the R.A.M.C. In Dundee he took a keen and active part in the local affairs of the British Medical Association, and was president of the Dundee Branch in 1931-2, chairman of the Dundee Division in 1947-8, and a member of the Scottish Committee from 1945 to 1949. His chief recreations were walking and climbing, and when over 70 he was still able to climb a Cuillin. His retirement was forced upon him, much against his will, by the onset of glaucoma, but he continued to walk several miles daily until the day before his death. He is survived by his widow, a daughter, and three sons, one of whom is a psychiatrist in Dundee.

The death occurred at his home in Northampton on March 28 of Dr. STEPHEN ROWLAND, who was medical officer of health for Northampton County Borough from 1926 to 1946. Aged 82, he had been seriously ill for some months. He was perhaps unique among medical officers of health in holding the square-rigged master's certificate. Stephen Rowland was born in Blackburn, Lancashire, on September 1, 1879. He went to sea as an apprentice in a barque, the *Muncaster Castle*, and served five and a half years. In 1897 he passed his second mate's examination and joined the *Wray Castle*, a full-rigged ship. Two years later he passed as first mate and in 1901 the square-rigged master's examination. Soon after obtaining his master's certificate he entered Edinburgh University as a medical student, and graduated M.B., C.M. in 1907. Taking the Cambridge D.P.H. in 1909 with a career in the public health service in view, he was appointed senior assistant medical officer at Monsall Isolation Hospital, Manchester, in the following year, and then, in 1912, he became medical officer to a waterworks at Birchinlee, a small place in North Derbyshire not far from Sheffield. He left this appointment to serve throughout the first world war in the R.A.M.C., attaining the rank of captain. After the war he secured a post at the Northampton Tuberculosis Dispensary. In 1924 he proceeded to the M.D., and two years later succeeded the late Dr. J. D. McCrindle as medical officer of health, school medical officer, and chief tuberculosis officer of the county borough of Northampton, an appointment he held until he retired in 1946. He was president of the Northamptonshire Branch of the British Medical Association in 1934. He never lost his love for sailing ships, and his skill in modelling them was exceptional. Four of his models are in the permanent collection at Edinburgh Museum, while his last—one of the largest he made—is at the Royal Maritime Museum, Greenwich. He leaves a widow and two sons, Flight Lieutenant Stephen Rowland and Lieutenant-Commander Bernard Rowland, R.N., and a grandchild.—C. G. P.

The profession in West Lothian generally, and in Bo'ness particularly, has suffered a severe loss through the tragic death on April 12, after a disastrous motor accident, of its senior active practitioner, Dr. W. A. SHAFTO. His wife and son were seriously injured at the same time. A native of Forfarshire, William Alexander Shafto was born on September 27, 1886, and studied medicine at Edinburgh University, where he graduated M.B., Ch.B. in 1910, proceeding to the M.D. in 1913, in which year he also took the D.P.H. He settled at Bo'ness in 1914 as assistant to and, later on, partner with Dr. John Graham, whose death left him in full control of the practice. During the first world war,

Dr. Shafto served with the R.A.M.C. in the Middle East, becoming medical officer at Bagdad and receiving a mention in dispatches. On demobilization he returned to Bo'ness and settled down to consolidate the practice. In this he was eminently successful. He became medical officer to the Post Office, and later on he was appointed medical referee to the sheriff court at Linlithgow for West Lothian cases under the Workmen's Compensation Act. He was a very sound and wise practitioner and a real friend to all his patients. Although he did not play any active part in public work, he did take his full share in the deliberations of the West Lothian Local Medical and Panel Committees. He was a very keen and competent golfer, with, at his best, a low single-figure handicap. The deepest sympathy of all who knew him, fellow-practitioners, patients, and friends, will be extended in full measure to his widow, his daughter, and his son.—H.

A. McW. G. writes: There are few houses in Bo'ness and the surrounding districts of West Lothian which have not been penetrated by the shadow of sorrow attending the tragic death of Dr. W. A. Shafto. Few men were so privileged as was he in the possession of so much of that inner flame which radiates a deep, confident, satisfying peace, eclipsing all personal care and the shadows of adversity. This presence, this aura of peace, was in him a composite of a life of learning, meditation, and service to people with whom he felt deeply in all his senses. His essential goodness was a fountain from which the whole community gained elevation. Apart from the professional sphere, in which he was so notable, Dr. Shafto's interests lay in his family, his garden, his books, of which Shakespeare was most favoured, his dog, which was almost as well known as his master, and lastly, but by no means least, his golf. He is survived by his wife, who is slowly recovering from serious injury, and by a son and a daughter, who is also a medical graduate of Edinburgh University.

The news of the sudden death of Dr. W. J. DAWSON at Cheltenham on April 17, at the early age of 33, has deeply shocked his many friends. Descended from farming stock, William John Dawson was born on May 2, 1921, and educated at Fraserburgh Academy and at Aberdeen University, where he graduated M.B., Ch.B. in 1943. After holding hospital appointments in Wolverhampton, in Grantham, and at the North Middlesex Hospital, he was in general practice at Slaithwaite, Yorkshire, before settling at Cheltenham in 1948.

I. D. I. writes: Although of a retiring disposition, Johnny Dawson brought many gifts to those he honoured with his friendship—a delightful sense of humour, love of serious disputation, a joy in quiet conviviality, and a ready wit. He had a full and enjoyable student career, and his influence, though unobtrusive, was real and valuable and felt in many fields of activity. He was an accomplished though occasional artist, producing caricature or set design with efficiency, while music was an abiding interest. Nor, despite his mitral lesion, of which he was aware, was he averse from games, playing hockey especially with enjoyment. At Cheltenham he readily established himself in the respect and esteem of colleagues and friends, who appreciated the integrity and idealism behind his modest exterior. In recent months it seems that his illness worsened and he was to have undergone cardiac surgery, but this was not to be. So we, who mourn the loss of one whose good companionship we have been privileged to share, extend our deepest sympathy to his widow and her children in their grievous sorrow.

Dr. FREDERIC LONGHURST, formerly anaesthetist to St. George's Hospital and the Grosvenor Hospital for Women, died at his home in Fowey, Cornwall, on April 19, aged 79. Frederic William Longhurst, whose father was Dr. A. E. Temple Longhurst, of Eaton Square, London, was educated at Westminster School and St. George's Hospital, where he qualified M.R.C.S.

L.R.C.P. in 1900. After holding resident appointments at the Worcester General Infirmary and at the Hospital for Sick Children, Great Ormond Street, he went into general practice in London, living in Hobart Place, London, S.W.1. His first appointment as an anaesthetist was to the Gordon Hospital, and later he became anaesthetist to St. George's Hospital, the Grosvenor Hospital for Women, and the General Lying-in Hospital in Lambeth. Frederick Longhurst had a most lovable disposition, and he obtained fame in London as the very handsome doctor whose patients were never sick after receiving an anaesthetic at his hands, which certainly was an unusual feat in those days of ether and chloroform anaesthesia. He took a very active interest in the medical school at St. George's, and was a keen lawn-tennis player until his arthritis drove him off the courts. Very young in heart and refusing to be incapacitated by this disability, he courageously submitted himself late in life to a severe surgical operation, and he was able to enjoy a happy and reasonably active life to within a day or two of his death.

Medical Notes in Parliament

DOCTORS' RIGHT TO PRESCRIBE

A debate on the social services which occupied the House of Commons on May 4, like all the debates in the last week of a Parliament now dissolved, had a marked election flavour, and was for the most part a compound of comment on party manifestos and a refurbishing of views on Health Service expenditure and changes recently made in pension and benefit rates.

Dr. EDITH SUMMERSKILL (Fulham, West, Lab.) castigated the Government for what she called their callous disregard of the Phillips Report on the economic and financial problems of the provision for old age and their niggardly treatment of recipients of national assistance. She then came to the Is. prescription charge, and asked whether it should be continued in view of the hardship it imposed and the administrative burden entailed. She quoted in support the resolution of the B.M.A. conference at Cardiff, and some of the speeches calling it a major retrograde step and asserting that because of it children in large families were not receiving proper treatment.

Unnecessary Expense in Prescribing

Then she came to drugs, and engaged the Minister in a duel on the doctor's right to prescribe. About £50m. a year was spent on drugs, she said, and about 30% of this went on proprietaries. How could the Minister allow this huge sum to go to swell the profits of the big drug houses when he had to be so cheese-paring in other directions? He had done everything except take strong action. He should refuse to sanction unnecessary expense in prescribing where there was a satisfactory alternative. Only the hypochondriacs and those in big business making colossal profits would object, and the taxpayers would be delighted.

Mr. MACLEOD said that what she was asking was that the Minister of Health should take powers to tell a doctor that he must not prescribe something that he thought best for the patient. That was the fundamental difficulty in the proposal. It would no doubt be desirable in many cases if doctors would prescribe what was in the *National Formulary*. But if a doctor, for whatever professional reasons, thought it right to prescribe a certain drug, did Dr. Summerskill think it proper to forbid him to prescribe it?

Dr. SUMMERSKILL said that the Minister already exercised certain powers. His officials examined a cross-section of prescriptions, and if they concluded that a doctor was guilty of excessive and expensive prescribing the doctor was informed. The Minister had established the principle. What he was asking her was a question of degree.

Mr. MACLEOD said that he understood Dr. Summerskill's proposal would take that discretion away from the doctor.

Mr. JAMES GRIFFITHS (Llanelly, Lab.) interposed to give the case of a constituent who believed that a certain proprietary medicine was the best for him, and had been receiving it on a Health Service prescription from his doctor. Then it was stopped. He wrote to the Minister, and it was clear from the reply that it was stopped because it was thought that other prescriptions would be of equal value.

Mr. MACLEOD said it was suggested to doctors that certain asthma preparations were not of proved therapeutic value. But if in his discretion a doctor still decided that they should be prescribed it was quite legitimate.

Dr. SUMMERSKILL said the Minister was on a very bad wicket. In asthma there was a nervous element, and a patient might feel convinced that a certain preparation was the best for his complaint. On this question she would say that the doctor had probably a right to prescribe it, because he was prescribing for a nervous patient who had faith in that particular drug. She was shocked to learn that he could tell a doctor that he could not prescribe something for a nervous patient. The Minister did not know what his policy was or should be. Obviously, where there was a satisfactory alternative—in the case quoted it was not satisfactory—the doctor should be told that he must prescribe it.

Mental Hospitals

Continuing, Dr. Summerskill spoke of long waiting-lists for operations of a simple kind, and asked if the Minister thought he was justified in allowing beds to be earmarked for fee-paying patients. About mental hospitals there had been alarming questions. They had heard about overcrowding and shortage of nurses, and these, combined with the activities associated with mental patients, had presented a horrifying picture reminiscent of Hogarth's "Bedlam." Yet there was no pressure group on behalf of mental patients. Why? Often because mental patients filled people with fear; there were few visitors to see the conditions; and there were even some doctors who were inclined to regard money spent on mental disease as wasted because of the doubtful return in dividends in terms of healthy, useful people to the community.

Mr. OSBERT PEAKE, Minister of Pensions and National Insurance, answered the point about the Phillips Report. He said there were a number of important questions still before the National Insurance Advisory Committee. It was fairly clear that, arising from these, and from the Phillips Report itself, there would have to be legislation amending the National Insurance Scheme. But he thought they built fairly well in 1946, and he would be reluctant to introduce changes just for the sake of change.

Mr. MACLEOD in the interval had sent for the letter he wrote to Mr. Griffiths, referring to the prescribing of a proprietary medicine for asthma, and quoted from it:

"I am advised that [this medicine] is not therapeutically superior to the standard preparation. . . . On the other hand, it is much more expensive, and, believing as I do that doctors would not wish the funds available for the Health Service to be spent unnecessarily, I have asked them not to prescribe it. I cannot prohibit them from doing so, and, while I hope the doctors generally will comply with my request, I am sure they quite understand that they are still free to prescribe whatever they think necessary in the individual case."

On the advice of the Cohen Committee, he said, it was from time to time suggested to doctors that they should not prescribe a certain drug, but he did not interfere in any way—he would regard it as improper to do so—with the clinical freedom of doctors, if they so wished, to prescribe a particular drug in relation to a particular patient.

Mr. GRIFFITHS apologized for his memory having been at fault, but asked if there was any question of doctors being charged or questioned about prescriptions afterwards.

Mr. MACLEOD said that if a doctor chose to go against the advice given him he would not be surcharged for that. It was possible—a different point—that his prescribing as a whole might be looked at, and one element might be the over-prescribing of one particular drug. The difficulty he was in was that he could not see how what Dr. Summerskill

had in mind, relating to the prescribing of ordinary substances on the list, could be achieved without interfering with the clinical freedom of doctors.

Private Beds

On the question of private beds, he said that about 1% of beds in the Health Service were private, and about one-third of those at any given time were occupied by non-paying patients, on the grounds of medical urgency or to see that the beds were filled. It was incredible that the Labour Party must concentrate its only practical proposal on two-thirds of 1% of the beds. The proposal was a breach of pledges by Socialist Ministers, and a breach of faith with millions of people who paid into contributory schemes so that they might have some privacy in hospital. He would believe in the proposal when the Opposition practised what they preached, and he saw members of the party who were ill going into the public wards of hospitals.

On the cost of drugs, he said the total bill was about £43m. (not including hospitals), and within that sum £24m. was due to proprietary medicines. Many of the greatest discoveries had been made by private firms—the antibiotics were an obvious example—and the industry had an important export trade. He was in close touch with the Association of British Pharmaceutical Industry, and they had been working out formulas which would enable a satisfactory guide about suitable profits to be reached.

As to mental beds, the mental hospitals had no waiting-list, but on the mental-deficiency side there was a waiting-list of about 7,000. There were plans for the construction of 6,000 more beds in progress, and in addition the substantial hospital building programme recently announced would include a share for the mental-deficiency side.

Nuclear Radiation Committee

The membership of the committee appointed by the Medical Research Council to prepare a report on the medical aspects of nuclear radiation was announced on May 4 and is as follows:

Sir Harold Himsworth, F.R.S. (chairman), Secretary of the Medical Research Council.

Sir Ernest Rock Carling, Consultant Adviser, Ministries of Health and Home Office (Civil Defence), and member of the Health Policy Committee of the Atomic Energy Authority.

Sir John Cockcroft, F.R.S., Director, Atomic Energy Research Establishment.

Professor A. Haddow, Director, Chester Beatty Research Institute.

Dr. J. F. Loutit, Director, Medical Research Council Radiobiological Research Unit.

Professor K. Mather, F.R.S., Professor of Genetics, Birmingham University.

Professor W. V. Mayneord, Professor of Physics applied to Medicine, London University.

Professor P. B. Medawar, F.R.S., Professor of Zoology and Comparative Anatomy, University College, London.

Professor J. S. Mitchell, F.R.S., Professor of Radiotherapeutics, Cambridge University.

Professor L. S. Penrose, F.R.S., Galton Professor of Eugenics, University College, London.

Sir Edward Salisbury, F.R.S., Director, Royal Botanic Gardens.

Dr. F. G. Spear, Deputy Director, Strangeways Research Laboratory, Cambridge.

Professor J. R. Squire, Professor of Experimental Pathology, Birmingham University.

Professor C. H. Waddington, F.R.S., Professor of Animal Genetics, Edinburgh University.

Sir Lionel Whitby, Regius Professor of Physic, Cambridge University.

Professor B. W. Windeyer, Professor of Radiology (Therapeutic), London University.

Lists of Patients for Voting

The MINISTER OF HEALTH made his promised statement on the use of doctors' lists for the purpose of the postal vote on May 3. He said that he had studied carefully the documents sent him by Mrs. B. Castle (Blackburn, West,

Lab.), who had said that pressure was being used by local Conservative associations on doctors to send the names and addresses of sick, blind, and aged persons for the purposes of the postal vote.

Mr. MACLEOD stated that it was desirable that everyone should be aware of their right to a postal vote, and equally important that any information given should be made available to all political parties who asked for it. There was nothing wrong in responsible citizens, doctors or others, bringing to the notice of those concerned, whatever their politics, their rights as postal voters. On the specific question about extracting patients' names from doctors' lists, he would not expect information concerning doctors' N.H.S. patients, which was normally regarded as confidential, to be disclosed for some entirely different purpose. He was sure that doctors understood the position, and that no special communication was necessary.

Chest Disease on Tyneside

Mr. BLENKINSOP (Newcastle-upon-Tyne, East, Lab.) asked the Minister of Health on May 2 whether he was aware of the high level of chest diseases, particularly tuberculosis and bronchitis, on Tyneside compared with the rest of the country; and whether he would give all possible support both to research into causes and to provision of adequate facilities for treatment. Mr. IAIN MACLEOD replied "Yes." There was a particular research project in hand dealing with bronchitis in Newcastle. He understood the regional board had a number of plans for additional chest clinics, and he thought it was intended to give priority to Gateshead, where the problem was perhaps more serious than elsewhere.

Poliomyelitis Vaccine

Dr. BARNET STROSS asked the Parliamentary Secretary to the Ministry of Works, as representing the Lord President of the Council, whether, in view of the difficulty in obtaining a sufficient number of monkeys to provide the new vaccine for use against poliomyelitis, he would encourage by all possible means research on the use of an alternative medium. Mr. J. R. BEVINS stated on May 3 that the current programme of poliomyelitis research co-ordinated by the Medical Research Council might show whether there was any practicable alternative to the use of monkeys in preparing a poliomyelitis vaccine, but he was advised that an adequate substitute for monkeys was unlikely to be found in the near future for a vaccine of the Salk type. It was hoped, however, that adequate supplies of monkeys would be available again shortly.

Dr. STROSS said it was rather nauseating to think in terms of breeding and destroying so many of these tiny creatures whose kidneys had to be used. He asked for an assurance that every possible means would be used to find a substitute, which in the end might be better as well as simpler. Mr. BEVINS assured him that research to find a promising substitute was in progress.

Mr. PETER FREEMAN (Newport, Lab.) asked the Minister of Health on May 4, in view of the deaths, injuries, and paralyses that had already occurred to children injected with the vaccine obtained from the kidneys of the corpses of monkeys for the alleged cure of poliomyelitis, if he would prohibit all further experiments on children in the country by this method; and if he would give an assurance that children would only undergo this injection after the authorities had obtained the parents' prior consent in writing. Mr. IAIN MACLEOD replied that naturally the recently reported events in America were being fully considered by the Medical Research Council, and a member of their staff was going over there immediately to get first-hand information. This should be ready for study here before the routine safety tests, now being conducted on batches of vaccine, were finished, and therefore before any of the proposed trials on children over here were due to begin. Meanwhile arrangements for these trials continued. There was no intention of inoculating any child unless the full consent of the parents had been first obtained.

A Doctor's Telephone

Mr. M. EDELMAN (Coventry, North, Lab.) asked the Postmaster-General whether he had studied the case of a doctor who refused to permit his patients to call him by telephone; and whether he would make it a condition for the priority given to doctors in issuing them with telephones that they should not apply such restrictive measures to their patients who sought to summon them on legitimate occasions.

Dr. CHARLES HILL replied on May 4 that this case was the only one of its kind which had come to notice, and the doctor was not the actual subscriber. On the general issue it would be impossible to enforce the observance of such a condition as Mr. Edelman suggested, even if it were desirable to impose it.

Welfare Foods

Mr. H. MARQUAND (Middlesbrough, East, Lab.) asked the Minister of Health for a statement indicating the trend in the consumption of welfare foods since responsibility for their distribution was transferred to local authorities. Miss PAT HORNSBY-SMITH, Parliamentary Secretary, stated on May 2 that there had been a downward trend. These foods were, of course, intended for those whose diet might otherwise be deficient, and the arrangements of the local authorities were well adapted to concentrate attention on this group. In the community as a whole the downward trend might well continue with the continuing improvement in the general diet and standard of living. In the second half of 1953 the distribution of national dried milk was 12.34 million tons; January to June, 1954, 11.92 million tons; and July to December, 1954, 11.33 million tons. The corresponding figures for cod-liver oil are: 3.28 million bottles, 3.30, and 2.79; vitamins A and D, 1.03 million packets, 1.03, and 0.83; and orange juice: 15.58 million bottles, 14.81, and 13.41. The figures were estimates.

Building Industry Accidents

Dr. BARNET STROSS asked the Minister of Labour on May 3 to what causes he attributed the increase in the accident rate in the building industry by 50% between the years 1948 and 1953, in spite of the introduction of regulations in 1948; and how he proposed to lower the rate at which men were injured in this industry. Mr. HAROLD WATKINSON replied that the apparent increase in the accident rate at building operations could be attributed, in part at least, to the efforts constantly being made by the Factory Inspectorate to secure a better understanding by employers of their obligation to report accidents in accordance with the provisions of the Factories Act. Fatal accidents, which were reported almost without exception, had not increased.

Nutritional Value of Flour

The MINISTER OF AGRICULTURE, FISHERIES, AND FOOD has arranged for an authoritative review of the scientific and medical evidence on the differences in composition and nutritional value of flour of varying extraction rates.

Lord Adrian, P.R.S., has nominated for the conduct of this review the following panel of persons:

Sir Henry Cohen (chairman), Professor of Medicine, University of Liverpool.

Professor L. J. Wits, Professor of Clinical Medicine, University of Oxford.

Professor J. H. Gaddum, F.R.S., Professor of Materia Medica, University of Edinburgh.

Dr. A. C. Chibnall, F.R.S., formerly Professor of Biochemistry, University of Cambridge.

Professor R. A. Morton, F.R.S., Professor of Biochemistry, University of Liverpool.

The formal terms of reference of the panel are:

"In the light of the scientific and medical evidence now available—

"(1) to determine the differences in composition and nutritive value between (a) National flour as defined in the Flour Order, 1953; (b) flour of extraction rates less than National flour as defined in the Flour Order, 1953, to which the three token nutrients have been restored; (c) flour of extraction rates

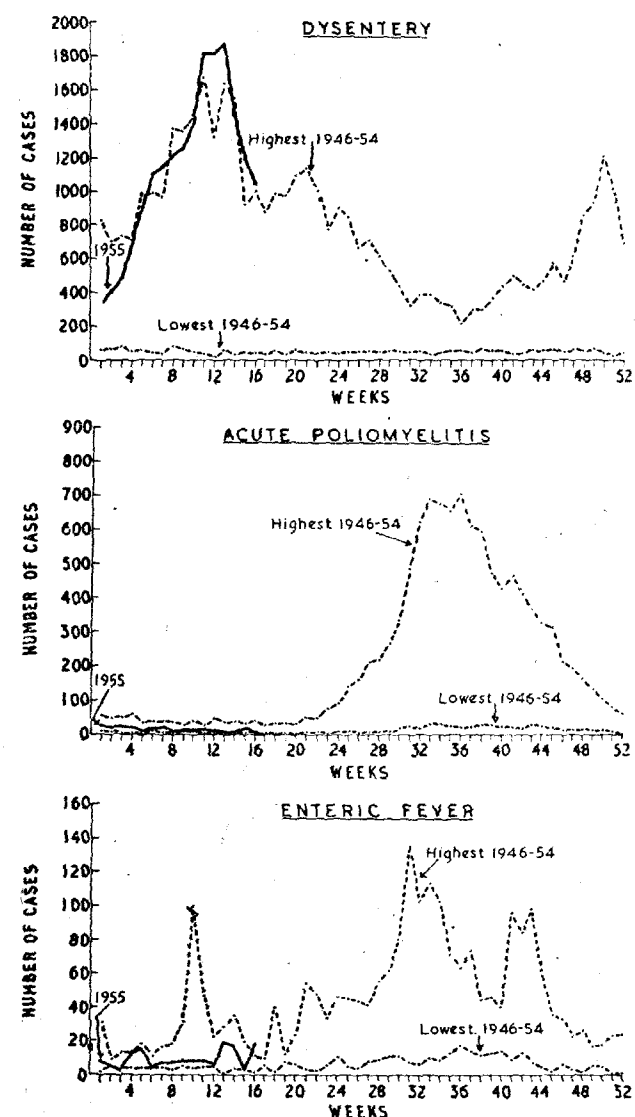
less than National flour as defined in the Flour Order, 1953, to which the three token nutrients have not been restored; and
"(2) to advise whether any such differences are significant from the point of view of the health of the population.

Beds and Centres.—In each year from 1951 to 1954 inclusive the number of hospital beds unoccupied through shortage of staff were 27,812, 23,013, 18,874, and 17,049 (provisional). The number of new health centres provided each year were one, three, none, and one.

Wages and Salaries.—About £5½m. more than was estimated to have been required in 1954-5, as a result of wage and salary increases has been provided for in the 1955-6 Health Service estimates.

Vital Statistics**Graphs of Infectious Diseases**

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1946-54 are shown thus -----, the figures for 1955 thus ———. Except for the curves showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.

**INFECTIOUS DISEASES AND VITAL STATISTICS**

Summary for British Isles for week ending April 23 (No. 16) and corresponding week 1954.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrar-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1955					1954				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	14	2	1	0	5	12	0	3	1	0
Dysentery ..	1,053	47	323	24	1	711	91	351	2	1
Encephalitis, acute ..	3	0	0	0	0	3	1	0	0	0
Enteric fever: Typhoid ..	1	1	2	0	0	1	0	0	0	0
Paratyphoid ..	15	0	0	0	0	3	0	1	0	0
Food-poisoning ..	135	25	8	0	0	85	8	0	0	0
infective enteritis or diarrhoea under 2 years ..				12	11				8	15
Measles* ..	28,425	2614	267	498	280	2,196	93	184	115	405
Meningococcal infection ..	36	3	14	6	3	34	2	11	3	4
Ophthalmia neonatorum ..	48	1	8	0	0	35	3	7	0	0
Pneumonia† ..	688	44	188	14	3	478	32	204	9	5
Poliomyelitis, acute: Paralytic ..	1	0	0	0	0	6	0	0	0	0
Non-paralytic ..	5	0	2	0	2	4	0	0	3	0
Puerperal fever‡ ..	220	31	9	2	0	232	36	14	3	0
Scarlet fever ..	467	30	55	43	17	789	58	122	32	35
Tuberculosis: Respiratory ..	788	85	155	22	0	706	81	148	30	0
Non-respiratory ..	97	6	19	7	0	113	7	31	3	0
Whooping-cough ..	1,658	114	86	57	64	2,133	63	314	31	25

Infectious Diseases

A decreased incidence was recorded for most infectious diseases in England and Wales during the week ending April 23. The largest falls in the numbers of notifications were 4,544 for measles, from 32,969 to 28,425, 138 for dysentery, from 1,191 to 1,053, 130 for scarlet fever, from 597 to 467, and 116 for acute pneumonia, from 804 to 688. The only large rise was 184 for whooping-cough, from 1,474 to 1,658.

The largest declines in the incidence of measles were 857 in Warwickshire, from 3,565 to 2,708, 677 in London, from 3,291 to 2,614, 644 in Middlesex, from 2,597 to 1,953, 439 in Kent, from 1,252 to 813, 423 in Yorkshire West Riding, from 3,726 to 3,303, and 273 in Buckinghamshire, from 652 to 379, and the largest exceptions to the general decline were increases of 166 in Southampton county, from 976 to 1,142, and 150 in Staffordshire, from 1,309 to 1,459. The rise in whooping-cough was mainly due to an increase of 99 in Middlesex, from 47 to 146, and this rise was due to an outbreak of 107 cases in Southall M.B. The largest fall in the number of notifications of scarlet fever was 39 in Lancashire, from 104 to 65. 14 cases of diphtheria were notified, being 7 more than in the preceding week; these cases involved 12 areas. 6 of the 15 cases of paratyphoid fever were notified in Durham, Sunderland R.D. 6 cases of acute poliomyelitis were notified, and these were 13 fewer for paralytic and 1 fewer for non-paralytic cases than in the preceding week. 2 cases were notified in Somersetshire, Yeovil R.D., and Lincolnshire, Grimsby C.B.

The largest centres of dysentery were Lancashire 422 (Oldham C.B. 80, Chadderton U.D. 62, Blackpool C.B. 33, Liverpool C.B. 32, Manchester C.B. 28, Worsley U.D. 28, Blackburn C.B. 27, Whiston R.D. 14, Crompton U.D. 12, Royton U.D. 12), Durham 149 (Felling U.D. 29, Gateshead C.B. 26, Easington R.D. 25, Seaham U.D. 24, South Shields C.B. 16, Stanley U.D. 12), Yorkshire West Riding 72 (Leeds C.B. 17, Goole M.B. 15), Leicestershire 54 (Leicester C.B. 47), Surrey 50 (Banstead U.D. 24, Beddington and Wallington M.B. 11), London 47 (Shoreditch 11, Hackney 10), Northumberland 44 (Newcastle-upon Tyne C.B. 14), Yorkshire North Riding 31 (Middlesbrough C.B. 30), and Norfolk 30 (Norwich C.B. 20).

Week Ending April 30

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 461, whooping-cough 1,768, diphtheria 9, measles 22,537, acute pneumonia 540, acute poliomyelitis 19, dysentery 879, and paratyphoid fever 15.

DEATHS in Great Towns	1955					1954				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	1	0	0	0	0	1	0	0	0	0
Encephalitis, acute ..	0	0	0	0	0	0	0	0	0	0
Enteric fever ..	0	0	0	0	0	1	0	0	0	0
Infective enteritis or diarrhoea under 2 years ..	4	0	2	0	0	6	1	2	1	2
Influenza ..	21	1	1	0	2	12	3	3	1	1
Measles ..	2	0	1	0	0	0	0	0	0	1
Meningococcal infection ..	0	0	0	0	0	0	0	0	0	0
Pneumonia ..	252	38	15	6	5	197	23	22	20	7
Poliomyelitis, acute ..	0	0	0	0	0	1	0	0	0	0
Scarlet fever ..	0	0	0	0	0	0	0	0	0	0
Tuberculosis: Respiratory ..	66	9	11	0	5	96	16	10	6	6
Non-respiratory ..	2	0	0	0	0	1	0	0	0	0
Whooping-cough ..	1	0	1	0	0	1	0	0	0	0
Deaths 0-1 year ..	200	30	36	7	16	218	32	26	10	28
Deaths (excluding stillbirths) ..	5,687	785	651	123	185	5,218	768	612	155	171
LIVE BIRTHS ..	7,754	1,156	931	249	431	7,552	1,111	1,101	228	441
STILLBIRTHS ..	203	28	26	0	0	185	26	24	0	0

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Medical News

Eighth World Health Assembly.—The assembly opened on May 10 in Mexico City under the chairmanship of last year's president, Dr. JOSEPH N. TOGBA, director-general of the Liberian National Health Service. One of the more difficult problems before the assembly is to decide how best to allocate W.H.O.'s limited resources in the field of atomic medicine: should priority be given to developing the use of radio-isotopes or to the protection of populations against radiation health hazards?

Human Trial of Live Polio Vaccine.—On May 3, at the meeting of the Association of American Physicians in Atlantic City, U.S.A., Dr. ALBERT B. SABIN, director of the Children's Hospital Research Foundation, University of Cincinnati College of Medicine, announced a successful human trial of live poliomyelitis vaccine. According to the account in the *New York Times*, Dr. Sabin reported "the finding of viruses of the three known polio types that were capable of stimulating the formation of antibodies although they did not cause polio symptoms in monkeys or chimpanzees." After 18 months' testing the characteristics of the attenuated viruses had been established, and a vaccine prepared from them was given to 26 volunteers at a Federal reformatory. "The volunteers," continues the *New York Times* report, "were between 21 and 30 years old. They swallowed doses of the attenuated polio viruses, but developed no symptoms of the infections, Dr. Sabin said. Antibodies were formed, but no signs of paralysis or other illness observed." After reading his report, Dr. Sabin is quoted as emphasizing that the work with live viruses was still "in an experimental stage," and that it might be a long time before a workable live virus vaccine could be achieved.

Salk Vaccine.—Meanwhile the Salk (dead virus) vaccine continues to claim the anxious attention of the American public. The Federal Government has recommended a further postponement of the vaccination programme, and vaccination is reported to have ceased in every state except Michigan. Dr. LEONARD SCHEELE, the U.S. Surgeon General, in a statement on May 8 said that among the five million children already inoculated with Salk vaccine there had been 50 cases of paralytic and 2 of non-paralytic poliomyelitis, 44 of which followed vaccination with the banned Cutter product. Testifying earlier before the Congressional banking committee, Dr. Scheele referred to the expert working party which is investigating these cases. Its report, he said, would determine whether the public health service would continue to examine batches of vaccine "by protocol"—that is, by close scrutiny of the maker's written evidence of safety and efficiency, a day's procedure—or whether it would have to test each batch by animal inoculation, a process, Dr. Scheele testified, that would take 28 to 33 days. A dispatch from Washington records the arrival there on May 9 of Dr. W. L. M. PERRY, the Medical Research Council's emissary (see *Journal*, May 7, p. 1166). Current British methods of screening poliomyelitis vaccine are described on p. 1204 of this issue.

Places in Special Schools.—According to a survey of physically handicapped children in England and Wales, undertaken by the Ministry of Education, there were on October 1, 1954, 1,052 children of compulsory school age awaiting places in special schools. These children were those known to local authorities whose condition came within the terms of the School Health Service and Handicapped Pupils Regulations, 1953; blind, deaf, and "delicate" children are not included. Of the total, 202 needed places in day schools, and 850 in boarding schools. Parental consent had been given in 525 of the latter cases. No less than 485 of these unplaced pupils were suffering from cerebral palsy. The next commonest conditions were poliomyelitis (100), heart defects (78), muscular dystrophy (73), and spina bifida (68). According to the Ministry enough

additional boarding-school places are likely to come into use in the next two or three years to accommodate all the children whose parents are likely to consent to their attending boarding schools.

Rectorship of Edinburgh University.—On May 5, with traditional pomp, Sir SYDNEY SMITH was installed as Rector of Edinburgh University. In his address he spoke of the State's increasing monetary interest in the universities: Up to the present, said Sir Sydney, there had been no interference with the methods by which the universities carried out their functions, but "the dependence on Government grants for 75% of their expenditure may represent the writing on the wall."

Medical Candidates.—Since our list of medical candidates for the General Election was printed (*Journal*, May 7, p. 1149) two more have come forward. They are: DAVID GORDON EVANS, Buckingham, Labour (1938). Assistant General Secretary, Medical Practitioners' Union; Lecturer at London School of Tropical Medicine and Hygiene; formerly regional medical officer, J. Arthur Rank Organization; member, Association of Industrial Medical Officers; Squadron-Leader, R.A.F.V.R., 1940-6. And GERARD FOLLIOTT VAUGHAN, Poplar, Conservative (1947). Chief Assistant in the Department of Psychological Medicine at Guy's Hospital. (The date in parentheses is the year of the candidate's qualification.)

Dr. Stott Commemoration Fund.—A fund is being raised to commemorate Dr. L. B. STOTT's 33 years' service as medical officer to the Papworth Village Settlement for the treatment and rehabilitation of sufferers from tuberculosis. Dr. Stott retired last December because of ill-health. The fund will be used for one or more of the following: Prizes for children at Papworth School; grants to children at the school or resident in Papworth who win scholarships; the erection of a shelter in the children's playing fields. Contributions should be sent to the Secretary, Dr. Stott Commemoration Fund, St. Peter's Hostel, Papworth Everard, Cambridge.

Cadmium Poisoning.—Whether cadmium poisoning should be a "prescribed disease" under the National Insurance (Industrial Injuries) Acts, and, if so, for what occupations, is being considered by the industrial diseases subcommittee of the Industrial Injuries Advisory Council. Persons and organizations interested in the question of prescribing cadmium poisoning are invited to submit written evidence. Communications should be addressed to the Secretary, Industrial Injuries Advisory Council, 10, John Adam Street, London, W.C.2, to arrive not later than June 6.

Sir Arthur Keith's Estate.—The late Sir Arthur Keith, whose death occurred on January 8 (see *Journal*, January 15, p. 168) left estate of £11,778 gross value. Among his bequests were £500 to the Royal College of Surgeons, for the upkeep of Down House, and such of his books, manuscripts, and papers as the librarian may select. He also bequeathed £500 to the Royal Anthropological Institute of Great Britain and Ireland, £200 to the Royal Medical Benevolent Fund, £100 to the Anatomical Society of Great Britain and Ireland, and 100 guineas to Aberdeen University for the anthropological museum in Marischal College.

W.H.O. Appointments.—Dr. R. M. DOWDESWELL, formerly deputy director of laboratory services in Kenya and more recently visiting professor of bacteriology at the American University, Beirut, has been appointed director of the El Calioab Public Health Demonstration Project in Egypt. Dr. T. EVANS, assistant director of medical services, Northern Rhodesia, has been appointed deputy director of the W.H.O. Regional Office for Africa at Brazzaville.

Hunterian Society.—At the annual general meeting on May 2 Mr. A. DICKSON WRIGHT was elected president for 1955-6 in succession to Dr. W. S. C. COPEMAN. Professor E. N. DA C. ANDRADE, F.R.S., gave an address on "Isotopes."

News in Brief.—Mr. C. E. ENGEL, of the photographic department of Guy's Hospital, London, won the prize for foreign medical films in this year's competition organized by the French journal *La Presse Médicale* (see *Journal*, December 11, 1954, p. 1431). His film was "Mitral Valvulotomy for Mitral Stenosis." Dr. PETER HANSELL, director of the Westminster Hospital's photographic department, was accorded an "honourable mention" for his film "Grafting on the Cornea."

Dr. L. GORDON HOPKINS was presented with the second Sydney Body gold medal at a ceremony at Southend General Hospital in March. It was awarded for his "distinguished services to medicine in Southend for the past 50 years." Dr. Hopkins is 80.

COMING EVENTS

Association of Medical Records Officers.—One-day Medical Records Exhibition at the Bonnington Hotel, Southampton Row, London, W.C.1, from 10 a.m. to 6 p.m. on May 21. Exhibition open to all interested in problems of records storage, out-patient waiting, medical correspondence and indexing. At 11 a.m. Dr. N. M. GOODMAN (Ministry of Health) will lecture on "Statistics and Records of Cancer."

Medical Association for the Prevention of War.—Annual conference on June 4, 2 to 6 p.m., at 45, Russell Square, London, W.C.1, on "The Medical Effects of Radioactive Explosions." Speakers include Dr. W. R. S. DOLL, Dr. R. H. DOBBS, and Dr. G. DISCOMBE. Open, free, to all members of the medical profession and others interested.

National Association for Maternal and Child Welfare.—Annual conference at Church House, Westminster, June 22-24. Details from secretary, N.A.M.C.W., Tavistock House North, Tavistock Square, London, W.C.1.

NEW ISSUES

British Journal of Industrial Medicine.—The next issue (Vol. 12, No. 2) is now available. The contents include:

MORTALITY FROM LUNG CANCER IN ASBESTOS WORKERS. Richard Doll.
PRIMARY LUNG CANCER IN SOUTH WALES COAL-WORKERS WITH PNEUMOCONIOSIS. W. R. L. JAMES.
PULMONARY FIBROSIS IN NON-FERROUS FOUNDRY WORKERS. H. E. Harding and A. I. G. McLaughlin.
LEPTOSPIRAL SEROLOGY IN SCOTTISH COAL-MINERS. R. S. F. Adam and P. N. Edmunds.
DIURNAL VARIATION IN MENTAL PERFORMANCE. Bo Bjerner, Åke Holm, and Åke Swenson.
PHYSIOLOGICAL OBSERVATIONS ON MEN WORKING IN SUPPOSEDLY LIMITING ENVIRONMENTS IN A WEST AFRICAN GOLD-MINE. W. S. S. Ladell.
THE INFLUENCE OF INSPIRED AIR TEMPERATURE ON TOLERANCE TO WORK IN THE HEAT. A. R. Lind.
INVESTIGATIONS INTO THE EFFECTS OF EXPOSURE TO TRICHLORETHYLENE IN MECHANICAL ENGINEERING. E. Grandjean, R. Münchinger, V. Turrian, P. A. Haas, H.-K. Knöpfel, and H. Rosenmund.
CONFERENCE OF THE BRITISH OCCUPATIONAL HYGIENE SOCIETY ON RADIATION HAZARDS IN INDUSTRY.
THE HEALTH OF WORKERS EXPOSED TO IONIZING RADIATIONS. A. S. McLean.
RADIATION SAFETY AT AN ATOMIC ENERGY FACTORY. D. R. R. Fair.
PROTECTION AGAINST X RAYS AND GAMMA RAYS IN THE INDUSTRIAL FIELD. W. Binks.
SAFETY CRITERIA IN ATOMIC ENERGY. F. R. Farmer.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

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

Monday, May 16

EDINBURGH UNIVERSITY.—At West Lecture Theatre, University New Buildings, 5 p.m., Dr. D. J. Guinier: Anaesthesia, Antiseptics, Antibiotics.
INSTITUTE OF PSYCHIATRY.—5.30 p.m., lecture demonstration by Dr. E. Stengel.
ST. ANDREWS UNIVERSITY.—At Physiology Lecture Theatre, Queen's College, Dundee, 5 p.m., open postgraduate lecture by Dr. R. Heim de Balsac (Paris): Observations on the Vascular Factor in the Radiology of the Lung Fields.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, Gower Street, W.C., 4.45 p.m., Professor Emil L. Smith (University of Utah): Mode of Action of Proteolytic Enzymes.

Tuesday, May 17

ILFORD MEDICAL SOCIETY.—At King George Hospital, Ilford, 8.45 p.m., annual general meeting. Dr. C. V. Bloom: The Deprived Child Today.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. S. C. Gold: Drug Eruptions.
OXFORD UNIVERSITY MEDICAL SOCIETY.—At Maternity Lecture Theatre, Radcliffe Infirmary, 8.15 p.m., Mrs. E. J. Radley Smith: Leucotomy.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, W.C., 5.15 p.m., Cushny Memorial Lecture by Dr. J. D. N. Nabarro: The Adrenal Cortex and Renal Function.

WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY.—5 p.m., Altmouth Wright Lecture by Dr. A. T. R. Mattick: The Lactobacilli and Some Streptococci.

Wednesday, May 18

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Prevention of Hospital Infection.
NORTH-WESTERN TUBERCULOSIS SOCIETY.—At Aintree Hospital, Liverpool, 5.30 p.m., Dr. J. Baxter: Rehabilitation of Tuberculous Patients; Dr. J. O. O'Rourke: Escape from Sanatorium: Some Aspects of Self-determined Discharge.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Professor G. Payling Wright: General Pathology of Tuberculosis (III).
SOUTH-WEST LONDON MEDICAL SOCIETY.—At Bolingbroke Hospital, 8.10 p.m., Bolingbroke Lecture by Mr. A. Dickson Wright: Varicose Veins.
WILLESDEN GENERAL HOSPITAL MEDICAL SOCIETY.—At Department of Physical Medicine, Willesden General Hospital, 8.45 p.m., Dr. E. A. Blake Pritchard: Migraine.

Thursday, May 19

BRITISH INSTITUTE OF RADIOLOGY.—8 p.m., annual general meeting; 8.30 p.m., Dr. J. A. C. Fleming: Some Reflections on the Position and Scientific Role of the Institute.
EDINBURGH UNIVERSITY.—At West Lecture Theatre, University New Buildings, 5 p.m., Dr. D. J. Guthrie: History of Medical History.
HONYMAN GILLESPIE LECTURE.—At University New Buildings, Edinburgh, 5 p.m., Dr. J. H. Wright: Unilateral Renal Hypertension.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. C. M. Fletcher: Atmospheric Pollution and Disease.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor H. R. S. Huxley: Subphrenic Abscess, with particular reference to the Spread of Infection.
ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—7.30 p.m., Professor A. Corradetti: Studies on Comparative Pathology and Immunology in Mammal and Bird *Plasmodium* Infections.
ST. ANDREWS UNIVERSITY.—At Physiology Department, Medical School, Small's Wynd, Dundee, 5 p.m., Professor A. Kekwick: Obesity.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., postgraduate demonstration in neurology.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, Gower Street, W.C., 4.45 p.m., Professor Emil L. Smith (University of Utah): Mode of Action of Proteolytic Enzymes.
WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At Royal College of Physicians of London, 8.30 p.m., Cavendish Lecture by Sir Charles Dadds, F.R.S.: The Renaissance of Treatment.

Friday, May 20

BRITISH INSTITUTE OF RADIOLOGY.—5 p.m., meeting of medical members.
FACULTY OF RADIOLOGISTS.—At Royal College of Surgeons of England, 4.30 p.m., Skinner Lecture by Dr. S. Whately Davidson: Some Anomalies of the Respiratory System.
● INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. R. M. B. MacKenna.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Dr. J. G. Scadding.
LONDON UNIVERSITY.—At St. Thomas's Hospital Medical School, 5 p.m., special university lecture in pharmacology by Professor V. Erspamer (Bari): Biological Significance of 5-Hydroxytryptamine and Related Substances.
OSLER CLUB OF LONDON.—At Royal Army Medical College, 8 p.m., meeting in honour of Sir Anthony Bowly, Bt. (May 10, 1855-1929). Sir Gordon Gordon-Taylor: Reminiscences of Some Famous Surgeons of the 1914-18 War.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—(1) 2 p.m., Mr. A. L. d'Abreu: Surgery of Congenital Heart Disease; (2) 4 p.m., Dr. I. Douglas-Wilson: Words without End.
ST. ANDREWS UNIVERSITY.—At Department of Medicine, Queen's College, Dundee, 2.30 p.m., discussion to be opened by Dr. J. Wright, Dr. R. W. D. Turner, Professor R. Walmsley, and Dr. K. G. Lowe: Pulmonary Stenosis as an Isolated Lesion and with Associated Atrial Septal Defect (Fallot's Triology).
ST. MARK'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Dr. F. S. W. Brimblecombe: Lactation and Breast Feeding.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, W.C., 5.15 p.m., Cushny Memorial Lecture by Dr. H. Harris: Genetic Aspects of Tubular Function.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Clare.—On April 27, 1955, at St. David's Hospital, Cardiff, to Mary Hancock, wife of Deryck Edwin Clare, M.B., B.S., C.P.H., a son.
Drummond.—On April 11, 1955, at St. George's Hospital, London, S.W., to Ann, wife of Dr. P. Drummond, a son—Christopher Gordon.
Edwards.—On May 5, 1955, at Southmead Hospital, Bristol, to Hetty, wife of Errol M. Edwards, M.R.C.O.G., a daughter—Deirdre.
Fleischl.—On April 25, 1955, to Charmian (formerly Quinton), M.B., B.S., wife of Peter Fleischl, M.B., M.R.C.P., a son—John Murray.
Hume.—On May 5, 1955, at St. David's Hospital, Cardiff, to Rosamond (formerly Hyslop), wife of Dr. Michael Hume, a daughter—Caroline Morwena.
Perrem.—On May 4, 1955, at Battledown Manor, Cheltenham, Glos., to Mary, wife of Dr. John F. Perrem, R.A.F., a son—Timothy John.
Watson.—On May 5, 1955, to Audrey, wife of Dr. David Lister Watson, Wiveliscombe, Somerset, a son—Neil Clarke.

DEATHS

Chilcott.—On April 9, 1955, at 26, Stormont Road, Highgate, London, N., Arthur Edward Chilcott, M.D., aged 91.
Grosvenor.—On April 12, 1955, at Salisbury, Southern Rhodesia, Harold Octavius Washington Grosvenor, M.R.C.S., L.R.C.P.
Haynes.—On April 1, 1955, at 57, Crown Street, Brentwood, Essex, Horace Guy Lankaster Haynes, T.D., M.R.C.S., L.R.C.P., Lieutenant-Colonel, R.A.M.C.T., retired.
Heesom.—On April 19, 1955, at his home, Berkswell House, High Trees, Reigate, Surrey, Alan Hedley Beecroft Heesom, M.R.C.S., L.R.C.P., L.D.S.
Macewen.—On April 17, 1955, at Gartferry, Innellan, Argyll, Hugh Allan Macewen, O.B.E., M.B., Ch.B., D.P.H.

Any Questions ?

Exertion after Hernia Repair

Q.—Does strenuous exertion after a repair of an inguinal hernia predispose to a recurrence or does it strengthen the abdominal muscles and thus reduce the tendency to recurrence? Does the use of unabsorbable suture materials lessen the chances of recurrence after repair of a hernia?

A.—Strenuous exertion should certainly be avoided for the first month or six weeks after a repair operation for inguinal hernia—particularly in fat or flabby patients; graduated abdominal exercises, however, are all to the good. By far the majority of recurrences after hernia operations occur within the first year, and probably two out of three of these within the first six weeks. "Hasten slowly" is therefore a good motto for this initial period.

The absorbable suture probably produces a better fibrous reaction than the non-absorbable. However, because of the likely possibility of stretching this new fibrous tissue in the fat, the flabby, the chronic bronchitic, or the patient whose occupation involves constant severe strain, in these cases more reliance should be placed on the non-absorbable materials.

Tuberculosis in Pet Monkeys

Q.—My small children keep as a pet a Mona monkey. I have heard that there is a good deal of pulmonary tuberculosis in monkeys in captivity, and I am therefore a little doubtful about whether I should allow them to retain the animal. I have no reason to suspect that he is not in good health. I should be grateful for your advice about this.

A.—Most species of monkey are susceptible to tuberculosis, but in the wild state do not have any opportunity of acquiring the infection. They may, however, become infected after capture, and in this case the infection will be of the primary type, often progressive and terminating fatally. Such monkeys will be dangerously infective to man.

Monkeys kept as pets should always be tested with old tuberculin, a convenient site for inoculation being the upper eyelid. A positive reaction indicates present or past infection. A negative reaction suggests freedom from infection, but does not absolutely exclude it. They should therefore in addition be examined clinically, and also radiographed for signs of pulmonary tuberculosis. The absence of any sign of infection after proper investigation should reassure the owner.

Tuberculous persons or tuberculous milk are potential sources of infection to captive monkeys.

Pineapple Finger

Q.—I would be glad of any information or reference you can give me on the form of industrial dermatitis known as "pineapple finger" and on any other illness peculiar to people canning pineapples.

A.—According to Schwartz, Tulipan, and Peck¹ the peeling of pineapples may cause dermatitis because of the sharp spears on the pineapple and the high content of sugar in the juice. A full account of pineapple dermatosis has been given by I. Polunin.² He describes erosions of the fingertips caused by a proteolytic enzyme in pineapple juice which causes separation of the superficial layers of the skin. Pineapples have long been used in cooking to soften tough meat, and photographers in the past used the juice to remove the gelatin from old photographic plates.

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Testosterone for Birth Control

Q.—Testosterone inhibits spermatogenesis. Is it of value in birth control? What possibility is there of its producing malignancy? What dose is required to inhibit spermatogenesis?

A.—It is true that testosterone in sufficient dosage will inhibit spermatogenesis, but it could certainly not be recommended as a form of birth control. It is uncertain, for example, whether, after sufficiently prolonged administration of testosterone, testicular recovery could take place. So far as the writer knows, there is no likelihood of testosterone producing malignancy. The amount of testosterone required to inhibit spermatogenesis completely varies in different individuals, but it is probable that for most men a weekly injection of 100 mg. of testosterone phenyl propionate would, within a period of two months or so, reduce the rate of sperm production to infertile levels.

Treatment of Tinnitus

Q.—What can be done to help a woman of 60 with severe tinnitus—periodic attacks of buzzing noises in both ears so severe that she is reduced to tears? She has been treated over the last two years with drugs, but the tinnitus has now reached a stage (attacks twice weekly lasting 1–24 hours) when none brings her any relief.

A.—There is no specific drug or treatment that can abolish the tinnitus. If the cause be wax in the ear, fluid in the tympanum, or any of the ototoxic drugs such as quinine, salicylates, or occasionally aspirin, removal should result in the tinnitus disappearing. Troublesome tinnitus such as mentioned in the question is, however, usually due to some disturbance of cochlear function. Destruction of the cochlea or even section of the auditory nerve has been repeatedly carried out for tinnitus without success in but rare exceptions. In fact, this lack of success after the hopes of the patient may have been built up by the operation may often result in the tinnitus becoming more intolerable than ever. In itself tinnitus can do no harm, but it can be distracting, particularly to a nervous or introspective person.

Various forms of treatment designed to increase the blood supply to the internal ear have been tried, but usually give no definite relief. Very occasionally an injection of the stellate ganglion with a local analgesic may produce some temporary change, and might be tried in this case.

Indications for Vitamin B₁₂

Q.—In what conditions is vitamin B₁₂ definitely indicated? Advertisers suggest its use in a wide variety of conditions.

A.—It has been suggested that cyanocobalamin (vitamin B₁₂) increases the weight of premature babies and underweight children, that it has some general tonic effect in adults, and that it is of value in the treatment of diabetic neuropathy. The main weight of scientific and clinical evidence does not support these claims and suggests that its use should largely be confined to the treatment of Addisonian pernicious anaemia, in which its therapeutic efficacy appears to be identical with that of liver extract, including its ability to prevent and to ameliorate the nervous complications of the disorder. Its cost is less than that of liver extract, the amount needed for injection is smaller, and it does not cause allergic reactions. In consequence it is probable that cyanocobalamin will replace liver extract in the future. It is occasionally effective in other high colour-index anaemias (the megaloblastic anaemias of pregnancy, infancy, malabsorption, and the Tropics), but in these folic acid is usually the drug of choice. Subacute combined degeneration of the cord hardly ever occurs in these latter anaemias, but it is wise for maintenance purposes to supplement folic acid with parenteral therapy with cyanocobalamin or liver extract, since severe peripheral neuritis may occur in patients taking folic acid alone for a long time.

Sympathomimetic Drugs and Asthma

Q.—What drugs should be included under the heading of sympathomimetic drugs? Is it true that if such drugs are given to a child with asthma they lead to addiction, tend to make the asthma chronic, and may harm the heart?

A.—The following drugs are included under the heading of sympathomimetic drugs—ephedrine, adrenaline, nor-adrenaline, isopropyl-noradrenaline, "propadrine," methyl ephedrine, amphetamine, "paredrine," "kephrine," and "paredrinol."

Those of the above that are used in asthma do not lead to addiction, do not harm the heart, and do not make the asthma chronic. Ephedrine and adrenaline have been used for very many years and in all countries, and are generally acknowledged to be of very considerable benefit to asthmatics; in some cases adrenaline is life-saving. Side-effects such as palpitation or general excitability may occur, but these are not dangerous or harmful and can be reduced by the addition of a mild sedative such as phenobarbitone and by keeping the dose to the minimum necessary to relieve the attack.

Intolerance to Humidity

Q.—Is it known why some individuals are intolerant of humidity? A woman of 51, formerly unaffected by tropical climates, has for the past seven years become most sensitive to increases in humidity even in the United Kingdom. Such increases precipitate headache, stifling respiration, nasal congestion, and profuse sweating of the head and neck, leading to a complaint of intolerable "heat" although the actual temperature may be moderately cool and the majority of the community feel comfortably warm or even cool. Is there any means of helping such patients to tolerate raised humidity?

A.—This type of complaint is not unknown in some women in the Tropics at or about the menopausal age. The hyperhidrotic areas are those supplied by the cervical sympathetic, and these regions are often unaffected in anhidrotic heat exhaustion. The chief points of interest here are the long duration of the disorder and its association with humidity. On the other hand, the head, and particularly the forehead, is one of the first places, after the palms, to be affected in emotional sweating. As the patient also gets headaches, this may indicate that the trouble is psychogenic rather than endocrine in origin.

Presumably the questioner means relative humidity. When the relative humidity is high sweating anywhere is more apparent, as the "saturation deficit" is low and hence evaporation slow. There is, however, no physiological reason for humidity to affect heat loss and hence stimulate sweating in a resting clothed subject until the air temperature reaches 75° F. (23.9° C.), or in a nude man until it reaches 85° F. (29.4° C.); these limits are lower for working subjects. Provided there are no obvious signs of humidity, such as damp walls, men are as comfortable in 80 or 90% relative humidity in air at 60–70° F. (15.6–21.1° C.) as in lower humidities. On damp overcast days, however, the diffuse sky radiation, which cannot be avoided like sunlight, is very much greater than on clear dry days; recent work suggests that thermal radiation to the skin causes an increase in the heart rate, independent of any effect due to a raised body temperature; and it is well known that thermal radiation from any source if it warms the skin results in nasal congestion ("nose closing" effect); this may be of importance in specially sensitive persons. These effects, combined with the impossibility of getting any shade from a diffuse radiation which comes from all over the sky, might well be a precipitating factor in psychogenic sweating. The bad temper and vague malaise often complained of by people in sub-tropical regions during winds carrying high fine dust,

such as the Khamseen or Harmattan, may also be caused in this way, as dust has the same effect as water vapour in diffusing solar radiation.

Pityriasis Rubra Pilaris

Q.—I have a patient suffering from pityriasis rubra pilaris of long standing. He has visited skin specialists in this country (Ireland), England, and on the Continent, but unfortunately nobody has helped him. Is there any modern advance in the treatment of this condition? Would the topical application of cortisone benefit him?

A.—It is generally accepted that pityriasis rubra pilaris is extremely resistant to treatment. A temporary improvement can sometimes be produced by the use of salicylic acid ointment, and irritation may be relieved by the usual measures.

In recent years this disorder has been treated by the administration of vitamin A concentrate, 24,000 units two or three times daily continued for some months. In some cases apparently there is a definite improvement, but more often the results are indecisive and some cases are not helped at all. However, the treatment is probably worth a trial.

I have no information regarding the local application of cortisone in this disease. Pityriasis rubra pilaris is usually thought to be a naevoid condition, and, on general principles, one would not expect improvement to follow the application of cortisone.

Significance of Nocturnal Polyuria

Q.—I should be very grateful for any information about the possible causes of nocturnal polyuria with frequency. The case in which I am interested is that of a man aged 76 in normal general health. For the past 10 years he has been troubled with nocturnal frequency of micturition—about five or six times between the time of going to bed (about midnight) and rising (7 a.m.). Between 35 and 40 ounces (about a litre) of urine is passed, of S.G. 1010, neutral in reaction, and with no abnormal constituents. Practically no fluid is taken after dinner at 7.30 p.m., and then only half a pint of cider (284 ml.) as a rule. During the day there is no polyuria or frequency. There is no palpable enlargement of the prostate, and there has never been any difficulty in passing urine. I remember reading in the "Journal" some years ago that prisoners of war were troubled by nocturnal polyuria, but do not remember if any explanation of the condition was offered.

A.—In health, the rate of urinary excretion of water, sodium, potassium, and chloride is less during the night than in the day. This patient shows a reversal of this diurnal rhythm, with nocturnal polyuria rather than oliguria. This abnormality tends to occur in any condition in which there is expansion of the extracellular fluid volume due to sodium retention. It has been found, as stated, in starvation, in congestive heart failure with or without oedema, in cirrhosis of the liver,² and during treatment with cortisone.³

The most likely cause in a patient of 76 is incipient heart failure. This symptom of nocturnal polyuria may occur at a stage when there are few signs of failure, and where the only other symptom is exertional dyspnoea. It is suggested that treatment by restriction of dietary salt might result in considerable relief. If there is other evidence of heart failure—e.g., increase of jugular venous pressure or cardiac enlargement—digitalization would be of great benefit.

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Syphilis and Sterility

Q.—How does syphilis cause sterility? Is its action to be explained simply on the basis of gummatous changes in the gonads? How often are the ovaries affected?

A.—Syphilis may cause male sterility, either by gummatous changes in the testis; by obstruction of the epididymal canal with cellular debris; or by secondary testicular failure due apparently to impairment of the gonadotrophic stimulation of the testis. In this last case it would seem that the testicular failure is part of a more generalized pattern of endocrine dysfunction.

In the female, syphilis by no means regularly results in sterility, though the sequence, abortion—stillbirth—syphilitic live-birth—normal live-birth, is a well-known one. It is doubtful if the ovaries are at all commonly directly affected by syphilis.

Nowadays, syphilis is a relatively rare, and an increasingly less common, cause of infertility. This of course is the result of the much more effective means of treating the early stages of the disease now at our disposal.

Hymenolepis Nana Infections

Q.—What is the best treatment for infection with *Hymenolepis nana*? I have had no success with male fern, mepacrine, and chloroquine.

A.—This is a difficult worm to eradicate, though fortunately, except in very heavy infections, it seldom gives rise to symptoms. It is advisable to starve the patient for 48 hours before administering the anthelmintic and to follow the treatment with a saline purgative. As the adults live in the upper ileum it is important that, whatever the anthelmintic used, it should be liberated in this region. For this reason capsules of male fern are less suitable than a draught such as extract of male fern (extractum filicis) 90 minims (6 ml.), syrup of ginger 90 minims (6 ml.), peppermint water to 1½ oz. (42 ml.). Male fern administered in this way is probably the best of the anthelmintics available, but another which might usefully be tried is hexylresorcinol.

Peripheral Neuritis after Isoniazid

Q.—Can you give me any information on the development of acute peripheral neuritis due to the administration of isoniazid?

A.—Peripheral neuritis may occur in patients receiving large doses of isoniazid (6–10 mg., or more, per kilo per day). It is very rare indeed in patients receiving 200 mg. daily (or 3 mg./kilo), the standard dose used in the Medical Research Council trials. The neuritis is probably a direct toxic effect and not an allergic reaction. It usually clears up when the drug is stopped, or even, in the milder cases, if the dose is lowered.

NOTES AND COMMENTS

Hairy Tongue.—Dr. W. TOMASZEWSKI (Edinburgh) writes: In your answer ("Any Questions?" April 9, p. 924) the parasitic theory is given as one of the causes of hairy tongue. It is an old textbook story which is totally lacking in proof. Although the presence of some types of fungi (mainly monilia) has been described, in a number of cases inoculation of the tongue with these fungi has failed to reproduce the clinical condition. The presence of fungi is incidental, the matted long filiform papillae being a favourable nidus for their growth and persistence. The same types of fungi can be found also on a normal tongue. Conversely in nearly 50% of cases of idiopathic, black, hairy tongue the presence of fungi has not been demonstrated.¹ There is also a statement that "recently studies of the tongue with Wood's light have shown that the flora of the dorsum of the tongue may change very rapidly in the apparently normal, healthy mouth. . . ." This is not a wholly true statement, as examination in Wood's light merely enables one to follow changes in the fluorescence of the tongue.² The changes of the bacterial flora on the tongue can be reliably ascertained only by microscopical

examinations of tongue scrapings. I wrote about these spontaneous changes of bacterial flora in a recent letter.³ I have made a large number of examinations of the bacterial flora in black tongue, but so far there is no evidence that any particular microflora is associated with the occurrence of this condition.

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2. *Ibid.*, 1951, 1, 117.
3. *Ibid.*, 1954, 2, 1420.

OUR EXPERT writes: I would not agree that the parasitic theory of black hairy tongue can be ruled out, if for no other reason than the excellent therapeutic results obtained with gentian violet, but it may well be that *Candida albicans*, when present, serves to keep the condition going.^{1,2} I am a little surprised that anyone could think it possible to study the flora of the tongue without a microscope, and to avoid further ambiguity let me also add that such studies of fluorescence of the tongue not only need Wood's light and a microscope but appropriate cultural aids as well. Finally, Laskaris and Curtis³ report a fairly consistent microflora with hairy tongue, so it would seem that much more work will have to be done on the bacteriology and mycology of these lesions before it will be safe to dogmatize about them.

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"Once a Caesarean."—Dr. D. F. BRUCE (Glasgow) writes: I should like to comment on two points raised by your expert under the heading "Once a Caesarean" ("Any Questions?" April 16, p. 983). Firstly it is unnecessary to anaesthetize the patient in order to examine the scar of a previous lower-segment caesarean section. Provided that this examination is carried out immediately after completion of the third stage of labour, satisfactory exploration of the lower uterine segment is possible without causing discomfort. This is the routine practice in the Obstetric Unit of the Southern General Hospital, Glasgow. The second point concerns the risk of rupture of a transverse lower-segment scar in subsequent labour. In a short series of 54 cases of labour following caesarean section¹ there was no instance of rupture of the uterus. In 41 of these cases the previous caesarean section was of the lower-segment type, the incision having been transverse in each instance. In four cases the labour was the second following caesarean section. In no case was sterilization indicated. These cases were, of course, selected as being suitable for trial of labour.

REFERENCE

1. Bruce, D. F., *Glasg. med. J.*, 1953, 34, 354.

OUR EXPERT writes: In practice, most women with a caesarean section scar in the uterus are delivered with forceps applied prophylactically, so some sort of anaesthesia is already in use when labour is complete. In other cases it is a matter of opinion whether an anaesthetic should be administered for the sole purpose of exploring the uterus, and there are arguments for and against. Often, as Dr. Bruce says, the scar can be palpated satisfactorily without anaesthesia, provided the patient is in the lithotomy position. Dr. Bruce's statistics on the risk of rupture of the scar are valuable and go to swell those which have been appearing in various medical journals and maternity hospital reports during recent years.

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CLASSIFICATION OF THE EPILEPSIES*

BY

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No lecture on epilepsy can begin without reference to Hughlings Jackson, who almost a century ago defined epileptic seizures as the expression of occasional, sudden, excessive, rapid, local discharge in the grey matter. This definition needs hardly any qualification to-day. Yet within the last fifteen years our knowledge of epilepsy has greatly expanded owing to the introduction of the electroencephalogram, a method by which the discharge, which was for Jackson hypothetical, can now be seen and recorded in many seizures. The knowledge thus gained is still in process of assimilation, and what we believe to-day may no longer be true in a year's time. I am not perturbed by this reflection. It is necessary for clear thinking to have beliefs. It is equally important that we should be prepared to change them, which is not so easy. I would commend to you in this connexion Sir Thomas Browne's saying that "to purchase a clear and warrantable body of truth, we must forget, and part with, much of what we know."

If we are to think clearly about epilepsy we must begin by arranging our observations in some kind of order. The classification of seizures in terms of medical science is in itself a problem which has exercised many minds in recent years. I shall put before you the method of classification which I have proposed myself and believe at present to be the most satisfactory. It requires tabulation of the data under separate headings, and the most convenient arrangement is in parallel vertical columns.

The first heading is Clinical. A seizure is a clinical event, and the symptoms observed, or elicited by questioning the patient, must be classified in terms of clinical usage. What these terms should be I will discuss later. It will suffice for the moment if I say that under the Clinical heading we shall record clinical phenomena only—for example, loss of consciousness, convulsive movements, odd behaviour, and abnormal sensations. The heading for the second column is Anatomical. If we accept Hughlings Jackson's definition—and there is no reason to doubt it—the discharge must begin somewhere in the brain. It will be our aim under this heading to indicate the site of origin of the discharge. The third heading is Physiological. Seizures may be accompanied by observed disorder of function in the neurones. Of this the only example at present known is the physical disturbance recorded by the E.E.G.

The fourth column is Pathological. The terms of classification in this column will be those to which we

*A clinical lecture delivered at Guy's Hospital.

are all accustomed, inflammation, trauma, new growth, and so on. Finally, I think it useful for practical purposes to have a column in which to record any specific response of seizures to particular drugs or other forms of treatment. A convenient heading will be Therapeutic. In this column we shall make such entries as dione-responsive, primidone ("mysoline")-responsive, and so on. Our object, of course, will be to establish correlations between groups of data in the different columns.

Clinical Patterns of Seizure

I will now go back to consider the classification of seizures in clinical terms. The simplest method is to make use of the plan followed in recording a neurological examination. We begin with the mental state and record loss or clouding of consciousness, disordered behaviour, disturbance of thought, hallucinations, and illusions. Next comes speech, which may be arrested or disorganized in a seizure. After this we take the special senses, any of which may be involved in an attack. Then we have the motor system to consider, which will include a large part of our clinical data—convulsive movement, tonic or clonic, generalized or localized. Sensation will also include many data provided by the patient's account of numbness, tingling, and other somatic sensory experience in attacks. Finally, there is the important heading for visceral symptoms, which may be motor—for example, vasoconstriction, salivation, or involuntary micturition—or sensory—for example, the well-known epigastric aura. The visceral symptoms are commonly both motor and sensory.

I shall not attempt to describe the great variety of symptoms or combinations of symptoms that may be observed in epileptic seizures. The point I wish to make now is that it has been possible to relate certain clinical patterns of seizure to certain anatomical sites of discharge, so that we can speak of pre-central or post-central seizures, temporal-lobe seizures, occipital-lobe seizures, and so on.

In this process of clinico-anatomical correlation the E.E.G. has proved very useful, for when the epileptic discharge arises near the surface of the brain it is associated with a localized electrical disturbance which can often be recorded, either in association with seizures or in the intervals between them. This is a more delicate, and often a more certain, method of establishing the site of the discharging lesion than any other, and has made us more confident of the relationship between clinical pattern and anatomical site than when we had to depend upon the evidence provided by pathological lesions. Sometimes the E.E.G. will indicate the site of discharge when the clinical pattern is of doubtful value. On the other hand, the clinical pattern may sometimes be distinctive when the E.E.G. fails to reveal any localized discharge, probably because the discharge is arising deeply and is therefore not picked up by the scalp electrodes.

Contribution of the E.E.G.

Apart from its localizing value, the E.E.G. may sometimes provide data for use in the pathological column. For example, replacement of the normal alpha rhythm by localized very slow wave activity indicates an active or recent destructive lesion. Generalized slow-wave activity is met with in the presence of increased intracranial pressure.

But the main contribution of the E.E.G. to the study of epilepsy has arisen from the discovery that there is a large group of seizures associated with a particular pattern of electrical disturbance. In this instance the data belong to the physiological column. The distinctive feature of this pattern of discharge is that it is bilateral, synchronous, and symmetrical. Now, taking the physiological column as our point of departure, we may proceed to see what correlations can be established with data in the other columns. The clinical pattern of seizures associated with this type of E.E.G. is quite simply described, but at this point we must digress for a moment to define terms commonly, and sometimes loosely, used in the clinical description of seizures—major or grand mal, and minor or petit mal. It is generally accepted that a major seizure is one in which there is loss of consciousness and generalized convulsive movement. Any other kind of seizure is usually described as minor epilepsy. This division is, I think, unsatisfactory, for there is a great variation, not only in the pattern but in the duration of seizures which would thus be included in the minor category. I can see no completely satisfactory solution for this difficulty, but if we take as our measure the duration of the attack we shall find that there is a large group in which the seizure is over in less than a minute. As a term of clinical usage petit mal was often in the past employed to describe these very brief seizures, but, as I shall later explain, petit mal has now lost its purely clinical meaning. It is convenient to have a term for these little attacks, and minimal seizure is, I think, appropriate, provided that we remember that the word "minimal" refers only to the duration of the seizure.

Now, when we examine the clinical features of attacks associated with the bilateral, synchronous, and symmetrical discharge we find that they are either minimal seizures of a particular kind or major seizures which from the moment of onset are attended by loss of consciousness and generalized convulsion. I must reiterate that these major seizures are not preceded by any other symptoms. As we shall observe later, an epileptic discharge arising in any part of the brain can spread to involve the whole of it and will then be attended by loss of consciousness and generalized convulsion. In such attacks—focal or partial seizures—there is nearly always some initial symptom corresponding with the site of the initial discharge, and if the onset of an attack can be recorded by the E.E.G. localized discharge will be apparent, preceding the general spread. But in the seizures of the group which we are now discussing both the convulsive movements and the electrical discharge are symmetrical and generalized from the first.

Minimal Seizures

The minimal seizures of this group are of two kinds, each as a rule well defined. The most frequent form is the "lapse" or "absence." There is a sudden, brief suspension of mental function with loss of consciousness. The whole episode lasts from 5 to 15 seconds, and may easily pass unnoticed. During the attack the patient has a fixed stare and is motionless, but there is sometimes twitching of the eyelids and occasionally of the arms, and the eyeballs may turn upwards. The seizure ends as abruptly as it began, and the patient will continue with what he was previously doing or saying as if there had been no interruption. Sometimes the lapse may be longer and last up to a minute, but it is probable that in such cases there has been a very rapid succession of brief attacks. Occasionally the lapse may be incomplete—that is to say,

consciousness is not lost, but clouded, and the patient may be able to describe a momentary state in which he is dimly aware of what is going on around him but unable to initiate thought or action. But where consciousness is lost—and this is the general rule—he has no memory of the time during which the seizure occurred, being aware of the interruption only when it is over.

The other form of minimal seizure observed in patients of this group is the myoclonic attack. This consists of involuntary jerks of the muscles without loss of consciousness. These jerks are usually bilateral and symmetrical, but vary in their extent and distribution. They are often confined to the upper limbs. The duration of the jerks is very brief, not more than a fraction of a second, but there may be a succession or volley of jerks. If the jerk is of large extent whatever is held in the hand may be flung into the air, or if the trunk and lower limbs are involved the patient may be thrown to the ground. Occasionally there may be loss or clouding of consciousness in a myoclonic seizure, but as a rule the patient is aware of all that is happening.

A third variety of minimal seizure has been described as belonging to the group under consideration—the so-called "akinetic" attack in which the patient falls, without loss of consciousness and without myoclonus. Doubt has been cast upon this interpretation, the alternative explanation being that the fall is due to a brief single myoclonus involving the lower limbs. Of this it is difficult to be certain, but I believe from my own observation that true akinetic seizures do occur, and this belief is supported by accounts given by intelligent patients who describe their minimal seizures as of three separate kinds—"blanks," "jerks," and "falls."

Differences in E.E.G. Wave Form

This, then, briefly is the clinical range of attacks associated with the bilateral, synchronous, symmetrical abnormality in the E.E.G.: major seizures of the generalized type, and two, or possibly three, species of minimal seizure. Corresponding with these different types of seizure there are differences in the wave form of the E.E.G. In the major seizure the normal alpha rhythm is replaced by waves of a much higher voltage, though of about the same rate—10 cycles per second—giving rise to a series of spikes, which continues unaltered throughout the tonic phase of the convulsion. In the clonic phase the series of spikes is interrupted by rhythmic slow waves corresponding with the intervals between the clonic spasms. In the form of minimal seizure represented clinically by a lapse of consciousness, the E.E.G. shows a regular sequence of alternating spikes and slow waves at a fairly constant rate of three spike-and-wave complexes per second. The myoclonic jerks are associated with isolated spikes or short runs of spikes which may be mixed up with an occasional slow wave. The akinetic seizure, whose existence is now doubted by some authorities, is accompanied by an E.E.G. of the same type as that seen in myoclonic seizures.

Anatomy and Pathology

We have now established in some detail correlations between physiological and clinical data for this group of seizures and must proceed to examine the data in the other columns. The anatomical site of discharge as determined by the E.E.G. would appear to be generalized, but it seems probable from animal experiments that bilateral, synchronous, symmetrical discharge in the cerebral cortex may represent the effect of an initial discharge arising in the central grey matter and propagated to the cortex. The evidence for this is strong enough to have given rise to the term "centrencephalic," or more simply central epilepsy, for this group of seizures, so that we may provisionally enter the word central under the anatomical heading.

Under the pathological heading there are no positive data to record, for no one has ever been able to discover any histological basis for this group of seizures, which therefore remains idiopathic in the traditional sense of that word.

We may therefore enter the word idiopathic under the pathological heading. Incidentally it is in this group of seizures that heredity seems to be of more importance than in any other, so that we might perhaps add genetic in brackets under idiopathic.

Therapeutic Data

There now remains the therapeutic column, and in this we have important data to record, for the minimal seizures of this group often respond in dramatic fashion to the dione group of drugs, of which troxidone ("tridione") is that generally used. Dione-responsiveness appears to be specific for this particular type of seizure. It has no beneficial effect upon the major seizures of this group and may even increase their frequency. On the other hand, the drugs which are often effective in controlling the major seizures have usually no effect upon the minimal seizures.

To summarize the data we have now recorded for this group of seizures, they are as follows:

Clinical	Anatomical	Physiological	Pathological	Therapeutic
1. Major—generalized		Bilateral, synchronous, symmetrical E.E.G. discharge	Idiopathic (genetic)	—
2. Minimal (a) lapses (b) jerks	Central			Dione-responsive

"Central Epilepsy"

We now need a single descriptive term for this group of seizures. So far as the E.E.G. is a guide, the discharge being generalized, we might use the term "generalized epilepsy." Or we might speak of "central epilepsy" or of "idiopathic epilepsy," and in fact all these terms have been, and still are, used. This, I suppose, does not matter so long as we all understand what is meant. For myself, I prefer the term "central epilepsy," because it is a new one and therefore less liable to misinterpretation than terms which have been used in the past in other ways.

There are, however, some further problems of nomenclature which must be discussed if we are to understand what is being written about the epilepsies. You will find that petit mal is now generally used in a specific way to denote minimal seizures of the central type. Sometimes they are called true petit mal, with the implication that, although minimal seizures of similar clinical appearance may occur in association with other forms of E.E.G., it is only those minimal seizures having the bilateral synchronous patterns of E.E.G. that should truly be described as petit mal. The use of the name petit mal in this sense has been widely accepted, and I have no objection to it so long as it is remembered that it is a definition in terms of the E.E.G. and not a term of clinical description.

If we are going to call the minimal seizures of central epilepsy petit mal, it would seem quite logical to call the major seizures grand mal, again remembering that the E.E.G. is the criterion, and using grand mal only to describe major seizures of the central type. Having thus defined central epilepsy with its subdivision into petit mal and grand mal, I must deal very briefly with the natural history of the disease.

Petit mal seizures nearly always begin in childhood, and from the first occur with great frequency, up to 20 to 30 times a day. They are sometimes controlled by troxidone, but even if they are not they may cease about the age of puberty, never to recur. The lapses are so brief that they need not as a rule interfere with normal education, and the same is true of the jerks, unless they are so extensive as to cause falling. In a considerable proportion of the cases, however, the petit mal seizures are followed sooner or later by grand mal, and the liability to seizures of this type is likely to persist, with or without continuation of the petit mal. A series of myoclonic jerks during the first hour after waking in the morning is especially apt to conclude with a generalized convulsive seizure.

Grand mal seizures, with or without petit mal, may begin at any age, but rarely after 30. The drugs which have proved most effective in the treatment of grand mal are phenobarbitone and phenytoin sodium in combination, primidone, and methoin. The principles of treatment are simple. The drug or drugs chosen should be given first in moderate dosage. If the attacks continue, the dosage should be gradually increased up to the point at which either the attacks cease or intolerable toxic symptoms occur. In the latter case another drug or combination of drugs should be tried in the same way. Each therapeutic trial should be continued long enough for a just appraisal of the effect, having regard to the frequency of seizures before treatment was started. In this way the best medication can be determined, and in a considerable number of cases the seizures, even if they are not abolished, can be brought down to a frequency which is not incapacitating.

"Partial Epilepsy"

In all forms of epilepsy other than that which I have defined as central epilepsy, the clinical and E.E.G. data indicate a discharge arising in some part of the brain. It may be restricted to this part or spread to other parts, but the initial discharge is localized. This is what in the past has been called focal epilepsy, but Gastaut (1954), whose recent monograph, *The Epilepsies*, I would commend to you, prefers the term partial epilepsy for good reasons. It was for a long time supposed that focal epileptic seizures always arose from cells in the cortex and that there was a specific relationship between a particular cortical focus and a particular pattern of seizure. This no longer appears true, the fact being that the cortical neurones represent only one link in a circuit comprising at a deeper level neurones of the central grey matter. Cerebral function is represented not in a cortical mosaic but in sectors of brain which include cortex, optic thalamus (and other basal ganglia), and connecting neurones. The discharge responsible for a partial (as opposed to a generalized) seizure may arise either in the cortical or in the central grey matter. Partial epilepsy, proposed by Gastaut instead of focal epilepsy, is therefore a better term, and I think it should be adopted.

Of the symptoms of partial epilepsy there is an endless variety. I have been especially interested in the clinical patterns of seizures all my clinical life and continue to learn new ones. Hughlings Jackson penetrated to the core of the matter when he said 75 years ago that there were as many different epilepsies as there were sites of discharging lesions. Partial seizures may be of the major, minor, or minimal degree, depending upon the amount of spread of the discharge. In the major seizures there may be little or no clinical evidence of a localized onset, though careful questioning of the patient or a witness of the attack will often bring some important point to light, as, for example, twisting of the head and eyes to one side before the onset of generalized tonic spasm, or the memory of an unpleasant smell or visual hallucination before consciousness was lost. The minor or minimal seizures are much richer in clinical clues, for consciousness is often preserved, or is lost relatively late in the attack, and the patient is able to give an account of the initial symptom. Many partial seizures are thus easily identified—pre- and post-central from localized spasm or sensory disturbance, occipital from crude visual hallucinations, postero-inferior frontal from adverse movement of head and eyes, and some of the temporal lobe seizures from the occurrence of an olfactory aura, masticatory movements, or a dreamy state.

Murray Falconer (1954) has given an excellent account of the many seizure patterns that may result from discharge in different parts of the temporal lobe region. But discharge arising in this region or in the frontal lobe may begin and end with loss of consciousness. It may therefore be very difficult, sometimes I think impossible, to distinguish clinically between a minimal seizure arising from

the frontal or temporal regions and the lapse of petit mal, and here the E.E.G. may be of critical importance in arriving at a correct diagnosis.

You will have observed that I have attached a good deal of importance to the E.E.G. in distinguishing between central and partial seizures and in the localization of the site of discharge in the latter, but, as I have already indicated, the E.E.G. is by no means infallible. A positive E.E.G. depends first upon the chance of an epileptic discharge occurring while the record is being made. This chance may be a very small one, though various methods are now used to precipitate what are called subclinical seizures while the record is in progress. Nevertheless there are a great many cases in which we can be quite sure from the clinical evidence that the patient is suffering from epilepsy yet the E.E.G. is negative. This may be true for partial seizures even though the patient is having clinical attacks at the time the record is made. We recently had in the wards a man who was having partial seizures of pre-central origin with tonic and clonic convulsive spasm involving the left side of the face and adversion of head and eyes to the left. These occurred frequently during the period of the E.E.G. record, which showed no abnormality. It is probable in this case that the discharge was arising deeply.

One of the most interesting developments in recent years has been in our knowledge of the pathology of partial seizures, for which it seems possible that there is always an organic cause to be found—that is to say, a demonstrable histological lesion. The importance of scars, due to birth injury, neonatal anoxia, or encephalitis, has been increasingly revealed from the study of brain substance excised by neurosurgeons. Mr. Murray Falconer's lecture has told of what is now being done in the surgical treatment of partial epilepsy.

Conclusion

I will conclude with a brief account of the steps which should be taken in the investigation of a case of epilepsy. First and foremost there is the clinical history, including, of course, the family history, birth, neonatal symptoms, and past history, with special reference to any head injury, or encephalitis complicating one of the exanthemata, leading up to the description of the seizures, by patient and witness. Next comes the neurological and general examination. When this has been completed the distinction between central and partial epilepsy can very often be made on clinical grounds. It is, however, I think essential to have an E.E.G. in every case, for the combination of clinical and electrical data provides the surest basis for diagnosis and treatment. If the clinical and E.E.G. evidence agree in indicating the diagnosis of central epilepsy there is no need for radiographs of the skull, but in every case of partial epilepsy, or *when-ever there is any doubt*, radiographs should be taken. It is true that they will usually reveal nothing, but if this step is not taken the presence of a benign tumour may be missed, at a stage at which there are no symptoms of increased intracranial pressure or any abnormal physical signs—the stage, in fact, at which a benign tumour can be most safely removed. Many benign tumours of the kind which present with epileptic seizures contain areas of calcification; others may cause a shift of the calcified pineal, or erosion or thickening of bone. It has happened to me twice in the last three years to have encountered a patient in the early teens with seizures taking the form of attacks of unconsciousness, sometimes going on to generalized convulsive spasm, with no certain clue to the site of discharge, and without any other symptoms or signs, in which the radiograph revealed a calcified mass in the left temporal lobe. In each instance this proved to be a benign intraventricular tumour, which was successfully removed.

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A NEW TREATMENT OF BARBITURATE INTOXICATION

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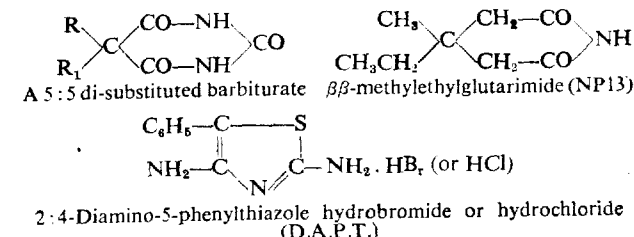
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The increasing popularity of barbiturates as suicidal agents has created a world-wide problem, and over the past decade the amount of barbiturate used on both sides of the Atlantic has more than trebled, while the incidence of barbiturate coma has increased fivefold (Nilsson, 1951; Locket and Angus, 1952; Clemmesen, 1954; Goldstein, 1947; Koppányi and Fazekas, 1950, 1952, 1954; Möller, 1954; *Lancet*, 1951, 1953; Goodman and Gilman, 1947). Until recently the over-all death rate from barbiturate intoxication treated with central analeptics of different types has remained steady at about 10%, increasing to over 20% in serious cases (defined by Nilsson as "one which has been in coma for 24 hours or in which complications are present"). This figure has now been reduced as a result of improved medical care (Nilsson, 1951; Locket and Angus, 1952; Clemmesen, 1954) and possibly, although to a much less extent, the more judicious use of the newer central analeptics (Koppányi and Fazekas, 1950, 1954; Eckenhoff *et al.*, 1949). We wish to discuss a new method of treatment incorporating the use of two new substances, $\beta\beta$ -methylthylglutarimide (NP13) and 2:4-diamino-5-phenylthiazole hydrobromide or hydrochloride (D.A.P.T.), which we feel should, when used in conjunction with good medical treatment, further reduce the death rate from this condition.

In our small series of 41 cases of pure barbiturate intoxication, of which nine were serious, there was one death, which we suggest was not due to the treatment, and we feel that the method has been promising enough to warrant further large-scale clinical trials.

The merit of the method lies in the fact that the more active agent, NP13, unlike the central analeptics in current use, appears to exert, in therapeutic doses at least, a direct antagonism to the offending barbiturate, and will readily restore the patient from a deep coma to a desired state of light anaesthesia—"the safe state"—from which spontaneous recovery to full consciousness usually occurs within eight hours. This removes the need for strict and prolonged medical and nursing care (Nilsson, 1951; Locket and Angus, 1952; Clemmesen, 1954; Möller, 1954) and virtually eliminates the risk of complications. The chemical structure of NP13 indicates a definite resemblance to the barbiturate ring system.

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D.A.P.T., itself a weak barbiturate antagonist, is, however, a good synergist to NP13 as well as an excellent respiratory stimulant. It greatly reduces the risk of toxic manifestations, which sometimes occur when NP13 alone is given rapidly and in high dosage. Both substances in therapeutic doses appear to cause a slight rise in blood pressure, and a large dose (75 mg.) given intravenously to a barbiturized patient has produced a large rise in blood pressure and sweating, suggesting a direct effect on the autonomic ganglia. However, both substances, especially NP13, in high dosage, and particularly if given rapidly, will cause convulsions in both barbiturized and normal animals (Benica and Wilson, 1950; Shaw *et al.*, 1954), and we have often deliberately induced convulsions in dogs several times in the course of a single experiment without the loss of an animal. However, full animal investigation (Shaw and Bentley, 1952; Shaw *et al.*, 1954) has indicated that these substances possess a high therapeutic index, and no signs of toxicity have been observed with the suggested method of treatment. Investigation of the mode of excretion of NP13 and estimations of the barbiturate content of the cerebrospinal fluid, blood, and urine of our patients were carried out in collaboration with N. E. W. McCallum, Department of Pathology, University of Melbourne. Preliminary work has shown that much of the NP13 is excreted in the urine unchanged.

Method of Treatment

The treatment suggested for cases of barbiturate intoxication consists of: (1) general medical treatment; and (2) specific treatment with NP13 and D.A.P.T.

1. General Medical Treatment

As our patients were returned fairly quickly (two hours) to the "safe state" we have been able to dispense with many of the elaborate procedures employed by Nilsson *et al.* in their prolonged management of the comatose patient. We have found the following minimal procedures satisfactory. A laryngoscope is passed in the casualty department to assess the pharyngeal and laryngeal reflexes. If these are absent a cuffed tube is inserted, and the stomach contents are carefully aspirated if the patient is treated within 4-5 hours of ingesting the barbiturate. Gastric lavage should not be performed (Möller, 1954; *Lancet*, 1951). An antibiotic "cover" should be employed. The patient is then transferred to the ward if necessary and a clear airway and adequate oxygenation are ensured. Close watch should be kept for complications.

2. Specific Treatment with NP13 and D.A.P.T.

This should preferably be given in the ward, and an emergency tray containing, amongst other things, 2.5% thiopentone sodium should be at hand in case the patient should show any idiosyncrasy to these drugs. The two drugs are administered in physiological saline in the following dilutions: NP13 0.5% (5 mg. per ml.) and D.A.P.T. 1.5% (15 mg. per ml.).

Preparation of Solutions.—NP13 is relatively insoluble in water at neutral pH and room temperature, and 0.5% approaches the maximum degree of solubility obtaining under

these conditions. This low solubility is not a disadvantage, as it minimizes the risk of overdosage. Of the crystalline powder 2.5 g. should be dissolved in 500 ml. of physiological saline at 80-90° C. The resulting colourless solution is autoclaved and is then ready for use. This solution appears to retain its activity for over three months.

D.A.P.T. decomposes on autoclaving when in solution, but is perfectly stable in the solid state; consequently 300 mg. of the dry sterilized powder is dissolved in 20 ml. of physiological saline as required. The resulting colourless solution is stable at room temperature for up to 24 hours.

Mode of Administration.—Our experience to date has led us to adopt the following procedures:

Set up a 5% glucose intravenous infusion (dextran if indicated) as a means of affording rapid action of the drugs.

Inject, by two separate (20-ml.) syringes, into the rubber tubing of the drip every three to five minutes, 1 ml. D.A.P.T. solution, followed immediately by 10 ml. NP13 solution. This probably allows more control than would direct infusion of the two solutions. Decrease these quantities by half if the patient's response should cause concern. The response is assessed by the following, noted after each injection: Pulse, respirations, blood pressure, tone, reflexes (knee, ankle, plantar withdrawal; the return of laryngeal and pharyngeal reflexes is judged by their effects on the endotracheal tube or, in its absence, by signs of swallowing and coughing); eye signs (movement, lacrimation, reaction of pupil to light); presence of voluntary movement, reaction to supraorbital pain stimulus (often misleading); phonation, state of peripheral circulation, colour and temperature of skin. These afford a good progress report of a patient's recovery.

Continue the injections until the patient is brought to the "safe state," denoted by a return of tone and reflexes (including pharyngeal and laryngeal). This is usually associated with groaning, voluntary movement, and return towards normal of pulse rate, respiratory rate, and blood pressure. The treatment generally takes about two hours in a deeply comatose patient. A total dose of 200 ml. (1.0 g.) NP13 solution and 20 ml. (0.3 g.) D.A.P.T. solution is usually adequate in most cases (see Tables I and II). No attempt should be made to wake the patient.

Once the "safe state" has been reached, remove the endotracheal tube and treat the patient as if recovering from light anaesthesia. Spontaneous recovery to full consciousness usually occurs within eight hours.

Signs of Toxicity

Vomiting or retching is usually the earliest, and may be the only, clinical sign of incipient toxicity. This may rarely be followed by slight flickers of the fingers. In bringing a barbiturized patient to the "safe state" toxic effects are unlikely unless the drugs are given more rapidly or in larger doses than suggested. Should they occur, however, treatment should be temporarily suspended, and, should they be severe, they may be readily reversed by a small intravenous dose of 2.5% thiopentone sodium. A more accurate indication of incipient toxicity is obtainable if the treatment is carried out under electroencephalographic control.

Regression

If after the patient has been brought to the "safe state" his condition regresses, further small treatments may be given as required (Cases 10, 12, 14, 15, 21, 24, 25, 35, 36, 39). Regression is more likely to occur when the coma has lasted a long time before treatment is started, or if the barbiturate concerned is a long-acting one (such as phenobarbitone).

Advantages

The rapid restoration of the comatose patient to the easily manageable "safe state" has three advantages: (1) It obviates the need for prolonged endotracheal intubation; (2) it minimizes both the immediate risk to the patient's life and the remote risk associated with possible complications

of prolonged barbiturate coma; and (3) it is valuable from the viewpoint of hospital economy in that it affords relief from prolonged and strict nursing.

Results of Treatment

Details of illustrative cases are presented in Table I, showing (a) the response to treatment with NP13 and D.A.P.T. of a patient suffering from an overdose of a short-acting barbiturate (Case 17); (b) the response in a patient with an overdose of a long-acting barbiturate (Case 18); (c) the response of a "serious case" (Cases 11 and 24); (d) regression (Case 24); and (e) the effects of NP13 overdosage (Cases 1 and 26). Table II gives a synopsis of the other cases treated.

The proportion of serious cases in our series (10, 11, 12, 15, 24, 25, 32, 35, 36) was about 25%. Eight patients (Cases 6, 7, 9, 19, 27, 30, 33, 34) presented a picture of light barbiturate coma and would probably have awakened spontaneously without specific therapy, although not nearly so quickly. We found phenobarbitone to be the most frequently ingested barbiturate, with "seconal" (quinalbarbitone), "carbrital" (phenobarbitone+carbromal), and "nembutal" (pentobarbitone) slightly less common. Our oldest patient was 84, the youngest 14. The longest periods of coma preceding treatment were 80 hours (Case 10) and 6 days (Case 32).

Nine patients were treated with NP13 alone (Cases 1-6, 8, 26, 37), and one (Case 33) with D.A.P.T. alone. Signs of overdosage were observed in four of our earliest cases (1, 2, 3, 26), and were due to administration of excessive doses of NP13 in an endeavour to restore complete consciousness immediately. The risk of overdosage was subsequently minimized by using a mixture of NP13 and D.A.P.T. and stopping when the patient had reached the "safe state."

This condition of overdosage, manifested by excessive excitement and restlessness on awaking, was effectively

reversed by sedation with paraldehyde or a barbiturate such as quinalbarbitone, amylobarbitone, or diallylbarbitone. No residual effects were encountered.

Thirty patients given a mixture of NP13 and D.A.P.T. (Cases 7, 9-25, 27, 30-32, 34-41) were readily brought to the "safe state," from which they awoke spontaneously, usually within eight hours. No toxic manifestations, either acute or chronic, followed.

Ten patients (Cases 10, 12, 14, 15, 21, 24, 25, 35, 36, 39) regressed and received more than one treatment. This generally followed (a) the ingestion of a large dose of barbiturate, usually of the long-acting variety, or (b) a long delay before specific treatment was started. In Case 14 the second treatment was purely diagnostic to assess the degree of regression.

The largest effective single dose of NP13 used in one treatment was 2.0 g. (Case 8), and of D.A.P.T. 0.62 g. (Case 12). The largest effective over-all dose of NP13 used in one patient was 5.49 g., and of D.A.P.T. 1.70 g. (Case 24).

The most reliable single sign of a favourable response was the plantar withdrawal reflex, its increased activity usually paralleling the patient's progressive recovery. The fact that NP13 has some analgesic properties of its own made the response to supraorbital pressure an unreliable index of recovery.

Our experience to date indicates that treatment with NP13 and D.A.P.T. is quickly effective in reversing the most severe respiratory and circulatory depression accompanying barbiturate intoxication. Indeed, on restoring the patient to the "safe state" the blood pressure, pulse rate, and respiratory rate usually return towards normal. The respirations, previously shallow, irregular, and sometimes stridulous, assume a deep, regular, and more even character. We have had no occasion to give vasopressor agents once the specific treatment has been instituted, and we feel that these should be

TABLE I.—Reports of Selected Cases of Barbiturate Intoxication

Case No.	Age and Sex	Agent and Quantity Taken	Duration of Coma before Treatment (Hours)	State before Specific Treatment	Total Specific Treatment (Dose in Grammes)	Dose (in Grammes) Required to Produce "Safe State"	State after Treatment	Comments
17	F 40	Quinalbarbitone 2 g.	5	P. 120, R. 22, B.P. 140/90. Atonia, areflexia, no response to supraorbital pressure. Pupils sluggish to light. Moist crepitations in chest	NP13 0.45 0.2 in 1 hour D.A.P.T. 0.2 in 1 hour	NP13 0.45 0.2 in 1 hour D.A.P.T. 0.2 in 1 hour	P. 80, R. 18, B.P. 170/110. Brisk reflexes, good tone. Tried to walk out of hospital; restrained. 4th day: Signed herself out. Routine tests: Only abnormality low serum potassium (3.6 mEq/l.). E.E.G.: Return to normal pattern, no signs of drug toxicity	No regression. Following morning: Feels well; rational; wants to go home; no signs of toxicity. 3rd day: Tried to walk out of hospital; restrained. 4th day: Signed herself out. Routine tests: Only abnormality low serum potassium (3.6 mEq/l.). E.E.G.: Return to normal pattern, no signs of drug toxicity
18	M 34	Phenobarbitone 3.3 g. + alcohol	7	P. 120, R. 26, B.P. 120/80. Knee reflexes slightly active only. Ankle clonus. Atonia, pupils fixed and unreactive. No response to supraorbital pressure. Peripheral return poor, rectal temp. 35° F. (35° C.)	1.8 0.57 in 3 hours	1.8 0.57 in 3 hours	P. 132, R. 24, B.P. 125/80. Reflexes brisk, good tone, swallowing, coughing, groaning, trying to get up, obeying orders. Pupils react briskly to light. Colour and peripheral return good	No regression. Quite conscious and trying to get up. Following morning: Talking rationally though a little dull; eating. 3rd day: Well, wants to go home, asks about wife; uneventful recovery. Routine tests: No abnormality detected. E.E.G.: Within normal limits
11	F 36	Butobarbitone 8.3 g.	17	P. 120, R. 6, B.P. 85/60. Cold and cyanosed. Atonia, areflexia, incontinent. Pupils irregular and fixed. No response to supraorbital pressure. Peripheral circulatory failure	3 doses of 9 mg. picotoin given 1-hourly produced transient return of reflexes 1.2 0.44 in 1½ hours	1.2 0.44 in 1½ hours	P. 110, R. 18, B.P. 110/80. Reflexes brisk, groaning, voluntary movement of head and body, good tone, brisk pupillary light reflex	No regression. 6 hours later: Co operative, speaking, obeying orders. 2nd day: Tried to walk out of hospital; restrained. 3rd day: Discharged for psychiatric treatment. Routine tests: Only abnormality low serum potassium (3.3 mEq/l.). E.E.G.: Normal tracing on day of discharge
24	F 47	Phenobarbitone 7 g.	30	P. 80 (weak), R. 10, B.P. 50/20. Areflexia, atonia, fixed pupils. No response to supraorbital pressure. Cyanosed, peripheral circulatory failure, chemotic conjunctivae	(1) 0.9 0.15 in 2 hours	0.9 0.15 in 2 hours	P. 90, R. 32, B.P. 95/60. Some reflexes present. Patient spastic. Respirations good depth and regular, full pulse	Patient returned from critical toward safe state. Regressed. Given further treatment on 2nd day (2)

TABLE I.—continued

Case No.	Age and Sex	Agent and Quantity Taken	Duration of Coma before Treatment (Hours)	State before Specific Treatment	Total Specific Treatment (Dose in Grammes)	Dose (in Grammes) Required to Produce "Safe State"	State after Treatment	Comments
24	(continued)			P. 108, R. 16, B.P. 75/50. Areflexia, atonia, fixed pupils. Slight cyanosis and poor peripheral return. No response to supraorbital pressure	NP13 1.35 0.57 in 2½ hours D.A.P.T. 0.57 in 2½ hours	NP13 1.35 0.57 in 2½ hours D.A.P.T. 0.57 in 2½ hours	P. 108, R. 24, B.P. 90/55, T. 99° F. (37.2° C.). Reflexes present, fair tone, good plantar response. Good peripheral return. No cyanosis. Swallowing. No response to supraorbital pressure. Brisk pupillary light reflex	5 hours later: Some regression; "intra-dex" substituted for 5% glucose. 10 hours later: Developing R. basal pneumonia; T. 101.5° F. (38.6° C.). Has allergic penicillin rash. Given aureomycin. Regressed. Given further treatment (3)
				P. 128, R. 26, B.P. 80/60. Atonia, areflexia, slight pupillary reflex. No response to supraorbital pressure. Peripheral return adequate	(3) 0.5 0.15 in 45 minutes	0.5 0.15 in 45 minutes	P. 132, R. 28, B.P. 90/60. As in (2) above. Conjunctivae still chemotic. Response to supraorbital pressure	3rd day: Again some regression. Forced cough occasionally present. Oral therapy by Ryle's tube. Right chest consolidated. Regressed again on 4th day. Given further treatment (4)
				P. 92, R. 18, B.P. 60/35. Atonia, areflexia, mildly cyanosed. Poor peripheral return. Right lung consolidated, some dullness left base	(4) 0.95 0.29 in 1½ hours	0.95 0.29 in 1½ hours	P. 96, R. 16, B.P. 110/65. Active reflexes, good tone. Swallowing, moving jaw. Colour peripheral return good. No response to supraorbital pressure	6 hours later: Slight regression, but B.P. 125/70. Regression on 5th day. Given further treatment (5)
				P. 108, R. 18, B.P. 110/65. Sluggish reflexes slight tone; pupillary reflex good. Right chest still consolidated. No response to supraorbital pressure	(5) 0.3 0.1 in 40 minutes	0.3 0.1 in 40 minutes	P. 100, R. 15, B.P. 120/75. Brisk reflexes, good tone. Definite response to supraorbital pressure, swallowing and chewing. Raising eyelids. Colour and peripheral return good	6 hours later (6th day): Some regression, but condition satisfactory; good urinary output. Given further treatment (6)
				P. 100, R. 18, B.P. 115/75. Decreased reflex response, slight tone. No response to supraorbital pressure. Colour and peripheral return good	(6) 0.45 0.14 in 45 minutes	0.45 0.14 in 45 minutes	P. 84, R. 18, B.P. 125/65. Brisk reflexes and good tone; yawning, coughing, swallowing, moving jaw and eyelids. Groaning. Marked response to supraorbital pressure	14 hours later (7th day): Some regression, but condition satisfactory. Given further treatment (7)
				P. 108, R. 25, B.P. 115/65. Decreased tone and reflexes. No response to supraorbital pressure. Colour and peripheral return good. Right lung still fully consolidated	(7) 0.65 0.19 in 55 minutes	0.65 0.19 in 55 minutes	P. 108, R. 22, B.P. 135/75. Brisk reflexes, good tone; swallowing, coughing, moving jaw, and opening eyes. Groaning	Large quantities of barbiturate still present in urine. 15 hours later: Some regression. Given further treatment (8). Patient started menstruating. Serum electrolytes: Sodium 139 mEq/l.; potassium 3.4 mEq/l.; proteins, 6 g.%; pH of serum 7.4. Given 8 g. KCl per day
				P. 84, R. 22, B.P. 120/65. Decreased tone and reflexes. Some response to supraorbital pressure. Colour and peripheral return good	(8) 0.25 0.08 in 30 minutes	0.25 0.08 in 30 minutes	P. 104, R. 20, B.P. 135/75. Brisk reflexes, good tone, coughing more strongly. Opening eyes and rejecting oral airway. Groans on supraorbital pressure	Pneumonia resolving; slow progress over next 2 days. Still much barbiturate in urine. Further treatment next day (9)
				P. 108, R. 16, B.P. 105/60. Decreased tone and reflexes. Groaning on supraorbital pressure	(9) 0.15 0.04 in 15 minutes	0.15 0.04 in 15 minutes	P. 112, R. 16, B.P. 120/65. Brisk reflexes, good tone. Obeying orders and trying to talk in a slurred voice; moving head and biting airway	No regression; patient talking rationally on 12th day. Very weak. Eating. No apparent residual cortical damage. Good insight into domestic problems. Chest almost clear. Slow progress and uneventful recovery
1	F 26	Cyclobarbitone 3.6 g.	2	P. 88, R. 18, B.P. 105/90. Atonia, areflexia, pupils sluggish to light, no reaction to supraorbital pressure	1.75 in 95 minutes	0.25 0.35 in 20-30 minutes	P. 92, R. 18, B.P. 115/80. Restless, moaning, retching; brisk reflexes	Patient overdosed, required paraldehyde after 8 hours. 2nd day: Still restless and confused. 3rd day: Quieter. 4th day: Normal, no after-effects
26		Voluntary patient given 0.75 g. sodium pentobarbitone under E.E.G. control	1	P. 84, R. 12. Decreased tone, depressed reflexes, some intercostal paralysis. Slight response to supraorbital pressure	1.0 in 30 minutes	0.3 —	Reflexes exaggerated, groaning, moving whole body and opening eyes. Flushed, vomiting. Did not wake completely	3 hours later: Flushed, irritable, dizzy, confused; rambling speech. Reflexes exaggerated, tossing in bed, slight muscular twitches of fingers, arms, and isolated facial muscles. P. 92, R. 14, B.P. 100/70. Patient presented with picture of cerebral irritation due to NP13 overdosage. Sedated with paraldehyde, "sodium amytal," and "luminal." Took 2 days to return to normal. There were no residual after-effects, but there was amnesia for the event. E.E.G.: The "spikes" indicative of incipient NP13 toxicity were initially hidden by muscle spikes and appeared only later, whereupon NP13 was stopped

TABLE II.—Summary of Other Cases Treated

Case No.	Age (Years) and Sex	Agent and Quantity Taken	Duration of Coma before Treatment Started (Hours)	Complications Present	Regression Present	No. of Treatments Given	Total Dose (grammes)	Comments
2	F 38	Quinalbarbitone ? dose	6	Nil	—	1	NP13 D.A.P.T. 1.8 in 90 minutes	One of our earliest cases. Patient overdosed. At safe state with 0.5 g. Restless 3 days
3	M 54	"Sedormid" ? dose	14	"	—	1	0.75 in 45 minutes	Overdosed. Safe state with 0.4 g. Restless 3 days
4	F 21	Phenobarbitone ? dose	13	"	—	1	0.45 in 2½ hours	Some regression 6 hours later, but uneventful recovery
5	F 14	Phenobarbitone ? dose (7 also small amount of bromide or paraldehyde)	11	"	—	1	0.6 in 2 hours	No regression or signs of toxicity. Uneventful recovery
6	F 27	"Carbital" ? dose	9	"	—	1	1.7 in 1½ hours	Awake 1 hour later. Uneventful recovery
7	F 44	Quinalbarbitone 1.6 g.	7	"	—	1	0.43 0.1 in 2 hours	No signs of toxicity. E.E.G. 3 days later, normal rhythm
8	M 28	Phenobarbitone ? dose	?	"	—	1	2.0 in 50 minutes	Completely conscious after 2 days. Uneventful recovery. Some signs of toxicity due to rapid administration
9	F 32	"Carbital" (pentobarbitone sodium 1 g., carbromal 2.7 g.)	4	"	—	1	0.3 0.18 in 25 minutes	Well next day. No signs of toxicity
10	F 49	"Carbital" and phenobarbitone ? dose	80	Bronchopneumonia and peripheral circulatory failure	Yes	2	0.9 0.5	2nd day co-operative; 5 days later approaching normal
12	M 84	?	?	Bronchopneumonia	"	2	2.1 0.77	Conscious 2nd day, talking 3rd day, normal 5th day
13	F 28	Bromvaletone 20 g.	12	Nil	—	1	0.7 0.3 in 1½ hours	Uneventful recovery next day
14	M 42	"Carbital" (pentobarbitone sodium 3 g., carbromal 8 g.). Phenobarbitone ? dose	12	"	Yes	2	0.4 0.57	Uneventful recovery
15	F 49	Phenobarbitone 5 g.	12	Peripheral circulatory failure	"	4	1.55 0.63	Patient took 5 days to return to normal. No after-effects
16	F 23	Quinalbarbitone 2.5 g.	?	Nil	—	1	0.8 0.3 in 2 hours	Well next day. Uneventful recovery
19	M 25	"Carbital" (pentobarbitone sodium 3 g., carbromal 8 g.)	13	"	—	1	0.4 0.12 in 40 minutes	" " " " " "
20	F 46	Butobarbitone 2.4 g.	14	"	—	1	0.25 0.1 in 30 minutes	" " " " " "
21	F 50	Phenobarbitone 6.5 g.	3	"	Yes	3	0.85 0.45	Patient took 5 days to return to normal. No after-effects
22	F 22	"Carbital" (pentobarbitone sodium 1 g., carbromal 3 g.)	8	"	—	1	0.6 0.18 in 1½ hours	Well next day. Uneventful recovery
23	F 28	"Carbital" (pentobarbitone sodium 2 g., carbromal 5.6 g.)	3	"	—	1	0.5 0.17 in 1½ hours	" " " " " "
25	M 57	Phenobarbitone 3 g.	30	Peripheral circulatory failure. On nor-adrenaline drip	Yes	4	1.85 0.63	Conscious after 5 days. Slow subsequent uneventful recovery
27	M 50	Given phenobarbitone sodium 1.4 g. in an attempt to control hiccup over 5 days	—	—	—	1	0.13 0.1 in 20 minutes	Patient initially drowsy, quickly recovered. Subsequent regression, return of hiccups
30	M 53	Pentobarbitone sodium 2.5 g.	7	Nil	—	1	0.3 0.1 in 45 minutes	Uneventful quick recovery
31	F 54	"Carbital" (pentobarbitone sodium 2 g., carbromal 5.5 g.)	10	"	—	1	0.5 0.15 in 1½ hours	Quick response, uneventful recovery
32	F 64	Phenobarbitone ? dose	6 days	Early pneumonia	—	1	0.2 0.08 in 20 minutes	Patient not very deep; quick response. Took 3-4 days for full recovery
33	F 38	Quinalbarbitone sodium 3 g.	12	Nil	—	1	— 0.18 over 30 minutes	Patient in light coma at start of treatment. Quick response; no regression; uneventful recovery
34	M 36	Pentobarbitone sodium ? dose	14	"	—	1	0.15 0.05 over 15 minutes	Patient bright when treatment started. Quick response, uneventful recovery
35	M 65	Phenobarbitone 6 g.	Over 24	Early bronchopneumonia and peripheral circulatory failure	Yes	2	0.95 0.3	Very ill. Good response to safe state with 1st treatment. Regressed. Not fully recovered for 5 days
36	M 57	Phenobarbitone 3 g.	30	Peripheral circulatory failure. Put on noradrenaline drip before specific treatment started	"	4	0.9 0.33	Very ill. Initial response good, but regressed. Not fully recovered for 5 days
37	F 45	"Carbital" (pentobarbitone sodium 1.5 g., carbromal 3.5 g.)	6	Nil	—	1	0.25 in 30 minutes	In deep coma on admission. Recovered suddenly; sat up and talked. No regression; uneventful recovery
38	M 33	Pentobarbitone sodium ? dose	About 12	"	—	1	0.23 0.24 in 35 minutes	Quick response, uneventful recovery
39	F 66	Phenobarbitone ? dose	12-18	"	Yes	3	3.0 0.69	Patient in deep coma on admission. Regressed. Not fully recovered for 7 days
40	M 56	"Sedormid" ? dose	About 6	"	—	1	0.65 0.15 in 40 minutes	Suddenly recovered. Confused and restless. Uneventful recovery
41	F 46	Pentobarbitone sodium 5 g.	17	Peripheral circulatory failure	—	1	0.2 0.3 (given ammonium β -methyl-ethylglutamate acid 0.7 g. over 3 hours initially)	The ammonium salt afforded some lightening of the coma, but gave rise to symptoms of cerebral irritation. Subsequent NP13 gave rapid, uneventful recovery
29	F 61	"Carbital" (pentobarbitone sodium 5 g., carbromal 12 g.)	12	Nil	Yes	2	1.0 0.3 Over 3 hours	The only fatality in the series. See text for case report

used only as supportive measures during the initial acute phase of the coma pending the start of treatment.

NP13 has been used to advantage as an aid in the differential diagnosis of cerebrovascular accident and barbiturate intoxication in a patient whose condition was rapidly deteriorating and in whom no localizing signs were present (Case 28).

Control electroencephalograms (E.E.G.s) were taken in three patients (Cases 11, 15, 22) and one volunteer (Case 26). In ten other cases (7, 10, 16-23) recordings were made at the end of treatment. The volunteer was given an overdose of NP13 in an endeavour to effect immediate and complete awakening, and the E.E.G. showed the characteristic spikes of cerebral irritation. The remaining patients all received a mixture of NP13 and D.A.P.T. In the cases under E.E.G. control treatment was stopped either before, or as soon as, there was any suggestion of sharp wave activity. All records taken after termination of therapy showed varying degrees of abnormality indicated by slow or increased low-voltage fast activity. Serial records revealed a gradual disappearance of these abnormalities. Complete clinical recovery was usually apparent for some time before the E.E.G. pattern became normal, especially in patients who had taken long-acting barbiturates.

Routine investigations were carried out in 14 cases (10, 11, 12, 14-23, 25) during the week following recovery. These included tests of renal and liver function, full blood count, naked-eye and microscopical examination of cerebrospinal fluid, electrocardiography, and estimation of serum electrolyte balance. The only abnormality detected in seven cases (11, 15-17, 20-22) was a low serum potassium value of the order of 3.5 mEq per litre. This was occasionally accompanied by a concomitant imbalance of the other ions.

Case 24 deserves special mention. This patient (probably the most seriously ill patient in our series) was comatose for ten days, and during this period was given nine consecutive treatments with NP13 and D.A.P.T., with eventual restoration to full consciousness. Her subsequent rehabilitation was slow and uneventful. We followed this procedure as we felt that the patient's severe and prolonged coma was in part due to a secondary cerebral hypoxia of hypotensive origin superimposed on the primary barbiturate hypoxia. We were therefore disinclined to give more than minimally adequate doses of NP13 and D.A.P.T. (to maintain the "safe state"), to avoid the risk of excessively stimulating an already overburdened nervous apparatus and mechanism. An adequate blood pressure and high renal output were maintained throughout. Large quantities of barbiturate were still being excreted in the urine seven or eight days after the coma began.

One patient (Case 29) died, but death was not thought to be due to the specific treatment. Details of this case follow.

Report of a Fatal Case

A woman aged 61 took 50 "carbital" capsules (containing 5 g. pentobarbitone sodium and 12 g. carbromal) about 12 hours before treatment was instituted. On admission: pulse rate 72 per minute; shallow, irregular respirations (rate 32 per minute); blood pressure 120/70 mm. Hg. No reflexes could be elicited. She was atonic, hypothermic (temperature 95° F.—35° C.), and unresponsive to painful stimuli, with unreactive pupils and a poor peripheral return. She was given 1 g. NP13 and 0.3 g. D.A.P.T. in two treatments over three hours. There was a rapid return of reflexes and some response to painful stimuli, but facial twitches suddenly developed and there were signs of respiratory depression. The twitching was quickly controlled with thiopentone sodium; the patient was intubated and artificial respiration started. Owing to a fault in the circuit the patient rebreathed air with a high CO₂ content for several hours before it was discovered. When, eight hours later, in an attempt to promote normal respiration, a small dose of D.A.P.T. (60 mg.) was given in divided doses over 12 minutes, the patient had a unilateral left-sided epileptiform convulsion which 0.4 g. thiopentone sodium failed to

control. Lumbar puncture gave a blood-stained cerebrospinal fluid with a protein content of 1,600 mg. per 100 ml. and showing xanthochromia on sedimentation of the red cells. There were no localizing signs of a cerebro-vascular episode.

In spite of prolonged artificial respiration following tracheotomy and the administration of a continuous nor-adrenaline drip, the blood pressure progressively fell and the patient died.

Significant Post-mortem Findings.—The skull was normal. The arteries to the brain were well preserved and showed minimal atheroma. In the middle cranial fossa there was a little brownish-yellow staining of the dura. Over the parietal surface of the left cerebral hemisphere there was a very small localized area of subarachnoid bleeding, not sufficiently marked to lift the membrane off the brain; there was also a very small amount of subdural bleeding in this area. The brain did not show evidence of compression; it was symmetrical and the convolutions appeared normal. On routine serial section of the substance of the brain no naked-eye abnormality was detected. There was no bruising or evidence of injury on the scalp. The coronary vessels showed marked thickening and calcification. The heart was a little enlarged. No infarction or scarring was visible in the heart wall. There was patchy atheroma of the aorta. Both lungs showed extensive consolidation and waterlogging. The liver and kidney contained $\frac{1}{2}$ gr. of carbromal and 1/10 gr. of pentobarbitone per lb. (124 and 14 mg. per kg.).

Discussion

There are at present two schools of thought as to the treatment of acute barbiturate intoxication. Both agree that the basis of good management is thorough and intelligent medical care. They are, however, at variance regarding the concomitant use of central analeptics, of which only picrotoxin, leptazol, "geastimol," and occasionally amphetamine and nikethamide are in present-day use.

The conservative school is led by Nilsson, who regards acute barbiturate intoxication as "an anaesthesia which is drawn out to last for days instead of lasting, like a common so-called surgical anaesthesia, for at most a few hours," and who therefore treats the condition "in accordance with anaesthesiological principles." Nilsson (mortality rate 2-3%), Locket and Angus (mortality rate 3-4%), and Clemmesen (mortality rate 1.6%) relied solely on a carefully planned medical regimen. None used central analeptics, and indeed all stressed the dangers involved in their use. Their excellent results afford strong support for their expectant routine of treatment.

This mode of management has been criticized by the protagonists of the analeptic school of treatment led by Koppányi and Fazekas (1952), who insist that there is still a definite place for central analeptics, especially in cases of severe barbiturate intoxication.

In the absence of adequate information concerning the mode of action of central analeptics (Eckenhoff *et al.*, 1949), and in the presence of many animal experiments (Maloney, 1935, 1936; Mousel and Essex, 1941; Schmidt, 1945; Davis *et al.*, 1944) and clinical data (Nilsson, 1951; Locket and Angus, 1952; Clemmesen, 1954) indicating the dangers involved in their use, we find ourselves drawn more closely to the conservative school of treatment led by Nilsson. There appear to be, however, two disadvantages to this conservative management. (1) One can never be sure, with a patient in deep barbiturate coma, if and when he will regain consciousness, and if and when complications which could alter the whole outlook of the case will develop. Naturally, the more prolonged the coma the greater would be the risk of this occurring, despite the most scrupulous medical care. (2) The management of a case of prolonged barbiturate coma presents a serious problem in a busy overcrowded hospital. Our new method of treatment helps by bringing such a patient in two hours to a desired state of light anaesthesia—the "safe state"—from which

spontaneous recovery to full consciousness usually occurs within eight hours. It thus removes the immediate risk to the patient's life, prevents the onset of complications often associated with prolonged barbiturate coma, and also promotes a speedier discharge from hospital. We do not attempt to restore full consciousness, for not only have we found this to be impossible in many cases, but there is also the risk, especially when using NP13 alone, of producing an excited, irritable patient who often needs prolonged sedation. Our inability to awaken the patient fully may be due to a concomitant cerebral hypoxia and disordered cerebral metabolism resulting from the prolonged action of the barbiturate (Bailey *et al.*, 1953; Bain, 1952; Brody and Bain, 1954), and naturally time must be allowed for restitution to normal.

We have previously suggested that NP13 in therapeutic doses may exert a direct antagonism to the barbiturate, as indicated by the fact that rabbits can be put to sleep or awakened almost at will by the alternate intravenous administration of thiopentone sodium and NP13. This change can be rapidly and repeatedly effected without any apparent harm to the animal. The antagonism is further supported by our observations, both in patients suffering from deep barbiturate coma and in dogs under deep pentobarbitone anaesthesia, of a rapid clinical and somewhat slower encephalographic recovery to the unnarcotized state after the administration of NP13 or a mixture of NP13 and D.A.P.T. This is in direct contrast to the findings of most workers, who agree, on both clinical and experimental grounds, that all of the central analeptics in current use, except possibly picrotoxin, are of little value in the treatment of deep barbiturate coma. It is also in direct contrast to the observations of Mousel and Essex (1941), who found that nikethamide, leptazol, picrotoxin, α -lobeline, and geastimol all failed to produce demonstrable change in the E.E.G. of dogs deeply anaesthetized with amytal.

Present evidence suggests that NP13 is the best substance yet used in the treatment of barbiturate coma, and in combination with D.A.P.T. should ensure a quick, safe recovery without risk of convulsions and secondary depression, which often follow treatment with central analeptics.

Finally we wish to emphasize the value of D.A.P.T. not only as a barbiturate antagonist, but also as a potent, non-specific respiratory stimulant. This latter property has been specially important in the management of barbiturate coma where pneumonic complications have supervened. We elsewhere (Shulman and Shaw, 1955) suggest other clinical uses for D.A.P.T., especially in relieving prolonged and severe pain and in the fields of anaesthesia and obstetrics.

Summary

A new method of treating acute barbiturate intoxication, incorporating the use of two new substances— $\beta\beta$ -methyleneethylglutarimide (NP13) and 2:4-diamino-5-phenylthiazole hydrobromide or hydrochloride (D.A.P.T.)—has been outlined. It compares more than favourably with other methods in that it minimizes the risk of complications and removes the need for strict and prolonged medical and nursing care without incurring the risk of convulsions and secondary depression sometimes accompanying treatment with analeptics.

Animal and clinical investigations have revealed that NP13 and D.A.P.T. possess a high therapeutic index and quickly relieve the acute phase of severe barbiturate coma, whereby the patient is deliberately restored to an easily manageable state of light anaesthesia—the "safe state," from which spontaneous recovery to full consciousness usually occurs within eight hours.

The pharmacology of NP13 and D.A.P.T. has been briefly described, and evidence presented to suggest that NP13, which has a structural resemblance to the barbiturate ring system, may exert its effect by a direct antagonism to the offending barbiturate.

Results of treatment with these drugs in 41 cases of barbiturate intoxication have been summarized.

It is suggested that these substances may provide an effective means of controlling anaesthesia induced by barbiturates, both in enabling a rapid recovery to the conscious state where desired and in counteracting any emergency such as laryngeal spasm.

The value of D.A.P.T. as a non-specific respiratory stimulant is pointed out and suggestions are made as to its further clinical use.

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The role of the family doctor in research was discussed by Professor J. M. MACKINTOSH in the first John Matheson Shaw lecture, delivered at the Royal College of Physicians of Edinburgh last November. Tracing the history of the general practitioner through the nineteenth century, Professor Mackintosh showed that it was not until the end of that period that research by general practitioners came to be taken seriously. To-day the College of General Practitioners can guide his investigations, making his contribution part of a large survey, and the Public Health Laboratory Services provide him with facilities he used to lack. In several fields the family doctor has an advantage over the specialist; with his knowledge of family background perhaps extending over two or three generations, he can report on hereditary defects; again, the knowledge of background and environment is vital to a study of mental illness and stress diseases. The effectiveness of new drugs and vaccines, the epidemiology of common ailments, the incubation periods of well-known infections can all be studied best in general practice, and "we all know that the family doctor is the only medical worker to-day to see disease in its early stages." Professor Mackintosh suggested that the chief obstacle to general-practitioner research lay in the defective undergraduate training, which did not, for instance, include even elementary statistics, and the chief incentive is the co-operation between doctors and the College of General Practitioners.

MEGALOBlastic ANAEMIA OF PREGNANCY AND THE PUERPERIUM

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Investigation of patients with megaloblastic anaemia of pregnancy and the puerperium is handicapped by the urgency with which treatment must be carried out and by the tendency of the anaemia to remit spontaneously after delivery. Strauss and Castle (1933) suggested that this anaemia was due to a temporary reduction in the secretion of intrinsic factor, but the failure of parenteral liver extracts and vitamin B₁₂ to bring about remission in most cases has made it clear that this cannot be the only explanation. Three cases have been described in which defective absorption of fat was discovered on subsequent admission to hospital (Davidson, 1948; Tuck and Whittaker, 1950; Thompson and Ungley, 1951), and Tuck and Whittaker (1950) have proposed that, in some instances at least, the underlying mechanism may be an occult idiopathic steatorrhoea, which is unmasked by pregnancy. In the present observations on nine patients, particular attention has been directed to the detection of abnormalities of gastric secretion and defects of the absorption of fat and labelled vitamin B₁₂ from the intestine. We show that there was no evidence of reduction in the secretion of intrinsic factor or in the absorption of fat in these patients.

Clinical Features

The salient clinical features are presented in Table I. Four women were investigated before term and the remaining five were seen after delivery; in all cases the diagnosis was confirmed by finding megaloblastic changes in the sternal marrow. Of particular interest is the high incidence of complications such as vomiting, diarrhoea, and haemorrhage, which might tend to decrease the supply of or increase the demand for haemopoietic factors during pregnancy and the puerperium. The tongue was sore in three patients. There was atrophy of the papillae in four patients—complete in

two and confined to the edge of the tongue in two. Aphthous ulcers were present in four patients, three of whom had leucopenia. The spleen was palpable in two patients, in whom the level of haemoglobin was less than 5 g. No neurological abnormality was detected in any of the patients.

Treatment was with folic acid by mouth or vitamin B₁₂ by injection. Folic acid was given in a dose of 20 mg. daily. Vitamin B₁₂ was given on a single day only, in a dosage of 2,000 μ g.; this was the "flushing dose" which was employed in measuring the excretion of labelled vitamin B₁₂ in the urine. In Case 8 only 100 μ g. of vitamin B₁₂ was given.

Of the three patients seen three weeks or more before delivery, one responded well to folic acid alone, another failed to respond to vitamin B₁₂ but subsequently improved with folic acid, and the third showed no improvement up to the time of delivery with combined folic acid and vitamin B₁₂ therapy. A fourth patient was treated with vitamin B₁₂ and folic acid one week before delivery without apparent effect, but gradual improvement occurred during the puerperium.

In three patients the diagnosis was made early in the puerperium. An optimal response followed treatment with vitamin B₁₂ in one and folic acid in another. The third received both vitamin B₁₂ and folic acid, and showed a progressive increase in haemoglobin, although the reticulocytes did not rise above 3%. Since spontaneous remission is common following delivery, it is not certain that these responses were due to specific therapy.

Two patients were seen with severe anaemia six weeks after delivery. There was no response to vitamin B₁₂ over a period of eight days in Case 8, but prompt symptomatic and haematological remission followed the administration of folic acid. Case 9 was transfused initially and then treated with vitamin B₁₂ with an optimal reticulocytosis and rise in haemoglobin and the haematocrit reading.

Special Investigations

(A) Methods

1. *Gastric Secretion.*—Gastric acidity was measured directly in seven subjects and indirectly by the "diagnex" technique (Conway and Meikle, 1953) in one (Case 5). In two patients free acid was found in the resting juice and no stimulant was given. Fractional test-meal examinations were carried out on four patients with histamine and one patient with gruel. The urinary excretion of uropepsinogen over a 24-hour period was measured in seven subjects (Aitken *et al.*, 1951).

2. *Gastric Biopsy.*—Biopsy of the gastric mucous membrane was carried out in four patients, using Wood's flexible gastric biopsy tube (Wood *et al.*, 1949).

3. *Absorption of Vitamin B₁₂.*—The absorption of vitamin B₁₂ was tested by measuring the amount of radioactivity which was found in the faeces after an oral dose of 0.5 μ g. of vitamin B₁₂ labelled with cobalt⁶⁰ (Heinle *et al.*, 1952). This gave an indirect assessment of the secretion of

TABLE I

Case	Age	Previous Pregnancies	Diagnosis of Anaemia	Complicating Features	Hb Before Therapy (g./100 ml.)	Response to Therapy
1	22	4	Ante partum 4 weeks	Fifth pregnancy within 5 years	4.6	Transfused—Hb 6.8 g. Folic acid—good response
2	18	0	Ante partum 4 weeks	Twin pregnancy	9.8	B ₁₂ —no response 14 days. Folic acid—good response
3	20	0	Ante partum 3 weeks	Vomiting and anorexia throughout pregnancy	9.9	B ₁₂ and folic acid—no improvement up to time of delivery
4	23	1	Ante partum 1 week	Poor diet; hypertension	10.3	B ₁₂ and folic acid—no reticulocytosis, improved post partum
5	34	2	Post partum 1 week	Very poor diet; appendicectomy in first trimester	8.9	B ₁₂ —good response
6	28	2	Post partum 2 weeks	Anorexia, diarrhoea, mild toxæmia, and post-partum haemorrhage	3.9	Transfused—Hb 9.7 g. Folic acid—good response
7	20	2	Post partum 1 week	Post-partum haemorrhage; third pregnancy in 3 years	9.2	B ₁₂ and folic acid—moderate rise Hb, reticulocytosis 3%
8	22	0	Post partum 6 weeks	Post-partum vomiting; puerperal fever—endometritis	5.3	B ₁₂ —no response 8 days. Folic acid—good response
9	29	1	Post partum 6 weeks	Ante-partum diarrhoea; breast abscess first week post partum	4.7	Transfused—Hb 9.6 g. B ₁₂ —good response

intrinsic factor. In six patients a parenteral injection of 2,000 μ g. of non-radioactive vitamin B₁₂ was given with the oral dose in order to rid the body of as much of the absorbed radioactivity as possible (Schilling, 1953). Normally 15% or more of the oral dose of 0.5 μ g. of Co⁶⁰-vitamin B₁₂ is excreted in the urine with this technique (Callender and Evans, 1955). The collection of stools was incomplete in Case 3, and only the radioactivity in the urine was measured.

4. *Absorption of Fat*.—The absorption of fat was estimated in six of the subjects by a four-day fat balance with a measured dietary intake of 70 to 100 g. of fat daily.

5. *Serum Vitamin B₁₂*.—The level of vitamin B₁₂ in the serum was determined by microbiological assay, in two cases with *Euglena gracilis* and in four cases with *Lactobacillus leichmannii*.

TABLE II

Patient	Free Acid in Gastric Juice	Uropepsinogen Excretion (Units/24 hr.)	Percentage of Oral Dose of Co ⁶⁰ -vitamin B ₁₂ in Faeces	Fat Absorption (% of Dietary Intake)	Serum Vitamin B ₁₂ (μ g./ml.)
Normal values		50+	9-47	90+	100+
1	0	140	30; 17	—	—
2*	+	9	18	91	430
3	Not tested	—	(23)†	—	—
4	+	116	28	95	140; 110
5*	+	310	16	96	310
6*	0	161	42; 33	—	—
7	+	132	28	96	260
8*	+	164	36	95	190; 175
9	+	48	28	96	220

* Gastric biopsy. † Radioactivity in urine.

(B) Results (Table II)

1. *Gastric Secretion*.—The fractional test meal revealed achlorhydria in two patients, but in one of these (Case 1) the uropepsinogen excretion was within normal limits, and in the other (Case 6) the biopsy showed no atrophy of the gastric body glands. Uropepsinogen excretion was low in two patients, within the range encountered in pernicious anaemia, but in both of them free acid was present in the gastric juice.

2. *Gastric Biopsy*.—Histological examination of the gastric mucosa revealed no abnormality. There was evidence of superficial gastritis in Case 6, but no atrophy of the gastric body glands was noted.

3. *Absorption of Vitamin B₁₂*.—The absorption of vitamin B₁₂ was normal in all nine patients, implying that the secretion of intrinsic factor was adequate.

4. *Absorption of Fat*.—The absorption of fat was within normal limits in the six patients tested. The low normal result on the basis of a four-day fat balance does not absolutely exclude the possibility of steatorrhoea in Case 2.

5. *Serum Vitamin B₁₂*.—Normal quantities of vitamin B₁₂ were present in the serum of five patients. The values in Case 4 are just above the range observed in untreated pernicious anaemia, and might be explained by the grossly inadequate diet which she took throughout her two pregnancies and the intervening period.

Discussion

The preceding investigations do not provide conclusive evidence of the nature of the disturbance of haemopoiesis in megaloblastic anaemia of pregnancy and the puerperium or of its pathogenesis. The secretion of intrinsic factor, as determined by the absorption of radioactive vitamin B₁₂, was normal and there is therefore no support for the theories of Strauss and Castle (1933). The absorption of fat was also normal in our patients, as it was in six cases of megaloblastic anaemia of pregnancy recently studied by Moore *et al.* (1955). It must therefore be concluded that, though megaloblastic anaemia in pregnancy may occasionally be due to adult coeliac disease, this is by no means a common cause.

Although the absorption of vitamin B₁₂ is normal the possibility exists of a deficiency of the vitamin in the diet. This is probably not uncommon in India (Das Gupta, 1954), and it has been described in Europe. Nieweg *et al.* (1954) report two patients responding to vitamin B₁₂ therapy in whom the evidence favours a deficiency of the vitamin. In one the serum vitamin B₁₂ was very low (40 μ g. per ml.), and in the other the blood folic acid was normal. In 20% of a group of patients studied during pregnancy and lactation, Heinrich (1954) found low serum vitamin B₁₂ levels and reduced excretion of vitamin B₁₂ in the urine, although there was no evidence of macrocytic anaemia. Oral administration of vitamin B₁₂ was effective in restoring normal serum levels and urinary excretion in these patients, and Heinrich suggested the existence of a state of hypovitaminosis-B₁₂ due to increased demands for the vitamin during pregnancy and lactation.

However, Mollin and Ross (1954) report serum vitamin B₁₂ levels in 31 cases of megaloblastic anaemia of pregnancy and the puerperium, and in only two were the levels as low as is seen in untreated cases of pernicious anaemia. In our cases, likewise, the level of vitamin B₁₂ in the serum was within normal limits. Hence it would appear that, although vitamin-B₁₂ deficiency may occur in Europe, it is not commonly responsible for the development of megaloblastic anaemia in pregnancy. In the two women who improved with vitamin B₁₂ therapy in the present series the response may have been mediated by some indirect mechanism, related to the massive size of the dose, for in both of them the serum levels of vitamin B₁₂ were normal. This conclusion is supported by the work of Moore *et al.* (1955), who obtained a satisfactory response to vitamin B₁₂ in 13 out of 17 cases of megaloblastic anaemia of pregnancy by giving massive doses, of the order of 1,000 μ g. Five of their patients were treated before delivery and 12 after. The four women who did not respond to vitamin B₁₂, which in two instances was pushed to 5,000 μ g., responded to folic acid.

At present it is difficult to assess the folic acid status of the organism other than by the response to treatment. Folic acid in large doses is usually effective in the megaloblastic anaemia of pregnancy, both before and after delivery. This observation favours a folic acid deficiency, though this deficiency, like that of vitamin B₁₂, is more likely to be relative than absolute, for remission may occur after delivery in patients who receive no treatment at all.

It seems likely that patients with megaloblastic anaemia of pregnancy and the puerperium do not represent a homogeneous group, and this may explain the variable findings and response to therapy. Complications of pregnancy and the puerperium occur frequently in relation to megaloblastic anaemia. Toxaemia and infection may interfere with the utilization of haemopoietic factors; haemorrhage and multiple or rapidly repeated pregnancies may increase the demands; while poor diet and gastro-intestinal upsets reduce the natural supply. However, in some patients pregnancy alone may induce the anaemia, and in such cases the cause appears to be the development of resistance to vitamin B₁₂ and folic acid.

Summary

Nine patients with megaloblastic anaemia of pregnancy and the puerperium have been studied. The incidence of complications of pregnancy and the puerperium was high.

No abnormality in the secretion of intrinsic factor or the absorption of fat was discovered in any case.

The serum vitamin B₁₂ levels were normal.

In women treated before delivery folic acid was more effective than vitamin B₁₂.

Although an absolute deficiency of folic acid cannot be excluded, the anaemia seems more likely to be due to resistance to the action of the haemopoietic factors than to deficiency.

We are grateful to Dr. Lester Smith, of Glaxo Laboratories Ltd., for supplies of labelled vitamin B₁₂; to Dr. G. I. M. Ross and Dr. G. H. Spray for microbiological assays of serum vitamin B₁₂; and to Dr. W. D. Richards for histological interpretation of the gastric biopsy specimens. We are indebted to Dr. A. M. Cooke and to the obstetricians of the Maternity Department of the United Oxford Hospitals for permitting us to study patients under their care. Miss Julie Pink and Mrs. Alison Jones have given valuable technical assistance. The expenses of this investigation were in part borne with a grant from the Medical Research Council.

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MEGALOBlastic ANAEMIA
FOLLOWING ANTICONVULSANTS

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Two cases of megaloblastic anaemia occurring in epileptics who had been taking phenobarbitone and phenytoin were reported by Badenoch (1954), who suggested that the anticonvulsants might have played a part in the production of the anaemia. Other cases have been reported by Hawkins and Meynell (1954), Chalmers and Boheimer (1954), and Rhind and Varadi (1954).

In April, 1954, we first encountered a megaloblastic anaemia in a patient who had been receiving phenytoin and phenobarbitone. In the absence of any obvious cause we speculated whether anticonvulsant drugs could have had any causative relationship. Our suspicions were strengthened when in July a further epileptic patient under our care developed a megaloblastic anaemia which had no obvious cause. The cases reported recently, together with the cases we now record, seem to indicate that megaloblastic anaemia may arise after the prolonged use of anticonvulsant drugs, and that this anaemia is probably due to phenytoin.

Case 1

A man aged 28 was admitted to Prestwich Hospital with an epileptic psychosis in August, 1952. He had suffered from major and minor fits for seven years and had been taking both phenytoin and phenobarbitone for at least

eighteen months. At the time his anaemia was detected he was taking phenytoin 1½ gr. (100 mg.), and phenobarbitone, ½ gr. (50 mg.), thrice daily. He was a good eater and was on a full mixed diet. There was no history of steatorrhoea.

On April 23, 1954, he was noted to be pale and he complained of weakness. Physical examination revealed nothing beyond pallor of skin and mucous membranes and a loud apical systolic murmur. A blood count showed: haemoglobin, 50%; red cells, 2,660,000 per c.mm.; white cells, 6,800 per c.mm. (polymorphs 48%, lymphocytes 50%, monocytes 2%). Anisocytosis and poikilocytosis were present. A fractional test meal revealed a small quantity of free acid. Sternal marrow puncture revealed megaloblastic erythropoiesis, the predominant cells being early and intermediate megaloblasts. The white-cell series showed early forms, some of which were larger than normal.

On May 4 vitamin B₁₂ was started (100 μ g. daily), but in spite of this his blood picture continued to deteriorate and there was no reticulocyte response. By May 10 the blood count was: haemoglobin, 25%; red cells, 1,800,000 per c.mm.; white cells, 3,200 per c.mm.; and reticulocytes, 3%. His physical condition was unaltered. He had a smooth tongue but no active glossitis, a loud apical systolic murmur, and high pulse pressure (B.P. 110/50). There was no evidence of subacute combined degeneration of the cord or any clinical evidence of steatorrhoea or liver disease.

On May 10 he was put on oral folic acid, 5 mg. four times a day. On the 11th his reticulocytes were 5%, and by the 13th they had reached 8%. In addition to folic acid, 20 mg. daily, he received a crude liver preparation ("hepatex T," 4 ml. daily) from May 11 to 13. Otherwise he was maintained solely on folic acid.

On the 13th he was transferred to the Manchester Royal Infirmary under the care of Dr. J. F. Wilkinson. His reticulocytes reached a peak of over 30%, and on his return to Prestwich Hospital on June 2 his haemoglobin had reached 70%. By July 9 the blood count showed: haemoglobin, 90%; red cells, 5,000,000 per c.mm.; white cells, 13,600 (normal differential).

He was discharged home in August, his mental state having improved. He remained on phenytoin and phenobarbitone throughout his illness, and at the time of discharge was taking folic acid, 20 mg. daily.

Case 2

A 26-year-old male epileptic had suffered from epilepsy following a head injury at the age of 5 which had left him with a left hemiparesis. He was also suffering from an epileptic psychosis. He had been on phenobarbitone and phenytoin since 1950. In May, 1954, he was put on to primidone, 0.25 g. thrice daily, in addition to phenytoin, 1½ gr. (100 mg.), and phenobarbitone, ½ gr. (32 mg.), thrice daily to obtain better control of his fits. He was a good eater and was on a full mixed diet. There was no history of steatorrhoea.

Physical examination on August 24, 1954, revealed intense pallor, a left hemiparesis, an apical systolic murmur, and a blood pressure of 140/70 mm. Hg. He had mild hypertrophy of the gums but no significant glossitis. There was no evidence of subacute combined degeneration of the cord or any clinical evidence of steatorrhoea or liver disease. A blood count showed: haemoglobin, 28%; red cells, 1,620,000 per c.mm.; white cells, 3,600 per c.mm. (polymorphs 31%, lymphocytes 64%, monocytes 3%, eosinophils 3%). Anisocytosis, poikilocytosis, punctate basophilia, Howell-Jolly bodies, and Cabot rings were obvious in the blood film. Sternal marrow puncture showed a megaloblastic marrow, early and intermediate megaloblasts predominating. No abnormality was noted in the white-cell series.

A fractional test meal with histamine showed free acid present. There were no fat globules in the faeces, and faecal-fat estimation showed total fat 28%, with a normal split/unsplitted ratio. The glucose-tolerance test showed normal

absorption of glucose (fasting blood sugar, 85 mg. per 100 ml.; 30 minutes, 150 mg.; 60 minutes, 170 mg.; 90 minutes, 140 mg.; 120 minutes, 80 mg.). Liver-function tests were normal (serum bilirubin, 0.4 mg. per 100 ml.; serum alkaline phosphatase, 7.5 King-Armstrong units; thymol turbidity, 2 units; thymol flocculation, 0; colloidal gold, 0).

On August 25 he was started on vitamin B₁₂ (100 µg. intramuscularly daily). By the 28th he had still shown no reticulocyte response (reticulocytes remaining stationary at 1%). As the blood picture was deteriorating (haemoglobin, 24%; red cells, 1,300,000 per c.mm. on the 28th) and he was having occasional major fits, he was started on folic acid, 10 mg. twice daily.

On August 30 the reticulocytes were 3%, but on the 31st they rose to 12%. By September 2 a reticulocyte response of 30% had been achieved. The blood picture improved rapidly until on October 12 it showed: haemoglobin, 90%; red cells, 4,980,000 per c.mm.; white cells, 7,800 per c.mm. (normal differential count). The patient is now in good general health and is being maintained on folic acid, 20 mg. daily. He has continued on phenytoin and phenobarbitone throughout, primidone having been discontinued when his anaemia was first noted.

Discussion

Megaloblastic erythropoiesis is found in pernicious anaemia, the sprue syndrome, abnormalities of the gastrointestinal tract, nutritional deficiency, diphyllobothrium infestation, and, rarely, in liver disease. Recently, megaloblastic anaemia has been reported in patients who had been receiving anticonvulsants (Badenoch, 1954; Hawkins and Meynell, 1954; Chalmers and Boheimer, 1954; Rhind and Varadi, 1954).

Our two cases were encountered among the epileptic patients in a large mental hospital. The type of patient restricted full investigation, but in both cases the well-known causes of megaloblastic anaemia did not seem to be present. Free acid was found in the gastric juice, there was no evidence of nutritional deficiency or of steatorrhoea or liver disease, and there was nothing to suggest organic disease or previous surgical intervention in the gastrointestinal tract. Both cases responded well to folic acid, but the clinical impression was that vitamin B₁₂ was ineffective.

In Case 1 no reticulocyte response was obtained after six days' treatment with vitamin B₁₂. In Case 2 there was no reticulocyte response five days after commencing vitamin B₁₂, although a response appeared on the sixth day (three days after the start of folic acid treatment). In both cases a good reticulocytosis followed the use of folic acid, and with this drug alone the blood picture was restored to normal and maintained at this level. Both cases had been on phenytoin and phenobarbitone for a period of years, and both continued to receive these drugs during their illness.

Vitamin B₁₂ resistance has been reported in all the other cases except one of those reported by Badenoch (1954). Folic acid produced a favourable response in the other recorded cases.

The mechanism of this type of anaemia is obscure. There are numerous instances of the effects of the hydantoins, particularly methoin, upon bone marrow, but only agranulocytosis and aplastic anaemia have been reported in the past (Jones, 1951; MacArthur, 1952). Phenobarbitone rarely causes marrow damage, although a few cases of agranulocytosis have been recorded (Watkins, 1933). Primidone was given to one of our cases, and Chalmers and Boheimer had one of their patients on the drug. Serious blood dyscrasias, however, do not seem to have been recorded in trials so far with this drug, though the fact that it is a dione and a relatively new addition to therapeutics suggests that we may see such results in the future.

Phenytoin would appear to be responsible for the megaloblastic anaemia in these cases. It was the only drug used in the case recorded by Hawkins and Meynell, and it had been used in all other cases reported, although, in these, other drugs had been given in conjunction with phenytoin. If phenytoin is responsible it is remarkable that no previous cases of this type of anaemia associated with the drug have been recorded, for it has been in use since 1938. There is the possibility that previous cases have been dismissed as idiopathic megaloblastic anaemias and the relationship to phenytoin has not been recognized. Another possibility has been suggested by Hawkins and Meynell, to the effect that anaemia may appear only if the patient has taken the drug for a long time. Their patient had been on phenytoin for 13 years. However, most of the recorded cases were on phenytoin for much shorter periods, although the length of time on the drug has been more in the nature of years than months. A further interesting point is that, whilst the number of epileptics on phenytoin is enormous, this complication appears to be a rarity. At this hospital 75 other epileptics receiving anticonvulsant drugs have been screened so far, but none has shown any evidence of anaemia, though in age, type of epilepsy, food, and living conditions, in addition to anticonvulsant medication, they closely resemble the two recorded cases.

Hawkins and Meynell suggest that phenytoin may either affect absorption of haematopoietic factors or act as a folic acid antagonist. In only one case, that of Rhind and Varadi, has there been evidence of malabsorption, and even this was inconclusive. The normal vitamin B₁₂ serum levels in those cases in which this has been determined (Badenoch, 1954; Chalmers and Boheimer, 1954; Rhind and Varadi, 1954), and the excellent response to folic acid, suggest that this anaemia is essentially a folic acid deficiency, whatever its precise mechanism. It is extremely difficult to produce a folic acid deficiency in the experimental animal, but, in man, megaloblasts have occasionally been found in the bone marrow in cases of acute leukaemia treated by aminopterin (Stickney, 1952). Wintrobe (1951) reports that in pigs a vitamin B₁₂ refractory megaloblastic anaemia can be produced, but only by reducing dietary vitamin B₁₂, excluding folic acid from the diet, and giving a folic acid antagonist in conjunction with succinylsulphathiazole. This porcine anaemia responds promptly to folic acid and resembles the anaemia in the cases on phenytoin reported here.

Whatever the mechanism, it seems essential that epileptics treated with anticonvulsants be watched for the possible advent of this anaemia. The severity of the condition and the excellent response to folic acid make this imperative. Further work will be necessary to elucidate the precise mechanism involved and to produce means of preventing this complication.

Summary

Two cases of megaloblastic anaemia which developed after the prolonged use of anticonvulsants are recorded. Both cases responded well to folic acid, and the evidence suggested that they were refractory to vitamin B₁₂. The literature is briefly reviewed and possible causative mechanisms of this anaemia are discussed.

Thanks are due to Dr. J. P. McGuinness, medical superintendent of Prestwich Hospital, for permission to record these two cases; to Dr. J. F. Wilkinson and Dr. M. C. G. Israels for help with the treatment of Case 1; and to Mr. T. Read for the laboratory procedures.

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LIPODYSTROPHIA PROGRESSIVA AND TEMPORARY HYDRONEPHROSIS

BY

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If the association of two diseases in a patient is not fortuitous their relationship to each other may throw light on the aetiology of one or both diseases. Lawrence's (1946) study of a woman with lipodystrophia progressiva and insulin-resistant diabetes supports the concept of two types of diabetes mellitus and suggests the simple explanation that the elderly obese person develops diabetes because she is unable to convert any more carbohydrate into fat.

In this paper the association of temporary hydronephrosis with lipodystrophia progressiva is reported and the renal disorders which have been described with this disease are reviewed. It is suggested that in some of the case reports the renal changes may have been similar to those present in the patient described here.

Gross hydronephrosis can develop in a week and disappear completely if the obstruction is removed early enough, and the term "temporary hydronephrosis" has been used to describe these transient changes (Fowler and Frankel, 1947).

Ellis (1951), writing about lipodystrophia progressiva, mentions the association of this condition with renal disease. He makes a brief reference to the occurrence of oliguria in Gerhartz's case (1916). The daily urinary output of this patient was 400-1,100 ml., and it is difficult to believe that this is a significant oliguria. Klien (1921) reports on a patient with lipodystrophia and mentions polyuria. Recently a patient with this disease was shown at the Royal Society of Medicine (Tizard, 1954), and the summary of the case included the information that "she is said to drink and void excessive quantities of fluid." The glucose-tolerance test in this patient was normal, but full urinary investigations including a pyelogram had not been done. Following the paper by Lawrence (1946) on the association of lipodystrophia and diabetes, any patient with lipodystrophia complaining of thirst and polyuria may be examined for further evidence of diabetes mellitus only, as happened to our patient, when studied for a short period at another hospital.

In 1932 two cases were reported in which lipodystrophia progressiva and uraemia occurred in the same patient. They were both thought to have had chronic nephritis, but in neither did the diagnosis appear likely, nor was it confirmed. They both had unusual clinical features in common with the patient described in the present paper.

Horton and Emmett (1932) report the case of a woman of 61 with a history of increasing nausea for one year with occasional attacks of vomiting. The patient was alert, and physical examination was essentially negative except for lipodystrophia affecting the legs. There were no symptoms or signs suggesting uraemia. On admission the blood urea was 400 mg. per 100 ml. After five weeks on a diet containing 25 g. of protein and 3-4 litres of fluid daily, the blood urea fell to 60 mg. per 100 ml. It was stated that pus cells, grade III, were present in the urine, but no mention of urine culture was made. The renal lesion was diagnosed as chronic

diffuse glomerulonephritis after the possibility of polycystic kidneys had been considered and dismissed, as no enlargement of the kidneys could be found on abdominal palpation.

Berger (1932) reported the case of a woman aged 26 who developed lipodystrophia at the age of 3½ years. Pyelitis occurred at 6 and another attack a year later. At the age of 19 the blood pressure was found to be raised and albumin was present in the urine. A diagnosis of acute exacerbation of chronic nephritis was made. Following a severe reaction to vaccination, the patient for a short time passed into uraemic coma. During the next seven years she remained well, and clinical examination at the end of this period was essentially negative except for the lipodystrophia. The blood urea was then 21 mg. per 100 ml.

Igersheimer (1948) described the case of a patient who had lipodystrophia progressiva, bilateral hydronephrosis with aberrant renal arteries, and other congenital abnormalities.

Case Report

The patient was the youngest of four children. Her parents and siblings were healthy. At the age of 2½ years she had scarlet fever and was in bed for three months with subsequent "kidney trouble." She had several attacks of sore throat until tonsillectomy at the age of 5. Between the ages of 5 and 9 she remained well except for mild attacks of measles, chicken-pox, and rubella. In 1950, at the age of 9, she was referred to the out-patient department with a ten-day history of abdominal pain and nausea. Her doctor wrote that she was "very lethargic and looked cadaverous."

She presented with the typical appearance of lipodystrophia progressiva with the so-called "death's head" and circumoral wrinkling on speaking or smiling. Loss of subcutaneous fat was symmetrical and complete down to the pelvic girdle, where there was an abrupt change. Below this level subcutaneous fat was present in normal but not excessive amounts. Her weight was 3 st. 10 lb. 4 oz. (24.2 kg.). Examination was otherwise negative. In view of the recent illness further investigations were done: a Mantoux test, which was negative; E.S.R., 4 mm. in the first hour; Hb, 98%; W.B.C., 5,000; and x-ray examination of the chest, normal. No investigation of the urinary system was done at this time except for a routine examination of the urine, which contained no abnormal constituents. The mother was told that improvement in the child's appearance was unlikely, but that she would remain healthy.

In September, 1951, fifteen months later, the mother, anxious for something to be done to improve the child's appearance, took her to a London teaching hospital, where she was an in-patient for fifteen days. In the case summary on her discharge it was noted that the child "was said to be rather thirsty." The glucose-tolerance test was normal. No special urinary-tract investigations were done. It was concluded that she was "a case of lipodystrophia progressiva unassociated with evident endocrine disorder."

In February, 1952, four months later, the child was admitted to Bromley Hospital with a history of repeated vomiting for five days, and abdominal pain and red urine for three days. The temperature at the onset had been 103° F. (39.4° C.) and there had been repeated rigors, dysuria, and frequency. On examination she showed the features of lipodystrophia unchanged from when she was first seen twenty months previously. The child now looked toxic and dehydrated, with a dry furred tongue. The pulse was of poor quality and the rate 100 before admission. In hospital the rate was at first about 90, later rising on occasion to over 120. The temperature settled to 99° F. (37.2° C.) and for the next three weeks there was a low-grade pyrexia up to 99.5° F. (37.5° C.). During the fourth

week the temperature fell and was normal for the remaining three weeks in hospital. For the first few days tenderness was present in the right loin. There was no tenderness in the left loin or over the bladder. The B.P. was 120/80, and, with the exception of the urine, the remainder of the physical examination was negative.

The urine on admission was scanty and contained a very heavy cloud of albumin. There were numerous red cells, pus cells, and isolated cellular casts. Catheter specimens of urine were sterile. Five days after admission the blood urea was 330 mg. per 100 ml.; W.B.C., 19,000, with 80% polymorphs; E.S.R., 25 mm. in the first hour.

Four days later the blood urea was still 320 mg. per 100 ml. and oliguria persisted. The Bull-Borsh regime was then started, and the blood urea fell to 183 mg. per 100 ml. after a further five days and in the next fortnight to 40 mg. per 100 ml. The child's condition improved with the fall in

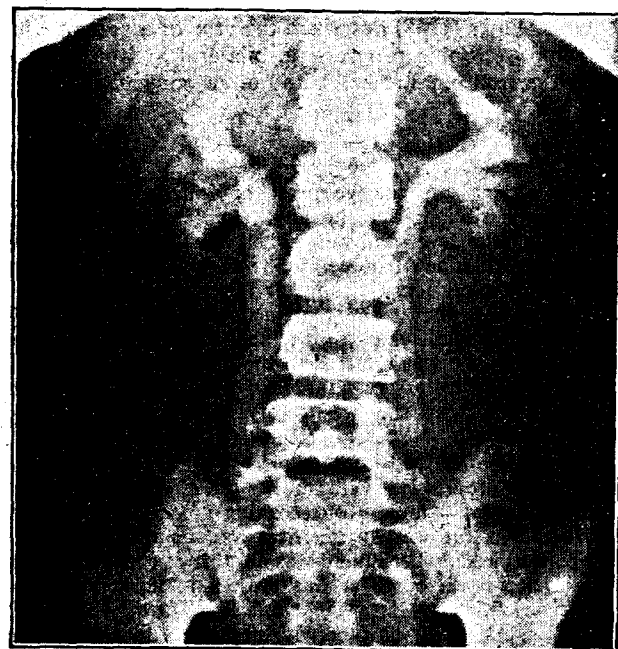


FIG. 1.—Intravenous pyelogram done on March 26, 1952.



FIG. 2.—Intravenous pyelogram done on October 9, 1953.

the blood urea. An intravenous pyelogram, when the blood urea had fallen to normal, showed bilateral hydrocalicosis, hydronephrosis, and hydroureter more marked on the right (Fig. 1). Cystoscopy showed no abnormality. The child was discharged from hospital on April 9, weighing 4 st. 6 lb. (28.1 kg.), and returned to school one month later.

During her stay in hospital there was striking mental instability, the child being one moment aggressive and abusive and the next exceedingly timid. This was in marked contrast to her mental state when her condition improved. Her personality then becoming stable and pleasant. The mental changes appeared to be a manifestation of uraemia, improving as the blood urea fell.

When seen in the out-patient department three months later she was free of symptoms, was feeling well, and had won the high jump at school. No abnormal constituents were found in the urine, the intravenous pyelogram showed only slight bilateral hydronephrosis and hydroureter affecting mainly the right side.

Her progress was watched in the out-patient department and she continued to remain well until fourteen months later. While on holiday she was admitted on August 13, 1953, to the Royal County Hospital, Ryde, with a history of vomiting, abdominal pain, headache, and dark urine for four days. The urine contained large amounts of albumin, many pus cells, and red blood cells with a moderate amount of granular and cellular casts. The B.P. was 130/80, E.S.R. 47 mm. in the first hour, and Hb 90%. The blood urea was 73 mg. and later rose to 109 mg. per 100 ml. Before transfer back to Bromley Hospital the blood urea had fallen to 28 mg. An intravenous pyelogram (Fig. 2) showed little change from that done one year previously, but there was marked improvement as compared with the first x-ray films taken soon after the most severe uraemic episode. On discharge from hospital on October 12 she was free of symptoms and her general condition was satisfactory, although there was still a moderate albuminuria.

When seen in the out-patient department in March, 1954, she was feeling well. The B.P. was 140/80. The urine contained 0.5 g. of albumin and a moderate number of red cells and pus cells. The blood urea was 32 mg. per 100 ml. and the urea clearance (Van Slyke) 54%. An E.E.G. in November showed no abnormality.

Discussion

In retrospect, it appears likely that the first illness in June, 1950, was due to incipient or transitory uraemia and that she has therefore been in renal failure three times. The nature of the kidney trouble at 2½ years old is unknown.

Although the equanimity of most patients with lipodystrophy emphasizes their mental stability, psychological disturbances have occurred in a number of patients. Warin and Ingram (1950) reported two such cases and reviewed other instances of this association. The presence with lipodystrophy of mental disorder due to organic disease of the brain lends some support to the theory that this disease results from a lesion in the central nervous system. In our patient the mental changes were due to uraemia, and, although in none of the case reports was mental change attributed to this cause, renal and other organic disease may pass unrecognized when presenting with mental symptoms (Stokes *et al.*, 1954).

In this child the three attacks of uraemia were clearly due to the hydronephrosis. The cause of the uraemia in the patients with lipodystrophy described by Horton and Emmett (1932) and Berger (1932) was obscure. In Berger's patient it seems improbable that an acute exacerbation of chronic nephritis had caused uraemia when seven years later the patient was in good health and the blood urea 21 mg. per 100 ml. Intravenous pyelography, which might have shown a hydronephrosis, was not done in either of these two patients. This technique had not been introduced at the time Gerhartz (1916) and Klien (1921) described their cases.

Renal failure did not occur in Igersheimer's (1948) patient with lipodystrophy and hydronephrosis. Igersheimer maintained that lipodystrophy is due to a defect of the mesenchyme and described various mesenchymal abnormalities in his patient. He reviewed other published cases to support his view. The hydronephrosis in his patient was believed to be due to an aberrant renal artery. This was found at operation and cut. A subsequent intravenous pyelogram showed no change from the appearance before operation.

Igersheimer summarily dismisses the nervous, endocrine, and other causes suggested for lipodystrophia progressiva. The different hypotheses concerning aetiology have been fairly reviewed by Ellis (1951). There is much evidence to suggest that lipodystrophy may result from a lesion in the central nervous system (Warin and Ingram, 1950).

Besides that of associated mesenchymal defects or mere chance, there is another possible explanation for the occurrence together of uraemia and lipodystrophy. Lesions of two closely related areas of the brain, anterior to the hypothalamus, may be responsible for trophic changes and uraemia, both of these effects occurring if both areas are involved. Evidence that the cause of lipodystrophy may lie in a lesion related to the hypothalamus is found in the diencephalic syndrome (Russell, 1951), where profound wasting is a prominent feature. In Tizard's patient (1954) the profound wasting was a true lipodystrophy with disappearance of subcutaneous fat and no muscle-wasting. Dr. Russell, who saw this child, thought it likely that she had a diencephalic lesion. Evidence that trophic changes and uraemia can be due to lesions in closely related areas anterior to the hypothalamus is furnished by McLardy (1950). After prefrontal leucotomy, trophic changes with gross wasting and uraemia have often been described. These complications of the operation usually occur when the incisions go too far back (Freeman, 1953). McLardy has shown that prefrontal leucotomy can be followed by uraemia or trophic changes, depending upon which of two areas is damaged. Injury to posterior area 47 of the orbital cortex leads to uraemic death, and the severance of connexions between the caudate nucleus and Brodmann's (non-granular) cortical areas 8 and 6 is concerned with the trophic fatalities. The immediate cause of renal failure in McLardy's series of uraemic deaths is not known, but he mentions the work of Cort, who claimed to reproduce Trueta's renal shunt mechanism in cats by electrical stimulation of the cortex of area 13.

If renal failure in lipodystrophy is due to a lesion in the central nervous system, this could be caused by abnormal function of the autonomic innervation of the urinary tract, producing hydronephrosis, or of renal cortical arterioles, producing a Trueta shunt effect. Besides the evidence of the present case, hydronephrosis as a functional disorder of the urinary tract is common in man. The rare cortical necrosis of the kidney during pregnancy is the only disease which may be comparable to Trueta's shunt mechanism in the experimental animal.

Lesions affecting autonomic centres are responsible for diverse vegetative effects, including uraemia. The common idiopathic hydronephrosis with no organic obstruction may be due to disease of the central nervous system involving an autonomic centre regulating the function of the renal tract.

Summary

A case of lipodystrophia progressiva, temporary hydronephrosis, and recurrent uraemia is described.

The occurrence of renal disease with lipodystrophy is reviewed. The association of the two diseases may be fortuitous; the result of a mesenchymal defect; or the result of a lesion of adjacent centres in the central nervous system, responsible for the renal and trophic changes.

Evidence is submitted that a lesion anterior to the hypothalamus may be responsible for these changes.

My thanks are due to Dr. N. S. Plummer for permission to publish this case and for his helpful criticism.

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MALIGNANT GRANULOMA OF THE NOSE

BY

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The condition known as malignant granuloma of the nose is uncommon and almost invariably fatal. The chief purpose of this report is to present a unique result—a treated case which has remained healed for over five years. The secondary purpose is to present another case of a different and unusual type.

Only five cases of recovery appear in the literature, but closer examination of the case records and subsequent history reveals inconsistencies. Woods's case (1921) healed locally after interstitial irradiation, but the patient died within two years, of generalized sarcomatosis. The diagnosis of the original lesion must therefore be suspect. In the case of M'Arthur and Dew (1925) the local lesion healed after three doses of deep x rays, but the patient died four years after the last dose from what was called "miner's phthisis." No necropsy was permitted, and Stewart (1933) quotes a letter from M'Arthur in which the possibility of pulmonary sarcomatosis was envisaged. Schütz (1938) records eight cases, in one of which spontaneous resolution occurred, but the account is too brief to be entirely acceptable. Hoover (1941) describes an admittedly atypical case which apparently healed after excision of the granulomatous area followed by antisyphilitic treatment.

An exhaustive survey of the literature by Williams (1949) failed to reveal any cases of survival other than those cited above. His discussion of the pathology is most instructive, particularly in assessing a link with periarteritis nodosa and with certain types of hypersensitivity reactions. Following upon this paper, Williams and Hochfilzer (1950), Moore *et al.* (1951), and Woodburn and Harris (1951) have had some success with cortisone and A.C.T.H., but the follow-up period recorded is too short for appraisal.

Finally, Sneddon and Colquhoun (1952) claim a cure with chlortetracycline ("aureomycin") and chloramphenicol, but the patient died a year or so later, and, furthermore, the precise nature of the lesion was never identified by biopsy. They considered the lesion to be staphylococcal in origin, but no other case has been recorded in which the local lesion healed with antibiotics (Breckenridge *et al.*, 1954).

Case 1

A married woman aged 28 was first seen at the Royal National Throat, Nose, and Ear Hospital on June 24, 1947, complaining of right-sided nasal obstruction, an intermittent swelling in the right nasal cavity, a purulent nasal discharge, and considerable crusting with fetor. Some of the symptoms had been present for over two years. There was a large septal perforation, crusts in both nasal cavities, mucopus in the nasopharynx, and a nodular swelling of the right side of the palate. A radiographic opacity of the right antrum was present and antral lavage revealed pus and crusts. The W.R. was negative. On a tentative diagnosis of atrophic rhinitis, she was advised to use an alkaline nasal douche and a nasal paint of glycerin and glucose, night and morning, and this kept her relatively comfortable. As this diagnosis was not convincing, she was kept under close observation, attending frequently at short intervals, until on October 7 a large piece of necrotic bone, thought to be a sequestrum of the septum, was removed from the left side of the nose.

A few weeks later she was admitted to a hospital nearer her home because of acute maxillary sinusitis. This occurred



FIG. 1.—Case 1. Showing the external extent of the ulcer with necrotic bone in the margins.

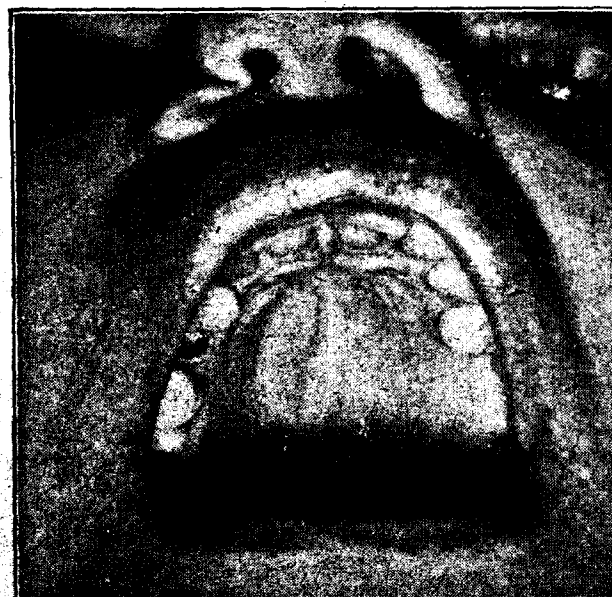


FIG. 2.—Case 1. Showing the nodular enlargement of the palate.

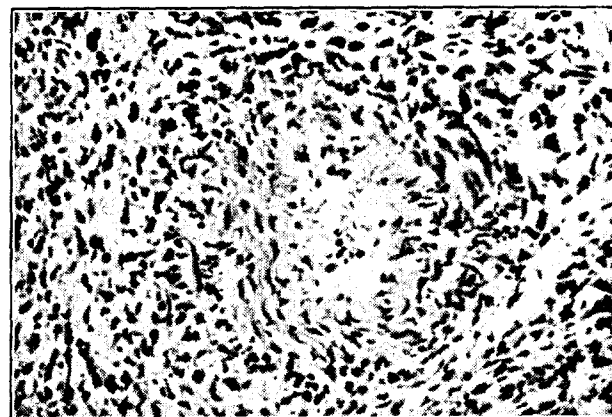


FIG. 3.—Case 1. Showing the pleomorphic cellular reaction and the absence of focal necrosis and of necrotizing angitis. ($\times 230$.)

three times during the next fifteen months, necessitating her readmission on each occasion. These attacks were treated with penicillin and antral lavage, and in September, 1948, by a Caldwell-Luc operation on the right side. After this operation the right side of the nose and the tissues underlying it literally melted away, and an ulcer appeared which rapidly spread upwards almost to the margin of the right orbit. At this stage I saw her again, quite fortuitously, in my out-patient clinic at another hospital, where she was referred by her doctor. It was now evident that this ulcer was the external opening of a large fistula into the right nasal cavity, right ethmoidal region, and right antrum, and that its margins consisted of necrotic bone and of granulation tissue (Fig. 1). The mucosa on the buccal surface of the palate was thickened and nodular, although still intact (Fig. 2), but on palpation it was found that the bone of the hard palate had been almost completely destroyed. A diagnosis of malignant granuloma now sprang to mind, and, so far as confirmation is possible, this diagnosis was confirmed by biopsies from the edge of the ulcer and from the swelling on the palate.

Dr. I. Friedmann's report is as follows: "The histological appearances (Fig. 3) of this case are characteristic of malignant granuloma of the nose in so far as they consist of a chronic fibrous non-specific inflammatory granulation tissue infiltrated by pleomorphic inflammatory cells, including plasmacytes and lymphocytes. There are no giant cells present and there is no evidence of focal necrosis, frequently seen in similar cases. A small artery found in the biopsy specimen shows no evidence of necrotizing angitis. This histological picture virtually excludes all known forms of specific granulomatous reactions as well as neoplasm. There are possibly several histological types or variations of malignant granuloma of the nose. The most common type appears to be a pleomorphocellular granulation tissue as described in this case. In other cases one or more of the following morphological features have predominated: (1) histiocytes, (2) foreign-body giant cells, (3) extensive necrosis. One particular variety, the giant-cell granuloma, is frequently associated with necrotizing vascular disease resembling polyarteritis nodosa. The case here described appears to belong to the classical type as there was no sign of systemic vascular complications."

In spite of treatment with sulphonamides and penicillin, pieces of necrotic bone were daily extruded from the depths of the cavity, and later the palatal mucosa gave way. The patient was referred to Dr. M. Lederman, radiotherapist at the Royal Marsden Hospital, for irradiation, but after consultation it was decided not to risk a form of treatment which might itself cause bone necrosis. Large doses of potassium iodide together with a course of calciferol were given and the ulcer became cleaner and showed signs of healing. The horrible fetor disappeared and the steady necrosis and sloughing ceased. However, the improvement

was only temporary, and a few months later the condition again became noticeably active. Dr. Lederman then consented, with some misgivings, to try a course of deep x rays, and the very small dose of 300 r was administered between December 19, 1949, and January 21, 1950. A dramatic change followed. The margins of the ulcer became clean and a healthy skin-mucosal junction formed. The mucosal junction between the oral and nasal surfaces of the palate also healed. By April 12 there was no further evidence of activity, and the vast, hideous cavity gradually became lined with pink mucosa.

As the ulcer remained soundly healed, Mr. J. P. Reidy, early in 1952, began the difficult plastic reconstruction which is still in progress. In spite of four operations on the tissues of the nose and face, there has been no evidence of any return of the disease.

Comment

The natural history of malignant granuloma of the nose has not been precisely identified, and the histological picture itself has not been clearly established as a specific entity. Stewart's exhaustive review of the cases described up to 1930 was accompanied by a composite clinical description based on these records, but it is more than possible that some of them would not now be accepted as true cases of the disease. The lesion usually begins as an intranasal ulcerative process which soon appears on the face after having eroded the lateral wall of the nose or the anterior wall of the antrum. The facial tissues are progressively destroyed and bone necrosis with sequestration is a marked feature. The spread towards the pharynx is slower. Death usually results from cachexia, in anything from one to three years. The case reported here has followed the classical course, except for the end-result.

However, there is occasionally another type of case in which the necrotizing reaction remains confined within the nasal cavities and spreads over the surface of the mucosa. One such case has recently come under my care.

Case 2

A man aged 48 was first seen on October 26, 1954, complaining of pain in the nose for about four months. This pain followed a thyroidectomy. The teeth were thought to be the cause of the pain and had been extracted, but without relief. The right nasal cavity contained pus and crusts, and pus was found on antral lavage. On November 11 a granular area was noticed on the septum and a portion was removed for biopsy. This revealed a non-specific type of granulation tissue covered with a thick stratified squamous epithelium. The granular area increased in extent and a large ulcer appeared on the septum and also on the middle turbinal. On December 15 the patient was admitted and the antrum opened and inspected by the Caldwell-Luc approach. Macroscopically it appeared normal, and pieces

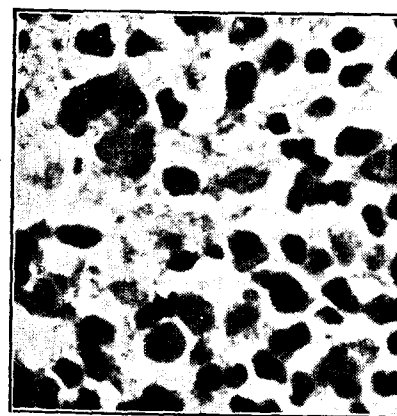


FIG. 4.—Case 2. Showing the similar pleomorphic reaction, but with an excess of histiocytes and plasmacytes. ($\times 750$.)

of tissue for biopsy were taken from the antral mucosa, the right middle turbinal, and the septum. The antral mucosa was normal, but (Fig. 4) "the nasal mucosa is densely infiltrated by large lymphocytes and histiocytes showing considerable irregularity of nuclear size and shape. There are numerous plasmacytes present, and frequent mitoses

are seen. The cartilage of the nasal septum has been eroded by the process" (Dr. I. Friedmann). Dr. L. W. Pagel concurred with this description, and both pathologists agree that this is a case of malignant granuloma. The distinctive feature of predominance of histiocytes and plasmacytes is a variation to which Dr. Friedmann has already drawn attention.

By January 8, 1955, destruction of the septum had occurred, but the process, although spreading rapidly within the nasal cavity, still shows no sign of involving the skin.

Discussion

Although it is possible that these two differing clinical pictures are associated with certain variations in the histological picture (Friedmann, 1955), the ultimate prognosis has hitherto been fatal in both types of case. Case 2 has been treated in a similar manner to Case 1, but it is as yet too early to say what will happen.

No rationale is claimed for the treatment given in Case 1, much less for the dramatic success with which it was attended. It was frankly a shot in the dark, entirely on an empirical basis of trial and error. The patient is apparently cured, presumably by the irradiation, as resolution followed immediately after it was given, and the disease had previously resisted, or relapsed after, other methods of treatment. The reluctance in trying irradiation naturally follows the knowledge that irradiation can itself cause, especially in bone, a similar necrotizing type of lesion. The end-result indicates that an almost absurdly small dose was the treatment of choice in this particular case, and would be well worth trying in other similar cases. In fact, at a meeting of the Section of Laryngology of the Royal Society of Medicine on December 3, 1954, Mr. Gilroy Glass reported two cases which were treated similarly and which have responded similarly. They had remained healed for about a year, up to the time of his report.

Summary

A case of malignant granuloma of the nose is described which has been cured by a very small dose of deep x rays. This is the first genuine case recorded in which the patient has not died of the disease.

In addition to the classical type of case with sloughing of the facial tissues there is another type which remains confined within the nasal cavities, spreading superficially in the mucosa.

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The third pamphlet in a series on Food Hygiene has just been published by the Central Council for Health Education. This leaflet deals with refrigerator storage. It describes how the refrigerator should be used and cleaned, and what foods should have priority in it. A previous leaflet advised on food storage without a refrigerator, and another presented a "Shopping Quiz" for housewives, drawing attention to poor hygiene standards in food shops.

IMMEDIATE PARTIAL GASTRECTOMY FOR PERFORATED PEPTIC ULCER

BY

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Between March, 1950, and December, 1951, five elective partial gastrectomies were performed at the University Surgical Unit for severe recurrent symptoms following simple closure of a perforated peptic ulcer. The simple closure antedated the ultimate resection by periods varying from six months to three years. Impressed with the inconvenience to the patients of disabling symptoms in the intervening period and of the increased technical difficulties at the time of the second operation, it was decided to treat certain selected cases of perforated peptic ulcers by immediate partial gastrectomy.

Some would consider that the treatment of a perforated peptic ulcer is a life-saving measure and that the simplest operation is all that should be attempted. Figures from Continental clinics support the contention that immediate gastrectomy is a safe procedure. Nuboer (1951) published a series of 131 immediate partial gastrectomies for perforated peptic ulcer with a mortality of 3.8%. Very low mortality rates are also revealed by certain Russian authors (Rozanov, 1953; Lidskii and Nurenberg-Charbiani, 1953). Lowdon (1952) performed partial gastrectomy without mortality in 51 consecutive cases of perforated peptic ulcer in patients between the ages of 20 and 70. These figures imply that in experienced hands the mortality rate from immediate partial resection can be expected to be no greater than that of simple suture.

The issue over which the various exponents of the major procedure are at variance is in the selection of the cases. In Nuboer's clinic "since 1943 partial gastrectomy has been done in nearly all cases of perforated ulcers. No regard is paid to the patients' age or duration of perforation." Nuboer justified this apparent lack of discrimination by suggesting on histological evidence that all the perforations, even in patients with a short history, were of a chronic nature. These findings, however, were not confirmed by Lowdon (1952) in some of his cases with a history of short duration. Forty (1951) quoted findings in 19 perforations examined histologically, in which no fewer than 15 were classified as being of an acute nature, and such findings imply that a critical assessment of each individual case is desirable. It would appear reasonable, therefore, to select individuals for immediate partial gastrectomy by estimating their probable prognosis after simple suture alone, the items of importance in such assessment being (a) the situation, appearance, and size of the perforation, (b) the duration and severity of the symptomatology prior to perforation, and (c) an appreciation of the statistical surveys of progress after peptic ulcer perforation.

Results

Between January, 1952, and June, 1954, 54 cases of perforated peptic ulcer were admitted under our care: 4 were treated conservatively with 2 deaths; 2 elderly patients with perforated gastric ulcer found to be unfit for resection were treated by simple suture, with 1 death; and 33 cases of perforated duodenal ulcer were treated by simple closure, with 3 deaths.

The following brief summaries describe the remaining 15 cases, which were treated by immediate partial gastrectomy:

Case 1.—Male, aged 65, with a two-year history of dyspepsia, perforated 16 hours before admission. Large perforation of duodenum with gross peritoneal soiling. Immediate partial gastrectomy; uneventful recovery.

Case 2.—Male, aged 60, with a long history of dyspepsia, perforated two hours before admission. Large perforation of anterior wall of first part of duodenum. Immediate partial gastrectomy; uneventful recovery.

Case 3.—Male, aged 55, with recent symptoms, perforated seven hours before admission. General condition poor. Perforated lesion found on distal third of greater curvature of stomach. Partial gastrectomy; developed paralytic ileus and renal failure; died on 11th post-operative day. Histology—benign gastric ulcer.

Case 4.—Male, aged 66, with recent dyspepsia and melaena, perforated 8 hours before admission. Perforation of anterior wall of stomach, with considerable peritoneal soiling. Immediate gastrectomy; general peritonitis and paralytic ileus; died on 10th post-operative day. Histology—chronic gastric ulcer.

Case 5.—Male, aged 64, with a long dyspeptic history, perforated six hours before admission. Large perforated duodenal ulcer, with gross peritoneal soiling; immediate gastrectomy; uneventful recovery.

Case 6.—Male, aged 64, with a four-year history of severe dyspepsia, perforated 15 hours before admission. Large perforation of pyloric antrum with early localization; uneventful recovery followed partial gastrectomy. Histology—gastric carcinoma.

Case 7.—Male, aged 60; previous gastro-entrostomy in 1933, perforated three hours before admission. Large perforated lesion just above the previous anastomosis seen at operation. Immediate gastrectomy; uneventful recovery. Histology—gastric carcinoma.

Case 8.—Male, aged 56; continuous dyspepsia since a previous perforation was successfully sutured in 1943. Perforated duodenal ulcer treated by immediate partial gastrectomy; uneventful recovery.

Case 9.—Male, aged 60, with a 20-years history of dyspepsia, perforated 12 hours before admission. Perforation in a stenosed duodenum treated by immediate gastrectomy; uneventful recovery.

Case 10.—Male, aged 42, with a history of two previous perforations, was admitted four hours after his third. Perforated duodenal ulcer treated by immediate gastrectomy; uneventful recovery.

Case 11.—Male, aged 71, with a 25-years history of dyspepsia, presented with a perforation and haematemesis. Partial gastrectomy for a large perforated duodenal ulcer; uneventful recovery.

Case 12.—Male, aged 56; long history; perforated eight hours before admission. Immediate partial gastrectomy performed in presence of perforated and stenosed duodenum; uneventful recovery.

Case 13.—Male, aged 44; eight years' dyspepsia, perforated three hours before admission. Perforated lesion of lesser curve dealt with by a Pauchet type of partial gastrectomy; uneventful recovery. Histology—chronic gastric ulcer.

Case 14.—Male, aged 59; recent symptoms. Large perforation of duodenum treated by partial gastrectomy five hours after onset of symptoms; uneventful recovery.

MAY 21, 1955

Case 15.—Male, aged 70, perforated three hours before admission. Very large perforation of duodenum treated by partial gastrectomy. Satisfactory recovery followed re-suture of a wound dehiscence on the seventh post-operative day.

Discussion

If the patient's general condition permits, a partial resection is the operation of choice in nearly all cases of perforated gastric ulcer. Such perforations, especially if chronic, are often difficult to suture, the amount of intra-peritoneal contamination is great, and containment of the infective material is unsatisfactory. The greater mortality following treatment by simple suture and toilet of patients with perforated gastric as compared with duodenal ulcers has been demonstrated by Chamberlain (1951) and Gilmour (1953). Another justification for routine immediate resection is the high proportion of carcinomas of the stomach which appear in the guise of simple gastric perforation. Thus Doll (1950) quoted 17 cases of perforated carcinoma of the stomach occurring in the eleven years 1938–48 in the Central Middlesex Hospital. Perforations were found at operation in 11 cases, but only 3 were recognized to be neoplastic, and 7 were discharged from hospital with the diagnosis of simple gastric ulcer. Kennedy (1951) quoted a five-year series of 111 acute perforations from the London Hospital which included seven cases of perforated gastric carcinoma. In the present series Cases 6 and 7, thought at operation to be of a simple nature, proved on histological examination to be malignant.

In the case of perforated duodenal ulcers the possibility of neoplasm is so rare as to be disregarded. The size of the ulcer, however, should be considered when deciding on the procedure to adopt. Simple closure is unwise where considerable cicatricial narrowing is present or in cases of large perforation, as simple closure may produce complete stenosis. The occlusion of a large duodenal perforation by an omental plug, although perhaps immediately successful, leaves an area of very imperfectly constituted duodenal wall which, in the continued presence of hyperchlorhydria, will inevitably re-ulcerate and perhaps re-perforate. Luer (1949) found that if the perforation was 1 cm. in diameter or more, the mortality rate following simple suture was more than double the rate in smaller perforations. The experience in this small series of cases suggests that radical operation in such emergency cases is no more difficult than in elective cases and that the subsequent smooth post-operative course is most satisfactory.

A history of previous perforation was taken as an indication for gastric resection if the case was in other respects satisfactory (Cases 8 and 10).

In either gastric or duodenal perforations the co-existence of haemorrhage increases the mortality rate (Avery Jones *et al.*, 1950). This dangerous combination is most satisfactorily dealt with by immediate partial gastrectomy, and in the present series was regarded as a definite indication if the patient's general condition allowed (Case 11).

The appearance of chronicity in a perforated duodenal ulcer may be simulated by inflammatory oedema, and in the absence of previous ulcer dyspepsia it may well be that the lesion is an acute one and immediate resection is unjustifiable: nor should duration of symptoms alone be taken as unequivocal evidence of chronicity. If the perforation is small, even with a long preceding period of dyspepsia, it may be, as contended by Forty (1951), that the patient has had a series of acute or subacute ulcers, each healing in turn. If, however, the perforation has the appearance of being in a chronic ulcer and the patient gives a well-defined period of disabling dyspepsia with perhaps previous hospital treatment and radiological confirmation of a chronic ulcer, immediate partial gastrectomy is justifiable.

The results of a follow-up study of 733 cases of perforation treated by simple suture are valuable in assessing the probable ultimate prognosis after perforation (Illingworth *et al.*, 1946). It was found that remission of ulcer symp-

toms after perforation was seldom of long duration, within five years 70% having relapsed and 50% developing severe symptoms. The prognosis was found to be worse in cases with a long antecedent history, whilst the incidence rate of major complications, particularly re-perforation and haematemesis, was 20% within five years of perforation.

When the series presented in this paper was started it was hoped that a critical selection of cases for immediate gastrectomy would eliminate the expected 20% of major complications and a proportion of the remaining cases which would be expected on the above statistical evidence to relapse. On making the selection we were influenced by the fact that the majority of patients seen in this hospital are industrial workers, miners, and others in whom the economic factor of loss of work is important and in whom prolonged dietary out-patient treatment is often impracticable.

In assessing fitness for immediate partial gastrectomy the patient's general condition was the main guide, and no arbitrary time interval since the onset of symptoms was laid down. For example, in Case 1, although the ulcer had perforated 16 hours previously, the patient was in excellent general condition and, following partial gastrectomy, made an uninterrupted recovery. A gross degree of peritoneal soiling was usually regarded as a contraindication to gastric resection, although in the first case in the series recovery followed gastrectomy in the presence of gross peritoneal contamination.

In no case did the technique of operation present any marked difficulty, and in general Nuboer's findings were confirmed. It was usually easy to free the duodenum, pylorus, and stomach from the inflamed and oedematous surrounding tissue. As Lowdon pointed out, the anterior duodenal perforation is usually unassociated with the technical difficulties so common with posterior and penetrating ulcers. In the majority of cases the closure of the duodenal stump was simple, although when dealing with perforated duodenal ulcers it was in most cases necessary to perform an open division and closure of the duodenum as the oedema of its walls and the size of the perforations prevented the application of a clamp distal to the ulcer. No case of leak from the duodenal stump occurred.

The two fatalities occurred early in the series, and in each case a considerable degree of peritoneal contamination accompanied the perforation. This subsequently led to a more cautious attitude in such cases, although an uneventful recovery followed immediate resection in Cases 1 and 5, in both of which peritoneal soiling was considerable. Tanner (1954) has reported similar successful cases of immediate gastrectomy performed in late perforation with frank pus in the peritoneal cavity.

The remaining cases all had a smooth post-operative recovery, the results encouraging us to continue the policy of performing immediate resection in selected cases.

Summary

Experience with immediate partial gastrectomy for perforated gastric duodenal lesions is recorded.

The operation was performed in carefully selected cases only.

The chief criteria for such selection in a patient fit for resection were (a) any perforated gastric lesion, (b) large perforations, (c) a history of previous perforation, (d) a long preceding history of ulcer dyspepsia, and (e) concomitant haematemesis.

Fifteen cases were selected for immediate gastrectomy in a series of 54 perforations dealt with over a period of 30 months. There were two fatalities.

The operation in no case presented any technical difficulty and the post-operative period was uneventful.

ADDENDUM.—Since June, 1954, a further 15 cases of perforated peptic ulcer have been admitted to the University

Surgical Unit. Four of these cases were dealt with by immediate partial gastrectomy without mortality.

We wish to thank Professor R. P. Jepson for his advice during the preparation of this short communication.

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CONGENITAL ATRESIA OF THE BILE DUCTS

REPORT OF CASE TREATED SUCCESSFULLY BY CHOLECYSTOJEJUNOSTOMY

BY

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John Thomson, of Edinburgh, first aroused interest in this condition by his careful analysis of 50 cases in 1892. Holmes (1916) collected 120 cases from the literature, described a large number of variations in malformations of the extrahepatic bile ducts, and concluded that about 16% of the patients could be amenable to surgical treatment. Ladd (1928) was the first surgeon to operate successfully upon a case of congenital atresia of the choledochus. Gray *et al.* (1948), in reporting two cases of their own which were successfully treated by cholecystogastrostomy, state that between 1928 and 1948 only 17 cases were recorded in the literature as being cured by surgical measures.

Durell and Halliwell (1952) described a case of congenital atresia of the common bile duct which was cured by cholecystogastrostomy, and remarked that surgical intervention had been successful apparently in only 21 cases up to 1949. Moore (1953) explored 31 cases of congenital atresia of the bile ducts and performed 8 anastomoses, only one of these patients surviving operation. Likewise, Greaney *et al.* (1954) explored 33 cases, 9 which were suitable for biliary-intestinal anastomosis, and 3 of which were cured. Gross (1953), in by far the largest series, records 146 cases: in 119 nothing could be done on abdominal exploration; in 27 the gall-bladder or the hepatic or common duct was available for anastomosis to the duodenum, and 12 of these were cured.

So far as can be ascertained from published articles, 38 cases of congenital atresia of the extrahepatic bile ducts have been successfully treated by surgery. The majority of the successful operations for this rare abnormality have been recorded by American surgeons. Durell and Halliwell (1952) gave an excellent account of the first case to be cured by cholecystogastrostomy in this country.

So far as I am aware the case described below is the first recorded account of a successful cholecystojejunostomy combined with jejunojejunostomy for atresia of the common bile duct to be published in the British literature.

Pathology

In this congenital abnormality one or more parts of the external biliary tract are either absent or exist as fibrous cords. The extent of such obliteration determines the operability of the case. It will be operable if the atresia exists in the lower portion of the hepatic duct or in the common duct, or if the gall-bladder and cystic duct communicate with the hepatic duct which is distended with bile.

The gall-bladder may be found in one of four pathological conditions: (1) it may be absent or atretic; (2) it may contain a small lumen which does not communicate with the ductal system; (3) it may be distended with white bile-mucocele; and (4) it may be normal or enlarged and contain normal bile, indicating that the blockage is in the common duct. The liver is enlarged, stained dark green, and diffusely nodular, portraying the picture of portal cirrhosis of the obstructive type. The edge of the spleen is usually palpable and portal hypertension is a common feature. Ascites may or may not be evident. Petechiae, extravasation of blood in the subcutaneous tissues, and cerebral haemorrhage have been observed in some of these cases.

Diagnosis

The clinical picture is similar in most cases. The outstanding sign is jaundice, which is present at birth or appears two or three weeks later. This is at first mild, the skin being merely tinted pale yellow, but gradually increases until at the end of a month or so it is intense and gives place to a greenish-yellow hue.

The congested cirrhotic liver at the same time gradually enlarges and feels unduly hard on palpation, its edge being rounded and firm. The notched margin of the spleen is frequently detected. The stools are white, putty-like in consistency, and acholic, while the urine is bile-laden and dark brown. It should be noted that the stools are always white from birth even though jaundice may not be noticed until the second or third week of life.

The icteric index varies in different infants and from day to day in the same patient, ranging mostly between 50 and 200; the blood picture shows a secondary anaemia; the red cells are not unduly fragile; there is no microspherocytosis; the clotting time is seldom elevated; the prothrombin time may be lowered; and the liver-function tests support a diagnosis of obstructive jaundice.

The condition may be confused with icterus neonatorum, erythroblastosis foetalis, jaundice of haemolytic sepsis, congenital syphilis, or congenital haemolytic anaemia. Every attempt should be made to arrive at a diagnosis within the first four or five weeks of life and not to delay exploratory laparotomy beyond the second month, as the majority of patients will die of liver failure within five months if the blockage is not relieved. It is a surprising fact, however, that a few patients possessing no extrahepatic ducts have lived to be 8 to 10 months old. The diagnosis can be arrived at by a process of elimination with a fair degree of certainty by the end of the first month of life, and sometimes earlier than this. In other words, the diagnosis is made by excluding other causes of jaundice and by proving that the infant under investigation is suffering from obstructive jaundice.

To-day, about 20 to 25% of these babies present conditions of the extrahepatic ducts which are correctable only by operative measures.

Operative Treatment

Pre-operative measures include the correction of dehydration, one or two small transfusions of blood, and the administration of vitamin K. Penicillin is given intramuscularly before and after operation.

The anaesthetic of choice is open ether. Satisfactory relaxation of the abdominal muscles cannot be obtained with local analgesia. The use of muscle relaxants is definitely contraindicated. There is a choice of two incisions: right

vertical epigastric muscle-split incision or Kocher's incision. Considerable difficulty may be experienced in determining the type of malformation present. The liver is enlarged and defies mobilization, the gall-bladder and the ducts (when present) are small, the anomalies show wide variations, and the operative field is highly vascular.

If the gall-bladder is present and the common bile duct cannot be seen, a wise manoeuvre consists in inserting a hypodermic needle into the fundus of the viscus and distending the gall-bladder with saline solution. When the cystic duct is patent and the common duct is present the fluid will distend the choledochus and bring it into view. In some cases of obstructive jaundice the lower end of the common bile duct is plugged with mucus or inspissated bile, and this method may be sufficient to produce displacement of the mucus-laden biliary sand and cause it to pass into the duodenum, thus relieving the obstruction.

Some surgeons practise operative cholangiography with the object of illuminating the existing ductal system. I have no special experience of this method of investigation for the type of case under discussion. Where, however, there is a definite stenosis of the common bile duct, although cholecystogastrostomy has often been practised for the relief of this condition, Ladd and Gross (1941) have no doubt that choledochoduodenostomy, when feasible, is a far superior operation in spite of its greater technical difficulty. According to Gross (1953), choledochoduodenostomy or hepaticoduodenostomy is the operation of choice when the lower end of the common duct is atretic or when only a nubbin of the hepatic duct is available for anastomosis to the intestine. I believe, however, that the mobile proximal loop of jejunum is more suitable for end-to-side union to the bile duct or gall-bladder than is the thick-walled pyloric segment of the stomach or the tethered duodenum.

Choice of Operation

The choice will in many cases depend upon the site and extent of the obliterative process and also upon the condition of the gall-bladder itself (see Table).

Conditions and Appropriate Operations

Condition Found at Operation	Operation of Choice
A Gall-bladder present; cystic duct communicates with main ducts; stricture lower end of common bile duct	(1) Cholecystojejunostomy plus entero-anastomosis (2) Choledochoduodenostomy (3) Cholecystoduodenostomy (4) Cholecystogastrostomy
B Gall-bladder functionless or absent; stricture lower end of common bile duct	(1) Choledochoduodenostomy (2) Choledochojejunostomy plus entero-anastomosis
C Extensive stricture of common duct, but hepatic duct patent and contains bile	(1) Hepaticojejunostomy plus entero-anastomosis (2) Hepaticoduodenostomy
D No extrahepatic ducts	(1) Longmire's operation

When choledochoduodenostomy is a feasible procedure the bulbous lower end of the common duct should be freed and divided, and a small short rubber tube or a piece of No. 8 catheter about 1.5 cm. long should be inserted upward toward the hepatic duct. An opening is made in the antero-superior wall of the first part of the duodenum, opposite the end of the duct, and the small segment of catheter is led through the hole into the lumen of the bowel. With the tube in place, a single row of closely and carefully applied interrupted mattress sutures of fine silk or "dek-natel," mounted on eyeless needles, is inserted so as to anchor the wall of the duct to the duodenum.

Hepaticoduodenostomy or hepaticojejunostomy is likewise performed with one row of interrupted mattress sutures, but after the latter operation an entero-anastomosis between the afferent and efferent limbs of the jejunum is carried out to divert the gastric and duodenal contents away from the vulnerable biliary tree.

When the gall-bladder obviously contains bile, as demonstrated by aspiration into a Record syringe, the organ may be anastomosed to the stomach, the duodenum, or to a loop of proximal jejunum with every hope of success. The operative technique of cholecystojejunostomy combined with jejunojejunostomy is described in the following report.

Case Report

The patient was a full-term male child born on October 8, 1951. He was normal at birth and weighed 7 lb. (3.2 kg.). Delivery was uneventful. The infant was breast-fed. Jaundice was noticed during the second week of life, the urine was dark brown, and the stools were white. No drugs had been administered. The parents and two other children were alive and well. There was no family history of jaundice, syphilis, or congenital deformity. The patient was admitted, under my care, to the Southend General Hospital.

On admission the infant was 1 month old and his weight 7 lb. 11 oz. (3.5 kg.). He was ill and apathetic, with jaundice of the skin and conjunctivae. No petechial haemorrhages or rashes could be seen, nor was there any evidence of sepsis of the skin or umbilicus. On inspection the abdomen was slightly protuberant and there were no distended veins. There was a moderate degree of hepatomegaly, as the rounded edge of the liver could be felt three fingerbreadths below the right costal margin. The spleen could not be palpated. A nystagmus was present, with no other abnormal neurological signs. The urine was a deep brown colour and contained bile salts and pigments. No urobilinogen was present. The stools were white and obviously contained no bile pigments. The value for haemoglobin was 5.6 g. per 100 ml. of blood (or 36%); the red cell count was 2,300,000; the colour index was 0.8; and leucocytes numbered 13,000 per c.mm. Red blood cells were of normal fragility, and 20 nucleated red cells were seen while counting 100 white cells.

The Wassermann and Kahn reactions were negative. The van den Bergh test gave a direct positive reaction and the serum bilirubin was 10.3 mg. per 100 ml. Blood grouping showed that parents and baby belonged to Group A and Rh positive.

A diagnosis of congenital atresia of the bile ducts was made. The infant's general condition was improved by two intravenous infusions of 120 ml. of blood, which raised the haemoglobin to 80%, and by the intramuscular administration of vitamins B and K.

Four days after admission to hospital the child's condition deteriorated, opisthotonos developed, and the nystagmus increased. The condition was diagnosed as an intracranial haemorrhage, and lumbar and ventricular punctures were performed. No cerebrospinal fluid was obtained on lumbar puncture and the ventricular fluid contained blood. The ventricular tap was repeated two days later and the fluid was blood-stained and xanthochromic. Six days later the circumference of the head had increased and bulging of the anterior fontanelle was present. The subdural spaces in each side were explored and 4 ml. of dark-brown blood was removed from the right side. As no further haemorrhages occurred, operation was carried out, under ether anaesthesia, on November 29, 1951.

Operation.—The abdomen was explored through a vertical right epigastric muscle-split incision which extended from the costal margin to 1 inch (2.5 cm.) below the umbilicus. Exposure revealed an enlarged cirrhotic dark-green liver. The spleen was larger and firmer than normal and a small amount of yellowish ascitic fluid was removed by aspiration. The tiny gall-bladder was tensely distended and the common bile duct ended in a bulbous nubbin above the duodenum. A hypodermic needle was inserted into the fundus of the gall-bladder and yellow bile was aspirated into a Record syringe, after which saline solution was forcibly injected to distend the minute ducts. The common bile duct ended abruptly about 2 or 3 mm. below the point

of entrance of the cystic duct. The fundus of the gall-bladder was mobilized; a long loop of the proximal jejunum was drawn upward in front of the transverse colon; and the apex of the loop was anastomosed to the full length of the gall-bladder by the side-to-side method, using two rows of interrupted sutures of the finest silk, mounted on eyeless needles. Portions of the jejunum proximal and distal to the stoma were anchored to the capsule of the liver to relieve any tension on the suture line. The operation was completed by performing a side-to-side jejunojejunostomy well below the previous anastomosis, with the object of diverting gastric and intestinal contents from the biliary tree. The individual layers of the abdominal incision were approximated with interrupted sutures of silk, and a small dressing was strapped over the wound.

Post-operative Progress.—Bile was noticed in the vomitus the night after the operation and in the stools three days later. During the next week the jaundice began to fade and the urine became lighter in colour. The liver was not palpable three weeks after operation. The wound healed soundly, jaundice entirely disappeared, no further haemorrhages occurred, the appetite rapidly improved, and the infant made an uninterrupted recovery. He was discharged from hospital six weeks after operation, weighing 9 lb. 2 oz. (4.1 kg.). The patient has been examined periodically during the last three years. When last seen he looked the picture of health and was developing normally.

Conclusions and Summary

A newborn child who has jaundice should be subjected to an exploratory operation shortly after a diagnosis of *obstructive* jaundice is made.

A search then must be made for any evidence of extrahepatic biliary passages which might be used to establish a free flow of bile into the intestinal tract.

Fully 20% of cases of atresia of the bile ducts can be cured by the performance of choledochenterostomy or cholecystoenterostomy.

The techniques of these operations are briefly discussed.

A case of congenital atresia of the common bile duct, which was successfully treated by cholecystojejunostomy combined with entero-anastomosis, is described.

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Ambulance, a professional journal for ambulance and industrial first-aid personnel, has had its first issue. A development of the quarterly review published by the Institute of Certified Ambulance Personnel for their members. *Ambulance* is expected, while continuing to be the official organ of the Institute, to interest readers outside it. It will be on sale to the public (price 1s.) and be produced four times a year. Its aim is to encourage free expression of ideas, even if these do not represent the official views of the Institute, and its columns are open to any reader for discussion on any topic which concerns ambulance men and women. The theme of the first issue is industrial safety. An editorial suggests that "the first-aid arrangements made by industrial firms under the Factory Acts are capable of improvement if they are to safeguard workers under present-day conditions." Another article discusses the prospect of an industrial medical service being set up.

ATTEMPTED SUICIDE WITH METHYLPENTYNOL AND PERSOMNIA

BY

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Methylpentynol ("oblivon") is an unsaturated tertiary carbinol described by Margolin *et al.* in 1951. "Persomnia" is a synergistic combination of the open-chain ureides, carbromal and bromvaletone. Both these drugs have sedative and hypnotic powers, and, as well as being prescribed widely, are freely obtainable without prescription. The following case is described because there are still relatively few reports of overdosage with methylpentynol, and because this is the first reported case of attempted suicide with this combination of drugs.

Case Report

A soldier aged 38, weight 140 lb. (63.5 kg.), attempted suicide on February 6, 1955, by swallowing 25 capsules of oblivon (6.25 g. of methylpentynol) and about 75 tablets of persomnia (225 gr. (15 g.) of carbromal and 75 gr. (5 g.) of bromvaletone). These drugs were purchased from chemists' shops without prescription. The man was suffering from a severe reactive depression of two weeks' duration.

At 11.30 p.m. he began his attempt by taking oblivon, and continued with persomnia until he fell asleep. At 7.30 a.m. the following morning he was discovered unconscious on his bed, and tablets were found on the floor and in the bed. He was unresponsive to any stimuli. When seen by a medical officer at 8 a.m. he was in coma, and was at once transferred to hospital.

On admission at 9 a.m. he was found to be still comatose, but his colour, breathing, and pulse volume were satisfactory. Gastric lavage with sodium bicarbonate solution was performed and 20 mg. of amphetamine sulphate was left in the stomach. General supportive therapy was begun and he was started on intramuscular amphetamine. By 1.30 p.m. his coma had lightened, and by the following morning he was fully conscious. He was unable to recall anything from the time he took the drugs until he awoke in hospital on February 8. He was quite rational and was able to give a coherent account of himself. His only complaint was of headache. There was slight pyrexia, which was accounted for by bronchitis due to secondary respiratory infection. On February 11 he complained of pain in the left popliteal fossa, and this was found to be due to early thrombophlebitis.

The next day he was transferred to the psychiatric division of the Royal Victoria Hospital. The thrombophlebitis and residual bronchitis cleared up with penicillin. There was no apathy or ataxia, and he was left with only some depression relevant to his problems. During the next month he improved with sedation and psychotherapy.

Comment

Bourne (1954) and Lemere (1952) have reported cases of overdosage by methylpentynol, with recovery, in patients who had ingested respectively 6.25 g. and 8.75 g. The largest recorded overdose followed by recovery was 10 g. (Brown and Ellis, 1955). The only reported fatality appears to have followed a dose of 4.5 to 6 g. (Cares *et al.*, 1953).

Only one case of death from persomnia has been recorded (Coroner's Court, Bedford, 1952). This occurred in a woman

who swallowed over 200 tablets—800 gr. (52 g.). Hobart (1951) states that detoxication of the open-chain ureide sedatives is fairly rapid, and that 60–600 gr. (4–40 g.) have been taken in suicidal cases without harm.

Synergism between methylpentynol and barbiturates resulted in death in a man who took 9 oblivon capsules and 20 pentobarbitone sodium ("nembutal") tablets (*British Medical Journal*, 1955). Although it appears from our case that methylpentynol and persomnia do not potentiate each other, the possibility of an additive effect might be considered.

Finally, we would agree with Glatt (1955), who said with reference to methylpentynol, "It is regrettable that members of the public should still be able to purchase large quantities of this drug so easily without a prescription, in spite of the advice of the Pharmaceutical Society; it should be supplied only on a prescription." On the other hand there are no indications for placing special restrictions on the sale of persomnia, but note should be taken of a recent report in the English literature of a purpuric eruption caused by carbromal (Borrie, 1955).

Summary

A soldier aged 38 attempted suicide by swallowing 25 capsules of oblivon and 75 tablets of persomnia. He was suffering from reactive depression. He recovered on routine treatment. This is the first reported case of attempted suicide with this combination of drugs.

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Medical Memoranda

Recurrent Abortion Associated with a Bicornuate Uterus

A successful outcome to a pregnancy in one horn of a bicornuate uterus is by no means a rarity, but the problem of how best to advise a patient with such a developmental abnormality of the uterus after four successive abortions may be difficult to solve. This is illustrated by the following case.

CASE REPORT

When first seen by me at Farnborough Hospital in 1949 the patient was a healthy woman aged 28. Her general medical and family history contained no features of relevance. Menstruation had begun at 15, and periods of six days' duration were occurring regularly at 26-day intervals. Her first four pregnancies all terminated in abortion, and the details may be summarized as follows.

The first pregnancy, in 1943, ended in abortion at two months and was followed by evacuation of the uterus under general anaesthesia. A diagnosis of "subseptate uterus" was made, but a hysterogram some six months later was reported as "indefinite," as the dye was not retained.

The second pregnancy, in 1946, terminated in abortion at 10 weeks. The patient was receiving weekly injections thought to have been of progesterone, and it was on the day after the third of these that the abortion occurred.

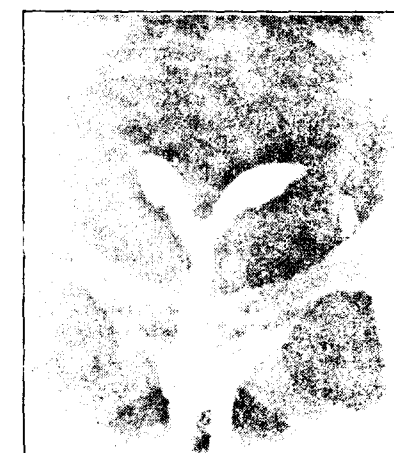
The third pregnancy, in 1949, lasted nearly 14 weeks, and it was at this time that the patient first came under my care. When the second period was due there had been three small painless vaginal blood losses on consecutive days. She allowed a week to elapse before reporting to the clinic, and a pregnanediol estimation at the time revealed no evidence of progesterone deficiency. When the third period would have been due vaginal loss recommenced. She was admitted to hospital, and, in spite of complete bed rest, abortion occurred two weeks later. Evacuation of the uterus followed, and on examination under anaesthesia an indentation could be clearly felt in the position of the fundus. A finger passed through the open cervical canal identified a projection into the uterine cavity, the retained products of conception being found in the left horn.

The fourth pregnancy occurred in 1951, and the patient was seen after she had had seven weeks' amenorrhoea. She stated that one week previously a small red blood loss per vaginam had been noted, and this had been followed by a slight pinkish discharge every morning. Some days later, at the time when the second period was due, a further small fresh blood loss occurred, but with complete rest in bed and 2 gr. (0.13 g.) of phenobarbitone daily for seven days this symptom was not repeated. The time when the next period would have occurred was estimated and complete bed rest was again the regime adopted. Nothing untoward occurred. Progress appeared to be satisfactory until the 22nd week of pregnancy, when backache and a watery vaginal loss were followed by complete abortion. A male foetus was passed which was normal on inspection. Macroscopically the placenta showed no abnormality.

Eight months later a hysterosogram was undertaken. One and a quarter hours after $\frac{1}{2}$ gr. (22 mg.) of "omnupon" had been administered hypodermically, an intrauterine injection of "viskiosol six" was given. The x-ray picture obtained is reproduced. The patient was naturally anxious about the outcome of any future pregnancies, and I advised that a further attempt might be made.

Three months later she began her fifth pregnancy. As had been previously arranged, she was admitted to hospital for complete rest in bed at the times when her periods would normally have been due. Progress was uneventful until the 26th week, when she was readmitted to hospital complaining of backache and watery discharge. These symptoms, however, were not apparent after admission, and three days later she returned home.

At 36 weeks the foetal position was left sacro-anterior. Maturity and the presentation of breech with extended legs were confirmed radiologically. No attempt at external cephalic version was made, and elective caesarean section was decided upon. The operation was performed three weeks later. Foetus and placenta were found to be occupying the left horn of the uterus and were delivered through a longitudinal incision in this horn, breech extraction of a female infant being achieved with no difficulty. The right horn of the uterus was hypertrophied and about the size of a 10-weeks pregnancy. A thick muscular projection extended from the indent in the fundus down to the level



Radiograph showing uterus bicornis unicollis.

of the internal os. The child appeared normal in all respects and weighed 5 lb. 12 oz. (2.6 kg.). Maternal and infant progress was uneventful.

COMMENT

In an attempt to assess what the chances of a successful conclusion to a fifth pregnancy would be I was influenced by the writings of Malpas (1938) and Eastman (1950). These authors estimated mathematically the "spontaneous cure rate"—that is, the chances of successful pregnancy—following any given number of successive abortions. Their calculations included both those abortions resulting from accidental or fortuitous factors and also those in which a recurrent cause was present. The figure arrived at by Malpas for the chance of successful pregnancy following four consecutive abortions was 6% and that of Eastman under 2%.

In the case here reported there was a most definite causative factor for the abortion, failure of approximation of the Müllerian ducts having led to the condition of uterus bicornis unicollis. The mathematical chances of a fifth pregnancy succeeding seemed very slight indeed. The decision to advise the patient to make a fifth attempt was taken because of the fact that the duration of each pregnancy had increased, abortion occurring at 8, 10, 14, and then 22 weeks. This suggested that each successive hypertrophy of the pregnant horn of the uterus made it more capable of containing the next pregnancy, and it was hoped that if this sequence were maintained a viable foetus might result. In this decision I was influenced, too, by the keenness of the patient herself to try again. Another alternative was to perform an abdominal metraplasty, but it was decided to await the outcome of this further attempt.

It is an established fact that when pregnancy occurs in one horn of a uterus the other undergoes hypertrophy and a decidual reaction occurs. Occasionally the non-pregnant horn continues to menstruate, and this bleeding at the time of a period from a pregnant bicornuate uterus is not necessarily indicative of threatening abortion. However, in this case the losses were followed by abortion on too many occasions for this symptom to be ignored, and thus rest over the time when the periods were due was regarded as important.

I am indebted to Mr. R. C. Thomas for permission to report this case, and to Mr. D. Lindsay and Mr. K. G. Seager for their helpful advice.

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Purpura following Manipulation of the Spine

The patient, a milk tester aged 42, is well known to me, as he has suffered for years from a contact eczema of the forearms. I have therefore had frequent occasion to inspect his skin, and before the episode described below he had not shown any purpuric manifestation.

On June 3, 1954, he was driving a motor-cycle combination with his head turned sideways to view a field of wheat, when he hit a small obstruction in the road. The jar was not excessive. Two hundred yards further on he tried to dismount, but found that he was unable to do so because of pain in his back. With considerable difficulty he got home and retired to bed. I saw him the next day and found him almost completely immobilized, with the now common syndrome, "the acute back."

On June 5 I asked an orthopaedic surgeon to see him on a domiciliary visit and he diagnosed, "joint lesions at L 3-4 joint on the left side, and the L 4-5 joint on the right side." These he mobilized by forward pressure on the left side of the third and on the right side of the fourth lumbar vertebra, with suitable positioning to lock the neighbouring joints. There was some relief of pain from this manoeuvre.

On June 6 I was called to see him as a rash had appeared on both lower legs. The rash was a florid petechial one, extending from his toes up over his thighs. There was a large effusion into the right knee-joint and bilateral effusion into both ankles.

He was admitted to the skin ward of the Gloucester General Hospital for observation, where the rash and joint symptoms subsided over the next ten days.

Since that date I have seen another patient who was manipulated by an osteopath for a cervical lesion, and who exhibited two patches of purpura on the shoulder in the skin area supplied by nerves arising from the vertebral apertures manipulated. Blood, fragility, and clotting tests in this patient were all normal and his rash faded within two days.

The orthopaedic surgeon who manipulated the first patient told me that he had seen transitory eruptions following manipulation, but nothing of the magnitude of the case described. I make no suggestion about the mechanism of this phenomenon, but think it worth reporting as yet another cause of purpuric eruptions.

I thank Mr. J. Bourdillon for his orthopaedic care of this case, and Dr. R. E. Bowers for his advice and for admitting this case to his dermatological beds for observation.

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The Adrenal X-Zone in Kwashiorkor

Although information is available concerning the morphological changes in the human adrenal before and after birth, nothing is known of the function of the foetal X-zone of the cortex, which is most concerned in these changes. Anencephaly is the only condition definitely known to be associated with changes in the development and disappearance of this zone. Consequently the report by Gillman and Gillman (1951) that this zone persists in African infants dying of kwashiorkor is of great interest, since it would suggest a new approach to the physiology of this zone. As a first step in this direction it was necessary to confirm, if possible, the original observation.

The adrenals from seven cases of kwashiorkor in African children between the ages of 1 and 4 years were examined by methods used previously (Stoner, Whiteley, and Emery, 1953). They were compared with the adrenals from 19 other African children dying from a variety of causes, and with the adrenals from a larger series of English children (Stoner *et al.*, 1953). The behaviour of the foetal X-zone appeared to be the same in all three groups. No evidence of its persistence in the cases of kwashiorkor was found, and, so far as could be ascertained from these small groups, the rate of involution of the foetal X-zone after birth in the African adrenals was the same as in the English series and equally unaffected by systemic disease.

We have been prompted to report this negative observation since, with modern methods of treatment, fatal cases of kwashiorkor are becoming infrequent, and the original claim of Gillman and Gillman has now been reiterated in two reviews (Lanman, 1953; Baar, 1954).

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Reviews

PSYCHO-ANALYTICAL TECHNIQUE

The Technique of Psycho-analysis. By Edward Glover, M.D. (Pp. 404+x. 35s.) London: Baillière, Tindall and Cox. 1955.

Neither Freud nor any of the early pioneers in psycho-analysis ventured to write a full exposition of its technique. Perhaps they were acting on Bernard Shaw's cruel epigram, "He who can does; he who cannot teaches"; but more probably they were daunted by the endless ramifications of an enormously complex subject. The second generation of psycho-analysts were less restrained, and after the First World War several books appeared on technique. One recalls a very poor one in 1920 by Paul Bousfield, a fairly good one in 1922 by David Forsyth, and an excellent one in the same year by de Saussure. Then followed a series of six lectures by Edward Glover in 1928, which were published as a supplement to the *International Journal of Psycho-Analysis*. Since that time Dr. Glover has severed his connexion with other psycho-analysts. This has doubtless given him more independence, but has its own peculiar disadvantages.

The present book is made up of three parts. The first, longest, and most essential one consists of a greatly expanded version of the lectures just mentioned. The second is a record of a lengthy questionnaire Dr. Glover carried out in 1936-8 among British psycho-analysts. The main conclusion emerging from it is the extraordinary difficulty of formulating questions with sufficient precision to elicit comparable replies of value from different analysts. The third part is a reprint of three thoughtful essays that were published in the *International Journal* in 1931, 1937, and 1954 respectively.

The book is written in an easy, fluent, and vivid style, and is packed with the author's characteristic shrewd wisdom. Although ostensibly addressed to students, it can be read with profit by every practising psycho-analyst. So many detailed issues are raised in it that it would need a long technical essay to evaluate them properly, and this no doubt will happen elsewhere. In the meantime it can be hailed as a contribution of value to a difficult topic, and recommended to those who are directly concerned with it. It is well produced and has an excellent index.

ERNEST JONES.

EPSOM COLLEGE

Epsom College Register, 1855-1954. Edited by T. R. Thomson. (Pp. 620; illustrated. 31s. 6d.) Oxford: University Press for Old Epsomian Club. 1955.

Timed very accurately to anticipate the visit of Her Majesty, whose demonstration of her interest in the centenary of the College has gratified the whole of our profession, this *Epsom College Register*, as a labour of love on the part of Dr. T. R. Thomson and of the Old Epsomian Club, reflects the greatest credit on all concerned in its production, including the Oxford University Press. The introductory chapters, which are in fact a brief history of the school in its first hundred years of existence, should prove intriguing to the medical profession at large as well as to the considerable Epsomian section of it, and also to those of the general public who are education-minded. That the College has deserved well of the profession, so many of whose sons it has educated, especially by its provision of free places for those boys (and girls) left in straitened circumstances by early parental death and other causes, is a truism which there is no need to labour here. That it urgently needs financial help to carry out an essential programme of improved buildings and other amenities is equally true. The Council has for some months striven unceasingly to convince the medical profession of this, with a degree of success not as yet by any means commensurate

with its truth. The production of this admirable volume may help to persuade those who chance to read it that the enterprise and vision of the Council really do deserve generous support. Of the *Register* itself it can be reported that it is well worthy to take rank among the best of the similar products emanating in recent years from public schools of similar standing. It is a splendid monument to the patriotism and piety of the Old Epsomian Club.

HENRY ROBINSON.

MODERN TRENDS IN OPHTHALMOLOGY

Modern Trends in Ophthalmology. Third series. Edited by Arnold Sorsby. (Pp. 346+xiv; illustrated. 65s.) London: Butterworth and Co., Ltd. 1955.

The purpose of a book such as this is to enable its reader to keep in touch not only with recently consolidated gains in knowledge but also with current trends in thought and experiments in technique through which the advances of the future may accrue. This volume, the third of its series, follows the general lines of its predecessors. Its 28 chapters divided into six sections cover such a diversity of subject-matter as to make a general appraisal difficult; the value attached to each section will vary with the interests, experience, and familiarity with the literature of each individual reader, but each section is not without interest, and the general balance is good. Those surgically inclined will welcome the chapters on corneal and retinal operations and on surgical technicalities, and another giving a clear exposition of the management of vertical squint. In the diagnostic and clinical fields are excellent and well-illustrated articles on, among other subjects, slit-lamp fundus microscopy, binocular ophthalmoscopy, and tonography; while particular recognition may be accorded to chapters on the nature of malformations and on the criteria of genetic affections, and to the section on social ophthalmology dealing with the problems of the blind and visually handicapped. Current views in relation to ocular pharmacology, collagen diseases, allergy, virus diseases, and the fitting of contact lenses are among other subjects discussed.

Some of the sections are so short and of such little apparent value or interest as to make the reviewer wish that they had been omitted to allow of the "selected bibliographies" having been made less selective; for example, in one chapter in which 36 or so authors are quoted in the text, only 12 references are appended. It is also perhaps unfortunate that in certain directions, particularly in an article on retrolental fibroplasia, and even allowing for the inevitable time-lag between writing and publication, the book's titular claim to modernity can hardly be upheld. Nevertheless this volume, excellently produced and well illustrated and indexed, will go a long way in helping to keep the ophthalmologist abreast of the times and in touch with the modern trends of his specialty.

A. J. B. GOLDSMITH.

RECENT ADVANCES IN TREATMENT

Modern Treatment Yearbook, 1955. Edited by Sir Cecil Wakeley, Bt., K.B.E., C.B., LL.D., M.Ch., D.Sc., F.R.C.S., F.R.S.E., F.R.S.A., F.A.C.S., F.R.A.C.S. With 36 contributors. (Pp. 344+viii; illustrated. 25s.) London: For Medical Press by Baillière, Tindall and Cox, Ltd. 1955.

The Modern Treatment Yearbook, which comes of age in this twenty-first publication, is designed to keep the practitioner informed on the practical application of the latest research in medicine, using the latter term in its widest sense. Though the emphasis is on therapeutics, the yearbook includes more than a bare description of recent advances in treatment, for it recognizes that it is impossible to describe treatment adequately without defining the condition to be treated, which often involves some discussion on aetiology and diagnosis. It thus provides what is essentially an annual refresher course in medicine given by 36 physicians and surgeons, mostly chosen from those working in London or its environs. A great diversity of subjects is covered

in these 36 well-chosen articles, including, for example, the new insulins, Bornholm disease, blood-vessel grafting, temporal arteritis, growing pains, and prolonged labour. Though the book is a small one comprising only 344 pages, and though it is packed full of concise information, it is nevertheless eminently readable, even by an exhausted practitioner at the end of a long day. Instead of the tabulated instruction so popular in many current American therapeutic works of reference, each contribution in this book consists of a well-written short essay summarizing in excellent English, in simple terms, and with much wisdom the present state of our knowledge on a large number of subjects of current interest in which advances have recently been made.

This is a very good book indeed, and it was a most encouraging and unusual experience for the reviewer to find that there was nothing in it he could not understand.

D. M. DUNLOP.

GALEN

Galen of Pergamon. By George Sarton. (Pp. 112; illustrated. \$2.50.) Lawrence, Kansas: University of Kansas Press. 1954.

English literature of the history of medicine is poor in reliable works on Galen and has very few translations of his writings. This is a serious deficiency. Hippocrates is at best a shadowy figure who may well have written nothing, and every member of the so-called "Hippocratic" collection is of disputable date and authorship. Most of them come from a world lit by a misty half-light of scholarship. But Galen is a real and very human figure, one of a world and circle familiar to philosophical historians. To them Galen's use of the experimental method is as well known as Harvey's, perhaps better. Moreover, it was the translation into Latin of Galen's works, and specially of his anatomical works, that set medicine on its modern scientific path, signposted by observation and experiment. Hitherto the only full account of Galen in English was in a scattered series of pleasantly readable papers by the late Dr. Joseph Walsh which are, unfortunately, not easily accessible. Thus Dr. Sarton in this handy little volume opens to English readers what is almost a new chapter in the study of ancient medicine.

Galen, as Dr. Sarton tells us, was a Greek of Asia Minor who studied at many centres in the East Mediterranean—then under complete Roman control. He spent several years at Alexandria. His writings are the chief source of our knowledge of the great medical school there. His most active and creative years were spent at Rome, where he was physician to Marcus Aurelius (Emperor, 161–180) and tutor to his son Commodus (Emperor, 180–192). He must have been very familiar with the Latin tongue, but his writings are all in Greek, the scientific lingua franca of his time. Of all this Sarton gives a concise and excellent account, wisely treating lightly the differences between the over-written ancient "medical sects," the tedious and unclear exposition of which has repelled many readers of medical history. Sarton's booklet provides also good summaries of Galen's various activities, as anatomist and physiologist, as clinician, and as philosopher, with sections on his character, style, bibliography, and translation. Altogether a useful and well-timed little book.

CHARLES SINGER.

GYNAECOLOGY

Gynecology: Diseases and Minor Surgery. Compiled and edited by Robert J. Lowrie, M.A., M.D., F.A.C.S. Foreword by Claude E. Heaton, M.D. (Pp. 852+xix; 775 illustrations, 19 in colour. £8 2s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

This work on gynaecology, the first of two volumes, is described as representing the culmination of many years of effort of 79 contributors from 30 medical schools and other institutions in the United States, Canada, and Great Britain.

The book, which is generously illustrated, covers the subject of gynaecology with considerable thoroughness, even including matters which seem more appropriate to undergraduate teaching. To remind graduate readers that

the cervix is also called the "neck of the womb" seems unnecessary, as are two illustrations showing how a digital examination of the pelvic organs is carried out. Also, a number of opinions are expressed which will not be accepted in this country. For example, in the chapter on infertility there is the statement that "donor insemination is a needed and rewarding medical service"; even in America this statement is probably no longer acceptable now that an American judge in Chicago has ruled that, "except where donor and recipient are married to each other, artificial insemination is illegal and constitutes adultery on the part of the mother . . . and the children fathered by anyone but the mother's husband are illegitimate" (*British Medical Journal*, 1954, 2, 1555). On a lighter level, it must be pointed out that the use of gin, 1–2 oz., for dysmenorrhoea is not "so highly regarded by the English School." There are some surprises, too: for example, a section describing in considerable detail the "Kenny" treatment in acute poliomyelitis. The claim is made in the foreword that due consideration has been given "to the role of the psyche" in gynaecological disorders, yet there is no separate chapter about this extremely important subject.

This book contains much wisdom: nevertheless its form and cost will not commend themselves to many in this country.

C. S. RUSSELL.

CRANIAL HYPEROSTOSIS

Hyperostosis Cranii. By Sherwood Moore, M.D. (Pp. 226+x; illustrated. 75s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1955.

The syndrome of obesity, facial hirsuties, and frontal hyperostosis described by Morgagni and re-described by at least three other writers has been known to physicians for nearly two centuries. Dr. Moore has collected practically all the available information on this condition, to which he has added studies of his own.

He subdivides the syndrome into five types and elaborates the whole affair into something which, in the reviewer's opinion, is more complex than the facts justify. It is also suggested that frontal hyperostosis causes headache, fatigue, muscular weakness, nervousness, depression, diplopia, epileptiform seizures, impairment of memory, and other alarming symptoms. These features may have occurred in patients with frontal hyperostosis, but the evidence that they are caused by it is exceedingly uncertain. As regards the aetiology, the author's own words are: "The theory is advanced that hyperostosis and its syndrome are the manifestation of an endogenous intoxication traceable to aberrance in some unknown phase of the function of reproduction." It will be news to most doctors that cranial hyperostosis has social, economic, and palaeopathological aspects.

Although Dr. Moore's book does not throw any new light on Morgagni's syndrome, it must remain a valuable source book for those wishing to explore the subject; the bibliography runs to 315 titles.

A. M. COOKE.

Doctor to the Islands, by Tom and Lydia Davis, is an account of a young doctor, born and brought up on the Cook Islands, who returns from New Zealand to his old home as medical officer. Tom Davis is a self-confident and critical young man. He credits his predecessors with little knowledge and the administration of the Islands with a lack of interest in local welfare which is hard to believe. None the less the problems facing a doctor on the Cook Islands and on others in Polynesia, and the various methods adopted to try to solve them, make interesting reading, as do "Dr. Tom's" excursions into politics on behalf of the islanders. Medicine is not the only topic in the book, however, for Tom Davis took back to Rarotonga with him a New Zealand girl he had married and she has included her account of social life and conditions there. As husband and wife have written alternate chapters in the book the result is rather disjointed. For those who like sailing yarns the last few chapters give a lively story of a Pacific crossing in a small yacht at the worst time of the year. *Doctor to the Islands*, which is published by Michael Joseph, costs 15s.

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DEFENCE AGAINST ATOM BOMBS

On August 6, 1945, soon after 8 a.m., an American Superfortress bomber released an atomic bomb over the centre of the Japanese city of Hiroshima. More than 4 square miles (10 square km.) of the city were destroyed. The city centre was dominated by a number of reinforced concrete buildings owned by banks, department stores, and other commercial enterprises, while outside the centre lay a densely packed zone of small wooden workshops and lightly constructed dwellings. The destruction was due partly to blast and partly to fire, which took firm hold of the city about an hour after the attack and burned unchecked for days.¹ The population of Hiroshima was something under 300,000—or about the size of Coventry, though more straggling.² The population was considerably swollen at the time of the bombing by war workers and military establishments. It is believed that an alert had been sounded before the bomb was dropped but had been "relaxed." The number killed will never be precisely known; it is often estimated at 70,000–80,000, with about an equivalent number of injured. However, the Hiroshima city authorities placed the final toll of immediate and delayed deaths as 210,000 to 240,000.³ The civil defence services, if they attempted to function at all, were overwhelmed by a disaster the scale of which was completely unforeseen. A photograph in a book published in 1953 by a committee of the National Research Council of Japan conveys more forcibly than any words the plight of the survivors. It shows⁴ a group of more or less seriously injured people the day after the disaster, lying in the open, without shelter or shade, without food or water, without hope or comfort. Yet five miles distant was relatively undamaged terrain from beyond which might have come mobile medical and rescue teams and supplies—had they existed to meet a disaster on this scale.

Doubtless the efficiency of atomic weapons has been greatly increased since 1945, and estimates of the destructive power of the hydrogen bomb in particular are too well known to need recapitulation. However, it is at least uncertain if the most powerful weapons would be used in any new war. Smaller, though locally more highly destructive, atomic weapons have recently been developed, such as guided missiles, and projectiles that can be fired from an 11-in. (30-mm.) gun.⁵ While it may be true that a small number of hydrogen bombs released over selected areas in Britain might paralyse defence and rescue work, this is unlikely unless an attack with smaller weapons were to be successfully developed. The lessons of Hiroshima and Nagasaki are therefore still relevant to our own civil defence, and they point to the need for an efficient civil defence service. Neglect to provide one cannot be excused on the ground that it might be rendered useless by a hydrogen bomb attack.

An important investigation on atomic bomb injuries in relation to the type of protection has recently been reported by two American workers,⁶ who analysed the case histories of 5,136 persons injured at Hiroshima and interviewed 1,207 uninjured persons who had been exposed to the bombs. All these survivors reported that they had been within a radius of 13,120 ft. (2½ miles, or 4 km.) from the ground-centre of the explosion. Excluded from the analysis were a small number of uninjured persons within this distance, who were in tunnels or in air-raid shelters. Of the injured, more than half had mechanical injuries—lacerations and contusions—but remarkably enough no fractures were encountered. A. A. Liebow, S. Warren, and E. de Coursey⁷ had earlier reported that, among the survivors of Hiroshima seen two months after the bombing, only 4.5% had fractures. They attributed this low figure to the fact that only those who were able to move escaped the flames. Some time elapsed—perhaps one hour—between the explosion and the spread of the fires. Burns afflicted 45% of the injured. All except three of these were due to flash and not to fire; most were confined to the extremities and were of second or third degree. Radiation effects were suffered by 34%; they were usually moderate, as might be expected in a group of patients who had survived several weeks to months after exposure. The absence of blast injuries was another unexpected finding. Those near enough to be thus injured must have been killed in this or some other way.

Unexpected, too, and with an important bearing on our own problems of civil defence, were the results of the analyses in relation to the class of protection.

¹ *Medical Aspects of Atomic Warfare*, 1948, War Office Publication, London.

² *Report of the British Mission to Japan (Effects of Atomic Bombs on Hiroshima and Nagasaki)*, 1946, H.M.S.O., London.

³ Kusano, N. (editor), *Atomic Bomb Injuries*, 1953, Tokyo.

⁴ — *ibid.*, 1953, p. 22, Tokyo.

⁵ Hunter, C. G., and Wedd, G. D., *Med. ill. (Lond.)*, 1954, 8, 754.

⁶ Reynolds, M. L., and Lynch, F. Y., *Publ. Hlth Rep. (Wash.)*, 1955, 70, 26.

⁷ Liebow, A. A., et al., *Amer. J. Path.*, 1949, 25, 853.

Of those people who were indoors or in heavy buildings at the time of the explosion 80-88% suffered mechanical injuries, as against 28% of those in the open. Moreover, the most severe mechanical injuries were in the people who were indoors or shielded out of doors. Doubtless the percentage of people remaining alive to tell of their experience was greater indoors than out, but those who were preserved indoors suffered injury from flying glass and debris, falling walls, and the like. The investigation clearly shows that severe mechanical injuries in each distance zone increased with increasing protection, and were incurred in one-half to two-thirds of the injured persons who were indoors in buildings of either light or heavy construction.

What are the lessons to be learnt from this survey? Clearly an investigation of the effects on survivors of an atomic explosion cannot give a true picture of the effects on the whole exposed population. Nevertheless, such an investigation can yield information of the utmost value for the planning of civil defence and rescue. Thus, if the interpretation of the low incidence of fractures in survivors is correct, probably a great many lives could be saved if people immobilized by injuries were removed to safety before the widespread fires get under way—about one hour after the explosions at Hiroshima and Nagasaki. In a western city, with a much lower proportion and density of timber construction, this interval might well be increased. The analysis of the injuries in relation to the type of protection affords, perhaps, the most unexpected finding; it seems clear that satisfactory protection can be given only by a structure built or adapted for this purpose, in which the risk of flying glass, plaster, or other debris is reduced to a minimum. Finally, there is the lesson of the flash burns, which injured about 45% of the survivors. Of all the atomic bomb hazards, that from heat flash is most easily avoided. Indeed, the thinnest layer of light-coloured fabric is sufficient to protect against it. Moreover, the moment that elapses between the light flash and the heat flash may be sufficient to enable those caught in the open to protect themselves from the latter. Evidently instruction in civil defence should be directed to the general public as well as to defence service personnel.

BANNING OF HEROIN

The quantity of heroin (diacetylmorphine) that the Home Office has authorized to be manufactured in the U.K. this year is 150 kg. Some of this may be exported, though none has yet been. In 1954 the amount manufactured was 198 kg., and of this the authorized quantity exported was 27 kg. The amount

medically prescribed was perhaps something like 100 kg., since some might have been put into stock and some used for the manufacture of nalorphine. The number of doses to which this weight is equivalent would seem to be at least several million in a year. The drug is therefore commonly prescribed in Britain; and, since its universally known dangers of causing addiction would allow its prescription only after particularly careful thought, those doctors who claim that for some cases it has no satisfactory substitute would find many of their colleagues in agreement with them. Moreover, they cannot be accused of taking unnecessary risks with such a drug, for the number of addicts in this country is trifling. About forty are known to the authorities, and the strict control over supplies of the drug makes it most improbable that the true total can be much greater. The decision to ban its use altogether may therefore have been taken a little hastily, especially since a possible alternative exists which could be tried—namely, a ban on the export of the drug.

Repeating the Government's decision to prohibit the manufacture and export of heroin after December 31 next "except for small quantities for purely scientific purposes," Lord Mancroft¹ said that the ban was made in order to give effect to a resolution adopted by the Economic and Social Council of the United Nations, that the advice of the appropriate statutory bodies was taken, and that adequate supplies of a perfectly good substitute were available. In taking this step the British Government is falling into line with the great majority of the United Nations members—many of which have never had trouble with addiction to heroin—including Canada, Australia, New Zealand, and the U.S.A., and indeed only France, Belgium, and Italy have not yet agreed to a ban on manufacture or import. Those countries where the drug is prohibited are apparently satisfied with the consequences of this, several of them after some years' experience. Nor did opinion in Britain seem to be much different until fairly recently, and the monograph on heroin was omitted from the *British Pharmacopoeia* in 1953. The *National Formulary* contains no preparation of heroin; the introductory notes in the present edition² state that "its use could with advantage be reduced and reserved for parenteral administration." When the view was advanced in these columns two years ago³ that in order to help to free the world from its thousands of heroin addicts the advantages of prohibiting its manufacture in

¹ House of Lords Hansard, Vol. 192, No. 48, Col. 595 (April 27).

² *National Formulary*, 1955, British Medical Association and Pharmaceutical Society of Great Britain.

³ *British Medical Journal*, 1953, 2, 196.

⁴ *Ibid.*, 1953, 2, 338.

⁵ Fifth Report of Expert Committee on Drugs Liable to Produce Addiction, *Wld Hlth Org. techn. Rep. Ser.*, No. 95, 1955.

Britain outweighed the disadvantages, Dr. A. H. Douthwaite's disagreement with that opinion⁴ was left unsupported. But since then opinion has hardened, no doubt in part because clinical experience with the newer synthetic analgesics has increasingly shown that they do not meet the needs of some cases, and that heroin alone can do so. Incidentally, addiction to pethidine, according to the World Health Organization, is now reaching alarming proportions.⁵ The B.M.A. considered the matter last year in response to a request from the World Medical Association, and the Council agreed that the medical profession should not be deprived of the use of this drug. As Dr. R. Hale-White points out elsewhere (p. 1277), this is a sufficient refutation of the opinion expressed in the House of Lords by Lords Mancroft and Haden-Guest that the whole medical profession is behind this Order. Further opposition to it is evident in motions sent in by B.M.A. Divisions (published in the *Supplement* this week at p. 242) for debate at the Annual Representative Meeting in June. Opinion seems on the contrary to favour the continued prescribing of the drug. All this, combined with the fact that the drug is widely prescribed with relatively little ill effect, suggests that alternative means should be sought for preventing the abuse of heroin. Surely the Government might well try authorizing production for home use only and place a ban on exports.

DENTAL CARIES

In 1947 a group of research workers from the United States and Canada met at the University of Michigan⁶ to discuss the mechanism of dental caries. Last year the World Health Organization sponsored a seminar during which the aetiology of dental caries was discussed. From 1945 to 1951 the Royal Swedish Medical Board⁷⁻⁹ carried out far-reaching experiments into the cause of dental caries. All agree that the prime factor in the cause of dental caries is the concentration of acid in the mouth and the length of time it is present on the tooth surface. Acids are produced by the fermentation of carbohydrate foods. Most of the food is swallowed; much that remains on the tooth surfaces is quickly washed away by saliva, and some of the acid produced by fermentation is efficiently neutralized. But small areas on the tooth surface are sheltered from the forces of mastication and the stream of saliva, and food stagnates there. When fermentable particles of food lodge in these areas several times a day and, owing to their sticky nature, remain there for some time, these particular sites on the tooth surface become carious. The total

quantity of fermentable carbohydrates consumed is therefore subsidiary to the frequency with which they are taken, their time relationship with other foods, and their physical consistence.

Experiments and observations show that dental caries is increased by impaired salivary flow, by a lowered buffer capacity of the saliva, or by an increase in the frequency of taking sticky fermentable carbohydrate foods into the mouth; it is decreased by the avoidance of such foods, reducing the frequency with which they are eaten, alteration of the consistence of the food so that it does not stick to the teeth, or by introducing specific enzyme inhibitors into the mouth. Although tooth structure has some influence on whether caries occurs or not, the decisive factors are usually conditions on the tooth surface.

The findings of the Medical Research Council's recently published report¹⁰ on "The Effect of Sugar Supplements on Dental Caries in Children" cause no surprise. Extra sugar was given with their meals to test groups of children in three areas in England, but the control groups were not without considerable amounts of sugar and other fermentable carbohydrates, for both groups took their full sweet, sugar, and jam ration in two areas and breakfast cereal and bread *ad lib.* in all three. Both test and control groups, therefore, had sugar and wheat flour products, and both showed much the same amount of dental caries. Such alteration in percentage of sugar in a meal has been shown in animal experiments^{11 12} to have little effect on dental caries, and in the Swedish experiments sugar was shown to have the least effect when taken with other foods. The number of children taking part in the M.R.C. experiments was small, and the authors state on page 30 of the report, referring to the largest of the three studies: "The small number exposed to risk prevents any definite conclusions being drawn. . . ." It is surprising to find, however, that the extensive Swedish experiments have not been mentioned.

NEW TESTS OF HEARING

The eight years which have followed the publication in 1947 of the report on hearing-aids and audiometers¹ by the Electro-Acoustics Committee of the Medical Research Council have witnessed notable advances in the functional investigation of hearing. For example, the methods of speech audiometry prescribed by the committee have enabled otologists to measure accurately not only the essential handicap of the deaf subject—namely, his inability to understand the spoken voice—but also the extent to which this handicap can be corrected by means of hearing-aids and otherwise. In addition to these improvements in the measurement of hearing loss, the qualitative analysis of it has also been the subject of important developments. Thus in 1948 M. R. Dix, C. S. Hallpike, and J. D. Hood,² of the Medical Research Council's Otological Research Unit, demonstrated for

¹ *Spec. Rep. Ser. med. Res. Coun. (Lond.)*, No. 261, Hearing Aids and Audiometers, 1947, H.M.S.O.

² Dix, M. R., et al., *Proc. roy. Soc. Med.*, 1948, 41, 516.

³ Hood, J. D., *Acta oto-laryng. (Stockh.)*, Suppl. XCII, 1950.

⁴ Rüedi, L., *Schweiz. med. Wschr.*, 1954, 84, 1411.

⁵ Tschirren, B., *ibid.*, 1954, 84, 1414.

⁶ *Dental Caries* (ed. Kenneth A. Easlick), 1948, London.

⁷ Lundqvist, C., *Oral Sugar Clearance, Odontol. Rev.*, 1952, 3, Suppl. 1.

⁸ The Vipeholm Dental Caries Study, *Acta odont. scand.*, 1954, 11, 232.

⁹ *British Medical Journal*, August 8, 1953, p. 331.

¹⁰ *Spec. Rep. Ser. med. Res. Coun. (Lond.)*, No. 288, 1955. H.M.S.O., 4s.

¹¹ Mitchell, D. F., et al., *J. dent. Res.*, 1951, 30, 778.

¹² Wakeman, E. J., et al., *ibid.*, 1948, 27, 489.

the first time that the phenomenon of loudness recruitment, first described by Fowler, of New York, and considered by him to be a general characteristic of "nerve" deafness due to lesions of any of the cochlear nervous elements, was in fact pathognomonic of lesions of the hair cells of Corti's organ. By contrast, in cases of deafness due to lesions of the cochlear nerve fibres, loudness recruitment was characteristically absent or incomplete. As a result of this work, now widely confirmed, tests for loudness recruitment have become valuable in making the important clinical distinction between end-organ deafness and nerve-fibre deafness.

Results of comparable clinical value have also accrued from the work of J. D. Hood³ on cochlear fatigue and adaptation. Hood carried out a number of exact studies of the deafening effect on the normal human ear of prolonged exposure to pure tones, and he was able to show that this deafness underwent an abrupt increase when the stimulus intensity exceeded a certain critical level. Hood was also the first to give a clear account of the phenomenon of cochlear adaptation, a particularly elusive variety of deafness which occurs during and immediately after the application of a sustained sound stimulus. Its rapid disappearance on removal of the stimulus makes the phenomenon exceedingly difficult to investigate, and its demonstration was possible only by means of an ingenious test carried out during the application of the stimulus.

The clinical importance of cochlear adaptation and of the methods since developed for its measurement lies in the fact that it undergoes a striking increase in cases of deafness due to disease of the neural elements of the cochlear apparatus, in particular the hair cells of Corti's organ. Thus it comes about that in cases of deafness of obscure origin clinical investigation of cochlear adaptation provides valuable evidence of whether or not the cochlear end-organs are affected.

As might be expected, these delicate methods of investigation of the functional state of the cochlear end-organs are beginning to prove of exceptional value in the investigation of the early stages of its derangement by disease or injury, and a notable example has recently been provided by the work of L. Rüedi⁴ and others,⁵ of Zurich. These workers have used them for investigating the effect of vitamin A in protecting the cochlear end-organs from injury by prolonged pure-tone stimulation. In Rüedi's experiments a group of normal subjects were exposed to prolonged pure-tone stimuli of high intensity, and the critical intensity level was determined. Repetition of the tests after a period of high vitamin-A intake revealed a marked increase in the critical level, indicating an increase in the resistance to injury of Corti's organ. Functional changes of this kind could not be revealed by any of the usual tests of cochlear function, such, for instance, as pure-tone audiometry carried out according to the usual technique. The successful use by Rüedi and his colleagues of these new methods of investigation of cochlear function, therefore, gives grounds for the hope that otologists elsewhere will find in them an equally valuable instrument for the investigation of the early stages of cochlear disease or injury.

HEALTH SERVICES IN NORTHERN IRELAND

The report¹ of a committee set up by the Government of Northern Ireland "to advise on criticisms and suggestions made by members of both Houses of the Northern Ireland Parliament about the operation of the health services" is summarized in this week's *Supplement*. Two out of three members of the committee, the chairman of which was Mr. H. G. Tanner, have been closely associated with the development of hospital and health services in Great Britain. Such criticisms of the health service as have been voiced in the Northern Ireland Parliament seem mainly to have been directed to the system itself—not to any laxity or maladministration which may have occurred, but to the possibility of such occurrence should the good sense and restraint which have hitherto characterized the service be diminished. The main complaint is that parliamentary control over health services is ineffective, and that too much power is in the hands of nominated bodies or corporations which cannot readily be called to parliamentary or governmental account.

In Northern Ireland there has been a devolution of responsibility which does not obtain in Great Britain. The Ministry of Health and Local Government is not empowered itself to provide health services, but only to promote or secure their provision and co-ordination, which it does mainly through a Hospitals Authority and a General Health Services Board. The Ministry has thus a less positive role in administration than the Ministry of Health in England, and parliamentary critics have complained of the Hospitals Authority in particular as autocratic in dealing with hospital management committees and hospital staffs, and as stultifying local initiative. The Tanner Committee scarcely subscribes to these criticisms. It finds that the Hospitals Authority has shown itself energetic, that it has many achievements to its credit, and that there is no foundation for any charge of irresponsibility or extravagance. Nevertheless, it agrees that its relationship with the Ministry is anomalous, and that the position both of the Authority and the General Health Services Board in regard to the Ministry should be that of agent to principal. The system which has been found successful in Great Britain should be adopted in Northern Ireland.

A large number of detailed recommendations are made by the committee, but so far as general medical services are concerned their effect would be to alter the position very slightly. One recommendation concerning consultants is that their contracts should be reviewed at regular intervals; another is that distinction awards should no longer be made by the Authority but preferably by a single committee having jurisdiction over the whole of the United Kingdom, to which Northern Ireland advisers should be attached. But in general the report presents a picture of the health services of Northern Ireland—where there has been greater freedom to incur capital expenditure than in England and Wales and Scotland—as in a state of vigorous and continuous growth.

¹ *Report of the Committee on the Health Services in Northern Ireland*, Cmd. 334, H.M.S.O., Belfast.

INBORN DEFECTS OF THE RENAL TUBULE

Fanconi attributed the syndrome popularly associated with his name to a genetically determined defect of the renal tubule. It is only recently, however, that attempts have been made to relate this syndrome to a number of hitherto distinct metabolic lesions, whose underlying cause appears to be a failure in function of the proximal tubule.¹⁻⁴ This part of the kidneys is concerned in the reabsorption of water, glucose, amino-acids, phosphate, bicarbonate, calcium, and possibly potassium, so that a wide variety of single or multiple biochemical abnormalities may be predicted as likely to follow disordered function here. The best-known single defect is renal glycosuria, but renal diabetes insipidus also occurs occasionally, and is characterized by extreme polyuria which is insensitive to posterior pituitary extract. Amino-aciduria occurs in hepato-lenticular degeneration (Wilson's disease) and in congenital cystinuria. It has been suggested that cirrhosis of the liver in the former results from the drain of amino-acids, though it is possible that both the hepatic and the renal lesions are secondary to the accumulation of copper. Faulty reabsorption of phosphates leads to vitamin-D-resistant rickets, while hyperchloraemic acidosis (Albright's syndrome) may be the result of a failure to reabsorb bicarbonate, with a compensatory increase in chloride reabsorption. Idiopathic hypercalcaemia has also been reported, though hypopotassemia has not been recognized as a single defect. Theoretically any combination of defects might be expected, but so far only a few are well defined. Glycosuric rickets appears to be a specific entity, though in many cases amino-aciduria has not been looked for. Glycosuria has been noted in some patients with Wilson's disease. The triple resorptive defect of glucose, phosphate, and amino-acids occurs in the classical Fanconi syndrome, and it is interesting that in some of these patients also the metabolism of water, bicarbonate, and potassium may be disordered; cirrhosis of the liver is a well-recognized complication. Cystinosis, in which cystine is deposited in the tissues, is usually considered to be a variant of the Fanconi syndrome, and may be accompanied by glycosuria and hypophosphataemia.

Although these diseases were originally found in children, a number of cases have been reported in adults^{5,6}; many of these were originally termed Milkman's syndrome because of the pseudo-fractures and osteomalacia. They are presumably milder forms of the inherited defect, though it is conceivable that acquired lesions or some other inborn error of metabolism may be responsible. It is important to realize that these conditions do not give rise to renal failure in the accepted clinical sense except occasionally as a

terminal complication, and death usually results from dehydration, acidosis, or intercurrent infection. The limited necropsy material from cases of the Fanconi syndrome has invariably shown degenerative changes in the proximal convoluted tubule. The absence of phosphatase from this part of the kidney led to the view that deficient phosphorylation is responsible for the faulty reabsorption.^{7,8} However, E. M. Darmady has recently shown, by painstaking micro-dissection of individual nephrons from two cases, that the proximal tubules are abnormally short and are joined to the glomerulus by a thin "swan-like" neck.⁷ Further work on other examples of the group, using both histochemical and histological techniques, will be awaited with much interest. There is no doubt that the new classification will help to clarify many defects which are at present obscure. Prognosis has already been improved by the introduction of measures designed to counteract the metabolic disturbances. Massive doses of vitamin D, alkalinizing regimes, and the replacement of water and potassium are all important, and there is some experimental evidence that methyltestosterone may have a beneficial effect on renal tubular function.⁹

NEW LOOK IN PHYSICAL MEDICINE

Taunts of therapeutic empiricism and false pathological conceptions based on therapy have in the past often been directed at the specialty of physical medicine. Some degree of empiricism is probably inevitable in a specialty which has grown up slowly over the course of centuries, so that many of its methods are surrounded by an aura of traditional sanctity, and Dr. W. S. Tegner,¹ in his Samuel Hyde Memorial Lecture, scrutinizes ruthlessly the scientific basis of most of the treatments which are still being used in orthodox departments of physical medicine. He refutes absolutely the conception of a specialist in physical medicine being concerned only with therapy: in point of fact he must be a skilful diagnostician in view of the wide range of disorders from which his patients may be suffering. In addition, he is in the best position to undertake the long-term planning and management of chronic disorders of the locomotor system, such as rheumatoid arthritis. Tegner admits the strong suggestive influence of many physical treatments, and proceeds systematically to destroy some popularly held misconceptions on massage, electrical currents, ionization therapies, ultra-violet light, and various forms of heat treatment. He favourably reviews the recent experiments which have put short-wave therapy on a sound scientific basis and, conversely, have failed to show that microwave therapy and ultrasonics have advantages compensating for their expense and danger. He criticizes the use of such meaningless jargon as "tonic effects" and "removal of waste products and metabolites," and also the multiple names by which a single mode of treatment may be known—for

¹ McCune, D. J., et al., *Amer. J. dis. Child.*, 1943, 65, 81.

² Jackson, W. P. U., and Linder, G. C., *Quart. J. Med.*, 1953, 22, 133.

³ Myerson, R. M., and Pastor, B. H., *Amer. J. med. Sci.*, 1954, 228, 378.

⁴ Singer, M., *J. Bone Jt Surg.*, 1954, 36-B, 633.

⁵ Stowers, J. M., and Dent, C. E., *Quart. J. Med.*, 1947, 16, 275.

⁶ Cooke, W. T., et al., *Arch. intern. Med.*, 1947, 80, 147.

⁷ Clay, R. D., et al., *J. Path. Bact.*, 1953, 65, 551.

⁸ Anderson, I. A., et al., *Quart. J. Med.*, 1952, 21, 33.

¹ *Proc. roy. Soc. Med.*, 1954, 47, 389.

² *Ann. phys. Med.*, 1954, 2, 75-85.

example, constant current, direct current, or galvanism, all of which mean the same thing. Finally, he commends the newly developed electrodiagnostic techniques as examples of the recent scientific trends in physical medicine and as excellent research weapons.

At the annual meeting of the British Association of Physical Medicine last year Drs. A. C. Boyle, A. T. Richardson, and R. Doll contributed to a symposium on "The Scientific Approach."² They discussed in more general terms the imperative necessity of applying a statistical scrutiny to all new forms of therapy before they are accepted, and of reviewing as soon as possible all the classical methods still in use. In each case three questions had to be answered: "Is this treatment of value?" "Of how great a value?" "And with what type of patient?" None of these speakers eschewed the use of "placebo" remedies, provided that the physician was perfectly clear about the nature of his prescription and chose an inexpensive and harmless method of achieving the desired result. Another point made by all the contributors to this discussion was the importance of understanding the natural history of the disease being treated, and of realizing the potentiality it had for spontaneous remissions. Doll, speaking from the statistician's point of view, once again emphasized the dangers of "general impressions" in therapeutics, and the pitfalls in using theoretical considerations in developing a new approach rather than the essential test of "Does it work?" Specialists in physical medicine have often been challenged to subject their techniques to scientific validation, and it is a healthy sign that they should now be critically examining the methods by which the specialty can achieve its objects of restoring the patient to health and of making a useful contribution to medical research.

GENETICS OF CONGENITAL HEART DISEASE

Large-scale studies of the families of children with congenital heart disease have been published only in the last few years. Before then selected individual families had been reported. For example, G. C. Walker and L. B. Ellis¹ recorded the case of a father and four of his eight children all with signs of patent ductus arteriosus, and M. Campbell² recorded signs of auricular septal defect in three generations. In neither of these families was there full post-mortem or operative confirmation of the nature of the lesion. In addition, genetic factors are known to play a part in the causation of certain syndromes with which congenital heart disease may be associated. For example, situs inversus, partial or complete, is in some cases at least due to recessive genes,^{3,4} and cardiac malformations in addition to dextrocardia are commonly present in this condition. Congenital heart lesions are also often found in association with arachnodactyly, which is usually due to a dominant gene.

In 1953 T. McKeown and his colleagues⁵ gave an account of the family histories of 437 children with congenital heart disease who had been born in Birmingham between 1940 and 1949. They found a small but definite increase in the incidence of congenital heart disease among the brothers and sisters of these index cases. Their estimate of the general incidence at birth

was 3.2 per thousand, but among the 352 sibs born after their index cases six were affected, five of whom were also index cases in the series. It was noteworthy that in the two fraternities with two affected children in whom the precise lesion was known the pair of affected sibs had the same lesion, in one pair transposition of the great vessels, in the other a ventricular septal defect. Non-cardiac malformations did not occur with undue frequency in sibs. In only two instances were the parents first cousins, and in both the malformation was dextrocardia with transposition of the viscera. This year P. E. Polanyi and M. Campbell⁶ have reported on the families of 386 children attending Guy's Hospital. Their findings are similar. Of 635 sibs whose condition was known, 9 had congenital heart disease, and 6 of the 265 born after the index case were affected. Here, too, there was a tendency for the affected sibs within a fraternity to have the same or similar lesions. While Polanyi and Campbell thought that the incidence they found of non-cardiac malformations among the sibs (2%) was unduly high, it is doubtful if this is really so. In only three instances were the parents first cousins, and in one of these the child was one of the few patients with transposition of viscera.

Specific types of congenital heart disease are evidently apt to be concentrated in certain fraternities, but the risk of subsequent children having congenital heart disease is not high and of the order of 1 in 50. If simple genetic factors are at work they must have a low penetrance, and this is supported by the finding that usually only one of a pair of monozygous twins is affected.

It is desirable for genetic analysis to break down congenital heart disease into specific types. This will become possible as more operations are performed on cases of congenital heart disease, making exact diagnosis possible. R. C. Anderson,⁷ of Minneapolis, Minnesota, has made just such a study of 105 families in which the index case was proved at operation to have patent ductus arteriosus without other cardiac defects (four other children were excluded because of a known maternal history in pregnancy of rubella). Of 145 sibs born after the index case, two had patent ductus arteriosus and one of these also had coarctation. Since the general incidence of patent ductus arteriosus is almost certainly less than 1 in 5,000, Anderson's data show a familial concentration. None of the sibs in this series had any type of cardiac or non-cardiac malformation. All of the four probably monozygous twins of index cases were unaffected.

There is no convincing evidence that maternal age or birth order or season of birth affects the incidence of congenital heart disease. Sex, however, plays a part; coarctation of the aorta occurs mostly in males and patent ductus arteriosus mostly in females. Polanyi and Campbell⁶ show that aortic stenosis, Fallot's tetralogy, and transposition of the great vessels also occur predominantly in males.

¹ Walker, G. C., and Ellis, L. B., *Proc. New Engl. Heart Ass.*, 1940-1, 1940, 26.

² Campbell, M., *Quart. J. Med. (N.S.)*, 1949, 18, 379.

³ Cockayne, E. A., *ibid.*, 1938, 7, 479.

⁴ Torgersen, J., *Amer. J. hum. Genet.*, 1950, 2, 361.

⁵ McKeown, T., *et al.*, *Brit. Heart J.*, 1953, 15, 273.

⁶ Polanyi, P. E., and Campbell, M., *Ann. hum. Genet.*, 1955, 19, 209.

⁷ Anderson, R. C., *Pediatrics*, 1954, 14, 143.

EMERGENCIES IN GENERAL PRACTICE

TREATMENT OF SEVERE ASTHMA

BY

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The development of the first really severe attack of asthma is an alarming event for the patient, for the patient's friends, and, at times, for the doctor. Usually there has been some previous evidence of an asthmatic tendency which may have amounted to little more than discomfort. Then an attack of tightness in the chest lasts longer than usual, increases in severity, and the patient's efforts become concentrated simply in trying to breathe out the air which overfills his lungs. Any attempts his relatives or friends make to help are of little avail and their distress at standing by and watching his gasping respirations only too often adds to the patient's alarm. It is in this atmosphere that the doctor finds himself. Successful treatment depends to a great extent on the tacit assumption that the attack can and will be treated successfully. It is rare for an asthmatic attack to be fatal, unless it occurs in elderly patients, or is complicated by other conditions, such as spontaneous pneumothorax, or unless wrongly treated by respiratory sedatives.

Much depends on the way in which the situation is handled. The doctor must be prepared to give up time to the patient's treatment, and time spent in initial treatment is time saved in the long run. The patient will usually have found the position which gives greatest relief, either sitting forward in bed or sitting up in a chair.

Antispasmodic Treatment

Treatment of the bronchospasm should be begun at once. It is rare that adrenaline is unsuccessful, provided it is given correctly, and it is important to give it with care when first used. Once the patient appreciates its use he will look forward with confidence to its benefits during subsequent attacks; if it is used inadequately it may need much persuasion and perseverance on the next occasion to overcome his prejudice against it.

A dose of 5 minims (0.3 ml.) of adrenaline, 1 in 1,000, is given hypodermically. If this dose does not give relief after 10 minutes, adrenaline should be injected at the rate of 1 minim (0.06 ml.) a minute, keeping the needle *in situ*, until the spasm is relieved. In this way large doses of adrenaline can be given without ill effects.

In those cases in which adrenaline is ineffective, aminophylline can be given. It is best administered by intravenous injection, the contents of one ampoule containing 0.25 g. in 10 ml. of water being injected slowly. This can be repeated after four hours, and if necessary the dose can be doubled provided the total of 20 ml. is given slowly. Intravenous treatment may usefully be supplemented by giving the aminophylline in a rectal suppository. This is a convenient way of maintaining some antispasmodic action over a prolonged period and is particularly useful for administration at night.

Antihistamine drugs are usually of little help in relieving severe asthmatic attacks.

Sedatives

During the acute stage sedative treatment is usually inadvisable. As the attack passes off, small doses of sedative can be given to calm the patient and to help ward off another attack. Phenobarbitone in $\frac{1}{2}$ -gr. (32-mg.) doses is usually effective. Opium derivatives and large doses of barbiturates

are contraindicated. The patient's life may depend on his respiratory efforts, and depression of the respiratory centre, particularly by the use of morphine, may prove fatal.

Oxygen

If there is marked cyanosis, oxygen will often help the patient. It should be given with a B.L.B. mask or "polymask." The administration of oxygen, however, may distress the patient more than benefit him, as the application of anything over the mouth or nose may increase the sense of suffocation, and the very suggestion of oxygen may be associated in the patient's mind with the terminal stages of severe illness.

A.C.T.H. and Cortisone

A.C.T.H. and cortisone are on occasions of definite use in treating asthma, but, with our present knowledge, they should be used with caution. A.C.T.H. and cortisone are given in doses of 100 g. in divided doses six-hourly during the first 24 hours and continued, with reduced dosage if possible, for three or four days; cortisone can be given by mouth. There is no doubt that in many instances this treatment will give definite relief. If, however, the treatment has to be repeated, its results, using the same dose, may be disappointing and an increased amount will be required to produce the same effect. Large doses and more continued treatment are not without danger to the patient. At the present time it is probably advisable to withhold these remedies, giving them only when there is urgent need. They are usually called for in treating elderly patients with emphysema who are in great distress and in danger of developing cardiac failure, and also in cases in which the acute attack is prolonged and is developing into status asthmaticus.

Status Asthmaticus

If the attack becomes prolonged, with no remissions, and extends over a period of several days and nights, the condition then is indeed a difficult one to treat. It is advisable whenever possible to remove the patient from home surroundings, preferably into a hospital. The atmosphere of a hospital ward, with efficient nursing and the knowledge that there is always medical help at hand if required, will do much to quieten the patient. Continuous treatment with aminophylline can be carried out if required by slow intravenous drip, using 0.5-1.5 g. of aminophylline in a litre. At this stage the patient is often suffering from some degree of dehydration, since the continued breathlessness has made drinking and eating difficult or almost impossible. By giving aminophylline intravenously, the necessary fluid can be supplied, and it may be useful to use 5% glucose-saline as the vehicle for the drug. The patient should also be encouraged to take sips of water by mouth. When cyanosis is marked, an oxygen tent may be necessary. Cortisone or A.C.T.H. may be required and should be given if other treatments have been tried and failed, or, as already indicated, should be given to patients with severe emphysema or cardiac failure.

Treatment after the Attack

As soon as the attack has been controlled, it becomes necessary to take steps to prevent another attack developing. A small dose of sedative such as phenobarbitone, $\frac{1}{2}$ gr. (32 mg.) two or three times during the day will often quieten the patient. The first evidence of recurrence of wheezing or tightness in the chest should be treated immediately. An

injection of adrenaline, 3 to 5 minims (0.2 to 0.3 ml.) should be given at once. The earlier this is done, the more likely it is to ward off a fresh attack. If it is not possible for the doctor to give the injection immediately, it is often advisable for suitable patients to be taught how to give the injection to themselves. When this is not feasible, ephedrine, $\frac{1}{2}$ gr. (32 mg.), or isoprenaline, 20 mg., can be taken in tablet form, isoprenaline tablets being dissolved slowly under the tongue. Atomizers may be used to give adrenaline or isoprenaline by inhalation. Many of the proprietary preparations for the treatment of asthma contain one or other of these drugs together with phenobarbitone. Aminophylline suppositories given in the early part of the night may help to prevent an attack in the early hours of the morning. Some patients find antihistamine preparations beneficial, if taken as soon as the first symptoms of spasm are noticed. Expectorant mixtures containing potassium iodide and ammonium carbonate relieve those patients who have difficulty in coughing up sputum after an attack and are of particular use for patients who have chronic bronchitis complicated by asthma.

It is now recognized that one of the most successful treatments in controlling the incidence of attacks and in controlling an attack in its early stage is breathing exercises. If the patient conscientiously practises those exercises which encourage proper diaphragmatic breathing and full expiration, he will be able to reduce the number of attacks and also can often abort an attack. The breathing exercises can be combined with postural exercises when there is evidence of localized chronic infection in the bronchial tree.

Prevention of Pulmonary Infection

Care should be taken to detect pneumonic lesions during the period after an asthmatic attack, particularly in those patients who suffer from chronic bronchitis. During an asthmatic attack, bronchi or bronchioles may become plugged with thick mucous secretion, with resultant segments of collapsed lung beyond. Usually re-expansion takes place, but at times the collapsed portion of the lung becomes infected and prompt treatment with antibiotics is indicated if this complication is suspected.

Next article on Emergencies in General Practice.—"Post-partum Maternal Collapse," by Miss Josephine Barnes.

Refresher Course Book.—Copies of the second volume of collected articles from the Refresher Course for General Practitioners published in the *Journal* are still available at 25s. (postage 1s.) each. The volume contains 60 articles, all of which were revised by their authors for publication in the book. The first volume is now sold out and out of print. Copies of the second volume may be obtained from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or through any bookseller.

PRACTICAL ADVICE ON HEARING-AIDS

In a lecture at the Institute of Laryngology and Otology, London University, on April 29 Mr. J. CHALMERS BALLANTYNE, assistant director of the audiology unit of the Royal National Throat, Nose, and Ear Hospital, discussed the indications for advising a hearing-aid, the choice of a suitable instrument, and the way to get the best results from it.

The ability of a deaf person to hear with an aid, said Mr. Ballantyne, was determined very largely by the type, as well as the degree, of his deafness, and it was essential to have a clear understanding of the differences between the two broad types of deafness—perceptive (or "nerve") deafness and conductive (or "middle-ear") deafness. The hearing apparatus had two parts, a perceiving apparatus and a conducting apparatus. The perceiving apparatus consisted

of the end-organ of hearing itself—that is, the organ of Corti—and the acoustic nerve and its central connexions. The conducting apparatus consisted of the external auditory canal, the middle ear, and the Eustachian tube. It also included the fluids of the inner ear. Its function was to conduct sound-waves from their source to the end-organ, amplifying them to some extent as it did so. Perceptive deafness resulted from any lesion in the perceiving apparatus, while conductive deafness was due to lesions in the conducting apparatus. The two types of deafness could nearly always be distinguished from one another by a careful history, a thorough clinical examination, and a single tuning-fork.

Indications for the Use of Hearing-aids

There were very few deaf people who could not derive some benefit from using an aid, continued Mr. Ballantyne, and it was much better to start using one too early than too late. When deafness was purely conductive in nature, as in early cases of otosclerosis and in suppurative disease of the middle ear, the perceiving apparatus was normal. In theory, all that was required to allow such a patient to hear normally was to amplify sounds to such a degree that they would reach the normal perceiving apparatus at a normal degree of loudness. In practice also, the necessary amplification could usually be provided by an electrical hearing-aid.

When deafness was purely perceptive, as in the deafness following meningitis or the deafness of old age, the problem was much more complex. Amplified sounds reached the abnormal perceiving apparatus with the same degree of loudness as in the normal ear, sometimes even louder. But they were distorted sounds, often uncomfortable and sometimes painful. And it was characteristic of perceptive deafness that, beyond a certain point, the ability to understand speech became reduced and not enhanced by further amplification. On the other hand, many patients suffering from perceptive deafness could derive real benefit from an electrical aid.

Construction of Electrical Aids

Since the second world war the design and construction of electrical hearing-aids had improved enormously. Aids consisted of three parts: a microphone, an amplifier, and a receiver. The microphone converted sound energy into electrical impulses; the amplifier amplified the sounds; and the receiver converted the electrical impulses back into sound energy.

The Amplifier.—Most electrical aids used a system of thermionic valves, the power required by this system being provided by two batteries. A low-tension battery warmed the filaments in the valves, and a high-tension battery provided the power for the amplification. Many commercial firms are now substituting the so-called "transistor" valve for the thermionic valve.

The Receiver.—There were three different types of receiver: the insert receiver, the flat receiver, and the bone-conduction receiver. The insert receiver fitted into the ear itself and was by far the most commonly prescribed. It should be made to measure for each individual user. It could be used even in the presence of active middle-ear discharge, provided that the ear was cleaned regularly by simple aural toilet and the insert kept free from discharge. An external otitis might result in a few cases, when the use of an insert must be discontinued, at least temporarily. The flat receiver was worn with a headband. It was large, uncomfortable, and now rarely prescribed. Leakage of sound was almost invariable, with consequent "howling." The bone-conductor receiver also caused considerable discomfort by the presence of a headband, but it might be indicated in some cases of aural discharge with external otitis. In a very limited number of cases of conductive deafness, not exceeding 2% of all hearing-aid users, it might give a very good performance. One commercial firm now produced a bone-conductor receiver carried on a spectacle frame.

Choice of an Aid

The choice, continued Mr. Ballantyne, lay between the Government aid and a commercial one. The "Medresco" aid (the name being derived from Medical Research Council) was a duo-pack aid—that is, the batteries were carried separately from the microphone and amplifier. Its designers intended to produce an efficient aid, at the lowest possible cost, and of value to the greatest possible number of deaf persons. In these objects they had largely succeeded. The size of the batteries was perhaps the greatest single disadvantage of the Government aid, for they were large and undoubtedly cumbersome. On the other hand, they lasted much longer than smaller batteries and were cheaper to produce. And much smaller batteries were available, at the patient's own expense, which could be used with the Government aid (*low tension*: Ever Ready B119, Siemens S119, Drydex D.H.519; *high tension*: Ever Ready D18, Siemens S18, Drydex D.L.14). Improvements to the Medresco aid were gradually being made, and a smaller model should be available before very long. The aid itself was issued free to any deaf person considered by an otologist to be likely to benefit from its use. It was obtainable at any hearing-aid distribution centre, where repairs were also available. Batteries could be replaced at any hospital.

Commercial aids were nearly all of the mono-pack type—that is, the batteries were included with the microphone and amplifier. They were lighter in weight, less conspicuous, and much more comfortable to wear. In some, but by no means in all, said Mr. Ballantyne, the performance also was better than that of the Medresco. Their great disadvantage was, of course, the cost, which varied roughly from £15 to £35 for thermionic-valve aids, and was approximately £20 more for "transistor" aids. Maintenance and repairs added considerably to the burden. The choice of a commercial aid should be made only after trying several under all the normal conditions of the patient's life. The aid should be tried not only at home but in the office, church, theatre, and the like.

The National Institute for the Deaf had an approved list of manufacturers and was always ready to offer advice on this matter. Test reports were also made on commercial aids by members of the Medical and Scientific Committee of the Institute.

It was claimed for the newer transistor aids that maintenance costs were considerably reduced, since only one battery was needed, with a working life of up to 200 hours. But their ability to withstand hard, constant wear remained to be proved.

It was often advisable to consult an agent who stocked a variety of makes before making a final decision.

The Wearing of an Aid

Many deaf persons were opposed to the idea of wearing an aid. It advertised their disability, so they thought. Little did many of them realize how much more obvious it was when they refused to wear one. In women the aid could easily be worn without any sign of its presence. The receiver could be hidden by an appropriate hair-style, and the lead likewise made invisible. In children the various parts of the aid could be distributed by means of a home-made harness, details of which were obtainable from the Deaf Children's Society. All children, the speaker continued, should be provided with the smaller mono-pack type of aid, but this ideal was not yet attainable.

A person with only a mild or moderate degree of deafness might need an aid only for hearing at a distance, as in a church or theatre. Many otosclerotics heard better in noisy surroundings than in quiet rooms—the phenomenon of "paracusis." In the noisy surroundings of certain occupations they therefore found an aid unnecessary and uncomfortable. Most other users, depending on professional or social necessity, should wear their aids all day.

When there was only a slight difference in the degree of deafness in the two ears the aid should be worn in the better ear. This meant less amplification and therefore less distortion, which in turn meant less battery consumption and less expense. The deaf person with an aid should sit as near as possible to the speaker. The further away he sat, the greater was the amplification needed and the more uncomfortable the background noise became. In a theatre, concert hall, or conference room the deaf person should sit as near as possible to the centre of the hall or table. With practice, an aid could be used quite satisfactorily with a telephone, and some commercial firms made a special adapter for this purpose.

Rehabilitation

It was impossible to over-emphasize the importance of careful instruction in the use of a hearing-aid. It was not enough to hand it "over the counter," so to speak, and expect the deafened person to hear immediately. Many an aid had been relegated to the bottom drawer within a month or so through failure to realize this.

Nor did the doctor's duty end there, for other "aids" to hearing might be needed to obtain full benefit, and every possible clue to the meaning of speech must be utilized. Auditory training taught the patient to distinguish, or discriminate, the many complex sounds of speech. And visual training, better known as lip-reading, enabled him to fill in the many visual clues to the pattern of speech.

Finally, said Mr. Ballantyne, many patients asked whether the continued use of a hearing-aid would cause deterioration in their hearing. Most patients who used aids suffered from a progressive deafness, but there was no evidence whatsoever that the use of an aid would, *per se*, affect the hearing adversely.

THE QUEEN AT EPSOM COLLEGE

The Queen and the Duke of Edinburgh visited Epsom College on Friday afternoon, May 13, and inspected the buildings and grounds. The visit took place almost exactly 100 years after Her Majesty's great-great-grandfather, the Prince Consort, opened the College on June 15, 1855. The skies were uncertain, but the picturesque red brick buildings of the College standing in 90 acres of Epsom Downs framed a very happy occasion. The Queen, who is the College patron, was welcomed on arrival by General Sir Robert Haining, Lord Lieutenant of the County of Surrey, who presented the High Sheriff (Colonel the Hon. Guy Cubitt) and the Mayor of Epsom (Councillor Langston), and the Mayor in turn made other local presentations. Then, with the Royal Standard flying above the school buildings, the Queen inspected a guard of honour formed of the combined cadet corps. Lord Webb-Johnson, President of Epsom College, presented Dr. Henry Robinson (treasurer), Mr. R. W. Raven (chairman of the College council), Air Marshal Sir Lawrence Pendred (president of the Old Epsomian Club), and Mr. H. W. F. Franklin (headmaster). Accompanied by the last-named, Her Majesty and the Duke of Edinburgh made a leisurely and informal tour of the school, visiting the boys' rooms, the chemistry, physics, and biology laboratories, watching the pupils at work at the benches—Epsom was one of the first public schools to install such laboratories in the early 'seventies—the natural history museum, the art school, the carpenters' shop, and the assembly hall, where members of the dramatic society were giving a performance of *Twelfth Night*, with a very spirited Malvolio. The royal party next visited the chapel, where a surpliced choir of some 40 boys sang an anthem. The sporting and athletic side of the College was also in evidence—on the cricket pitch, and in the fives court (near which the remains of an early Bronze Age man were discovered a few years ago), the gymnasium, and the rifle range. A pause was made at the sanatorium, a building of modern design, with 58 beds, operating theatre, and

x-ray apparatus; here the royal party were received by the medical officer and the resident matron. The whole tour lasted an hour and a half, after which tea was taken in the headmaster's house in the company of the ladies of the College and the prefects. Before leaving, the Queen and the Duke planted trees in commemoration of the College centenary.

Epsom's Links with Medicine

Epsom College was founded 100 years ago by John Probert, who was a member of council of the then



The Queen in the Biology Laboratory.



The Queen with the Headmaster of Epsom College, Mr. H. W. F. Franklin. (Photos by Bippa.)

Provincial Medical and Surgical Association, afterwards the British Medical Association, and one of the first presidents of the Metropolitan Counties Branch. It was originally known as the Royal Medical Benevolent College, though it was never intended that it should be exclusively for doctors' sons or for boys intending to be doctors. About one in three Epsomians enter the medical profession, and the centenary register shows this to have been roughly the proportion throughout its history. But the College has always had a special claim upon the charities of the medical profession. Out of its complement of 350 boarders and 150 day boys, 62 at present are Foundation scholars, all sons of members of the medical profession in necessitous circumstances, most of them orphans; those who need it have everything paid; others are helped according to their needs. Further, in addition to 25 leaving scholarships available for boys studying medicine, scholarships are awarded to Epsomians every year by nine London teaching hospitals. Like other public schools, Epsom College has found it difficult to modernize its buildings and equipment out of its ordinary financial resources, and a centenary appeal, of which readers of this journal have already been reminded, has been made for not less than £150,000 in order that the school may "embark with confidence on a second hundred years of vigorous life and useful service to the community." Such an appeal cannot need many words of commendation to members of the medical profession.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM

ANNUAL CONGRESS: LONDON, APRIL 28-30

This year's meeting of the Ophthalmological Society of the United Kingdom, held under the presidency of Mr. O. GAYER MORGAN at the Royal Society of Medicine, was most successful. From a wide variety of subjects discussed, four have been chosen for summary here. First, the clinical aspects of retinal vein thrombosis, the subject of Mr. Gayer Morgan's presidential address; secondly, the use of "diamox" (acetazolamide) in glaucoma; and, lastly, two examples of modern ophthalmic techniques—the intraocular injection of air, and the use of radioactive isotopes in tumour diagnosis.

Retinal Vein Thrombosis

The seriousness of thrombosis of the retinal veins, said Mr. GAYER MORGAN, lay in the fact that it produced permanent visual disability in such a large proportion of cases. In the eye the close proximity of the arterioles and veins in the optic nerve and at their crossings made it possible for sclerosis of retinal arterioles to involve the adjacent walls of the veins. While in the kidney, the heart, and the brain the main factor leading to thrombosis was slowing of the blood stream in the arteries, in the eye the veins were affected more as a result of involvement of the common adventitia than because of stagnation, in spite of there being often concomitant arterial disease.

Treatment in the past had resolved itself into a review of the general health and the use of vasodilators. But now, said the president, it seemed that anticoagulants had a useful part to play in the treatment. They might prevent extension of the clotting or promote recanalization. There was also the possibility of using them prophylactically in cases of threatened venous thrombosis. One of the essentials for the rational use of anticoagulants was the recognition of the prethrombotic state. Patients with two good eyes often delayed attending until complete thrombosis had occurred, but those who had lost the sight of one eye from a previous thrombotic episode came up immediately they noticed their symptoms and so treatment could be started in the prethrombotic period. The ultimate outlook varied. There

might be absorption of the blood and reappearance of normal vision and an apparently normal vein; or a narrow and sheathed venous vessel might persist with many new collaterals, but even in this latter case there was no loss of field, so the blood supply to the retina must be adequate.

Mr. Gayer Morgan then described four cases which he had himself observed carefully over a period of time. From these he concluded that if anticoagulants were to be really useful they should be administered when a retinal vein was found to be dilated, when extravasation of blood was minimal, and while visual acuity was still good.

Action of Diamox in Glaucoma

Mr. E. S. PERKINS opened the symposium by discussing the clinical aspects. Diamox had a quick action, he said, and might reduce the ocular tension in all types of glaucoma. After a few days' use it might become less effective, but combined with miotics there was an additive effect. In a series of many varieties of glaucoma he had found the tension was reduced and kept so in 48% of cases; it was reduced but failed to remain within normal limits in a further 38%; while in 14% it was unaffected. Diamox was used initially in doses of 500 mg. at once and 250 mg. six-hourly, and later reduced to 250 mg. twice or thrice daily. Its chief use was as a pre-operative drug, particularly in acute congestive glaucoma, but it was disappointing as a therapeutic measure in patients with long-standing congestive attacks. The side-effects consisted of diuresis, nausea, vomiting, and paraesthesiae in the limbs. Mr. Perkins also discussed the possible modes of action of diamox. The drug was known to inhibit the enzyme carbonic anhydrase, and he described experiments showing that this enzyme is present in iris and ciliary tissue.

Dr. J. GLOSTER described experiments designed to measure the extent and rate of change in intraocular pressure induced by diamox when given intravenously to rabbits in a dose of 50 mg. per kg. of body weight. Intraocular pressure was continuously measured manometrically, and blood-pressure readings were also taken. In general, the intraocular pressure was reduced by 3 to 5 cm. of water in 15 minutes in the rabbit and the effect began two to three minutes after the administration of the drug.

Dr. M. LANGHAM, from his observations on the entrance of fluorescein into the eye, believed that the rate of flow of aqueous was reduced after the injection of diamox. There was no evidence that the drug produced an increase in permeability of the blood-aqueous barrier, as shown by measuring the accumulation of ascorbic acid and fluorescein in the eye before and after its use, nor was there any evidence to suggest that it acted by decreasing the resistance to drainage. Studies on the pH of aqueous humour and its ionic content did not answer the question of whether diamox acted specifically on the formation of aqueous humour by neutralizing carbonic anhydrase in the eye, or whether the results on intraocular pressure were of a secondary non-specific character.

In the discussion Professor G. P. SOURDILLE and Mr. A. PALIN gave some interesting clinical experiences with diamox in glaucoma. Dr. DOROTHY CAMPBELL showed how the plasma sodium and the degree of diuresis varied with the changes in intraocular pressure after the use of diamox in patients with glaucoma, and Sir STEWART DUKE-ELDER summarized the present standing of the drug.

Use of Air in Ophthalmology

Mr. H. B. STALLARD said that the intraocular injection of air had been used in ophthalmology therapeutically for the treatment of tuberculous iritis, diagnostically as an aid to the location of intraocular foreign bodies and intra-orbital neoplasms, but chiefly to help in the anatomical replacement following operations. After cataract extraction air was injected into the anterior chamber to re-form this and to keep the iris and vitreous face away from the wound; following cyclodialysis for glaucoma, air checked bleeding,

re-formed the anterior chamber, and kept the fistulous tract open; after the operation for retinal detachment air in the vitreous restored the normal anatomical position of the retina; it was of value in the operation of keratoplasty to keep the bed of the transplant away from the iris and lens; and in the division of anterior synechiae air could be used to put the synechiae on the stretch and facilitate intraocular instrumentation. Air was compressible, continued Mr. Stallard; it produced a spring-like pressure, its site in the eye could be controlled by posture, and it was absorbed over a period of four to eight days. These were the properties which made it so useful in ophthalmology. The dangers attending its use, air embolism and the production of glaucoma, were almost negligible. Sterilization of the air was achieved by autoclaving a syringe with the plunger withdrawn.

Radioactive Isotopes

Mr. ANTHONY PALIN and Dr. R. C. TUDWAY read a paper on the use of radioactive isotopes in the diagnosis of intraocular tumours. The technique had practical importance because it was often difficult to distinguish clinically between malignant and non-malignant neoplasms in the eye. However, the excess take-up of such isotopes by most actively growing tumour tissue had now been amply verified. The authors used radioactive phosphorus (P^{32}) which with its short-range beta emissions appeared to give significant findings on the Geiger-counter. Adult patients were given 1 millicurie of radioactive phosphorus in water, sucked through a straw, and 24 hours later Geiger-counter readings were taken by a medical assistant or technician who had no knowledge of the site of the tumour. These readings were taken in the various meridians of the affected eye, and controls were taken from the symmetrical meridians in the fellow eye. The statistical error of the method was plus or minus 15%. In general (save in very small or very posterior tumours) the significant difference between the two eyes was taken as 40% or over. The cases of malignant tumour which the authors had studied showed a significant differential reading, and there was only one case, which had a low total, and therefore unsatisfactory, count, where the results of the method were misleading. In the discussion it was pointed out that the results did not depend on pigmentation of the tumour but rather on hyperactive cell metabolism; that most of Mr. Palin's cases were clinically suspect before the test was used; that, in the acute stage, uveitis might produce a misleading result; and that the method as at present developed was not of value in gliomata in young children.

Reports of Societies

RADIOACTIVE ISOTOPES

SYMPOSIUM AT ROYAL SOCIETY OF MEDICINE

[FROM A SPECIAL CORRESPONDENT]

Looking back over the past decade of clinical experience with artificial radioactive isotopes, one gets the impression that many people were apt at first to be too enthusiastic about the part this new tool would play in therapy and diagnosis. It was clear, however, from the tone of all the speakers at the symposium arranged by the Section of Medicine at the Royal Society of Medicine on April 26, that work with radioisotopes is now entering a period of more balanced assessment and comparison with other methods.

ABC of Radioisotope Therapy

The therapeutic uses of radioisotopes depend upon the fact that when the atoms of an unstable element disintegrate they emit radiations capable of destroying the tissues through which they pass. These radiations are of three kinds: (1) Electrons, or beta particles, which penetrate up to

about a millimetre of tissue; (2) gamma rays, which are electromagnetic radiations of rather shorter wavelength than x rays and which penetrate several centimetres of tissue; and (3) alpha particles, emitted only by the heavier elements and having a penetrating power much less than that of beta particles. Each unstable isotope emits radiations with a characteristic penetrating power and each has a characteristic rate of disintegration. The "half life" of different isotopes varies from a fraction of a second to millions of years.

A radioisotope is handled by the body in the same way as the naturally occurring stable isotope. Moreover, radioisotopes can be measured in minute amounts by means of their radiations. If, therefore, a substance normally present in the body is labelled by adding to it a negligible amount of the corresponding radioactive material, we can follow the way in which the substance moves about the body or is metabolized. This may be done either by measuring the radioactivity in serial samples of body fluids, or, as with some of the radioiodine tests of thyroid function, by measuring the gamma radiations with a detector outside the body. This is the basis of the increasing number of clinical tests in which a radioisotope is used.

Methods of Localizing the Dose

If a radioisotope with suitable properties can be brought into or near a tissue it may be possible to destroy that tissue without undue damage to near-by organs. In a sense, this new branch of radiotherapy can be regarded as an extension of the older technique of local irradiation by implanting radium or radon seeds. But, owing to the wide choice of radioisotopes now available, it has been possible to devise other more satisfactory methods for achieving a local effect.

Dr. E. E. POCHIN (U.C.H., London), opening the discussion, dealt in broad outline with the principles underlying these methods. The surface of the body might be irradiated by local application of a beta-ray emitter, he said, instancing the extensive use of P^{32} in surface applicators for the treatment of superficial lesions of the skin. A solution of radioactive material could be injected directly into the lumen of a hollow viscus or introduced inside a rubber bag. Both these methods had been used for irradiating superficial tumours in the mucosa of the bladder. Another way was to inject the radioactive material as a colloidal suspension into a solid tissue. In the colloidal state, most of the injected material was retained at or near the injection site. Colloidal gold¹⁹⁹, for example, had been used in a variety of malignant tumours.

A more promising use of radiogold lay in the treatment of malignant effusions, continued Dr. Pochin. If colloidal radioactive gold were injected into the peritoneal cavity, it was rapidly deposited upon the peritoneal membrane. From this position malignant metastases were irradiated by beta radiations. However, since the beta rays of Au^{199} were of low penetrating power, the damage to the metastatic deposits was confined to a thin shell over their surface, unless they were very small. This might help to explain why radiogold appears to have no useful effect in some cases, while in others it led to marked improvement.

If small radioactive colloidal particles were injected intravenously they would accumulate in the reticulo-endothelial system and irradiate selectively those organs which contain a high proportion of R.E. cells. This principle had been tried in the treatment of the reticulosos and of a few primary tumours of the liver (using radioactive colloidal gold). If, however, large particles, 30 to 50 microns in diameter, were injected intravenously, they were arrested in the lung capillaries, whence they might irradiate the lungs selectively. If the injection could be made by cardiac catheter into one pulmonary artery, the irradiation could be localized in one lung. The first attempts to develop this method had been made with carbon particles coated with radioactive gold. But this had the disadvantage that distant organs might be damaged by the gamma rays of Au^{199} .

Metabolic Localization

Perhaps the most spectacular, and certainly the most successful, therapeutic use of radioisotopes, went on Dr. Pochin, was based on what might be called "metabolic localization." If the radioactive material was given internally in the form of a chemical substance which naturally accumulates within a particular organ or tissue it might be possible to achieve a high and uniformly distributed radiation dose without undue irradiation to the rest of the body. The two most promising examples of this were the use of radioiodine (I^{131}) in the treatment of thyroid disease and of P^{32} in the treatment of polycythaemia vera. The thyroid concentrated iodine to such an extent that the intensity of radiation delivered to the thyroid from a dose of I^{131} might be several hundred times as great as the radiation to the rest of the body. For this reason it was always possible to destroy selectively a normal or overactive thyroid gland by means of radioiodine. At present it would be fair to say that radioiodine provided a useful alternative to surgery and the antithyroid drugs in selected cases of Graves's disease and toxic nodular goitre. Radioiodine was simpler and less unpleasant to the patient than either of the former methods, and it entailed no immediate hazards. There was, however, still a possibility that carcinoma might arise in those parts of the thyroid which had been irradiated but not destroyed. No cases of cancer of the thyroid attributable to radioiodine had yet been reported among the many hundreds treated and followed for five years or longer. But most people agreed that, until more experience had accumulated, radioiodine should be used in the treatment of the non-malignant thyroid only if the patient was past middle age or if there was appreciable risk from other forms of treatment.

In malignant disease of the thyroid radioiodine was the treatment of choice if there were metastases which had the power to concentrate iodine. Generally, the tumours most likely to concentrate radioiodine were the most highly differentiated.

Concluding his remarks, Dr. Pochin stressed the great possibilities for the further development of radioisotope techniques. While it was probable, he said, that new methods would be introduced, whereby better local radiation effects could be obtained in tissues, of equal importance was the gradual improvement in methods of selecting patients. This was also one of the points stressed by the next speaker, Professor Smithers.

Experience at the Royal Marsden Hospital

Professor D. W. SMITHERS gave a brief survey of the results of work with radioisotopes over the past four years at the Royal Marsden Hospital (formerly the Royal Cancer). This survey included, among many other topics, the diagnostic use of I^{131} in thyroid disease, studies of the blood circulation by means of Na^{24} , measurement of red blood cell volume with red cells labelled by Cr^{51} ; and the therapeutic uses of I^{131} in thyroid carcinoma, P^{32} in polycythaemia, and colloidal gold in malignant effusions.

With regard to the therapeutic applications of radioisotopes, said Professor Smithers, in some cases there was already enough experience to show that the new treatment had something useful to offer the patient for whom previously there was little else. This was certainly true of radioiodine in the treatment of iodine-concentrating metastases from a thyroid carcinoma. To a lesser extent it seemed true also of Au^{199} in the palliative treatment of malignant effusions, but it might be several years before it became possible to pick out with any confidence those patients most likely to derive benefit from this treatment. In other cases, as, for instance, the infiltration of prostatic tumours with Au^{199} , doubts about the wisdom of increasing tissue tensions in malignant disease even with radioactive materials had held back workers in Britain until the results of trials by others were available. Again, artificial radioisotopes had in a few cases been adopted because they had some slight practical advantage over the older methods. Such was the case with tantalum¹⁸² wire, which

appeared to be superior to radon seeds in the treatment of superficial tumours of the bladder, and with implants of gold¹⁹⁹ grains, which might supersede radon seeds in the treatment of some types of tumour.

Professor Smithers showed two films—one demonstrating the therapeutic uses of isotopes by surface, intracavitary, and interstitial application; the other the treatment of a young woman with malignant disease of the thyroid, a tracheotomy, and metastases in the neck nodes and lungs. This patient was treated by radioiodine. The tumours all regressed, and nearly six years after the treatment she was in normal health, with no clinical or radiological evidence of disease. Professor Smithers was careful to point out that this was an exceptional case.

Radioisotopes in the General Hospital

The last speaker, Mr. N. VEALL (Guy's Hospital), discussed the value of radioisotopes in diagnosis and research. He stressed the fact that radioisotope techniques were applicable in almost every branch of medical research, and quoted several examples to show how some of the methods developed for research had been adapted for routine clinical use. It was now possible for diagnostic tests to be carried out in the smaller hospitals, since the necessary equipment for most of the established procedures involved a capital expenditure of less than £200. When the volume of work justified such a course specialized equipment was available for carrying out particular tests on a mass scale. In some hospitals, for instance, hundreds of radioiodine tests of thyroid function were performed each year.

Another speaker asked whether every general hospital should be allowed to embark on work with radioisotopes, or whether it ought to be restricted to a few large centres. Mr. VEALL was rather of the opinion that the apparatus needed for many diagnostic tests was now so cheap and so simple to operate that any medical centre wishing to use it should be encouraged to do so. However, Professor SMITHERS pointed out that when isotopes were used for treatment adequate facilities must be available if only to ensure, among other things, proper precautions against radiation hazards by everyone concerned and for the disposal of radioactive wastes. He thought it would be uneconomical to have more than a limited number of radiotherapeutic centres throughout the country; and therapy, at least with internally administered isotopes, would tend to be confined to the larger medical centres.

LOCAL MEDICAL SOCIETIES

Manchester Medical Society

Some of the difficulties in diagnosing ankylosing spondylitis, and their bearing on treatment, were stressed by Dr. J. SHARP, lecturer in rheumatic diseases at Manchester, at a meeting of the Section of Medicine on March 23. In the majority of spondylitis patients referred to a special clinic for x-ray treatment, said Dr. Sharp, the disease conformed strictly to the generally recognized picture, and 70% of them were much improved by deep x-ray therapy. In the remainder, the disease had unusual features, and of these only 31%, a very significantly smaller proportion, derived similar benefit from treatment. There was evidence that the difference in the effects of treatment was due to inclusion in the "atypical" group of some patients with rheumatoid arthritis affecting the spine, of others with psoriatic arthropathy with spinal involvement, of a few with Reiter's disease, and of some who had developed a form of spondylitis following repeated and prolonged attacks of rheumatic fever, and that these conditions were usually unresponsive to x-ray therapy. Further, immobilization usually had an adverse effect in ankylosing spondylitis, while it was often helpful in these other conditions. About a third of the patients in the "atypical" group did not seem to fit into any of these categories, and Dr. Sharp suggested that other, as yet unrecognized, conditions might be represented.

Nova et Vetera

GLOUCESTERSHIRE ROYAL HOSPITAL

This year the Gloucestershire Royal Hospital celebrates the bicentenary of its foundation, and on May 3 the occasion was honoured by a visit of the Queen and the Duke of Edinburgh. A thanksgiving service was held on May 8 in Gloucester Cathedral.

In 1754 certain benevolent people in the city and county of Gloucester decided to form a charity to found and endow the Gloucester General Infirmary for "the cure of the sick and lame of any County or Nation, who are destitute of the means of support." The ample pecuniary return so quickly made to the appeal on the first formation of the charity in 1754 enabled the promoters of the scheme to act with promptitude. The conclusion being formed that the erection of a new building would be the most satisfactory course, land called the Talbot Ground near the South Gate was purchased, on which the present buildings now stand.

To prevent delay in offering to the poor the advantage of the charity, the Crown and Sceptre Inn, Westgate Street, was purchased for the sum of £300, fitted up as a temporary hospital, and opened for the immediate reception of patients on August 14, 1755. To mark this occasion an inauguration service was held in Gloucester Cathedral, followed by a dinner at the Bell Hotel, both being attended by most of the leading persons in the county and city.

On July 18, 1761, the new building, which had been erected at a cost of £6,200, was publicly opened after a service at the cathedral and a dinner at the King's Head Hotel, presided over by Sir Onesiphorus Paul. At that time the four principal wards in the new building were named "Beaufort," "Berkeley," "Benson," and "Talbot," and the total beddage was 116.

The Old Infirmary (the Crown and Sceptre Inn) was sold in 1765. In 1813 the Squirrel Inn and other property adjoining the Infirmary on the south side was purchased for £1,000, and in 1827 the south wing to accommodate 54 patients was erected at a cost of £4,745, thus increasing the number of beds to 170. In 1877 the hospital was established as a training school for nurses, and since that date many thousands of students have received their training and gained their certificates through the excellent teaching facilities provided.

In 1878 another institution in Gloucester, called the Gloucestershire Eye Institution, was closed and all the cases were transferred to the General Infirmary. The Infirmary thereupon, under an arrangement with the Eye Institution, created an ophthalmic department, and the hospital became known as the Gloucestershire General Infirmary and Eye Institution.

On June 23, 1909, on the occasion of the visit of H.M. King Edward VII to the Royal Agricultural Show held in Gloucester, it was made known in the reply to the address of the Gloucester Corporation that His Majesty had been graciously pleased to accede to the request of the hospital committee to use the prefix "Royal," in the name of the Institution, "in recognition of the admirable work done by those responsible for its management, and the devoted and successful efforts of its staff in the prevention and alleviation of human suffering," and thereafter it was called the Gloucestershire Royal Infirmary and Eye Institution.

In July, 1948, the hospital was taken over under the National Health Service Act, and the newly appointed group management committee decided that the other hospital in the city, known as the City General Hospital, previously administered by the local authority, should become part of the Royal Hospital, and the two are now one unit, known as the Gloucestershire Royal Hospital.

C. J. ADAMS,
House Governor.

Correspondence

Because of the present high cost of producing the *Journal*, and the great pressure on our space, correspondents are asked to keep their letters short.

Army Pathology

SIR,—In his interesting annotation on Army pathology (*Journal*, April 30, p. 1087) Major-General A. Sachs omits all mention of one of its most notable contributions to medicine—namely, the first clear account of the pathology of syphilitic aortitis. In 1875, Francis H. Welch, Assistant Professor of Pathology at Netley, gave a paper at the Royal Medical and Chirurgical Society entitled "On Aortic Aneurysm in the Army and the Conditions Associated with It." The paper was published in the *Medico-Chirurgical Transactions* in 1876.¹ Welch showed that aneurysm was due not to strain, as usually supposed, but to a diseased condition of the aortic wall which preceded dilatation. He gave an accurate account of the macroscopic and microscopic features of the aortic lesion, and distinguished it from atheroma. By reference to the medical history sheets of soldiers dying from aneurysm, he was able to show conclusively that a high proportion had been treated for syphilis, a fact difficult to prove in civilian cases before the advent of the Wassermann reaction.

It is evident that syphilitic aortitis had not escaped notice at Netley before Welch's time. For Myers, in his *Essay on Diseases of the Heart among Soldiers*,² mentions that Dr. Aitken had recognized aortitis in cases of aneurysm and had regarded it as syphilitic. Prior to this, a good deal of inquiry had been directed to the cause of aneurysm in soldiers, and the widely accepted explanation was that it arose from a hypertrophied heart ejecting blood with excessive force. The cause of this cardiac hypertrophy was supposed to be tight clothing and accoutrements, combined with strain, alcoholism, and other factors.

Though Welch's classical paper received inadequate recognition at the time, and his views were disputed, to-day it is generally accepted as the pioneer account of syphilitic aortitis. Both Allbutt and Osler so regarded it, and historians of cardiology such as Herrick, and Willis and Dry, have paid proper tribute to Welch's work. The centenary of Army pathology warrants some reference to it.—I am, etc.,

London, W.1.

REFERENCES

1. Welch, F. H., *Med.-chir. Trans.*, 1876, 59, 59.
2. Myers, A. B. R., *Essay on Diseases of the Heart Among Soldiers*, 1870, London.

Classification of Breast Cancer

SIR,—Anyone who is concerned about the present unsatisfactory state of affairs in assessing the treatment of breast cancer will readily agree with Mr. Michael Harmer's plea (*Journal*, March 26, p. 790) for a standardized internationally accepted scheme of clinical staging. That such an anatomical yardstick is necessary in comparing the results of any form of treatment of malignant disease will be agreed by all. Unfortunately, however, in breast cancer the problem is not quite as simple as this.

For any system of staging to be of real value, accurate information regarding the involvement of regional nodes must be available. Clinical determination of axillary node involvement is incorrect in about 20% of cases with enlarged glands and 40% of cases with impalpable glands; and although routine histological examination of these glands gives a more accurate assessment even this may fail to reveal small metastases unless serial sections are cut.¹ In the majority of patients supraclavicular gland involvement is based entirely upon clinical examination, and the state of the internal mammary nodes is ignored. Thus any system of classification of breast cancer based entirely upon

clinical staging can only be an approximate guide to prognosis.

An attempt to present a more accurate classification was made by grouping cases according to both clinical stage and histological grade.² The Manchester staging system and the method of grading introduced by Patey and Scarff³ were used: the results are shown in the diagram.

It is evident that each stage contains representatives of three types of tumour, each bearing a different prognosis. Grade III cases are seen to account for many of the failures in Stage I, and Grade I cases for the successes in the more advanced stages. It is postulated that the histological grade of malignancy provides a measure of the probable extent of the growth, those of low grade tending to remain localized to the primary site and those of high grade tending to metastasize early. This may compensate, to some extent, for the omissions and errors which may arise in the clinical assessment of glandular involvement.

We agree that an international method of staging breast cancer is urgently required, but we feel that to use a system of clinical staging alone in comparing the results of treatment would be to neglect the most significant denominator of all—namely, the inherent degree of malignancy of the cancer cells. Such a course, in our opinion, would only serve to increase the confusion that already exists.—We are, etc.,

H. J. G. BLOOM.

W. W. RICHARDSON.

London, W.1.

REFERENCES

1. Saphir, O., and Amromin, G. D., *Cancer*, 1948, 1, 238.
2. Bloom, H. J. G., *Brit. J. Cancer*, 1950, 4, 259.
3. Patey, D. H., and Scarff, R. W., *Lancet*, 1, 801.

Anxiety Neurosis

SIR,—However much I lack the urge to effort for common welfare, I cannot let Dr. Ronald A. B. Rorie's article (*Journal*, April 30, p. 1062) pass in silence. I fear the silence, hence my attempt to combat it. As you see from the article, Dr. Rorie occupies an important position in the practice of objective medicine—that is, "real" medicine—and the article is "from a thesis submitted to the University of St. Andrews for the degree of doctor of medicine." So its shortcomings—if any—are worthy of examination.

In his second paragraph he says: "The family doctor . . . through lack of training has not the knowledge, and too often not the inclination, to attempt to deal with the obviously neurotic patient." I would humbly ask, without knowledge how can the family (or any other type of) doctor deal with the neurotic patient, so why throw in the slurring words about the lack of inclination? With reference to paragraph five, would Dr. Rorie to-day like to name the medical schools—in Britain—that attempt to supply the opportunity to obtain the aforesaid necessary "knowledge"? I do not ask Dr. Rorie to place these schools in order of merit. With reference to paragraph seven, how does Dr. Rorie propose to rectify the persisting Victorian disapproval? Does he suggest that it is the G.P.'s job? With reference to paragraph ten, which begins, "It is obvious that if the general practitioner refuses, consciously or otherwise . . ." Please, please Dr. Rorie how can the G.P. refuse unconsciously (=otherwise)? This brings us back to the G.P.'s faulty teaching and (I hope) forces us to consider who is responsible for it.

In his last paragraph but one Dr. Rorie says there is a very strong case for a "small psychiatric unit" in all general hospitals. I could not agree more with this modest requirement, which nevertheless may not come into action for a long time yet because the time lag is at the very top—that is, in the medical schools—as Dr. Rorie himself says. Another reason is that the "small psychiatric unit" will carry, or force, a good deal more with it—for example, there is just as much need for psychiatric

social workers, men and women, as there is need for midwives, district nurses, and such others as the welfare officers of local authorities. These trained (when they are trained) people need not be quite as expensive as registered medical practitioners, but in the effectiveness of their particular jobs of work can be just as useful.

Meanwhile, such ideas carried into co-operative effort will set free your G.P. and you will have every right to demand that he (or she) should be fully trained in knowledge of the job he has to do. The giving of a "merit award" to a G.P. worthy of it might be easily as practicable as the administration of merit awards in the present circumstances to other parts of the medical profession. Finally, if this country wants the general medical practitioner to survive, his training policy cannot be allowed to remain in the state indicated by paragraph five of Dr. Rorie's article. How can anyone expect a "doctor" to become interested in a part (an abnormal part) of real life that he is without adequate knowledge of? Even though I appear to see some related matters in a way not covered by Dr. Rorie's article, I sincerely congratulate him on it.—I am, etc.,

Mansfield.

JOHN McNAMARA.

Psychosomatic Appendicitis?

SIR,—Dr. J. W. Weston (*Journal*, May 7, p. 1158) states that he has had recurrent attacks of mild appendicular colic, and apparently has made a self-diagnosis on the assumption (a prevalent mistake) that pain produced in the appendix is situated in the right iliac fossa. That tenderness and, secondarily, pain in the right iliac fossa do occur in both the inflammatory and obstructive types of appendicitis is well recognized—if the appendix is in the normal site. But the excitation of pain in that situation is produced not in the appendix: it is caused primarily by stimulation of the somatic nerve afferents of the parietal peritoneum, and not by "overaction of the sympathetic." Since the appendix, like the rest of the gut, has a bilateral nerve supply through the autonomic system, it necessarily follows that pain produced in any part of the intestine will be situated in the midline and at a definite site—epigastric, umbilical, or hypogastric—depending on the embryonic position of the segment of gut at fault. On the other hand, pain produced in a bilateral organ (or tissue) is always unilateral, since the innervation is unilateral—e.g., kidney, testis, arm, leg, etc.

Dr. Weston would be wise to "wonder" a little longer and to consider other possible causes for his attacks of "sharp stabbing pain localized to the right iliac fossa" before having his appendix removed.—I am, etc.,

Dundee.

F. R. BROWN.

Ban on Heroin

SIR,—Your report under the heading "Medical Notes in Parliament" in the *Journal* of May 7 (p. 1163) makes me write to you again on this subject. You have published several letters in which the ban on heroin is deplored for one reason or another. The writers of these, and the host of doctors who are in agreement with their views, must think that the Association has taken no action in the matter, if Lord Haden-Guest can assume that "the whole medical profession, so far as could be ascertained, was behind the Order" and Lord Mancroft can say "the vast weight of evidence was in favour of the move."

The Association received last year from the World Medical Association a questionnaire on the subject of the ban on the manufacture of heroin. This was referred to the Science Committee, who recommended as follows: "That the World Medical Association be informed that it is the duty of the Government to legislate against misuse of heroin, but the medical profession should not in any way be deprived of the use of this or any other drug which may assist in the treatment of patients." This resolution was endorsed by the Council of the Association in November, 1954. Seeing that the overwhelming majority of medical men are members of the Association the statements of Lord Haden-Guest

and Lord Mancroft were singularly uninformed. Lord Haden-Guest, being a doctor, should have found out the Association's view on the matter before making such a statement.

This is not the first time that the opinion of the Association has been entirely ignored by the Central Health Services Council in recommendations to the Minister, which seems strange seeing that the chairman was recently President of the Association. I am sure it would give satisfaction to members if the Association's views were made clear, possibly by the Public Relations Officer, on occasions such as this when the Government takes a decision contrary to the expressed view of the Association.

I wish someone would inform me what the "perfectly good substitute is" for heroin—to use Lord Mancroft's words. Is it something known to the Central Health Services Council and the Members of the House of Lords but kept hidden from the small fry in whose hands is the treatment of the patients of this country? Or is it "physeptone"? If the latter, Lord Mancroft is in error in his description of this drug.—I am, etc.,

London, N.W.1.

R. HALE-WHITE.

SIR,—One appreciates the good intention behind the ban on heroin, but there are certain aspects of this matter which cannot help causing concern. It is clear from the correspondence in the *Journal* and elsewhere that there is no complete substitute for heroin, and such is my own experience. If there was a substitute, then no one would object at all to the ban, and it is obvious that the Government has been misinformed on this point. As it is, legislation will be brought into effect which will have the direct result of condemning some citizens to suffer pain which could be relieved by this drug. A few people will be asked, therefore, to make this sacrifice for the good of a supposedly larger number of their fellow creatures. Such a policy invokes a principle which has always been regarded as unethical and unacceptable to British Medicine, for it is the same principle under which the Germans carried out their much discussed experiments on human subjects. We have fought strongly to preserve the right to prescribe drugs of doubtful value, and I can only hope that the same effort will be made to preserve heroin until a genuine substitute is available. The fundamental function of clinical practice is to relieve suffering, and no weapon employed to this end should ever be banned, even for the most cogent socio-economic reason.—I am, etc.,

Barnton, Midlothian.

A. G. DONALD.

The Changing Face of Medicine

SIR,—I was highly interested to read Dr. C. P. D. Grant's splendid contribution, "Youth Looks at General Practice" (*Journal*, April 30, p. 1049) and your comments (p. 1075), and I entirely agree when he calls the N.H.S. a system "designed to undermine incentive and initiative," a system in which a list of "heads" has to be built up to provide a living wage, a system in which "the G.P. can very easily degenerate into a rather apathetic kind of sorting clerk."

Is it not worth while to learn from excellent insurance schemes working in other countries which provide a system without lists and capitation fees? They offer individual services rendered by G.P.s and paid for according to an approved national scale of fees. Minor surgery, treatment of fractures, suitable laboratory investigations, some physiotherapy, all within the capacity of the G.P., could easily be done in G.P. surgeries and paid for accordingly. What an incentive for the G.P. to treat the patient and not to transfer them much too readily to overcrowded out-patient departments. It would mean saving of money and working time for patients sent to such departments, relief of overworked out-patient department personnel, saving of salaries and manpower of nurses so short in supply, clerks, secretaries, physiotherapists, porters, etc. Costs for ambulances and hospital cars would be greatly reduced.

Specialists' services could be changed to bring at the disposal of patients specialists not only for domiciliary visits but also for consultations in their own consulting-rooms, where certain treatment could be provided. Patients would be pleased to have their self-chosen specialist, who would be paid according to an approved scale of national fees.

By abolishing lists and capitation fees I, as a middle-aged G.P., could envisage an easier entry of the young generation into general practice.—I am, etc.,

Finchley, N.3.

H. SIMON.

SIR,—My own reactions to eighteen months in general practice differ slightly from those expressed in Dr. C. P. D. Grant's excellent article "Youth Looks at General Practice" (*Journal*, April 30, p. 1049) and Dr. G. F. G. Marshall's letter (*Journal*, May 7, p. 1153). My feeling has been that the many differences between hospital work and general practice all spring from the fundamental one that in hospital jobs we were one of many who played a part in the treatment of the individual patient, whereas in general practice we are alone in representing the medical profession to him. I was just as conscious of these differences as Drs. Grant and Marshall, but I cannot agree with them that this experience of itself constituted an adverse criticism of the undergraduate curriculum.

There is no alternative, as I see it, to the ironical fact that to learn general practice one must first become a general practitioner. One's ingenuity in the application of general principles of both medicine and common sense was certainly taxed to a degree at first, but I never found my basic knowledge so lacking as to be in fear of making a serious error. Occasional reference to a picture book of skin rashes and a small handbook of prescribing was of particular help at first. Harvey Cushing once wrote that every patient presented two questions: first, what can be learnt from him, and secondly what can be done for him. How true to the newcomer to general practice! I personally found the problem of explanation to constitute the greatest difficulty, especially in the giving of a judicious forecast as to the course an illness might take and its likely duration. One can so easily be held to account for any unexplained sequelae when one lives in patients' midst.

Drs. Grant and Marshall both allude to the question of satisfaction of work in general practice. As Dr. Grant says, the tendency to apathy to clinical matters and over-concern with "the practice" as a business entity is a real danger as years go by. This can hardly be conducive to happiness, as no doubt Osler would have told us. I am hesitant in agreeing with the stress which Dr. Marshall lays on the approval earned of patients as a central, reliable source of satisfaction. It is pleasant indeed to bask in the knowledge of this state, and yet, if we do, it is all too easy with time to cease self-criticism and for our clinical standards consequently to fall. As I see it, we can only be sustained in our relative intellectual isolation by keeping alive the scientific approach to problems nurtured in our hospital days by continued reading, especially of symposia which review current thought. As in other facets of life, we have to live on a vision, and much effort is constantly required if it is to remain bright in our minds. It is in this sphere, and the occasions on which my patients have derived benefit in advice or treatment as a direct result of my reading, that I have found the greatest satisfaction of all.

Such an approach, as the mainspring of our thought and work, can do much to help us restore the prestige of general practice to its rightful place in medicine and our own self-respect as professional men. Dr. Grant's suggestions about the introduction of general-practitioner clinical assistantships, and access to x-ray departments and pathology laboratories, would help greatly in this motive, and I very much hope will be introduced in due course. George Eliot epitomized this approach in her *Middlemarch*: "I should never have been happy in any profession that did not call forth the highest intellectual strain, and yet keep me in warm contact with my neighbours. There is nothing like

medicine for this: one can have the exclusive scientific life which touches the distance, and befriend the old fogies of the parish too."—I am, etc.,

Heswall, Cheshire.

D. S. CRAIG.

SIR,—I feel that many of the statements in Dr. C. P. D. Grant's article "Youth Looks at General Practice" (*Journal*, April 30, p. 1049) should not go unanswered. I qualified just before the late war and have been in practice some seven years, five of these in my own single-handed practice, and feel sure that his attitude on many things is not typical of the less senior general practitioner.

He complains of the "volume of trivial complaints." The only objective study on this point that I have seen¹ considered a disease serious when it embodied a major threat to life or livelihood. On this basis, in a London practice of over 3,000, 16% of diagnoses were of serious disease, and the work involved in dealing with these patients was 43% of the total work in the year. In my experience much disease that does not embody such a threat is serious enough to the patient, and difficult and interesting to treat. As for "trivial illness," much serious illness begins in this way, much is a symptom of serious underlying psychological or social trouble which the good doctor must treat, and the remainder gives a good opportunity for health education of a valuable kind.

Dr. Grant deplores "the cessation of clinical control of patients removed to hospital under the National Health Service." What does he suppose happened to these patients prior to 1948? If they did not in fact go to hospital, could they afford to pay doctors and nurses to look after them elsewhere, and were the doctors satisfied that all the resources of medicine were available for their patients in these circumstances? Surely the truth about the increased demand for hospital beds is that now millions of people have a family doctor who never had one before, and that much chronic illness which before was endured in silence is now diagnosed and treated.

I agree very much with Dr. Grant that family doctors should be able to get many investigations done without referring the patient to hospital. (It seems that the co-operation of the Northern Ireland Hospitals Authority puts us in Northern Ireland in a privileged position in this respect.) Much more co-operation between hospital and general practice would be of great advantage to both—and to the patient; but many general practitioners would feel that their work lay in their practices rather than in doing hospital work described as "routine" and not needing "very advanced or specialized knowledge." Many general practitioners seem to feel that because they do not work in hospital they are cut off from all that is really interesting and important in medicine. This mistaken attitude has its origin in methods of medical education; the student has to be taught about disease largely as it is seen by specialists in hospitals. Lay misconceptions about medicine are reinforced, and the drama of the operating theatre, the laboratory, and the x-ray departments has come to be regarded as the occupation of every medical man who does a worthwhile job. This produces the attitude of mind which causes Dr. Grant to refer to "the malingerers and neurotics—the pests, the 10% hard core of every doctor's list." It is true that even to-day the undergraduate receives inadequate training in psychological medicine, but that does not justify the description of sick people as pests and malingerers.

However thankful we may often be for the resources of our hospitals and the wisdom of our specialists the practice of medicine is coming more and more into the patient's home. An emergency tracheotomy or intubation for laryngeal diphtheria was a dramatic event, but prophylactic immunization is preferable. Lobectomy for bronchiectasis, or localization and removal of a complicating brain abscess, are remarkable and admirable processes; but prevention of pertussis and early treatment of pneumonia are more acceptable to the patient. Cardiac surgery can mean new life for a cardiac cripple; good general practice in many cases could forestall the development of rheumatic carditis. These are only the most obvious instances; and every year medical progress increases the possibilities of the family doctor's work.

Dr. Grant speaks of "the young practitioner, excluded from the hospital and committed to his desk by the system. . . ." Desks were not unknown previously, and a careful history taken behind one by a doctor who knows his patient as a person often gives more useful information

than a sheaf of special investigations. I prefer to think of the family doctor not as excluded from the hospital but as having the great opportunity of living among his patients, observing them in health and disease, in their homes and at their work, following the natural history of each condition from origin to cure, or as it accompanies each patient to the inevitable end, however long delayed. The opportunities for clinical work and even for research in general practice are very great. Exceptional men have taken advantage of this in the past, and will again in the future. This needs saying again and again, because there is a fashion now for thoughtless general practitioners to belittle their work and to bemoan their "loss of status." I am in complete agreement with Dr. Grant's final sentence: "... taken seriously and practised conscientiously it [general practice] is the most difficult specialty of all."—I am, etc.,

Belfast.

R. P. MAYBIN.

REFERENCE

¹ Backett, E. M., et al., *British Medical Journal*, 1954, 1, 109.

SIR,—Your report (*Journal*, April 30, p. 1045) of the 1954 presidential address to the Edinburgh Obstetrical Society by Dr. Clifford Kennedy states, "and then two years in the Services, when the mind of the doctor, so far as things medical are concerned, might in the average case be a complete vacuum." Surely this is an *ex cathedra* statement which in fairness to the Services, and the Army, in which I served, in particular should not be allowed to pass unchallenged.

In the first place, doctors, like other people, are called up to meet the needs of the nation, and not specifically to further their personal ambitions. Secondly, despite this fact, experience shows that if any show professional leanings or initiative their place in the professional orbit of the Service is assured. Lastly, I feel sure that the number of Service medical officers who, on transfer to part-time service, can honestly say that they have derived little or no benefit professionally during their time in the Forces must be very small.—I am, etc.,

London, S.W.1.

MALCOLM ROBINSON.

Difficulties of Child Adoption

SIR,—Dr. P. M. Fea's letter (*Journal*, April 30, p. 1096) indicates a grave lack of appreciation of the many problems involved in child adoption, and the consequent need for safeguards to protect the child from unwise placement and the adoptive parents from the tragedy of failure. The suggestion that the unwanted child must "justify its existence" implies that the child has incurred a debt to society only to be discharged by the satisfaction of the emotional needs of others, whether these be suitable or not as adoptive parents. The adoption societies are at the present time in a position to select from many applicants. Far from having "an unfounded suspicion" of would-be adopters, experience has shown that there are many considerations other than the fact that a couple may be "kindly disposed." So long as there are younger couples wanting a child it does not seem unreasonable that 40 is usually the upper age limit for adoptive parents.

Some emotional disturbances are exhibited by a proportion of adopted children, and such disturbances are often intensified when the parents are elderly, and particularly when the child reaches adolescence. Children are normally placed in infancy, when they have the best chance to settle in their new home. The later the age of adoption the greater is the chance of behaviour disorders. Dr. Fea, and others who are concerned with these questions, would find that they are discussed by Kornitzer¹ and the Home Office report on adoption.²—I am, etc.,

Beckenham.

LORNA M. BRIERLEY.

REFERENCES

- ¹ Kornitzer, M., *Child Adoption in the Modern World*, 1952. Putnam, London.
- ² Report of the Departmental Committee on the Adoption of Children, 1954. H.M.S.O., London.

Measles

SIR,—Your leading article (*Journal*, April 23, p. 1018) deprecates the prophylactic use of sulphonamides and penicillin as routine treatment of measles. During the January–March epidemic this practice has had approximately 50 cases of true measles, ranging from 1 year to 7 years, and in all cases we prescribed sulphonamides or penicillin. There was only one instance of complication, which was in a child of 5 years who developed bronchopneumonia and right-sided otitis media: this case occurred when the mother had not followed our instructions to give the prophylactic treatment.

It would be interesting to know the incidence of complications with or without prophylactic treatment. It appears that there is a definite place for routine prophylactic treatment in measles, starting in the pre-rash stage as soon as the catarrhal symptoms appear and there is a history of recent measles contact. I wish to thank my principal, Dr. R. G. Wigoder, for permission to record these results.—I am, etc.,

London, S.E.6.

J. F. LUND.

The Foot as a Half-dome

SIR,—I was especially interested in Dr. J. McKenzie's article (*Journal*, April 30, p. 1068) in which he compares the foot to a half-dome, as it is a concept that I myself found most useful in explaining the mechanics of the foot. But why does he, in common with so many others, describe the forefoot as being pronated when the foot has adopted a "flat-footed" attitude? When the foot is allowed to collapse from the active fully arched posture into a resting or flat-footed attitude, no movement of the forefoot takes place relative to the ground, for it remains plantar grade throughout. Hence it is certainly not pronated relative to the ground. But in this position the back part of the foot has "rolled in" into a valgus or everted position, and since the forefoot has not moved it must now be in a position of inversion in relation to the rest of the foot, and inversion is synonymous with supination. In the flat-footed stance the forefoot is thus supinated relative to the back part of the foot. Thus the change from the fully arched to the relaxed flat-footed posture is brought about primarily by rotation about an antero-posterior axis of the front and back parts of the foot in opposite directions. It is for this reason that I like to refer to the foot in the relaxed posture as being "unscrewed" rather than flat, and "screwed up" when it adopts the fully arched active position.—I am, etc.,

London, S.E.1.

T. T. STAMM.

Influenza

SIR,—Even in the face of an epidemic of influenza it is well-nigh impossible these days to differentiate such cases from other respiratory viral infections without routine serology in every case, as suggested by Dr. John Fry (*Journal*, February 19, p. 478). It is equally impossible to assess the true incidence of pulmonary opacities without radiological investigation of the chest in every case, and, for many reasons, that cannot normally be countenanced.

In the first half of 1953 (influenza virus A year) the Army Chest Centre, Connaught Hospital, Bramshott, was asked to deal with the overflow of mild cases of upper respiratory tract infection from other hospitals. Five hundred cases were admitted as upper respiratory tract infection between January 15, 1953, and May 5, 1953. Every case had a radiograph of the chest on admission, and the incidence of pulmonary opacities was most revealing. Routine serology (see Table) was carried out in all such cases and in random cases amongst the remainder. The cases were classified as follows: infectious mononucleosis, 6; rheumatic fever, 1; rubella, 1; tuberculous primary pleural effusion, 1 (A. and A.F.B. isolated on culture); transverse myelitis, 1; herpetic stomatitis, 1; malaria, malignant tertiary, 1; scarlet fever, 1.

The remaining 487 cases were then divided into the following groups, which are as defined by Stuart-Harris¹ but with certain modification. The figures in parentheses give the number with pulmonary opacities: *Group One*.—Common cold, 8. *Group Two*.—Bacterial sore throat, 112 (1). *Group Three*.—Febrile catarrh with exudate, 47 (4). *Group Four*.—An influenza-like illness with (a) no evidence of catarrh, 51 (1); (b) minimal catarrh, 67 (16); (c) marked catarrh, 202 (44). All groups were easily recognized, and therefore the high and accurate incidence of pulmonary abnormalities demonstrable on routine radiological examination of the chest in every case on admission is of particular interest—for example, Group 3 plus Group 4 (a), (b), and (c): 65 out of 367 cases, or 17.71%; Group 3 plus Group 4 (b) and (c)—that is, all cases with catarrh: 64 out of 316 cases, or 20.2%—that is, 1 in 5; Group 4 (b) and (c); 60 out of 269 cases, or 22.3%—that is, more than 1 in 5.

	Total Cases	Serology Tested	Influenza "A"	Influenza "B"	"Q" Fever	Psittacosis L.G.V. Group of Viruses	Streptococcus MG	Agglutinins	Negative Serology
Group 1	8	—	—	—	—	—	—	—	—
" 2	112	7 (1R)	—	—	—	—	—	—	7 (1R)
" 3	47	10 (4R)	—	—	—	—	—	—	10 (4R)
" 4(a)	51	6 (1R)	2	2	—	—	—	—	2
" 4(b)	67	24 (16R)	7 (3R)	3 (3R)	—	2 (2R)	—	—	12 (8R)
" 4(c)	202	61 (43R)	16 (10R)	12 (9R)	1 (1R)	2 (2R)	—	—	30 (21R)
Total	487	108 (65R + 1R AWOL)	25 (14R)	17 (12R)	1 (1R)	4 (4R)	—	—	61 (34R)

R=With radiological changes. The case who went A.W.O.L. did not have serological tests carried out.

These results are of outstanding interest because such a rate of pulmonary complications demonstrable on chest radiography is by no means generally recognized. Such results would be of special significance to those with Service experience, who know that anyone with a febrile illness of at least one day's duration is likely to be admitted to hospital. The radiological changes were those found in respiratory virus infections but are not diagnostic of, or peculiar to, any one virus. The term "adhesive bronchial pneumonia" is both descriptive and accurate and should replace the term "aspiration pneumonia," which is apt to be so readily used in such cases.

These brief remarks are part of a paper on the subject of upper respiratory tract infection which it is hoped to publish in the *Journal of the Royal Army Medical Corps* in due course. The authors of this work include Captain C. H. Jones, R.A.M.C., and Captain J. G. Elliott, R.A.M.C.—I am, etc.,

Hindhead, Surrey.

JOHN MACKAY-DICK.

REFERENCE

¹ Stuart-Harris, C. H., *Influenza*, 1953.

Exchange Transfusion in Haemolytic Disease of the Newborn

SIR.—The article by Drs. William Walker and Sheila Murray on the treatment of haemolytic disease of the newborn (*Journal*, July 17, 1954, p. 126), claiming a mortality rate of 2%, and reiterated in a further article by Drs. Walker and G. A. Neligan (*Journal*, March 19, p. 681), cannot be allowed to pass without comment.

Admirable as is the work of the Durham school on this subject, they lay themselves open to the criticism that by ignoring stillbirths when computing their mortality rate they have rendered their figures worthless, since all of the worst risks will have been eliminated before birth, and the mortality rate for the less severely affected liveborn infants becomes unfairly bettered. Furthermore, in the matter of

excluding the deaths of several of the liveborn infants in the 1955 report, it would seem that the liveborn mortality rate is also questionable. For example, two of the infants (K. and P.) amongst the group III cases, whose death was not attributable to haemolytic disease, had cord blood Hb values of 8.0 g.%, while one of them (K) had a serum bilirubin value of 15 mg.%. This alone, according to Dr. Walker's own published standards, should signify a severe degree of disease, severe enough *per se* to cause the death of many infants. Yet he has excluded them from the mortality figures on the grounds of double pathology. He has included in his mortality figures a much less severely affected infant (H.) in group III whose cord Hb value was 10.3 g.% and bilirubin only 1.9 mg.%. To the critical observer such inconsistencies render the figures quite unacceptable, but one might well ask what should or should not be included on the grounds of double pathology, because who is to judge just where to draw the line? It is a simple matter, by excluding cases on the grounds of other causes of death, to make one's mortality rate just what one likes. Indeed, the post-mortem results of many of Dr. Walker's cases showed just exactly nothing, or ? heart failure. Hence, if the necropsy revealed nothing, the death was presumed as due to haemolytic disease; if any other pathological cause can be found, haemolytic disease is excluded.

The only really scientifically honest way to arrive at approximate mortality figures is to include all stillbirths and all neonatal deaths of infants whose erythrocytes show a positive direct Coombs test. This may be difficult in the case of macerated stillbirths, but we have in this hospital counted all stillbirths (after 28 weeks) of infants whose mother's serum contained abnormal antibodies. Usually the presumption of incompatibility becomes almost a certainty when the previous history is consulted or there has been an undoubted change in maternal antibody titre. The stillbirth rate by this means may be slightly too high, but the figure must be closer to the truth than that obtained by ignoring these cases.

It is unfortunate that these British workers have decided to write off their erythroblastic stillbirths as irretrievable on evidence which is not even statistically significant.¹ Premature induction of labour, as a means of saving at least a proportion of these affected infants, has been banned on unacceptable evidence. The incidence of kernicterus in premature infants is reputed to be higher than in mature babies, and this is also debatable. It is more probable that it is not prematurity itself which contributes to kernicterus, but the way in which the babies are treated and handled. Evidence to substantiate these remarks is shortly to be published, and the plea is advanced to those interested workers to keep an open mind before accepting the dictum that "premature induction of labour has no routine place in the management of this disease."—I am, etc.,

Subiaco, Western Australia.

G. A. KELSALL.

REFERENCE

¹ Mollison, P. L., and Walker, W., *Lancet*, 1952, 1, 429.

Coal-workers' Pneumoconiosis

SIR.—I have read with great interest and appreciation Drs. J. C. Gilson and G. S. Kilpatrick's article on coal-workers' pneumoconiosis (*Journal*, April 23, p. 994). They have given a lucid summary of a difficult social and therapeutic problem. They discuss the nature of chest pain in these cases, and I would like to quote some of the symptomatology I have elicited from Durham miners with pneumoconiosis.

Assessment of pain is always difficult, and especially so when the question of pension is involved. When one has excluded the more obvious causes of pain such as strain, cough fracture, or pleurisy, there remain a number of more obscure cases which often present some of the following features. The pain may be retrosternal, in either pectoral region; or be right across the front of the chest, and is often related to effort. In character it may be constrictive. If this is the only history obtained, cardiac ischaemia cannot

be ruled out without an E.C.G. before and after exercise. But usually the pain presents other features. For instance, it may be periodic, coming on for a few days or weeks at a time, though not continuously present. When the man is having a bad period the pain may not be related to exertion, but may occur in bed at night or while sitting in the armchair. When related to exertion the pain may be relieved by rest, but often persists for hours before this occurs. During the periods of remission the miner may be capable of considerable exertion. The pain is often associated with dyspnoea, more rarely with wheeze.

What such pain is due to is not clear. I have seldom attributed it to cardiac ischaemia because there are so frequently atypical features. Emphysematous bronchitis may get similar pain, but it seems a much more dominant feature in pneumoconiosis. Perhaps repeated undiagnosed pleuritis are related to the cause. I should be interested to learn if the above description of chest pain in pneumoconiosis fits in with the findings of Drs. Gilson and Kilpatrick.—I am, etc.,

Sunderland.

H. R. THOMSON.

Chlorpromazine

SIR.—The report by Dr. J. R. Tasker (*Journal*, April 16, p. 950) of a fatal case of agranulocytosis, due to chlorpromazine, clearly puts the drug in a new category. My note (*Journal*, April 23, p. 1034) concerning the use of the drug in a few cases of severe and otherwise intractable vomiting of whooping-cough was by then already in the process of printing, and it invited the obvious rejoinder by Dr. J. H. Owen (*Journal*, May 7, p. 1155).

The fact remains that whooping-cough is at present in this country one of the chief killing diseases of childhood, with an impressive respiratory morbidity in later adult life. Chlorpromazine, as a drug powerfully effective in controlling the paroxysms and vomiting of this potentially lethal and disabling illness, is worthy of a controlled group trial in a selected number of severe cases as short-term therapy. The general practitioner will see but few cases of this type even in an epidemic. If this correspondence stimulates a more extensive investigation, it will have served its purpose.—I am, etc.,

London, S.E.13.

HOWARD REEVE.

Cyst Formation Following Hernia Repair

SIR.—It would be a pity to allow Mr. G. T. Watts's rather sweeping condemnation of the method of hernia repair by skin implant (*Journal*, May 7, p. 1156) to pass unchallenged. I have used the method now for 10 years, restricting it to difficult cases where a satisfactory repair from the tissues locally available appeared impossible—recurrent herniae, incisional herniae, about 100 cases in all—and have been very pleased with it. I have had no cysts, no serious sepsis, and few recurrences. In many of the cases the defect was large and the implant was the only bar to recurrence—for example, a man who had a hole blown in his abdominal wall by the discharge of a 12-bore sporting gun at a range of one yard (0.9 m.). In one case I had to reopen the abdomen three years after repairing a ventral hernia and was impressed by the thick shining tendon-like tissue which had replaced the skin implant.

The development of cysts implies that the skin has been placed under conditions which allow the survival of epithelial elements. I think the way to avoid this is to make sure that the skin is sutured everywhere under full tension in all directions, and especially that no little folds or loose corners are left at the edges of the implant. This is difficult and time-consuming and makes the operation a little tedious. I suspect that some of the cysts that occur may be due to modifications of the method introduced in a misguided attempt to make it easier or quicker. I am sure that if used only for the sort of case I have indicated, and carried out with care, the method will be found more successful than the alternatives of repair by fascia lata or by the implantation of some foreign body.—I am, etc.,

West Hartlepool.

W. IRVING.

Natural Childbirth

SIR.—This subject, whenever it is discussed, invariably discovers ardent adherents, equally passionate dissenters, and much confusion between antenatal exercises, antenatal preparation for pregnancy, labour, and the puerperium, and relaxation exercises. Would it not be wise to admit that there is little to be said for antenatal exercises in relieving the discomfort and shortening the duration of labour, but that they do prepare the woman for the very valuable exercises she will, if she is wise, practise after delivery?

Antenatal preparation has, of course, a great deal to be said in its favour, for the average primigravida is sublimely ignorant of the problems ahead, has probably acquired a great deal of horrific and incorrect information about the pangs of labour, the travail of childbirth, and so on from friends and relatives, who become surprisingly sadistic at such times, and is almost certainly scared about some aspect of pregnancy, in particular labour. Intelligent advice and correction on all these matters is obviously part of good antenatal preparation for natural childbirth, but what is "natural childbirth"? Presumably it means an unassisted delivery with no pain, at most only discomfort, and this question of pain is really what all the correspondence is about.

Dick Read's contribution to the problem is his reiteration of the well-known fact that tension begets pain, or, rather, lowers the pain threshold; and the essence of natural childbirth is preparation for a natural process. Not every woman can be assured of freedom from discomfort when she is having a baby any more than when she is having a tooth drilled. Her appreciation of pain can, however, be lowered by previous preparation, pain-relieving drugs, or frank anaesthesia, and the first may be enough or the last necessary. The experienced general practitioner is perfectly well aware of this, and when looking after a young primigravida he first gains her confidence, explains the problems she must face, and, in fact, with continuing supervision does everything to relieve tension and anxiety. When she goes into labour his steady voice and confident assurance are powerful and continuous aids towards "natural childbirth." Unknowingly he may induce a state bordering on hypnosis, and with some cases a completely painless labour follows. The essential factor is surely the confidence the woman has in her attendant, and obviously antenatal preparation must encourage it. Relaxation exercises, conducted by the one who will attend the woman in labour, are all to the good, and good relaxation between contractions may be ensured, but it is useless to promise every woman a labour free from pain, and analgesics should never be withheld even by the most enthusiastic "naturalists."

Perhaps if we remember the disservice done to women by referring to "pains," by the publicity given to such items as gas to relieve the anguish of labour for every woman, "trilene" now safe for midwives, and so on, and tried rationally to present the problem, and promote relaxation fairly and try to relieve tension, natural childbirth might and could be more commonly achieved, even in highly organized maternity units.—I am, etc.,

Pembury, Kent.

E. D. GRASBY.

Ante-partum Haemorrhage

SIR.—Mr. Frank Stabler's excellent paper on this subject (*Journal*, May 7, p. 1145) will be of great value to the general practitioner in the out-patient management of this condition. I would venture to disagree, however, with one of his recommendations. My colleagues in the pathological laboratory have impressed upon me the importance of providing a sample of blood for cross-matching before the administration of dextran or any of the other plasma substitutes; and in cases where the restoration of blood volume is necessary merely as a preliminary to blood transfusion we have found it is usually preferable to use normal saline rather than dextran. In domiciliary conditions it may sometimes be difficult to obtain a blood sample and then to put

up a dextran transfusion, and for that reason I would suggest that normal saline should be used as a stopgap measure. Although the saline is rapidly excreted from the circulation in normal circumstances, in the collapsed patient it seems to produce temporary improvement for about an hour, which should usually give sufficient time for a flying squad to reach the patient with blood.—I am, etc.,

Worcester.

J. A. CHALMERS.

Injection Technique

SIR,—I am grateful to Dr. John Richards (*Journal*, April 30, p. 1092) for drawing attention to the value of stretching the skin when giving injections. That is a point I omitted to mention (*Journal*, April 9, p. 909), and the benefit of which I had not fully appreciated. But surely, apart from assisting penetration of the skin by the needle, does it not supply a further illustration of Pavlov's dictum, that whether the stimulus be pain, touch, temperature, or stretching, the body can only respond to, or sense, one stimulus at one time? Stretching of the skin may be felt during an injection instead of either the touch of the needle or the pain of its prick. The more the skin is stretched, the stronger will be the stimulation of the stretch-sensing nerve endings, and the greater the chance that stretch-stimulation will override and prevent appreciation of pain-stimulation. A quickly given injection affords time for appreciation of one stimulus only—the dominating stimulus. Make sure when giving injections that the dominating stimulus is the pleasant one—stretch or touch—not the unpleasant one of pain.

Based on this principle, here is another simple but effective dodge. When injecting children in the arm, instruct the mother to stroke or rub the child's leg. The dominating stimulus observed by the child is the touch on the leg; the minor stimulus, pain in the arm, escapes its observation—provided the pain stimulus in the arm is reduced from a major to a minor stimulus by employing the procedure which I described in my letter.—I am, etc.,

Reading.

K. D. SALZMANN.

Diphtheria Immunization in Guernsey

SIR,—In 1937 an epidemic of diphtheria started in the autumn, reached its peak in the winter and autumn of 1938, and subsided in 1939. In 1938 the Guernsey Board of Health proposed that there should be a law for the compulsory immunization of all children between 1 year of age (afterwards changed to 2 years) and 10 years of age, without any conscience clauses for exemption. Exemption could be obtained for ill-health, previous attack of diphtheria, or a negative Schick test, subsequently all children to come under the law on reaching the age of 2 years. The *Projet de Loi* was passed by the States of Guernsey in June, 1938; this was confirmed by Order in Council in March, 1939.

A campaign for voluntary immunization was carried out until the law came into force, and 40% of children under 15 years of age had been inoculated by January, 1939; by the end of 1939, 7,600 children (76%) had been inoculated. A large number over the age of 10 years had been immunized voluntarily. In 1940 approximately 8,000 children out of the 10,000 under 14 years of age were evacuated to Britain, and in June the island was occupied by the Germans. Supplies of A.P.T. and T.A.F. could no longer be obtained, and immunization was suspended until liberation in May, 1945. Then all children between the ages of 2 and 7, which covered the war years, not previously immunized, came under the compulsory law. Subsequently all children in Guernsey come under the law as they become 2 years of age, and in practice more than 95% of these children are immunized. Children not traced, children who come to live here after 2 years of age or exempted for ill health, account for the remainder. Free voluntary reinoculation is offered, and since 1945 approximately 40% have accepted this. The injections are carried out by the local medical practitioners. No serious ill effects from the injections have been reported.

When the law was proposed in 1938 there was considerable opposition, but since the war this has died down, and even individual objection on principle is very rare, although pressure has to be brought on a certain number of parents due to their inertia.

I give below the numbers of notified cases of diphtheria for the years 1897 to 1954, with the population at certain years.

Year	Notified Cases of Diphtheria	Population	Year	Notified Cases of Diphtheria	Population
1897	35	37,242	1927	33	
1898	122		1928	61	
1899	121		1929	57	
1900	80		1930	37	
1901	66	40,300 (census)	1931	32	
1902	179		1932	11	40,478 (census)
1903	107		1933	6	
1904	50		1934	4	
1905	40		1935	3	
1906	125		1936	1	
1907	94		1937	62	
1908	48		1938	489	
1909	37		1939	192	
1910	65		1940	11	
1911	117	41,854 (census)	1941	1	33,500 (average)
1912	163		1942	5	
1913	72		1943	—	
1914	45		1944	—	
1915	28		1945	2 (average)	
1916	6		1946	4	25,500 (average)
1917	8				38,000 (estimate)
1918	14		1947	2	
1919	8				
1920	86		1948	—	
1921	278	37,914 (census)	1949	3	
1922	179		1950	—	
1923	122		1951	2	43,547 (census)
1924	172		1952	1	
1925	216		1953	—	
1926	101		1954	—	43,414 (estimate)

—I am, etc.,

Grange, Guernsey.

ROWAN REVELL.

POINTS FROM LETTERS

Analgesia for Tooth Extraction

MR. HERBERT CAIGER (Banstead, Surrey) writes: The following simple method of securing almost painless extraction seems worth putting on record. A dentist in Kimberley used it when extracting a lower molar of mine some 60 years ago. . . . I used it very frequently for 20 years in country practice in South Africa, where dentists were not always available. Swabs of cotton-wool are soaked in a mixture of equal parts of tinct. aconit. and chloroform and applied, one on the inside and one on the outside of the gum, for about three-quarters of a minute, with a larger dry swab covering each. The numbing and burning sensation produced almost completely obliterates the pain of extraction. This simple technique . . . is available without an anaesthetist; it is less painful to the patients than injection into the gums, and probably less costly; and available when more modern methods are perhaps not so. If possible, the tinct. aconit. used for the mixture should be made with rectified spirit like that in the *Pharmacopoeia* of 1885—not like the later tincture made with weaker spirit and mixing less perfectly with the chloroform.

Speaking Up

DR. J. B. GURNEY-SMITH (Redhill) writes: I read with considerable interest the two recent letters on this subject and venture a few observations. I agree with Dr. J. Hamilton Mellroy (*Journal*, April 2, p. 853) in his plea for instruction in voice production for medical students. Comparatively few in our profession are blessed with polished articulation, as is apparent after attending a sectional discussion of any medical society. Medicine is one of the three great learned professions, and it is obvious that a doctor is liable to be involved in situations requiring public utterances from time to time. I feel no doctor, however learned he be, should be invited to deliver lectures and addresses unless he knows how to "deliver the goods." As an Anglican lay-reader, who frequently conducts services and preaches in churches of varying size and of diverse acoustic properties, I can vouch for my views. I would like to pass on two simple tips which are very important—that is, (1) look at the back row in speaking and then everyone in between will hear, (2) maintain an even volume of tone throughout the delivery. How many speakers and even clergy drop their voices at the ends of sentences and so one misses the last few words, which may be vital.

Obituary

JOHN LOWE, C.B.E., M.C., M.D., F.R.C.P.

Dr. John Lowe, medical secretary of the British Empire Leprosy Relief Association and honorary secretary of the International Leprosy Association, died suddenly in London on May 13.

Born at Handsworth, Birmingham, in 1898, John Lowe attended King Edward's School, Birmingham. After service in the first world war, during which he won the M.C. in France, he studied medicine at Birmingham University, graduating M.B., Ch.B. in 1922. A year later he went out to India as a medical missionary in the Leprosy Home at Dichpalli in the Nizam's Dominions. While there he obtained the M.D. for a thesis on malaria. In 1931 he joined the leprosy research department at the Calcutta School of Tropical Medicine, and became head of the department in 1935. For a number of years he acted as assistant editor, and later as editor, of the *Indian Medical Gazette*. During the second world war he was appointed professor of tropical medicine and director of the School of Tropical Medicine at Calcutta. For his work on leprosy he was awarded the Kaiser-i-Hind Gold Medal in 1944.

In 1946 Lowe retired from his appointments in India and in the following year, after obtaining the M.R.C.P., went out to Nigeria. He first worked under the British Empire Leprosy Relief Association, and later under the Nigerian Government at the Leprosy Research Centre at Uzuakoli in the Eastern Province. His energies were chiefly directed towards finding an improved form of treatment for leprosy. He was the first to publish satisfactory results with the oral administration of diamino-diphenyl sulphone. This was found to be effective, safe, and easily administered, while inexpensive enough to be used in wholesale mass treatment. It is now adopted as the standard treatment for leprosy in most countries throughout the world. Lowe published many papers, chiefly on leprosy. He was a clear thinker, writer, and speaker.

Lowe was appointed C.B.E. in 1953, and in spite of impaired health he continued to work in Nigeria till he came home in 1954. In that year he was elected F.R.C.P. and was appointed medical secretary of the British Empire Leprosy Relief Association, and undertook also the honorary secretaryship of the International Leprosy Association. But his work was hampered by repeated heart attacks, and in the end it was from one of these he died. He is survived by a widow and two sons, both medical men.

E. M. writes: Dr. Lowe has added much to our knowledge of leprosy, and sufferers from that disease in India, Africa, and indeed throughout the world owe him a debt of gratitude. His death is a sore loss in the field of leprosy research, a field in which there are all too few first-class workers. Low had the true scientific spirit—the desire for truth and the power of self-criticism. While not seeking undue credit for himself, he was always quick to give credit to others whom he considered worthy. In research he was a good colleague to work with. Though sometimes deliberate in getting off the mark, he lost no time once he got going, and threw himself with energy and thoroughness into whatever he had undertaken.

Sir ARTHUR MACNULTY writes: May I be allowed to pay a tribute to my friend and colleague Dr. John Lowe? He was well known as a specialist in tropical diseases, his work in this field at the Calcutta School of Tropical Medicine being outstanding. He did much research in leprosy, and

from 1947 to 1954 was in charge of the research unit of the leprosy settlement at Uzuakoli, Nigeria. The British Empire Leprosy Relief Association were glad to welcome him back as their medical secretary, and as chairman of the medical committee of the association I found his counsel and help invaluable. He had done much research on the treatment of leprosy by sulphonamides, and was investigating the use of B.C.G. in prophylaxis of the disease. In spite of ill-health, he battled on, working indefatigably in the campaign against leprosy, although he knew the price might be his own life. I often exhorted him to rest and take more care of himself. His reply invariably was that he preferred to die fighting. He had his wish, and, after a noble and well-spent life, no one could have been better prepared when the summons came to leave this world.

ETHEL CASSIE, O.B.E., M.D., D.P.H.

Dr. Ethel Cassie, who died at her home at Freeland, Oxfordshire, on May 7, was one of the architects of the maternal and child health services of the country. She was 72 years of age. She was best known as the senior medical officer for maternity and child welfare at Birmingham, but her earlier work will be remembered also in Scotland, where she opened the first child welfare centres in Edinburgh more than 40 years ago. Her 22 years in Birmingham brought to the services of that city a more than national repute for the high quality of the administration and practice of maternal and child health work.

Ethel Wiseman was born on September 3, 1882, at Dalhousie, Punjab, India, the eldest child of Frederick Wiseman, of the Indian Civil Service. Her father's early decision that his first child should become a doctor remained unaltered when the first child was a girl, and Ethel Wiseman entered the Edinburgh School of Medicine for Women in 1901. She graduated M.B., Ch.B. in 1906, obtaining the Dorothy Gilfillan Prize as the most distinguished woman student in the university examination, and took the D.P.H. of the Scottish Royal Colleges in 1907. She married Alexander Cassie, a science tutor, in 1907, but the marriage was not finally successful and they parted in 1920. Alexander Cassie died in 1933. Ethel Cassie commenced general practice in Edinburgh in 1908 and was appointed visiting physician to the Hospital and Dispensary for Women and Children. She became medical officer of health of the county and boroughs of Clackmannanshire in 1915 (substituting for the medical officer of health, who was on war service) and assistant medical officer for child welfare in Leith in 1918. In 1921 she was appointed senior medical officer for maternity and child welfare in Birmingham, first under Sir John Robertson and later under Dr. H. P. Newsholme, and continued in this post until her retirement for health reasons in 1943. She proceeded to the M.D. in 1923, and in 1926 gained the Jessie Macgregor Prize for Medical Women, awarded by the Royal College of Physicians of Edinburgh for "the best record of original work in the science of medicine."

It was the quality of originality that made Ethel Cassie outstanding in health administration. She was not one to wait for a lead from others, but rather to give the lead and explore new fields. It was on her advice that the first premature baby unit in this country was opened at the Sorrento Maternity Home in Birmingham 24 years ago. Her understanding of the needs and difficulties of foster children and illegitimate children led to the adoption of special schemes for their care in Birmingham many years before their needs were high-lighted by

the Curtis Committee. Much of her pioneer work has later been embodied in Government circulars to local authorities. She published in 1929 a textbook on maternity and child welfare and contributed also to other publications, but she was not prolific either as a writer or on the platform, preferring always to translate her thought into action rather than words. Her administrative ability and wisdom, coupled with a lively knowledge of clinical medicine, brought her wider responsibilities than local authority work. She was a member of the Departmental Committee on Maternal Mortality appointed by the Minister of Health in 1928, which issued its classic reports in 1930 and 1932. She was appointed O.B.E. in 1941, and in the following year became a member of the Minister of Health's Advisory Committee on Mothers and Young Children. In 1944 she was appointed a member of the Royal Commission on Population, and those who knew her well would discern her influence in its report issued in 1949. Later she took part in initiating a Ministry of Health survey of the growth of infants and young children, but increasing ill-health compelled her to relinquish active work in 1951. Her death will recall to many how much the present high standard of maternal and child health in this country owes to her, not only through her leadership in local authority work but through the stimulus of her constructive thought over a wide field. There was indeed truth in the ancient form of words appointing her—"our trusty and well-beloved Ethel Cassie"—to the Royal Commission in 1944, "reposing great trust and confidence in your knowledge and ability."—K. M. H.

Dr. GEORGIE I. BRODIE writes: With the death of Dr. Ethel Cassie there passes one of the most outstanding and colourful personalities in the field of maternity and child welfare. As her deputy in Birmingham I was privileged to learn from and to be inspired by her. From near and far her pioneer work in the sphere of maternity and child welfare was renowned. Closely working with her, I was daily aware of the bases of that renown. Hers was the mind of a builder, and to the edifice she constructed in Birmingham she brought many talents, not the least of which were a clarity of mind, a singleness of purpose, and a capacity to imbue others with enthusiasm for improving the lot of mothers and children. All workers in the maternity and child welfare field owe much to her for making a model administrative service, which has been copied here and abroad, and rarely improved upon. To her ability as a medical officer Dr. Cassie added a wide range of interests. She was recognized as a connoisseur of old furniture and china. She travelled widely, was a voracious reader, and an interesting conversationalist. Her charm was never more evident than in her own home, where she entertained so delightfully, and those of us who were privileged to enjoy her friendship and hospitality will for long feel the loss of a stimulating and endearing personality. The maternity and child welfare service will always owe a debt of gratitude to Dr. Cassie for her outstanding ability and pioneer work.

J. R. HUTCHINSON, M.D., D.P.H.

Dr. J. R. Hutchinson died on May 6 at Chalfont St. Giles, Buckinghamshire, aged 75. He had retired from the Ministry of Health in 1947 after 36 years' service in the epidemiological divisions of the Local Government Board and the Ministry of Health, of which he became a senior medical officer.

James Randal Hutchinson studied medicine at Owens College, Manchester, and graduated M.B., Ch.B. with honours in 1902. He was awarded the Bradley scholarship for clinical surgery, but was soon attracted to preventive medicine, and took the D.P.H.

of Manchester in 1904. His first contribution to public-health literature consisted of papers on the eyesight of Blackburn schoolchildren, which were published in the medical officer of health's annual report for 1907. In 1908 he became senior assistant to that great character Dr. James Niven, medical officer of health of Manchester, and two years later was himself appointed medical officer of health of Wigan. These were busy times and places for a man interested in communicable diseases. He published reports on outbreaks of scarlet fever at Crumpsall in 1909, typhoid from ice-cream in Manchester in 1910, and smallpox in Wigan in 1911. Throughout the period he was intimately concerned with the clinical care of the infectious diseases and particularly tuberculosis, and in 1911 he proceeded M.D., his thesis having dealt with "the presence of typhoid bacilli in enteric fever and afterwards." In this connexion it is interesting to note that in 1943 he published in the *British Medical Journal* a paper on the value of phage typing in the investigation of outbreaks of paratyphoid fever.

Hutchinson was in his 32nd year when, in 1911, he joined the medical inspectorate of the Local Government Board, and he was responsible for several of the reports to the Board which are classic examples of the descriptive epidemiology of that period. He became a master of the subject of the local authority's responsibility for the control of infectious diseases and was typical of that small but strong body of local-government-trained men who provided the backbone of the newly formed Ministry of Health, in which he rose to the post of senior medical officer. He had a fine gift of appraisal and criticism and was a trenchant critic of loose theorizing, sloppy argument, and tendentious conclusions. His fastidious mind was well suited to the pursuit of epidemiology and was matched by his personal characteristics in a remarkable way. His very many friends in the public health service will remember this precision—how neatly the bows on his bespoke shoes were tied and how the bowler hat gave place to the boater on the same day in May each year; how his car was always spotless, and there was rarely a weed in his lawn. These qualities made him a challenging teacher but also a comfortable and loyal companion. One knew where one was with Randal Hutchinson and could rely on his facts and on the soundness of his judgment. Perhaps his most characteristic work was the "Report of the Committee on Vaccination, 1926" which remains as a memorial. His swan song was a historical note on "The Prevention of Smallpox in England," published as an appendix to the Chief Medical Officer's Report, 1946.

Dr. Hutchinson was married and is survived by his widow, to whom we extend deep sympathy in her loss.—W. H. B.

CORNELIUS A. GRIFFITHS, F.R.C.S.

With the death of Mr. Cornelius A. Griffiths on May 7 Cardiff has lost a notable surgeon of the old school. He was 90 years of age. Cornelius Albert Griffiths was born at Merthyr in 1865. He studied medicine at Bristol, where he gained the Martyn Memorial Scholarship in Pathology in 1888 and the Sanders Scholarship in 1889, and at St. Bartholomew's Hospital, London. With the foundation of the University of Bristol still many years ahead and the University of Wales not yet empowered to grant medical degrees, he sat the London Conjoint examination and qualified

in 1889. He then held house appointments at Bristol General Hospital, and from 1890 to 1893 was medical tutor in the Bristol Medical School. In the latter year he obtained the F.R.C.S., and took the post of resident medical officer at the old Swansea General and Eye Hospital. In 1894 he settled at Cardiff and a few years later was appointed honorary assistant surgeon to the Cardiff Infirmary, and surgeon and honorary secretary of the Cardiff branch of the Surgical Aid Society. Later, he became honorary consulting surgeon to the Porth and Maesteg cottage hospitals. During the first world war he worked as a surgeon at the 3rd Western General Hospital, with the rank of major in the R.A.M.C., and after the war he became honorary surgeon to King Edward VII Hospital, now the Cardiff Royal Infirmary. He was a member of the British Medical Association for 65 years, and a justice of the peace for Cardiff for over 30 years.

We are indebted to Professor LAMBERT ROGERS for the following appreciation:

At 90 years of age the death of Mr. Cornelius Griffiths removes from us the last survivor of a little group of octogenarian and contemporary members of the consultant staff of the Cardiff Royal Infirmary. In the last few years they have dropped away one by one: first Mr. Geary Grant, consulting surgeon, then Dr. Cyril Lewis, consulting physician, and Sir Ewen Maclean, at one time President of the Royal College of Obstetricians and Gynaecologists, and professor of obstetrics and gynaecology, and now Mr. Cornelius Griffiths, who outlived them all and who had been a consulting surgeon for many years. Often his slightly stooping, spare figure with its slow, deliberate, and measured tread was to be seen walking along one of the main streets of Cardiff, stick in hand, cigar in mouth, and a soft round hat on his head. Recently his memory had been failing and he would not always recognize whoever addressed him; and more recently still he had been missing from his accustomed haunts and confined to his house. His actions were always deliberate, unhurried, and gentle, as was his operating, for he was a neat, bloodless, precise, and careful operator whom it was a pleasure to watch at work. While he was no great contributor to the literature of his subject, Cornelius Griffiths was a painstaking, careful practitioner of it and was one of that great band of provincial surgeons in this country who, true to high ideals, have done so much to enhance the prestige of British surgery and the high standard of surgical work in the hospitals of our land. His death, like his living and all that he did, appears to have been gentle and dignified. He was revered and respected in Cardiff and South Wales, where he had an extensive consulting practice. He had been retired for so many years that the younger surgeons of to-day knew him not.

A. J. WILSON, M.D., F.R.C.P.Ed.

Dr. A. J. Wilson, who died suddenly on April 30 at the age of 56, was a well-known physician in the Midlands. At the time of his death he was the senior honorary physician and honorary physician in charge of the electrocardiographic unit at the Coventry and Warwickshire Hospital, Coventry.

Arthur James Wilson was born at Whitehaven, Cumberland, on April 3, 1899. From St. Joseph's College, Dumfries, he entered Edinburgh University to study medicine at the age of 16, graduating M.B., Ch.B., with first-class honours, in 1921. A brilliant student, he acquired many prizes and distinctions, including the Wightman Prize in clinical medicine in 1920 and the Pattison Prize in clinical surgery in 1921. He proceeded to the M.D., with honours, in 1928. Obtaining the M.R.C.P.Ed. in 1936, he was elected a Fellow of the

College four years later. After graduation Wilson held appointments as house-physician at the Coventry and Warwickshire Hospital and as senior house-surgeon at Salford Royal Hospital, before returning to Coventry to become honorary anaesthetist at the Coventry and Warwickshire Hospital. For a short period he was engaged in general practice in partnership with the late Dr. W. H. Lowman. In 1927 he was appointed assistant physician to the Coventry and Warwickshire Hospital, and was made honorary physician in 1929. He was also honorary physician to the Manor Hospital, Nuneaton, for many years. Always ready to take an active part in the local affairs of the British Medical Association, he often showed cases of clinical interest to meetings of the Coventry Division, of which he was honorary secretary in 1927-8. Besides being a member of the board of management of the Coventry and Warwickshire Hospital for many years, and chairman in 1931-2, he also served as vice-chairman of the medical committee of the hospital from 1944 to 1946, being chairman in 1946-7.

Dr. C. S. APPELYARD writes: As one of his oldest friends and a fellow student, I would like, on behalf of my medical colleagues, to give our appreciation of the well-known "A.J.," as he was affectionately called. His services were unrelenting to his hospital and to his patients. We of the profession owe him a great debt of gratitude for his kindness to and care of ourselves, our wives, and families. Himself a bachelor, he was a man of unassuming character, devoted entirely to his profession. He had been working for 16 years suffering from a painful affliction which was much graver than any of us realized. He died in harness at the age of 56 as we had always known him, the same unassuming and very gallant gentleman. His loss will be lamented by his many patients and old friends.

HARRY J. RAE, M.C., M.B., D.P.H.

Dr. Harry J. Rae, who died on May 8, was until 1952 medical officer of health of the then joint public health service of the North-East of Scotland. He was 69 years of age.

Harry James Rae was born at Aberdeen on January 30, 1886, and received both his scholastic and university education in that city. He obtained the M.A. in 1907 and completed the medical curriculum, with honours, in 1911. After holding various hospital appointments and undertaking the course for the Diploma in Public Health he was appointed in 1914 to a vacancy in the school medical service of the County of Aberdeenshire. In 1915 he became the chief tuberculosis officer for that county, but shortly afterwards joined the R.A.M.C. and served in the first world war with a field ambulance unit in the Middle East. For war service he was awarded the Military Cross. On demobilization he returned to the duties of tuberculosis officer, which post he held until he became, in 1925, medical officer of health for the county. The medical officer of health of the city of Aberdeen was then the late Dr. J. Parlange Kinloch, and a partnership between city and county was established with the object of avoiding redundancy in all health service projects. Facilities available in the city health department became available for the county authority, and particularly so when legislation was anticipated and the poor law hospitals in the city of Aberdeen were taken over by the city council. When Dr. Parlange Kinloch was appointed chief medical officer in the Department of Health for Scotland in 1928,

Rae was appointed medical officer of health to the City of Aberdeen and was at the same time made head of the public health department of Aberdeen University. In view of the increased facilities which had become available the county council, in order to maintain the liaison, made an approach to the city council, and Rae was maintained in office as the county medical officer of health. In a short time a similar arrangement was made with the county council of Kincardineshire, and a joint public health service for the North-East of Scotland became a reality. It was due to Rae's untiring efforts that this project was so successful. To write reports for, and to attend the meetings of, no less than three major local authorities obviously required a man of great capacity and initiative. The pattern of the joint north-eastern public health arrangement was examined by deputations from various health authorities in other parts of Scotland and England, and many were the laudatory comments on such an arrangement.

Despite his immense amount of local authority work, Rae took a most active interest in the teaching of the undergraduates and of the postgraduates for the Diploma in Public Health. He was an active member of the Scottish branch of the Society of Medical Officers of Health and the Sanitary Association for Scotland. With the introduction of the National Health Service (Scotland) Act, 1947, the administrative control of hospitals was removed from the local authorities, but this seemed in no way to lighten the duties of the medical officer of health, though it did lessen the need for a joint public health service. In appreciation of his many years of service Rae was allowed to continue in office for a year after he was due to retire. He was appointed an Honorary Physician to King George VI in 1950, and in 1952-3 he was an Honorary Physician to the Queen. In 1953 he became a city councillor. When the British Medical Association held its Annual Meeting at Aberdeen in 1939 he served as a vice-president of the Section of Public Health and Hygiene.

He is survived by his wife, two sons, Captain Harry J. Rae, Royal Signals, and Dr. William Rae, of Aberdeen, and two daughters, Mrs. Agnes Clark, of Coupar Angus, and Dr. Isobel Margetts, of Nottingham.

H. A. MACEWEN, O.B.E., M.B., D.P.H.

Dr. H. A. Macewen, formerly a senior medical officer of the Ministry of Health, died at his home at Innellan, Argyllshire, on April 17 at the age of 74.

Hugh Allan Macewen was born on May 21, 1880, the second son of the late Sir William Macewen, F.R.S., Regius Professor of Surgery in Glasgow University, and a Past President of the British Medical Association. Hugh Macewen was educated at Glasgow Academy and at Glasgow University, where he graduated M.B., Ch.B. in 1905. In the following year he took both the Cambridge D.P.H. and the D.P.H. of the English Royal Colleges. After acting as resident medical officer at Bethesda Hospital, Hamburg, and in several Glasgow fever hospitals, he decided on a career in administrative medicine, becoming assistant medical officer of health for Stirlingshire and Dunbartonshire. A brief tenure of a similar post in Cumberland followed, and then, in 1910, he became medical officer of health for Fife and Kinross. In 1911 he was appointed medical inspector for the Local Government Board, London, and in 1920 he joined the staff of the Ministry of Health as medical officer, proceeding later in the same year to deputy senior medical officer and in 1924 to senior

medical officer, a post which he filled with distinction until his retirement in 1941. During this period at the Ministry, especially prior to and during the early part of the second world war, he did very valuable and pioneer administrative work, about which an appreciative article was printed in the *Medical Officer* in 1941. From 1941 to 1942 he acted as temporary medical superintendent of Ballochyle emergency hospital, Ayrshire. During the course of his career he wrote a number of papers on public health subjects, and the first edition of his useful book on *Food Inspection* was published in 1910, the year in which he was elected a Fellow of the Royal Society of Edinburgh.

Macewen was a kindly man, rather shy and retiring, but having a courteous and friendly disposition, which made him a charming host. His home at Innellan overlooked a beautiful stretch of the Firth of Clyde, which gave him much interest and pleasure in his later years. Many people, especially the young, found him a wise counsellor. He set himself high standards and was essentially upright and extremely conscientious. In 1925 he married Dr. Barbara Cunningham, to whom he was ever devoted and whose admirable care sustained him during his last distressing illness.—H. B. K.

The death occurred at Bishop Auckland on March 4 of Dr. D. B. CAMA, who had practised in the county of Durham for many years. Dhun Boman Cama was born in Bombay on April 27, 1883, a member of a distinguished Parsee family, and received his early education in Bombay. He then studied medicine in Edinburgh, taking the Scottish triple qualification in 1911. After gaining early experience in general practice he settled at Witton Park, Co. Durham, in 1917, and in 1932 moved to Bishop Auckland, where he soon won the affection of his patients. He is survived by his widow, a daughter, and two sons. His elder son, Dr. Leonard Cama, carries on the medical practice.

J. C. writes: Strenuous work during the second world war severely affected Dr. Cama's health, but, combating ill-health with great fortitude, he continued in practice until 1951. His work exemplified the highest traditions of medical practice, and his skill, tireless efforts, and great kindness won the affection of all his patients. A man of few outside interests, he most enjoyed the company of his family and his friends, and his hospitality was renowned.

Lieutenant-Colonel H. G. L. HAYNES, who had lived and worked in Brentwood since 1920, died there on April 1, aged 77. Horace Guy Lankester Haynes was born at Evesham on June 18, 1877, and from the Grammar School there he entered Epsom College with a scholarship. From Downing College, Cambridge, where he was an exhibitioner, he went on to the Westminster Hospital, qualifying in 1903. After holding house appointments at the Westminster Hospital and the Children's Hospital, Shadwell, he was in general practice at Marksfield, Leicestershire, from 1908 until the outbreak of war in 1914. He served first in the 84th Field Ambulance and later commanded with great distinction the 2/2 London Field Ambulance, 56th Division. He was a keen Territorial and in 1932 was awarded the Territorial Decoration. Lieutenant-Colonel Haynes settled in Brentwood in 1920, where he was a prominent citizen until his death. For 25 years he was medical superintendent of Middleton Hall, a private mental home in Brentwood. During this time he not only managed the home, but was always willing to give his expert opinion and advice to the general practitioners of the town. It was during those years that he took a keen interest in the work of the British Medical Association, being president of the Essex Branch in 1926-7 and chairman of the Mid-Essex Division from 1930 to 1933. He attended a number of Annual Meetings as the representative of his Division. He also held office in

the Romford Medical Society and the Royal Medico-Psychological Association, of which he was an honorary member. During the last war he was appointed chairman of the Ministry of Labour and National Service Medical Board, and he continued to serve in that capacity until early this year.

M.R. writes: Colonel Haynes was a quiet, retiring man, difficult to know well, and slow to make friends. To those who had his friendship he was a delightful companion, full of reminiscences, with a puckish sense of humour. He was keenly interested in sport, especially rugby and cricket, and had an astounding memory for batting and bowling averages, and of famous victories and defeats of the years gone by. He was a regular habitué of Twickenham and Lord's, and enjoyed taking his friends with him and regaling them with his pungent comments on the game and his memories of the "good old days." Colonel Haynes had four sons, whose careers in medicine and the Services he watched with great pride and satisfaction. The loss of his youngest son in the Navy during the last war was a blow from which he never completely recovered. To his widow and three surviving sons his friends extend their sympathy.

Colonel ALFRED SPITTELER, who served in the Indian Medical Service for some thirty years, died at Beckington, Somerset, on April 11 at the age of 82. Born on June 10, 1872, Alfred Spitteler graduated M.B., C.M. at Madras University in 1897 before coming to London to continue his medical studies at University College Hospital. He took the D.P.H. of the English Royal Colleges in 1900 and the London Conjoint diploma five years later. Having decided to join the Indian Medical Service, he entered Netley as a probationer in March, 1900, and later in the same year was posted to India, where he served as medical officer to a number of regiments, and also as a specialist in public health. From 1902-4 he was on active service in Somaliland, being awarded the East Africa General Service medal with the Somaliland clasp. He left India for Mesopotamia early in 1915 as a member of a detachment of the Indian Expeditionary Force, and was mentioned in dispatches in the following year for distinguished service in the field. Later he served in Kurdistan, and in 1920 was again mentioned in dispatches, and in the same year he was appointed O.B.E. and promoted to lieutenant-colonel. After a further period of service in India he was for a few months in 1927 A.D.M.S. and civil administrator at Aden, being granted the brevet rank of colonel. Back in India in the following year, he retired from the I.M.S. in 1929, and came to England to settle in the West Country. For several years he was chairman of the Callington branch of the British Legion and was county commissioner for Cornwall of the Boy Scouts. During the second world war, from 1943 to 1945, he was medical officer to troops and officer commanding a camp reception station at Ilfracombe. He is survived by his widow, formerly Miss Louisa E. Dore, whom he married in 1904, and by whom he had two sons.

Mr. K. B. BELLWOOD, consulting surgeon to the ear, nose, and throat department of Bedford General Hospital, died suddenly on April 17 at his home at Bedford. He was 64 years of age. Kenneth Benson Bellwood was born at Middlesbrough on October 21, 1890, and from Sir William Turner's School, Redcar, he entered Pembroke College, Cambridge, in 1909, taking the Natural Sciences Tripos in 1912. Going on to St. Bartholomew's Hospital with a Shuter clinical scholarship, he qualified M.R.C.S., L.R.C.P. in 1914, graduating M.B., B.Chir. three years later. After qualification he held the appointment of midwifery assistant at St. Bartholomew's Hospital before entering the Royal Navy for service in the first world war. He was appointed O.B.E. in 1919 for his contribution to the war effort, and in the same year became surgeon in charge of the ear, nose, and throat department of the Royal Naval Hospital, Chatham. In the following year, on his return to civilian life, he became house-surgeon to the ear, nose, and throat depart-

ment at St. Bartholomew's. In 1921 he took the F.R.C.S. and for a short time held the appointment of surgeon to the Seamen's Hospital Society at Albert Dock Hospital. Deciding to enter general practice, he went into partnership with the late Mr. W. H. Miller at Bedford, where he began to specialize as an oto-rhino-laryngologist. In 1930 he was appointed ear, nose, and throat surgeon to the Bedford County Hospital, where he built up the excellent department that exists to-day. Bellwood never spared himself, and the strain under which he worked may have influenced the course of the illness from which he eventually died. He was appointed consultant surgeon in 1948. Still in harness when his last relapse occurred a few weeks ago, he appeared to be making good progress towards recovery when he died quite suddenly and without distress. His death has saddened his many friends and old patients, who loved him for his modesty and kindness. His colleagues held him in great respect, and in 1938 he was elected president of the Bedfordshire Branch of the B.M.A. He married Miss Florence V. Cooper in 1921, and she survives him together with two daughters. A great family man, he was never happier than when surrounded by his children and grandchildren.

Dr. J. MEADMORE CROCKER, who was in practice at Bingley, Yorkshire, for over 50 years, died at the home of his daughter at Eldwick, near Bingley, on April 14, five days after his 89th birthday. James Meadmore Crocker was born at Wetherby, Yorkshire, on April 9, 1866, the eldest son of Dr. James Crocker, and studied medicine at Leeds, qualifying M.R.C.S., L.R.C.P. in 1890. He then entered into partnership with his father, who had settled at Bingley in 1871, and took over the whole of the practice when Dr. James Crocker died in 1903. After 46 years of devoted service to his patients he retired from general practice in 1936. He held many local medical appointments, including those of police surgeon, factory surgeon, public assistance medical officer, and public vaccinator. For nearly half a century he was medical officer to the Morton Banks Infectious Diseases Hospital at Keighley until he relinquished the appointment in 1948, and he had been a member of the honorary medical staff of the Bingley Hospital since its foundation in 1891. During the first world war he was in charge of the medical side of Morton Banks Hospital, with the rank of major in the R.A.M.C. He came out of retirement on the outbreak of the second world war in 1939 to take over his old practice when his successor, Dr. W. A. Lochhead, was called up for service in the R.A.M.C. There were no trams or omnibuses at Bingley when Dr. Meadmore Crocker first started in practice there, and his visits to patients were made on horseback and later in a gig, until in 1907 he became the first doctor in the town to own and drive a motor-car. He is survived by one son and one daughter.

Dr. P. C. RAIMENT, who died suddenly at Cheltenham on April 20 at the age of 74, had had an interesting career. Born on August 24, 1880, Percy Charles Raiment received his medical training at the London Hospital Medical College, qualifying M.R.C.S., L.R.C.P. in 1908. After holding the appointments of assistant house-surgeon at Huddersfield Royal Infirmary and senior house-surgeon at the East Suffolk and Ipswich Hospital, he settled in practice at Brook Green, in West London, in 1910. Becoming a member of the British Medical Association in the following year, he soon took an active part in its affairs. He was assistant honorary secretary of the Kensington Division from 1912 to 1915, and one of the representatives of the Division at the Annual Representative Meetings held at Liverpool in 1912 and at Aberdeen in 1914. The first world war, in which he served as a captain in the R.A.M.C. attached to the 6th South Lancashire Regiment, provided a dividing point in his career. Entering the R.A.M.C. from general practice, he returned to civilian life as a student once again, this time at Oxford. He entered University

College, and matriculated in 1919 at the age of 38. Two years later he obtained the B.A., with a first class in the Honours School of Natural Science, and in 1924 he proceeded to the M.A. In 1923 he was appointed senior demonstrator of biochemistry at Oxford, and in the same year he published *A Laboratory Handbook of Biochemistry*, a work written jointly with Mr. G. L. Peskett. Dr. Raiment was awarded a research scholarship by the British Medical Association in 1925-6 for work on the significance of the changes in the inorganic radicals of the blood in cases of chronic rheumatism, gout, and allied diseases, the research scholarship being renewed for 1926-7. He left England in 1928 on his appointment as professor of physiology in Cairo University, but he held the appointment for only two or three years, and on his return to England he retired from medical work.

Dr. J. F. RAMSDEN died at his home at Alverstoke, Hampshire, on May 1 after a long illness. He was 40 years of age. John Fletcher Ramsden was born on June 14, 1914, and was educated at Berkhamsted School and at Birmingham University, where he graduated M.B., Ch.B. in 1939. He then became assistant to Dr. Peter Dawes, at Feckenham, Worcestershire, but left there to serve as a surgeon-lieutenant in the R.N.V.R. during the second world war. In 1946 he became senior house-surgeon at the North Staffordshire Infirmary, Stoke-on-Trent, and in the following year joined Drs. N. L. Russell and D. C. Mackenzie in general practice at Gosport. In spite of illness in 1950, he carried on bravely for another three years, but his state of health caused him to give up work entirely in 1953. He had a most attractive personality and was beloved by his patients and by everyone with whom he came into contact. He is survived by a widow and two children, both of school age.

L. H. G. M. writes: Those of us who studied with John Ramsden in the nineteen-thirties at the Birmingham Medical School knew him to have a terrific sense of fun. Although he had great wit, he coupled this with a nature so kind and generous that he had scores of friends. On May 1 Rammy died, just short of his 41st birthday. His illness had lasted five years, and the courage he showed throughout it was seen at its best in the latter months, when his sense of humour remained unchanged and a visit to his sick-room filled one with admiration and humility. Such courage in adversity was greatness indeed. He leaves a widow and two children, to whom our deepest sympathies go in their grief.

Dr. W. NUNAN, who was well known in Bombay until his retirement from practice there in 1935, died in London on May 3 aged 75. William Nunan was born in Limerick on January 26, 1880, and was educated in Limerick and at Clongowes Wood College, Kildare. He studied medicine at Trinity College, Dublin, graduating M.B., B.Ch., B.A.O. in 1905, and proceeding to the M.D. in the following year. His brother, Sir Joseph Nunan, K.C., was at Trinity College at the same time. After some years of practice in an Irish country town Dr. Nunan went to Bombay, where he was appointed police surgeon in 1911 and coroner four years afterwards. He was also administrative medical officer of the Bombay Port Trust. Always interested in medico-legal matters, Dr. Nunan was appointed professor of medical jurisprudence and toxicology at the Grant Medical College, Bombay, in 1919, and he was an examiner in his subject to the University of Bombay. Though he led a busy life as physician and teacher, he found time to take a very active part in the life of the community, and in 1932 he was awarded the Kaiser-i-Hind medal for social and general work in India. When he returned to this country in 1935 Dr. Nunan became interested in psychiatry, and from 1946 to 1948 he worked as a psychiatric specialist in the Ministry of Pensions in Southampton and Portsmouth. Later he was appointed psychotherapist at the Tavistock Clinic. He was the author of a book entitled *Lectures in Medical Jurisprudence*, and he wrote a number of articles on psychiatric subjects, particularly on the use of suggestion as a remedial agent.

H. S. K. L. and H. G. D. write: The death of Dr. R. D. MOORE, whose obituary was printed in the *Journal* of April 30 (p. 1099), has brought to an end a life which exemplified all that was best in rural medical practice during the first part of this century. Churchdown was a small village when he settled there in 1900. Having acquired the nucleus of a practice from a doctor who had up to that time regularly visited the village from a near-by town, he was one of the first to realize the value of a motor-car to a rural practitioner. He quickly built up a practice extending over a very wide area. His stories of those pioneering days were most amusing: to stop at the foot of the Cotswolds to apply a handful of road dust to the belt drive of his car was a commonplace. He retired from practice in 1934, but continued to live in, and to take a keen interest in, the affairs of the village in which he had worked for so long. During the second world war he contrived to join the Home Guard as a combatant, again with the rank of major, and later he helped one of his former partners as medical officer to a rocket anti-aircraft battery. He remained at Churchdown until, because of failing sight, he decided to settle with his daughter and son-in-law in Kent, where he continued to make his life useful in spite of increasing blindness. During his early days he was a keen and good golfer, but cricket was the game he loved most throughout his life. He missed few county matches, and his holidays were usually found to coincide with Test matches. Few doctors can have left behind them so much affection among both patients and colleagues, an affection well earned. No effort was too great where the good of the sick was concerned, and he frequently drove patients to the hospital out-patient department in his car, remaining with them throughout the consultation to lessen their apprehension, and taking them home afterwards. His cheerfulness and constant optimism were a great inspiration to all who knew him, but his affable manner concealed a remarkable ability to recognize serious illness when he encountered it. It is still said of him that his presence alone could effect a cure, and his memory is cherished in many a home.

Mr. J. F. BALLARD, director of the Boston Medical Library, who died on May 15 aged 76, was well known to medical librarians in this country. James Francis Ballard joined the staff of the Boston Medical Library as a messenger boy in 1892 and became assistant librarian (the highest paid position in the library) in 1909. In 1927 the title of his post was changed to director. Ballard was actively interested in library affairs all his life. In 1937-8 he was president of the (American) Medical Library Association. He devised the modern classification of the Boston Medical Library (third edition, 1948) now used in a number of medical libraries throughout the world and translated into Japanese and Spanish. An authority on early medical literature, he wrote the *Catalogue of the Medieval and Renaissance Manuscripts and Incunabula in the Boston Medical Library* (Boston, 1944), a scholarly record of one of the best collections of its kind. In 1920 Ballard was sent abroad by the China Board of the Rockefeller Foundation to purchase a medical library for Peking Medical School, and on his return he was commissioned to establish a medical library for the new University of Rochester School of Medicine. At the time of his death he was consultant to several medical libraries, including the Armed Forces Medical Library, Washington. In 1942, when he had completed 50 years' service, a life-sized head-and-shoulders plaque of Ballard was unveiled in Boston Medical Library. During his service of over 62 years this medical library has grown from modest beginnings to become the third largest in the United States. James Ballard was a most genial person, who had many friends all over the world. Those who had the pleasure of meeting him at the first International Congress on Medical Librarianship in London, 1953, will be particularly sorry to learn of his passing.

Medico-Legal

FATAL REACTION TO PENICILLIN

Another death from allergic shock due to penicillin was the subject of a coroner's inquest on April 22. The case before the Westminster coroner, Dr. H. N. Stafford, was of a woman, aged 72, who was receiving penicillin treatment for furunculosis of the left hand. She had previously received several injections of penicillin, and on April 19 her medical practitioner, Dr. G. K. C. Rettie, gave her an injection of crystalline penicillin, 500,000 units, into the left deltoid muscle. About five minutes afterwards the patient became flushed and had difficulty in getting her breath. In spite of remedial measures she died within the next five minutes. Dr. Keith Simpson, consultant pathologist, carried out the post-mortem examination. He reported that a vein in the arm was transfixed during the injection, and this would result in a reaction to penicillin likely to be dangerous to life. There was no error of technique, but an unfortunate mishap. He gave the cause of death as allergic shock following penicillin injection. The coroner returned a verdict of death from misadventure.

CYANIDE POISONING OF BABY

The death of a baby from poisoning due to hydrocyanic acid gas and from dysentery was the subject of an inquest on March 1 before the Oldham Deputy Coroner, Mr. H. Armistead. According to the baby's father, Mr. A. E. Hall, the family moved house on February 25. Before moving into their new house their furniture was disinfected by the Oldham Housing Department. Among the furniture was a pram, and the baby, 9-month-old Alana Hall, was put in it at about 7 p.m. and quickly fell asleep. Later in the evening she became restless, but did not awaken. Between 9 and 10 p.m. Mr. Hall noticed that she was rather pale and had trouble with breathing. On admission soon afterwards to the Oldham Royal Infirmary she was found to be dead. During the last few days before death she had suffered from diarrhoea. After the furniture was moved into the new house, the family, with the exception of Mrs. Hall, appeared to be affected unpleasantly. Mr. Hall suffered from a severe headache, and their 2-year-old daughter was sick. The pet budgerigar died after being taken into the house.

Mrs. Hall stated that there was a small tear in the leather upholstery of the pram. The budgerigar had been in the same room as the baby.

Mr. H. Lancashire, a disinfectant employed by the Oldham Corporation, said that he loaded the large removal disinfecting van with furniture, including the pram, and drove it to the Croftbank cyanide operator. After the disinfecting had been carried out he drove it to the new house and helped to unload the contents. He gave the family the usual instructions about ventilation, "getting plenty of fresh air into the house, etc." Since this case written instructions were now being left with new tenants.

Mr. N. T. Pickering, employed by the Croftbank Chemical Company as a cyanide fumigation operator, said he carried out the fumigation by the pot generation method—a mixture of 4 lb. (1.8 kg.) of water, 3 lb. (1.4 kg.) of sulphuric acid, and 2 lb. (0.9 kg.) of sodium cyanide. When fumigation was complete, he carried out the usual tests after ventilating the van. As there was plenty of breeze he did not set the fan in operation inside the van. The tests indicated that the air was clear. In answer to a question from the coroner, he said the gas could get into the pram upholstery through any tear and then come out gradually.

Post-mortem examination was carried out by Dr. C. H. Adderley, group pathologist to the Oldham Hospitals. In his opinion the cause of death was dysentery caused by *Shigella sonnei* and hydrogen cyanide poisoning. Dr. J. B. Firth, director of the North-western Forensic Science Laboratory, found traces of cyanide in the organs of the dead body, and also in the body of the budgerigar.

A verdict of accidental death was returned.

The Services

A Supplement to the *London Gazette* has announced the following awards:

Second Clasp to the Territorial Efficiency Decoration.—Majors F. A. Edwards, T.D., and B. L. McQuillan, T.D., R.A.M.C.

First Clasp to the Territorial Efficiency Decoration.—Majors F. A. Edwards, T.D., B. L. McQuillan, T.D., and A. D. Stoker, T.D., and Captain H. W. Wykes, R.A.M.C.

Territorial Efficiency Decoration.—Majors (Honorary Lieutenant-Colonels) R. W. Fairbrother and R. B. Lumsden, Major E. Grey-Turner, M.C., Captains (Honorary Majors) C. Cockburn, C. W. A. Kimbell (retired), and N. Macmichael (retired), and Captain H. W. Wykes, R.A.M.C.

Universities and Colleges

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a quarterly comitia of the College held on January 27, with the President, Sir Russell Brain, in the chair, the following candidates, having satisfied the Censors' Board, were elected Members of the College:

J. C. Barker, M.B., A. W. Beard, B.M., W. C. Boake, M.B., H. G. T. Bridge, B.M., Stephanie J. Carter, M.B., H. D. Chalke, L.R.C.P., A. Coady, M.B., A. T. Cook, M.B., Captain R.A.M.C., L. Cudcowitz, M.D., D. W. Davies, M.B., Pamela A. Davies, M.B., Felicity C. Edwards, B.M., M. R. E. Evans, M.B., H. A. Fleming, M.D., E. G. Galea, M.B., Mary A. Le C. Hills, M.B., W. A. Hudson, M.B., R. B. Hunter, M.B., H. K. Ibbertson, M.B., K. V. Jones, M.B., Captain R.A.M.C., W. I. N. Kessel, M.B., J. W. Lance, M.B., J. H. Lawrence, M.B., D. W. Levy, M.B., Elizabeth A. Martin, M.B., S. Mattingly, M.B., W. K. Newton, M.B., D. W. Piper, M.B., J. C. Pond, M.B., E. J. Ross, M.B., G. F. M. Russell, M.B., M. Sandler, M.B., E. P. J. Silberstein, M.B., K. S. Somers, M.B., C. E. Stroud, M.B., G. S. Wakefield, M.B., R. T. T. Warwick, B.M., W. C. Watson, M.B., Rose A. J. Whelaw, M.B., W. H. Wolfenden, M.B., Joan F. Zilva, M.B.

Licences

Licences to practise were conferred upon the following 71 candidates who had passed the final examination in medicine, surgery, and midwifery of the Conjoint Board and who had complied with the by-laws of the College:

J. R. Akers, N. M. Bailey, G. C. W. Baker, Margaret A. Barrie, G. D. Blackledge, J. P. Booth, P. S. Boulter, H. J. Bradley, A. T. Brown, Elizabeth A. Burns, Enid J. Cartwright, Joan E. Chaffers, Evelyn B. Clayton, V. E. Crapnell, Hilary J. Crawford, D. R. Crockett, Sheila R. Crosland, I. I. Dainow, D. J. Davies, J. G. Davies, Ann Davis, G. H. Daw, J. A. Dew-Jones, G. S. Dormand, L. W. S. Eyears, W. J. Fessel, Phyllis M. Flcury, J. J. Fryatt, R. H. S. Gibbs, R. C. Giles, J. N. Godlee, S. A. Greenhalgh, R. L. Hargrove, Sheila C. Hay, W. T. Henry, I. Janota, Jona Jones, P. H. Johnson, A. N. Kalra, H. W. Kirkpatrick, J. K. M. McKay, Dorothy M. Mahabir, E. Mallett, A. G. Matheson, Maryrose E. Mears, P. H. Merry, D. M. G. Murphy, G. A. Naylor, M. J. O'Neill, J. E. Pearson, Jane Platnauer, D. J. H. Prosser, Margaret A. Riddell, Muriel I. Riegelhaupt, K. P. Robinson, C. R. Salmon, A. N. Sargent, A. A. Shaikh, D. J. Sils, G. C. Spackman, J. D. Spink, F. Summers, G. G. Temple, E. R. Thomas, L. F. Thomas, D. J. Thornton, Ailsa M. Thurgar, M. D. A. Vickers, A. W. Ware, Gladys M. L. West, J. P. M. Williams.

Diplomas

Diplomas in Medical Radiodiagnosis, in Pathology, and in Tropical Medicine and Hygiene were granted, jointly with the Royal College of Surgeons of England, to the successful candidates whose names were printed in the report of the meeting of the Royal College of Surgeons of England in the *Journal* of December 25, 1954 (p. 1556).

Diplomas in Laryngology and Otology, in Anaesthetics, and in Ophthalmology were granted, jointly with the Royal College of Surgeons of England, to the successful candidates whose names are printed below in the report of the meeting of the Royal College of Surgeons of England.

Other Diplomas in special subjects were granted, jointly with the Royal College of Surgeons of England, as follows:

DIPLOMA IN CHILD HEALTH.—R. S. Bull, J. A. Kay.
DIPLOMA IN INDUSTRIAL HEALTH.—A. J. Essex-Cater, W. N. Taylor.
DIPLOMA IN MEDICAL RADIOLOGY.—C. F. Baxter, C. Bissyllas, K. N. H. Low, Helen M. Mellor, J. W. Logan.
DIPLOMA IN PSYCHOLOGICAL MEDICINE.—V. N. Bagadia, B. C. Bignold, Maatjie V. Buhrmann, H. W. Conran, L. D. J. Coore, D. Davis, R. Doherty, T. Gallia, R. A. Gelfer, S. Goldin, B. Gordon, M. G. Jovanoudera, A. F. Johnston, M. H. B. Joyce, W. A. Ker, R. D. Laing, R. P. Michael, P. McK. Middleton, Marjorie A. Morgan, J. G. Neville, J. Pisani, P. K. Ray, G. H. Renton, E. A. Ritchie, D. H. Ropschitz, A. J. E. Rowe, R. Sander, C. P. Seager, R. V. Shirvaikar, H. J. Stott, J. L. Swift, L. Tarlo, J. F. Thomson, D. L. Walker, Eva Waller, J. S. Whitley, W. E. J. Wilson, E. A. M. Wood.
DIPLOMA IN PUBLIC HEALTH.—N. K. Bharucha, Nulece Cassels, Joan M. St. V. Dawkins, R. C. Greenberg, M. Husain, D. M. O. Lowry, H. R. Miller, J. P. J. O'Keefe, Hla Kyaw Pe, G. W. Piper, G. H. G. Poole, J. D. Russell, W. J. Wigfield.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College held on February 10 with Sir Harry Platt, President, in the chair, the Handcock Prize was awarded to P. S. Boulter (Guy's Hospital).

A Fellowship in the Faculty of Anaesthetics was granted to R. W. Milner (Jamaica).

Diplomas of Membership were granted to P. R. Holt and to the other successful candidates whose names are printed above in the report of the meeting of the Royal College of Physicians of London held on January 27 as recipients of the L.R.C.P.

A Diploma in Industrial Health was granted, jointly with the Royal College of Physicians of London, to Z. Khan; in Psychological Medicine to D. L. Walker; and in Public Health to I. H. Seppelt, in addition to the other successful candidates for these diplomas whose names are printed above in the report of the meeting of the Royal College of Physicians of London.

At a meeting of the Council of the College held on March 10, with Sir Harry Platt, President, in the chair, the second Lady Cade Medal was awarded to Squadron Leader Peter Howard; the Hallett Prize to D. Singh (Patna); the Handcock Prize was presented to P. S. Boulter (Guy's); and Paul E. Copus (Cardiff High School) was awarded the twenty-fourth Macloghlin Scholarship.

Vital Statistics

Marriages and Divorces in 1953

In England and Wales in 1953 there were 344,998 marriages, giving a rate of 15.6 persons married per 1,000 population. This rate is lower than any since 1945, when it was 18.7. London and the South-eastern region had the highest marriage rate with 16.7, and the Eastern region lowest with 13.4. On the other hand, London and the South-eastern region had the lowest birth rate with 14.1 per 1,000 population; the Northern region had the highest birth rate with 17.5. Many more marriages were celebrated in March than in any other month (56,840). The distribution of marriages is now affected largely by the date of Easter and the end of the income-tax year. The least popular month was November with 15,475 marriages. The commonest age for marriage continued to be 23 for men and 21 for women. 71 youths aged 16 were married and 1,725 girls of that age, while 248 men and 47 women aged 80 or over got married; 6 of these men were aged 90 or over. The divorce rate continued to fall, there being 29,736 divorces and 590 annulments. The commonest age group for both men and women to have their marriage dissolved was 30 to 34 years. 6,530 boys and 6,534 girls were adopted under the Adoption of Children Acts. Of the 8,787 confinements which resulted in multiple births, 8,703 were of twins, 83 of triplets, and 1 of quintuplets.—*Registrar-General's Statistical Review of England and Wales for 1953*, Tables, Part II, Civil, 1955, H.M.S.O., 5s.

Week Ending May 7

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 575, whooping-cough 1,850, diphtheria 4, measles 19,492, acute pneumonia 499, acute poliomyelitis 24, dysentery 862, paratyphoid fever 9, and typhoid fever 3.

Infectious Diseases

In England and Wales during the week ending April 30 the largest falls in the number of notifications of infectious diseases were 5,888 for measles, from 28,425 to 22,537, 174 for dysentery, from 1,053 to 879, and 148 for acute pneumonia, from 688 to 540, and the only large rise was 110 for whooping-cough, from 1,658 to 1,768.

The largest decreases in the incidence of measles were 825 in London, from 2,614 to 1,789, 791 in Essex, from 2,098 to 1,307, 733 in Yorkshire West Riding, from 3,303 to 2,570, 653 in Warwickshire, from 2,708 to 2,055, 411 in Middlesex, from 1,953 to 1,542, 374 in Surrey, from 1,345 to 971. The number of notifications of scarlet fever was 461, being 6 fewer than in the preceding week, and there were no large fluctuations in the local trends. The largest vari-

ations in the trends of whooping-cough were an increase of 30 in Kent, from 64 to 94, and a fall of 72 in Middlesex, from 146 to 74. 9 cases of diphtheria were notified, 5 fewer than in the preceding week; of these, 3 were notified in Kingston-upon-Hull C.B. and 2 in Liverpool C.B. 6 of the 15 cases of paratyphoid fever were notified in Durham (Sunderland C.B. 4).

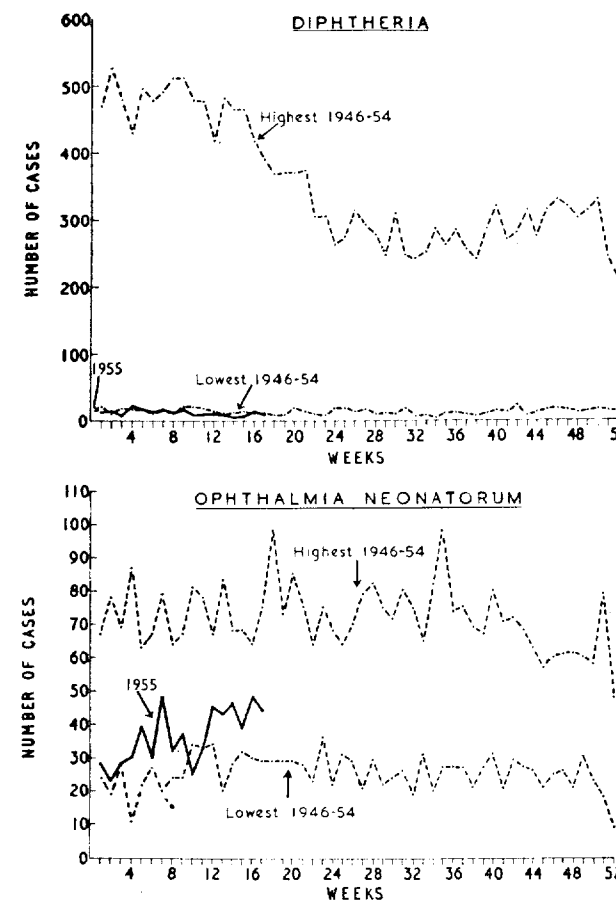
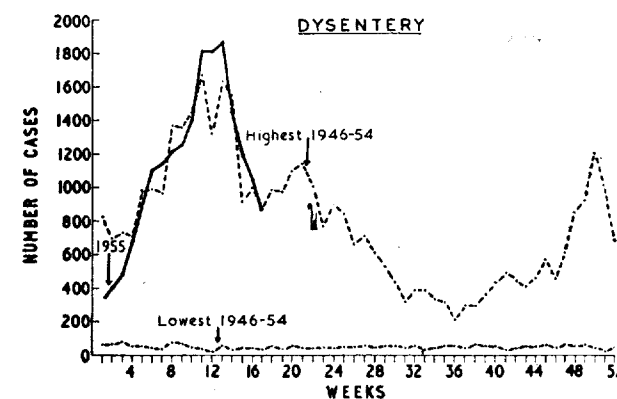
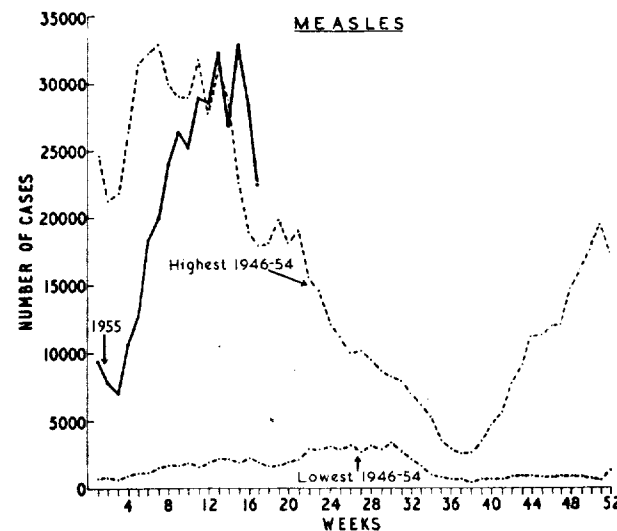
19 cases of acute poliomyelitis were notified, and these were 8 more for paralytic and 5 more for non-paralytic cases than in the preceding week. The largest returns were London 4, Kent 4, Somersetshire 3, Yorkshire West Riding 3 (Leeds C.B. 2).

The number of notifications of dysentery fell below 1,000 for the first time for 11 weeks. The largest centres of infection were Lancashire 329 (Blackburn C.B. 45, Liverpool C.B. 45, Oldham C.B. 44, Manchester C.B. 34, Blackpool C.B. 27, Salford C.B. 25, Middleton M.B. 24, Worsley U.D. 16); Durham 110 (Easington R.D. 34, Seaham U.D. 18, Gateshead C.B. 16); London 75 (Stepney 19, Southwark 11); Yorkshire West Riding 66 (Rotherham R.D. 15, Leeds C.B. 12); Northumberland 43 (Newcastle-upon-Tyne C.B. 19); Leicestershire 37 (Leicester C.B. 27); Yorkshire North Riding 30 (Middlesbrough C.B. 30).

In Scotland the number of notifications of dysentery fell from 323 to 296. The largest returns were Glasgow 158 and Edinburgh 38.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1946-54 are shown thus ----, the figures for 1955 thus —. Except for the curves showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Health of Eire in 1953

The annual report of the Department of Health of Eire for 1953-4 shows that the birth rate during 1953 was 21.1 per 1,000 of the population, being 0.8 below the rate for 1952. It was the smallest rate since 1942, but was above the rates for 1930-41. The infant mortality rate was 39 per 1,000 live births and was the lowest rate ever recorded in Eire, being 2 below the rate for 1952 and 8 below the average of the five years 1948-52. The death rate was 11.8 per 1,000 population, being 0.1 below the rate for 1952. The death rates for 1952 and 1953 were exceptionally low. The death rate varied between 12.1 and 15.3 between 1930 and 1951.

A further decline was recorded in the death rate from tuberculosis. This rate has fallen steadily from 124 per 100,000 population in 1947 to 40 in 1953, but it is still much above the level of mortality in England and Wales (20) and Scotland (26). The number of persons treated by the tuberculosis service was 36,037, a rise of 2,198 on the total for 1952. Since 1949 the number of persons treated has increased each year by 2,000-3,000. 6,602 new cases of tuberculosis came under the notice of the health authorities, a decrease of 193 compared with 1952. The deaths from infectious diseases in 1953 included 476 from influenza, 185 from gastro-enteritis (under age 2), 59 from whooping-cough, 35 from measles, 33 from poliomyelitis, 3 from scarlet fever, and 3 from diphtheria.

The cost of the local health services has risen rapidly from £5½m. in 1947-8 to over £11m. in 1953-4. During this period the proportion paid by the Exchequer has risen from 16% to 50% of the total. Grants from the Hospital Trust Fund during the year amounting to nearly £4m. were made for construction and maintenance. The sweepstakes held on the Cambridgeshire, Grand National, and Derby resulted in over £1½m. being paid to the funds of the Hospital Trust Board.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending April 30 (No. 17) and corresponding week 1954.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1955					1954				
	Eng. & Wales	London	Scot.	N. Ire	Eire	Eng. & Wales	London	Scot.	N. Ire	Eire
Diphtheria ..	9	0	1	0		12	0	3	0	0
Dysentery ..	879	75	296	18	29	759	108	280	3	3
Encephalitis, acute ..	3	0		0		3	2	0	0	
Enteric fever: Typhoid ..	0	0	0	0	1	3	0	1	0	0
Paratyphoid ..	15	0	1	0		3	1	0	0	2
Food-poisoning ..	177	22		2		112	13		0	
Infective enteritis or diarrhoea under 2 years ..				14	17				15	17
Measles* ..	22,537	1,789	229	235	301	1,970	72	212	87	340
Meningococcal infection ..	38	3	18	0	2	29	6	17	0	1
Ophthalmia neonatorum ..	44	0	6	1		38	3	12	0	
Pneumonia* ..	540	27	178	6	5	521	39	144	5	1
Poliomyelitis, acute: Paralytic ..	9	2		0	0	15	2		0	0
Non-paralytic ..	10	2				5	0		2	
Puerperal fever† ..	270	41	10	0		222	26	14	0	
Scarlet fever ..	461	28	81	37	12	623	40	136	27	39
Tuberculosis: Respiratory ..	867	85	158	30		810	107	134	30	
Non-respiratory ..	100	7	24	6		128	8	32	3	
Whooping-cough ..	1,768	115	129	46	60	2,233	88	402	29	26

DEATHS in Great Towns	1955					1954				
	Eng. & Wales	London	Scot.	N. Ire	Eire	Eng. & Wales	London	Scot.	N. Ire	Eire
Diphtheria ..	1	0	0	0	1	0	0	0	0	0
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute ..	0			0		0	0		0	
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	7	0	2	0	0	9	0	4	0	0
Influenza ..	16	0	0	0	7	10	2	1	1	0
Measles ..	1	0	0	0	0	0	0	0	0	1
Meningococcal infection ..	0	0				0	1			
Pneumonia ..	245	36	20	8	11	194	28	23	15	9
Poliomyelitis, acute ..	0	0		0	0	1	0	0	0	0
Scarlet fever ..	0	0	0	0	0	0	0	0	0	0
Tuberculosis: Respiratory ..	96	17	13	2	8	87	19	14	0	7
Non-respiratory ..	2	2	1	1		2	1	1	1	
Whooping-cough ..	0	0	0	0	0	0	0	0	1	0
Deaths 0-1 year ..	241	38	33	13	15	191	23	29	9	10
Deaths (excluding stillbirths) ..	5,729	858	613	13	202	5,270	743	702	148	189
LIVE BIRTHS ..	7,744	1,144	1,016	229	490	8,266	1,229	1,039	247	440
STILLBIRTHS ..	233	19	19			244	39	26		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Medical News

St. John "Save-a-Life" Week.—In many parts of England, Wales, and Northern Ireland May 21–28 will be the St. John Ambulance Brigade's "safe-a-life" week. During this week units of the Brigade will give life-saving demonstrations at works canteens, seaside beaches, swimming-baths, and other places of popular resort. They will be concentrating on the Holger-Nielsen method of artificial respiration. According to figures for England and Wales given by the Brigade, in 1953 1,107 persons lost their lives through accidental drowning and "nearly 1,000 more through asphyxia and electric shock." The Brigade hopes, through its "save-a-life" week, to increase the chances of recovery of those involved in such accidents. The week is being inaugurated by a meeting at the Chapter Hall, St. John's Gate, Clerkenwell, on May 21, at which the speakers will be Lieutenant-General Sir OTTO LUND and Lady MOUNT-BATTEN.

Delayed Effects of Hiroshima Bomb.—Less than a year after an atomic bomb was dropped on Hiroshima in 1945, the U.S. Atomic Bomb Casualty Commission was established in Japan and began collecting data on the results of the explosion. In an interview given to the regional editor of *U.S. News and World Report* and published in that magazine on May 13, Dr. ROBERT H. HOLMES, director of the Commission, summarizes the results of what is now almost a 10-year follow-up on the inhabitants of Hiroshima. The positive findings, according to Dr. Holmes, are an increased incidence of leukaemia (103 cases) and of cataract. In addition 15 microcephalic children were born to women who were in the early stages of pregnancy at the time of the explosion, but, Dr. Holmes stresses, "no genetic effects thus far have been observed among the first generation of offspring from exposed parents." The microcephalics represented, he points out, a developmental defect *in utero*, not a genetic effect. Immediately following the dropping of the bomb, there was evidence of infertility among the survivors, "but so far as our data indicate this was a transient phenomenon, and, as the general health of the individual improved, the fertility reappeared." Dr. Holmes said that the commission were studying the possibility of premature ageing and an increased incidence of cancer, but it was too early for any definite conclusions on these questions.

Society of Chiropodists.—"One Hundred Million Feet" were referred to as the problem of the chiropodists at the annual dinner of the Society of Chiropodists at Park Lane Hotel, London, on May 13, with Mr. John H. HANBY, the president, presiding. Mr. T. T. STAMM, proposing the toast of the profession of chiropody, said that chiropodists were now united in a single body recognized by the State, and with recognized standards of training and ethics. Having attained this position it must now be their purpose to develop it in the public interest. Chiropody's function was not just to provide comfort but to improve function and keep feet on the road. The chiropodist was an essential member of the orthopaedic team. Mr. Stamm summed up by saying that the profession of chiropody should now have three main aims: to work to restore foot function, to retain its independence, and to increase its contact with the medical profession. Mr. HANBY, replying to the toast, stressed particularly the chiropodist's role in prevention among schoolchildren and, at the other end of the scale, in making the aged mobile. The latter was an urgent problem, and, as to the former, there were too few chiropodists in the school health service. Mr. J. R. HALL proposed the toast of the guests, on behalf of whom Dr. W. S. C. COPEMAN replied.

Harveian Society of London.—The legal profession was well represented at the Buckston-Browne-Gray-Hill dinner, held on May 13 at the Royal College of Surgeons. Sir

FRED PRITCHARD, Q.C., proposing the toast to the Harveian Society of London, spoke of the value of friendships formed through intercommunication of two great professions. Some much-needed reforms to-day could come about only if the law and medicine worked together to secure them, with the object of common service in mind. Nearly everybody agreed that the rules which affect present-day laws about insanity should be overhauled. Neither profession could revise the rules alone, but the law and medicine together should see to it that the rules were revised in a way which would be of advantage to the community. Responding to the toast, Mr. A. DICKSON WRIGHT, the president of the Harveian Society, supported the idea that the law and medicine should collaborate more closely, and mingled humorous and serious remarks about both professions in a way entirely his own. The health of the guests was proposed by Dr. D. GERAINT JAMES, and Mr. H. EDMUND DAVIES, Q.C., Recorder of Cardiff, replied.

Eighth World Health Assembly.—At the opening session on May 10, Dr. IGNACIO MORONES PRIETO, Mexico's Minister of Health and Welfare, was elected president of the Assembly. Dr. S. AL WAHBI (Iraq), Dr. J. GRATZER (Austria), and Sir ARCOT MUDALIAR (India) were elected vice-presidents.

U.S.A. Poliomyelitis Inoculation Programme.—On May 13 the U.S. Public Health Service cleared over four million doses of Salk poliomyelitis vaccine, and inoculation in the United States has been resumed. Meanwhile President Eisenhower has accepted the Department of Health and Welfare's recommendation that distribution of the vaccine should continue on a voluntary basis. While there is a shortage of vaccine, inoculation will be limited to children between the ages of 5 and 9. A report from Denver, Colorado, states that the parents of two unrelated children who had been inoculated with Cutter vaccine have developed paralytic poliomyelitis. Dr. FLORIO, the city health director, is quoted as saying: "It is definitely possible that these parents contracted polio from their children."

Sex Hormones.—Last autumn representatives of the B.M.A., the Pharmaceutical Society, and the Royal College of Nursing discussed the dangers inherent in the general availability of sex hormones without prescription and what measures of control were needed. As a result of these discussions the following statement was issued by the council of the Pharmaceutical Society and published in a recent issue of the *Pharmaceutical Journal* (April 16, p. 288):

Some time ago in view of reports of the misuse of sex hormones for the suppression of lactation and the treatment of menopausal conditions the British Medical Association approached the Society to discuss whether any control should be imposed on their distribution and enquiry was made as to the practice of pharmacists in response to requests for such products. This showed the need for some regulation of the supply of sex hormones and after consideration it was agreed that the appropriate course would be for the matter to be the subject of advice to pharmacists by the Council of the Society. Accordingly the Council have decided to advise pharmacists not to supply sex hormones or their preparations unless satisfied that the customer is obtaining them on medical advice. This does not apply to cosmetic preparations containing hormones which are at present the subject of separate consideration.

American Grants for Leukaemia Research.—The Robert Roesler de Villiers Foundation (of New York) will shortly make grants-in-aid in support of research on leukaemia. Investigators in the United Kingdom who are interested should apply to the Regius Professor of Physic, University Department of Medicine, Tennis Court Road, Cambridge, before June 15. During the year 1955, awards of not more than \$1,000 (about £350) will be made to any one research worker.

Medical Candidates.—The names of two other medical candidates for Parliament have been announced, in addition to those mentioned in the *Journal* of May 7 (p. 1149) and May 14 (p. 1230). They are: WILLIAM STANLEY RUSSELL

THOMAS, Brecon and Radnor, Liberal (1919). Barrister-at-law, Lincoln's Inn. M.P. for Southampton from 1940 to 1945. Deputy Chairman, London Liberal National Party, 1937–45. Member, Select Committee on Public Petitions, 1942–4. Member, Select Committee on National Expenditure, 1944. JESSE DICKSON MABON, Renfrewshire West, Labour and Co-operative (1954).

Sir James Learmonth, Regius Professor of Clinical Surgery at Edinburgh, is visiting Strasbourg University from May 21 to 25 under the Foreign University Exchange Scheme.

COMING EVENTS

Polish Medical Association in Great Britain.—Annual meeting on May 28 and 29 at 18, Queen's Gate Terrace, London, S.W.7. Dr. J. CZEKALOWSKI will speak on "The Newer Approach to the Virus Problem." Full details of programme from hon. secretary, Polish Medical Association, 14, Collingham Gardens, London, S.W.5.

Concert in Aid of Lord Horder Centres for Arthritics.—IRENE KOHLER and the London Philharmonic Orchestra at the Royal Albert Hall on June 2 at 8 p.m. Programme and tickets (21s. to 2s.) from the Hall or the usual agents.

NEW ISSUES

British Journal of Ophthalmology.—The new issue (Vol. 39, No. 5) is now available. The contents include:

GENERALIZED CHOROIDAL SCLEROSIS. COURSE AND MODE OF INHERITANCE. Arnold Sorsby and J. B. Davey.
OCULAR CHANGES IN THE BLOCH-SULZBERGER SYNDROME (INCONTINENTIA PIGMENTI). J. Graham Scott, A. I. Friedmann, M. Chittiers, and W. J. Pepler.
PRELIMINARY REPORT ON THE USE OF CONTRAST MEDIA IN ORBITAL RADIOGRAPHY. J. W. Cowie and J. S. Groves.
VARIATION OF FIXATION DIRECTION WITH COLOUR OF FIXATION TARGET. D. H. Fender.
CLASSIFICATION OF ANGIOID STREAKS. R. J. McWilliam.
OPHTHALMIA NODOSA DUE TO CATAPILLAR HAIRS. J. A. Corkey.
DIBENZYLINE IN GLAUCOMA. John Primrose.
ABNORMAL FUNDUS REFLEXES AND RETINITIS PIGMENTOSA. R. P. Crick.

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

Archives of Disease in Childhood.—The new issue (Vol. 30, No. 150) is now available. The contents include:

ON THE PROGNOSIS OF CRETINISM. David Lawson.
THE ABSORPTION OF SHORT-CHAIN FATS BY PREMATURE INFANTS. Selma E. Snyderman, Soledad Morales, and L. Emmett Holt, jun.
A STUDY OF CEREBRAL PALSY IN THE CHILDHOOD POPULATION OF EDINBURGH. T. T. S. Ingram.
CONGENITAL PNEUMONIA AND PNEUMONIA IN THE NEONATAL PERIOD. Kr. Harnaes and K. H. Torp.
HAEMOGLOBIN AND RED CELLS IN THE HUMAN FOETUS: II. THE RED CELLS. Elizabeth P. N. Turnbull and James Walker.
HAEMOGLOBIN AND RED CELLS IN THE HUMAN FOETUS: III. FOETAL AND ADULT HAEMOGLOBIN. Elizabeth P. N. Turnbull and James Walker.
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A CASE OF HYPOTHYROIDISM WITH NEPHROCALCINOSIS. Jean M. Naylor.
METASTATIC TUBERCULOUS ABSCESSSES. F. J. W. Miller and Maureen Cashman.
BILE PERITONITIS IN INFANCY. Pamela A. Davies and A. Elliot-Smith.
SUPERFICIAL GANGRENE OF THE SKIN IN CHICKENPOX. R. S. Illingworth and R. B. Zachary.
SUBACUTE AND CHRONIC INTUSSUSCEPTION IN INFANTS AND CHILDREN. Duncan Macaulay and Thomas Moore.
GANGRENE OF THE EXTREMITIES IN TWO AFRICAN INFANTS. Lorna G. Macdougall.
A CASE OF FIBROMA OF THE LEFT VENTRICLE IN A CHILD OF 4 YEARS. Ursula James and Margaret H. Stanfield.
FAMILY PERIODIC PARALYSIS IN A MENTALLY DEFECTIVE BOY. Thomas A. Corstoun.
PELLAGRA IN AN ENGLISH CHILD. G. W. Hickish.

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SOCIETIES AND LECTURES

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

Monday, May 23

BRITISH ASSOCIATION OF SPORT AND MEDICINE.—At Middlesex Hospital Medical School, 8 p.m., Mr. Philip Wiles: Athletic Injuries as Seen in the Hospital.

LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., special university lecture in pathology by Dr. R. J. Huebner (Bethesda, U.S.A.): Newly Recognized Respiratory Viruses and the Search for Diseases which they Cause.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. A. C. Corcoran (Cleveland): Current Developments in Hypertension.

Tuesday, May 24

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. W. N. Goldsmith: Skin Lesions in Metabolic Disorders.

LONDON AMATEUR BOXING ASSOCIATION.—At 69, Victoria Street, S.W., 8 p.m., Mr. A. Rugg-Gunn: Eye Injuries.

NATIONAL BOOK LEAGUE.—At 7, Albemarle Street, W., 7.30 p.m., Professor J. Z. Young, F.R.S.: Memory.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor H. G. Hanley: Surgery of Male Subfertility.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Physiology Lecture Theatre, 5 p.m., Dr. A. C. Corcoran (Cleveland Clinic, Ohio): Evaluation of Anti-hypertensive Drugs.

UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, W.C., 5.15 p.m., Cushny Memorial Lecture by Professor R. A. McCance, F.R.S.: Metabolism and Renal Function in the First Few Days of Life.

WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY.—5 p.m., Almoth Wright Lecture by Lord Stamp: Action of Bacterial Enzymes on Immunizing Antigens.

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Wednesday, May 25

BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—8 p.m., Dr. J. D. Sutherland: Psychotherapeutic Provisions in a National Health Service.

EUGENICS SOCIETY.—At Royal Society, Burlington House, 5.30 p.m., Dr. J. A. H. Waterhouse, Ph.D.: Twins and Genetics.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Localized Diseases of the Collar.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. J. Anderson: General Aspects of Erythroblastosis and its Impact on Pathological Processes.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Professor T. N. A. Jeffcoate: Pruritus Vulvae.

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Any Questions ?

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

Deposit of Tartar on Dentures

Q.—Could you please advise on the cause and removal of a deposit on my dentures which resists the commercial cleaning solutions? It forms a minute, spreading, fawnish-white coating over the plastic of the dentures, especially in the interstices of the teeth. If I retain the dentures in my mouth overnight for three or four nights the deposit at once gets the upper hand. If the deposit is "tartar," what is tartar? Where does it come from? What is the best way to prevent its deposition? Does its appearance depend on the pH of one's saliva? Will anything dissolve it from the dentures?

A.—The deposit on the dentures is probably "tartar." The mode of deposition of this tartar or calculus is still undetermined, though much work has been done on it. The saliva contains a very high concentration of calcium and phosphorus, and their stability may depend on the colloids also present in the saliva. It has been postulated that the low tension of carbon dioxide in the mouth, with consequent loss of carbon dioxide from the saliva, causes precipitation of calcium salts. It is thought that the presence of carbon dioxide is important in maintaining a high concentration of calcium salts in the saliva. The pH of the saliva is very variable, largely depending on the carbon dioxide content, and there is no obvious correlation of figures for salivary pH and tartar deposition from one individual to another.

The tartar deposit tends to be greatest opposite the openings of the salivary ducts, and forms on the natural teeth and to some extent on dentures. There is at present no known way of stopping this deposition and recourse must be had to its physical removal. Brushing the dentures each day with a soft brush and soap should keep them well polished and free of tartar, but if the surface of the dentures loses its polish tartar deposits may be more marked. It would be as well, if the deposit continues, to get the dentures repolished, as this helps to prevent further deposition.

Serology in Herpes Zoster

Q.—What is the present status of the complement fixation test performed on the patient's serum in the diagnosis of herpes zoster? Has any other diagnostic test been designed for this purpose? Have any of these tests been carried out on a series of normal individuals? Has it definitely been established that herpes zoster is due to a virus? What is the evidence for this? Please give references.

A.—Serological tests for herpes zoster are difficult to perform because the antigen used in the test consists of vesicle fluid collected from cases of varicella or zoster during the early stages of the eruption. The limitations of such a test are considerable. However, a number of investigations carried out some years ago indicated that the serum from patients convalescent from zoster fixed complement in the presence of zoster or varicella vesicle fluid antigen.¹ In one or two cases increases in antibody titre were detected. Furthermore, these serological tests indicated a very close relationship between the two viruses. The sera from normal individuals usually have a lower antibody titre or are clearly negative, but the findings in both cases must be related to the titre after the onset of infection.¹

The great difficulty about varicella and zoster viruses is that they cannot be grown in the ordinary culture media used in virology. But recently Weller has managed to propagate both viruses in tissue culture.^{2,3} This development may lead to the production of a diagnostic antigen. Another

test of some practicable value is the examination of scrapings from vesicular lesions for the presence of multinucleate epithelial cells and intranuclear inclusion bodies. These cytological changes are commonly found in both zoster and varicella, but they cannot be distinguished one from the other nor from similar lesions seen in herpes simplex infections. However, herpes simplex virus can be grown quite readily in the laboratory, which helps to distinguish the two if the need arises.

The virus aetiology of zoster is based on two main findings. The disease has been reproduced in human beings by direct inoculation of vesicle fluid.⁴ In some cases typical varicella has resulted (usually in children) or a local vesicle has developed. Natural cases of varicella in children resulting from an adult with zoster are well recognized.⁵ Secondly, the virus has been grown in tissue culture from vesicle fluid, and the actual causative agent, the virus elementary bodies, has been seen in vesicle fluid under the electron microscope.⁶

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1. Brain, R. T. (1933). *Brit. J. exp. Path.*, **14**, 67.
2. Weller, T. H., and Stoddard, M. B. (1952). *J. Immunol.*, **68**, 311.
3. — (1953). *Proc. Soc. exp. Biol. (N.Y.)*, **83**, 340.
4. Kundratitz, K. (1925). *Z. Kinderheilk.*, **39**, 379.
5. Blank, H. (1949). *Acta derm. venerol.*, **29**, 77.
6. Rake, G., Blank, H., Coriell, L. L., Nagler, F. P. O., and Scott, T. F. McNair (1948). *J. Bact.*, **56**, 293.

Ultrasonic Vibrations and Gall-stones

Q.—I have heard that it is possible to disintegrate gall-stones *in situ* by directing ultrasonic waves on them. Has this therapy in fact been used with any success?

A.—A number of physical studies have been made in the attempt to disintegrate calculi, both urinary and biliary, by ultrasonic vibrations. The results have been discussed by Mulvaney.¹ Up to the present only partial disruption of the calculi has been achieved and that only under conditions which are quite impracticable clinically. Even if disintegration of gall-stones in the gall-bladder could be achieved clinically, it would seem inadvisable to carry this out, as the small fragments resulting would be more of a danger to the patient than the larger gall-stones from which they are derived, owing to the likelihood of their passing into and obstructing the common bile duct.

REFERENCE

1. *J. Urol.*, 1953, **70**, 704.

Psychiatric Treatment of Adult Enuretic

Q.—What can psychiatric treatment offer a man of 26 who is a persistent bed-wetter, and has on that account ruled out the possibility of marriage?

A.—It is improbable at this age that enuresis is the result of a primary emotional disturbance. In children the opposite is the case, but those with emotional problems tend to get better with time or with treatment, leaving a residue of cases where the cause is constitutional and biological rather than psychological. It is likely that the patient belongs to this group, and inquiry should be made about the depth of his sleep, for if he sleeps very heavily dextro-amphetamine taken at bedtime may result in his being awakened in time by the discomfort in his bladder. The dose required may vary from 2½ to 30 mg. If there is a history of precipitancy of micturition by day, he should be tried on propantheline bromide ("probanthine") 15 mg. at bedtime. Nocturnal epilepsy is less likely as a cause, but inquiry should be made about disturbance of his bedding, biting of his tongue, and whether attacks have occurred by day.

Although it would be unwise to promise it, it is nevertheless true that some of these patients are cured by marriage. The most probable explanation lies in their being disturbed during the night by the movement of the other occupant of the bed. This, added to bladder discomfort, may be sufficient to awaken the deep sleeper.

There may of course be an emotional reaction which is secondary to the enuresis but which requires treatment. If the patient has ruled out marriage as a possibility, it

sounds as if this may be the case. Enuretics often marry, and women will frequently accept the burden involved with patience. Psychotherapy in such a case would not affect the enuresis, but might encourage a more hopeful and resolute acceptance of the disability. Such psychotherapy should be on the level of discussion and counselling, and extensive procedures should not be required.

Sensitization to Streptomycin

Q.—In the case of a person who is administering streptomycin by injection and has become sensitized to the drug, as evidenced by dermatitis of the hands, is there any likelihood of this sensitization disappearing spontaneously while contact with the drug is maintained? Full protective technique is observed, and it is presumed that the absorption of the drug occurs by inhalation.

A.—In our experience sensitization to streptomycin, acquired by handling the drug, does not disappear spontaneously while contact with the drug is maintained. If the patient ceases contact with the drug, the dermatitis may clear up, but fresh contact is apt to result in a fresh outbreak. Of course, it must be determined that the sensitization is indeed to streptomycin. The simplest technique for determining this is to inject 25 to 100 micrograms in 0.1 ml. intradermally. If the patient is sensitive erythema appears, which may be observed at 6, 12, or 24 hours after the injection. The actual dose given should depend on the severity of the symptoms. The higher dose may produce some general exacerbation if the patient is very sensitive, but the test should not be regarded as negative unless the full dose of 100 micrograms has been given. Desensitization is feasible although a little tedious. The technique is described by Crofton.¹ Clinical details and the frequency of this form of sensitization have been described by the Ministry of Health² and by Crofton and Foreman.³

REFERENCES

1. *British Medical Journal*, 1953, **2**, 1014.
2. *Ibid.*, 1953, **2**, 39.
3. *Ibid.*, 1948, **2**, 71.

Olfactory Hallucinations

Q.—A close relative of mine, aged 28, complains that her clothes emit obnoxious odours due to some naphthalene which was once used in her clothes cupboards. The cupboards have since been cleaned to her satisfaction, but she still complains that people in buses, theatres, and shops can still smell her clothes, even at a distance. She is convinced that when people smoke or sniff they do so because of her, and as a result is loath to go out. Neither I nor anyone else can smell anything abnormal. Could this condition be due to any nasal or other physical condition, or should she be referred for a psychiatric opinion? The patient is the neatest of persons and fastidious to a degree. What treatment is advised?

A.—This patient should certainly be referred for a psychiatric opinion. The symptoms described could not be solely due to any nasal or other physical condition, since she undoubtedly seems to misinterpret the behaviour of others. It is all very suggestive of the onset of schizophrenia. The first thing, however, would be to have a competent psychiatric opinion before deciding what treatment should be adopted. To suffer from olfactory hallucinations, coupled with other misinterpretations, at the age of 28 is unlikely to be due to a depression, although such symptoms can occur in involutional melancholia, nor are any other symptoms of depression described in this case.

Treatment of Warts

Q.—I would be grateful if you would tell me what you consider the best treatment for warts.

A.—Treatment of infective warts may be radical, and this is indicated when they are single or few and in sites where they are for one reason or another troublesome. The best radical measure is careful curettage under local analgesia, the wart being shelled out and the cavity being swabbed with

phenol or trichloroacetic acid. Cautery, diathermy, caustics, freezing, and radiotherapy are used to the same end but are more crude, lack the precision of curettage, and are not without dangers.

The oedematous warts occurring at the anus, and on the vulva or prepuce, may be associated with local discharges. Effective treatment of the discharge will usually clear the warts. Otherwise they are commonly responsive to a single or repeated painting of podophyllin resin (25% in 90% spirit).

Multiple plantar warts and mosaic warts often clear after soaking the part in 3% formalin for ten minutes at night for six weeks. In general, desiccating measures which cause some desquamation of the skin and antiseptics have some value, as for instance sulphur and resorcin pastes for flat warts, but most other treatments are probably effective only through suggestion. Wart charming is an effective remedy in the hands of the few.

Nervous instability with sweating and greasiness of the skin predisposes to warts and their spread, and this probably accounts for their high incidence in children. The manner in which remedies are prescribed and presented is important. For the great variety of measures employed in this field the reader may consult textbooks.

Toxicity of Rotenone

Q.—I should be grateful for information on the chances of dermatitis or toxic effects in a factory where girls are engaged in packing an insecticide containing 0.5% powdered rotenone. The percentage has recently been raised from 0.25%. No physical ill effects have ever been found with the latter concentration, but there is, of course, some escape of the powder into the air. The methods adopted to prevent any ill effects consist in the use of an industrial vacuum cleaner and the provision of light fabric face masks.

A.—Rotenone is the active principle of derris root and also of various tropical plants of the genus *Lonchocarpus*. Information about derris root can be obtained in the earlier editions of the *British Pharmaceutical Codex*, but not in the 1954 edition. References to rotenone are to be found in *Occupational Diseases of the Skin* (2nd edition) by Schwarz, Tulipan, and Peck, pp. 413-14. A paper by Haag¹ deals with toxicological studies of *Derris Elliptica*. It is said that derris dust if inhaled in sufficient quantity will produce fatty degeneration of the liver. Rotenone is a sensitizer, and dermatitis has been reported amongst workers who make and use spray solution containing it.

It would be useful to know the other ingredients of the powder containing 0.5% rotenone. Some of the so-called "inert" powders which have been used as vehicles, such as kaolin and talc, are known to produce pulmonary fibrosis.

Packing of powders is commonly done under exhaust ventilation, and if this is efficient there should be no need for the workers to wear respirators.

REFERENCE

1. *J. Pharmacol.*, 1931, **43**, 193.

Treatment of Uterine Hypoplasia

Q.—What is the treatment of sterility due to uterine hypoplasia?

A.—Uterine hypoplasia is frequently diagnosed as a result of an impression gained during bimanual examination, and this is unreliable evidence no matter how skilled the observer. As a rule the diagnosis requires examination under anaesthesia, measurement of the uterus, and diagnostic curettage. To justify a diagnosis of uterine hypoplasia, the overall length of the uterus should be 2½ in. (6.3 cm.) or less, and the endometrium should be thin and should show an unstimulated appearance on microscopic examination. The uterine index—that is, the length of the cavity of the body of the uterus relative to the length of the cervical canal—is difficult to measure accurately, and, in any case, is not so informative as was once believed. Uterine hypoplasia is usually manifested by a late menarche, although this symptom by itself is of little significance.

Amenorrhoea or infrequent menstruation is also to be expected; a scanty regular loss is not necessarily indicative of hypoplasia.

However, even if uterine hypoplasia is proved to exist, there is no evidence that the condition *per se* lowers fertility, despite the general statements to the contrary which are found in most gynaecological textbooks and in monographs on infertility. Why should it? A small cavity with ill-prepared walls does not prevent conception, as the frequent occurrence of tubal pregnancy proves. It might, however, favour abortion. The only circumstance in which uterine hypoplasia is associated with infertility is when it is the result of inadequate ovarian function. In such case the uterus can be made to grow to normal size with oestrogen, but this does not raise fertility and the effect is only temporary. For the real cause of the sterility is failure of the ovary to produce ova, so treatment should be directed to the establishment of ovulation, even though the results are generally unsatisfactory. If uterine hypoplasia occurs despite normal ovarian function, then it is presumably because the uterus is unresponsive to ovarian hormones. It is the target organ which is at fault, the fault being unknown but allegedly inherent. In that case treatment with oestrogens is not likely to affect the uterus at all.

A critical, some may say hypercritical, outlook leads to the conclusion that uterine hypoplasia is more often a convenient label than a proved state; and that when it is present its treatment is either unnecessary or is doomed to failure unless its cause can be traced and corrected.

Methylpentynol in Pregnancy

Q.—*I should be glad to know whether there is any danger in expectant mothers taking methylpentynol before visiting the dentist, especially when they are going to have gas.*

A.—There are no reports in the literature to suggest that methylpentynol is dangerous for expectant mothers. It is destroyed in the body very much like ordinary alcohol, and the ill effects of too much methylpentynol resemble the effects of too much alcohol.

Treatment of Bee Stings

Q.—*What is the best treatment for bee stings? I am a member of a bee club and have been asked for advice.*

A.—Bee stings may result in a local reaction due to the injected bee-venom, a more generalized allergic reaction, or both.

The sting should be gently removed. Local therapy consists in the application of an antihistaminic ointment: various alkali solutions are also of help—for example, soap, sodium bicarbonate, methylene blue, weak ammonia, or calamine. For the milder urticarial reactions an antihistaminic drug, preferably one that does not cause drowsiness, ephedrine, or a combination of these two should be given. For the severe allergic reactions, angioneurotic oedema, severe dyspnoea, collapse, or unconsciousness, 1:1,000 adrenaline should be given in doses of 5–10 min. (0.3–0.6 ml.) and repeated as necessary. Some sensitized bee-keepers have found taking a small dose of ephedrine prior to handling the bees a means of reducing the severity of their reactions. All might well be advised to carry with them ephedrine and an antihistaminic to take as soon as they are stung, while the more severely affected should carry isoprenaline.

"Desensitization" or hyposensitization presents a series of difficult problems which are well discussed by Mueller and Hill, of Boston.¹ Isolated successful cases have been recorded, but it is not known for a series of patients what proportion would be adequately protected nor for how long the protection is likely to last once the injections are stopped. Bee-venom antigen is available from commercial firms, but skin testing and hyposensitization should be advised and carried out by an expert, for the antigen is a potent one. As in the treatment of hay fever, the dosage depends on the degree of sensitivity and even in skilled hands carries some risk of untoward reactions occurring. One

might expect the results to be similar to those of hyposensitization to hay fever and other immediate wealing allergies. The writer hesitates to advise hyposensitization except in individual cases and only when undertaken by experts.

REFERENCE

¹ Mueller, H. L., and Hill, L. W. (1953). *New Engl. J. Med.*, 249, 726.

Sparks from a Silk Shirt

Q.—*When I wear a leather corset and an artificial silk shirt the crepitations and sparks of static electricity are observed on removal of the shirt. Are such sparks sufficient to ignite ether or petrol?*

A.—The only safe answer is yes, though the risk of ignition of dangerous vapours by the crepitations and sparks alone is probably small and would require the co-existence of various other favourable factors. Nevertheless, in these kind of circumstances no avoidable risk, however slight, should ever be incurred. The conditions described in the question are particularly favourable to the development of static charges of high potential.

It has long been known that the ordinary movements of an anaesthetist, or other person in an operating theatre, can build up in himself a high charge of static electricity. Should he then approach or handle an object of lesser electric potential a spark will be formed sufficient to ignite or explode any dangerous vapour in the vicinity. This is known to be the explanation of many disasters that have occurred. If ordinary movements can do this, how much more so will the relatively violent ones described in the question? Silk is considered to be specially dangerous, and other fabrics may be little less dangerous. The risk of such accidents is much accentuated by the use of footwear made of ordinary non-conductive rubber or other similar material and also by furnishing operating rooms with non-conducting floor coverings such as linoleum.

Specific Desensitization to Foods

Q.—*An asthmatic child has been advised to avoid milk, fish, eggs, cheese, chocolate, and nuts. As it will be difficult to provide such a diet, can you please advise me whether it would be worth undertaking specific desensitization, and, if so, how should it be done?*

A.—Specific desensitization to foods is not advised. Neither oral nor parenteral "hyposensitization" have been proved to be effective, and both methods are considered by most authorities to be ineffective. Complete elimination from the diet and re-testing by ingestion every six months or so is the accepted treatment of proved food allergies.

The writer, however, would emphasize the great importance of not eliminating from the diet of any asthmatic (child or adult) any food unless it has been shown beyond doubt that its ingestion, even when introduced into the diet in a hidden or unsuspected form, repeatedly precipitates asthma.

Correction.—In the Parliamentary report on the consumption of welfare foods (*Journal*, May 14, p. 1228) the word "tons" (of dried milk) should read "tins."

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THE NATURAL HISTORY OF ANAEMIA ASSOCIATED WITH PROTEIN MALNUTRITION*

BY

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During the past three decades it has become clear that protein malnutrition is a major cause of death and disability throughout the Tropics. Its severest effects are on infants and young children, but there are reasons for believing that older children and adults, and particularly pregnant women, are affected by it. The term "protein malnutrition" has been discussed by Platt (1953); its meaning is wider than simple dietary protein deficiency, and includes disturbances produced primarily by under-feeding but aggravated by zymotic agents and infection which may convert borderline nutrition into malnutrition.

The study on which these lectures are based began in 1950 in Nigeria when I was confronted with a number of severely anaemic pregnant women. Anaemia in pregnancy is common in Nigeria and throughout the Tropics, and difficulties were encountered in finding an effective remedy for it. Similar difficulties were experienced by Napier (1940) in treating anaemia in pregnancy in India. Earlier work (Woodruff, 1951) has indicated that protein malnutrition plays an important part in the causation of this anaemia, and there is prevalent in Nigeria, as in the Tropics generally, the disease variously known as malignant malnutrition, kwashiorkor, and fatty liver disease. This has recently been referred to as the protein malnutrition syndrome in childhood. It is associated with an anaemia, and, in view of this, further investigations were undertaken to answer the question whether the anaemia in protein malnutrition in childhood is similar to or different from that encountered in pregnant women. There were obvious similarities between both sets of patients in that they were living on poor diets; in the children there was a special demand for protein imposed by the growth of their own body, and in the pregnant women a similar demand imposed by the foetus.

In considering the anaemias associated with protein malnutrition it is necessary to take into account many facts relating to the persons affected, their disease, and their environment. Thus the local foods are of obvious importance; so are the parasites and other causes of locally prevalent diseases, and the habits and social customs of the people.

*Being the text of the Goulstonian Lectures delivered before the Royal College of Physicians of London on February 23 and 25, 1954.

The patients were all studied at hospitals associated with University College, Ibadan, Nigeria, a town which has grown rapidly during the last 50 years and in which the social and economic conditions prevailing have previously been described (Woodruff, 1951).

Although poverty plays a part in the causation of malnutrition, Trowell *et al.* (1954) have drawn attention to the fact that malnutrition often depends more on the type of crops grown in the patients' neighbourhood than on monetary wealth. Thus in a cassava-growing region wealthy people may live on an unbalanced and poor cassava diet. Certainly the parents of grossly malnourished children often are sufficiently well off to wear costly clothing. Taboos are important causes of malnutrition in some regions. Thus in Western Nigeria a common taboo prohibits the eating of eggs, so although hens are numerous no use is made of the valuable source of protein their eggs supply.

Methods of Investigation.—The haematological methods used were standard and have previously been described in detail (Woodruff, 1951). The electrophoretic studies of plasma proteins were made with paper as described by Flynn and de Mayo (1951). Reticulocyte ripening was studied by the method described by Nizet and Robschey-Robbins (1950).

ANAEMIA AND MALNUTRITION IN PREGNANT WOMEN

These patients, numbering 45, all complained of lassitude and weakness, and many of dyspnoea. Only two gave a history of having had soreness of the tongue. The most outstanding clinical findings were hepatomegaly and splenomegaly. The liver was palpable in 30 and the spleen in 32 cases. In 10 the liver reached 3 in. (7.5 cm.) or more below the costal margin, and the spleen did so in nine. Subcutaneous oedema was present in 10 cases and ascites in one. No evidence of cardiac failure was found to explain the hepatosplenomegaly or oedema. A trace of albumin was present in the urine of several patients, but there were no casts.

The haematological findings for 40 patients are shown in Table I; in the remaining five cases either the patient was first seen in convalescence or full haematological indices were not obtained. It is apparent that these anaemias are of considerable severity; about 50% are normocytic, 25% macrocytic, and 25% microcytic, as judged by the mean corpuscular volume (M.C.V.). The mean corpuscular

TABLE I.—Haematological Values at Initial Examination in 40 Cases of Anaemia in Pregnancy

Type of Anaemia	Haemoglobin (g. per 100 ml.)		Red Blood Cells (millions per c.mm.)		M.C.V. (cu. μ)		M.C.H.C. (%)		Reticulocytes (% of R.B.C.)	
	Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range
Macrocytic (M.C.V. > 95 cu. μ) (11 cases)	6.93	5.18-8.70	2.23	1.81-2.90	102.76	95.30-120.40	30.33	26.60-33.30	4.51	1.2-9.5
Normocytic (M.C.V. 82-95 cu. μ) (19 cases)	5.55	4.62-9.18	2.00	0.89-3.98	86.88	82.30-93.46	33.04	26.20-38.00	4.49	0.5-16.5
Microcytic (M.C.V. < 82 cu. μ) (10 cases)	6.66	4.14-9.62	2.60	1.38-3.36	74.26	57.70-81.81	33.47	28.60-37.68	3.30	0.5-6.0

haemoglobin concentration (M.C.H.C.) in the majority of cases is satisfactory, and evidence of iron deficiency was infrequent.

Reticulocyte counts at initial examination averaged 4%, indicating that the marrow was active, and this was borne out by microscopical examination of the marrow films, which with two exceptions showed macronormoblastic hyperplasia. In two cases Ehrlich megaloblasts were present. Dr. D. S. Ridley has kindly examined the marrow films and reports that the principal features are: (1) the cells are larger than normal, but not so large as those of the megaloblastic series, the pronormoblasts being 15-21 μ and early normoblasts up to 17 μ in diameter; (2) normal coarsely marked nuclei are found; (3) there is premature haemoglobinization; (4) primitive forms predominate in relation to the scanty late normoblasts; and (5) erythropoiesis is active.

The sickle-cell trait was found in only six cases, thus this abnormality could not be held responsible for the characteristics of the anaemia.

The gastric juice was examined in 39 cases, and histamine-fast achlorhydria was found in 11. Among these 11 patients were the two with megaloblastic marrow.

Schumm's test was positive in 21 cases, so that in these there was a haemolytic process at work. Fairley *et al.* (1938) described such a process in pregnant women suffering from nutritional macrocytic anaemia, and in his cases, too, there was hepatomegaly. Fairley thought it probable that this haemolytic process was initiated by malaria, but continued in the absence of an overt infection. Such a mechanism may be at work in these cases, although haemolytic anaemia in liver disease has been described by Davidson and Fullerton (1938) and by Coleman (1948), and this affords another possible basis for this feature.

In 1950 it was suspected that the anaemia in these cases might respond to liver extract, vitamin B₁₂, or folic acid, for it is associated with a macronormoblastic marrow in which the cells are sometimes difficult to distinguish from megaloblasts. Megaloblastic anaemia in pregnancy has been reported in the Tropics by many workers, and Wills (1931, 1932, 1933), Manson-Bahr (1951), and others have found it to respond to specific haemopoietic substances. Vitamin B₁₂ in doses of 100 and 120 μ g. failed, however, to bring about a reticulocyte crisis or improvement in the haematological picture. Maximal doses of liver and of folic acid also failed. The therapeutic failure of vitamin B₁₂ is understandable in the light of estimations of the vitamin in the serum which Dr. G. I. M. Ross has kindly carried out in five cases, the concentrations ranging from 470 to 1,000 μ g. per ml. The normal range was found by Mollin and Ross (1952) to be from 100 to 720 μ g., with a mean of 358 μ g. per ml. of serum. Thus the values in these women were all normal or slightly above normal.

In macrocytic, normocytic, and microcytic groups iron administered before delivery failed to evoke a reticulocyte crisis or haematological improvement. In one of the cases the M.C.H.C. was as low as 26.6%. Five of the patients improved spontaneously after delivery without treatment. In others, however, this tendency towards spontaneous remission was absent.

The problem, therefore, was of an anaemia often of considerable severity, occurring late in pregnancy, refractory to treatment with iron, folic acid, liver extract, and vitamin B₁₂, and associated with a macronormoblastic marrow and hepatosplenomegaly.

Investigations Concerning the Cause of the Anaemia

Role of Helminths

Of the many questions posed by this anaemia one of the first is whether parasites such as intestinal worms are important aetiological factors. Accordingly stools were searched in all cases; ova of *Ancylostoma duodenale* were found in 14, and ova of *Ascaris lumbricoides* in 34. Treating both worm infections did not, however, influence the anaemia. In many of the cases the infection was light, only very few ova being present. Infection with *A. lumbricoides* is not recognized as a cause of anaemia, though the nutritional demands of this parasite have to be met from the patient's diet and may aggravate any malnutrition present. Infection with *A. duodenale*, where present, no doubt aggravated the anaemia, but the extent to which it did so was probably small, for the characteristics of the anaemia in infected and non-infected persons were similar.

Malaria

One or more blood films from the patients were examined on admission, and subsequently whenever there was fever. Patients found to have overt malaria were excluded from the study. Ibadan is, however, in a highly malarious region, and probably all the patients had been infected in the past but their infections had been adequately dealt with by their immune processes. Malaria may have played a part in the causation of the anaemia and malnutrition, but there is abundant evidence that other very important factors were also at work. Thus patients, and particularly pregnant women, with malarial parasites in the blood and anaemia not uncommonly failed to improve haematologically when given adequate antimalarial treatment.

In well-nourished persons, even when severe anaemia is caused by malaria, the anaemia improves rapidly after adequate antimalarial treatment has been instituted. To one of the pregnant women in this series 600 mg. of mepacrine had been given empirically daily for three days before she was seen for the purpose of this study. Her haemoglobin content was 5.03 g., and her total plasma protein level 5.93 g. per 100 ml. (albumin 1.95 and globulin 3.45 g. per 100 ml.). During the subsequent eight weeks she was delivered, received 2 pints (1.1 litres) of blood by transfusion and 0.9 g. ferrous gluconate daily for three weeks, yet at the end of this period her haemoglobin level was unchanged. She was given a supplement of 4 oz. (113 g.) casein daily, and in two weeks the haemoglobin had risen to 6.2 g., and the total plasma proteins to 7.08 g. per 100 ml. (albumin 3.11 and globulin 3.60 g. per 100 ml.). In cases such as this it is clear that conditions other than malaria are important in preventing recovery from the anaemia.

Significance of the Hepatomegaly

The next question is, what is the significance of the hepatomegaly: is it possible that it is related to the anaemia? Syphilitic disease of the liver was excluded, as the Kahn test, performed in 36 cases, gave a positive result in only one case.

A biopsy of the liver was taken in 42 of the 43 patients, and histological examination showed fatty infiltration in about a quarter of these, and in almost all an increase in fibrous tissue. The fat, when present, was usually in the peripheral portions of the liver lobules, but in some cases it was irregularly distributed; it was never gross, but simulated that seen in mild cases of fatty liver disease in malnutrition of childhood (Woodruff, 1951). The fibrous tissue was

increased in the portal tracts and also occurred diffusely between liver cells. Staining with Wilder's silver method showed that reticulin, instead of being a fine strand between parenchymal cells, was thicker than normal and in multiple strands, often appearing like teased-out rope or lacework. In most cases the cytoplasm of the parenchymal liver cells was thin, vacuolated, and stained badly; in some cells only filaments of cytoplasm were present. Biopsies were repeated after treatment in eight cases, and the late Dr. W. Silvera (who kindly examined the sections) found that in the second specimens the cytoplasm invariably stained better than in the first, and fat where originally present had diminished or disappeared. No change in reticulin was, however, noted. Dr. D. S. Ridley has stained several of these sections for glycogen and found this greatly increased. Certainly the cells are not filled with their normal complement of healthy cytoplasm.

This liver damage has much in common with that found in children suffering from protein malnutrition, and is also similar to that which can be produced in animals by feeding them on diets low in protein and adequate in carbohydrate or fat. Accordingly the question arose whether the anaemia in these cases is the result not of deficiency of a specific haemopoietic factor but of protein, and whether protein malnutrition causes the liver damage and both contribute to the production of anaemia.

Plasma Proteins

The plasma proteins were estimated chemically in 34 cases. The mean values are shown in Table II, from which it will be found that the albumin fraction is reduced and the globulin fraction increased as compared with normal

TABLE II.—Plasma Proteins (g. per 100 ml.) in 34 Cases of Anaemia in Pregnancy

	Total Protein	Albumin	Globulin	Fibrinogen	A/G Ratio
Mean	7.37	3.15	3.76	0.46	0.84:1
Range	4.9-8.7	1.9-4.1	2.6-4.9	0.1-1.2	0.48-1.48:1
Normal range (Harrison, 1947)	5.8-8.8	3.4-6.7	1.2-2.9	0.2-0.4	4.0-1.2:1

TABLE III.—Electrophoretic Separation of Serum Proteins in Cases Studied

	Albumin (%)	Globulin (%)			
		α_1	α_2	β	γ
Mean of 9 women with anaemia in pregnancy	38.23	10.60	7.33	10.03	33.81
Mean of 5 young children with severe protein malnutrition	27.89	13.59	15.07	15.99	27.46
Mean of 11 older children, adult males, and non-pregnant females with protein malnutrition and anaemia	25.72	8.99	15.64	12.58	37.07
Normal average:					
Ricketts <i>et al.</i> (1949)	60.30	4.00	9.70	12.80	13.20
Taylor <i>et al.</i> (1949)	64.10	4.10	7.70	11.40	12.70
Mean of 12 patients with malaria (Taylor <i>et al.</i> , 1949)	55.90	6.80	8.10	13.70	15.30
Mean of 7 patients with cirrhosis of liver and ascites (Ricketts <i>et al.</i> , 1949)	35.20	4.20	7.20	7.70	35.70

values. Serum was examined electrophoretically in nine cases to determine the type of globulin responsible for the increased amounts present. Typical electrophoretic patterns are shown in Figs. 1 and 2 and may be compared with that from a healthy Syrian woman living in Ibadan (Fig. 3). The mean values of the various protein fractions are summarized in Table III and compared with figures from other patients studied and with those of healthy persons, patients with malaria, and patients with cirrhosis of the liver.

It is clear from a review of the literature on the plasma proteins in malaria (Maegraith, 1948) that in this disease the albumin is reduced and the globulin increased. It is not clear, however, which globulin fraction becomes increased. Taylor *et al.* (1949) infected 12 healthy volunteers with malaria and permitted them to have five to eight paroxysms of fever. The electrophoretic protein patterns before and after the experiment are shown in lines 5 and 6 respectively in Table III. The albumin fraction decreased by 14.5%, the α_1 globulin increased by 62%, and the γ globulin by 19%. Similar changes have been reported by Ganzin (1954).

There is a large literature on the changes in the plasma proteins which may occur in liver disease. The figures given in Table III are those obtained by Ricketts *et al.* (1949) in seven patients with hepatic cirrhosis and ascites, and it is seen that there is nearly three times the normal amount of γ globulin present. The serological changes in the pregnant women fit in most readily with the interpretation that they were brought about by liver damage and to some extent also by malaria.

The position thus far, therefore, was that these women were anaemic, they were not suffering from deficiency of any known specific haemopoietic factor, and the anaemia appeared not to be caused by the presence of parasites but was associated with liver damage and altered levels of various protein fractions in the blood. The next question which arose was whether there was any evidence that the patients' diets were deficient in protein. Answering this was fortunately facilitated by the fact that the hospitals at Ibadan, like the great majority of those in tropical Africa, do not provide patients with food except in special cases. Food must be brought by relatives or friends, who visit the hospital thrice daily for this purpose. It was thus possible, by weighing and charting the food brought, to obtain an indication of what the patients eat in their homes. In 1950 this was done in 13 cases, and the protein, carbohydrate, and calorie content estimated. The mean daily protein consumption worked out at approximately 50 g., and the total calories provided about 2,000. Miss M. W. Grant, of the Department of Nutrition at the London School of Hygiene and Tropical Medicine, has carefully

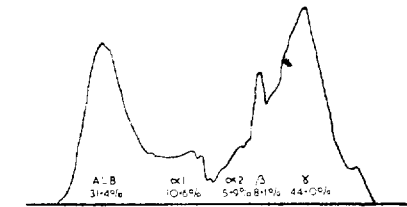


FIG. 1

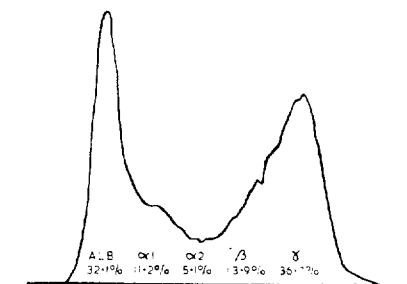


FIG. 2

Figs. 1 and 2.—Protein pattern obtained by electrophoresis of serum of two of the patients with anaemia in pregnancy. In this and in subsequent similar diagrams figures under Alb. indicate percentage of albumin present, those under α_1 , α_2 , β , and γ the percentages of the various globulin fractions.

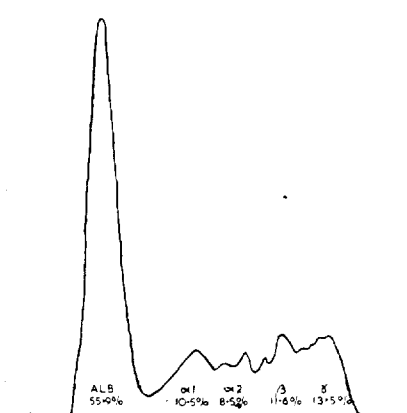


FIG. 3.—Protein pattern obtained by electrophoresis of serum of a healthy Syrian woman living in Ibadan.

checked the diets and these figures, and considers that the values were probably all over-estimated by as much as 30%, the reason being that the water content of the flour used in Ibadan is greater than the figure given in the tables used. Even so, the protein content of the diets was just over half that usually recommended for pregnant women, whereas their calorie value appeared to be adequate. This fitted in with the appearance of the patients, who were fairly well covered. In 1953 more accurate dietary data were obtained, not only by weighing and recording food eaten but by collecting representative samples for analysis. The exact counterpart of food eaten by the patients was placed in a container, aliquots were dried and brought back to this country, and Professor B. S. Platt kindly had these analysed. With the data obtained from these analyses and the records of the patients' diets Miss M. W. Grant and Miss Dare have been able to estimate accurately the calorie, protein, fat, and carbohydrate values of the diets. These are shown in Table IV, and support the suggestion that the

TABLE IV.—*Constituents of the Diet of 14 Patients*

Case No.	Calories	Protein (g.)	Fat (g.)	Carbohydrate (g.)
Pregnant women:				
5/53	1,900	56.9	53.3	297.3
6/53	1,303	35.7	59.8	155.2
22/53	1,145	30.0	29.2	190.6
23/53	1,097	43.5	39.3	141.9
27/53	1,439	35.6	56.6	195.6
28/53	1,579	36.7	51.5	241.8
33/53	1,022	26.1	43.2	132.9
34/53	1,112	36.1	34.7	164.7
40/53	1,209	29.5	41.2	179.7
47/53	1,625	33.4	54.6	251.0
Mean	1,343	36.4	46.3	195.1
% calories	100	10.9	31.0	58.1
Non-pregnant adults:				
29/53	2,740	62.6	77.0	448.3
44/53	976	27.4	32.1	143.6
Adolescents:				
36/53	1,132	30.3	35.2	173.4
48/53	1,432	37.2	45.0	219.3

earlier figures were over-estimates. Thus the mean daily protein intake was 36.4 g. The calorie value was adequate for patients lying in bed.

In the League of Nations *Report on the Physiological Basis of Nutrition* (1936) it is recommended that women between the fourth and ninth months of pregnancy should have 1.5 g. protein per kg. body weight. For the women in this series this would have been 77.3 g. per day. In 1950 the Committee on Nutrition of the British Medical Association recommended that at least 14% of a pregnant woman's calories should be supplied by protein. Thus by either of these standards the women in this series were living on a diet grossly deficient in protein.

A further question which now suggested itself was whether the patients who developed anaemia were those who had an excessive demand on their already poor supplies of dietary protein. This arose from the fact that there seemed to be an extraordinary proportion of twins born of the women studied. Accordingly the obstetric history of the patients was gone into. Much of this has previously been reported (Woodruff, 1951), but, in brief, it has been found that among 45 women studied there was one twin pregnancy in five pregnancies. Ross (1952) states that the ratio throughout the world is 1 in 90. In the United States of America among white persons it is 1 in 88, and among coloured citizens 1 in 67; among Africans in Rhodesia, where Ross was working, the rate is 1 in 35. At Ibadan in 1953 the ratio in 1,000 consecutive hospital deliveries was found to be 1 in 20. Twin pregnancies therefore were four times as common among the anaemic women as they were in non-anaemic pregnant women delivered in hospital at Ibadan. This suggests that those who have heavy nutritional demands imposed by twin pregnancy and are living on this deficient diet are more likely to develop anaemia than are women bearing only one child. The people of Nigeria recognize

that to bear twins imposes a greater risk to maternal health than does a single pregnancy, and for this reason have an elaborate ritual following their birth. It is considered that evil spirits are brought by the twins and are responsible for this ill-health. Two wooden idols are therefore made, into which it is hoped the spirits will enter, thus preventing harm to mother or children. As in much folklore, there is some basis for the belief, for certainly anaemia in pregnancy with its associated risks to health is more common among women bearing twins.

Cytological Appearances

There seemed, therefore, to be good evidence that this anaemia was associated with protein malnutrition and with liver damage. Further, this liver damage was of the kind

TABLE V.—*Cell Diameter and Thickness (in μ) in 34 Cases of Anaemia in Pregnancy*

Type of Anaemia	M.C.D.		σ		M.C.A.T.	
	Mean	Range	Mean	Range	Mean	Range
Macrocytic (9 cases)	7.87	7.46-8.51	0.76	0.60-0.93	2.07	1.55-2.49
Normocytic (17 cases)	7.61	7.06-8.20	0.90	0.52-2.63	1.94	1.61-2.62
Microcytic (10 cases)	7.52	6.32-8.10	1.06	0.51-2.79	1.76	1.37-2.13
Normal values	7.20	6.70-7.70*	0.46	0.40-0.50†	2.10	1.70-2.50‡

* Whitby and Britton (1950). † Larsen (1948). ‡ Price-Jones, Vaughan, and Goddard (1935).

reported by Himsworth (1950) in animals deprived of protein and given adequate calories in the form of fat or carbohydrates—namely, diffuse fibrosis and fatty infiltration. Larsen (1948) found that in patients with acute or chronic liver disease the red blood cells have an increased diameter but diminished thickness. Thus the ratio of their diameter to their thickness is greater than normal. Glynn, Himsworth, and Neuburger (1945) have also reported this type of red blood cell in rats suffering from hepatic disease induced by methionine deficiency. The next question therefore was whether the cells in these cases were also broader and thinner than normal.

Their characteristic appearance in thin films suggested that they were. The cells were larger than those of microcytic anaemia, yet they had the pale, vacuolated appearance of those found in that disease. Trowell has called them "foam" or "bubble" cells, and many resemble target cells. There is polychromasia due to the slight increase in reticulocytes and there is also well-marked anisocytosis—a point which is brought out by the wide base of the Price-Jones curves in such cases.

Price-Jones curves were constructed in 36 cases. A shift to the right was present in 24 cases, to the left in only two, and a centrally placed curve was found in 10 cases. In all cases the base was broader than normal. Normal values and the figures obtained from these curves are summarized in Table V. The mean cell diameter (M.C.D.) was increased

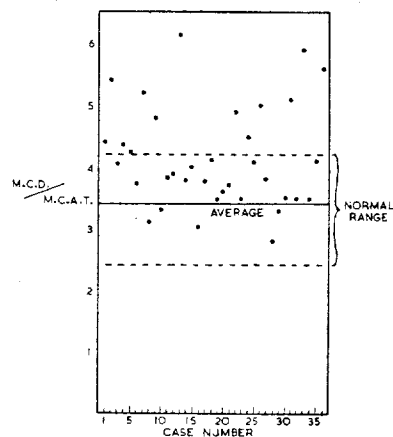


FIG. 4.—The ratio of red blood cell diameter to thickness in 36 women with anaemia in pregnancy. In all but five cases this ratio is greater than the average in health—that is, the cells are thinner than average.

even in most cases which were microcytic when classified according to the M.C.V. It was greater than normal in 15 cases, and in the upper half of the normal range in 15 cases. The standard deviation (σ) of the M.C.D., which Larsen (1948) finds is constantly raised in liver disease, was also raised in all cases. The range was 0.51-2.79 μ . The mean corpuscular average thickness (M.C.A.T.) was below normal average in 34 cases. Haden (1935) has shown that normally the diameter of the red blood cell is 2.4-4.2 times its thickness, and that when the diameter is more than 4.2 times the thickness the cell is abnormally thin. The diameter-thickness ratio in the pregnant anaemic women is shown in Fig. 4; it will be seen that in 13 cases the cells were pathologically thin, and in all but five they were thinner than average.

Response to Treatment

In view of the evidence of protein malnutrition, five patients were given daily supplements of 2-4 oz. (56.5-113 g.) casein after a control period of 10 days. This was followed by steady improvement without the development of a well-marked reticulocyte crisis (Fig. 5). In these cases, and in others in which improvement took place on a good diet only, the haematological improvement was invariably accompanied by increase in plasma albumin and by the albumin-globulin ratio becoming less abnormal. In Table VI the values in nine cases before and after treatment are shown and attention is drawn to the fact that albumin has increased in every case.

There is a further important piece of evidence suggesting that protein malnutrition causes liver damage in pregnant women. Following the demonstration of what appeared to be liver damage due to protein malnutrition in anaemic

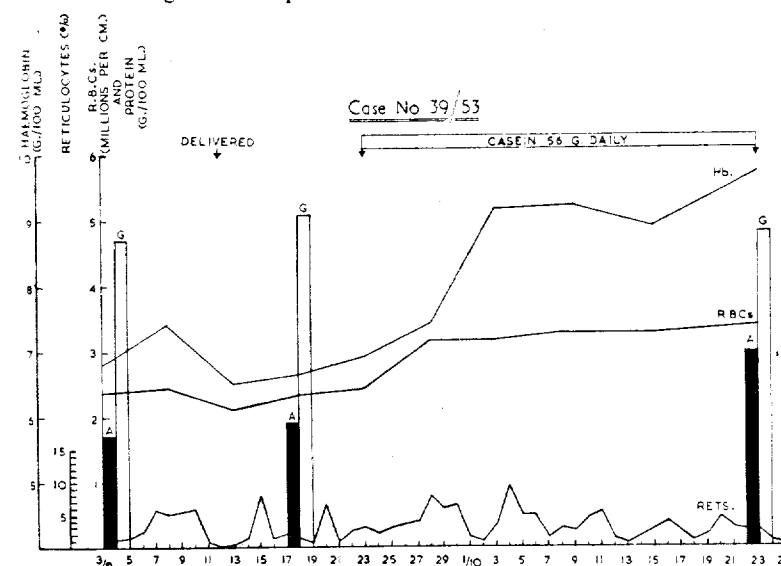


FIG. 5.—Improvement in haematological values in anaemia in pregnancy following treatment with casein. Rectangles labelled A and G indicate albumin and globulin values respectively.

TABLE VI.—*Serum Proteins Before and After Treatment in 9 Cases of Anaemia in Pregnancy*

Case No.	Before Treatment					After Treatment				
	Total Protein (g.%)	Albumin (g.%)	Globulin (g.%)	A/G Ratio	Haemoglobin (g.%)	Total Protein (g.%)	Albumin (g.%)	Globulin (g.%)	A/G Ratio	Haemoglobin (g.%)
28/53	5.40	1.95	3.45	0.57/1	3.96	6.71	3.11	3.60	0.86/1	6.22
33/53	6.90	2.22	4.68	0.48/1	5.03	6.26	2.78	3.48	0.80/1	6.96
38/53	6.24	2.62	3.62	0.72/1	4.29	6.63	3.12	3.51	0.89/1	7.25
39/53	6.44	1.70	4.74	0.36/1	6.81	7.75	2.95	4.80	0.62/1	9.77
47/53	6.17	2.31	3.86	0.60/1	7.70	7.10	2.71	4.39	0.62/1	9.18
51/53	7.26	3.18	4.08	0.78/1	6.07	7.73	3.33	4.40	0.74/1	7.55
53/53	6.14	2.47	3.67	0.68/1	5.18	6.12	3.00	3.12	0.96/1	9.18
53/53	5.61	3.00	2.61	1.15/1	7.55	6.00	3.37	2.63	1.28/1	8.58
55/53	7.27	2.84	4.43	0.64/1	4.14	7.60	3.35	4.25	0.79/1	6.66
Mean	6.38	2.47	3.90	0.55/1	5.63	6.88	3.08	3.79	0.84/1	7.93

mothers, Silvera and Jelliffe (1952) at Ibadan examined the livers of infants who died within a few hours of being born of malnourished mothers. They found that in several instances the infant's liver was grossly infiltrated with fat and even contained an increased amount of fibrous tissue. This fatty infiltration and fibrosis is of very great interest in that it cannot have been caused by parasites. In two instances vascular or congestive damage arising during childbirth could be excluded by the fact that the two mothers from whose infants the specimens were obtained were delivered by caesarean section. A nutritional cause was the only one likely. It appears that in tropical parts some infants may be born with the handicap of a damaged liver.

Comment

The evidence thus far therefore suggests that anaemia in pregnant women in Nigeria might be associated with protein malnutrition and liver damage, in some cases no doubt aggravated by parasitic infection. Further, this malnutrition is more likely to develop in those who have heavy demands on their protein supplies. If this hypothesis is correct, then the anaemia of these pregnant women and that of children and non-pregnant adults suffering from protein malnutrition ought to have much in common, and to test the hypothesis a comparison was made of the anaemia in these three types of patients.

ANAEMIA ASSOCIATED WITH PROTEIN MALNUTRITION IN EARLY CHILDHOOD

This series of nine children were studied by courtesy of, and with much help from, Dr. A. Tompkins. All presented with classical clinical manifestations of protein malnutrition or kwashiorkor. They were oedematous, each had a dermatitis and liver damage, and eight had ascites. Their hair, instead of being crisp and curly as it should be in Africans, was soft and straight. One might ask how children are allowed to become so ill, and the answer to that question in part lies in local folklore and superstition. The child affected is commonly believed to be possessed of a spirit or devil, and the advice of an indigenous practitioner is first sought. His usual treatment is to tie the head of a snake, lizard, or rat on to the patient, and it is only when this has failed that help is sought from a hospital or a medically qualified person. Thus we have another example of how ignorance and spurious beliefs play a part in the causation of this disorder.

The age at which this florid clinical condition occurs varies considerably, but the commonest is some months after the cessation of breast-feeding; this takes place much later than in Europe, usually between the ages of 2 and 3 years. At this time the child is given a diet of starchy gruels high in carbohydrate and relatively low in protein. Though the disease is commonest at

this age, it may occur in a modified form at any time in childhood, and it seems probable that a variety of it is found in adult life. The ages of the children in this series ranged from 2½ to 6 years. In two of the cases the illness had started after the mother had left the child in the care of a grandparent while she was preoccupied with a later addition to the family. This is not uncommon history, and it is probable that the grandparent, by reason of age or incapacity, is unable to provide more than the cheapest and most readily available foods. These are cassava, yams, and maize, all of which are rich in carbohydrate and poor in protein.

Anorexia was usual, and this is an important symptom as it leads to aggravation of the dietetic deficiency. Oedema, when it first appeared, often affected the most dependent parts of the body, and therefore the side on which the child had been lying during sleep (Fig. 6). Later all the subcutaneous tissue becomes oedematous, and in addition to ascites there may be pleural or pericardial effusions.



FIG. 6.—Unilateral oedema of face following sleep in child suffering from protein malnutrition.

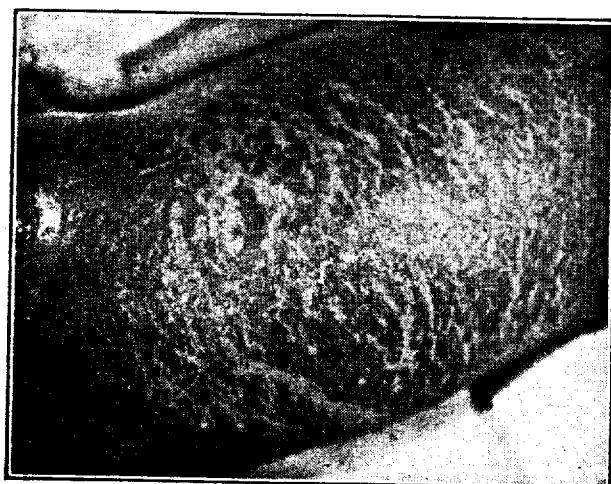


FIG. 7.—"Crazy-pavement" dermatosis in an African child suffering from protein malnutrition.

ference with the nutrition of the superficial layers which results from the oedema beneath pressing on capillaries and restricting blood supply. In addition to this "crazy-pavement" dermatosis, however, there may be generalized depigmentation of the skin and hair, which, instead of being the normal black of the African child, assumes a light-brown colour. Nagchaudhuri and Platt (1954) have investigated this and found that there are chemical changes in the pigment in the hair of these cases. Such generalized depigmentation was present in one case.

In this group of nine children with oedema and skin changes the liver was palpable in seven, the greatest distance below the costal margin being 1½ in. (3.7 cm.). The spleen was palpable in only two cases; in one of these it was just tipped on inspiration, and in the other it was 1 in. (2.5 cm.) below the left costal margin.

Results of Investigations

Haematological Values

Detailed haematological observations were made in six cases. The bone marrow was uniformly macronormoblastic, but megaloblasts were not found and sickling was not detected in any of the six cases.

The haematological indices at initial examination are shown in Table VII. The anaemia, it will be noted, is well

TABLE VII.—Haematological Values in 6 Children with Protein Malnutrition

Case No.	Hb (g.%)	R.B.C. (Millions/c.mm.)	M.C.V. (cu.μ)	M.C.H.C. (%)	M.C.D. (μ)	M.C.A.T. (μ)
25/53	6.66	2.07	106.28	30.00	8.82	1.74
30/53	8.88	3.62	71.82	34.15	7.84	1.49
31/53	8.14	3.35	80.59	30.15	8.14	1.55
37/53	8.88	3.21	81.00	34.15	7.84	1.68
42/53	8.58	3.72	69.89	32.61	7.58	1.46
61/53	7.84	2.76	86.96	32.70	7.02	2.24
Mean	8.16	3.12	82.76	32.29	8.04	1.58

marked, though not severe. Schumm's test was negative in all six cases. The M.C.V. is on the low side of the normal range in most cases, but the M.C.D. is abnormally increased in four cases and at the upper limit of the normal range in one case. The M.C.A.T. is below the normal range in all but two cases. There is little evidence of iron deficiency, the lowest M.C.H.C. being 30%. The Price-Jones curves showed a shift to the right in four cases, and in two the curve was centrally placed; in all it was flatter than normal. The standard deviation of the M.C.D. was increased just as it was in the pregnant women, the mean being 0.916 and the range 0.369–1.513. The values for the ratio of cell diameter to thickness in these cases are shown in Fig. 8, from which it is obvious that the cells are very much thinner than normal. This anaemia is therefore orthochromic and, as judged by cell volume, normocytic, but on the basis of cell diameter it is macrocytic. The cells, however, like those of the pregnant women, are thinner than normal and the ratio of cell diameter to cell thickness is increased.

Parasites

Particular attention has been paid to examination for parasites in these as in all cases in the study. Ova of *A. duodenale* were not found in the stools of any of these children, but in two cases ova of *A. lumbricoides* were found. Blood films were examined for malarial parasites both on admission and subsequently whenever there was fever; in two cases *Plasmodium falciparum* rings were found on admission. Trowell, Davies, and Dean (1952) find that those affected by kwashiorkor usually harbour some parasites, but the same syndrome may occur in the absence of parasitic infections. The findings in this series support this statement.

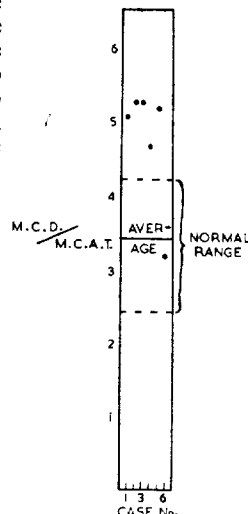


FIG. 8.—The ratio of red blood cell diameter to thickness in six children with anaemia and protein malnutrition. In five cases the cells are pathologically thin.

TABLE VIII.—Plasma Proteins and Corresponding Haemoglobin Values and Red Blood Cell Counts in 5 Children Suffering from Protein Malnutrition

Case No.	Date	Total Protein (g.%)	Albumin (g.%)	Globulin (g.%)	Fibrinogen (g.%)	A/G Ratio	Plasma Colloid Osmotic Pressure (mm. Water at 0°C.)	Hb (g.%)	R.B.C. Millions/c.mm.
30/53	2/9/53	3.85	1.24	2.42	0.19	0.51:1	103.6	8.88	3.62
	29/10/53	7.55	3.88	3.41	0.26	1.14:1	309.4	9.47	3.31
37/53	9/9/53	4.97	0.71	3.96	0.30	0.18:1	115.6	8.88	3.21
	22/10/53	5.94	1.29	4.33	0.32	0.29:1	163.0	10.80	3.94
42/53	26/9/53	4.56	0.91	3.23	0.42	0.28:1	108.2	8.14	3.46
	25/10/53	5.30	1.55	3.70	0.05	0.42:1	154.6	10.66	3.59
31/53 (serum)	29/8/53	4.10	0.20	3.90	—	0.05:1	85.4	8.14	3.35
61/53 (serum)	26/10/53	6.57	3.88	2.69	—	1.44:1	278.0	7.84	2.76
Normal range (Harrison, 1947)		5.8–8.8	3.4–6.7	1.2–2.9	0.20–0.40	4.1–1.2/1	247–342*		

* Keys *et al.*, 1950a.

Plasma Proteins

The plasma proteins were estimated in five of the six cases, and the values obtained, together with the corresponding haemoglobin and red blood cell counts, are shown in Table VIII. In three cases the figures obtained after treatment are also given. By comparison with normal values the albumin fraction before treatment is low and the globulin fraction greater than normal in all but two cases, so that there is a striking inversion of the albumin-globulin ratio. The albumin, it will be noted, increased with treatment. This increase is most marked in the first case, where after eight weeks' treatment with a good diet and a supplement of 56 g. milk protein daily the figures approximated to those at the lower end of the normal range.

The colloid osmotic pressure of the plasma in these cases is shown in Table VIII, the figures for Case 61/53 being obtained during convalescence. These pressures have been calculated from the formula propounded by Keys (1938), who in a series of 40 normal young men found the range to be from 247 to 342 mm. water (Keys *et al.*, 1950a). Thus the values were lower than normal in all four cases in which they were calculated before treatment. The development of oedema is dependent on several factors, of which the plasma colloid osmotic pressure is only one. In nephritis with hypoproteinaemia, Muntwyler *et al.* (1933) found that oedema usually developed when the plasma colloid osmotic pressure dropped below 160 mm. water, and that patients with pressure above this figure had no oedema. His findings accord well with those in this series in which all the patients had gross oedema and a plasma colloid osmotic pressure below 160 mm. water when first observed. The oedema became less with treatment; when the second reading was obtained, it had disappeared altogether from Case 30/53 and in Cases 37/53 and 42/53 was just perceptible.

Electrophoresis of the Plasma Proteins

In view of the abnormal globulin values found in these children the question again arose as to what globulin fraction predominated.

Serum was examined electrophoretically in five cases, a typical curve being shown in Fig. 9; the combined results obtained are shown in Table III and are compared with those in normal serum. Electrophoresis confirmed that in all these malnourished children the albumin fraction was grossly reduced and the α₁ and γ globulin increased. In cirrhosis of the liver the reduction in albumin and increase in β and γ globulins closely parallel the changes in these malnourished children.

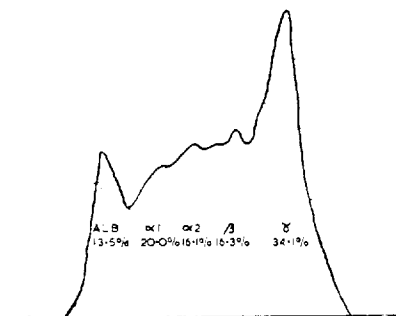


FIG. 9.—Protein pattern obtained by electrophoresis of serum of child with protein malnutrition and anaemia.

In Taylor's malaria experiment (Taylor *et al.*, 1949) the increase in γ globulin was proportionately less, and that of α₁ globulin proportionately greater, than in the children or in cirrhosis. It is of course difficult to compare Taylor's experiment with malaria in volunteers and the findings in these children, who probably had been chronically infected most of their lives. Nevertheless, if the changes were due only to malaria one would expect them to be of the same qualitative kind as in Taylor's experiment. Again, the interpretation which, though provisional, best fits the facts is that the increase in γ globulin is the one that is associated with liver damage and the increase in α₁ globulin is brought about as part of the development of immunity to malaria. Liver damage, malaria, and a low-protein diet probably all contribute to the low albumin values.

Liver Pathology

Liver was obtained for histological examination in all cases. In two this was at necropsy, in the remainder by biopsy. The outstanding features were infiltration with fat and some increase in fibrous tissue in the portal tracts and between the parenchymal cells as in the pregnant women.

Response to Treatment

Regarding treatment in these cases, there is general agreement that best results are obtained with well-balanced diets rich in protein. On admission, therefore, all the patients were given a balanced diet and a 50 g. supplement of casein daily. It was not possible to observe the children during a control period before giving them this diet, as their condition on admission was critical. This was emphasized by the fact that two of them died within a few hours.

The responses of these cases were similar to one another, and in brief this meant a gradual improvement in the clinical condition over a period of weeks or months and a coincident rise in haemoglobin and plasma protein levels. As in the pregnant women, no marked reticulocyte crisis occurred, and this is understandable if there is a deficiency of protein rather than of specific haemopoietic substances. The anaemia would thus be unlike that present in pernicious and similar anaemias, where microquantities of a haemopoietic substance are deficient, the other requirements of haemoglobin production being available. Here it is probable that the materials from which haemoglobin is made are defective or deficient, and this can be corrected only gradually.

The slowness of the therapeutic response in malnutrition and undernutrition has been commented on by many workers. Keys *et al.* (1950b), reviewing the literature on starvation during and after the two world wars, state that the plasma protein level in malnourished persons given a liberal diet increases at only a slow rate. This is understandable on the basis of work done by Elman *et al.* (1942), who from experiments on dogs found that a deficiency of 1 g. of plasma protein is equivalent to one of approximately 30 g. of body protein. Thus by computing the plasma protein deficit and multiplying by 30 a rough indication of the total body protein deficit can be reached. In protein-deficient dogs Elman *et al.* noted that, although infusion of

plasma or amino-acids temporarily raised the plasma protein level, it was only after the total body protein deficit had been replaced that permanent elevation of plasma protein level occurred. On the basis of the plasma protein values and the estimated plasma volume the mean total initial body protein deficit in children in this series can be computed as approximately 450 g. per child. According to the League of Nations (1936) standards the mean daily protein requirement for growth and metabolism of those children worked out at 41 g. It is thus clear that, with these large deficits to make good, a diet containing more than 41 g. of protein daily would be needed for a considerable period before normal plasma protein values could be obtained and maintained.

Reticulocyte Ripening

The rate at which reticulocytes ripened was studied in two children. In the first the estimations were made at an interval of three weeks, during which the haematological values of the plasma proteins had not changed significantly. The rate at which reticulocytes ripened also remained virtually constant, the percentage present in the blood diminishing by increments of 0.5 and 0.6 per hour respectively. In the other case estimations were made at the beginning, in the middle, and at the end of a six-week period, during which the haemoglobin level had risen from 8.88 g. to 10.80 g. per 100 ml., and the plasma protein level from 4.97 g. (albumin 0.71 g.) to 5.94 g. (albumin 1.29 g.) per 100 ml. The successive rates at which reticulocytes ripened also improved, the percentage present in the blood diminishing by increments of 0.5, 0.6, and 1.0 per hour. Similar results were obtained in three pregnant women. In one whose plasma proteins had not changed significantly during three weeks the percentage of reticulocytes present in the blood decreased by 0.4 per hour at the beginning and at the end of the period. In two others whose plasma proteins had respectively improved from 7.45 g. (albumin 2.22 g.) and 6.62 g. (albumin 2.23 g.) to 7.9 g. (albumin 2.80 g.) and 7.53 g. (albumin 2.62 g.) per 100 ml., the rate of reticulocyte ripening also improved. Before treatment the percentage of reticulocytes in the blood decreased by increments of 0.64 and 0.5 per hour respectively, and after treatment in each case by increments of 1% per hour.

Nizet and Robscheit-Robbins (1950) have shown that in dogs with simple anaemia the reticulocytes ripen at the normal rate, but in those with anaemia and hypoproteinaemia ripening is delayed. They found that this delay can be overcome by adding various amino-acids or plasma proteins to the suspension, and conclude that the red blood cell at the reticulocyte stage is able to incorporate plasma proteins into itself or synthesize proteins from amino-acids. Thus if the plasma proteins are abnormal or deficient, some disturbance may take place in the ripening of reticulocytes and therefore in the formation of the mature red cell. These workers state that it is at present not clear whether man is ever subjected to protein depletion severe enough to bring about this effect. The present investigations in children and adults suggest, however, that in protein malnutrition of the kind here being discussed the disturbance is sufficient to delay reticulocyte ripening.

TABLE IX.—Haematological Values in 17 Older Children, Adult Males, and Non-pregnant Females Suffering from Protein Malnutrition

	Macrocytic (M.C.V. >95 cu.μ) (6 Cases)		Normocytic (M.C.V. 82-95 cu.μ) (2 Cases)		Microcytic (M.C.V. <82 cu.μ) (9 Cases)	
	Mean	Range	Mean	Range	Mean	Range
Hb (g%)	6.76	2.88-10.36	8.84	6.07-11.62	7.37	2.66-11.84
R.B.C. (millions/c.mm.)	2.18	1.06-3.75	3.27	2.14-4.40	3.40	1.37-4.59
M.C.V. (cu.μ)	107.84	96.24-131.03	88.98	84.50-93.46	67.94	50.50-78.29
M.C.H.C. (%)	29.37	24.00-32.66	30.87	30.35-31.40	31.91	28.27-35.39
M.C.D. (μ)	8.22	7.49-9.75	7.52	7.30-7.74	7.88	7.13-8.69
M.C.A.T. (μ)	1.37	0.77-2.10	0.73	0.59-0.88	0.86	0.66-1.15
M.C.D./M.C.A.T.	2.28	2.03-2.69	1.68	1.35-2.02	1.46	1.18-1.82
Reticulocytes (% of R.B.C.)	3.68	2.93-4.82	4.66	3.61-5.71	5.44	4.02-7.34
	4.20	0.50-12.00	0.50	0.50-1.00	1.56	0.50-4.00

Comment

These children with protein malnutrition therefore have an anaemia. They have histological evidence of liver damage, there is gross abnormality of their plasma proteins with reduction in albumin and increase in globulin, and there is evidence of arrest in the ripening of reticulocytes. The condition responds slowly to a good diet rich in protein.

Thus protein malnutrition and anaemia occur in acute or subacute forms during two phases of life in which growth is rapid: in children when the growth is that of their own body, and in pregnant women when it is that of the foetus. The question arises as to what extent protein malnutrition occurs in association with anaemia at other times of life, and, if it occurs, what are the characteristics of the anaemia.

ANAEMIA AND PROTEIN MALNUTRITION IN OLDER CHILDREN AND ADULTS

Of 21 anaemic older Nigerian children and adults studied, all complained of lassitude, weakness, and inability to carry on with their work; most of them also complained of dyspnoea. In 15 the abdomen was distended by hepatomegaly, splenomegaly, or ascites. In most instances the swelling was of considerable extent, as can be seen from Fig. 10. The liver was palpable in 13 cases and the spleen



FIG. 10

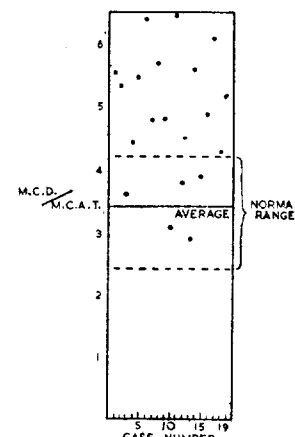


FIG. 11

FIG. 10.—Older child with ascites and cirrhosis of the liver. FIG. 11.—The ratio of red blood cell diameter to thickness in 19 older children, adult males, and non-pregnant females suffering from anaemia and chronic protein malnutrition.

in eight. The liver was 3 in. (7.6 cm.) or more below the costal margin in four cases; the spleen reached for a similar distance in three. In 11 patients there was ascites, and in 10 clinically detectable oedema. One patient complained of sore tongue. Some fever was present from time to time in most cases, but there were periods of several weeks without any rise in temperature.

Results of Investigations

Haematological Findings

The initial haematological values in 17 of these cases are summarized in Table IX; four are excluded as complete haematological investigation was not possible in these cases. Once again the anaemia was well marked, there was no great tendency to hypochromia, the M.C.D. was increased, and the M.C.A.T. diminished in almost all cases. The bone marrow was macronormoblastic, but megaloblasts were not found. Schumm's test was positive in three cases.

The Price-Jones curves were displaced to the right in all but two of the cases, in which they were centrally placed. The curves were broader than normal in all cases. The ratio M.C.D./M.C.A.T. is shown in Fig. 11, and it is apparent that in almost all cases the cells were thinner than normal.

Here, then, were a set of anaemias of considerable severity and almost all associated with hepatosplenomegaly, ascites, or oedema, and a macronormoblastic bone marrow. It was again important to exclude sickle-cell disease and parasites as causes of anaemia, and accordingly appropriate searches were made.

Parasites and the Sickle-cell Trait

Of the 17 cases subjected to detailed haematological studies the sickle-cell trait was present in one-fifth. The characteristics of the anaemia in these cases were similar to those of the others in which the trait was not present, and sicklaemia was accordingly thought not to be an important aetiological factor. Cases of anaemia in which overt malaria were found have been excluded.

Ova of *Ancylostoma duodenale* were found in the stools of eight patients, and ova of *Ascaris lumbricoides* in five, a double infection being present in three. The faeces were free from helminthic ova in seven cases. In a further case the only parasite found was *Taenia saginata*, which can be discounted as a cause of anaemia; in yet another, fatal case a single *A. lumbricoides* was found at necropsy. In most of the cases the infections were light as judged by the number of eggs present in the faeces. It is unlikely that a light infection with *A. lumbricoides* plays an important part in the causation of protein malnutrition or anaemia. If to the three cases in which this parasite alone was present are added the seven without intestinal parasites, and the one infected with *T. saginata* only, it will be seen that in 11 of the 21 cases intestinal parasites could be excluded as a cause of the malnutrition and anaemia. In more than half of the patients, therefore, it seemed unlikely that parasites were playing a part in the causation of the disease at the time of their admission to hospital.

Plasma Proteins

Analysis of the plasma proteins both chemically and electrophoretically gave similar results to those found in the children and pregnant women, the albumin invariably being reduced and the globulin greatly increased. The values in

TABLE X.—Plasma Proteins (g. per 100 ml.) in Older Children, Adult Males, and Non-pregnant Females

	12 Patients		7 Patients (Means)	
	Means	Range	Before Treatment	After Treatment
Total protein	6.07	3.93-7.30	5.84	6.34
Albumin	1.96	0.62-3.34	1.94	2.49
Globulin	3.82	2.49-5.02	3.64	3.60
Fibrinogen	0.29	0.14-0.50	0.26	0.25
A/G ratio	0.46/1	0.13/1-0.66/1	0.55/1	0.71/1
Haemoglobin	—	—	6.08	7.71

12 cases are shown in Table X, in which figures obtained before and after treatment are also given. In each of the cases the albumin content improved after treatment with a high-protein diet.

A curve typical of those obtained by electrophoretic separation of the serum proteins in the series is shown in

Fig. 12. Mean values estimated electrophoretically in 11 cases are shown in Table III. In these older children and adults the albumin deficit, and the amount of γ globulin present, were greater than in either of the other groups. This and the advanced liver changes found suggested that malnutrition was of longer standing in cases in this group than in the children and pregnant women.

One point which is clearly brought out by the figures is that the total protein value may give little indication of the disorganization which may be present in the various constituents. Thus one patient's plasma proteins amounted to 7.30 g. per 100 ml., but in that total there was only 1.87 g. albumin compared with 5.02 g. globulin. In an oedematous young male adult who died shortly after admission the figures were: total 5.48 g. (albumin 0.62 g., globulin 4.86 g.) per 100 ml. serum.

Proteins in Ascitic Fluid

The electrophoretic pattern of the proteins in ascitic fluid and the rate at which fluid accumulated were determined in two cases. It was found that in one approximately 4.6 g.,

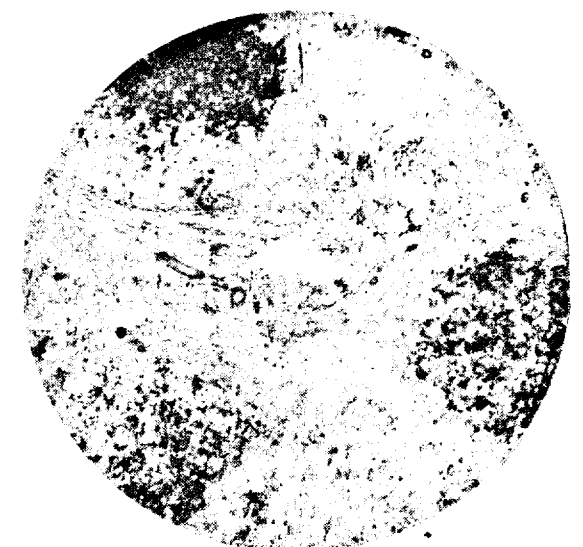


FIG. 13.—Frozen section of liver from a child who died at the age of 8 with cirrhosis of "hobnail" type. Note fibrous strands and fatty infiltration. The fat appears black in the photograph. (Stain Sudan III and haematoxylin. x35.)

and in the other 7.5 g., of protein were being lost into the fluid daily. Thus the onset of ascites in one of these malnourished persons may constitute a serious drain on protein supplies. In one case the rate of production of fluid fell from 200 ml. to 80 ml. daily after the institution of a high-protein diet. No emphasis is placed on this observation in a single case, but it fitted in well with the hypothesis that protein malnutrition was the most important factor in the causation of the ascites.

Liver Histology

Specimens of liver were obtained either by biopsy or at necropsy in all cases. Again, either fat or fibrosis was a constant finding, and in two cases cirrhosis was gross and

advanced. In one child who died at the age of 8 the liver was found at necropsy to be of the typical "hobnail" type, and in addition to being cirrhotic it was also grossly infiltrated with fat (Fig. 13). Such changes are almost certainly later chronic manifestations of the process which is seen in its early acute form in younger children and pregnant women.

One adult male who died had a primary carcinoma of the liver in addition to gross cirrhosis. On the primary nature of this growth the late Dr. W. D. Silvera and Dr. D. S. Ridley were agreed.

Hippuric Acid Excretion Test

In view of the histological and naked-eye evidence of liver damage obtained it is hardly surprising that abnormally small quantities of hippuric acid were excreted after the usual test doses of 6 g. sodium benzoate had been given. In the five cases in which this was done the mean amount of hippuric acid excreted in four hours and expressed as benzoic acid was 0.946 g., range 0.471-1.973 g. Harrison (1947) considers values below 2.5 g. to be abnormal.

Response to Treatment

In this group treatment was even more difficult than in the children or pregnant women. In general the results were poor, but small increases in haemoglobin with coincident improvement in plasma albumin were usually obtainable after the patient had been on a good diet with a supplement of casein for at least two weeks. In those having a treatable infection, such as ankylostomiasis, the outlook was more favourable. The remainder, however, all had advanced chronic liver disease and belonged to a class of patient notoriously unresponsive to treatment. The evidence pointed to the disease in these cases having reached an irreversible stage. Three of the patients died within a few weeks of admission to hospital; all had grossly cirrhotic livers.

DISCUSSION

There is, therefore, evidence that anaemia in some African older children, adult males, and non-pregnant females may be associated with chronic protein malnutrition and liver damage, and this anaemia has the same characteristics as that found in young children and pregnant women. This type of disease is very much more common in the Tropics than in temperate regions. When it occurs it seems to be more chronic than that in children and pregnant women, and unless there are aggravating parasitic factors it is even less amenable to treatment.

Thus protein malnutrition may develop in acute form in childhood and in pregnancy, both periods of rapid growth. It may occur at other times in chronic form if there is a prolonged drain on protein supplies. Some individuals are probably always bordering on this state of malnutrition, and this might be expected to affect their growth and development and to disturb their metabolic and physiological processes. Thus it has been shown by Burke, Harding, and Stuart (1943) that protein deficiency in pregnancy may lead to a low birth weight of the infant. In Nigeria infants born of women with anaemia weigh, on an average, 2 lb. (0.907 kg.) less than those of healthy women (Woodruff, 1954). Platt (1939) has shown that in malnourished children there is a stunting of growth; the growth curves begin to fall away from normal at 6 months of age, and full physical development may never take place. Anaemia and liver damage appear to be other aspects of this malnutrition syndrome.

There is another way in which the disease may manifest itself on a large scale in the Tropics, and this is in

the development of gynaecomastia. Several of the male patients in the series suffered from this, and it is a common condition in Africans, Trowell (1948) finding 25 (5%) of 500 East African railway workers so affected. Figs 13 and 14 are photographs of two of the patients

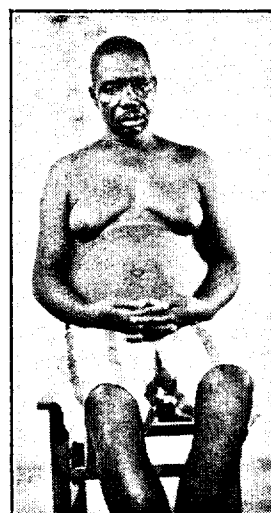


FIG. 14

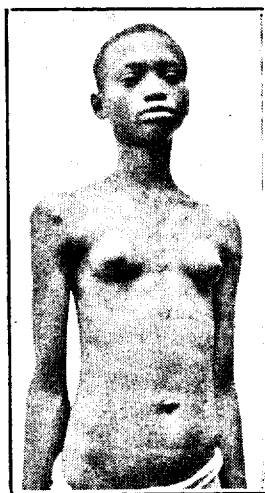


FIG. 15

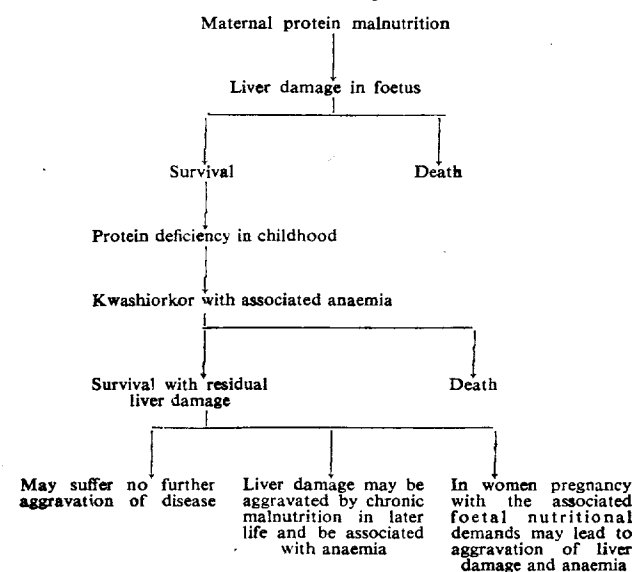
Figs. 14 and 15.—Gynaecomastia, probably resulting from liver damage caused by protein malnutrition.

studied. In these cases once again liver biopsy showed fatty infiltration or fibrosis. It seems that the gynaecomastia results from damage which renders the liver incapable of inactivating oestrogens normally produced, and this damage also is probably caused by prolonged protein malnutrition. Disturbances of this kind illustrate the gross changes in bodily functions which may occur in the syndrome.

CONCLUSIONS

This study indicates that the natural history of anaemia associated with protein malnutrition may briefly be summed up as follows:

Evolution of Nutritional Macrocytic Anaemia Associated with Liver Damage



Among certain communities children may be born with livers already damaged by maternal malnutrition. If they survive they again pass through a period following weaning during which the demand for protein imposed by growth is greater than the supply, and the liver is liable to be damaged. At these times an anaemia and other signs of malnutrition may develop. The anaemia is associated with a macronormoblastic marrow and with red cells which are broader and thinner than normal. Many succumb while passing through this stage in childhood; others recover, but probably the majority of these latter are left with some hepatic damage and fibrosis. Nevertheless the functional reserve of the liver is such that, in spite of this, the patient manages until he or she passes through a period in which demands for protein are again in excess of the available supply. In women this state may occur in acute form during pregnancy, foetal growth being the precipitating factor. In adult males and non-pregnant females the disease is less common, but when seen in hospital practice in Nigeria it usually represents a late stage of a chronic process. It develops if the diet is markedly and chronically deficient in protein, and particularly if parasites impose an additional drain on deficient supplies of nutrients. In these cases one of the factors in the causation of the anaemia may be that haemoglobin in its production can draw on plasma proteins, as has been shown by Whipple (1948), and thus when these proteins are abnormal or deficient the production of haemoglobin may be affected. In these cases abnormality, as distinct from deficiency, of plasma proteins may arise from the production of antibodies containing protein, or from liver disease, it being established that the liver plays an important part in protein synthesis.

The characteristics of protein malnutrition in Nigerians are similar whether it occurs in childhood, in pregnancy, or in adult life unassociated with pregnancy. In many cases the disease starts in early life, or even in intrauterine life, and progresses as it is aggravated during periods of growth or deprivation until finally it ends in advanced hepatic cirrhosis with all its concomitant haematological and other features. This stage may even be reached in childhood.

Many of the clinical and pathological states considered in this work are gross and unlikely to be encountered in Great Britain. Nevertheless they provide an insight into the function of various organs and tissues, and into processes which may affect the body in a less florid form in the temperate zones in conditions—such as nephrosis, exudative dermatoses, burns, alcoholism, and cirrhosis of the liver—resulting from non-nutritional causes.

Finally it should be added that Dr. Goulston clearly wished these lectures to illustrate disease processes, for he directed that they should be read "on some dead body, if possibly it can be procured, which shall then and there be dissected for the diseases treated of, and shall afterwards be buried." It is hoped that this study of the natural history of anaemia associated with protein malnutrition may have applications which extend beyond the syndrome seen in the Tropics to disease processes encountered in other regions of the world.

I am grateful for help and co-operation received from many persons while carrying out this work, particularly from Professor A. Brown, Mr. J. B. Lawson, Dr. A. B. Tompkins, and Dr. K. Mellanby. To Professor B. S. Platt I am indebted for much helpful criticism. For technical assistance I wish especially to thank Mr. L. E. Pettitt, Mrs. A. Walshe, and Miss I. Florence.

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A plea for more enlightened treatment of criminals was made by Sir DAVID HENDERSON in the Morison lecture on "Society and Criminal Conduct," which he delivered last December at the Royal College of Physicians of Edinburgh. He declared that further research must be devoted to the causation and motivation of abnormal conduct. By the time criminal behaviour had been fully established it was often irremediable. The law must be sufficiently elastic to take cognizance of all the data, hereditary, physical, and social, surrounding criminal behaviour. Society must take care that the law is not merely a system of revenge. "We may extol the reformatory outlook, but the spirit of revenge and retaliation, of hate and anger, and resentment, has its roots dug deep." His analysis of 150 "lust cases" shows the difficulty of reconciling the legal with the medical approach; a disturbing feature of homosexual cases was the inconsistency of the sentences imposed. Of 129 reprieved murderers, 112 had made a satisfactory readjustment to society. The 150 lust cases showed 81 sane, 17 insane, 26 defective, and 26 psychopathic. Sir David said he had come to believe that abnormality and unsoundness of mind could not be accepted as synonymous. Abnormality demanded an individual approach which could be effected only through clinical research. There was a close parallel between mental illness and the disorders that resulted in crime; both were best treated at a preventive level.

EXPRESSION OF THE SICKLE-CELL GENE IN AFRICA

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It has always been difficult to reconcile the accepted theory of the inheritance of sickle-cell anaemia with the facts found in Africa. Neel (1947, 1949) and Beet (1949) concluded that the sickle-cell gene was harmless in the heterozygote but produced sickle-cell anaemia in homozygotes. Although the sickle-cell trait has been found to be present in 20, 30, and even 40% of individuals in some African peoples, the anaemia is considered to be rare in adults. In infants, however, it has been found to occur with a frequency which falls well within the range of the expected incidence of homozygotes (J. and C. Lambotte-Légrand, 1951; Foy, Kondi, and Brass, 1951; Vandepitte and Louis, 1953; Hutton, 1953; Welbourn and Raper, 1954). Nevertheless one of us stated: "I do not believe that in Uganda we could have overlooked sickle-cell anaemia present in all homozygous carriers of the trait. Even if they had died in early infancy, it would have been such a 'slaughter of the innocents' that it could not have escaped our attention" (Lehmann, 1952).

A high incidence of the trait in an adult population with a low incidence of sickle-cell anaemia could be explained most easily by the early death of affected infants. Such a removal of the gene, however, before the age of procreation should lead to a fall in the sickling incidence. Neel (1953) has suggested that the high incidence of the trait found in certain peoples might be explained either (a) by a very high rate of mutation from the gene for normal haemoglobin to that for haemoglobin S, sufficient to replace the loss by death from sickle-cell anaemia, or (b) by a reproductive advantage over the normal or non-sickling homozygote conferred on the heterozygote by the haemoglobin S gene balancing the disadvantage of the anaemia in S homozygotes—the theory of balanced polymorphism. Neel thought that there was some evidence of an increased mutation rate in his family studies in the U.S.A.; but Vandepitte (1954), in the Belgian Congo, could find no evidence of a mutation rate sufficient to replace the loss of S homozygotes in infancy. Balanced polymorphism has been proposed as a possible mechanism for the maintenance of congenital anaemias by Haldane (1949) and for the survival of the sickle-cell trait by Beet (1946, 1947), by Raper (1949), and particularly by Brain (1952a, 1952b). They all suggested that the sickle cell might be more resistant to tropical parasites, particularly the malaria parasite.

Allison (1954) was the first to report very striking differences in the degree of incidence of malaria parasites in sicklers and non-sicklers, though his work has been challenged by Moore, Brass, and Foy (1954). Recently Raper (1954) has reported a statistically significant difference in the degree of parasitaemia of sickling and non-sickling children during the second year of life.

There exists, however, yet a third possible explanation of the high incidence of the S gene which can be added

to those described. If it was found that some healthy African adults were homozygous for the S gene, it would explain in part why sickle-cell anaemia is not found with the expected frequency in adults and why the trait is inherited more often than one would expect if all the homozygotes died in early infancy. One of us (Edington, 1953) was struck by the histories given by patients suffering from sickle-cell anaemia in the Gold Coast. Symptomatically these patients improved with advancing years. One patient aged 44 had been free from crises for nine years and had had six children, three of whom were alive and well; another, aged 39, was suffering from sickle-cell anaemia but had five children who were all alive and well. In view of the discovery, however, of modified sickle-cell anaemia in individuals heterozygous for S and another inherited abnormality of haemoglobin (sickle-cell-thalassaemia, sickle-cell-haemoglobin C disease, sickle-cell-haemoglobin D disease; see Itano, 1953a) there was a possibility that these patients were not the true S homozygotes, as electrophoretic analyses of the haemoglobins had not been performed.

Electrophoretic Tests

Until recently the study of the genetics of sickling depended on the testing of whole families for the presence or absence of the sickling character in the red cells and on the clinical condition of those showing sickling; the diagnosis of homozygosity and heterozygosity was subject to considerable doubt. With the introduction of electrophoretic tests on haemoglobin there is now no reasonable doubt that, subject to certain rare exceptions, a determination of the genotype can be made by means of a single test on the blood of an individual, and need not depend on a study of the rest of the family. Normal non-sickling persons show as a rule 100% of haemoglobin A, and in any case no haemoglobin S. Heterozygous sicklers have both types of haemoglobin, while homozygous sicklers have mainly haemoglobin S, together usually with a varying amount of persistent foetal haemoglobin (haemoglobin F) but no haemoglobin A.

There is very strong evidence that genes for haemoglobins A, C, D, E and G, and S belong to a series of multiple alleles, so that all homozygotes and all heterozygous combinations of them can be diagnosed electrophoretically, except that haemoglobins D and S are indistinguishable, as they have the same electrophoretic mobility. Homozygous haemoglobin D (never yet found) could certainly be distinguished by the absence of sickling, but SS and SD can be separated only by solubility measurements. Haemoglobin S is much less soluble in the reduced state than haemoglobin D; thus SS and SD can be separated by their different solubilities. To establish the claim that an individual is a homozygote for haemoglobin S, electrophoretic and solubility studies are therefore necessary. As S homozygotes also possess foetal haemoglobin, a possibility arises that individuals with sickle-cell-thalassaemia disease (SAF) could be mistaken for S homozygotes (SSF).

As Itano (1953a, 1953b) has pointed out, the solubility of the haemoglobin of an SS individual depends on the proportion of F being present; thus the solubility of haemoglobin from an S homozygote with a high proportion of persistent F may be within the same range as the solubility of the haemoglobin of a patient with sickle-cell-thalassaemia disease, in whom the proportion of S is high and that of F moderate and A low. If the amount of A is small—up to 8.2%—it may escape detection by electrophoresis (Singer and Fisher, 1953). Thus a sickle-cell homozygote with a high percentage of foetal haemoglobin and a sickle-cell-thalassaemia individual may not be differentiated by electrophoresis (though this will be exceptional), and the solubility of the two haemoglobin mixtures may be within the same

range, the upper range for that seen in SS homozygotes. If such a finding is made the only recourse is still the family study. However, thalassaemia has never been found in the Gold Coast, in spite of an exhaustive search. This was stimulated particularly by a high incidence of target cells (Edington, 1953).

We have recently conducted a survey of Gold Coast Africans for abnormal haemoglobins (Edington and Lehmann, 1954), and were particularly interested in trying to discover whether in such an investigation symptomless homozygotes for the S haemoglobin could be found. Of the 200 individuals examined, 38 were sicklers, and two of these were homozygous for the S gene (which incidentally would be the expected incidence for homozygotes).

Case 1

J. A. S., a plethoric African man of the Gã tribe aged 40, reported to the out-patient department of the Gold Coast Hospital complaining of epigastric pain occurring about half an hour after meals during the last six weeks. Previous history, family history, physical examination, and laboratory and radiological investigations revealed no abnormality apart from sickling of the erythrocytes and that the patient was symptomatically relieved by alkalis. He had had three children, one of whom, a son aged 22, was alive and well. A boy aged 14 had died of dysentery and a girl aged 7 of "measles." When the analysis of the haemoglobin revealed that J. A. S. was an S homozygote further investigations were made. On direct questioning he admitted that he had suffered from "rheumatism" in childhood. At the age of 8 he had had attacks of pain in the larger joints of the limbs accompanied by fever; these attacks occurred about ten times in that year and gradually lessened in frequency and severity until they ceased at the age of 18.

Laboratory Investigations.—Urine: no sugar, bile, albumin, casts, or urobilin. Kahn test negative; van den Bergh negative; serum bilirubin, 0.3 mg. per 100 ml.; haemoglobin (Grey wedge), 13 g. per 100 ml.; red cells, 4,600,000; reticulocytes, 1.2%; white cells, 5,400; P.C.V., 43%; sickling of the erythrocytes—no filamentous forms noted; thin film and differential count revealed no abnormality apart from the presence of scanty target cells (less than 4%).

Case 2

E. B. A. D., a well-built man of the Akwapim tribe aged 30, reported to the out-patient department of the Gold Coast Hospital complaining of a "rash." He was suffering from a mild neurodermatitis which cleared rapidly with treatment. Analysis of the haemoglobin revealed that he was an S homozygote.

On direct questioning he admitted that he had suffered from attacks of pain in the larger joints which had begun at the age of 12 and were worse in the rainy season. During these attacks his eyes were yellowish and his urine was highly coloured. The attacks were never severe, and ceased at the age of 25, when he stopped playing football—to which game he attributed the illness. His parents were dead, cause unknown. He is married with one child alive and well. Physical examination revealed no abnormality. Neither the liver nor the spleen was palpable.

Laboratory Investigations.—Kahn test negative; serum bilirubin, 0.7 mg. per 100 ml.; haemoglobin (Grey wedge) 15.5 g. per 100 ml.; red cells, 4,860,000; reticulocytes, 1%; white cells, 4,600; P.C.V., 48%; no abnormality detected in the thin film. Urine: urobilin present in a dilution of 1:2.

Investigation of the Haemoglobins

The chemical investigation of the two bloods showed all the features usually considered typical of sickle-cell anaemia. Fig. 1 shows the electrophoretic pattern of the haemoglobin of both individuals—a single band in the S position. Both bloods contained foetal haemoglobin determined by alkali denaturation (Singer, Chernoff, and Singer, 1951). The

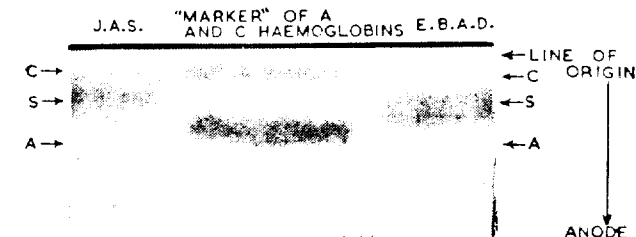


FIG. 1.—The blood of J. A. S. and E. B. A. D., two Gold Coast Africans, is compared by paper electrophoresis with a blood containing as a "marker" A and C haemoglobins. Both individuals show a single band in the S position. Foetal haemoglobin was found by chemical means, but it does not separate on paper electrophoresis from A or S haemoglobin. The haemoglobins are photographed unstained (for detailed technique see Lehmann and Smith, 1954).

solubility of the haemoglobins determined after Itano (1953b) certainly for the first individual fell well within the range of the solubilities found by that author only in sickle-cell anaemia (<0.44 g./l. of 2.24 M phosphate buffer).

	% Alkali-resistant (Foetal) Haemoglobin	Solubility in g./l. of 2.24 M Phosphate Buffer
J. A. S.	5.2	0.15
E. B. A. D.	24.2	0.50

The second individual shows a high foetal haemoglobin and the solubility is within the range for that seen in both sickle-cell anaemia and sickle-cell-thalassaemia disease (0.44–0.90 g./l. of 2.24 M phosphate buffer). It has already been pointed out that the possibility of finding the sickle-cell-thalassaemia disease in the Gold Coast can be disregarded, and so far as the major argument of this communication is concerned it may be stated that from the accepted point of view both sickle-cell homozygotes (SSF) and sickle-cell-thalassaemia individuals (SAF) should be suffering from anaemia.

It thus seems that, at least in the Gold Coast, the homozygous inheritance of the S gene can be a benign condition which would be missed in ordinary clinical and haematological investigations and which may be detected only by the analysis of the haemoglobin.

The Sickle-cell Trait

While it has been shown that every sickle-cell haemoglobin homozygote need not suffer from a severe disease, it cannot, on the other hand, be taken for granted that the heterozygous condition will always be entirely harmless and express itself solely as a trait rather than as a disease. Haematuria due to pathological lesions in the kidney and ascribed to the presence of the sickle-cell trait has been described in American negroes (Harrison and Harrison, 1952). Vernier (1955) summarizes 35 reports of one-sided renal haemorrhage in sickle cell individuals, most of them sickle cell trait carriers.

We have recently seen in Accra a girl of the Gã tribe, aged 18, suffering from haematuria, whose haemoglobin on electrophoretic analysis revealed the presence of the trait—that is, of both normal and sickle-cell haemoglobin. No history of previous illness was given and the physical examination revealed no abnormality. The results of the laboratory investigations were as follows. Urine: numerous red blood cells present; a few of them were abnormally shaped, but no definite sickle cells were seen. Culture was sterile and guinea-pig inoculation was negative. Serum bilirubin, 1.2 mg. per 100 ml.; direct van den Bergh test negative. Hb, 12.3 g. per 100 ml.; red cells, 4,320,000; reticulocytes, 2.8%; white cells, 8,100; P.C.V., 33%; sickling positive. A peripheral blood film showed many target cells with an occasional poikilocyte and polychromatic red cell. The alkaline phosphatase and thymol turbidity were within normal limits. The haematuria cleared within a few days, but no follow-up was possible. It cannot be claimed that the presence of the trait was definitely responsible for this girl's symptoms, but in view of the reports in the American literature it must be considered in the differential diagnosis of the condition.

The sickling phenomenon may certainly play a part in the terminal phases of other diseases where the picture of the crises can be seen at necropsy without evidence of previous acute episodes (Thoma, 1953). At the present moment it is not clear whether these crises, which are not uncommon in the Gold Coast (Edington, 1951, 1955), occur most often in the S homozygote, in the heterozygote for S and normal haemoglobin, or in the individual bearing the S gene in combination with some other abnormal haemoglobin. In an attempt to elucidate this problem we have recently begun to examine electrophoretically the blood of all subjects coming to necropsy, and the crisis has been noted in one woman suffering from sickle-cell haemoglobin C disease. In addition, however, the blood of another woman (K.L.), who presented at necropsy the typical features of the crisis, revealed on electrophoretic analysis the presence of the trait only (normal and sickle-cell haemoglobin) (Fig. 2), as is described in detail below.

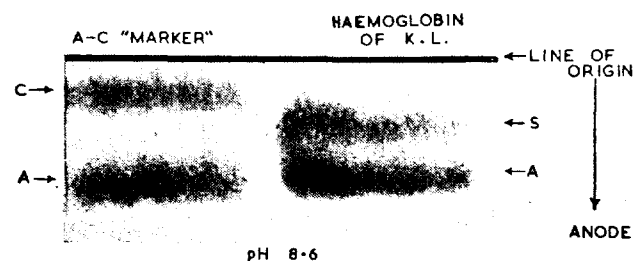


FIG. 2.—The blood of K.L., who died in sickle-cell crisis, is compared by filter-paper electrophoresis (for details see Lehmann and Smith, 1954) with a "marker" blood from an individual heterozygous for A and C haemoglobins. The haemoglobin of K.L. shows bands in the S and A position. K.L. is heterozygous for A and S haemoglobins.

Crisis in a "Sickle-cell-trait Carrier"

K.L., an African woman of the Gã tribe aged 23, was admitted to the Maternity Hospital, Accra, in a comatose condition. Shortly after admission she died following the expulsion of a hydatidiform mole. She had had one previous child, who had died in infancy. No history of previous illnesses was obtained from the relatives. The patient had been ill for two weeks with fever. Substernal pain and cough had been noted during the last week and she was thought to be three months pregnant.

Necropsy Report.—The body was that of a well-built plethoric African female. The sclerae were slightly jaundiced. There was frothy mucus in the trachea and the lungs were congested and grossly oedematous (795 g.). Heart: the left ventricle was hypertrophied; no lesions of the myocardium, valves, or coronary arteries were noted (320 g.). The liver was congested (1,975 g.). The spleen was enlarged, rubbery in consistency, and dark blue in colour (495 g.). The cut surface was dark red and did not bleed on section. The uterus was enlarged to the size of a three-months pregnancy. No abnormal blood clot was present and the placental site appeared macroscopically normal. The remaining abdominal organs exhibited intense pallor and the kidneys were oedematous. The sternal marrow was dark red and dry. The brain was pale and the vessels contained watery blood. The heart's blood showed sickling on direct examination, and electrophoretic analysis of the haemoglobin revealed the presence of sickle and normal adult haemoglobins (Fig. 2).

Histological Examination.—All organs were fixed in 10% formol saline and transferred to formol sublimate saline before embedding. **Liver:** The sinusoids were congested and contained numerous white blood cells; the Kupffer cells were distended and contained numerous sickled erythrocytes; free iron-containing pigment was present in the Kupffer cells and periportal parenchymal cells. **Haemofuchsin** was not detected; a little malarial pigment was present. **Spleen:** There was gross congestion and haemorrhage and the sinuses were stuffed with sickled cells; the Malpighian corpuscles were widely separated and com-

pressed; the germinal centres were hypertrophied and surrounded by a narrow rim of lymphocytes; traces of free iron-containing pigment were present; a reticulin stain showed interruption of the normal reticulin pattern in the areas of haemorrhage. **Uterus:** Tags of placenta were adherent and a marked polymorphonuclear infiltration with small abscesses was present. **Lung:** The smaller vessels were congested with sickled erythrocytes. The alveoli showed gross oedema and heart failure cells were present. **Kidney:** An occasional hyalinized glomerulus was noted, and there were occasional casts in the collecting tubules. Thrombosed vessels were not noted and no free iron was present. Apart from a normoblastic hyperplasia seen in the sternal marrow no other abnormality was noted in the remaining organs.

Comment.—The gross pathology of the spleen and the histopathology of the liver and spleen were those found in the sickle-cell crisis. Mild haemolysis was also probably present, as shown by the presence of jaundice, iron pigment in the Kupffer cells, and a normoblastic hyperplasia of the sternal marrow. This was probably not of long standing, as there was only a little free iron in the spleen, and none in the kidney. Undoubtedly a septicaemic element was also present, and it is difficult to decide what part this played as an eventual cause of death. It is considered that the terminal crisis was probably initiated by the septicaemic condition and was directly responsible for death.

Discussion

Two Gold Coast Africans, to all intents and purposes healthy, have been found to be homozygous for the sickle-cell gene. Previously it had been thought that most patients suffering from sickle-cell anaemia died in childhood, and it was difficult to explain the high incidence of the trait in certain communities because of this belief. At the present time the mortality occurring in S homozygotes is not known, but it is possible that a considerable number reach adult life, procreate, and lead relatively normal lives. One of us (G.M.E.) has now observed over 50 patients suffering from sickle-cell anaemia, and the prognosis, in the Gold Coast at least, is by no means gloomy. Many of these patients have improved with the passing years and are able to lead useful and normal lives. It is too early yet to venture an opinion on the fertility of these patients, as the majority were children when first seen and have not yet reached the age of marriage, but from the histories obtained in the older patients it is not expected that fertility would be greatly impaired. The survival of the relatively healthy homozygote may be a potent factor in maintaining a high incidence of the trait in certain peoples.

On the other hand, there is no doubt that sickle-cell anaemia is the cause of considerable mortality, the exact extent of which is unknown, and in this communication it has been suggested that the trait itself may be by no means harmless. It is impossible to say to what extent procreation by S homozygotes helps to balance the mortality caused by the sickling phenomenon, but this possibility must be taken into account, in addition to the possible protection afforded by the trait against malaria and a possible high mutation rate of the S gene, when discussing reasons for the persistent high incidence of the trait in certain African and Indian peoples.

Summary

Of 200 individuals examined in the Gold Coast, 19% showed sickling and two (1%) were found to be homozygous for S haemoglobin. They were adults not suffering from sickle-cell anaemia, yet chemically their haemoglobin was indistinguishable from that of such patients.

A sickle-cell crisis is described in a woman heterozygous for sickle-cell and normal haemoglobin.

These findings, and their bearing on the current theories on the expression of the sickle-cell gene and its population dynamics, are discussed.

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OSTEOMALACIA IN VON RECKLINGHAUSEN'S NEUROFIBROMATOSIS

METABOLIC STUDY OF A CASE

BY

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Von Recklinghausen's neurofibromatosis is a hereditary and familial disease. It is characterized by lesions of skin, nerve, and bone. Skeletal abnormalities are said to occur in 7% of cases (Gould, 1918; Reuben, 1934). The commonest abnormality is scoliosis (Hagelstam, 1946; Fairbank, 1951). There may be overgrowth or undergrowth of individual bones, while neurofibromata may erode the bones from the periosteum or cystic changes may occur in bone.

Apart from neurofibromatous affection of bone, the occurrence of osteomalacia in association with neurofibromatosis has been reported too often to be a chance finding. Gould (1918) reported typical histological findings of osteomalacia in five cases of von Recklinghausen's disease which he examined *post mortem*. He gave no indication of the aetiology. Since then further cases have been reported but without full metabolic investigations. Merklen and Israel (1934) described a case of von Recklinghausen's disease with general rarefaction of bone and Milkman's syndrome. Milkman's syndrome is now generally believed to be invariably due to osteomalacia. Nørgaard (1937) described many radiological abnormalities of the skeleton in two cases.

In Fig. 3, Case 1, of his article it can be seen that the x-ray film of the pelvis shows a pseudo-fracture through the left inferior pubic ramus and another through the superior pubic ramus. The patient was 22 years old, and an x-ray film one year previously showed no pseudo-fracture. This patient then was undoubtedly suffering from osteomalacia. Hernberg and Edgren (1949) reported the case of a woman aged 32 with neurofibromatosis of skin and multiple pseudo-fractures (Looser-Milkman syndrome). She had a serum inorganic phosphorus of only 2 mg. per 100 ml. with normal calcium, and was given 11 million units of vitamin D in twelve weeks with no apparent effect until eight months later, when healing occurred. They suggested that this might be a "parallel phenomenon" to von Recklinghausen's disease or raised resistance to vitamin D. Since then knowledge of the pathogenesis of osteomalacia and rickets has advanced, and it is now clear that these cases are due to a hereditary abnormality of the renal tubule. Dent (1952) described two cases of osteomalacia in von Recklinghausen's disease which he considered to be due to resistant rickets (Types I and II respectively). Fraser and Nordin (1953) reported a case which they felt was due to resistant rickets. Swann (1954) also reported several cases of this syndrome.

We are recording a further case in which the opportunity was taken to make metabolic studies on varying doses of vitamin D, proving conclusively that this disease falls into the group known as resistant rickets. In addition, biopsies were made from affected bone, and the results of these are also reported.

Case History

The patient was a man aged 55 who for seven months before admission had increasingly severe backache, made worse by coughing and sneezing. More recently he noticed aching pain in his shoulders, left ankle, and left foot. Walking was almost impossible. His general health was satisfactory, but he had always had a "weak bladder" and passed urine every 1½ hours by day, and two or three times at night. He had had no relevant past illnesses, apart from "fits" as a child. His father and paternal grandmother had had neurofibromatosis.

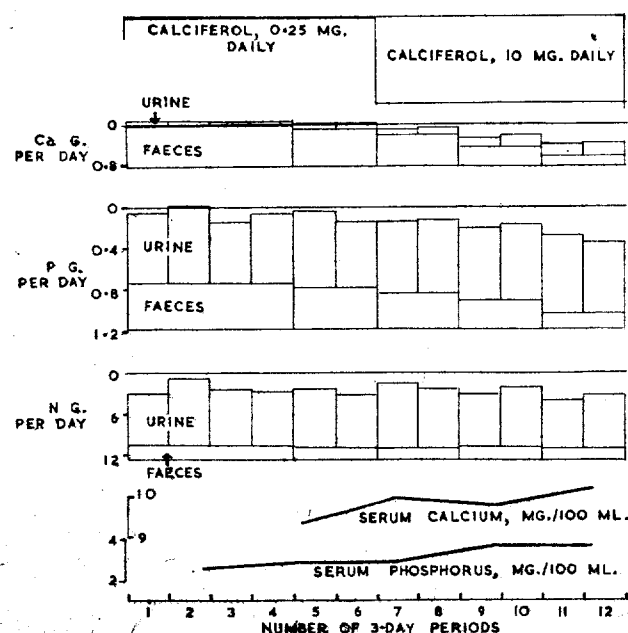
Examination revealed a stunted little man with typical skin lesions, both pigmentation and tumours, covering the trunk, head, neck, and limbs. The right leg was 1½ in. (3.8 cm.) shorter than the left, and all the muscles below the right knee were partially atrophied. There was a tarsal equinovarus deformity of the right foot. He gave the impression of being of rather low intelligence, and was virtually illiterate.

Investigations.—Haemoglobin, 98% (14.5 g. per 100 ml.); W.B.C., 6,750 (normal differential count); E.S.R., 3 mm. (Wintrobe). Urine: normal cytology; sterile on culture, no albumin or sugar. Serum calcium, 9.9 mg. per 100 ml.; phosphorus, 2.2 mg. per 100 ml.; alkaline phosphatase, 14.5 King-Armstrong units; potassium, 5.3 mEq/l.; alkali reserve, 29 mEq/l.; blood urea, 37 mg. per 100 ml.; plasma protein, total 6.9 g. per 100 ml. (albumin 3.2 g., globulin 3.7 g.). Urea clearance, 63% of normal (uncorrected). Glucose-tolerance test, normal, rising from 70 to a maximum of 151 and back to 70 mg. per 100 ml. in two hours. Sugar appeared in the urine at the height of the curve. Paper chromatography of urine: No aminoaciduria; superglycine pattern present, which we have come to associate with osteomalacia in the adult (C. E. Dent). X-ray examination showed multiple fractures of ribs ("There is an opacity in the right lower zone which on lateral view is seen to be below the diaphragm, which is tented up over it.") There was some kyphosis and some demineralization of the

spine. "The tibiae and fibulae are markedly porotic. There is a cystic appearance at the upper and lower ends of the left fibula and the upper ends of the tibiae. There is a pseudoarthrosis at the lower end of the left fibula, resulting in valgus deformity of the ankle. There are pseudofractures through the lower third of the shaft of the left tibia and neck of right femur." Fat balance: On 80 g. intake there was 93% absorption over twelve days. The patient required four daily doses of 700 mg. of ascorbic acid orally before he was "saturated."

Pathological Report.—Biopsy specimens were taken from the left femur and left fibula, including the pseudoarthrosis, and also a chip from the tibia in the region of the pseudo-fracture, three months after treatment. *Resected portion of fibula:* The specimen consisted of a length of fibular shaft approximately 2 in. (5 cm.) in length. The upper part was reasonably normal in its external appearance, while the lower part was irregular in contour and ended as one surface of a pseudoarthrosis. Histologically the lower part of the bone was extremely osteoporotic, and its periosteal surface was deeply indented by irregular masses of mucoid fibrous tissue. Degenerated cartilage and fibrocartilage covered the surface of pseudoarthrosis. The upper part of the bone was slightly osteoporotic; excessive amounts of osteoid tissue could not be demonstrated in either situation. *Biopsy from tibia:* Sections showed that the localized rarefaction evident clinically at the site of biopsy (an "Umbauzone" of Looser) was the result of resorption of bone. Haversian spaces were greatly enlarged: there was some irregular new formation of bone, including some periosteal new bone. There was no evidence of excessive amounts of osteoid tissue on the surface of either the compact or the trabecular bone.

Metabolic Procedure.—The patient was admitted to the metabolic ward at the country branch of the Royal National Orthopaedic Hospital. He was not confined to bed, but allowed to sit in a chair. The metabolic regime and the collection of excreta followed the methods advocated by Albright and Reifenstein (1948). Urine was collected in three-day and six-day periods. Food was prepared by the dietitian in the metabolic unit kitchen. Bulk supplies of meat, biscuits, and homogenized milk were used. Bread was made in the unit from unfortified flour.



In these metabolic charts the intakes are measured vertically downwards from the baseline marked O. Positive balance is indicated by the fact that the rectangles showing urinary and faecal output fall below this baseline—that is, excretion is less than intake; and negative balance when they reach above the baseline—that is, excretion is greater than intake.

Distilled water was used throughout. The diet was analysed twice during the balance. The patient was on this diet eight days before balance studies were recorded.

The diet contained; calcium, 813 mg. per day; phosphorus, 1,184 mg.; nitrogen, 12.55 g. Three litres of distilled water was given daily. Balance data for calcium, phosphorus, and nitrogen for six consecutive six-day periods are shown in the Chart. The following points will be noted:

Six-day Periods 1-3.—Patient was given 0.25 mg. (10,000 units) calciferol daily. Faecal calcium was equal to dietary intake with low normal urine calcium. The slightly lowered faecal calcium in period 3 is exactly accounted for by slightly lowered faecal nitrogen, and is therefore due to variation in faecal collections. The net balance for calcium was negative. Phosphorus and nitrogen balance was positive.

Six-day Periods 4, 5, and 6.—Patient was given calciferol 10 mg. (400,000 units) daily by mouth. This resulted in a steady decrease in faecal calcium with a slight rise in urine calcium, bringing the patient into strongly positive balance for calcium and phosphorus. The rapidity of this response shows that the dose of calciferol was unnecessarily high. With the improvement in the calcium and phosphorus balance the serum inorganic phosphorus rose from 2.6 mg. to 3.6 mg. per 100 ml.

Discussion

Osteomalacia results from under-saturation of body fluids with respect to calcium and phosphate ions. This leads to a failure to precipitate calcium salts in the organic matrix of bone. It is manifested by a lowered serum calcium or inorganic phosphorus, or both, with demineralization of bones. The latter may be generalized or localized in the pseudo-fractures described by Looser, and which Albright and Reifenstein (1948) considered to be pathognomonic of osteomalacia.

Osteomalacia can occur from a variety of conditions which, by one means or another, lower the ionic product of calcium $\times$ phosphorus. These are now considered in relation to our own patient.

1. Dietary.—Deficiency of calcium salts or vitamin D. Our patient's diet contained a high proportion of bread and cheese containing adequate calcium salts, and was in fact deficient only in ascorbic acid, and even this had caused no signs or symptoms of scurvy.

2. Absorption Defect.—The commonest cause of osteomalacia in this country is steatorrhoea. The patient gave no history of bowel abnormality. A 12-day fat balance showed 93% of fat absorption on a daily intake of 80 g., during which time metabolic studies showed him to be in negative calcium balance. Moreover, a normal urine calcium excretion virtually excluded a diagnosis of steatorrhoea.

3. Renal Acidosis.—The patient did not have acidosis. Urine calcium was not high. He did not have aminoaciduria.

4. Resistant Rickets Group—Renal Tubular Defect with Hypophosphataemia.—Balance studies show that on a normal intake of calcium and phosphorus, and despite 0.25 mg. (10,000 units) of calciferol daily, he still failed to maintain a normal serum inorganic phosphorus and was in negative balance for calcium, mainly due to high faecal excretion. The positive balance for phosphorus was accounted for by the positive nitrogen balance. On administration of 10 mg. (400,000 units) of calciferol daily, the patient went into strongly positive calcium and phosphorus balance, and the serum inorganic phosphorus rose from 2.4 to 3.7 mg. per 100 ml. He has since been maintained on half of this dosage of calciferol, with remission of all symptoms and healing of his pseudo-fractures.

This type of balance chart is highly characteristic of cases of resistant rickets in adults or older adolescents. The total lack of response to 10,000 units of calciferol daily is quite unlike other types of osteomalacia, which are

particularly sensitive to these small doses (Bauer and Marble, 1932). On the other hand, the immediate and considerable improvement in calcium and phosphorus balance on massive doses of calciferol indicates that osteomalacia is present but "resistant" to doses of calciferol which would cure other types of the disease than resistant rickets. It has been shown by Bauer, Marble, and Claflin (1932) that normal subjects on large doses of calciferol will show a prompt improvement in absorption of calcium and phosphorus, but, unlike osteomalacics, there is an equally great increase in urinary calcium and phosphorus, so that the calcium and phosphorus balance is not improved. In our case the marked improvement in calcium and phosphorus balance on high doses of calciferol confirms that the patient was suffering from osteomalacia.

The histological criterion of active osteomalacia is the presence of excessive osteoid disposed as wide bands of pale staining tissue on the surface of both compact and trabecular bone. In the present case, although evidence of osteomalacia had been clear, the absence of this histological feature at the time of biopsy after three months of high dosage with vitamin D indicates that remineralization of osteoid had been effected.

Summary

Metabolic balance studies on a case of von Recklinghausen's neurofibromatosis with osteomalacia is presented.

The association of the two diseases is noted, and proved cases previously mentioned in the literature are quoted.

The aetiology of the osteomalacia is shown to be a renal tubular defect, presumably congenital, which brings it into the group of diseases usually known as resistant rickets.

Bone biopsy showed that there is osteoporosis as well as osteomalacia. The cystic appearance of bone is due to combined osteoporosis with deep indentation of bone by mucoid fibrous tissue originating from the periosteum. There was no histological evidence of osteomalacia at the time of biopsy, presumably as a result of treatment.

We wish to thank Dr. James Dow for referring this case to us; Mr. John W. Woolen for the serum analyses and fat balances; Miss Patricia Carroll for her help in the routine chemical investigations; and the nursing staff of the metabolic unit for their care of the patient during the prolonged periods involved in these balances.

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POST-OPERATIVE STAPHYLOCOCCAL ENTEROCOLITIS DURING ANTIBIOTIC THERAPY

BY

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Staphylococcal enteritis during antibiotic therapy is now of clinical importance. An antibiotic-induced intestinal bacterial vacuum in the recipient renders conditions very suitable for colonization by resistant staphylococci (Smith, 1952). Though chlortetracycline ("aureomycin") and oxytetracycline ("terramycin"), the most potent producers of an intestinal bacterial vacuum, have normally been incriminated, chloramphenicol, and penicillin and streptomycin together, have also been blamed. Zischka (1950), quoted by Herrell *et al.* (1953), even described a case following sulphaguanidine therapy. Parenteral administration has also produced the condition (Reiner *et al.*, 1952; Fairlie and Kendall, 1953; Herrell *et al.*, 1953). The normal post-operative increase in adrenocortical hormones may account for the infection gaining a hold, even in some cases without the aid of antibiotics (Herrell *et al.*, 1953). It seems justifiable to differentiate staphylococcal enteritis from post-operative pseudo-membranous enteritis; Prohaska *et al.* (1954), Dearing and Heilman (1953), and Pettet *et al.* (1954) are also of this opinion.

Cross-infection is the main factor in its causation. Cases have been described by Kramer (1948), Reiner *et al.* (1952), Dearing and Heilman (1953), Gardner (1953), Terplan *et al.* (1953), Wakefield and Sommers (1953), Hay and McKenzie (1954), Choremis *et al.* (1954), Williams (1954), Spink (1954), Bowie (1954), and Fairlie and Kendall (1953).

Three further cases are now recorded.

Case 1

A small, ill woman aged 68 had a strangulated femoral hernia repaired, 4 cm. of severely affected ileum being returned to the abdomen. She received 1 g. of streptomycin and 300,000 units of aqueous procaine penicillin intramuscularly twice daily for 4½ days. The streptomycin totalled 9 g. The wound suppurated and local infection increased over the next two days. The pus was not cultured. Her general condition deteriorated. Oral chloramphenicol, 0.5 g. six-hourly, was begun at 10 a.m. on the sixth day after operation. Two days later the wound was only slightly inflamed, and her general condition had so improved that provisional arrangements for her return home were made.

However, the next day she vomited several times and had severe diarrhoea. Her throat was red and sore. Chloramphenicol was stopped, a total of 6.5 g. having been given. She deteriorated with vomiting, diarrhoea, and circulatory collapse, and died ten days after operation.

At necropsy, otherwise healthy small and large intestines were full of a creamy and practically odourless light-yellow fluid. Acute infantile gastro-enteritis was simulated. This observation led to culture of the fluid, which gave a growth of coagulase-positive staphylococci insensitive to penicillin, sulphathiazole, streptomycin, chloramphenicol, and chlortetracycline. It was concluded that staphylococcal enteritis caused death.

Case 2

A man aged 35 with Crohn's disease received pre-operatively 26 g. of succinylsulphathiazole in 5½ days and streptomycin 2 g. and 1 g. on the two days before operation.

Right hemicolectomy was performed. Post-operatively he received 300,000 units of "distaquaine" and 0.5 g. of streptomycin intramuscularly twice daily. Apparently well, he passed a large loose stool on the evening of the day after the operation and a loose greenish stool the next morning. At 5.45 p.m. that day he collapsed with severe diarrhoea, dyspnoea, and cyanosis, lapsing into semicoma. The pulse was rapid and the blood pressure unrecordable. Penicillin and streptomycin therapy was discontinued. A total of 1.5 g. of intramuscular streptomycin had been given. Examination of a direct smear of anal discharge showed Gram-positive cocci, later proved to be *Staphylococcus aureus*.

Despite massive intravenous therapy his general condition failed to improve. Erythromycin, 400 mg., was administered via an indwelling Ryle's tube at midnight and again at 6 a.m. three days after operation with 0.5 g. of chlortetracycline intravenously. Diarrhoea continued. The patient died at 10.45 a.m. on the third post-operative day.

At necropsy a normal stomach contained 300 ml. of bile-stained fluid. Loops of intestine were bound together by thin fibrinous adhesions. The jejunum and ileum were acutely inflamed with a very red mucosa, containing much mucus and soft yellow exudate. The colon contained mucus and similar yellow fluid. The anastomosis was perfect. The exudate showed large numbers of Gram-positive cocci and relatively few faecal organisms, although a culture of anal discharge taken a few moments before death had shown enterococci only. Culture gave a growth of coagulase-positive *Staph. aureus*, enterococci, and coliform bacilli insensitive to penicillin and streptomycin.

Case 3

A stout, well-preserved woman aged 82 had a perforated gastric ulcer oversewn. Premedication had included 500,000 units of aqueous penicillin and 1 g. of streptomycin.

During a satisfactory post-operative course she received 300,000 units of distaquaine and 0.5 g. of streptomycin twice daily. Her bowels moved normally on the morning of the third day. However, at 2 p.m. the same day persistent vomiting and severe diarrhoea developed. Later, yellowish mucoid fluid was frequently voided. Her general condition rapidly deteriorated. Penicillin and streptomycin were stopped. The streptomycin given totalled 3.5 g. Despite intravenous fluid and chlortetracycline she lapsed into coma and circulatory failure, dying at 2 a.m. on the fourth post-operative day.

Necropsy showed an oversewn healing gastric ulcer in the fundus of the stomach. The small intestine was injected and contained thin pale fluid. No ulceration was present. Culture of the fluid gave a moderate growth of staphylococci, coagulase-positive and insensitive to penicillin and streptomycin. Enterococci and coliform bacilli were also present.

Discussion

Sudden severe diarrhoea, collapse, vomiting, and the finding in the intestinal fluid of staphylococci resistant to the antibiotic used were the salient features of these cases. The sudden onset and severe cholera-like course are noteworthy.

Under oral erythromycin the intestinal fluid in Case 2 became free from staphylococci. Nevertheless these organisms were obtained from the mucosa and membrane at necropsy. Terplan *et al.* (1953) recorded the same state of affairs. It probably represents the first stage in the elimination of the staphylococci.

Penicillin active against Gram-positive organisms and streptomycin against Gram-negative organisms are, when given together, similar in action to, but less powerful than, the wide-spectrum antibiotics. This paper and the experiences of Fairlie and Kendall (1953) and Choremis *et al.* (1954) show that penicillin and streptomycin given together can give rise to antibiotic-resistant fatal staphylococcal enteritis.

The advent of antibiotic-resistant staphylococci makes the administration of antibiotics potentially hazardous. Their prophylactic post-operative "umbrella" use in abdominal surgery becomes inadvisable. McKittrick and Wheelock (1954) could find in their cases no evidence that routine antibiotic measures, in the absence of specific indication, lessened post-operative morbidity. Moreover, should infection ensue after such routine use, there is a very real danger that the causative organism will be resistant to the antibiotics used.

Neither of the two patients treated responded to the intravenous fluid given. Frequent vomiting militates against efficacious oral therapy even though the staphylococci may be presumed to be still sensitive to erythromycin. Early diagnosis and, better, prevention is important.

Diagnosis is made on the clinical picture and confirmed by the finding of Gram-positive cocci in a direct smear of the anal discharge. Intravenous fluid replacement must be commensurate with the intestinal loss of fluid. Isolation nursing of the patient to limit spread of the numerous antibiotic-resistant staphylococci is required.

If in special cases wide-spectrum antibiotics have been used pre-operatively, a specimen of the bowel contents taken at operation should be cultured. Should staphylococci be found, treatment with erythromycin will avoid overt superinfection (Dearing and Heilman, 1953).

Though the poorly absorbed sulphonamides have greatly reduced sepsis in large-bowel surgery, the search for more thorough sterilization continues. Neomycin alone, or fortified with phthalylsulphathiazole or bacitracin, may be such an antiseptic (Fog, 1953, 1954; Poth, 1953; Anlyan *et al.*, 1954). These, however, produce the most complete and prolonged bacterial vacuum so far known. The possible advent of new clinical syndromes consequent upon the disturbance of the normal intestinal flora should be remembered (Smith, 1952). Animal experiments suggest that too thorough bowel disinfection renders implantation of carcinoma at a suture line more likely (Vink, 1954).

The lesson to be learned from these cases is that, at present, pre-operative large-bowel antisepsis should be obtained by the use of the poorly absorbed sulphonamides alone and that the combination of penicillin and streptomycin can give rise to staphylococcal enteritis. The use of penicillin and sulphadimidine has not, so far as I know, given rise to staphylococcal enteritis.

Summary

Three further cases, all fatal, of antibiotic-induced post-operative staphylococcal enteritis are reported.

Established cases respond poorly to treatment.

At present, pre-operative large-bowel antisepsis should probably be confined to the use of the poorly absorbed sulphonamides alone. With scrupulous anastomotic suturing, free from tension, an uneventful recovery should follow.

Post-operative use of wide-spectrum antibiotics should normally be reserved solely for the treatment of established complications of some magnitude.

Staphylococcal enteritis is a heavy price to pay for prophylaxis against possible sepsis.

It is now quite evident that in an attempt to banish the risk of sepsis in abdominal surgery—an infection which the unmolested patient will overcome provided it is not excessive or continuing—we may subject the patient to infinitely more serious hazards by the precipitate administration of wide-spectrum antibiotics.

I wish to thank Dr. D. Evans and Dr. I. MacKenzie for the bacteriological work; Mr. J. R. Ratcliffe and Mr. G. Harrison for access to the cases; and Mr. H. Blacow Yates and Mr. F. O'Gorman for help and encouragement in writing this paper.

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REPAIR OF INJURIES TO THE TENDONS OF THE HAND

BY

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In our country, Pirogov as early as the middle of the nineteenth century demonstrated experimentally the role of haemorrhage within the tendon sheath in the regeneration of damaged tendons. He was the first of many to contribute to the study of the circulation in relation to problems of regeneration and repair of tendon injuries.

During the last thirty-five years improvements in the surgery of tendon injuries have been made by Janelidse, Girgoloav, Ruffanov, Gorinovskaya, Nikilaev, Rosov, Priorov, Kotschergein, Bogdanov, Grigorieva, Weinstein, Nikiforova, and others. They have studied the methods of foreign authors, and particularly of Bunnel, Iselin, Allen, and Mason. With this as a basis there has been issued a guide to surgeons on the treatment of these injuries related to factors such as the site, type of injury, and occupation of the injured worker. A number of points remain in dispute, but we believe that certain general principles have been agreed. I will attempt to outline our policy as concisely as possible.

If it were possible to exclude mistakes at the time of primary surgery in all medical institutions it would certainly greatly decrease the number of difficult problems of tendon repair, which so often lead to unsatisfactory results. The first condition for success in the treatment of tendon injuries is the availability of qualified surgeons able to carry out the necessary technical procedures immediately, carefully, and gently, in a well-equipped operating theatre, following early admission to hospital. The organization of the Health Service in the Soviet Union has endeavoured to make such treatment widely available.

We have put particular emphasis on the organization of the surgical care of industrial injuries. Every industrial plant includes a health department with a surgery for traumatic cases, and hospital beds are available day and night. This organization primarily means that surgery can be carried out within two hours of the accident. The operating surgeon retains responsibility for the patient until recovery is complete.

This report is based on the results of operations on tendon injuries of the wrist and fingers in 375 patients (see Table I). Special attention is paid to industrial injuries as shown in Table II. It will be seen that only 28 of a total of 123 patients had isolated injuries of the tendons, the remaining 95 had accompanying extensive

TABLE I.—Summary of Data of Soviet Surgeons on Primary Tendon Suture

Author	Year	No. of Cases	Site		Good Results (%)	
			Flexors	Extensors	Flexors	Extensors
Weinstein ..	1936	71	26	45	42	80
Svigaskaja ..	1938	131	76	55	81	82
Atanov ..	1939	83	34	49	82	67
Michelson ..	1939	92	92	—	40	—
Choranov ..	1941	40	24	16	83	100
Grigorieva ..	1948	106	49	57	65	95
Lebedev ..	1951	70	45	25	64	100
Rosov ..	1951	444	189	255	71	86
Bogdanov ..	1953	355	167	188	75	89

TABLE II.—Types of Industrial Injuries to Tendons of the Hand

With fracture ..	43
Isolated injuries ..	28
With fracture and defects of soft tissue ..	19
With soft tissue defects ..	19
With damage to nerves and blood vessels ..	7
With injury to joints ..	7

123

skin defects, fractures, or nerve lesions. These complications must be taken into account in evaluation of our surgical technique.

Primary Suture

As a first-aid measure we insist on the immediate immobilization of the hand, with the fingers flexed into a fist for damage to the flexor tendons, and with the fingers extended in rupture of the extensors. This prevents retraction of muscles and torn tendon ends and facilitates primary surgery.

The role of surgery is then to transform the accidental wound into a surgical wound. Operating early with adequate assistance, we aim at accurate suturing of damaged nerves and tendons. This is followed by accurate skin apposition or grafting. Fractures are immobilized in the required position. Primary and accurate surgery during the first hours after injury can make a great contribution to the results obtained in these injuries. Primary suture of tendons restores the anatomical relations of the tissues; it removes a situation in which abnormal nerve impulses are engendered by the damage; it contributes to the re-establishment of normal physiological interrelations between the central nervous system and the local motor apparatus; and it predisposes to early recovery of function without rigidity or contracture.

Primary suture, if antibiotics are available, is in our opinion indicated for all tendon injuries when an experienced surgeon is available, except in the "no-man's-land" area. Outside this zone there are absolutely no contra-indications to primary suture even with fractures or skin defects, unless associated with severe disturbance of the circulation. The results of treatment depend not so much on the extent of the damage as its site.

We do not agree with those authors who state, "Repair in 'no-man's-land,' from the middle palmar crease to the middle finger crease, as a rule must be secondary." Primary suture within this zone is permissible, particularly in clean-cut incised wounds, if the hand has been at once correctly immobilized. We have rejected tendon sutures on the palmar surface with silk, and use capron. We permit the use of silk in the reconstruction of extensor tendons. Primary suture is not indicated: (1) If the surgeon is in any doubt about the efficiency of its use in the "no-man's-land" area. (2) In flexor tendon injuries in this region if the accident has occurred with the fingers flexed. In these cases, search for the retracted tendon ends necessitates a larger incision, with damage to the gliding mechanism. Suture is not desirable within the fibro-annular pulleys of the palm and phalanges. (3) In extensive injuries of palmar soft tissues or fractures of the distal part of the metacarpals or proximal phalanges with displacement.

Primary suture in isolated rupture of the profundus tendon over the middle phalanx distal to the bifurcation of sublimis may be carried out by direct suture.

In injuries of the long flexor to the thumb, the proximal end can usually be found between the two heads of origin of the short flexor. Where suture cannot be carried out here, free grafting will be necessary.

It is well known that the results of primary tendon suture vary with the mechanism of the injury. When the palm of the hand has been damaged by falling on a sharp cutting object with the fingers extended, the proximal end of the tendon, although displaced to the base of the palm, can be found and confidently sutured. In injuries to the palm with the fingers closed into a fist, as, for example, in grasping the blade of a knife, the distal end of the tendon retracts, primary suture is difficult, and its results are less satisfactory.

Most of these operations are carried out by us under local analgesia without a tourniquet, or under intraosseous analgesia with a broad pneumatic cuff. Careful use of this method can prevent the formation of a haematoma. Esmarch bandages are not used. Occasionally we operate under inhalational anaesthesia.

The technique of suture must be speedy, simple, and stable. To be stable the tendon must be crossed without damaging its circulation. The suture must be countersunk in the tendon so that only a minimal amount is left on the surface to interfere with gliding. We use a modification of the method described by Cuneo.

Primary tendon suture has given excellent and satisfactory results in 75% of flexor and 89% of extensor tendon injuries.

Delayed Suture

The second group comprises those in whom primary suture has not been carried out. These cases have been operated on 21 to 45 days after injury, when the inflammatory reaction has settled; occasionally later. In the majority we have succeeded in uniting the severed tendons by delayed suture, and only occasionally have we required to use grafts for injuries in the "no-man's-land" area or beneath the carpal ligament. If problems of skin cover do not interfere, the earlier we operate the easier is the operation found to be and the better its results. In our experience, with early surgery, the dense adhesions between the retracted ends of the tendons and the intermediate structures had not yet formed. Good mobility of the joints is one of the conditions which determine the success of surgery. Only on two occasions (on the 29th and 57th days) have we found extensive fibrous thickening with involvement of the tendon in deep scarring. We have excised these scars as is our practice in Dupuytren's contracture. We have then isolated and sutured the deep flexor proximal in the "no-man's-land" area, using a capron suture.

Where there has been delayed healing of a laceration of the palm or the fingers with extensive scarring we do not rush into reconstructive surgery. We use physiotherapy, including baths, to restore movement and circulation to the skin. Three days before operation we clean the operating field and keep the hand in a sterile bag. We have found it very necessary to remove damaged scarred skin in the palm, and to replace it by some form of plastic procedure, in order to obtain satisfactory results in tendon repair. It is well recognized that secondary repairs to flexor tendons in the zone of "no-man's-land" are very difficult, particularly where the pulleys are destroyed.

Our incisions run parallel to the palmar crease and are curved to the base of the hypothenar eminence. When both ends of the injured tendon or tendons have been located, the distal tendon with its scars may be removed from the sheath and from beneath the pulleys without damage to the annular ligament. We use special instruments designed by Rosov. The freed channel is filled by a free graft derived preferably from the long extensor of the third or fourth toe.

The paratenon is preserved, and is prevented from displacement by a stitch. The graft must exceed the length of the "no-man's-land" area. After extraction of the

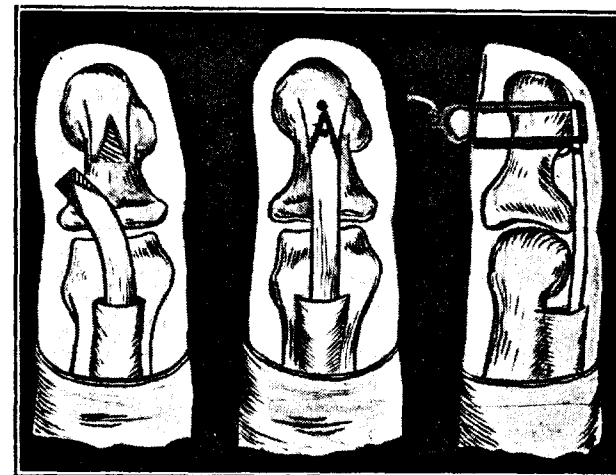


FIG. 1.—Method of suture of distal end of flexor tendon graft.

graft it is sutured at the distal end to the bone of the distal phalanx. A wedge is cut in the distal tendon reaching to the bone. With the finest possible awl two holes are made which perforate the bone to the dorsum. The graft is then sutured to the bone by a stitch which is tied over a dorsal bolster of gauze. The sides of the wedge of the distal tendon are then sutured to the graft as described by Allen (Fig. 1). The stitch is withdrawn after three weeks.

The proximal graft is sutured side by side to the proximal end of the deep flexor tendon. Where both tendons have been injured we are convinced that only profundus should be sutured. In patients with multiple injuries to flexor tendons we operate by stages; firstly by repairing the tendons of two fingers only, and delaying reconstruction of the remaining tendons to a second stage. In cases of destroyed annular ligaments, Rosov, Dubrov, and Nikolaeva reconstruct them with free fascial flaps or by transplants from the extensor tendons of a toe. We have no personal experience of this method, and use a flap from the underlying lumbrical muscle.

In 25% of primary operations we have had good results with nearly full flexion and adequate extension. In 50%, flexion was adequate but not full. When the patient was not satisfied with the end-result because the tip of the finger did not reach the palm, we proposed a second operation—arthrodesis of the distal joint in 25 degrees of flexion. By

this means we improved the end-results in seven patients. The others refused the secondary operation and adjusted themselves to their work.

In the repair of tendons beneath the carpal ligament we usually use free grafts. If the median nerve is divided we suture it at the same time. In late cases with multiple damage to the tendons in this area we have sometimes been obliged to excise the carpal ligament in order to envelop the tendon suture with loose cellular tissue.

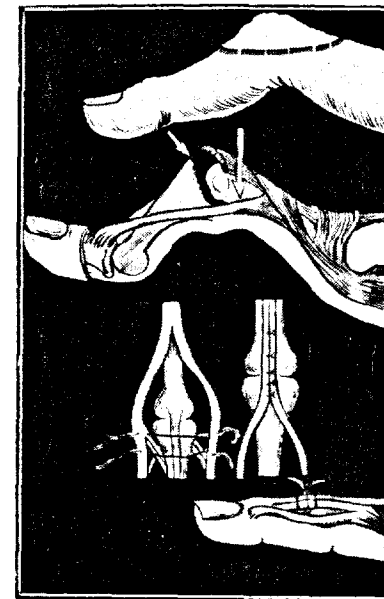


FIG. 2.—Pathology and treatment of injury to the extensor of the proximal interphalangeal joint.

the extensor aponeurosis over the proximal joint. The proximal aponeurosis is dissected out so as to define the lateral bundles. These are approximated with the finger in extension, with five or six fine sutures. The proximal stitches include not only the lateral bundles but also the middle bundle of the long extensor (Fig. 2).

Post-operative Treatment

After tendon repairs it is necessary to immobilize the hand in plaster for four weeks, to prevent retraction of the sutured tendon ends. Following repair of the flexor tendons, the plaster is applied to the back of the hand and forearm to stabilize the fingers in a position of flexion. In injuries of the extensor tendons the splint is applied to the palmar surface with the fingers extended.

The hand is elevated for three to four days after operation. Stitches are removed on the 9th or 10th day, and the patient is discharged from hospital. From the 21st day movement of the fingers is allowed. After six to eight weeks the patient returns to light work, progressing gently to full work after three months.

Aftercare includes physiotherapy and baths, started from the 15th day. The patient also receives corticotrophin, which we have found to help in preventing scar formation and in the absorption of scarring around the repaired tendons. The surgeon who has carried out the operation must keep his patient under personal observation, and should certainly see him at least twice a week. At the end of the third week the surgeon must direct active exercises, with gentle use, to ensure the best possible function.

Conclusion

In extensor tendon injuries, plastic repairs have given satisfactory results in 85% of the patients. Tendon repair on the palmar surface has given satisfactory results in 77%, including 65% in the area of "no-man's-land."

INCISION FOR GALL-BLADDER SURGERY

BY

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The two incisions generally used for operating on the gall-bladder are the right upper paramedian and Kocher's incision. The paramedian incision is often chosen when the costal angle is narrow, and Kocher's when the costal angle is broad.

Kocher (1895) described his incision as an obliquely transverse incision 10 to 15 cm. long, made at a distance of 4 to 6 cm. from the costal margin. As generally carried out in this country it is 2 to 3 cm. from and parallel to the costal margin, care being taken at its lateral extremity to spare the ninth costal nerve. I was deterred from using Kocher's incision by seeing post-operative scar herniae after its employment, but for the past seven years have utilized with increasing frequency a modification which has the advantage of dividing the rectus sheath in the direction of the fibres of its main component—namely, the aponeurosis of the internal oblique. As a result, any straining after operation by tensing the external and internal oblique and transversalis abdominal muscles tends to approximate the fibres of the rectus sheath. It is essentially a muscle-splitting operation so far as the rectus sheath is concerned and so is easy to close, and the stitches do not subsequently cut out. Compared with any vertical incision the patient is far more comfortable after operation, breathing, bending, and moving easier. Normally, patients get out of bed the day after operation. I have never seen a scar hernia follow its use.

Technique

The incision (Fig. 1) is from the midline, one handbreadth—3½ in. (9 cm.)—above the umbilicus to the tip of the tenth right costal cartilage. In some fat patients there is a natural skin crease in this line which can be utilized. The skin,

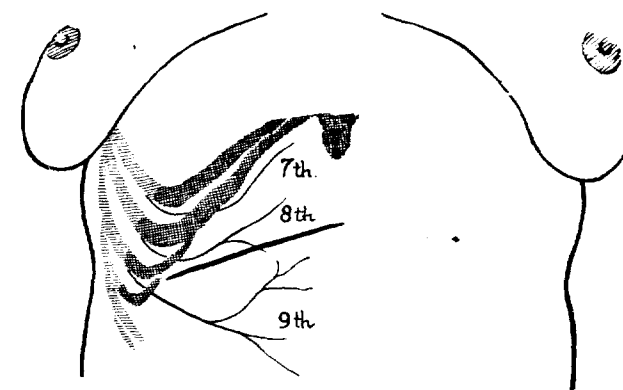


FIG. 1.—The line of incision.

the subcutaneous tissue, the anterior rectus sheath, and the rectus muscle are divided in the line of the incision as far out as the outer border of the rectus abdominis (Fig. 2). The medial two-thirds of the posterior rectus sheath with the underlying peritoneum is cut in the same line, then the transversus abdominis is split laterally in the direction of its fibres.

When cutting the fibres of the rectus muscle, branches of the superior epigastric require ligation one-third and two-

thirds of the way across the muscle. More length is seldom required laterally unless it is desired for mobilizing the duodenum. It can be obtained by splitting the external and internal oblique and the transversalis muscles in the direction of their fibres. This incision over the gall-bladder gives an excellent exposure of the biliary passages and it is

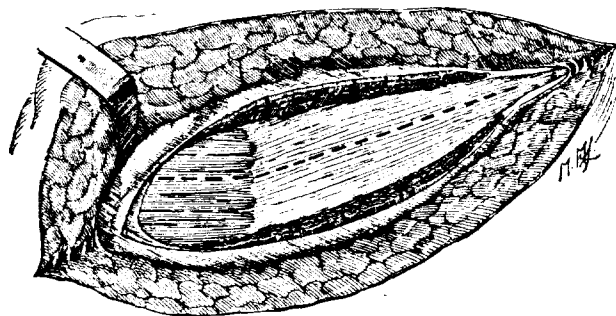


FIG. 2.—The incision completed.

easy to explore the common bile duct and, in the average case, to pass the standard Desjardins forceps down this duct. For a barrel-chested patient with a high liver I have a more curved pair of Desjardins forceps available. Should more room be required medially the incision is extended through the linea alba into the left rectus sheath. As the incision lies between the eighth and ninth intercostal nerves, these nerves are in no danger of injury and do not have to be identified (Fig. 1). Should the lateral margin of the incision be made a little low the ninth intercostal nerve is seen lying on the posterior layer of the rectus sheath near its lateral margin. The direction of the ninth nerve at this point is that taken by the ninth rib in the axilla (Fig. 1).

Anatomical Points

Identification of Ninth and Tenth Costal Cartilages

The tenth costal cartilage can be felt by running the finger outwards along the smoothly curving lower costal margin till a definite step is felt, which is caused by the tenth costal cartilage. Fig. 1 shows the usual way the tenth cartilage turns up to form this step. In two cases the tenth rib was floating and did not articulate with the ninth, reminiscent of the three floating ribs of the anthropoids. The narrow spear-like tip of the ninth costal cartilage can be felt only by taking the ninth costal cartilage between the right finger and thumb, where it is lying along the postero-inferior border of the costal margin, and, by moving it, to feel with the other hand its sharp tip where it articulates with the broad eighth costal cartilage. This identification of the tip of the ninth is not a necessary step of the operation, but it is of interest in the diagnosis of gall-bladder tenderness, which is situated most commonly 1 in. (2.5 cm.) below the tip of the ninth costal cartilage on a line drawn from the tip of that cartilage to the umbilicus. It is the surface marking of the infundibulum (Hartmann's pouch), where, with the patient supine, stones tend to gravitate.

Direction of Fibres in Rectus Sheath

On exposing the anterior layer of the rectus sheath, fibres of the external oblique are seen running downwards and

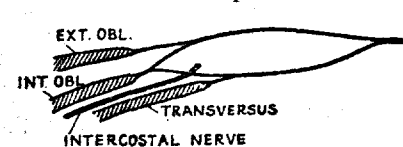


FIG. 3.—Showing fusion of the external oblique/aponeurosis with the internal oblique.

the line of the incision. The external oblique aponeurosis becomes fused with the internal oblique about a quarter of the way from the lateral border of the rectus sheath (Fig. 3).

The posterior layer of the rectus sheath shows the stout fibres of the internal oblique running upwards and inwards along the line of the incision. The red muscular fibres of the transversus abdominis show through the outer third of the posterior layer of the sheath. These muscular fibres run transversely as a thin aponeurotic layer which becomes fused with the posterior rectus sheath at the junction of the outer and middle thirds of the sheath. The transversus aponeurotic fibres are by far the weaker component of the posterior rectus sheath.

Course of the Intercostal Nerves

The ninth intercostal nerve leaves the subcostal groove about the mid-axillary line and runs downwards and forwards, passing behind the tenth costal cartilage where the cartilage is turning up (Fig. 1). It lies on the transversus muscle and is below the line of the incision. The eighth intercostal nerve as it passes behind the ninth costal cartilage is directed upwards and medially and is above the line of the incision. In dividing the rectus muscle a fine twig connecting the eighth and ninth nerves can occasionally be seen. The line of incision runs between these nerves (Fig. 1).

Anatomical dissections by Davies, Gladstone, and Stibbe (1932) have shown that the rectus muscle does not receive a segmental supply from one intercostal nerve. As a result of communications in the thorax, and again between intercostal nerves when lying on the transversus abdominis muscle, any one segment of the rectus is supplied by at least three intercostal nerves. The division of any minor connecting branch in the rectus muscle does not affect the strength of the rectus muscle when the incision is healed.

I wish to thank Sir Wilfrid Le Gros Clark for drawing my attention to the work of Davies, Gladstone, and Stibbe and to the skeleton of the anthropoid, and to Miss M. C. McLarty for the drawings.

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MULTIPLE TOXIC EFFECTS OF PHENYLBUTAZONE

REPORT OF A FATAL CASE

BY

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It is almost four years since Currie (1951) first drew attention to the therapeutic effect of phenylbutazone ("butazolidin"). Since then it has been employed extensively both in hospital and in general practice, and many reports on its use, mainly in the treatment of rheumatoid arthritis, have appeared in the medical press. There is general agreement that the drug has a marked analgesic action in rheumatoid arthritis in roughly one case in three, but it is doubtful whether it has any anti-inflammatory properties. As Hart (1953) pointed out, although occasionally a reduction of inflammatory swelling is seen, increase in range of movement and function tests, and decrease in stiffness, are essentially secondary to the relief of pain. Steinbrocker (1953) reported on the results he had obtained in a large series of patients on short- and long-term phenylbutazone treatment, and came to the conclusion that the drug was a powerful analgesic but that its antirheumatic effect, if any, was slight.

Since the introduction of phenylbutazone in the treatment of the rheumatic diseases numerous reports of its

toxic effects have been published, the incidence varying between 20 and 50%. While the majority of the side-effects are of a mild nature, serious complications have been encountered from time to time, and a not insignificant number of fatalities have been attributed to the use of this drug. Deaths due to agranulocytosis (*British Medical Journal*, 1952; *Lancet*, 1953; Newns, 1953; Etess and Jacobson, 1953; Steinberg *et al.*, 1953; Dilling, 1953; Wood, 1954), aplastic anaemia (Leonard, 1953), haematemesis (*British Medical Journal*, 1952), perforation of a peptic ulcer (Benstead, 1953), and to renal failure (Bruck *et al.*, 1954; Johnson and Larkin, 1954) have been recorded. The non-fatal complications are by now well known, and include sodium retention with oedema, various types of skin rashes, activation or perforation of a peptic ulcer, agranulocytosis, thrombocytopenia, nausea, vomiting and diarrhoea, jaundice, and bleeding manifestations with resultant anaemia—for example, haematemesis, melaena, and haematuria. Many patients have experienced two or more complications at the same time (Hart, 1953; Pemberton, 1954). The following case, which had a fatal termination, is of interest in that multiple toxic reactions, including a polyneuritis, made their appearance during the administration of phenylbutazone.

Case History

A single woman aged 41 was admitted to hospital on July 3, 1953, with a history of rheumatoid arthritis of seven years' duration, involving her hands, wrists, ankles, and feet. Six months before admission her doctor put her on phenylbutazone, when she was given 600 mg. a day for one week, 500 mg. a day for two days, and then 400 mg. for one day. The drug had to be discontinued at this point on account of a haematemesis of moderate severity. This was accompanied by ulceration of the mouth and lips. Recovery from the haemorrhage was rapid and the buccal ulcers healed. Six weeks later her joints became so painful that she persuaded her doctor, against his better judgment, to let her resume the phenylbutazone. She was put on 200 mg. daily, and this gave her considerable relief from pain. She was maintained on this dose for three months, when a rash appeared on her legs and the drug was stopped. After a few days the ulcers reappeared in her mouth and mild jaundice was noted by her doctor. Two weeks later she developed weakness of her arms and legs, and within a week she was unable to move her arms or legs. This was unaccompanied by pain.

On admission she was seen to be a thin and ill-looking woman with a sallow complexion, and lay limply in bed. She was afebrile, with a mild tachycardia. There was no evidence of jaundice. Multiple small punched-out ulcers were present on the ankles and feet, and a few superficial ulcers were seen on the lips and in the mouth. There was loss of all types of sensation in the arms below the elbows and in the legs below the knees. Weakness of the shoulder-girdle and hip muscles and complete loss of power below the elbows and knees were present. All deep reflexes in the arms and legs were absent; the plantar responses were flexor. There were chronic rheumatoid changes in the fingers, wrists, knees, ankles, and feet. The liver and spleen were not palpable. The heart and lungs were normal.

Laboratory investigations on admission resulted as follows: haemoglobin, 65%; red blood cells, 3,750,000; white blood cells, 11,800; blood film, normal; erythrocyte sedimentation rate (Westergren), 96 mm. in one hour; blood W.R., negative; blood urea, 30 mg. per 100 ml.; blood uric acid, 1.9 mg. per 100 ml.; plasma proteins, normal; thymol turbidity, 3 units; thymol flocculation, positive after 4 hours; alkaline phosphatase, 3.5 K.A. units per 100 ml.; van den Bergh, negative; icterus index, 4; urine: no sugar, albumin, bile, or urobilin; faecal occult blood, positive.

In spite of intensive medical measures, physiotherapy, and splintage, her condition slowly deteriorated and she became emaciated. Flexion contracture of the fingers and subluxation of the knees developed. She was unconscious for three days before she died on January 28, 1954, seven months from the date of admission.

Necropsy.—The body was that of an extremely emaciated woman with numerous pressure sores over the bony prominences. A moderate degree of rheumatoid arthritis of the fingers, wrists, knees, and ankles was noted. The heart appeared normal. The lungs showed evidence of a bilateral bronchopneumonia with abscess formation. Abdomen: a lesser-curvature posterior-wall chronic ulcer, 12 by 7 mm., with a small perforation and associated peritonitis, was found; the liver weighed 1,140 g. and was soft and pale; a few small gall-stones were present in the gall-bladder, which was small and had a thickened wall; the spleen was congested; the genito-urinary organs were normal. Endocrine glands: the pituitary, thyroid, and adrenals were normal. Apart from some general pallor and oedema, the brain was normal. Macroscopically, no gross abnormality was seen in the spinal cord or peripheral nerves.

Histological Examination.—There was evidence of a widespread polyneuritis with marked degeneration and vacuolation of the posterior columns of the cord. Both median nerves showed almost complete loss of myelin sheaths and very severe loss of axis cylinders. The ulnar nerves presented a similar but slightly less marked appearance. Many nerve bundles in the sciatic nerves looked shrunken, and the myelin sheaths stained irregularly, but the axis cylinders were well preserved. The liver showed a moderate degree of fatty infiltration around the portal tracts. There was no evidence of central necrosis. The spleen was normal. Some focal cellular infiltrate and tubular atrophy, with an occasional damaged glomerulus, were seen in the kidneys. A bronchopneumonia with abscess formation was present in both lungs.

Discussion

This case presents some interesting features. The patient received a total of only 5.6 g. of phenylbutazone prior to the haematemesis, which was of moderate severity. Careful questioning did not reveal any previous history of gastric disturbance. In addition to the haemorrhage, superficial ulceration of the mouth and lips was noted, a finding which may well have reflected the state of the gastric mucosa at that time. Multiple superficial gastric erosions were reported at necropsy by Dilling (1953) in a case of fatal agranulocytosis following phenylbutazone therapy.

It is obvious that treatment with phenylbutazone should have been permanently discontinued at this point, but six weeks later it was resumed at the patient's own request, and she was maintained on it for a further three months, when the second series of side-effects made their appearance.

It will be seen that this patient had six complications in all. Four of these—namely, ulceration of the mouth, rash, haematemesis, and perforation—could be directly attributed to the administration of phenylbutazone, as all are now accepted as toxic effects of the drug and have been reported on frequent occasions. Whether the jaundice and polyneuritis were associated with the use of the drug is difficult to establish, for as Currie *et al.* (1953) pointed out, not all symptoms occurring during drug therapy are necessarily due to the drug. While jaundice, mainly of the obstructive variety, has been reported from time to time (Bourne, 1953; Solomon, 1953), post-mortem examination in this case revealed several small calculi in the gall-bladder and only some fatty infiltration of the liver. The icterus, therefore, could have been due either to obstruction of the common bile duct by a gall-stone or to a mild toxic hepatitis, followed by regeneration of liver tissue.

Headache and vertigo have occasionally been encountered during phenylbutazone therapy, but neurological signs are apparently rare. Loxton *et al.* (1952) reported a case which developed a lesion of the central nervous system with

paralysis of the left leg and urinary incontinence and which they attributed to a haemorrhagic transverse myelitis. While the evidence incriminating phenylbutazone as the cause of the polyneuritis in the present case is purely circumstantial, no other aetiological factor could be demonstrated.

The immediate cause of death was presumably the acute peritonitis resulting from perforation of the gastric ulcer in an emaciated and moribund subject. Clearly, a fatal issue could, and should, have been avoided if the phenylbutazone therapy had been permanently discontinued by her doctor at the time of the haematemesis. It demonstrates once more how vital it is that medical men should not be influenced in their judgment by the entreaties of the patient.

It is generally accepted that phenylbutazone is rapidly absorbed when given by mouth. Pemberton (1954) regarded a blood concentration of 12–16 mg. per 100 ml. as the therapeutic range of the drug. On the other hand, Currie *et al.* (1953) found that an initial blood concentration of 8–11 mg. per 100 ml. was sufficient to suppress the symptoms, and that remission could be maintained by much lower concentrations—4.6 to 8 mg. per 100 ml. Bruck *et al.* (1954) obtained maximal suppression of symptoms in their series at any level between 5 and 10 mg. per 100 ml. Phenylbutazone is slowly eliminated from the body (Burns *et al.*, 1952), and appreciable levels remain in the blood for at least two weeks after the cessation of treatment (Pemberton, 1954). Toxic effects, therefore, can be expected after the drug has been withdrawn. Shields *et al.* (1953) reported a case in which perforation of a gastric ulcer occurred seventy-two hours after discontinuation of phenylbutazone therapy, and Wood (1954) a case in which a rash appeared six days after the drug was stopped.

Some observers (Bruck *et al.*, 1954) have found a striking correlation between the frequency of toxic reactions and the blood phenylbutazone level, while others (Leonard, 1953; Nassim and Pilkington, 1953; Pemberton, 1954) have failed to confirm this observation, and feel that the administration of small doses of phenylbutazone does not eliminate the possibility of the occurrence of toxic side-effects. In the case reported here a moderately severe haematemesis with ulceration of the mouth and lips developed after a total dosage of only 5.6 g., the maximum dose being 600 mg. a day. This raises the question whether the toxic effects of phenylbutazone are due entirely to overdosage or whether an idiosyncrasy to the drug may be responsible in certain cases. Support for the latter view has been produced by O'Brien and Storey (1954), who recorded a case in which they attributed the cause of death during phenylbutazone therapy to a hypersensitivity reaction, which was manifest histologically by three types of lesion: polyarteritis nodosa, hypersensitivity angitis, and granulomatous lesions. A severe case of sensitivity to phenylbutazone with the features of Stevens-Johnson syndrome and granulocytopenia was described by Steel and Moffatt (1954). It has also been suggested that agranulocytosis may be due to an idiosyncrasy to the drug (Stifel and Burnheimer, 1953), and that the drop in the white-cell count is sudden, so that daily counts, which give a false sense of security, are of doubtful value in anticipating this complication.

If toxic symptoms develop during phenylbutazone therapy the drug is generally withdrawn either temporarily or permanently, according to the nature and severity of the reaction. Many observers advocate the resumption of the drug, usually on a smaller dosage, once all signs of the reaction have disappeared, except in cases with the more serious complications. In this connexion, Fishman and Reynolds (1953) issued a warning, stating that it was unwise to resume treatment with phenylbutazone, however mild the toxic effects. They reported the case of a woman who received phenylbutazone for a whiplash injury of the neck following a car accident. A mild rash appeared after she had taken sixteen 200-mg. tablets, and was of the morbilliform type. This began to subside fairly quickly with treat-

ment and omission of the drug, and had almost disappeared when, for no obvious reason, it suddenly flared up again and developed into an exfoliative dermatitis which nearly proved fatal.

My experience with the present case, added to an overall incidence of 26% of toxic reactions, including four patients with severe haematemesis, forces me to the conclusion that phenylbutazone is a dangerous drug and that the risks attached to its use in rheumatoid arthritis are not outweighed by its advantages. As it is still widely employed in general practice, where for obvious reasons patients cannot be kept under the strictest supervision, I feel that the publication of reports on its toxic effects may act as a deterrent to its use in the treatment of rheumatoid arthritis. In its place one would recommend aspirin, given in maximum tolerated doses as described in the recent Medical Research Council and Nuffield Foundation Report (1954).

Phenylbutazone, however, would appear to be an effective therapeutic agent in the acute stages of gout (Huffman *et al.*, 1954) on which it has a marked uricosuric effect. The majority of acute attacks of gout are brought under control within 8–12 hours, and the drug need be given only for a matter of days, thus greatly reducing the danger of side-effects.

Summary

The literature on the toxic effects of phenylbutazone therapy in rheumatoid arthritis is briefly reviewed.

A fatal case is reported in which six complications developed during the administration of the drug—namely, ulceration of the lips and mouth, a rash, haematemesis, perforation of a gastric ulcer, jaundice, and a polyneuritis—and their causal relationship to the use of the drug is discussed.

The possible factors in the production of side-effects are mentioned.

It is felt that phenylbutazone is a dangerous drug and should not be employed in the treatment of rheumatoid arthritis, and that aspirin given in maximum tolerated doses is as effective and much less toxic.

My thanks are due to Professor E. J. Wayne for helpful criticism, and to Professor D. F. Cappell and Dr. M. Leslie for post-mortem, histological, and laboratory reports.

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A CASE OF STEVENS-JOHNSON SYNDROME WITH EXTENSIVE SURGICAL EMPHYSEMA

BY

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The condition known as Stevens-Johnson syndrome, a skin eruption resembling erythema multiforme, with lesions of the mouth, conjunctivae, genitalia, and anus, was described by Stevens and Johnson in 1922. A similar condition had been recorded in the last century, but does not appear to have been thought worthy of special notice. The cause of the disease is unknown. It is suggested that the eruption may be due to hypersensitivity or allergy, because some cases give a history of recent upper respiratory infection or of the administration of sulphonamides. A virus has been suggested, but at present there is no proof of this. The condition usually runs a benign course, with full recovery in ten days, but respiratory complications may occur (Liddle, 1951).

The following case of Stevens-Johnson syndrome is reported because of its severity and because of the unusual complication of surgical emphysema.

Case History

A boy aged 9 years 11 months was admitted to hospital on May 1, 1954, with the following history. Five days previously he had complained of headache, and was listless. His throat and conjunctivae were inflamed, and his temperature was 102° F. (38.9° C.). He was started on a course of "tresamide" (each 0.5-g. tablet containing sulphamerazine 0.1 g., sulphadiazine 0.2 g., sulphacetamide, 0.2 g.), which was replaced by chloramphenicol on the fourth day of the illness because of the appearance of a morbilliform rash on the chest. On the next day the rash spread all over the face, chest, and limbs, and many of the lesions became vesicular. He had severe toxæmia, headache, and nausea, and his temperature rose to 105° F. (40.6° C.).

He was admitted to an isolation hospital as a suspected case of smallpox, and thereafter transferred to the Grove Hospital on the sixth day of the illness.

On admission he was seen to be a well-built boy, with no history of previous illness. He was semicomatose and profoundly toxæmic. His temperature was 99° F. (37.2° C.), pulse 108, and respirations 20. There was the dusky-red rash of erythema multiforme on the face, neck, trunk, and limbs. In places the rash was confluent and there were many large vesicles containing yellow fluid. Some vesicles had burst, particularly round the eyes, ears, and neck, and the underlying dermis was fiery red. The lips were purplish, cracked, and bleeding. The buccal mucosa was overlaid with collapsed vesicles, and gingivitis and ulceration of the tongue were present. The conjunctivae were deeply injected and oedematous. He had photophobia, but no corneal lesions were seen. There was some ulceration of the glans penis and dysuria, probably due to lesions within the meatus. There was no urethral discharge. Gross surgical emphysema was present on the chest, stretching from the neck to the lower abdomen. Respiration was a little laboured and there was a suggestion of cyanosis. Anteriorly, breath and heart sounds were difficult to hear, but auscultation of the back of the chest revealed moist crepitations in all areas. The spleen and liver could not be felt. A diagnosis of Stevens-Johnson syndrome was made.

The patient was placed in an oxygen tent and parenteral penicillin (250,000 units six-hourly) and streptomycin (0.5 g. six-hourly) were given. On the day after admission the general condition was unchanged and the surgical emphysema had spread downwards to the groins and into the upper parts

of the thighs. In the region of the lower ribs large pockets of air were palpable under the skin.

On the fifth day after admission exudation into the vesicles was maximal, with dehydration and circulatory collapse. The temperature rose to 104° F. (40° C.), and the pulse was frequent and weak. Intravenous plasma was given (3 pints - 1.7 litres) as it was thought that protein loss in the exudate was high. The plasma was followed by glucose-saline. Intravenous therapy was continued for two days, after which the patient's condition began to improve. On the sixth day, when the mouth lesions were clearing, oral chlortetracycline was given (250 mg.) six-hourly, in place of the penicillin and streptomycin. By the tenth day the rash had begun to fade and the raw areas were drying. There was heavy desquamation of the hands and feet. By this time the conjunctivae were nearly normal, and there were no corneal lesions.

The chest was slow in clearing. Three weeks after admission the patient was still raising much thick sputum, although by then the pyrexia had subsided. From the third week onwards recovery was uninterrupted. The patient was discharged after five weeks, the only sequelae being some staining from the rash and loosening of all finger- and toenails.

Chest X-ray Examination.—Films were taken on the third, seventh, and twelfth days after admission. In the first film pronounced surgical emphysema was seen in the soft tissues of the neck and thoracic wall, but the lungs were clear. On each side of the superior mediastinum thin vertical lines of opacity were visible. These lines appeared to represent lateral displacement of the mediastinal pleura, suggesting the presence of mediastinal emphysema. The second film showed patchy shadowing of the lung fields, and the mediastinal appearances were the same. The final film showed some left basal collapse, the surgical emphysema was less marked, and the mediastinal pleura was no longer displaced.

Comment

This case represents a severe form of the Stevens-Johnson syndrome, in which skin, mucous membranes, and respiratory systems were all heavily affected. In addition there was severe toxæmia. The chief point of interest was the surgical emphysema which occurred early in the disease and which persisted for nearly three weeks. The likely explanation for the surgical emphysema seems to be as follows. In respiratory infections, such as pertussis, influenza, or measles, and in bronchial asthma, valvular obstruction of terminal bronchioles may be produced by mucous plugs or by inflammatory oedema of the lining mucosa. Alveolar air trapped behind the obstruction may be forced into the interstitial spaces of the lung by expiratory pressure. The air may then pass along the vascular sheaths (Aisner and Franco, 1949), to reach the hilum and thence the mediastinum. Air may then escape from the mediastinum into the tissues of the neck.

Similar cases of mediastinal emphysema have been described in association with the muscular straining of parturition (MacRae, 1949) and the lifting of heavy weights. Here the expiratory muscles are forcibly contracted with the glottis closed, causing rupture of alveoli.

In the present case it seems probable that the obstruction was caused by thick mucus or by the swelling of the mucosal lining of the small air passages.

The area of collapse seen in the third x-ray film may be significant. Possibly it marks the site at which a number of bronchioles became obstructed, causing the air in the alveoli distal to the obstruction to be forced into the vascular sheaths of the lung.

My thanks are due to Dr. J. S. Anderson, medical director of the Fever Unit, Grove Hospital, and to Dr. J. C. McEntee for permission to publish this case.

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PARAPLEGIA FOLLOWING THE USE OF "EFOCAINE"

BY

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"Efocaine" is a long-acting local analgesic consisting of a solution of 1% procaine base, 0.25% procaine hydrochloride, and 5% butyl-*p*-aminobenzoate in a solvent composed of 2% polyethylene glycol-300, 78% propylene glycol, and water. It also contains 0.1% sodium metabisulphite and phenylmercuric borate (1:25,000) as preservative. When diluted with body fluids the aqueous insoluble analgesic base is deposited in a micro-crystalline form. The slow absorption of this deposit is believed to be responsible for the long-acting analgesic properties of efocaine, but it is evident that such a compound might cause serious ill effects if deposited in delicate tissue.

Three examples of such complications have been reported from America by Shapiro and Norman (1953); in one patient intercostal nerve block in the thoracic region was followed by "transverse myelitis" causing permanent paraplegia. Three further examples have been reported by Brittingham *et al.* (1954); in all three, paravertebral block of several intercostal nerves with efocaine was followed by paraplegia. Two of these patients improved to some extent, but the third was permanently paralysed. Angerer *et al.* (1953) described another striking case in which paraplegia developed within a few minutes of the injection of efocaine into an intercostal nerve. This patient died, and the necropsy findings suggested that the spinal cord lesions were secondary to thrombophlebitis of an intercostal vein.

The present report deals with a patient in whom evidence of severe spinal cord damage occurred after the injection of efocaine into intercostal nerves for the prevention of post-operative pain after the reduction of a hiatal hernia.

Case Report

A married woman aged 50, who had complained of indigestion for many years, was found to have a sliding hernia of the stomach through the oesophageal hiatus of the diaphragm. In spite of medical treatment her condition deteriorated until she could take only fluids by mouth. Oesophagoscopy showed superficial ulceration of the lower oesophagus adjacent to the herniated gastric mucosa.

On January 1, 1953, left lateral thoracotomy was performed under general anaesthesia with thiopentone, D-tubocurarine, gas and oxygen. The patient lay in the right lateral position and the left seventh rib was resected. A local analgesic consisting of 1/2,000 amethocaine hydrochloride and 0.25% procaine was injected into the third, fourth, fifth, sixth, seventh, eighth, and ninth intercostal nerves, into the mediastinal tissues, and into the splanchnic nerves. The hernia was reduced and the diaphragm repaired without difficulty. Before closing the chest 1 ml. of efocaine was injected directly into each of the sixth, seventh, eighth, and

ninth intercostal nerves at the angles of the ribs, where the nerves were clearly visible under the parietal pleura.

After returning to the ward the patient complained of numbness and paralysis of the legs. On January 2 she was found to have a flaccid paralysis of the lower trunk and leg muscles with complete sensory loss from the seventh dorsal dermatome downwards. Retention of urine and incontinence of faeces were present. On January 3 the C.S.F. contained 13 polymorphonuclear leucocytes per ml. and 950 mg. of protein per 100 ml., but there was no evidence of block on jugular compression. During the next three weeks her neurological condition did not change, but the C.S.F. returned slowly towards normal. On January 9 the C.S.F. protein value was 788 mg. per 100 ml. and on January 15 it had fallen to 435 mg.

The glucose and chloride content of the C.S.F. remained normal throughout. The C.S.F. Wassermann reaction was negative.

The thoracotomy wound healed normally and the digestive symptoms disappeared. A post-operative barium swallow showed complete reduction of the hernia and a normally functioning cardia. On January 24 the patient was transferred to a neurological unit for long-term rehabilitation.

On admission to the neurological unit some three weeks after operation the patient was found to have complete loss of spinal cord function from the seventh dorsal segment downwards. As she had complained of shoulder and trunk pains prior to operation the possibility of coincidental spinal cord compression was considered. A lumbar puncture on February 3 revealed the spinal fluid to be under a pressure of 110 mm. of water, with a rapid rise and fall of pressure on bilateral jugular compression. The fluid contained 3 cells (2 mononuclear and 1 polymorphonuclear), 100 mg. of protein per 100 ml., and an increased amount of globulin (Nonne-Apelt and Pandy). Radiographs of the spine showed no abnormalities apart from a minimal degree of osteophytosis in the mid-dorsal region, and a myelographic examination was within normal limits.

The usual measures for the long-term treatment of a spinal paraplegic subject were instituted. During the succeeding nine months there was never at any time evidence of returning spinal cord function. There remained complete absence of sphincter control, necessitating the regular administration of enemata and the maintenance of an indwelling vesical catheter. At the time of admission a small sacral bedsore involving skin and subcutaneous tissue was already present. This took many months to heal, and, despite the greatest possible care, it was impossible to prevent the development of similar lesions over the femoral trochanters. These later-developing lesions proved most resistant to treatment, so that at the end of the nine months' observation period they were still incompletely healed.

The patient was much troubled by persisting sensations of burning and "tightening" in her legs and lower abdomen, in addition to hallucinations of movements of her toes. These symptoms varied considerably in intensity from time to time and proved difficult to analyse, since they appeared to be dependent upon factors of both physical and psychogenic origin. Their response to the simpler analgesics was also variable, but at no time did they seem to become intolerable to the patient. On October 7 the spinal fluid was found to be normal in all respects, but in view of the extensive motor paralysis it was not possible to rehabilitate the patient beyond the state of a wheelchair existence, despite the application of appropriate leg splints. A final neurological examination confirmed that there was no objective evidence of spinal motor, sensory, or reflex function from the seventh dorsal segment downwards, a moderate degree of wasting of the legs having occurred by this time.

Discussion

This case emphasizes the possible catastrophic effects of the injection of a long-acting analgesic such as efocaine. It is conceivable that the drug passed along the perineural

sheath of one of the intercostal nerves, but the very high C.S.F. protein figures and the complete lack of recovery of reflex function below the level of the lesion suggest that extensive necrosis of the spinal cord occurred. Such widespread damage cannot reasonably be attributed to the small amount of efocaine which could have entered the spinal cord via the perineural sheath.

The clinical picture and C.S.F. changes can be explained on the basis of necrosis through interference with the blood supply of the spinal cord. The injection of efocaine close to an intercostal vein might have produced thrombosis which spread into the spinal cord and caused intramedullary thrombosis with necrosis. This view is supported by the necropsy findings in the patient reported by Angerer *et al.* (1953). Forty-four hours after the injection of efocaine they found that the intercostal vein immediately beneath the needle puncture was acutely inflamed and filled with recent thrombus. The spinal cord itself showed extensive necrosis, with evidence of acute inflammation.

The mode of action of efocaine has been reinvestigated by Mannheimer *et al.* (1954), and they have shown that the substance produces necrosis of both nerve and muscle of similar severity to that caused by the injection of alcohol and phenol. These findings, together with the published reports of gross neurological damage, lead to the conclusion that the clinical use of efocaine is no longer justifiable.

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Medical Memoranda

Long Survival in Renal Carcinoma

There are many gaps in our knowledge of the natural life history of malignant tumours, and renal cancer seems to be particularly unpredictable. In the patient we are here reporting, at least a quarter of a century elapsed before the disease caused death, and treatment was refused for a decade after the tumour was clinically apparent.

CASE REPORT

In 1930 a Jewish business man, aged 31, began to experience pain in the left flank and haematuria. The pain was episodic until 1934, when its severity so increased that he sought admission to hospital. A mass was then discovered in relation to the left kidney, of such a size that it caused obvious deformity of the stomach on radiological examination.

Surgical treatment was strongly urged, but the patient stubbornly refused to submit to operation until 1943. The operation disclosed a rounded tumour which replaced the lower pole of the kidney and was "much larger than the renal tissue proper." There was no involvement of the renal vein, or any evidence of metastases. Nephrectomy was carried out.

Pathological examination of the tumour by the late Colonel Harvey showed the tumour to be a glandular carcinoma (hypernephroma) of clear cell type. Its structure was unusually glandular, and of the small alveolar and tubular type rather than the larger and more cellular masses more common in this tumour. There was considerable polymorphism of the cell nuclei, suggestive of degenerative forms. Though mitotic activity was not recognized, the tumour had spread into the fibrous tissue separating the growth from the kidney. In some areas haemorrhage and necrosis were marked.

The patient remained relatively well until 1949, when he began to complain of vague abdominal discomfort. Sundry investigations were negative; but in 1952, when he came under our joint care, there was a mass in the left flank and some enlargement of the liver. Barium enema revealed a filling defect suggestive of extrinsic pressure in the descending colon, and a radiograph of the chest showed a rounded opacity in the right mid-zone. As much for diagnostic as therapeutic reasons, he was advised to undergo laparotomy.

At operation extensive malignant disease was found throughout the abdominal cavity, including a large fixed mass involving the descending colon and the adjacent part of the posterior abdominal wall. Numerous secondary growths were present in the liver, including a massive growth in the left lobe. It was found practicable to remove the pericolic tissue and so relieve the obvious obstruction.

Histological examination showed the tissue to be metastatic hypernephroma. There was a remarkably good immediate recovery, and he was able to return to the business he had conducted so successfully throughout the years; thereafter his condition deteriorated; but in spite of the extensive metastases he survived for another two years, and died in September, 1954.

COMMENT

It is notoriously difficult to forecast the expectation of life in patients with renal tumours. Herbut (1952) has stated that symptoms and signs may be prolonged up to 35 years; and Griffiths and Thackray (1949) reported a 10-year survival rate of 21% after nephrectomy. The "best" American figures—those of Priestley (1939) at the Mayo Clinic—record a 10-year survival in 27.3% of 395 cases. Nevertheless, survival for 25 years despite the well-substantiated existence of renal carcinoma, as in the present case, seems to us most exceptional. Possibly the phenomenon was thrown into sharper relief by a number of contemporary cases in which the course was very rapid.

The corollary is obvious—that great caution must be exercised in venturing a prognosis in renal tumours, both with and without operation, and that even greater caution is needed when claims are made for the efficacy of treatment.

We are indebted to Dr. Alister Matheson for letting us have access to his careful records regarding this patient.

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Case of Bilateral Calcification of the Breasts

The deposition of calcium in the soft tissues of aged subjects is not uncommon, particularly in those parts where fibrous tissue normally predominates. In the breast, fibrous tissue is laid down in varying amounts after the menopause; only very rarely, however, does it go on to calcification so extensive as to be detectable both clinically and radiologically. The following is a case discovered accidentally shortly before the patient's death.

CASE RECORD

A woman aged 85 was admitted to hospital with a three-weeks history of pain in the left groin. Her private practitioner suspected the presence of a fatigue fracture of the neck of the left femur, no history of trauma being elicited. This was confirmed radiologically. Examination of the

breasts to exclude a primary malignant tumour revealed hard craggy mobile masses in the lower and outer quadrants of both breasts. The skin overlying them was normal, and no glands were palpable in the axillae or the supraclavicular fossae. Despite the remarkable hardness of the tumours, they were thought to be the result of fibro-adenosis. A routine chest x-ray examination revealed no intrathoracic abnormality, but the lower and outer quadrants of both breasts were found to be involved by extensive calcium deposits.

The patient underwent pinning of her femur, but succumbed to a hypostatic pneumonia ten days later. Specimens of her breast tissue were obtained at necropsy. The sections showed that the breasts had been practically replaced by fibrous tissue; large calcium deposits were irregularly scattered throughout the portions clinically involved.

COMMENT

It is unlikely that the breasts had previously been affected by fibro-adenosis; if they had, no remnant of such a condition was evident on microscopy. Such symmetry as was displayed here is, in any case, unusual. This symmetry may, however, be the clue to the aetiology of this condition. The pendulous unsupported breasts weigh heavily on the fibrous tissue, as they rotate downwards and outwards in the normal subject. Prolonged stresses and strains occurring in an abnormally fibrous breast are likely to exert their maximum effect on the lower and outer quadrant. Elsewhere in the body, fibrous tissue subjected to chronic stress not infrequently undergoes calcification; and it may be that a similar mechanism is responsible for the interesting distribution of calcium deposits, of which the above is an example.

My thanks are due to Mr. E. Chitty for permission to publish.

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Varicella with Neurological Complications in an Adult

Although chicken-pox is so common, involvement of the nervous system is extremely rare. In a study of 2,534 patients with varicella, Bullowa and Wishik (1935) found five cases of encephalitis and three cases of meningitis. Of the 108 cases with neurological complications described in the literature, in only eight was the patient over the age of 20 years, and about 90% were in the first decade of life.

CASE REPORT

An unmarried cashier aged 21 was admitted to hospital in September, 1952, with a severe attack of varicella, the rash of which had appeared almost three weeks previously. About a week after the onset of the illness she began to vomit once or twice a day, and continued to do so for two weeks. Twelve days after she had first noticed the rash she found that she was seeing double and that she had to close one eye in order to see clearly. Her past history was irrelevant. She had been vaccinated in infancy.

On admission she did not look unduly ill. She was co-operative and mentally clear. Her temperature was 101° F. (38.3° C.). She had a profuse rash on the trunk and limbs and to a less degree on the face. The lesions had a typical centripetal distribution and were mainly in the scab stage, but there were some pustules. There had been obvious haemorrhages into the more recent lesions.

Examination of her nervous system revealed no neck or back stiffness. Her pupils were equal and regular and reacted to light and on accommodation, but she was unable to abduct her right eye beyond the central position, and on looking to the right she had diplopia, the false image being projected to the right of, and level with, the

true image. All other movements of the right eye and all movements of the left eye were normal; other cranial nerves and the disks and retinae were normal; tendon reflexes in the upper limbs were present and equal on the two sides; abdominal reflexes were present. The knee- and ankle-jerks were absent in both legs; plantar reflexes were flexor. Sensation to light touch, pain, heat and cold, vibration, and posture was normal. A coarse tremor of the outstretched hands, more marked on the right than on the left, was noticeable, but no intention tremor was present and there was normal co-ordination of movements in all limbs; no muscle weakness or wasting was found. There were no abnormal physical signs in any other system.

Investigations.—A full blood count was normal. The Wassermann reaction and Paul-Bunnell and Widal tests were negative. Blood culture was sterile. There were no pathogenic organisms in nose and throat, urine, or faeces. The C.S.F. on admission contained 110 mg. of protein per 100 ml.; leucocyte count, chlorides, and sugar were normal. The C.S.F. showed practically no change during the next five weeks, and even on discharge the protein was still 110 mg. per 100 ml.

Crystalline penicillin, 500,000 units six-hourly, was given, but she continued to have a swinging temperature, and on the fifth day of treatment the penicillin was discontinued and chloramphenicol, 500 mg. six-hourly, was given for seven days. Though the temperature subsided two days later, the impression was formed at the time that the improvement was coincidental and not in fact due to the treatment.

Towards the end of the second week in hospital it just became possible to elicit the knee- and ankle-jerks on reinforcement, and by the fifth week the reflexes were considered to be within normal limits; at about the same time the paresis of the right eye was beginning to show some improvement. Despite the improvement she was having mild attacks of depression with bouts of crying because she felt that her friends would laugh at her as she had a squint. She was discharged home on November 8.

When seen again two months later she complained of feeling nervous but was no longer depressed. She had occasional double vision and the right eye still showed some weakness of abduction; all other cranial nerves were normal and her tendon reflexes were present and equal. When last seen in October, 1953, she was considerably improved, had lost her nervousness, and had gained over 14 lb. (6.4 kg.) in weight. She had no diplopia and all movements of both eyes were full.

COMMENT

That nervous manifestations do not occur more often is surprising when it is considered that the causal organism of varicella is closely allied to, if not identical with, that of the neurotropic virus of herpes zoster. In the great majority of cases nervous complications occur between four and ten days after the appearance of the rash.

The C.S.F. findings have been recorded in only about 50% of published cases; the protein content was normal or slightly increased in 75%, but in the remainder there was a considerable increase; the leucocyte count was within the normal range in most cases.

The prognosis is good; about 90% of the patients recover. Residual defects are unusual, but are most common when ocular signs are the prominent or only manifestation of nervous system involvement.

I am indebted to Dr. Ernest Evans for his valuable criticism.

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Reviews

PTERIDINES

Ciba Foundation Symposium on Chemistry and Biology of Pteridines. Editors for the Ciba Foundation: G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., and Margaret P. Cameron, M.A., A.B.L.S. (Pp. 425+xiv. 42s.) London: J. and A. Churchill, Ltd. 1954.

When the late Sir Frederick Gowland Hopkins took up the study of butterfly pigments at the beginning of his career he believed that these substances might have metabolic significance. When he died in 1947 he had lived to see a tale unfolding which, although it still has much to reveal, has already borne witness to his prescience. Hopkins himself thought at first that the coloured substances he had extracted from butterflies were uric acid derivatives, and, since they appeared to be present in material voided from the rectum of lepidoptera, he inferred that "a normal excretory product subserves the purposes of ornament." It was not until 1940 that the difficulties of analysis and synthesis of these pigments were finally overcome, and one of the commonest, leucopterin, was shown to be not a purine but a pteridine derivative, pteridines being chemically related to the nucleus of riboflavin. Subsequently the structure and synthesis of many related insect pigments and other substances have been elucidated and some shown to have great metabolic importance.

In 1944 the name "folic acid" (Latin *folium*, leaf) was coined to describe a growth factor from plant sources for *Streptococcus faecalis*, which later was found to be pteroylglutamic acid, a substance formed by the union of a pteridine with *p*-aminobenzoic acid and glutamic acid. Before this, in 1940, Woods and Fildes had recognized that *p*-aminobenzoic acid must be of importance in cellular metabolism because of its ability to overcome the inhibition of bacterial growth which can be brought about by sulphonamide drugs. Since pteroylglutamic acid was first isolated many related substances have been obtained from natural sources. Some have more than one glutamic acid residue in the molecule, and a number have been recognized as growth factors for micro-organisms of various strains. Rhizopterins (from *Rhizopus nigricans*) has a most interesting chemical constitution—namely, N_{10} -formyl-pterioic acid, pterioic acid being the substance obtained by the removal of the glutamic acid residue from pteroylglutamic acid. The fact that rhizopterins possessed one carbon atom in a reactive side-chain—a formic acid residue—was of particular interest.

The organism *Leuconostoc citrovorum* will grow on a medium containing liver extract, but in 1948 research showed that the liver extract could be replaced by a single substance folic acid ("leucovorin" or "citrovorum factor"). Folic acid is another formyl derivative, being N_{5} -formyl-tetrahydropteroylglutamic acid. In the processes of metabolism *p*-aminobenzoic acid is almost certainly converted into a substance closely related to folic acid, this postulated substance, coenzyme F, being concerned in processes of biosynthesis in which one-carbon-atom units are utilized. Such a coenzyme or coenzymes may be involved in the synthesis of methionine, serine, histidine, and possibly other amino-acids, as well as in the formation of purines and thymine. In such instances a single carbon atom is introduced into the molecule under the aegis of the coenzyme, this atom almost certainly originating in a formic acid residue of the type found in folic acid. Although these processes have mostly been worked out in micro-organisms, there is every likelihood that they also apply in the main to higher animals. There is now good evidence that sulphonamides inhibit bacterial growth by preventing competitively the utilization of *p*-aminobenzoic acid for the production of folic acid or related substances, which the bacteria themselves need.

Pteroylglutamic acid is effective in the treatment of various types of experimental anaemia, and is of value as an addition to vitamin B₁₂ (cyanocobalamin) in the treatment of

pernicious anaemia in man. Here the biosynthesis of nucleic acids, dependent as it is on that of purines and thymine, may rest on the presence of co-factors closely related to folic acid.

Antagonists to pteroylglutamic acid have been synthesized in the laboratory, of which aminopterin (4-aminopteroylglutamic acid) is the best-known. This substance can induce death with anaemia and leucopenia in experimental animals, and has been used in the treatment of acute leukaemia in children. Although it does not cure leukaemia, it may bring about a remission and can therefore be of aid in the treatment of this disease. Aminopterin inhibits mitosis in mammalian cells, and this suggests the possibility that folic acid derivatives may be of wide-spread significance in cellular reproduction, a process in which the synthesis of nucleic acids is of course of prime importance. Xanthopterin, a pteridine derivative simpler than pteroylglutamic acid, is a yellow colouring matter found in butterfly wings and in the yellow bands of wasps. Its administration to mammals is followed by enlargement of the kidneys to many times their normal size. Xanthopterin apparently directly stimulates mitosis and cell division in the epithelium of the renal tubules.

It is clear that a colloquium on the chemistry and biology of pteridines is dealing with matters of wide and deep significance. The volume under review gives the proceedings of a small international conference on recent progress in the research of pteridines, held under the auspices of the Ciba Foundation. The symposium was divided into two parts, the first on chemistry under the chairmanship of Professor A. Albert, and the second on biological aspects under that of Dr. W. Jacobson. Some of the titles of the sections will illustrate the scope of the discussions. "Recent development in pteridine synthesis," "The pteridines of *Drosophila melanogaster*," "Sulphonamide derivatives of pteridines," "Metabolic relations between *p*-aminobenzoic acid and folic acid in micro-organisms," "The function of folic acid in the biosynthesis of purine and pyrimidine derivatives," "The effects of folic acid analogues on the growth and cell division of micro-organisms," "The mode of action of folic acid antagonists and the function of the *Leuconostoc citrovorum* factor," "Some aspects of disordered folic acid metabolism in man," "Occurrence of hepatic fibrosis in children with acute leukaemia treated with folic acid antagonists." The book is well edited and the accounts of the discussions after each of the papers are very readable. The width of the discussions which occur when biologists and chemists meet together with a common interest is well illustrated by a colloquium which ranges from insect pigments to diseases of man. Biochemistry knows no boundaries of species and type, and, although one would not have expected *a priori* that the study of insect pigments would be of benefit in human medicine, such is the simple but stirring truth.

F. G. YOUNG.

RENAL FUNCTION

Reflections on Renal Function. By James R. Robinson, M.D., Ph.D.(Cantab.). (Pp. 163; 17s. 6d.) Oxford: Blackwell Scientific Publications, 1954.

This small book is based on lectures given to Cambridge students reading for an honours degree in physiology, and we are glad that the author has been willing to share his reflections with a larger public. The result is eminently suitable for a variety of readers, for, although Dr. Robinson makes no concessions to popularity, he requires really nothing of his reader beyond a reasonable intelligence and a willingness to be interested, and indeed entertained, by his clear account of a fascinating subject, written as it is in most attractive English. It is not long enough to tire him, nor so short as to be a mere synopsis. The more advanced reader will find here a point of view as well as an exposition, together with enough references to make a useful, if not comprehensive, bibliography.

A brief quotation from the introduction will give a better impression of the style and scope of this work than a summary of its contents. "The kidneys may be regarded as organs which help to stabilize the internal environment of

the body and to keep it chemically distinct from its surroundings. The elimination of waste products is but one aspect of this much larger task. . . . The two main questions to be considered are, first, how the kidneys do what they do, and, secondly, how they know what to do, or more properly, how they are directed to do it. This second question is concerned with the kidney as one part of the body in relation to other parts, and is for that reason more complex. The simpler question of the mechanism of the kidney itself will be taken up first."

ROBERT PLATT.

RESPIRATORY TRACT IN INFLUENZA

The Histopathology of the Respiratory Tract in Human Influenza. By J. F. Ph. Hers, M.D. (Pp. 77; illustrated. 17.50 Dutch florins.) Leyden: H. E. Stenfort Kroese, N.V. 1955.

This monograph provides much-needed evidence concerning histological changes in the trachea, bronchi, and lungs in human influenza. It is the most detailed account yet to appear of correlated bacteriological and histological studies designed to elucidate the precise role played by the influenza virus in the various forms of fatal influenzal bronchitis and pneumonia. The author marshals evidence from patients who died from infection by bacteria such as *Haemophilus influenzae* and the pneumococcus but in whom influenza virus infection could not be demonstrated. The changes in other patients with combined virus and bacterial infection are then compared and are used to attempt an interpretation of the relative role of virus and bacteria in the production of the well-known necrotizing epithelial lesions of influenza-virus-staphylococcal pneumonia. The argument that the virus and not the bacterium is responsible for necrosis of the ciliated epithelium of the trachea and bronchi, which has formerly been advanced purely on the basis of animal work, is thus reinforced by human evidence. Although the number of patients thus studied is small, the studies are elaborate and the results convincing.

The book is easy to read and beautifully illustrated. It also contains some interesting comments on the lungs in measles and chicken-pox and a few histological preparations from material collected in the 1918 epidemic and preserved in Leyden ever since.

C. H. STUART-HARRIS.

REGIONAL ALLERGY OF NORTH AMERICA

Regional Allergy of the United States, Canada, Mexico, and Cuba. A Symposium of Thirty-nine Contributors. Edited by Max Samter, M.D., and Oren C. Durham. (Pp. 395+xvii; illustrated. 61s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1955.

As is stated in the preface to this book, "the shifting industrial pattern of the country has made camp followers out of large sections of the population," and thus allergists throughout the North American Continent are frequently asked by their patients what effects a transfer to a different region will have on their symptoms and what regions are the most free from the particular allergens to which the individual patient may be sensitive.

This volume, which is the joint effort of some thirty-nine contributors in different regions of the continent, answers these questions very fully. The pollen and mould season and counts in the different regions throughout the year are given in detail and the major allergenic factors present in each region described. A special appendix lists the Ragweed Pollen Indices for the chief districts throughout North America, and should be particularly useful.

This book will prove invaluable to all allergists in the Americas, and to allergists in this country whose patients are considering immigration or are making visits abroad. The amount of geographical and climatic information given about each region makes the book surprisingly readable and will be of interest to many readers other than allergists. The printing and production are of the excellence expected of this publisher.

C. J. C. BRITTON.

SURGERY OF PULMONARY TUBERCULOSIS

The Surgery of Pulmonary Tuberculosis. By James H. Forsee, A.B., B.S., M.D., F.A.C.S., F.A.C.P. (Pp. 208; illustrated. 48s.) London: Henry Kimpton. 1954.

An up-to-date monograph on the value of surgery in pulmonary tuberculosis is particularly welcome, since the treatment of the disease has undergone radical changes in the past few years. The introduction of chemotherapy and pulmonary excision are the two most striking advances and have caused a therapeutic revolution. The author is an enthusiastic supporter of both these principles, and is optimistic enough to feel that an accurate forecast can be made of the time required for treatment.

The book is divided into sections, starting with the patient and his disease and the general application of surgery to pulmonary tuberculosis. The individual operations and their techniques are then described, and finally an analysis is made of the surgical treatment. This last section is worked out in detail, and supports the author's contention that excision of an arrested or controlled disease focus is a safe and satisfactory procedure. The figures given for thoracoplasty between the years 1947 and 1952 show a 74% good result in over 300 patients, as opposed to a 91% good result in 400 cases of pulmonary excision over the same period.

It is unlikely that precise indications for the selection of patients suitable for surgery will be widely agreed upon, but Colonel Forsee has defined his own attitude quite clearly and has based his opinions on an extensive experience.

T. HOLMES SELLORS.

GYNAECOLOGY FOR STUDENTS AND G.P.s

Gynécologie. By Nicolas C. Louros. Translated from the Greek by Dr. Télémaque Nicoglou. (Pp. 404; illustrated. 5,500 fr.) Paris: Expansion Scientifique Française. 1955.

This is a French translation of a textbook on gynaecology for students and general practitioners written by Professor Louros of the University of Athens. Professor Louros is well known in this country, especially for his writing on obstetrics, so it is all the more interesting to learn his views on gynaecology. And it is amazing to see how many he is able to express within the compass of this comparatively small and copiously illustrated book. For its subject-matter is all-embracing; it includes sections on endocrinology and operative gynaecology, and recalls shades of the past by adding breast surgery (including plastic operations) to gynaecology.

It is inevitable that some subjects receive little more than a mention to whet the appetite, but, by and large, the accounts of pathology and treatment tally closely with those obtaining in this country. The illustrations invite particular attention; many are reproductions from the German and American literature, but some of the best are simple line-and-wash drawings by the author himself. The half-tone illustrations relieved by a single colour are often more effective than those in full colour, but the production as a whole has a finish which makes it attractive.

T. N. A. JEFFCOATE.

MODERN CYTOLOGY

General Cytology. By E. D. P. De Robertis, M.D., W. W. Nowinski, Ph.D., and Francisco A. Saez, Ph.D. Second edition. (Pp. 456+xiv; illustrated. 40s.) Philadelphia and London: W. B. Saunders Company. 1954.

The first edition of this book was published in Argentina in 1946. This, the second edition, is a greatly expanded version of the first and can justifiably claim to be a reliable and readable general account of modern cytology written for those who, having a basic knowledge of genetics and the physical sciences, would like to learn some of the potentialities of this rapidly expanding science and the methods whereby the submicroscopic organization and ultimate metabolism of the cell are investigated and correlated with its manifold functions.

The illustrations are of good quality and carefully selected, there are many clear diagrams, references are plentiful, and the volume is neither heavy nor cumbersome.

G. HADFIELD.

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ANAEMIA AND PROTEIN MALNUTRITION

Anaemia is a major medical problem among the natives of tropical countries and several factors contribute to it. Malaria, *Ancylostoma duodenale*, and many other parasitic and infectious agents may lead to anaemia, but malnutrition is probably the most important single factor. The dietary ingredients necessary for normal haemopoiesis are many and diverse, including iron, trace metals, vitamin B₁₂, folic acid, vitamin C, and sufficient protein of high biological value. Whereas anaemia in Britain, when due to a deficiency of any of these factors, is usually attributable to a lack of absorption of iron or B₁₂, in the Tropics insufficient dietary protein seems to be the principal cause, and Professor A. W. Woodruff shows this to be so in his Goulstonian Lectures for 1954, published in our opening pages this week.

Woodruff has now been able to study 45 Nigerian women suffering from anaemia associated with pregnancy, his report¹ on the first 25 cases in this series having been published in this *Journal* in 1951. This anaemia was normocytic in about half the cases, macrocytic and microcytic respectively in about one-quarter. Reticulocytes averaged about 4%, indicating a fair degree of marrow activity, which was confirmed by marrow studies. With two exceptions the picture was macronormoblastic. The exceptions, in which megaloblasts were found, were among the minority of cases which showed a histamine-fast achlorhydria. Despite the considerable variation in mean corpuscular volume, the red cells throughout this group of patients were characterized by their unusual thinness, which is best expressed as the ratio of the mean cell diameter to the mean corpuscular average thickness. The increased variation of red cell diameter in each individual as revealed by a Price-Jones curve was a further characteristic of importance. The significance of these various minutiae of red cell shape and size lies

in their remarkable similarity to those established by G. Larsen² as characterizing the anaemia associated with hepatic disease; this concordance is enhanced by the fact that the liver and spleen are enlarged in two-thirds of these Nigerian cases. Further evidence of hepatic damage was obtained by biopsy, which showed fatty infiltration or excessive fibrosis in all the 42 subjects so studied, findings usually associated with deficiency of dietary protein. The low level of the serum albumin and the high level of serum globulin, especially its γ fraction, seen in most of these cases is a further feature usually found in subjects with chronic liver disease. Haematology, blood protein levels, and hepatic biopsy therefore all agree in associating the anaemia with hepatic injury of the kind that is found both clinically and experimentally in conjunction with dietary deficiency of lipotropic factors—which, in terms of practical dietetics, implies a deficiency of protein.

Owing to the curious custom in tropical Africa by which the relatives are responsible for the feeding of hospital patients a fairly accurate estimate of their everyday diet could be obtained. This revealed that, although the caloric intake was perhaps adequate for subjects confined to bed, the protein level of 36 g. per day was less than half that recommended for pregnant women in the League of Nations 1936 report on the physiological basis of nutrition.³ At this level there can be no doubt that the patients were indeed suffering from protein insufficiency. The complete failure of the anaemia to respond to folic acid, B₁₂, or iron, and the gradual but unequivocal response to a daily supplement of 56–113 g. of casein, show moreover that it is to this insufficiency that the anaemia must be attributed. Further evidence pointing to protein deficiency as mainly responsible for the anaemia is obtained from a study of the similar condition prevalent in the same community among young children and non-pregnant adults. The details of 9 young children and 21 older children and adults that Woodruff has collected can leave little doubt that the anaemia of pregnancy which he studied is but a special example of the general anaemia common among people subsisting on a diet poor in protein.

Since, according to the figures given by Tristram,⁴ nine of the ten essential amino-acids make up 61% of the haemoglobin molecule, it is not surprising that an adequate intake of protein of good quality is essential for the maintenance of a normal haemoglobin level. Diets deficient in one or more of the essential amino-acids soon cause anaemia in experimental animals. This has been shown in rats when supplied with a diet deficient only in lysine⁵ or methionine.⁶ Moreover, with methionine deficiency the marrow

¹ *British Medical Journal*, 1951, 2, 1415.² Larsen, G., *Acta med. scand.*, 1948, 132, suppl. 220.³ *The Problem of Nutrition*, 1936, 2, League of Nations, Geneva.⁴ Tristram, G. R., *Advanc. in Protein Chem.*, 1949, 5, 84.⁵ Gillespie, M., et al., *Biochem. J.*, 1945, 39, 203.⁶ Glynn, L. E., et al., *Brit. J. exp. Path.*, 1945, 26, 326.⁷ Wills, L., *Indian J. med. Res.*, 1933–4, 21, 669.⁸ Robschtein-Robbins, F. S., and Whipple, G. H., *J. exp. Med.*, 1949, 88, 339 and 359.⁹ ——— *ibid.*, 1951, 94, 223.¹⁰ *British Medical Journal*, 1955, 1, 1245.

picture was typically macronormoblastic and indistinguishable from that described by L. Wills.⁷ Woodruff, and others in their cases of anaemia in the Tropics. Further, since haemoglobin contains so high a proportion of amino-acids which the body is incapable of synthesizing, the nature of the dietary protein is at least as important as its mere quantity. Whipple and his colleagues^{8,9} have made a special study of this problem, using for the purpose dogs depleted of both protein and haemoglobin by repeated bleeding. They have found that the processes by which haemoglobin and plasma protein are restored do not run parallel: beef protein, for example, favours formation of haemoglobin, while egg protein favours formation of the plasma proteins. In view of Woodruff's encouraging therapeutic results with casein it is of interest that Whipple has found that this is a "superior protein as promoting new haemoglobin and plasma protein output," comparing favourably with liver and beef under experimental conditions. Vegetable protein, such as peanut meal and wheat gluten, was far less satisfactory, partly because it was unpalatable to the experimental animal. This in itself may be a reflection of its inadequacy, since it has been shown,⁶ for example, that small supplements of methionine greatly improve the impaired appetites of rats on diets deficient in this amino-acid.

Anaemia in pregnant women is by no means confined to the Tropics, though in Europe and the U.S.A. it is rarely attributable to deficiency of dietary protein; the great majority of cases are of the iron-deficient type. The rarer macrocytic variety is usually megaloblastic, and, although resistant to B₁₂, it responds readily to folic acid, as Professor L. J. Witts and his colleagues¹⁰ reported in last week's *Journal*. The speed with which these cases respond is in marked contrast to the very slow reaction of the protein-deficient group. As Woodruff rightly points out, the protein deficiency of his tropical patients may amount to hundreds of grammes, and, though haemoglobin synthesis ranks high among the priorities, much of this deficit must be made good before the haemoglobin response becomes adequate.

STERILIZING THE GUT

In recent years, and especially since 1952, there have been increasingly frequent reports of sudden and severe, often fatal, enterocolitis after surgical operations. The main facts seem to be clear. The increase in this syndrome has followed the widespread use of powerful antibacterial drugs; the surgical operations which it follows are abdominal operations in which pre-operative antibacterial treatment has been used; in most cases almost complete sterilization of the

faeces has been achieved before and just after operation; in many cases staphylococci are the only or the predominant organisms subsequently isolated; and these staphylococci are found to be resistant to the drug which has been used in pre-operative medication. The disastrous nature of this syndrome has been emphasized in this and other journals more than once,^{1,2,3} but a paper by Mr. B. J. Fowler (page 1313) describing three fatal cases once again draws attention to this serious sequel of modern surgical pre-operative technique.

The first of Fowler's cases, a woman of 68, after a course of penicillin and streptomycin which failed to control local sepsis, at first showed rapid improvement when given chloramphenicol. Yet three days later she vomited, had severe diarrhoea, and died ten days after operation. The second patient, a man of 35, had received succinylsulphathiazole and streptomycin, went into a state of collapse after developing diarrhoea, continued to deteriorate on treatment with erythromycin and chlortetracycline (aureomycin), and died on the third post-operative day. The third patient, a woman of 82, had had penicillin and streptomycin, developed vomiting and diarrhoea, and died on the fourth day after operation. From the intestinal contents of all three patients coagulase positive staphylococci resistant to penicillin and streptomycin were isolated after death.

There can be little serious doubt that in Fowler's cases, as in so many others previously described, the disastrous outcome was the result of the antibiotic "umbrella" used to cover the operation. Although oxytetracycline (terramycin) has often been singled out as a conspicuous cause of post-operative enterocolitis, this syndrome is no respecter of antibiotics, and Fowler's cases show that the combination of penicillin and streptomycin can be just as dangerous. Some surgeons now feel that the fashion of gut sterilization has gone too far and would agree with Fowler's plea for the use of the poorly absorbed sulphonamides. The recent great fall in the incidence of peritonitis after abdominal operations seems to have been in large part due to the sulphonamides, and the more complete sterilization of the gut achieved by the antibiotics has been of doubtful value to the surgeon, who has to weigh one risk against another. If the danger of peritonitis after abdominal operations can be shown to have become very small as a result of using poorly absorbed sulphonamides, there would seem to be little point in striving to eliminate that risk completely if the process of eliminating it results, as so often seems to happen,

¹ *British Medical Journal*, 1953, 1, 1382.

² *Lancet*, 1953, 2, 1245.

³ *British Medical Journal*, 1954, 2, 221.

⁴ *Ibid.*, 1955, 1, 973.

in greatly increased risk of fatal enteritis. One of the first things that needs to be done is to obtain an accurate appraisal of the facts and from that an accurate estimate of the risks involved.

There are several other questions arising out of this post-operative syndrome which urgently demand an answer. One of the most important of these is the question of dosage. Mennie⁴ has sensibly pointed out that the doses of the drugs used are often far greater than the dose claimed by the manufacturers to be effective and indicated by preliminary pharmacological tests. One of the great difficulties with new drugs is to determine the smallest dose which will be clinically effective in man, and to determine it quickly before excessive dosage throws a drug into undeserved ill-repute. Then there is the epidemiological aspect of this syndrome. It mainly occurs in institutions, since it is there that nearly all operations take place. It also naturally tends to occur in certain wards, particularly where there is one surgeon who specializes in certain abdominal operations. The part played by the staphylococcus in the syndrome, however, is still mysterious. The staphylococcus is not always the cause, and bacteriological investigations are often not done or are done too late. There is a strong inference, however, that where the staphylococcus fills the "bacteriological vacuum" produced by over-efficient sterilization of the gut the strain which multiplies in the gut is one which is already present in the environment and which was already drug-resistant when it reached the victim's alimentary tract. The use of a particular drug, in fact, has merely given the drug-resistant organism the chance for which it was waiting. If so, then careful epidemiological studies of staphylococcal types in surgical wards would be of great interest.

Finally, what can be done in the treatment and prevention of this condition? Some lives have been saved by the prompt administration of erythromycin, often the only drug to which these staphylococci will respond. But in many cases both specific and general methods of treatment are bound to fail, since the condition is an acute and fulminating one. It is conceivable that vitamin deficiency may play a part in the development of the condition, and it has been suggested that the liberal use of vitamins may help to prevent it. But convincing evidence of this is lacking, and for the present it seems wiser to rely on some of the methods of prevention that have already been discussed—smaller dosage of antibiotics or, perhaps better still, none at all, with a return to the use of poorly absorbed sulphonamides, and at the same time energetic measures to eliminate staphylococcal infection from surgical wards.

AN EPIDEMIOLOGICAL CENTENARY

The Section of Epidemiology of the Royal Society of Medicine marked the centenary of the publication of the 1855 edition of John Snow's work on cholera by holding a meeting at the London School of Hygiene, where the public health students had prepared an exhibition containing many interesting relics—an outstanding exhibit being a portrait in oils, not exhibited before, lent by a member of the Snow family. Professor J. M. Mackintosh was unfortunately unable to be present because of illness, but in a paper read for him he sketched the social background to Snow's work and told how the opposition of the water companies of the time delayed the universal recognition of his conclusions.

The president of the Section, Professor Bradford Hill, in his appreciation of Snow, pointed out that his reputation rested not upon the removal of the handle of the Broad Street pump—an event that could have had little effect on an already waning epidemic—but upon his theory of the mode of spread of cholera, built up by reasoning based upon innumerable careful observations. Snow did not merely demonstrate the part played by infected water in the dissemination of cholera: by studying the way in which the disease spread from person to person he was able to infer—thirty years before the discovery of the cholera vibrio—that it was caused by "some material which passes from the sick to the healthy and which has the property of increasing and multiplying in the systems of the persons it attacks": that this material derives from the faeces and vomit of patients and is introduced into the alimentary tract by swallowing; and that "the morbid matter of cholera, having the property of reproducing its own kind, must necessarily have some sort of structure, most likely that of a cell." From this basis he proceeded to show the part that was played by sewage-infected water in furthering the spread of the disease.

Many present-day workers see Snow as one of the founders of modern epidemiology. W. H. Frost wrote in the introduction to the American reprint of Snow's work, "Epidemiology . . . is something more than the total of its established facts. It includes their orderly arrangement into chains of inference which extend more or less beyond the bounds of direct observation." Much of the evidence produced in epidemiological studies is circumstantial in character, but such evidence can often be quite convincing, particularly when the epidemiologist makes use of the modern statistical techniques which are the outstanding contribution of the twentieth century to his subject. To-day the epidemiologist sees his greatest challenge in the aetiology of the common killing diseases of middle and later life. In his task he is finding that the old method of arrangement of facts into chains of inference to formulate a hypothesis, followed by the use of other data to test the hypothesis, is still a rewarding method of investigation. Although his analytical techniques have a refinement that was impossible a century ago, his method of working is in the direct descent from John Snow.

CLINICAL THERMOMETERS

About 3½ million clinical thermometers are sold in Britain annually, and it would be surprising if an occasional one out of so many instruments did not fall below its purchaser's expectations. But how many do not show the accuracy required of them is problematical. Since they are commonly read to the nearest 0.2° F., their materials and manufacturer must conform to strict standards, and the intricacies of glass-blowing are such that these standards are not easily attained. No doubt the manufacturers are constantly checking samples of their products, but a recent American investigation suggests that some independent checking might be worth while in Britain. E. G. Dimond and M. H. Andrews¹ tested 465 thermometers—all in use at a large general hospital—against a standard thermometer of known accuracy. Of these 465 clinical instruments, 34 (7%) were exactly in accord with the standard, 7% showed variation of 1° F. or more from the standard, and about 78% varied by less than 0.5° F. The greatest error was 3.3° F. from the standard. Clearly the unreliability of a small proportion of these thermometers could lead to difficulties in, for example, the investigation of a case of supposed continued low-grade fever in a child or the notification of a case of puerperal pyrexia. In Britain the National Physical Laboratory tests some clinical thermometers, and marks with its monogram those that pass the test. Some thermometers, too, are manufactured in accordance with the limits of tolerance set by the British Standards Institution, a letter from whose technical director appears at page 1339, and some of these are included among the instruments tested by the N.P.L. The British Standard permits a maximum error of $\pm 0.2^\circ$ F. at and below 106° F. The N.P.L. and B.S.I. thermometers cost slightly more, and comprise only a minority of those in use. Whether the cheaper types are sufficiently accurate for clinical practice is something that might well be investigated.

TENDON REPAIR

At the end of the first world war Sterling Bunnell² laid down the principles governing successful tendon surgery, but it required the second world war to produce a rapid acceleration in their application and the growth of surgical teams primarily interested in hand surgery. The fundamental principles governing tendon repair are two³: first, all tendon repair demands vascularization from adhesions to neighbouring tissues, since the tendon has no blood supply of its own; and, secondly, any adhesions in the digital tendon sheath will affect the function of the tendon adversely. It has taken forty years of work to strike a practical balance between these mutually antagonistic factors.

Before the importance of early treatment to the injured hand was appreciated, experience had to be gained from the results of treating late hand injuries. It was found that if a tendon was to function there must be no adhesions to it; but local repairs in the tendon

sheath almost inevitably produced local adhesion. The procedure of grafting was then devised, in which the tendon graft was sutured at the base of the terminal phalanx, where its gliding movement was small and adhesions necessary for its attachment were minimal, and suture of the proximal portion was done in the palm outside the tendon sheath. Careful attention to the digital sheath and its pulleys is essential to avoid adhesions, and difficulties are encountered where the sheath is occupied by two tendons, the so-called "no-man's-land" between the distal palmar crease and the proximal interphalangeal crease. Here the pressure on the graft resulted in adhesions to the sheath or to its fellow tendon, either or both usually leaving the finger with flexor sublimis function only. It was soon recognized that an actively functioning flexor profundus alone was all that was required, and the sublimis tendons were sacrificed by removal. On this basis very satisfactory delayed repair was possible.

To avoid the necessity for this complicated technique and the time wasted by the patient, attention was naturally turned to the acute injury, and some measure of general agreement has been arrived at in treatment. Again there are two main factors to consider. First, the type of wound has an important bearing on treatment. Two types may be distinguished: the incised wound—often surgical in its tidiness but most unsurgical in its disregard for anatomy—in which primary repair is possible; and the crushing injury in which fractures, bursting of the tendon sheath, and loss of skin may occur and are inevitably followed by adhesions and which demands delayed repair. Secondly, there is the level of the wound to be considered. If it is in the wrist, then primary suture is aimed at, since secondary repair is very difficult here. Once again the sublimis tendons can be sacrificed if necessary. In the palm primary suture is usually satisfactory. In the tendon sheath distal to the proximal finger crease the profundus can be sutured with every chance of success if the wound is a clean incised one. In "no-man's-land," because of the difficulties encountered, it has been the habit of many surgeons⁴ to leave the wound and do a delayed graft. The terrors of this area may be more imaginary than real, for Allen and his colleagues in Chicago are now excising the sublimis and carrying out primary repair in this area when the wound is clean. It is interesting to note that Professor R. F. Bogdanov, of Sverdlovsk in the U.S.S.R., writing in this issue on the subject (p. 1315), is also quite definite that repair in this area need not be secondary. Extensor tendons, being surrounded by mesotendon and paratendon, offer no difficulty in repair, and the same proportion of successful results as is claimed by Professor Bogdanov for primary suture would be expected in English-speaking countries. Comparison of figures is, however, difficult, since Professor Bogdanov's statistics are based on a regional classification, and the end-results are much more strongly influenced by the character of the wound than its position. It is obvious from his report that surgeons in Russia are prepared to exercise

¹ *Surg. Gynec. Obstet.*, 1918, 26, 103.

² Mason, M. L., and Allen, H., *Ann. Surg.*, 1941, 113, 424.

³ Rank, B. K., and Wakefield, A. R., *Surgery of Repair as Applied to Hand Injuries*, 1953, p. 100, Edinburgh.

the patience and scrupulous attention which the precision surgery of the hand demands, and are developing that special experience of their craft which is essential for success and which justifies the segregation of hand injuries in special clinics.

ROYAL SOCIETY CONVERSAZIONE

In spite of the enormous grants nowadays poured by the Treasury and industry into scientific research, at least some scientists seem to be free still to carry out investigations that have no immediate bearing on man's affairs. They were fairly well represented once again at the Royal Society's Conversazione held on May 19, when exhibits intended to illustrate some of the more important lines of research were displayed at the Society's rooms off Piccadilly. The songs of birds and the music of the spheres (detected by radio-telescope), the hearing of whales and the spinning of spider's webs, were the subject of exhibits that did not seem to portend the immediate exploitation of man's environment. But not quite the same could be said of the animated diagram showing how a chain reaction works in a nuclear reactor.

Of special interest to medical men was an exhibit by Drs. Jean Hanson and H. E. Huxley (of London and Cambridge respectively) showing how striped muscle contracts. Two different types of protein filament lie alongside each other, partly overlapping. Contraction occurs when the filaments of one type slide along those of the other type, so that the two arrays come to overlap almost completely. Supply of adenosine triphosphate causes this movement, and it was demonstrated under the microscope. Cinematography was the basis of two exhibits. Drs. G. M. Ardran and F. H. Kemp (Nuffield Institute of Medical Research, Oxford) illustrated the swallowing mechanism by means of short x-ray cine films taken of subjects swallowing radio-opaque fluids. This technique has shown, among other things, that the soft palate closes down on to the back of the tongue to help form a bolus in the mouth just before swallowing, and that this is its main role rather than shutting off the nasal from the pharyngeal cavity. Apparently it is true too that some people, though very few, really can pour a glass of beer straight down their throats without any appreciable swallowing movements with the mouth. The use of high-speed cinematography in analysing fast movements in living creatures was demonstrated by Dr. D. A. McDonald (St. Bartholomew's Hospital). His film, taken at 1,000-2,000 frames per second, showed a cat righting itself in falling (successfully but not quite so expertly when blindfolded), the flow of blood through arteries in experimental animals, and human responses to a blow to the face—all with an infinitely lethargic motion that would have appealed to Marvell's coy mistress.

Human respiration came in for a surprising amount of attention. Drs. A. J. Buller and A. C. Dornhorst (St. Thomas's Hospital) translated into electrical wave patterns the sounds passing through the chest wall, thus providing a visual analysis of such time-honoured

clinical signs as aegophany, amphoric breathing, and dullness. Dr. B. M. Wright (Pneumoconiosis Research Unit, Cardiff) showed a small meter for measuring the amount of air breathed by a man at work. The mechanism consists mostly of wrist-watch wheels, and the air drawn through it when it is fitted into a mask turns a dial to record the volume. It was originally developed to estimate the dust inhaled by miners. Mr. H. S. Wolff (National Institute for Medical Research) was also occupied with a flow-meter, though of a different kind. It measures the volume of air a person expires while working, and also takes a sample for subsequent analysis. The oxygen consumed in a variety of jobs—some of them strenuously athletic—can be measured with it; and it can be worn for many hours, allowing the wearer to drink and to smoke. For light relief the visitor could contemplate a curious optical illusion staged by Dr. R. A. Weale (Institute of Ophthalmology, London).

No demonstration of current research would be complete without those sub-atomic particles of biology, the viruses. Dr. Elinor McCloy (London School of Hygiene and Tropical Medicine) showed how prophage—a kind of derivative or incomplete phage—is thought to become attached to specific sites on the genetic apparatus of bacteria, thereby blocking the destructive effects of phage in those bacteria. Drs. R. E. F. Matthews and J. D. Smith (Cambridge) illustrated the chemotherapy of plant viruses with some synthesized compounds similar to, but not identical with, the natural bases of the virus nucleic acids. The virus particles incorporate these synthesized competitors, and their powers of infection are thereby inhibited. With any luck this work may ultimately be of great importance not only in the treatment of human virus diseases but in furthering our understanding of what distinguishes living organism from dead matter.

TOXIC EFFECTS OF COBALT

The benefit conferred by cobaltous chloride in the treatment of certain anaemias of childhood and in the anaemias associated with chronic infection, renal disease, and carcinomatosis has been discussed recently in these columns.¹ Side-effects appear to be uncommon and occur usually with doses in excess of 100 mg. daily. Anorexia, nausea, and vomiting can largely be prevented by administering enteric-coated tablets. Tinnitus, deafness, flushing of the face and extremities, and paraesthesiae have been reported.² Large doses in animals cause renal damage, but this hazard has not yet been encountered in man, even in patients with severe renal disease. Recently, however, Kriss and his colleagues³ have reported a serious and unexpected toxic action on the thyroid; they found hypothyroidism with hyperplasia of the thyroid in five of their patients. Goitres developed during treatment, and tests of thyroid function, including radioactive iodine, showed reduction of normal activity. This goitrogenic action has since been confirmed in

¹ *British Medical Journal*, 1954, 2, 1038.

² Gardner, F. H., *J. Lab. clin. Med.*, 1953, 41, 56.

³ *J. Amer. med. Ass.*, 1955, 157, 117.

⁴ Gardner, D., et al., *Lancet*, 1954, 2, 1285.

¹ Dimond, E. G., and Andrews, M. H., *J. Amer. med. Ass.*, 1954, 156, 125.

Britain.⁴ Recovery follows withdrawal of the drug, and it would be interesting to know whether thyroid function is invariably depressed in patients receiving cobalt.

Why cobalt should cause polycythaemia remains a mystery, though animal experiments suggest that the metal inhibits enzyme systems containing sulphhydryl groups. Kriss *et al.* believe—and there is some support from Kirkwood's experiments⁵—that it has a similar inhibitory action on the tyrosine iodine system in the thyroid. It seems likely that the drug is a poison rather than an essential element in erythropoiesis, and this should be borne in mind when treating patients. While it is reasonable to treat cases of chronic renal disease and of carcinomatosis with cobalt, administration of the drug to children should await further knowledge of its side-effects. Many would agree that its inclusion in proprietary preparations for the treatment of anaemia is unjustified. Though caution is necessary in therapy, the demonstration that cobalt is a goitrogenic agent may help to unravel the biochemistry of thyroid function.

CINERADIOGRAPHY

Cineradiography, the formation of x-ray pictures at the rate of 16 per second or faster, has nearly always been carried out by the indirect method of photographing a fluorescent screen image. Speeds of up to 100 frames per second have been possible. However, the work has often been limited by overheating of the x-ray tube, poor definition, and the high dose of radiation necessary. The combination of fast film (35 mm.) and fluorescent screens together with wide aperture lenses (f 1.0 to f 0.71), camera shutters preferably closed for only one-quarter of the cycle, and pulsed x-ray units leaves little room for improvement along these lines. The dose rate depends on the type of examination being performed, but an antero-posterior view of the heart requires a skin dose of the order of 0.1–0.3r per picture.

Recently several methods have been devised by which a considerably brighter image of the fluorescent picture may be obtained.^{1,2,3} The method developed by Colman¹ consists of an electron lens which uses a fluorescent screen as object and produces a luminous image reduced in size but greatly increased in brightness. The Westinghouse-Marconi¹ and Philips⁴ image intensifiers are of this type. Cinematography of the reduced, intensified image can be performed if a suitable optical system is available. With an apparatus of this type the skin dose of radiation for an antero-posterior view of the heart is about 0.2–0.5r per 100 frames, and 1.2r per 100 frames for an abdomen. The definition at maximum intensification is limited by statistical fluctuation of the x-ray quanta, as predicted by Sturm and Morgan,⁵ demonstrated by Ardran and Wyatt,^{6,7} and described by Tol and Oosterkamp.⁸ A compromise may have to be made

between definition and amplification of brightness. Thus within limits the definition will depend on the dose of radiation used. The definition approaches that of conventional intensifying screen radiography as the dose of radiation approaches that used in screen radiography. The best possible definition is not always required when moving pictures are viewed by projection, and thus the radiation dose may be kept low. The definition obtained in cineradiography by means of the image intensifier may, with only 2–5% of the radiation dose, be as good as or better than the definition obtained with orthodox cine fluorography. At present the small field which can be examined (approximately 5 in. (12.5 cm.) in diameter) limits the usefulness of the apparatus, but it may be employed for studying the act of swallowing, selective angiocardiology, and movements of the duodenal cap. Image intensifiers covering larger fields are being developed.

In the future almost all cineradiography and much rapid serial work may well be carried out with image intensifiers, when these are available in a size which covers the part under examination. Now that the limit imposed by overheating the x-ray tube has been removed it must be remembered that, although the dose per picture can be exceedingly low, the total dose can rise to a dangerous amount if the cineradiographic examination is continued for a long period. Great care will still be necessary to avoid an excessive dose to the gonads when the abdomen and pelvis are examined by cineradiography.

"SURGERY, GYNECOLOGY AND OBSTETRICS"

Surgery, Gynecology and Obstetrics comes high on the list of famous and successful medical journals. For fifty years now leading surgeons have contributed to it, and their colleagues all over the world have turned to it as a source of authoritative information. The high and, indeed, luxurious standard of presentation reflects the pride of the editors, publishers, and printers in their journal, which in this its golden jubilee year has temporarily dispensed with its familiar cover and appears handsomely dressed in blue and gold. In the first number of the year Dr. Loyal Davis, the present editor, describes how the journal came into being in 1905. It was so successful financially that it could pay for the meeting of the Clinical Congress of Surgeons in London in 1913. Following that meeting the American College of Surgeons was founded, and since 1935 the College has owned the journal, the earnings of which are used to further the educational purposes of the College. In an editorial also appearing in the first number for 1955 Dr. Sumner L. Koch, an associate editor of the journal, looks beyond the remarkable surgical advances of the last few decades. If, as in his view is entirely conceivable, the centre of activity of surgeons moves during the next half-century from the operating-room to the laboratories of physics and chemistry, *Surgery, Gynecology and Obstetrics* will be there to guide them, as it has in the past, through the intricacies of new and strange techniques.

EMERGENCIES IN GENERAL PRACTICE POST-PARTUM MATERNAL COLLAPSE

BY

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For the purpose of this article it is proposed to limit discussion to those cases in which sudden collapse of the mother occurs within a few minutes or hours after delivery. Such a condition may arise at any time during pregnancy or during the puerperium, but the varieties most commonly encountered in practice occur mainly during the immediate post-partum period.

A full discussion of these conditions would involve a survey of all the general medical and surgical conditions, to say nothing of those of obstetrical origin, which can lead to sudden collapse or shock. Broadly, they can be divided into conditions directly due to pregnancy and childbirth—that is, to obstetrical conditions—and those due to general medical or surgical diseases which are acutely exacerbated by the process of labour.

Obstetrical Causes

The causes arising directly out of pregnancy and labour which may lead to post-partum collapse may be defined as follows.

Haemorrhage.—This must be regarded as the commonest and most important cause of post-partum collapse. Bleeding may come from the birth canal and be visible externally; the main causes are retained placenta, uterine inertia, and bleeding from lacerations of the genital tract. Internal haemorrhage may occur, the most frequent cause being rupture of the uterus; internal bleeding may also occur from rupture of a vessel in the broad ligament or tearing of the vaginal vault. Antepartum haemorrhage, whether of the accidental variety or due to placenta praevia, is apt to be followed by post-partum haemorrhage.

Trauma.—Surgical shock may result from a difficult delivery or may follow precipitate labour. Many obstetric operations, and especially difficult forceps delivery and craniotomy, may lead to maternal shock; the cause appears to be linked with the effect of traction on the broad ligaments. A similar effect is seen when shock follows an attempt to deliver the placenta by Credé's method. The dangers of forcible manipulation of the uterus cannot be overemphasized, and indeed Credé's method has now been entirely abandoned by many obstetricians, who feel that they prefer manual removal of the placenta as the safer procedure.

Acute Inversion of the Uterus.—This may result from trauma, but in many recorded instances the uterus has become inverted in the absence of any interference. Acute inversion may be complete, the uterine fundus protruding from the vulva and lying between the mother's thighs, or it may be partial so that the fundus is not visible. In either instance the mother collapses in a state of profound shock which is probably caused by traction on the broad ligaments.

Embolism.—Pulmonary embolism may occur from previous venous thrombosis in cases in which thrombophlebitis or phlebothrombosis has occurred during the latter part of pregnancy; in general, however, pulmonary embolism from this cause is commonest between the tenth and fourteenth days of the puerperium. In cases of cardiac disease thrombi in the heart itself may be displaced during labour. Amniotic fluid embolism is a somewhat obscure condition, but the presence of amniotic fluid in the mother's lungs has been demonstrated in cases of unexplained sudden death during

or shortly after labour. Air embolism is recognized as an occasional happening in labour. It may occur at forceps delivery, during manual removal of the placenta, or during packing of the uterus. It is possible that a low-lying placenta may predispose to its occurrence.

Drugs.—Pituitary shock is well recognized as a cause of collapse in the recently delivered woman and is believed to be due to spasm of the coronary vessels. Two important points must be made in this connexion. The danger of shock results chiefly from repeated administration of posterior pituitary extracts for arrest of post-partum haemorrhage. For this reason many prefer not to use them but to rely on ergometrine, which does not carry this risk and is equally effective. Posterior pituitary extract is much more dangerous than injectio oxytocini (B.P.), as the latter contains mainly the oxytocic factor. Nevertheless, as no pure preparation of oxytocin exists as yet, all known preparations of oxytocin containing a small proportion of vasopressin, shock may follow the use of the oxytocic factor. Thus if pituitary extract is given in the post-partum period, oxytocin should be used, but only one injection should be given; it should be used intravenously only with the greatest caution and in a dose not exceeding two units, if indeed it is used at all. Sudden collapse may follow the administration of anaesthetics during labour; the recently delivered woman appears to be particularly susceptible to this. Recent reports of maternal deaths due to inhalation of vomit have received considerable notice, and it must always be remembered that the stomach empties slowly during labour. Chloroform is especially dangerous in causing collapse.

Toxaemia of Late Pregnancy.—An eclamptic convulsion may occur in the recently delivered mother, and in severe toxæmia cerebral haemorrhage may cause collapse with coma.

Nervous Influences.—There are many who believe that post-partum collapse rarely if ever occurs without a cause such as one of those already described. Occasional cases are, however, encountered where the mother goes into profound shock after a normal delivery and no apparent cause is found. Collapse may sometimes follow a psychological shock at the time of delivery. Such an occurrence is described in the First Book of Samuel, Chapter 4, where the death of Eli and the birth of Ichabod are described: "And his daughter in law, Phinehas' wife, was with child, near to be delivered: and when she heard the tidings that the ark of God was taken, and that her father in law and her husband were dead, she bowed herself and travailed; for her pains came upon her. And about the time of her death the women that stood by her said unto her, Fear not; for thou hast born a son. But she answered not, neither did she regard it."

In practice, post-partum collapse in the absence of shock or haemorrhage is very uncommon, and it should be a rule always to exclude all possible physical causes before ascribing it to nervous influences.

Non-Obstetrical Causes

In the majority of cases where the mother collapses suddenly after childbirth an obstetrical cause is responsible. Nevertheless there is a variety of non-obstetrical causes for such a catastrophe. The main group consists of cases of heart disease, especially mitral stenosis. The woman who is in incipient heart failure before the onset of labour may

¹ *Radiology*, 1948, 51, 359.

² *Amer. J. Roentgenol.*, 1949, 62, 617.

³ Moon, R. J., *Science*, 1950, 112, 389.

⁴ van Alphen, P. M., Burger, G. C. E., Oosterkamp, W. J., Teves, M. C., and Tol, T., *Fortschr. Röntgenstr.*, 1952, 77, 469.

⁵ *Radiology*, 1951, 57, 556.

⁶ Demonstration at the Annual General Meeting of the British Institute of Radiology, November, 1953. London.

⁷ *J. Physiol. (Lond.)*, 1954, 126, 1P.

⁸ *Nature, Lond.*, 1954, 174, 397.

collapse suddenly when the uterus empties. Here an overloading of the maternal circulation results from the sudden release of blood from the pelvic organs, and this may even be fatal. Other less common cardiovascular diseases include myocarditis, pericarditis, and pericardial effusion.

Rupture of a vital organ may occur, as, for example, the heart, spleen, pancreas, aorta, mesenteric vessels, bowel, or gall-bladder. Internal haemorrhage may occur from the lungs, stomach, or splenic veins. Cerebral haemorrhage sometimes occurs even in the absence of severe toxæmia. Uraemia may become manifest for the first time in the immediate post-partum period. Profound anaemia in pregnancy may become evident for the first time after delivery, especially if there has been loss of blood during labour.

Diagnosis

The practitioner who is called to a case where the mother has collapsed suddenly after delivery is faced with a grave situation demanding immediate action. There will be time only for a rapid survey of the situation, but this is well rewarded, as correct diagnosis is essential before treatment is begun.

A brief history is taken; this will include the history of past illnesses, with special reference to conditions such as heart disease and anaemia. The history of past pregnancies is important. Operations such as caesarean section, hysterotomy, and myomectomy may have left a potentially dangerous uterine scar. The history of the present pregnancy will include the presence of any abnormalities and the amount of antenatal care received. Important events include toxæmia, anaemia, breathlessness, varicose veins, or antepartum haemorrhage. The history of the labour is next taken, including the length of each stage, and of the actual delivery, whether normal, difficult, or precipitate. A note is made of all drugs, including anaesthetics, given during labour and of any untoward symptoms such as vomiting or pain in the chest or abdomen. The history of the third stage is very important and should include an account of all attempts, whether successful or not, to deliver the placenta. If the placenta is available it should be examined to ensure that it is complete.

A general examination of the mother follows. The skin and mucous membranes are inspected for pallor and sweating. The rate and volume of the pulse are noted and the blood pressure is recorded. A note is made of obvious symptoms such as dyspnoea, restlessness, or pain in the chest or abdomen. The heart and lungs are next examined; a churning sound in the heart is characteristic of air embolism. The lungs may show evidence of pulmonary oedema.

Examination of the abdomen follows; the uterine fundus is felt to see if it is firmly contracted and palpable per abdomen. Tenderness or rigidity may be felt in the abdominal wall or over the uterus itself. Free fluid may be detectable if there is intraperitoneal haemorrhage. The vulva is next inspected to see if blood is still being lost. A pelvic examination should follow but may be deferred if the placenta is still retained. Pelvic examination after removal or expulsion of the placenta may reveal a laceration of the cervix or vagina or an incomplete inversion of the uterus.

The clinical signs of shock and haemorrhage are very similar. The patient is pale, sweating, restless, and anxious, the pulse is soft, and its rate rapid, often up to 150 a minute. The blood pressure falls, the systolic pressure falling more in proportion than the diastolic.

Prevention

Prevention of post-partum collapse begins in the antenatal period, when abnormalities such as toxæmia, anaemia, heart disease, and thrombophlebitis may be detected and treated. Disproportion, even in multiparae, must be excluded and potentially dangerous conditions such as multiple pregnancy and malpresentation diagnosed. The choosing of cases for home delivery is important: all cases with a previous history of grave disease and cases of multiple pregnancy, of mal-

presentation and of suspected disproportion are safest in hospital, where there are facilities for any emergency treatment that may become necessary.

During labour the emphasis must above all be on avoiding trauma and haemorrhage. Caesarean section has become so safe that it is to be preferred to difficult delivery, and it is now used without hesitation in many conditions. Few would condone the old "difficult forceps" delivery with excessive traction on the maternal soft parts and foetal skull; forceps should rarely if ever be applied before full dilatation of the cervix. The danger of Credé's manoeuvre for expulsion of the placenta cannot be overemphasized, and it is doubtless still responsible for much unnecessary obstetric shock. In fact its use should no longer be taught to medical students or pupil midwives except to stress its dangers. Care must be exercised in the use of all drugs during labour, two of the most dangerous being chloroform and posterior pituitary extract. Perineal sutures should be inserted under local analgesia.

A massive post-partum haemorrhage will demand immediate treatment. The slow, steady trickle is almost more dangerous in that it may go on unnoticed until the mother is in a grave condition. The amount of blood lost after delivery should be most carefully watched and action taken when the total reaches 20 oz. (568 ml.), if not before.

Treatment

The treatment adopted in the individual case of post-partum collapse will depend on the cause; in most cases haemorrhage or shock will be responsible, and their treatment is dealt with in some detail.

The treatment of post-partum haemorrhage may be outlined as follows. If the placenta has not been delivered the uterine fundus must be gently grasped and rubbed up until it contracts: ergometrine, 0.25 to 0.5 mg., is then given intravenously. A strong contraction will occur in about half a minute and an attempt may then be made to deliver the placenta by gentle fundal pressure. Excessive force must be avoided, as this will only increase existing shock. If the attempt fails preparations should be made for manual removal, and meanwhile haemorrhage will have been checked. It has been shown that shock tends to increase for as long as the placenta is retained. Anaesthesia for manual removal will depend on the circumstances; the ideal anaesthetic for this purpose is a small dose of thiopentone, provided the necessary equipment, which must include oxygen, is available. In an emergency, manual removal can be gently performed without anaesthesia, or with analgesia with gas and air or trichlorethylene ("trilene").

If bleeding occurs after complete expulsion of the placenta, ergometrine should immediately be given intravenously; intramuscular injection is apt to be less effective in the shocked patient. The uterus will contract and bimanual compression should be carried out until bleeding is arrested. This is best done by the external method; the uterus is lifted well up into the abdomen and held firmly between the two hands. The patient's legs should be straightened and the foot of the bed raised. If bleeding continues and the uterus is empty and well contracted, the blood may be coming from a laceration of the genital tract, and arrangements should be made to suture this as soon as possible. In domiciliary practice it may be necessary to pack the vagina firmly with gauze until such arrangements can be made.

All cases of serious haemorrhage require blood transfusion, and it is here that in domiciliary practice the obstetric flying-squad service has proved most valuable. Restorative measures must be carried out while awaiting the arrival of blood. The foot of the bed is raised and moderate but not excessive warmth applied to the patient's body. Morphine, $\frac{1}{2}$ gr. (16 mg.), is given if she is restless and anxious. Blood should be taken for cross-matching and intravenous therapy begun without delay. There is no substitute for blood in a case of haemorrhage, but it may be some time before transfusion can be given. In the interval, glucose saline, or,

better still, one of the plasma substitutes, may be given by intravenous drip. Every practitioner who conducts midwifery cases should include in his equipment a giving set and one or more bottles of plasma substitute.

Three satisfactory plasma substitutes are at present available: polyvidone ("plasmosan" consists of a 3.5% aqueous solution of polyvidone with electrolytes in the same proportion as in plasma), dextran, and improved preparations of gum acacia. Blood must be taken for cross-matching before administering plasma substitutes, as their effect on the red corpuscles may make subsequent matching of blood difficult.

Plasma substitutes are advantageous in the treatment of post-partum collapse in that they have a pressor effect, so that within a short time of commencing administration there is often a dramatic improvement, the blood pressure rising and the pulse rate falling. In cases in which the blood pressure remains persistently low a small dose, say 10 mg., of methylamphetamine hydrochloride may be added to the drip, but this drug should be used with caution and in the minimal dose.

As a general principle, where there has been haemorrhage the amount of blood lost should be replaced by transfusion, but care must be taken not to overload the circulation, and the actual amount given will depend on the response to treatment.

When no improvement follows the arrest of external haemorrhage and adequate restorative treatment, including blood transfusion, internal haemorrhage must be suspected and the situation is grave. Immediate laparotomy is likely to offer the only chance of saving the patient's life, and arrangements for this, including removal to hospital if necessary, must be undertaken without delay.

Cases are now being described of post-partum haemorrhage due to afibrinogenæmia; they usually follow accidental antepartum haemorrhage. Steady and continuous loss of blood occurs after delivery, and if the blood is examined in a test-tube it is found that normal clotting is not occurring. The treatment of such cases is to give fibrinogen, but supplies of this substance are not as yet easily available. Bottled blood is useless as it contains little fibrinogen, but fresh blood or reconstituted dried plasma may be given if fibrinogen is not obtainable.

Oxygen is invaluable in all cases of shock and collapse, and should be given in high concentration, preferably with a special oxygen mask.

In treating shock in the absence of haemorrhage the same general principles apply, except that blood should not be given; general restorative measures should include moderate warmth, morphine for restlessness, oxygen, and intravenous infusion of a plasma substitute, with a small dose of methylamphetamine hydrochloride when the blood pressure remains low.

Acute inversion of the uterus may be responsible for unexplained shock; incomplete inversion may not be diagnosed without vaginal examination. The patient is likely to show profound shock, and, in addition, there may be haemorrhage. Restorative treatment should be begun at once. Replacement of the uterus may be undertaken by O'Sullivan's method. If the placenta is still attached to the uterus it is gently peeled off; the uterine fundus is replaced by giving a hot douche under pressure, while occluding the vaginal orifice with the forearm. This simple method has proved its value in many recorded cases.

In cases of embolism little can be done except to give oxygen; intravenous therapy is best avoided owing to the risk of overloading the already embarrassed heart. In the cases of collapse due to the rarer conditions treatment must be applied according to the cause, and accurate diagnosis becomes of the utmost importance.

Conclusion

Post-partum collapse is most frequently the result of haemorrhage or shock, and these still rank high among causes of maternal mortality. Their prevention and prompt

treatment can save many lives. The contributions made by the National Blood Transfusion Service and the obstetric flying squads have done much to reduce maternal mortality to its present low level.

Next article on Emergencies in General Practice.—
"Acute Hepatic Failure," by Dr. Sheila Sherlock.

Refresher Course Book.—Copies of the second volume of collected articles from the Refresher Course for General Practitioners are still available at 25s. (postage 1s.) each. The first volume is now sold out.

Clinical Pathology Book.—"Clinical Pathology in General Practice," a collection of 39 articles on clinical pathology that appeared in the Journal as part of the Refresher Course for General Practitioners, is now available, price 21s. (postage 9d.).

Both these volumes are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or through any bookseller.

JUBILEE OF SHEFFIELD UNIVERSITY

The University of Sheffield, with its 2,000 full-time students and 300 full-time staff, is engaged in a session-long celebration of its jubilee. The celebrations began last October with a visit by the Queen, were continued during the month of April in a series of "open days," when the public visited the departments, including the 13 departments of medicine, and they reach their climax on May 31 with a cathedral service and a little later with an honorary degree congregation. It was on May 31, 1905, that the royal charter was brought to the city, escorted from the station, we are told, by a procession of thirty carriages decorated with college colours.

The School of Medicine

Sheffield University grew out of three institutions, the oldest of which was the Medical School, founded in 1828. This was known earlier as the Medical Institution, but by 1868 it had become the Sheffield School of Medicine, having passed through many vicissitudes and perils, but gradually altering its character from an old school of anatomy concerned with apprentice assistants to that proper to a medical faculty. The greatest of its builders was Arthur John Hall (1866-1951), who joined the staff in 1889 and became eventually a legendary figure in the university. Another name which appears in the early records is Christopher Addison, who was professor of anatomy at Sheffield from 1897 to 1901. In the year that Addison came to Sheffield, University College (1897-1905) was founded, the Medical School joining with two institutions for arts and science and technology. The movement for higher education in Sheffield had been started by a group of great industrialists—Mark Firth, the Master Cutler, after whom the present Firth Hall is named, Henry Stephenson, and Frederick Thomas Mappin, all of whom belonged to the mid-Victorian era and established Firth College as an embryo university in which research in relation to local industries was specially developed. The Medical School came into the set-up not as a poor relation, as had been feared at one time, but as an equal partner, though it is true that, left on its own, the Medical School could hardly have developed into a university.

In 1905 King Edward VII opened the new university buildings on Western Bank, which meant for the medical departments far more satisfactory accommodation than they had had hitherto in their cramped quarters in the centre of the city. The first decade of this century saw the rise of a number of new universities. Leeds had been incorporated the previous year, Liverpool the year before that. The steel metropolis was in no way behind in the acclaim with which the creation of its university was greeted. At its

first conferment of degrees the awards, honorary and other, were so numerous as to move a local rhymester:

"Oh, why this face of woe?" I asked a wight,
With whom I talked awhile on yesternight—
Said he, "I am the only man in town
Who hasn't got a Doctor's hood and gown."

Sheffield and the B.M.A.

It was shortly after the establishment of the university that the British Medical Association held its annual meeting in Sheffield, when fifteen further honorary degrees were conferred on distinguished medical men, among them the president of the Association, Simeon Snell. There had been two previous annual meetings in Sheffield, one in 1876, when the president was Martin de Bartolomé, for many years president of the Medical School and leader of the profession in Sheffield, and the other in 1846, when the president was Dr. F. C. Favell, one of the eleven proprietors of the then Sheffield Medical Institution. Many famous names in medicine have been associated with the more recent history of the university—J. B. Leathes, professor of physiology, 1919-33; Edward Mellanby, professor of pharmacology 1920-34, whose appointment was the first to be made more for research than for teaching; and Howard Florey, professor of pathology 1931-5, who was later to make his name for his work on penicillin. In 1946 came the appointment of the first full-time professor of medicine, the present holder of the chair, Dr. C. H. Stuart-Harris.

The jubilee of the university is commemorated in a handsome and massive volume, *The Story of a Modern University*,¹ very closely documented, excellently illustrated, and altogether worthy of the occasion. It is the work of Dr. Arthur W. Chapman, the registrar of the university since 1944. It prints as a foreword a noble passage spoken by John Masefield at the inauguration of the late Earl of Harewood as Chancellor of the University nine years ago:

"In these days of broken frontiers and collapsing values, when the dams are down and the floods are making misery . . . wherever a University stands, it stands and shines; wherever it exists, the free minds of men, urged on to full and fair inquiry, may still bring wisdom into human affairs."

Reports of Societies

PSYCHOLOGICAL FACTORS IN EDUCATIONAL DISABILITY

The Section of Psychiatry of the Royal Society of Medicine discussed "Psychological Factors in Educational Disability" at its annual general meeting on May 10, with Dr. W. MAYER-GROSS, president of the Section, in the chair.

Dr. D. RUSSELL DAVIS and Dr. NORMA KENT (Cambridge) described a study of intellectual development in schoolchildren with special reference to family background. They restricted themselves to those aspects of intellectual development that are measured by conventional intelligence tests. Their aim was to see in what way the home environment affects intelligence. Do the degree and character of a child's intelligence at a given age depend on his upbringing? They agreed that intelligence is due partly, but only partly, to genetical factors.

Home Influences

Ideally, they said, the effects of environment were best studied by comparing the abilities of pairs of identical twins where one of each pair had been brought up in a different family from the other—only such twins were rare. Another way was to study the intelligence of children transferred at different ages from their natural parents to foster-parents, and to see how far the children's I.Q.s correlated with those of the natural and adoptive parents. These correlations varied in degree according to the age of the children at

¹ Oxford University Press, 50s. net.

adoption; when they were adopted at a few months old their intelligence later on was much closer to that of their foster-parents than of their natural parents. In assessing a child's upbringing, the factors most easily measured were probably not the most important. Notably in Iowa, attempts had been made to assess the "stimulation value" of the home, taking into account such things as the availability of toys, the participation of parents in play, the provision of space for play, and the quality of the talk and books in the home. Assessments made in this way correlated relatively highly with the intelligence of the children.

The rate of intellectual development was set not at birth but only gradually during the first few years of life. This was shown by the results of studies of children fostered at different ages and by studies on the "constancy" of I.Q.s. Thus correlations between tests and retests showed that I.Q.s were relatively constant during school years but were much less so at younger ages. Taking the correlation coefficients for test and retest after two years as measures of constancy, constancy was found to show a substantial increase between 2 and 6 years old. It was therefore in the children's circumstances during those years and earlier that one should look for the factors which affect the children's intelligence subsequently. Levy had shown that over-protected children were relatively good at reading and bad at arithmetic. Only children, and children first and last in order of birth, seemed to do well intellectually. Striking differences in the intelligence of the sibs in one family were common, and these might be attributed partly to difference in the ways in which the sibs had been brought up.

Discipline and Intelligence

Recent investigations in Cambridge had shown that there were consistent variations in the intelligence of school-children according to the kind of discipline adopted by the parents. At lengthy interviews with the mothers, the kind of parental training was assessed, note being taken of the frequency, consistency, and generosity of rewards, etc., so that the child's upbringing was assessed as predominantly "normal," "demanding," "over-anxious," or "unconcerned"; a demanding parent, for instance was one who set high standards, was inflexible in applying them, and gave poor rewards. One hundred and eighteen 8-year-old primary-school children had been given the Binet Scale (Form M), the W.I.S.C. "performance" subtests, and the Schonell graded word vocabulary test to measure reading age. Those who had demanding parents had a significantly higher mean I.Q. on the Binet than those from "normal" homes (124 compared with 110); their reading age was rather higher, but not significantly so. Of the 12 children with high I.Q.s (over 140) in the sample of 118, no fewer than 9 came from demanding homes. Children from "over-anxious" homes did significantly less well than the "normal" on the "performance" subtests (mean I.Q. 101 compared with 110), but did not differ significantly on the Binet Scale and reading test. Children with "unconcerned" parents showed a Binet I.Q. lower than that of the normal (97 compared with 110) and were particularly backward in reading—a pattern of test results shown by juvenile offenders. The conclusion was that the discipline in the home exerts a powerful influence on intellectual development, and that these findings have a bearing on the aetiology of mental defect.

Anxiety: Spur or Curb?

Mr. R. LYNN (Cambridge) spoke on "Emotional Factors in Reading Attainment" and concentrated on the effect of anxiety. There were two schools of thought: those like Schonell and Kanner who thought that when children were anxious for success their anxiety inhibited their efforts, and those who with Burt and Klein believed anxiety was a spur to effort and that the growth of reading skill was a form of defence against emotional upset. Mr. Lynn's survey was of 42 boys and 38 girls aged 7½ to 11 selected by their headmaster as good, poor, or average readers. Their reading age was assessed with Schonell's graded word vocabulary test,

and their tendency to anxiety by four informal interviews totalling three hours with the psychologist. At the interview they were asked informally six questions concerning personal anxieties, based on the Freudian view that the fear of loss of the mother was a source of anxiety, and six questions concerning impersonal anxieties. The questions in the first group included: "Have you ever been frightened your mother might die?", "Does scolding upset you?", "Are you easily hurt?", "Do you dislike being alone?" Those in the second group included questions about fear of thunder, of animals, of the dark, and tendency to nightmares. The results showed positive correlations between the reading age and affirmative replies to anxiety ($r = 0.33$ for personal group, $r = 0.24$ for impersonal group). The most striking individual case was a girl of 10½ with a reading age of 16½ and Binet I.Q. 146 who replied "yes" to four out of the first six questions and three out of the second six. She was discovered to come from a broken home with a timid, over-anxious mother. This supported the idea that anxiety favoured good school work, or perhaps it was that a central nervous system good at learning to read was also good at feeling anxiety.

Mr. Lynn went on to discuss anxiety as a socializing force, and to suggest that it might sometimes need redirecting rather than eliminating altogether, and this point was taken up in subsequent discussion when speakers suggested that neurotic anxiety was different from Lynn's questionnaire measure, and that the quantity of anxiety was important. A little might be good, a lot was bad. Other discussion turned on the relative value of questionnaire and interview, on the reliability of intelligence tests, on the exponential growth curve, which implied that a two-years span at three years old was not the same thing as two years at seven. Dr. DAVIS made it clear that in his results there was no correlation between parental I.Q. and the class of discipline in the home.

Constitutional Factors

Finally, Mr. GEORGE ETLINGER read a paper by himself and Mr. C. V. JACKSON (Institute of Neurology, London) on "Organic Factors in Developmental Dyslexia."

Difficulty in reading was commonly associated with certain factors which included anomalies of lateral preference, anomalies in the visual perception of apparent movement, minor E.E.G. abnormalities, anomalies of maturation of spatial and temporal perception, as well as indications of a specific genetical background. They had excluded from a group of 24 dyslexics referred to the National Hospital for Nervous Diseases at Queen Square 16 on account of the presence of frank neurological disorders or marked emotional or psychoneurotic features (which could be construed as primary to the dyslexia) or on account of insufficiently pronounced dyslexia. The remainder seemed to show marked reading disability without neurological signs and in association with better than average general intelligence. Half of these cases were, however, also retarded on visuo-constructive tests. Of special interest was the finding that only four cases were fully right-handed, and consistent unilateral hand, foot, and eye preferences were present in only one-third of this admittedly small group of cases. Moreover, some sinistral ancestry was reported in five out of the six cases in which relevant data were available, and a family history of dyslexia was established in one case. The results on the Jasper-Raney test of lateral dominance accorded with the view put forward by McFie that in many dyslexics normal dominance had not become fully established in either cerebral hemisphere. The present study, though insufficient in numbers for sure conclusions, emphasized the constitutional origin of specific dyslexia, which was best regarded as a selective failure of learning, directly due to defective maturation of those cerebral mechanisms underlying language and its development.

In the subsequent discussion it was suggested that many if not all of the cases of specific reading disability that were not secondary to mental defect could be regarded in this

light (according to Dr. MAYER-GROSS 24% of Army recruits are backward in reading). Nor did such cases show any speech disorder or motor clumsiness, even of a minor kind. The speakers had no suggestion for their treatment.

Nova et Vetera

DAVID BRUCE (1855-1931)

Sir David Bruce, who was born in Melbourne of Scottish parents on May 29, 1855, received his medical education at Edinburgh. After qualification in 1881 and two years in general practice he joined the Army Medical Service. While on duty in Malta he investigated many cases of the obscure continued fever then prevalent on the island, and in 1886 he isolated from the spleen in fatal cases an organism, *Micrococcus melitensis*, which he proved was the cause of Malta fever.¹ It was later renamed *Brucella melitensis*.

Bruce left Malta in 1888, and after a teaching appointment at Netley he was posted to South Africa in 1894. Here his attention was directed to nagana, a disease causing many fatalities among horses and cattle. Within two months he was able to report² the discovery of an organism (later named *Trypanosoma brucei*) in the blood of infected animals. During the next two years Bruce and his wife elucidated the main facts as they are now known about trypanosomiasis and its transmitter, the tsetse fly. The Bruces were among those besieged in Ladysmith during the South African war, and served respectively as operating surgeon and theatre sister.

It was J. Everett Dutton³ who in 1901 first recognized trypanosomes (*T. gambiense*) in the blood of humans suffering from sleeping sickness. In 1903 Bruce went to Uganda to supervise and control the Royal Society's Sleeping Sickness Commission. With D. N. Nabarro he showed that the tsetse fly was the vector.⁴ Castellani, a member of the commission, had found trypanosomes in the cerebrospinal fluid in five cases of sleeping sickness a year previously⁵ and had informed Bruce of the fact. Trypanosomiasis due to *T. brucei* did not affect man, but Bruce recognized the implications of Castellani's findings. He set up fly-feeding experiments, and by August, 1903, he had proved that sleeping sickness was caused by a trypanosome, that the vector was the tsetse fly, and that the disease could be transmitted by the bite of this insect.

Later work by Bruce included the demonstration of the source of infection of Malta fever in goat's milk, and research on the aetiology and control of trench fever and tetanus. He was knighted in 1908. A bibliography of his publications, together with appreciations of the man and his work, appears in the current *Journal of the R.A.M.C.* (April, 1955).

Bruce married in 1883 Mary Steele, a daughter of a general practitioner, and she assisted him in all his scientific work, both at home and abroad. He died in London on November 27, 1931, four days after Lady Bruce.

Sir Rickard Christophers has concluded a biography⁶ of Bruce with the following discerning sketch of his character: "Bruce was a man of strong physique and forceful mind. . . . His approach to the problems which he undertook to solve was extraordinarily simple, logical, vigorous, and direct, and this was backed by a remarkable, seemingly intuitive, perception of the essential point for attack. In his personal relations, whilst he is said to have been somewhat reserved and self-contained, all agree as to his loyalty and integrity of mind and purpose."

REFERENCES

- ¹ *Practitioner*, 1887, 39, 161.
- ² *Preliminary Report on the Tsetse Fly Disease or Nagana, in Zululand*. Durban, 1895.
- ³ *Thompson Yates Lab. Rep.*, 1902, 4, 455.
- ⁴ *Reports of the Sleeping Sickness Commission of the Royal Society*. London, 1903-19.
- ⁵ *Proc. roy. Soc.*, 1903, 71, 501.
- ⁶ *Dictionary of National Biography, 1931-1940*. 1949. Oxford University Press, London.

BRITISH ASSOCIATION OF PHYSICAL
MEDICINE

ANNUAL MEETING IN LONDON

The annual meeting of the British Association of Physical Medicine was held at St. Thomas's Hospital, London, on April 22 and 23.

The first subject discussed was "The Use of Hydrocortisone by Local Injection," and Dr. J. H. CYRIAX drew attention to the great importance of accurate anatomical localization of soft-tissue lesions for the effective use of hydrocortisone. Dr. P. HUME KENDALL described results obtained at Guy's Hospital. In selected cases of rheumatoid arthritis it had been confirmed that the chief value of the hormone appeared to have been the production of a remission sufficient to permit the commencement of more active physiotherapy than would previously have been possible. In osteoarthritis hydrocortisone had been of use only in the early case or where symptoms had been aggravated by recent injury. In acute rotator cuff lesions of the shoulder results had been good, but the effect on the "frozen shoulder" was usually disappointing. Various soft-tissue lesions such as tennis and golfer's elbow, plantar fasciitis, de Quervain's syndrome, and tenosynovitis had responded well. In acute traumatic articular effusions uncomplicated by serious bone or ligamentous injury the results were often dramatic, even in the presence of haemarthrosis, where hyaluronidase was combined with hydrocortisone after aspiration.

The Department of Physical Medicine

Opening a discussion on "The Department of Physical Medicine," Dr. W. S. TEGNER reviewed the evolution of the modern physical medicine department of a large hospital. Physical medicine had been and was still undergoing changes, and that necessitated fluidity in the make-up and organization of departments. Space and ease of access were important, and many architects still thought in terms of a rigid design incapable of adaptation. As regards staff, doctors, physiotherapists, technicians, and often nurses worked together, and there might be difficulties in integrating their various activities to secure efficiency. This also raised the question of the relationship of the physiotherapy school with the physical medicine department, and Dr. Tegner deplored attempts to use students as a form of cheap labour, particularly where this practice had prompted the opening of a school of physiotherapy. Beds and doctors in adequate numbers were required by physical medicine departments, since attendances and waiting-lists continued to grow all over the country.

Dr. W. A. FELL drew attention to the problems peculiar to physical medicine departments outside London and the bigger provincial centres, since over 25% of the patients might come from many miles away and have to spend a whole day away from home or work for the purpose of receiving one treatment. Some of those with even minor complaints found it impossible to travel the mile or so from home to the nearest point at which public transport was available. The only alternative in these cases was to use expensive hospital transport. At present it was necessary to treat patients in the central department, because only there could be found the requisite medical and technical staff and equipment. There was thus an overwhelming case for the provision of properly constituted peripheral clinics.

Disadvantages of the "Closed" Department

Dr. A. T. RICHARDSON said that the maintenance of closed physical medicine departments was indefensible for any reason, since it wasted the time of patients, doctors throughout the hospital, and physiotherapists, and prevented the general practitioner from having direct access to the physical medicine specialist. It might be argued that the closed system permitted a filtering of patients referred to physical medicine specialists, but surely they were the very people best fitted to reject cases for which there were no indications for treatment in the department. A great deal of time could be saved by a sound system of decentraliza-

tion whereby a patient could go to the department with a written prescription—e.g., from the dermatologist for ultra-violet-light therapy, from the chest department for breathing exercises, or from the orthopaedic surgeon for post-operative exercises. To achieve real efficiency, however, the physical medicine specialist and the physiotherapy services must be used intelligently, and this in turn depended on the better training of students in this field of medicine.

Dr. Richardson included within the scope of physical medicine the diagnosis and treatment of the medical disorders of the locomotor system, the treatment of these and other disorders by physiotherapy, and medical rehabilitation. It was now considered that the M.R.C.P. or its equivalent was essential for the attainment of consultant status in physical medicine, in addition to considerable experience in the specialty and the possession of the Diploma in Physical Medicine. There were now a sufficient number of fully qualified registrars to ensure that future appointments to consultant grade would fulfil these criteria.

Dr. F. S. COCKSEY expressed his concern at the shortage of physiotherapists. Unless a lowering of the standards of training for physiotherapists was to be accepted (a suggestion firmly rejected by many later speakers) there would have to be a continual economy in the prescription of treatment. He made a plea for a firm integration of the medicine practised in the physical medicine department with other hospital services and in close association with the local authority services and general practitioners.

In the ensuing discussion a number of speakers mentioned the apparent ignorance of many members of the medical profession and of lay committees of the proper function of the qualified physical medicine specialist and his department.

Correspondence

Diversities of Sex

SIR,—Dr. C. N. ARMSTRONG (*Journal*, May 14, p. 1173) has made a most graceful contribution to an important and difficult subject. He has given a simple practical classification of the diversities of sex, which in the past have been enshrouded in ambiguity. Few previous classifications have helped to simplify; most, owing to their complexity, have increased confusion.

I agree that there is no precise definition in law or medicine of what really constitutes male or female sex. Social laws demand it, but law and medicine, being exact and enlightened sciences, recognize the fact that there is often no clear-cut definition between the male and female. Sex perhaps, like most other things, is merely a question of relativity. Dr. Armstrong wisely emphasizes the difference between the genetic and the gonadal sex of the individual. Fortunately, in most people these correspond and there is no problem, but serious difficulties may arise when there is divergence between the genetic and gonadal sex and if there is added to this an imbalance of hormones. The subject then becomes extremely complex and a clear-cut definition of the sex is impossible. I believe, also, that the process of sexing by chromosomes is at present inexact and unreliable. This may be due to human errors and lack of experience in a new field. At present, I have under my care a patient whom I believe to be what Dr. Armstrong would describe as "a female pseudohermaphrodite." One authority on chromosomes called her a girl and another a boy. She is a girl, and has always been brought up as one, and will, I hope, always remain one.

It is of very great practical importance to make the right sex diagnosis in small babies soon after they are born, if possible, because they will soon have to be christened and a correct diagnosis will make life easier and more happy for them. However, if a patient of doubtful sex comes for treatment and advice in adult life, it is usually unwise to change the sex in which they have been reared and in which they usually wish to remain. I thoroughly

agree, however, that if the sex is obvious and the patient wishes to "change," being a transvestist and psychologically bizarre, it is most improper to accede to this. Moreover, the gonads should not be removed from any patient of doubtful sex in order to satisfy the patient, the surgeon, or the barrister. It may cause irreparable misery, and I expect Dr. Armstrong recognized this mistake in his Case 1, although he does not mention it. Everyone interested in this subject will remember Harold Chapple's¹ classical description of the really beautiful girl, with ardent amorous instincts and activities, who lost all her womanly beauty and charm, and then her happiness, when, against his sound advice, her testes were removed.—I am, etc.,

Leeds, 1.

MICHAEL C. OLDFIELD.

REFERENCE

¹ Chapple, H., *British Medical Journal*, 1937, 1, 802.

"Half-minute" Thermometers

SIR,—In your issue of May 7 (p. 1158) Dr. Peter Gilbert drew attention to the unreliability of the conventional "half-minute" indication on clinical thermometers, and he asked whether it would not be possible for every thermometer to be supplied with a "certificate of time" as well as of accuracy.

Apart from the fact that the provision of such an additional certificate would involve extra cost for the manufacturer, it still would not overcome the difficulty that the time required for a particular thermometer to indicate the true temperature of a patient depends on a variety of factors outside the manufacturer's control. We are advised by medical authorities that the most important of these are: the initial temperature of the thermometer, the manner in which it is placed (and retained) in position, and the physical condition of the patient. Even to indicate a minimum time, such as three or five minutes, might well be misleading in some circumstances of use. It is expressly for these reasons that a time indication is not given on a British Standard clinical thermometer. Thermometers made in accordance with the provisions of British Standard 691 (which was revised last year) are classified as "quick," "medium," or "stubby," and each must be accompanied by an explanatory note drawing attention to the considerations mentioned above.

Although British Standard clinical thermometers are coming into increasingly wide use by the medical profession and hospital authorities, it is known that the advantages they provide for a very slight additional cost are still not appreciated by many people, and for that reason this Institution is shortly undertaking an information campaign to encourage the wider use of British Standard thermometers. The interest and help in this direction of professional people would be as welcome as it would obviously be valuable.—I am, etc.,

London, W.1.

G. WESTON,
Technical Director,
British Standards Institution.

Niddah and Sterility

SIR,—Sir Ernest Kennaway (*Journal*, May 7, p. 1107) suggests that there is some doubt as to how often the law of Niddah (post-menstrual abstinence from coitus) is observed to-day among Jewish patients. I would suggest that it is far more frequently observed than many people imagine and that in this infertility clinic it is a most important cause of sterility.

Where a woman has a short menstrual cycle, for example 23 days, she will ovulate about the ninth day. If, as often happens, she menstruates for eight days and then observes seven days' abstinence, the first coitus will not be until the 15th day—that is, when the ovum is presumably dead. Every year I meet with a number of cases of this type, which quite often have been subjected to considerable useless treatment for what is a very simple condition, once the knowledge of Niddah is kept in mind. The administration of oestrogen or sometimes testosterone at the onset of the period will postpone ovulation and enable such patients to have intercourse when the ovum is still alive. The fact

that Niddah is such an important factor in my clinic suggests that it is observed by many other orthodox Jewish patients, and therefore may well be an important factor in cervical cancer, as Sir Ernest suggests. Certainly all those dealing with orthodox Jewish patients who are infertile should inquire about its observance.—I am, etc.,

Manchester, 8.

BERNARD SANDLER.

Professional Secrecy

SIR,—My attention has been drawn to a communication, H.M.(55)46, from the Ministry of Health, dated May 10, 1955, addressed to regional hospital boards and hospital management committees concerning "Carnal Knowledge of Mental Defectives" (see *Journal*, page 1350). This memorandum describes the new procedure to be adopted when a certified mental defective is found to be pregnant, or there is reason to think that sexual intercourse has taken place. A previous memorandum on this subject advised that a report should be submitted to the Board of Control but that the local police should not be informed. The new memorandum repeats the advice of reporting the facts to the Board of Control, but reverses the advice on communication with the police. It states that "the Ministry is of opinion that it is desirable that in future such cases should be reported to the police not necessarily with a view to prosecution but to enable the police, in consultation with the medical superintendent, to decide what is the best course to take in all the circumstances." It concludes that medical superintendents should send reports to the local chief constable even where the offence has been committed in another police area.

The current policy of the Association concerning professional secrecy is expressed in the following terms: "It is a practitioner's obligation to observe strictly the rule of professional secrecy by refraining from disclosing voluntarily without the consent of the patient (save with statutory sanction) to any third party information which he has learnt in his professional relationship with the patient."

Unfortunately the advice now tendered by the Ministry of Health has apparently been prepared and issued without any prior consultation with the British Medical Association or any of the defence bodies who are materially interested in this matter for the protection of their members. Furthermore, reasons have not been advanced to justify the change of advice and the abrogation of the rule of professional secrecy in the case of mental defectives.

There may well be occasions when it would be fitting and proper for the police to intervene by the institution of legal proceedings against a suspected offender, and there may also be sound reasons in law for issuing the advice described above. The writer feels, however, that, before a change of this order is sponsored by official Governmental departments relating to an important ethical tenet, the least that the Association could expect would be a communication from the parties who propose an alteration, setting out their reasons and any legal sanction that might be invoked for their support. I hope that opportunity will be afforded in the near future for representatives of the Association and of the Ministry to meet to discuss the situation created by the issue of the memorandum.—I am, etc.,

London, W.C.1.

ROBERT FORBES,
Chairman, Central Ethical Committee

Reserpine in Treatment of Chronic Psychotics

SIR,—I was interested to read the paper by Dr. E. S. Foote entitled "Reserpine in Treatment of Chronic Psychotics" (*Journal*, May 14, p. 1192). Chronic psychotics have been under treatment here on similar doses of reserpine for the past five months, but preliminary results in a controlled series have been rather disappointing so far. The practice has been to leave the patients' routine unaltered, apart, of course, from the administration of the tablets and the daily blood-pressure readings, and this may possibly be a reason why our results have been less promising than Dr. Foote's.

With regard to side effects, I think it is worth reporting at this stage the case of a female patient who complained of feeling "faint and dizzy" on two occasions when climbing the ward stairs during the first three days of treatment

with reserpine (1½ mg. three times a day). She stated that she had never felt like it before, and, in spite of continuing with the same dose, has had no similar symptoms since. Her daily blood-pressure readings showed no significant alteration from her pre-treatment readings, but one cannot help feeling that these two incidents were the result of a temporary fairly profound fall in blood pressure associated with moderately large initial doses of reserpine. I therefore agree with Dr. Foote that the initial dose should not be more than 0.5 mg. three times a day, and this dose is now given here as a routine for the first four days of treatment. I was interested to read of Dr. Foote's report of oedema occurring in patients with no apparent organic cause, as I have also had one similar case and wondered if it might be the result of reserpine therapy.—I am, etc.,

Epsom.

D. L. M. McNEILL.

Agricultural Pesticides

SIR,—May I be permitted space to comment upon the remarks made by Mr. A. F. McK. Jackson (*Journal*, May 7, p. 1157) relating to aldrin and dieldrin? Shell Chemicals Limited has not issued any literature containing a statement to the effect that dieldrin has eight times the oral toxicity of D.D.T. to mammals, nor, to the best of my knowledge, is there any other authority to that effect. What they have said, however, is that these compounds have an insecticidal efficiency of some eight times that of D.D.T. against many insect species. Aldrin and dieldrin, in common with all other chlorinated hydrocarbon insecticides, can be absorbed through the intact skin, but there is no question of such absorption taking place through the soles of normal footwear in ordinary everyday use, as is suggested by your correspondent. No special measures, other than those recommended for handling insecticidal chemicals such as D.D.T., are required for the processing, mixing, or application of aldrin- and dieldrin-based products.

Since their introduction over five years ago no serious cases of intoxication by aldrin or dieldrin have occurred during manufacture, formulation, or application of tens of millions of pounds of the technical materials, despite the fact that in a number of cases normal precautions were flagrantly disregarded. This record is particularly notable in view of the fact that large quantities of these insecticides have been handled by totally unskilled labour in many of the under-developed areas of the world. In a few instances there have been suicide attempts using aldrin and dieldrin, but in spite of the fact that gross overdoses—in one case amounting to 25.6 mg. of aldrin per kg. of body weight—were taken orally, no case proved fatal and the patients recovered without sequelae.

The last thing I wish to suggest is that materials of this nature can be handled without taking due and proper precautions, but, provided such precautions are taken, I see no reason, on the evidence available, to be alarmist in regard to the handling of these two compounds. It may be of interest that in Venezuela, for example, over 300,000 human dwellings have already been sprayed with dieldrin for the control of the vectors of South American sleeping-sickness and malaria. This programme with dieldrin is continuing under the direction of the Malaria Division of the Ministry of Health and Social Welfare.—I am, etc.,

London, E.C.3

RUPERT SCOTT,
Chief Medical Officer,
The Shell Petroleum Company Ltd.

Idiopathic Pulmonary Haemosiderosis

SIR,—I was interested to read the article by Captain N. A. J. Hamer (*Journal*, April 23, p. 1008) particularly because another example of this condition has recently come to my notice.

A man, now aged 28, had a perforated duodenal ulcer closed at an emergency operation in 1952, and subsequently he has never had more than minimal dyspeptic symptoms; in particular he denies a haematemesis or melaena at any time. In October, 1953, he had pneumonia in Hong Kong and was away from work for five weeks; no details of this illness are available, although it is

known that a chest film in January, 1954, was reported clear, but subsequently he noticed occasional blood in his sputum which he ignored because he felt in normal health. He was admitted to hospital on April 2, 1955, complaining of lassitude and a cough of three weeks' duration, which was productive of small amounts of blood-stained sputum. There had been no frank haemoptyses, but occasionally the sputum contained clots of blood: his appetite had been poor for several days, but his weight was steady.

On Examination.—A well-covered but remarkably pale man. T. 97.8° F. (36.55° C.); P. 118, regular; B.P. 150/70; heart normal. Abdomen: healed epigastric scar; no mass felt and no tenderness elicited. Chest: signs suggesting early consolidation at the left base.

R.B.C., 1.8 million per c.mm.; Hb, 36% (5.32 g.); colour index, 1.00; W.B.C., 11,900 (polymorphs 82%, lymphocytes 14%, monocytes 3%, basophils 1%, reticulocytes 4.2%); packed cell volume 15%. Blood group O; rhesus anti-D positive. Stool negative for occult blood (benzidine test). Direct van den Bergh negative. Serum bilirubin 0.7 mg.%.

A chest film on the day of admission revealed no definite abnormality, but a diagnosis of idiopathic pulmonary haemosiderosis was considered possible, and arrangements made for daily x-rays of the chest. On April 3 (the day following admission) there were multiple small, soft, round opacities scattered throughout both upper and middle lobes, with accentuation of the hilar shadows, but on April 4 the shadows were both smaller and harder in appearance, and on April 5 they had disappeared. On April 6 the medial parts of the left upper and middle zones and the right middle zone were granular in appearance; these appearances were unchanged on April 7, but they had become less marked on April 8, and the chest was radiologically normal on April 16.

Within 24 hours of admission the patient was running a temperature of 101° F. (38.3° C.), and in view of the persistent signs at the left base he was given a course of parenteral penicillin: moreover, his general condition was sufficiently poor for him to be given two pints (1.1 litres) of cross-matched blood on April 3. Following the transfusion his condition improved rapidly, and on April 6 a blood count showed: R.B.C. 3.02 million per c.mm., Hb, 52% (7.69 g.), reticulocytes 5.4%, M.C.H. 25.5 micromicrograms, M.C.H.C. 29.5%, M.C.V. 86 cubic microns. He was given tab. ferri. sulph. co., and on April 19 there were 3.69 million R.B.C. per c.mm., with Hb 73% (10.79 g.), and colour index 0.98. While in hospital he has continued to have small haemoptyses, but repeated examinations have failed to reveal tubercle bacilli or haemosiderin-containing macrophages in the sputum; neither have these cells been found in the gastric residue. There was no increase in the red cell fragility, and the platelets appeared normal in the blood examined.

This patient's illness is characteristic of the acute phase of early idiopathic pulmonary haemosiderosis, with the small haemoptyses, profound anaemia, and transient shadows in the chest films. It is not clear why haemosiderin-laden macrophages were not found in the sputum or gastric residue, but such a finding is not reported in every case in the literature. The course of the illness resembles that of a man aged 20 where the radiological opacities cleared rapidly after the first episode of haemoptyses with anaemia, but following a further attack there was "fixed" shadowing at the right base, the time interval between the first illness and the latter finding being practically three years. So far as the prognosis is concerned I would disagree with Captain Hamer's statement that the outlook is generally good in young adults when compared with children, in view of Walton and Williams's report² on the post-mortem findings in a youth of 19 with three years' symptoms.

I wish to thank both the medical officer-in-charge, R.N. Hospital, Plymouth, for access to the records and the Medical Director General of the Navy for permission to publish this letter. Surgeon-Commander P. H. K. Gray interpreted the chest films.—I am, etc.,

London.

J. M. CLIFF.

REFERENCES

1. Cliff, J. M., *Brit. J. Radiol.*, 1953, 26, 102.
2. Walton, M., and Williams, A. A., *British Medical Journal*, 1951, 2, 390.

A New Barbiturate Antagonist

SIR,—We have recently treated four cases of barbiturate poisoning with the new barbiturate antagonist β methyl β ethyl glutarimide (N.P.13, "megimide"). The patients had taken between 36 and 90 gr. (2.4 and 6 g.) of barbiturate

several hours before admission. They did not respond to pain and all reflexes were absent on admission. Routine stomach washout was performed. With the first three patients, who had all taken approximately 36 gr. (2.4 g.) of barbiturate, 100 mg., 200 mg., and 250 mg. of N.P.13 respectively were given intravenously over the course of about one hour. At the end of this time the patients were groaning, making spontaneous movements of the limbs, and would respond to simple commands. After this they were easily rousable and their further course was uneventful. The fourth patient, a lady of 41 years, had taken 90 gr. (6 g.) of a barbiturate mixture, "tuinal," three hours before admission. A glucose drip was set up and 100 mg. of N.P.13 given into the drip every five minutes to a total of 600 mg. After ten minutes the corneal reflexes returned, and half an hour after the beginning of treatment the patient was talking and attempting to raise herself from the bed. Subsequently she was easily rousable, and two hours later was awake and would take food. Further progress was uneventful.

In these cases there was a significant rise in the level of consciousness during treatment with N.P.13, and in each case the improvement was maintained. In the first three cases only small quantities of the drug were available for treatment, and it is suggested that, as in the fourth case, larger amounts of N.P.13 should be used. No toxic or side-effects were noted with the amount of drug used. It is felt that N.P.13 offers considerable advantages over existing methods of treatment of barbiturate poisoning and merits further trial. We would like to thank Professor R. E. Tunbridge, Professor S. J. Hartfall, and Dr. O. H. J. Maxwell Telling, under whose care these patients were treated, and Nicholas Products Laboratories, Ltd., for supplies of N.P.13.—We are, etc.,

J. P. BINGLE.

J. G. WHITWAM.

Leeds, 1.

** An article on the treatment of barbiturate poisoning with N.P.13 (and with D.A.P.T.) was published in last week's *Journal* (p. 1238).—Ed., *B.M.J.*

Chronic Appendicitis

SIR,—I was most interested to read the article "Right Iliac Fossa Pain" (*Journal*, March 26, p. 752) and your leading article on "Chronic Appendicitis" (p. 776).

In 1953 in Capetown I investigated 200 consecutive cases of appendicitis, of which 93 were designated, clinically, chronic appendicitis.¹ These latter cases were admitted only after all investigations for other possible causes of their right iliac fossa pain had proved negative. The histological investigation, consisting of examination of serial sections, was undertaken by the pathology department of the University of Capetown. In this "chronic appendix" group only 19.4% (18 cases) showed appendicular histological abnormalities; 12.9% (12 cases) presented other intra-abdominal pathology. In the remaining 67.7% (63 cases) no pathological evidence could be found to account for the patients' pain. A follow-up questionnaire was sent to these 63 cases, but the response was too poor to allow of critical analysis.

These findings bear out the contention that the clinical and pathological correlation of chronic appendicitis is still far from satisfactory.—I am, etc.,

London, W.12.

W. SILBER.

REFERENCE
¹Silber, W., *S. Afr. med. J.*, 1953, 27, 187.

Aftermath of Hysterectomy

SIR,—I was writing of the new biochemical pathology of atherosclerosis and "the coronary woman"; Miss Louisa Martindale (*Journal*, May 7, p. 1155) is raking in the old sweet garden of memory and surmise. I would challenge any private or public clinic to produce even a ten-year attested follow-up in regard to blood pressures and the physical *cum* psychosomatic symptoms of patients treated by ovarian ablation, radium, or deep x-ray therapy for non-malignant conditions of the pelvis. Indeed, I would fling the gauntlet further and ask why it is that women

suffer from acute lumbago (not disk disease) ten times less frequently than men do. It cannot be clothes or lack of exposure. Can it be an oestrogen *cum* adrenal protective mechanism? Tentative therapy of the male sufferer suggests that this is so.—I am, etc.,

London, W.1.

V. B. GREEN-ARMYTAGE.

Undergraduate Education in Preventive Health

SIR,—At the recent Royal Sanitary Institute Congress at Bournemouth (*Journal*, May 7, p. 1147) Professor R. H. Parry called attention to the need for closer integration of undergraduate medical training with the public health department. He also stated his belief that in time the general practitioner would be able to take over medical responsibilities at the health clinics. With this latter suggestion I am in full accord; but I submit that it cannot satisfactorily take place until Professor Parry's first proposal has been implemented and there has been a reorientation of undergraduate paediatric training. The work of the "baby" clinic is essentially preventive in outlook and deals with healthy babies. Undergraduate paediatric training, on the other hand, despite improvement in recent years, is largely concerned with disease. Anatomy and, what is more important, physiology, as taught to the medical student, are that of the adult. A course in paediatrics should begin with the study, largely on a practical basis, of the development of the child in its first two years and with the management of the healthy child in those years. Only when this has been achieved should the student go on to the study of departure from the normal. Here lies the way to that closer integration for which Professor Parry has asked.

It is useless to ask for earlier diagnosis of such conditions as cerebral palsy and congenital deafness when the newly qualified doctor is unacquainted with the normal development of locomotion and speech of the infant. Miss E. Whetnall (*Journal*, January 22, p. 227) has suggested the post-natal clinic as the ideal place for increasing the mother's awareness of the possibility and implications of partial deafness. All too often, however, the mother has to badger the doctor into such an awareness.

The syllabus and examination for the Diploma in Child Health lay much stress on the work of the school health service. The school medical officer should deliver a short series of undergraduate lectures and demonstrations on the handicaps of childhood and the application to them of the Education Act, 1944. The general practitioner may never see an example of the lipoidoses (I have not seen one in 11 years of clinical medicine). What he will have to deal with are the rheumatic child and the asthmatic child, not in isolation, but in relation to the world in which the child lives. These suggestions are, I submit, concrete examples of the application of such terms as preventive and social medicine to paediatrics.—I am, etc.,

London, N.12.

A. YARROW.

The Changing Face of Medicine

SIR,—Dr. Clifford Kennedy's article on "The Changing Face of Medicine" (*Journal*, April 30, p. 1045) was full of interest. I only want to refer to his courageous suggestion that merit awards for consultants should be done away with, and the money spent otherwise. I would suggest that the money be spent on a large increase in domiciliary consultations. Consultants and specialists are not synonymous terms, but specialists should be consultants. In the good old days a consultant was a wise doctor whom his colleagues liked to consult. The meritorious consultant got his reward in an increasing number of consultation fees. The same could easily be possible again if the administration permitted.

There would be many advantages. The waiting-lists for first visits to out-patients (though not necessarily for investigations) would be reduced. The consultant and specialist would be brought outside the hospital's four walls. The general practitioner would be brought into much closer contact with the leaders of the profession. It should be

remembered that every consultation provides the occasion for a miniature postgraduate course—which the hospital letter does not. If done on a large scale it would be necessary also to provide a small fee for the general practitioner, who has to find an hour of unpaid time at present. I would like to put this idea forward as a subject for discussion by the College of General Practitioners, and the Consultants and Specialists Committee.—I am, etc.,

Crowthorne, Berks.

H. D. FORBES FRASER.

SIR.—This is not an attempt to discredit the National Health Service. On the contrary I would like to concede that the N.H.S. has proved a boon and a blessing to the public; but it would be too optimistic to expect that such a revolutionary measure would not reveal in practice imperfections and even faults. With good will and determination these could all be smoothed out.

From the young doctor's point of view the most pressing problem is the finding of suitable employment. Under present conditions unemployment is likely to increase as time goes on, unless a remedy is found. Paradoxically, the position is largely due to the fact that junior hospital posts have been greatly multiplied since the advent of the N.H.S. This has encouraged greater numbers of students to take up medicine than is necessary for the smooth maintenance of the service. After the completion of a year's hospital service there are not sufficient posts available to absorb all the young doctors looking for suitable and remunerative employment. The number of well-qualified registrars appears to be in excess of the number required to fill vacancies for specialists or consultants, and general practice is apparently not able to absorb all the young aspirants to general practice. We have on the one hand, therefore, the apprehensive or disappointed registrar, and on the other the young graduate with inadequate experience for general practice swelling the ranks of the unemployed. The remedy can, I believe, be found in a realistic redistribution of hospital beds, and reduction of the lists in the larger practices. The specialized hospitals are too big, and the G.P. hospitals too small and too few. General practice could also absorb more general practitioners, as there are still too many large practices employing assistants, where more principals are needed. The employment of an assistant in a large practice may be good business, but I refuse to believe that it is conducive to good medicine. Extension of the G.P. hospital to, say, 100 to 200 beds, where these could be fully utilized, would absorb many young graduates and afford the right kind of postgraduate training for the aspirant to general practice, and would save the more specialized hospital from being cluttered up with patients requiring no specialized investigation or treatment. The patient would also gain by remaining, while in hospital, under the care of the home doctor. The G.P.'s status would be enhanced. He would be able to take a practical share in the main divisions of medical work, medicine, surgery, anaesthetics, and midwifery, while co-operating with the consultant or specialist where necessary. With ready access to the regional laboratory he could conduct most of his own investigations.

I consider I have been very fortunate in always having been on the staff of local hospitals, general and maternity, and child welfare clinics. With the facilities provided by the regional laboratories I do the major part of the medical investigations of my practice, have conducted something like 4,000 maternity cases with only two maternal deaths, have given thousands of general anaesthetics, including spinal, and from time to time have been doing straightforward surgery without a single mishap. I have therefore been fortunate enough to be able to avoid becoming a sign-board. While not earning the remuneration of the doctor with the big list, I have experienced a full and satisfactory professional life.

Under present conditions the G.P. has not the facilities to give the best of which he is capable. The specialist's time to a considerable extent is wasted with cases which

could be looked after by the family doctor. Under the conditions I have visualized there would be a better all-round use of medical personnel and of hospital beds, and I believe a reduction in hospital expenditure, while the training provided for the young aspirant, whether for G.P. or specialist post, would be more in keeping with his or her respective needs and requirements.—I am, etc.,

Fraserburgh.

J. MACLEOD.

Opportunities for Medical Practice

SIR.—Sir Stanley Davidson's article (*Journal*, May 14, p. 1171) makes clear the urgent need for a change in the official attitude to medical education and to medical practice. It is obvious that medical practice, in the sense that this is now understood, cannot continue to absorb the numbers of practitioners now becoming qualified. From now on, either the number of doctors must be kept constant, or the remuneration *per capita* must fall, or the State health services must pay out more and more. Is there, in fact, any over-doctoring in the absolute sense? A more liberal supply of doctors, if this implies increased medical care and the disappearance of the "overworked practitioner," might be a very good thing indeed. And surely medical practice is but one aspect of the aim of medical education. The modern world needs medical men in many fields—in commerce, law, scientific research, and even politics. My guess is that demand for medical graduates in these fields will increase steadily. The men working outside medical practice are not a loss to the profession. They are vital to it, fully utilizing a general medical education, and continuing throughout their careers to maintain contact with practising doctors.

It would be dangerous in the extreme to tamper with the autonomy of universities in the admission of students for medical training, on the basis of the alleged over-doctoring of the population. A plea may be made, however, for cutting out some of the detail in the present medical course, which is designed to suit the traditional needs of general practitioners, some of which needs hardly exist any longer. General practice has rapidly become a specialty where, in the future, standards should be established and guarded by the College of General Practitioners. The undergraduates' course could therefore be redesigned with an eye to producing a new type of medical graduate much better fitted to choose between practice and the ancillary branches of medicine. The course could be shortened from the present six years to five years, or even less, and made more intensive in its purely scientific and clinical aspects. Undergraduate "specials," which are cram courses designed to suit the needs of a general practitioner of 30 or more years ago, could be covered more generally in medical or surgical teaching. The present state of affairs is uneconomic and threatens to become more so. If things continue as they are a medical man will have spent one-half his life as a liability on his parents or on the State, only to find that in the second half he is barely able to meet his economic responsibilities.—I am, etc.,

Stourbridge.

O. C. FORBES.

Cancer of the Upper Alimentary Tract

SIR.—Dr. L. D. Sanghvi and his colleagues (*Journal*, May 7, p. 1111) point out that intra-oral carcinoma accounts for 35.9% of all cancer cases in Bombay, whereas only 6.7% of cancers treated in London hospitals were situated in the oropharynx. These striking figures indicate that interest must presumably focus on some outstanding difference between the habits of Indians and Europeans.

Smoking and chewing tobacco (the practices investigated in the article by Dr. Sanghvi *et al.*) have, after all, got their western equivalents. No European, however, constantly subjects his oral cavity to the intense (but delicious) irritation of a curry, while most Indians do so twice daily. As one who has experienced the prolonged intra-oral burning which invariably follows an Indian curry, I am surprised to find that

the writers did not ask their patients for data concerning the spices in their diet. Surely this factor cannot be omitted when investigating the aetiology of carcinomas of the mouth and pharynx in Indians.—I am, etc.,

London, E.1.

F. E. LOEFFLER.

Giant Cells in Measles

SIR.—I read with interest the annotation on "Giant Cells in Measles" (*Journal*, April 30, p. 1078). Three years ago I performed a necropsy on a child dying of measles who had been treated with antibiotics and showed apparently pure measles pneumonia. I do not remember seeing giant cells within the bronchi, but these were very frequent within the alveoli and showed degenerative appearances. They appeared to be formed by desquamation and fusion of alveolar epithelium. Small rounded acidophil intracytoplasmic inclusion bodies were very frequent within them and also within single epithelial cells. No giant cells could be found in the pulmonary lymph nodes, however. It would certainly seem very reasonable that these cells, quite possibly containing inclusions, should be found in the sputum.—I am, etc.,

Southampton.

R. A. GOODBODY.

Chicken-pox Quarantine

SIR.—Dr. J. J. Linehan's scepticism as to the protective value of chicken-pox against zoster (*Journal*, May 7, p. 1156) will no doubt endure until it is possible to grow the relevant virus and then submit suitable volunteers to challenge with it. Otherwise the available evidence must be based on histories that are rarely verifiable and on one's own personal experience. On this point, for some years past I have made it a practice to question—and examine—all cases of zoster for evidence of previous chicken-pox. So far I cannot recall one that convinced me. This may of course be no more than coincidence, though I wonder. In any event, Dr. Linehan will, I am sure, agree with me that to rely on histories in infectious work is to court, and not infrequently to experience, disaster.

Common ground at present is that the one disease may give rise to the other, and that, so far as virology can ascertain to-day, the two viruses appear to be identical. The hypothesis that "herpes zoster is a response of an immune person to an overwhelming dose of varicella-zoster virus" is surely dismissed by those cases of zoster (I have seen two recently) who proceed to develop a generalized chicken-pox eruption. Here it seems that a hitherto localized infection suddenly spills over into the blood. Incidentally, I have never known the converse to occur. It might be argued with more cogency that a localized infection like zoster will not give rise to such a stable immunity as when the virus has challenged the whole body as in chicken-pox. Perhaps I may here be allowed to cite a personal experience. Having enjoyed a mild attack of shingles at school, I have subsequently been exposed to chicken-pox on literally thousands of occasions, but I have never developed the disease. Clearly, in some cases at least, zoster can protect against chicken-pox as well.—I am, etc.,

Isleworth.

G. E. BREEN.

Salk Vaccine

SIR.—Dr. J. G. Humble (*Journal*, May 7, p. 1154) asks if rhesus sensitization is a possibility after inoculation with anti-poliomyelitis vaccine. At the suggestion of Professor Stuart Harris, samples of the vaccine prepared in this country have been studied at this centre. A number of *in vitro* inhibition tests against rhesus anti-sera (anti-D, anti-C, anti-E, and anti-c) have been carried out, but so far I have not found that the material contains any substance capable of inhibiting either immune rhesus antibodies or the normal isoagglutinins. As yet there has been no opportunity of estimating whether the vaccine is more powerful *in vivo*.—I am, etc.,

Sheffield, 10.

J. S. CAMPBELL.

Ban on Heroin

SIR.—Mr. D. K. Mulvany's letter on the subject of the ban on heroin (*Journal*, May 14, p. 1221) contains the extraordinary suggestion that a consultant should have to add his signature to the general practitioner's prescription so that "the procurement of heroin could be tightened up." Apart from the difficulty of obtaining his signature for each prescription in the case of a patient dying at home, has Mr. Mulvany considered the implications of his suggestion? One of these appears to be that general practitioners' lax prescribing of heroin is a source of danger. The other is that consultants are more responsible than general practitioners in prescribing dangerous drugs.—I am, etc.,

Farnham Common.

DAVID MILWARD.

SIR.—I cannot believe that the individuals who have been responsible for the decision to ban heroin fully appreciate its indispensable role in the relief of suffering and pain associated with incurable malignant disease. It is also irritating to have handed out to us the misinformed statement, which surely does not find support in the experience of unbiased medical men, that we already have efficient substitutes for heroin. What a boost this is for the drug houses, but what a piece of presumptuous poppycock. With growing numbers of incurable cancer patients coming under our care, the ban can only be regarded as an iniquitous action which we can scarcely condone.

Apart from the few troubled voices of those crying in the wilderness, I am not aware of an organized protest from any of the official bodies within the profession. Is there any reason why we cannot have a nation-wide ballot—conducted, for example, by the B.M.A., the Royal Colleges, or the College of General Practitioners—in order to determine the consensus of medical opinion in the matter? The results could form the basis of a concerted protest by the profession to the Government against removal from our pharmacopoeia of this valuable and irreplaceable drug. The banning of heroin, in its practical consequences and in the manner in which it has been decreed, poses an issue of considerable moment to all who practise the healing art.—I am, etc.,

Perth.

R. G. SIMPSON.

SIR.—May I be allowed to add my protest in support of Dr. A. H. Douthwaite (*Journal*, April 9, p. 907), Dr. R. Hale-White (*Journal*, April 30, p. 1092), and others on the ban on heroin? As an anaesthetist I seldom have recourse to this drug, but there are occasions when it is the only effective remedy. Cannot the B.M.A. take a really strong and conclusive line on this question?—I am, etc.,

Hove.

J. H. CRAWFORD.

Food-poisoning

SIR.—May I draw attention to a small error in Dr. Christopher Hardwick's interesting article (*Journal*, May 14, p. 1205)? Unless corrected this may give rise to some confusion. It is quite correct to say that *Amanita phalloides* may be eaten in mistake for the field mushroom. Indeed, this fungus is said to be responsible for 90% of the deaths due to mushroom poisoning. However, the English name for this variety is not "fly agaric," as Dr. Hardwick states, but "death cap."

The fly agaric is the *Amanita muscaria* and contains muscarufin as well as muscarine, and this presumably accounts for its distinctive colour. It is the decorative fungus which may be seen ornamenting the pages of many fairy-tale books or the back-cloth of the pantomime. Its former use as a fly killer has determined its name in many languages besides Latin and English. The Russian "mukhomor" means "fly-death." The fly agaric has a scarlet cap with white spots and because of this brilliant colouring is very unlikely to be eaten in mistake for some other variety.

The death cap on the other hand is white, almost entirely lacking in pigment. It may grow on grassland verging woods. It can be distinguished from the field mushroom (*Psalliota campestris*) by the colour of the gills, which are white, not pink, brown, or black, and by the volva, which is a distinct cup at the base of the stem presenting (hence the botanical name) a phallic appearance in the young specimen.—I am, etc.,

London, S.W.17.

BRIAN H. KIRMAN.

Difficulties of Child Adoption

SIR.—Our attention has been drawn to Dr. P. M. Fea's letter (*Journal*, April 30, p. 1096). I am afraid the fact is that there simply are not any girls of about 5 available for adoption by anybody. Girls are far more in demand than boys, and every society has a long waiting-list of adopters waiting for girl babies. This is aggravated by the fact that girls are also more readily received by grandmothers, and even by employers, than boys, so that not only are more girls than boys asked for, but fewer girls than boys are offered for adoption. Only about 1% of the "inmates of homes" are available for adoption, and it is safe to say that none of those available is a girl of 5—girls have all been adopted long before reaching that age. Once a child reaches school age unadopted, the chances of its being offered for adoption are much less than before, since a mother who has managed to keep her child with her up to that age finds her task much easier once the child goes to school. And a girl of 5 who is orphaned usually has relatives who are able and willing to take her on. Every adoption society is overwhelmed by requests for toddler girls, which it would be happy to satisfy if the children were available—we should not be concerning ourselves with adoption at all if we preferred to leave children languishing in homes. But the number of people wanting to adopt children as a whole is about 10 times the number of children offered for adoption, and in the case of girls probably 20 times. For girls of 5 it must be hundreds to one.—I am, etc.,

London, N.W.11.

M. E. EDWARDS,

Chairman, Standing Conference of
Societies Registered for Adoption.

British Society of Dental Hypnotists

SIR.—At the annual general meeting of the British Society of Dental Hypnotists it was decided unanimously to change the name of the Society to the Dental and Medical Society for the Study of Hypnosis. This was done at the request of the increasing number of medical practitioners who have joined the Society and taken theoretical and practical study courses in the use of hypnosis. They felt that it would be a wise thing if the Society were expanded into dental and medical sections, with separate committees and a joint committee to dictate general policy. Some of our future meetings will be of a general nature and others of more specialized type to suit each profession. The courses of instruction will continue but will become, in their later stages, more specialized in character, and the students will separate for this purpose. The Society now numbers nearly 200 members, of whom over 150 have attended the courses of instruction we have held on the theory and practice of hypnosis, its uses, limitations, and dangers.

The Society, since its inception, has laid special emphasis on the needs of the general practitioner both of medicine and dentistry, and in view of the recent B.M.A. report supporting further teaching and investigation in hypnosis we should welcome further members of both professions who are interested. At our annual general meeting held on May 3 the following resolution was passed unanimously: "This Society feels strongly that the use of hypnosis should be confined to the members of the medical and dental professions."—I am, etc.,

London, W.1.

E. E. WOOCKEY,
Chairman.

Obituary

W. M. ROBSON, M.D., F.R.C.P.

Dr. W. M. Robson, consulting physician to Northampton General Hospital and to the Oxford Regional Hospital Board, died at his home at Northampton on May 10. He was 77 years of age.

William Morton Robson was born in 1877, the son of John S. Robson, J.P., of Butterknowle, Co. Durham, and was educated at St. James's School, Bishop Auckland, and at the Forest School, Walthamstow. He entered Guy's Hospital as a medical student in 1895 and qualified M.R.C.S., L.R.C.P. in 1901, taking the London M.B. in the same year. After holding several hospital appointments at Guy's and other London hospitals, he went to Northampton in 1903 as junior medical officer at St. Andrew's Hospital, an appointment which gave him time to work for higher qualifications. He proceeded to the M.D. in 1903, winning a gold medal, and obtained the M.R.C.P. two years later, when he was elected to the honorary staff of Northampton General Hospital as assistant physician with charge of the electrical department. This was the forerunner of the present x-ray department. In due course Robson became radiologist as well as physician, and it was in no small part due to his influence that an anonymous benefactor subsequently gave much of the present equipment of the x-ray department to the hospital. Robson's skill as a clinician helped him greatly in his radiological duties, and for many years he was in charge of the diagnostic and radiotherapeutic work. His diagnostic reports, notable for their brevity, were always written by his own hand; in x-ray therapy he followed closely the technique of Coutard, and, though his dosage by modern standards was often low, his results were remarkably good and he seldom distressed patients by his treatment. His interest also extended to venereology, and he established the venereal diseases clinic, which remained under his direction until his final retirement in 1950. During the first world war he served with the rank of major in the R.A.M.C., and was attached to Berry Wood Mental Hospital, which had been taken over for the reception of Service casualties.

Robson was elected F.R.C.P. in 1920, and for thirty years as senior physician was a central figure in the life of the Northampton General Hospital. Always quietly courteous and thoughtful, his judgment was extremely sound and his opinion carried weight not only in clinical matters but also in the board of management on which he served many years. He was honorary secretary of the old Northamptonshire Division of the British Medical Association from 1922 to 1927; chairman of the Division in 1930-1; and honorary secretary of the Northamptonshire Branch in 1935. He wrote little, but, despite many hospital commitments and a considerable private consulting practice, he found time for relaxation in sport and the entertainment of his friends. He was an excellent shot and in later years a keen and expert fisherman. A genial host—and a connoisseur of port—he was a master of the bridge table. He leaves a widow and one daughter.—R. O. L.

W. F. ANNAND, M.D.

The medical profession in Coventry heard with deep regret of the death on May 6 at the age of 75 of Dr. W. F. Annand, consulting physician to the Coventry and Warwickshire Hospital.

William Fraser Annand was born at Peterhead, Aberdeenshire, on September 20, 1879, and went to school at South Shields, where his father, R. C. Annand, J.P., was an engineer and an inventor of printing machines. He began his medical studies at Durham University and went on to University College Hospital, London, where he had a distinguished student career, gaining gold medals in medicine, surgery, and pathology. He graduated M.B., B.S. at London University in 1903 and proceeded to the M.D. two years later. After holding house appointments at University College Hospital, the East London Hospital for Children, and at Queen Charlotte's Hospital he went into general practice at Stafford, where he was appointed honorary physician to the Staffordshire General Infirmary.

In 1909 Annand moved to Coventry, and three years later began his long association with the Coventry and Warwickshire Hospital as honorary anaesthetist. In 1919 he became honorary physician to the hospital, taking a very keen interest in its development and serving on the board of governors. For a long period he was chairman of the medical advisory committee. On his retirement in 1939 the board of governors appointed him honorary consulting physician to the hospital. He was chairman of the Coventry Division of the British Medical Association in 1925-6.

The death of Dr. Annand's wife in 1939 was a great blow to him, for her gaiety and zest of life were a constant joy to him after hours of heavy responsibility. During the second world war he returned to active duties at the Coventry and Warwickshire Hospital, and in 1941 he received Royal commendation for his work during the air raids. He finally retired in 1946, but four months later, while on holiday, he had a severe heart attack and since then had had to lead the life of an invalid. His recreations were golf and bridge, and fortunately he was able to continue to play bridge up to a week or two before his death. He is survived by a son and a daughter, who is matron of the National Temperance Hospital, London, and to them and to all his relatives we extend our deepest sympathy. In the passing of William Fraser Annand, Coventry has lost a great physician and his colleagues a loyal and trusted friend.—W. P. E.

T. W. J. JOHNSON, M.D., F.R.C.P., F.R.A.C.P.

Dr. T. W. J. Johnson, consulting physician to the Auckland Hospital, New Zealand, died at his home at Auckland on October 16, 1954, after a short illness.

Born at Auckland in 1885, Thomas William James Johnson was educated at Thames High School and at Auckland Grammar School, where he won a junior scholarship to Otago University. At the university he more than maintained his early promise and gained many prizes, including the first award of the medical travelling scholarship. He graduated M.B., Ch.B. at the University of New Zealand in 1909, and then held posts at Dunedin Hospital before coming to London, where he worked at the Middlesex Hospital and the Maida Vale Hospital for Nervous Diseases. After obtaining the London Conjoint diploma in 1911 and the M.R.C.P. in the same year, he returned to New Zealand, where he proceeded to the M.D. in 1912 with a thesis on the apex beat. For the next 10 years he was in practice at Napier, being elected to the honorary staff of the local hospital.

In 1921 Johnson again came to London for postgraduate studies, after which he settled at Auckland, where

in due course he was appointed senior honorary physician to the Auckland Hospital, a post he continued to hold until his retirement in 1951. He was elected a Fellow of the Royal College of Physicians of London in 1932. Six years later he became a Foundation Fellow, a Censor, and a member of the Dominion Committee of the Royal Australasian College of Physicians, and in 1942 he was elected a vice-president of the College. He was an examiner in medicine for the University of New Zealand, consulting physician to the Royal New Zealand Navy and to the Fiji Government in New Zealand, and had served on the Medical Council of New Zealand. He also did good work as the chairman of the Miners' Pension Appeal Board and of the Dominion Tuberculosis Committee, and he helped to establish the Auckland Clinical Society and to found the medical library at the Auckland Hospital. When he retired in 1951 he was appointed consulting physician to the Auckland Hospital and became a member of its committee on appointments. From 1936 to 1938 he was chairman of the Auckland Division of the British Medical Association. Johnson was an excellent teacher. He expressed himself clearly and in simple language and gave every possible assistance to his students. To the newly qualified he was a never-failing source of encouragement. He helped them in their work when the need arose, and his advice, eagerly sought, was of great value to them in their careers. An all-round sportsman, he played hockey for his university, and in later life became an expert angler and a competent golfer. A man of many hobbies, he was particularly interested in the history, folk-lore, and language of the Maori people, and was well versed in the natural history of New Zealand. He is survived by a widow and two sons, both members of the medical profession.

OTTO ROSENHEIM, Ph.D., F.R.S.

Dr. Otto Rosenheim, who made notable contributions to biochemistry and physiology, died in London on May 7 at the age of 84.

Otto Rosenheim was born and educated in Germany. At the University of Würzburg, where he took his Ph.D. degree, he worked under Emil Fischer, and later he continued his studies at the Universities of Bonn and Geneva. In 1895 he came to England, where he secured an appointment at the University of Manchester. Six years later he moved to London, having obtained a research studentship in pharmacological chemistry at King's College. In 1904 he was appointed lecturer at King's College and, later, assistant professor of physiology. He also held a readership in biochemistry in the University of London until 1920. Having given up his official appointments, Rosenheim became a voluntary worker at the National Institute for Medical Research at Hampstead, where his research into the chemistry of sterols with Dr. Harold King led to some notable advances. Rosenheim was elected a Fellow of the Royal Society in 1917 for his work on brain chemistry. He married Miss Mary Christine Tebb, whom he met when she was on the staff of King's College, and with whom he collaborated in research work. She died in 1953.

We are indebted to Dr. HAROLD KING for the following appreciation:

It is difficult in a few words to do justice to the work of a born investigator like Otto Rosenheim. He chose for his field of operations physiological chemistry, and at King's College, London, between the years 1901 and 1920

contributed fundamental observations to this subject. With Tunnicliffe he was concerned with the toxicity of beer containing selenium which arose from the sulphuric acid used in preparing the sugars for fermentation; and in another inquiry he showed that formaldehyde—1:5,000 in milk and 1:9,000 in food—had no effect on healthy children. With Locke, Rosenheim took part in a classical investigation: they devised a new perfusion method for the mammalian heart, using dextrose in oxygenated Ringer solution, and followed the sugar metabolism. An outstanding piece of research work then followed in which Rosenheim was assisted by Mary Christine Tebb, who later became his wife. They took up the chemistry of brain, and incidentally laid low the myth of protagon as a single entity, but, more important, they devised methods for the separation of the constituents of the brain—phrenosin, kersin, and sphingomyelin—leading to the elucidation of the structure of the two former substances. At King's College, too, Rosenheim demonstrated that, contrary to Dixon and Taylor's findings, an extract of placenta had no pressor effect if there was no putrefaction.

After five years of retirement, Rosenheim joined the National Institute of Medical Research at Hampstead as a voluntary worker and revelled in the facilities provided. With Dudley he cleared up the distribution of two mammalian bases of unknown function, spermine and spermidine, and elucidated their structures. A fruitful co-operation with Webster resulted in the proof that the substance which on irradiation cured rickets in rats, the so-called provitamin-D, was ergosterol. Much has flowed therefrom. In association with Drummond he delved in the vitamin-A field and found that arsenic trichloride gave with cod-liver oil a blue colour proportional in intensity to the vitamin-A content. Other fish and bird oils were examined, some of which are now in daily use in medicine. The writer was fortunate in a collaborative effort with Rosenheim whereby revolutionary formulae were proposed for the sterols and bile acids in 1932. These have received universal acceptance and have led to remarkable advances in the knowledge of certain heart poisons, sex hormones, and principles of the adrenals.

The death of Dr. J. MAC K. JOHNSTONE occurred at his home at Leven, Fife, on April 17. James MacKersie Johnstone was born at Muirkirk, Ayrshire, on August 20, 1881, but most of his early life was spent in Lanarkshire. He received his medical education at Edinburgh University, where he graduated M.B., Ch.B. in 1902. After a few months as a locumtenent he went as assistant to Dr. W. Young, of West Calder, Midlothian, and then took up practice in 1905 in the Lanarkshire village of Tarbrax. After service in the first world war he returned to his practice, but in 1919 he moved to Leven, where he continued to practise until his death. Dr. Johnstone was a keen member of the British Medical Association, and from 1924 to 1947 he carried out the duties of honorary secretary of the Fife Branch, as well as those of honorary secretary of the Fife panel committee. In 1947 his colleagues showed their appreciation of his devoted services by making a presentation at a dinner given in his honour, and later they elected him president of the Fife Branch for 1948-9. He also served the profession on the Scottish Committee of the B.M.A. for many years, was vice-chairman of the Fife executive council, and a member of the East Fife hospitals management board. Although he had not enjoyed the best of health for some time, his sudden death came as a great shock to his colleagues. Our sympathy goes out to his widow, daughter, and two sons.—A. M. G.

Mr. A. H. B. HEESOM, dental surgeon to the East Surrey and Redhill County Hospitals, died at his home at Reigate on April 19 at the age of 54. Alan Hedley Beecroft Heesom was born at Redhill on September 29, 1900, and was educated at Marlborough and at Guy's Hospital, qualifying L.D.S. in 1926 and taking the Conjoint diploma of M.R.C.S., L.R.C.P. in the following year. After holding the appoint-

ment of dental house-surgeon at Guy's Hospital he joined his father, Mr. E. E. D. Heesom, in 1929, succeeding to the practice two years later, when his father retired. He was honorary dental surgeon to the East Surrey Hospital from 1934 until the inception of the National Health Service in 1948, when he was appointed senior hospital dental officer to the Redhill Group of Hospitals. He was extremely popular with all his patients and his professional colleagues, both medical and dental, as was shown by the very large attendance at his funeral service, the congregation being representative of all walks of life in the borough. He is survived by his widow and a son and a daughter.

The death occurred at Bolton on April 22 of Dr. JAMES SCOTT, honorary consultant gynaecologist to the Bolton Royal Infirmary. He was 73 years of age. James Scott was born on February 26, 1882, and received his medical training at Edinburgh University, where he graduated M.B., Ch.B. in 1907. He went to the Bolton Royal Infirmary as a house-surgeon in the same year, and remained for three years. During this time his ability and keenness were fully appreciated, with the result that he went as assistant to one of the staff who was also in general practice. In 1911 he was appointed to the staff of the Bolton Royal Infirmary as honorary assistant surgeon, and in 1913 he obtained his own general practice at Bolton. With the outbreak of the first world war in 1914 he joined the R.A.M.C., retiring with the rank of captain, and during his service he was awarded the Military Cross. He returned to the staff of the Bolton Royal Infirmary in 1920, and from then on his main interest was in gynaecology. In 1929 he was appointed honorary gynaecologist to the Royal Infirmary, where he founded the department. He remained in this position until 1948, when he retired from the active staff and was appointed honorary consultant gynaecologist. Dr. Scott was hard-working, conscientious, and took scrupulous care in all he did. He was a very capable surgeon, and was always insistent that everything in the operating theatre should be exactly as he wished it, but he was completely disinterested in the clock. He was never happier in the theatre than when doing a colporrhaphy, which provided him with plenty of opportunity to show his care and neatness. He continued in general practice until 1954, when he was forced by ill health to retire, and later in the year he returned to his beloved Scotland, living at Selkirk.—T. N. H.

Dr. LLEWELYN WYNNE DAVIES, who was formerly assistant director of medical services in Nigeria, died on April 24, aged 80. The fourth son of the Reverend David Davies, of Llansilin, Llewelyn Wynne Davies went to school in Oswestry, and studied medicine at King's College, London, and Edinburgh University, where he graduated M.B., Ch.B. in 1897, proceeding to the M.D. in 1903. After holding resident appointments at a number of hospitals, including The Hospital for Sick Children, Great Ormond Street, he continued his postgraduate studies at Heidelberg and Berlin. He also travelled widely as a ship surgeon and was in Japanese waters during the Russo-Japanese War. For some years thereafter he was a general practitioner in Hayle, Cornwall, and then joined the Colonial Medical Service in 1911, being sent to Nigeria, where he did pioneer medical work in unexplored areas of the country. During the first world war he saw active service in German-East Africa, Mesopotamia, India, and Afghanistan, being mentioned in dispatches. He was appointed O.B.E. in 1919. Retiring from the Colonial Medical Service in 1931, he farmed for some years in Llansilin and took an interest in many aspects of country life. Few men were so capable of offering intelligent advice on varied subjects. A keen antiquarian, he was president of the Offa Field Club and a committee member of the Cambrian Archaeological Association. He was also well known as a churchman, being a member of the governing body of the Church of Wales. A justice of the peace, he served on many committees concerned with local government and with the University of Wales. Throughout his life he maintained a fatherly interest in

Llansilin, and his home there was the centre of village life. Although unmarried, he loved family life and was always interested in child care. By young people in particular a visit to his home was never to be forgotten. Two of his nieces are medical practitioners.—I. H.

The death occurred suddenly at Oxford on May 9 of Dr. C. A. R. McCAY, who had been in general practice there for more than 30 years. Charles Alexander Ramsay McCay was born at Castlederg, Co. Tyrone, on May 12, 1890, the son of the late Rev. James McCay, and received his medical training at the Meath Hospital. He took the Irish Conjoint diploma in 1916, and then immediately volunteered for service with the R.A.M.C. in the first world war, attaining the rank of captain. After three years' service in France he returned to Dublin, where he took the D.P.H. at the Royal Colleges in 1919, and the F.R.C.S.I. (in the following year), gaining first place in the latter examinations. He then held resident posts in Dublin and Northampton before settling at Oxford in 1922, in partnership with Dr. Robert Hitchings. He became the senior partner in 1930, when Dr. Hitchings retired, and remained so until the time of his death. He was deeply interested in medical activities of all kinds, and his influence was widely felt. He was a product of the old school, and firmly believed that the doctor should also be the friend and counsellor of his patient. He set himself and his colleagues a very high standard in all medical matters, and strongly opposed any tendency to undermine the responsibility and position of the general practitioner. He was a man of fine character—generous and warm-hearted—and by his passing Oxford has lost a really good doctor, and many people a trusted friend and adviser. He is survived by his widow, three daughters, and two sons.—J. C. S.

Sir ROBERT MCCARRISON writes: As one who enjoyed the friendship of that grand family doctor, Charles McCay, may I quote these lines which so fittingly tell what manner of man he was:

"But once I pass this way
And then—no more.

So while I may,
With all my might,
I will essay
Sweet comfort and delight
To all I meet upon the pilgrim's way."

This might well be his epitaph; for he will long be held in affectionate remembrance by the many to whom, in his pilgrimage, he brought comfort and healing both as friend and as doctor.

The obituary of Mr. R. DAVIES-COLLEY was printed in the *Journal* of April 30 (p. 1097). A.E.S. writes: When "D.C." as he was always known, returned from the first world war he arrived at Guy's arrayed in a grey morning-coat and top-hat. Later, I think, he got a little less formal, but usually wore grey. He was very polite and addressed all nurses (to their gratification and astonishment) as sister. As Mr. T. B. Layton writes, he never showed any emotion. Everybody knew that he had been keen on obstetrics. He was a good surgeon, but had not the tidy and precise habits of Mr. Fagge, whose house-surgeon I was when D.C. was assistant surgeon. A popular, bland, and imposing figure, Davies-Colley will be remembered with affection by all who came under his influence.

Medico-Legal

PSITTACOSIS IN FAMILY

Judgment was entered for defendants with costs by Mr. Justice Gorman in the High Court on May 13 in the action for damages brought by a family of five who alleged they contracted psittacosis from a parrot bought at a pet shop. The defendants were the Regent Pet Stores (Palmer's) Ltd.,

of London, N.W., who denied that any parrot they had sold was suffering from psittacosis or that there was any breach of warranty or negligence by them in connexion with the sale of the bird. The plaintiffs were Mr. W. C. Downes, a trolleybus driver, Mrs. F. A. Downes, his wife, G. W. Downes, now aged 14, Mrs. Daphne Chalk, aged 21, and Elaine Downes, aged 9, all of London, N. Entering judgment for the defendants, his lordship ordered Mr. Downes, who was legally aided, to pay £36 towards the costs. Giving judgment, his lordship said he was satisfied that, while Mr. W. C. Downes, the father, suffered from psittacosis, and it was probable that the boy Graham, Mrs. Chalk, and the girl Elaine had too, he was not satisfied that Mrs. Downes had. The allegation of breach of warranty was that the parrot was weak, dejected, and suffering from psittacosis when it was sold on December 18, 1952, and subsequently died on December 29, 1952. He could not accept this, and preferred the evidence of the defence witnesses that the bird was in good condition when it left the pet stores. It had been stated that the birds in the pet stores were inspected frequently every day, and there had been no indication that this particular parrot was out of condition. In any case, added his lordship, there was a room set aside as a hospital for sick birds. The greatest possible care was given to birds and pets, and there was no evidence whatever that there had been any sort of trouble of any description in respect of pets and their care. He was quite unable to say on the evidence that the bird was suffering from psittacosis at the time of the sale.

FAULTY MCGILL TUBE CAUSES DEATH

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

On March 1, 1955, Karen Jennifer Wills, aged 3 years 11 months, was admitted to the Southern Hospital, Dartford, for operation to correct a slight squint of the left eye. Her general health was good, and the operation was performed next day.

Premedication for the anaesthetic consisted of "nembutal" 1½ gr. (100 mg.) and atropine 1/100 gr. (0.65 mg.), followed by ether anaesthesia. After induction and intubation at 10.40 a.m. the operation began at 10.52. Oxygen was slightly increased because of some coughing on the tube similar to hiccups, and the anaesthetist passed his finger into the child's mouth to ascertain that things were all right. Later she became slightly cyanosed, so that the oxygen was again adjusted and a further check with the finger in her mouth was carried out. Her colour was then restored. Five minutes later the operation was concluded. She was then cyanosed and little or no chest movement could be seen. Resuscitative measures were at once applied and maintained for twenty-five minutes, but without avail. Only then was the tube taken out of the child's mouth, and it was found to have a transverse fracture about 1½ in. (4 cm.) from the end nearest the lips, behind the teeth at the back of the tongue.

How this break occurred, and precisely what caused the lack of oxygen contributing to the vagal inhibition which caused her sudden death, did not become clear from the evidence at the inquest held by the coroner for North-west Kent at Dartford on March 8 and 29.

The tube used was a nasal tube, deliberately selected. It was examined by the anaesthetist, who saw no sign of fracture, and no force was used in removing it. A representative of the suppliers said that although tubes had been known to split longitudinally he had never known of a split round the tube. The minimum pull required to break a similar tube on test was 28 lb. (12½ kg.). Although autoclaving tended to harden tubes, this one did not appear to be hard.

Mr. W. H. Stevens, an expert on rubber and plastics, examined the broken tube, which in his view could have broken as it had only by force exerted along its axis. He found that it had perished to some extent, because when he

squeezed it longitudinally cracking was produced, and the cracks contained foreign particles of, he thought, a siliceous character. One crack contained reddish rust. He was unable to break the tube in the way it had broken except by pulling hard along its axis. He did not think that the degree of perishing which he found could have been seen with the naked eye.

A verdict was recorded of death by misadventure from vagal inhibition.

£2,000 DAMAGES FOR RHEUMATOID ARTHRITIS

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

From August, 1950, to April, 1953, Mrs. Maureen McKendrick, a teacher at St. Conval's Junior Secondary School, Glasgow, had as her class-room what had been the back kitchen in the house which formed the school annexe. It was a badly heated and ventilated room, the temperature of which was usually about 50° to 52° F. (10°-11° C.), but as low as 42° F. (6° C.) in winter. It never rose to the 56° F. (13° C.) required by the school regulations. In winter Mrs. McKendrick and her class wore their overcoats in an effort to keep warm, and when conditions were unendurable special arrangements were made for the class to be transferred to the main school building. During this period Mrs. McKendrick's health gradually deteriorated, until she became crippled by rheumatoid arthritis.

Mrs. McKendrick brought an action against her employers, the Glasgow Corporation, alleging that by reason of the conditions in which she was required to work the corporation had failed to take reasonable care for her safety, as a result of which her rheumatoid arthritis had been brought about. The corporation denied that the room was in an unhealthy or dangerous condition, and said that it had had to be used at the time because of shortage of teaching accommodation. Its use had since been discontinued because it was not satisfactory from a teaching point of view.

In the Court of Session evidence was led on behalf of the corporation that damp and cold were not the cause of rheumatoid arthritis. Dr. Dudley Hart, of Harley Street, agreed in cross-examination that for a slim young girl in her twenties conditions of cold and damp in a room in which she had to work would be unsatisfactory, but said that from the point of view of causing rheumatoid arthritis cold and damp had no relevance. Dr. J. P. Currie, of the Glasgow Infirmary, a member of the Empire Rheumatism Council, said that although cold and damp were normally associated with rheumatism in general that was in his opinion a fallacy. Although it was suggested that a prolonged course of exposure to cold and damp working conditions were causative, contributory, or aggravating factors in the progress of rheumatoid arthritis, he believed that in the light of present knowledge of the disease all those conclusions were untenable. He did not think that living in a damp house or sleeping in a damp bed would be positive factors. There was no high incidence of the disease among refrigeration plant workers, and fishmongers and butchers were apparently immune. It was a common disease in Spain, Switzerland, and the Arizona desert.

In his summing up¹ to the jury Lord Walker said that before they could find for Mrs. McKendrick they must be satisfied of three things: that the room was cold, damp, and ill-ventilated throughout the two and a half years she was working there; that these conditions caused or aggravated the rheumatoid arthritis from which she suffered; and that the corporation ought reasonably to have anticipated that rheumatoid arthritis was likely to occur if she was exposed to the conditions in the room.

By a majority of seven to five the jury found a verdict for Mrs. McKendrick and awarded her £2,000 damages.

¹ *Scotsman*, May 18, 1955.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending May 7 (No. 18) and corresponding week 1954.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1955					1954				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	4	0	5	0	1	9	0	3	0	1
Dysentery ..	862	71	393	24	4	948	107	311	3	4
Encephalitis, acute ..	2	0		0		5	0	0	0	
Enteric fever: Typhoid ..	3	0	0	0		2	1	1	0	0
Paratyphoid ..	9	0	0	0		13	0	1	0	0
Food-poisoning ..	155	14		1		231	102		0	
Infective enteritis or diarrhoea under 2 years ..					8	11			13	23
Measles*	19,492	1236	153	304	396	1,734	71	201	108	331
Meningococcal infection ..	29	2	14	0	1	32	2	11	1	2
Ophthalmia neonatorum ..	34	4	3	0		32	1	10	1	
Pneumonia†	499	23	152	13	12	506	23	183	10	2
Poliomyelitis, acute: Paralytic ..	14	1		4	0	15	2		2	0
Non-paralytic ..	10				1	8	1		0	0
Puerperal fever‡	274	48	11	0		244	36	16	0	
Scarlet fever ..	575	42	69	60	17	719	32	118	23	35
Tuberculosis: Respiratory ..	788	107	157	25		937	97	189	37	
Non-respiratory ..	109	9	24	8		149	8	30	4	
Whooping-cough ..	1,850	103	128	42	50	2,381	98	356	49	50

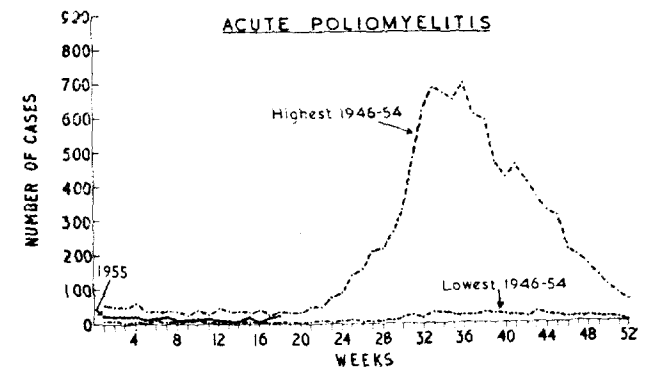
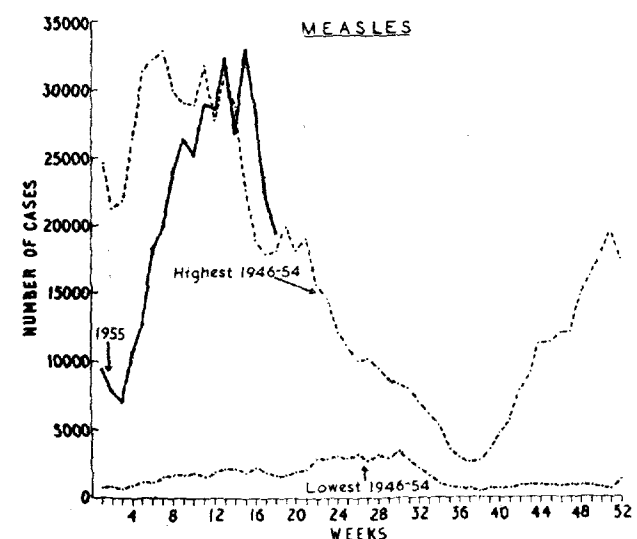
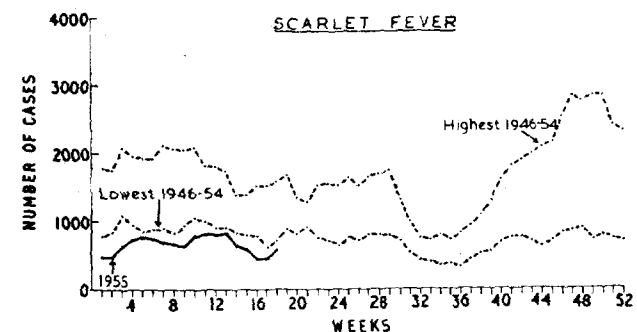
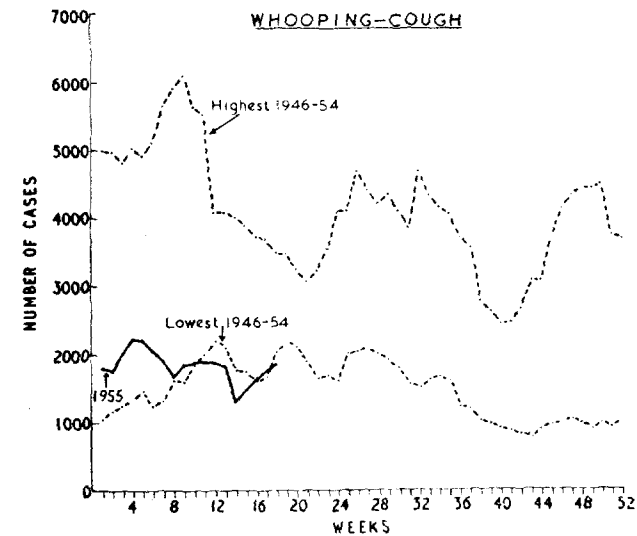
DEATHS In Great Towns	1955					1954				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute ..		0			0		0			0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	2	1	1	0	0	9	1	1	2	1
Influenza ..	19	1	2	1	0	11	1	1	1	1
Measles ..		1	0	0	0			1	0	1
Meningococcal infection ..		0	0				0	0		
Pneumonia ..	220	26	19	9	3	189	34	20	12	10
Poliomyelitis, acute ..	1	0			0	1	0		0	
Scarlet fever ..		1	0	0	0		0	0	0	0
Tuberculosis: Respiratory ..	74	10	8	3	2	87	12	11	1	9
Non-respiratory ..		1	1	0	0		0	0	1	0
Whooping-cough ..		0	0	0	0		9	0	0	0
Deaths 0-1 year ..	201	27	28	7	11	226	28	37	9	17
Deaths (excluding stillbirths) ..	5,239	733	563	111	156	5,242	750	619	152	191
LIVE BIRTHS ..	7,596	1,154	967	231	377	8,009	1,227	1,008	240	426
STILLBIRTHS ..	177	20	29			213	26	32		

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

Vital Statistics

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1946-54 are shown thus ----, the figures for 1955 thus —. Except for the curves showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The largest fluctuations in the notifications of infectious diseases in England and Wales during the week ending May 7 were a decrease of 3,045 for measles, from 22,537 to 19,492, and increases of 114 for scarlet fever, from 461 to 575, and 82 for whooping-cough, from 1,768 to 1,850.

The largest falls in the incidence of measles were 553 in London, from 1,789 to 1,236, 427 in Yorkshire West Riding, from 2,570 to 2,143, 424 in Warwickshire, from 2,055 to 1,631, 272 in Staffordshire, from 1,268 to 996, 258 in Southampton county, from 993 to 735, and 246 in Surrey, from 971 to 725, and the largest rises were 90 in Glamorgan-shire, from 603 to 693, 83 in Durham, from 719 to 802, 69 in Gloucestershire, from 410 to 479, and 64 in Middlesex, from 1,542 to 1,606. A small rise in the incidence of scarlet fever occurred in most regions, but there were no large local fluctuations. The largest rises in whooping-cough were 38 in Yorkshire West Riding, from 127 to 165, 35 in Durham, from 103 to 138, 34 in Leicestershire, from 55 to 89.

4 cases of diphtheria, 5 fewer than in the preceding week, were notified. The number of notifications was the same as in the 34th week of 1954 and is the smallest number recorded in any week. The four cases were notified in the northern cities of Kingston-upon-Hull C.B. 2, Wallasey C.B. 1, and Liverpool C.B. 1.

24 cases of acute poliomyelitis were notified, and these were 5 more for paralytic and the same for non-paralytic cases as in the preceding week. The largest returns were Lancashire 5 (Liverpool C.B. 3, Longridge U.D. 2), Middlesex 2 (Acton M.B. 2), Worcestershire 2 (Bromsgrove U.D. 2), Yorkshire West Riding 2.

The notifications of dysentery numbered 862 and were 17 fewer than in the preceding week. The largest centres of infection were Lancashire 319 (Manchester C.B. 47, Blackburn C.B. 44, Liverpool C.B. 40, Oldham C.B. 33, Blackburn C.B. 31, Salford C.B. 22, Whiston R.D. 13, Rochdale C.B. 12, Huyton-with-Roby U.D. 11), Durham 135 (Easington R.D. 26, Seaham U.D. 24, Stanley U.D. 17, South Shields C.B. 15, Felling U.D. 13, Whickham U.D. 13), London 71 (Islington 14), Surrey 44 (Woking U.D. 24), Northumberland 38 (Newburn U.D. 10), Yorkshire North Riding 36 (Middlesbrough C.B. 35), Leicestershire 31 (Leicester C.B. 22), and Yorkshire West Riding 28 (Leeds C.B. 10).

In Scotland the number of notifications of dysentery rose from 296 to 393. The largest returns were those of the cities of Glasgow 197, Dundee 61, and Edinburgh 37.

Week Ending May 14

The notifications of infectious diseases during the week included: scarlet fever 571, whooping-cough 1,805, diphtheria 9, measles 20,384, acute pneumonia 441, acute poliomyelitis 16, dysentery 1,038, paratyphoid fever 12, and typhoid fever 2.

Medical News

"Clinical Pathology in General Practice."—The 39 articles on clinical pathology which appeared originally in the *Journal* from October, 1953, to July, 1954, as part of the Refresher Course for General Practitioners are now available as a book. A leaflet describing it is inserted in this issue of the *Journal*. The book sets out to be a practical handbook on clinical pathology. It describes how best to take and preserve specimens, and discusses the value and interpretation of the various tests. It includes details of the laboratory facilities available in Britain and a full index. Written primarily for the general practitioner, this volume is likely to interest equally the hospital worker. Its cost is 21s.

Orthopaedic Accident Service.—From June 1 the Royal National Orthopaedic Hospital, Brockley Hill, Stanmore (Grimsdyke 2900), will operate a twenty-four hour accident service for the treatment of orthopaedic injuries. Facilities are available for the reception of injuries direct from the site of accident. Requests for admission or out-patient treatment should be made to the duty registrar. The service is planned to deal with major and minor injuries, and will supplement the existing special organizations of the Royal National Orthopaedic Hospital for peripheral nerve injuries, hand injuries, rehabilitation, and resettlement.

Joint Annual Meeting.—Members who have resolved to attend the Joint Annual Meeting in Canada on June 20-24 but not yet arranged to do so are asked to communicate before May 31 with the Secretary of the British Medical Association. It may not be possible after that date to reserve either a passage to the meeting or accommodation there.

Carnal Knowledge of Mental Defectives.—When a certified mentally defective patient is found to be pregnant or there is reason to think that sexual intercourse has taken place, the administrative procedure to be followed is set out in a National Health Service communication H.M. (55) 46, sent to hospital boards and committees by the Ministry of Health. The Board of Control should be informed, as before, but the following change in procedure has been made: "Following consultations with the Secretary of State for the Home Department, the Minister is of opinion that it is desirable that in future such cases should be reported to the police, not necessarily with a view to prosecution but to enable the police in consultation with the medical superintendent to decide what is the best course to take in all the circumstances." Medical superintendents are asked to send reports to the local chief constable even when the offence has been committed in another police area.

Eighth World Health Assembly.—Dr. I. MORONES PRIETO succeeded Dr. JOSEPH N. TOGBA as president of the World Health Assembly at its eighth session, which began on May 11 in Mexico City. Dr. Morones Prieto is Mexico's Minister of Health and Welfare. Dr. ANDRIJA STAMPAR, president of the Yugoslav Academy of Sciences and Arts, was awarded the Léon Bernard Foundation Prize in recognition of his "outstanding contribution and practical achievements in the field of social medicine." The prize, which consists of a medal and 1,000 Swiss francs, was presented by Dr. Morones Prieto. He stated that Dr. Stampar had introduced basic concepts of social medicine into the medical schools and health services of Yugoslavia as well as in other countries. Dr. Stampar was chairman of the Interim Commission of the World Health Organization in 1946-8 and president of the First World Health Assembly in 1948.

NAPT Travelling Fellowship.—The Scottish Branch of the National Association for the Prevention of Tuberculosis offers a travelling fellowship, valued at £250, to a doctor working in Scotland in the field of tuberculosis. Details from the Scottish Secretary, NAPT, 65, Castle Street, Edinburgh, 2. The last date for applications is July 15.

Rockefeller Foundation Grants.—Among recent grants are one of \$35,000 to the University of London for research into nucleic acids by Professor J. T. RANDALL and Dr. M. H. F. WILKINS in the department of physics at King's College, and another of \$45,500 (£15,000) to the London School of Hygiene and Tropical Medicine for the investigation of industrial conditions hazardous to health in a new department of occupational health. The present grant brings the total support to this school by Rockefeller funds to about \$2,500,000 since 1922. Professor H. A. KREBS, Nobel Prize winner, recently of Sheffield and now professor of biochemistry at Oxford, will continue to be aided by a grant made to Sheffield University when he was there. This grant for Dr. KREBS's work is a continuation of Rockefeller Foundation support which began in 1935.

Cerebral Palsies.—A century after the publication of Little's classical descriptions of cerebral palsy a Little Committee has been formed to study the clinical features of the disease and the administrative problems of training medical and other staff for work on it. The committee consists of the following members: Dr. W. R. F. COLLIS (chairman), Mrs. EIRENE COLLIS, Dr. WILLIAM DUNHAM, Dr. L. T. HILLIARD, Sir FRANCIS WALSHE, Dr. DAVID LAWSON (secretary at Queen Mary's Hospital for Children, Carshalton, Surrey).

Paediatrician Honoured.—On May 6 at the Dewsbury General Hospital local doctors and nurses entertained Professor C. WILFRED VINING, when a plaque was unveiled to commemorate his work as paediatrician to hospitals in the district from 1930 to 1953.

Medical Patron.—Lord IVEAGH, who is to be invested as a Knight of the Garter on June 13, has been a friend of medicine all his life. As a young man at Cambridge he became interested in research and in 1900 persuaded his father to endow the Lister Institute with a gift of £250,000. He was also associated at an early stage with the work of Wright and Fleming at St. Mary's Hospital. This was the result of a meeting called by Arthur Balfour in his room at the House of Commons to discuss the treatment of influenza by inoculation. It was then decided to form a committee to further the work being done at St. Mary's, of which Rupert Guinness (as he then was) was one of the most active members. In 1921 Lord Iveagh became chairman of the Wright-Fleming Institute of Microbiology and in 1929 presented it with the sum of £40,000 to be spent on new laboratories. He also endowed a ward at the hospital. He was a lifelong friend of Sir Alexander Fleming, who lived for many years as his neighbour in Suffolk. It was on Fleming's suggestion that early in the century he installed a pollenarium on his estate at Pyrford in Surrey. Here for many years the special grasses have been grown to provide the pollen from which vaccines for the treatment of hay fever are manufactured.

Research Fellowships.—The following Beit Memorial Fellowships for Medical Research are announced:

P. C. CALDWELL, D. Phil.: to investigate the mechanism of muscular contraction in Crustacea at the Marine Biological Laboratory, Plymouth.

R.-H. CÔTÉ, D.Sc.: to investigate the chemical constitution of human blood group substances at the Lister Institute of Preventive Medicine.

Miss E. I. B. DRESEL, Ph.D.: to investigate the biosynthesis of porphyrin pigments at University College Hospital Medical School, London.

J. M. LOWENSTEIN, Ph.D.: to investigate the biosynthesis of pyrimidines in mammals at the Department of Biochemistry, Oxford.

R. WHITTAM, D.Phil.: to investigate the metabolism of adenine nucleotides in relation to the active transport of inorganic ions at the Physiological Laboratory, University of Oxford.

Orthopaedic Meeting.—On April 22-23 the President of the British Orthopaedic Association, Professor BRYAN MCFARLAND, and some twenty members attended the spring meeting of the Société Belge d'Orthopédie et de Chirurgie de l'Appareil Moteur at Brussels at the invitation of the society's president, Dr. ROBERT SÈUR.

Ulster Paediatric Society.—A meeting was held on May 7 in the Institute of Clinical Science, Belfast. A demonstration of clinical cases occupied the morning, and after lunch papers were read by Dr. O. D. FISHER, Mr. D. S. GORDON, Dr. W. A. B. CAMPBELL, and Mr. J. A. W. BINGHAM.

Rose Simmonds Memorial Fund.—The first Rose Simmonds Memorial prizes for student dietitians (see *Journal*, July 3, 1954, p. 51) were presented by Miss PAT HORNSBY-SMITH, Parliamentary Secretary to the Ministry of Health, at the annual meeting of the British Dietetic Association on April 30.

Analgesia Research.—The National Birthday Trust Fund has made a grant of £1,200 to Dr. HILDA ROBERTS, lecturer in anaesthesia at the London Postgraduate Medical School, to enable her to do full-time research. The work will be carried out in the Research Unit of Obstetric Analgesia at Hammersmith Hospital.

Honorary Degree.—When QUEEN ELIZABETH THE QUEEN MOTHER is installed as Chancellor of London University on November 24 the honorary degree of Doctor of Laws will be conferred on Viscount MALVERN OF RHODESIA (formerly Sir Godfrey Huggins).

Lady Templer Hospital, Malaya.—Dr. M. R. J. SNELLING, from the King Edward VII Sanatorium, Midhurst, has been appointed first medical superintendent of the Lady Templer Hospital for Tuberculosis at Kuala Lumpur. He will shortly be joined by a thoracic surgical team and 28 Australian nursing sisters. The hospital has 250 beds.

Dr. Scott Thomson has been appointed part-time professor of bacteriology in the University of Wales. Dr. Scott Thomson is director of the Regional Public Health Laboratory (Medical Research Council), Cardiff, and has been lecturer in bacteriology in the Medical School since 1946. He was a major in the R.A.M.C. and was bacteriologist of the penicillin research team set up by the War Office in 1943.

Dr. G. R. Hargreaves has been appointed Nuffield Professor of Psychiatry at Leeds University from October 1. Dr. Hargreaves, who qualified in 1932, was in 1948 appointed the first chief of the Mental Health Section of the World Health Organization.

Dr. K. G. Bergin, B.O.A.C.'s medical superintendent, London Airport, has been elected a Fellow of the Royal Aeronautical Society.

Dr. J. Ferguson Smith, of Glasgow, has been elected an honorary member of the German Dermatological Society "on account of his outstanding scientific services in the domain of dermatology."

Faculty of Ophthalmologists.—At the council meeting on May 13 the following were elected officers for 1955-6: President, Dr. JOHN MARSHALL. Vice-presidents, Mr. T. KEITH LYLE and Mr. J. R. WHEELER. Honorary Treasurer, Mr. A. McKIE REID. Honorary Secretary, Mr. E. F. KING.

COMING EVENTS

"Rehabilitation of the Handicapped."—Two-day course, under joint auspices of British Council for Rehabilitation and Manchester University, at the College of Technology, Sackville Street, Manchester 1. June 6 and 7. Intended for industrialists, industrial M.O.s and nurses, personnel officers, etc. Details from British Council for Rehabilitation, Tavistock House (South), Tavistock Square, London, W.C.1.

Israeli Medical Association.—Third World Assembly in Jerusalem, Haifa, and Tel Aviv, August 10-20. Organized tour from Britain leaves London on August 8 (cost £158). Details and programme from Messrs. D. F. LONG and Co., Travel House, Mornington Crescent, London, N.W.1.

Asian-Pacific Tuberculosis Conference.—In Sydney, August 15-21, the week preceding the Australasian Medical Congress. The programme includes discussions on B.C.G. vaccination and tuberculosis control and treatment. Details from Dr. BRUCE GEDDES, Royal North Shore Hospital of Sydney, Crows Nest, New South Wales.

SOCIETIES AND LECTURES

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

Monday, May 30

EDINBURGH UNIVERSITY: FACULTY OF MEDICINE.—At Laing Surgical Lecture Theatre, Edinburgh Royal Infirmary, 12 noon, Professor S. F. HAINES (Minnesota, U.S.A.): Thyroid Gland in Relationship to Neuromuscular Disease.

Tuesday, May 31

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. E. M. Wigley: The Alopecias.

●INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—3 p.m., Mr. F. C. Dwyer: Lumbosacral Backache.

OXFORD UNIVERSITY MEDICAL SOCIETY.—At Maternity Lecture Theatre, Radcliffe Infirmary, 8.15 p.m., Professor R. J. Harrison: Origin, Development and Treatment of Human Intersexes.

ROYAL STATISTICAL SOCIETY: STUDY CIRCLE ON MEDICAL STATISTICS.—At Westminster Medical School, 5.45 p.m., annual general meeting. Three short papers: Controlled Trials in Medical Research. Dr. P. Armitage: Sequential Methods; Dr. J. Knowlton: Some Practical Problems; Dr. R. F. Wright: Statistical Inference.

UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, W.C., 5.15 p.m., Cushing Memorial Lecture by Professor G. M. Bull: Physiology of Osmotic Diuresis and its Clinical Effects.

WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY.—5 p.m., Altmouth Wright Lecture by Professor A. C. Frazer: Studies on Intestinal Function in Man.

Wednesday, June 1

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Diagnosis and Treatment of Tinea Capitis.

●INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—3 p.m., Mr. N. F. Morris: Face and Brow Presentation.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. I. Friedmann: Pathology of the Ear.

Thursday, June 2

HONAN GILLESPIE LECTURE.—At University New Buildings, Edinburgh, 5 p.m., Dr. John Gillies: Induced Hypotension—A Review.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor R. Roaf: Natural History of Deformities as seen in India.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., postgraduate demonstration in neurology.

SURREY INTER-HOSPITAL PSYCHIATRIC ASSOCIATION.—At Horton Hospital, Epsom, Surrey, 8 p.m., clinical meeting. Papers by Dr. A. R. Worters: Problem of Incontinence in the Senile Psychotic; Dr. G. H. A. Chamberlain: Investigation into the Use of Acetylcholine in the Chronic Psychotic.

Friday, June 3

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. L. Forman: Disorders of Hair and Scalp.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Dr. J. G. Scadding.

INSTITUTE OF LARYNGOLOGY AND OTOLARYNGOLOGY.—3.30 p.m., Mr. N. Asherson: Intra-cranial Complications of Ear and Sinus Disease.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—2.30 p.m., visit to Heritage Craft School and Hospital, Chislehurst, Sussex.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Sir Arthur Porritt: Carcinoma of the Breast.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Dr. J. Suchet and Dr. M. W. Lloyd-Owen: Analgesia and Anaesthesia in Labour.

APPOINTMENTS

FAIRLEY, H. BARRIE, M.B., B.S., F.F.A.R.C.S., D.A., Anaesthetist, Toronto General Hospital; Clinical Assistant, University of Toronto.

HENRY, H. S. A., M.B., F.R.C.S.I., D.L.O., Part-time Consultant Ear, Nose, and Throat Surgeon to South Down and South Armagh Group of Hospitals, Northern Ireland Hospitals Authority.

MACDONALD, IAN ALISTAIR, M.D., D.P.M., Consultant Psychiatrist and Medical Superintendent, Highcroft Hall Hospital, Birmingham.

MAKEY, A. R., M.S., F.R.C.S., Part-time Assistant Surgeon, Charing Cross Hospital.

VOIGHT, ETHEL MARY, M.B., B.Ch., Assistant County Medical Officer, School Medical Officer, Wiltshire County Council.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Longstaff.—On May 18, 1955, at Westwood Hospital, Beverley, East Yorks, to Peggy (formerly King-Davies), wife of Dr. John Longstaff, a daughter—Fiona Sarah.

Rose.—On April 20, 1955, at Rotorua, New Zealand, to Flora Rose (formerly Macdonald), M.B., B.S., wife of Benjamin Rose, M.R.C.P., a son—Timothy Julian.

DEATHS

Allott.—On April 29, 1955, at Besborough Heath End, Farnham, Harold Wordsworth Leach Allott, M.R.C.S., L.R.C.P., Lieutenant-Colonel, R.A.M.C., retired.

Bailey.—On April 27, 1955, at Dartmouth, Devon, Charles Henry Farley Bailey, M.R.C.S., L.R.C.P., late of Newport Pagnell, Bucks, aged 81.

Brakenridge.—On April 14, 1955, at Chew Magna, near Bristol, Francis John Brakenridge, C.M.G., M.R.C.S., L.R.C.P., D.P.H., Colonel, late R.A.M.C., retired, aged 83.

Browne.—On April 23, 1955, Hugh Derbyshire Browne, M.R.C.S., L.R.C.P., of Margam Cottage, Haywards Heath, Sussex.

Circuit.—On April 4, 1955, at Little Glemham Rectory, Woodbridge, Suffolk, Kathleen Circuit, M.R.C.S., L.R.C.P.

Clarke.—On April 27, 1955, at the Royal Naval Hospital, Chatham, Kent, Hubert Arthur Clarke, M.R.C.S., L.R.C.P., I.D.S., Surgeon Commander, R.N., retired, of Trincomalee, Poonery Bay, Sussex.

Clarkson.—On April 15, 1955, George Aylwin Clarkson, F.R.C.S., of Oakhurst, Gander Hill, Haywards Heath, Sussex, aged 85.

Any Questions?

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

Vaccination for Genital Herpes

Q.—Could you please give me an opinion on the efficacy of vaccination therapy in a case of recurrent genital herpes? What is the best method of administering vaccination therapy, and how great is the danger of encephalitis?

A.—I am not aware of any published series of cases of the treatment of herpes genitalis by vaccination. My own impression from treating these cases is that vaccination is less effective than in the treatment of recurrent herpes on the face. However, other treatment of herpes genitalis is so unsatisfactory that the vaccine treatment is usually indicated. The vaccination should be carried out at intervals of a fortnight to a total of six or eight inoculations.

The danger of encephalitis seems to be almost entirely confined to primary vaccination in adolescents and adults. Re-vaccination is almost free from this risk.

Gaseous Distension of the Colon

Q.—A man of 60 complains of severe flatulence after a meal. X-ray examination shows gross gaseous distension of the colon by reason of which the stomach, which is of the "cascade" type, seems almost to be pushed up into the chest. What is the best line of treatment?

A.—Excessive gas in the colon may displace the stomach and has a number of causes, but most cases of severe flatulence after a meal are in fact due to air swallowing, with accumulation of air in the stomach under the left diaphragm, and not in the colon. If, as in this case, it is clearly shown in the x-ray picture that the gas is colonic, this may be due to intestinal carbohydrate dyspepsia, provided all causes of obstruction can be ruled out.

The commonest cause of this dyspepsia is undue hurry in the passage of food through the small intestine with resulting bacterial fermentation of starch which has reached the colon undigested. There is sometimes an associated achlorhydria and often an excessive excitability of the autonomic nervous system. The treatment is to cut down drastically all starches in the diet—particularly vegetables—and to give small doses of a sedative such as phenobarbitone, $\frac{1}{2}$ gr. (32 mg.) three times a day, to reduce nervous excitability, and acid, hydrochlor. dil., 15 min. (0.9 ml.), daily, with the two main meals of the day, in a glass of water.

Gas absorption in the small and large intestine may be reduced in cases of portal hypertension or heart failure, and severe meteorism may be due to a small mesenteric thrombosis.

Presumably in the case described all causes of chronic obstruction such as volvulus or peritoneal bands have been excluded, but simple chronic constipation in elderly patients, either of the "dyschezia" type or associated with diverticulitis, may sometimes lead to a considerable degree of megacolon with much gaseous distension. If this is the case a short course of colon washouts might be tried, giving these daily for four or five days to see if relief occurred. Two ounces (56 ml.) of liquid paraffin should first be run into the rectum and retained for one to three hours with the patient lying flat, after which 1 to 2 pints (0.5 to 1 litre) of warm saline should be run into the rectum under low pressure and then allowed to be evacuated.

Abdominal massage is unlikely to be of assistance, and the use of purgatives actually detrimental. Charcoal and other so-called adsorbents are almost, if not entirely, useless. Unless stool cultures show a definitely abnormal flora anti-septics or antibiotics should not be given.

Careers for Tuberculous Patients

Q.—What principles should govern the choice of a career for a patient with tuberculosis? Training colleges will not accept active cases nor, presumably, quiescent ones. Should going to the university be postponed until the disease is arrested? Should careers involving much examination study be avoided? Should office work be avoided, as many offices are stuffy and badly ventilated? Your expert's views would be helpful.

A.—It is possible nowadays to take a much more optimistic view of tuberculosis than formerly. In the writer's opinion, although each case must be judged on its merits, a patient with arrested tuberculosis could in general be accepted for a training college, provided he remains under supervision by a competent chest physician. Nowadays relatively few careers have to be closed to a patient just because he has had tuberculosis. The university certainly need not be postponed for any long period; in the writer's experience most students found to have pulmonary tuberculosis by mass miniature radiography are back at the university the following academic year. They are advised to have 9 to 10 hours in bed and have to forgo strenuous sports, but are quite able to undertake the normal amount of study. It follows, of course, that there is no need to forgo a career which involves examinations. Office work, with its routine hours and lack of physical exertion, is in general very suitable for the ex-tuberculous patient. At present it is wise to advise against jobs involving heavy physical effort or dusty conditions, but it may well be that even these will later be opened to suitable ex-patients. All these remarks apply, of course, only if the patient has been well and thoroughly treated, if he remains under skilled supervision, and if his disease is regarded as securely under control.

Preservation of Fibrinogen

Q.—Solutions of fibrinogen prepared by the method of Jaques appear to become readily injected when stored at 4° C. What is the best method of preserving these solutions?

A.—Solutions of fibrinogen cannot be stored even in the refrigerator at 4° C. for more than two or three days. The reactivity of the fibrinogen deteriorates even if the solutions are not infected. Nor, in my view, is preservation improved by freezing the solution solid at -20° C. The only satisfactory method of storage is to dry the solution by the lyophil drying method immediately the solution has been dialysed. The material can be made in quite large bulk, and suitable amounts weighed out and dissolved as required. Advice on the construction of a satisfactory freeze-drying apparatus can be obtained from any well-equipped university biochemistry laboratory.

Vaginal Pessaries in Virgins

Q.—How does one treat a virgin who has a *Trichomonas vaginalis* infection? Is there not a risk of damage to the hymen if vaginal pessaries are used? I would appreciate your advice.

A.—If the opening in the hymen is wide enough to allow swabs to be taken and the diagnosis to be made, it nearly always allows the patient to insert vaginal pessaries without injury. Even if their regular use does result in slight stretching or tearing of the hymen it does not matter so long as the patient is responsible for it herself.

In cases where the hymeneal opening is exceptionally small and when the patient is nervous, uncooperative, or lacking in self-confidence it may sometimes be necessary to get her permission (or that of her parents if she is under age) to administer a general anaesthetic with a view to vaginal examination: this will inevitably dilate or tear the hymen. It will allow the case to be properly assessed, and has the added advantage that it allows a thorough cleaning of the vagina before the start of the treatment with pessaries.

Anticoagulants in the Puerperium

Q.—Is there any evidence that anticoagulants given to the mother for phlebotrombosis in the puerperium may be passed on to the baby through the breast milk and cause spontaneous bleeding?

A.—Anticoagulants of the heparin group are not absorbed from the intestinal tract and are therefore harmless to the baby even if excreted in the breast milk. The dicoumarol group of anticoagulants (dicoumarol, ethyl biscoumacetate, phenylindanedione) given to the mother are excreted in breast milk and can be absorbed from the intestinal tract. There is therefore the theoretical possibility that the baby might absorb sufficient anticoagulant from the breast milk to disturb its own clotting mechanism. No case of prolonged bleeding in a baby seems yet to have been reported as a result of administering anticoagulants to the mother in the puerperium, and it is not very likely that enough anticoagulant would in practice be absorbed to increase the baby's clotting-time significantly. An injection of vitamin K (5 mg.) would rapidly restore the normal coagulation rate if this was found to be raised.

Nocturnal Epilepsy in a Boy

Q.—What is the best drug for a boy aged 12 who suffers from nocturnal epilepsy? He began to have the fits eight months ago. Physical examination was entirely negative and x-ray examination showed nothing abnormal. He has never had an attack during the day. He was kept free from attacks with phenobarbitone, $\frac{1}{2}$ gr. (32 mg.) at bedtime, until two weeks ago, when the fits began again (he was away from home at the time). Now phenobarbitone, 1 gr. (65 mg.), keeps him all right. I would welcome suggestions as to treatment.

A.—In the treatment of epilepsy it is best to begin with a trial of whatever anticonvulsant may seem to be the most suitable, and, if it is ineffective in the dose first given, to increase this up to the limit of the patient's tolerance. If this should fail, other drugs or combinations of drugs should be tried. In the present case 1 gr. of phenobarbitone appears to be effective, and this should therefore be continued. It is important that whatever drugs may prove effective in controlling the seizures should be continued without reduction of the dose for a long period. This might reasonably be for three years after the last seizure, during which time the growth of the patient will have brought about a reduction of the dosage in relation to body weight. At the end of that time the dose might be halved, and if at the end of a further six months there had been no recurrence of seizures treatment might be stopped.

Intraperitoneal Sulphonamides in Research

Q.—In the course of experimental work on the pathology of certain obscure diseases of animals, in particular reptiles, I want to use a sulphonamide preparation systemically, but the only satisfactory route of administration is intraperitoneal. Can you please suggest the most suitable preparation for this purpose?

A.—It has been the general experience of experimental workers on the pharmacology of sulphonamide and allied drugs that the intraperitoneal route offers a safe and effective method of administration.

The simple sodium salt solutions are too alkaline for administration in this way, and it has been usual to use simple suspensions in saline or in 10% gum acacia of finely powdered (pestle and mortar) drug. The newer carboxymethyl cellulose preparations such as are employed in intramuscular penicillin suspension make excellent suspending agents. A site on the midline, above the bladder and avoiding the spleen, is chosen; a new sharp needle is the best safeguard against penetration of gut or vital tissue. The usual safeguard of withdrawing the needle a few millimetres and then withdrawing the piston before slowly injecting should

be practised. Absorption of sulphonamide drugs from the peritoneum of small laboratory animals and cats and dogs is rapid, approximating more to the intravenous than to the intramuscular route. It seems likely that this would also be true of reptiles.

The wide range of acetylation of sulphonamides among animals, and the possible sequelae of crystallization of acetyl-derivatives in, for example, warm atmospheres, would have to be considered, and this might influence the choice of drug. The writer has seen no reference to acetylation in reptiles, and a cautious experimental approach to dose is suggested. A calculation based on weight (man) should first be attempted; thereafter an increased dose based on surface area should then be used. For small reptiles the latter might well be seven times the former. Sulphathiazole remains the first choice.

Prognosis in Aplastic Anaemia

Q.—What is the longest recorded interval between onset and spontaneous recovery of the marrow in a case of aplastic anaemia? We have under our care a patient with panhaemocytopenia who, in the last four months, has had about 50 pints (28 litres) of blood. The frequent transfusions are causing great distress to the patient, and we are beginning to wonder whether further transfusion is justified. We should be very grateful for your expert's views.

A.—The writer is unable to answer the question as to the longest recorded interval between the onset and spontaneous recovery in aplastic anaemia. In the typical "idiopathic" form of the disease in which the marrow is truly aplastic recovery is undoubtedly extremely unusual. However, patients in whom the marrow aplasia is less complete have been kept alive for several years by blood transfusions, and in the writer's opinion the patient should never be allowed to die from lack of red cells. Even if the chances of recovery are remote, who can say that an individual patient will not recover or have a worthwhile remission? Is the distress to the patient caused by the transfusions psychological, or are the transfusions technically difficult or usually accompanied by reactions? If reactions occur frequently, they might be avoided by careful selection of blood after carrying out investigations for immune iso-antibodies. Possibly, too, transfusions of washed cells might be tolerated better.

Osteo- or Rheumatoid Arthritis?

Q.—My wife, aged 59, has recently developed painful Heberden's nodes on the terminal phalanges. She has fine crepitus in the knee-joints, but otherwise no other signs of rheumatoid arthritis. She has had salicylates and is now having phenylbutazone (1 tablet three times daily). Can you suggest any other treatment to retard the development of rheumatoid arthritis?

A.—Painful Heberden's nodes and fine crepitus in the knee-joints are signs of early generalized osteoarthritis, a condition which is extremely common in middle-aged women and which rarely causes serious crippling. Although the affected joints are painful in the early stages, this is followed by bony enlargement which is relatively painless. A more detailed description of the clinical and radiological features of this type of arthritis was published not long ago in the *British Medical Journal* (1952, 1, 181).

There is no evidence that this form of osteoarthritis predisposes to the development of rheumatoid arthritis, but rheumatoid arthritis is not uncommon in the sixth decade, and the two conditions may therefore coexist. Rheumatoid arthritis should be suspected if the following features are present: (1) Constitutional illness with weight loss; (2) cool, mauve, moist extremities; (3) marked soft tissue thickening around the joints; and (4) severe morning stiffness lasting two or three hours.

When there is any doubt, x-ray examination of hands and feet and a differential agglutination test for rheumatoid arthritis which is now done at most of the major rheumatism centres will help to clarify the diagnosis. Slight elevation

of the sedimentation rate is not uncommon in polyarticular osteoarthritis, but marked elevation will be strongly in favour of a concomitant rheumatoid process.

In generalized osteoarthritis rest of the affected joints and local warmth give the best relief of pain. Drug therapy with salicylates, phenylbutazone, etc., is generally less effective than in other rheumatic diseases.

Stilbamidine and Trigeminal Neuralgia

Q.—Can you give me any information on the use of stilbamidine in the treatment of trigeminal neuralgia? A patient of mine has shown me a cutting from an American newspaper on the subject, and I am anxious to know if there is any authentic basis for the idea.

A.—Stilbamidine has been used in the treatment of leishmaniasis. One author reports that half of a group of patients examined after such treatment had developed a trigeminal neuropathy. The patients complained of hyperaesthesia, paraesthesiae, anaesthesia, and formication in various parts of the trigeminal field. The symptoms arose three months after completion of a course of treatment and in one case had persisted for two years. Examination showed a loss of light touch sensibility with preservation of pain, both deep and superficial. These facts may have led to a trial of the drug in cases of trigeminal neuralgia. However, no reports of a series of such cases so treated (and followed for an adequate period afterwards) have appeared in the literature. The neurological findings above described would suggest that the drug would not be of value. Further, the paraesthesiae which the drug induces might add to the patient's difficulties, since it is well known that sufferers cured of trigeminal neuralgia by sensory root section or alcohol injection of the semilunar ganglion may be greatly troubled by paraesthesiae.

The Elderly Husband

Q.—A widower of 67 has recently married a woman of 35. He was worried beforehand whether he would be able to consummate the marriage successfully, and in the event he has proved impotent despite a course of testosterone propionate. Is his impotence likely to be due solely to psychological causes, solely to physical causes, or to a combination of the two? What treatment is advised?

A.—In view of his age, it is probable that his impotence is mainly physiological, but one would like to know how long he has been a widower, whether or not there was a decline in his sexual capacity in the latter years of his previous married life, whether sexual dreams and morning erections still persist, and a great many other things. The age at which sexuality disappears differs enormously in different individuals, some men retaining their potency well into the 70's and others ceasing to take any interest in sex in the late 50's.

If lack of intercourse is causing his wife distress and some treatment has to be attempted, I would recommend the implantation of tablets of testosterone, a form of therapy more effective than testosterone given by injection. Any psychological factors present will also have to be dealt with. The outlook is not good.

Amoebiasis in Children

Q.—In the treatment of amoebiasis in children (aged 3 years and over) what dosage of emetine is indicated? What other drugs are recommended for oral use or by enema, and in what dosage?

A.—Children between 3 and 8 years may be given one-third of the adult dose of emetine hydrochloride, emetine bismuth iodide, or di-iodohydroxyquinoline, those aged 8 to 10 one-half, children of 10 to 14 two-thirds, and those over 14 full doses. Only acute amoebic dysentery with trophozoites of *Entamoeba histolytica* in the stool should be treated with emetine by injection. Adults should be given 1 gr. (65 mg.) daily for three to four days, and this should

be followed by a full course of emetine bismuth iodide. Children are given proportionately smaller doses. If cysts of *E. histolytica* only are found, emetine bismuth iodide should be given without a preceding course of emetine hydrochloride. The adult dose of emetine bismuth iodide is 3 gr. (0.2 g.) given nightly for 10 nights. This drug may cause nausea and for this reason it should be administered in the evening and preceded by a mild hypnotic. Most patients will then sleep through the period during which nausea is most troublesome. In the unlikely event of nausea and vomiting being severe, emetine bismuth iodide should be replaced by di-iodohydroxyquinoline, the adult dose of which is 0.6 g. thrice daily for 21 days. There is no justification for giving anti-amoebic drugs by enema either to children or to adults, for it is now generally agreed that the results so obtained are not superior to those following routine treatment as here outlined.

Results of Surgery in Lumbar Disk Lesions

Q.—What are the immediate and long-term results of operating on properly selected lumbar disk lesions? Are there any special sequelae or complications to be taken into account when advising a patient?

A.—Where the proper indications for surgery are present skilled operative treatment of lumbar disk protrusions will in most cases bring rapid and lasting relief from symptoms. Crural pain is quickly and completely relieved in the great majority, and though low back pain persists in mild form more frequently, with proper post-operative management it is rarely severe or persistent. The long-term results in several large post-operative series of patients have been satisfactory, and the incidence of recurrent protrusion requiring a second operation has been no more than 5%.

The risks to life and function are extremely small, and where the indications for it are present—in particular when crural pain is severe and persistent—operation can be recommended with confidence.

Treatment of Black Tongue

Q.—What is the treatment of "black tongue"?

A.—The treatment of black tongue will depend upon the cause. If it is due to overgrowth of *Candida albicans* and allied yeasts, painting with 4% to 2% gentian violet will often lead to its rapid disappearance. When it is due to some chemical or other irritant and is associated with overgrowth of the filiform papillae, producing black hairy tongue, painting with trichloroacetic acid (30% to 90%) will frequently be effective. A course of superficial x-ray treatment (50–75 r at weekly intervals, to a total of about 300 r) is also very effective. I have found hydrocortisone lozenges (1–2.5 mg.) locally to be effective in the few cases in which they have been tried.

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SIR HENRY DALE'S CONTRIBUTION TO PHYSIOLOGY*

BY

LORD ADRIAN, O.M., M.D., F.R.C.P., P.R.S.

Master of Trinity College, Cambridge

There is no one who could write adequately about the whole field of Sir Henry Dale's scientific work, but no one can write about any part of it without feeling that in this case our conventional labels and signposts are a mistake. Certainly he began in the early years of this century with work which would then have ranked as physiology, and he is now regarded by physiologists in every part of the world with the affectionate veneration we reserve for our greatest masters. But his first researches could be claimed now by the anatomists, his major contributions have enriched the fields of pharmacology and therapeutics, and, as head of the National Institute for Medical Research and President of the Royal Society, he has helped to guide the whole course of scientific work in Great Britain.

Labels, in fact, can only tend to obscure what all of us would wish to emphasize, that he has always been the leader who decides where the advance should go and never the subordinate commander, who must keep to one sector of the field.

No one could have led as Dale has done if his knowledge of the field had been limited to any one sector.

It is true that in the early years of the century, when he began his career in the Wellcome Research Laboratories, the field was a great deal smaller than it is to-day. Biochemistry had scarcely begun, no one measured H-ion concentrations, the hormones were few, and the vitamins had still to arrive. At that time Dale's grasp of the whole range of physiology and of the sciences which could assist it seemed remarkable enough. He could meet

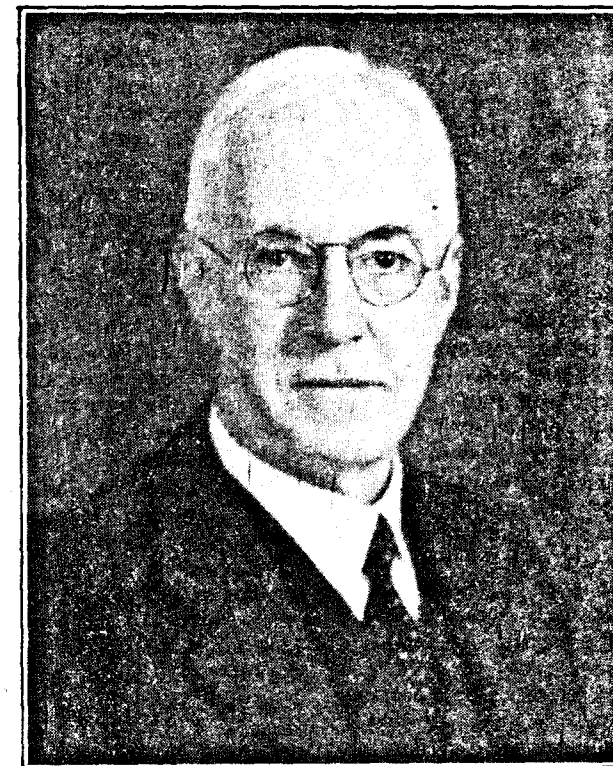
pharmacologists, organic chemists, and clinicians on their own ground; he could use their methods as well as speak their language, and could see the bearing of a discovery in one department on the advance of another. But the marvel has been that he can still do so in spite of all the expansion of medical science in this half-

century, the entry of biochemistry and physical chemistry, the multiplication of hormones and vitamins and enzymes, and the proliferation of technical terms and methods of every sort. The great triumphs of chemotherapy have been in the field which he knows best, but it is difficult to think of any in which he cannot still hold his own.

Clarity of Ideas

Part of the secret must lie in the clarity of ideas which has always made it a pleasure to read his papers. The volumes of the *Journal of Physiology* in the years before the first war contain many classics, for those were the days when physiology could claim an undisputed leadership; there was also Langley's stern editing to make every writer keep to the point. Dale's papers then were among those which every student could

read and remember without any thought of the examinations ahead. They might deal with subjects of forbidding unfamiliarity— β -iminazolyethylamine, for instance—but as soon as one began to read them one could see why Dale thought the subject important, and before one finished it had become evident that he had made it so. He would use the standard techniques of the pharmacologist, the kymographic tracing of blood pressure and respiration and volume change: the records he published left no doubt that his experimental skill was of a very high order, but he avoided unnecessary



Sir Henry Dale, O.M.

Sir Henry Dale is 80 on Thursday, June 9.

*The first of four invited contributions to celebrate the eightieth birthday of Sir Henry Dale on June 9.

The photograph is supplied by Walter Stoneman.

complications and unusual apparatus. There was no need to change the technique so long as it could give decisive answers, and they were decisive because the right questions were asked. In fact, he has been ready to adopt whatever new method would be more effective; but for Dale the technique has always seemed to follow the problem and rarely to suggest it.

Assembling of Evidence

This may do less than justice to the strategy which has led to so many advances. An attack cannot be planned without regard to the arms which can be employed, and Dale has always known where to find them and what to expect from them. His many collaborators and pupils have never found him set in his ways; it is rather that he can develop his theme with such knowledge and authority that in the completed account of an investigation we follow the argument and rarely stop to think of all the difficulties which must have been surmounted in assembling the evidence for it. Yet no one can have seen Dale at work in the laboratory or listened to his communications to the Physiological Society without realizing that it is the evidence which is all-important. Dale has never let his theories take charge: often enough his evidence has led to elaborate theorizing by others—about the role of histamine for instance, or about humoral transmitters in the nerve fibre. When such new horizons are opened it is hard to keep to the solid and familiar ground, but Dale has been more concerned to apply the brake than to be first in the gold rush. The gold he has found will keep its value.

Those who have listened to his lectures must often have been surprised to learn that he has never occupied a professorial chair at a university. He would have shone in teaching as he has in research, and medical education would have profited by his wisdom. But he has taught the whole body of physiologists throughout his career, through the medium of his published work and even more by his personal contact with them at congresses and symposia. For many years he has set the example at the International Congresses of Physiology by showing the rank and file how much more interesting a communication can be when it is clearly presented and illustrated. All of us are agreed that the kymographic records which bear the hall-mark of the National Institute for Medical Research have set a standard which few laboratories can hope to reach.

Such virtues are no doubt of minor account in comparison with Dale's specific achievements in the field of scientific investigation, but his effect on the development of medical science generally has been of major importance. Though he could not serve on the Medical Research Council when he was Director of the National Institute, his ideas have played a large part in the policy of the Council, and his direction of the Institute has led to many developments in fields remote from physiology and pharmacology.

To have remained as fertile in his own researches as Dale has done, as accessible and as encouraging to his juniors, and yet to have made his Institute famous for the variety as well as the standard of its performance is an index of talents and personal qualities which can only arouse our admiration. We cannot feel envy at the power to have accomplished so much; it is too far beyond our reach.

SALUTE TO HENRY HALLETT DALE

BY

OTTO LOEWI, M.D.

Foreign Member of the Royal Society

Sir Henry Dale's eightieth birthday is a welcome occasion for reflections on what science in general and scientists themselves owe to him. Such retrospection is especially gratifying to one who has had the good luck to enjoy Henry Dale's friendship for more than half a century. We met for the first time in 1903, in the small and poorly equipped, yet extremely creative and dynamic laboratory of Ernest Starling. Our interests and aspirations had much in common, and before long a close mutual relationship developed, from which emerged our lifelong friendship. This was deepened when, as time went on, our main interest and work coincided in the field of the chemical transmission of nervous impulses. That such a mechanism existed had been seriously considered first by Elliott (1904) and then by Dale (1914), because of the correspondence they had noted between the effects produced by adrenaline or acetylcholine and those due to the activities of sympathetic or parasympathetic nerves respectively. Later the chemical transmission of impulses from post-ganglionic nerves was established, and then Dale demonstrated, through ingenious planning, methods, and experiments, that the chemical transmission holds good to a much greater extent than I had realized. No better evidence of this can be offered than a quotation from a certain Harvey Lecture (1933): "I personally do not believe in a humoral mechanism in the case of striated muscle." Within the next year Dale demonstrated the chemical nature of transmission from spinal nerves to striated muscles. It was a discovery that made me happy, which may seem strange in view of the sentence just quoted. But it was not strange at all, for the fact stood forth that physiology owed and still owes to Dale the knowledge that the transmission of impulses from all peripheral, efferent nerves to their effector organs is of chemical nature.

It is fascinating to follow Dale's development from the very beginning. He was introduced to experimental medicine by some of the great physiologists of those days: Gaskell, Langley, Anderson, Starling, and Bayliss. At the age of 29 he accepted a post as independent research worker in the Wellcome Physiological Research Laboratories. He has since said: "I was attracted to the offer . . . by an instinctive feeling that it would be a good thing for me, at that stage, to be obliged to stand scientifically on my own feet, to find my own problems, to plan my own experimental attack upon them, to learn and devise methods for myself and to make my own mistakes." Dale's continual development ever since has fully justified the early confidence he had in himself. His scientific achievements, here dealt with in tributes from Lord Adrian and Professor Burn, were of such distinction that soon he became a leader in the fields of pharmacology and physiology and attracted a great number of ardent young associates from many lands. Endowed with imagination, strengthened by self-criticism, and urged on by a contagious enthusiasm and intellectual curiosity, he probed into the very roots of his problems and in doing so became an inspiring educator. He familiarized his students not only with facts, methods, and the art of observing and experimenting, but with ways of scientific thinking and

with the principles applicable to any field of experimental science. And more than all this, Dale became and has remained a scientific father and personal friend to his pupils. Small wonder that every single one of them cherishes a deep, unfaltering devotion to him.

In time the realm of Dale's interests expanded so widely that he became master of the essential problems in nearly every branch of experimental medicine. It became almost a routine for other men of wide scientific knowledge to turn to him for advice or to call upon him—again and again from across the Atlantic—to be the chief speaker at the dedication of research institutes. Hardly anyone else would have dealt with the possibilities of these institutes from so many angles or have so clearly indicated the direction research should take in the future. By such deeds Dale has shown himself to be a pre-eminent elder statesman in science.

For years Dale has been besought to deliver speeches on general themes and to commemorate famous men or anniversaries and to dignify special occasions. By consenting to the publication of a selection of such lectures and addresses in a book called *An Autumn Gleaning*, Dale has given us opportunity to broaden our knowledge of his thought and personality. He is as generous in appreciation of the achievements of others as he is modest about his own. In the introduction to the book just mentioned, he suggests that it may be "a late aftermath of weeds." I agree with the reviewer (Hugh Taylor, *American Scientist*, Vol. 43, p. 36, April, 1955) who calls the book "a golden harvest."

Dale's training at Trinity, one of the foremost humanistic colleges, may in part be responsible for his leaning to the historical aspects of science. He follows up the growth of ideas through the centuries and sees scientific developments in their proper setting. Over and beyond his education he possesses the capacity to grasp what is essential. His flair for the essential in any matter is generally recognized. English friends have related to me more than once that, whenever a scientific discussion becomes entangled, everybody eagerly waits for Dale to rescue it; he always makes the point.

Another characteristic of Dale's is his unusual talent to express the wealth of his thoughts by means of deeply penetrating words. More than that he has an artistic mode of formulation, which should serve the younger generation as a prototype of simplicity, lucidity, and beauty.

I finally desire to emphasize—have tried indeed to do it all along—that Dale's intellectual and aesthetic culture are attended by a strong ethical sense. He has a deep feeling of moral obligation. It shines through everything he writes or speaks. He has a genuine eagerness for any good cause.

To do justice to Dale's personality as a whole would require a big volume. In a short essay like this, only a few of his innumerable facets can be singled out.

The achievements of creative men in science, art, and music originate almost entirely from their aspiration to make the best possible use of their natural endowments. Doing so, they are happy and they do not claim gratitude. Their fellow men are grateful to them, in part because they benefit by their achievements, but for a larger reason as well, because these achievements testify to the heights that can be reached by mankind. Contemplating their deeds, we feel pride, courage, and optimism. On Henry Dale's eightieth birthday I feel joy in saying this to him:

Happy birthday, dear old friend.

SIR HENRY DALE'S CONTRIBUTION TO THERAPEUTICS

BY

J. H. BURN, M.D., F.R.S.

Professor of Pharmacology, University of Oxford

In considering Sir Henry Dale's contributions to therapeutics it is right to mention first his discovery of the action of posterior lobe pituitary extract on the uterus. Though he published no paper dealing specifically with the action of this extract until 1909, there is a record of the stimulant action on the uterus of the cat in his paper on "The Action of Ergot," which appeared in the *Journal of Physiology* in 1906. He pointed out the significance of this effect, since he had shown that the uterus of the cat in the non-pregnant state, unlike that of many other animals, was caused to relax by sympathetic stimulation and by the action of sympathomimetic amines.

Dale's main interest until the end of the first world war was in problems which were at first sight academic; his work on the action of histamine on the capillaries, however, had a great impact on clinical thought. It is hard to remember that up to 1918 the current view was that of Tigerstedt, according to which the capillaries lacked the power to contract and were purely passive structures. Dale and Richards in 1918 were the first to demonstrate that the vasodilator action of histamine seen in the body was due to capillary dilatation, and that a state of capillary constriction could be maintained under certain conditions in a perfused limb. This indicated that the capillaries behaved as though they had a tone of their own. Krogh's work, based on the direct observation of capillary changes and published only a few months later, confirmed and amplified the conception of independent capillary activity in great detail.

While the evidence of Dale and Richards and of Krogh was of interest mainly to physiologists, the work of Dale and Laidlaw on histamine shock brought the importance of capillary dilatation and of capillary permeability to the minds of physicians, surgeons, and pathologists alike. Dale and Laidlaw demonstrated that the injection of histamine into the cat anaesthetized with ether caused a profound and irreversible fall of blood pressure due to stagnation of blood in the widely dilated capillaries of the intestine, and that the blood in the main vessels became concentrated by loss of fluid through the capillary walls.

An interesting observation which is still not fully explained appeared in the first paper of the first volume of the *British Journal of Experimental Pathology*. Dale showed that when a cat was anaesthetized with ether or chloroform for some time, and then without operation allowed to recover, it remained for many hours highly sensitive to the effect of injected histamine. Collapse was caused by an amount of histamine one-tenth of that which was without effect on the cat before it received the anaesthetic.

Biological Standardization

The most important contributions to therapeutics were, no doubt, those which came under the heading of biological standardization. The importance of accurate dosage of drugs was always recognized by those who compiled the various pharmacopoeias, but its full gravity was appreciated only when the number of potent remedies underwent rapid

expansion. The appearance of agents the purity and potency of which could not be determined by chemical means gave rise to special problems, for it was not known how to measure these agents with any accuracy. For the antitoxic sera this did not matter so much. Provided that a patient was given not less than a certain dose of diphtheria antitoxin, no harm was done if he received more, and the doctor was satisfied if the manufacturer could assure him a potency which might be greater than the strength stated on the label but was definitely not less.

When the National Institute for Medical Research was established in Hampstead in 1920 there were two problems urgently needing attention. The one was the provision of a standard for the posterior lobe extract of the pituitary body, which varied widely in potency as made by different firms. A method for comparing the potency of two extracts had been described by Dale and Laidlaw in 1912, but there was no agreement between manufacturers about the strength of the extract which should be made commercially available to medical men. After its effect on the parturient uterus was discovered some doctors used it to accelerate the course of labour, and records appeared in the literature from 1910 to 1920 of patients in whom the injection of posterior lobe extract produced rupture of the uterus. In 1920 Dale therefore arranged an investigation, which established that of the extracts available in Britain the strongest was no less than 80 times the potency of the weakest. This meant that a doctor who used the product made by one firm at one time and the product made by another firm at another time might observe a completely different response on the two occasions. Since uniformity could result only when a common standard of reference was available, Dale investigated standards which had been proposed in the United States, showed that they were unsatisfactory because they were not prepared from the posterior lobe, and he suggested in their place a fresh extract of posterior lobe obtained by following a particular procedure. Actually this standard preparation was superseded in 1925 by the acetone-dried powder prepared in the laboratory of Carl Voegtlin, which was more suited not only to national but also to international use. The work, however, achieved a uniformity of potency in Britain from 1922 onwards.

The second problem which demanded attention at that time was presented by the manufacture of neoarsphenamine. German supplies ceased in 1914, and during the first world war the manufacture in Britain was controlled only by a test to ensure that the preparations administered to patients were not unduly toxic. By 1920 there were numerous reports that British neoarsphenamine was much less efficient in therapy than the original German product had been. Dale therefore arranged for tests for potency to be applied as well as for tests for toxicity, the tests for potency being made on mice infected with trypanosomes according to a method described by Voegtlin and Homer Smith. The results supported the clinical opinions and indicated that some samples of British neoarsphenamine were very weak. Not all manufacturers, however, were at that time willing to accept this evidence, and they protested that tests on trypanosomes in mice were not relevant to the cure of syphilis in man. Dale therefore arranged with Dr. C. F. White for a trial of a series of neoarsphenamine samples on men with a primary syphilitic lesion, in order to compare the results so obtained with the results in mice. The comparison provided a complete vindication of the mouse test, and from that time forward all samples of neoarsphenamine made in Britain were examined not only for toxicity but also for therapeutic action. There can be no doubt that Dale's effort in this matter, as in the matter of pituitary (posterior lobe) extract, was a contribution to therapeutics in Britain of very great importance.

The Introduction of Insulin

When Banting and Best announced the discovery of insulin and Macleod and Collip were assisting them to devise a method of preparing solutions for therapeutic use, Dale,

with H. W. Dudley as his companion, visited Toronto to learn at first hand of the progress of the work. This visit and the work which followed it enabled insulin to be made available in Britain in the shortest possible time as an agent which from the first was of nearly uniform potency.

The situation was full of dangers. The manufacture of a product like insulin was new to pharmaceutical firms in every country, and it seemed too great an adventure for any single firm in Britain. It involved the preparation of an unstable substance in sufficiently purified form for subcutaneous injection, from a tissue rich in an enzyme which could destroy the insulin, and full of other material. The preparation of insulin had defeated many who had attempted it on a small scale. What was now needed was a large-scale process which could be relied upon to produce insulin with regularity and at reasonable cost. This had to be accomplished with little guidance from previous experience of other tissues. For various reasons Dale sought to persuade the manufacturers who were interested to combine their resources, and it was as a result that the two firms Allen and Hanburys and British Drug Houses united to produce the AB brand. Much work was carried out by Dudley at the National Institute which enabled him to obtain insulin as a picrate, and in this way assistance was given in devising a commercial process. Frequent consultation between Dale, Dudley, and F. H. Carr greatly facilitated large-scale production.

Standardization of Insulin

Still more important, however, was the solution of the problem of standardization, which from the first constituted a serious obstacle to progress in purification. It was studied intensively under Dale's direction. The Toronto workers from the first attempted to measure insulin in terms of a rabbit unit, the definition of which was continually modified in the attempt to make such a unit satisfactory. Difficulty arose from the fact that the injection of the same amount of insulin into different rabbits, even when these were of the same sex and of similar weight, caused a fall of blood sugar which differed in magnitude in different animals. The measurement of the hypoglycaemia in different rabbits took considerable time, and for many months it was not obvious how the variation in the response of different animals could be overcome.

Dale's own view from the first was that the method of standardization could not succeed if it was to depend on a rabbit unit, and that it was essential that the method should be comparative, each preparation of insulin being tested in comparison with a standard preparation to determine the difference between them. This was the basis of Ehrlich's method of standardizing diphtheria antitoxin. Using this as the guiding principle, H. P. Marks, working under Dale's direction, finally arrived at an expression of the hypoglycaemic effect on a series of rabbits in terms of the mean effect in the group. This constituted an important advance which had far-reaching consequences. When a given dose of one preparation was injected into several rabbits the hypoglycaemic reaction of each rabbit differed, as has been pointed out. At that time the question seemed to be which of the different responses was to be regarded as the correct one. A revolution of thinking was required before it was realized that all the responses must be taken into account, and that the correct response was the mean of these very varying responses. Once this had been grasped, it was possible to determine a "dose effect" curve for insulin; that is to say, to determine for each of a series of doses of insulin the mean hypoglycaemic response in several animals.

At this stage a firm basis for insulin standardization had been laid down; it was carried out as a comparison of an unknown sample with a preparation specially kept for use as a standard, so that the potency of the unknown sample could be expressed in terms of the standard. The unknown might be four-fifths of the standard, or it might be one and a half times the standard; the number of units the unknown contained was then determined by the number of units

arbitrarily given to a certain weight of the standard. If it was decided to say that the standard contained 8 units in 1 mg., then it followed that if the unknown was four-fifths of the standard the unknown must contain 6.4 units per mg.

International Standardization

This procedure to-day may seem simple and obvious, but in 1923 and 1924 it was entirely new for a substance such as insulin. The success achieved had a very wide influence on the biological standardization of many other substances. Moreover, it came at a time when the establishment of international standards had been under consideration and provided a compelling reason for international agreement. At the International Physiological Congress in Edinburgh in 1923, Dale, Magnus, and others had considered the question of having standard preparations of various kinds, Magnus being specially concerned with a standard preparation of digitalis. As an outcome the Health Organization of the League of Nations arranged a conference in Geneva in 1925, of which Dale was the chairman. At that meeting international standards were agreed upon by the representatives of several countries for insulin, pituitary (posterior lobe) extract, neoarsphenamine and sulpharsphenamine, and for digitalis. This was a great achievement which was based on a careful organization of experimental work in different countries beforehand, and led to close and friendly relations between all the workers concerned. It meant, for example, in the case of insulin that a uniform system of measuring its potency was adopted throughout the world within four years of its discovery. Had Dale not succeeded in persuading the other members to adopt the comparative method of standardization, the meaning of "one unit of insulin" might well have remained obscure and the potency of different samples have shown wide variation for many years.

So successful was the Geneva Conference of 1925 that later conferences in 1928, 1934, 1935, and 1938 extended the list of substances for which international standards were provided almost as a matter of course. Since the second world war the work has continued under the World Health Organization, and the number of international standard preparations has reached fifty, with another fifty under consideration. How great a contribution this has been to therapeutics throughout the world it is quite impossible to indicate or measure. It is very largely due to Dale's skilful persuasion that instead of confusion there is order and co-operation in a field where national prejudices are sometimes just as capable of preventing agreement as in politics generally.

To conclude this account without reference to the changes in the treatment of myasthenia gravis resulting from Dale's work on skeletal muscle would be wrong. Papers by Dale and Gasser in 1925 and by Dale and Gaddum in 1930 pointed the way to the paper by Dale, Feldberg, and Vogt in 1936. The results described in the last paper stimulated Walker to use physostigmine in myasthenia and later neostigmine. Thereafter the symptoms of myasthenia gravis were for the most part brought under control.

"It is so easy to get the impression, from the popular acclaim which greets its real or imagined achievements, that the life of the research worker must be passed at a level of emotional tension rather like that of a gambler. In past years I have had more than one young man come asking for an opportunity to do whole-time research, and to be paid for doing it, with little to show in the way of credentials, beyond a dislike for the idea of teaching or practice, and a feeling that research must, by comparison, be full of excitement and fun. I did my best to correct that impression. The research worker, if he is successful, may indeed have his moments of discovery and seemingly sudden revelation, from which he may experience more than a momentary exhilaration; but, in spite of what popular report may suggest, such moments do not come merely by fortunate accident."—From *Autumn Gleanings*, p. 139, by Sir Henry Dale.

SIR HENRY DALE: HIS INFLUENCE ON SCIENCE

BY

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At the International Congress of Physiology in Boston in 1929 it was easy to arrange a special luncheon in honour of Sir Henry Dale by those whom, at some time previously, he had graciously received as collaborators in his laboratory. The occasion was symbolic of the loyalty and affection of the group as a whole. Those present were holders, or were to be holders, of responsible positions in physiology, pharmacology, biochemistry, and internal medicine. There illustrated was the area of his influence but not its depth. To find an expression for the latter one has to range far from the favoured few who have been with him in his laboratory, and then reflect upon what measuring device can be invoked. In current usage, the adjectives sympathomimetic, cholinergic, and adrenergic enter into descriptions with the readiness of older examples of their kind, as vasoconstrictor or vasodilator. Out in the common domain their influence goes on, though their origin may be forgotten.

Sir Henry's first paper affords us a starting-point. Typical of first papers, its subject matter was probably assigned to him by his professor. It is not one of the sources of the great stream that would develop later and in times of flood overflow its banks to add fertility to the adjoining fields; but it presaged the kind of careful work that makes possible the development of each innovation upon a solid foundation of what has gone before. A half-century later it was to become of great use to me. Also, it supplies us with a date, 1900.

A few years before, the action of an extract of the suprarenal gland had been discovered. It was just becoming associated with the sympathetic nervous system, and the structure of its active principle was still unknown. Acetylcholine had long been in the chemical catalogue, with its pharmacodynamic potency quite unsuspected; and histamine was not yet even a chemical curiosity. Such was the background of the sector of the evolution in the physiological sciences in which Sir Henry Dale's influence was destined to be greatest.

Pure and applied science—why extol one above the other? Where, indeed, is the division? There is but one science: that which, by whichever of its methods, leads to verifiable facts and what can be done with them. For the youthful Dale the course of the main stream was long to follow the saga of ergot. Freedom he had. And it was from the part of his researches that would be called "pure" that the irradiation took place out into the world of physiology and pharmacology, long before the advent of any proper understanding of ergot as a therapeutic agent.

Out of the saga of ergot, as told in the previous papers, now omitting all reference to chronology or collaborators, there can be brought into focus two great sets of contributions: the delineation of the sympathomimetic amines and the description of the actions of the quaternary ammonium bases. Through the whole there had to be carried the theme of adrenaline, which

not long since had been announced. In spite of his early clarifying discovery of the ergotoxin reversal, and in spite of other useful contributions to the mode of its action, again and again he was forced to point out discrepancies in the interpretation of the various experiments.

So fundamental were these developments to an understanding of the control of the circulation, and later to ideas about the nervous system, that each one as it appeared sent its reverberations throughout the laboratories of the world in which these subjects were of interest. To follow them would require a recapitulation of the history of a chapter of the physiological sciences over a half century. But, impossible as is the tracing of irradiation of influence in brief statement, it is still possible to give some hint of how it operated, in an illustration pertaining to the regulation of the vascular system.

Ramifications from Isolation of Histamine

The isolation of histamine and the description of its action, in 1910, may be taken as the point of departure. Here it is convenient also to mention the adduction, seventeen years later, of the proof that histamine is a normal constituent of the body; whereby the growing suspicion that the substance has a physiological significance was confirmed. It was partly the destiny of the analysis of the vasodilator action of histamine to follow a course parallel to that of the vasodilator action of adrenaline. The way of the latter had its rough spots. Annoying differences between the actions of the sympathetic nerves and adrenaline kept obtruding themselves; and the problem of what maintains the vascular tone essential for relaxation by either substance kept resisting a satisfactory solution. Many years were to pass, then at last new light from several of the laboratories of the world: noradrenaline and 5-hydroxytryptamine, each in its way to remove some of the shadows.

In the early experimentation on histamine there occurred a brilliant example of a chance observation appearing before a "prepared mind." Diverted for a time, as the result of a fortunate accident, toward the interpretation of anaphylaxis, Dale in a fundamental contribution not only pointed out the strategy for future work but also supplied an important part of the tactics. The significance of antigen meeting antibody in the organs still stands. The "Dale" bath is still in use. Here is an influence with a history of its own extending throughout a specialty. It might be characterized as pertaining to an offshoot from what I have called the main stream, were it not for the fact that histamine, which opened the front door, again crept in at the back. Its re-entrance, however, is connected with a larger subject: tissue injury.

During the first world war physiologists turned their attention to wound shock. It is not for me to recount Dale's comparisons of histamine shock and wound shock, but to turn to the aftermath. At the time facts were missing, needed for interpretations. A forced conclusion was that there was no justification for assuming that histamine is the only cell constituent which injury liberates. In the subsequent history, with the entrance of heparin on to the scene, the incoagulability of the blood was accounted for. With the second world war came the description of "precapillary sphincters" susceptible to influence by products of tissue injury. More recently has come the claim that ferritin has such an action.

Through work in widely separated laboratories attention has been directed to mast cells. They first came into prominence when heparin was associated with their granules. Their prominence became enhanced when histamine was found in the same location. At last a source of bound histamine in the tissues, long postulated, had been found. Since these cells are widely distributed along the course of the

smaller blood vessels, they are well placed for participation in vascular reactions. Consequently, new perspectives of interpretation are opening up—as, for example, in relation to the triple reaction of the human skin. Histamine research has come to full flower.

In 1910 it would have been impossible for anyone to foresee the number and extent of the ramifications from the description of the action of histamine. Along each of the branches there has been a succession of investigators. Now, the groups situated at the growing ends of the branches, as they look back over their specialized histories, find a meeting-place at a common point.

One, indeed, wonders what some future commentator will have to say in addition; especially in view of the rapidly changing frontier in pharmacology. As a science, pharmacology itself has matured. From its origin, wherein it was devoted to experimental testing of the validity of its inherited accumulation of empirical lore, it has evolved to a stage at which its investigations can be guided by working hypotheses, comprehensive in their scope. Substances identified in the body have contributed largely to the therapeutic armamentarium. Bodies of unrelated facts have been brought together into an understandable whole. Some of the most powerful pharmacodynamic agents, like acetylcholine and histamine, have turned out to be highly important in the operation of physiological mechanisms, while chemical prowess has been able to prepare molecules with actions imitative or antagonistic. For other powerful agents, to the action of which no clue has yet been discovered, patterns of thought have come into existence to point out the way in which solutions are most probably to be found.

Significance of Acetylcholine

In a search for an analogy for the wave of curiosity that swept through the minds of physiologists in the early 'twenties, after Professor Otto Loewi published his famous papers, there rises into view recollections of what happened more than a century earlier. Just as in the earlier time everyone felt impelled to experiment with the Galvani fork, so in the later time there was a strong desire to see personally the experiment on the frog heart. For an understanding of the revolution that had been launched, familiarity with Dale's papers on the amines and quaternary bases had laid a solid foundation. Now his differentiation of the nicotine-like from the muscarine-like action of acetylcholine would mount into a position of enormous importance.

Much as he had done in contributing to the physiological world the basis for a receptive understanding of the rapid surge of events, it was Dale himself who was in the best position to make effective use of those contributions. How he influenced the course of events can henceforth be derived directly, step by step, from the description of the successive accomplishments by himself and his colleagues: finding acetylcholine as a normal constituent of the body, its liberation during synaptic transmission through sympathetic ganglia, and its liberation at myoneural junctions. As experimentation spread to a world-wide scale, sober expressions of doubt appeared on the one hand, and over-enthusiastic extrapolations on the other. These he met or modulated by powerful arguments in a succession of lectures, both at home and abroad. Who can say where we now stand in the history of chemical transmission? Certainly the subject has not evolved to a point whereby it can explain all transmission. If I am not misinterpreting a recent statement by Sir Henry, it amounts to a cautious intimation that there may be transmitters as yet unknown. Such an intimation could well be taken seriously.

International Recognition

As, year by year, Sir Henry's contributions became more and more interwoven in the general fabric of his science, international recognition of the originator of these contributions grew in proportion, expressed by the long list of his

honorary memberships in foreign societies with particular designations and national academies and societies of science and learning devoted to broader purposes. Thus he became an outstanding representative of that ideal of science which knows no frontiers, in an age when political disturbances engendered upheavals of a magnitude without previous parallel. When the storm abated it was apparent to all that not even science had emerged unscathed. To return to its proper position in society it must pass through a healing process. By virtue of his position Sir Henry was favourably situated to come forward effectively on behalf of the restoration; and he did.

The particular occasion to which I would refer, though it is not the only one, is that of his Pilgrim Trust Lecture delivered before the National Academy of Sciences at a joint meeting with the American Philosophical Society, held in Philadelphia in 1946. On his chosen topic, "The Freedom of Science," he talked calmly and objectively; but through his reasoned words there could not fail to shine light from

incandescent feeling behind them. It is always unfair to quote out of context even the choicest passages of a discourse of this sort. For those not among the favoured listeners the whole must be read in order to get its import.

It is the right and duty of every scientist boldly to examine nature without restriction of purpose or fear of outcome, and to communicate the findings openly in order that the aggregate can be tempered under the impact of general criticism. No surer way has ever been invented for determining the laws that cannot be transgressed with impunity in the course of human behaviour. If science has been misused, the misuse is without uniqueness among man's activities; and the way to salvation is not imminent through a study of cause and effect for science alone. True it is that the prime instinct of all living things is for survival. Although at times a retreat may be justifiable for the protection of both civilization and science in the long run, to prevent undue curtailment of the freedom of science in the name of survival, relentless vigilance is needed.

PULMONARY OEDEMA*

BY

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Pulmonary congestion and oedema are the most common manifestations of left ventricular failure, and may range in severity from the basal rales of chronic congestive failure to acute pulmonary oedema and attacks of cardiac asthma. More recently an intermediate group of cases with subacute pulmonary oedema has been recognized, caused by uraemia, malignant hypertension, polyarteritis nodosa, and the "rheumatic lung." Although the symptoms, signs, and radiological changes of pulmonary oedema are well recognized, its pathogenesis in heart failure is still uncertain, and until recently there was little information on the circulatory changes in the lungs in man. The occurrence of attacks of pulmonary oedema during the course of cardiac catheterization has enabled these changes to be studied, and the altered distensibility of the congested and oedematous lung has been investigated. These results have thrown new light on the problem of cardiac dyspnoea, and it is my purpose to review this recent work and to attempt to correlate it with the various manifestations of pulmonary oedema.

The subject of pulmonary oedema has been extensively studied by experimental physiologists, who have shown that in animals pulmonary oedema may be produced by increased pressure in the pulmonary capillaries, by increased capillary permeability caused by anoxia, phosgene, and certain other chemicals, notably the thiourea compounds, or by neurogenic vasodilatation of the capillaries with resulting increased permeability, the stimulus arising either from direct excitation of nervous centres, as in head injuries, or reflexly from stimuli arising in the heart or large vessels. The type of pulmonary oedema produced experimentally in a normal animal, however, bears little resemblance to the clinical attack of acute pulmonary oedema which occurs in a patient with a long history of chronic pulmonary congestion, and for this reason caution is necessary in applying the results of these animal experiments to man.

*St. Cyres Lecture, delivered on June 25, 1954, at the Royal Society of Medicine, under the auspices of the National Heart Hospital.

Acute Pulmonary Oedema

I shall use the term "acute pulmonary oedema" to include both cardiac asthma and paroxysmal nocturnal cardiac dyspnoea. These terms merely emphasize particular clinical features of the attacks, but the fundamental mechanism is the same.

Aetiology.—Most cases of acute pulmonary oedema are due to left ventricular failure caused by hypertension, coronary artery disease, or disease of the aortic valve. The group of cases with pulmonary oedema caused by cerebral vascular accidents or fractures of the skull is of particular interest in relation to the pathogenesis of the oedema (Cameron, 1948). In comparison with left ventricular failure, mitral stenosis is an uncommon cause of pulmonary oedema, and the high incidence of this symptom in recently published series of cases of mitral stenosis (Wood, 1954) is due to the recognition of the fact that the most spectacular results of mitral valvotomy are found in this particular group of cases.

Historical.—The clinical features of an attack of acute pulmonary oedema were fully recognized in the early years of the last century, and in 1832 James Hope, who first used the term "cardiac asthma," described the mechanism of the attack, and the circulatory measurements which are reported later are a striking confirmation of at least part of his theory. He wrote that "while the left ventricle was palpitating to disgorge itself, the right, acting in concert with it, deluged the lungs with an inordinate quantity of blood, whence ensued a paroxysm of dyspnoea."

Clinical Features

The clinical manifestations of acute left ventricular failure were fully described by Bedford (1939). Nearly always these attacks occur in patients with a background of chronic pulmonary congestion, as shown by the history of increasing effort dyspnoea and often orthopnoea. A short, dry, frequently repeated cough is usually the earliest symptom and may be associated with a sense

of oppression in the chest. At the height of the attack the most striking feature is intense dyspnoea, often with wheezing, and the increased effort of breathing is shown by the laboured respiration. The chest appears over-distended, and on auscultation a notable feature is the absence of added sounds in the lungs in the very early stages of the attack in spite of the intense dyspnoea.

In short attacks the lung may remain clinically dry throughout or a few rales may appear in the mid-zones or at the bases. In longer-lasting or more severe attacks signs of moisture soon appear and increase until, at the stage when frothy fluid is being coughed up, bubbling rales can be heard all over the chest. In less severe attacks there may be only nocturnal cough and wheezing on lying down, rapidly relieved when the patient sits up. Normal sinus rhythm and pulsus alternans are frequently present. Tachycardia is a constant feature, the rate frequently exceeding 120 a minute. The blood pressure during attacks rises abruptly, particularly in the hypertensive cases, the increase being caused by marked peripheral vasoconstriction as shown by the pallor and coldness of the skin. Cyanosis in the early stages, or in short attacks, is rarely marked, and if present is peripheral in type; during the frothy stage of a severe attack there is increasing cyanosis of central type.

In severe attacks death may occur from asphyxia, or signs of peripheral circulatory failure and shock may appear, cyanosis being replaced by a dusky grey colour of the skin, the blood pressure falls to a low level, and the pulse is rapid and feeble. The breathing now becomes shallow and is no longer laboured, and it is evident that the pulmonary oedema has been decreased by the onset of peripheral circulatory failure.

In mitral stenosis the attacks are sometimes of unusual severity and may fail to respond to the methods of treatment which are usually effective in attacks caused by left ventricular failure, so that an emergency valvotomy may be necessary. More often they are of shorter duration and may be precipitated by emotion, exertion, tachycardia from any cause, or enforced recumbency during cardiac catheterization (Lenègre and Scébat, 1952). During these short attacks dyspnoea is marked and there is often a little frothy blood-tinged sputum.

If acute pulmonary oedema is caused by failure of the left side of the heart there is nearly always a previous history of dyspnoea on effort due to chronic pulmonary congestion, but occasionally it may occur as the first symptom in a previously healthy person as a result of cardiac infarction. The usual pain of infarction may be absent, the patient rapidly becoming dyspnoeic and coughing up large amounts of frothy fluid. These cases should be distinguished from those in which the initial ischaemic pain disappears with the onset of shock and on recovery from shock pass rapidly into acute left ventricular failure with pulmonary oedema. In these patients the blood pressure falls, often abruptly, during the acute phase, and this contrasts with the rise in pressure which is the rule in the attacks due to hypertensive failure. The electrocardiogram will show the typical changes of cardiac infarction, although not infrequently these may not appear until several days after the onset of the attack. An attack of acute breathlessness at night occurring in middle-aged or elderly patients, with no previous dyspnoea and with no history of a recent respiratory infection with bronchospasm, may well be

caused by cardiac infarction, and if the blood pressure falls during the stage of intense dyspnoea this diagnosis is even more probable.

The rare cases of an acquired ventricular septal defect due to rupture of a septal infarct are interesting physiologically, as they illustrate the effect of a combination of a sudden increase in pulmonary blood flow due to the left-to-right shunt and damage to the left ventricular muscle in causing pulmonary oedema. In three cases I have seen in which the diagnosis was made during life, acute pulmonary oedema followed rapidly on the rupture of the septum; in two cases there was little response to treatment, and the patients died 7 to 10 days later. The third lived for a year with orthopnoea, recurrent acute pulmonary oedema, and severe right-sided failure. These cases present a striking contrast to those patients who have an acquired intracardiac shunt due to rupture of a sinus of Valsalva aneurysm into the right heart, with a healthy heart muscle, and in whom the sudden increase in pulmonary flow may not cause oedema of the lung. One such patient lived for over a year and died of a carcinoma of the rectum. A second went successfully through a pregnancy four years after the rupture of her aneurysm, and, even with the increased blood volume of pregnancy and the effect of the placental arteriovenous shunt, developed only minimal signs of basal congestion during the later months of pregnancy.

Rupture of an aortic valve cusp sometimes due to bacterial endocarditis may precipitate acute left ventricular failure, and severe pulmonary oedema may cause the death of the patient.

Physiological Factors

The factors responsible for the formation of oedema fluid in the lungs are fundamentally the same as those concerned in the production of oedema elsewhere in the body, and are (1) hydrostatic pressure relationships, (2) osmotic factors, and (3) the permeability of the capillary wall.

By impaction of the end of a cardiac catheter in a small terminal branch of the pulmonary artery it is possible to obtain pressure readings—"the wedge pressure" or "pulmonary capillary venous pressure"—which reflect with reasonable accuracy the pressure changes in the pulmonary veins and left atrium (Epps and Adler, 1953). The mean left atrial pressure measured in this way is usually 5 to 10 mm. Hg, and the true pulmonary capillary pressure cannot be less than this figure. The intrathoracic pressure variations with respiration will affect pressure in the capillaries and interstitial tissue equally, and so will have little effect on the effective filtration pressure in the capillaries, which in the normal lung is in the region of 5 to 10 mm. Hg.

The osmotic pressure of the plasma proteins in the pulmonary capillaries is the same as that elsewhere in the body—that is, 25 to 30 mm. Hg with the normal plasma protein level of 7 g.%. It is probable, however, that the effective osmotic pressure tending to prevent leakage of fluid through the capillary wall is appreciably lower than this. No information is available on the protein content of interstitial fluid and lung lymph in the normal human, but in normal animals there is considerable leakage of protein, which reaches a concentration of 2.5 to 3 g.% in the lung lymph with an osmotic pressure of about 11 mm. Hg (Warren and Drinker, 1942). If, as seems likely, the same happens in man, the effective osmotic pressure will not be more than 200 mm. Hg.

Studies of lymphatic flow in animals show that significant amounts of protein and fluid escape from the vessels into the interstitial tissue of the lung and are removed by the lymphatics. If the permeability of the capillaries is increased, either by anoxia or by capillary toxæmia, a

considerable increase in the amount of fluid escaping occurs and pulmonary oedema results, the oedema fluid having the same protein content as normal lung lymph (Drinker, 1945). The effect of neurogenic factors on the permeability of the capillary membrane has been the subject of much experimental work. Parts of the pulmonary vascular bed are certainly supplied with functionally active vasomotor fibres, and there is evidence, both clinical and experimental, pointing to some influence of the nervous system in the permeability of the lung capillaries (Daly, 1946), but the importance of this factor in human pulmonary oedema is still conjectural.

In the normal person the relatively low filtration pressure and higher osmotic pressure will reduce the transudation of fluid in the lung to a minimum, and any fluid which may escape is efficiently removed by the lymphatics. If, however, the filtration pressure in the pulmonary capillaries exceeds the effective plasma osmotic pressure, or if the permeability of the capillaries is increased in any way, fluid may pass through the capillary wall into the interstitial tissues of the lung. The barrier separating the plasma in the capillaries from the alveolar spaces in the normal lung is extremely thin, about 0.8 μ , composed of the capillary wall, thin interstitial tissue, alveolar lining membrane, and



FIG. 1.—Thickening of alveolar and capillary lining in mitral stenosis. ($\times 700$.)

mucin layer (Macklin, 1954); so that if the lymphatic channels, which start in this region, are unable to remove the fluid as fast as it is formed, it can readily escape into the air passages, to produce the frothy fluid of pulmonary oedema.

In mitral stenosis or chronic left ventricular failure transudation of fluid from the capillaries may be hindered by thickening of the basement membrane and the barrier layer may be much thicker, often as much as 15 μ (Fig. 1), due to thickening of the alveolar epithelium and structural changes in the interstitial tissue (Parker and Weiss, 1936), so that, even if there is interstitial oedema, fluid may not be able to pass readily into the air passages, and the lungs may be clinically dry. The absence of structural changes in the lung may be one reason why larger amounts of frothy fluid are frequently coughed up in attacks due to cardiac infarction than in those due to chronic left-sided failure, where intense dyspnoea may dominate the clinical picture of cardiac asthma.

Circulatory Changes During Acute Pulmonary Oedema

Until recently no accurate measurements of the circulatory changes in the lungs during attacks of pulmonary oedema have been possible, although the presence of pulmonary hypertension during the attacks has been inferred from the marked pulsation over the ventricle and pulmonary artery and the loud pulmonary

second sound (Bedford, 1939). A number of patients with mitral stenosis have developed acute pulmonary oedema during the course of pre-operative cardiac catheterization, and circulatory measurements have been made during these attacks. They were precipitated by a variety of causes, such as anxiety, prolonged recumbency, or exercise, and were usually short-lasting, but were apparently identical with the spontaneously occurring attacks; with cough, dyspnoea, and expectoration of frothy sputum. From personally observed cases and from reports in the literature (Gorlin *et al.*, 1951; Lenègre and Scébat, 1952; Lenègre *et al.*, 1953) measurements in 23 cases of pulmonary oedema have been collected, and in 6 cases studies before and during the attacks have been made (Fig. 2). Details of a small number of attacks of acute pulmonary oedema occurring in the course of physiological studies on patients with left ventricular failure have also been obtained from the literature.

In attacks due to mitral stenosis (Fig. 2) there is usually a slight to moderate increase in the pulmonary artery pressure before the attacks, and during the attacks the pressure

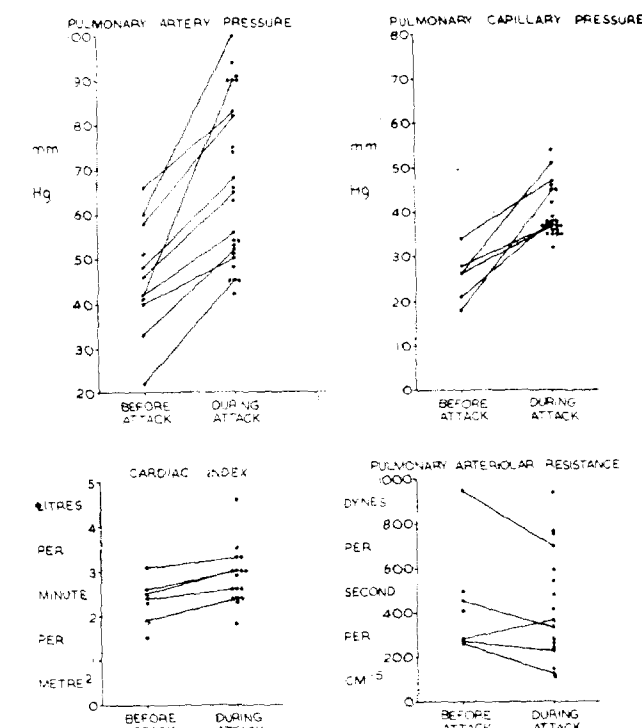


FIG. 2.—Haemodynamic studies in 23 cases of mitral stenosis with acute pulmonary oedema.

rises abruptly. The "pulmonary capillary" pressure before the attack was raised to between 25 and 30 mm. Hg and during the attack rose to a level between 32 and 54 mm. Hg. In 15 of the 23 cases the pressure was between 35 and 38 mm. Hg. The cardiac output before the attack was usually slightly below the average normal of 3 litres per minute per square metre. During the attack a slight rise in output is common, but this figure may be inaccurate because of the obvious difficulties of measuring the factors necessary for its calculation according to the Fick principle during an attack of acute dyspnoea. The pulmonary arteriolar resistance before the attacks shows a slight to moderate increase, and changes in resistance during the attack are variable. No case of acute pulmonary oedema occurred in patients with a very high resistance. The work of the right ventricle was increased in all cases, and its ability to carry out the work without any significant increase in the end-diastolic pressure is in keeping with the clinical observation that marked systemic venous engorgement is unusual during an attack of pulmonary oedema.

Catheter studies on patients during acute pulmonary oedema due to left ventricular failure are infrequent, but in all recorded cases the pattern is the same—that is, an abrupt rise in pulmonary artery and “pulmonary capillary” pressure, the latter in all cases exceeding 30 mm. Hg, and a slight rise or no change in cardiac output. The pulmonary artery/pulmonary capillary pressure gradient is usually unchanged during an attack. The arterial oxygen saturation before the attack was usually reduced—with figures between 84 and 96% saturation. In these short attacks a slight fall in arterial oxygen saturation sometimes occurred, as was to be expected, but it was surprising to find a number of patients with an initially somewhat low saturation who actually increased their arterial oxygen saturation during an attack which caused intense dyspnoea. In severe attacks there is profound arterial anoxia, with levels sometimes as low as 45% saturation.

Mechanism of the Attack

The level of the “pulmonary capillary” pressure in all recorded attacks of pulmonary oedema due to left ventricular failure or mitral stenosis has exceeded the plasma osmotic pressure, often by a considerable margin, and this would seem to be a clear demonstration of the mechanism of the attack. In the cases presented here this margin has been an appreciable one, as the effective plasma osmotic pressure is probably not more than 20 mm. Hg and the “pulmonary capillary” pressure has usually been over 35 mm. Hg. This may not, however, be the sole mechanism, as will be seen if the effects of exercise in patients with mitral stenosis or left ventricular failure are studied. In a group of patients with mitral stenosis, whose disability varied from Grade 1 to Grade 4, and many of whom gave a history of attacks of nocturnal dyspnoea, exercise for three to five minutes in the recumbent position produced changes in cardiac output, pulmonary artery pressure, and pulmonary capillary pressure which are exactly comparable to those recorded during acute pulmonary oedema, and yet in no patient did such an attack occur (Fig. 3). In patients with left ventricular failure, effort produces exactly the same change (Lewis *et al.*, 1953). Many patients tolerated this mild exercise well, and, in spite of a considerable elevation of “pulmonary capillary” pressure, in several cases to over 50 mm. Hg, no acute oedema developed.

There are several possible explanations for this discrepancy. One is that the thickening of the pulmonary capillary wall or alveolar lining described earlier hinders the escape of fluid from the capillaries into the air passages, and that this enables some patients to withstand the high pressures without clinical oedema developing (Araujo and Lukas, 1952). Another is that in acute pulmonary oedema the speed of transudation of fluid from the capillaries is suddenly increased, and in the absence of a significant increase in the rate of blood flow through the lungs this must be due

to an increase in capillary permeability. The lung capillaries usually allow some protein to escape, and in acute pulmonary oedema the protein content of the frothy sputum, the lung oedema fluid, and fluid from a hydrothorax, if this is present, contains from 2.5 to 3.5 g. of protein%. The idea that increased capillary permeability is responsible for acute pulmonary oedema has long been favoured by experimental physiologists, but the only factor, excluding drugs and poisons, which is known for certain to produce this effect is anoxia, and in the early stages of the attacks there is no evidence of anoxia. It is in the later stages of the attack that anoxia becomes important, and then it may well augment or perpetuate the clinical attack.

The idea of neurogenic factors altering capillary permeability is still a theoretical one, and many of the experiments which purported to demonstrate such an effect, such as injecting substances into the floor of the fourth ventricle (Cameron and De, 1949), have subsequently been shown to cause an increase of left atrial pressure to a level of over 30 mm. Hg (Sarnoff and Sarnoff, 1952). Clinically, the view that increased capillary permeability causes acute pulmonary oedema has always had many supporters, and this factor is often invoked to account for the occurrence of attacks in sleep or as a result of excitement, emotion, or anxiety. So far as the last factor is concerned, it is common to find that if during cardiac catheterization the patient is apprehensive the pulmonary capillary and pulmonary artery pressures rise, and with reassurance or sedation will fall to much lower levels. The action of morphine or the barbiturates in stopping attacks is commonly explained on the basis that they damp down pulmonary vasomotor reflexes, but the true explanation of the action of morphine may equally well be that it lowers capillary pressure by decreasing anxiety, decreasing the muscular movements which are increasing the venous return to the heart, and decreasing metabolism, which will lower the oxygen needs of the tissues and hence lower the cardiac output.

Factors Responsible in Mitral Stenosis

The factors responsible for this high pulmonary capillary pressure in mitral stenosis have been discussed by Gorlin *et al.* (1951), who showed that in the presence of severe stenosis a high left atrial pressure is necessary to produce a rate of flow through the narrowed valve sufficient to fill the ventricle in diastole and to maintain the cardiac output. In acute pulmonary oedema when the cardiac output is almost unchanged, tachycardia is a constant feature during the attack, and Gorlin *et al.* have shown that even a slight increase in heart rate of 10 to 15 a minute will shorten the diastolic filling period of the left ventricle and render necessary a higher pressure gradient across the mitral valve. Momentary disproportion between the output of the right

and left ventricle is a factor which may elevate the pulmonary capillary pressure, but with present techniques this cannot be detected. These changes in pulmonary capillary pressure are brought about by only a slight increase in pulmonary blood volume, owing to the relatively inelastic pulmonary venous and left atrial compartments (Ball *et al.*, 1952). These patients usually have only slight to moderate enlargement of the left atrium, and in patients with massive left atrial enlargement, commonly due to mitral incompetence, large volume changes are possible with relatively little change in pressure and attacks of acute pulmonary oedema are uncommon.

In attacks due to left ventricular failure the high left atrial

pressures are probably associated with a high left ventricular filling pressure, which is necessary to maintain the output of the failing left ventricle. The contrast between the performances of the right and left ventricles in pulmonary oedema is striking, the right ventricle carrying out increased work with a normal filling pressure and the left doing so only because of considerable increase of filling pressure.

It has recently been suggested (Burch and Romney, 1954) that active constriction of the pulmonary veins may be partly responsible for the rise in pulmonary capillary pressure—the so-called “pulmonary venous throttle mechanism.” In mitral stenosis the pulmonary veins at necropsy are often small and contracted (Holling, 1951), and in life have been shown by tomography often to be smaller than usual (de Bettencourt *et al.*, 1953). There is certainly a plentiful supply of nerve fibres to the pulmonary veins, but there is no proof that pulmonary venous constriction does in fact occur.

The conclusion to be drawn from this haemodynamic study is that acute pulmonary oedema in patients with cardiovascular disease does not occur unless the left atrial and pulmonary capillary pressures exceed by a considerable margin the effective plasma osmotic pressure. The additional factor of increased pulmonary capillary permeability may in some cases be responsible for the sudden outpouring of fluid, which eventually escapes into the air passages. The probable sequence of events is that there is initially acute interstitial oedema of the lung, but that the fluid is removed by the lymphatics and none escapes into the alveoli. This corresponds with the attacks of paroxysmal dyspnoea, during which the absence of moist sounds in the lungs is a striking feature. If transudation persists the lymphatics become unable to deal with the fluid, which then escapes through the barrier layer of alveolar epithelium and mucin to enter the air passage, and a frank attack of acute oedema with frothy sputum results.

The cause of the actual attack of acute pulmonary oedema can in most instances be explained by these haemodynamic changes, which increase pulmonary capillary pressure. Tachycardia, whether caused by emotion, anxiety, exertion, or infection, is responsible for many of the attacks, particularly in mitral stenosis. Attacks occurring during sleep are sometimes caused by the orthopnoeic patient slipping down in the bed and increasing the pulmonary congestion and oedema. Another explanation which has some evidence to support it is that sudden movement while asleep following a period of muscular relaxation may cause a considerable increase in the venous return to the heart. Continuous recordings of heart rates show that even in the healthy individual a transitory increase in the heart rate of 30 to 40 beats a minute may occur during sleep, and if this occurs in a patient with heart failure it may precipitate an attack (Christie, 1938).

Treatment

The recognition of the fact that acute pulmonary oedema does not occur unless there is a considerable increase in pulmonary capillary pressure places on a rational basis most of the methods of treatment which are effective in this condition, as anything which decreases the venous return or lowers the capillary pressure is likely by itself to stop an attack if given before the stage when there is severe anoxia which has increased capillary permeability. Venesection, limb tourniquets, or drugs such as theophylline with ethylenediamine act in this way, the latter also relieving bronchospasm. The ganglion-blocking drugs, such as hexamethonium, which produce peripheral vasodilatation and a fall in systemic pressure, are often remarkably effective in stopping attacks of acute pulmonary oedema, the dyspnoea being relieved soon after the blood pressure has been lowered by slow and cautious intravenous injection of the drug. The method of action of morphine has already been described.

Digitalis would seem to have an obvious place in the treatment of acute pulmonary oedema, as it increases the

efficiency and improves the emptying of the failing left ventricle. If given intravenously, for speed of action, it may sometimes have a marked pressor effect; and Bayliss *et al.* (1950) have described three cases of acute left ventricular failure which were caused in this way by digoxin. For this reason it is best given orally, and some additional more rapidly acting drug is necessary during the acute stage of the attack. General anaesthesia in patients with pulmonary oedema, prior to either mitral valvotomy or emergency surgery, often produces a remarkable improvement in the patient's condition and signs of oedema decrease and may disappear. The combination of a good airway, high oxygen content of inhaled air, and muscular relaxation with low venous return is probably responsible for this improvement. The frothy character of the oedema fluid due to its high protein and mucin content has led to the use of anti-foaming agents, given by inhalation, in the treatment of acute pulmonary oedema, and good results have been reported (Goldmann and Luisada, 1952).

Direct evidence of the value of lowering the pulmonary capillary pressure is given by the effect of a successful mitral valvotomy in relieving attacks of acute pulmonary oedema. The left atrial pressure is lowered, often to normal figures, immediately after valvotomy (Munnell and Lam, 1951), and the effect of this can be observed at the time of operation, when the congested and oedematous lung becomes dry and the dilated subpleural lymphatics shrink.

Any procedure which reduces chronic pulmonary congestion will diminish the danger of acute pulmonary oedema. Treatment between attacks with digitalis, salt restriction, and the regular use of the mercurial diuretics, with a sedative at night, will often lessen the frequency of attacks, and may stop them altogether.

Subacute Pulmonary Oedema

An unusual type of pulmonary oedema which is subacute in its clinical course is seen in several diseases, all of which are associated with left ventricular strain. It occurs in uraemia, acute nephritis, polyarteritis nodosa, malignant hypertension, and as the “rheumatic” lung in acute rheumatism. The pathological, clinical, and radiological changes are identical in all these diseases with the exception of some cases of polyarteritis. The lungs are solid and rubbery in consistency, particularly in the perihilar region. Histologically there are an early interstitial oedema and an intra-alveolar fibrinous exudate, later infiltration of the exudate with mononuclear cells and fibroblasts, and dilatation of the alveolar ducts, which are lined by a hyaline membrane (Hadfield, 1938; Doniach, 1947).

The fundamental difference between subacute and acute pulmonary oedema is that in the former the exudate clots and is then organized. Clinically there is intense dyspnoea, although the lungs may show no abnormality on clinical examination, and the scarcity of added sounds in the chest is in striking contrast to the extent of the lesion seen radiologically. Episodes of acute pulmonary oedema may be superimposed, often as a terminal event. The scarcity of added sounds in the lungs in this group is explained by the organization of alveolar exudate which has a high fibrin content. Occasionally in polyarteritis nodosa there may be extensive radiological and pathological changes in the lungs, although the patient has no signs or symptoms referable to the chest. In one such case the organizing exudate was almost entirely confined to the interstitial tissue of the lung. The histological and clinical picture of subacute pulmonary oedema suggests that it is due to a combination of altered capillary permeability and left ventricular failure.

Radiology

The radiological features of acute pulmonary oedema have been reviewed by Jackson (1951). The typical appearance consists of dense cloudy opacities spreading outwards from the hilar into the central parts of the lung, obscuring

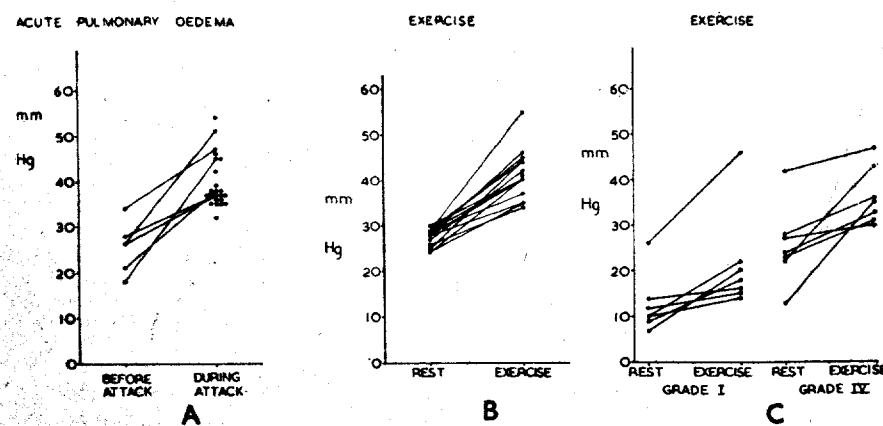


FIG. 3.—“Pulmonary capillary” pressures in acute pulmonary oedema (A) and at rest and on exercise in mitral stenosis (B), and in left ventricular failure (C). (C drawn from data taken from Lewis *et al.*, 1953.)

the lung markings, and leaving the peripheral parts of the lung clear. If the lungs of patients dying with pulmonary oedema are x-rayed after removal from the body the opacities are seen to be much more extensive, clouding those parts of the lung which appear translucent in the ordinary film. The rapidity with which these changes disappear, often in less than 24 hours, and the distressed state of the patient account for the difficulty in getting adequate films in acute pulmonary oedema. In subacute pulmonary oedema the opacities are rounded and more definite, corresponding to the rubbery areas which are found at necropsy, and in addition the changes of ordinary acute pulmonary oedema may be superimposed.

Relationship between Pulmonary Oedema and Dyspnoea

Dyspnoea is the chief symptom of left heart failure and is seen in its most extreme form in acute pulmonary oedema, where the intense effort of breathing is obvious. The intensity of respiratory effort or the force exerted on the lungs can be measured in patients made dyspnoeic by exercise by recording changes in intrathoracic pressure, using an oesophageal catheter; and in heart failure this force may be almost as great as in the normal person, although the resultant volume of pulmonary ventilation is much less owing to the increased rigidity of the lung (Marshall *et al.*, 1954). The cause for the increased rigidity at rest is probably the structural changes in the lung previously described, and the further increase in effort is usually ascribed to passive congestion of the lung, although from animal experiments (Hayward and Knott, 1954) it seems probable that pulmonary oedema is a more potent factor than pulmonary congestion in increasing the rigidity of the lung.

The amount of blood in the pulmonary capillaries at any one time is only about 50 to 60 ml. in the normal subject (Roughton, 1945) and the amount of extra blood in them during passive congestion may be small. Kopelman and Lee (1951) measured the intrathoracic blood volume in patients with mitral stenosis and left ventricular failure and showed that, whilst in mitral stenosis it is normal and in left ventricular failure increased, no significant change takes place when recovery from failure occurs. Studies on the effects of exercise (Fig. 3) on patients with heart failure show that even with mild exercise the pulmonary capillary pressure may exceed the effective plasma osmotic pressure, so that interstitial oedema may well be occurring in this early stage in development of failure, but the lymphatics may be able to remove it before it enters the air passages. This is supported by the well-recognized clinical fact that the dyspnoea of early hypertensive heart failure can occur without signs of moisture in the lungs, although the chest x-ray film shows an increase in hilar markings, and the mercurial diuretics will cause a diuresis and improve the dyspnoea. The concept that lung oedema is responsible for the altered distensibility of the lungs and cardiac dyspnoea is supported by measurements of lung rigidity before and after mitral valvotomy.

Hayward and Knott (1955) showed that after a successful mitral valvotomy the distensibility of the lung is improved, and that on exercise the lung behaves as does the normal lung, no increase in rigidity occurring. The improvement can be attributed to the fall in left atrial and pulmonary capillary pressure, and these measurements provide one explanation for the marked improvement in dyspnoea which often occurs in spite of no significant change in cardiac output or pulmonary artery pressure or in the result of lung-function studies. Pre- and post-operative chest x-ray films in successful cases often show no appreciable difference, and this again suggests that changes in the pulmonary capillaries which are invisible in the chest film are responsible for the improvements in effort tolerance.

In acute pulmonary oedema the rigidity of the lung may be enormously increased and the intense respiratory effort may produce only a small amount of lung ventilation. Thus

in one patient the intrathoracic pressure swing was 30 cm. H₂O for each breath, with a pulmonary ventilation of only 18 litres a minute, in comparison with the usual figure in normal individuals of 5 cm. H₂O pressure swing at rest, increasing to 40 to 50 cm. H₂O on effort causing dyspnoea with a pulmonary ventilation of 90 to 115 litres a minute. An additional factor decreasing lung distensibility in pulmonary oedema may be surface tension changes in the lung due to the presence of the sticky mucinous fluid in the air passages and the congested alveoli. Bronchospasm, which is often a striking clinical feature of acute pulmonary oedema, is an important contributory cause of the dyspnoea by increasing respiratory resistance. The bronchial veins drain either directly into the left atrium or into a main pulmonary vein, and swelling of their small tributaries lying in the submucosa of the bronchioles, caused by a high left atrial pressure, may contribute to the bronchial narrowing (Marchand *et al.*, 1950).

Summary

Studies on the formation and removal of oedema fluid in the lung show that in cardiovascular disease pulmonary oedema does not occur unless the left atrial and pulmonary capillary pressures exceed the effective plasma osmotic pressure by a considerable margin.

Exercise in patients with mitral stenosis or left ventricular failure produces circulatory changes identical with those found during attacks of acute pulmonary oedema. The fact that acute pulmonary oedema does not necessarily occur in spite of a high pulmonary capillary pressure suggests either that the fluid is hindered in its escape into the interstitial tissue of the lung and air passages by the structural changes in the capillary wall and alveolar epithelium, or that it is rapidly removed by the extensive pulmonary lymphatic system.

In acute attacks of pulmonary oedema, in addition to the high pulmonary capillary pressure some unknown factor, possibly neurogenic, may suddenly increase the capillary permeability. All those procedures which are effective in the treatment of the acute clinical attack lower the pulmonary capillary pressure, which is invariably raised during it.

Subacute pulmonary oedema due to uraemia, malignant hypertension, polyarteritis nodosa, and the "rheumatic lung" is characterized by clotting and organization of the interstitial and alveolar exudate, and is probably caused by a combination of left ventricular failure and altered capillary permeability.

The increased rigidity of the lung which occurs on exercise in patients with heart failure and is responsible for the increased respiratory effort when the patient is dyspnoeic, and the low minute volume of ventilation, may be caused more by interstitial oedema of the lung than by pulmonary capillary congestion.

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TREATMENT OF INTRACTABLE PAIN WITH LARGE DOSES OF MORPHINE AND DIAMINO-PHENYLTHIAZOLE

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Morphine given as its salts has the world-wide reputation of being the most effective agent for the relief of pain and associated mental anguish. Its use in large doses for the relief of severe pain, of either medical or surgical origin, has been hindered by the risk of producing severe respiratory depression.

To date, the only substances known clinically to be active in combating this respiratory depressant effect have been N-allylnormorphine ("lethidrone," "nalorphine," "nalline") and, more recently, levallorphan (Eckenhoff and Funderberg, 1954). Lasagna and Beecher (1954) have studied the analgesic potentialities of mixtures of morphine and nalorphine, but, to date, no satisfactory clinical combination of these two drugs has been found that, in adequate therapeutic doses, does not produce some toxic effect.

In this paper we wish to discuss the clinical use, in 35 cases, of a morphine antagonist—namely, 2:4-diamino-5-phenylthiazole hydrobromide (D.A.P.T.) (Davies *et al.*, 1950)—which, while having in therapeutic doses little effect on the analgesic properties of morphine, reveals marked and lasting antagonism to its respiratory depressant effect and thus renders the clinical use of large doses of morphine a safe procedure.

The use of D.A.P.T. as a morphine antagonist in animals has been previously reported (Shaw and Bentley, 1949, 1952; Shaw and Shulman, 1955), and D.A.P.T. has also been used as a synergist with $\beta\beta$ -methylene-glutarimide (NP13, "megimide") in the treatment of barbiturate intoxication (Shulman *et al.*, 1955).

Pharmacology of D.A.P.T.

From the above animal experiments and from the clinical results obtained it would appear that the following are the facts of pharmacological importance regarding D.A.P.T.

1. It is a specific antagonist of morphine (Shaw and Bentley, 1955). It has been found to be specially effective in relieving the respiratory depression caused by excessive

doses of morphine, heroin, "omnupon," and the synthetic analgesics, pethidine, and methadone hydrochloride. The depth of respiration is increased rather than the rate. It appears sometimes to antagonize the vomiting and, usually, the constipation associated with morphine.

2. It appears to be a non-specific respiratory stimulant, especially by the parenteral route. Its use in barbiturate poisoning has been discussed already (Shulman *et al.*, 1955).

3. Prolonged administration of large doses of morphine—1½–2 gr. (80–130 mg.) thrice daily—in the presence of D.A.P.T. demonstrated that these doses did not lose their analgesic effect—or, at the most, the morphine dosage had to be increased by 30%. We feel it would be unwise on this evidence to claim that D.A.P.T. prevents the onset of tolerance, but in our series (30 cases continuing, some up to five months) there were no signs of development of tolerance or addiction. In two cases the injection of large—2-gr. (130-mg.)—doses of morphine thrice daily enabled us to reduce the total daily requirement when this had been given in small—½-gr. (32-mg.)—amounts at frequent intervals.

4. Whereas therapeutic doses will antagonize the respiratory depressant effect of morphine, an increase in the dosage will also antagonize its soporific action. A still higher dosage may leave the patient awake and mentally restless. This may be associated with transient muscular twitches, prolonged and forced expirations, and occasionally vomiting. Mental disorientation has been produced occasionally in the aged.

5. It seems to have a high therapeutic index (about 10) when used in animals or clinically, either as a morphine antagonist or as a synergist to $\beta\beta$ -methylene-glutarimide in the treatment of barbiturate intoxication. In the latter case doses of more than 0.5 g. have been given over a two-hour period with the production of neither acute nor delayed toxic symptoms.

6. It has no analgesic properties of its own when given by either the oral or the parenteral route.

7. Small doses have little effect on the blood pressure, but with a large intravenous dose (75 mg.) there may be a rise in blood pressure.

8. It is a stable white crystalline powder readily soluble in water (4%) at room temperature. Physiological solutions slowly hydrolyse, but refrigerated solutions have been shown to retain their activity for periods up to one week.

Some preparations of D.A.P.T. contain a toxic impurity, and it has been our practice to check all samples for toxicity by means of a "rat test"—that is, the LD₅₀ of a standard pure sample is compared with that of the new preparation.

Treatment of Severe Pain

Principle.—Before the new treatment can be successfully applied it is essential to discard an ancient concept—namely, that morphine is a dangerous drug. Up till now the use of morphine has been attended by the immediate risk of respiratory depression and the long-term inconvenience of tolerance. Both these dangers are now banished by the use of the thiazole derivative. Accordingly it is recommended that the present practice of the administration of small dosages of morphine at frequent intervals be abandoned. One should aim at large—1–2-gr. (65–130-mg.)—doses of morphine, which are sufficient to produce an analgesia of six to eight hours' duration and which nevertheless still keep the patient alert. These doses should be given at the initiation of the treatment. The great psychological advantage of never having the patient suffer severe pain cannot be too strongly stressed. The principle of the treatment therefore consists in giving gradually increasing amounts—½-gr. (16-mg.) increments—of morphine accompanied by D.A.P.T. (15 mg.) over a period of one (or two) days until the desired degree of analgesia is obtained.

Detail.—The patient will probably be receiving ½–1 gr. (16–22 mg.) of morphine. In the following, "treatment" means the injection of both morphine and D.A.P.T. and

the subsequent observations of respiration, etc. Inject $\frac{1}{2}$ gr. (32 mg.) of morphine, and 15 mg. of D.A.P.T. 30 minutes later—that is, when the maximum effect of morphine is being exerted—both injections being intramuscular. Observe respirations (and sedation) every 15 minutes for two hours. If the pain returns before the termination of six hours and the respirations have not fallen below 6–8 a minute, repeat the "treatment" with $\frac{1}{2}$ gr. (50 g.) of morphine and 15 mg. of D.A.P.T. (observe respirations as before). If the degree of respiratory depression should cause concern a dose of 10 mg. of D.A.P.T. may be repeated at 10-minute intervals (see Note 3). If the pain returns before the expiration of six hours, and the respirations have not fallen below 6–8 a minute, repeat the "treatment" with 1 gr. (65 mg.) of morphine and 15 mg. of D.A.P.T. (observe respiration as before).

At this stage pain of mild-to-moderate intensity should be receiving up to eight hours' relief per "treatment" without any undue sedation. The patient is now said to be stabilized.

In cases of very severe pain it may be necessary to give doses of morphine of up to 2 gr. (130 mg.) three or four times a day, in the following manner.

Inject $\frac{1}{2}$ gr. (90 mg.) of morphine and 15 mg. of D.A.P.T. (intramuscularly) and observe respiration, etc., as before. Repeat this "treatment" when pain returns or at the end of six hours. If the analgesia is still inadequate and the respirations have not fallen below 6–8 a minute give two "treatments" of $\frac{1}{2}$ gr. (100 mg.) of morphine and 15 mg. of D.A.P.T. If adequate analgesia is not obtained inject 2 gr. (130 mg.) of morphine and 15 mg. of D.A.P.T. When the patient has been stabilized, usually on the second day of treatment, the intramuscular injection of D.A.P.T. is replaced by the oral administration. A dose of 20 mg. (one tablet) of D.A.P.T. is given at the same time as the morphine injection. If the patient is unduly sedated during the day, the oral dose of D.A.P.T. may be increased up to 30 or 40 mg., and reduced to 20 mg. at night.

Notes

1. The plan of the procedure is simple. The patient is given graded doses of morphine (with D.A.P.T.) until respiratory depression (or sedation) is evident or an analgesia of from six to eight hours is obtained.

2. D.A.P.T. is an extremely safe drug. The dose is 15 mg. intramuscularly; as much as 100 mg. has been given without ill effect, but careful administration is advised as these high doses are approached.

3. Slow and irregular breathing is not a sign of respiratory danger, provided that the respirations are deep and cyanosis is not present. Under these conditions a rate as slow as 6 a minute is not dangerous. If at any time the respiration of the patient should cause concern—that is, if the rate should fall below 6–8 or the breathing be shallow, with cyanosis—further intramuscular injections of 10 mg. of D.A.P.T. may be made at 10-minute intervals until 60 mg. of D.A.P.T. has been given. It must be stressed that

D.A.P.T. will increase the depth rather than the rate of respiration. For more rapid action the D.A.P.T. may be injected intravenously.

4. It has been found easier to prevent the onset of pain than to alleviate it once it has occurred. Accordingly it is better to give four treatments a day rather than three if pain tends to recur at about seven hours.

5. Care should always be exercised in the treatment of the aged.

6. At night it is desirable to give a barbiturate cover or an injection of hyoscine—1/150–1/100 gr. (0.43–0.65 mg.).

7. If the patient has not received sufficient relief from a large injection (over 1 gr.—65 mg.) of morphine it is safe to repeat the injection (with D.A.P.T.) at any time after two hours.

8. If the patient's condition worsens as death approaches and the period of analgesia shortens, the dose of morphine may be increased by $\frac{1}{2}$ gr. (16-mg.) increments. The need to increase the D.A.P.T. is unusual, but it may be increased by 5–10 mg. in the presence of respiratory depression or undue sedation.

9. D.A.P.T. given in therapeutic doses to a morphinized patient causes practically no side-effects. Slight irregular flickers of the fingers, shoulder, and neck were occasionally observed, but these could not be differentiated from identical movements seen in the drowsy and deeply morphinized patient to whom no D.A.P.T. had been given.

In some of our early cases morphine and thiazole were given cautiously by continuous intravenous therapy. Such procedure has not been necessary in our later cases.

The Concomitant Use of Other Drugs

There are no pharmacological contraindications to the use of the following drugs with D.A.P.T.

1. Hyoscine.—This drug in larger doses (1/100 gr. (0.65 mg.) intramuscularly) increases the drowsiness and may extend the period of analgesia. It should be used only at night or in cases of very severe pain.

2. Atropine has a similar action to that of hyoscine, but less marked.

3. Barbiturate.—This drug may be used where it is felt to be of benefit, especially at night if sleep does not come easily.

4. Chlorpromazine ("Largactil").—This drug has been used in about 10 of our cases. Vomiting is usually lessened and the period of analgesia increased, but the patient is much drowsier.

5. "Marzine".—This new anti-emetic has been used in six cases of hyperemesis. The vomiting is usually prevented until the terminal stages are reached, when it appears to lose its efficacy.

A brief synopsis of two of the 35 cases investigated appears below. Further summaries are given in Table I. A list of the dosages required for complete relief is given in Table II. In all but four cases these dosages remained unaltered until death supervened. In the four cases mentioned—dose 1– $\frac{1}{2}$ gr. (65–80 mg.)—the dose had to be increased to 2 gr. (130 mg.) during the final two days.

TABLE I

Age and Sex (Years)	Condition	Before Treatment		Treatment		After Treatment Duration of Analgesia (Hours)	Duration of Treatment (Weeks)	Comments
		Dose of Morphine gr. mg.	Duration of Analgesia (Hours)	Morphine (gr.)	D.A.P.T. (mg.)			
F 35	Ca. breast, oedema arm	$\frac{1}{2}$ 22	2–3	2 I.M. q.d.	20–40 P.O.	6	18	Excellent relief of pain. No side-effects with large dose morphine over 4 months' period
F 42	Ca. cervix	$\frac{1}{2}$ 22	2–4	1 I.M.	8 I.M.	8–12	2	Slight mental disorientation due to secondary in brain or to morphine (?)
F 69	Melanoma of toe	$\frac{1}{2}$ 16	2	1 I.M. b.d.	8 I.M.	8–12	2	
F 65	Ca. breast, oedema left arm	$\frac{1}{2}$ 16	2	$\frac{1}{2}$ I.M. q.d.	20 P.O.	6–7	4	
F 55	Ca. breast	$\frac{1}{2}$ 22	1 $\frac{1}{2}$	1 I.M. t.i.d.	20 I.M.	8	1	Complete relief from severe pain. No side-effects
F 55	" femur	$\frac{1}{2}$ 32	2	1 I.M. t.i.d. 2 I.M. (terminal two days)	20 P.O.	8	12	
F 85	Gangrene left foot	$\frac{1}{2}$ 11	2–4	1 I.V.	6 I.V.	10–12	2	8 mg. D.A.P.T. gave signs of mental disorientation in old patient
F 52	Ca. colon	$\frac{1}{2}$ 32	2	1 I.M.	4 I.M.	6–10	2	
				2 I.M. q.d.	20–40 P.O.	6–7	10	No mental disorientation. Hospitalized at commencement. One month later returned home
F 78	" breast	$\frac{1}{2}$ 16	1	$\frac{1}{2}$ I.M. t.i.d.	20 P.O.	8	13	
F 55	" femur	$\frac{1}{2}$ 16	2	1 I.M. t.i.d.	40 P.O. (day); 20 P.O. (night)	8	12	

TABLE II

Dose of Morphine to Give 8 Hours Analgesia	No. of Patients Receiving Relief
$\frac{1}{2}$ gr. (32 mg.)	2
$\frac{1}{2}$ gr. (48 mg.)	3
1 gr. (65 mg.)	8
$1\frac{1}{2}$ gr. (77 mg.)	10
$1\frac{1}{2}$ gr. (110 mg.)	6
2 gr. (130 mg.)	5
2 $\frac{1}{2}$ gr. (160 mg.)	1
	35

Case 1.—A woman aged 52 had cancer of the lower jaw with extensive metastases and was greatly emaciated. When seen she was receiving 8 gr. (0.52 g.) of morphine a day, in divided doses, with less than two hours' relief from pain. Vomiting and constipation were troublesome. The patient was stabilized with $\frac{1}{2}$ gr. (110 mg.) of morphine and 15 mg. of D.A.P.T. intramuscularly. During the next two days she was free of pain for six hours at a time and the vomiting and constipation were relieved. The dosage of morphine was then increased to 2 gr. (130 mg.) and 20 mg. of thiazole was given orally. Pain was relieved for eight hours, and she did not feel drowsy. The treatment continued for five weeks until the patient died. There were no untoward symptoms other than a transitory mild mental disorientation. This disorientation has been observed in other cases: it is mild and transitory, and appears to be due to the large doses of morphine rather than the D.A.P.T., as it has been observed only in the older patients.

Case 2.—A woman aged 38 with cancer of the breast, marked oedema of the left arm, and intolerable pain received no more than two hours' relief from $\frac{1}{2}$ gr. (16 mg.) of morphine. Treatment was begun, and the patient stabilized, on $\frac{1}{2}$ gr. (110 mg.) of morphine and 15 mg. of D.A.P.T. intramuscularly three times a day. There was complete absence of pain with a decrease in the incidence of vomiting, and the constipation was rectified. On the fourth day oral administration of D.A.P.T. (20 mg.) was substituted for intramuscular injection. Later the dose of D.A.P.T. given during the day was increased to 40 mg. at each "treatment" to combat slight sedation (the nightly dose remained at 20 mg.). Two months later the dose of morphine had to be increased to 2 gr. (130 mg.) three times a day; it is impossible to say whether this was due to development of tolerance or the increasing severity of the pain. There were no untoward side-reactions. The patient died after 18 weeks' treatment.

At the beginning of treatment this patient was very depressed. About one week after initiation her mood changed to one of cheerfulness and remained so until within one week of death. In about one-quarter of our cases we have noticed this favourable change in outlook. It does not appear to be a euphoria due to the morphine, but rather owes its origin to the D.A.P.T. This aspect is still under investigation.

Discussion

The adequate relief of prolonged and severe pain still remains one of the unsolved problems of medicine. To date, morphine and its analogues have been the drugs used, and these have been only partially effective in producing relief from severe pain. This is due to the fact that it has not been possible to administer sufficiently large doses to produce complete analgesia without evoking dangerous and undesirable side-effects such as respiratory depression, tolerance, vomiting, and constipation; especially in old and cachectic patients with poor hepatic and renal function.

The method here described, incorporating the use of 2:4-diamino-5-phenylthiazole hydrobromide (D.A.P.T.), permits the use of large doses of morphine, adequate to effect satisfactory analgesia, without the associated production of these dangerous and undesirable side-effects.

Special mention must be made of the apparent ability of D.A.P.T. to prevent or delay the onset of tolerance. This clinical observation, if substantiated by further work in progress, would make the action of D.A.P.T. unique in this regard.

As it is rare to have the opportunity of safely administering doses of morphine of the order of 1–2 gr. (65–130 g.) in a single injection, the following few points of physiological interest arising therefrom are worthy of mention.

The slow intravenous administration (20 minutes) of 1 gr. (65 mg.) of morphine sulphate with 1/150 gr. (0.43 mg.) of hyoscine hydrobromide exerts its maximum clinical effect

within 20 minutes. Given intramuscularly, the full effect is not exerted for 40 minutes. These observations are also borne out in dogs under electroencephalographic control.

The slow intravenous or intramuscular administration of 1 gr. (65 mg.) of morphine sulphate and 1/150 gr. (0.43 mg.) of hyoscine hydrobromide usually has little depressant effect on the blood pressure or pulse rate. An occasional fall in the systolic pressure of 5–15 mm. Hg. associated with a transient pallor of the skin and a subjective feeling of cold, is sometimes observed, but this is quickly followed by a warm, flushed, and slightly sweaty skin with a return to normal blood pressure and an accompanying subjective feeling of warmth.

It would be natural to compare the action of D.A.P.T. with that of N-allylnormorphine (nalline). A full clinical comparison will be given in a later paper (Shulman, in preparation).

Nalline by itself has certain opiate properties and is not free from undesirable side-reactions when given in therapeutic doses (Payne, 1954; and several others). D.A.P.T. in doses at least five times the therapeutic is almost without side-reactions of any kind.

Nalline produces withdrawal symptoms in patients who have received only a few doses of morphine. This we have never observed with D.A.P.T. in therapeutic cases. Indeed, if it were so, our method of treatment of intolerable pain would not be possible, as all our patients had been receiving morphine before the beginning of treatment.

Nalline itself may cause vomiting, and does not appear to antagonize that due to morphine.

Nalline would appear to antagonize the analgesic action of morphine. This is certainly not the case with D.A.P.T. in therapeutic doses. Lasagna and Beecher (1954) have tried unsuccessfully to evolve a combination of nalline and morphine in post-operative patients and healthy volunteers which would give the desired therapeutic effect of analgesia without the concomitant production of the associated unpleasant side-reactions of morphine, and have discussed the difficulties involved in obtaining such a clinically useful mixture.

In addition to the extensive series of cases given above, D.A.P.T. has been used in a few cases of neonatal asphyxia, in methadone hydrochloride poisoning, and for the relief of post-operative pain. In the last-mentioned example the ability of the patient to cough painlessly was important. It should now be possible to use larger doses of morphine pre-operatively in conjunction with D.A.P.T., perhaps by intravenous administration. Finally, the removal of the risk of respiratory depression due to morphine should lead to an extension of this drug's use in the fields where it is already of value—namely, "shock," coronary occlusion, obstetrics, etc.—and may open up new fields in anaesthesia.

We wish to express our thanks to the superintendent and staffs of the Alfred, Austin, Royal Melbourne, and Women's Hospitals, and the Peter MacCallum Institute, Melbourne, for their kind co-operation in this investigation. We are indebted to Professor W. Davies, of the Chemistry Department of the University of Melbourne; Mr. E. T. Rosenblum, of Felton Grimwade and Duerdins Pty., Ltd. (Melbourne); Monsanto Chemicals (Australia) Ltd., and Nicholas Pty. Ltd. (Australia) for their gifts of 2:4-diamino-5-phenylthiazole hydrobromide. We are most grateful to Miss M. Bell, Miss S. Loewe, Miss M. Parker, and Mr. W. Straffon for their kind assistance with this work. Finally, we especially wish to express our thanks to Professor R. D. Wright, Dr. Kaye Scott, and Dr. W. P. Holman, for their kindly interest and advice during this investigation. This work was partly aided by a grant from the National Health and Medical Research Council of Australia.

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BLOOD CHOLINESTERASE VALUES IN EARLY DIAGNOSIS OF EXCESSIVE EXPOSURE TO PHOSPHORUS INSECTICIDES

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The phosphorus insecticides are a group of substances which owe their high mammalian toxicity to their inhibitory action on the enzyme cholinesterase located in the central and peripheral nervous system. Precautions to protect those engaged in the application of these insecticides are prescribed by the Agriculture (Poisonous Substances) Regulations, 1953, and similar action should be taken with regard to those engaged in their manufacture. If the precautions taken are inadequate, or are temporarily relaxed, the first sign of excessive exposure will be a diminution of the activity of cholinesterase circulating in the blood. Several surveys of the blood cholinesterase values of large groups of normal individuals have been published; these are necessary in order to provide a standard of reference whereby abnormally low values may be recognized. The results obtained reveal a wide scatter in both the plasma and the red-cell enzyme activities, though the coefficients of variation obtained by the various authors are consistent with one another (Callaway, Davies, and Rutland, 1951; Wolfie and Winter, 1952; Fleisher and Pope, 1954).

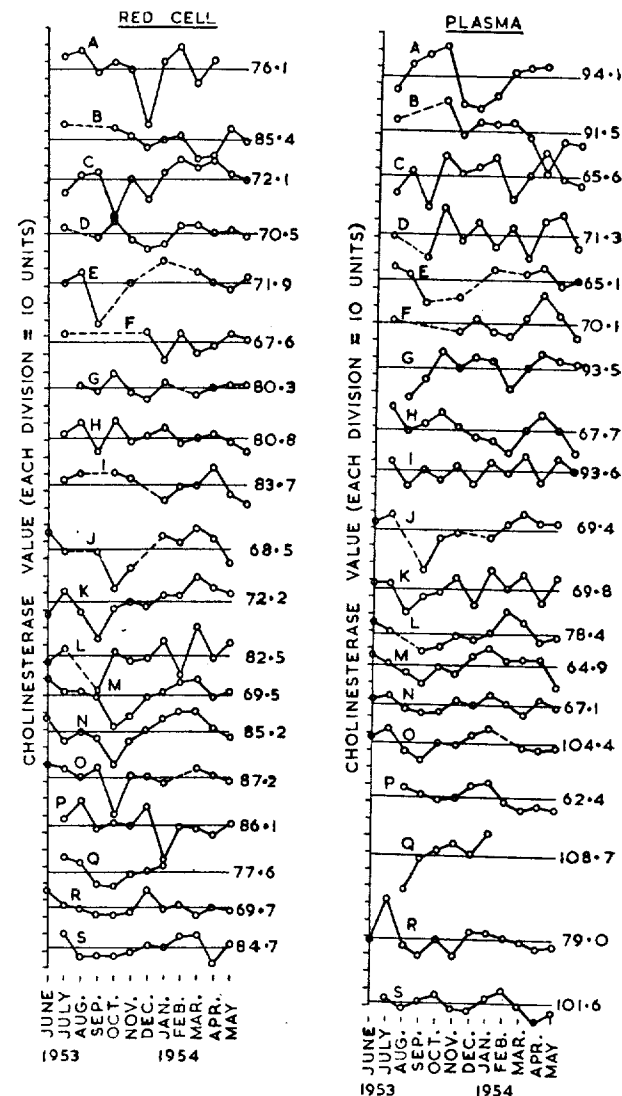
Callaway *et al.* (1951) have suggested that a better indication of a significant fall in blood cholinesterase activity would be obtained if a measurement on an individual is referred, not to the average value of a normal population, but to a series of readings on the same individual prior to exposure to an anticholinesterase, and they have recommended a statistical procedure for doing this. The present investigation was undertaken to extend this treatment by a study of the nature of the temporal variation of cholinesterase activity in normal individuals and thereby to establish criteria for the recognition of significantly low blood cholinesterase values.

Experimental

The selection of the individuals who took part in these tests was not random. Volunteers were requested, and from those who offered themselves were selected the ones who showed the widest range of cholinesterase values. The sex and occupations of the subjects are shown in Table II. The technique of taking finger-tip blood samples and the procedure for measuring cholinesterase activity were similar to those used by Wolfie and Winter (1952); wherever possible, duplicate blood samples were taken to permit the calculation of the experimental error. The tests were made only when the subjects were in sufficiently good health to continue their normal employment, and none at any time came into contact with phosphorus insecticides or any other known cholinesterase inhibitor.

Experimental Results.—The results obtained from the cholinesterase measurements are displayed graphically in the Chart. Where duplicate blood samples were available, the points on the graphs are the mean of the pairs of determinations.

Experimental Error.—For the calculation of the experimental error, 119 duplicate pairs of red-cell samples and 135 duplicate pairs of plasma samples were available. From these duplicate measurements red-cell and plasma variances due to combined sampling and measurement error were found to be 24.3 and 33.3 respectively, corresponding to



Monthly red-cell and plasma cholinesterase values, showing individual average values. The reference letters correspond with those in Table II.

standard deviations of 4.93 and 5.77. In order, therefore, that two single determinations should be regarded as significantly different ($P=0.05$) they must differ by at least 14 units for red cells and 16 units for plasma, or, if the averages of duplicate determinations are being compared, by 10 and 12 units.

Monthly Averages and Variances

Table I shows the averages of the monthly groups of determinations and the monthly variances which are a measure of the variation of the individual values within these groups. There is no evidence to suggest, and no reason to suppose, that these variances are not homogeneous, and the combined variance within the monthly groups can be shown by the usual method of analysis of variance to be 99 for red cell and 283 for plasma. These two terms are a measure of the scatter of cholinesterase activities in normal individuals; the coefficients of variation derived from them are 12.8 and 21.3 respectively, which are within the range of the figures quoted by Callaway *et al.*

TABLE I.—Monthly Averages and Variances

Month	Red Cell		Plasma	
	Average	Variance	Average	Variance
June, 1953	79.7	92.1	79.6	185.8
July	82.3	69.6	83.3	297.0
August	75.6	145.0	75.2	376.6
September	76.1	192.4	81.6	425.8
October	72.3	138.8	77.6	297.3
November	71.9	146.8	80.2	257.4
December	79.2	93.0	80.7	271.3
January, 1954	80.0	62.9	82.0	366.0
February	77.4	71.4	78.8	246.2
March	82.2	105.5	81.1	190.1
April	77.9	49.5	76.8	194.5
May	76.1	78.7	73.6	254.2

A comparison of the monthly averages gives no indication of any real seasonal variation in the cholinesterase values, nor any change in the quantitative interpretation of the method of measurement. Analysis of variance does not conflict with this impression; there is no evidence of any significant difference between the monthly averages of the plasma values, while the red-cell averages show a difference with a low order of significance (P between 0.05 and 0.1).

Individual Averages and Variances

It is evident that if a series of measurements of a variable property, such as enzyme activity, are made on an individual, the results will approximate more closely to one another the shorter the interval between the measurements. As the interval increases, the dependence of a result on that of the previous determination decreases, and when the interval exceeds any periodicity in the fluctuation of the enzyme activity the results will be scattered randomly round the average value. An inspection of the graphs in the Chart reveals that this interdependence or serial correlation does occur to some extent and is manifest by a secular drift around the average value, but it is broken up by completely random variations. The individual variances reported in Table II range between 165 and 18.8 for red cell and 158

TABLE II.—Individual Averages and Variances

Reference	Occupation	Sex	Red Cell		Plasma	
			Average	Variance	Average	Variance
A	Packer	M	76.1	164.7	94.1	158.3
B	Bricklayer	M	85.4	42.6	91.5	124.3
C	Process worker	M	72.1	95.8	65.6	101.9
D	Engineer's labourer	M	70.5	27.0	71.3	100.9
E	Plant superintendent	M	71.9	103.3	63.1	57.8
F	Joiner	M	67.6	35.4	70.1	62.1
G	Warehouseman	M	80.3	18.8	93.5	73.8
H	Production supervisor	M	80.8	57.5	67.7	72.7
I	Process worker	M	83.7	53.1	93.6	35.9
J	Bricklayer	M	68.5	119.4	69.4	92.7
K	Plant superintendent	M	72.2	85.6	69.8	58.9
L	Production supervisor	M	82.5	102.6	78.4	47.2
M	Laboratory assistant	F	69.5	66.3	64.9	47.8
N	Laboratory assistant	F	85.2	78.3	67.1	15.3
O	Office worker	M	87.2	64.5	104.4	33.0
P	Instrument maker	M	86.1	77.2	62.4	32.7
Q	Joiner	M	77.6	41.6	108.7	126.7
R	Boilerman	M	69.7	25.3	79.0	75.6
S	Maintenance fitter	M	84.7	34.7	101.6	45.0

and 15.3 for plasma cholinesterase. The Bartlett test fails to show any significant difference between these variances; the conclusion should not be drawn from this that the variances are equal for all individuals, but that the evidence is not sufficient to discriminate between them. Nevertheless, the usual method of analysis of variance is sufficiently valid, and this reveals the expected highly significant differences between the individual averages, although the scatter of these averages is considerably less than that of single determinations.

The variance between the groups of individual figures, calculated by analysis of variance, may be regarded as an estimate of the variance of the basic individual red cell and plasma values, independent of temporal variation; these variances were calculated to be 43 and 211 respectively. These figures give rise to coefficients of variation of 8.4 and

18.3 compared with 12.8 and 21.3 derived from the variances of single individual values quoted above. These observations demonstrate that the scatter of single enzyme measurements on a large number of individuals derives from differences in the basic cholinesterase activities of the individuals, amplified by the deviations from these basic values which operate at the time of measurement. These deviations are themselves compounded of the variation due to experimental error and temporal changes in the blood cholinesterase activity due to causes at present unknown. There is an indication from the graphs in the Chart that for most individuals the same general trends exist in the temporal variation of both red-cell and plasma cholinesterase, yet there is clearly no close correlation between them.

The method derived by Callaway *et al.* for the recognition of significant decreases in blood cholinesterase activity may now be examined in the light of the above observations. These authors considered that the significance of the deviation of a value from the mean of n previous values on the same individual is given by the expression $s\sqrt{(n+1)/n}$, where s is an estimate of the standard deviation of the distribution of values round the individual average; s was calculated from repeated measurements of the blood cholinesterase activity of a limited number of young Service men. This treatment is based on the assumptions that the individual values are randomly scattered round the individual averages and that the variances are homogeneous, both of which are not entirely in accordance with the experimental findings described above. An alternative statistical treatment of the results, involving an attempt at a mathematical study of serial correlation, can hardly be justified, as all the information contained in the experimental figures which is relevant to the application of these cholinesterase measurements may be extracted from the Chart by inspection.

Criteria for the Assessment of Excessive Exposure

From the information derived from the present investigation it is possible, when confronted by one or more cholinesterase values in an individual, to form an opinion whether the values are so much below the average value for the population or a decrease between two successive readings is so large that an abnormal fall in blood cholinesterase activity has occurred. Such a procedure would enable the non-observance of safety precautions, or faulty operation of plant or of apparatus used in the production or application of phosphorus insecticides, to be deduced from blood cholinesterase measurements on those engaged on these operations. If, however, the tests are regarded as a method of diagnosis of the early stages of poisoning and as a means of deciding whether a man should or should not continue in his employment, then it is necessary to define a value below which the symptoms of poisoning may be expected to manifest themselves. This is a matter of considerable difficulty, as there is little agreement in the literature on this point (Garlick, 1950; Brown and Bush, 1950; Grob, Garlick, and Harvey, 1950; Barnes and Davies, 1951; Williams and Griffiths, 1951; Kay *et al.*, 1952).

Moreover, there is evidence that a man with a decreased cholinesterase value may remain without symptoms and yet be in a hypersensitive state which will cause him to react strongly to a further absorption of the anticholinesterase, to which, in the absence of a previous exposure, he would not be susceptible (Davies and Nicholls, 1955). It is therefore desirable, when there is reason to suspect an abnormally low value, not only to search for the cause but to remove the subject from the range of the phosphorus insecticide until his blood cholinesterase value has returned to normal.

In applying cholinesterase measurements to control the manufacture and use of phosphorus insecticides it is understandable if, in order to gain a larger margin of safety, somewhat narrower limits of normality are defined than the experimental evidence justifies, and a number of normal individuals are thereby classed as victims of excessive

exposure. Yet it must be remembered that this method will fall into disrepute, and lose that energetic co-operation from management and men which is essential to it, if men are too frequently taken off work or there is an interruption of production or application processes when no clinical symptoms are apparent, nor any evidence of unsatisfactory working conditions.

Owing to differences in technique and in the definition of units it is not always possible to make direct comparisons between cholinesterase activities measured in different laboratories. Nevertheless, the ratio between two values determined in the same laboratory should be comparable; a statistic such as the coefficient of variation, which is itself a ratio, can be regarded as a property of the population under investigation and independent of variations in technique. In order that the deductions from the present investigation should be generally applicable, all quantitative terms have been presented as ratios based on the relevant average value for the population; and before any laboratory can apply these or any other recommendations of a like nature it is necessary that an adequate estimate of this statistic should be determined. This should be based on cholinesterase determinations on as many randomly selected normal individuals as possible; the number should not be less than 20.

The approach to the significance of a single blood cholinesterase measurement on an individual varies according to the previous history of cholinesterase measurements. If no value previous to contact with phosphorus insecticides is recorded, then the distribution of single measurements of cholinesterase activity on a normal population must be invoked. The present investigation gives population averages of 77.7 and 79.2 for red-cell and plasma cholinesterase values respectively, with standard deviations of 9.9 and 16.8. There is therefore a one in forty chance that a normal individual will have a plasma and red-cell cholinesterase value less than 57.8 and 45.6—that is, 74.3% and 57.5% of the average values respectively. It is suggested that if a red-cell or plasma cholinesterase value of an individual in contact with phosphorus insecticides is found to be less than one-half of the population average, it should be regarded as a sign that appropriate action should be taken—that is, he should not be allowed to continue in his employment and the process and precautionary measures should be carefully scrutinized. If a value between 50% and 60% of the population average is encountered it should be regarded as an alerting signal to stimulate an active supervision of the process; in particular, frequent blood cholinesterase measurements should be made in those concerned in the process. If the single cholinesterase determination has been made in order to confirm suspected symptoms of anticholinesterase poisoning, then there need be no hesitation in accepting a value below 60% of the population average as confirmatory evidence.

The procedure just outlined is bound to miss small but significant decreases in cholinesterase in subjects whose normal activity is high. If one or more pre-exposure values on an individual are known, these provide some indication of the individual's normal value, and it seems desirable to modify the above recommendations by requiring that appropriate action be taken if an individual is found to have a cholinesterase value one-half of the population average or one-half of the average of his pre-exposure values, whichever is the higher.

Regular Testing

The most desirable procedure is the regular testing of all individuals engaged upon, or likely to be engaged upon, the manufacture or handling of phosphorus insecticides. From an inspection of the graphs obtained by plotting the results obtained from such regular tests, the pattern of the normal cholinesterase values may be determined and any departure therefrom recognized. The individual graphs of the Chart reveal drifts around the individual average interspersed with random fluctuations of varying magnitude. In no case is

any value inferior to that of the previous month by more than 30 units, nor are any of those approaching this value maintained into the subsequent months. It is recommended, therefore, that if in such a systematic series of tests a decrease of more than 40% of the population average is encountered it should be regarded as a reason for taking the appropriate action defined above, and if the fall is between 30 and 40% of the population average then supervisory measures should be made stricter. There is not sufficient evidence to indicate the extent of any likely downward drift in normal individuals, but it is suggested that the condition should be suspected if the value approaches 60% of its pre-exposure value.

The separate determination of red-cell and plasma cholinesterase has been stated to present a diagnostic advantage in cases of poisoning by anticholinesterases (Grob *et al.*, 1950). If the experimental procedure is restricted to the enzyme activity of whole blood there is a considerable saving of time; the criteria suggested above would equally apply to such measurements.

Summary

The red-cell and plasma cholinesterase values of 19 normal individuals have been measured at monthly intervals for a period of one year. The distribution of the monthly values on each individual is not entirely random, there being some measure of serial correlation. There is no clear evidence of any seasonal variation in the values.

The distribution of all the values on all the individuals has a coefficient of variation of 12.8 and 21.3 for red cell and plasma respectively. The contributory factors to this variation are discussed, and it is shown to be compounded of a basic individual variation, increased by the experimental error of measurement and individual temporal variations of unknown origin.

The establishment of limits of cholinesterase activity, whereby excessive exposure to phosphorus insecticides may be recognized, is discussed.

I am indebted to Dr. O. L. Davies for valuable advice and criticism of the statistical treatment of the results, to the subjects for their patient co-operation, and to Miss Sylvia Morrissey and Mr. Z. S. Berczy for technical assistance.

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Claimed to be Britain's first secondary school for spastics, the Thomas Delarue School was opened recently by the National Spastics Society at Dene Park, Tonbridge, Kent. This is the first of five special schools which the Society and its groups will open this year. Eighteen children from a number of towns and cities in England and Wales will be admitted to the Thomas Delarue School this term, and it is hoped eventually to accommodate 45 handicapped boys and girls. Education up to general certificate level, combined with treatment, will be provided. A second school was opened on May 11 at Craig-y-Parc, Cardiff. Twelve children aged from 5 to 16 from towns and cities in Wales and the West of England will be the first pupils, but it is hoped that facilities will eventually be available for 35 to receive education and treatment.

A FIELD TEST FOR THE ASSAY OF HUMAN WHOLE-BLOOD CHOLINESTERASE

BY

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The level of cholinesterase (ChE) in the blood is a valuable index of the amount of anticholinesterase which has been absorbed into the system, and it has in fact been used for this purpose (Metcalf, 1951; Davies, 1952a; Marchand, 1952). Since anticholinesterases are being used extensively in agriculture and for insect vector control—very often far removed from laboratory facilities—the determination of such an index under field conditions would be useful. The essential requirement of a field test is simplicity. The procedure and equipment required should be simple, few reagents be necessary, and the time taken for the performance of the test be reduced to a minimum. Finally, the test should be sufficiently uncomplicated to be carried out by non-specialist personnel.

Aldridge and Davies (1952) have discussed the possibility of applying the generally used techniques for ChE assay to field conditions, and came to the conclusion that, for reasons given, these were unsuitable. They did, however, suggest that the electrometric method of Michel (1949) was satisfactory under certain circumstances. They based their suggestion on the fact that this technique lent itself to the rapid and easy estimation of considerable numbers of samples. While subsequent experience has shown this to be true, there are two major disadvantages. The pH meter is not reliable enough to use in the field; and the glass electrode is most certainly too fragile for this purpose.

Fleisher and Pope (1954) have applied the Hestrin (1949) colorimetric method to the estimation of whole-blood ChE. Their method possesses the advantage that it is a colorimetric technique and that single estimations can be completed, including the collection of the blood sample, in twenty-five minutes. Its disadvantages as a field test are (1) relatively few tests can be performed in a given time, and (2) at least six reagents and an equally large number of manipulative processes are involved. Furthermore, the technique requires the use of a spectrophotometer.

Limperos and Ranta (1953) have described a test which they have used under field conditions and which approximates to the requirements. The principle is the same as that of the electrometric method. The differences are (1) that changes in pH are followed by changes in a bromthymol blue (B.T.B.) solution incorporated in the reaction mixture, and (2) the test is carried out in an unbuffered medium. The levels of enzyme activity are assessed by the colour of the solution after a given interval of twenty minutes, and these colours are green, olive green, olive brown, and orange. In practice the distinction between the first two and the second two is difficult. This is a serious disadvantage, since (as is shown below) this is the important range. A second major disadvantage is that under certain conditions of illumination the combination of blood and B.T.B.

appears to fluoresce. When this happens colour assessment is almost impossible. Despite these difficulties a relatively slight modification of procedure has been shown to give a workable and satisfactory test. If a fixed colour change is taken—for example, from green to orange—and the time for the change to occur is observed, these difficulties are overcome.

Experimental

Apparatus.—Tubes 3 by $\frac{1}{8}$ in. (7.5 by 1 cm.) (one for each test). Pipettes: 10 ml. graduated in 1 ml.; 5 ml. graduated in 0.5 ml.; 20 c.mm. haemoglobin pipette. Rack to hold ten 3 by $\frac{1}{8}$ -in. tubes. Watch to read accurately in minutes. Triangular needles, 1 packet. Thermometer.

Reagents.—Two solutions only are needed. (1) Acetylcholine chloride ampoules (Roche Products), 0.6% solution. Dissolve the contents of six 0.1-g. ampoules in 100 ml. of distilled water. This solution can be stored at 20° C. for a period of five or six days without deterioration, and provides sufficient solution for 200 tests. (2) Bromthymol blue: (a) Stock solution, 0.04 g. of powder is dissolved in 1 ml. of N/20 sodium hydroxide. Approximately 90 ml. of distilled water is added and then sodium hydroxide, dropwise, until the solution just turns blue. The total volume is made up to 100 ml. The pH of this solution should be 7.7, and if it is possible, since this solution can be made up in the laboratory, it should be checked with a pH meter. (b) For use, dilute two volumes of stock solution with one volume of distilled water.

Technique.—Collect 20 c.mm. of blood in a haemoglobin pipette and wash it out into 1 ml. of dilute B.T.B. solution contained in one 3 by $\frac{1}{8}$ -in. tube. Add 0.5 ml. of acetylcholine chloride solution and note the time of addition. Note the exact time at which the colour of the reaction mixture becomes deep orange. The interval is a measure of the enzyme activity. To facilitate the determination of the end-point, a standard* is easily prepared as follows: Blood and B.T.B. solution in the above proportions are added to a tube and then 0.15 ml. of N/100 acetic acid. The volume is then made up to 1.5 ml. (The pH should be 6.7.)

Results

If the time interval over which the requisite colour change occurs is determined precisely, then the assessment of whole-blood activity correlates closely with determinations made by the electrometric method. This is shown in Fig. 1. In this figure the reciprocal of the time

(T) taken to effect the given colour change at temperature (t) is plotted against the activity of the sample in $\Delta pH/\text{hour}$ always determined at 25° C. (For convenience the actual ΔpH value has been multiplied by 100 throughout.) In this case t was between 19 and 22° C. The close correlation between $\Delta pH/\text{hour}$ and T is obvious from the graph.

The relative activities of different specimens at varying temperatures have been plotted against the temperature, the activity at 20° C. being taken as equivalent to 100. The relative activity increases with temperature in a non-linear fashion from 10° to 40° C. Above 40° C. results become uncertain. At 10° C. the relative activity is about 65, whilst at 30° C. it is 137.

*A permanent glass standard is obtainable from Tintometer Ltd., Salisbury.

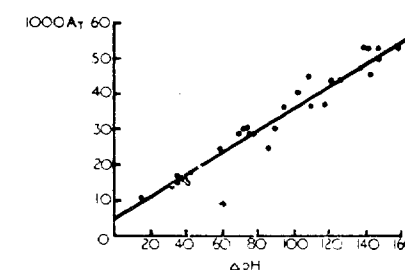


FIG. 1.—The relationship between ChE activity measured as (1) the reciprocal of the time necessary to effect given colour change (that is, A/T), and (2) in electrometric units (that is, ΔpH). A/T determined at temperatures between 19 and 22° C., ΔpH determined at 25° C.

The information yielded by these two series of experiments allows us to simplify the test for field conditions. If in addition it is possible to relate enzyme levels to zones which will permit clear-cut executive action, then a very useful test may be evolved. The latter idea is possible, for three critical levels of whole-blood ChE activity; (1) The lower level of normal whole-blood ChE activity; (2) the level of hypersensitivity; (3) the clinical danger level.

Lower Level of Normality.—There have been very many determinations of normal values of red-cell, plasma, and whole-blood ChE, and the limits of variation have been extensively worked out (Callaway *et al.*, 1951; Wolfie and Winter, 1952; Fleisher and Pope, 1954). These are consistent with each other. For the present purpose the values for the whole-blood ChE as determined in this laboratory have been used to define the lower limits of normal activity. On a recently determined series the mean value of whole-blood ChE was 133 (Δ pH/hour) with a standard deviation of 12 (Δ pH/hour). The lower fiducial limit of normality is therefore 109 (Δ pH/hour).

Level of Hypersensitivity.—No symptoms of systemic poisoning are obvious until a very significant reduction of the blood ChE has occurred. Callaway *et al.* (1954), however, have shown that when the whole-blood ChE of rabbits has, by previous exposure to anticholinesterase, been reduced to half the pre-exposure value, there is a significant reduction in the LD₅₀, thus demonstrating that a reduction in the blood ChE level is indicative of an increased sensitivity towards further doses of anticholinesterase. Their data did not permit an extrapolation which would have indicated the exact point at which this increased sensitivity is first obvious. In the absence of such precise data, and bearing in mind the main purpose for which this test is being evolved, we therefore suggest that the level of clinical significance could be set at 50% of the mean normal level—that is, at Δ pH/hour of 67.

Clinical Danger Level.—Davies (1952b) noticed that the blood cholinesterase of animals dosed with anticholinesterase by the intravenous, intramuscular, or percutaneous route had to be reduced to at least 20% of normal before the onset of serious clinical symptoms. In his experience the critical whole-blood cholinesterase level is about 20% of normal, although it does not follow that symptoms automatically appear when this level of blood cholinesterase is reached (Frawley *et al.*, 1952). The clinical danger level may therefore be set at 20% of the mean normal level—that is, at Δ pH/hour of 26 units.

Effect of Temperature

The most difficult problem has been to evolve a method of temperature compensation without the use of a constant temperature bath or enclosure. This was done as follows. As indicated above, several simultaneous observations were carried out on the same sample at various temperatures, together with electrometric determinations at 25° C. These results were then summarized in a family of straight lines corresponding to each temperature and relating $1,000/A_T$ and Δ pH/hour, where T is the time taken for the completion of the colour change. From these, T was determined for each critical level at varying temperatures, and a new family of curves constructed relating T and temperature. By plotting these on one diagram, as in Fig. 2, a chart showing various zones has been constructed, each zone corresponding to the interpretation shown on the right side. (See also Table I.)

TABLE I

	Lower Level of Normality Δ pH 109	Upper Level of Hypersensitivity Δ pH 67	Level of Serious Poisoning Δ pH 26
10° C.	41 minutes	63 minutes	111 minutes
15° C.	32 "	49 "	98 "
20° C.	26 "	40 "	87 "
25° C.	22 "	34 "	74 "
30° C.	19 "	30 "	62 "
35° C.	14 "	23 "	53 "

The *modus operandi* of the test is therefore as follows: The temperature of the ambient air is noted. An ordinate of the chart is then drawn corresponding to this temperature, and the time read off at the point where it cuts each curve.

The tubes are prepared as described earlier—that is, 1 ml. of B.T.B., 20 c.mm. of blood, and 0.5 ml. of acetylcholine chloride—and then the colours noted at each of these times, obtained from the chart (Fig. 2). In all the tubes in which the colour has changed to deep orange at the time of inspection the reaction is complete. For example, if the temperature was 23° C., the test with all normal blood samples would be complete in 21 minutes. Blood which changed colour in less than

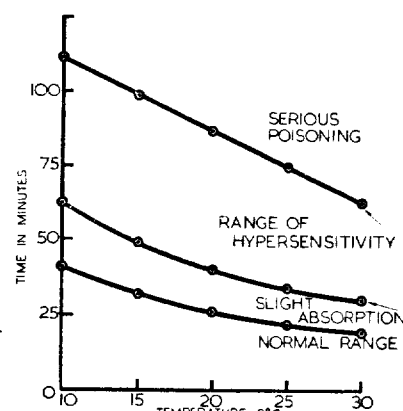


Fig. 2.—Chart relating time of colour change with temperature and degree of poisoning.

34 minutes but longer than 21 minutes would possess whole-blood ChE levels lower than normal, and the level would indicate a slight absorption of anticholinesterase. Such levels would, however, be of little clinical significance. They would, on the other hand, indicate indifferent safety procedures or personal carelessness on the part of the individual.

If the time taken is longer than 34 minutes this indicates that the individual is hypersensitive, and will come into the appropriate zone. If even after 72 minutes the test is not complete, at least 80% inhibition is indicated, implying danger of clinical symptoms.

It should be emphasized that an exact colour match with the standard is seldom necessary, since the criterion at the critical time is whether the colour change is complete at that time.

One other point with reference to temperature needs to be discussed. The test may in extreme circumstances—that is, at 10° C.—take 100 minutes to complete, and if no constant temperature bath is to be used it is rather important to know what temperature fluctuation may be permitted during the period of the test itself. The experiments on which the relationship between field test and the electrometric method (shown in Fig. 1) were based were carried out at 19° C., 20° C., and 22° C., hence a variation of 3° C. during the period of the test would seem to be permissible. Lowry *et al.* (1954) confirm this suggestion, for they state that to measure cholinesterase to within 3% the permissible temperature range is 3° C. This is, however, a point that ought to be checked under a wide variation of conditions, or at least kept in mind during the period of the test.

A series of experiments were carried out at different temperatures to check the chart that has been produced. The procedure was exactly as described. Forty-eight samples of blood were prepared by diluting normal blood with inactivated blood. Thirty samples (obtained from eight individuals) were examined on different occasions in the climatic chamber at 31° C. and 85% relative humidity. A further 16 samples (from four individuals) were tested in a constant temperature bath at 31° C. The results are shown in Table II.

Of the 47 samples so tested, 45 conform precisely to the pattern described in the test. Of the discrepant samples those with Δ pH/hour—116, T_{31} —19 minutes are only just outside the expected zone. A sample of Δ pH—116 should have a reaction time of 18 minutes or less.

TABLE II.—The Confirmation of Reaction Times at 31° C.

Normal Range Δ pH hr.—109		Range of Slight Absorption Δ pH hr.—109-67		Hypersensitive Range Δ pH hr.—67-26	
T_{31}	18 min.	T_{31}	18-29 min.	T_{31}	29-67 min.
130	15	108	20	66	31
126	15	104	20	63	32
146	14	103	21	59	42
132	15	103	20	58	39
123	15	102	20	56	40
140	14	100	22	55	33
129	15	100	22	53	40
148	15	96	22	52	40
136	16	95	23	49	35
133	15	88	23	36	47
127	15	87	23	36	50
146	15	85	26	33	50
116	19	81	25	30	52
116	19	78	27		
110	18	76	27		
		75	27		
		75	28		
		73	28		
		67	27		

Δ pH hour values and reaction times grouped according to the clinical zones described in Fig. 2.

Summary

The field test of Limperos and Ranta for the assay of human whole-blood ChE has been modified to facilitate its more extensive use. A chart has been constructed which permits adjustments in the conditions of the test to compensate for temperature variation and to relate ChE levels to the degree of poisoning.

We thank the Chief Scientist of the Ministry of Supply for permission to publish this paper. We also thank Dr. Donald Hunter, Director for Research in Industrial Medicine, for seconding one of us (J. D. N.) to C.D.E.E., Ministry of Supply, Porton, to facilitate the development of this work.

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Speaking at a largely attended council meeting of the Invalid Children's Aid Association on May 13, Dr. F. S. COOKSEY, director of the department of physical medicine at King's College Hospital, London, described the rehabilitation of the physically handicapped child under three heads: medical care, education of the mind and body, and "settlement," both at home during school life and later at work. With regard to the first, Dr. Cooksey stressed the importance of early diagnosis, particularly in cases of cerebral palsy, and of integrating the medical care under one doctor. "Only one man can integrate the treatment of the child, and he is the family doctor—who frequently does not," said Dr. Cooksey. So far as education is concerned, he thought that too many children with potentially normal brains were suffering from lack of education because they are segregated on account of their physical handicaps. "We should realize that the physically handicapped child should earn its living with its brain, not necessarily with its hands." Craft work was emphasized too much. Speaking of settlement in the home, Dr. Cooksey drew attention to permissive regulations under the National Assistance Act which allow for alterations to be made in the home so that the handicapped child can live more comfortably—such things as the widening of doors, the erection of ramps, and special appliances and furniture.

Medical Memorandum

Female Circumcision and the Age of the Menarche

From previous observations (Ellis, 1950; Wilson and Sutherland, 1953) it is evident that in tropical countries the onset of menstruation may be early or late compared with that for English children, but that it is not determined solely by the climate.

Studies in African ethnopsychiatry (Carothers, 1953) suggest that environmental factors may be of importance in the development of personality and constitution. It is of interest, for example, that exophthalmic goitre (Graves's disease), which may be associated with personality type (Martin and Fisher, 1945), is rare in Africans (Gillman and Gillman, 1951; Carothers, 1953; Davidson, 1954; Wilson, 1954). It is well known, too, that changes in environment which directly or indirectly modify glandular function may affect menstruation in English girls (Browne, 1950).

During nutritional investigations in Sierra Leone which extended from December, 1953, to February, 1954, the opportunity arose to investigate the influence of initiation rites, which include female circumcision, on the age at menarche of Africans. A comparison was made between Creole girls who are Colony-born Africans, among whom no circumcision is practised, and girls belonging to native tribes in the Protectorate, who at the age of about 12-13 years retire into seclusion for ceremonies of initiation. These rites are characterized by an operation on the clitoris and labia minora, which may vary from small incisions to total excision, with the object of restricting sexual pleasure. After this the girl is ready for marriage; without the operation she will not obtain a husband. This initiation and operation usually precedes the menarche; in view of the high emotional content of the ritual it therefore seemed possible that the onset of menstruation might be affected.

Records for the tribal girls were particularly difficult to obtain, and data were available for only 33. The number of Creole girls studied was 129. The present age of each girl was recorded, together with a note whether or not her periods had started. With this information the average age of the menarche and its standard deviation may be calculated, using the statistical technique of probit analysis. The results obtained may be compared with corresponding results for 2,590 girls in the South of England (Wilson and Sutherland, 1953). None of the differences is statistically significant (see Table). Although the number of tribal girls is small, it may be concluded that there is no evidence that the initiation and operation has any substantial effect upon the age of the menarche.

	No. of Girls	Average Age of Menarche (years)	Standard Deviation (years)
Tribes	33	13.44	1.30
Creoles	129	13.65	0.94
S. England	2,590	13.49	1.19

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Reviews

HOWELL'S PHYSIOLOGY

A Textbook of Physiology. Edited by John F. Fulton, M.D., with 12 collaborators. 17th edition. (Pp. 1,275+xliv; illustrated. 94s. 6d.) Philadelphia and London: W. B. Saunders Company. 1955.

The seventeenth edition of what was originally *Howell's Textbook of Physiology* appears under the editorship of Professor Fulton and twelve other distinguished American physiologists; altogether, however, it is the work of thirty contributors. A conscientious review of a book containing over 1,200 pages is neither feasible nor expected by the editor, so I can only express an opinion of its merits based on a cursory glance through the whole and a careful reading of those parts about which I know more than the ordinary run of physiologists.

A general word of praise may be uttered at once: if I were going to teach physiology in some obscure medical school in the heart of Africa, isolated from the modern literature and given the opportunity to take only one book with me, then the textbook under review would be the ineluctable choice. I say this with a strong feeling of disloyalty to an old favourite and the only other large textbook with which a comparison is invited—namely, Starling's *Principles of Human Physiology*; and I say it, furthermore, in spite of the poor literary presentation, the immature judgment, and the obvious lack of any guiding spirit that are revealed by some of the contributions in the book under review. It is unfortunate, but true, that the cause of these defects—the multiple authorship—constitutes the very reason why the book should be the more valuable as an aid to teachers; the author of each section is, or should be, familiar with the literature relevant to his subject-matter, whereas the single author of a large text must, for most of the time he is writing, be dealing with subjects to which, in the course of his everyday activities, he does not normally devote much thought. Scientific writing is not, and should not be, a whole-time task; rather should it be the occupation that fills up idle hours when the day in the laboratory or clinic is over.

Treated in this way, there is an obvious limit to what may be expected of a single author, and it may well be argued that the writing and keeping up to date of a large textbook covering the whole field of physiology are a task beyond the capacities of anyone who is not a complete slave to his work. This consideration, whilst it emphasizes the necessity for multiple authorship, raises the question of the place of large comprehensive textbooks in modern physiology; if the treatments of individual aspects were thorough, up to date, and authoritative, they would occupy a welcome place on the shelves of all research workers and teachers, although their use to medical students—the people for whom they were primarily written by their original authors—would be negligible on account of their size. Unfortunately, an inspection of those parts of Fulton's book on which I feel justified in expressing an opinion reveals that these standards are not always attained; the authors have not always taken the trouble to master the details of the work they describe, and one has the suspicion that they have not always had recourse to the original literature, taking their facts and opinions at second-hand from reviews. (An obvious exception is that part of the book dealing with the nervous system; constituting nearly half the book, it is in itself a scholarly monograph.) Since it fails, therefore, as an introduction to most subjects for the research worker, and since it is unsuitable on account of its size for the medical student, the remaining function—namely, as a source of ready knowledge for teachers in a hurry to prepare a lecture—stands as its sole justification for existence.

The alternative to such a book is a series of monographs covering the whole field of physiology; such a conception has everything to recommend it, and only begs the question

of its execution. The difference between hastily throwing together a chapter or two on demand and constructing an exhaustive and well-considered monograph is the difference between a few weeks' and a year's work; moreover, the ability to write, and the inclination to sacrifice the time required for it, are becoming rarer, while the expenses of producing a scientific book are rising rapidly to the point where it will be impossible to publish at a reasonable price books with the limited circulation one must expect for such specialized works. Thus the modern medical and scientific publisher is confronted with a problem which will not resolve itself easily; meanwhile the large textbooks of physiology remain as anachronistic survivals from a day when research was, perhaps, more leisurely; when the scientist did not, as he seems to do to-day, spend his spare time growing vegetables or usurping the functions of a builder and decorator; when the ability to express oneself with ease was one that was taken for granted in most men of science; and, finally, when the medical student was treated as a reasoning human being instead of as a sausage-skin, to be stuffed full of miscellaneous information by over-zealous preclinical departments, competing among themselves to squeeze in the most of their particular brand of knowledge.

HUGH DAVSON.

NEUROSURGERY

Correlative Neurosurgery. By Edgar A. Kahn, Robert C. Bassett, Richard C. Schneider, and Elizabeth Caroline Crosby, with eleven other contributors. Foreword by Kenneth G. McKenzie, M.B., F.R.C.S.(C). (Pp. 413+xv; illustrated. £7.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1955.

Designed as a textbook for the younger neurosurgeon, this volume has been compiled by a number of authors, most of whom were associated with the late Dr. Max Peet. It therefore reflects largely the views of a single school of neurosurgeons. There are excellent opening chapters on the aids to diagnosis of radiology, electroencephalography, and the use of radioactive isotopes, which are clear and up to date. When dealing with the actual intracranial surgery a great amount of fine detail of operative technique is given together with quite admirably clear, simple diagrams, drawings, and photographs. It is perhaps in the finer points of technical detail that the book is at its best.

Many of the chapters dealing purely with surgery are followed by a neuro-anatomical study of the part of the central nervous system concerned. These are a most valuable addition, and are both clear in content and very well and simply illustrated.

All fields of neurosurgery are amply covered in the book, but it would perhaps have been more satisfactory if the actual figures with survival and mortality rates had been given in all the chapters concerned with methods of treatment, for it is highly important to be aware of the exact volume of experience which has been responsible for the views expressed.

The book is superbly produced and well put together, and the standard of the frequent illustrations is very high indeed.

W. MCKISSOCK.

ACUTE POLIOMYELITIS

Treatment of Acute Poliomyelitis. Edited by William A. Spencer, M.D. Second edition. (Pp. 134+xi; illustrated. 27s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1954.

The recent news from the United States of a partially successful vaccine for poliomyelitis must not be allowed to distract attention from the need to improve provision for treatment of the acute disease, and we must always be prepared for severe outbreaks. Some of the American clinics for the treatment of acute poliomyelitis have for many years led the world as regards their methods, and this small book is specially welcome, for it brings to the clinician a wealth of detailed information about treatment techniques

from a first-class U.S. Poliomyelitis Respiratory Centre, and is published in co-operation with the National Foundation of Infantile Paralysis.

The book is presented like the notebook of a student attending a course of lectures, and consists of nearly 90 short sections from 23 authors. These include such subjects as laboratory guides to respiratory management, indications for tracheotomy, body positioning, care of paralysed muscles, and home care for the respiratory patient. Of special interest to the British reader are the sections on machines for assisted coughing, and the astonishing glossopharyngeal breathing by which patients can be taught to force a series of mouthfuls of air into their lungs by a manoeuvre of the tongue and throat. Positive-pressure intratracheal breathing has not yet been adopted in the U.S.A., partly perhaps because anaesthetists are not playing much part in the treatment of poliomyelitis, and partly because the technique of having a tracheotomy in a tank respirator has been developed much more than in this country, to provide an efficient method of treating the "combined" case.

W. RITCHIE RUSSELL.

WORK OF THE CASUALTY OFFICER

The Casualty Department. By T. G. Lowden, M.A., B.M., B.Ch., F.R.C.S. (Pp. 278+viii; illustrated. 37s. 6d.) Edinburgh and London: E. and S. Livingstone, Ltd. 1955.

Whilst in some hospitals the work of the casualty department is recognized to be of considerable importance, there are still many places where relatively junior men undertake this responsible work without adequate supervision or training. Mr. Lowden's book should be of particular value to the junior casualty officer, and it is likely to prove helpful to more senior people as well.

Starting with a short chapter on sepsis and antibiotics, the author goes on to describe common septic lesions. Primary suture of some septic wounds is recommended, and, although this may be a reasonable proposition in the hands of the discerning and experienced surgeon, some may question the wisdom of such advice in a book of this type. Then follows a long chapter on the septic hand, which is sound and in accordance with modern enlightened opinion. The chapter on soft-tissue wounds with skin loss encourages the casualty officer to think of early skin replacement without stimulating an unnecessarily officious desire to graft all such wounds. There are further useful chapters on burns and on minor non-emergency surgery. The author mentions the simple method of removing a lipoma by cutting into it and separately shelling out the two halves, and it would have been useful had he described that simple method of dealing with a sebaceous cyst by expressing the contents through a small incision and gently withdrawing the cyst wall. The last few chapters, on organization of the casualty department, anaesthesia, disposal of cases, and legal responsibilities, will all prove of value to the casualty officer.

Certain criticisms of this book must be made. The incorrect spelling of Bunnell and Wolfe is of but minor importance. However, much of the book is written in a rather awkward style which does not make for easy reading, and one may hope that the author will give this matter his attention in any future edition of a work which should prove popular in the casualty department.

R. S. MURLEY.

PHYSIOLOGICAL ACOUSTICS

Physiological Acoustics. By Ernest Glen Wever and Merle Lawrence. (Pp. 454; 148 figures. 80s.) Princeton, New Jersey: Princeton University Press. 1954.

With the possible exception of nuclear physics, there have in recent years been greater advances in acoustics than in any other branch of the physical sciences, and in consequence the literature on the subject is vast. Even to the professional physicist acoustics has the reputation of being difficult, while to those doctors whose work demands that

they should keep abreast of events in acoustics much of what is written to-day is a closed book, and many must wish that they had paid more attention to physics during the year in which it formed part of their studies.

To-day physiologists, psychologists, and of course otologists need to have a good up-to-date knowledge of the properties of sound, of how it is conducted to and perceived by the ear, how it reaches the conscious level, and finally the physical basis for the various forms of deafness. Dr. Wever and Dr. Lawrence, from Princeton University, have in their book *Physiological Acoustics* provided a contemporary and authoritative account of the mechanism of hearing which is easy to read and above all is interesting. Nothing of importance is left out, and to the scientific worker interested in acoustics, the physiologist, or the otologist this work is likely to become a standard source of reference. To the otologist in particular the book should appeal, for, despite its title, it does contain some interesting physical facts concerning deafness; and there is a chapter devoted to the forms of conductive deafness and to otosclerosis and the fenestration operation. This puts in a simple form the physical reason for the success of the fenestration operation, and indirectly it helps to explain some of the failures. For the research worker there are details of the general layout and management of animal experiments. Perhaps the most attractive feature of the book is the easy style in which it is written, and this, combined with the experience and authority of Dr. Wever, makes it a book which should be read by all interested in acoustics.

TERENCE CAWTHORNE.

MEDICO-HISTORICAL BIBLIOGRAPHY

Garrison and Morton's Medical Bibliography. An Annotated Check-list of Texts Illustrating the History of Medicine. By Leslie T. Morton. 2nd ed. (Pp. 655+xiii. £5 5s.) London: Grafton and Co. 1954.

How ungrateful we all are to those who serve us best! We daily consult dictionaries, year-books, and bibliographies without a thought of the high skill of those who made them and the vast labour that they involve. There should be a form of short prayer for the souls of the compilers of these works to be muttered when we find just what we want—a rarer event than some might think. Certainly Mr. Morton's "mountain of merit" would have reached a good height by now had we all been as grateful to him as we should be.

The history of this admirable book is as follows. In 1912 Fielding H. Garrison, editor of the *Index-Catalogue of the Library of the Surgeon-General's Office*, published at Washington an extract from that great work as a bibliography of the most important contributions to the literature of medicine and the allied sciences. He used it as a scaffolding for his well-known *Introduction to the History of Medicine*. Later he revised the list and published it in the *Johns Hopkins Bulletin of the History of Medicine*, in 1933. After Garrison's death in 1935 Mr. Morton set to work to revise it. He was in a good position to do this as a result of his experience in the libraries of University College, London, and St. Thomas's Hospital Medical School. In 1943 he produced a complete revision, admirably arranged, of Garrison's original plan. This *Medical Bibliography* has ever since been in constant use by teachers and historians of medicine and has become a standard reference work essential to every library, medical or other, of any importance. It has been the constant companion of the reviewer since it first appeared, and he can heartily recommend it as the most efficient and reliable guide to its subject that is known to him. The book has been for some time out of print, and Mr. Morton, now Information Officer of the *British Medical Journal*, has produced a second edition with nearly 7,000 entries as against the 5,500 of the first. For conciseness, convenience, accuracy, and accessibility of its vast store of information the book has no rival. We wish it the success that is its just due.

CHARLES SINGER.

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SIR HENRY DALE

Sir Henry Dale's eightieth birthday, which falls on June 9, will bring to him messages of good will from throughout the world of medicine and science, and indeed from far beyond it. To those who are familiar with Sir Henry's apparently boundless energy and enthusiasm the fact that such a young man has now completed nearly eighty years of active life will be a matter for admiration and even astonishment. To those who know of him only from his publications, and especially from the classical papers which appeared from his pen in the early years of the present century, it might be surprising that Sir Henry Dale is not already an honoured member of the pantheon of the past. Those who are acquainted with him personally realize that in him exists the living embodiment of a most interesting period of medical history; and history that lives is always entrancing.

But Sir Henry has always been much more than an outstandingly successful investigator. He almost alone now has claim—a claim that he himself would undoubtedly reject—to be a polymath in the world of medical sciences. True, he has had the good fortune to grow in stature during a period of unprecedented expansion in scientific knowledge, and he has himself contributed to the advance of knowledge in so many different aspects of medical science that familiarity with his own publications alone is a liberal education in itself. But nobody can fail to be awed at the range of knowledge he commands. Indeed, nobody can again hope to attain the degree of understanding and experience in every aspect of medical research such as Sir Henry can bring to bear upon any problem before him, whether it be biological standardization, the properties of chemotherapeutic agents, or synaptic transmission of the nerve impulse. As Lord Adrian writes in our opening pages this week, conventional labels fail to apply to Sir Henry, whose achievements can be claimed by anatomists, physiologists, pharmacologists, biochemists, and even, let it be said, by chemists, for he was at one time Fullerian Professor of Chemistry at the Royal Institution, London.

Claude Bernard was described by Professor Charles Singer as "a severe and powerful thinker with an

Olympian intellectual aloofness." "Aloofness" is a word that could never be applied to Sir Henry Dale, appropriate though the rest of the quotation may be. Although Sir Henry valued greatly the time he spent in Germany during his early years, and particularly his period in Ehrlich's laboratory, he never became a "Geheimrat." As director of the National Institute for Medical Research and President of the Royal Society during the dark early years of the war, his responsibilities were tremendous, but always he remained a friend as well as a mentor of those colleagues, senior and junior, who had the good fortune to be associated with him. His personal laboratory (F4) at the National Institute, whence came so much of scientific importance between the wars, was not a laboratory alone. F4 was indeed a nursery from which emerged many whose inspiration and accomplishment owe much to a director who continued to work with his own hands for as long as a laboratory was available. His care for and interest in the work of all those who were associated with him was witnessed by the frequency with which Sir Henry's itching pencil clarified and illuminated the many publications which came from the Institute during his tenure of the directorship. The rounded periods—reminiscent both of the Prayer Book and of Gibbon—of his own publications have set a standard of lucidity and precision in scientific writing which has influenced many but which none can equal.

Many years ago the late Sir Frederick Gowland Hopkins wrote: "Up to near the end of the last century nearly every expert looked to the influence of the nervous system alone as concerned with the co-ordination of functions in the body; the conception of chemical regulation and co-ordination had achieved no place in the mind of the majority." How the researches of Sir Henry Dale have resulted in a blending of the idea of chemical regulation and co-ordination with that of the role of the nervous system will be clear from the contributions of Professor J. H. Burn (page 1357), Professor Otto Loewi (page 1356), Dr. Herbert S. Gasser (page 1359), and Lord Adrian (page 1355) in the *Journal* this week. A point that stands out in these accounts is the significance of a mind prepared to evaluate the unexpected and seemingly irrelevant result. The apparently casual use of post-pituitary extract in control experiments which formed part of an investigation concerned with the biological effects of preparations from ergot led surely, in Dale's hands, to the recognition and investigation of the powerful and beneficial oxytocic effects of the posterior pituitary gland. Who would expect that an examination of the pharmacological properties of an extract or ergot could lead also to the

recognition of acetylcholine as a chemical transmitter of nervous impulses, or of histamine as a substance of such wide biological significance as is now recognized? Fortunately Sir Henry Dale was there to appreciate the import of these apparently insignificant initial observations, and to rear thereupon such a structure of knowledge that now each step in the development of it seems to have been inevitable. But it was inevitable only because Sir Henry with his agile and unprejudiced mind was there to seize upon the significance of the apparently irrelevant event. The final demonstration in 1936 that acetylcholine is a transmitter of impulses passing along voluntary motor nerves was the culmination of a series of papers on the subject which stretched over nearly a quarter of a century. From this developed the use of neostigmine in myasthenia gravis and as an antagonist of D-tubocurarine in anaesthesia. The demonstration of humoral transmission in ganglia led naturally to the investigation of the pharmacology of methonium compounds and to the use of a hexamethonium to ensure a bloodless field in surgery. The recognition of the relationship of histamine to anaphylaxis by Dale and Laidlaw in 1919 ultimately resulted in the development of the antihistamine substances which are now of value in many allergic and related conditions. And so the process continued; particular and apparently casual laboratory observations leading to general ideas of significance in medicine as a whole.

Throughout long periods of international distinction and responsibility Sir Henry has been ably supported by his gracious wife, and Lady Dale is known to investigators of all ages throughout the world as a kindly and generous hostess. To Sir Henry and Lady Dale we send our greetings on this most joyous occasion.

PULMONARY OEDEMA

Cardiac asthma and acute pulmonary oedema are commonplace medical emergencies, and it usually falls to the family doctor to treat the distressing attacks of paroxysmal nocturnal dyspnoea which are so alarming to the patient and his relations. Though the bedside diagnosis of pulmonary oedema presents little difficulty, and orthodox treatment is usually successful, the underlying mechanism of the attacks has hitherto been a matter of conjecture and treatment has been largely empirical. In the St. Cyres lecture, published at page 1361 of this issue of the *Journal*, Dr. G. W. Hayward reviews many of the problems of pulmonary oedema in the light of experimental data obtained by modern cardiological technique.

Acute pulmonary oedema occurs most often as a complication of hypertensive heart disease or aortic valvular disorders, but it is also seen not uncommonly in the course of mitral stenosis. It is perhaps not fully appreciated that acute pulmonary oedema may be the only manifestation of acute myocardial infarction, the underlying disease often being overlooked because of the absence of the characteristic substernal pain. The onset of pulmonary oedema depends on changes in the balance between the hydrostatic pressure within the capillaries and the osmotic pressure of the plasma and in the permeability of the capillary walls. An additional factor in patients with chronic venous congestion is that the pathological thickening of the barrier between capillaries and alveoli greatly impedes transudation of fluid into the alveoli. Studies of the pressures in the pulmonary circulation by means of cardiac catheterization confirm that pulmonary oedema occurs only when the pulmonary capillary pressure is greater than the effective plasma osmotic pressure. In the early stages this gives rise to interstitial oedema of the lung, and Hayward believes that a similar state probably exists in a more chronic form in patients with congestive heart failure, when it is responsible for the dyspnoea of cardiac failure by preventing normal lung distension. In acute pulmonary oedema the interstitial fluid is at first removed by the lymphatics, but eventually the fluid breaks through the barrier into the alveoli, and there is a sudden flooding of the respiratory tract. At some stage in this process the additional factor of increased capillary permeability also helps to cause oedema, and it may be that this is the additional impetus enabling the oedema fluid to break through into the alveoli. It is not certain what leads to the increased capillary permeability: in the late phases of pulmonary oedema it is probably aggravated by anoxia, but at the beginning of the attacks anoxia is not severe enough to have this effect, and it is possible that there is a neurogenic cause for the early increase in permeability. The clinician is aware that many attacks of acute pulmonary oedema seem to be aggravated by emotion, by unusual exertion, and by infection, and it now appears that all these factors exert their deleterious effect by increasing the pulmonary capillary pressure. The attacks, which so often occur in the early hours of the morning, are caused by an increase in pulmonary congestion when the orthopnoeic patient slips down in the bed, or by a sudden increase in venous return to the heart when a sudden muscular movement takes place during sleep.

Recent studies have thrown no new light on the treatment of acute pulmonary oedema, but they have confirmed the soundness of traditional therapy and

supplied a logical explanation for many forms of treatment already known to be effective. Any measure diminishing either the venous return to the heart or the pulmonary capillary pressure can relieve the attack in the early stages before capillary damage from anoxia has taken place. In this way venesection and administration of aminophylline exert their good effect. Morphine has long been a stand-by in the treatment of pulmonary oedema, and although there is no direct proof of its mode of action it probably lowers capillary pressure by allaying anxiety. It may also act by depressing muscle tone and thus diminishing venous return to the heart, and at the same time the cardiac output falls, since metabolism is lowered. The use of digitalis requires some caution. There can be no doubt of the value of digitalis in the treatment of hypertensive heart failure, but the intravenous use of digoxin has been known to precipitate acute left ventricular failure by its vasopressor effect. In patients with mitral stenosis, attacks of pulmonary oedema usually disappear altogether after the operation of mitral valvotomy. It remains important to treat chronic venous congestion between the attacks of pulmonary oedema by digitalis, by the mercurial diuretics, and by limiting the intake of salt. It is remarkable how effective these simple measures are in delaying, or even in preventing, further attacks of acute pulmonary oedema.

TRIETHYLENE-MELAMINE

Three years ago we discussed in these columns¹ attempts to find substitutes for nitrogen mustard in the treatment of Hodgkin's disease, lymphomas, and chronic leukaemias. Nitrogen mustard itself has serious disadvantages. It must be given intravenously, and it often causes severe nausea and vomiting; even when every care is taken the veins tend to become thrombosed; some degree of bone-marrow depression is almost always produced and is occasionally a danger to life. Triethylene-melamine at first seemed a promising substitute, for it could be given by mouth, and gastrointestinal upset was less severe and less frequent. Early clinical trials²⁻⁷ showed that its therapeutic effects were similar to those of nitrogen mustard and it was thought to be more useful in the chronic leukaemias. Now

from further experience it has become clear that triethylene-melamine has grave drawbacks. In cases of generalized Hodgkin's disease quite striking remissions may be obtained with it, but it is difficult to predict in advance which patients will respond. E. K. Blackburn and G. M. King⁸ state that complete therapeutic failures are less frequent than with nitrogen mustard, but M. M. Wintrobe *et al.*⁹ prefer to administer nitrogen mustard first and use triethylene-melamine only for maintenance therapy. L. M. Meyer *et al.*¹⁰ thought the results were inferior to those obtained with nitrogen mustard. On the other hand, most workers find that in chronic lymphatic leukaemia much better control is possible with triethylene-melamine. Patients are extremely sensitive to the drug and a single dose of 2.5 mg. may have a significant effect.⁹ Blackburn and King consider that triethylene-melamine is probably the treatment of choice in many cases of chronic lymphatic leukaemia. However, this malady is often symptomless for many years even when generalized lymph-node enlargement, high lymphocyte counts, and heavy infiltration of the bone marrow are present. There is no satisfactory evidence that treatment of such patients defers the onset of symptoms or increases the expectation of life. Symptoms resulting from a group of large nodes are probably better treated by local radiotherapy than by chemotherapy, and once anaemia or thrombocytopenia supervenes none of the chemotherapeutic agents available are of any significant value.⁹ Triethylene-melamine has given benefit in cases of chronic myeloid leukaemia; much larger doses are required than in the lymphatic variety, and although good remissions can be induced they are difficult to maintain.^{6, 10, 11} "Myleran" (1,4, dimethanesulphonyloxybutane) appears to be far more effective in this condition,⁹ particularly in maintenance therapy, but administration of it is probably better postponed until radiotherapy has lost its effect. However, it may be justifiable to give myleran first if x-ray facilities are not available.¹²

The greatest danger of triethylene-melamine is its extreme toxicity to the bone marrow—its narrow margin of safety and the "unpredictable vulnerability of the marrow."¹⁰ Even with the most scrupulous precautions irreversible damage of the bone marrow may follow treatment. The doses recommended in almost all of the earlier reports have since proved to be far too high, and, because of fatalities after doses well within the therapeutic range, all investigators have become extremely cautious. Deaths have been recorded following total doses as small as 10 mg.¹⁰ and 7.5 mg. (0.124 mg. per kg. body weight).⁸ Furthermore, patients who have received two or three courses of treatment without experiencing depression of bone marrow have sometimes succumbed to a subsequent course.^{13, 14}

The capricious behaviour of triethylene-melamine is explained by its chemistry. The molecules tend to polymerize, with resulting loss of activity. Samples thus vary in potency, and P. Alexander and W. C. J. Ross have shown wide variation in laboratory tests which include hydrolysis rates, capacity to combine with desoxyribose-nucleic acid, and ability to gelate soluble proteins. It

is most unsatisfactory for clinicians to have to depend on so unstable and toxic a compound. Yet no satisfactory substitute is available, though many substances are undergoing clinical trials, especially in the United States. "Thio-tepa" (triethylene-thiophosphoramide), closely allied to triethylene-melamine but chemically less reactive, has been very effective in an experimental leukaemia¹⁵; but clinical trials are still at an early stage, and some workers have found it less beneficial than triethylene melamine.⁹ W. C. J. Ross and his colleagues¹⁶ have synthesized a series of water-soluble aromatic nitrogen mustards which are powerful inhibitors of the transplanted Walker rat tumour. One of these, known as "CB1348" (di-2-chloroethyl-*p*-amino-phenylbutyric acid), has been tried clinically; preliminary results have shown that the drug may be effective in Hodgkin's disease, lymphosarcoma, and lymphatic leukaemia.¹⁷ CB1348 is given orally, is said to be free of side effects, and unlikely to produce irreversible damage to the bone marrow unless large doses are given. But toxic substances of this class cannot do more than palliate, and a solution of the problem of radical therapy in this distressing group of diseases certainly lies elsewhere.

SWELLINGS OF THE SALIVARY GLANDS

Recurrent swelling of a salivary gland is a familiar clinical problem, but except when calculi are present the aetiology of the condition is often obscure and treatment difficult. This is particularly true of the parotid, where stone formation is uncommon and recurrent parotitis is more often seen. In a recent Hunterian Lecture S. S. Rose has reported his findings in 192 cases of recurrent swelling of the parotid and submandibular salivary glands.¹ Careful radiological examination of these patients, including sialography, has done much to clarify the aetiology of the condition. In this series of patients, 74 had recurrent swelling of the submandibular gland, and in only two of these was the obstruction of the duct not due to a stone. Rose has produced a satisfactory classification for the causes of recurrent parotitis. Among the 118 patients in his group, duct obstruction accounted for 42 and recurrent infection for 66. Less common causes included congenital dilatation of the ducts of the gland and Sjögren's syndrome. Calculi were present in less than 3% of patients with swelling of the parotid.

Obstruction of the parotid duct is usually near its orifice at the papilla. In young adults the obstruction occurs about the time of eruption of the third molar tooth. It is believed that the papilla becomes damaged as a result of alteration in the mechanism of mastication. In patients over the age of 40 the papilla may be damaged by an ill-fitting denture. Recurrent pyogenic parotitis is usually related to inhibition of the normal secretion of saliva, which is decreased or sometimes absent, and may be associated with xerostomia.

Treatment of recurrent parotitis depends in the first instance on an accurate diagnosis, and here sialography is a helpful investigation. Duct obstruction is treated

by removal of the underlying cause, such as an ill-fitting denture, and dilatation of Stensen's duct with a lacrimal dilator. Often one dilatation is sufficient to cure the condition. In cases of recurrent infection general treatment is directed towards the correction of anaemia, achlorhydria, and oral sepsis. Patients are advised not to eat dry food, and chewing-gum is beneficial to patients with xerostomia. Infection is treated by injecting 1 g. of streptomycin in 2 ml. of solution into the duct daily for six days. This injection acts not only because of its antibiotic effect but also by mechanically dilating and washing out the duct.

INTERNATIONAL NON-PROPRIETARY NAMES

About five years ago a Subcommittee on Non-proprietary Names, attached to the Expert Committee on the International Pharmacopoeia, was appointed by the World Health Organization, and its sixth report was recently issued. The purpose of the subcommittee was the establishment of an international system of common nomenclature for new pharmaceutical products comparable to the activity in the national field of the British Pharmacopoeia Commission for the last fifteen years and to the American Medical Association for a longer period. Since 1950 the Scandinavian Pharmacopoeia Council has issued lists of non-proprietary names known as N.F.N. names (Nordisk Farmakopoei). The World Health Organization invited national pharmacopoeia commissions, drug manufacturers, and others to report on drugs for which international non-proprietary names were required and to suggest names for them. The subcommittee of three members were required to deal with the proposals by correspondence, and the chairman, Professor R. Hazard, of Paris, after consultation with his colleagues, was to decide on the names. The international non-proprietary names so selected were sent to pharmacopoeia commissions and other interested bodies with a recommendation that they be adopted and protected from registration as trade marks. Early in 1951 a first short list of names was issued, and a second list appeared towards the end of the year; few of the names were novel, most being already well established in national pharmacopoeias or works of reference.

By the end of 1952 a total of 430 names had been issued, many of them newly coined, but about this time very strong criticisms were made, especially in the United States, of the procedure used for the selection and publication of the names. This led to the issue by the Executive Board of the World Health Organization of a new procedure and a list of guiding principles to be followed by its subcommittee. In effect, all names previously issued were withdrawn and a three-stage process for publication was applied. Names proposed are first considered by the subcommittee, and, if acceptable within the "guiding principles," then published in the *Chronicle of the World Health Organization* as "proposed international non-proprietary names." During the six months after publication any interested person may raise formal objection to a proposed name,

¹ Rose, S. S., *Ann. roy. Coll. Surg. Engl.*, 1954, 15, 374.

¹ *British Medical Journal*, 1952, 1, 1343.
² Karnofsky, D. A., *et al.*, *Arch. Intern. Med.*, 1951, 87, 477.
³ Paterson, E., and Boland, J., *Brit. J. Cancer*, 1951, 5, 28.
⁴ Hansen, P. B., and Bichel, J., *Acta radiol. (Stockh.)*, 1951, 36, 469.
⁵ Bayrd, E. D., *et al.*, *Cancer*, 1952, 7, 336.
⁶ Silverberg, J. H., and Dameshek, W., *J. Amer. med. Ass.*, 1952, 148, 1015.
⁷ Rundles, R. W., and Barton, W. B., *Blood*, 1952, 7, 483.
⁸ Blackburn, E. K., and King, G. M., *J. Fac. Radiol.*, 1954, 6, 96.
⁹ Wintrobe, M. M., *et al.*, *Ann. Intern. Med.*, 1954, 41, 447.
¹⁰ Meyer, L. M., *et al.*, *Acta med. scand.*, 1952, 144, Suppl. 272.
¹¹ Bond, W. H., *et al.*, *Arch. Intern. Med.*, 1953, 91, 602.
¹² Galton, D. A. O., and Tili, M., *Lancet*, 1955, 1, 425.
¹³ Haddow, A., *Proc. roy. Soc. Med.*, 1953, 46, 692.
¹⁴ Nabarro, J. D. N., *ibid.*, 1953, 46, 696.
¹⁵ Sparks, S. J., *et al.*, *Cancer Res.*, 1954, 14, 753.
¹⁶ Everett, J. L., *et al.*, *J. chem. Soc.*, 1953, 2386.
¹⁷ Haddow, A., *Ciba Foundation Symposium on Leukaemia*, 1954, London.

and, in so far as objection is sustained, the name must be withdrawn by the World Health Organization. If no objections remain at the end of six months the name is then issued as a "recommended international non-proprietary name." By these means legitimate interests in private property in names are safeguarded, but there can be no prospect of meeting the essential need for a reasonably quick decision on a new name. The period of six months allowed for formal objection was recently reduced to four months, but although a list of "proposed" names was published in October, 1953, none attained the status of "recommended" names until the end of April, 1955.

The difficulties in the way of agreement at the international level are no doubt immense, but it can scarcely be possible for the national bodies responsible for the issue of non-proprietary names to withhold decisions for 18 months or more until "recommended" names are available from Geneva. To achieve its objective, the World Health Organization will need to provide the facilities for quicker decisions. Failing this, the sub-committee may come to function only in a general advisory capacity and as a clearing-house of information on national drug-naming activities.

TRYPSIN IN THROMBO-EMBOLIC DISEASE

For many years the proteolytic enzyme trypsin has been of interest to people studying blood coagulation. Its *in vitro* properties in promoting clotting were the first to be investigated. Ferguson and Erickson¹ showed that the addition of trypsin and calcium to plasma caused clotting in 16 seconds; after the addition of calcium alone the plasma took 95 seconds to coagulate. Whether it can be concluded from this that proteolysis plays a part in physiological blood coagulation is not known. It is perhaps significant that inhibitors of trypsin, such as soya-bean trypsin inhibitor, also oppose coagulation. In recent times it is not so much the coagulant properties of trypsin which have been of interest, but rather its action as an agent for the destruction of fibrin; such dissolution of fibrin is referred to as fibrinolysis. I. Innerfield and his co-workers^{2,3} and M. E. Peck⁴ have reported on the therapeutic trial in man of trypsin preparations for intravenous and intramuscular administration. The object of therapy with heparin and drugs of the coumarin group is to stop the spread of intravascular clotting; in contrast, trypsin is intended to remove intravascular thrombus when it has formed.

Our knowledge of human fibrinolysis is incomplete, but *in vitro* activation of proteolytic enzyme systems in plasma capable of destroying fibrin has been produced by various methods. The active enzyme is called plasmin, and it is believed to have a precursor plasminogen. Plasminogen can become plasmin *in vitro* under the influence of culture filtrates of *Strepto-*

coccus haemolyticus (streptokinase).⁵ The system can be activated also by certain inorganic solvents such as chloroform or ether, which possibly remove inhibitors.⁶ It is thought that trypsin activates plasminogen to plasmin,⁶ and that it may in addition have a direct action on fibrin itself.⁵ Innerfield *et al.*⁵ have studied the effect of intravenous administration of trypsin on experimentally produced thrombi in rabbits and dogs. They have described evidence suggesting restoration of circulation with diminution and even disappearance of thrombus. Microscopical examination showed removal of fibrin with the enclosed cellular and platelet masses without damage to the vessel wall. The same workers did not confirm previous observations of intravascular clotting after injection of trypsin intravenously. Such intravascular clotting is to be expected in view of the readily demonstrable *in vitro* coagulant action of trypsin. They attribute this failure of trypsin to produce coagulation *in vivo* to circulating antitryptic substances; it was not due to significant reduction of clotting proteins by proteolysis, which occurred only after very large intravenous doses of trypsin. Such large doses, therefore, had an anticoagulant activity. The object of trypsin therapy was to administer sufficient to lyse fibrin without unduly affecting the coagulation mechanism. Since carrying out these animal investigations Innerfield *et al.*² and Peck⁴ have reported the use of trypsin in man. They report favourably on the results of administering intravenous trypsin for thrombophlebitis. As an incidental finding during these observations, they noticed that trypsin had an apparently dramatic effect on inflammatory processes quite apart from its action on intravascular thrombus. Minor general reactions were not uncommon after intravenous administration of trypsin. They included immediate flushing of the face, a general feeling of warmth, and occasionally a sense of suffocation. Sometimes a delayed reaction appeared some hours after the injection, with nausea, vomiting, and abdominal pain. At the site of intravenous injection a local phlebitis was occasionally found. More recently Innerfield³ has reported on the favourable effect of intramuscular trypsin on the prevention of relapse in cases of chronic recurrent thrombophlebitis.

The assessment of any therapeutic agent in thrombo-embolic disease is difficult, and the results of further trials are awaited with interest. It can be shown *in vitro* that fibrinolytic activity is most successful when the enzyme is given optimal opportunity for contact with the fibrin. In a completely occluded vessel the greater part of the thrombus will be beyond the reach of administered trypsin. The work, however, is important in that it represents a renewed interest in the dissolution of fibrin rather than the prevention of its formation by anticoagulant drugs.

We record with regret the death on May 28 of Dr. C. W. Buckley, the distinguished rheumatologist, at the age of 80. He was formerly consulting physician to the Devonshire Royal Hospital, Buxton, and editor of *Annals of the Rheumatic Diseases*.

¹ Ferguson, J. H., and Erickson, B. N., *Amer. J. Physiol.*, 1939, 126, 661.

² Innerfield, I., *et al.*, *J. Amer. med. Ass.*, 1953, 152, 597.

³ — *ibid.*, 1954, 156, 1056.

⁴ Peck, M. E., *ibid.*, 1954, 156, 1260.

⁵ Innerfield, I., *et al.*, *J. clin. Invest.*, 1952, 31, 1049.

⁶ Kochotaty, W., *et al.*, *Blood*, 1952, 7, 882.

EMERGENCIES IN GENERAL PRACTICE

ACUTE HEPATIC FAILURE

BY

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"Wandering and uncertain shiverings . . . follows a most fatal putrefaction of that noble entrail."

—BOERHAAVE (1742).

Failure of liver-cell function may occur suddenly with deep coma, or its onset may be insidious and associated with a perplexing combination of mental and neurological signs. In either category its early recognition is important because it is often reversible and its recurrence can be anticipated and prevented.

The features common to all forms of acute hepatic failure are cerebral changes, fetor hepaticus, and mild fever.

The cerebral changes are diffuse, and all parts of the central nervous system may be involved. Mental disturbances are the most conspicuous; change in personality, confusion, mania, and sometimes screaming are followed by stupor and eventually coma ("hepatic coma") resembling a deep sleep. Disordered motor activity is shown by the "flapping" tremor reminiscent of the beating of a bird's wings. When the patient holds his arms in front of him with his fingers separated, rapid irregular movements occur in bursts, with flexion extension of the wrists and metacarpo-phalangeal joints. There is also a fine 6-9-per-second tremor of the outstretched hands. The movements disappear in repose and are apt to be overlooked if the patient is observed only at rest and not asked to hold his hands in front of him.

Fetor hepaticus is a sweet, slightly faecal odour detected in the breath. It has been likened to the smell of mice or to a freshly opened corpse. It is of intestinal origin.

The temperature may be raised to 100-101° F. (37.8-38.3° C.).

The two commonest causes of acute hepatic failure are acute virus hepatitis and portal cirrhosis of the liver.

Virus Hepatitis

Of the patients with virus hepatitis, 99.8% recover uneventfully. The unfortunate complication of severe liver-cell necrosis is therefore rare and correspondingly difficult to recognize.

In the jaundiced patient mental disturbance provides the earliest warning of this grave turn of events. The patient becomes disorientated, confused, and rambling. Fetor hepaticus and the flapping tremor are present. Jaundice is deep, and persistent vomiting is a bad sign. The temperature rises. Daily percussion of hepatic dullness reveals shrinking of the liver under the right costal margin. Ascites may be present if the illness is of longer than two to three weeks' duration.

Acute hepatic failure can also occur early in the course of virus hepatitis, and is then extremely difficult to diagnose, for jaundice is inconspicuous or absent. The predominant clinical features are mental, and the patient may be admitted to a mental hospital without the hepatic disease being recognized. Helpful diagnostic points are a history of

epidemic jaundice in the community or recent injection therapy giving the opportunity for transmission of the hepatitis virus. There is anorexia, the liver edge is tender, and percussion over the right lower ribs posteriorly causes sickening right upper quadrant abdominal pain. The urine contains bilirubin, but sensitive tests may be needed to demonstrate it. Fouchet's method or the new tablet test are equally satisfactory.

Portal Cirrhosis

When hepatic failure complicates chronic portal cirrhosis it is important to know why it has developed. An effort must be made to determine any factor which has depressed the liver function. Gastro-intestinal haemorrhage may have occurred from oesophageal varices, and evidence of haemorrhage must be sought. The bleeding is often slow and occult, and melaena may be detected only by rectal examination. Acute infections such as pneumonia, minor surgical operations such as paracentesis abdominis, and acute alcoholism are other possible precipitants.

When mental or neurological changes complicate well-documented cases of portal cirrhosis, the problem of recognition of the syndrome should not be difficult. Episodes of confusion, flapping tremor of the hands or arms, fetor hepaticus, or stupor can be detected by careful examination. Indeed, if the portal cirrhosis is well recognized, it is difficult to know what else could cause this strange, episodic, neurological picture. Difficulty in diagnosis arises when cirrhosis has not been considered as the underlying cause and the patient is believed to be suffering from one of the other organic dementias, arising from conditions such as cerebral atherosclerosis, cardiac failure, uraemia, Parkinsonism, and disseminated sclerosis, or from the abuse of drugs. The recognition of the underlying cirrhosis, therefore, becomes the key to the diagnostic problem. A history of alcoholism or previous jaundice should be sought, and clinical features of cirrhosis such as mild jaundice, spider naevi on the skin, palmar erythema, ascites, distended abdominal wall veins, and enlargement of liver and spleen noted.

Rarely, the neurological changes in the cirrhotic patient are chronic, and episodes of tremor, confusion, stupor, and coma may occur for years before the correct diagnosis is made. This concept of "chronic intermittent hepatic coma" has been recognized only recently. In the intervals between the episodes the patient is almost normal. Deterioration can often be related to increased amounts of nitrogen-containing substances in the intestines and may therefore follow medication with ammonium chloride, methionine or other amino-acids, or even a high protein diet. The relationship of this observation to the treatment of patients with liver disease is discussed later.

Other Causes

When acute hepatic failure occurs in pregnancy the commonest causes are virus hepatitis and eclampsia. Virus hepatitis of serum type is common in pregnancy because of the many injections performed during antenatal supervision. Cirrhosis is an unlikely diagnosis because patients with chronic liver disease are usually infertile.

Certain poisons cause acute hepatic failure, and suicidal or accidental ingestion of such chemicals as carbon tetrachloride or phosphorus must always be considered.

Prognosis

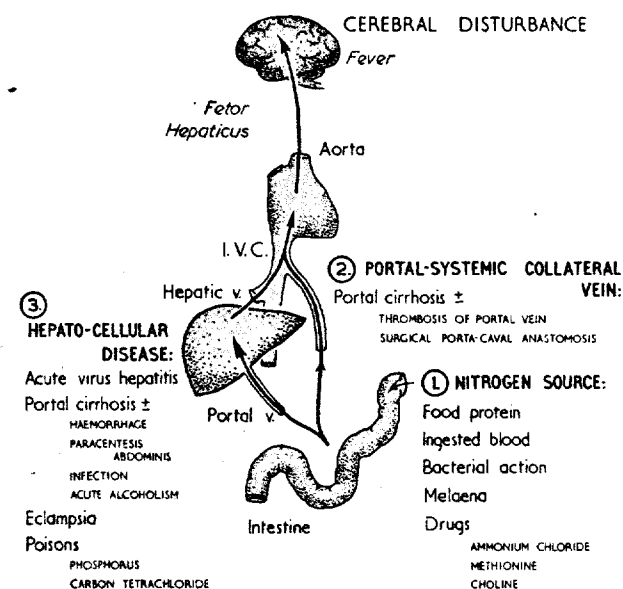
Acute hepatic failure complicating virus hepatitis has a worse outlook than that complicating cirrhosis of the liver. The mortality rate in patients with virus hepatitis and hepatic coma is about 70%. However, the liver possesses such an enormous power of regeneration that even the deeply comatose patient may resume consciousness and ultimately recover completely, with apparently no residual liver damage or shortened expectancy of life. In speaking to the relatives a reasonably hopeful attitude must therefore always be maintained.

The prognosis for acute hepatic failure complicating cirrhosis is very variable and hence difficult to predict. When there has been a clear precipitating factor such as alcoholism or infection the outlook is fairly good because such features can be corrected. When the acute failure follows haemorrhage the prognosis is poor, for the bleeding may be difficult to control.

Insidiously developing hepatic failure in the cirrhotic patient carries a reasonably good prognosis, especially if the patient is not jaundiced and neurological changes can be related to increased amounts of nitrogen in the intestines. With correct dietary management the patients can be maintained in mental equilibrium for years.

Pathogenesis of Acute Liver Failure

All the clinical features of acute hepatic failure are probably due to absorption into the blood stream of intestinal contents which have not been detoxicated by the liver (see diagram). Normally, the liver acts as a useful intermediary



The mechanism of neurological changes leading to hepatic coma (modified from Sherlock, Summerskill, White, and Phear, 1954, *Lancet*, 2, 453). The three important factors are: (1) Nitrogenous substances in the intestines. (2) Portal-systemic collateral veins diverting blood past the liver. (3) Depressed hepato-cellular function.

filter, which prevents gastro-intestinal poisons reaching the systemic circulation and the brain. The failing liver of hepatitis or cirrhosis is unable to fulfil this function adequately and the by-pass may even be accentuated by the presence of collateral vessels connecting the portal and systemic circulations, as in cirrhosis with portal hypertension. If the portal vein is thrombosed, a not uncommon complication of hepatic cirrhosis, the whole portal blood flow is deviated through collateral channels. Poisons which are apt to gain entrance to the general circulation include bacteria causing pyrexia, various intestinal toxins producing fœtor hepaticus, and certain nitrogenous substances causing cerebral disturbance. The actual cerebral poisons present

in portal venous blood are unknown, but undesirable effects may follow such nitrogen-containing substances as a high-protein diet, ammonium chloride, urea, methionine, or choline. The portal vein and cerebrospinal fluid contain a high concentration of ammonia in hepatic coma. However, the relation between the neurological changes in man and blood "ammonium" concentration is not close enough to assume that ammonia toxicity is the cause. The patients are not hypoglycaemic and no other constant biochemical abnormality has been demonstrated.

This theory of "auto-intoxication" or *portal-systemic encephalopathy* may appear to be an old one, but it certainly accounts for many of the clinical features which commonly occur in hepatic failure, and it suggests a regime of management which has proved satisfactory in these patients.

Treatment

There is little active treatment that can be undertaken before hospital admission. Therefore admission is urgent and should be arranged as soon as the diagnosis is made. It is important to resist the use of drugs which are detoxicated by the liver, because their prolonged and undesirable action may contribute to the coma. Such drugs include morphine and most barbiturates. If the patient is restless and sedation is indicated, paraldehyde may be given per rectum in a dose of 16-20 ml. emulsified in 60 ml. of normal saline. Otherwise, glucose drinks will suffice as a temporary measure.

The management of the patient in hospital is here given only in outline. The initial care should always be undertaken in an establishment where constant supervision, a suitable dietary regime, and clinical and biochemical assessment of liver-cell function are all available. The basic principles, however, apply equally when the cirrhotic patient is discharged home to the practitioner's supervision.

Treatment in hospital is directed along two lines: (1) eliminating potentially toxic nitrogenous substances from the intestines; and (2) improving hepato-cellular function.

Elimination of Intestinal Intoxicants

Possible toxic nitrogenous compounds include a high-protein diet, methionine, choline, and ammonium chloride, and these are all avoided. The physician is torn between the policy of a liberal protein diet as a general principle in liver disease and the avoidance of protein because of its potential toxicity. When the patient is first observed, protein should not be given, but he should be maintained for one week on glucose and a little fat. This alone may produce a striking remission of the neurological sequelae and permit more adequate assessment of liver-cell function. Such a protein-free diet can be used only temporarily until symptoms are brought under control; thereafter, protein must be gradually increased. A diet containing 25 g. of protein is introduced for one week, and this should be raised by 25 g. during successive weeks. It is usually found that patients with cirrhosis and chronic neurological complications can tolerate only 50 g. of protein daily. It must not be thought that all patients with cirrhosis of the liver should have such a low-protein diet; it is recommended only for those with neurological complications.

During the initial protein-free period, adequate caloric intake must be maintained, otherwise endogenous protein breakdown produces amino-acids and a further metabolic strain on the liver. So long as the patient remains co-operative 2,000 calories can be administered daily by mouth in the form of 20% glucose in fruit juices. Should he be unco-operative, it may be necessary to resort to gastric tube-feeding or intravenous infusions. An intragastric tube supplying 20% glucose in water at a rate of 20-30 drops a minute provides 2 litres or 1,600 calories during 24 hours; 1 g. of potassium chloride is added to each litre.

Intravenous feeding is recommended if persistent vomiting or uncooperation makes the intragastric drip method impracticable. In order to provide sufficient calories without

fluid overload, 20% glucose in water is employed, 2 litres a day being given. Since this would irritate small veins, with a resulting phlebitis, it is delivered into a large venous channel, such as the innominate vein or superior vena cava, by means of "polythene" tubing. This method ensures continuous intravenous feeding for several days.

Since toxæmia from the effect of intestinal bacteria on nitrogen-containing substances may play a part in the genesis of these changes, temporary sterilization of the gut is worthwhile. It is best to choose a broad-spectrum antibiotic such as chlortetracycline or tetracycline, giving 0.5 g. six-hourly orally, or if necessary by stomach tube, as long as the coma lasts or to a maximum of one week. Parenteral antibiotics are not effective.

After an enema initially, daily motions should be ensured with magnesium sulphate.

Improvement of Hepato-cellular Function

This implies the energetic treatment of any factor which is depressing liver function and precipitating failure. Infection is treated with antibiotics, anaemia is controlled by blood transfusion, and alcohol is forbidden. A carbohydrate diet allows the maximal metabolic rest to the liver.

Intravenous glutamic acid has been advocated for the treatment of patients with hepatic coma. Wide experience of it in many parts of the world has failed to show any consistent improvement in patients suffering from a condition remarkable for its day-to-day variation.

Results of Treatment

Any treatment advocated for hepato-cellular failure is difficult to assess, for the cause of the syndrome is uncertain and the clinical state so variable from time to time. Using the above conservative regime, I have treated 21 patients with the syndrome of acute hepatic failure due to virus hepatitis or portal cirrhosis. Two of five patients with virus hepatitis and 11 of 16 with portal cirrhosis have survived episodes of coma.

If the patient with acute virus hepatitis survives acute hepatic failure, recovery is usually complete. The cirrhotic patient, however, is liable to recurrences, and the general practitioner must then decide whether readmission to hospital is necessary. Gastro-intestinal haemorrhage, rapidly accumulating ascites, or deep coma are clear indications for immediate admission to hospital. If, on the other hand, the changes described above are recognized early, conservative management can be employed in the home. Improvement can be reasonably expected within 36 hours, and this may avert unnecessary readmission to hospital.

Next article on Emergencies in General Practice.—
"Pulmonary Embolism," by Professor R. B. Hunter.

CHILD WELFARE CENTRE**"PROVINCE OF NATAL" WELFARE CENTRE
OPENED IN LONDON**

The High Commissioner for the Union of South Africa (Mr. G. P. JOOSTE) on May 26 opened the "Province of Natal" Centre for Child Health in London. The centre is a handsome and spacious erection in Guilford Place, on the dividing border between the boroughs of Holborn and St. Pancras, and adjacent to the Hospital for Sick Children, Great Ormond Street. In addition to serving as a welfare centre, it is to house the Institute of Child Health, hitherto located at the hospital, and it seems to have a fair amount of space unallocated and available for future developments.

The ground floor is planned for maternity and child welfare work, with a hall for lectures and meetings, a kitchen for demonstrations, and a creche open on certain afternoons a week in which busy mothers may leave their children. The first floor is given over to school health work, and here all the activities of a school health service which are more conveniently carried out at a clinic than in the school itself will proceed. On this or the floor above there are a dental department, an orthoptic clinic, a clinic for minor ailments, an audiology room, and a child guidance centre, where a psychiatrist and psychiatric social worker will be engaged. Elsewhere in the building are two large laboratories and all their accessories. Special attention was drawn to the system of benches cantilevered from the wall and provided with continuous service racks, while each of the under-bench units is independent and removable.

A South African Benefaction

At the opening ceremony Professor ALAN MONCRIEFF, Director of the Institute of Child Health, explained how this new venture had come about. He reminded the company that the University of London Institute of Child Health was founded in 1946, with a generous gift from the Nuffield Foundation to establish a chair in child health and with the warm support of the university authorities on the one hand and the board of management and staff of the Hospital for Sick Children on the other. Investigations then began to be made into where and how a model welfare centre could be established. In 1947 the Mayor of Durban, Mr. Rupert Brown, came to London, and in an interview with Professor Moncrieff said how sorry he was that the National Health Service newly instituted in Britain prevented the people of Natal from helping Great Ormond Street. "I remember gripping my chair hard as I launched into a tactful explanation to him of how the money could still be used—for our model welfare centre." He had a dreadful feeling that he was too late, but fortunately the Mayor was convinced, the South African Gift Committee was communicated with, and before the end of the year a grant of £106,888 had been made. Then ensued a period of planning and architects' conferences. The University had acquired land, a portion of which was available, and the London County Council signified its willingness to pay 90% of the cost of maintenance and all the salaries of medical and nursing staff. A house committee, with representatives of the L.C.C., the two borough councils from whose areas most of the children will be drawn, and the Institute of Child Health, will control general matters of policy, voluntary help, clinic sessions, amenities, and so forth. Professor Moncrieff added that it was a stipulation at the time of the original gift that the name "Province of Natal" should be associated with the centre.

The object was first to give a model service to the children of this part of London, and also as a university centre to undertake teaching and research. Postgraduate doctors and student nurses would come from Great Ormond Street to learn what was going forward, also health visitors, and it was hoped that the L.C.C. would use the centre in the training of their medical and nursing staffs.

The HIGH COMMISSIONER then formally declared the Centre open and unveiled a commemorative plaque. He explained that the financial assistance which came from the people of Natal was from a fund originally called the "Salute to Britain" fund, expressive of the deep feeling of sympathy for the people of Britain in their ordeal during the war. It was difficult to conceive a more fitting manner in which the money could have been used than in the construction of this Centre to alleviate suffering and promote knowledge in the service of children, in whom lay the future of any nation.

The thanks of the London County Council for the facilities provided by the centre were voiced by its chairman, Mr. NORMAN PRITCHARD, and His Excellency was thanked by Lord WAVERLEY, chairman of the governing body of the British Postgraduate Medical Federation.

MEDICAL MEMBERS OF PARLIAMENT

Below are biographical notes of the members of the medical profession who were successful at the General Election held on May 26. Altogether 20 candidates with medical qualifications stood for election.

Dr. R. F. B. Bennett

Dr. R. F. B. Bennett (Conservative, Gosport and Fareham) was born in July, 1911, and was educated at Winchester, New College, Oxford, and St. George's Hospital, London. He qualified in 1937, and graduated B.M., B.Ch. in 1942. During the war he served in the R.N.V.R., and subsequently with the Fleet Air Arm, first in the Western Approaches, where he was twice torpedoed, and then in Tanganyika and Ceylon, completing more than 500 hours' flying as a pilot. Towards the end of the war he was attached to the R.N. Psychiatric Hospital at Knowle. After the war he was a psychiatrist



for South Hampshire. Dr. Bennett contested the East Woolwich constituency in the 1945 election. In 1950 he had a majority of 10,584 at Gosport and Fareham, and a similar majority in 1951. He was Parliamentary Private Secretary to the Home Secretary from 1951 to 1954, and to the Minister of Fuel and Power from November, 1954, to this year's General Election. He has been secretary of the Conservative Parliamentary Committees on Air and Civil Aviation since 1951; psychiatrist to the Institute for the Study and Treatment of Delinquency since 1950; and a member of the South-west Metropolitan Regional Hospital Board since 1953. He was a member of the Steering Committee of the Parliamentary and Scientific Committee from 1952 to 1954. He is a member of the Inner Temple, and holds the rank of surgeon lieutenant-commander in the R.N.V.R.

Dr. R. F. B. BENNETT (Conservative) 30,918
Mr. S. J. Surrey (Labour) 18,432

Dr. A. D. D. Broughton

Dr. A. D. D. Broughton (Labour, Batley and Morley) was born on October 18, 1902. He was educated at Rossall School, Cambridge University, and the London Hospital. He qualified in 1929 and graduated M.B., B.Chir. in 1937. He took the D.P.M. in 1936 and the D.P.H. a year later. Dr. Broughton held appointments as casualty officer at Poplar Hospital and as receiving-room officer at the London Hospital before returning to Rossall School for a few years as resident medical officer. He entered general practice in Batley in 1932. During the war he served in the Medical Branch



of the Royal Air Force. Dr. Broughton was elected a member of the Batley Borough Council in 1946 and held office as vice-chairman of the public health and of the maternity and child welfare committees. He took his seat in Parliament in February, 1949, after winning the Batley and Morley by-election, and was returned with a majority of 9,885 in the 1950 election, and with only a slightly reduced majority in the 1951 election.

Dr. A. D. D. BROUGHTON (Labour) 27,178
Mr. H. Watson (Conservative) 17,970

Mr. J. D. Cronin

Mr. J. D. Cronin (Labour, Loughborough) was born on March 1, 1916, and received his medical education at St. Bartholomew's Hospital, qualifying in 1939. In the following year he graduated M.B., B.S. at London University, and in 1947 he obtained the F.R.C.S. Mr. Cronin is orthopaedic surgeon to the French Hospital and is an adviser on industrial injuries to a number of trade unions. He is examiner in surgery for the General Nursing Council. During the second world war he served from 1942 to 1946 in the R.A.M.C., attaining the rank of captain.



Mr. J. D. CRONIN (Labour) 24,044
Mr. M. V. Argyle (Conservative) 19,781

Mr. Walter Elliot

Mr. Walter Elliot (Conservative, Kelvingrove) was born on September 19, 1888, and was educated at Glasgow Academy and the University of Glasgow. He took the B.Sc. in 1910, graduated M.B., Ch.B. in 1913, and proceeded D.Sc. in 1923. The honorary degree of LL.D. has been conferred on him by the Universities of Aberdeen, Edinburgh, Glasgow, and St. Andrews, and Leeds and Manchester, and he is an honorary D.Sc. of the University of South Africa. From 1933 to 1936 he was Lord Rector of Aberdeen University, and he was Rector of Glasgow University from 1947 to 1950. Mr. Elliot was elected F.R.S. in 1935 and F.R.C.P. in 1940. During the war of 1914-18 he served with the R.A.M.C. Mr. Elliot was returned to Parliament as Member for the Lanark division in 1918 and again in 1923, and he was a Member for the Kelvingrove division of Glasgow from 1924 until the General Election of 1945, when he lost his seat by 88 votes to the Labour candidate. In 1946 he was returned to Westminster by the Scottish Universities after a spectacular contest in which all his opponents lost their deposits.



The Representation of the People Act of 1948 abolished the university vote, and Mr. Elliot therefore returned to the Kelvingrove division of Glasgow for the General Election held in 1950, when he had a majority of 1,224, and he was re-elected in the following year with an improved majority. Mr. Elliot became a Privy Councillor in 1932, and from 1923 onwards he held in succession the offices of Under-Secretary of Health for Scotland, Under-Secretary of State for Scotland, Financial Secretary to the Treasury, Minister of Agriculture and Fisheries, Secretary of State for Scotland, and Minister of Health. In 1941-2 he was a director of Public Relations at the War Office.

Mr. WALTER ELLIOT (Conservative) 14,854
Mr. J. L. Williams (Labour) 11,966

Mr. Somerville Hastings

Mr. Somerville Hastings (Labour, Barking) was born on March 4, 1878. He is consulting aural surgeon to the Middlesex Hospital. A student at Middlesex Hospital and University College, London, he graduated M.B., B.S. in 1902 and took the F.R.C.S. in 1904. Mr. Hastings has been interested in medical politics for many years. He was a member of the B.M.A. Planning Commission, whose report was published in 1942. In 1929 he assisted in the formation of the Socialist Medical Association, of which he is a past president. He is also a member of the public health advisory committee of the Labour Party. He was returned as Labour M.P. for Reading in 1923, and again in 1929, and was Parliamentary Private Secretary to the Board of Education in the first Labour Government.



Mr. Hastings has been a member of the London County Council since 1932, and he became chairman of the hospitals and medical services committee of the council in 1934, holding this post for 10 years until he became chairman of the council itself. He was a member of the Curtis Committee, and is now vice-chairman of the children's committee of the London County Council. He is an alderman of the council. At present, at the age of 77, he is a member of the North-east Metropolitan Regional Hospital Board. Mr. Somerville Hastings was returned in 1945 as the Member for Barking with a majority of 18,911; in 1950 with a majority of 20,030; and in 1951 with a still larger majority.

Mr. SOMERVILLE HASTINGS (Labour) 27,129
Mr. B. Massey (Conservative) 12,082

Dr. Charles Hill

Dr. Charles Hill (Liberal and Conservative, Luton) was born on January 15, 1904, and was educated at St. Olave's School, Trinity College, Cambridge, and at the London Hospital. He qualified in 1927, and graduated M.B., B.Chir. in 1929, proceeding M.D. in 1936. For a time he was a London University extension lecturer, and then spent two years as deputy medical officer of health for Oxford before coming to the B.M.A. as assistant secretary in 1932. Three years later he was made deputy secretary, and in 1944 he became secretary, which post he held until his resignation in 1950. He has been active in the affairs of



the World Medical Association, of which body he was president in 1949-50. He was formerly chairman, and is now vice-president, of the Central Council for Health Education. He first stood for Parliament in 1945, when he unsuccessfully contested the Cambridge University constituency as an Independent. In 1950 he was returned for Luton as a Liberal and Conservative with a majority of 1,086, which figure he improved upon at the 1951 General Election. He was Parliamentary Secretary to the Ministry of Food from 1951 to April 7 this year, when he was appointed Postmaster-General, becoming also a Privy Councillor.

Dr. CHARLES HILL (Liberal and Conservative) ... 24,722
Mr. M. Janis (Labour) 20,304
Miss J. Henderson (Liberal) 3,140

Dr. Donald McI. Johnson

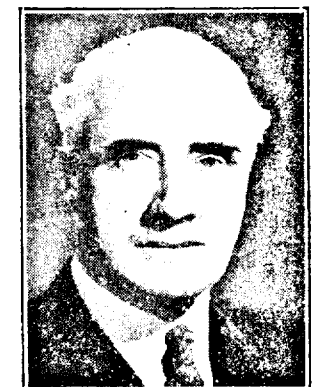
Dr. D. McI. Johnson (Conservative, Carlisle) was born on February 17, 1903. He was educated at Cheltenham College and at Gonville and Caius College, Cambridge, and St. Bartholomew's Hospital, qualifying in 1926. He was in general practice when war broke out in 1939, when, as a Territorial officer, he was mobilized for service in the R.A.M.C. Since the end of the second world war he has founded a publishing firm and has written a number of books. He is a member of Sutton and Cheam Borough Council. He has stood for Parliament on four previous occasions as a Liberal candidate.



Dr. D. McI. JOHNSON (Conservative) 20,071
Mr. A. Hargreaves (Labour) 19,701

Colonel Malcolm Stoddart-Scott

Colonel Malcolm Stoddart-Scott (Conservative, Ripon) was born on September 23, 1901. He was educated at Elmfield College, York, Ashville College, Harrogate, and Leeds University, where he graduated M.B., Ch.B. in 1926, and proceeded M.D. in 1929. Colonel Stoddart-Scott served as D.A.D.M.S. and A.D.M.S. 48th Division in the second world war. He has been honorary secretary of the Conservative Parliamentary Health Committee, and he sat on the Standing Committees which dealt with the National Health Service Bill, Analgesia in Childbirth Bill, Nurses Bill, Milk Designation Bill, and other measures. He was first elected to Parliament in 1945 as the Conservative Member for Pudsey and Otley with a majority of 1,651. In 1950 he was returned for Ripon with a majority of 10,975, and in 1951 he increased his majority to 12,420.



Colonel M. STODDART-SCOTT (Conservative) ... 21,977
Mr. E. Brierley (Labour) 9,912

Dr. Barnet Stross

Dr. Barnet Stross (Labour, Stoke-on-Trent Central) was born on December 25, 1899, and was educated at Leeds Grammar School and at Leeds University. He graduated M.B., Ch.B. in 1925, and was engaged in general practice in Stoke-on-Trent until 1948. Dr. Stross was elected councillor of the City of Stoke-on-Trent in 1937, and in the following year he accepted an invitation to stand as Parliamentary candidate for the Hanley division of Stoke-on-Trent. In 1945 he entered Parliament, representing this division. Dr. Stross served on the Standing Committees responsible for con-



sidering the National Health Service Bill, the Nationalization of Coal Bill, and the Criminal Justice Bill. He was returned as the Member for Stoke-on-Trent (Hanley) in 1945 with a majority of 11,602; for Stoke-on-Trent Central in 1950 with a majority of 16,547; and in 1951, again for Stoke-on-Trent Central, with a slightly reduced majority.

Dr. BARNET STROSS (Labour) 28,452
Mr. G. B. Price (Conservative) 16,097

Dr. Edith Summerskill

Dr. Edith Summerskill (Labour, Warrington), who was born in 1901, was a student of King's College, London, and Charing Cross Hospital. She qualified in 1924. She served on the Middlesex County Council from 1932 to 1938, fought a Parliamentary by-election in Putney in 1934 (reducing the majority against Labour from 22,000 to 2,000), contested Bury at the 1935 General Election, and was returned in 1938 as the Member for West Fulham. In 1945 she was again returned by West Fulham, and was Parliamentary Secretary at the Ministry of Food from then until 1950, when



in the next Government she became Minister of National Insurance. In 1946 Dr. Summerskill represented Great Britain at the Food and Agriculture Organization's conference at Washington, and again in 1947 in Geneva. She was one of the organizers of the Socialist Medical Association. In the 1949 New Year Honours List it was announced that Dr. Summerskill had become a Privy Councillor. In 1945 Dr. Summerskill had a majority of 7,521; at the 1950 election she had a majority of 2,849; and in 1951 2,583. She was adopted as the Labour candidate for Warrington at this election in place of Dr. H. B. W. Morgan, the retiring Member, who did not seek re-election.

Dr. EDITH SUMMERSKILL (Labour) 22,721
Mr. H. Davies (Conservative) 17,075

Acknowledgments

The photographs of Dr. Charles Hill and Dr. A. D. D. Broughton are by Elliott and Fry Ltd.; that of Mr. J. D. Cronin by Wakefields of Chiswick; Colonel Malcolm Stoddart-Scott by Bassano; Mr. Walter Elliot by Davis (Streatham); Mr. Somerville Hastings by Illustrated; Dr. D. McI. Johnson by Cumberland News; Dr. Edith Summerskill by London News Agency; Dr. R. F. Bennett by Barrett; and that of Dr. Barnet Stross was taken privately.

Radiotelephony is being used by many local health authorities in the control of their ambulance fleets, and is to be introduced on a limited scale into the London ambulance service. The health committee of the London County Council proposes to equip six ambulances and a staff car for two-way radio-transmission, and to adapt three more ambulances as reserves, with a control set at headquarters. These ambulances will be used primarily to reinforce general ambulance stations working under pressure; their crews will be able to receive instructions without returning to base, to verify doubtful information quickly, and to report immediately any special circumstances, such as births in ambulances. They will also be a valuable means of controlling operations at any major disaster. The estimated cost of initial equipment is £2,975.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Environmental Cancer Research

SIR.—Sir Ernest Kennaway in a recent article (*Journal*, May 7, p. 1107) called attention to the significance of studying cancer in man from the epidemiological point of view. He emphasizes that this type of cancer research, though it may be empirical, can well lead to the identification of carcinogenic factors for man whose avoidance would be followed by a reduction in incidence of certain cancer types.

For many years Sir Ernest has played a leading role in cancer research, covering many phases of this field. It is thus of interest that of late he has given so much emphasis to the study of cancer as it is influenced by our environment as a practical means of combating cancer. He has pointed out that environmental factors do not only play a role in certain limited occupational fields, but can also affect large segments of the population as, for instance, cancer of the lung and cancer of the cervix. On my visits to London I always look forward to a discussion with Sir Ernest and to learning from him about his latest research in cancer epidemiology. He has contributed greatly to my own interests in this field. This admiration, however, does not prevent us from having occasional differences of opinion.

Sir Ernest believes that the circumcision factor may not account for the low rate of cervical cancer in Jewish women because of the great differences in cervix and penile cancer rates in England, which should both be influenced by smegma application. This view does not consider that differences in tissue susceptibility may account for such variances in rates. Furthermore, there may be co-factors affecting the cervix but not the penis. Similarly, smoking affects both lung and larynx cancer, though here, too, the incidence rates vary greatly.¹ It is important, however, that the incidence pattern be similar among different population groups as far as penile and cervical cancer are concerned for these two types of cancer, as is the case. It is for this reason, added to the statistical evidence available, that we felt the circumcision factor to be consistent with the belief that it aids in lowering the rate of cancer of the cervix.

In respect to the abstinence after menses data, we had no proof that such abstinence was a factor in the low incidence of cervical cancer in Jewish women. Ten out of twenty Jewish women with cancer of the cervix (not five as erroneously stated in the *British Medical Journal* article) did not abstain after menses, whereas five abstained for the full period of seven days.² We pointed out that these were insufficient cases to allow statistical analysis, though they were in line with the controls. As our other reason as to why we felt that the abstinence period was probably not as important as proposed, we found that the rate of abstinence in Jewish women in New York City in the early fifties, and certainly in the forties and younger age groups, has decreased so markedly that the rate of cervical cancer should have been increasing significantly among Jewish women in this city, a fact which has not been observed. As the younger Jewish women advance into the cancer age, the answer to this question will be even more apparent. Perhaps the abstinence factor could be more easily examined if it could be studied independently from the factor of circumcision. We believe that, since Jews continue circumcision and as long as there are not many inter-racial marriages, the rate of cancer of the cervix will remain low in Jewish women in spite of the fact that they no longer significantly practise the abstinence period. Subsequent years will prove or disprove this concept. We have

repeatedly emphasized, furthermore, that circumcision represents only one of the factors that seems to affect the risk to develop cancer of the cervix. However, in environmental factors, as Sir Ernest has so frequently pointed out, it suffices if we successfully halt exposure to one given factor.

To those who, in addition to carrying out laboratory research, also have the task of caring for cancer patients, the need for preventive measures becomes increasingly clear. Some day it is hoped, of course, that what Sir Ernest calls fundamental research will give us the basic answer and cure for all cancers. However, such an answer and such a cure do not seem within our reach at present. It is therefore important that we must concentrate on the study and modification of environmental factors which seem to influence the development of a majority of our cancers. In this field international co-operation is of first-rate importance. It is along these lines that Sir Ernest Kennaway has made so many significant contributions which have stimulated research in many parts of the world.—I am, etc.,
New York, 21, U.S.A.

ERNEST L. WYNDER.

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Measles

SIR.—Dr. J. F. Lund (*Journal*, May 21, p. 1279) raises certain important and urgent principles which require a considerable amount of further thought and attention from all those engaged in the practice of medicine. The subject is the use (and abuse) of antibiotics not only in general practice but also in other branches of medicine.

We seem to be confused over the whole matter. How much of the vast amounts of these drugs, which are now being used and which are costing the nation so much money, are really necessary? It seems impractical and a sign of inexperience that we should immediately think in terms of antibiotics when confronted with all types of infections, irrespective of whether they be severe or slight. We are all agreed that the more severe conditions, such as the pneumonias, meningitis and osteomyelitis, require urgent and adequate treatment with the antibiotics, but is it necessary to treat sore throats indiscriminately with "25 g. of aureomycin, 36 penicillin lozenges and a gargle," as was seen on one prescription handed to a chemist? We seem to have forgotten that these same infections used to settle down without a great deal of trouble, in most instances, a decade or so ago. A further factor which has apparently escaped notice is that it is probable that the virulence of the infecting organisms has altered. There is no question that scarlet fever is now both less frequent and less severe, and that ear infections are also less virulent. Whether this has come about because or in spite of the use of these drugs is a matter for conjecture, discussion, and research. A further question to be answered is: What is the best route for their administration, with special reference to oral penicillin? Are the wide-spectrum antibiotics as necessary as prescribing costs suggest? It may not have been such a bad idea to have retained the restrictions which were previously applied to the use of these drugs in general practice. Another aspect which merits consideration is the steadily rising numbers of fatalities and ill effects attributable to the use of these substances. Yet another thought is to the future. The proportions of resistant organisms are mounting, especially so in the hospitals. It would be disastrous to think that in the future we might run out of antibiotics which would control these resistant organisms.

To return to Dr. Lund's question. In the same measles epidemic, and only some few miles from him, I had in my own practice 135 cases of measles and I did not use any prophylactic chemotherapy or antibiotics. Of all these, only four children eventually needed selective treatment with intramuscular penicillin: two catarrhal children who developed an acute chest infection which settled within five days and two other children needed similar therapy for acute otitis media—these also cleared up rapidly with no after-

effects. It is most important to know whether these drugs are or are not necessary in view of the almost equally good results with these two differing forms of therapy. We await therefore with great interest and expectation the results of the College of General Practitioners' investigation into this very subject.

To show that antibiotics are not necessary in the vast majority of other common infections in general practice I would like to quote from some figures which I have been keeping over the past few months. I have followed the rule that non-specific therapy be given unless there are definite indications for their administration. The two conditions which have been observed are acute otitis media and acute exudative throat infections. In acute otitis media, out of 80 cases antibiotics (penicillin only was used) were considered necessary in only 39% of cases; there were no complicating after-effects in any of these 80. In the acute sore throats, antibiotics (again intramuscular penicillin was the only one used) were required in only 25% out of the 50 cases seen.

I hope that I have made the issues clear—namely, that we need a reassessment and reorientation in clarifying the indications for the use of antibiotics, especially in reference to their use for minor conditions in general practice.—I am, etc.,

Beckenham, Kent.

JOHN FRY.

SIR.—I was interested in Dr. J. F. Lund's letter (*Journal*, May 21, p. 1279) describing his experiences with prophylactic penicillin in measles. Between January and April of this year I treated 100 cases, ranging in age from 5 months to 7 years. They all received an oral penicillin suspension in a dosage of 100,000 units to 200,000 units four-hourly, depending upon age. The only complication I encountered was in the case of a boy aged 3½ years who developed appendicitis seven days after the appearance of his rash. I gather this is a recognized complication of measles, which is a disease primarily affecting the mucous membranes. Incidentally, it was not mentioned as a complication in your interesting leading article on measles in the *Journal* of April 23 (p. 1018).—I am, etc.,

London, S.W.4.

G. J. GRAINGER.

SIR.—I would like to endorse Dr. J. F. Lund's remarks in his letter on the prophylactic use of sulphonamides in measles (*Journal*, May 21, p. 1279). I personally have seen just over 80 cases during the recent epidemic with an age range of 6 months to 7 years. In addition there have been about another 100 cases dealt with by the practice. All have had prophylactic sulphonamides and none have developed complications. We may, or may not, have been lucky, but propose to continue with our present routine.—I am, etc.,

Spondon, Derbyshire.

R. G. G. TAYLOR.

SIR.—I am afraid Dr. J. F. Lund (*Journal*, May 21, p. 1279) and his principal, Dr. R. G. Wigoder, have drawn false conclusions from a mere coincidence. My partner Dr. T. D. Reilly and I have notified 56 cases of measles since January 1. We have used no prophylactic sulphonamides or penicillin and we have had no case with complications. It is to be hoped that none of the organisms in Dr. Lund's patients will prove resistant to penicillin in later illnesses, otherwise its already expensive use will require increased expense in the use of newer antibiotics.—I am, etc.,

Liverpool, 22.

F. R. CRADDOCK.

Disseminated Sclerosis

SIR.—We feel that Dr. Hugh Garland did not do full justice to the book by Drs. Douglas McAlpine, Nigel D. Compston, and Charles E. Lumsden on *Multiple Sclerosis* in the review in the *Journal* of May 14 (p. 1197). It is a valuable book, the first of its kind in this country on this important subject. We calculate that there is approximately one case of disseminated sclerosis per thousand of the adult

population in Northern Ireland, which emphasizes how common is the disease. Dr. Garland implies that one should not make a diagnosis of disseminated sclerosis in two or more members of one family. In a controlled study¹ we have found 6.5% familial incidence and we know of no controlled study which refutes this finding. We cannot, however, claim that the familial factor is important in the aetiology. A similar familial incidence is found in diabetes mellitus; yet no one would consider changing the diagnosis of diabetes mellitus on account of a positive familial history.

Dr. Garland mentions Professor Platt's valuable suggestion that artificial feeding in infancy may play a part in the aetiology of disseminated sclerosis. We inquired into breast-feeding in our survey, and where a definite answer could be obtained we found that 90% of our patients had been breast-fed. However, we did not inquire how long this had been carried on. However, recently we came across a young woman in her twenties with undoubted disseminated sclerosis, who gave the startling information that she had been nursed at the breast for three years.—We are, etc.,

R. S. ALLISON.

J. H. D. MILLAR.

Belfast.

REFERENCE

¹ Allison, R. S., and Millar, J. H. D., *Ulster med. J.*, 1954, 23, Suppl. No. 2.

Food-poisoning

SIR,—I think that doctors in the public health service will have been struck by an air of unreality in Dr. Christopher Hardwick's article on "Acute Food-poisoning" (*Journal*, May 14, p. 1205). To say that "single cases and outbreaks of food-poisoning still occur with some frequency" seems a marked understatement to the M.O.H. who is recording them week by week without much intermission. Dr. Hardwick also says that outbreaks of bacillary dysentery due to *S. sonnei* "occur occasionally" and that various institutions provide the bulk of the cases. In actual fact, this is a constant disease, occurring week by week in the general population of a large town, much as scarlet fever and whooping-cough occur, all the year round.

We in the public health service are constantly saddened and baffled by the complete detachment of our clinical brethren from the wider aspects of medicine, and here is yet another example of the way in which clinical teachers seem to be quite unaware that facts and figures about the present situation await them at the end of a telephone in the local town hall.—I am, etc.,

Cambridge.

CYRIL G. EASTWOOD.

The Changing Face of Medicine

SIR,—I read with interest Professor Kennedy's presidential address as delivered to the Edinburgh Obstetrical Society and reported in the *Journal*, April 30, p. 1045. It contains a reference to the problem of National Service and the doctor, which I am sure was not made in a bad spirit but which would seem to indicate that the two years thus spent is a complete and utter waste of time in the majority of cases. I feel that this is an opinion widely held and upon which a little illumination is well overdue.

What has the R.A.M.C. to offer to the National Service medical officer? It cannot be denied that it provides for the regular and short-service officer facilities for post-graduate specialist study which are unrivalled in the civilian medical world. Obviously these facilities cannot be made available to the man who is there for two years only, and he has to be used exclusively to fulfil the military commitments of the country. But every effort is made to give the National Serviceman the sort of work he would like, if this is at all possible and provided he has sufficient experience to be able to carry it out.

He may go to a military hospital to serve in whichever specialty he may have had experience in. Here he will find abundant clinical material with every opportunity to learn and every encouragement to do so. Should he take advantage of this and mark his work with the attainment of a higher degree or part of it, he will find genuine pleasure

at his success. There is no lack of helpful teaching and advice. Such special facilities which do exist he may make free use of. He may be posted as a general duty medical officer. Here he is virtually a general practitioner. Considering the age group of his patients it is not surprising that chronic ill-health is uncommon and many conditions practically non-existent—but he should find plenty to occupy his attention. For the rest, many will find themselves in close proximity to a civilian hospital. There is no Army regulation to stop them visiting such a place. It must be remembered that there is no compulsion on the National Service medical officer to improve his knowledge and ability beyond that necessary in the performance of his duties—much depends upon himself as it does in civilian practice. As a National Service officer myself I can say in all sincerity that I have received nothing other than help and encouragement during my period of service.

In conclusion I would like to make it clear that I do not suggest that a period of National Service is a benefit from the purely professional point of view, or that it is intended that it should be. It is a matter of personal initiative. If a man has no desire to learn and is content to vegetate then he has every right to do so and no one will compel him. In such circumstances, however, he is in no position to grumble and say that he has learned nothing and forgotten much. If a refresher course is needed on the completion of his service then it is completely and utterly his own unaided fault, and any vacuum which may exist is confined solely to that space between his ears.—I am, etc.,

London, S.W.1.

G. T. TATE.

The Ban on Heroin

SIR,—As some of the small fry of Dr. R. Hale-White's letter (*Journal*, May 21, p. 1277) we, too, wonder what is "the perfectly good substitute for heroin." It certainly is not morphine, amidone, pethidine, or codeine. We wonder whether the chairman of the Central Health Services Council and Lord Haden-Guest have heard of the Brompton mixture of heroin and cocaine for the relief of suffering of, for example, cancer of the lung, and, if they have, we wonder what they would substitute for it.—We are, etc.,

E. H. V. HENSLEY.

F. C. HEATLEY.

H. J. BLISS.

G. SWIFT.

J. A. PATERSON.

G. FISHER.

Winchester

SIR,—I am very concerned about the proposed Government ban on heroin (diamorphine) and would like to add my voice of protest to that of Dr. A. H. Douthwaite (*Journal*, April 9, p. 907). Here is our most potent weapon for the relief of pain to be denied us. Not only is heroin the most potent but often it is an irreplaceable drug. And heroin has other uses besides analgesic.

May I recall the case of a patient of mine—the victim of Buerger's disease? In the course of eight years this man had over forty operations, mostly amputations of major or minor extent and a sympathectomy, and now he has lost both legs and parts of all his fingers. During those eight years he suffered continuous pain of greater or less severity. When at its worst nothing could control it but heroin. Everything was tried—pethidine and the modern synthetic analgesics were useless, morphine was ineffective and made him sick. And he needed heroin in heroic doses. When the pain was at its worst he was taking heroin $\frac{1}{2}$ gr. (22 mg.) by injection every two hours, day and night for days on end—he and his wife gave the injections—4 gr. (0.26 g.) of heroin a day. At that he did not appear drugged, but felt and acted like a normal man; and it abolished his pain. One will say that he had become addicted to it. That is not so. If his pain eased up he would drop it in a day or two and do with something milder. Two years ago his disease became arrested, since when he has had no pain and no drugs. And the Government propose to deny us the use of this unique drug.

Fortunately my patient's disease is now quiescent, but it may flare up again.

Fortunately Buerger's disease is a rare condition, but there are others who suffer it. And there are other painful

conditions besides this. Our most powerful ally for the relief of pain is to be outlawed, but why is this being done? Because heroin addiction is a problem in America. I contend that this is not a justifiable reason for banning its use in this country. For one thing, it will not stop drug addiction in America. Further, there are other and better ways of controlling their addicts without interfering with us. Britain manufactures and exports heroin; there is no problem of addiction in this country. Surely American interests could be served by banning the export of the drug, though continuing its manufacture for home consumption.

Furthermore, note that all this has been done behind our backs. There was an annotation in the *Journal* of July 25, 1953 (p. 196), to the effect that W.H.O. had recommended that production and importation of diamorphine be abolished throughout the world. Since then nothing. Surely a step of such importance deserves some announcement in anticipation, perhaps a leading article in our official journal. The first printed word concerning it was a letter of protest by Dr. Douthwaite, after the Government decision had been made.

Also our legislators are being deceived. The subject has been brought up in the House of Lords (reported in the *Journal* of May 7, p. 1163), where Lord Mancroft said that "adequate supplies of a perfectly good substitute were now available." He has been deceived. There is no substitute for heroin. And, again, Lord Haden-Guest asserted that "the whole medical profession, so far as could be ascertained, was behind the order." That is untrue. Not only were the profession never consulted or asked their opinion, they were never even informed that such a step was being contemplated.

A week or two ago I placed these points before a meeting of the local Division of the British Medical Association—mainly to find out whether other doctors thought in this matter as I did. I was greatly gratified by the support my ideas received from them, and it was largely at the instigation of this meeting that I was encouraged to place my views before you.—I am, etc.,

Moffat, Dumfriesshire.

W. J. GILLIES.

SIR,—Maybe those who favour the ban on heroin are also heroic in disapproving of any attempt to relieve nocturnal cough by prescribing a linctus. Some of us, however, will wonder what to give our coughing diabetics at night if our old friend and stand-by linct. diamorph. et hyoscyam. is to disappear. Probably one or other of the big drug firms will come to our rescue, but, as they seem to have run out of names which are easy to remember, we may find ourselves, particularly the older among us, groping vainly when we try to recall the title of their products.—I am, etc.,

Launceston.

DONALD M. O'CONNOR.

Clinical Staging of Cancer of the Breast

SIR,—I would be grateful if you would allow me to comment upon the response to my letter on this subject which you, Sir, and the Editor of the *Lancet* were good enough to publish recently (*Journal*, March 26, p. 790). A copy of the letter and a covering note were sent to a surgeon and a radiotherapist at each of the teaching hospitals in Great Britain and to a number of interested clinicians. In all, sixty-five people were written to, and I asked not only for their personal views but suggested that they might feel inclined to bring the matter forward for discussion at their hospital medical committees. Forty-three replied, with varying degrees of enthusiasm, that they favoured the plan to establish an international staging and wished me luck, though several said it would be an uphill struggle. Two said it was hopeless trying and one said the attempt should not be made at all. The opinions most frequently expressed were that the British Empire Cancer Campaign, the Royal College of Surgeons, and the Faculty of Radiologists were the most appropriate bodies to deal with the matter. Mr. R. M. Blaikley has informed your readers (*Journal*, April 16, p. 970), and this has also been pointed out to me

by individual correspondents as well as by the reports from medical committees which are beginning to reach me, that a committee of the General Register Office under the chairmanship of Dr. A. H. T. Robb-Smith is considering this subject at the moment. It seems, therefore, that the problem is actively exercising learned opinion, and it is certainly not the wish of my colleagues at the Royal Marsden Hospital, on whose behalf I first wrote, to complicate the issue further at present.

I think it is generally agreed that any staging must be clinical, although, as Dr. H. J. G. Bloom and Dr. W. W. Richardson point out (*Journal*, May 21, p. 1276), a pathological staging of the regional lymph nodes is much more accurate. But it is a fact that this information is not available in a high proportion of the cases, and their graph indicates that within each clinical stage what one loses in pathological grade 3 cases one gains in grade 1 cases. My personal view is that staging should only be clinical but that in the presentation of results the histology should also be considered when this is known. Dr. Robert Morrison's staging (*Journal*, May 7, p. 1153), employing as it does eleven groups, looks complex but is in fact an application of the T.N.M. system, which will undoubtedly form the basis of any international staging, not only for cancer of the breast but for other sites as well. I feel confident myself that an acceptable staging will emerge in the not-too-distant future.—I am, etc.,

London, W.1.

MICHAEL HARMER.

Treatment of Severe Asthma

SIR,—In the article "Treatment of Severe Asthma" in the "Emergencies in General Practice" series (*Journal*, May 21, p. 1269) considerable space and attention have been given to A.C.T.H. and cortisone, remedies which are not likely to be available to the general practitioner called to treat an attack. Intravenous infusion is also often impracticable, as is the administration of oxygen.

In a short article for general practitioners I find it depressing that nearly a third of the space is devoted to the above-mentioned remedies whilst several useful and easily available drugs are omitted. Every doctor has his own particular drill for treating an acute asthmatic attack, but surely pethidine and paraldehyde warrant at least half as much space as cortisone and A.C.T.H.—I am, etc.,

London, S.E.2.

PETER H. SHERWOOD.

Insecticide Vaporizers

SIR,—Your annotation on "Insecticide Vaporizers" (*Journal*, May 14, p. 1202) has over-simplified the case and fails to distinguish black from white. The impression is given that insecticide vaporizers originated in America and are only now coming into use in this country. The contrary is the case, for the first test of such equipment was made in the course of Admiralty trials of new insecticides in 1946, and as part of the programme the mammalian toxicity of a "continuous-flow aerosol" was investigated.¹

Arrangements were soon made for manufacture in the U.S.A., and in both countries this original apparatus has been in use on an ever-increasing scale with great success and no single recorded case of harm to a human being.

Your annotation is, of necessity, based on American sources, and it is a regrettable fact that the situation in the U.S.A., following the introduction of the original British-designed apparatus, rapidly got out of hand, and it is believed that there are now over 90 different and indifferent copies of the original. At this point the vital importance of discriminating between correctly designed equipment and copies based on insufficient technical and scientific knowledge must be very strongly stressed. The A.M.A. Committee on Pesticides noted that few machines conformed to what was considered to be a reasonably safe design, and herein lies the reason for such cases of illness attributed to the "vapours" that have so far been reported in the U.S.A. The reverse is the case in Britain, for by far the greatest number of vaporizers in use in this country are the

product of very careful design and strict control over the output and insecticides used. All these units conform to, and in performance are well within, the limits stated by the A.M.A. Committee for insecticide vaporizers and the Canadian Standards Association.

Your statement on the fluctuating performance of a unit subjected to local air currents is misleading, for the essential point has been entirely missed, as the outputs referred to a unit in which the thermostat was known (and stated) to be wrongly placed. This was, in fact, part of the experimental work carried out at the University of Massachusetts on behalf of the original American company.²

Barnes³ and Brown⁴ testify to the safety of both D.D.T. and B.H.C. in general use, and Princ⁵ sums up recent work on D.D.T.: "Most scientists to-day agree that the danger of chronic toxicity from D.D.T. exposure is negligible," and more recently still in a leading article on "Agricultural Poisons" (*Journal*, April 2, p. 836) you commented as follows: "Although D.D.T., chlordane, B.H.C., and similar substances have been used in considerable quantities in many parts of the world, there is no evidence to suggest that persons using them as insecticides suffer any serious risk of acute or chronic poisoning." The experiment cited in which rats were affected when exposed to continuous inhalation falls into its proper perspective when it is realized that the dosage was appreciably greater than that possible with the majority of British vaporizers correctly sited and installed, and the fact that they have been used for much longer periods in a number of laboratory animal houses for the control of flies and body parasites with great success and perfect safety, and that one important installation has been in continuous use for nearly two and a half years.

Finally, I must refute your statement as to the ineffectiveness of such vaporizers. It is impossible in the space permitted to do more than state that the continuous-flow aerosol is a highly effective method of pest control in enclosed spaces and to give a few references, in particular the generalized account of the method in its application in many fields which has been published in *The Times Review of Industry*.⁶⁻¹²—I am, etc.,

F. G. SAREL WHITFIELD.

Avebury Research Laboratories,
Avebury, Oxon.

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Labelling the Container

SIR,—I wonder whether the time has not come to do away with the custom—peculiar to this country, I believe—to label medicine containers so that neither patient nor doctor can assess their contents. May I suggest that, on the contrary, it should be made compulsory for the chemist to label every medicine in such a way that its composition is clearly and fully described on the container?

As far as I can see it serves no useful purpose to keep the patient in ignorance of the nature of the medicine he is taking. The time should have passed when ignorance may have been thought to have therapeutic value, and to be a welcome help to ensure the superiority of the doctor. If the doctor's prescription does not satisfy the possibly critical mind of the patient nothing is lost by explaining the matter, or even by thinking twice before prescribing. Conversely, I cannot see any possible harm arising from the fact that the patient knows the ingredients of the medicine he is taking. There is no place in present-day medicine for the use of coloured water or other miracle drugs;

besides, in the case of placebos or for special reasons, the chemist could always be advised how to label the medicine. It happens not seldom that medicines are mixed up in the household and that the wrong drug is taken or given to children. This would occur less frequently. Even errors in dispensing may more easily be discovered if the container is labelled by the chemist.

Much of the doctor's time and mental energy would be saved if he were not so often confronted with bottles of tablets or medicine and expected to decide on sight which of them should be continued and which should be stopped; or if he were not asked to repeat the prescription for the "medium-sized" white tablets of which the patient has run out; or if he were spared the efforts he has to make when he wants to know which drugs other doctors or the hospital had previously prescribed. The patient would less often be treated with drugs which had already proved to be useless, and the State and the private patient would save appreciable sums of money if the identity of the medicine in the private medicine cupboard, in which highly expensive drugs such as antibiotics and hormone preparations often live a long and useless life, could be assessed, and if these drugs could be used when they are again needed.—I am, etc.,

London, W.1.

H. UCKO.

Cases Wanted

SIR,—In October, 1954, Kurtzke and Berlin¹ reported favourably on the use of isoniazid in a small series of cases (30) of multiple sclerosis. The results were sufficiently encouraging to warrant a therapeutic trial, and this is now being carried out in four hospitals—Middlesex Hospital, London, W.1; the Maida Vale Hospital for Nervous Diseases, London, W.9; Bristol Royal Infirmary (Dr. A. M. G. Campbell); and the Royal Victoria Hospital, Belfast (Dr. R. S. Allison).

The trial is limited to cases of recent onset, including retrobulbar neuritis, and those with a recent relapse who were capable of walking half a mile before the relapse. Cases are admitted for a period varying from two to four weeks. The trial is blind—that is, the clinician in charge of the case does not know if the patient is receiving isoniazid or the control drug, arsenic, since both substances are used in identical tablet form.

In order to expedite the entry of cases into this trial it is hoped that general practitioners will refer suitable cases to one of the above hospitals.—I am, etc.,

London, W.1.

DOUGLAS McALPINE.

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Technique of Psycho-analysis

SIR,—In view of the extremely friendly and laudatory nature of Dr. Ernest Jones's review of my *Technique of Psycho-analysis* (*Journal*, May 21, p. 1261) it may seem a little ungracious to correct him on a minor point of fact. Dr. Jones maintains that, since the first edition of this book was published in 1928, "Dr. Glover has severed his connexion with other psycho-analysts." This is not quite accurate enough. In 1944, owing to my conviction that the orientations of an increasing section of the British Psycho-analytical Society, and consequently of its training system, had become profoundly unscientific, I demitted my offices in, and membership of, that Society. To mark the continuance of my relations with other psycho-analysts and with the International Association, I sought for and obtained membership of the Swiss Psycho-analytical Society. About the same time I was made an honorary member of the American Psycho-analytical Association, and subsequently was appointed chairman of the then Research Committee of the International Association. A small point, perhaps, but of some scientific and professional moment to me.—I am, etc.,

London, W.1.

EDWARD GLOVER.

Obituary

E. A. RENNER, O.B.E., M.B., Ch.B.

Dr. E. A. Renner, director of medical services of Sierra Leone, died in London on April 28 at the age of 60.

Edowo Awunor Renner was born at Freetown, Sierra Leone, on June 3, 1894, the son of Dr. W. A. Renner, who had served for 33 years in the medical service of the Colony and who had acted as principal medical officer, as the director was then termed. E. A. Renner's early education was received at the Boys' High School, Freetown, and was interspersed with regular visits to his grandparents, who had retired to Jersey, in the Channel Islands. Later he was a pupil at Park Field School, Sefton Park, Liverpool, and he went on to become a medical student at Edinburgh University, where he graduated M.B., Ch.B. in 1919.

Renner was always interested in the welfare of his own people, and he joined the Sierra Leone medical service in 1920. During his 35 years of devoted service he was medical officer in many of the medical stations throughout the Colony and Protectorate, and at one period of his career he was in charge of the pathological laboratory. During the latter part of his clinical career he was stationed at Freetown as senior medical officer in charge of the Maternity Hospital, and was also a much sought after and highly respected private practitioner in that city. For his public-spirited work he was appointed O.B.E. in 1948. Apart from his clinical acumen, he displayed outstanding administrative ability, which, combined with great tact and a very pleasant manner, endeared him to everyone. He was promoted deputy director in 1950, and a year later director of medical services of Sierra Leone, and was therefore the first African director of medical services in any of the West African colonies.

Renner was appointed director at a very difficult time, when the post-war shortage of staff and constitutional changes in the Colony added to the responsibilities of the director. His tact and preparedness to appreciate the views of the other man without sacrificing his own principles were no doubt of great value to the Colony and to the medical department, and without him much could not have been accomplished. Despite his onerous duties he found time to interest himself in the Red Cross, to which he rendered valuable service, and he was also a very keen freemason and churchman. "Teddy" Renner, as he was affectionately called by all his friends, will be greatly missed, and it is a tragedy that he died before he could enjoy a well-earned retirement with his family in England. He leaves a widow and four children, his eldest son being in medical practice in Beaconsfield.—F. McL.

A. J. WILSON, M.D., F.R.C.P.Ed.

The obituary of Dr. A. J. Wilson was printed in the *Journal* of May 21 (p. 1285). We are indebted to Dr. J. SHULMAN for the following appreciation:

By any assessment Arthur J. Wilson was remarkable. By rigid assessment he was a man of unusual talents and character. During the first world war his medical studies were interrupted by service in the Royal Flying Corps, in which he was for a time an instructor in aerial gunnery. I first met him in 1922, when we were fellow residents at the Coventry and Warwickshire Hospital. I am proud to

think that our friendship, established then, endured to the time of his death. From the very onset of his professional career he was outstanding. His life was a model of spartan simplicity—even as a young hospital resident it was obvious that he had a definite objective in life which nothing could deter him from achieving. Self-discipline was so firmly established in his character in these early days that he rapidly earned an enviable reputation for early rising, punctuality, precision, and accuracy—neatness and tidiness dominated every activity. His very handwriting was so neat and legible that throughout his life it was always a pleasure for others to read his medical notes. Clinical work followed the same pattern, and so careful and accurate were his observations that in all the 33 years of our acquaintance I have not known a diagnosis, once established by him, ever amended by anyone else. Ill-health unfortunately dogged his early professional career, and, advised by Sir Robert Philip, he showed rare courage in deciding to practise as a physician consultant at a time when it was almost a dangerous experiment so to do. He was by this time honorary physician to the Coventry and Warwickshire Hospital and was a pioneer in establishing the department of cardiology there. It was only natural, with his sound knowledge, accompanied by the most scrupulously careful and patient clinical observations, that he rapidly built up an undisputed reputation for reliability among practitioners and colleagues. Simple spartan tastes never deserted him. Apart from music and photography, medicine was his only hobby. Self-discipline was so firmly engendered that no one ever knew him to utter an angry or unkind word. This gentleness, accompanied by a charming simplicity of manner, always made him a most delightful listener, and he extended this quality to all his patients. For those who knew him his memory will be green for many a day.

Dr. W. J. GRANT, who was in practice at Shrewsbury for nearly 33 years, died at his home there on March 28 at the age of 63. William James Grant was born in Prince Edward Island, Canada, on January 31, 1892, and was educated at St. Dunstan's College, Charlottetown, Prince Edward Island, and at Laval University, Quebec, where, in 1909, he obtained the certificate of B.A. which entitled him to begin his professional studies in medicine. He entered McGill University, Montreal, for this purpose, and graduated M.D., C.M. in 1914, after which he held a resident appointment at the Western General Hospital, Montreal. From 1915 to 1919 he served first in the R.A.M.C. and then in the R.C.A.M.C., and on return to civilian life he decided to make his home in England, and for a short time was honorary assistant surgeon at Croydon General Hospital. He obtained the F.R.C.S.Ed. in 1921, and in the following year entered into partnership with Dr. J. D. Williams at Shrewsbury. When Dr. Williams retired soon afterwards Dr. Grant took over the whole of the practice. Dr. Grant was exceptionally knowledgeable and well read in medico-political matters. While his views were not always shared by his colleagues in Shropshire, his presence at local meetings never failed to add interest and fire to the proceedings. For some time he was a member of the executive committee of the Fellowship for Freedom in Medicine, and, although he had to resign from the committee because of the distance he had to travel to attend meetings, he remained a staunch supporter of the Fellowship. He will be remembered for his determined fight to secure better remuneration under the Danckwerts award for the single-handed practitioner with a small list of patients, a fight which was crowned with success. He was one of the signatories to the requisition which, in 1953, called for an extraordinary general meeting of the British Medical Association, and it was he who submitted the main pleading on behalf of the small-list practitioner at that meeting. Dr. Grant was chairman of the local committee of the British Medical Guild; he was also a member of the Shrewsbury medical board and for the past few years its chairman, and a member of the Industrial Injuries

Disablement Board of the Ministry of Pensions and National Insurance. With the full knowledge of the hopelessness of his final illness, he bore it with great fortitude. He is survived by his widow, two sons, and two daughters.—A. G. W.

Medico-Legal

"AUTOMATISM" AS A DEFENCE

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

On February 11, 1955, Stanley Charlson was tried before Mr. Justice Barry and a jury at Chester Assizes on charges of causing grievous bodily harm with intent to murder or with intent to cause grievous bodily harm, and of unlawfully wounding his 10-year-old son Peter.¹

Charlson's family medical background was that his mother had died of a cerebral haemorrhage, his aunt of a cerebral tumour, and his sister of meningitis. He himself some six years before had had trouble with his legs, which he had been told was neuritis, and since then had had increasing weakness in his legs and difficulty in co-ordinating their movements if he tried to walk fast or run. He also had had persistent headaches, sometimes of great severity. On examination by the prison doctor he was found to have signs of organic disorder of the nervous system pointing to the possibility of a cerebral tumour, though the doctor did not make a definite diagnosis. There was no question of any "disease of the mind."

Charlson, who was a devoted husband and father and on excellent terms with his son, had called Peter into the back room of their home to see a rat which was standing on a stone in the river. He then for no apparent reason picked up a wooden mallet from the floor, struck him twice on the head, breaking the skin of the scalp and causing blood to flow, and then threw him out of the window 25 ft. (8 m.) into the river, severely injuring his arm and leg. When interviewed by the police later in the day, Charlson was dazed and bewildered and knew that he had done something dreadful. He remembered hitting Peter with the mallet in the back room, but could not think why he had done so.

Mr. Justice Barry in summing up to the jury told them that no defence of insanity was raised in the case. It was, however, for the prosecution to prove on the first two charges that Charlson had had the intent specified in the charge—namely, to murder Peter or cause him grievous bodily harm. On the third charge, of unlawful wounding, the prosecution would have to prove no more than that when he struck the blows he knew what he was doing. However, if he did not know what he was doing, if his actions were purely automatic and his mind had had no control over the movement of his limbs, if he was in the same position as a person in an epileptic fit, then no legal responsibility for his act rested upon him at all. The prison doctor had given evidence that someone suffering from a cerebral tumour is liable to outbursts of impulsive violence over which he would have no control and which would be quite without motive, and that Charlson's conduct was wholly consistent with such a condition.

The jury returned a verdict of "Not Guilty" on all three charges.

FEMUR FRACTURED DURING E.C.T.

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

On March 31, 1955, Mr. Israel Weingott, a tailor, withdrew an action against Dr. Dalton E. Sands and the Board of Governors of King's College Hospital on the second day of the hearing. Mr. Weingott's case had been that electric convulsion therapy had been administered to him under Dr. Sands's supervision while sitting in a chair instead of lying down, resulting in a fracture of his left femur.

Mr. Weingott gave evidence that he was sitting in a chair before the treatment, in the course of which he became unconscious. Dr. Rossiter Lewis, called as expert witness on his behalf, said that the essential principles to be observed during E.C.T. were that the patient should be flat on his back on a bed or couch of firm consistency and in a position to be properly controlled by assistants at his head and feet or in some kind of restraining jacket to prevent violent movements of the legs. It was possible for the patient to suffer a broken femur during treatment even if these principles were observed. The risk would be greatly increased if the treatment were given to the patient sitting in a chair.

A former porter at the hospital gave evidence that on the day on which the treatment was given he took Mr. Weingott straight to the cubicle in which he was to have his treatment, and that this contained a wooden armchair but no couch. He said that later he collected him from the cubicle on a trolley and took him to the casualty department for his fractured femur to be treated. In cross-examination he was unable to explain how he came to do this when his time sheets showed that he was not on duty on the day in question.

Announcing the withdrawal of the case Mr. Weingott's counsel said that Mr. Weingott having heard the evidence was satisfied that there was no foundation for any of the charges of negligence he had made against the doctor and the hospital. The Lord Chief Justice said that the most serious thing was the allegation against the doctor, and he had been very glad to hear it withdrawn. Although he felt that the plaintiff had been entirely honest in bringing the action, he had obviously suffered from mental trouble, and his evidence was not such that he would have acted on it. There would be judgment for the defendants with costs.

The Medical Defence Union instructed Messrs. Hempsons, solicitors, to act for Dr. Sands.

Universities and Colleges

UNIVERSITY OF OXFORD

Dr. R. M. Acheson has been elected to a Radcliffe Travelling Fellowship, and Dr. R. G. Tucker has been awarded the Radcliffe Prize.

Mr. H. J. R. Beveridge (Ampleforth College) has been elected to a Nuffield Scholarship in Medicine at Pembroke College.

In Congregation on April 28 the degree of D.M. was conferred on Mrs. Zaida M. Hall and, in absence, on Constance L. Simpson.

Dr. J. L. Gowans has been elected to the Staines Medical Research Fellowship at Exeter College as from October 1, 1955.

UNIVERSITY OF CAMBRIDGE

The following degrees were conferred in Congregation on April 30:

M.D.—E. H. R. Ford.
M.B.—J. R. Burwell.

In Congregation on May 14 the following degrees were conferred:

M.A.—R. A. Parker, M.B., B.S.
M.B., B.Chir.—L. M. Barrett.
M.B.—J. S. Garfield (by proxy).

Drs. John Hugh Ross and Richard Hume Adrian have been elected to Fellowships at Corpus Christi College.

UNIVERSITY OF GLASGOW

The following degrees were conferred on April 30:

M.D.—M. C. Macleod (with honours), R. C. MacLeod.
Ph.D.—T. C. D. Whiteside, M.B., Ch.B.

UNIVERSITY OF DUBLIN

SCHOOL OF PHYSIC, TRINITY COLLEGE

The following degrees were conferred on May 12:

M.D.—Margaret K. B. Knox, E. du P. Meiring.
M.B., B.Ch., B.A.O.—P. R. D. Black, Jean R. Ellis, A. C. A. Hempel.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending May 14 (No. 19) and corresponding week 1954.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1955					1954				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	9	0	7	0		9	0	4	1	2
Dysentery ..	1,038	53	409	13		1,031	153	335	6	1
Encephalitis, acute ..	4	0		0		5	0	0	0	
Enteric fever:										
Typhoid ..	2	1	2	0		3	1	0	0	0
Paratyphoid ..	12	0	3	0		7	0	1	0	0
Food-poisoning ..	211	40		3		240	22		0	
Infective enteritis or diarrhoea under 2 years ..				10	17				8	20
Measles* ..	20,384	1063	254	290	273	1,706	58	169	121	332
Meningococcal infection ..	22	1	15	1		35	5	15	0	1
Ophthalmia neonatorum ..	45	3	5	1		29	4	12	0	
Pneumonia† ..	441	25	170	2	5	463	35	196	5	2
Poliomyelitis, acute:										
Paralytic ..	11	2	0	1	1	14	0		2	1
Non-paralytic ..	5	0				5	1			
Puerperal fever‡ ..	274	36	2	1		258	43	14	1	
Scarlet fever ..	571	27	66	42	13	898	54	110	32	43
Tuberculosis:										
Respiratory ..	823	107	186	35		816	91	170	21	
Non-respiratory ..	127	10	25	7		118	6	26	3	
Whooping-cough ..	1,805	75	137	49	28	2,660	85	308	47	39

DEATHS in Great Towns	1955					1954				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute ..		0		0			0	0	0	0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	3	0	1	0	0	9	0	1	1	0
Influenza ..	10	1	0	0	2	10	2	0	2	0
Measles ..		0	0	0	0		0	0	0	0
Meningococcal infection ..		1	0				0	0		
Pneumonia ..	175	17	18	11	11	200	41	25	19	9
Poliomyelitis, acute ..	1	0		0		0	0	0	0	0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory ..	73	14	9	0	5	86	11	13	2	9
Non-respiratory ..		1	1	0	0		1	0	0	2
Whooping-cough ..	1	0	0	0	0	2	0	0	1	0
Deaths 0-1 year ..	197	36	23	10	15	249	28	30	8	17
Deaths (excluding stillbirths) ..	5,026	680	563	111	168	5,441	755	637	139	180
LIVE BIRTHS ..	7,669	1185	926	258	433	8,016	1216	962	235	445
STILLBIRTHS ..	186	23	23			207	21	24		

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

Vital Statistics

Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in April was 116, compared with 113 (revised figure) in the previous month and 107 (revised figure) in April, 1954.

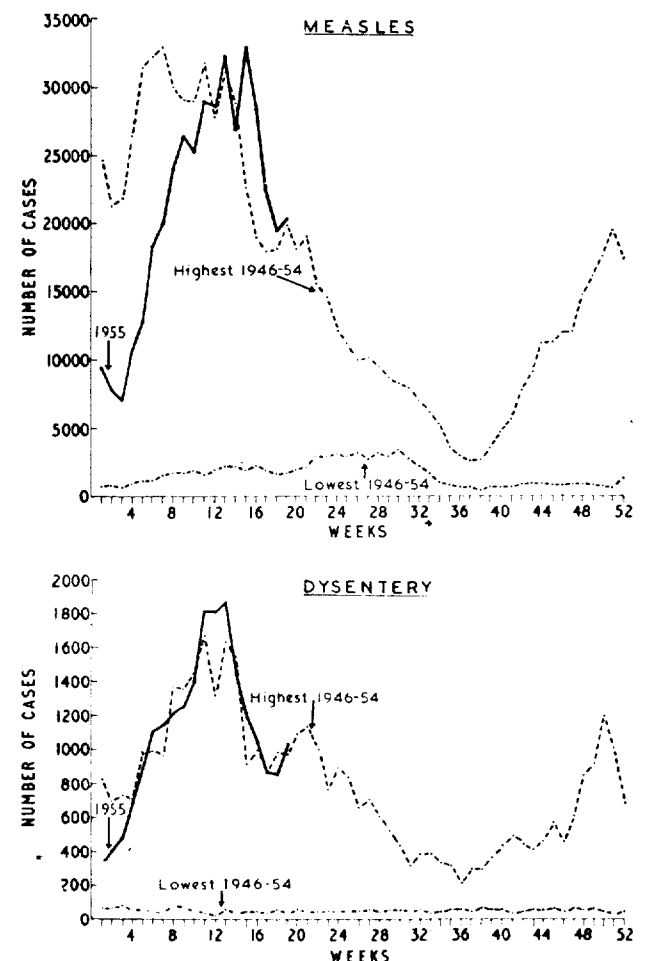
The numbers of cases of industrial diseases in the United Kingdom reported during April, 1955, were as follows: lead poisoning 5, anthrax 1, epitheliomatous ulceration 15, chrome ulceration 26; total 47. There were no deaths.—*Ministry of Labour Gazette*, May, 1955.

Week Ending May 21

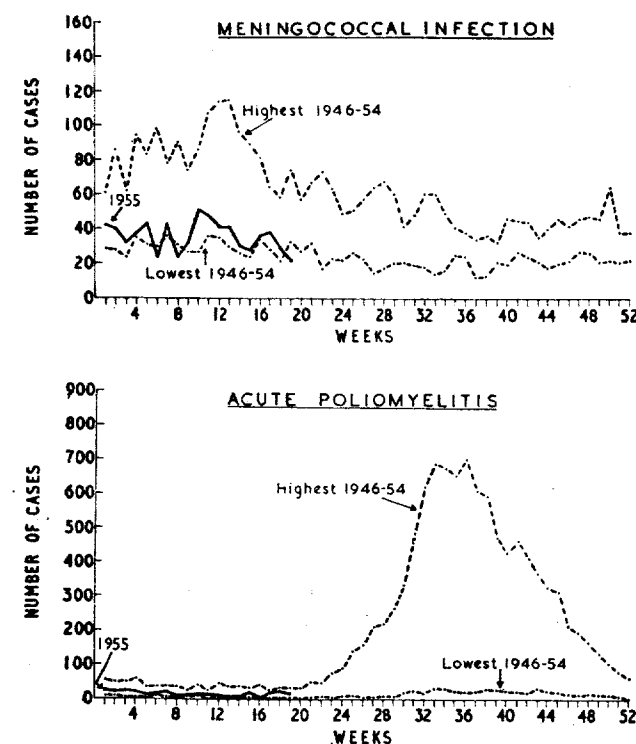
The notifications of infectious diseases during the week included: scarlet fever 620, whooping-cough 1,613, diphtheria 17, measles 23,655, acute pneumonia 377, acute poliomyelitis 19, dysentery 1,232, paratyphoid fever 7, and typhoid fever 3.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1946-54 are shown thus -----, the figures for 1955 thus ———. Except for the curves showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



¹ 1955 1 *Weekly Law Reports*, p. 317.



Infectious Diseases

The largest rises in the number of notifications of infectious diseases in England and Wales during the week ending May 14 were 892 for measles, from 19,492 to 20,384, and 176 for dysentery, from 862 to 1,038, and the largest falls were 58 for acute pneumonia, from 499 to 441, and 45 for whooping-cough, from 1,850 to 1,805.

The largest increases in the incidence of measles were 427 in Leicestershire, from 472 to 899, 303 in Glamorganshire, from 693 to 996, 256 in Kent, from 600 to 856, and 213 in Southampton County, from 735 to 948, and the largest decreases were 292 in Middlesex, from 1,606 to 1,314, 276 in Yorkshire West Riding, from 2,143 to 1,867, 232 in Warwickshire, from 1,631 to 1,399, and 216 in Essex, from 1,269 to 1,053. 571 cases of scarlet fever, 4 fewer than in the preceding week, were notified, and there were no large fluctuations in the local trends. Only small changes were reported in the returns for whooping-cough. 9 cases of diphtheria were notified, being 5 more than in the preceding week. The areas with more than one case of diphtheria were Kingston-upon-Hull C.B. 3 and Liverpool C.B. 2.

16 cases of acute poliomyelitis were notified, and these were 3 fewer for paralytic and 5 fewer for non-paralytic cases than in the preceding week. The largest returns were Yorkshire West Riding 3, London 2, Wiltshire 2, Warwickshire 2 (Birmingham C.B. 2).

The rise in the notifications of dysentery was mainly due to a large outbreak in Surrey, Croydon C.B. The largest centres of infection were Lancashire 339 (Liverpool C.B. 53, Blackburn C.B. 49, Manchester C.B. 45, Oldham C.B. 39, Middleton M.B. 19, Blackpool C.B. 18, Whiston R.D. 16, Crompton U.D. 13, Salford C.B. 11, Rochdale C.B. 10), Surrey 162 (Croydon C.B. 147), Durham 107 (Easington R.D. 23, Stanley U.D. 19, Seaham U.D. 17, South Shields C.B. 10), Northumberland 75 (Castle Ward R.D. 36, Newcastle-upon-Tyne C.B. 22), Yorkshire West Riding 62 (Huddersfield C.B. 29, Leeds C.B. 11), London 53 (Islington 16), Yorkshire North Riding 42 (Middlesbrough C.B. 38), Warwickshire 24 (Coventry C.B. 14), and Middlesex 22.

In Scotland the number of notifications of dysentery increased by 16 to 409. The largest returns were those of the cities of Glasgow 224, Edinburgh 46, and Dundee 37.

Medical News

Westminster Hospital Old Students' Dinner.—The annual Westminster Hospital dinner was held on May 27 at the Royal College of Surgeons. A large gathering, said to be a record, assembled to support the chairman, Dr. F. M. ALLCHIN. In proposing the toast of Westminster Hospital and Westminster Medical School, the chairman said that the school was full and that there were 500 applications a year for the 60 vacancies. Mr. F. A. D'ABREU proposed the toast of the guests, for whom Sir DANIEL DAVIES replied. Sir STANFORD CADE proposed the health of the chairman, and his speech, like Dr. Allchin's in reply, was a mixture of sentiment and reminiscence suitable to such an occasion.

Prison M.O.s.—The Annual Conference of Prison Medical Officers and Psychologists was held at the Home Office on May 20, the chair being taken by Dr. H. K. SNELL, Director of Medical Services, Prison Commission. Dr. J. D. W. PEARCE, of St. Mary's Hospital, and Mr. EDWARD CLARKE, barrister-at-law, spoke on "The Value of Statements Elicited During Conditions of Altered Consciousness Artificially Induced." Dr. I. A. ANGUS, Dr. W. A. NORTON, and Mrs. A. SMITH, of the Brixton Prison staff, contributed a paper on "Observations on Eleven Cases of G.P.I. at Brixton," and Dr. C. F. T. SAVILLE, medical officer at Aylesbury Borstal Institution, read a paper on "A Visit to Some Spanish Prisons."

The Society of Physicians in Wales held its sixth meeting at Tenby on May 13-14 under the chairmanship of Dr. JOHN DE SWIET. The following papers were read: "Leptospirosis in Pembrokeshire," by Dr. GLAN DAVIES. "Carpal Tunnel Syndrome," by Dr. GEOFFREY LLOYD. "Treatment of Severe Hypertension by Oral Medication," by Dr. JOHN FORBES. "Some Observations on Thrombocytopenia," by Professor SCARBOROUGH. "Experimental Embolic Carditis," by Dr. ANEURIN HUGHES. "Perforation of Interventricular Septum in Myocardial Infarction," by Dr. J. M. SWITHINBANK. "Electrocardiographic Changes in Pulmonary Embolism," by Dr. J. DE SWIET.

Royal Society Awards.—Under the Royal Society and Nuffield Foundation Commonwealth Bursaries Scheme, Mr. D. H. COLLESS (University of Malaya) receives an award to enable him to study the systematics of mosquitoes at the Natural History Museum; Dr. A. A. KINNEAR (University of Pretoria) to enable him to study endocrinological techniques at Birmingham; and Dr. J. H. D. MILLAR (consultant neurologist, Belfast) to enable him to study electrocortigraphy at the Montreal Neurological Institute.

R.S.I. Elections.—The following medical men have been elected to the council of the Royal Sanitary Institute: Dr. E. HUGHES, Dr. A. G. G. THOMPSON.

Dr. J. H. F. Brotherston has been appointed professor of public health and social medicine at the University of Edinburgh in succession to Professor F. A. E. Crew, F.R.S., who retires on September 20. Dr. Brotherston is aged 40, and qualified at Edinburgh in 1940. After service with the R.A.M.C. during the war, he worked at the London School of Hygiene and Tropical Medicine, and at Guy's Hospital.

Dr. C. V. Harrison, of the London Postgraduate Medical School, has been appointed professor of morbid anatomy in the University of London.

New French Neurosurgical Journal.—Messrs. Masson and Co. announce the publication of a new quarterly journal, *Neuro-Chirurgie*. The journal is sponsored by the Société de Neuro-Chirurgie de Langue Française, but will also publish papers by authors who are not members of this society. Subscription is £4 12s. 6d. per annum, and the journal is published from 120, Boulevard Saint-Germain, Paris, 6.

COMING EVENTS

Hammersmith Hospital and Postgraduate Medical School.—The golden jubilee of Hammersmith Hospital and the twentieth anniversary of the founding of the Postgraduate Medical School are being celebrated next week. The Queen is to visit the hospital and medical school on June 5, and June 8 will be an "open day" (from 2.30 to 5.30 p.m.), when special arrangements are being made to show interested doctors the work which is going on. Points of interest will include a new metabolic unit for the investigation of metabolic disorders, the Medical Research Council's cyclotron and linear accelerator, an exhibition illustrating the research work of the medical school, and a radio-isotope laboratory. Medical films will be shown in the lower lecture theatre, which will be the assembly point from which groups will be collected for conducted tours of the medical school and hospital.

A celebration ball will be held at the Park Lane Hotel on Thursday, June 9. Tickets (30s. including supper) can be obtained from Mr. J. G. BRICE, F.R.C.S., Hammersmith Hospital, London, W.12.

Royal Society of Tropical Medicine and Hygiene.—The Annual General Meeting will be held on June 15 (changed from June 16) at Manson House, 26, Portland Place, London, W.1, 7.30 p.m.

NEW ISSUES

Journal of Clinical Pathology.—The new issue (Vol. 8, No. 2) is now available. The contents include:

- HISTOLOGICAL DIFFERENTIATION BETWEEN PHAEOCHROMOCYTOMA AND MELANOMA OF THE SUPRARENAL GLAND. John C. Dick, Grace M. Ritchie, and Henry Thompson.
- RETICULUM-CELLLED MEDULLARY RETICULOSIS IN A YOUNG ADULT. F. G. J. Hayhoe.
- NASOPHARYNGEAL PLASMACYTOMA WITH EXTENSIVE SKIN METASTASES. D. Enslie-Smith, J. M. Johnstone, and I. C. Whyte.
- GLYCOGEN STORAGE IN THE LIVER IN DIABETES MELLITUS. R. Winston Evans, T. R. Little, and H. S. Pemberton.
- CYTOLOGICAL EXAMINATION OF SPUTUM IN RELATION TO ITS MACROSCOPIC PURULANCE. G. A. Rawlins.
- THE DRIED DISC TECHNIQUE WITH BACITRACIN, CARBOMYCIN, ERYTHROMYCIN, POLYMYXIN B, AND TETRACYCLINE. R. W. Fairbrother and R. C. Jennings.
- SENSITIVITY TESTS FOR THE POLYMYXINS. S. R. M. Bushby.
- FURADANTIN IN PROTEUS BACILLURIA. S. J. Heffernan, P. W. Kippax, and W. A. V. Pamplin.
- A CHROMATOGRAPHIC METHOD FOR THE DETERMINATION OF THE THREE BILE PIGMENTS IN SERUM. Barbara H. Billing.
- THE THREE SERUM BILE PIGMENTS IN OBSTRUCTIVE JAUNDICE AND HEPATITIS. Barbara H. Billing.
- AN INVESTIGATION OF SERUM LIPIDS AND LIPOPROTEINS BY PAPER ELECTROPHORESIS. W. G. Dangerfield and E. B. Smith.
- THE RELIABILITY OF THE DETERMINATION OF URINARY PROTEINS BY ELECTROPHORESIS ON FILTER PAPER. D. Wolvius and J. C. M. Verschure.
- AN APPARATUS FOR PAPER ELECTROPHORESIS. G. T. Franglen, N. H. Martin, and J. D. Treherne.
- THE USE OF BORATE BUFFER IN PAPER ELECTROPHORESIS OF SERUM. R. Conden and Myfanwy N. Powell.
- AMINO-ACID COMPOSITION OF SERUM PROTEINS IN HEALTH AND DISEASE. A. J. Cummings and F. V. Flynn.
- PLASMA CREATININE. Mary Ralston.
- AN ASSESSMENT OF NEW TESTS FOR DETECTING BILIRUBIN IN URINE. Daphne Bryant and F. V. Flynn.
- UPTAKE OF SULPHATE ³⁵S BY LEUKAEMIC HUMAN BONE MARROW *in vivo*. F. Ellis, L. G. Lajtha, and R. Oliver.
- HAEMORRHAGIC DIATHESIS DUE TO A CIRCULATING ANTICOAGULANT INVESTIGATED BY THE THROMBOPLASTIN GENERATION TEST. D. M. D. Evans.
- THE EFFECT OF ANTIBIOTICS ON THROMBOPLASTIN GENERATION. W. N. Bell and H. G. Altan.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

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

Monday, June 6

- GUY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Carbutt Memorial Lecture by Dr. J. M. H. Campbell: Cyanotic Congenital Heart Disease.
- INSTITUTE OF DERMATOLOGY.—June 6 to 30, semi-permanent exhibition: Some Interesting Photographs and Moulages (Department of Medical Illustration).
- INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—4.30 p.m., Mr. W. Hawks-worth: Utero-vaginal Prolapse.

Tuesday, June 7

- INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. J. Wallace: Vulval Atrophy.
- WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY.—5 p.m., Alroth Wright Lecture by Professor B. Ephrussi (Paris): Intrinsic Factors Controlling the Synthesis of Cytochromes in Yeast.

Wednesday, June 8

- INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Moniliasis and Related Diseases.
- LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE.—3 p.m., University Extension Lecture by Dr. J. A. Scott: Public Health in an Urban Community.

Thursday, June 9

- BRITISH SOCIETY FOR RESEARCH IN AGEING.—At Ciba Foundation, 41, Portland Place, W., 2 p.m., symposium: Endocrinology and Ageing. Dr. V. Korenchevsky: Endocrinological Factors in Ageing; Dr. J. A. Lorraine: Hormonal Relations in the Menopause; Dr. P. L. Krohn: The Ageing Ovary; Dr. P. J. Thung, Dr. L. Boot, and Dr. O. Muhlbock (Amsterdam): Old Age Changes in the Morphology and Functions of the Mouse Ovary.
- INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Benign Epithelial Tumours.
- NORTH-WESTERN TUBERCULOSIS SOCIETY.—At Wrightington Hospital, Appley Bridge, Wigan, 3 p.m., summer meeting.
- NUFFIELD ORTHOPAEDIC CENTRE.—At Windfield-Morris Orthopaedic Hospital, 8.30 p.m., Mr. W. Gissane: Some Problems in the Treatment of Injuries.
- POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. Felipe de la Balze (Buenos Aires): Some Histological and Functional Aspects of Normal and Pathological Testes.
- ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor Milroy Paul (Colombo): Haemorrhages from Head Injuries.
- ROYAL SOCIETY.—11 a.m., discussion to be opened by Professor H. S. W. Massey, F.R.S.: Radiative Balance in the Atmosphere.
- ST. ANDREWS UNIVERSITY.—At Physiology Department, Medical School, Small's Wynd, Dundee, 5 p.m., Professor H. A. Salvesen (Oslo): Relation of the Parathyroids to Bone Metabolism and Bone Disease.
- ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., postgraduate demonstration in psychiatry.

Friday, June 10

- INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. G. B. Dowling.
- INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Dr. J. G. Scadding.
- INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—3 p.m., Mr. A. H. C. Walker: Obstetric Fistulae.
- POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Mr. P. McG. Moffatt: Use of the Ophthalmoscope in Medicine (I).
- UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, W.C., 5.30 p.m., Professor O. Krayer (Harvard Medical School): New Aspects of the Pharmacology of Veratrum Alkaloids: The Anti-accelerator Cardiac Action of the Secondary Amines.
- WHITTINGTON HOSPITAL.—At Archway Wing, N., 5.15 p.m., clinical pathological conference. Dr. J. M. Alstow: The Community, the Profession, and the Hospital.

APPOINTMENTS

SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—B. H. Brock, M.B., B.Chir., F.R.C.S., Registrar in Orthopaedic and Traumatic Surgery at Windfield Orthopaedic Hospital and United Bristol Hospitals; T. Galla, M.B., Ch.B., D.P.M., Senior Registrar in Psychiatry at the Bristol Mental Hospitals; S. Haroon, M.B., B.S., D.G.O., Registrar in Obstetrics and Gynaecology at Gloucestershire Royal Hospital, Gloucester; J. J. Y. Dawson, M.D., M.R.C.P., Senior Consultant Chest Physician to Plymouth Clinical Area; B. M. Hibbard, M.B., B.S., D.Obst.R.C.O.G., Registrar in Obstetrics and Gynaecology to Bath Group of Hospitals; W. Lumsden Walker, M.B., Ch.B., D.P.H., D.P.M., Medical Superintendent to the Hortham-Brentley Hospital Group, Bristol; T. C. Leahy, M.B., B.Ch., Senior Hospital Medical Officer to the Hortham-Brentley Hospital Group, Bristol; R. V. Walley, M.B., B.Chir., Deputy Resident Physician (Infectious Diseases), at Ham Green Hospital, near Bristol; J. R. Moyle, M.R.C.S., L.R.C.P., D.M.R.D., Consultant Radiologist to Plymouth Clinical Area; B. Chudecki, Med.Dipl., Cracow, Assistant Radiologist to Exeter Clinical Area.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

- Jacobs.**—On May 11, 1955, at Arnold House, Arnold, Notts, to Jean (formerly Thwaites), wife of Dr. Brendan Jacobs, a son—Stephen Brendan.
- Perren.**—On May 4, 1955, at Battledown Manor, Cheltenham, Glos, to Mary, wife of Dr. John F. Perren, R.A.F., a son—Timothy John (corrected announcement).
- Picken.**—On May 23, 1955, at Cardiff, to Lisel (formerly Regensteiner), wife of David K. W. Picken, M.B., F.F.A.R.C.S., a brother for Charles—Ralph.

DEATHS

- Cobb.**—On April 15, 1955, at Lymington Hospital, Lymington, Hants, William Ernest Stanley Cobb, M.R.C.S., L.R.C.P.
- Fisk.**—On April 27, 1955, at Fairland House, Beccles, Suffolk, Harry Hope Fisk, M.R.C.S., L.R.C.P.
- Hill.**—On April 18, 1955, at the White House, Laverstock, Salisbury, Wilts, Horace Bryden Hill, M.B., B.S., M.R.C.P., Surgeon Captain, R.N., retired.
- Hudson.**—On May 17, 1955, at Watermillock House, Ulswater, Cumberland, James Hudson, M.D., formerly of Newcastle-upon-Tyne, aged 90.
- King.**—On April 15, 1955, at Carmarthen, Leslie Reginald King, M.B., B.Chir., late of Stow-on-the-Wold, Glos.
- Kingdon.**—On April 2, 1955, at Trehunsey, Hillside Road, Sidmouth, Devon, Clement Thomas Cory Kingdon, M.D., aged 86.
- Mitchell.**—On April 28, 1955, at his home, Holmhurst, Greystones, Co. Wicklow, Robert Hollingsworth Mitchell, M.B., B.Ch., aged 51.
- Patterson.**—On April 19, 1955, Elizabeth Patterson, M.B., B.S., of 50, Weymouth Street, London, W.
- Renner.**—On April 28, 1955, in London, Edowo Awunor Penner, O.B.E., M.B., Ch.B., of Sierra Leone, West Africa, and Fintny House, Penn Road, Beaconsfield, Bucks, aged 61.
- Trubridge.**—On April 11, 1955, at his home, Lennox, Mass., U.S.A., Luigi Walter Trubridge, M.D.

Any Questions ?

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

Rapid Suppression of Lactation

Q.—What is the best method of suppressing the milk, if an immediate cessation of breast-feeding is required ?

A.—If the decision against breast-feeding is already taken by the time delivery is complete, oestrogen therapy should be commenced immediately. Every hour counts and the sooner it is given after delivery the more effective it is. The aim is to give not less than 50 mg. stilboestrol (or 1.5 to 2 mg. ethinyl oestradiol) during the next four to seven days, and the dose should be high (say 5 mg. stilboestrol three times a day) during the first one or two days, and then gradually reduced. Bandaging of the breasts, aperients, and fluid restriction are unnecessary. Sometimes, at the end of the course of treatment, there is slight filling and secretion from the breasts, but this is not usually enough to require treatment. If it is, however, a supplementary modified and shortened course of oestrogen therapy can be given.

Once lactation is established it is much more difficult to suppress it with oestrogens. In such a situation a similar course of treatment is given in the hope that it will help. The breasts should be emptied at the commencement of treatment, but thereafter suckling, expression, the use of a breast pump, and any sort of local stimulation of the breasts are to be avoided.

Emotional Sweating

Q.—Is there any treatment for excessive under-arm perspiration? My patient is a healthy young woman of 20 who has to change her clothing several times a day because of drenching sweats.

A.—Though we know a good deal about sweat, the physiology of sweating, and the mechanism involved in disorders of sweating, it is unfortunately true that such knowledge is not readily translated into practical measures for the treatment of the suffering patient. Sweating may be a consequence of heat or of emotional disturbance, mental effort or sensory stimulation. Emotional sweating particularly affects the axillae, palms and soles, and forehead. The channel along which these disturbances act is nervous, and interruption of continuity of that channel at various levels may abolish the function of sweating.

Atropine, methanthelinium ("banthine"), and similar drugs are acetylcholine-inhibitors and so may protect the secretory mechanism from excessive stimulation, but they are usually effective only in doses so close to those producing untoward side-effects that they are not suitable for continuous use. They may with advantage be employed on particular occasions. Tincture of belladonna, 10–12 minims (0.6–1.2 ml.), may be taken half to one hour before the occasion and will usually be tolerated. In the last resort surgical interruption of the nervous channel by sympathectomy may be performed, usually with excellent results in the hands and feet but less successfully in the axillae. In a proportion of patients in whom the operation is performed in the upper sympathetic chain a more or less troublesome gustatory sweating of head or face has been reported as a sequel. It would be ideal if a similar blocking of impulse could be achieved by the use of those drugs which are known to be ganglion-blocking agents, such as the hexamethonium group. Unfortunately, as with the acetylcholine inhibitors, the effective dosage is so near the toxic dose that the continuous administration is dangerous. How-

ever, it may help to prescribe a tolerated dose of methylphenobarbitone, 3 gr. (200 mg.) twice daily, or amylobarbitone sodium, 1 gr. (65 mg.) thrice daily, which are the more effective of the barbiturates as ganglion-blocking agents.

While many patients suffer excessive sweating as a simple aberration of the normal physiology without any more significant psychological component than temperamental sensitiveness, a proportion are dependent upon psychological experience in childhood or adolescence, and such patients can with advantage be treated by the psychiatrist.

Routine treatment of patients with hyperhidrosis is largely empirical and symptomatic and relies upon local measures. These are often not very successful. Most local measures depend in part upon a blocking of the gland orifice, and thus carry with them the risk of inflammatory and infective sequelae such as occur with any retained secretions. Others closely approach a direct irritant effect and have therefore to be used with caution. The patient should try a variety of remedies and in varying concentrations to discover which is most helpful and most acceptable. Bathing twice daily for ten minutes in a solution of bleaching powder, a teaspoonful to a quart (2.3 litres), increasing to a teaspoonful to a pint (0.6 litres), is helpful, care being taken to avoid producing a dermatitis. Formalin solution, aluminium acetate and chloride, each starting with a concentration of 1% and 10% sodium hexametaphosphate, are other astringents of value. In some patients the use of the constant current (15 to 20 mA for 20 minutes twice a week) is effective, the negative pole being placed in the axilla. X rays (300 r at 90 kV through 2 mm. aluminium on three occasions at monthly intervals) should be prescribed only by those experienced and expert in this field and should not be repeated.

In conclusion, every patient with axillary hyperhidrosis presents an individual medical problem, and should not be treated along routine or empirical lines until the medical and often the psychosomatic aspects have received attention.

Management of a Transverse Colostomy

Q.—About three months ago a transverse colostomy was performed on a male patient aged 55 on account of a perforated diverticulum. Can you assist me towards (a) reducing the number of "actions" of the colostomy; and (b) increasing the solidity of the faeces? The patient has been instructed about diet and fluid restriction and takes "isogel" water-absorbing granules.

A.—The "control" of a transverse colostomy can never be as good as that of an iliac operation. Since in this case the operation was done for a perforated diverticulum there is a possibility that the colostomy may later on be closed, but not, of course, until careful radiological studies of the distal bowel have shown its condition and patency. It is true, too, that all colostomies tend to settle down and become more manageable with the passage of time.

So far as diet is concerned each patient is a law unto himself; it requires painstaking observation on the part of the patient to find out the reaction of his bowel to various foods. It is usually thought best to give a comparatively non-residue-forming diet so that there is little bulk left to stimulate the colon, and, of course, as has been done already in this case, to keep the fluid intake down to a minimum. Kaolin is probably the most reliable material to make the bowel contents more solid and might be used instead of the "isogel." Green vegetables, onions, and so on tend to give a malodorous flatus and so should be avoided; activated charcoal in the form of biscuits is useful here. Habit-forming drugs to help control would naturally be used with great caution, but in the early stages of colostomy life the administration of a small dose of chlorodyne with meals is sometimes of help. In the case of a transverse colostomy, washing out the bowel is rarely of help and may even stimulate the bowel to greater activity.

Sobering Up with Aspirin

Q.—What effect might 50 gr. (3.3 g.) of aspirin have on the clinical signs and symptoms of alcoholic intoxication, and on the alcohol content of the urine? Locally, the "boys" when out on a drinking round commonly use aspirin, as well as amphetamine and "oblivon," to help them sober up.

A.—Individuals vary greatly in their sensitivity to aspirin. A dose of 50 gr. (3.3 g.) might produce nausea and vomiting in an average individual, and in a hypersensitive person might also give rise to tinnitus and deafness. It would not alter the signs or symptoms in a person who had been drinking nor make him appear to be more sober than if he had not taken it. The concentration of alcohol in the urine would not be affected by aspirin, and a knowledge of this figure or of the amount of alcohol consumed could be used as evidence in the usual way. Salicylates tend to interfere with the Cavett method for the assay of alcohol in urine, but accurate results are given by the Kozelka and Hine method. The "boys" would be well advised not to use "oblivon" (methylpentynol) as a means of sobering up, since its effects resemble those of alcohol and its use would tend to increase their apparent degree of intoxication. Aspirin would have no effect except through psychological mechanisms. Amphetamine taken after a patient has ceased to drink has a distinct sobering effect, and, taken the morning after, prevents or abates the usual symptoms of hangover.

Brown Tongue

Q.—A man aged 39 complains of a foul taste in his mouth and a brown patch on his tongue for two years. On two occasions during that time the patch disappeared completely without treatment, and with it the foul taste. On examination four weeks ago there was an ulcer about one inch (2.5 cm.) long down the middle of the tongue at the junction of the anterior two-thirds and posterior third of the tongue. In and around it was a friable brown material removable by scraping. A barium swallow and meal showed no abnormality, but a swab gave a pure growth of a fungus of the genus *Candida* on culture. I treated him with tyrothricin lozenges for a week, which produced no improvement, so I followed this with 1% aqueous gentian violet as a paint night and morning for two weeks. This has resulted in amelioration of the foul taste, but the brown patch is still present on the anterior two-thirds to a slight extent, while the posterior one-third remains unchanged, for the patient cannot paint that without gagging. I should be grateful for advice on further treatment.

A.—The brown patch may well be caused by infection with *Candida*, but it should be remembered that this yeast may be present only as a secondary invader or even as a harmless saprophyte. The ulceration suggests that there is an active infection, and the improvement with gentian violet would support the view that *Candida* is playing a pathogenic role. Tyrothricin has some fungicidal activity, so that improvement could occur, but one would expect more benefit from gentian violet.

Spontaneous change in the flora of the mouth is quite common in the healthy mouth. Van Leeuwenhoek, in his pioneer studies with the microscope, observed changes in his own buccal micro-flora after drinking hot coffee. It is not surprising, therefore, to find that spontaneous recovery from brown tongue occurs.

The foul taste is probably the result of some change in the enzymes in and near the taste buds, rather than the production of an evil-tasting substance by the invading organism. Why this is not a more frequent accompaniment of brown tongue has not been explained.

Treatment should be carried out by the doctor, and the posterior part of the tongue should be painted with gentian violet. If this is not successful it might be worth trying with 33% trichloroacetic acid. Superficial x-ray treatment

to the posterior part of the tongue is difficult and may be impossible, so that local application will have to be persisted in; it would be worth giving the patient a lozenge containing benzocaine or other local analgesic to suck before attempting to paint the remaining brown areas.

Right of Disposal of Wife's Dead Body

Q.—In the case of a wife's death, who has the right of disposal of the body? Does a son or a daughter take precedence over the husband? Is the position in Scots law the same as in English law? If not, please indicate the difference.

A.—In England, if a wife leaves a will, her executors (whoever they may be) have a statutory responsibility for her burial and they have the right of disposal of her dead body to the exclusion of her husband and family. If she leaves no will, her husband will be the next of kin, and the duty of burial and its complementary right of disposal rest on him.

In Scotland the English statutes do not apply and there is no reported decision of the courts on the subject: in consequence the position is far from clear. The best opinion appears to be that the husband's wishes would take precedence over those of the family of the deceased.

Lack of Beard

Q.—A 33-year-old man is worried by his lack of beard. Each morning he shaves, but the soft texture of his beard and the sparsity of its distribution are a source of embarrassment to him. On examination he is well built. He has normal distribution of body hair with male configuration. He leads a normal sex life. The genital organs appear normal, if slightly below average size. What is the reason for the lack of beard? What is the possible treatment?

A.—Normally the growth of the beard is dependent on a sufficiency of testosterone produced by the testicular interstitial tissue. Since, however, this man's sexual life and growth of body hair are normal, his lack of beard is unlikely to be due to deficiency of androgens. His condition is probably what is termed "resistance of the target organ"—that is, insensitivity of the hair follicles to androgenic stimulation. In such a case treatment will probably be ineffective, but a trial might be made of the daily local inunction of testosterone cream.

Some Problems of an Adolescent Girl

Q.—I should be grateful for advice on the treatment of a healthy girl of 17, whose peripheral circulation is very poor. She has chilblains in winter, but her main complaint is the purplish discoloration of her legs and cheeks, worse in winter but never completely absent. There is also adolescent acne, a very coarse skin over the buttocks and outer surface of the arms, and a rather sour body odour in spite of daily baths and strict attention to hygiene.

A.—A pernicious type of circulation with erythrocytosis of the calves is a constitutional condition (unless acquired after acute poliomyelitis). It is often congenital, sometimes inherited, and is not very amenable to treatment. Small doses of thyroid extract (e.g., $\frac{1}{4}$ gr.—16 mg.—daily) are sometimes useful. The body must be kept warm to lessen peripheral vascular tone, and sudden considerable changes of temperature should be avoided. Central heating is a help, and on going out in cold weather warm clothing is essential. It is difficult to get a girl of 17 to wear woollen stockings, but she might be persuaded to put them on over nylons when she goes out of doors. Otherwise jeans should be worn. Elastic stockings are helpful because they are warm, and because they lessen the chronic oedema so often present with erythrocytotic legs.

The other complaints are associated with adolescence, and time will effect a cure. Acne vulgaris can usually be improved by simple measures. The greasiness of the skin

requires the frequent use of soap and water or rinsing with weak cetrimide solution ($\frac{1}{4}$ -1%). No grease should be applied to the skin, and if make-up is used a "liquid powder" is best. Chocolate and fried food must be avoided and the intake of starch reduced. Precipitated sulphur (6%) in calamine lotion may be applied at night. Fractional doses of x rays are helpful.

Watercress Cultivation

Q.—I would be grateful if you can tell me whether any standards for the purity of water used for commercial watercress beds have ever been formulated. Is there any literature on the subject to which I could refer?

A.—The Ministry of Agriculture and Fisheries has had two schemes governing the grade and designation of watercress. Under the National Mark Scheme certain physical qualities were demanded, but there was no mention made about water purity. In a trial scheme, first suggested in 1950, the same physical qualities were mentioned and extended to include a declaration that the ingoing water to the cress beds should be of drinking-water quality. Neither the National Mark Scheme (suspended at the beginning of the second world war) nor the trial scheme is at present in operation. The inquirer should refer to a paper¹ read before the Royal Sanitary Institute's Health Congress at Scarborough in 1954, which is an excellent review of information concerned with the hygiene of watercress cultivation.

The best policy to aim at would be to insist on a standard of purity for the water similar to the prevailing standard for rural water supplies, but in any case, as watercress is eaten in the fresh state, its consumption is somewhat hazardous, because it may be exposed to contamination from sources other than the water supply in which it is grown.² It is recommended by some authorities that watercress should be cleansed by soaking in a chlorine solution (free chlorine 150 parts per million) for about 10 minutes and then washed thoroughly in mains tap water. There is no wilting of the leaves and no appreciable taste after this procedure.

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Drug Treatment of Ménière's Disease

Q.—What place have vasodilators, antihistamine drugs, vitamins, and streptomycin in the treatment of Ménière's disease? How successful are they? Are there any measures that will improve the hearing loss when the degree of loss does not appear to be static?

A.—The morbid anatomical basis of Ménière's disease of the labyrinth consists in a dilatation of the endolymphatic system resulting from some disturbance in the circulation of the endolymph. The cause of this disturbance is as yet unknown. The beneficial effects of histamine and nicotinic acid described by Shelden and Horton¹ and Miles Atkinson²⁻⁴ are likely to be dependent upon some improvement in the circulation of the endolymph, brought about by vasodilatation within the labyrinth. The good effects of cervical sympathectomy, described by Garnett Passe,⁵ are likely to be brought about in the same way. The therapeutic effect of certain antihistamines—for example, dimenhydrinate, mepyramine, and promethazine—is probably dependent, like that of phenobarbitone, upon its depressant action upon the vestibular centres. Vitamin therapy has been recommended by a number of authors, in particular with vitamins A and B. The good results claimed have not been substantiated. Streptomycin has also been prescribed for Ménière's disease in view of its destructive effect upon the vestibular neurones. The use of streptomycin has, however, certain serious disadvantages. There is evidence that in addition to its effect upon the vestibular neurones it also brings about widespread pathological changes in the vestibulo-cerebellar pathways. The effect of this is a persistent state of general imbalance which in elderly people may be very serious.

Improvement of hearing sometimes follows vasodilator therapy—for example, intravenous infusion of histamine. It must, however, be added that similar improvements in hearing sometimes appear to occur spontaneously in the natural course of the disease.

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- ³ J. Amer. med. Ass., 1941, 116, 1753.
- ⁴ Ibid., 1942, 119, 4.
- ⁵ Arch. Otolaryng. (Chicago), 1943, 37, 40.
- ⁶ Eye, Ear, Nose, Throat Monthly, 1944, 23, 436.
- ⁷ Arch. Otolaryng. (Chicago), 1953, 57, 257.

Irritation of Tip of Penis

Q.—I have a patient aged 76 years who complains of intense irritation of the tip of the penis. The irritation is apt to come on at any time of the day or night, and is extremely embarrassing, as the desire to scratch is almost unendurable. I would welcome some suggestions on diagnosis and treatment.

A.—I assume that the urine has been tested for sugar, and that there is no urethritis or balanitis to account for the irritation. Also that the meatus appears normal and that there are no disturbances of micturition such as difficulty, frequency, or pain. If nothing can be found to account for the meatal irritation, I should give the patient a course of testosterone intramuscularly on the supposition that it is due to senile tissue changes. Testosterone is often very effective in the treatment of senile pruritus. It might also be worth while giving the patient some 1% cinchocaine ointment for local use.

Ritual Circumcision

Q.—My son, now aged 2 years, had a ritual circumcision performed when he was 7 days old. I was very worried at the time, as there was practically no penile skin left, but I was assured that this was quite in order. As a matter of fact the wound healed quite well, and we have had no trouble: the shaft of the penis is almost completely covered by good scar tissue and there remains a small area of normal skin at the root. Is this in fact in accordance with the established principles of ritual circumcision, and will the scar tissue give rise to any trouble in future years?

A.—To remove so much skin is certainly not in accordance with ritual ceremony, and it is fortunate that the wound healed so well. The skin of the penis is very elastic, and it is quite easy for a priest (or medical man) to pull down too much at the time of circumcision. But the scar should not cause trouble in future years.

Corrections.—The late Dr. John Lowe did much research on the treatment of leprosy by sulphones, not sulphonamides as inadvertently stated in Sir Arthur MacNalty's appreciation (May 21, p. 1283).

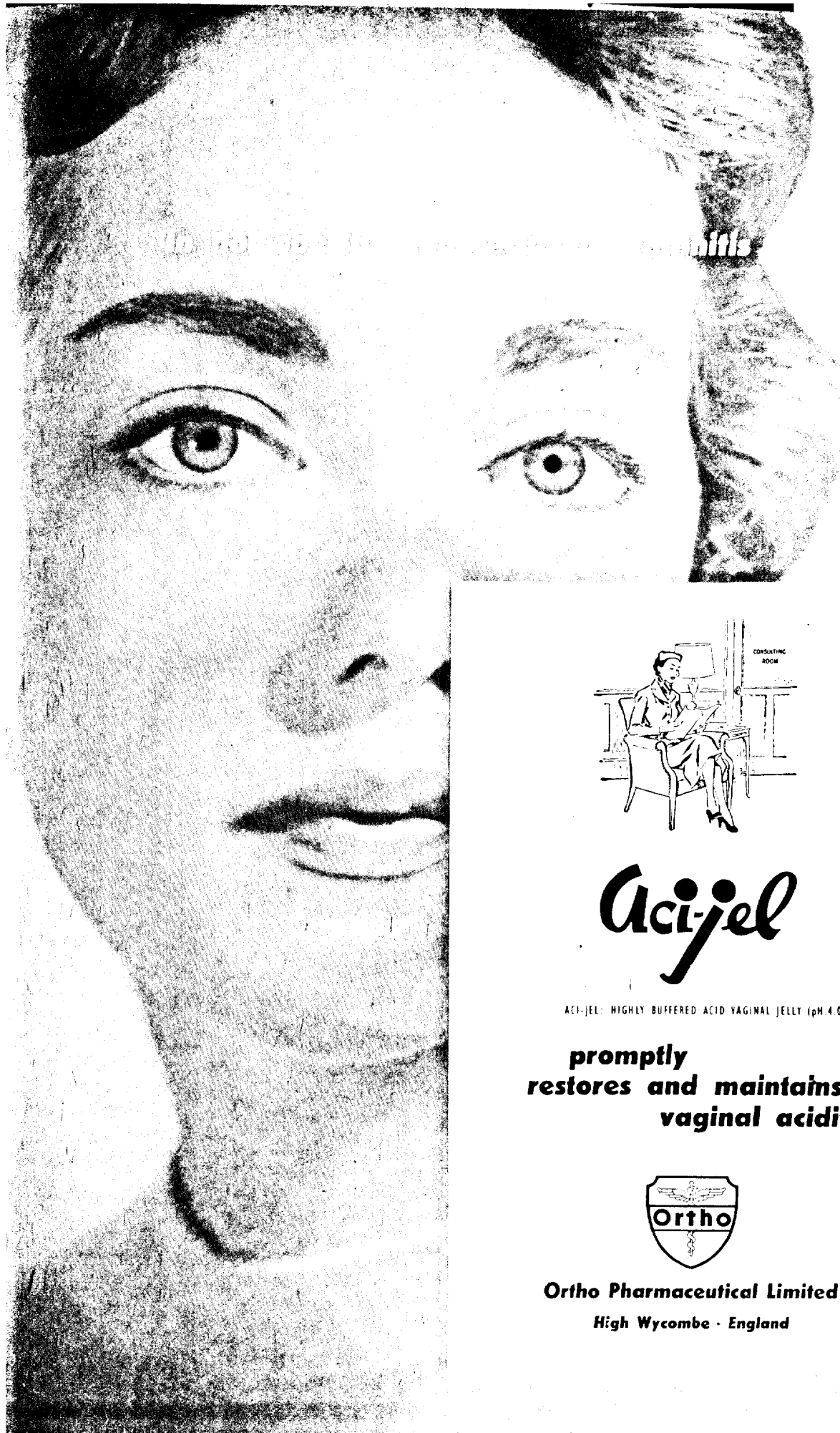
In announcing a research grant to Dr. Hilda Roberts (May 28, p. 1351) we described her present appointment as lecturer in anaesthesia in the Postgraduate Medical School. Dr. Roberts resigned from that post on March 31 and is now an honorary research assistant of the Institute of Obstetrics and Gynaecology at Hammersmith Hospital.

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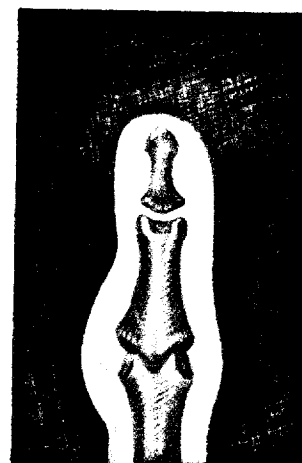
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THE EVOLUTION OF THE TREATMENT OF ADDISONIAN ANAEMIA*

BY

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The rational treatment of any disease is governed entirely by the depth of understanding of its fundamental cause and of the factors which may contribute. The treatment of Addisonian anaemia has therefore evolved with the accumulation of knowledge through the century since 1855, when Addison, in the preamble to his classical monograph, *On the Constitutional and Local Effects of Disease of the Suprarenal Capsules*, wrote his few brief paragraphs on an "idiopathic anaemia."

It would not be within the terms of my title to enter into a long discussion on whether the first recognizable clinical descriptions of Addisonian anaemia should be ascribed to James Scarth Combe, of Edinburgh, to Thomas Addison, of Guy's, or to Professor Anton Biermer, of Zurich. But it would be appropriate to mention that Addison recognized that the malady was fatal, the onset was insidious, the usual symptoms of anaemia were present, that the body fat was often well preserved, and that treatment was ineffective. He stated that the condition arose from "no discoverable cause whatever," but speculated that "from the disease having uniformly occurred in fat people" he was "naturally led to entertain a suspicion that some form of fatty degeneration might have a share at least in its production."

Addison's most clear description—though submerged in his classical monograph on suprarenal disease, and consequently open to the criticism that the author was confusing two diseases—is nevertheless far superior to that given by Combe (1824), whose patient had, indeed, a severe anaemia, but with no convincing features suggestive of Addisonian anaemia.

There is no doubt, however, that the account of 15 cases of fatal anaemia which he had met with in the course of five years, given by Biermer in 1872, came nearer than any other that had previously appeared to depicting Addisonian anaemia as it is recognized to-day.

Addison's position was, however, firmly established some years after his death by two staunch advocates: first, his devoted pupil—Samuel Wilks—who in 1874, in a letter to the *British Medical Journal*, asserted that Thomas Addison had lectured about the disease as far back as 1843; and, secondly, William Pepper, professor of clinical medicine in the University of Pennsylvania, himself greatly interested in the disease, who gave, in 1875, some of the first reports of the bone marrow—

albeit not very convincing, since they suggest leukaemia rather than pernicious anaemia—and who considered that "the older and equally clear description by Addison of idiopathic anaemia was one and the same affection as the progressive pernicious anaemia reported by Biermer."

Addison as a Diagnostician

Addison was outstandingly famous as a diagnostician; his obituary notice in the *Medical Times and Gazette* (1860, 2, 20) says: "Diagnosis was his forte, and those who knew him best are aware that he stood unrivalled in his power of searching into the complex framework of the body and dragging the hidden malady to light. His very meagre and simple prescriptions—if he remembered to prescribe at all—showed that he made no study of therapeutics."

Nevertheless, in what is always regarded as his first public pronouncement on Addisonian anaemia, his communication to the South London Medical Society in 1849, there are some scant descriptions of treatment, but it is difficult to know whether Addison was then speaking of suprarenal disease or his "idiopathic anaemia." The probability is the former, but there is clearly confusion of both. Whatever may have been the nature of these cases, the somewhat non-specific treatment can be regarded as appropriate to all of them.

In referring to two patients who recovered, he says of one, "A man below the middle period of life, who was looked upon as past all hope, and suspected to be suffering from some latent malignant disease, slowly, but steadily, recovered under the free use of brandy, but with the singular result that the hair on one side of his head turned permanently grey, whilst the other side retained its original brown colour."

Treatment of anaemia at that time had not progressed since the time when Sydenham wrote, "We give Mars in the pale colours, the pallor disappears, and once again the face is rosy and ruddy." Then, as now, the iron-deficiency anaemias would have responded to iron in the form of the oxide, the sulphate, and the carbonate, provided sufficient was given, and this irrespective of mercury and other metals, the astringents, diet according to the powers of the stomach, as well as formidable purgings, which were put into operation at the same time.

Pepper (1875), however, appreciated that Addisonian anaemia was in a class by itself, and doubtless he had found, like others, that iron was ineffective. Unhindered by our modern knowledge of such trivialities

*Addison Centenary Memorial Lecture delivered at Guy's Hospital Medical School on March 23, 1955.

as blood groups, he made at least a rational if somewhat perilous approach to symptomatic treatment by advocating and practising blood transfusion, with reactions and results which strike terror into the heart of the modern reader.

Approach to Rational Treatment

At this time—the 'seventies—the current views on aetiology can hardly be regarded as pointing the way to rational treatment, but even then the possibility of a psychosomatic influence was being seriously considered.

Samuel Wilks (1874), in the letter to which I have already alluded, and in which he succinctly established the priority of Addison over Biermer, said: "I express an opinion that nervous shock may be the starting point of the morbid process, and I know of a case where a young lady poisoned her father, and was so overwhelmed with grief that she took to her bed, became anaemic and died. Two of my cases gave a distinct history of moral shock, and a young lad, who died in one of Sir W. Gull's beds, with extreme anaemia, had never been well since he had been attacked by a sheep in a field." He then delivers the knock-out blow to the Continental claim: "The German and the Swiss doctors do not allude to this probable cause."

The last quarter of the nineteenth century provided a steady accumulation of clinical detail about Addisonian anaemia, but relatively little in the way of fundamental understanding, with the one exception of the finding of changes in the stomach, which, however, were not properly comprehended at that time. Consequently, though the clinical entity itself became clearer, the approach to rational and specific treatment was wanting. Glossitis, a number of characteristic changes in the peripheral blood, the hereditary factor, retinal haemorrhages, and neurological changes all came to be built into the picture of the disease.

It was Samuel Fenwick (1877), physician to the London Hospital, who supplied the first appreciation of the importance of stomach function. In a lecture on "Atrophy of the Stomach" he made a clear distinction between Addison's anaemia and Addison's disease, and he described four cases of the former which, after death, had a well-marked lesion of the glandular structure of the stomach. He says: "The stomach showed no signs of post-mortem solution; the whole of the glandular structure of the organ was in a state of atrophy." He actually tested an infusion of the stomach with half a drachm of hydrochloric acid for its power to digest hard-boiled egg. This observation—the failure of stomach function—was, as we now know, the key not only to the proper understanding of the disease but also to its specific treatment as practised to-day.

However, the correct interpretation of these findings was side-tracked—in fact, obscured—for almost half a century after Samuel Fenwick's lecture, largely as the result of the work of William Hunter (1901), a physician at Charing Cross Hospital, who in an incisive and convincing monograph postulated a septic origin for the disease.

A Septic Origin?

Hunter's thesis was based on the belief that Addisonian anaemia was essentially haemolytic by reason of infection of the alimentary canal with haemolytic organisms. The preface to his monograph contains a table in the form of a genealogical tree emanating from the question "What is Pernicious Anaemia?" and evolving to be answered in the later "generations" by confident statements that the disease must originate in the gastro-intestinal area from a "special poison" in the liver, from "infection" in the intestine and stomach, the latter with *Sireptococcus longus*, and a "special infection" with associated dental cario-necrosis and glossitis.

Hunter's monograph, convincingly written, greatly influenced the treatment of Addisonian anaemia. First, he

advocated the prevention and removal of the infective cause of the disease by paying attention to the hygiene of the teeth and of the mouth. Secondly, he said it was essential to change such conditions in the gastro-intestinal tract as favoured the operation of the infective cause. This was done by washing out the stomach, by administering what was regarded as a gastric antiseptic—salicylic acid or bismuth salicylate—as well as intestinal antiseptics, such as salol, naphthol, calomel, or mercuric chloride, and, not least, enemata containing salicylic acid. Thirdly, there were certain measures designed to combat the chief symptoms, of which the most important and most widely used was arsenic in the form of Fowler's solution. This had been introduced by Byrom Bramwell (1877), with high hopes of effecting permanent cure, though experience had shown that it had only a temporary beneficial influence.

It is perhaps interesting to note that Minot and Castle (1935) took the trouble to investigate the action of arsenic in pernicious anaemia when they were carrying out their studies on the significance and interpretation of the reticulocyte count. They found that arsenic would produce an irregular and often sustained reticulocyte response in pernicious anaemia, sometimes associated with showers of nucleated cells, but that the reaction was not physiological, since any subsequent rise in the red-cell count, if such occurred at all, was irregular, disorderly, and incalculable. It is now known that arsenic has no real blood-building value and that it acts as a bone-marrow depressant rather than as a stimulant.

Hunter also practised dietetic treatment, stating as his view that "the most important factor regulating the amount of blood destruction in health is the nature of the diet, a nitrogenous diet causing a much greater destruction than a farinaceous one." He also made a very limited trial of antistreptococcal serum, but even though most of the cases which he records seem to have had a remission he clearly rated this remedy quite low.

Hunter's views dominated the treatment of pernicious anaemia for a quarter of a century, and were supported by Arthur Hurst (1923), who showed that, as the result of oral sepsis, the *Str. longus* became implanted in, and could be recovered from, both stomach and duodenum. Hurst is best known for his emphasis upon the loss of stomach function, particularly the complete achlorhydria so characteristic of Addisonian anaemia, which permitted the implantation of the toxin-producing streptococcus in the upper part of the alimentary tract. Hurst realized the primary importance of the achlorhydria, since it preceded the anaemia and was not, therefore, a secondary phenomenon, whilst it persisted even in remission. He held the view that the anaemia and nervous system changes were both toxic in origin.

When I entered the wards of the Middlesex Hospital in the early 'twenties, the main treatment of Addisonian anaemia followed the views of William Hunter, as expanded by Hurst. Wholesale dental extractions, the administration of arsenic, dilute hydrochloric acid three times a day before meals, for life, together with acidophilus milk. Splenectomy had also a considerable vogue, especially following the reasonably favourable report of Krumbhaar (1916).

Transfusion, with or without splenectomy, was also widely practised, especially in America, with, however, no more than a temporary effect, and this method of treatment must have given George Minot (Minot and Lee, 1917) some of his first experience with pernicious anaemia.

The Work of Whipple, Minot, and Murphy

Meanwhile, in the year following the first world war the way was being prepared for one of the most far-reaching discoveries in medicine. As early as 1918, George Whipple, first in California, and later in Rochester, began a long-term fundamental study upon the power of different foodstuffs—meat, liver, and other substances—to effect the regeneration of haemoglobin in dogs, otherwise maintained on a

standard basic diet, and exsanguinated to a fixed degree. This original and ingenious programme was both simple and effective.

During the period from 1918 to 1925, in association with his colleagues C. W. Hooper and Mrs. Robscheit-Robbins, Whipple published a series of papers, unravelling the basic physiology of haemopoiesis in a systematic and orderly manner, and with a thoroughness and pertinacity which can scarcely have been equalled before or since. The most significant papers in relation to my theme are entitled: "Blood Regeneration following Simple Anaemia: Influence of Meat, Liver and Various Extracts Alone or Combined with Standard Diets" (Hooper, Robscheit, and Whipple, 1920); "Favourable Influence of Liver, Heart, and Skeletal Muscle in Diet on Blood Regeneration in Anaemia" (Whipple and Robscheit-Robbins, 1925). It should also be noted that Whipple (1922) had suggested that, "In pernicious anaemia, there may be a scarcity of the material from which the stroma of the red-blood cells are formed or that a disease of the stroma-forming cells of the marrow exists."

Critics have sometimes said that though Whipple and his colleagues clearly demonstrated the virtues of liver and other substances in blood regeneration, their standard of reference, a dog rendered anaemic by bleeding, bore no resemblance whatever to pernicious anaemia. But no one can read the first fully documented paper of Minot and Murphy (1926) without feeling Whipple's influence, and, indeed, the paper contains this significant paragraph: "Following the work of Whipple and Robscheit-Robbins, we made a few observations on patients, concerning the influence of a diet containing an abundance of liver and muscle-meat, on blood regeneration. The effect appeared to be quite similar to that which they obtained in dogs. These observations, together with the information given above, led us to investigate the value of a diet with an abundance of food rich in complete proteins and iron—particularly liver—and relatively low in fat, as a means of treatment for pernicious anaemia."

The award of the Nobel Prize in 1934 to Whipple, Minot, and Murphy expressed the judgment of an impartial world towards these great men.

Looking back over the intervening period and re-reading Minot and Murphy's simple conclusion that "the dietetic treatment of pernicious anaemia is of more importance than hitherto recognized," one must greatly admire their modesty and the care with which they attempted to control their remarkable results. Their most commendable caution in interpreting therapeutic successes in a disease well known to be subject to one or more spontaneous remissions ought to be blazoned as an example to all who undertake therapeutic trials. After a most critical discussion of results with other remedies, they say, in relation to the obvious constancy and endurance of their own: "There is no data to indicate whether the remission in these 45 cases will last longer than those of others." This simple paper, patently honest and diffident in the extreme, resembles the gentle opening bars of a great unfinished symphony, of which some movements have even now not yet been composed, much less played.

A Developmental Sequence

The developments have been remarkable: In therapeutics, the sequence from liver itself to oral and parenteral extracts, crude and refined, to folic acid, folinic acid, and vitamin B₁₂. In clinical medicine, the comprehension of much about the megaloblastic anaemias—not only pernicious anaemia, but also the nutritional anaemias of pregnancy, infancy, and alimentary disturbances such as sprue. In physiology and pathology, a steady advance in knowledge of the fundamental processes of blood formation, including the cytochemistry and biochemistry of erythropoietic metabolism, all of which has illuminated the field of protein chemistry far beyond the haemopoietic system.

With the discovery of the efficacy of liver the true pathology and aetiology of Addisonian anaemia was shown to be not a haemolytic phenomenon but a maturation defect causing dyshaemopoiesis—a shift from a destructive process to a deficiency disease. Nevertheless, there is ample evidence that excessive red-cell destruction contributes to the anaemic state, even though this haemolytic aspect is of quite secondary importance compared with dyshaemopoiesis (Singer *et al.*, 1948).

The concept of Addisonian anaemia has, however, been greatly extended, so that it is now regarded as a generalized cellular disease, and not simply as a dyshaemopoietic anaemia with neurotrophic complications. Cellular degenerations or changes are found not only in the erythroblasts of the bone marrow and the tissue of the central nervous system, but also in the granular leucocytes of the marrow giving rise to macropolycytes, in the megakaryocytes, in the epithelial cells of the tongue, oesophagus, stomach, and even the respiratory tract (Graham and Rheault, 1954). These multiple changes are all rectified with liver or vitamin B₁₂.

Many times during the past hundred years has diet been considered important in the treatment of Addisonian anaemia. Many times also has the fashion changed, as is so frequently the case with dietetic measures for any pathological condition even to this day. Fenwick (1880), for example, recommended protein foods rather than farinaceous, whereas Hunter advocated the reverse. It should also be appreciated that others (Gibson and Howard, 1923) before Minot and Murphy—some also basing their work on that of Whipple and his colleagues—had prescribed liver for patients with Addisonian anaemia, and had reported improvement, but none had recognized that liver possessed a complete curative effect.

What is remarkable is not that Minot and Murphy thought of trying the effect of liver, since there were a number of pointers, from the well-known beneficial effect of liver-soup in sprue to the experimental work of Whipple, but that they had the foresight or instinct or courage to exhibit it in sufficient amount—half a pound or more of raw or lightly cooked liver a day for life—and with sufficient persistence to obtain and maintain the required effect.

There should be a plaque somewhere to record the fortitude and faith of the first 45 patients with Addisonian anaemia whom Minot and Murphy treated, who endured this nauseating treatment and so gave this great boom to mankind.

When I was in Boston in 1946 there was a dramatic clinical demonstration of two cases of Addisonian anaemia at the Peter Bent Brigham Hospital. Minot and Murphy were both present. The first case was one of the original series of 45 reported in 1926; the patient, a woman, had reached the age of 80, and was dying of carcinoma of the stomach; she had had more than twenty years of happy life, and had graduated through all the advances in liver therapy to that time. The second case, a newly identified one, presented as a contrast, had, with one single parenteral injection of a concentrated extract, shown a maximum reticulocyte response and all the other expected features of a complete remission.

Minot's technique for estimating an early response to treatment by means of a reticulocyte count was a neat and most effective clinical method for control. It was probably crucial in the discovery of liver, since the occurrence of a reticulocyte crisis encouraged persistence and indicated dosage. It has since found numerous applications in clinical haematology, as well as in the elucidation of the pathology of blood disease and the evaluation of methods of treatment.

Castle's Hypothesis

The remarkable investigations of William B. Castle and his colleagues, which began in 1929 and continue even to this day, have clearly shown the role of the stomach in the production of Addisonian anaemia. The experiments,

brilliantly planned and faultlessly executed, showed the relationship between normal haemopoiesis, the diet, gastric secretion, and liver function.

Castle's work can be accounted among the greatest advances in the study of disease processes. It called attention to the vital point in Addisonian anaemia—that certain stomach secretions were essential for fundamental nutrition. The weak antiseptic action of the normal stomach juices in preventing the implantation of a haemolytic organism in the intestine, the basis of twenty-five years of treatment for Addisonian anaemia, ceased to be important almost overnight.

Castle's experimental work led him to propose (Castle *et al.*, 1930) his hypothesis that normal erythropoiesis depended upon a substance of unknown composition generally referred to as the haemopoietic or anti-pernicious anaemia principle. This principle, he suggested, was formed in the normal stomach or in the small intestine by the interaction of two factors—an extrinsic factor present in certain protein constituents of food, and an intrinsic factor secreted by the epithelial cells of the fundus of the stomach.

The haemopoietic principle, absorbed from the alimentary tract, was stored in the liver, whence it ultimately reached the bone marrow by way of the blood stream. Castle's hypothesis explained Addisonian anaemia by an absence of intrinsic factor; it had also the merit of supplying a rational explanation for most megaloblastic anaemias either by other deficiencies or by failure in the processes of absorption, transport, or storage of the haemopoietic principle.

The treatment of Addisonian anaemia quickly evolved from Minot and Murphy's great announcement, largely as the result of the work of Edwin J. Cohn and his associates, who in 1928 introduced a refined and highly potent liver extract for parenteral injection which was subsequently improved through the following decade. Somewhat later, Sharp (1929), Sturgis and Isaacs (1929), and Wilkinson (1930) showed that hog's stomach contained a substance active in the treatment of Addisonian anaemia. This factor, at first thought to be the same as that present in liver, was found to have different properties; it can now, in the terminology of Castle's hypothesis, be regarded as intrinsic factor, and can, in fact, be used to effect absorption of vitamin B₁₂ from the stomach.

With increasing knowledge, however, it became clear that Castle's hypothesis was not a complete explanation, since it did not always fit new facts as they were discovered. It was, for example, found that a number of megaloblastic anaemias would respond to crude liver extracts, but not to refined and concentrated products, and this suggested that liver contained more than one substance, each or all of which might be necessary for supplying the deficiency in different types of megaloblastic anaemia.

Folic Acid and Vitamin B₁₂

This belief was eventually confirmed by the synthesis of folic acid in 1945 by Angier and his team, and the isolation of vitamin B₁₂, almost simultaneously, in 1948, by Lester Smith in England and Rickes and his colleagues in America. Studies with these substances have shown that the anti-anaemic properties of liver itself, as well as the crude extracts or products, can be attributed to both folic acid and vitamin B₁₂, whereas the refined liver extracts owe their activity to vitamin B₁₂ alone. Addisonian anaemia, including the neurological complications, is now known to be due essentially to a deficiency of vitamin B₁₂, whereas most if not all of the other megaloblastic anaemias of similar haematological type are due to a deficiency of both folic acid and vitamin B₁₂, or, in some cases, of folic acid alone.

So far as Addisonian anaemia is concerned, the limitations of folic acid are now fully appreciated. Notwithstanding haemopoietic activity, folic acid fails to prevent or cure the nervous lesions associated with the disease. Indeed, exces-

sive administration would seem to precipitate neurological complications in advanced and untreated cases of the disease by rapidly immobilizing any traces of vitamin B₁₂ in the tissues, thereby creating an acute and sudden shortage of essential neurotrophic material.

Vitamin B₁₂, or cyanocobalamin, the unique cobalt-containing material which was isolated by modern methods of chemical separation, was originally prepared by an expensive process from ox-liver. It is now obtained from the metabolism fluids of a number of bacteria.

In Addisonian anaemia it is active in a daily dose as low as 1 µg., whilst a satisfactory haematological response can be obtained with as little as 20 µg. a day, and a maintenance dose of some 45 µg. every six weeks. It is also protective against the neurotrophic complications in the same somewhat uncertain and unpredictable manner as occurs with liver extracts. Experience has shown that a dosage higher than the minimum should always be used, and especially in arteriosclerotic subjects or those in whom an infection supervenes. Something of the order of 100 µg. a day is advisable until remission is complete, with a maintenance dose of 50 µg. every two weeks. Maintenance by means of massive doses at long intervals is unsatisfactory.

It is now also appreciated that most cases of Addisonian anaemia require to take iron in order to complete recovery, whilst a number may be thyroid-deficient.

Some Difficulties in Treatment

The evolution of liver treatment for Addisonian anaemia from 1926 to the present day has emphasized certain therapeutic principles, has revealed a number of complications or difficulties, and, above all, has brought to light something of the nature and mode of interaction of various related substances in the processes of haemopoiesis, especially with regard to the synthesis of substances which are fundamental constituents of a biological cell—namely, nucleic acid and its derivatives.

None would now question that Addisonian anaemia, a deficiency disease due to failure of stomach function, is incurable, and that adequate treatment must be maintained for life if haematological relapse and, above all, neurotrophic complications are to be avoided. A critical analysis (Wilkinson, 1932) of such cases as have been reported to have re-established the essential gastric function has shown quite clearly that most, if not all, are likely to have been sprue or some other alimentary disease, rather than Addisonian anaemia. Fully restored cases usually relapse in two to ten months if treatment is omitted, but some have remained well for nearly two and a half years.

Proper maintenance, with haematological control, is, however, a prime requirement, since it is really no kindness to cure a patient of Addisonian anaemia if he is afterwards to develop, and die from, preventable spinal paralysis.

Clinical experience has shown that the dosage of vitamin B₁₂, whether as such or as liver extract, should be increased in the aged, or the arteriosclerotic, and in such as develop an infective process; while septic foci should be removed. Other deficiencies may also complicate the picture, so that some with Addisonian anaemia may be found to need regular courses of iron or thyroid extract, and sometimes vitamin C, while those with neurotrophic disturbances are the better for large doses of the complete vitamin B complex, which, with calcium pantothenate, may be very effective in relieving other deficiency symptoms, such as glossitis.

In brief, the treatment of Addisonian anaemia has evolved to the point where specific curative treatment is available, with which the physician can ensure that no patient who is co-operative need die of the disease *per se*. But this is not to say that the treatment has reached a mechanical stage where neither skill nor art is required. Optimum dosage differs from patient to patient. Constant haematological and clinical supervision are necessary. Minor difficulties, such as sensitivity to liver extract, may be troublesome, and

the possibility of other incidental deficiencies should always be borne in mind, since their treatment can greatly increase the comfort and well-being of the patient.

Pathology and Biochemistry of Erythropoiesis

So much for the evolution of treatment. This survey would not, however, be complete without some short and simple account of the revelations arising from this evolution in respect of the fundamental pathology and biochemistry of erythropoiesis.

Knowledge has come from many sources, but above all from the clinical field (which would have pleased Addison), since no satisfactory technique for assay and evaluation in an animal has ever been devised. Castle, for example, had to carry out the whole of his classical work on the human subject, and likewise with the primary testing of various extracts of liver, as well as folic acid and vitamin B₁₂.

Throughout the years the hypothesis of Castle has provided an invaluable working basis for the clinician in all cases of megaloblastic anaemia. It has to be admitted, however, that the hypothesis is no longer acceptable in its original form, even though in the clinical field it still has most valuable applications, and has also provided a focusing point for new discoveries which might otherwise have become inextricably confused.

But vitamin B₁₂, which, at the outset, was thought to be the haemopoietic principle, has the natural distribution and all the properties of extrinsic factor. It cannot be absorbed in active form without gastric intrinsic factor, but, once absorbed, it behaves like the haemopoietic principle. Evidence has now accumulated to show that vitamin B₁₂ itself is microbiologically active, but not haemopoietically so unless it becomes bound to intrinsic factor, possibly a mucoprotein, in the gastric juice or its counterpart in the tissues. The bond is heat-labile, and when dissociated by heat the vitamin B₁₂ is no longer haemopoietically active. In Addisonian anaemia vitamin B₁₂ is highly active by parenteral injection by reason of a tissue-binding substance, since it appears in the serum in bound form, but it is only active by mouth when given in massive dose (3 mg.) or in association with normal gastric juice (Ungley, 1949).

Knowledge concerning erythropoiesis has also come from studies in bacterial metabolism and animal nutrition, and, indeed, the fact that intestinal bacteria may immobilize such substances as vitamin B₁₂ has an influence on therapeutics, which may be profoundly altered by a change of flora brought about by an antibiotic. Thus, the binding of vitamin B₁₂ so that it is no longer available to bacteria may, in fact, be one of the essential functions of Castle's intrinsic factor, irrespective of conversion of vitamin B₁₂ to a haemopoietically active form.

Functional Relationship between Folic Acid and Vitamin B₁₂

A problem of fundamental importance is a determination of the functional relationship between folic acid and vitamin B₁₂, particularly whether they are independent haemopoietic agents or whether their actions are inter-related so that the presence of one is necessary for the functioning of the other. Folic acid was at one time thought to correspond to Castle's extrinsic factor, but this obviously is not the case; and, indeed, it is difficult to fit folic acid into Castle's hypothesis at all.

The activity of folic acid seems to be dependent upon its conversion to folinic acid, otherwise known as the citrovorum factor, and so called because it is an essential growth factor for *Leuconostoc citrovorum*. Folinic acid has been shown to be therapeutically active in certain megaloblastic anaemias (Davidson and Girdwood, 1951), but, unfortunately, attempts to throw light on the relationship of folic acid, folinic acid, and vitamin B₁₂ by *in vivo* and *in vitro* studies of bone marrow have produced confusing and inexplicable results. When vitamin B₁₂ is injected into the bone marrow of a case of Addisonian anaemia in relapse

the material is utilized by the cells, but this is not the case with either folic acid or folinic acid. On the other hand, when the materials are tested *in vitro* with megaloblastic marrow cultures, folic acid can bring about normal maturation, whereas vitamin B₁₂ will not do so unless associated with normal gastric juice.

Studies of the metabolic requirements of bacteria have also shown that the pyrimidine base, thymine, can replace folic acid, and that the desoxyriboside of thymine, thymidine, can replace vitamin B₁₂ in satisfying certain essential growth requirements of organisms. Both of these substances, as well as a number of others (Welch and Heinle, 1951), possess some haemopoietic activity in megaloblastic anaemias.

This rapidly accumulating tangle of facts has not as yet been unravelled, but from the angle of basic biochemistry the views of Vilter and his colleagues (1950) offer a logical and rational approach to the problem, particularly in the co-ordination of bacteriological metabolic experiments with therapeutic results in the megaloblastic anaemias.

In brief, it is suggested that all the substances which I have considered are concerned in the formation of nucleic acid, which is essential for haemopoiesis. The synthesis of nucleic acid is thought to be brought about by a "chain reaction" in which, in the first stage, folic acid, probably first converted to folinic acid, exercises a coenzyme function in the formation, from uracil and other simple substances, of purines and pyrimidines (such as thymine). In the second stage, vitamin B₁₂ is thought to act as the coenzyme for the conversion of pyrimidines to nucleosides (such as thymidine) which are available for the formation of nucleotides, and so of nucleic acid. On this theory a deficiency in either folic acid or vitamin B₁₂ may cause a breakdown in nucleic acid metabolism.

These views point to there being some interplay between folic acid and vitamin B₁₂ in certain metabolic processes, and it may well be that the riddle of the interchangeable haemopoietic roles of these substances in Addisonian anaemia will be solved only through detailed studies of biochemical reactions.

We know that we have not yet solved all the therapeutic problems of Addisonian anaemia, much less drawn all the dividends from the discoveries which have been made since Addison first lighted a beacon a century ago. At that time he could hardly have been aware of the magnitude of the vista which he was about to illuminate, even as we do not know what will happen in the next century.

Conclusion

In a brief hour I have tried to look over the past, including the near-past in which the tempo of advance has so rapidly increased. In so doing, one remembers with gratitude the heritage of this great hospital through its many sons whom Addison inspired, most of whose contributions in the field of my subject can be found in succeeding volumes of the *Guy's Hospital Reports*.

I think of Wilks, Pye-Smith, Taylor, French, Campbell, Hurst, John Conybeare, Izod Bennett, whose pupil I once was because he came to us at Middlesex, and John Ryle, who was my immediate predecessor at Cambridge.

"Let us now praise famous men."

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ARTERIAL REPLACEMENT BY "ORLON" CLOTH*

A PRELIMINARY REPORT OF ITS EXPERIMENTAL AND CLINICAL USE

BY

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During the years since the second world war it has gradually become clear that the grafts used as substitutes for arteries served chiefly as scaffolding on which the tissues of the host developed a new vessel. The survival of cells from the donor has not proved essential for success. Indeed, good results may be obtained where no effort is made to maintain the viability of the cells of the graft. K. Nakayama (1953, personal communication) has used human homografts preserved in alcohol to replace the aortic bifurcation. In our own hands the results with heterografts sterilized and preserved in neutral formalin and used in animals have been most satisfactory over considerable periods of time. It therefore seemed a logical consequence that artificial materials might be used as a scaffold, and Voorhees and his colleagues (1952) reported the successful use of an inert plastic cloth, "vinyon-N."

Experimental Studies

Vinyon-N was difficult to obtain in England, and so we chose for trial "orlon," a plastic developed by duPont and available in Great Britain from Zurrer Silks (Darwen) Ltd., Anchor Mills, Darwen, Lancs. It was one of a variety of woven plastic materials which were easily available and likely to be chemically inert in the body. The choice was made chiefly on the naked-eye appearance of the weave and its power to hold sutures. Its ability to prevent excessive leakage of water, or blood through its pores was also tested on the laboratory bench before it was used surgically. It was found to be more suitable in these ways than other materials that were tried.

Orlon is an acrylic resin, a polymer of acrylonitrile, and possesses the qualities of strong resistance to acids, alkalis,



FIG. 1.—Orlon replacing portion of abdominal aorta of dog. Carrel suture used (see text).

salts, and greases. The fabric used was 175 on the weft and 260 on the warp. It was inelastic, soft, and pliable, and sewed easily without tearing.

Mongrel or greyhound dogs were anaesthetized with intravenous pentobarbitone sodium, and under aseptic conditions the peritoneum was opened through a long midline incision. The posterior peritoneum was incised, exposing the distal abdominal aorta, the lumbar arteries were ligated, and 2 to 3 cm. of aorta was resected after Blalock clamps had been applied to it above and below. The tube of orlon fabric was then sutured end-to-end to the aorta with over-and-over continuous stitches of 5/0 silk moistened with liquid paraffin, and the clamps were temporarily removed to allow blood to fill the tube and test for leaks at the anastomoses. Blood oozed through the orlon fabric for about a minute while clotting was occurring in the interstices of the fabric.



FIG. 2.—Aortogram two months after insertion of orlon. Carrel suturing not used. The upper anastomosis (arrow) is not used. The thickness of collagen is barely discernible, the lower is located by the small notch.

Animal Studies with Orlon

Dog No.	Type of Anastomosis	Result	Time (Weeks) and Method of Check	Total Time Followed (Weeks)
G.2	End-to-end	Patent	12 Necropsy	12
G.3	"	Ruptured anastomosis	16 "	16
G.4	"	Patent	21 Aortogram	21*
G.6	"	"	15 Clinical	15*
G.7	"	"	8 Aortogram	16*
G.9	End-to-side	"	16 Clinical	16*
G.10	End-to-end	"	4 Aortogram	8
G.11	Side-to-side†	Thrombosis	8 Necropsy	—
G.12	"	Patent	3 Aortogram	5
			5 Necropsy	4*
			4 Clinical	4*

* Indicates animal still surviving for further study.

† All prostheses were inserted in the aorta, except in G.11 (aorta to external iliac).



FIG. 3.—Interior of orlon tube inserted end-to-side two months previously. The interior of the host aorta is visible at either end, and that of the orlon, covered by transparent new "intima," in the centre.

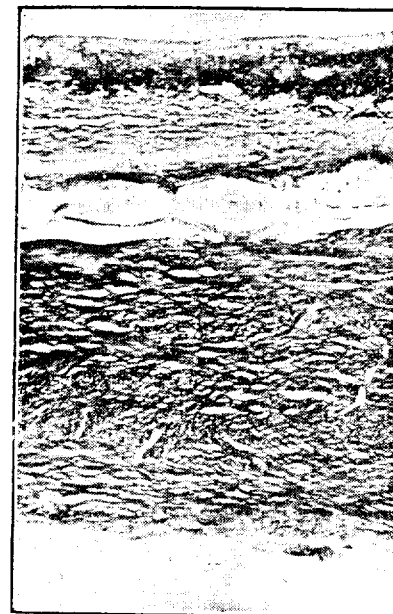


FIG. 4.—Microscopical section (x55) of orlon and collagen four months after insertion. Spaces near the orlon are artefacts. The thickness of collagen is greater on the exterior (see text).

possible a larger stoma than would end-to-end anastomosis, in which the stoma would, of course, be limited to a diameter equal to that of the host artery. A large stoma, and particularly one in which the suture line did not completely encircle the host vessel, should be less liable to closure by thrombosis. The end-to-side and side-to-side anastomoses worked well in the aortas of dogs in which they were tried.

The posterior peritoneum was closed over the prosthesis and the abdomen closed in layers. Penicillin and "plasman" were given post-operatively. At a later date patency of the grafts was determined by an aortogram performed by injecting diodone into the aorta above the prosthesis through a cardiac catheter which had been passed down into the aorta from the common carotid artery (Fig. 2).

The results in the dogs which had orlon prostheses are shown in the Table. The prostheses were implanted in their abdominal aortas or as shunts around an aortic or iliac obstruction. One (G.10) died 10 hours after operation without recovering from the anaesthetic. The prosthesis was patent and lined internally by smooth fibrin. The anastomosis was intact. Another (G.3) died at 16 weeks post-operatively from rupture of a false aneurysm that was surrounding the prosthesis and which had formed from an anastomotic leak. The orlon tube was floating in the centre of the false aneurysmal sac and had no fibrous reaction within or around it. The significance of this lack of reaction

is discussed below. The suture material was found to have pulled out of the aorta at the distal anastomosis. In one animal (G.11) a 5-in. (12.5-cm.) long shunt had been placed from the aorta to the left common iliac artery, bridging a tape ligation on the iliac artery. The shunt thrombosed in the early post-operative period, and on sacrifice at four weeks the graft was found to be thrombosed and one of the distal anastomotic sutures had constricted the iliac artery. All the other orlon prostheses have remained patent. The two failures were due to technical errors which were in no way peculiar to the material or the method.

The tubes become lined with a smooth glistening layer of hyaline collagenous tissue, the innermost layer indistinguishable from intima (Figs. 3 and 4). They are surrounded by a thick layer of fibrous tissue which encases and grows into the meshes of the cloth (Fig. 5). They are tolerated without ill effect. The collagen lining and surrounding the tube results from the vascularity and activity of the surrounding tissues. This was well shown in dog G.3. Rupture of the distal suture line occurred soon after operation, and blood continued to flow through and around the tube and into the false aneurysmal sac, in which it lay almost free for several months before death. Despite this, the orlon tube looked almost as fresh as when it was inserted. There was a little fibrin deposited on it, but no collagen formation whatever. This suggests that contact with surrounding living tissues may be necessary for the collagen to form. Mere contact with circulating blood is insufficient.

Another interesting point that emerged at necropsy was the way in which the orlon retained its strength. After several months in the tissues the tensile strength of the fabric appeared to be quite unchanged. This is of great practical importance, because mere unsupported collagen would be expected to stretch under pressure and with the passage of time.

None of the prostheses and their surrounding tissues have shown evidence of calcification on x-ray examination.

Clinical Application

Encouraged by these results, we placed orlon tubes in three patients. Brief case summaries are presented.

Case 1

A 58-year-old male Civil Servant was admitted to St. Bartholomew's Hospital complaining of epigastric pain of three months' duration. For four years he had had intermittent claudication of the left calf, which appeared after 150 yards. For the past 18 months he had noticed increasing epigastric discomfort, which for three months had been severe and was associated with nausea, morning vomiting, and weight loss. Two months before admission he noted the appearance of a tender mass in the left mid-abdomen that had more recently increased in size.

On examination he was noted to be a thin ill-looking man who appeared older than his age. The blood pressure was 210/108. The veins in the neck were distended; the heart was enlarged and there was an apical systolic murmur. In the abdomen there was a visible swelling in the left upper portion which had an expansile pulsation, measured 5 by 12 cm., extended from the left of the umbilicus to just

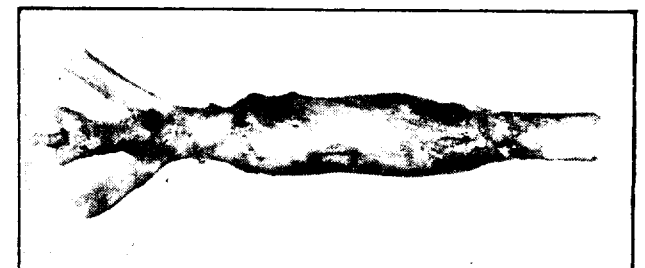


FIG. 5.—Exterior of aorta and collagen-surrounded orlon removed from an animal three months after operation.

*Based on a communication to the Surgical Research Society, London, November 26, 1954.

below the costal margin, and was compressible, tender, movable from side to side, but not superiorly and inferiorly. Peripheral pulses were decreased bilaterally and neither posterior tibial pulse was palpable.

Aortography showed a large aneurysm of the abdominal aorta extending from just below the kidneys down to and involving both common iliac arteries. It was evident that the aneurysm was expanding, that rupture was imminent, and that intervention was necessary. Operation was performed through a long midline incision. The aneurysm extending from 1 cm. below the kidneys to 2 cm. below the bifurcation was excised and an orlon prosthesis anastomosed end-to-end to the aorta above and to each common iliac artery below. After operation the femoral pulses were good. He experienced a fall in blood pressure during the first 30 minutes of the operation and afterwards passed little urine. His blood urea rose to 332 mg. per 100 ml. by the fourth day, and he became comatose and died. Necropsy revealed marked renal fibrosis and atheroma of the renal arteries. The orlon prosthesis was patent and the anastomosis intact. Death was due to failure of the diseased kidneys to function following the period of hypotension during operation.

Case 2

A 62-year-old male clerk of works was admitted to St. Bartholomew's Hospital complaining of pain in the leg on walking. Two years previously he had noticed that pain developed in the left calf after walking about 200 yards.



FIG. 6.—Orlon prosthesis in place on iliac vessels of Case 2 after completion of side-to-side anastomoses.

It had steadily increased in severity until the present, when it occurred after 75 yards of slow walking. He had been forced to stop work because of the pain. There was no rest pain or ulceration.

On examination the blood pressure was 200/100. Major abnormal findings were limited to the extremities, where the left foot was colder than the right, and paled quickly on elevation to 20 degrees. Pulses were completely absent on the left, but present though diminished on the right. Aortography revealed obstruction of the left external iliac artery.

The ischaemia was considered to be too severe for relief by ganglionectomy alone, and it was decided to use an arterial prosthesis. Operation was performed through a left paramedian incision. The left iliac vessels were exposed and a tube of orlon 5 in. (12.5 cm.) long was anastomosed to the left common iliac artery above the block and to the left common femoral artery below it (Fig. 6). The anastomoses were done side-to-side to make larger stomata. The existing collateral circulation was not disturbed. A left lumbar ganglionectomy was also performed. Post-operatively the pulses were all present in the left leg and stronger than in the right. Six months after operation he was able to walk three-quarters of a mile without claudication and the pulses remained present and strong.

Case 3

A 67-year-old company director was admitted to St. Bartholomew's Hospital complaining of a large pulsating swelling in the left groin. For many years he had noticed

a small lump in the left lower abdomen, which three weeks before admission had suddenly enlarged and started to pulsate and had become very prominent. There was a history of three myocardial infarctions at ages 64, 65, and 66, and moderate exertional dyspnoea and angina since the last infarction.

On examination the pulse was 88 and grossly irregular; the blood pressure was 180/105. The heart was not enlarged, but auricular fibrillation was present. In the abdomen there was a large pulsating visible mass in the left lower quadrant just below the umbilicus and extending down to the inguinal ligament. Its most prominent part was pushing out the anterior abdominal wall. The pulses were diminished bilaterally and absent distal to the popliteal artery on the left. Because of its possible harmful effect on renal function, aortography was not done. Operation was performed through a long left paramedian incision and a huge abdominal aneurysm was excised. It was 8 in. (20 cm.) in antero-posterior and 5 in. (12.5 cm.) in lateral extent. A λ-shaped orlon graft was placed from 2 in. (5 cm.) below the renal arteries to 3 in. (7.5 cm.) beyond the bifurcation and anastomosed end-to-end to the aorta above and to the common iliac below. Post-operatively he has had good pulses in both legs, and the prosthesis has functioned perfectly in the five months since operation.

Preparing the Prostheses

1. *The Seam*.—Ordinary fine white nylon sewing thread (No. 102) has been used to sew the seam, as orlon thread was not available to begin with. More recently pure orlon thread has been used. No difference has been discernible in the results from the two materials. A sewing machine is used to sew the seam and three rows of stitches are inserted close together and about 5 mm. from the free edges of the cloth. The ways in which the cloth is folded and sewn can be seen in Fig. 7. Prostheses for end-to-end or side-to-side anastomosis need only one longitudinal seam, for they are made from a single piece of cloth folded upon itself. The ends of the prosthesis intended for side-to-side use are closed by seams which lie close to the stomata. This avoids having a blind bag at each end (Fig. 7). Two pieces of cloth of the same shape are placed one on the other and sewn together when a branching prosthesis is needed. More seams are then required. A prosthesis for the aortic bifurcation is shown in Fig. 7. The same principle may be used for a greater number of branches.

2. *The Ends*.—Sutures placed close to the edge of a single thickness of cloth may pull out; therefore the ends are folded over. The folding is done before sewing the seams to avoid narrowing the ends of the tube.

3. *Size*.—Rough dimensions may be obtained from angiograms. The length is estimated without great difficulty. The diameter measured from the arteriogram tends to be smaller in obliterative disease and larger in aneurysmal disease than is needed in the operation. The diameter of the prosthesis as it lies flat and undistended needs to be

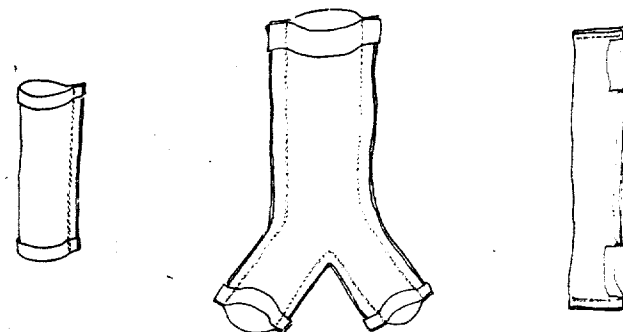


FIG. 7.—Diagrams to show folds and seams of prostheses for (from left to right) end-to-end, bifurcation, and side-to-side insertion.

approximately twice the diameter measured on the arteriogram film. It is convenient to have two or three prostheses of slightly different dimensions prepared before operation. One of them is usually found to be of the correct size. Should it prove too long it is easy to unpick some of the seam and trim it to the required length.

4. *Sterilization*.—The completed tubes are sterilized by boiling or autoclaving before operation. The latter is preferable. It is important to avoid folds or wrinkles in the cloth. The completed prostheses are smoothed with an electric iron before autoclaving. This is particularly helpful in keeping the folds at the stomata turned conveniently backwards so that suturing is facilitated when the time comes. Glass rods or small test-tubes are inserted inside the prostheses to prevent wrinkling during autoclaving.

Discussion

The advantages of these cloth prostheses over homografts are obvious. They are far more easily obtained and there is no anxiety about their sterility. They have, however, limitations. They cannot be used across the line of flexion of a joint, or certainly not if the joint is to be acutely flexed in the immediate post-operative period, for if this is done the tube is folded, the lumen obstructed, and thrombosis follows. This was the result when a prosthesis was inserted in a dog from the aorta to the femoral artery and the hip-joint flexed. Perhaps if flexion was avoided by splintage or other means until a firm collagenous wall had formed success might be obtained. Until this point is elucidated further we have avoided using a prosthesis below or across the inguinal ligament in patients, relying still upon homografts for this region.

A point of technical interest became evident when the aortograms were examined. When the classical Carrel everting suture was used a definite constriction was always produced at the anastomosis. This did not occur when a simple over-and-over running suture was used without eversion of the inner surfaces. The latter type of suture also has the advantage of greater speed and ease of execution.

The idea of using seamless tubes soon comes to mind when considering prostheses, and through the kindness of Messrs. Ethicon Sutures we have had some of these for preliminary trial. Certain disadvantages came to light which were not at first obvious. A turnover at the ends is desirable, and this necessarily produces some constriction, which is undesirable in the smaller-lumen tubes. Also, where branches are involved they are less adaptable for use compared with the prostheses made to measure. However, there is no doubt that with further trial still better prostheses will be evolved.

Summary

Experimental studies using "orlon" cloth prostheses to replace arteries of dogs are described.

The prostheses can be inserted end-to-end, end-to-side, or side-to-side into the arterial tree of the host. Branching prostheses may also be used.

Their clinical use in the treatment of arterial disease is reported.

Technical points in preparing the prostheses are outlined.

Advantages and disadvantages of prostheses compared with homografts are discussed.

We are grateful to many colleagues who have helped with this work. Professor Sir James Paterson Ross has given advice and encouragement, and Professor E. C. Amoroso has given us hospitality and facilities at the Royal Veterinary College for the animal studies. Dr. Hugh Cleland has helped with some of the operations. Miss D. Aitken has given skilled technical help, particularly in preparing the prostheses.

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SENSITIVITY TO FIVE ANTIBIOTICS OF A FURTHER 200 STRAINS OF STAPH. PYOGENES ISOLATED FROM OUT-PATIENTS

BY

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Three years ago a report was made from this laboratory of the sensitivity to five antibiotics of strains of *Staphylococcus pyogenes* isolated from out-patients (Birnstingl, Shooter, and Hunt, 1952). It was found that, although the majority of staphylococci isolated from in-patients at that time were resistant to penicillin, resistant staphylococci were isolated from only 32 of 200 out-patient infections. No strains were resistant to streptomycin, chlortetracycline, oxytetracycline, or to chloramphenicol. In view of the continued prevalence of penicillin-resistant staphylococci in hospital wards, and the increasing number of strains found to be resistant to the later antibiotics, we have again examined 200 strains of *Staph. pyogenes* isolated from out-patient infections to see if resistant staphylococci are responsible for more of these infections than was the case three years ago.

Sources of Staphylococci

Swabs were taken from patients with acute infections of the skin and subcutaneous tissues attending the casualty department between October, 1954, and March, 1955. Whenever possible, swabs were taken on the first attendance, or, if this was not possible, when a lesion was opened. Swabs taken from patients attending other out-patient departments of this hospital, such as the skin and ear-nose-and-throat departments, were not included in the series, and care was also taken to exclude patients attending other hospitals, or who had recently been discharged from hospital wards.

Methods of Isolation and of Testing Sensitivity

All the swabs were sown direct on to two horse-blood-agar plates from which cups had been cut with a cork-borer. After inoculation these cups were filled with penicillin 10 units/ml., streptomycin 250 µg./ml., oxytetracycline 50 µg./ml., chloramphenicol 250 µg./ml., and erythromycin 100 µg./ml. respectively. Staphylococci which coagulated plasma in a tube were regarded as *Staph. pyogenes*: those which were inhibited by antibiotics to approximately the same degree as the Oxford H staphylococcus were described as sensitive.

Dilution sensitivity tests were carried out for all the antibiotics used with the exception of penicillin. For these tests stock solutions of streptomycin calcium chloride complex (1,000 µg./ml.), oxytetracycline (100 µg./ml.), chloramphenicol (1,000 µg./ml.), and erythromycin (100 µg./ml.) were prepared in distilled water and stored at -8° C. The solutions of streptomycin and chloramphenicol were replaced every two months; solutions of oxytetracycline and erythromycin were made up weekly. For testing, series of two-fold dilutions of each of the four antibiotics in nutrient agar plates were prepared immediately before use, each plate

containing 14 ml. of nutrient agar and 1 ml. of a solution of antibiotic of such strength as to give the required concentration when uniformly diffused in the medium. Each plate was divided by diamond marking into 12 approximately equal sectors of just over 5 square cm. An 18-hour nutrient broth culture of each staphylococcus was used as the inoculum, a 1-mm. loopful of the undiluted culture being spread over each sector. (For streptomycin, tests were also made using this inoculum diluted 300 times.) The plates were incubated at 37° C. for 18 hours, and the end-point was determined by inspection of the surface of the medium.

Results

For *Staph. pyogenes*, resistance to penicillin is dependent on the production of penicillinase, and as this can be detected in primary culture no further examination was thought necessary. Of the 200 strains isolated, 43 produced penicillinase and were resistant. Sensitivity to the

Sensitivity of 200 Strains of *Staph. pyogenes* to Streptomycin, Oxytetracycline, Chloramphenicol, and Erythromycin

Minimum Inhibitory Concentration (µg. per ml.)	Streptomycin		Oxytetracycline	Chloramphenicol	Erythromycin
	Undiluted Inoculum	1 in 300 Inoculum			
>64	1	—	—	—	—
64	26	—	—	1	—
32	87	—	—	186	—
16	—	—	—	12	—
8	17	4	—	—	—
4	1	103	38	—	—
2	—	90	119	—	13
1	—	2	42	—	187
0.5	—	—	—	—	—
0.25	—	—	—	—	—

other antibiotics is shown in the Table. With one exception strains found sensitive by the dilution method had already been so described on primary isolation.

We have deliberately used a heavy inoculum when testing sensitivity, partly to enable a comparison to be made with previous work, and partly in the belief that the results obtained may be more applicable to conditions in the body (Spink, 1951). In a small pilot experiment involving 12 strains it was found that for oxytetracycline, chloramphenicol, and erythromycin, the difference between an inoculum of undiluted culture or a 1 in 300 dilution of undiluted culture amounted to only one serial dilution of the antibiotic. For streptomycin the difference was greater, and the results are accordingly reported as those obtained with undiluted culture or its 1 in 300 dilution.

Discussion

Penicillin.—In the three years since the last survey much penicillin has been prescribed in general practice, and many members of the public have entered and left hospital wards. A considerable number of this last group of patients must have taken with them to the outer world penicillin-resistant hospital staphylococci, and it is gratifying and perhaps a little surprising that we have isolated only 43 resistant strains (21.5%), as compared with 16% three years ago. The spread of resistant staphylococci within hospitals has been so rapid that it might be thought that there is some special feature of the hospital environment which encourages them in preference to sensitive strains. Perhaps in the outer world sensitive staphylococci are better able to hold their own, and a 21.5% rate represents a state of equilibrium.

Streptomycin.—With the use of a heavy inoculum two of our strains were relatively resistant to streptomycin, but that this represents the selection of a few resistant variants is suggested by the finding that all the strains were sensitive when tested with a dilute inoculum. There are few indications for the use of streptomycin in the treatment of staphylococcal infections, and it was included as a matter of theoretical interest.

Other Antibiotics.—Resistance to oxytetracycline, chloramphenicol, erythromycin (and streptomycin) is the result of

exposure of staphylococci to these drugs, and resistance, once acquired, is permanent. This type of resistance is becoming an additional characteristic of hospital staphylococci, and its occurrence is related to the frequency with which the newer antibiotics are prescribed. That we have found only one staphylococcus to be resistant to chloramphenicol and none to be resistant to the other antibiotics presumably reflects the relatively restricted use of antibiotics in general practice, and the dilution among the general public of resistant hospital strains.

If *in vitro* sensitivity tests can be taken as a guide to the likely outcome of treatment—and for most infections and drugs there is general agreement that they can—our findings would suggest that some 80% of staphylococcal infections originating outside hospital will respond to treatment with penicillin, and almost all to treatment with oxytetracycline, chloramphenicol, and erythromycin.

Summary

Two hundred strains of *Staph. pyogenes* isolated from out-patients with acute staphylococcal infections of the skin and subcutaneous tissues have been tested for their sensitivity to penicillin, streptomycin, oxytetracycline, chloramphenicol, and erythromycin. Of the strains tested, 21.5% were resistant to penicillin. One strain was resistant to chloramphenicol, and none to the other antibiotics.

Comparison of these results with those of a similar investigation carried out three years ago has shown that there has been a slight increase in the proportion of strains resistant to penicillin, but virtually no increase in strains resistant to the other antibiotics.

We are indebted to Professor L. P. Garrod for advice, and to Miss M. Rhodes for technical assistance.

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TREATMENT OF THE PREMENSTRUAL SYNDROME

VALUE OF ETHISTERONE, MEPHENESIN, AND A PLACEBO COMPARED

BY

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In a recent penetrating contribution on the premenstrual syndrome Greene and Dalton (1953) reached the conclusion that the wide variety of distressing symptoms from which many women suffer during the final week or so of the menstrual cycle, and occasionally at other points of the cycle, are probably due to water-retention. This, in turn, they felt was very likely the result of an abnormal elevation of the oestradiol/progesterone ratio. Claims for the beneficial results of treatment aimed either at dehydration or at correcting the alleged hormonal disturbance have, they point out, been made by a number of writers. They themselves found treatment by a progestogen to be almost invariably successful, in mild cases relief usually being obtained by the oral administration of ethisterone in a dosage of 25 mg. twice daily during the second half of the menstrual cycle. Still more effective was the intramuscular injection of progesterone, 25 mg. on alternate days during

the same phase of the cycle, or the implantation of progesterone, which then remained available for many months.

My own experiences with ethisterone, used in much the same way as above, had been less convincing of its efficacy. Moreover, it has seemed probable that psychological factors, leading to the tension-pain syndrome, might constitute a not unimportant part of the premenstrual syndrome, so that the administration of a muscle-relaxing drug might be expected to have some value in the management of the condition. There have already been reports that mephenesin ("myanesin"; 3-(2-methylphenoxy)propane-1:2-diol) administered orally to patients with disturbed psychic functions manifested as anxiety could produce sedation without soporific effect (Schlan and Unna, 1949); and Ström-Olsen (1951) found this drug to be of value in combination with psychotherapy in relieving tension states. There seemed to be good reason, therefore, for submitting the use of mephenesin orally in the treatment of premenstrual symptoms to clinical trial, and at the same time to compare its value with that of ethisterone.

Plan of the Experiment

Since the assessment of the patients' symptoms could only be subjective, it was clearly necessary to adopt a plan which would eliminate, so far as possible, both patient and observer bias. The use of a placebo, indistinguishable from the active tablets, was a prime requirement, and ignorance of the nature of each set of tablets, both by the patient and, at least until after the result had been recorded, by the observer, was equally important. The scheme employed therefore consisted of four groups of treatments: placebo; ethisterone, 10 mg.; mephenesin, 0.5 g.; and ethisterone, 10 mg., + mephenesin, 0.5 g. All the tablets, of course, looked alike and were put up in numbered boxes, a complete set of the four treatments, in prearranged order, being contained within a larger numbered box. It was intended that each patient in the trial should have each of the four treatments in successive months, in random order, the actual order remaining unknown to the observer until the end of the trial. This therefore called for 24, that is 24 patients for a complete series.

The patients were women attending the Fertility and Endocrine Clinics of the Obstetric Hospital, University College Hospital, and employees of the Savings Bank division of the General Post Office (kindly referred by Dr. Mary Parkes). The nature of the trial was explained to them—namely, that they would be having four different treatments in successive months, and would be asked which seemed to be effective. A record was made of their age, parity, the duration of their premenstrual symptoms, whether the latter were mild or severe, and whether they were constant or inconstant from one cycle to another. They were entered into the trial in the order in which they presented themselves and were given the first box of tablets from the appropriate large container. They were told to take one tablet five times a day for 10 days, starting on the 15th day of the cycle, and to return a month later.

On their return the effect of treatment in the cycle just finished was scored as ++ if symptoms were completely abolished; + if there was some, but incomplete, improvement; 0 if the symptoms were unchanged; and — if the symptoms were worse, or additional symptoms, thought to have been caused by the treatment, were noticed. They were then given the second box of tablets, and so on until all four months of treatment had been accomplished. Naturally, in a trial of this kind, it is inevitable that, for one reason or another, not every patient completes the planned series of treatments.

Results

The clinical details of the patients, and their results with the individual treatments, are shown in Table I. From this it is at once clear that there is considerable variation in the severity and variability of the symptoms from patient to patient, and in the same patient from cycle to cycle. This naturally makes the assessment of the value of different treatments more difficult.

Table II shows the results of treatment for each successive month, regardless of the treatment actually used. It would

TABLE I.—Details of Patients and Their Individual Results

No.	Age	Parity	Duration of Symptoms	Symptoms	Months of Treatment			
					1	2	3	4
1	24	0	3 yrs.	Severe	Constant	A+	Conceived in this cycle	
1a	37	0	>10 "	"	A0	B+		
2	30	2	>6 "	Mild	"	B0	C+	D+
3	34	2	3 "	Severe	Variable	B+	C+	D0
4	35	2	15 "	"	Constant	B0	C0	A0
5	33	0	>10 "	"	"	A+	D+	C+
6	40	0	>5 "	Mild	Variable	D+	A+	B0
7	31	0	3 "	Severe	Constant	C+	D+	A+
8	31	0	>5 "	"	Variable	C+	B0	D+
9	37	0	>5 "	"	Constant	A++	C0	D+
10	41	0	>5 "	"	Variable	C+	A++	D+
11	18	0	4 "	"	"	B0	C+	A0
12	34	1	5 "	"	Constant	C0	D0	B+
13	24	0	8 "	"	Variable	A+	B0	D+
14	21	0	>5 "	Mild	Constant	B++	A0	C+
15	18	0	3 "	Severe	"	B0	D+	C+
16	30	0	3 "	"	"	B+	D+	C+
17	33	0	20 "	"	Variable	A++	C0	B+
18	20	0	6 "	Mild	Constant	C+	A++	B++
19	34	0	20 "	"	"	D+	C++	A++
20	18	0	1 "	Severe	"	A+	B++	C+
21	16	0	1 "	Mild	"	A+	D0	C+
22	37	0	10 "	Severe	"	D0	A+	C++
23	32	0	5 "	"	Variable	D+	C+	B+
24	17	0	1 "	Mild	"	D+	C+	B+

A = Mephenesin. B = Ethisterone. C = Mephenesin + ethisterone. D = Placebo. ++ = Very good. + = Good. 0 = No effect. — = Side-effects.

TABLE II.—Results of Treatment by Months Irrespective of Actual Treatment

Month	Very Good	Good	Total	No Effect	Side-effects	Total
1	3	7	10	7	7	14
2	4	6	10	8	4	12
3	4	12	16	4	1	5
4	5	7	12	4	4	8

TABLE III.—Comparison of Results in First and Second Months with those in Third and Fourth

Months	Good	No Good
1+2	20	26
3+4	28	13

TABLE IV.—Results of Treatment by Different Treatments, Irrespective of Months

Treatment	Very Good	Good	Total	No Effects	Side-effects	Total
Mephenesin	8	6	14	5	4	9
Mephenesin + ethisterone	3	10	13	4	4	8
Ethisterone	3	10	13	8	2	10
Placebo	2	6	8	6	6	12

TABLE V.—Comparison of Mephenesin versus the Rest

Treatment	Good	No Good
Mephenesin + (mephenesin + ethisterone)	27	17
Ethisterone + placebo	21	22

TABLE VI.—Comparison of Ethisterone versus the Rest

Treatment	Good	No Good
Ethisterone + (ethisterone + mephenesin)	26	18
Mephenesin + placebo	22	21

appear that fewer good results were obtained during months 1 + 2 than during months 3 + 4; this is more apparent in Table III. The difference is not significant ($\chi^2=1.302$); nevertheless it seems possible that the suggestibility of the patients may have been heightened towards the latter part of the trial, so that those who had not yet experienced relief from the treatments they had had so far presumably thought that some of the later treatments ought to be effective.

Table IV sets out the results of the different treatments, irrespective of months. It will be seen that complete relief of symptoms occurred most often with mephenesin, but that when the "very good" and "good" results combined were compared with the poor results, there was not much to choose between mephenesin, ethisterone, or mephenesin + ethisterone. The placebo, though less effective than the above, was by no means devoid of apparent value.

Tables V and VI compare mephenesin with the rest and ethisterone with the rest. The similarity in these groups of figures will be noticed. None of these differences is statistically significant.

Discussion

The results of this limited trial suggest that both ethisterone and mephenesin have some value in the treatment of the premenstrual syndrome, but that neither can be expected to help more than about 60% of patients. The combination of mephenesin and ethisterone appears to be no better than either substance alone. Mephenesin alone completely relieved eight patients, whereas ethisterone and ethisterone + mephenesin had this effect on only three each, and the placebo did as well in two patients. Table I shows that of the 21 patients who had all four treatments, only 3 had no relief from any treatment, 10 benefited from either ethisterone or mephenesin, and 8 appeared to be helped by both.

The incidence of side-effects was notably low both with mephenesin and with ethisterone; in point of fact, more complaints of these were recorded for the placebo than for the other tablets.

Since in this trial either ethisterone or mephenesin alone helped some 60% of patients, and one or the other was of some value to about 90% of the patients, it is apparent that hormonal imbalance may not be the sole cause of the symptoms in at least some of the patients. The evidence suggests that psychological factors, manifesting themselves in tension states, may be an important part of the premenstrual syndrome in some cases, and where successful treatment does not follow from ethisterone therapy the use of mephenesin might well be considered.

Summary

A clinical trial of ethisterone and of mephenesin, alone and in combination, for the treatment of premenstrual symptoms has been carried out by means of a random block design, whereby the effects of the various treatments could be compared with each other and with those due to a placebo.

While mephenesin produced complete relief more often than ethisterone, an overall analysis suggests that there is little to choose between them. Either substance alone helped only some 60% of patients, and a combination of the two was no more effective; but one or the other was of some value to about 90% of the patients.

My thanks are due to Dr. Mary Parkes for referring the majority of the patients to me for the purposes of this trial; and to Dr. B. M. Merriman, of British Drug Houses Ltd., for supplying the sets of tablets.

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ANTERIOR TIBIAL SYNDROME FOLLOWING ARTERIAL EMBOLISM

BY

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Carter *et al.* (1949) described a syndrome consisting of ischaemic necrosis of the muscles of the anterior tibial compartment of the leg, with a lesion of the anterior tibial nerve. Their 10 patients were fit young men, in eight of whom the onset was clearly related to strenuous unaccustomed exercise involving the use of the leg muscles. The condition developed in their two remaining cases after transfusion into the affected limb. The main clinical features were pain, swelling, redness, and tenderness in the front of the leg. There was inability to dorsiflex the foot and toes. The peroneal muscles were not affected. Involvement of the anterior tibial nerve produced paralysis of the extensor digitorum brevis muscle and sensory loss on the dorsum of the foot. The degree of residual foot-drop was lessened by the development of contracture in the affected muscles.

Vogt (1943) described the first similar case. Sirbu *et al.* (1944) described one case in which both legs were affected after marching, and another which followed repair of a small muscle hernia through the anterior crural fascia. Horn (1945) reported two cases in young soldiers after marching, and Phalen (1948) described the case of a young man who developed the syndrome after walking half a mile. The case of a young Greek who showed the same condition in both legs after long-jumping on a concrete pavement was recorded by Pearson *et al.* (1948). Hughes (1948) described three cases of "ischaemic necrosis of the anterior tibial muscles due to fatigue." Two were in healthy men who played football before the onset of their symptoms, and the third case occurred in a young man suffering from a febrile systemic illness, possibly polyarteritis nodosa. Tillotson and Coventry (1950) described a case in a hiker following his first walk of the season. Horn and Sevvitt (1951) reported a case in which the syndrome was included in the sequelae of a traumatic rupture of the popliteal artery. Similar symptoms were noted by Psaki and Schields (1952) in a soldier who sustained a twisted ankle.

Below, two cases are described in which the syndrome followed arterial embolism.

Case 1

A woman aged 51, who had chronic rheumatic heart disease, with aortic incompetence, mitral stenosis, and controlled auricular fibrillation, was admitted to hospital on May 25, 1954. There was a moderate degree of peripheral arteriosclerosis. She complained of severe pain, of sudden onset, in the right calf. The right lower limb was found to be cold and pale up to a handbreadth below the knee; the toes were deeply cyanosed, and gangrene appeared likely. The right popliteal pulsation was much weaker than the left and no pulsations could be felt at the right ankle. The right femoral pulsation and all pulses in the left lower limb were normal. A diagnosis of arterial embolism was made and treatment begun with analgesics and oral vasodilators (nicotinic acid, 100 mg., and tolazoline hydrochloride, 25 mg., both thrice daily). The affected leg was exposed and the foot supported in a right-angled splint.

On May 26 she complained of severe pain in the front of the right leg, and this region was seen to be swollen. The maximum calf circumferences were right 12 in. (30 cm.) and left 10½ in. (26.5 cm.), but measurements from the fibulae posteriorly round to the anterior tibial borders were equal. The swollen area was bright red in colour, fading a little in the lower third of the leg, and very tender. The patient was unable to dorsiflex the foot and toes. Voluntary movement was present in the peroneal and posterior tibial muscle groups but was limited by pain. The right ankle-jerk, which had previously been normal, was now diminished. Sensation to light touch and to pinprick was reduced in the lower part of the leg and was absent over the toes and dorsum of the foot.

Over the next three weeks the condition of the right leg slowly improved, though pain remained troublesome. The toes became normal in appearance and the temperature of the leg and foot increased slightly. A weak right posterior tibial pulse became palpable. The redness and tenderness diminished, becoming more localized in the upper third of the leg. There was some reduction in the swelling of the anterior tibial compartment, but dorsiflexion of the foot and toes remained impossible. Sensation returned to the lower part of the right leg and foot, though not to a small area on the dorsum of the foot proximal to the first interdigital cleft.

On June 16 the patient suddenly became unconscious and died after ten minutes. It was thought that a cerebral embolus was responsible, but permission for necropsy was not obtained.

Case 2

A woman aged 70, who suffered from mild hypertension and auricular fibrillation, was admitted to hospital on November 10, 1953. She gave a history of sudden onset of severe pain in the left calf, beginning seven hours before admission. Examination showed considerable peripheral arteriosclerosis. The left lower limb was cold and pale from the knee downwards and the popliteal and ankle pulses were absent. The left femoral pulsation and all pulses in the right lower limb were present and normal. The patient was unable to dorsiflex the foot and toes. The peroneal and posterior tibial muscles showed slight weakness. The left ankle-jerk was reduced and all forms of sensation were diminished below the left knee. A diagnosis of arterial embolism was made. Treatment consisted of analgesics, elevation of the head of the bed, and exposure of the affected limb. The foot was supported in a right-angled splint. Tolazoline hydrochloride was given orally—50 mg. thrice daily. Papaverine sulphate (60 mg.) was given by intra-arterial injection (Edwards *et al.*, 1952). Paravertebral lumbar sympathetic block was performed (Dr. G. Jackson Rees) on November 11 and 12.

On November 13 the patient complained of pain in the front of the left leg. Examination showed redness of the skin over the anterior tibial compartment with some swelling and acute tenderness. The redness gradually faded over the next three weeks, as did the tenderness. The swelling subsided in about six weeks and the anterior tibial muscles then felt woody. During this period the left leg and foot became warmer. The peronei and posterior tibial muscles regained normal power, but there was no recovery of dorsiflexion of the foot and toes. Sensation to light touch and to pinprick returned to the leg and foot.

By January 8, 1954, she was able to walk. Although passive plantar flexion of the left foot was partly limited by contracture of the anterior tibial muscles, the degree of foot-drop required a toe-raising spring. Domestic circumstances delayed her discharge from hospital until April 9. At this time the anterior tibial muscles still felt woody and showed no wasting. A weak left dorsalis pedis pulsation had become palpable, though the left foot remained colder than the right. She did not attend for follow-up, and inquiries revealed that she died at home on May 26, the cause of death being a cerebral vascular accident.

Discussion

Although these cases occurred in older patients, and although the main clinical features did not appear for two to three days after the embolism, they conform to the description of the anterior tibial syndrome. This syndrome has not previously been described following arterial embolism. Haimovici (1950) does not include it in a review of peripheral arterial embolism and its sequelae. Mufson (1952), discussing the neurological complications of peripheral vascular disease, does not mention the condition.

Two main views have been put forward to explain the production of ischaemic necrosis of the muscles of the anterior tibial compartment. The walls of the compartment do not allow of rapid distension, and Carter *et al.* (1949) suggested that a raised pressure within the compartment, produced either by the muscle trauma of unaccustomed exertion or by leakage of transfused fluid along the tendon sheaths, was the main causative factor and operated by reducing the blood supply to the affected muscles. Hughes (1948, 1949) considered that the syndrome had a primarily vascular basis and showed that the histological changes were similar to those found in Volkmann's ischaemia. He pointed out that an increased tension in the compartment should affect all muscles equally. There was in fact a varying incidence of damage to the three muscles in the anterior tibial compartment, and he suggested that this variation might be related to differences in their blood supplies. He concluded that segmental spasm of the anterior tibial artery was responsible for the syndrome.

The two present cases lend support to the view that the anterior tibial syndrome has its origin in vascular inadequacy. Profound arterial spasm is a well-recognized concomitant of embolic arterial occlusion. The appearance of the syndrome after an interval of two to three days may have been due to a delayed improvement, either spontaneously or as a result of treatment, in the blood supply to the leg muscles. This would cause swelling of the muscles, and in the anterior tibial compartment increased tension might well lead to further interference with blood supply. The cases described by Carter *et al.* (1949) following exertion or transfusion did not show any significant impairment of peripheral blood flow in the limbs affected, but the shortest interval between symptoms and examination was one week in nine of their ten cases. It seems possible that spasm of the anterior tibial artery may have occurred in these cases, passing off before the development of the syndrome. This explanation must remain hypothetical until similar cases are studied at the earliest stage.

Carter *et al.* (1949) differentiated the anterior tibial syndrome from cellulitis of the leg, osteomyelitis of the tibia, tenosynovitis, acute thrombophlebitis, and traction lesions of the lateral popliteal nerve. Ferguson and Liversedge (1954) described nine cases of ischaemic lateral popliteal nerve palsy. These cases differed in certain important respects from the anterior tibial syndrome (involvement of the peroneal group, muscle wasting, and electromyographic findings), though three cases appear to have followed acute arterial occlusion, and one developed after a transfusion and another after an injection into the saphenous vein.

In discussing treatment of those cases of the syndrome which followed undue exertion involving the legs, Carter *et al.* (1949) advised graduated training as a prophylactic measure. For the acute stage they suggested complete rest of the affected limb, and, if improvement did not occur, surgical decompression of the anterior tibial compartment by fasciotomy. The necrotic muscles are, however, prone to infection (Hughes, 1948). Decompression was considered in the two cases now described but not employed, as it was felt that the onset of gangrene might thereby be hastened. Psaki and Schields (1952) described improvement in muscle power following lumbar sympathectomy as late as eleven months after the first symptoms. If spasm of or obstruction to the anterior tibial artery is indeed a causative factor, measures

designed to relieve vasospasm or to promote vasodilatation will be valuable, particularly at an early stage. When there is clinical evidence of raised tension in the anterior tibial compartment surgical decompression would seem to be reasonable, if by so doing survival of the limb is not prejudiced.

Summary

Two cases in which the clinical features of the anterior tibial syndrome followed arterial embolism are described. Pathogenesis, diagnosis, and treatment are briefly discussed.

I am indebted to Dr. E. T. Baker-Bates (Case 1) and to Dr. C. S. McKendrick (Case 2) for permission to report these cases.

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THE ROLE OF SULPHONAMIDES IN THE INFECTIVE DIARRHOEAS OF AFRICAN CHILDREN

BY

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The problem of diarrhoea in infancy and childhood has been the subject of much research; owing to the multiplicity of causes a very careful clinical, bacteriological, and biochemical assessment may be required before an accurate diagnosis can be made and effective treatment selected.

In many tropical and backward countries immediate laboratory services are not always available, medical personnel is limited, and clinical examination alone may fail to reveal the presence of more than one disease. The discovery of otitis media or pneumonia in a child presenting with diarrhoea does not preclude the fact that there may be a coexisting bacillary dysentery even in the absence of blood and mucus in the stools.

The problem of selecting treatment is equally complex if one is to provide a satisfactory standard of therapy within the economic limits of a rapidly developing community.

In infantile gastro-enteritis in which no pathogenic organisms are isolated from the stools, sulphonamides are considered to be of doubtful value, and a regime of graduated feeding and parenteral fluids (with or without the more recent antibiotics) still forms the basis of treatment. In bacillary dysentery sulphonamides are widely used and the "non-absorbable" compounds have been accepted as the standard treatment in many countries.

Present Investigation

The original object of the present experiment had been to assess the efficacy of the "absorbable" sulphonamide sulphadimidine ("sulphamezathine"), as compared with the "non-absorbable" compounds, sulphaguanidine and phthalylsulphathiazole ("thalazole"), in the treatment of bacil-

lary dysentery in children. As it proved impracticable to await the result of a stool culture before beginning treatment, it was decided that all cases presenting with diarrhoea as their main symptom should be included in the trial.

Although the scope of the trial was thus widened to include many possible diseases and the scientific limitations were fully realized, it was hoped that the results might be of some value to others in assessing the efficacy of sulphonamides in the treatment of infantile dysentery and non-dysenteric diarrhoea, and establishing, if possible, the drug of choice.

Sulphaguanidine has become well established in the treatment of bacillary dysentery and is recommended as the most suitable drug in tropical countries because there is little or no danger of crystalluria, and it has the advantage of rarely causing unfavourable side-effects (Boyd, 1951; Scadding, 1944). It is considered most effective in the early stages of an acute attack, but of least value when treatment is started late in the illness (Lyon, 1943; Brewer, 1943). This is of considerable practical importance in communities who do not seek medical advice until local remedies have failed and the disease is in an advanced or chronic stage. A further disadvantage so far as children are concerned is the high dosage of sulphaguanidine which is recommended. In an acutely ill and dehydrated child there is often difficulty in ensuring that the appropriate dose is swallowed.

Poth and Ross (1944) claim that phthalylsulphathiazole is highly specific in Flexner dysentery and have also proved it of value in the treatment of non-dysenteric diarrhoea. This, however, has not been borne out by Brodie *et al.* (1946), who found that it took longer to effect a cure with phthalylsulphathiazole than with either sulphaguanidine or controls, but that it reduced considerably the number of bacteriologically positive cases during convalescence. Both sulphaguanidine and phthalylsulphathiazole have the disadvantage of failing to control a parenteral or secondary infection which may complicate or perpetuate the state of diarrhoea.

Since it is known that the dysentery organisms inhabit the mucous membrane lining of the intestinal tract, the "absorbable" sulphonamides have the advantage of reaching the source of infection both through the lumen of the gut and via the blood stream (Hardy and Watt, 1944).

From previous experiments (Hardy, 1945) sulphadiazine has been recommended as the sulphonamide of choice in bacillary dysentery, with sulphadimidine of almost equal efficacy. Watt and Cummins (1945), however, place sulphadimidine in the undesirable class of sulphonamide owing to the greater percentage of toxic reactions observed in their series.

Although the possibility of renal complications with "absorbable" sulphonamides must always be borne in mind, particularly in hot climates, sulphadimidine is reported to be more highly soluble in all urines than sulphadiazine (M.R.C., 1945), and was therefore chosen for use in the present trial.

Realizing, therefore, the various advantages and disadvantages of the drugs employed, the experiment was designed as follows:

Selection of Cases.—All infants and children entering the medical wards of King George VI Hospital, Nairobi, with the main presenting symptom of diarrhoea, were admitted to the series and each succeeding case was treated with phthalylsulphathiazole, sulphadimidine, and sulphaguanidine respectively.

Clinical Assessment.—The severity of each case on admission was classified as follows: mild, moderate, severe, or moribund. As it was rarely possible to obtain an accurate history from the parents regarding the length of illness and the number or character of the stools passed daily, the clinical assessment was made on the general appearance, toxicity, and hydration of the patient. This assessment and the subsequent daily records of progress were made personally to ensure uniformity throughout the series. The groin temperature was recorded twice daily.

Dosage.—Although all children in the present series were weighed on admission, it was realized that this could not always be done in out-patient departments and the more isolated hospitals. The scheme of dosage was therefore assessed according to age (Table I) and appropriate adjust-

TABLE I

	Phthalylsulphathiazole and Sulphadimidine	Sulphaguanidine
Adults	4 g. daily	10 g. daily
8-12 years	3 g. "	8 " "
4-8 "	2.5 g. "	6 " "
2-4 "	2 g. "	4 " "
6 months-2 years	1.5 g. "	3 " "
0-6 months	1 g. "	2 " "

TABLE II

	Phthalylsulphathiazole	Sulphadimidine	Sulphaguanidine
No. of cases	107	107	103
Clinical condition on admission:			
Mild	16	26	21
Moderate	38	23	31
Severe	31	40	30
Moribund	22	18	21

ments were made for emaciated and undernourished children. Each dose was given in the form of a suspension and the appropriate dose administered at six-hourly intervals.

A total of 317 African children were treated, with an average age of 1 year and 8 months. Table II shows the distribution of cases and the clinical condition on admission.

Results

Treatment was limited to a seven-day period, and if there was no response at the end of this time the trial drug was discontinued and other therapy instituted.

The response to treatment is shown in Table III; although the total number of cases in the sulphaguanidine series fit for discharge within the trial period was fewer than in either the phthalylsulphathiazole or the sulphadimidine series the figure is not significant.

In an assessment of the bacteriological results (Table IV) phthalylsulphathiazole appeared less effective in the cases of proved bacillary dysentery, but gave a higher percentage

TABLE III

	Phthalylsulphathiazole	Sulphadimidine	Sulphaguanidine
No. fit for discharge between 3rd and 6th days	24	30	17
No. fit for discharge on 7th day	49	44	46
No. still febrile on 5th, 6th, or 7th day	26	26	35
Total No. discharged within trial period	73 (68.2%)	74 (69.1%)	63 (61.1%)

TABLE IV

	Phthalylsulphathiazole	Sulphadimidine	Sulphaguanidine
Total No. with proved shigellae	50 (46.7%)	48 (44.9%)	48 (46.6%)
Shigellae present Day 1	44	41	43
Negative culture Day 5	17 (38.6%)	21 (51.2%)	20 (46.5%)
No pathogens Day 1 but shigellae isolated Day 5	6	7	5
Salmonellae, <i>B. proteus</i> , or <i>B. paracolon</i> isolated Day 1	18	22	19
Negative culture Day 5	10 (55.5%)	8 (36.4%)	9 (47.3%)
No pathogens throughout	39	37	36
Total No. deaths	15	16	13
No. showing shigellae	9	8	7

of negative cultures in the non-dysenteric group, whereas sulphadimidine showed a higher percentage of negative cultures in the Shigella group and less in the non-dysenteric series. The results with sulphaguanidine were similar in both groups. These figures, however, are not significant, and it can be said that the three drugs are of equal efficacy as regards both sterilization of stools and general clinical improvement.

Of the Shigella organisms isolated throughout the series, 70% were *S. flexneri*, 11% *S. schmitzi*, 4% *S. sonnei*, and 15% were classified as atypical Shigella organisms. No difference was noted in the efficacy of the three trial drugs against these different strains, and the few Sonne infections encountered were no more resistant to treatment than the Flexner or Schmitzi infections or the atypical organisms.

No oliguria, anuria, or other obvious toxic reactions were encountered with any of the drugs under trial, and the number of parenteral infusions required was the same for each group.

In the sulphadimidine series it was noted that other chemotherapy was required in a significantly smaller number of cases (Table V) than with either of the "non-absorbable" compounds, despite the fact that the incidence of parenteral complications was approximately the same in all groups.

TABLE V

	Phthalylsulphathiazole	Sulphadimidine	Sulphaguanidine
No. requiring infusions	35	32	35
"other chemotherapy"	33	14	29

TABLE VI

Parenteral Infections	No. of Cases	Phthalylsulphathiazole		Sulphadimidine		Sulphaguanidine	
		No. Showing <i>B. proteus</i> , <i>B. paracolon</i> , or <i>Salmonellae</i>	No. Showing Shigellae	No. Showing <i>B. proteus</i> , <i>B. paracolon</i> , or <i>Salmonellae</i>	No. Showing Shigellae	No. Showing <i>B. proteus</i> , <i>B. paracolon</i> , or <i>Salmonellae</i>	No. Showing Shigellae
Pneumonia	13	1	7	16	1	10	1
Pulmonary tuberculosis	6	—	4	6	—	3	—
Bronchitis	5	—	2	5	—	2	—
Upper respiratory tract infection	3	1	—	—	—	3	—
Otitis media	1	1	—	1	—	—	—
Thrush	3	—	1	4	—	2	—
Conjunctivitis	2	1	—	—	—	—	—
Polymyositis	—	—	—	2	1	—	—
Laryngitis	—	—	—	1	—	—	—
Cellulitis	—	—	—	1	—	—	—
Pyelitis	—	—	—	1	—	—	—
Malaria	—	—	—	1	—	—	—
Encephalitis	—	—	—	—	—	1	—
Nephritis	—	—	—	—	—	—	1
Total	33	4	14	38	2	23	2

Table VI gives an indication of the variety of parenteral infections encountered among children presenting with diarrhoea and shows the incidence of dual infections among the cases of proved bacillary dysentery. From these figures it has been estimated that of the 146 cases of proved bacillary dysentery throughout the entire series 33.5% had a co-existing parenteral infection.

Summary and Conclusions

In tropical countries where diarrhoea is a common presenting symptom in children, and large numbers of cases are seen by a limited number of medical personnel, the problem of making a precise diagnosis can be very difficult, particularly if hospital and laboratory facilities are not immediately available.

Under these circumstances treatment must of necessity be simple, giving the optimum facilities to the greatest number of patients, whether treatment be undertaken in out-patient dispensaries, clinics, or district hospitals.

A survey was therefore made of 317 cases of diarrhoea in African children, each succeeding case being treated with phthalylsulphathiazole, sulphadimidine, and sulphaguanidine respectively, with the aim of establishing the relative merits of the "absorbable" and "non-absorbable" sulphonamides in the treatment of bacillary dysentery and non-dysenteric diarrhoea.

The average age group of the children in the series was 1 year and 8 months and the causes of the diarrhoea fell roughly into five groups: (1) proved bacillary dysentery; (2) enteric infections where salmonellae, *B. proteus*, or *B. paracolon* were isolated on stool culture; (3) enteric infections with no pathogenic organisms on stool culture and no obvious parenteral infections; (4) parenteral infections; (5) mixed enteral and parenteral infections.

It was found that all three drugs were equally effective in cases where *Shigella* organisms were isolated from the stools and gave similar results in the enteric infections of non-dysenteric origin.

If diarrhoea was found to be secondary to a parenteral infection or if mixed infections were present, sulphadimidine had a definite advantage in that, in many cases, it controlled both infections without additional chemotherapy.

Toxic reactions such as oliguria or anuria were not encountered with any of these drugs under trial, and no other undesirable side-effects were noticed.

The trial period for each drug was limited to seven days, by which time 68.2% of the cases on phthalylsulphathiazole, 69.1% on sulphadimidine, and 61.1% on sulphaguanidine were fit for discharge.

A point of considerable importance was the relatively high incidence of dual infections, showing that it was not enough to attribute the diarrhoea to an obvious parenteral infection or yet to conclude that the majority of cases would be dysenteric in origin, since the two might well coincide, with the symptoms of one sometimes overshadowing those of the other.

Therefore, in reviewing all aspects of the problem of diarrhoea in African children, and bearing in mind that not all cases are admitted to hospital or seen and treated by fully qualified medical personnel, it is essential to provide a regime of treatment which combines efficiency with ease of administration, simplicity, safety, and cheapness.

Since the "wide spectrum" antibiotics are not always available for routine use and the "non-absorbable" sulphonamides require the addition of penicillin or other antibiotics in the case of mixed infections, it is suggested that sulphadimidine could be used as a valuable general-purpose sulphonamide in the diarrhoeal diseases of African childhood.

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CHRONIC RECTAL BLEEDING DUE TO MILK

BY

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The following case of rectal bleeding probably due to an allergy to milk may be found of interest.

Case Report

A woman aged 38 was admitted to the B. D. Petit Hospital, Bombay, on November 15, 1953, with a history of bleeding per rectum for the past seven years. She had been operated on for both internal and external piles about six and a half years previously. She had been passing two stools a day, semi-solid, with no evidence of mucus. Blood was passed every day either mixed with stools or after the act of defaecation as frank blood or blood clots. The bleeding was not related to straining. She had been under observation in different hospitals for long periods, but bleeding per rectum persisted. There was no previous history of dysentery or diarrhoea. Her menstrual history was normal at first, but for the last three years she had a loss every three or four months for two or three days. Her father had severe asthma, and her son had allergic rhinitis. The patient had been married for 18 years and had twins, a boy and a girl, aged 17. Her husband was short-tempered, and at times used physical violence; consequently her married life was not happy.

Physical examination showed a well-built woman. Her blood pressure was 135/90 mm. Hg. No abnormality was detected in the cardiovascular, alimentary, or respiratory systems. The liver and spleen were not palpable. Vaginal examination showed no abnormality. A blood count showed: haemoglobin, 75%; red cells 3,100,000; white cells, 8,200 per c.mm. (polymorphs 82%, lymphocytes 18%). The bleeding time, coagulation time, platelet count, prothrombin time, and fragility tests were within normal limits. Seven years ago, when the patient was admitted to the same hospital, malingering was suspected because her husband was not treating her well at home, and traumatic bleeding from the rectum was supposed to be her device to stay in hospital. This time, however, every stool passed was semi-solid with mucus and frank blood not too well mixed. Microscopical examination showed many red blood cells. Urine analysis, gastric analysis and barium meal examination showed nothing abnormal. A barium enema suggested colitis of the descending and the sigmoid colon.

On November 18 a sigmoidoscope was passed 10 in. (25 cm.). At 2½ in. (6.3 cm.) an ulcer ¾ in. (1.9 cm.) in diameter was seen. The base was not raised. There were multiple punctate haemorrhagic areas ¼ to 1/6 in. (6 to 4 mm.) in diameter, the intervening mucosa showing only slight exudation of mucus throughout and no congestion. A smear from the mucous membrane did not show amoebae and the culture was negative for any pathogenic organism. Punch biopsy from the ulcerated area showed submucous infiltration with eosinophil and mononuclear cells.

Punctate haemorrhagic spots without evidence of inflammation of the colon suggested a diagnosis of allergy. Since the commonest allergen is milk (Antia, 1953), it was decided to exclude milk allergy. On November 20 the patient was put on fruit juice and water only. The bleeding per rectum stopped on November 22—according to the patient, for the first time in the last seven years. Two soft-boiled eggs were added on November 25 and biscuits on November 27,

without any passage of blood, either macroscopically or microscopically. On November 28, in addition, half a cup of milk with half a cup of tea twice a day was started, and on the 30th bleeding per rectum recurred, continuing until the milk was stopped on December 2. Then only fruit juice, soft-boiled eggs, biscuits, and mashed potatoes were given for two days, during which there was no bleeding. On December 5 three cups of milk were added to the diet, and next day bleeding recurred, and continued until December 8. Thereafter the patient was given the routine hospital diet except that milk was stopped in all forms: the bleeding did not recur. On December 16 sigmoidoscopy showed that the ulcer had completely healed and that the colon looked perfectly healthy.

It was decided to test the sensitivity of the skin to milk and to try to desensitize the patient by small doses. However, the husband was impatient to take his wife home and she was discharged with advice to start taking one drop of milk a day and to increase it daily by one drop, as advised by Andresen (1953). The patient reported again three and six months later, when she said that, by gradually increasing the amount of milk by one drop every day, she was able to take milk in her tea (she had not ventured to take a larger amount) and that the bleeding per rectum had stopped completely.

Summary and Conclusions

The case is described of a woman aged 38 with an unusual history of bleeding per rectum every day for seven years. Any possibility of malingering was dispelled by punctate bleeding all over the colon, which led to the belief that it was probably an allergic manifestation. Milk allergy was suspected.

All diet was stopped except fruit juice and water, and for the first time in seven years the bleeding stopped. Further tests showed that bleeding restarted whenever milk was given.

An apparent lag of 24–48 hours between bleeding and starting or stopping of milk might be explained by the products of milk digestion coming in contact with the mucosa of colon (Gray *et al.*, 1940).

The patient has apparently been desensitized to milk by gradually increasing the amount by one drop a day.

Our thanks are due to the Superintendent, B. D. Petit Hospital, for permission to publish this case

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A good year, continuing the progress of the last few years, is reported by the British Empire Leprosy Relief Association for 1954. Every request for financial help to build homes for child patients was met, and by the end of the year 1,916 children were in the care of Belra in 23 different centres. The policy for treating adults has been to concentrate on out-patient care rather than on enforcing isolation, because the application of sulphone treatment depends on early diagnosis, which out-patient care facilitates. Two rural centres have been established in Tanganyika, a nurse has been posted to Northern Nigeria and a worker to Southern Nigeria to open treatment clinics throughout these neighbourhoods, and the number of Belra men on the Gold Coast working with the Government has been increased from one to eight. Many cases still need institution treatment, and for these a pilot leprosarium and a Red Cross Hospital are due to be opened in Tanganyika. Research on leprosy and in the allied field of tuberculosis is being carried on with the co-operation of the East Africa High Commission and the Medical Research Council.

Medical Memorandum

Ischaemia of Lower Limb as Cause of Motor Accidents

In view of the appalling number of road casualties in this and other countries, and the constant search for remedies, it is thought that the case described here will be of interest. It illustrates a possible cause of motor accidents which is not widely recognized.

CASE HISTORY

A lorry driver aged 58 was referred for medical examination because he had been involved in numerous minor accidents. The nature of these accidents suggested either that his eyesight was defective or that he was grossly careless. He denied any eye trouble, or that he was unfit in any other way. He attributed his accidents to "bad luck" or "bad judgment."

On examination he was a grey-haired, rather elderly-looking man. His visual acuity and colour vision were normal. The only abnormal physical signs were a grossly deficient blood supply to the right foot—the right dorsalis pedis and posterior tibial arteries being impalpable—and diffuse loss of sensation over the sole and medial four toes of the right foot.

After the examination he admitted that his foot occasionally felt numb, so that he was unable to feel the brake pedal or accelerator when he was driving. Henceforth he was not allowed to drive on the public highway, but only on his firm's private roads. His private doctor was told of the disability, but the patient was not referred to a hospital for further investigation.

Five months later his right big toe became septic after minimal trauma, and he was treated at a hospital casualty department. When he reported for work a few days later his toe was partly gangrenous: he was referred to another hospital, where he was admitted. Here he was found to have an inflamed swollen hallux with a slough of the top part of the nail-bed. The right dorsalis pedis and posterior tibial arteries were still impalpable; and there was impaired sensation over the sole of the foot, which was inconstant and disappeared when the foot was warmed. A radiograph showed bony destruction of the tip of the phalanx of the right hallux, but the results of other investigations were normal.

Subsequently the dead bone in the toe was excised, and after graduated exercises he was discharged. He was no longer allowed to drive.

COMMENT

Arteriosclerosis is so common and widespread a disease that cases similar to the one described are probably not uncommon; especially when so many old people are allowed to drive cars.

In this case it was thought that the impaired blood supply to the foot caused an ischaemic neuropathy. As Cohen (1954) has pointed out, patients with ischaemic nerve lesions can present with slipper anaesthesia of the foot, a delayed response to pain or pressure, or wasting and paresis of the intrinsic muscles of the foot. Recovery from an ischaemic nerve lesion is slow, and the sole of the foot may remain numb.

Doctors should bear in mind the potential liability of such patients to their employers, and their potential danger to the public if they are allowed to drive motor vehicles. Casualty officers should always look for peripheral vascular disease as a cause of chronic infection or ulceration of the feet and toes. A gangrenous toe is usually recognized as such; but the fact that it may indicate a major arterial block high up in the limb (Leriche, 1940) is not so widely appreciated.

F. L. DAVIES, M.B., F.R.C.S.

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Reviews

PHYSICAL SIGNS IN SURGERY

Demonstrations of Physical Signs in Clinical Surgery. By Hamilton Bailey, F.R.C.S., F.A.C.S., F.R.S.E. Assisted by Allan Clain, M.B., F.R.C.S. 12th edition. (Pp. 456+xii; illustrated. 38s. 6d.) Bristol: John Wright and Sons Ltd. 1954.

A book that has necessitated twelve editions and ten reprints and been translated into six languages must patently have exceptional virtues which have enabled it successfully to meet a great demand. Many successive generations of medical students have imbibed the teaching in Hamilton Bailey's *Demonstrations of Physical Signs in Clinical Surgery*, and there is no doubt that the present 12th edition (in which the author has been assisted by Allan Clain) will be even more popular. The reasons for this are to be found on any page of the book opened at random, for it will reveal, not only a concise description of a physical sign, but several very excellent and clear photographic illustrations of cases showing the sign or how it is elicited, and these have obviously been chosen with great care. How lavishly these illustrations are provided will be appreciated when it is recorded that there are no fewer than 681 of them in some 430 pages of letterpress.

Since the first edition was published colour reproduction has come into its own, and in the present edition there are, despite their great cost nowadays, a very large number of first-quality coloured illustrations; indeed, the publishers and printers are to be congratulated upon the truth of tint they have achieved, for it will go far to make the student feel that he has actually observed the cases. As it is quite impossible for a student to see examples of every condition during his curriculum, these illustrations form a very good and useful "second best."

At a time when eponymous designations are rather frowned upon by the pundits it is refreshing to find that the author commends their use; as he says in the preface, "In many respects this is an advantage, for an anatomico-pathological label is often cumbersome." But to enhance the mere name he gives in footnotes a few personal details; thus "Jean Martin Charcot, 1825-1893, Physician, Hôpital Salpêtrière, Paris." I regard this as entirely admirable, the only small criticism being that, in the case of some contemporary names, signs which have long been widely known and practised but are often of untraced origin are attributed to writers who happen to have mentioned them in their contributions. Nevertheless it is delightful, and instructive, to read: "Pierre Charles Alexandre Louis, 1787-1872, Physician in Paris. Some consider that it is Antoine Louis (1723-1792), Surgeon to the Charité Hospital, Paris, and designer of the guillotine, to whom the angle of Louis should be attributed." The latter certainly has the support of *Gray's Anatomy*.

Altogether this is an excellent production which can be strongly recommended to the student, and perhaps also to those who have to teach him.

NORMAN C. LAKE.

MORAL ASPECTS OF MEDICAL PRACTICE

Morals and Medicine. By Joseph Fletcher. Foreword by Karl Menninger, M.D. (Pp. 243+xvii. 15s.) London: Victor Gollancz, Ltd. 1955.

In this book a professor of "pastoral theology and Christian ethics" faces some of the moral problems encountered in modern medical practice which, though they have given the Roman Catholic Church "furiously to think," are still largely ignored by other Christian denominations and by the medical profession in general. Most moral systems are, as the author points out, anchored to some form of religious belief (and for him to the Christian religion), but it is through personality (which is a unique quality in every human being) that we obtain, he maintains, our knowledge

of the good. This book should therefore appeal to every practising doctor who believes that the conduct of medical practice must be based on moral principles.

Starting from this premise the author discusses the moral problems associated with contraception and sterilization; and exhibits little sympathy with Catholic doctrine. Indeed, he comes down clearly on the side of man's right to control parenthood, within reason, and to prevent sterility by artificial insemination when necessary, within the marriage bond. He even comes down on the side of euthanasia. Here, however, we cannot help feeling that, though he is well informed on medical matters, lack of first-hand experience of medical practice leads him to carry his argument too far. For he underrates the power of modern medicine to relieve pain and keep unconscious for long periods. Nor does he seriously discuss the growing problem (much more important than that of active euthanasia) of withholding the standard treatment for a disease when, in the doctor's judgment, it would merely prolong suffering. Further, his lack of medical experience is evident in his discussion on the patient's right to be told the truth—the part of his book which the average practising doctor will find much the most important. True that the truth should be told much more often than it is told. But so often what is the truth? Minor criticisms of this kind, however, should not be allowed to detract from the real value of this well-written book, which should be brought and thought about by as many practising doctors as can make the time to read it.

A. E. CLARK-KENNEDY.

CLINICAL ENDOCRINOLOGY

Clinical Endocrinology: For Practitioners and Students. By Laurence Martin, M.D., F.R.C.P., and Martin Hynes, M.D., M.R.C.P. Second edition. Foreword by Sir Lionel Whitby, C.V.O., M.C., M.D., F.R.C.P., D.P.H. (Pp. 253+ix; illustrated. 20s.) London: J. and A. Churchill, Ltd. 1954.

It is pleasing to see that a second edition of this excellent little book has now appeared six years after the first. The very comprehensive and concise survey of endocrinology has been brought well up to date by the inclusion of such topics as isotope methods of thyroid investigation and modern knowledge of adrenal function and dysfunction. The boundaries of endocrinology continue to expand until they infiltrate deeply into most branches of medicine, and it becomes increasingly difficult to know where to draw its limits; but some must be drawn, and the authors of this book have wisely omitted any account of the many non-endocrine diseases for which cortisone or A.C.T.H. is useful.

A very great deal of reliable and up-to-date information is contained within these 250 pages, and more still can be obtained by use of the lists of references at the end of each chapter, which are up to date, well chosen, and to accessible journals. The illustrations also are informative and well selected. The result is a book of high standard which the publishers have produced at a low price. In a rapidly advancing subject such as this many aspects change frequently, but most of the information here presented is likely to remain valid for years to come.

The book is primarily designed for practitioners and for students working for higher degrees, and to both it can be recommended as an excellent survey of the subject in very handy form.

C. L. COPE.

Cargoes on the Great Lakes, by Marie McPhedran (George G. Harrap and Co., Ltd., 10s. 6d.), is a book of great charm that tells the story of the freighters moving on the face of the sea-waters of Lake Superior, Lake Michigan, Lake Huron, Lake Erie, and Lake Ontario, on whose hospitable shores many British doctors are now gathering with their Canadian cousins in the combined meeting of the Canadian Medical Association and the B.M.A. Marie McPhedran guides the reader along these great waterways with an intelligent hand, skilled in narrative and selection of points of interest; and Dorothy Ivens brightens the pages with the apt illustrations. A useful, enjoyable, and informative book for old and young.

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THE A.R.M.

Despite the difficulties of travel imposed by the railway strike there was an excellent attendance at this year's Annual Representative Meeting of the Association in the Great Hall of B.M.A. House in London under the chairmanship of Dr. I. D. Grant, of Glasgow. There were some 251 motions and amendments on the agenda, and the meeting, under able direction from the chair, completed its work by midday on Saturday, June 4, within the allotted space of three and half days. The Chairman, who, with his deputy, Dr. A. Beauchamp, of Birmingham, was returned to office unopposed for another year, may perhaps find the Representative Body less attentive to business when it moves its tents from the businesslike atmosphere of Headquarters to the attractions of seaside Brighton in 1956.

On the domestic front the meeting supported the Treasurer in his attitude of cautious optimism towards the Association's finances, and, in voting against suggestions for modifying the subscription rate for some categories of membership, agreed that after a period of stabilization time must be allowed to build up a reserve. The course of the debate also showed that representatives and their constituents continue to give anxious thought to the dangers of sectionalism within the profession and, correspondingly, the Association. As various speakers made clear, the Representative Body's desire to preserve its position as the effective parliament of the whole profession sprang as much from the need for professional unity as from a properly jealous regard for the Association's prestige. The Chairman of Council summed the matter up when he said "there was only one British Medical Association, which included all kinds and conditions of men, and its doors were open to all." All they had to do, he went on to say, "was to take their place as doctors among other doctors" in the affairs of the Association.

The meeting was unsympathetic towards some motions under the General Medical Services Committee's business calling for an increase in remuneration for general practitioners because of the increased cost of living. The chairman of the Committee,

Dr. Talbot Rogers, had little difficulty in persuading his hearers that such ideas were out of touch with reality. But there was overwhelming support for a motion calling on the B.M.A. to continue to press for the right of private patients to receive drugs free of charge as part of the National Health Service. Several speakers rebutted the suggestion in the Cohen Report—and echoed by one sincere but solitary representative—that this provision would lead to two standards of practice. Dr. R. Green (Brighton) had the ear of the meeting when he urged that the essence of this matter was justice to the patients, of whom "some of the most impecunious have elected to remain private patients." In Dr. Rowland Hill's regretted absence through illness, Mr. Nicholson-Lailley took the bowling for the consultants and specialists and at the end of a long and patient innings received a well-deserved ovation.

The proposed ban of heroin by the Government came under fire after lunch on the third day of the meeting. The main burden of the protests in several motions and amendments was that the Association, as representing all branches of the profession, should have been consulted by the Government before taking action; that if heroin was to come under a ban it should apply only to its export; and that the banning of any drug of therapeutic value of whatever kind was a threat, even if a veiled one, to clinical freedom. Statesmanlike pleas from Dr. J. G. M. Hamilton and Dr. S. Wand that representatives should give due weight to the grave international aspects of the problem were attentively listened to, but the meeting registered by a majority its opinion that heroin should continue to be manufactured in this country, but not exported, and instructed the Council to approach the Government to seek a reversal of its decision.

Members of the public health service, disappointed by the recent award of the Industrial Court, should be heartened by the evident sympathy of the Representative Body. Dr. J. B. Tilley, chairman of the Public Health Committee, said that it was a matter of grave concern that medical men and women who chose to practise preventive medicine were paid less than they might expect to be paid in other branches of the profession. Speaking in the debate which followed, Dr. Guy Dain said that the first step in any medical service was the establishment of a preventive service, yet the reward offered to those in the public health service was so poor that young doctors were not coming forward to take the D.P.H. "We must do what we can to get them better conditions." Dr. Dain concluded, and the meeting passed a motion by Gateshead demanding urgent action to bring "remuneration in the salaried medical services of the

State and local authorities" up to a level comparable with that of the rest of the profession engaged in hospital and general practice.

One of the last matters to be discussed was the possibility of changing the arrangements at Annual Meetings, so that the Scientific Meeting and the Representative Meeting might be combined, thus enabling all members to have an opportunity of taking part in both the scientific and medico-political activities of the Association. Speakers recognized that this presented great difficulties, but the general opinion was that the suggestion was a useful one and well worth further investigation.

Though there were no fireworks this year, the A.R.M. dealt with the matters before it in a business-like way and much was achieved. The long hours of discussion were lightened by many pleasant social occasions, and by the labours of those who had the responsibility of arranging the meeting. In particular, thanks are due to the council of the Metropolitan Counties Branch, the Ladies Committee of the Branch, and the London Association of the Medical Women's Federation.

CORONARY DISEASE IN INFANCY

It has become evident that coronary thrombosis in young people is not so rare a disease as was previously thought.^{1,2} In 1942 N. Reitman, W. R. Greenwood, and J. H. Kler³ described 221 cases of coronary thrombosis in patients under 40 years of age, 34 being under 30 years of age. However, coronary artery disease was thought never to occur in infants until J. H. Bryant and W. H. White⁴ described a case in 1891. Since then about forty cases in infancy and childhood have appeared in the literature. The frequency of recent reports of coronary artery disease⁵⁻⁷ in young infants would suggest that arteriosclerosis and coronary thrombosis are not a natural process of ageing and "wear and tear," but due to some specific disease. The aetiology remains obscure, but infection, hyperparathyroidism, excess vitamin D, and inborn errors of calcium metabolism, such as idiopathic hypercalcaemia, have been suggested. Other possibilities that have been considered are drug therapy, rheumatic arteritis, allergy, and congenital abnormality of the arteries.

Pathologically, the findings in infants have been well tabulated and described.⁸⁻¹⁰ Many of the medium-sized arteries are affected. Calcification occurs in the internal elastic lamina of the media, with subsequent fibroblastic proliferation of the intima. In some cases, calcification follows necrosis and granulomatous proliferation.¹⁰ Myocardial

damage consists of subendocardial infarction, patchy replacement fibrosis, and often subsequent calcification. In contrast to the condition in adults, atherosclerosis is extremely rare. Most of the infant patients have been between 2 and 8 months of age. One case was reported¹¹ with myocardial infarction occurring at 10½ hours of age, and W. A. Stryker⁸ refers to abnormal vascular findings in a stillborn foetus.

Clinically, dyspnoea and pallor develop suddenly in a previously healthy infant; however, this acute picture may be preceded by intermittent vomiting and failure to thrive, or merely by a mild upper respiratory infection. On physical examination the child's condition closely resembles that of adults with myocardial infarction. Dyspnoea, shock, ashen-grey colour of the skin, and evidence of cardiac failure are prominent findings. Pulmonary oedema and hepatic enlargement are frequently present. Clinically and radiologically the heart is grossly enlarged. W. A. Cochrane and D. H. Bowden⁶ suggested that radiography of the neck might aid in the diagnosis by revealing calcification of the thyroid arteries, which are commonly affected. Few electrocardiograms have been done, but these are often typical of ventricular hypertrophy, myocardial anoxia, and infarction. Death is usually rapid—a matter of a few hours.

The differential diagnosis would include those conditions producing sudden collapse in young infants. Hence fulminating septicaemia, adrenal insufficiency, and congenital renal disease could be diagnosed by the usual diagnostic procedures. Certain congenital cardiac conditions which give rise to cardiac failure in young infants, such as patent ductus arteriosus, coarctation of the aorta, and transposition of the great vessels can be distinguished without much difficulty by present-day methods. However, endocardial fibroelastosis, acute interstitial myocarditis, and glycogen storage disease of the heart all produce marked cardiac enlargement and failure in young infants, and would be almost impossible to differentiate. Moreover, an aberrant left coronary artery from the pulmonary artery gives a similar clinical and electrocardiographic picture. Treatment has been very disappointing and the fact that the diagnosis has most commonly been made at the post-mortem table testifies to the inefficacy of oxygen, antibiotics, digitalis, mercurial diuretics, and the other drugs that have been tried.

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⁷ Martelle, R. R., *J. Pediatr.*, 1955, **48**, 322.

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CAUSE OF ITCHING

Since the work of Sir Thomas Lewis showing that a substance indistinguishable from histamine existed in a combined form in human skin, that histamine was liberated when the skin was damaged, and that histamine pricked into the skin caused itching, the view has been widely held that itching of the skin is due to the release of histamine. The view gained support from the observation that antihistamine substances relieved the rash and the itch of urticaria. Two years ago J. L. Broadbent¹ published an account of work with cowhage, which is the name given to the trichomes which cover the pod of a tropical plant, *Mucuna pruriens*. Cowhage is sometimes sold as itching powder, and it has been believed to cause itching mechanically. However, Broadbent came to the conclusion that cowhage caused a liberation of histamine in the skin, though cowhage itself did not contain histamine, as nettle stings have been shown to do.² He based his conclusion on the observations that extracts of cowhage produced a triple response (like histamine) when injected intradermally, that when cowhage was first extracted, the material left behind caused little itching, and that an antihistamine substance given by mouth reduced the itching caused by cowhage. Subsequently K. Bowden, B. G. Brown, and J. E. Batty³ showed that a crude extract of the trichomes of cowhage contains 5-hydroxytryptamine, and the authors stated that this substance probably accounts for the pain which occurs when cowhage is applied to the skin, though they could not say whether it was responsible for the itching.

Now comes a further development in a publication by R. P. Arthur and W. B. Shelley.⁴ They claim that the active principle in cowhage which causes itching is an enzyme called mucunain, and have described the results of testing a series of enzymes for their power to produce itching. They used the trichomes of cowhage to introduce these enzymes into the skin after first destroying the mucunain by "autoclaving at 250° C. for 30 min." They then soaked the trichomes in the enzyme solutions, which ranged in strength from 10% downwards. They found that when they introduced a single impregnated trichome into the skin, using a watchmaker's forceps and working under a microscope, a localized itch resulted which was "mild to intense." They tried a wide variety of enzymes, and found that only proteinases were active, and of these only the endopeptidases with activities in the physiological pH range. Thus among the active ones were papain, trypsin, and chymotrypsin, while pepsin and many others were inactive. The three active enzymes were studied as crystalline preparations; they caused itching with the shortest latent period (5 sec.) and the longest duration (30 min.). Arthur and Shelley believe that these enzymes cause itching by liberating another substance, but they believe that this is not histamine. Their reason for this is that the active

endopeptidases invariably elicited the pure sensation of intense itching without any weal or flare, whereas histamine and the potent histamine liberator 48/80 never produced itching in the absence of wealing.

B VITAMINS IN TOXIC STATES

Replacement therapy in actual or threatened deficiency states is the only theoretically valid indication for vitamins of the B complex. The average diet in this country contains ample vitamin B to meet nutritional requirements, and deficiency syndromes are very rare. When they occur, they are nearly always caused by defects of absorption such as the steatorrheas, the disorders which may follow gastro-intestinal surgery, or pernicious anaemia, which is due to a failure to absorb vitamin B₁₂. Vitamin-B deficiencies are difficult to induce in man, and prolonged deprivation is usually necessary. It is several years before vitamin B₁₂ deficiency becomes manifest after total gastrectomy, which removes the natural source of intrinsic factor; and clinical signs of pyridoxine deficiency cannot be deliberately induced in man unless a metabolic antagonist to the vitamin is given.¹ It is therefore unlikely that true deficiencies can arise in acute toxic states, and if the B vitamins have any beneficial effect it is probably due to some secondary action analogous to the vasodilator effect of nicotinamide. Thiamine and pyridoxine have long been popular in the treatment of radiation sickness, vomiting of pregnancy, and post-operative vomiting. Pyridoxine has been the more frequently used, but even in controlled trials the results have been conflicting,^{2,3,4} although response has been more convincing in radiation sickness than in other forms of nausea and vomiting.⁵ There is some evidence that patients with vitamin-B deficiency are abnormally sensitive to irradiation.⁶ Intravenous thiamine and pyridoxine have also been used empirically in the treatment of acute alcoholism.^{7,8} Nausea, vomiting, and anorexia are difficult symptoms to assess objectively, and a convincing answer can only come from large-scale blind trials in which neither patient nor doctor knows whether test substance or dummy is being used. If clinical impressions could be confirmed in this way it would not be the first time that successful treatment has been based on doubtful premises.

Vitamins of the B group have also been used in the treatment of acute and chronic liver disease. In cirrhosis of the liver they are indicated only in patients with alcoholism and associated malnutrition: in infective hepatitis their value has never been convincingly demonstrated. Campbell and Pruitt⁹ recently carried out a

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⁶ Bean, W. B., et al., *Amer. J. med. Sci.*, 1944, **208**, 46.

⁷ Wordsworth, V. P., *British Medical Journal*, 1953, **1**, 935.

⁸ Martensen-Larsen, O., *ibid.*, 1954, **2**, 464.

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¹⁰ *Ann. intern. Med.*, 1954, **41**, 963.

¹¹ *British Medical Journal*, 1950, **2**, 748.

¹² *Ibid.*, 1955, **1**, 459.

¹ Broadbent, J. L., *Brit. J. Pharmacol.*, 1953, **8**, 263.

² Emmelin, N., and Feldberg, W., *J. Physiol.*, 1947, **106**, 440.

³ Bowden, K., et al., *Nature (Lond.)*, 1954, **174**, 925.

⁴ Arthur, R. P., and Shelley, W. B., *ibid.*, 1955, **175**, 901.

controlled trial of vitamin B₁₂ and folic acid in soldiers with infective hepatitis and claimed quicker clinical recovery and more rapid improvement in liver function tests in the treated group, but Colwell¹⁰ was unable to confirm this. Latner¹¹ includes B vitamins in the treatment of acute liver failure, but Reynell¹² has shown that they are of no value in experimental liver failure in rats, and there is little theoretical justification for their use. It has yet to be shown that vitamin B therapy has any place in the treatment of liver disease as it is seen in this country.

ADVERTISING ON TELEVISION

The Independent Television Authority published last week a booklet entitled "Principles for Television Advertising" which is described as a general code of television advertising conduct. The rules are based on the recommendations of a committee appointed by the Authority, the Advertising Advisory Committee, on which Dr. Guy Dain serves as a representative of the British Medical Association. The general principle which will govern all television advertising is that it should be "legal, clean, honest, and truthful." It follows that false and misleading advertisements will not be allowed, and "no advertisement shall contain any reference which is likely to lead the public to assume that the product advertised has some special property or quality which is in fact unknown, unrecognized, or incapable of being established." Scientific terms must be used with a proper sense of responsibility to the ordinary viewer, and the irresponsible use of testimonials must be avoided. In so far as advertising on children's programmes is concerned, no product is to be advertised which might result in harm to children physically, mentally, or morally, and no method of advertising may be used "which takes advantage of the natural credulity and sense of loyalty of children." Among the particular safeguards specified is one which forbids any advertisement which encourages children to enter strange places or to converse with strangers in an effort to collect coupons, wrappers, or labels.

The advertising of medicines and treatments presents particular problems. The rules state that no advertisements will be accepted for specifics for slimming or bust development, contraceptives, smoking cures, and products for the treatment of alcoholism. In addition there are already statutory restrictions on the advertising of remedies for cancer, venereal diseases, tuberculosis, and other disorders. In general, advertisements for medicines will be accepted if they comply with "The British Code of Standards in Relation to the Advertising of Medicines and Treatments." This code,¹ which has the approval, among other bodies, of the Newspaper Proprietors Association, the Advertising Association, and the Proprietary Association of Great Britain, has helped greatly in recent years to improve the standard of patent medicine advertisements in newspapers and periodicals, and its strict application to television advertisements should be a

¹ "British Code of Standards in Relation to the Advertising of Medicines and Treatments," 1953, third edition.

useful safeguard against any tendency to unscrupulous advertising of medicines or methods of treatment. Finally, doctors will be relieved to know that "statements, gestures, or representations that give the impression of professional advice or recommendation should not be allowed."

SHOPLIFTING

Only very few of the many convicted shoplifters are referred to the psychiatrist. In the course of one year 3,400 persons were apprehended for shoplifting in five Chicago department stores; 4.5% were arrested, and for 25 of them psychiatric opinion was sought because they appeared to suffer from mental symptoms. Of 338 cases of shoplifting referred to a Chicago psychiatric institute,¹ 313 were females. 77% were labouring under a definable nervous disorder. Almost all psychiatric conditions were represented, mild depressions being the most frequent. Kleptomania (compulsive stealing) was found only in 4% of the group. Shoplifting was not related to economic status.

At a recent meeting of the Medico-Legal Society, Lindsay Neustatter² discussed some interesting cases of shoplifting. He pointed out that, contrary to generally held beliefs, "of all crimes, theft is at the same time the simplest and the most difficult to understand."³ The association of shoplifting with tension and sometimes with sexual excitement has been known for a long time. It has been found to be precipitated by unfulfilled craving for affection and by lack of sexual gratification. In each of Lindsay Neustatter's five cases the irrational theft had taken place in a state of tension and depression. Three of his patients showed evidence of an hysterical personality. In one of his cases the act of shoplifting had been preceded by a craving for sweets, which had resulted in an excessive gain in weight. This case recalled J. Wilder's⁴ account of shoplifting in states of spontaneous hypoglycaemia. In the view of many psychiatrists the abnormal behaviour of the offenders does not imply that they should necessarily get away without punishment.

Regrettably, there is little systematic knowledge about shoplifting as a neurotic symptom. The offence has become more frequent since the barriers between potential customers and the goods they are invited to buy have been completely removed in many places. Some people find buying things a pleasant relief in states of depression, and a similar mechanism, though more primitive, might be at work in shoplifting, where the mode of acquisition provides an added thrill. The coexistence of this abnormal manifestation of acquisitiveness with oral craving recalls a similar association among the so-called oral character traits. There is need for more systematic studies in this field. It might even pay the big department stores, which are the chief victims of this offence, to finance serious research into this problem.

¹ Arief, A. J., and Bowie, C. G., *J. clin. Psychopath.*, 1947, 8, 565.

² Neustatter, W. L., *Med.-leg. J. (Camb.)*, 1954, 22, 107.

³ —, *Psychological Disorder and Crime*, 1953, London.

⁴ Wilder, J., *J. crim. Psychopath.*, 1940, 1, 219.

⁵ —, *Correctional Psychology*, 1944, New York.

PROLONGED PREGNANCY

The question of postmaturity arises often enough to perplex the obstetrician, and the question of how long a live pregnancy can remain in the uterus is of considerable medico-legal importance. Attention might therefore be drawn to a short paper recently published by Burrows,¹ in which he discusses the possibility that delayed nidation of the fertilized egg might account for some cases of prolonged gestation in the human. He points out that for some time biologists have known that blastocysts do not need an immediate attachment to the uterus for their survival. Most of the pertinent observations have been made on rodents. In mice gestation may be retarded by injury soon after coitus or by the occurrence of conception during lactation. But in other rodents, and perhaps in seals, delayed nidation is said to occur normally and in the absence of adverse factors, the blastocyst lying dormant for months before the development of the embryo is resumed. Further, Burrows himself noted that mice and rats occasionally bore two successive normal litters after a single mating. The explanation is said to lie in the retention of some of the blastocysts in the oviducts, their survival in a dormant state throughout pregnancy, and their subsequent entry into the uterus to develop as a second litter.

The possibility of deferred nidation occurring in the human raises several points of interest. It might explain cases of alleged superfoetation, either when twins of unequal maturity and size are born together, or the even rarer cases in which two babies of equal maturity are born within a few months of each other. It might also explain those cases in which, despite pregnancy being prolonged as measured by our present criteria, the foetus shows no signs of postmaturity either before labour or at delivery. One way of studying the question might be to make inquiries among women who became pregnant during lactation to see if the date of their conception could be determined accurately perhaps because of a single act of coitus. If the average interval between conception and delivery were found to be lengthened in these cases, it might afford relevant evidence.

PLEASE REPLY TO THE G.M.C.

Although the necessity for "getting registered" is well understood it is not so generally realized that, disciplinary procedures apart, it is occasionally necessary for doctors to take steps to keep registered. On two occasions² last year reminders to readers of the liability to erasure from the *Register* under the provisions of Section 14 of the Medical Act were published in the *Supplement*. Section 14 makes it the duty of the Registrars of the General Medical Council to keep the *Register* correct and "to erase the names of all registered persons who shall have died and . . . from time to time make the necessary alterations in addresses or qualifications of the persons registered." To carry out this duty the Registrars are empowered to write a letter to any registered doctor to inquire whether he has

ceased to practise or has changed his residence; and the Act goes on to say that if there is no answer to such a letter within six months "it shall be lawful to erase the name of such person from the *Register*." Some such powers as these are necessary if the General Medical Council—the body responsible for keeping the *Register*—is to carry out its essential task. A register which continued to include the names of deceased practitioners would fall into disrepute, not to mention the increased risk of impersonation which is sometimes attempted.

A letter at page 286 of this week's *Supplement* shows that at least one doctor is not clear about the procedure used by the Registrars in carrying out their obligations. At the beginning of each year about 10,000 doctors' names are selected alphabetically from the *Register* (the intention is to cover the entire *Register* in cycles of about five years), and they are circularized from the offices of the Council in London and Edinburgh by ordinary post with a request for confirmation of the correctness of the details already recorded on the *Register*. A detachable form is enclosed for reply. According to the President of the G.M.C.³ in one year one-third, and in no year less than one-sixth, of the practitioners circularized do not reply to this letter. A further—and registered—letter is sent in June to those practitioners who fail to reply to the first letter. During the summer and autumn the Council attempts to trace the practitioners who have not replied to either letter (and are therefore becoming liable to erasure) by seeking fresh addresses from the British Medical Association, the medical protection societies, the *Medical Directory*, and other sources. As a result of the co-operation, entailing not a little labour, of the bodies and persons consulted, the Registrars are usually able to establish communication with all except about 500 of the practitioners in question. In November or December of each year the names of the practitioners with whom it has not been possible to establish contact are erased.

Early in the present year every practitioner originally registered by virtue of an English, Scottish, or Irish qualification (other than a practitioner who became fully registered after January 1, 1954) whose name begins with a letter between I and N inclusive should have received a letter sent on behalf of the Council. Letters are not sent in the normal course to provisionally registered practitioners. Further registered letters were sent in May to practitioners who did not reply to the original letters. Any practitioner who has received a letter from the Council and has not replied would therefore be well advised to communicate with the appropriate office of the Council.

Medical men are supposed to be lax in filling up forms, replying to questionnaires, and so forth. It seems to be an occupational hazard. But it requires little imagination to see that the elaborate efforts made to trace the missing thousand or two names each year cost a great deal in time, money, and patience. Common courtesy, as well as self-interest, surely demands a prompt answer to the Registrars of the G.M.C.

² *Supplement*, January 2, 1954, p. 4.

³ *Ibid.*, October 16, 1954, p. 142.

⁴ *Supplement*, June 4, p. 267.

¹ Burrows, H., *J. Obstet. Gynaec. Brit. Emp.*, 1954, 61, 762.

EMERGENCIES IN GENERAL PRACTICE

PULMONARY EMBOLISM

BY

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Pulmonary embolism is thought to be the cause of death in 3% of hospital patients who are examined *post mortem*, but in only one-third of these is the diagnosis made before death. This fact stresses the difficulty in making the diagnosis of this serious and often fatal condition. In a significantly large number of cases pulmonary embolism is not the sudden dramatic incident of acute dyspnoea, chest pain, and circulatory collapse.

Aetiology

The one condition which is essential for pulmonary embolism is that a clot should form in any portion of the cardiovascular system peripheral to the pulmonary artery, and parts of this become detached and be carried by the blood stream into the pulmonary tree. The vast majority of emboli actually come from the deep veins of the legs, some from the pelvic veins, a few from the right side of the heart or from the venous channels in the upper extremities. The facts which are known about the disease are that it occurs principally in patients strictly confined to bed, and that it is rare in patients under 30 years of age. It is as common in medical as in surgical cases, with a notably high incidence among those with heart disease, though in 90% of these the origin of the clot is in the peripheral veins.

Two factors seem to be important in the initiation of deep vein thrombosis, one is slowing of the blood stream, and the other is injury to the vessel wall. Rest in bed produces slowing of the blood stream. Congestive heart failure also results in slowing of the circulation, and when due to mitral stenosis or myocardial infarction appears to be particularly apt to lead to venous thrombosis. Injury to the vessel wall may be of recent origin as in trauma, or there may be chronic insufficiency of the calf veins with distortion and dilatation of the venous channels. Such a state of affairs occurs temporarily during pregnancy, and predisposes the patient to thrombosis.

A small group of cases do occur in apparently healthy, ambulatory individuals, many of whom have recurring episodes of calf-vein thrombosis. It is said that this group, which is rare, is composed predominantly of males, but in my experience these patients are equally often females. Nearly one-third of them develop pulmonary embolism, and when this state of affairs occurs in ambulant patients it is important to consider the possibility of neoplastic disease and thromboangiitis obliterans.

Four events may result from sudden obstruction of the blood flow in the pulmonary arterial system: (1) the development of pulmonary infarction due to the obstruction; (2) the development of acute cor pulmonale because of a sharp rise in right ventricular pressure; (3) peripheral vascular collapse; and (4) the onset of certain cardiac disorders. It must be stressed, however, that pulmonary infarction, cor pulmonale, or cardiac disorders may occur without any dramatic incident. Anoxia may also result and be of sudden or gradual onset in any particular case.

Clinical Picture

The clinical features in any patient with this condition depend on the preponderance of the different factors mentioned, the size of the vessels occluded, movement of the emboli within the pulmonary vessels, and the state of the heart and lungs prior to the onset.

Pain may be due to disturbances in the pulmonary circulation, to pleural involvement, or to impairment of the coronary circulation. Fortunately from the diagnostic point of view, chest pain occurs in 75% of cases, in two-thirds of which it is pleuritic in nature, because of involvement of the pleura overlying the infarction, and in one-third anginal. It has been claimed that the latter is due to reduced coronary blood flow.

Fever occurs in over two-thirds of the patients and a sharp rise of temperature associated with leucocytosis may suggest a diagnosis of pneumonia. The fever does not, however, respond to the administration of antibiotics. Occasionally fever is the principal clinical manifestation of pulmonary embolism, perhaps associated with minimal chest signs on auscultation and a radiograph which is passed as normal.

Breathlessness may result from bronchospasm, immobility or diminished respiratory excursion of the diaphragm, anoxia, pulmonary infarction, or impairment of cardiac function, but it is important to remember that breathlessness may not be present.

Physical signs in the lungs may be absent in spite of chest pain and breathlessness, or, on the other hand, a massive area of infarction associated with a large pleural effusion may dominate the clinical picture, and if, as often happens, the pleural fluid is blood-stained, the diagnosis of pulmonary neoplasm may be entertained.

Cough is almost as common as dyspnoea, occurring in one-third of the patients, but haemoptysis, which is thought to be one of the classical features, is evident in only one-quarter of the cases.

Occasionally the presenting picture is one of acute cor pulmonale without any history of deep venous thrombosis or complaint of chest pain or haemoptysis. Under these circumstances there may be prominent pulsation over the pulmonary artery, dilatation and pulsation of the jugular veins, and cyanosis. In these cases a loud pericardial friction rub may be heard over the pulmonary area. This clinical picture may persist for days or weeks, or may be transient, particularly if right heart failure supervenes. Paroxysmal auricular fibrillation, paroxysmal auricular tachycardia, high-grade auriculo-ventricular block, and bundle-branch block may occur as part of the clinical picture.

Sudden chest pain and fever are therefore the commonest presenting features of pulmonary embolus and may on occasion be found without any other symptoms or signs. The diagnosis may be obvious or very difficult. I recently attended the post-mortem examination of a patient who was twice in my wards with "pneumonia." Pulmonary embolism was suspected because the response to antibiotics was unsatisfactory, but no confirmatory evidence could be found on detailed clinical, radiological, or cardiographic examinations. After her second admission she was sent to a convalescent home, where she died suddenly from a massive embolus. At post-mortem examination a solid clot extended from the deep calf veins to the inferior vena cava.

In the physical examination of the case of suspected embolism care has to be exercised, and on no account should the patient be asked to breathe deeply to facilitate auscultation of the chest. Death has occurred under such circumstances following the sucking of a large clot into the chest. The administration of adequate laxatives is also important to avoid straining at stool.

It will be evident from this account that the clinical picture may simulate many other disorders, more commonly pneumonia, acute myocardial infarction, pleurisy with effusion, pulmonary neoplasm, acute heart failure, or asthma.

Electrocardiographic examination is of great value in distinguishing acute pulmonary embolism from myocardial infarction, particularly when the patient complains of substernal pain. In pulmonary embolism there is usually electrocardiographic evidence of acute right ventricular stress. The changes are maximal within the first three days and may persist for weeks. In 15% of cases there is transient right bundle-branch block, making differentiation from myocardial infarction very difficult. A normal electrocardiogram, however, does not exclude pulmonary embolism.

Radiological Examination of the Chest.—When embolism occurs without infarction there may be a segmental area of increased translucency owing to absence of vascular shadows in the ischaemic area. Rounded or wedge-shaped shadows may be visible when infarction occurs. There may be no radiological signs or a massive area of consolidation. Radiological signs are so variable that I doubt the wisdom of moving a patient in domiciliary practice for this examination alone.

Diagnosis and Prognosis

It is obvious that a massive pulmonary embolus occurring without warning or signs of deep vein thrombosis cannot be anticipated and prevented. In my experience, however, more than half the cases which develop a pulmonary embolus have symptoms or signs before the major accident which are disregarded, some by the patient—such as pain in the calf; some by his medical attendant—unexplained pyrexia, slight chest pain, or a short attack of breathlessness—because many physicians still hesitate to consider the diagnosis without severe breathlessness, chest signs, and haemoptysis. The realization that pulmonary embolism may occur without dramatic symptoms and signs is all-important, and in such patients anticoagulant therapy should be instituted when deep vein thrombosis or a small pulmonary embolus is suspected. All seriously ill persons should have regular and frequent examinations of the calves for tenderness.

Published results suggest that 40% of patients who experienced a minor incident had a major embolism, and half of them died before the institution of anticoagulant therapy. In my experience, 18% of patients who had an embolus had a second one in spite of adequate anticoagulant therapy. The death rate in these treated cases was, however, greatly reduced, being in the region of only 2%. Anticoagulant therapy is therefore a major advance in the treatment of pulmonary embolism.

Treatment

Cases fall commonly into two clinical groups from the point of view of treatment. (1) The small embolus associated with chest pain, some rise of temperature, and perhaps slight breathlessness. Morphine, 15–20 mg. ($\frac{1}{2}$ – $\frac{3}{4}$ gr.), should be given initially by subcutaneous injection to allay distress and anxiety and anticoagulant therapy instituted. If such cases are not treated there is a risk of a second major embolus and also the danger of extension of the clot in the pulmonary tree giving rise to the gradual development of cor pulmonale or a large area of infarction without any further major incidents. Many cases in this category are diagnosed as pneumonia and are found resistant to treatment for that condition. (2) A large embolus, producing shock, acute breathlessness, pleural or substernal pain, cyanosis, and a fall of blood pressure. Morphine, 20 mg. ($\frac{1}{2}$ gr.), and atropine, 1 mg. (1/60 gr.), should be given by subcutaneous injection immediately and heparin is also urgent (see below). Morphine, 15 mg., may be repeated in one hour if considered necessary. Oxygen therapy is indicated if anoxia is marked.

Further treatment depends on developments. The patient may require treatment for cardiac failure or the intravenous injection of 0.5 g. of aminophylline for bronchospasm. In patients who have a large lung infarct it is wise to give antibiotics prophylactically.

When is it desirable to move the patient to hospital? Cases which have had a small embolism without shock or collapse can usually be moved at any convenient time, but they should be under the influence of heparin when this is done. Those who have suffered a massive embolism with shock and circulatory collapse are not fit to move. The temptation must be resisted to rush these cases to hospital for anticoagulant treatment. Difficult though the treatment may be to carry out in the home, therapy as detailed below should be carried out there until the patient is sufficiently recovered to withstand the stress of the journey.

Anticoagulant Therapy

Heparin is the drug of choice for the initial treatment of pulmonary embolism, and 15,000 units should be given intravenously by the practitioner whenever the diagnosis is made, and 10,000 units at six-hourly intervals thereafter. It is safe to administer heparin in this way, and control clotting times are unnecessary. Heparin prevents extension of the clot and promotes its resorption; it also has a vasodilator action. Its administration should be continued for three to five days. At a suitable time during this period the patient should be transferred to hospital for coumarin therapy. Heparin is of less value than coumarin-type anticoagulants in producing recanalization in the thrombosed vessel, both in the lungs and in the deep calf veins. It is unfortunate that coumarin treatment requires laboratory control, but it can be perfectly well carried out in the home if the laboratory facilities are at hand.

On the last day of heparin treatment 100 mg. of phenylindanedione (P.I.D.) should be given twice by mouth. The following morning the one-stage clotting test* is carried out, and further dosage of P.I.D. determined. During the first week of P.I.D. therapy daily estimations by the one-stage clotting test are required, but thereafter weekly or fortnightly estimations are usually sufficient. Over 70% of patients are maintained satisfactorily with a dose of 50 mg. a day. In the cases in which there are no further complications therapy should be continued till the patient has been fully ambulant for about a week or until there is resolution in the area of pulmonary infarction. The most remarkable improvement often occurs in an area of lung apparently irreparably damaged. When there is persistence of lung signs or evidence of acute cor pulmonale, treatment may have to be continued at home or in hospital with weekly laboratory checks for months. Some of our patients who required six to eight months' treatment have made a complete functional recovery.

In cases with recurrent pulmonary emboli, particularly when associated with mitral stenosis or migrating thrombophlebitis, permanent out-patient anticoagulant therapy should be considered.

Contraindications to Therapy.—Anticoagulant therapy is contraindicated under the following circumstances: if the patient is known to have a duodenal ulcer, malignant disease, advanced hepatic or renal disease, or any bleeding diathesis. It is also probably wise to avoid this form of therapy in severe hypertension if there is a history of cerebral thrombosis or if cerebral embolism has occurred within the previous fortnight.

Prevention

Early ambulation after operation or illness is desirable. Breathing exercises and foot and leg movements should be carried out in all patients confined to bed. These need not be elaborate, can easily be carried out in the home, and do not require the supervision of a physiotherapist. Flexion

*Quick, A. J., Stanley-Brown, M., and Bancroft, F. W., *Amer. J. med. Sci.*, 1935, 190, 501.

and extension of the ankle and knee-joints, together with clockwise and anticlockwise rotation of the feet, carried out two or three times a day is all that is required. In patients with a previous history of deep vein thrombosis, or thought to be likely subjects for thrombosis, knee-length elastic stockings should be fitted and worn during the period of bed rest. Thigh-length elastic stockings are undesirable because they wrinkle at the knee and may themselves traumatize the veins. Wilkins and his colleagues (*New Engl. J. Med.*, 1952, 246, 360) have shown that this simple procedure is sufficient to increase the blood flow in the calf veins and reduce the incidence of thrombosis. Patients with a history of deep venous thrombosis who are too ill to carry out leg exercises efficiently should be given anticoagulant drugs prophylactically and the foot of the bed should be elevated. A superficial vein thrombosis is not an indication for anticoagulant therapy. In fact, such treatment is contraindicated when phlebitis is present. But it must be remembered that patients in this group may also have damaged calf veins and may develop deep thrombosis. In pregnancy it is almost certain that patients have abnormally dilated deep veins and a careful watch must be kept when superficial thrombosis occurs.

Next article on Emergencies in General Practice.—"Serum and Anaphylactic Reactions," by Dr. D. A. Williams.

Refresher Course Book.—Copies of the second volume of collected articles from the Refresher Course for General Practitioners are still available at 25s. (postage 1s.) each. The first volume is now sold out.

Clinical Pathology Book.—"Clinical Pathology in General Practice," a collection of 39 articles on clinical pathology that appeared in the *Journal* as part of the Refresher Course for General Practitioners, is now available, price 21s. (postage 9d.).

Both these volumes are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or through any bookseller.

THE QUEEN AT HAMMERSMITH HOSPITAL

To mark the jubilee of the Hammersmith Hospital and the twentieth anniversary of the inauguration of the Postgraduate Medical School of London, which is associated with it, the QUEEN paid a visit to both institutions on June 6. Her Majesty was received at the entrance to the hospital by the MINISTER OF HEALTH (Mr. Iain Macleod), and proceeded at once to the School, where she was first shown documents relating to its opening by George V in 1935, one of his last public engagements. She then proceeded to one of the wards, where postgraduate students, including those from the Commonwealth and Empire, were in attendance. Three special exhibits were inspected by Her Majesty. The first was the metabolic unit, built last year for the investigation of metabolic disorders, including the effect of radiation upon the human body. The second was the Medical Research Council unit, a new building containing besides research laboratories an 8-million-volt linear accelerator and a 45-in. (1.1-m.) medical cyclotron. The third was the exhibition illustrating the research work of the School in the fields of surgery, medicine, obstetrics and gynaecology, and pathology. In the surgery section a display which caught the eye was the artificial heart-lung machine. The effect of operation and anaesthesia on the circulation was also ingeniously shown. The medical exhibit included a mass spectrometer for the instantaneous analysis of respired gases. Another exhibit was designed to demonstrate advances in the treatment of hypertension with new drugs. In the pathology section there were displays of improved vaccines for the treatment of chronic staphylococcal infections, and of the mechanisms of inheritance and variation in bacteria. Finally, the Queen spent some time in the wards and paid a visit to the nurses' home.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

The Ban on Heroin

SIR,—The banning of heroin seems to have produced in your correspondence columns a good deal of heat without much light. On the one hand we have the decision of an international committee, composed of not inconsiderable clinicians and pharmacologists, including members of the Narcotics Commission of the U.S.A. whose exhaustive researches on the addiction problem entitle them to a careful hearing; on the other hand we have the conviction of a number of distinguished clinicians that heroin is sometimes the only effective analgesic. The path of therapeutics is strewn with rejected remedies once held to be of great clinical importance, but there has been more than one instance where hasty generalizations largely on negative evidence have led to the unjustified condemnation of a remedy. In two instances to which I am referring, cod-liver oil and liquid extract of ergot, clinicians persisted in using them, and eventually their effectiveness was objectively established by the discovery of the vitamin content of the first and the ergometrine content of the second. Heroin is, however, to be banned without evidence of the kind that could objectively establish whether the clinical impressions of your correspondents are soundly based or not. A final trial of an analgesic, as any pharmacologist who has worked with them knows, can only be carried out on the clinical case. The particular claim made for heroin would entail difficult and protracted work, but the issue at stake, the relief of the agony of the dying, is so important that an attempt at a controlled trial should be made. The size and nature of the list of substitutes for heroin suggested show that the kernel of the problem has been missed. These substitutes are, it is true, remarkably similar qualitatively. They all reproduce the specific actions of morphine, but there are quantitative differences in their action. For example, their relative action in depressing respiration is not proportional to their analgesic activity. There is an *a priori* reason for supposing that the claim for retaining heroin may be sound. The effect of the morphine group in alleviating pain is almost certainly not a specific annulment of the impulses transmitted through pain fibres but a cerebral action related to the sense of euphoria produced. It is just because of its outstanding euphoric effect and consequent addiction production that the use of heroin is to be abolished.

Is the social evil of heroin addiction in this country sufficiently large to outweigh the therapeutic advantage which heroin may possess? After all, the social evil of addiction to alcohol is far graver, not only in this country but in others, than addiction to narcotic drugs. The community has decided, however, that the solace the majority get from alcohol justifies the use of strict regulation rather than abolition as a means of diminishing its use by that abnormal section of the community which may become addicts.—I am, etc.,

London, N.W.1.

J. TREVAN.

"Half-minute" Thermometers

SIR,—I think it is universally believed not only by the medical and nursing professions but by the entire population that when a thermometer is inscribed as "half-minute" it indicates the manufacturer's assurance that it will register the temperature of a human being in that space of time. We all know that this is not true. But we have grown up to it from the nursery, and I have no recollection of hearing a discussion as to how the manufacturers arrive at this figure or if it has any other meaning.

I heard an explanation a year or two ago which was new to me. I was told that "half-minute" had nothing to do

with registering the temperature of a human being, but guaranteed that if the thermometer were placed in warm water about blood heat it would record the temperature correctly in that time. I have asked various medical friends, but I have met no one who has confirmed this explanation. It would be interesting to know if it is correct. If so, it is astonishing that it is so little known. If it is not correct, it would be interesting to know how the "half-minute" is measured, and what it does mean.

It is certainly surprising that the medical and nursing professions have shown no curiosity as to the origin of this strange inscription.—I am, etc.,

London, W.8.

HENRY TIDY.

Diversities of Sex

SIR,—I congratulate Dr. C. N. Armstrong on his article on diversities of sex (*Journal*, May 14, p. 1173). But I would plead for the dropping of the clumsy term "pseudohermaphroditism" in favour of the compact and easily understood one of "intersex," male or female as the case may be. I do not relish the task of explaining to an intelligent parent that our scientific knowledge is such that we can class his child as a "female-false-male-female." As is shown in the article of Mr. A. F. Bromwich in your issue of February 12 (p. 395), this term of pseudohermaphroditism makes it necessary to add the prefix "true" when talking of hermaphroditism, which seems to me to add confusion to an already complicated subject.

I would also join with Mr. Michael Oldfield (*Journal*, May 28, p. 1338) in pleading that unless we are very sure of our ground we should refrain from action, either surgical or medical. There is no space to go into particular instances, but I have several ex-patients leading contented lives as adults unaware of their good fortune in not having their adrenals removed, an artificial vagina constructed, or life-long cortisone prescribed. Finally, it is probably too much to hope that those who attend the birth of such children will refrain from giving confident and definite opinions on their sex unless they have studied the subject.—I am, etc.,

London, W.1.

DENIS BROWNE.

The Aftermath of Hysterectomy

SIR,—Dr. Winifred Coppard (*Journal*, April 2, p. 852) draws attention to the fact that some women who require hormonal treatment after hysterectomy are left without it. I, too, have met cases where serious results have thereby occurred. Reasons for the oversight are various.

(1) The patient reports to the out-patient department in six weeks. Climacteric symptoms may not yet have begun and the case is finally discharged. Or possibly a new houseman does not distinguish between climacteric and post-operative stress, so that premonitory symptoms are misinterpreted. (2) If climacteric stress occurs later, the patient may be told by her friends that this must be expected. Therefore she does not report to her doctor at all. (3) If she does report, her doctor may have received no specific instruction for post-operative treatment. Knowing that oestrogen is contraindicated in certain types of case, he may feel doubtful of giving such therapy. In any case, some practitioners are averse to the alleviation of menopausal symptoms, either because they have found the intricacies of oestrogen dosage too tiresome or because they have not experienced the trial of an exacting menopause themselves. Therefore the patient may be left with exhortation only, which can be poor comfort.

It is confusing that, although a subtotal hysterectomy should not theoretically cause an early climacteric, in fact the ovarian blood supply may be disturbed by operation and menopausal stress can start within even a few days. Again, it is not widely realized that when hysterectomy has been needed to correct conditions due to a high oestrogen balance (endometriosis, metropathia haemorrhagica, etc.) the patient will experience a far more severe hormonal imbalance than will an average woman. These are the subjects who need to take relatively large doses, even of the synthetic oestrogen preparations. It is well to remember

that the presence of flushes is not an essential criterion for the diagnosis of menopausal stress. Forty per cent. of women have no menopausal flushes, yet they may suffer from severe depression or other character and functional changes during this phase.—I am, etc.,

London, N.W.1.

JOAN MALLESON.

Food-poisoning

SIR,—The article by Dr. Christopher Hardwick (*Journal*, May 14, p. 1205) on the emergency of acute food-poisoning illustrates the limitations and inadequacy of the purely clinical and therapeutic approach to a preventable condition. We must surely do something more than "recognize and treat each case as it occurs," for, unless certain steps are promptly taken, the factors causing a food-poisoning incident may continue to operate and produce many fresh victims. It is therefore to be regretted that Dr. Hardwick failed to emphasize that it is a most urgent duty of any registered medical practitioner to notify forthwith the local medical officer of health when in the course of hospital, institutional, or private practice he suspects food-poisoning in a patient. It then becomes the statutory duty of the medical officer to investigate the possible causes and to prevent further incidents by using his respective powers of detention and seizure of suspected and incriminated food. He is, moreover, armed with the legal authority to search for infectious food-handlers and to suspend them from their occupation as long as they continue to be infectious.

To assist these investigations it is of great importance that the remains of any foodstuffs consumed prior to the onset of symptoms, and any related containers, should be retained for bacteriological (and possibly also chemical) examination, instead of being destroyed as usually happens. Specimens of both vomitus and faeces should also be promptly submitted to the bacteriologist. By co-operation in these matters the practitioner first called to the patient can play a most effective part in the sphere of preventive medicine.

Certain other comments must be made. Staphylococci, usually of human derivation, may be concerned in the production of infective as well as toxic food-poisoning. Duck eggs are not merely under a cloud but should not be consumed at all unless they have been sterilized by boiling for at least 10 minutes. Lastly, your weekly publication of vital statistics shows that dysentery has been widely epidemic for many weeks and that there were 1,053 cases in England and Wales in the week ending April 23, so that familial and other outbreaks of dysentery resembling food-poisoning are far from rare, as suggested by Dr. Hardwick.—I am, etc.,

Gateshead, S.

JAMES GRANT.

Salicylate Intoxication in Children

SIR,—We read the leading article on salicylate intoxication in children (*Journal*, May 14, p. 1201) with appreciation, except for your statement that in this country aspirin is not much used for the very young. We think, on the contrary, that it is widely and wisely used by many general practitioners and paediatricians, notably for relief of pain in teething and earache, and, furthermore, we think this is a proper use of a drug with a great margin of safety. The sleep which follows relief of pain is of benefit to the infant directly, and because his mother also is rested.—We are, etc.,

LAWRENCE PAGE.

RONALD MAC KEITH.

London, S.E.1.

Megaloblastic Anaemia of Pregnancy

SIR,—The recent important paper (*Journal*, May 21, p. 1245) from the Nuffield Department of Clinical Medicine, Oxford, is an apt reminder of the riddle of megaloblastic anaemia of pregnancy. It is indeed fortunate that, despite our ignorance of the nature of the disease, treatment is usually satisfactory. The main clinical problem is, however, early diagnosis, and it is commonly thought that the only sure method is marrow biopsy.

Recently, in a survey of anaemia of pregnancy in co-operation with Professor Fairlie and the staff of the maternity department at the Royal Infirmary, Dundee, I have been examining the buffy coat from the Wintrobe haematocrit as well as the sternal marrow. Thus far, I have found megaloblasts in the buffy coat in every case with a megaloblastic marrow. Time spent on microscopy is much less than is necessary in the examination of the ordinary blood films. The value of examination of the buffy coat in Addisonian anaemia is well known, and its application in the diagnosis of anaemia in pregnancy is one that I can fully commend.

The examination of the buffy coat from these pregnant women has revealed further points of interest. Thus erythrophagocytosis has been observed in significant degree in a number of cases. These positive findings seemed to be related either to the uterine activity of labour itself or to abdominal pain during the last few months of pregnancy, pain which might well have been due to uterine activity. The possibility that these uterine contractions forced foetal erythrocytes into the maternal circulation has already received some serological confirmation.—I am, etc.,

Dundee.

H. B. GOODALL.

SIR,—I was disappointed to find in the article on megaloblastic anaemia of pregnancy by Drs. J. Badenoch, Sheila T. Callender, J. R. Evans, and A. L. Turnbull, and Professor L. J. Witts (*Journal*, May 21, p. 1245), no mention of the recurrence rate of this condition in future pregnancies. I have recently looked after a gravida-3 patient aged 26, in whom the condition occurred with each successive pregnancy. With her first child in 1949 she had a normal antenatal period and confinement, but was discovered on the tenth post-partum day to have a haemoglobin of 23% with a typical megaloblastic blood picture. She responded well to transfusion, liver injections, and folic acid. In 1953 the anaemia was detected during the antenatal period and she was maintained in good health on folic acid.

Finally she was admitted to hospital earlier this year, one week before term, in cardiac failure and with a haemoglobin of 25%. She was given immediate transfusion of three pints (1.7 l.) of packed cells, and went into labour after twenty-four hours. She had a rapid easy labour of nine hours and delivered herself spontaneously of a live child with a haemoglobin of 112%. After delivery she was found to have complete achlorhydria, but responded to folic acid 40 mg. daily, and her haemoglobin rose to 73% after three weeks.

I wish to thank Mr. A. J. Wrigley for permission to report this case.—I am, etc.,

London, S.E.1.

A. O. RUSSELL.

Rauwolfia Serpentina in Psoriasis

SIR,—During the course of systematic study in an endeavour to find a satisfactory method of treating psoriasis, one line of approach led to the use of rauwolfia serpentina in this condition. The work on psoriasis was commenced ten years ago, and this brief report refers to only a small section of the study, which has embraced more than 1,000 cases. The results achieved with rauwolfia serpentina and the current interest in this drug, however, appear to justify a special communication.

Rauwolfia serpentina contains a large number of alkaloids of which many exhibit qualitative and quantitative differences in pharmacological action. Of these various effects the two considered to be of particular importance for the treatment of psoriasis are sedation and adrenolytic action. Sedation has been found to be of value in psoriasis, and this type of effect is shown by at least two rauwolfia alkaloids, reserpine and rescinnamine. Therapy involving adrenergic inhibition emerged from the larger scheme of the main study, and it was noted that a number of alkaloids, such as ajmaline and raupin, have been reported to act as sympatholytic agents. Certain alkaloids related to yohimbine have adrenergic blocking properties, and some of the rauwolfia

compounds appear to be medullary stimulants which may be capable of counteracting any depressant effects induced by the sedative alkaloids in susceptible individuals.

The drug used in this series was the powdered whole root of rauwolfia serpentina standardized by biological assay. It was administered in the form of 50-mg. tablets, and control groups were given placebo tablets of identical appearance. Cases were unselected and all types of psoriasis were included. Thirty patients were treated with active "raudixin" tablets, and of these 15 cleared, 10 improved, 4 showed no change, and one became worse. Thus, 83% were benefited. Fourteen patients were given the placebo tablets, and of these 2 cleared, 3 improved, 9 showed no change, and none became worse. Thus, 35.7% were benefited. The dosage employed was one tablet given four times daily. No undesirable side effects were noted, and the drug was well tolerated by all patients, many of whom reported a feeling of well-being as well as symptomatic improvement.

Psoriasis has always proved difficult to treat, and any drug which can relieve the condition without inducing harmful reactions is worthy of consideration. Rauwolfia serpentina appears to be a useful adjunct in treatment, and further investigations are justified. I am indebted to Dr. G. Harvey for permission to publish these findings and to Messrs. E. R. Squibb and Sons for generous supplies of "raudixin" and placebo tablets and for their co-operation in technical matters.—I am, etc.,

Glasgow.

G. LESLIE.

Cost of Treatment

SIR,—Some weeks ago, amongst my morning post, I received from a manufacturer of oxytetracycline a glossy, well-produced pamphlet summarizing the use of that drug in paediatrics. From it I learned of its use in whooping-cough, salmonella infections, etc., but the centre page, taking up one-third of the print, informed me that it was "preferred for threadworm infections (enterobiasis)." Lest this should escape my notice, detailed instructions were printed about the dosage for various ages, but, to make sure, I was exhorted to treat the whole family at the same time. As there was no indication of the cost of this treatment, I wrote to the manufacturers to inquire the price of their recommended treatment for a National Health Service patient aged 6 years. Their reply, excluding dispensing charges, varied from £3 to £3 11s. per patient per course, depending on the vehicle used for the drug.

Now, Sir, I have hitherto relied in some part upon literature from drug firms to keep me up to date with recent therapeutic advances. If, however, a firm of standing is prepared to advise busy practitioners to use preparations for relatively harmless conditions without at the same time indicating the crippling cost, then in future I shall throw all circulars into the wastepaper basket unopened. I may add that I have voiced my protest to the firm in question, but I have had no reply. I hope that shame is the cause of their silence.

In conclusion, I must add that I have ascertained that treatment of threadworms with piperazine hydrate—an exceedingly efficacious drug—is 3s. per course.—I am, etc.,

Newent, Glos.

K. M. TOMLINSON.

Malignant Granuloma of the Nose

SIR,—With reference to Mr. Maxwell Ellis's article (*Journal*, May 21, p. 1251) several disease entities, all of them clinically very serious, are covered by the above title and may be confused in treatment. First of all there is a genuine malignant growth, a sarcoma or carcinoma, which may be diagnosable with the help of an adequate biopsy for morbid histology. Next comes the group of genuine granulomas, tuberculous, syphilitic, para-syphilitic, fungous, protozoal (Leishmania), coccal (synergistic gangrene), and fuso-spirillary and perhaps bacillary (Perez). The so-called "granuloma" of giant cell type associated with periarteritis

nodosa or disseminated "temporal" arteritis should be placed in a class by itself.

The only safe guide for treatment is careful diagnosis, in which the morbid histologist and the bacteriologist each have a special part to play—often a very difficult part. The genuine sarcoma or carcinoma requires an adequate biopsy, not the necrotic fragment which is so often all that comes to the morbid histologist, however keen and enlightened. The genuine granulomas also require an adequate biopsy, part of which should be examined histologically and part bacteriologically. It is important that both specimens, but particularly the bacteriological one, should be accompanied by a very full clinical description and history. Smears of the exudate may be very useful for the bacteriologist.

In England and America the condition usually diagnosed as "malignant granuloma" is an ulcerating gangrenous mass in the nasal cavities which gradually eats through soft tissue and bone in a most horrifying manner. Although clinically resembling the advance of a malignant growth, the process is actually inflammatory, the most likely infection being the micro-aerophilic streptococcus of Meleney associated with a pyogenic staphylococcus. Both these organisms should be susceptible to antibiotics, but are probably insensitive to penicillin and the more popular forms taken by this therapy.

The infecting organisms should be isolated in pure culture and tried against all available antibiotics in the hope of finding one to which they are sensitive. When found, this effective agent should be administered in very large doses.

The use of "deep" x-ray therapy—as recommended by Mr. Maxwell Ellis and Mr. Gilroy Glass—is most valuable. X-rays at one time used to be employed against large carbuncles with effect. The young growing capillaries and dividing cells of granulation tissue are disrupted by the small dose of x-rays, and organisms protected by the cells are laid bare to antibodies made by the patient and to circulating antibiotics. In these cases A.C.T.H. or cortisone can be very dangerous because the natural body defences are hamstrung: these remedies, however, may be very useful for the periarteritis nodosa or giant cell arteritis phase of a granuloma, but the infective or inflammatory phase is the most urgent and should be cleared up by the methods described before A.C.T.H. or cortisone is used for the systemic phase of the condition. I have not given any references, because Mr. Maxwell Ellis has given many in his paper and I do not wish to add unduly to the length of this note.—I am, etc.,

Epping.

FRANK MARSH.

Prognosis in Cancer of Large Intestine

SIR,—I read with great interest your leading article (*Journal*, May 14, p. 1199) on this subject, especially the remark that "it is surely time the public were better informed about the early symptoms of the disease, for only thus can the main source of the delay be reduced." During the last two and a half years such education has been carried out in the "Yorkshire experiment," and an attempt has been made to assess the results statistically. Harnett¹ found that the delay in seeking advice varied with the position of the growth in the four parts of the rectum, but over 40% delayed for more than three months. Further, he stated that the three common symptoms were (1) chronic intestinal obstruction, (2) diarrhoea and/or bowel irritability, (3) discharge of blood and/or mucus, in that order.

In the Yorkshire experiment on education the symptoms emphasized were "rectal bleeding" and "changes in the bowel habit," but only the delay in cases of "bleeding" was assessed. The cases registered for this assessment were those in which cancer was proved, and those in which the complaint was rectal bleeding whatever the cause. It would be of little value to quote the "average delay" because the extremes were so far apart, especially in the latter category of cases not due to cancer—one man waited 40 years before seeking advice. Incidentally, the contrast in delay

TABLE I.—Combined Non-malignant and Proved Cancer

Duration of Delay	July to December, 1953		January to June, 1954		July to December, 1954	
	No. of Patients	%	No. of Patients	%	No. of Patients	%
0-1 month	13	16.9	56	33.7	68	43.8
1-3 months	17	21.9	33	19.8	20	12.9
3-6 "	10	12.9	23	13.8	9	5.7
6-12 "	4	5.1	15	9.0	17	10.9
12-24 "	8	10.3	11	6.6	13	8.3
Over 2 years	25	32.3	28	16.8	28	18.0
Total	77	99.4	166	99.7	155	99.6

TABLE II.—Proved Cancer

Duration of Delay	July to December, 1953		January to June, 1954		July to December, 1954	
	No. of Patients	%	No. of Patients	%	No. of Patients	%
0-1 month	1	5.8	18	33.9	12	38.6
1-3 months	3	17.5	16	30.1	5	16.0
3-6 "	4	23.5	9	16.9	6	19.2
6-12 "	2	11.7	6	11.3	4	12.8
12-24 "	5	29.4	3	5.7	2	6.4
Over 2 years	2	11.6	1	1.8	2	6.4
Total	17	99.5	53	99.7	31	99.4

of reporting haematuria and rectal bleeding is remarkable—over 70% report haematuria within one month. The result to date, after two years' education, shows some improvement in the delay in reporting rectal bleeding in three six-monthly analyses. The figures collected are small, particularly during the first six months of the experiment, and in such a small population (600,000) it will be a long time before there are sufficient "proved cancers" to be of statistical importance. Nevertheless, there is an improvement in the percentage reporting rectal bleeding within the first month, 16.9% to 43.8%. This, in my opinion, justifies an investigation on a far larger scale, if the local health authorities can be persuaded to take part.—I am, etc.,

York.

MALCOLM DONALDSON.

REFERENCE

¹ Harnett, W. L., *Survey of Cancer in London*, 1952. London.

Longitudinal Research in Child Development

SIR,—In our recent article, "A Longitudinal Research in Child Development and Some of its Problems," we stated, "This is the first study of its kind to be started in Britain." We gather that certain readers have misunderstood this statement, and we therefore wish to clarify our meaning. What was intended was to convey that the combined study, described by us, was the first of this type of study, the two main points being that it is planned from birth to maturity, and it is a combined psychological and physical investigation.

It is of course by no means the first longitudinal study in Britain. A longitudinal study was started in Oxford in 1944 at the Social Medicine Unit, Oxford University, and ran for ten years.² A study was started in 1948 at the National Children's Homes, Harpenden, under the combined direction of the Ministry of Health and the Sherrington School of Physiology, St. Thomas's Hospital, London. This very comprehensive study is in progress. Before these, there were longitudinal studies made some time ago by Lowe³ and Fleming.⁴

It is hoped that what we intended to say will now be clear, and that our ambiguity will not have been thought discourteous to other investigators—a thing we should be most unhappy to feel.—We are, etc.,

TERENCE MOORE.
COLIN HINDLEY.
FRANK FAULKNER.

London, W.C.1.

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Flat Foot

SIR.—Mr. T. T. Stamm's contention that in the flat-footed attitude the forefoot is "supinated" (*Journal*, May 21, p. 1279) is, in its context, unanswerable. However, his is an over-simplified description of flat foot, which is true only if by forefoot is meant metatarsus. In flat foot, not only is the foot pronated on the talus, but, at the mid-tarsal joint, the forefoot is pronated on the hindfoot. The navicular, cuboid, and cuneiforms are thus pronated, relative both to the leg and to the hindfoot, and the metatarsus only is inverted, at the tarso-metatarsal joints. Sometimes the medial cuneiform moves with the first metatarsal.

There is some truth, therefore, in the customary description of the forefoot as pronated, endorsed by Dr. J. McKenzie (*Journal*, April 30, p. 1068). The abduction element of pronation in flat foot is plain to see. Humphry,¹ a century ago, rightly indicated that rotation of the foot about its long axis (eversion) and rotation of the foot about a vertical axis (abduction) cannot occur independently as tarsal movements, but are always combined in the single movement which we call pronation.—I am, etc.,

London, E.C.1.

E. SHEPHARD.

REFERENCE

¹ Humphry, G. M., *A Treatise on the Human Skeleton, Including the Joints*, 1858. Cambridge.

The Meaning of Social Medicine

SIR.—I must protest against Professor Thomas McKeown's smart aleck review of my book *The Meaning of Social Medicine* (*Journal*, March 19, p. 710). His introduction is flippant, and the rest of his brief treatment of my book is most cavalier. One is perhaps not warranted in expecting the professor to understand the meaning of social medicine, but surely simple decency would require him to treat an earnest work in a forthright and sober way.

His stuffy observation on "the recognition of a problem being mistaken for its solution," and his oh so superior query: why is it necessary to make exaggerated claims for a new subject?—reflect his own mind and have nothing to do with the substance or intent of my work. I am understandably grieved that my book, on the composition of which I worked so hard, has been so shabbily treated by your reviewer. Also, I feel that the readers of the *British Medical Journal* deserve something far better than the professor's boorish exhibit. I trust that not a few will take it upon themselves to see precisely what's what.—I am, etc.,

New York, 29.

IAGO GALDSTON.

Gonorrhoea Statistics

SIR.—A pro-forma has recently been circulated to V.D. clinics by the British Co-operative Clinical Group requesting statistics of certain points in connexion with cases of gonorrhoea attending for the first time in 1954. The information required comprises occupation, race and country, sex and status of contact, whether alcohol was taken, the incidence of reinfection, precautions taken, and the marital status of patients. It seems a pity that, when so many important questions in venereology need statistical investigation, so much time is wasted on relatively unimportant matters.

The problems we would like to see elucidated by a nationwide survey include the following: (1) The necessary period of surveillance in gonorrhoea. (2) The incidence, if any, of penicillin-resistant gonococci. (3) The sexual transmission of other infections such as non-specific urethritis and trichomonas infestation. (4) The optimum course of treatment for cases of acute syphilis—by no means agreed among venereologists. (5) The necessary period of surveillance in acute syphilis. (6) The optimum course of treatment for chronic syphilis including cerebrospinal forms. (7) Duration of treatment in latent syphilis. (8) The significance of doubtful serological tests in cases of pregnancy who have

had previous treatment. (9) Clinical opinions of the comparative value of the different serological tests for syphilis and possibly also the standardization of technique throughout the country.

With problems of such magnitude requiring elucidation, it seems to us rather trivial to employ our time finding out if an attack of gonorrhoea was got from a casual acquaintance or a close friend.—We are, etc.,

GERALD H. KNIGHT.
W. FOWLER.

Birmingham, 4.

Varicella with Neurological Complications

SIR.—I was interested to read Dr. M. S. Pathy's memorandum on varicella with neurological complications in an adult (*Journal*, May 28, p. 1324). In July, 1954, I was called to see a male patient of 32 years who developed severe headache, vertigo, and intractable vomiting three days after the appearance of a typical chicken-pox rash. His symptoms were so intense that he had to be removed to hospital. While in hospital he was examined by both E.N.T. and general surgeons, with negative findings. C.S.F. was reported as being normal. The headache and vertigo ceased after two weeks, but the vomiting persisted to such a degree as to give rise to anxiety regarding the patient's electrolyte balance. He was discharged from hospital on August 30, 1954, six weeks after admission, and complained of depression for the next week or two. He has remained quite well since this time.

There seems to be little doubt that this was a case of encephalitis complicating varicella.—I am, etc.,

London, N.W.6.

D. S. GOLDFOOT.

Chloramphenicol

SIR.—Yet another coroner's inquest (*Daily Telegraph*, May 14, 1955) recorded a death due to aplastic anaemia following treatment with chloramphenicol. At the beginning of its clinical use the drug was considered a potential bone marrow toxin on account of its structure incorporating a nitrobenzene ring. Early in 1950 there were reports that chloramphenicol was responsible for certain blood dyscrasias. A nation-wide survey in the U.S.A.¹ covering the period 1949 to July, 1952, brought to light 55 cases of blood dyscrasia in patients treated with chloramphenicol alone; of these 44 had aplastic anaemia, causing death in 23. A further 95 cases of blood dyscrasia received chloramphenicol in addition to some other drugs, bringing the total to 150. The authors of this survey point out that the dosage regimen appeared to have little or no bearing on the development of the blood complications. This is also borne out by the case history reported in June, 1954, to the Société Française d'Hématologie by S. Tara, describing a patient who died from aplastic anaemia after treatment with only 3 g. of chloramphenicol. In this country, in 1952, the *British Medical Journal*² drew attention to this very grave complication of chloramphenicol therapy. A few instances of fatal aplastic anaemia were published in the same year by Hawkins and Lederer³ and Wolman.⁴ In 1953 more cases were seen over here⁵ and abroad: Erslev⁶ published 2 cases and reviewed 40 cases with 27 deaths collected from the literature. Koster and Groen⁷ published one case of aplastic anaemia from which the patient died. A survey in Great Britain in 1954 by Hodgkinson⁸ dealt with 31 hospital cases of blood dyscrasia associated with chloramphenicol: 28 had aplastic anaemia, which proved fatal in no less than 24 at the time of publication of the report. More recently Johnston⁹ reported a case of chloramphenicol aplastic anaemia in a woman kept alive by transfusion of polycythaemic blood using sequestrene. I have seen last year a child who died from aplastic anaemia after prolonged treatment in a fever hospital with chloramphenicol for whooping-cough.

There is no doubt that chloramphenicol is not safe for use in routine antibiotic therapy. This antibiotic is the more dangerous because of its low threshold of toxicity and

Obituary

C. W. BUCKLEY, M.D., F.R.C.P.

Dr. C. W. Buckley, of Buxton, Derbyshire, died on May 28, aged 80. He was an outstanding authority on rheumatic disease and its treatment, and his reputation extended beyond this country. By his writings and teaching and his half-century of practice in Buxton itself he did much to encourage a scientific outlook in a field of medicine where empiricism has been particularly prominent. Buxton and the Devonshire Royal Hospital, where he was senior physician for many years, owed much to him and were not slow to acknowledge the debt. When he was made an honorary freeman of Buxton in 1947 a fellow alderman declared that no one had rendered greater service to the town.

Charles William Buckley was born on October 10, 1874. His family had been long connected with Derby, and he held the hereditary freedom of that city by lineal descent. The greater part of his life was spent in Derbyshire, but he came to London for his medical studies at St. Mary's Hospital, where he was an entrance scholar and Kerslake scholar in pathology and bacteriology. He graduated M.B. London in 1898, and proceeded M.D. in the following year. After being house-physician at St. Mary's he worked in the fever hospital service of the old Metropolitan Asylums Board. But the early years of this century found him established in his native county and building up a reputation in the new field of rheumatology. His association as physician to the Devonshire Royal Hospital at Buxton began in 1912, and in 1917 he became a member of the management committee.

In the first world war he attended the Canadian Red Cross Hospital at Buxton, and was made honorary major of the Royal Canadian Army Medical Corps. It was as a result of his work and initiative that a large sum of money was placed at the disposal of the University of Manchester for rheumatism research, in which the Devonshire Royal Hospital assisted. By this time he had become known far beyond Buxton, and in 1923 he was elected president of the Section of Balneology and Climatology of the Royal Society of Medicine. For many years he was also associated with the Buxton and District Hospital, and among other posts which he held were those of lecturer on arthritis and chronic rheumatism to the British Postgraduate Medical School, London, examiner in hydrology to the Chartered Society of Massage and Medical Gymnastics (now the Chartered Society of Physiotherapy), and membership of the Scientific Advisory Committee of the Empire Rheumatism Council, which he did much to encourage. He became a Member of the Royal College



[Navana Vandyk, London]

because when bone marrow depression occurs it is usually irreversible and resistant to treatment. As there are at present antibiotics as effective and certainly less dangerous to life than chloramphenicol, I think it would be wiser to discontinue the use of chloramphenicol altogether.—I am, etc.,

London, W.10.

A. I. SUCHETT-KAYE.

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Notification of Measles

SIR.—During the past month I have notified upwards of a hundred cases of measles. No doubt many other practitioners have had a similar experience. Has any useful purpose been achieved by the notification of this disease?—I am, etc.,

Feltham, Middx.

G. T. RUTHERFOORD.

POINTS FROM LETTERS

Speaking Up

Dr. W. F. BENSTED-SMITH (Newton Ferrers) writes: There is one basic and infallible rule for unaided speech—speak always to the back row. The rest will then hear quite well.

Redundant Circulars

Dr. R. A. F. JACK (Bromsgrove) writes: My young family have helped me to deal with the surfeit of advertisements that daily swell my morning post. The elder two, who by now have lost all interest in opening them, content themselves with collecting the stamps and bemoan the fact that so many envelopes these days are franked. They then pass them on to the younger two, who, armed with a pair of scissors each, cut out patterns or any interesting figures or illustrations that take their fancy. They preserve all blotters for me; and all large white envelopes that can be ungummed are put aside for subsequent painting practice or for conversion into paper darts. The result is that my wife and I get an extra quarter of an hour's peace each morning, so that in one way or another we all benefit from the unremitting onslaught of the various drug houses.

Epistaxis

Mr. JULIUS FINE (Johannesburg) writes: With reference to the discussion by Mr. C. Gill-Carey on epistaxis (*Journal*, March 12, p. 662) I believe that . . . in hypertensive cases, where control cannot be obtained, the blood pressure should be deliberately lowered by adequate medication, using hypotensives, instead of waiting for exsanguination and shock, to be followed by blood transfusion. General practitioners have not the facilities to manage the patients in this manner, but otologists still plug away at the old stereotyped routine to the extreme discomfort of the patient. I have yet to find a case of anterior epistaxis where short-wave cautery has failed after removal of the emergency nasal packing. The modern treatment should be a bold attack, using plugs as a first-aid emergency only and deliberately lowering the blood pressure with medication before the body lowers it by exsanguination.

Fluoridation of Public Water Supplies

Dr. EVA HILL (Ruakaka, New Zealand) writes: The subject of fluoridation of water supplies seems to be causing a considerable controversy throughout the world. The solution of the problem requires only the use of a little common sense and intellectual honesty. . . . Fluorine is not essential for the development of sound teeth. No two people are alike in their response to any drugs. The proposed mass-medication is a departure from ordinary common sense that is indefensible and absurd. The dosage, being tied to water consumption, is quite incalculable. The fact that few doctors or dentists prescribe fluoride for their families or patients should cast grave doubts on the proposal to force it on everyone. Fluorine can be administered economically in accurate doses to those who are convinced of its necessity. But no man has the right to force another to take a dangerous drug against his will.

of Physicians in 1923 and was elected a Fellow in 1933. A life member of the Heberden Society, he was also an original member of the Association of Physicians of Great Britain and Ireland.

To the British Medical Association, to which he was first elected in 1902, Buckley gave liberal service. He was chairman of the Buxton Division in 1934-5, and president of the Derbyshire Branch in the same year. At the Annual Meeting of the Association at Eastbourne in 1931 he was a vice-president of the Section of Hydrology and Climatology, and a vice-president of the Section of Physical Medicine at the Centenary Meeting in 1932. The Association committees on which he served included the Committee on the Causes and Treatment of Arthritis, set up in 1932; the Practitioners of Physical Medicine Group Committee, of which he was a member for 18 years; and spa treatment.

In 1938 Buckley published his well-known book, *Arthritis, Fibrositis, and Gout*, and he was the author of many articles in the specialist journals and in the *Encyclopaedia of Medical Practice* and the *Index of Treatment*. In 1939 a new quarterly journal, *Annals of the Rheumatic Diseases*, made its appearance under the aegis of the Scientific Advisory Committee of the Empire Rheumatism Council. Buckley, who had been largely responsible for the annual reports of the British Committee on Chronic Rheumatic Diseases, set up by the Royal College of Physicians of London in 1934, was the obvious choice as editor; and for fourteen years, until the end of 1953, he put his great experience and knowledge into that publication—since 1944 published by the British Medical Association—so that it became known as the leading rheumatological journal of the world. For many years he was a valued contributor to the *British Medical Journal*.

Buckley never failed to take his part as one of the chief citizens of Buxton. He became a member of the urban district council in 1906, and when Buxton became a borough in 1917 he was appointed chairman of the finance and general purposes committee, a position which he held for thirty or more years. In 1923 he became one of Buxton's first aldermen, and in 1924 mayor of the borough. He took a primary part in the public inquiry and in the negotiations which preceded the acquirement by the corporation of the famous pavilion gardens. Buckley was one of the most likeable of men, although he never sought popularity. There was something about his occasional speeches, whether at the Royal Society of Medicine in London or in the council chamber at Buxton, which held the attention. No one can ever have been bored by him. His quiet manner, the dignity of his words, the occasional half-cynical wit, and above all the breadth of vision were always impressive. He married Miss Lilian Hughes, of Manchester, and had one son, who died last year, and three daughters. In his retirement he went to live at Ashbourne, still in the same county, where he could pursue his chief recreation of fly-fishing, but he continued in consulting practice and visited the Buxton clinics until his last year of life.

We are indebted to Dr. W. S. C. COPEMAN for the following appreciation: Buckley's inquisitive and critical mind and scientific outlook worked against a wider background of general medicine than was usual amongst spa practitioners in his time. He felt strongly that the study of the rheumatic group of diseases was largely in their hands, but that it had become empirical and divorced from the main current of scientific medicine. At a period when such an approach

was difficult and unusual he undertook the systematic observation of these diseases as they presented themselves in his hospital and private practice in Buxton over a long period. He was thus instrumental in advancing our knowledge of certain of these diseases, more particularly ankylosing spondylitis. In this way he laid the foundation for the infant specialty of rheumatology as a branch of internal medicine. His election to the Fellowship of the Royal College of Physicians in 1933 was a signal mark of academic approbation of his work: such an award to a provincial physician in such circumstances was unusual at that time. Although the most modest of men, he continued to take active pride in this distinction all his life.

He was active also in projecting his views into the international field, mainly through the medium of the International Society of Medical Hydrology, and later the International League against Rheumatism, whose congresses he invariably attended. It was at the Rome congress in 1925 that I first met him discoursing characteristically to a small group of slightly puzzled Continental physicians on the influence of fly-fishing on the progress of British medicine—for he was a great fisherman, and firmly believed that this pursuit reconditioned the intellect as nothing else could. In spite of my very junior status he managed to have me elected as medical secretary of both bodies "to keep the trend of their activities," as he put it, "within the framework of general medicine and outside that of formal spa therapy."

Buckley was a quiet, kind, thoughtful man, with a sly sense of humour which some of his "victims" never discovered. About the time of the advent of the National Health Service he retired from the Devonshire Hospital and also from private practice; and it evidently grieved him that no appreciation of his great services to Buxton over a period of more than forty years was voiced by the new regional authority.

He was an original member of the committee of the Royal College of Physicians on chronic rheumatic diseases, which was formed in 1932 under the chairmanship of Sir Humphry Rolleston, and which four years later became the nucleus of the Empire Rheumatism Council; and he acted as editor of their "Reports," which later became the *Annals of the Rheumatic Diseases*. He resigned from this office only last year, when a special number was dedicated to him on his 80th birthday: the last time most of us saw him was at a dinner held at the Athenaeum at which Lord Horder presided, when a beautifully bound copy was presented to him. He will be much missed in many circles.

Dr. HUGH BARBER writes: C. W. Buckley made a reputation in Derbyshire in which he had no rival. He was accepted as the leading authority on "rheumatic" and allied disorders. His skill and experience were valued by the profession, and his kindly wisdom made him an excellent consultant. He was, moreover, a good general physician—of which there is proof, because more than twenty years after taking his M.D. he could satisfy the Censors of the Royal College of Physicians by passing the examination for Membership. A good committee man because he could pick out the essentials, he was a clear and concise speaker in a lecture or at a medical meeting, keeping to the point and making his meaning clear. In consultation he had the art of explaining things clearly to the patient and relatives. He was a student of medicine for more than sixty years, and in this way he kept in touch with younger colleagues when he had outlived so many of his contemporaries. Although he may have seen some of the old type of spa practice go rather out of fashion, he had sufficient work among the residents to compensate for this, and wide professional interests outside his own county which always kept him busy. He had recently been made an honorary member of the East Midland Society of Physicians, and I know he was sorry that he was not well enough to attend the last general meeting. The friendships he formed in such professional contacts were a real pleasure to him, and he will be missed by his friends and by a younger generation.

R. L. LANGDON-DOWN, M.B., M.R.C.P.

Although he had withdrawn from the central work of the British Medical Association for many years, Dr. R. L. Langdon-Down, whose death on May 29 we record with much regret, will be well remembered at Headquarters. For more than 30 years he devoted a large amount of his time to the work of the Association, retiring from active participation in 1935, when he was made a vice-president. He was in his 89th year.

Reginald Langdon Langdon-Down, who was born on August 4, 1866, was the eldest son of the late Dr. J. L. H. Langdon-Down, who founded the mental home at Teddington which his son was later to direct for many years. From Harrow School he went on to Trinity College, Cambridge, where he took his B.A. with a first-class in the Natural Sciences Tripos in 1888. He continued his clinical training at the London Hospital, and after graduating M.B., B.Chir. in 1892 he served as assistant demonstrator of anatomy and house-physician at his own teaching hospital.

In 1894 he took the M.R.C.P. and then went into private practice in the Richmond, Twickenham, and Teddington district, and in later years he also had a consulting practice in the West End. His particular bent was towards psychiatric work, especially work in mental deficiency. He became physician to the National Association for the Welfare of the Feeble-minded. When his father died in 1896 he and his brother, Percival Langdon-Down, carried on Normansfield, a home for mental defectives at Teddington. Percival died in 1925, and Reginald then took sole charge of the home until it was taken over by the National Health Service. Langdon-Down had a great gift of human sympathy. He was the kindest of men, and approached the unfortunate cases with which he was so largely occupied from a human as well as from a scientific point of view. Thus his article on "Idiocy" in *Quain's Dictionary of Medicine*, with its careful suggestions for treatment, is far more hopeful than many writings on the subject. His interest in children was by no means limited to the mentally deficient. He was occupied in all phases of child psychology and generally in the care and treatment of children. He was one of the honorary secretaries of the Section of Psychological Medicine at the Annual Meeting of the B.M.A. at Oxford in 1904 and a vice-president of the Section of Psychology at Toronto in 1906; and he represented the Association on the Child Guidance Council.

In his later years Langdon-Down was chiefly known in the Association for his work in medical ethics. He was a member of the Central Ethical Committee for a quarter of a century, and for some years was its chairman. But in his earlier career he was interested at every point in medico-political activities. When he was only 37 he had become chairman of his Division—the Richmond Division. Later he was chairman of South Middlesex Division. In 1904 he became a member of the council of the Metropolitan Counties Branch, and eventually became Branch president in 1914. He served his Division as representative at no fewer than 30 Annual Meetings. During the period 1903 (the first A.R.M.) to 1934 he was absent from the Annual Representative Meeting on only two occasions. When he became a member of the Central Council in 1917, retaining his seat until 1937, a long period of active work at the centre began. His service on the Ethical Committee was conspicuous for the patience and skill he exemplified in the very delicate matters which come

before that body. His co-operation was also sought in any Association work which had to do with his own subject of psychiatry. He was the leading spirit in the preparation and submission of evidence to the Royal Commission on Lunacy Law and Mental Disorder which sat under the chairmanship of Lord Macmillan in the late twenties. In 1926-9 he had the difficult task of presiding over a special committee set up by the Association to consider the question of psycho-analysis. At times during those long and seemingly irreconcilable discussions on a subject of acute controversy it seemed as if the committee must throw in its hand, and that it eventually produced a useful report was due above all else to the patience, dignity, and courtesy of its chairman and his capacity for understanding widely different points of view. Another subject on which he was able to speak with authority was the law relating to patents, and he took part in conferences on that subject in 1931 and 1932. For a time he was a member of the Finance and Journal Committees. Indeed, the full list of committees on which he served would be tedious to set out, but it meant the expenditure of great energy over a long period of years and in subjects which were often of a special character, calling for unusual knowledge and experience.

Though he lived an exceedingly busy professional life Langdon-Down had many outside interests. An enthusiastic painter in water-colours, he was also an authority on Oriental porcelain. He was at one time chairman of the governors of Hampton Grammar School and a governor of Epsom College.

Langdon-Down was twice married. His first wife died in 1917. Five years later he remarried, and his second wife died in 1942. He leaves two sons and two daughters, one of whom, Lady Brain, is the wife of Sir Russell Brain, the President of the Royal College of Physicians.

R. S. FREW, M.D., F.R.C.P.

A well-known specialist in diseases of children, Dr. Robert S. Frew, formerly physician to The Hospital for Sick Children, Great Ormond Street, and since his retirement consulting physician, died at his home at Chipping Campden in Gloucestershire on May 30.

Robert Skeoch Frew was born in Newfoundland on August 22, 1881, and was educated at St. John's. For his medical training he went to the University of Edinburgh, where he graduated M.B., Ch.B. in 1905. He also studied for some time at the University of Berlin. After serving as house-physician at the Royal Infirmary, Edinburgh, and for a brief period as assistant to the professor of pathology there, Dr. Frew came to London to The Great Ormond Street Hospital, where he was medical registrar, pathologist, and clinical assistant in the out-patient department. Later he was appointed physician to the hospital, and practised also as a consultant in paediatrics in Wimpole Street. He proceeded M.D. in 1910, and in 1911 became M.R.C.P. London. He was at one time assistant physician to the East London Hospital for Children, Shadwell, and from 1914 to 1928 he was physician to the children's department, King's College Hospital, Denmark Hill. Other hospital appointments which he held for many years were those of physician to Lord Mayor Treloar Orthopaedic Hospital at Alton in Hampshire and consulting physician for diseases of children to the Bromley Cottage Hospital. During the first world war he served as major in the R.A.M.C.

Dr. Frew was an individualist in paediatrics, holding views which were not always shared by the paediatricians of his time. These he expressed particularly in his book, published in 1936, entitled *Diseases in Childhood: A Clinical Study*. The book deals solely with diseases of infants, and describes a long series of cases which had come under his personal observation. He was also the author of many articles on paediatric subjects in the general and specialist journals. One of his earliest contributions, in which he collaborated with the late Sir Archibald Garrod, consulting physician to Great Ormond Street, was on glycosuria in tuberculous meningitis. He became a Fellow of the Royal College of Physicians of London in 1919.

He leaves a widow and a daughter.

J.A.C. writes: In the sudden and unexpected death of Dr. C. A. R. McCAY (whose obituary was published on May 28, p. 1347), Oxford lost one of its oldest and best-loved family doctors. Residing and practising for over thirty years in the Headington district, he had with his sympathy and kindness endeared himself to many thousands of past and present residents of the area. Apart from being their family doctor he was their guide, counsellor, and friend, and nothing was too much trouble where his patients were concerned. His quick sense of humour, his ready smile, and his quiet understanding and attention often turned gloom and despair into hope and determination. Setting himself a very high standard in medicine and keeping himself up to date with regular reading, he was a fine example and inspiration to his younger colleagues. Apart from medicine he was a man of wide interests, among which were shooting, fishing, golf, photography, and the collection of antiques. But first of all he was a family man, and to his widow and children we tender our deepest sympathy.

Medico-Legal

LEGAL LIABILITY IN THE N.H.S.

Until recently the judiciary both in Scotland and in England shared the view held in the medical profession that doctors should unquestionably accept full and sole responsibility in law for the treatment of patients in their care. The courts held that, since hospital doctors were not in any legal sense servants of the hospital authority, the hospital authority was not vicariously responsible for the professional actions of these doctors. But a series of modern judgments in the courts of appeal in England, and latterly in Scotland, shows that judicial opinion, and thus the law, has radically altered.

For instance, Lord President Cooper in *Hayward v. Board of Management for Royal Infirmary of Edinburgh* (1954) said that "the old Scottish decisions... are no longer applicable to a fundamentally different situation. Under the new Act and regulations the obligation on the State is in my view to treat the patient and not merely to make arrangements for his treatment by and at the sole responsibility of independent contractors." And Lord Justice Denning in *Razzel v. Snowball* (1954), the defendant being a part-time consultant orthopaedic surgeon, gave his opinion that "whatever may have been the position of a consultant in former times, nowadays, since the National Health Service Act, 1946, the term 'consultant' does not denote a particular relationship between a doctor and a hospital.... Whether he is called specialist or consultant makes no difference. He, like the rest of the staff, is merely carrying out the duties of the Minister."

Hospital Doctors

The Central Consultants and Specialists Committee (Scotland) has circulated a memorandum for consideration by

hospital doctors, general practitioners, and local authority medical officers in Scotland, calling attention to the present position.

The memorandum says that there is no reasonable doubt that the N.H.S. Acts, whatever their intention, have established a State hospital service in which the participating doctors are in law State servants. The whole profession should recognize a situation which raises issues of the utmost importance, particularly as doctors agreed to enter into contract with the new hospital boards principally on the assurance that there would be no significant change in their relationships with hospital authorities.

The committee does not think that hospital boards would wish deliberately to interfere with clinical discretion, but that they will be compelled to lay down rules or procedure for certain categories of medical staff in order to safeguard public funds. In support of this belief it mentions a recent action in which the court assigned the whole liability for damages to the hospital authority because it had allowed a junior medical officer to give a particular anaesthetic with unfortunate results. Apart from its intangible effect on the teaching and practice of hospital medicine, the Committee says that such a development could seriously hamper everyday hospital work, and that it could not be assumed that such a process once started could be limited.

The effect of the new relationships has already become apparent in the confidential handling of medical records. Hospital authorities require medical records and reports for legal purposes to be submitted to their own solicitor before passing them on. The Department of Health, in response to inquiry, adduces as the reason for this the responsibility of the Secretary of State and his agents, the hospital boards, "for treating patients."

Doctors Outside Hospitals

So far, the memorandum continues, the effects of these judicial interpretations of the N.H.S. Acts have been confined to the hospital field, but it would be logical to extend the doctrine of State responsibility to include treatment of patients under the Acts outside hospitals. It is doubtful if general practitioners' contracts with executive councils—"for services," not "of service"—would be sufficient to prevent it. If this happened all doctors in the N.H.S. would be servants either of the central Government or of local authorities.

Necessary Action

The Central Consultants and Specialists Committee (Scotland) has invited the Joint Consultants Committee (Scotland) to take steps to secure re-establishment in law of the previous relationship of hospital doctors to the management of the hospitals in which they work. The latter committee has received certain advice on the steps which they should take. Broadly, these will involve seeking the agreement of the United Kingdom Joint Consultants Committee to a common approach to the Government urging the necessary legislative action. Since it would be necessary for Parliament to be satisfied that any change did not infringe or diminish a patient's legal right to damages when negligence is proved, it is considered probable that governmental agreement to this action would be conditional on the profession accepting an arrangement under which membership of a medical protection society (or equivalent insurance) was a condition of employment of medical staffs in N.H.S. hospitals. The element of compulsion in such a condition is fully recognized, but the consensus of opinion of both committees is that acceptance of it is justifiable in view of the risk of much more important infringement of professional freedom if nothing is done.

To ensure that the Scottish Joint Committee knows the feeling of the profession in Scotland, meetings of hospital doctors, general practitioners, and local authority medical officers will be asked to report the numbers in favour of and against action being taken on the lines indicated in the memorandum.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending May 21 (No. 20) and corresponding week 1954.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1955					1954				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	17	2	1	0		22	0	4	0	0
Dysentery ..	1,232	60	314	11	2	1,104	144	324	6	4
Encephalitis, acute ..	1	0		0		5	1	0	0	0
Enteric fever: Typhoid ..	3	0	0	0	1	3	0	0	0	0
Paratyphoid ..	7	1	2	0		4	0	2	0	0
Food-poisoning ..	150	21		6		195	20		0	
Infective enteritis or diarrhoea under 2 years ..				9	13				16	15
Measles* ..	23,655	962	160	242	285	1,940	61	187	124	329
Meningococcal infection ..	27	3	7	0		27	1	10	1	3
Ophthalmia neonatorum ..	31	1	6	0		37	3	7	0	
Pneumonia† ..	377	19	127	10	4	520	32	180	8	4
Poliomyelitis, acute: Paralytic ..	16	3		6	0	17	0		4	2
Non-paralytic ..	3	1				9	0			
Puerperal fever‡ ..	209	37	10	1		208	27	14	2	
Scarlet fever ..	620	43	65	37	25	832	42	115	41	32
Tuberculosis: Respiratory ..	812	96	153	26		933	114	155	35	
Non-respiratory ..	112	9	18	11		150	14	33	4	
Whooping-cough ..	1,613	91	114	56	28	2,419	104	352	29	25

DEATHS in Great Towns	1955					1954				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute ..		0			0		0			0
Enteric fever ..	0	0	0	0		0	0	0	0	0
Infective enteritis or diarrhoea under 2 years ..	6	0	1	0	0	9	0	1	0	1
Influenza ..	8	0	0	1	1	16	3	0	0	1
Measles ..		1	0	0	1			0	0	0
Meningococcal infection ..		1	0				0	0		
Pneumonia ..	177	16	19	15	7	179	21	17	13	4
Poliomyelitis, acute ..	0	0			0	0	0			
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory ..	60	6	13	0	7	83	13	12	2	7
Non-respiratory ..		0	1	0	6		0	1	0	
Whooping-cough ..	1	1	0	0	0	1	0	0	0	0
Deaths 0-1 year ..	219	24	20	6	17	223	28	29	9	13
Deaths (excluding stillbirths) ..	4,955	674	572	113	174	4,734	653	591	123	155
LIVE BIRTHS ..	7,532	1092	937	215	412	8,243	1290	954	202	427
STILLBIRTHS ..	179	22	20			200	28	31		

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

Vital Statistics

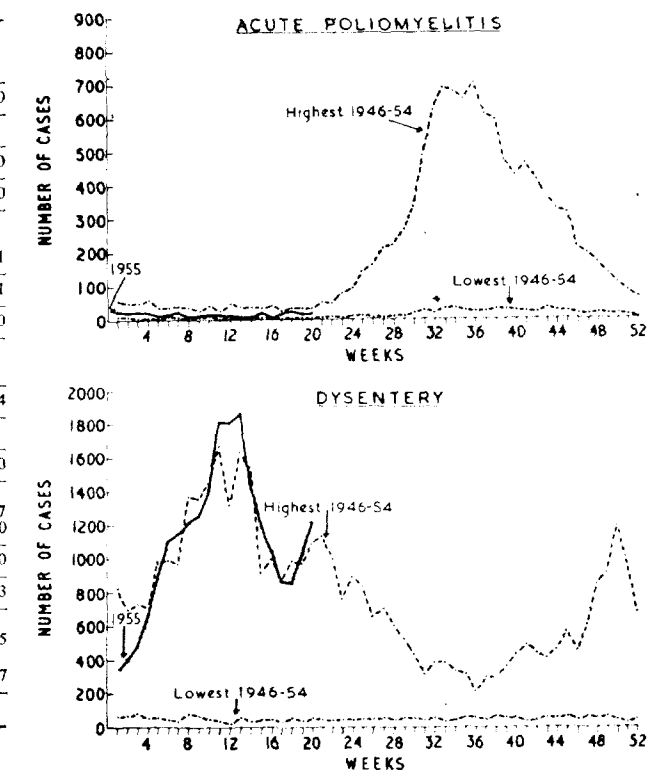
Infectious Diseases

The largest variations in the number of notifications of infectious diseases in England and Wales during the week ending May 21 were increases of 3,271 for measles, from 20,384 to 23,655, 194 for dysentery, from 1,038 to 1,232, and 49 for scarlet fever, from 571 to 620, and decreases of 192 for whooping-cough, from 1,805 to 1,613, and 64 for acute pneumonia, from 441 to 377.

The largest increases in the incidence of measles were 402 in Middlesex, from 1,314 to 1,716, 332 in Southampton county, from 948 to 1,280, 331 in Kent, from 856 to 1,187, 322 in Yorkshire West Riding, from 1,867 to 2,189, and 281 in Gloucestershire, from 585 to 866; the only large exceptions to the general rise in incidence were decreases of 101 in London, from 1,063 to 962, and 94 in Staffordshire, from 1,055 to 961. The only local variation of any size in the returns of scarlet fever was a rise of 26 in Lancashire, from 74 to 100. The largest fluctuations in the trends of whooping-cough were rises of 36 in Lancashire, from 164 to 200, and 35 in Lincolnshire, from 40 to 75, and falls of 73 in Yorkshire West Riding, from 149 to 76, and 30 in Warwickshire, from 123 to 93. 17 cases of diphtheria were notified, being 8 more than in the preceding week and the largest total for 9 weeks. The chief centres of diphtheria were Liverpool C.B. 5 and Birmingham C.B. 3. The largest returns for acute poliomyelitis were London 4, Somersetshire 2, and Essex 2 (Walthamstow M.B. 2).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1946-54 are shown thus -----, the figures for 1955 thus ———. Except for the curves showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Medical News

Live Virus Reported in Cutter Vaccine.—According to the *Daily Telegraph's* New York correspondent, Professor L. P. GEBHARDT, professor of bacteriology at Utah University, has announced the recovery of live poliomyelitis virus from samples of Salk vaccine made by the Cutter Laboratories and used in the State of Idaho. Apparently only one of the three virus strains contained in the vaccine, Type I, was recovered in Professor Gebhardt's tests on monkeys. The Cutter Laboratories were one of the six firms originally supplying Salk vaccine for the mass poliomyelitis inoculations in the United States, and it was their product that was first withdrawn when cases of paralytic poliomyelitis occurred after vaccination (see *British Medical Journal*, May 7, p. 1166). The *Daily Telegraph's* correspondent also reports that court permission has been given to the parents of a child who developed poliomyelitis after vaccination to file a claim against the Cutter Laboratories. The amount claimed is stated to be £35,800.

Eighth World Health Assembly.—W.H.O.'s working budget for 1956 is to be \$10,203,000. This includes \$9,612,000 recommended by the Director-General, Dr. M. G. CANDAU, to finance W.H.O.'s activities, \$309,484 intended for the provision of supplies and equipment to the health services of countries participating in malaria eradication campaigns, and \$42,000 to launch W.H.O.'s work on the peaceful uses of atomic energy and the protection of populations against the effects of atomic radiation. A world-wide fund for the eradication of malaria is also to be set up. It will be devoted to the provision of supplies, equipment, and services to those governments whose needs cannot be met through W.H.O.'s regular and technical assistance budgets. Sudan was unanimously accepted as an associate member of W.H.O. This brings the total membership to 85, including four associate members.

Presentation to Children's Hospital of Philadelphia.—As part of the centenary celebrations at the Children's Hospital of Philadelphia, U.S.A., Professor A. A. MONCRIEFF, acting as the delegate and spokesman of the Hospital for Sick Children, Great Ormond Street, and other British paediatric hospitals, presented the American hospital with a block and gavel made from the wood of a plane tree from the garden of the Great Ormond Street hospital.

Faculty of Anaesthetists.—At a meeting of the Board of the Faculty of Anaesthetists on June 1 at the Royal College of Surgeons of England, Dr. FRANKIS T. EVANS (St. Bartholomew's Hospital) was elected dean and Dr. R. F. WOOLMER (Royal Infirmary, Bristol) was re-elected vice-dean for the ensuing year.

COMING EVENTS

Maternal and Child Welfare.—Annual conference of the National Association for Maternal and Child Welfare on June 22-24, at Church House, Westminster. Opening by Minister of Health. Particulars from the Secretary, N.A.M.C.W., Tavistock House North, Tavistock Square, London, W.C.1.

West London Medico-Chirurgical Society.—Annual banquet on June 23 at the Royal College of Surgeons.

Cambridge Graduates' Medical Club.—Annual general meeting and dinner at Jesus College on June 24. Details from Dr. T. B. ANDERSON, 1, Huntingdon Road, Cambridge.

G.P. Refresher Course at Bristol.—There are still vacancies in the course from July 11 to 16. Applications to Dr. A. H. GALE, director of medical postgraduate studies, the University, Clifton, Bristol, 8.

SOCIETIES AND LECTURES

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

Saturday, June 11

NORTH-EAST METROPOLITAN REGIONAL TUBERCULOSIS SOCIETY.—At Rochford General Hospital, 12 noon, Dr. E. G. Sita Lumsden: Pulmonary Tuberculosis and Diabetes Mellitus; 2.30 p.m., Dr. R. J. Powell: Ototoxic Effects of Streptomycin and Dihydrostreptomycin; 3 p.m., Mr. D. S. M. Barlow: Constrictive Pericarditis.

Tuesday, June 14

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Serology and Laboratory Diagnosis of Syphilis.
●INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—12 noon, Dr. W. G. Oakley: Diabetes and Pregnancy.
●MIDDLESEX HOSPITAL.—4.30 p.m., Sanderson-Wells Lecture by Professor R. A. McCance, F.R.S.: Old Thoughts and New Work on Breads White and Brown.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor W. J. Atkinson: Early Management of Head Injuries.

Wednesday, June 15

●HYPNOTHERAPY GROUP.—At Royal Society of Medicine, 8 p.m., Dr. H. J. Shorvon: Use of Drugs in the Induction of the Hypnotic State.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Cutaneous Manifestations of Syphilis.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. G. Simon: Some Pitfalls in Chest Radiology.
●INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—4.30 p.m., Mr. A. Good-will: Wertheim's Hysterectomy.
ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—7.30 p.m., annual general meeting. Address by Sir William MacArthur: An Account of Some of Sir David Bruce's Researches, Based on his own Manuscript Notes.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. P. H. Tooley: Lecture-demonstration in psychiatry.

Thursday, June 16

INSTITUTE OF CARDIOLOGY.—11 a.m., Dr. Lewis Dexter (Boston): Selection of Cases for Cardiac Surgery.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Basal Cell Epithelioma.
INSTITUTE OF DISEASES OF THE CHEST.—5.30 p.m., Dr. P. V. Benjamin: Programmes for Tuberculosis Control in India.
LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of London, 8.30 p.m., annual general meeting and short papers by general practitioners.
OSLER CLUB OF LONDON.—At University College, W.C.1, 8 p.m., joint meeting with University College Medical Society in honour of Stephen Papet (July 17, 1855-1926). Professor G. P. Crowden, D.Sc.: Some Pioneers in Experimental Physiology; Dr. J. H. Baron: The Brown Dog of University College.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. I. C. Gilliland: Exophthalmos.
ROYAL SOCIETY.—4.30 p.m., Croonian Lecture by Professor C. H. Best, F.R.S. (Toronto): Dietary Factors in the Protection of the Liver, Kidneys, Heart, and Other Organs in Experimental Animals—The Lipotropic Agent.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., postgraduate demonstration in neurology.

Friday, June 17

INSTITUTE OF CARDIOLOGY.—At Barnes Hall, Royal Society of Medicine, 5 p.m., St. Cyres Lecture by Dr. Lewis Dexter (Boston, U.S.A.): Atrial Septal Defect.
●INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. A. D. Porter: Light Sensitivity.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Dr. J. G. Scadding.
INSTITUTE OF LARYNGOLOGY AND OTOLGY.—3.30 p.m., Mr. W. D. Doey: Sinusitis and Chest Disease.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. A. C. Thackray: Mucous Gland Tumours.

Saturday, June 18

BIOCHEMICAL SOCIETY.—At Department of Biochemistry, Oxford University, 11 a.m., 341st meeting. Scientific papers.
SOUTH-EAST METROPOLITAN REGIONAL TUBERCULOSIS SOCIETY.—At Benenden Sanatorium, 10.30 for 11 a.m., address by Professor H. Trimble (California), followed by a clinical demonstration by Dr. A. L. R. Mayer and his staff: Carcinoma of the Lung as a Differential Diagnosis of Pulmonary Tuberculosis.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Barnes.—On May 30, 1955, at St. Helen's Hospital, Barnsley, Yorks, to Mary, wife of Roy Barnes, M.R.C.S., L.R.C.P., D.P.H., a daughter—Cyrena.
Beveridge.—On June 2, 1955, at Haywood Maternity Hospital, Stoke-on-Trent, to Cynthia, wife of Dr. T. S. Beveridge, a son—Anthony Michael Day.—On May 21, 1955, to Micky, wife of Michael H. Day, M.B., B.S., a son—Jeremy Paul.
Goodson.—On June 2, 1955, at Tacoma, Washington, U.S.A., to Leonora (formerly Taylor), and Michael P. Goodson, M.D., a daughter—Sarah.
McCallum.—On June 4, 1955, to Dr. and Mrs. D. I. McCallum (Dr. Isabel S. Smellie), of 27, Magdala Road, Mapperley Park, Nottingham, a daughter.
Sers.—On May 12, 1955, in Antigonish, Nova Scotia, to Dr. Phyllis Mary (formerly Neil), wife of Dr. Roif Sers, a sister for Robert—Larissa Anne.

DEATHS

Fothergill.—On May 6, 1955, at "Hensol," Chorley Wood, Herts, Claud Francis Fothergill, M.B., B.Ch., aged 77.
Vallance.—On April 21, 1955, at Woodend Hospital, Aberdeen, James Vallance, M.C., M.B., Ch.B., of Flebister, Sanday, Orkney.
Vaughan.—On April 28, 1955, at Shrubland, Norwich Road, Wymondham, Norfolk, Arthur Llewellyn Vaughan, M.R.C.S., L.R.C.P., late of Diss, Norfolk, and Great Yeldham, Essex, aged 81.

Any Questions?

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

How Early can Mongolism be Diagnosed?

Q.—I shall be grateful if you would let me know what is the earliest age at which a child can be diagnosed as suffering from mongolism, and whether the condition can be diagnosed radiologically before the child is born.

A.—Mongolism can be diagnosed at birth, although it is by no means always possible to be sure of the diagnosis during the first days or even weeks of life. Except in the most typical instances, therefore, it is wise to suspend judgment until it has been possible to assess all the signs most carefully. Mongolism is essentially a condition in which mental deficiency is associated with a number of other congenital abnormalities, which commonly occur together in mongolism but any of which may be found in the normal. It is thus easy to be mistaken if a normal child shows some of the features of mongolism, especially in the first days of life.

The shape of the skull is very constantly abnormal in mongolism, and it is possible that the flattened occiput could be recognized radiologically before birth. On the other hand, this flattening of the occiput may be seen in the normal and be absent in the mongol. An observation that a child's skull *in utero* was an abnormal shape might legitimately arouse some suspicion of mongolism, but no more than that.

Clothing for Children in Hot Climates

Q.—In this relatively hot climate I advise mothers to dress their children in one layer of clothes only, preferably of "cellular" weave, so as to protect the child from the sun while at the same time allowing free circulation of air and evaporation of sweat. I condemn tight vests or layers of clothing of any form, especially during the rains, as this would lead to the formation of a moisture-soaked airlock between the garments and discourage the action of the skin. Is this advice sound?

A.—The only clothing required by a resting child when the ambient temperature is above 84° F. (28.9° C.) and he is sheltered from the wind is that dictated by decency; for an active child the limit will be lower. At temperatures below this, or when there is a breeze blowing on the body, first the skin and then later the whole body cools; hence the importance of seeing children are properly covered at night. Garments in a cellular weave when worn on the outside or as the sole garment are not demonstrably cooler, in experiments, than are other types, provided the cloth is no thicker; in general the thermal insulation of any cloth, of whatever weave, is proportional to its thickness, and cellular material, because of the way it is woven, is often thicker than other cloth of the same weight. For cellular material to be really cool when worn as an outer garment or in contact, through, for example, unzipped vents in a wind-breaker, with the outside air, the cells must be large in diameter, as in the Norwegian *brinje* garments.

The "moisture-soaked airlock" between two layers of clothing is only a reality when the outer layer is waterproof, or at least water-repellent; but if there is a lot of sweating and not much evaporation the fewer layers the better, and the advice your questioner gives to mothers is therefore good. He is also right to condemn tight vests; loose-fitting clothes are preferable, because there is then better pumping action between the clothes and the skin, giving more flow of air over the skin. Protection from the sun is certainly necessary; first, to avoid upsetting the heat balance—solar

radiation on the body can impose a heat load equal to the metabolic heat load of walking; and, second, to avoid sunburn. Your questioner might be interested in the dictum reputed to have been pronounced by the late Sir Charles Martin: "The rational dress for the Tropics consists of a sunshade and a pair of sandals only."

Chrome Ulceration

Q.—What is the latest treatment for chrome ulceration on the skin and eyes?

A.—It is assumed that appropriate preventive measures have been applied in the process concerned, and that personal protective measures are observed. Chrome ulceration can be prevented by covering any skin abrasion immediately with a waterproof dressing so that dust, mist, or solutions of chrome compounds cannot come in contact with damaged skin. No specific treatment is known for the ulcers, which heal slowly. The lesions should be inspected daily and care taken to avoid secondary infection.

The safest and most effective first-aid treatment following contamination of the eyes is adequate washing of the eyes with water. This should be started immediately and continued for at least twenty minutes. Except for the relief of pain, if necessary, by the insertion of homatropine and cocaine drops, or cocaine lamellae, no further treatment should be given until expert ophthalmological advice has been obtained.

Stewed Fruit and the Diet in Rheumatism

Q.—Are stewed fruits, cooked with sugar, unsuitable for "rheumatic" subjects, and, if so, why?

A.—There is no evidence to suggest that stewed fruits cooked with or without sugar are unsuitable for "rheumatic" subjects.

Dietary restrictions are generally not required in rheumatic disease, but obese patients may be encouraged to lose weight through a restricted calorie intake, since in this way damaged joints can be relieved of an unnecessary load.

Racial Differences in Runners

Q.—(1) A friend who is keenly interested in athletics tells me that he has heard it said that a narrow pelvis is an advantage to a sprinter. Is there any mechanical reason why this should be so? I should also like to know whether anthropomorphic surveys have shown a tendency for the pelvis in the black races to be narrower than in white races, which might account for the greater number of record-breaking sprinters found among the blacks. (2) I have also been told that exceptionally slow heart action is advantageous to the long-distance runner and that this is commoner among the inhabitants of cold climates, and hence the success of many Scandinavians in long-distance contests.

A.—It is incorrect to say that any single skeletal factor is advantageous to sprinters. The pelvic shape and size may be significant, but so also is the angle between the neck and shaft of the femur, the obliquity and length of the femora, and many other morphological factors. In surveys of the relationship between bicristal measurements and mean annual temperature Roberts' has shown that there is a tendency for the pelvis in black races to be narrower than in white races:

Bicristal Figures (as Percentage of Stature)

French, 16.9, 16.8; Norman, 16.4; West African, 15.1, 14.5, 15.2, 14.9; Central African, 14.5, 14.2, 15.6.

It is interesting that the growth rate of first-generation European children living in tropical climates falls approximately midway between that of indigenous European and indigenous African children. This suggests that environmental factors are in part responsible for observed "racial" differences in functional and anatomical measures.

(2) Inhabitants of cold climates do exhibit slower pulse rates than those of hot climates,² but the differences are only evident under basal conditions :

Relationship Between Basal Pulse Rate and Mean Annual Temperature

Cold Climates.—N. American Indians, 53 per minute; Mukden (Manchuria), 53 per minute; Miao (China, high altitude), 55 per minute; Peking, 61 per minute.

Hot Climates.—Javanese, 67 per minute; Hong Kong, 64 per minute; Bengal, 67 per minute; Australia (aborigines), 65 per minute.

An athlete is not a good long-distance runner simply because he has an exceptionally slow heart action. More often the converse is true, the slow heart rate being the result of prolonged athletic training. Athletic bradycardia is not confined to runners, but is frequently found in persons subjected to almost any form of strenuous physical conditioning, and is particularly marked in marathon runners and weight-lifters.³ Quantitative differences in training, and age differences, also play a part in the retardation of pulse frequency. Long-distance and marathon runners are usually older men with greater athletic experience than sprinters and middle-distance runners.⁴

It is unlikely that the success of Scandinavians in long-distance contests can be explained by "racial" bradycardia, and it is doubtful whether the heart action of Scandinavian runners is any slower than that of well-trained runners of any race. A more likely explanation is that a bigger proportion of Scandinavians train specifically for the long-distance events, and have consequently evolved training techniques superior to those of their rivals in countries where long-distance running is less popular. The importance to athletic achievement of improved training techniques and psychological factors has recently been stressed in this *Journal*,^{5,6} and must not be overlooked when trying to assess the value of natural anatomical and physiological advantages.

REFERENCES

- ¹ Roberts, D. F., "The Geographical Distribution of the Physical Characters of Man," Thesis in the Bodleian Library, Oxford, 1953.
- ² — *Actes du IV^e Congrès International des Sciences Anthropologiques et Ethnologiques*, 1952, 1, 145.
- ³ MacQueen, I. J., unpublished data.
- ⁴ Cotton, F. S., *J. Physiol.*, 1932, 76, 39.
- ⁵ MacQueen, I. J., *British Medical Journal*, 1954, 2, 1193.
- ⁶ *Ibid.*, 1954, 1, 1143.

Inheritance of Marble Bone Disease

Q.—*The only child by the second marriage of a patient of mine has just died at 4½ months from Albers-Schönberg's marble bone disease. There is a normal child by the first marriage. How shall I advise my patient on the possibility of future children by the present marriage being affected?*

A.—The severe form of marble bone disease (usually causing death in childhood from anaemia or infection) is very probably due to a recessive gene. Milder forms, in many instances at least, are due to a dominant gene. Accordingly, if the parents are normal and the child was severely affected, as her death at 4½ months suggests, the advice to give the mother is that the risk of any future child of this marriage being affected is 1 in 4.

Possible Benefits of Removing Nicotine from Tobacco

Q.—(1) *In what form is nicotine present in tobacco? Is it possible to remove the nicotine without altering the tobacco's flavour for smoking?* (2) *What are the medical benefits of so doing?*

A.—(1) Nicotine is present in fresh tobacco leaf together with the minor alkaloids as soluble salts in the leaf sap, especially in the cell vacuoles. During curing and fermentation most of the nicotine is lost, passing into a mixture of pyridine compounds largely unidentified. Tobacco leaf from which nicotine has been removed can still be smoked with satisfaction by some people but not by others. The heavier smokers miss the nicotine.

(2) The factor in tobacco which is responsible for some cases of lung cancer and coronary thrombosis has not yet

been established. It is unlikely that nicotine has anything to do with the production of the first of these diseases, but it may well be a responsible factor in the second. If this is so, one could hope for an improved prognosis in some cases of angina pectoris and coronary thrombosis if it were possible to provide cigarettes which contained no nicotine. Removal of nicotine would, of course, eliminate the rare danger of amblyopia.

Hazards of Thorium X

Q.—*Is there any risk in the frequent and long-continued use of thorium X varnish or ointment?*

A.—Preparations of thorium X produce very superficial reactions in the skin, when applied to its surface, by the action of the alpha particles. Theoretically these are almost entirely obstructed by the thinnest of tissue paper and one would not expect any permanent damage to the epidermis, or especially the dermis. However, traces of beta and gamma rays have been observed in the dermis and it is evident that some of the radioactive material penetrates via the sweat and sebaceous glands. Sufficient time has elapsed since the introduction of this method of treatment to justify the dogmatic statement that the risk to a patient is negligible if not more than 20 applications of thorium X in a strength not exceeding 2,000 electrostatic units per ml. or gramme are applied at monthly intervals. In some clinics many more treatments have been given when the patient accepts the risk, and so far evidence of permanent damage to the skin is rarely found. As a guide in practice one might state that unless encouraging progress has been obtained at the end of 20 paintings at monthly intervals there is little further to be expected from this treatment.

NOTES AND COMMENTS

Nausea after Morphine.—Dr. P. W. NATHAN (London, W.C.1) writes: In answering a question on the best way of dealing with nausea and vomiting following the administration of morphine ("Any Questions?" May 7, p. 1169) your expert referred to an article¹ by myself. Since I wrote that article, chlorpromazine has become available. My experience in using this drug has been limited, but it is consistent. It is clear that this drug is most useful in stopping nausea and vomiting caused by many analgesics. I have found that 25 mg. twice daily is usually enough for this purpose; I have never had to give more than 25 mg. three times a day. This drug is said to potentiate the action of analgesics, and thus there is another advantage in using it. I hope that this information will be useful to any doctors who look after dying patients with severe pain.

REFERENCE

- ¹ *British Medical Journal*, 1952, 2, 903.

Correction.—In the article on the "Treatment of Severe Asthma," by Dr. Margaret Macpherson (May 21, p. 1269), the dose of A.C.T.H. and cortisone during the first 24 hours of treatment should have been stated as 100 mg. (not 100 g. as printed).

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EFFECTS OF DIETARY PROTEIN, LIPOTROPIC FACTORS, AND RE-ALIMENTATION ON TOTAL HEPATIC LIPIDS AND THEIR DISTRIBUTION

BY

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AND

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[WITH SPECIAL PLATE]

Interest in the distribution of fat within the liver lobule has been stimulated by the observation that in the widespread disease kwashiorkor the stainable fat is found predominantly in the periportal regions. This subject has recently been reviewed by Brock (1954). It is, of course, a long step from the distribution of fat in the liver of the human infant to that seen in the rat, even when an attempt is made to utilize diets similar to those that produce the characteristic lesions in the human liver. The initial distribution of fat under standardized experimental conditions may not be the same as that which is seen at a later stage. Our lack of knowledge of the anatomy and physiology of the liver lobule prevents us from explaining the mechanisms which determine the localization of fat even when this is sharply defined and consistently reproducible. However, experimental work is steadily revealing new facts that are contributing to the solution of these problems.

In choline deficiency in the rat the first appearance of stainable fat is in the area around the central veins (Lillie, Ashburn, Sebrell, Daft, and Lowry, 1942; Glynn, Himsworth, and Lindan, 1948; Hartroft, 1950). In fasted rats given anterior pituitary extract the initial distribution of the fat is definitely periportal (Best, Hartroft, and Sellers, 1952). Some years ago Dible reported that in rats and rabbits during starvation the distribution of fat is sometimes mainly periportal (Dible, 1932; Dible and Libman, 1934). Shils and Stewart (1954a) have drawn attention to the periportal distribution of fat in the livers of rats fed corn-meal diets and remarked upon the similarity of the lesion to that described by many clinicians in children suffering from kwashiorkor. A similar distribution has been noted in rats consuming other plant materials, such as rice, cassava, and wheat flour (Shils, Friedland, and Stewart, 1954).

Several reports of fatty livers not responding to the usual supplements of choline or its precursors have appeared recently (Wang, Hegsted, Lapi, Zamcheck, and Black, 1949; Litwack, Hankes, and Elvehjem, 1952;

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Sauberlich, 1953; Singal, Hazan, Sydenstricker, and Littlejohn, 1953; Harper, Monson, Benton, and Elvehjem, 1953; Harper, Monson, Benton, Winje, and Elvehjem, 1954; Winje, Harper, Benton, Boldt, and Elvehjem, 1954). The basal diets fed to the rats in which this condition has been encountered have usually been low in protein. Under these conditions choline has often failed to maintain the liver fat within the normal range, although it has generally prevented any great increase in total liver lipids.

We wish to report some effects of varying the nature and amount of protein in the diet on the total lipids and distribution of stainable fat in the livers of rats and on the lipotropic effect of choline in these diets. Histological studies suggest that the abnormal lipid whose accumulation is not prevented by choline has a different distribution from that seen when the deficiency involves choline or its precursors. It was also noted, during a study of the accumulation and removal of stainable fat in periportal regions, that re-alimentation after diminished food intake due to dietary (protein) deficiency resulted in a transitory fatty liver, the demonstrable fat being exclusively periportal in distribution.

Methods

Five separate experiments will be reported involving some 300 albino (Wistar) rats. The animals were kept in individual cages with a false bottom of coarse wire screen. Fresh food and water were supplied each day; food intake was recorded daily and rats were weighed weekly. Unless otherwise stated, the animals were fed the diets *ad libitum* for three weeks and were then killed by stunning and exsanguination. Livers were removed at once and weighed. Portions were taken for histological examination, and the remainder of the tissue was analysed for total lipids (extraction with hot alcohol, rectification of the lipid residue with a mixture of petroleum ether and chloroform 3:1 v/v). The percentage composition of the basal diets fed in each experiment is shown in Table I. It should be noted that in these studies vitamin B₁₂ (300 µg. per 100 g.) was added to the vitamin mixture described by Ridout, Lucas, Patterson, and Best (1954), thus providing 3 µg. per 100 g. of ration. Basal diets are identified by the numerical suffix -0 (Tables I, II, III, and IV).

Histological Examination

The distribution of demonstrable fat in the livers was studied in frozen sections (5 μ) of formalin-fixed tissues using Wilson's trichrome-oil red O technique. Paraffin sections (5 μ) of Bouin-fixed tissues were stained with haematoxylin and eosin.

The sections were examined under a code number by one of us (W. S. H.). The amount of demonstrable lipid was graded from 0 to +++++ (Special Plate, Figs. 1 to 8). Although in Tables II, III, and IV the distribution of the lipid is recorded merely as periportal or centrolobular, the degree of localization varied considerably. The term "periportal" was applied not only when the fat-containing cells were restricted to regions immediately surrounding the portal vein and hepatic artery alone, but also when this distribution extended much farther towards the central vein but did not envelop it. In almost all cases, however, the lobular distribution of the lipid was remarkably clear and well defined, as shown in the figures. Often there was evidence of increased glycogen deposition, especially in the periportal regions (cf. Ramalingaswami, Sriramachari, and Patwardhan, 1954).

Dietary Conditions

In *Experiment I* the lipotropic effect of choline was compared in diets containing different amounts of protein (casein). In these diets (Ia, Ib, Ic, and Id, Table I) the total methionine was kept constant at 0.54% by adding sufficient supplementary DL-methionine. This amount of methionine is equal to that present in the last diet, which contains 18% casein. Groups of six male rats (weighing 70 to 90 g.) were fed these basal diets supplemented with choline chloride as shown in Table II.

In *Experiment II* the rats were fed an animal protein (fibrin), a vegetable protein (soya bean), and mixtures of the two (Table I). Again, in this experiment enough DL-methionine was added to all diets (except IIe) to bring the total to 0.54%. Groups of eight male rats (65 to 80 g.) were fed these basal diets supplemented with choline chloride as shown in Table II.

Experiment III permits comparison of the effect on the distribution of stainable fat in the livers of feeding a low-protein diet (3% casein) without supplementary methionine (Diet IIIa) and with supplementary methionine (Diet Ia). A similar comparison was made in high-protein diets containing less than half as much methionine (250 mg.) as does 18% casein (Diets IIb and Id respectively). Groups of ten female rats (65 to 90 g.) were fed the basal diets IIIa-0 and IIIb-0 (Table I), alone or supplemented with choline chloride (0.5%), as shown in Table III. Four groups were fed *ad libitum*; rats of the fifth group (IIIb-0 p.f.) were fed the same average amounts of food each day as were consumed by those in Group IIIa-0.

In *Experiment IV* the effect was studied of prolonged consumption of a diet very low in vegetable protein (soya protein 2% plus peanut protein 1%). This ration (IVa-0, Table I), which contains only 32 mg. methionine per 100 g. of mixture, was variously supplemented with choline chloride (0, 0.36%, and 1%, Table III) and fed *ad libitum* for 85 days to male rats (180 to 200 g.).

Experiment V was planned to supply data on the time relationships of both the accumulation of periportal liver lipids in rats on a low-protein diet and their removal when the animals were transferred to a "curative" diet high in protein (Table I, Diets Va and Vb respectively). Forty female rats (65 to 80 g.) were fed the low-protein diet (Va-0, 3% casein), which was supplemented with methionine to make it equivalent in that respect to the "curative" diet containing 18% casein; both diets contained 0.5% choline chloride. Pairs of rats were killed after being fed the low-protein diet for 2, 4, 8, and 16 days, respectively. The remaining 32 rats were transferred to the "curative" diet (Vb containing 18% casein). Groups of eight rats were killed after consuming the "curative" diet for 3, 7, 14, and

21 days, respectively. In addition 25 similar rats were fed a commercial stock ration ("master fox chow," Toronto Elevators, Ltd.). During the first 16 days these rats were pair-fed with those given the low-protein diet. Five rats were killed at the end of this time, and the remainder were then allowed to eat the chow *ad libitum*; groups of five rats were killed after 3, 7, 14, and 21 days, respectively.

Results

Livers from many normal rats of our colony have been examined during past years. The livers were subjected to chemical analysis and sections treated with oil red O were scrutinized carefully. Normal values for total liver lipids by our methods of extraction and rectification range from 5 to 8%, the mean and standard error being 6.62 ± 0.09 . The values for 20 male rats were 5.19 to 7.48, mean 6.31 ± 0.14 ; and for 38 females, 5.9 to 8.03, mean 6.79 ± 0.10 . No histologically demonstrable fat could be seen in most livers (Plate, Fig. 1a). Recently, since the above experiments were completed, we have been reinvestigating the "normal" rats of our colony and have found a more frequent appearance of fat in at least some hepatic parenchymal cells. This fat often occurs only as a few to many fine droplets per cell, but occasionally some cells (2 to 12 per high-power field) are seen to be filled with fat (Plate, Fig. 1b). These latter cells appear to be distributed at random within the hepatic lobules. This increased frequency of appearance of cells containing stainable fat is being investigated further.

Experiment I

Most of the stainable fat in the livers of rats consuming the basal diets low in casein (Ia-0, Ib-0, and Ic-0) was in periportal regions, with only a trace in centrolobular areas (see Table II and Plate, Fig. 2). It should be noted that these diets contained considerable methionine. We believe that adequacy of this choline precursor in these basal diets has been important in keeping the centrolobular areas clear. Even with 0.36% of choline chloride the amount of fat in periportal regions was not significantly reduced (cf. Plate, Fig. 2b). As the amount of protein in the diet was increased, less total lipid and periportal fat was observed: only traces of periportal fat could be detected when the diet contained 18% casein (Id-0). The lipotropic effect of a given amount of choline (as estimated by chemical analysis of liver tissue) improved as the protein content of the diet increased, but even large doses of choline were unable to prevent some deposition of abnormal fat so long as the protein in the diet was low.

Experiment II

The limited effectiveness of choline chloride in maintaining normal liver lipids is seen in other diets low in protein—for example, soya protein and a mixture of soya protein with fibrin. Diet IIa-0 (9% soya protein) gave total liver lipids of 9.0% (Plate, Fig. 3); even 0.36% choline chloride failed to reduce this value significantly. As in Experiment I, the deposition of centrolobular fat was prevented by choline, but the stainable fat in periportal regions was much less affected. Fibrin at 9% (Diet IIb-0) produced lower total lipids (by chemical analysis 6.7%) and considerably less stainable fat in periportal regions than did the soya protein, but the livers were not normal. Addition of choline chloride did not appreciably alter the findings (Plate, Fig. 4). A mixture of these two proteins at a total protein level of 9% (Diet IIc-0) also permitted the deposition of considerable periportal fat that was not affected by choline, although some prevention of lipid deposition could be shown analytically. Twice as much of the same protein mixture (that is, soya protein 12% plus fibrin 6%, Diet IId-0) resulted in a more nearly normal liver: only a trace of stainable fat could be detected in periportal regions and only a faint trace in the centrolobular area. Choline reduced the total lipid, but did not alter appreciably that seen in periportal regions.

The results when rats were fed Diet IIe-0 are of particular interest (Plate, Fig. 5). This ration was the same as Diet IId-0 except that the supplementary methionine was omitted. In the absence of this choline precursor the liver became very fatty (27% total lipids), the bulk of the stainable fat appearing in centrolobular position (+++ to ++++). Since the distribution of fat was diffuse throughout the lobule the amount in periportal regions was difficult to estimate, but it was recorded as +. A small supplement of choline chloride (0.12%) reduced the total lipids to 6.5%—that is, within the normal range—but a small amount of

stainable fat could still be seen around the central vein as well as in the periportal region. Had more choline been given, this centrolobular fat would probably have been eliminated.

Experiment III

The well-established fact that choline deficiency leads to an accumulation of fat in the centrolobular region was confirmed, as was the newer observation that stainable fat in the periportal region is connected with protein inadequacy. The ration containing 3% of casein without supplementary methionine (Diet IIIa-0) was not eaten well: it caused a

TABLE I.—Percentage Composition of Basal Diets

(All diets contained a constant portion amounting to 6.02%*)

Component	Diet I				Diet II					Diet III		Diet IV	Diet V	
	a	b	c	d	a	b	c	d	e	a	b		a	b
Casein	3	6	9	18	—	—	—	—	—	3	3	—	3	18
Fibrin	—	—	—	—	—	9	—	—	—	—	—	—	—	—
Soya protein†	—	—	—	—	9	—	6	12	12	—	10	—	—	—
Peanut meal‡	—	—	—	—	—	—	—	—	—	—	10	—	—	—
Corn (maize) oil	5	5	5	5	5	5	5	5	5	2	2	—	2	2
Beef fat	—	—	—	—	—	—	—	—	—	10	10	—	10	10
Primex§	—	—	—	—	—	—	—	—	—	—	—	20	—	—
L-Cystine	—	—	—	—	—	—	—	—	—	—	—	0.27	—	—
DL-Methionine	0.45	0.36	0.27	0	0.45	0.33	0.41	0.28	0	0	0	0	0.45	0
Choline chloride	—	—	—	—	—	—	—	—	—	—	—	—	0.50	0.50
Sucrose	—	—	—	—	—	—	—	—	—	—	—	—	—	—

To make total 100 in each case

* The constant portion consisted of "cellulose" (a non-nutritive powdered cellulose to supply bulk, obtainable from Chicago Dietetic Supply House, Chicago, Ill.) 2%, cod-liver-oil concentrate 0.010%, (Ayerst, McKenna, and Harrison, Ltd., Montreal; contains 200,000 i.u. vitamin A and 50,000 i.u. vitamin D per gramme), α -tocopheryl acetate 0.010%, salt mixture 3%, and sucrose-vitamin mixture 1%. The last two items are described fully by Ridout *et al.* (1954). Diet IV contained extra tocopheryl acetate to give a total of 0.035%.

† "Alpha protein" (Soya Products Division, Glidden Co., Chicago, Ill.) washed with water to remove traces of sulphite.

‡ Defatted peanut meal, washed with 50% ethanol to remove free and bound choline.

§ "Primex" (hydrogenated vegetable oil), obtainable from Proctor and Gamble, Ltd.

TABLE II.—Effect of the Nature and Amount of Dietary Protein on the Lipotropic Potency of Choline

(Sufficient DL-methionine added to keep total constant at 0.54% in all diets except IIe-0. Male rats (65 to 90 g.) fed rations for three weeks)

Experiment and Diet No.	Choline Chloride (%)	Average Daily Food Intake (g.)	Average Change in Weight (g.)	Total Lipids (% Liver Wt.)	Lobular Distribution of Stainable Fat			
					Portal		Central	
					Range	Mode	Range	Mode
Ia-0 (6)*	0	5.6	-8	12.5	+++	+++	0+	f.tr.
Ia-1 (6)	0.12	4.6	-9	16.0	+++	+++	0+	f.tr.
Ia-2 (6)	0.36	4.9	-10	9.9	+++	+++	0 tr.	0
Ib-0 (6)	0	5.9	+5	9.8	+++	+++	0	0
Ib-1 (6)	0.12	7.1	+15	11.3	+++	+++	0+	0
Ic-0 (6)	0	9.6	-54	10.7	+++	+++	0+	f.tr.
Ic-1 (6)	0.12	10.5	-61	9.1	+++	+++	0+	0
Ic-2 (6)	0.36	10.2	-61	6.8	+++	+++	0 f.tr.	0
Id-0 (6)	0	11.9	-93	8.9	f.tr.	f.tr.	0	0
Id-1 (6)	0.12	12.1	+105	6.6	0	f.tr.	0 tr.	0
Id-2 (6)	0.36	11.8	+100	5.8	0	0	0 tr.	0
IIa-0 (6)	0	6.7	-10	9.0	+++	+++	0+	tr.
IIa-1 (8)	0.12	6.7	-10	8.7	+++	+++	0+	tr.
IIa-2 (6)	0.36	7.0	-12	7.7	+++	+++	0 tr.	0
IIb-0 (8)	0	9.7	+55	6.7	+++	+++	0+	tr.
IIb-1 (8)	0.12	10.4	-63	5.8	+++	+++	0	0
IIb-2 (6)	0.36	10.4	-58	5.8	f.tr.	f.tr.	0	0
IIc-0 (6)	0	11.0	-49	10.7	+++	+++	0+	0
IIc-1 (8)	0.12	11.4	-52	9.3	+++	+++	0+	tr.
IIc-2 (6)	0.36	10.1	-46	8.4	+++	+++	0 v.f.tr.	0
IId-0 (8)	0	13.7	-102	7.9	v.f.tr.	tr.	v.f.tr./tr.	v.f.tr.
IId-1 (8)	0.12	13.0	-109	6.0	f.tr.	tr.	0 v.f.tr.	v.f.tr.
IId-2 (6)	0.36	14.0	-119	5.5	tr.	tr.	v.f.tr./f.tr.	v.f.tr.
IIe-0 (8)†	0	9.9	-55	27.2	+++	+++	+++	+++
IIe-1 (8)	0.12	12.0	-67	6.5	0	+++	+++	+++

* The figures in parentheses are the number of rats used in the experiment. f.tr. and v.f.tr. = faint and very faint trace.

† Six out of the eight rats in this group, which were fed the basal diet *unsupplemented* with methionine, died with kidney lesions and fatty livers.

TABLE III.—Effects of Choline in Diets Inadequate or More Adequate with Respect to Protein

(Diets IIIa and IIIb contained 3% and 18% respectively, of casein. Diet IV contained 3% protein (2% soya protein plus 1% peanut protein supplied as defatted meal))

Experiment and Diet No.	Choline Chloride (%)	No. of Rats	Average Daily Food Intake (g.)	Average Change in Weight (g.)	Total Lipids (% Liver Wt.)	Lobular Distribution of Stainable Fat	
						Portal	Central
IIIa-0	0	10*	5.7	-12	19.9	to ++	+++ to ++++
IIIa-1	0.50	10*	5.1	-13	5.8	+	+++ to ++++
IIIb-0	0	10*	10.3	-45	23.1	+	+++ to ++++
IIIb-Opt†	0	10*	6.0	+8	14.3	to ++	+++ to ++++
IIIb-1	0.50	10*	11.1	-60	5.2	±	v. faint tr.
IVa-0	0	10‡	7.0	-75	26.1	+	+++ to ++++
IVa-1	0.36	15‡	6.3	-74	7.3	±	0
IVa-2	1.0	15‡	6.6	-76	5.8	±	0

* Female rats (65 to 90 g.). † Pair-fed with rats in IIIa-0. ‡ Male rats (180 to 200 g.).

TABLE IV.—Rate of Appearance of Stainable Lipids in Periportal Areas and Effect on Liver Lipids of Realimentation with an Adequate Diet after a Period on a Similar Ration Low in Protein

(Forty female rats, 65 to 80 g., fed Diet Va-0 containing 3% casein; pairs of rats killed after periods shown. After 16 days the remaining rats were fed Diet Vb-0, containing 18% casein, for periods shown. Both rations contained 0.54% total methionine and 0.5% choline chloride)

Experiment and Diet No.	No. of Rats	Period Fed (Days)	Average Daily Food Intake (g.)	Average Change in Weight (g.)	Total Lipids (% Liver Wt.)	Lobular Distribution of Stainable Fat	
						Portal	Central
Va-0	2	2	7.1	-2	5.4	+	0 to f.tr.
	2	4	5.6	-10	6.2	0 to +	0
	2	8	5.0	-9	7.1	+ to ++	0
	2	16	4.8	-16	9.1	++	0
Vb-0	8	3	9.6	+19	18.0	+++	0
	8	7	9.3	+38	11.0	++	0
	8	14	10.0	+64	6.3	0 to +	0
	8	21	10.8	+91	5.1	f.tr.	0

moderate loss in weight and resulted in the development of a fatty liver. The total lipids reached 19.9%; there was considerable fat in periportal regions, with even more in centrolobular areas (Plate, Fig. 6). A similar ration containing 0.5% choline chloride resulted in a liver almost free from centrolobular fat but with considerable fat remaining in periportal regions. The total lipids were, however, only 5.8%. Diet Ia-0, a similar ration but with added methionine, was eaten in almost identical amounts and resulted in much lower liver lipids (compare 12.5% with 19.9%), the difference being mainly due to absence of fat from the central areas, as might have been predicted. Diet IIb-0, methionine-poor but containing 18% of protein, was eaten more freely, permitted a fair gain in weight, and caused a fatty liver, with the abnormal lipids mainly centrolobular, as was anticipated. Paired feeding reduced the total lipids somewhat, but did not change the distribution of stainable fat appreciably. Inclusion of choline chloride (Diet IIb-1) improved slightly both food intake and gain in weight, and almost completely prevented any stainable fat from appearing in the centrolobular region; a little remained in portal areas.

Experiment IV

Prolonged consumption of a diet low in protein and free from choline produced a very fatty liver, some of the lipid appearing in periportal areas, but most of the abnormal fat being centrolobular (Table III). The centrolobular deposition of stainable lipids was prevented by choline. Thus the effects of a low-protein diet on stainable liver lipids were essentially the same whether the rats were fed for three weeks or three months.

Experiment V

Development of a fatty liver upon realimentation has been noted frequently (for example, MacFarland and McHenry, 1945; Best, Lucas, Patterson, and Ridout, 1951), but the distribution of stainable fat in the present experiment proved interesting, being exclusively periportal. The low-protein diet (3% casein) resulted in a decreasing food intake (Table IV), in spite of adequate vitamins (including choline) and methionine. Despite the diminishing caloric intake and consequent loss of weight, the livers became increasingly fatty, the deposition of fat occurring in periportal regions (Plate, Fig. 7). When the rats were transferred to a similar diet in which the protein was made more adequate (casein 18%) they ate twice as much and began to gain weight. Coincident with this sudden increase in food consumption during the first three days on the "curative" ration there was a dramatic increase in the total liver lipids (to 18%), all of it occurring in periportal regions (Plate, Fig. 8). With continued intake of about the same amount of food, however, the abnormal fat soon disappeared, the liver appearing normal both histologically and chemically at the end of three weeks. No such increase in liver lipids occurred following realimentation in rats pair-fed a commercial ration throughout both the period of decreasing food intake and of realimentation.

Discussion

The data presented above show that protein inadequacy leads to the prompt appearance of stainable fat in periportal regions of the liver. It is a well-established fact that choline deficiency results in a rapid accumulation of abnormal lipids, mainly glyceride in nature, in centrolobular areas; the present data confirm this. The essential difference in the lesions can best be recognized when the deficiency is of mild degree and of brief duration; more severe or more prolonged deficiencies lead to a more generalized distribution of stainable fat, often obscuring the original site of appearance of the lipid.

DESCRIPTION OF SPECIAL PLATE

Photomicrographs ($\times 133$) of frozen sections of rats' livers stained with oil red O to demonstrate fat.

Fig. 1.—Livers of young rats (Wistar) fed the stock ration ("master fox chow"). In our strain under these dietary conditions there is usually no stainable fat (Fig. 1a), but occasionally some cells contain fine droplets and a few are filled with fat. When present these fat-filled cells are distributed at random within the lobule (Fig. 1b).

Fig. 2.—Lipid distribution typical of rats fed rations low in protein (made adequate with respect to methionine): Fig. 2a without choline (Diet Ia-0), and Fig. 2b with supplementary choline (Diet Ia-1). The choline is without significant effect on the periportal fat (++ to +++).

Fig. 3.—In the livers of rats fed Diet IIa-0 (soya protein 9%) there is abundant periportal accumulation of fat (++ to ++++). This photomicrograph illustrates the mode (++++).

Fig. 4.—The periportal deposition of lipids was the least when fibrin (Diet IIb-0) was the protein fed. The figure illustrates the appearance of the liver when the ration is supplemented with choline (Diet IIb-2). The findings (+) are essentially the same in the absence of choline.

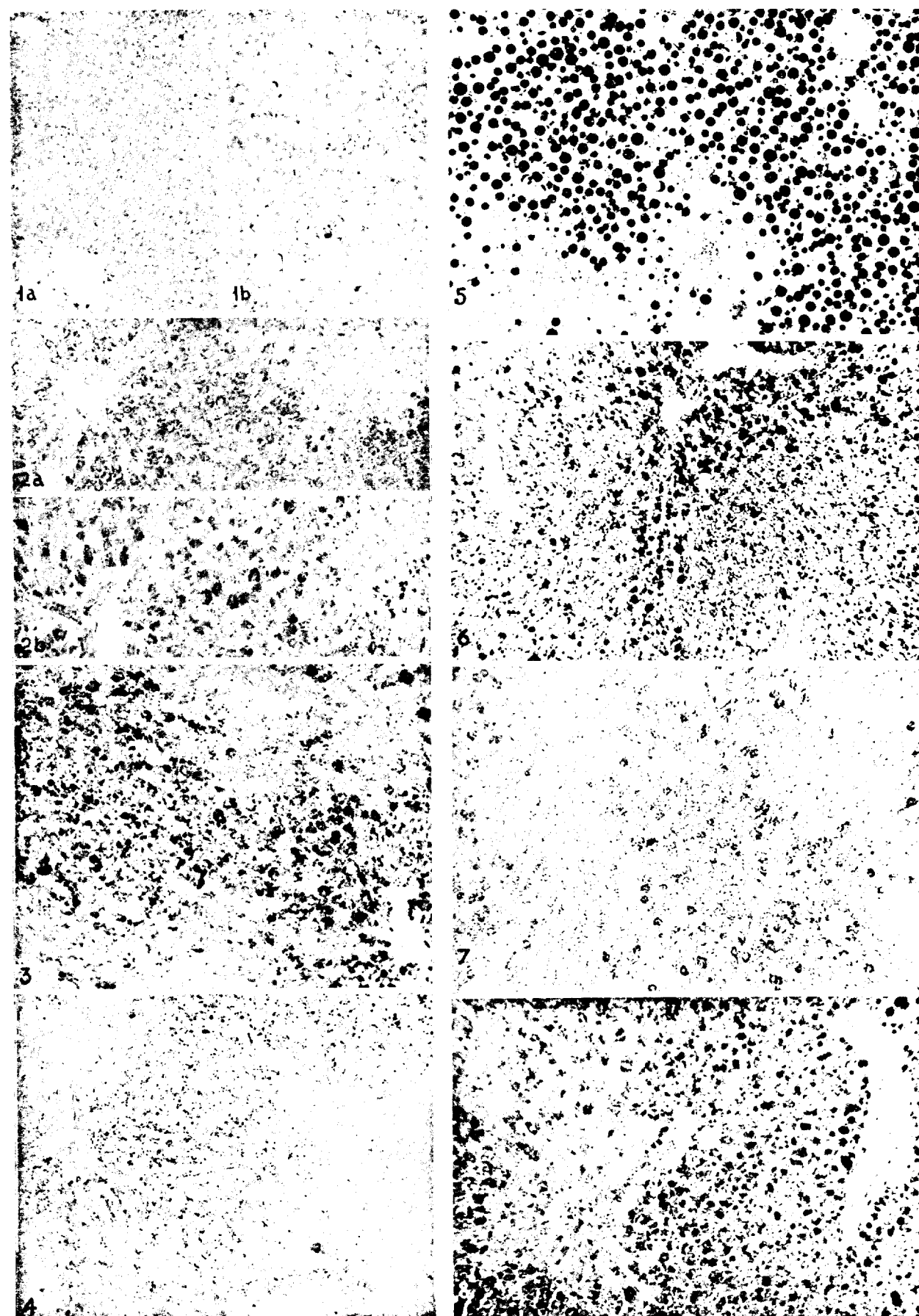
Fig. 5.—Stainable fat in relatively large amounts (+++ to ++++) present in centrolobular and non-portal regions of livers of rats fed rations low in choline (Diets IIc-0 and IVa-0).

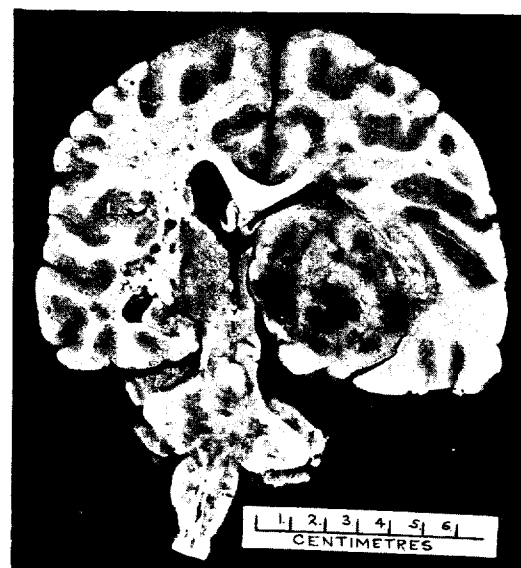
Fig. 6.—Dual distribution encountered in rats fed rations low in both choline and protein (for example, Diet IIIa-0): stainable fat present in relatively large amounts (++ to ++++) in centrolobular regions of the liver, and in smaller quantities (trace to +) in periportal areas.

Fig. 7.—Stainable fat (+) present in periportal regions only. Rat consumed a low-protein ration (Diet Va-0) supplemented with both choline and methionine for 16 days; food intake was low. A portal field is just to the right of and below centre.

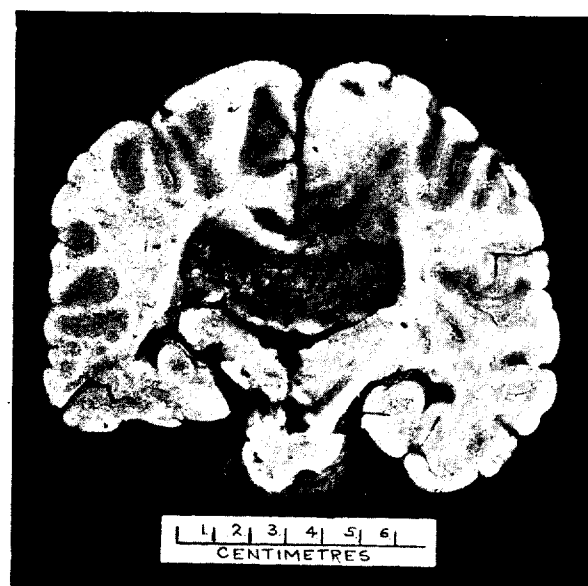
Fig. 8.—Abundant stainable fat present in periportal fields, but none occupies cells around central veins (one at left). A portal triad, cut longitudinally, is shown on the right. Rat consumed for three days excessive amounts of a ration containing 18% casein (methionine and choline believed adequate—Diet Vb-0). For 16 days previous to the three-day period the rat had eaten only small amounts of the same ration (Diet Va-0) as that consumed by the rat whose liver is shown in Fig. 7.

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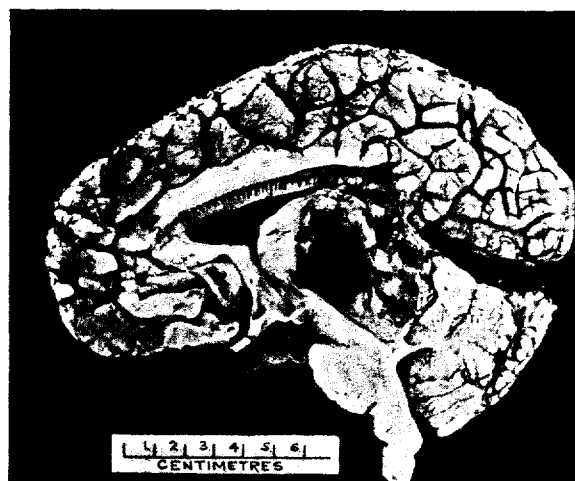




Glioblastoma of basal ganglia.



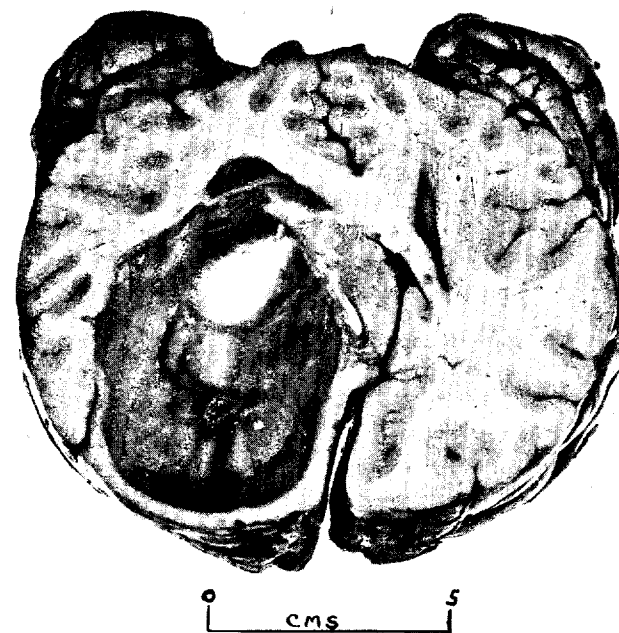
Glioma of corpus callosum.



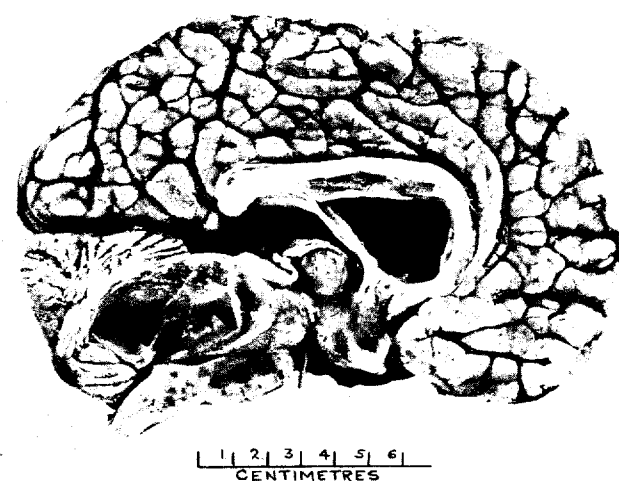
Pinealoma.



Rapidly growing malignant glioma.



Astrocytoma cyst of a hemisphere.



Cystic astrocytoma of cerebellum.

For complete protection of the hepatic cells in the portal region the amount of protein necessary depends upon its nature, fibrin being much more effective than casein, which is better than soya protein. The deleterious effect of diets low in protein on the cells in the portal region may be related to some inadequacy of essential amino-acids (cf. Lucas and Ridout, 1955). The effect of protein on hepatic cells around the central veins appears to be attributable largely, if not solely, to its content of the choline precursor methionine. Protein inadequacy in regard to protection of the liver appears to begin at about 12% in the diet when casein is fed, and below 6% in the case of fibrin (cf. data of Winje *et al.*, 1954); choline inadequacy begins at about 0.12% (expressed as chloride). It should be emphasized that these values may vary considerably, depending upon the strain, age, and sex of the rat, upon the adequacy of the diet with respect to other essential nutrients, upon environmental temperatures, and on other factors less well understood.

These observations may help to resolve two anomalies in the literature—namely, the occasional discrepancy between the chemical and histological estimations of liver fat and the lack of response of certain types of dietary fatty livers to the lipotropic agents. The term "fatty liver" has somewhat different connotations according to the viewpoint of the user. To the pathologist who is concerned with the appearance of the organ the liver is described as fatty if fat is evident microscopically in suitably stained sections. Not every cell need contain stainable fat. Cells in certain regions only may be affected, yet the organ would be referred to as a "fatty" liver. The biochemist, on the other hand, is concerned with the results of the chemical analysis—that is, with the quantity of lipids extractable from the tissue. Only when the analytical figure is increased appreciably above the normal range of values for the species would the chemist describe the liver as "fatty." The pathologist may see stainable fat, sometimes in considerable amount, before there is any significant increase in the extractable lipids. An erroneous impression of the magnitude of the increase above normal may be obtained unless attention is paid to the extraction procedure used, and especially to the base to which the analytical data are calculated, whether it be to fresh tissue, dry tissue, fat-free tissue, or dry, fat-free tissue. We have discussed elsewhere the merits and disadvantages of each of these (Ridout *et al.*, 1952). There are situations—for example, in protein depletion—where the values might better be expressed as percentages of body weight, or, better still, referred to the desoxypentose nucleic acid (D.N.A.) content of the liver. Campbell and Kosterlitz (1948, 1950, 1952) found that, although ribonucleic acid and phospholipid are lost from the liver in protein deficiency, the D.N.A. content of the liver of the adult rat varies linearly with body weight and is not affected by the protein content of the diet. Where effects of variations in dietary protein are under study, and particularly where a considerable change in the number of functional liver cells is apparent (as in necrosis or cirrhosis), the D.N.A. content of the liver should prove a useful basis for comparing changes in lipids and other hepatic components. However, at present in our laboratory the common practice is followed of referring the data to the fresh weight basis. All values are also calculated to the dry, fat-free basis, as this sometimes permits more useful comparisons, but these data are not always reported.

In choline deficiency hepatic lipid values of 15 to 40% of fresh liver weight are commonly observed. Figures of 25 to 45% reported in rats fed diets low in protein (for example, Harper, Benton, *et al.*, 1954) are expressed as percentages of dry liver weight. When referred to the fresh weight the total hepatic lipids are no more than about 8 to 18% (usually below 14%). These are certainly fatty livers, but quantitatively they are of mild degree as compared with those seen in choline deficiency. A considerable amount of stainable fat may appear in periportal areas with minimal elevation of total lipids as determined chemi-

cally. It has been suggested (Lucas and Ridout, 1955) that this unmasking of normal structural lipids (fat phaneriosis)* may be caused by improper formation of lipoproteins due to protein deficiency. Protein deficiency may seriously interfere with the formation of many vital factors which the lack of choline might not affect to the same extent. (Cf. Campbell and Kosterlitz, 1948, 1950, 1952.) While fibrosis or cirrhosis has not yet been produced in our rats by protein deficiency in the presence of abundant choline, even after a year, it is possible that these lesions may appear in more prolonged experiments, as Ramalingaswami (1954) has suggested.

With regard to the second anomaly, our findings confirm and supplement those from other laboratories that fatty livers due to diets low in protein do not respond to lipotropic substances. However, it is not surprising that a fatty liver due to protein deficiency is not cured by giving supplements of choline or its precursors.

In our opinion it has been obvious for many years that the clinical use of choline and methionine to repair the liver damage produced by multiple deficiencies—that is, of protein, minerals, vitamins, etc.—is doomed to failure because most hospital diets supply an abundance of the lipotropic agents. This does not decrease in any way the potential clinical significance of experimental work on the lipotropic factors; it merely means that in the laboratory it is possible to make choline the limiting factor by the design of the experiment. The clinician rarely encounters so simple a situation. If he supplied the missing amino-acids other than methionine and made good the other deficiencies except that of choline, this substance would be the limiting factor in the clinical situation.

The importance of the balance of amino-acids in the diet in the study of fatty livers was noted in this laboratory 10 years ago by Beveridge, Lucas, and O'Grady (1944, 1945), who pointed out that the lipotropic activity of a protein is determined not only by its content of methionine but also by the nature and quantity of the other amino-acids present. While studying changes in liver composition during protein depletion Wang *et al.* (1949) fed protein-free rations to rats and observed a fatty liver not completely preventable by choline (at the dosage used, which was high—0.50% choline chloride in the diet). Dick, Hall, Sydenstricker, McCollum, and Bowles (1952) suggested that some fatty livers may result from failure of certain cell functions when protein anabolism is reduced—that is, they may represent a non-specific effect of protein deficiency rather than a specific lack of any one essential amino-acid. When Harper, Benton, *et al.* (1954) observed an anti-lipotropic effect of methionine in rats fed threonine-deficient diets containing choline, they too concluded that the extent of fat deposition in the liver depends on the balance as well as on the absolute amounts of amino-acids in the ration. The fatty livers caused by diets deficient in threonine and lysine (Dick *et al.*, 1952; Singal *et al.*, 1953; Harper *et al.*, 1953), even with moderate amounts of choline in the food, are examples of fatty livers of non-specific origin—that is to say, due to inadequate or imbalanced protein—and the lesions would doubtless prove to be periportal in distribution. Indeed, Niño-Herrera, Harper, and Elvehjem (1954), reporting upon the histological differentiation of fatty livers produced by threonine or choline deficiency, stated:

"In the livers of choline-deficient animals the fatty infiltration is diffuse and is most severe in the vicinity of the central vein. In the livers of animals receiving low-protein diets containing choline the distribution of fatty cells results in a network appearance in which zones of normal cells are interspersed among the zones of fatty cells and only occasionally is the fatty infiltration not

*This is not the place to attempt a full discussion of the vigorously debated subject of lipophaneriosis. Modern biochemical and physicochemical studies of the lipoproteins have revealed the possibility of dissociation of these compounds to give free lipids, but the conditions governing this process are not well understood.

severe around the central vein of the lobule. The magnitude of the fatty infiltration is much greater in rats fed a diet deficient in choline.*

Shils and Stewart (1954b) have observed a periportal distribution of fat in livers of rats fed diets consisting principally of corn meal, rice, or cassava, and found that lysine and tryptophan prevented this fatty liver. These observations are in agreement with our hypothesis that protein deficiency or amino-acid imbalance causes the periportal type of lesion.

Shils and Stewart (1954a) suspected that the periportal accumulation of lipids seen in rats fed corn meal may be due to some unique property of corn proteins. Since the lesion was later seen in rats fed corn, rice, wheat, or cassava, Shils, Friedland, and Stewart (1954) believed that it is typical of plant products. Our finding of this periportal type of distribution whenever the amount of dietary protein is low, regardless of the source of the protein fed, confirms and extends their results but alters the conclusions.

Shils and Stewart (1953) reported observing a sex difference in the distribution of stainable fat in the liver lobule: in male rats the total concentration of hepatic lipids was higher than in females and the lipid appeared first in periportal areas; in females the fat was found first in central areas. Female rats responded somewhat to threonine; males did not (Shils and Stewart, 1954b). In our experiments, admittedly with different proteins, we have not noticed any significant difference in the distribution of stainable fat in the livers of male and female rats.

In a personal communication Ramalingaswami, who with his colleagues has published several thoughtful and stimulating papers on liver injury in protein malnutrition (for example, Sriramachari and Ramalingaswami, 1953; Ramalingaswami *et al.*, 1954), has informed us that the fat content of diets low in protein and choline may influence the localization of the fatty deposits in the hepatic lobule. After rats were fed for about three months on a low-fat, low-protein, choline-deficient diet he observed that the microscopical appearance of the livers presented a striking similarity to the picture in kwashiorkor.

In our present study the observation that may be of greatest practical significance concerns the abrupt increase in total liver lipids associated with a sudden improvement in the quality and quantity of food intake, even when the "curative" ration is adequate in protein and rich in choline (Experiment V). Liver fat increased within three days from 9 to 18%, all stainable fat being present in periportal regions. This is the largest amount of extractable lipid ever observed by us when the stainable fat was present in periportal regions exclusively. A similar increase in liver fat was not observed in other rats pair-fed a commercial stock ration, suggesting that an unidentified factor prevents the sudden but transient increase in liver lipids confined to the periportal regions. These experiments, which may have their clinical counterparts in the treatment of alcoholic subjects with certain "good" diets, reveal the presence of factors in addition to protein and choline that may be concerned in the deposition and localization of fat in the liver.

Summary

In rats fed diets containing a moderate amount of fat and 9% or less of protein, supplementary choline failed to prevent completely the accumulation of fat in periportal regions of the liver.

Lack of adequate protein resulted in the appearance of fat in the periportal areas, while deficiency of choline (or precursors) caused an accumulation of fat in the

*The literature concerning the site of lipid accumulation in threonine deficiency is contradictory, however. Dick and his associates reported that it occurs in the cells around the central veins. Unfortunately the histological techniques used by Niño-Herrera *et al.* were unsuitable for lipid studies. Using histochemical methods, Kerbel and Casselman in this laboratory have repeated the experiments relating directly to threonine deficiency and have found that the distribution of fat is clearly periportal.

cells bordering on the central vein. Protein inadequacy has not produced the massive accumulation of hepatic lipids seen in choline deficiency.

When rats were transferred on to an "adequate" diet (containing 18% casein and 0.5% choline chloride) after a period on a low-protein ration (3% casein) there was a dramatic appearance of a transient fatty liver (total lipids 18%), the fat appearing in periportal positions only. During three weeks on the same ration the hepatic lipids returned to normal. Other rats pair-fed the same amounts of a commercial ration did not develop fatty livers, so that the transient appearance of periportal fat is not entirely due to the increased food intake. Certain points of potential clinical interest have been discussed briefly.

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In 1953 in England and Wales 40 people were killed in quarry accidents and in Scotland 5. In 1952 these totals were 49 and 4 respectively. The injured numbered 104 in 1953 in England and Wales and 11 in Scotland, as compared with 118 and 14 respectively in 1952. The average death rate per 1,000 persons employed in all quarries in England, Scotland, and Wales was 0.99 in 1951, 0.85 in 1952, and 0.73 in 1953.—*Report of H.M. Inspectors of Mines and Quarries for 1953* (H.M.S.O., 2s.).

THE PROBLEM OF GLIOMA OF THE BRAIN*

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[WITH SPECIAL PLATE]

There tends to be a periodic lack of interest in the study of cerebral gliomata, though these neoplasms continue to inflict their havoc on the health and lives of far too many young and middle-aged people. This paper is therefore aimed at recalling attention to this important subject and reviewing certain facts and conclusions gained from our experience with a consecutive series of 700 patients with neoplasms of the brain, of which 466 were gliomata.

Surgical Pathology

The gross post-mortem appearances of gliomata are usually so distinctive that these neoplasms can be differentiated almost as well by the naked eye as by histological examination. Of the 466 gliomata in our series, 294 were completely solid and 172 partly cystic. In only 20 of the cystic cases was the neoplasm composed of a large cyst and a relatively small amount of tumour; in the other 152 the cysts were small in relation to the solid mass of the tumour.

The gliomata were classified histologically according to cell type as originally suggested by Bailey and Cushing (1926), this work being carried out by the late A. F. Bernard Shaw, Professor of Pathology in the University of Durham, and also by Professor R. Paterson Smith. The results were as shown in Table I.

In the unclassified group were placed neoplasms the histological appearances of which did not strictly conform to the criteria of diagnosis laid down by Bailey and Cushing: most were highly malignant. Even the most typical of the astrocytomata and oligodendrogliomata were not composed of a uniform type of cell; in the highly malignant types one zone differed considerably in cell content, cell size, mitotic activity, and vascularization. In no instance was it possible from the histological studies to reconstruct the general architecture of the growth and the way in which its mass was given cohesion. There were areas which seemed to be without any kind of histological pattern and yet did not appear to be zones of necrosis or of haemorrhage. A discrete edge to a glioma was never seen; brain tissue apparently reacts but little to the advance of a glioma. Cells presumably neoplastic in nature can nearly always be seen at considerable distances from, and entirely unconnected with, the main mass of the neoplasm.

*This paper was submitted for publication in December, 1952.

TABLE I

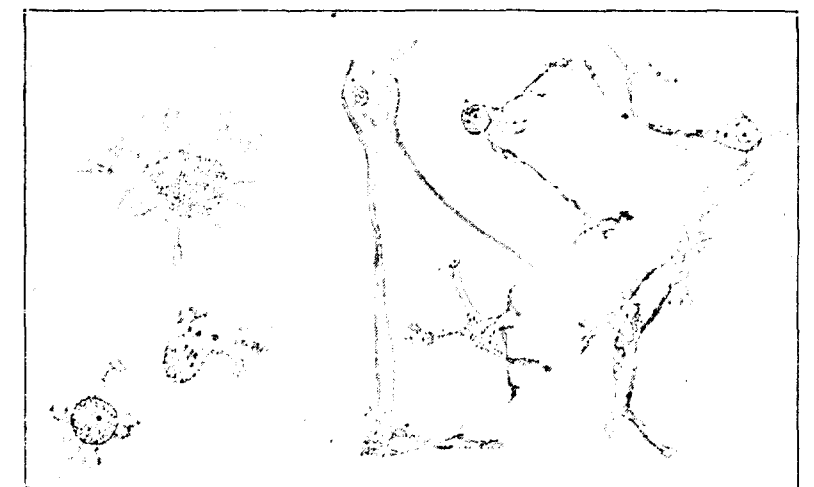
Type of Glioma (See Special Plate)	Adults	Children (Up to the Age of 12)
Astrocytoma:		
(a) Hemispherical	54	2
(b) Cerebellar	9	6
Astroblastoma	10	2
Spongioblastoma unipolare	5	2
Glioblastoma (spongioblastoma multiforme)	76	1
Oligodendroglioma	9	—
Ependymoma	7	6
Medulloblastoma	9	21
Haemangioblastoma	5	—
Pinealoma	3	2
Unclassified:		
(a) Partly cystic	66	2
(b) Solid	156	11
Papilloma	2	—
Total	411	55

As the appearance of a cell after it has been prepared for histological examination cannot possibly resemble that of its natural state, an effort was made to grow specimens in culture. This work was first carried out at the Christie Hospital and Holt Radium Institute, Manchester, with the help of Dr. Edith Ralston Patterson. The accompanying drawing, made by Miss D. Davison, depicts what was seen through a microscope at the edge of a culture of a glioblastoma.

There is now a tendency to classify gliomata according to their degree and type of malignancy. Theoretically this method may be an advance on the classification by cell type; in practice, however, it is doubtful whether it has any advantages, because, although precise criteria for classification can be laid down, tumour variations are so great that strict grouping according to the accepted rulings is difficult.

In the 231 cases in which the glioma was given a formal name the sites of occurrence were: frontal lobe, 49; temporal lobe, 66; parietal lobe, 44; occipital lobe, 12; third ventricle, 8; fourth ventricle, 6; brain-stem, 5; cerebellum, 41. In some instances the neoplasm was too large to be certain of the structure from which it originated, although it is obvious that most of the malignant types arose in the basal ganglia, vermis of the cerebellum, or corpus callosum. Also, although the bulk of many neoplasms occupied one lobe of the brain, extension had taken place into neighbouring zones. In no instance was there a metastasis outside the central nervous system.

The age incidence was as follows: 1 to 12 years, 42; 13 to 19, 18; 20 to 29, 31; 30 to 39, 43; 40 to 49, 44; 50 to 59, 44; 60 to 69, 9.



The microscopical aspect of cells growing from the edge of a culture of a glioblastoma. These appearances no doubt conform to the normal characteristics of cells before subjection to the processes of histological preparation.

The Problem of Early Diagnosis

In a case of cerebral glioma the clinical picture of course depends substantially on whether the neoplasm is in the early or the late stages of development. Moreover, in view of the many and widespread structures from which a glioma may arise, it will be obvious how difficult it is to consider a diagnosis without first grouping these neoplasms according to type and then subgrouping the types according to site of origin. For example, the clinical picture of cystic astrocytoma of the cerebellum is very different from that of astrocytomatous cyst of a hemisphere. Nevertheless this apparent need for subgrouping leads to a tendency to await a fully developed clinical syndrome before a firm diagnosis of cerebral neoplasm is risked. Late diagnosis may not be greatly detrimental therapeutically where a glioma is concerned, but has serious consequences in the case of meningioma or acoustic neuroma.

Here, in the interests of earlier recognition of a neoplasm, we will attempt to discuss diagnosis from the first symptom or sign in the group as a whole, without segregating the tumours into subgroups—for example, cystic astrocytoma of the cerebellum and the glioblastoma of the hemispheres. In the 231 cases in which the neoplasm was given a formal name we were able to classify the initial symptoms or signs as follows:

1. *Rise in Intracranial Pressure.*—In 142 instances headache, vomiting, dizziness, and papilloedema, singly or in combination, were the first signs or symptoms. Papilloedema was an early sign in 10 cases only, and, of course, was pathognomonic of a space-occupying lesion. In the remaining 89 cases a diagnosis was impossible on the characteristics of the headache, dizziness, or vomiting.

2. *Epilepsy.*—A sudden attack of epilepsy was the first sign in 40 cases; in 38 of these the seizures were major, and in the remaining 2 focal. All the attacks occurred in patients between the ages of 20 and 60 years. In 6 cases the seizures were followed by neurological signs from which the patient never fully recovered; in 4 cases there was hemiparesis, and in 2 a mild dysphasia. In every instance a lesion other than a glioma, or even a neoplasm, could have been the cause.

3. *Mental Change.*—Although in only 15 out of the 231 cases did mental change herald the presence of a cerebral glioma, it is probable that in many cases this symptom was overlooked or its significance not appreciated. Initially, mental change leads to minor and very subtle changes in behaviour that can be elicited only by direct questioning of an intimate relative or friend. A common first sign is a carelessness about personal appearance—for example, a man hitherto fastidious about his appearance may fail to shave cleanly, or a woman usually scrupulous about her hair may leave it unbrushed and untidy; again, a normally punctual person may start to get up late and show no concern about prompt arrival at work. Every change in behaviour cannot, of course, be regarded as having a sinister meaning. An intimate relative is quick to detect deterioration, but often withholds the information if not directly cross-questioned. The assessment of a minor change in behaviour makes heavy calls on the good judgment and experience of a general practitioner. Frank mental confusion and gross faults in behaviour, such as incontinence, are later signs of mental deterioration. Mental signs may, of course, be due to many kinds of pathological change, and when present can merely call attention to the possibility of a cerebral tumour and no more.

4. *Abnormal Neurological Signs.*—The appearance and persistence of an abnormal neurological sign was the first evidence of neoplasm in 34 of the 231 cases. All these signs, some of which developed rapidly and some slowly, could obviously have been caused by a lesion other than a tumour. They are as follows: hemiparesis, in 16 cases; dysphasia, 9; squint, 4; sensory loss, 2; ataxia, 3.

Differential Diagnosis

It will be apparent, therefore, that in most cases of glioma it is impossible to make a diagnosis on the first symptom or sign. Often it is difficult even to decide whether or not the brain itself is primarily affected. Also, to make diagnosis more difficult, other space-occupying lesions present more or less in the same way. In our series, for example, the gliomata had to be differentiated not only from vascular and degenerative lesions of the central nervous system, but from other types of space-occupying lesion, as shown in Table II.

TABLE II

Diagnosis	Adults	Children (Up to the Age of 12)
Glioma	411	55
Secondary carcinoma	62	2
Meningioma	59	—
Acoustic neuroma	25	—
Tumour of pituitary body or stalk	61	6
Epidermoid (cholesteatoma)	5	—
Granuloma	7	7
Total	630	70

In the few instances when the first symptom or sign throws strong suspicion on the possibility of a cerebral neoplasm it is probably wiser to proceed with special neurological investigations to establish diagnosis than to await the development of further confirmatory symptoms or signs. In the majority of cases, however, it is necessary to await possible developments before it can be decided that one is dealing with a progressive lesion of the central nervous system. But it is absolutely wrong to await the development of a fully established clinical syndrome before making a diagnosis or applying special diagnostic tests. For example, it is not necessary, in the case of a man who is forgetting an occasional word, to defer a diagnosis of glioblastoma until he is completely aphasic, disorientated, incontinent, and going blind with papilloedema. At the same time to swing violently from the policy of overwaiting to mere mechanistic methods of diagnosis is equally unsatisfactory. Obviously a multitude of patients with minor and purely transient disorders should not be subjected to the discomforts and dangers of special neurological investigations, nor should the usual simple clinical tests to eliminate conditions such as nephritis and hypertension be omitted.

Special Diagnostic Methods

Although straight radiographs of the head rarely reveal anything abnormal in the early stages of a space-occupying mass in the brain, they do occasionally show signs of pressure, hyperostosis, erosion, calcification, or dislocation of the pineal gland, and therefore should be made use of, particularly as this form of radiography is painless and without danger. Electroencephalographic investigation is also painless and without risk, and should be used routinely in the detection of neoplasms in their early stages. We have found electroencephalography to have limited value, however, as it tends to establish that a physical lesion is present without giving precise information concerning its pathology; but this should not preclude its free use.

Lumbar puncture may show that intracranial pressure is raised before there is clinical evidence of it. Occasionally a rise in the protein content of the cerebrospinal fluid is the first positive evidence of a cerebral tumour. In the early stages of a space-occupying lesion the value of lumbar puncture far outweighs its possible dangers.

When, in spite of the procedures referred to above, diagnosis is still in doubt, air encephalography, ventriculography, or cerebral angiography will be necessary to decide whether a neoplasm is present, and, if so, its nature.

In our experience, where there is little evidence of a rise in intracranial pressure, air encephalography is perfectly safe and is one of the most reliable methods for detecting a space-occupying lesion of the brain. Although we have performed air encephalography many hundreds of times during the last ten years we have not had one fatality or seen a single complication as a result.

Ventriculography is the safer method of air or oxygen replacement when there is obvious evidence that the intracranial pressure is raised. This procedure involves making two holes in the skull through which cannulae can be passed into the lateral ventricle, whereas with air encephalography it is necessary only to tap the spinal theca with a hollow needle at the lumbar or cisterna magna level.

Cerebral angiography is a most important procedure, by the aid of which it is possible not only to determine with great precision whether a space-occupying lesion is present and, if so, its location, but also to obtain valuable information concerning its pathology.

Neither cerebral angiography nor ventriculography is to be carried out lightly, as considerable danger is involved.

Operative Treatment

It is our purpose to summarize briefly the surgical methods of treatment we have employed in this series of 466 cases of glioma, of which 405 were operated upon, and to review our main surgical conclusions.

1. When once a cerebral tumour has been firmly diagnosed in its early stages, and provided the intracranial pressure is not high, no effort should be spared to establish its precise location and pathological nature, if necessary by air studies and angiography.

2. Burr-hole inspection and probing we have found to be useful in diagnosis for excluding chronic subdural haematoma or intracranial abscess, but taking a biopsy specimen through a burr-hole we have found to be of little value and often dangerous.

3. In the later stages of a cerebral neoplasm, when the intracranial pressure has been obviously high, we have often dispensed with air studies or angiography and chosen the site for exploration on the evidence of clinical symptoms and signs. Nowadays the removal of an osteoplastic flap for exploration of a tumour through the dura mater is a relatively benign procedure; it is often safer, quicker, and less dangerous to the patient than ventriculography or angiography.

4. To plan an exploration over the vault of the skull or in the posterior fossa merely to uncover a tumour without also taking into account the anatomical peculiarities of the area concerned will usually lead to unnecessary technical complications; for example, radical operations in the area of the frontal fossa are difficult unless the osteoplastic flap has been cut close to the edge of the superior longitudinal sinus and down to the floor of the frontal fossa. In operations in the area of the posterior fossa an angle tumour cannot be approached adequately through a midline exposure.

5. When operating to remove one of the more benign types of glioma the excision should be as radical as possible but without inflicting damage on those areas of the brain that must inevitably lead to severe incapacity. For example, we regard the surgical imposition of a hemiplegia as worse than failure.

6. Experience has taught us that piecemeal removal of a glioma is a waste of time. The only worthwhile type of internal decompression is the formal resection of a block of cerebral tissue—for example, excision of that part of the frontal lobe of the brain that lies within the anterior fossa.

7. Subtemporal decompression is to be avoided at all costs. For the last ten years it has been our practice, even if an osteoplastic flap is raised, never to open the dura mater unless there is reasonable certainty that it can be closed again; in other words, operability must be deter-

mined by the appearance of the brain through the dura mater or by probing. First to open the dura in the hope of being able to do something useful operatively will in only too many cases lead to the development of unsightly bulges on the head due to cerebral herniations.

8. When a diagnosis of malignant glioma can be established beyond reasonable doubt, a surgeon is justified in refraining from operating. With the help of special investigations, particularly cerebral angiography, a reasonably certain diagnosis can often be arrived at.

Prognosis

It will have been seen from the section on surgical pathology that every glioma is malignant. Indeed, the majority of gliomata are highly malignant and grow so quickly that they cause serious incapacity within a few months, and death within two years. A small percentage of neoplasms at the astrocytomatous end of the scale are relatively benign and may continue to grow for 10 to 20 years before fatally compressing the brain-stem. Some tumours, such as the cystic gliomata and haemangioblastomata of the cerebellum, although not naturally self-limiting, are so circumscribed that they can be totally excised and the patient cured. However, in the large majority of cases surgery cannot offer cures, and, this being so, it might with reason be asked why a neurological surgeon so often operates on the gliomata. Indeed, the taunt that his persistent efforts at surgical cure in these cases reveal "the triumph of optimism over common sense" has often been levelled. There is no doubt to prolong a patient's life in misery is poor surgical judgment. None the less, despite his knowledge and experience, a surgeon is often compelled to operate against his better judgment, by pressure of relatives or colleagues or by the uncertainty of the pathological diagnosis.

In reviewing the results of the operative treatment of gliomata a broad perspective must be maintained. For example, a patient's life can easily be prolonged by a wide but unsightly subtemporal decompression. In this connexion it might be asked what are the ethical responsibilities of a surgeon. His main object is, of course, to cure the patient or to relieve severe symptoms which are unaffected by simpler methods. However, a surgeon is quite entitled not to interfere with natural processes where he is confident he cannot favourably alter their course by his intervention. The more experienced a surgeon becomes the less frequently is he inclined to operate on gliomata.

Results

The results in our series have been as follows:

Cures.—Seven patients have been completely cured; in this group were 2 cases of haemangioblastoma and 3 of cystic astrocytoma of the cerebellum, and 2 of mucous cyst of the third ventricle.

Substantial Prolongation of Useful Life.—Twenty-three patients who were already completely incapacitated by the effects of cerebral compression were returned to useful life for the following periods: 4 with cystic glioma of the cerebellum, 5 years; 2 with oligodendroglioma of the frontal lobe, 5 years; 10 with cystic astrocytoma of a hemisphere, 2 years; and 7 with oligodendroglioma of a hemisphere, 2 years.

Substantial Relief of Symptoms.—In 52 cases distressing symptoms, such as severe pain and intractable vomiting, were relieved by operation when drugs, other than those interfering with consciousness, were of no avail.

Deep x-ray therapy, although found to retard the rate of growth of some of the more highly malignant of the gliomata, was never curative.

Conclusions

Though surgery has little to offer in the cure of cerebral gliomata, the diagnosis of these neoplasms, the care of patients suffering from them, and the management of near

relatives still remain the onerous responsibility, and the duty, of those doctors who choose to make the problem of cerebral neoplasia one of their primary interests. Moreover—and this is even more important—in our series of 700 unselected cases of cerebral neoplasm, although 466 were gliomata, there were 147 cases that were potentially curable by surgery; in other words, 21% of favourable cases. In cases of neoplasm of the brain the segregation of the favourable cases from those of glioma in the early stages is one of the main problems of differential diagnosis, and carelessness in the diagnosis and handling of the glioma cases will reflect unfavourably on the potentially curable group.

In a further group of cases we are already using the newer methods of diagnosis, such as with radioactive isotopes, and are experimenting with biochemical forms of treatment and deep x-ray therapy.

Summary

Experience with 700 cerebral neoplasms, of which 466 were gliomata, is reviewed.

The majority of these new growths are highly malignant and lead to death within two years. Early diagnosis is important. The initial symptoms and signs are raised intracranial pressure, epilepsy, mental change, and neurological signs, though it is generally impossible to base a diagnosis solely on the clinical evidence. X rays, electroencephalography, and lumbar puncture are useful diagnostic aids, but when these fail air encephalography, ventriculography, or angiography will be necessary to decide if a space-occupying lesion is present.

Surgical methods of treatment are summarized and discussed. It is emphasized that subtemporal decompression should be avoided.

Of the 405 patients operated upon, 7 were cured, 23 were returned to a useful life for periods of two to five years, and 52 relieved of distressing symptoms such as severe pain and vomiting.

The preparation of this work was assisted by a Research Grant from No. 1 Regional Hospital Board.

REFERENCE

Bailey, P., and Cushing, H. W. (1926). *A Classification of the Tumours of the Glioma Group on a Histogenic Basis with a Correlated Study of Prognosis*. Lippincott, Philadelphia.

The "Mental Health Facilities and Needs of Australia" were the subject of a report drawn up by Dr. ALAN STOLLER, Melbourne psychiatrist, with the assistance of Mr. K. W. ARSCOTT. The report was undertaken at the instigation of the Commonwealth Government and published by it. Its scope included examination of mental hospitals and auxiliary services, mental deficiency programmes, psychiatric services, and State legislation. Dr. Stoller sums up his findings on the hospitals: "Mental hospitals are hopelessly overcrowded, poorly maintained, and short-staffed. . . . Diagnostic and treatment equipment and facilities are sorely lacking. The hospitals are in no position to develop out-patient, training, and educational programmes, and research is virtually unthinkable." The average overcrowding percentage was 20%—at the main mental hospital for Queensland the figure was 95%. Victoria had the best mental health facilities, with active voluntary bodies, and residential centres for defective children. New South Wales provided four psychiatric clinics through the school medical service; elsewhere help for retarded children was extremely limited and legislation for them incomplete, so that often the number of such children was unknown. Early in May the Commonwealth Government announced a £A.30m. capital works programme to improve mental health facilities throughout the country.

BERYLLIOSIS: A CASE REPORT

BY

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The hazards of dermatitis and respiratory disease from handling beryllium compounds were known in Europe before the last war, and Marradi Fabroni (1935) suggested calling the lung disease berylliosis. Various syndromes caused by beryllium were seen in considerable numbers in the United States of America during the last war, and these have been reviewed by DeNardi *et al.* (1953). In Great Britain, beryllium has been used, though not in the same quantities as in America, in the fluorescent lamp industry and in the form of beryllium-copper alloys in the manufacture of electrical equipment and special springs. It is remarkable, therefore, that there has been only one published case of delayed pneumonitis in a beryllium worker in this country (Agate, 1948) and one case of beryllium granuloma of the skin in a fluorescent-light-tube worker (Lederer and Savage, 1954).

The delayed chemical pneumonitis first described by Hardy and Tabershaw (1946) is perhaps the most interesting and elusive manifestation of beryllium toxicity. It is a slowly progressive sarcoid-like change in the lungs and liver which may come on after a very short exposure to beryllium compounds and after a latent period which may vary from a few months to eleven years. The clinical features are the insidious onset of weight loss, weakness, dyspnoea, and cough, with occasional febrile periods. The prognosis is grave, as the mortality in 35 cases reported by DeNardi *et al.* (1953) was 35%, and many of the remainder were severely disabled by pulmonary fibrosis.

The only British case (Agate, 1948) occurred in a physicist working on the development of tubular fluorescent lamps who was exposed to small quantities of zinc beryllium manganese. His symptoms did not develop until three years after his last contact with beryllium.

Although the first cases were described in a fluorescent lamp factory, it has also been reported in a brass foundry making and finishing beryllium-copper alloys (Jackson, 1950), and even in people who lived near beryllium extraction plants. Hardy (1951) lists 11 different industries in which chronic beryllium poisoning has been found. The incidence of chronic berylliosis is fortunately low. DeNardi *et al.* (1953) report 8 cases among 3,027 workers in three beryllium extraction plants, though 6 cases were found in 310 workers in the brass foundry (Jackson, 1950).

The following case is reported to draw attention to the possibility of delayed chemical pneumonitis due to beryllium in an industry hitherto regarded as safe. The case also shows the combination of unusual skin granulomata with lung lesions and would appear to be due to beryllium-copper alloy.

Case Record

A 25-year-old woman was referred to the skin department in August, 1954, for treatment of Raynaud's phenomenon of the fingers, from which she had suffered since the age of 10. It was noted that, as well as having cold blue fingers, she had numerous linear granulomatous papules on the fingers, palms, forearms, and legs (Fig. 1), and that she had a granulating wound on the dorsum of the left foot, which she

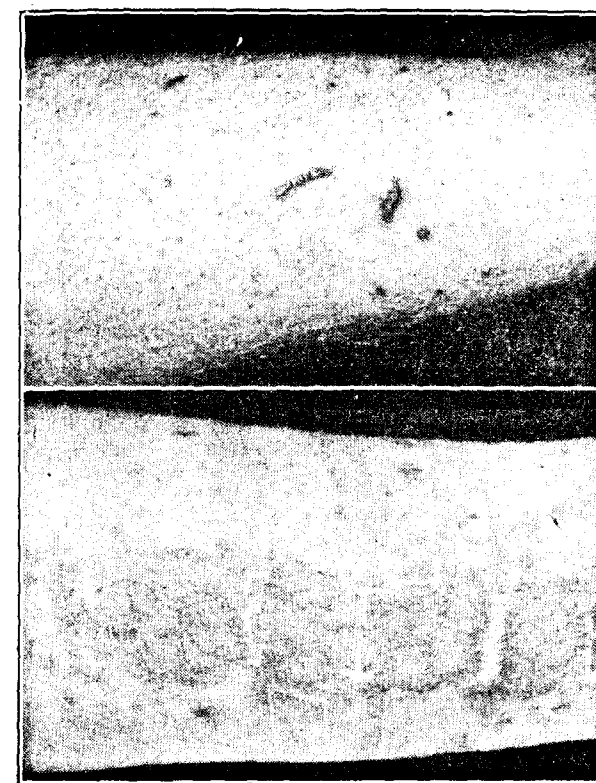


FIG. 1 (Above).—Leg showing linear sarcoid reaction. FIG. 2 (Below).—Patch tests with beryllium salts 48 hours after application.

stated she had cut at work four months previously and which had not healed. The granulomatous papules had appeared in the previous year. She also complained of a dry cough and increasing shortness of breath, which had so worried her that two weeks previously she had attended a mass radiography unit for a chest x-ray examination but no abnormality had been found. She had not lost weight, but had felt weak.

At the age of 10 she had had an attack of arthritis which had left some deformity of the right hand. Since the age of 10 she had had Raynaud's phenomenon of the fingers and toes. Her family history showed nothing relevant.

Occupational History.—For eight and a half years she had been employed by a firm of precious-metal smelters. For the first five years she was a backer in the rolling mill, handling gold, silver, and platinum sheets, and for the remaining three and a half years she operated a rotary shearing machine. This machine trimmed metal strip, a considerable quantity of which was 2% beryllium-copper alloy. She sustained frequent cuts and scratches on her hands, forearms, and legs from the sharp and jagged edges of the metal strip, and she could recall that the cut on her foot and several of the other linear granulomatous lesions had been caused by beryllium-copper strip. The machine which she operated was in a room by itself and she had no contact with fumes or dust from any other process. The shearing blade of the machine revolved only slowly, but fragments of the metal were occasionally thrown off.

On examination in August, 1954, she was not dyspnoeic at rest, but slight exertion produced rapid shallow breathing. Her fingers when cold were dusky blue and there was soft-tissue thickening around the right second and third metacarpophalangeal joints. On the back of the fingers and in the palms were numerous firm bluish-red papules, mainly aggregated in lines 0.5–1 cm. long. In the palms also were several superficial dry ulcers 2 mm. in diameter which resembled small chrome ulcers. On both forearms and on the lower part of the legs were more papules varying in colour from a yellowish brown on the forearms to a purplish blue

on the legs, which showed acrocyanosis. On the limbs the papules had obviously occurred along scratch marks. On the dorsum of the left foot was a healing laceration which showed a granulomatous lupoid change in the scar. No skin lesions were found on the trunk or face. No abnormality could be found in the cardiovascular system, nor were any adventitious sounds heard in the chest. There was no lymph-node enlargement, and the liver and spleen were not palpable.

Investigations

Histological examination of a papule from the left middle finger showed, in the dermis, numerous well-circumscribed nodules separated by dense fibrous tissue. The nodules consisted of foci of epithelioid cells, multinucleated giant cells, and small round cells. There was no caseation. Dark-ground and polarized-light examination of the section showed no foreign bodies. Histochemical staining for beryllium was negative. Mantoux test, 1/1,000 and 1/100—negative. The blood W.R. and Kahn test were negative. A blood count showed: Hb, 96%; white cells, 6,000 per c.mm. (polymorphs 60%, lymphocytes 30%, monocytes 8%, eosinophils 2%); E.S.R., 27 mm. in 1 hour; serum calcium, 9.8 mg. per 100 ml.; plasma proteins, total 7.3 g. per 100 ml. (albumin 4.8 g., globulin 2.5 g.). The E.C.G. was normal. Beryllium in urine, negative; beryllium in skin, negative.

Radiological examination of the hands and feet showed no abnormality. The lung fields showed a generalized very fine stippling; the picture was not the usual one seen in sarcoidosis, in which the stippling is usually dense and the hilar glands are more commonly involved. The evidence seemed to point to these changes being berylliosis rather than sarcoidosis, although differentiation is extremely difficult. Miniature radiographs of October, 1953, and August, 1954, did not demonstrate changes.

Skin patch tests were carried out with 1% and 2% solutions of beryllium sulphate and beryllium nitrate. In 48 hours a strongly positive eczematous reaction occurred beneath all four patches (Fig. 2). The inflammatory reaction was still present three weeks after the tests, and a skin biopsy was carried out from one area. There was a pronounced pseudo-tuberculous reaction in the dermis, made up of groups of concentric follicles. Each follicle was comprised of epithelioid cells, and most contained a multinucleated giant cell, some of these being very large with up to 50 nuclei. In one or two of the deeper follicles there was a necrotic centre. The epidermal changes were not significant. The follicles differed from the usual form of sarcoid in showing the central necrosis. No acid-fast bacilli could be found, nor optically active particles. Patch tests, using the same strength of solution carried out on 113 normal controls, were negative. One hundred of these patch tests were performed at St. John's Hospital for Diseases of the Skin (C. D. Calnan, 1955, personal communication).

Respiratory Function Tests.—Gaensler Timed Vital Capacity:—Total vital capacity, 2.19 litres, which is 75% of the predicted value for her age and weight; percentage of vital capacity expired in the first 0.75 second = 75% (normal). Helium mixing:—The rate of diffusion of the helium was slightly abnormal; there was some slowing of diffusion even in the best-ventilated part, and a small volume into which diffusion was slower still.

Progress.—The patient's dyspnoea and cough has become more marked during the three months she has been under observation. For several days after the patch tests the dyspnoea appeared to get worse than usual and moist rales were heard over both lungs for the first time. These have since disappeared. She has been removed from contact with beryllium and has been found a sedentary job which is within her capabilities.

Diagnosis

The presenting feature of sarcoid-like granulomata on skin damaged by beryllium-copper strip suggested at an early stage that at least the skin lesions were being produced by

beryllium, though lesions occurring as a Koebner phenomenon in sarcoidosis could not be excluded. The presence of small indolent ulcers clinically resembling chrome ulcers and previously described beryllium ulcers was, however, much in favour of berylliosis.

In 1953 DeNardi *et al.* reported the reliability of skin patch tests, which, they stated, showed an eczematous contact sensitivity in cases of berylliosis which had never shown any evidence of dermatitis. Patch tests were positive in 12 of their cases of chronic berylliosis, and results were negative in 5 other patients with various lung diseases, including sarcoidosis. The reliability of patch tests is also stressed by Van Ordstrand (1954), who states that, so far, he has no knowledge of a false-positive result. DeNardi *et al.* suggest four criteria upon which the diagnosis should be based: (1) history of exposure to beryllium; (2) clinical course of the pulmonary syndrome, including studies of pulmonary function; (3) radiographic evidence of granulomatosis of the lungs; and (4) patch tests.

The radiographic changes shown are those described by Wilson (1948) as stage I. He states that the earliest recognizable variation from the normal is a fine diffuse granularity presenting a fine sandpaper appearance, which under magnification of a reading-glass suggests a sandstorm. It is of interest that the miniature films taken by the mass radiography unit were incapable of showing this early positive change.

The patch tests were strongly positive, and it appeared that during the height of the skin reactions the lung lesions became temporarily more active. The initial change in the skin beneath the test patches appeared macroscopically to be an eczematous one, but a biopsy was not carried out immediately and there is no histological confirmation of this. Most significant, however, is the finding in the patch-test area three weeks later. Macroscopically the skin was still reddened and scaly and slight induration could be felt. Histologically, a sarcoid reaction was already present, and this extended deep into the corium. Histochemical staining to detect beryllium failed to demonstrate the metal in this tissue. Attempts to demonstrate beryllium in the urine and in skin papules from the forearm were also negative. Although unsatisfactory, there are a number of proved cases of berylliosis with similar negative findings (DeNardi *et al.*, 1953; Agate, 1948; Lederer and Savage, 1954).

Discussion

This case provides additional evidence that it is beryllium itself rather than beryllium in association with silicates which is responsible for the sarcoid-like granulomata of the lungs and dermis. It also supports the theory that berylliosis is an acquired allergy. In favour of the allergy theory are the low incidence among workers exposed to beryllium, the long latent period, and the minute amounts of the metal necessary to produce the disease.

It is difficult to determine in the present case how the beryllium entered the body, since the metal chips from the shearing machine were quite large and not likely to be airborne. That sufficient entered the body to produce an eczematous hypersensitivity is proved by the positive patch tests. It is perhaps strange that the patient did not show a contact dermatitis when handling the beryllium alloy, but the explanation may lie in the fact that metallic beryllium is very insoluble and until it has undergone some change in the body does not produce a response. Aldridge *et al.* (1949) have shown that beryllium ions attach themselves rapidly to protein, and it is likely that a beryllium-protein compound acts as the sensitizing allergen for the skin.

Of great interest was the sarcoid-like change in the dermis three weeks after application of beryllium nitrate solution to the skin. This reaction has not previously been reported in berylliosis. Although sarcoid reactions can be produced in sarcoid patients by the injection of extracts of lymph nodes and by tubercle bacilli and their extracts, I have been unable to discover a previous description of a sarcoid re-

action to substances applied to the skin. If the dermis responds to the presence of beryllium in this way, it is possible that the lung responds in the same way and the delayed chemical pneumonitis can thus be explained as an acquired hypersensitivity.

As has been stated, the prognosis of chronic berylliosis is poor and treatment has been disappointing, though there have been reports of benefit from the steroid hormones (Kennedy *et al.*, 1951). In the present case the symptoms are not disabling, and after removal from contact with beryllium the patient has been encouraged to continue working at a sedentary job within her physical capabilities.

Summary

A girl trimming 2% beryllium-copper alloy strip for three and a half years developed sarcoid-like granulomata on her hands and forearms, which had been scratched by the metal strip. She was found to have a pulmonary granulomatosis clinically similar to delayed chemical pneumonitis due to beryllium.

The case fulfilled all the criteria for diagnosis of systemic berylliosis and, in particular, illustrated eczematous hypersensitivity to beryllium shown by positive patch tests, to high dilution of beryllium salts, and a delayed sarcoid reaction in the skin used for the patch tests.

My thanks are due to Dr. Marjorie Clifton, of the Department of Medicine, Sheffield University, who carried out the respiratory function tests; to Dr. P. L. Bidstrup, of the London Hospital, for the estimations of beryllium in the urine and skin; to Professor D. H. Collins for the pathological reports; to Dr. J. M. Barnes, of the Toxicology Research Station, for the histochemical examination of the skin sections; to Mr. R. Brook for the photographs; and, lastly, to the patient, who submitted most willingly to the lengthy investigations.

[A short report of this case has already been published in the *Proceedings of the Royal Society of Medicine*, 1955, 48, 175.]

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Progress in the various branches of science needed for pest control is reviewed in the Pest Infestation Research Board report for 1954 (H.M.S.O., 3s.). The biology section is studying the population of pests associated with buildings, such as invest birds' nests or bat roosts; and also the populations found on stored materials, particularly those of the Khapra beetle—a serious pest in the maltings of Britain. The laboratory successfully fumigated Nelson's H.M.S. *Victory* with methyl bromide. No major change is reported in the work of the insecticide section, which has made considerable progress in studying the relative susceptibility of insects to insecticides. Paradichlorobenzene, in a test where Service uniforms were exposed to infestation for eight weeks, was found to kill all adult carpet beetles and 90% of the larvae; eggs hatched, but the young larvae died. 2% chlordane in refined kerosene painted in 3-in. (8-cm.) bands along the foot of walls, pipes, sinks, etc., and 5% chlordane in a non-inflammable oil on the outside walls, rid a 17-ward tuberculosis sanatorium of Pharaoh's ant at a cost of £75. Pit storage of grain is being tested throughout Africa and Cyprus; a gas-proof sheeting material is being tried out for this in collaboration with the Ministry of Supply.

GUILLOTINE TONSILLECTOMY AND CURETTAGE OF ADENOIDS UNDER ETHYL CHLORIDE ANAESTHESIA

BY

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This paper had been completed before the recent correspondence on the guillotine operation appeared in the *British Medical Journal*. This correspondence confirms our impression of the misunderstanding which exists concerning the guillotine operation and the anaesthesia required for it.

The published objections to the operation for removal of tonsils and adenoids in children by guillotine and curette under ethyl chloride anaesthesia would lead one to suppose that it was a thoroughly unsatisfactory procedure. This conclusion is entirely at variance with our experience; we here attempt to explain why this should be so, and why these objections should have gained such wide currency. In addition, we examine the suitability and safety of ethyl chloride as an anaesthetic agent for this operation.

Introduction

Removal of the tonsils is an extremely old operation, and is believed to have been practised before 53 B.C. It is, however, difficult to suppose that complete enucleation was often achieved, or that any definitive operation was possible before the introduction of anaesthetics. Nevertheless, in view of the technical difficulties (apart altogether from any considerations of humanity), it is worth noting that removal of the tonsils and adenoids in children entirely without anaesthesia has been not only practised but actually recommended, both in this country (Sydenham, 1935) and in Egypt (Shaheen, 1935), a mere twenty years ago.

Nowadays tonsillectomy is performed either by planned dissection or with the guillotine. Either method may be used in children, except in the presence of peritonsillar fibrosis, where, as in adults, dissection is by universal consent the correct procedure. Waugh (1909) drew attention to the poor standard of work being done with the guillotine, and recommended dissection. More recently Jobson (1942) gave what we believe to be the correct answer—namely, "... undoubtedly a great deal of bad work is done with the guillotine ... [but if] Sluder can produce 99.6% of complete enucleations, the method cannot be at fault." Throughout the intervening years the controversy over the respective merits of the two procedures has been bitter; but it is not our purpose to argue in favour of the superiority of one or other. We are concerned merely to record our impressions of what we regard as a satisfactory operation.

Technique

We have used the guillotine operation extensively in children up to the age of about 14 years, except, of course, in those with obvious peritonsillar fibrosis, and the details of the technique employed are as follows.

The only pre-operative medication administered is atropine sulphate, 1/100 gr. (0.65 mg.) injected subcutaneously about 45 minutes before operation. The gag is not inserted before beginning the induction of anaesthesia.

The child is "coaxed" to sleep with nitrous oxide from a Boyle's machine, while the anaesthetist simultaneously utters simple phrases of explanation and reassurance. The mask is applied to the face only when unconsciousness has supervened, and a little oxygen is then admitted. After a few further breaths the nitrous oxide is turned off, and some 5–10 ml. of ethyl chloride is introduced gradually into the breathing-tube. The anaesthetist indicates that the depth of anaesthesia is suitable by raising the child's head and shoulders, while a nurse removes the mask with one hand and places a small sandbag under the shoulders with the other. The surgeon now inserts the gag on the left side and opens the mouth. From this point on, the anaesthetist controls the gag with his left hand, and with his right he modifies the position of the head from moment to moment to suit the manoeuvres of the surgeon.

The surgeon next introduces the guillotine and removes each tonsil in turn, the anterior faucial pillar being gently pushed off the tonsil by one or more partial closures of the blade before the guillotine is fully closed. Each fossa is then inspected and palpated. The adenoids are then removed, the curette being introduced as often as is necessary to achieve complete removal. The child is turned over on its right side, the throat is mopped out and reinspected and the gag is removed. The chin is pushed forward routinely lest, as sometimes occurs, the temporo-mandibular joints should have been subluxated.

The patient's face and neck are liberally sponged with cold water; and finally, when the protective reflexes have manifestly returned and the bleeding has abated, the child is carried back to the ward head down, and placed in bed in the lateral or semi-prone position.

Discussion

Certain aspects of this procedure merit some discussion.

1. Pre-anaesthetic Sedation.—We believe that the dangers (Jackson, 1951) of administering pre-operative sedatives to children have been exaggerated; and we are not opposed in principle to their rational use (Anderson, 1952) in order to achieve a carefully judged effect. However, children thus sedated may exhibit post-operative somnolence and later restlessness, demanding a degree of continuous individual attention for a variable period. We feel that the necessity for sedation can be virtually eliminated if the children are handled at all stages with a sensible mixture of tact and frankness, and if, above all, they are subjected to a considerate induction of anaesthesia.

2. Anaesthesia.—The considerate induction referred to is provided by nitrous oxide and oxygen, as described above, since we agree with Bromage (1950) that it is "... more acceptable to the apprehensive patient than the most humane ethyl chloride induction." The nitrous oxide/oxygen/ethyl chloride sequence has been described before in various forms by Westell (1941), Minnitt and Gillies (1948), and Bromage (1950), among others. We have found that the great majority of children accept it almost without a murmur, though the amount of encouragement and persuasion required varies considerably. A few are a little tearful, but if sufficient patience is exerted none need be terrified. This picture presents a happy contrast to scenes which many doctors must recollect with distaste. Though it may seem obvious, it is worth pointing out that the dose of ethyl chloride for any given child is that amount which is required to produce the desired level of anaesthesia. There is no standard dose, and it is wise to have available rather more than is thought will be necessary. There are three main grounds for advocating a pleasant induction:

(a) All creatures have the right to expect that unpleasant procedures to which they have to be subjected in their own interests shall be made as tolerable as possible. This applies with even greater force to children than to adults, in that the former are more vulnerable because of their immature level of understanding, and because they are of necessity less able to protest effectively against callous handling.

(b) Many authors—for example, Burstein (1953) and Capon (1954)—have called attention to the psychic trauma which may follow crude induction of anaesthesia in children. Jackson (1951) cites night terrors, temper-tantrums, destructiveness, and increased fears. Gorham (1935) wrote: "... children may change in character... becoming nervous, irritable and waking up at night screaming... in some cases these symptoms last a week or two, in others as long as nine months. Nocturnal sedatives have had to be administered for quite long periods." Deming (1952) believes that the normal emotional growth of children may be disturbed by fears, obsessions, and regressive behaviour resulting from unpleasant anaesthetic encounters.

(c) No doubt large numbers of normal well-balanced children who are subjected to disagreeable experiences escape actual psychic trauma, but it is evident that a persistent fear of hospitals and everything connected with them may result. The development of such an attitude, which at best prejudices adjustment to the crisis of illness and at worst endangers life itself—for example, in cancer (Aitken-Swan and Paterson, 1955)—must be countered by every possible measure.

As well as fulfilling the foregoing psychological criteria, the method described provides for the immediate and continuous availability of oxygen. The importance of avoiding anoxia in all circumstances, and particularly in the presence of a potentially toxic agent such as ethyl chloride, has been repeatedly stressed, and is now very widely appreciated (Bird, 1930; Bromage, 1950). It is disturbing to learn that the use of oxygen with ethyl chloride has been deprecated on the ground that it was responsible for a prolonged and turbulent induction (Kingsford, 1930).

3. *Use of Gag.*—The gag is inserted after the child is anaesthetized, because the conscious child dislikes the presence of a gag in the mouth—it is puzzling and frightening, and it hinders the accomplishment of a smooth induction. Also, it is often dislodged deliberately or inadvertently in early anaesthesia; and if not, teeth may be loosened or damaged if the jaws are clenched in the second stage. We have, in any case, never encountered any difficulty in introducing it after the required depth of anaesthesia has been attained. It is well known that spasm of the masseters may occasionally persist even in deep ethyl chloride anaesthesia. In this event, a combination of sustained downward pressure on the chin and counter-pressure on the forehead is employed to separate the teeth enough to permit insertion of the gag, which is then opened, assisted if necessary by the pressure of the surgeon's forefinger and thumb on the lower and upper incisors respectively.

4. *Inspection.*—Should the final inspection show, if ever, that a remnant has been left, anaesthesia is resumed with nitrous oxide, oxygen, and ether or trichlorethylene by insufflation through the side-tube of the Boyle-Davis gag, or (preferably) through a nasotracheal tube; and the surgeon then dissects out the remnant.

5. *Recovery.*—The use of cold water slightly accelerates recovery from the anaesthetic by reflexly stimulating the respiration. It is also thought to hasten the arrest of bleeding, probably by inducing reflex vasoconstriction.

Classical Objections Considered

The following selection is representative of the objections of the very numerous authors who have recorded their disapproval of the guillotine operation (the italics are ours throughout).

Sharp (1952) sums up thus: "The guillotine, in the hands of experts, usually results in a satisfactory removal of large pedunculated tonsils, but the buried fibrotic tonsils present difficulties, and removal of them results in damage to the pillars of the fauces; the *necessarily light anaesthesia* generally employed gives little time for a deliberate and considered removal of the adenoids." He also remarks that, while the dissection method is the more leisurely procedure and is the operation of choice, it must be undertaken with the co-operation of an *experienced anaesthetist*.

McKenzie (1951), discussing the question "Dissection or guillotine?" remarks that there are failures with both methods, but that poor results due to the guillotine are the more common. He goes on to give a graphic description

of how they occur: "Most people are right-handed, and they seize the guillotine in their right hand, so that the right tonsil is removed first. The mouth now fills with blood, the patient may be *lightly anaesthetized* and cough repeatedly, and the left tonsil is hard to grasp. In consequence, a tonsil remnant is more likely on the left side." This is indeed a terrifying picture.

Atkinson (1942) is even more dramatic: "... hurried manipulations terminating in a rising tide of blood... The *lightly anaesthetized* patient is turned over, and, against a tightening barrier of resistant palatine muscle, the curette is forced into the nasopharynx... The adenoids become a concluding gesture in a welter of blood and confusion."

Laurence (1942) states: "... one should use an anaesthetic which permits one to do all that one wants to do." But he considers that ethyl chloride emphatically does not fulfil this specification.

Scott Stevenson (1952), comparing the two methods, considers that, though the dissection method possesses the greater advantages, it is not easy, takes longer, and requires a longer and *deeper anaesthesia*.

The criticisms embodied in these views may be grouped under two headings:

(1) That it is difficult to be certain of removing the tonsils completely, especially if they are buried or fibrotic; and that the faucial pillars and the palate may be damaged in the process. We have not found this to be so, but we have no doubt that if the guillotine is used routinely there will be failures attributable to peritonsillar fibrosis. From the description of our procedure it should be evident that there is ample time for the careful removal, inspection, and palpation mentioned. The other essential, if the peritonsillar tissues are to escape damage and easy access to the adenoids is to be provided, is that the musculature of the faucial pillars and soft palate be well *relaxed*—and this leads to the second group of objections.

(2) That the supposedly inevitable lightness of the anaesthesia, by providing inadequate muscular relaxation and compelling the surgeon to hurry, increases the hazards mentioned under (1) and impedes access to the adenoids. We are driven to conclude from the opinions previously quoted that the respective authors have based their views on the efforts of anaesthetists inexperienced in the use of ethyl chloride.

The guillotine operation is often regarded as a trivial one, and until quite recently the anaesthesia was commonly entrusted to the most junior member of the surgical team. He usually approached his task with reluctance and fear. The only positive element in his attitude was a vague but correct belief in the potency of the agent. Consequently it became his fixed resolve to brave the surgeon's annoyance at an inadequate anaesthesia rather than to run the slightest risk of the fatal result which he dreaded. Conversely, an occasional death may be attributable to a perverse determination in the opposite sense. Thus, we interpret the prevalent dislike of the guillotine operation as being largely an oblique protest against the inexperienced anaesthetist.

It cannot be too strongly emphasized that, far from being light, the anaesthesia must, on the contrary, be *deep*—a little deeper initially than the average depth of the anaesthesia for the dissection operation. The coughing and swallowing reflexes must be suppressed and the pharyngeal and palatal musculature fully relaxed to permit deliberate surgery. Further, with an agent such as ethyl chloride, which is highly volatile, and rapid both in its action and in its elimination, the *duration* of anaesthesia is closely related to the *depth* attained by the time the mask is removed. Thus, apart from providing the necessary relaxation, a reasonably deep anaesthesia assists the surgeon by allowing him longer operating time.

Moreover, is expert anaesthesia so essential for the dissection operation? Certainly, the more experienced the anaesthetist the better—but sometimes a choice has to be made. If so, we believe that the more experienced anaesthetist should be allotted to the guillotine operation, and

the less experienced for the dissection. A competent E.N.T. surgeon can help a novice anaesthetist who gets into difficulties with an endotracheal tube; and if at any time during the operation the level of anaesthesia becomes too light he can stop and wait for a minute or two until the situation is corrected. Such delays may be irksome, but they do not jeopardize the essential success of the procedure. With the guillotine operation, however, the situation is reversed. The services of an expert anaesthetist can be used to imbue a trainee surgeon with confidence by allowing him to concentrate entirely on the surgical aspects and by safely providing adequate operating-time.

Estimates of the time required for guillotining the tonsils and curetting the adenoids, and also of the time which the single-dose administration of ethyl chloride provides for the operation, vary considerably. Thus, for the operation, times as short as 30 seconds (Shaheen, 1935) and 40 seconds (Newell, 1930) are declared to be ample. Bird (1930), on the other hand, estimated his average operating time at 115 seconds, and did not find this restricted by the anaesthetic technique. Others (Atkinson, 1942; Laurence, 1942) consider that ethyl chloride cannot be relied on to provide enough time for satisfactory surgery.

We find that the surgeon has an average time of about 90 seconds at his disposal, and that this is long enough for a trained operator to accomplish his task in comfort. If the surgeon so requests, the anaesthesia can be deepened more than usual before removing the mask, and the operating-time thereby safely increased to at least two minutes.

Dangers of Ethyl Chloride

Warning of the dangers of ethyl chloride are numerous. Thus, an authoritative textbook of pharmacology (Goodman and Gilman, 1941) states: "... although ethyl chloride is less toxic than chloroform, ventricular fibrillation and sudden cardiac arrest may occur." Stirling (1954) considers that atropine is essential to protect against primary cardiac failure due to vagal stimulation. Leigh and Belton (1946) recommend "adequate premedication" with atropine, but it is more than doubtful if their scheme of dosage fulfils their own criterion of "adequacy."

From recent experimental and clinical studies (Virtue and Pierce, 1951; Bush, Bittenbender, and Adriani, 1952) we conclude that, although these statements are probably applicable to the dog, they cannot be regarded as proved for human subjects. Even in light *chloroform* anaesthesia, the protective role of atropine is doubted (Clark, 1952).

It must be assumed that ethyl chloride has been commonly administered to patients who have not had atropine, or who have had it in theoretically inadequate dosage. Series of 40,000 (Sington, 1930), 30,000 (Hewar, 1930), and 11,723 (Kingsford, 1930) ethyl chloride anaesthetics without a fatality have been reported. None of these authors stated his views on the role of atropine, and we must therefore conclude that they did not employ it, or that they considered its contribution to safety insignificant.

Since, however, most surgeons regard a dry mouth as essential in tonsillectomy, there need be no further discussion of this point.

Various authors (Jobson, 1942; Macintosh and Bannister, 1947; Minnitt and Gillies, 1948; Deming, 1952) draw attention to the dangers and disadvantages of ethyl chloride, including its depressant effect on the myocardium, the narrow margin between the effective and the lethal dose, the liability of laryngospasm, post-operative vomiting, and liver damage, and its potency and the consequent risk of overdosage. In some schools these considerations have been taken so seriously as to lead to the abandonment of ethyl chloride. We have no doubt that this view is too extreme, but we do not enumerate the risks of ethyl chloride anaesthesia merely to dismiss them—rather to emphasize our point that it should be entrusted only to those who have become skilled in its use through proper training and supervision. With this qualification it has proved in our hands to be an admirable agent for the operation under discussion.

Mortality

During the ten-year period 1943–52 the operation of guillotine tonsillectomy and/or curettage of adenoids was performed on 12,038 children up to the age of 14 in Carlisle and the surrounding district by Mr. R. S. Venters or one of his registrars, without a single death.

The only other comparable series which has come to our notice is that of Martin (1922), embracing 14,960 cases operated on in a teaching hospital between 1907 and 1920 with six deaths. Minnitt and Gillies (1948) quote this series along with a personal communication from the author which brings the total number of cases to 23,960, and the deaths to eight. The series is not in fact strictly comparable to ours, because in a small number of cases (not stated exactly) the tonsils were dissected, and it was not wholly confined to children. Nevertheless, all eight deaths were in children undergoing the guillotine operation. In fairness we must state our belief that the contrast in the mortality between Martin's series and our own is largely due to the spectacular improvement in the health of the general population, and especially in that of the "hospital class," during the last two decades.

Summary and Conclusions

Guillotine tonsillectomy and curettage of adenoids carried out by an experienced surgeon, under ethyl chloride anaesthesia administered by a *competent anaesthetist*, is a satisfactory operation.

The procedure, as carried out by us, is described in some detail, emphasis being laid on the necessity for a considerate induction of anaesthesia.

Those who have recorded their objections to the operation base their opinions on an experience of inexpert anaesthesia, usually too light.

Contrary to widespread belief, the operation requires an anaesthesia of considerable depth.

The competent anaesthetist, who is aware of the dangers of ethyl chloride, can employ it safely.

A recent series of over 12,000 cases without a death is recorded, and contrasted with one of some 25,000 dating from the first quarter of the century, in which there were eight deaths.

We are indebted to Mr. R. S. Venters for making his records available to us and for his advice.

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ANXIETY REACTIONS IN HYPNOSIS

BY

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Many patients exhibit some minor degree of anxiety when the question of hypnosis is first put to them. This is a fairly normal reaction. It is of little consequence, and is ordinarily minimized by establishing good rapport with the patient before mentioning the idea of treatment by hypnosis.

At the Threat of Loss of Ego Control

A mild, transitory anxiety reaction in the early stages of induction is very common. This is associated with the relinquishing of voluntary control. The abandonment of volition is a threat to the ego. It would seem that, under these circumstances, anxiety functions as a warning that all is not well with the psyche. For example, when hypnosis is being induced by suggestions of relaxation, it often happens that the first few suggestions are accepted easily; the patient relaxes, the limbs become flaccid, the facial muscles lose their tone, and the lips tend to gape. At this stage, when the patient is just on the verge of abandoning ego control in favour of the therapist, there is an exacerbation of anxiety. It is manifested by a general increase in tension. The relaxation is not so complete; the naso-labial folds become more marked; there may be some degree of frowning of the brow and a slight tightening of the lips. If the anxiety is not recognized it may motivate the production of defences against hypnosis, particularly in the form of restlessness, which not only provides an outlet for the anxiety but also serves as an effective defence against hypnosis by relaxation. On the other hand, as soon as the anxiety shows itself the suggestions of relaxation can momentarily give way to suggestions of calm and ease and security. The patient becomes aware of the therapist's empathy; he is reassured; the affective relationship is intensified; and the anxiety is allayed.

This type of anxiety reaction occurs more frequently when rapport with the patient is inadequate. A satisfactory affective relationship with the patient prior to hypnosis makes it easier for him to introject the idealized figure of the therapist, and the abandonment of ego control becomes so much the smoother.

At the Sudden Awareness of Hypnosis

In other circumstances much more severe anxiety reactions may occur. Occasionally during the induction, patients experience a sudden violent paroxysm of anxiety. This is quite distinct from the mild anxiety described above. It occurs in patients who may have given verbal acquiescence to the idea of hypnosis, but who nevertheless really believed that they could not be hypnotized. The acute anxiety follows the patient's first awareness that he is in fact hypnotized and has lost voluntary control.

Some patients defend themselves against hypnosis by simulation. By consciously carrying out all the therapist's suggestions the patient feels that he obeys the suggestions voluntarily, and by so doing has avoided being hypnotized. Sometimes it is obvious that the defence is used in clear consciousness; at other times it would seem to be an unconscious mechanism. If the patient is allowed to persist with his defence he actually becomes hypnotized, but he is not aware of it until he is challenged. It is at this moment that acute anxiety may be precipitated. The reaction is accompanied by the physical signs of anxiety, pallor, tremor, sweating, dilatation of the pupils, and rapid shallow breathing. The pulse is rapid and may be thready or full and bounding. To this there may be added a certain degree of collapse. The suddenness with which the condition may

develop can be quite alarming. The natural impulse to terminate hypnosis and wake the patient must be resisted. Suggestions of relaxation, drowsiness, and eventually sleep are added. Provided the patient is kept hypnotized this episode is easily managed, but there is a tendency for the acute anxiety to bring the patient out of hypnosis. The anxiety comes on without warning, and develops very quickly. Accordingly, it is wise to deepen hypnosis immediately the first signs of anxiety are observed. It is obviously very important that the therapist does not communicate to the patient his own anxiety by any non-verbal or extra-verbal means.

A company director in his late forties sought relief from tension and depression. Two years previously he had been treated with narcoanalysis and E.C.T. without improvement. He was a hysteroid personality, and fancied himself as an amateur actor. On a verbal level he desired hypnosis. His first defence was by depreciation. He depreciated the whole situation. By non-verbal means he conveyed the idea that the whole thing was silly. Induction was made by arm levitation. On the first suggestion of lightness of his hands he immediately lifted his arms into the air. When movement was suggested he straightway waved his arms about. He was smiling all the time, and it was obvious that he was defending himself by simulation. Following suggestions, various antics were performed with his arms, and he was allowed to believe that the therapist thought him hypnotized. He was in no way challenged, and was dismissed without comment. The same procedure was repeated in the second session, and in the third session the patient was suddenly challenged to put his arms down. He was unable to do so, and immediately developed an acute anxiety reaction. The anxiety was controlled by a deepening of hypnosis, and by allowing the patient to lie down. Subsequent hypnosis was uneventful.

At the Sudden Awareness of Repressed Material

A more common type of anxiety reaction occurs when a patient suddenly becomes aware of repressed traumatic material. Of course, this kind of reaction may occur in any type of reductive psychotherapy, but it occurs more readily in hypnoanalysis because the hypnotic state can allow the sudden surge into consciousness of repressed conflicts. In this respect it is important to distinguish between release of repressed material and awareness of the material. It would seem that, so long as the patient remains reasonably deeply hypnotized, the release of repressed material, by verbal ventilation, by acting out, or by projective techniques, does not produce anxiety. The hypnotized patient can express the traumatic conflicts in words, he can abreact and express the emotion appropriate to the conflict without producing anxiety; but if, for one reason or another, the hypnosis becomes lighter and the patient is able to comprehend in consciousness what he is expressing, then there may be a severe acute anxiety reaction. There is danger in the therapist becoming too interested in the content of the repressed conflicts and failing to keep watch on the depth of hypnosis. Abreaction itself may lighten hypnosis to such an extent that the patient may wake spontaneously, and in such circumstances acute anxiety may result.

There is another factor. Sometimes the production of anxiety from the sudden awareness of repressed conflicts is dependent on the means by which the repressed conflicts are expressed. In hypnoanalysis the conflicts are ordinarily expressed in words. Material that is too traumatic to be borne in consciousness is dealt with by the various psychic defence mechanisms and is again repressed, so that, on waking, the patient may remember the less traumatic incidents but has a spontaneous amnesia for the more traumatic material. But in hypnography—a technique in hypnoanalysis in which the hypnotized patient projects his conflicts by painting or drawing—these defence mechanisms cannot work so easily. The spoken word is transitory; it is easily repressed and forgotten. The painted representation of a conflict has a degree of permanence. The patient is confronted with it, and it tends to impress itself much more on his conscious awareness. Although the paintings are removed before the patient is awakened from hypnosis,

experience suggests that this type of acute anxiety reaction tends to occur more often during hypnography than in verbal hypnoanalysis.

An inadequate, dependent young man was receiving treatment for loss of confidence. When hypnotized he was given a crayon and told that his hand would draw something that represented his problems. With a rhythmical movement he made a series of marks on the paper. He became more and more preoccupied with what he was doing. The rhythmical character of the movement became more pronounced. His expression was very intense, and it seemed obvious that the drawing was a sexual equivalent. He began to verbalize his thoughts, and the sexual nature of the activity was confirmed. He abreacted a good deal of emotion. Hypnosis became lighter. He suddenly turned very pale and started to sweat. He woke from hypnosis spontaneously. In a shaky voice he said that he thought he had woken up and thought he was going to vomit. He became intensely tremulous; the sweating was profuse; his pulse was rapid and of poor volume. He looked alarmingly ill. He was immediately rehypnotized and given suggestions of calm and well-being. His physical condition was restored in ten to fifteen minutes. In subsequent sessions care was taken to maintain an adequate depth of hypnosis, and no further complications were encountered.

At the Inability to Fulfil a Post-Hypnotic Suggestion

Post-hypnotic suggestion is the spear-head of suggestive therapy, but this extremely useful weapon may at times be the means of precipitating an acute anxiety reaction. There is an extremely compelling quality about a post-hypnotic suggestion, and if the patient is unable to carry it out an acute anxiety reaction may result. In this respect it does not matter whether the patient is prevented from fulfilling the suggestion by reason of outside environmental factors or by reason of psychic factors within himself.

Accordingly, in suggestive therapy, specific post-hypnotic suggestions are best used sparingly and only when it is as certain as possible that the patient has both the material and the psychic means of carrying out the suggestions. On the other hand, non-specific post-hypnotic suggestion has not the same power to produce anxiety reactions, but nevertheless can give suitable patients considerable symptomatic relief.

A man of obsessive personality sought relief from particularly intractable insomnia of many years' duration. The severity of the insomnia had been confirmed by the hospital night staff, who reported that the patient hardly slept at all. He had previously been treated by narcoanalysis, "somnifaine," and E.C.T. without benefit. At different times he had been addicted to both paraldehyde and chloral hydrate. He also complained of irritability and uncontrollable rages. He was easily hypnotized, and after several sessions he was given the strong post-hypnotic suggestion that he would sleep each night without sedative until I saw him in a week's time. He was unable to fulfil the post-hypnotic suggestion, and arrived for the next appointment in a state of acute anxiety and covered with a generalized dermatitis. He was given suggestions of calm and relaxation, and ordered to take a sedative at night. In a week's time both the anxiety and the skin condition had subsided. He subsequently gained almost complete relief from the irritability and rages, although the insomnia persisted.

Discussion

Recent British and American literature suggests that there is a revival in the use of hypnosis, not only by psychiatrists using specialized hypnoanalytical techniques but also by the profession in general. Fortunately, acute anxiety reactions are not common, but when they do occur they may be alarming on account of the severity and the rapidity of onset. During the hypnotic session such reactions may occur from the sudden realization of having been hypnotized, or following the sudden awareness of repressed material. In each case the situation is met by immediately increasing the depth of hypnosis or by rehypnotizing the patient. Hypnosis with suggestions of calm allows the usual psychic defence mechanisms to re-establish themselves, and material that is too traumatic at the present degree of insight is automatically repressed again. Any attempt to deal with this type of acute anxiety at a conscious level is likely to get out of hand, and is best avoided.

Anxiety reactions from the inability to fulfil a post-hypnotic suggestion usually occur in the absence of the therapist. Such reactions can be minimized by using non-specific post-hypnotic suggestion, where possible, in place of specific suggestion. Specific suggestion should be used only when it is reasonably sure that the patient has both the physical and the psychic ability to fulfil the suggestion.

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TRAUMATIC RUPTURE OF THE PANCREAS

BY

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Traumatic subcutaneous rupture of the pancreas is a relatively rare condition. It was first reported by Travers (1827), whose patient was crushed by the wheel of a coach. The subject was reviewed by Stern (1930). Phillips and Seybold (1948) noted that the diagnosis was made pre-operatively in only 4 out of 15 cases found in the literature of the previous ten years. The pancreas lies deeply in the abdomen and is normally well protected against possible injury. However, Aldis (1946) pointed out that if the abdominal muscles happen to be flaccid at the time of injury the pancreas may be crushed against the vertebrae, even by mild force. A variety of other mechanisms may cause pancreatic injury; in a case described by Keynes (1944) rupture was apparently due to blast from an under-sea explosion. As might be expected, injury to the pancreas is often accompanied by damage to other abdominal organs, as in Travers's case, when both duodenum and jejunum were involved. This often complicates early diagnosis but makes operative treatment imperative. The case reported below was one of complete rupture of the pancreas occurring as an isolated injury due to an apparently minor blow.

Case Report

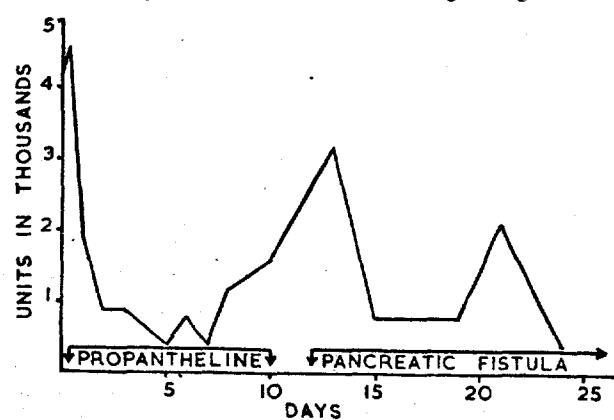
The patient was a young man, aged 20, in good health, with no previous medical history of note. About 24 hours before admission to hospital, while playing football, he had received a blow in the epigastrium from a player's knee. He felt "winded" and nauseated at the time. After a brief rest he returned to the field of play, but had to leave after a few minutes because he felt dizzy. He was able to go home after visiting the casualty department, where no serious symptoms or signs were found. Only slight epigastric pain was felt over the next few hours, but after a meal he vomited three times. The pain also became severe in the entire upper abdominal area. It was worse on moving and hiccuping. There was no pain in the shoulders or back. The pain and vomiting persisted during the night until his admission to hospital the following day.

When first seen he seemed in good general condition and had only moderate epigastric pain. The axillary temperature was 99.2° F. (37.3° C.), the blood pressure 120/80 mm. Hg, and the pulse 88. He was well coloured, the extremities were warm, and the veins were well filled. There was no wound or bruising of the abdominal wall. Only a minor degree of abdominal tenderness was present, generalized but more noticeable on the left side of the abdomen and in the left flank. No true rigidity was found, but there was some increase in muscle tone, again more pronounced on the left side. It was thought that a small amount of fluid was

present in the peritoneal cavity, as shifting dullness was elicited on the left side. Liver and spleen were not palpable. Bowel sounds were diminished, only an occasional sound being heard. Physical examination was otherwise negative. The urine was normal. Radiological examination of the abdomen showed slight gaseous distension of two loops of small intestine in the mid-abdominal region. During the next few hours an improvement occurred; the pulse remained between 70 and 80 and the temperature was 99° F. (37.2° C.). After drinking a cup of tea the symptoms returned; the pulse rose to 86 and the temperature to 101.6° F. (38.7° C.). There was a slight increase in abdominal tenderness and guarding. At this point, about 30 hours after injury, operation was carried out.

Under general anaesthesia, the abdomen was opened through a left paramedian incision. A mild peritonitis was present and a few ounces of blood was found in the left paracolic gutter and in the pelvis. A number of small white plaques were present in the mesentery of the proximal jejunum and in the retroperitoneal region, immediately to the left of the duodeno-jejunal flexure. Oedema and a dirty brown discoloration were seen in the lesser omentum and in the transverse mesocolon. On opening the lesser sac below the greater curvature of the stomach, the pancreas was found to have been completely transected from its upper to its lower border. This had occurred in the region of the portal vein and mesenteric vessels, so that the superior mesenteric artery could be seen pulsating, lying freely immediately behind the torn edge of the right segment of the pancreas. The two parts of the pancreas were separated by a distance varying from 1 to 2 cm. Very little blood was found in the neighbourhood of the injury and no active haemorrhage was occurring. The tail and distal part of the body of the pancreas were oedematous and felt hard and tense. The only other injury found was a small tear 5 cm. long on the costal surface of the right lobe of the liver involving little more than serosa. The abdomen was closed after leading a soft rubber drain to the site of rupture of the pancreas. No repair of the pancreas or pancreatic duct was attempted. The patient's condition at the end of operation was good, the blood pressure being 120/82 and the pulse rate 118.

Post-operative treatment was directed towards keeping pancreatic secretion at a minimum until healing of the pancreas had occurred, with a view to avoiding or minimizing pancreatic necrosis due to the liberation and activation of pancreatic enzymes. Little or no fluid was given by mouth for the first 48 hours after operation, and only 1.5 litres of intravenous fluid was given initially. Intravenous fluid therapy was then discontinued, as it was thought that the water administered might well increase the volume of fluid available for pancreatic secretion. In addition, propantheline bromide was given by mouth in a further effort to restrict the secretion of pancreatic juice. Dosage varied between 15 and 60 mg. daily, and a total of 390 mg. was given over



Serial observations of serum amylase in a case of rupture of pancreas. Values in Somogyi units. The period of propantheline therapy and the delayed onset of pancreatic fistula are also shown.

the first 10 days. On one occasion, 24 hours after treatment, the drug was temporarily stopped, as the blood pressure had risen to 170/120. This rise did not recur when treatment with the drug was resumed.

The progress of the pancreatic lesion was followed by frequent estimation of the serum amylase. On admission, before operation, the level was 4,180 Somogyi units, rising to 4,600 units after operation. The series of estimations are shown in the Chart. Morphine was not used to control pain, because of its tendency to cause spasm of the sphincter of Oddi. Pethidine was found to be effective, but was required in a dosage of 300 mg. daily for the first three days. By the fifth post-operative day the pain had practically gone, but the patient was very restless. He found it increasingly difficult to swallow fluids and became extremely dehydrated. His weight fell to 6 st. 6 lb. (40.8 kg.) from a normal of 9 st. 11 lb. (62.1 kg.). On the following day the axillary temperature rose to 100° F. (37.8° C.) and a degree of peripheral circulatory failure was apparent; the blood pressure was 104/90 and the pulse rate 120, the extremities were cyanosed, and there was very poor filling of the skin vessels. Examination of the blood gave the following results:

Serum Na ..	..	..	340 mg. per 100 ml.
Serum K ..	..	..	22 " " "
Serum chloride ..	..	..	620 " " "
Co ₂ combining power ..	..	..	46 vols. %

An intravenous infusion of dextran raised the blood pressure to 125/90, and water was given in the form of 5% glucose intravenously over the next 72 hours, by which time he was able to drink adequately and had made a striking clinical improvement. At the time rehydration was complete, coinciding with the end of propantheline therapy, a discharge of pancreatic fluid began from the drainage track. Little or none had occurred up to this point. Shortly after the fistula became active the serum amylase fell (see Chart). It had previously risen during the intravenous therapy. The clinical course now became uneventful, apart from a minor episode as shown by the last rise in serum amylase when the fistula became temporarily blocked. The fistula itself presented no difficulties in management, as only a small amount of pancreatic fluid was lost daily. The skin was prevented from digestion by aluminium paste. By the sixteenth day his weight had risen to 8 st. 8 lb. (54.4 kg.) and by the twenty-sixth day to 8 st. 11 lb. (55.8 kg.). The fistula healed and the patient was discharged after 33 days in hospital. When seen finally two months later, he was in excellent health and had no evidence of pancreatic dysfunction; his weight was static at his normal of 9 st. 11 lb. (62.1 kg.) and there was no radiological evidence of pancreatic calcification.

Discussion

Symptoms and physical signs following rupture of the pancreas can be very variable. They may occur early and be of a severity similar to those found in haemorrhagic pancreatic necrosis, or in others may be mild and delayed (Bockus, 1946).

Estimation of serum amylase may give valuable assistance in making the diagnosis, which should be suspected in all cases of upper abdominal injury. High values were found in all eight cases of a series described by Naffziger and McCorkle (1943). In the case described above, the amylase level seemed to follow the progress of the lesion with some fidelity. The treatment of the condition is operative, as otherwise it is impossible to decide with certainty what damage has been done to the pancreas or other organs. It would seem doubtful whether any operative repair of the pancreas should be attempted, as further pancreatic damage may be thus precipitated. It appears logical to attempt to cut down pancreatic secretion in the early stages to allow healing to occur. Both secretin and vagal mechanisms can be impaired to some extent by combining a reduction of oral intake with the use of a drug such as propantheline bromide. Care must be taken to avoid the production of a severe dehydration by this method.

Summary

A case of subcutaneous rupture of the pancreas due to an apparently minor injury is described. The treatment adopted was an exploratory operation followed by limitation of the secretion of pancreatic juice. The use of serial serum amylase estimations is recommended, both as a diagnostic test and as an index of the progress of the lesion.

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CHLORPROMAZINE HYDROCHLORIDE IN INTRAOCULAR SURGERY

BY

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Anaesthesia for intraocular surgery presents many special problems, and until recently it has not received serious attention from anaesthetists. Ophthalmologists have evolved a very efficient local analgesic technique, and operative results have on the whole been good, but there has always been the risk of an uncooperative patient. Furthermore, patients requiring intraocular surgery are frequently elderly, and the clinical picture is complicated by a varying degree of arteriosclerotic cerebral degeneration, so that complete co-operation cannot be assured. In addition, any operation on the eye must be an unpleasant experience for a conscious patient, who may flinch or "squeeze" the eye in such a manner as to jeopardize the ultimate result—a possibility which must be a constant source of anxiety to the surgeon.

Good visual acuity will often make a great difference to the mental and physical well-being of these difficult patients, so that any improvement in technique is important if it simplifies the surgeon's task and gives a better chance of success. Many patients requiring surgical intervention on the eye are suffering from general medical diseases—hypertension, cardiovascular disease, diabetes, chronic bronchitis—to say nothing of senility; and in this unit the pre- and post-operative supervision of the patient by the anaesthetist has proved of the utmost value.

Anaesthetic Requirements for Intraocular Surgery

The main anaesthetic requirements of a patient undergoing intraocular surgery are: (1) The anaesthetic technique must in no way raise the intraocular tension at any stage, and in fact should lower it so far as possible. (2) No sudden increase in arterial or venous blood pressure must be permitted, and when possible some degree of hypotension is desirable to lower the intraocular tension still further. (3) A tranquil recovery period free from restlessness, vomiting, coughing, and "squeezing" of the eye is essential; in

fact a prolonged period of quiescence for at least 24 hours after the operation is an advantage and reduces the risk of ocular complications.

During the last few years we have endeavoured to improve the technique of anaesthesia for intraocular surgery. In the first place, a method was used whereby the patient was premedicated to such a degree as to produce almost light-plane general anaesthesia, and this was combined with local infiltration analgesia and general akinesia, using D-tubocurarine in sufficient doses to cause relaxation of the levator palpebrae muscle and paresis of the extraocular muscles. This method usually produced good results and eliminated the need for co-operation from the patient; it also overcame the hazard of "squeezing" of the eye during the operation and for some time afterwards, and furthermore it lowered the intraocular tension and thus reduced the chances of vitreous loss during extraction. The main difficulty was, however, to judge the patient's response to premedicant drugs. While in some cases the technique left little to be desired, in others the effect on the patient was such as to produce severe depression of the vital centres, particularly of respiration, so that the procedure became rather hazardous. Furthermore, some patients became excitable and unmanageable.

The Suitability of Chlorpromazine

Chlorpromazine hydrochloride ("largactil") has been used in anaesthesia as one constituent of the "lytic cocktail," a mixture of drugs calculated to depress tissue metabolism and inhibit compensatory autonomic reflexes, thereby reducing the amount of the agent required to induce and maintain anaesthesia; or it may be used to allow operation without a general anaesthetic at all, only local analgesia and a muscle relaxant being necessary. It has also been employed in psychiatric medicine for the treatment of conditions characterized by agitation and central psychomotor overactivity. It was on the last count that we thought that this substance might produce favourable circumstances for intraocular surgery and give more consistent results than the previous techniques.

Chlorpromazine hydrochloride has a variety of pharmacological actions; those important in intraocular surgery are: (1) production of sleep and general lowering of metabolic rate; (2) potentiation of the action of other analgesic and anaesthetic drugs; (3) depressant effect on the vomiting centres; (4) pronounced anti-adrenaline effect, and (5) some reduction in muscle tone. It has a prolonged action, during which the patient sleeps peacefully, returning gradually to full consciousness in 12 to 24 hours; further, although sleeping most of the time, the patient can be roused and answer questions rationally after one to three hours. There is a considerable degree of depression of cerebral activity, but, even so, the respiratory rate is not depressed as much as might be expected; actually the amplitude is slightly increased. The central depressive effect on the vomiting centre is particularly advantageous.

Its effect on the blood pressure in normotensive patients is not so marked, but the greater the degree of hypertension the more precipitous is the fall in blood pressure; however, in no case in the present series did a patient appear to suffer any ill effects as a result of this. There is often a preliminary rise in the pulse rate, but this soon settles at slightly above normal. The patient becomes pale, but the peripheral circulation appears good.

Technique

The night before operation patients receive sedation with quinalbarbitone ("seconal"), 1½ or 3 gr. (0.1 or 0.2 g.). One hour pre-operatively quinalbarbitone, 1½ gr. (0.1 g.) by mouth, and pethidine, 100 mg. intramuscularly, are administered; in some frail subjects the quinalbarbitone has been omitted. The patient is brought to the anaesthetic room 15 minutes before the operation is due to start. An intravenous injection of a mixture of 50 mg. chlorpromazine hydrochloride and 100 mg. pethidine diluted to 20 ml. with

sterile water is started. The injection is given slowly at the rate of about 1 ml. per minute until the patient falls asleep and can tolerate a lubricated artificial airway. The dose required varies from 20 to 45 mg. of chlorpromazine and 40 to 90 mg. of pethidine. During induction a few patients complain of thirst or palpitations, but these are of short duration. Patients even at this stage are often just capable of responding to shouted instructions, but in a most apathetic way, and their efforts are poorly maintained. On questioning afterwards they have no recollection of this; on the other hand, there appears to be no retrograde amnesia, and all remember coming to the anaesthetic room.

A regional infiltration with procaine is given, coupled with a retrobulbar injection. A long, narrow-bore tube connected to an oxygen cylinder is placed beneath the face towel so that the open end is in close proximity to the artificial airway in an attempt to keep the air circulating beneath the towels and increase the oxygen concentration.

The patient sleeps peacefully throughout the operation, and the operator can take as long as he wishes without the fear of a restless patient. After the operation patients cause the minimal amount of trouble in the ward, and the method has been well received by the ward sister. After one to two hours patients will often remove their own airways. Unless disturbed, they sleep for the remainder of the 24 hours. If roused they answer questions with progressively more enthusiasm, and quickly drop off to sleep again. Next morning they have all appeared normal, the majority having no recollection of the previous 24 hours.

Results

Since March, 1954, 80 patients have been anaesthetized in this way. Their ages ranged from 18 to over 80 years, the majority being between 60 and 80 years. Three-quarters of this number were undergoing cataract operations, and the remainder operations for glaucoma and corneal grafting. There has been no mortality or morbidity in this series, and the patients' post-operative condition has been excellent. Although the method has not been used on the extremely frail and those with severe cardiac disease, it has been used for nervous patients, and also in many cases with marked signs of arteriosclerotic cerebral degeneration where a purely local technique would have been dangerous.

In one case vomiting occurred four hours after the operation, but it was of very short duration, and in this case there was a history of many years' "gastric trouble." With this exception there has been no coughing or straining in the post-operative period and recovery has been extremely quiet and uneventful. Two cases of severe hypertension, both with a pre-operative systolic blood pressure of over 250 mm. Hg, caused some anxiety in the post-operative period. Soon after injection of the chlorpromazine-pethidine mixture the systolic blood pressure in both cases fell to between 70 and 90 mm. Hg, and it remained at this level for just over three hours post-operatively. Apart from the hypotension, the physical state of these two patients appeared satisfactory and the pulse remained slow and easily palpable. At the end of three hours the blood pressure began to rise slowly in each case, and returned to the pre-operative level in 12 hours. Both patients made an uneventful recovery.

Summary

A method of anaesthesia for use in intraocular surgery has been described, the agent being a mixture of chlorpromazine hydrochloride and pethidine.

The results obtained in 80 cases have been briefly recounted.

The main advantages of the method are: (1) no co-operation is required from the patient during the operation or for several hours afterwards; (2) it produces a low-tension eye ideal for intraocular surgery; and (3) the recovery period is extremely tranquil.

LIVER DAMAGE AND EOSINOPHILIA FOLLOWING CHLORPROMAZINE THERAPY

REPORT OF A CASE

BY

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A relationship between chlorpromazine therapy and liver damage has been recognized. The extent of liver damage varies; at least one fatal case has been reported (Boardman, 1954). Lemire and Mitchell (1954) mention the occurrence of transient eosinophilia during chlorpromazine jaundice. The present case report also illustrates this unusual phenomenon.

Case History

The patient, a man aged 52, was of Jewish extraction. During the last four years, electric convulsion therapy had been given elsewhere on some 30 occasions for a recurring depressive state. Between March 31 and April 12, 1954, chlorpromazine was administered orally, the total dosage being 1.5 g. His previous medical history and family history were not relevant. About ten days after beginning this treatment he became nauseated. During the next three days he became febrile and began to vomit. He complained of pain in all his joints, frontal headaches, rigors, loss of appetite, and colicky abdominal pain; he developed a continuous burning pain in the epigastrium. Chlorpromazine was suspended. Admission was arranged to the Royal North Shore Hospital of Sydney on April 19.

Physical examination revealed a well-developed middle-aged man who was obviously jaundiced. His temperature was 102.2° F. (39° C.). The liver was not palpable, but there was generalized abdominal tenderness, maximal in the right hypochondrium. There were no splenomegaly, no glandular enlargement, and no abnormality on rectal examination. The blood pressure at the time of admission was 75/50. Subsequent readings were in the order of 100/70. The urine was very dark, and analysis revealed the presence of bile pigments, bile salts, and an excess of urobilinogen. The first faecal specimen examined after admission was pale.

On April 19 the leucocytes numbered 15,300 per c.mm., of which 49% were eosinophils. On the 20th the white cells totalled 14,900 per c.mm. (eosinophils 58%); the serum proteins were 7.9 g.%, the albumin-globulin ratio was 2.4:1; the thymol turbidity was 1 unit (normal range 0-4); the serum alkaline phosphatase was 12.8 modified Bodansky units (normal range 2.2-8.6) (Shinowara *et al.*, 1942); and the serum bilirubin was 3.8 mg. per 100 ml. The Casoni test was negative, and no ova, cysts, or parasites were found in the stools. The chest x-ray findings were normal; the plain x-ray film of the abdomen showed no gross abnormality; repeated examinations of the stools for occult blood were negative; and the Eagle flocculation test was negative. Three days after admission the temperature had fallen to normal. A slight subjective improvement had occurred but he remained deeply jaundiced.

By April 30 the diagnosis had not been established, so it was decided to perform liver biopsy by needle aspiration. This was done on May 3. The section showed bile pigment in the bile canaliculi, mainly near the centres of the lobules. There was no accumulation of bile in the bile ducts of the portal tracts. The liver cells appeared healthy throughout. Some of those near the centres of the lobules had bile in their cytoplasm. In the supporting tissue of the

portal tracts there were more lymphocytes and histiocytes than normal. The fibrous tissue was not increased. The Kupffer cells contained no bile pigment. A diagnosis of biliary obstruction was made.

Laparotomy was performed on May 10. The gall-bladder was normal and the common duct was not dilated. On opening the duct there was only a moderate flow of bile. A probe was passed towards the porta hepatis. However, neither the right nor the left intrahepatic duct could be entered, and it was thought that there was an obstruction at the origin of the intrahepatic portion of the common duct. The common bile duct was drained, using a T-tube. No abnormality was found on palpation of the other intra-abdominal organs.

Apart from a low-grade post-operative fever, due to a pulmonary infection, and mild colicky abdominal pain, convalescence was uneventful. The quantity of bile which drained ranged from 75 to 480 ml. daily from the first to the tenth post-operative days. These figures are within normal limits (Rundle *et al.*, 1955).

Nine days after operation (May 19) a cholangiogram was done. The gall-bladder and bile ducts filled well and appeared normal. The biliary drainage tubes were removed on May 26. At this time the degree of jaundice was lessening (serum bilirubin 3.8 mg. per 100 ml.) and the patient was beginning to regain his appetite and to feel well. The eosinophils had fallen to 5% of 16,300 cells.

Improvement was steadily maintained, and when discharged on June 12 the jaundice had almost completely subsided and the patient was feeling well.

When last seen, on December 23, he appeared to be perfectly well; in the interim further shock treatment had been given. The serum bilirubin, the serum proteins, and the thymol turbidity values were normal, but the urinary urobilinogen was still increased. The total white cell count was 10,950 per c.mm., and 6% of these were eosinophils.

Discussion

Both the patient and his wife were convinced at the time of admission that the illness had resulted from chlorpromazine, and his medical attendants at first thought that he was suffering from hepatitis. It was necessary to distinguish between an obstructive jaundice and a hepatocellular jaundice. In favour of the former were the presence of dark urine containing bile pigments and salts, the pallor of the stools, and the rising level of the serum alkaline phosphatase. However, it was difficult to explain the presence of excess urobilinogen in the urine if this really was an obstructive lesion.

The presence of eosinophilia suggested the possibility of an allergic process. Hodgkin's disease was considered, but there were no enlarged glands and the spleen was not enlarged. Parasitic causes of eosinophilia were sought but were not found.

The results of the liver biopsy suggested an obstructive lesion, but this could not be definitely demonstrated at operation. In fact, the post-operative cholangiogram showed the biliary tree to be normal. A careful review of sections of the liver biopsy has since been made and the appearances are now considered to be those described in the so-called cholangiolitic hepatitis (Watson and Hoffbauer, 1946; Goulston and Smith, 1951).

It would appear, therefore, that this patient was suffering from a form of hepatitis. The biochemical investigations may be explained on the basis of hepatitis with obstruction.

Infective hepatitis must be considered in the differential diagnosis, especially as it is common in the Sydney community at present. Eosinophilia does not appear to have been reported in this disease. On the contrary, it is stated (MacCallum *et al.*, 1951) that eosinophils are commonly absent in infective hepatitis. In this case the total number of eosinophils increased, attaining the high percentage of 58 at the height of the illness.

It is interesting that Lehmann and Hanrahan (1954) have noticed the occurrence of allergic reactions, such as urticaria and asthma. In their series of 71 patients treated over a period of four months with chlorpromazine, 13% showed such reactions. However, they do not mention eosinophilia. In our patient the eosinophilia may have been indicative of an underlying allergic reaction.

Lemire and Mitchell (1954) observed three cases of chlorpromazine jaundice in elderly people. In two of these patients a transient eosinophilia of 7 to 17% was noted. The liver-function tests revealed a hyperbilirubinaemia, an increased serum alkaline phosphatase, and a normal thymol turbidity. Two had liver biopsies performed, and all three were subjected to surgery. The authors consider that their patients were suffering from toxic hepatitis due to chlorpromazine, the mechanism of the complication being unknown. Their findings and conclusions correspond with our own.

Further observations will be necessary to establish whether our patient has sustained permanent liver damage as a result of chlorpromazine therapy. The presence of excess urobilinogen in the urine six months after apparent recovery does suggest this.

Summary

A case of hepatitis following chlorpromazine therapy is reported.

The occurrence of eosinophilia in this illness is discussed.

I wish to thank the General Medical Superintendent of the Royal North Shore Hospital of Sydney for permission to report this case; and Dr. F. A. E. Lawes, Mr. F. F. Rundle, Dr. I. D. Thomas, and Dr. K. Viner Smith for assistance in preparation of the paper.

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Medical Memoranda

Anaesthesia Following Long-term Oral Chlorpromazine Hydrochloride Therapy

A review by Dundee (1954) of the pharmacology and applications of chlorpromazine hydrochloride records the widespread clinical uses of this drug outside hospital practice, and the increasing possibilities of anaesthetists meeting emergency admissions so treated. The following case is put on record so that others may avoid "anaesthetist's distress" in similar cases.

CASE REPORT

A feeble-minded man of 20, weight 11½ stone (73 kg.), was admitted in February, 1955, with a diagnosis of acute appendicitis. He was given ½ gr. (22 mg.) of "omnipon" and 1/150 gr. (0.43 mg.) of scopolamine one hour before operation, and was induced with thiopentone sodium 600 mg., and maintained with gallamine triethiodide, 100 mg., nitrous oxide and oxygen, and ether. There was a delayed return of normal respiration for three-quarters of an hour.

At operation a gangrenous retrocaecal appendix was removed. The operation lasted for one hour and he did not regain consciousness for the next four and a half hours,

tolerating an oro-tracheal airway during this period, the tube being necessary to prevent a valvular obstruction of his larynx by a mobile epiglottis.

His post-operation pulse rate rose to between 130 and 140 for the subsequent two days. There was no post-anaesthetic vomiting and he made an uninterrupted recovery.

COMMENT

The significance of the fact that this patient had been treated with oral chlorpromazine, 25 mg. three times a day, for the fourteen months previous to his admission was not appreciated at the time, and consequently he was given a normal anaesthetic for his age and weight, with the somewhat anaesthetically distressing results. The post-operation tachycardia and absence of vomiting are a well-known feature of chlorpromazine premedication. This case suggests that care should be exercised in giving normal doses of anaesthetic drugs to patients taking chlorpromazine.

My thanks are due to Dr. H. M. Bird for permission to publish this case.

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Prolonged Coma in Simmonds's Disease

Patients with Simmonds's disease often die in coma, which may be induced by various factors, such as the following.

Hypoglycaemia.—A low fasting blood sugar, sensitivity to insulin, and repeated hypoglycaemic attacks are often features of Simmonds's disease (Sheehan and Summers, 1949, 1952; Alexander, 1953). While in mild cases recovery may be spontaneous or may follow administration of glucose, prolonged hypoglycaemia may result in damage to cerebral tissue which is irreversible and fails to respond to glucose. Although the length of hypoglycaemic coma which prevents a full degree of physical and mental recovery must vary from case to case, Lawrence *et al.* (1942) suggest that "coma of one to three hours is usually associated with complete recovery, while longer periods are dangerous." Convulsions in hypoglycaemia have been mentioned as an important factor in preventing recovery from that state (Grayzel, 1934).

Hypothermia.—The profound lowering of the body's metabolic rate that occurs both in Simmonds's disease and in myxoedema may lead to a reduction of temperature sufficient to promote coma. Sheehan and Summers (1952) have shown that in a patient in coma with a very low temperature rapid recovery took place following immersion in a hot bath.

Low Blood Pressure and Loss of Electrolytes.—The adrenals are commonly atrophied in Simmonds's disease, and in some cases coma may be ushered in by marked hypotension and salt depletion, suggesting Addisonian crisis (Sheehan and Summers, 1949; Wolff, 1950).

The case here described makes it apparent that deep coma of 40 hours' duration, associated with hypoglycaemia and convulsions, can be followed by full mental and physical recovery.

CASE REPORT

A woman of 41, who had been unconscious with convulsions since about 1 a.m., was admitted at 2.30 p.m. on June 22, 1953. She was lying deeply comatose, slightly sweating, and with shallow respirations, in a pool of her own excreta. Her limbs were spastic, her trunk in opisthotonos, while every few minutes she was seized with generalized clonic and tonic convulsions associated with coarse grunting noises. Her temperature was 101.6° F. (38.7° C.), pulse 88, B.P. 120/70. Plantar reflexes were extensor, corneal reflexes absent.

The patient was moderately well nourished, with pendulous breasts; her skin was waxy pale, axillary hair was

absent, and pubic very scanty. Following 50 g. of glucose intravenously, the convulsions became less severe, and on receipt of the blood-sugar report as 32 mg. per 100 ml. half an hour later, a further 100 mg. of glucose was administered intravenously with 100 mg. of cortisone acetate and 1 mega unit of penicillin intramuscularly. An intravenous 5% glucose-saline drip was set up. By 6 p.m. the blood sugar had risen to 86 mg. per 100 ml. and, although severe convulsions had ceased, she remained in deep coma, with extensor plantar reflexes. Cortisone, 100 mg. eight-hourly, was continued.

The next morning she was still deeply unconscious, and was incontinent of urine and faeces. The blood sugar was 140 mg. per 100 ml. During the day there were signs of improvement, and by 5 p.m. she had begun to stir and open her eyes. This was 40 hours after the known onset and 26 hours after the institution of treatment, during which she had been given 400 mg. of cortisone intramuscularly and about 260 g. of glucose intravenously.

From then on, progress was uneventful. On a regime of cortisone, 50 mg. daily by mouth, thyroid 1 gr. (65 mg.), and methyltestosterone, 15 mg., she asserted she had "never felt better."

The electrocardiogram on admission showed low-voltage and flat T waves, later reverting to normal. The electroencephalogram after recovery showed no convulsive organic abnormality.

The history, obtained subsequently, revealed that the patient had had three children, there having been serious post-partum haemorrhage after the last confinement 16 years previously, and subsequent total amenorrhoea. Simmonds's disease was diagnosed elsewhere in November, 1952, and she had been on testosterone and thyroid since then. She had never had fits, but had had one previous short coma, without convulsions, in January, 1953.

COMMENT

Of the known factors which can induce coma in Simmonds's disease, hypothermia and Addisonian crisis can be excluded in this patient, and the question then arises to what extent the hypoglycaemia was responsible for the prolonged coma. In fact, during the latter 24 hours of coma the blood-sugar levels were within normal range, but, as is known in insulin overdosage, the return of the blood sugar to normal may prevent neither permanent mental damage nor a fatal outcome. We have been unable to find a case recorded in which full recovery occurred after hypoglycaemia so deep and prolonged, and it is possible that in our case other factors were partly responsible for maintaining the comatose state.

While cortisone plays an important part in the maintenance therapy of Simmonds's disease, treatment of the coma with cortisone has not been universally successful. Thus Sheehan and Summers (1952) found that intravenous cortisone produced no appreciable effect in two cases of hypopituitary coma, although it is not clear to what extent hypoglycaemia was a factor in those cases. We feel that administration of cortisone as well as glucose to our patient was largely responsible for the successful outcome. Cortisone has been used to combat hypoglycaemia of various causes, such as pancreatic islet tumour and Addison's disease, and we feel encouraged to use it in prolonged hypoglycaemia of whatever aetiology.

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Reviews

BRITISH SURGICAL PROGRESS

British Surgical Practice: Surgical Progress, 1954. Under the general editorship of Sir Ernest Rock Carling, LL.D., F.R.C.S., F.R.C.P., F.F.R., and Sir James Paterson Ross, K.C.V.O., M.S., F.R.C.S. (Pp. 348+vii; illustrated. 42s.) London: Butterworth and Co., Ltd. 1955.

This is essentially a continuation of the great work on *British Surgical Practice* edited by the same authors and brings that work up to date. It consists of three sections: original articles, critical surveys, and abstracts. They are all of a very high order, and either describe or provide access to the latest achievements of surgery.

The first article, by Rodney Maingot, is perhaps the most arresting. He describes in detail the injuries which may occur to the bile ducts and the results which may follow, often unfortunately as the result of surgical procedures. He explains how such mistakes may arise, and how they might have been prevented by a more accurate knowledge of the abnormalities which may occur and by more accurate technique. There follows an admirable account of the methods which have been evolved for the repair of such injuries, sometimes the most difficult problem with which a surgeon can be faced.

The article by Poole-Wilson on injuries of the urethra and bladder, fortunately of less common occurrence, is clear and the result of wide experience. It will be welcomed by all who have to deal with these difficult conditions. That by Paul Brand, of Vellore, on reconstruction of the hand in leprosy, is of far wider appeal than to his own special field, and all who have to deal with the restoration of the functions of the hand after nerve injuries will appreciate the value of his work.

Pelvic viscerectomy for advanced cancer is the subject of an article by Sir Stanford Cade, and is an example of the extraordinary lengths to which modern surgery can go. Such operations can, of course, be justified only in desperate cases and when undertaken by surgeons of quite exceptional skill and wide experience. But he shows that with these conditions they are fully justified and may give relief which can be obtained in no other way.

The article by G. A. Hay and F. W. Spiers on the application of electronics to clinical practice shows how dependent the surgeon of the future may be on physical science. One only hopes that it will be his servant and not his master. After all, one can use a microscope quite effectively without knowing anything about spherical aberration.

The critical surveys include several articles of value. Those on antibiotics and on blood transfusion show important progress in these fields. On carcinoma of the oesophagus Ross Robertson gives a full and well-illustrated account of what can be done with the resources of modern surgery. That many surgeons now question whether such operations are worth while in no way detracts from the value of the article. Norman Tanner gives an excellent account of the present position of carcinoma of the stomach and the encouraging results of modern technique. The abstracts furnish a brief account of progress in a large number of fields and afford ready access to the literature for those who desire to explore these subjects further.

We would like to congratulate the editors on the high level of material, and the publishers on the standard of production maintained throughout the volume.

HENRY SOUTTAR.

THE AUTONOMIC NERVOUS SYSTEM

Clinical Aspects of the Autonomic Nervous System. By L. A. Gillilan, Ph.D., M.D. (Pp. 316+xii; illustrated. 45s.) London: J. and A. Churchill, Ltd. 1955.

The intention of the author, who is associate professor of anatomy at the Graduate School of Medicine, University of Pennsylvania, is to assemble the facts known about the

autonomic nervous system and "arrange them in such a way that the clinician will be able to use them in his practice." Unfortunately he has not been very successful in his task; there is a clear account of the anatomy and elementary physiology, but the clinical aspects are dealt with much less satisfactorily and there are some inaccuracies. The common accompaniment of narcolepsy is cataplexy with sudden loss of muscle tone, and not, as the author says, catalepsy "with statuesque attitudes"; while it has often been demonstrated that the common lesion of the posterior inferior cerebellar artery is a thrombosis and not, as the author implies, a haemorrhage.

There is a fairly comprehensive account of the mechanism of visceral pain, but no satisfactory description or explanation of the curiously localized shoulder-tip pain of subphrenic disease.

The bibliography is adequate, but it is strange to read in the preface that the autonomic nervous system got its first firm footing in medicine in 1935 when Max Peet devised his operation for the relief of hypertension; Leriche for a number of years before this had drawn attention to the clinical importance of the sympathetic nervous system, and in 1934 Gask and Ross had published a monograph on its surgery.

J. W. ALDREN TURNER.

GRENZ-RAY THERAPY

Grenz Ray Therapy: Principles, Methods, Clinical Applications. By Gustav Bucky, M.D., and Frank C. Combes, M.D. (Pp. 204; illustrated. 60s.) New York: Springer Publishing Company Inc. London: Lange, Maxwell and Springer, Ltd. 1954.

Grenz-ray therapy is not much used in this country, but it might be applied with advantage to patients suffering from superficial lesions of the skin and accessible mucous membranes and of the eye. The great difference between this form of treatment and that by more conventional methods of irradiation lies in the fact that, even with relatively large doses, so little penetrates to the deeper layers that the damage to the subepithelial connective tissues—for example, the dermis—is very slight. Thus, a dose to the epidermis of 1,000 r will deliver to the vessels of the dermis at a depth of 2 mm. only about 10 r, so that chronic changes due to vascular damage will be slight or non-existent. On the other hand, the doses delivered to these vessels even by so-called contact x rays for the same surface dose of 1,000 r will be of the order of 500 r—a dose by no means negligible, and capable, as any radio-therapist knows, of permanent irreversible damage to the vessels.

This, in essence, is the burden of the first part of this book concerned with physical and biological principles. The measurement of dose is not very thoroughly considered, but the absorption curves in tissues, carbon, water, and aluminium are thoroughly discussed, and the effect of air absorption on the beam and of oblique entry of the radiation into the tissues is stressed. These are considerations of little moment in most conventional x-ray treatment; indeed, the chief rivals to grenz rays in their particular field are likely to be artificially produced radio-isotopes, which have their limitations in convenience of application, especially to large areas.

The authors give a long list of successfully treated clinical conditions, especially of the skin. The chief advantage of grenz rays is the safety of repeating treatment to such lesions, even with much higher surface doses than would be safe with more penetrating radiation.

Since beryllium window tubes are now readily available and of constant performance this book should be in demand as a guide to all who begin to acquire experience in this field. It is well produced, and, although somewhat diffuse and repetitive, gives the answers to most of the questions likely to occur to those undertaking grenz-ray therapy.

FRANK ELLIS.

BIOLOGICAL SCIENCE

The Human Machine: Biological Science for the Armed Services. By Charles W. Shilling. (Pp. 292+xii; illustrated. 55s.) Annapolis, Maryland: Naval Institute. 1955.

This book is primarily addressed to members of the United States Armed Forces, but much of its content will appeal to a wider audience. It is an expression of a view which is beginning to gain wide acceptance, particularly on the other side of the Atlantic—namely, that some general knowledge of human biology is of value to the ordinary man in his personal life and everyday work.

Part I is an orthodox elementary account of the structure and functions of the body, with some interesting observations on the potentials of human performance. Part II gives a reasonable and not too austere prescription for a healthy life. The reviewer would have been inclined to omit Chapter 9 altogether. It amounts to little more than a nominal list of diseases—a gloomy catalogue of disaster which does little to advance the book's general argument. The sections on first aid and emergency treatment follow generally accepted lines. It is noted with regret, however, that on page 31 the use of oxygen and carbon dioxide breathing mixtures is still advocated.

The third part will probably be new to many British readers and is the most interesting one in the book. Entitled "The Human Machine as Part of the War Machine," it deals with man in relation to the various special environments created by war and military equipment. It will probably engender in the non-medical reader a clearer appreciation of the importance of welding man, equipment, and operation into a single harmonious design. This is a lesson which has not yet been fully learned in all quarters.

The production and printing are of a high standard, though some of the diagrams will tax the presbyopic. Only one minor misprint was noticed.

J. M. HOLFORD.

VITAMINS

Vitamins in Theory and Practice. By Leslie J. Harris, Sc.D., D.Sc., Ph.D., F.R.I.C. Fourth edition. (Pp. 366+xxii; illustrated. 35s.) Cambridge: University Press. 1955.

It is a pleasure to welcome once more a new edition of this book, the previous edition having appeared as long ago as 1938. Many notable contributions to our knowledge of the vitamins have, of course, been made in the intervening period, but the text has been revised and brought up to date wherever necessary, and new chapters have been introduced to deal with some of the more important additions to our knowledge of the subject.

It is as well to point out, in view of the long interval which has elapsed since the notices of the previous edition appeared, that this account of the vitamins can be read with pleasure and profit by the "ordinary" reader, as well as by medical students, doctors, dietitians, and others with a professional background of interest in nutrition. The book is profusely illustrated and thoroughly deserves the continuation of the support it has received in the past.

S. J. COWELL.

POTASSIUM METABOLISM

Potassium Metabolism in Health and Disease. By Howard L. Holley, M.D., and Warner W. Carlson, Ph.D. (Pp. 131+xii; illustrated. \$4.50.) New York and London: Grune and Stratton. 1955.

This book provides a concise and readable summary of current information on normal and abnormal potassium metabolism. The two authors write from the Departments of Medicine and of Biochemistry in the University of Alabama and their collaboration has given us an exceptionally lucid account of the ways in which potassium metabolism influences and is influenced by energy metabolism. The part played by potassium in nerve and muscle activity is also outlined. Some exception may be taken to the authors' belief, implicit on page 17 and explicit on page 22, that "transfer of potassium between the intracellular and

extracellular compartments is a relatively slow process"; for isotope studies, both *in vitro* and *in vivo*, indicate that transfer of potassium across the cell wall takes place very rapidly indeed.

The various clinical causes of potassium depletion and excess are adequately summarized; overdosage with deoxycortone acetate is mentioned, but aldosterone is referred to by its "old" name of electrocortin, and Conn's new syndrome of primary aldosteronism has not been anticipated. There is an appendix giving the potassium content of foods, and even of the public water-supply in 150 American cities; from this it would appear that only in Aberdeen, S. Dak., Galesburg, Ill., and Kansas City, Mo., could anyone expect to get as much as 1 mEq of potassium daily from the tap. This evidence of painstaking preoccupation with the needs of American readers may console any British kaliologist who happens to notice that in a list of 41 references it has not been found necessary to include any British work more recent than that of Sidney Ringer in 1883.

D. A. K. BLACK.

MARRIAGE GUIDANCE

Your Marriage: A Book for the Married and the About to be Married. By Kenneth Walker, F.R.C.S. Foreword by F. A. E. Crew, F.R.C.P., F.R.S., and a psychological postscript by Peter Fletcher. Second edition. (Pp. 150+xvi. 8s. 6d.) London: For British Social Biology Council by Secker and Warburg. 1955.

Any Wife or Any Husband: A Book for Couples who have met Sexual Difficulties and for Doctors. By Medica (Dr. Joan Graham). Second edition. (Pp. 147. 10s.) London: William Heinemann, Ltd. 1955.

These books were first published within a few months of each other, and it is remarkable that their second editions appear almost simultaneously. For they have no obvious connexion except their subject, and even to this they bring a different approach.

Mr. Walker's book has changed its title from *Marriage*, the possessive adjective being added to give it a more personal appeal. A psychological postscript also appears for the first time and discusses the role of emotional independence of the partners, and of social and economic factors, in determining stability of marriage. Otherwise the book consists of a simple short account of sex, adolescence and its problems, the choice of a marriage partner, the consummation of marriage, coital technique, the having and the avoiding of children, and mothers-in-law and other threats to domestic bliss. All will regard Mr. Walker's views on premarital chastity as realistic and honest, but some may find them unnecessary, at any rate in this context. The subtitle of this work, "A book for the married and the about to be married," is important in that it indicates its scope and also that it is intended for lay readers.

Medica's subtitle is equally important and revealing and reads, "A book for couples who have met sexual difficulties and for doctors"—a phrase which intrigues by its several possible interpretations. Difficult though her task may appear, there is no doubt that the author, a grandmother herself, has written something which should prove of the greatest help to the general practitioner and gynaecologist, and yet it is sufficiently non-technical to hand on to patients of average intelligence for their profit. It does not anticipate trouble, but has something practical to say to those who have tried and failed. It describes and comments usefully on the common disorders of sex encountered by both men and women: impotence, frigidity, lack of orgasm, dyspareunia, homosexuality, and various forms of maladjustment. Moreover, it answers reassuringly the many doubts and fears which a host of patients have always had but which they are more likely to ventilate to the doctor now than in the past.

The two books cannot be compared; their individual appeals vary according to whether one believes that it is better not to jump fences until they are reached or whether one accepts that to be forewarned is to be forearmed.

T. N. A. JEFFCOATE.

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DIETARY DEFICIENCIES AND FATTY LIVERS

Fat accumulates in the liver for one of two reasons. It may do so as a result of mobilization of fat from fat storage depots throughout the body in response to increased demands for fat combustion, as in unstabilized diabetes mellitus, and in these circumstances the chemical pattern of the hepatic fat is not altered. Or it may do so in response to liver injury or dietetic disturbance, in which case the pattern of hepatic fat is abnormal. Whenever fat accumulates in the liver owing to alterations of the diet, the cause has nearly always been traced to dietary changes which have prevented or interfered with the hepatic synthesis of phospholipids. The part played by phospholipids in fat metabolism is to transport fatty acids throughout the body, and the most important phospholipid in this respect is lecithin. Lecithin consists of glycerol to which are conjugated two fatty acids, one saturated and the other unsaturated, and the phosphate ester of the quaternary ammonium base choline, whose molecule contains three methyl groups. In the absence of lecithin from the diet fat accumulates in the liver, and it disappears when lecithin is restored. This dispersal of accumulated fat by lecithin is called its lipotropic action, and depends on the presence in the lecithin molecule of choline.

Diets deficient in choline and protein also cause fat accumulation in the liver round the central lobular vein. When this happens the formation and turnover of phospholipids in the liver are decreased and there is a hold-up in the transport of fatty acids, which are then conjugated with glycerol and deposited as neutral fat in the liver cells. Restoration of choline to the diet permits the turnover of phospholipid to start again and the incorporation of fatty acids in them, with resultant decrease in neutral fat. When fat has accumulated in the liver as a result of choline and protein deficiency, the adding of protein, but not choline, to the diet has a lipotropic effect, though it may not be sufficient to disperse all the accumulated fat. This is due to the methionine in the protein. Methionine is a sulphur-containing amino-acid which also contains a methyl group; this can be split off

to form choline (methyl group donation). The lipotropic effect of proteins is partly dependent on the amount of methionine they contain.

Choline synthesis, and therefore synthesis of lecithin, can be interfered with in other ways than by the suspension of methyl group donation. For example, rats receiving diets containing adequate quantities of choline develop fatty livers when they are fed with guanido-acetic acid. This is because choline itself donates methyl groups to guanido-acetic acid to form creatine, being diverted to this from its usual role in the formation of lecithin. Similarly, the sulphur-containing amino-acids cystine and homocystine have a liver-fattening action which can be prevented by the addition of adequate amounts of choline or methionine to the diet. It is thought that this is due to the stimulation which cystine and homocystine exert on growth and appetite, causing an increased demand for choline by the organism.

In the opening pages of the *Journal* this week Professor C. H. Best and his colleagues in Toronto give experimental details confirming and extending previous work on these problems, which Professor Best also discussed in the Croonian Lecture which he gave before the Royal Society in London earlier this week. In the present paper he and his colleagues report having found that, whereas animals receiving choline-deficient diets developed fat accumulation round the central lobular veins, animals receiving protein-deficient diets developed fat accumulation in the periportal regions. Periportal accumulation of fat was not dispersed by adding choline to the diet. The different sites of fat accumulation were clearly defined only in the early stages of deficiency. When either choline or protein had been deficient for a long time, fat accumulation extended throughout the whole lobule. The significance of these findings is not clear, though Best and his colleagues think that accumulation of periportal fat when the diet is deficient in protein may be due to qualitative and quantitative alterations in the amino-acids present. They also noted a transient increase in periportal fat when an animal was transferred from a diet low in protein to one containing adequate quantities of protein and choline.

Unfortunately fatty livers in man are often the result of multiple dietary deficiencies and do not benefit from the administration of only one lipotropic factor. Furthermore, the curative merits of individual substances in human hepatic disease are hard to assess, since they are not unreasonably administered in a lipotropic blunderbuss. Professor Best's finding of periportal fat accumulation in protein-deficient rats is of special interest, because it is in those regions of the liver that fat accumulates in kwashiorkor, a perplexing disease of dietary origin which is widespread throughout the world.

SURGERY OF SIMPLE PULMONARY STENOSIS

It is now established that surgical treatment of congenital stenosis of the pulmonary valve is effective and not unduly dangerous. Pulmonary stenosis is one of the lesions which make up Fallot's tetralogy, the others being a patent interventricular septum, dextro-position of the aorta, and enlargement of the right ventricle. Pulmonary stenosis also occurs as a congenital lesion with an intact ventricular septum, in which case the term simple pulmonary stenosis is used. This is less common than Fallot's tetralogy. It is often an isolated lesion, when it is sometimes referred to as pure pulmonary stenosis. It may also occur with a patent interatrial septum (patent foramen ovale). This condition is sometimes called the trilogy of Fallot, a term which is perhaps best eschewed to avoid confusion with the tetralogy. Less usually a patent ductus arteriosus accompanies the stenosis.

Not long after the successful operative treatment of Fallot's tetralogy by anastomosis of the subclavian artery to the pulmonary artery (Blalock's operation¹) was accepted, the alternative operation of pulmonary valvotomy was described by Sir Russell Brock² and Mr. Holmes Sellors.³ The results of valvotomy in 100 cases of Fallot's tetralogy were described by Sir Russell Brock, Dr. Maurice Campbell, and Dr. D. C. Deuchar⁴ recently in this *Journal* and commented on in a leading article; one-sixth of the patients died, the remainder were improved, most of them greatly. Brock and Campbell⁵ have now published the results of valvotomy in 58 cases of simple pulmonary stenosis. In this series 8 patients died, but 5 of these were in the first 6 patients; good results were obtained in 46 of the 50 survivors. Many other, but mostly smaller, series have been reported, and on the whole with similar results.

In simple pulmonary stenosis, as in Fallot's tetralogy, the narrowing may lie at the valve or below it in the infundibulum. The former is more common. Occasionally both types are combined. In valvular stenosis the cusps are fused and thickened, forming a dome-like projection with a small lumen, beyond which the pulmonary artery is usually dilated. Infundibular stenosis is either a long, narrow myocardial stenosis, or less often a membranous diaphragm with a thin-walled post-stenotic chamber. The pulmonary artery may be hypoplastic. As a

result of the stenosis the pulmonary circulation is diminished and the pressure in the right ventricle raised, so that this chamber hypertrophies. If the interatrial septum is intact, the arterial oxygen saturation is normal and there is no cyanosis, except occasionally peripheral venous cyanosis. A systolic murmur is heard, best at the second left interspace, and often a thrill. There may be no symptoms. The most frequent is dyspnoea, usually noticed on exertion, with reduced exercise capacity; patients also complain of easily tiring and of failure to gain weight. According to the severity of the stenosis, the heart enlarges and eventually fails. The size of the right ventricle can be assessed by fluoroscopy and confirmed by the electrocardiogram, which in advanced cases shows inversion of T-waves in the chest leads. Cardiac catheterization reveals the rise of pressure in the right heart; when the catheter passes the stenosis the pressure suddenly falls. Blood samples from various levels analysed for oxygen show no evidence of a shunt from one side of the heart to the other.

If a patent interatrial septum is present, with a functional opening allowing the passage of blood from right atrium to left, central cyanosis may occur, especially on exertion; it often leads to polycythemia, raised haemoglobin, and clubbing of the fingers. The septal opening can be confirmed by cardiac catheterization, which will show evidence of a shunt with changes in oxygen saturation; the catheter may pass through the foramen.

Indications for surgery are not unanimously accepted. Many patients do not need operation. It is more dangerous in infancy and the adult than in childhood, or if the heart is greatly enlarged or the patient severely cyanosed. It is indicated if the symptoms are pressing, if the heart is enlarged or shows electrocardiographic evidence of right ventricular strain, or if the pressure in the right ventricle is high—say above 100 mm. Hg. The stenosis may be approached from above or from below—through the pulmonary artery or through the ventricle. The latter route has been more commonly taken, as in Campbell and Brock's series. A valvular stenosis is divided with a valvotome and enlarged with metal dilators; an infundibular stenosis must be resected with a special punch. Exact diagnosis of the level of the obstruction can be made only at operation, but it can be suspected beforehand from the radiological appearances and the pressure pattern at cardiac catheterization.⁶ The adequacy of the valvotomy is best confirmed by pressure measurements at operation. F. Therkelsen⁷ claims that the approach through the pulmonary artery is more direct, avoids risk of injury to coronary vessels, and allows more time. H. Swan and others,⁸ dissatisfied with the

variable results from transventricular valvotomy, have recently described transarterial valvuloplasty under direct vision, using hypothermia and temporary occlusion of the great veins so that the heart is virtually dry. They claim restoration of normal haemodynamics, and have had no deaths in seven operations.

Brock and Campbell, in their series of 58 patients, had 33 without cyanosis, of whom 1 died, and 25 with cyanosis, of whom 7 died. Operation greatly improved the colour and capacity for exercise in the survivors of this group, and reduction of right ventricular pressure was marked. Results in the acyanotic group were good in all but four. The heart was often strikingly reduced in size, and showed improvement in the electrocardiogram. There has been no evidence of recurrence of stenosis after operation; and pulmonary regurgitation has only rarely occurred, and then has not been of serious import.

NON-SPECIFIC ENTEROCOLITIS

Recent observations on non-specific inflammatory lesions of the gut involving both small and large intestines are helping to solve some clinical problems. Typically, non-specific ulcerative colitis begins in the rectum and lower sigmoid colon; it may then extend proximally to attack the whole colon. Even when the whole colon is affected the small intestine is commonly spared, though the terminal few inches of the ileum may show inflammatory changes attributed to "backwash" from the diseased colon. Regional ileitis, or Crohn's disease,¹ is classically a granulomatous lesion of the ileum in which there is mucosal destruction, thickening and contraction of the bowel wall leading to stenosis, and liability to abscess and fistula formation. The functions of the small bowel may be gravely disturbed; steatorrhoea may develop, and the patient suffer from deficient absorption of vitamins and other substances. Many authors have described patients in whom both small intestine and colon are simultaneously affected; the right side of the colon commonly shows the disease most severely—in contrast to what is usually found in ulcerative colitis. Some authors regard these cases as examples of regional ileitis extending into the colon, whereas others see them as unusual cases of ulcerative colitis affecting primarily the right side of the colon and extending proximally up the ileum.

In an important paper W. T. Cooke and B. N. Brooke² make a case for regarding non-specific ileocolitis as a disease in its own right. They describe a group of sixteen patients in whom both small and large intestines were affected. Some patients presented with the clinical picture and laboratory findings of steatorrhoea, but radiological examination indicated colitis. In other patients the symptoms were those of ulcerative colitis, but barium follow-through studies revealed an abnormal terminal ileum. The condition of the ileum at laparotomy or necropsy differed from that in Crohn's disease in that the bowel wall was not thickened and did not adhere to or form fistulae with other organs, and the abnormal changes were confined to the mucosa. The mucosal changes consisted of numerous small ulcers distributed throughout the distal part of the small intestine. The mucosa between the ulcers was oedematous. The authors consider these appearances to be quite different from those seen in ileitis secondary to ulcerative colitis, when "backwash" causes a uniformly granular mucosa affecting the last foot or so of the ileum.

It seems likely that ileocolitis as described by Cooke and Brooke is a different disease from Crohn's disease. It is less clear that it differs essentially from ulcerative colitis other than in its site of maximum intensity. A firm conclusion would be unwise in view of our present ignorance of the pathogenesis of ulcerative colitis, and the issue should be left *sub judice* until we have more aetiological information. From a practical viewpoint Cooke and Brooke have rendered a valuable service to clinicians who encounter these patients by stressing the need to avoid ileostomy when there is gross disease of the ileum. Unless ileostomy is being carried out as an emergency, it would perhaps be wise to have barium follow-through studies made beforehand to exclude the possibility of severe ileitis; and sometimes a fat-balance investigation may be indicated.

The medical treatment should take account of the derangement of both large and small bowels. The basic requirements are a bland low-fat diet, high in protein, giving adequate calories, correction of any electrolyte disturbances, repeated blood transfusion if the patient is anaemic, and vitamin supplements. Folic acid and large doses of calcium may be necessary if steatorrhoea is severe. Sulphonamides and antibiotics are unlikely to do more than reduce the risk of pyogenic complications. Corticotrophin or cortisone should certainly be given a trial, since these agents have been found beneficial in both regional ileitis and ulcerative colitis,³⁻⁷ and Cooke and Brooke have given them in some cases with good effect.

¹ Blalock, A., and Taussig, H. B., *J. Amer. med. Ass.*, 1945, 128, 189.

² Brock, R. C., *British Medical Journal*, 1948, 1, 1121.

³ Sellors, T. H., *Lancet*, 1948, 1, 988.

⁴ Brock, R. C., et al., *British Medical Journal*, 1952, 2, 111.

⁵ — and Campbell, M., *Brit. Heart J.*, 1955, 17, 229.

⁶ Glover, R. P., et al., *J. thorac. Surg.*, 1954, 28, 481.

⁷ Therkelsen, F., *Thorax*, 1955, 10, 19.

⁸ Swan, H., et al., *J. thorac. Surg.*, 1954, 28, 504.

¹ Crohn, B. B., *Regional Ileitis*, 1949, New York.

² Cooke, W. T., and Brooke, B. N., *Quart. J. Med. (New Series)*, 1955, 24, 1.

³ Machella, T. E., and Hollan, O. R., *Amer. J. med. Sci.*, 1951, 221, 501.

⁴ Gray, S. J., et al., *Arch. intern. Med.*, 1951, 87, 646.

⁵ Kirsner, J. B., and Palmer, W. L., *J. Amer. med. Ass.*, 1951, 147, 541.

⁶ Wirts, C. W., et al., *ibid.*, 1954, 164, 36.

⁷ Truelove, S. C., and Wits, L. J., *British Medical Journal*, 1954, 2, 375.

DOCTORS' SMOKING HABITS

"Do as I say, not as I do" may have been a useful adage for the Victorian parent, but it is unlikely to carry much weight with the Elizabethan patient. So whether the apparent connexion between cigarette smoking on the one hand and lung cancer and coronary thrombosis on the other will lead to any significant change in popular habits will depend primarily on the seriousness with which the profession takes its own warnings. Two recent papers from Britain and the U.S.A. throw light on the present attitude of medical men in this respect. The English investigation¹ was carried out on a small scale and was confined to the 217 doctors working in Oxford hospitals. It has the peculiar merit, however, that 211 (or 97%) replied to the questionnaire which was sent them. From the replies it appeared that slightly over a quarter had never smoked cigarettes, while another quarter had smoked cigarettes at one time but had subsequently stopped. Of those that stopped, 18 stopped during the four years preceding October, 1950, when extensive data were first published in this *Journal* linking cigarette smoking with the development of lung cancer,² and 22 stopped during the following four years. Reasons for stopping were many, the numerically most important being minor ill-health and expense. Eight gave the risk of carcinoma as the principal reason. In contrast with the 40 who had stopped smoking cigarettes during the last 8 years, 11 had begun to smoke them—including 9 beginning before October, 1950. Clearly, therefore, the effect of the new evidence on doctors' smoking habits has not been great, though it would appear to have played some part in reducing the proportion smoking cigarettes from 56.9% to 47.4% over the last four years—that is, by 17% of the initial figure. That the effect has not been greater may be partly because professional opinion is not altogether agreed upon the significance of the epidemiological data. Rather more than half (57%) of the doctors were satisfied with the evidence for an association between smoking and lung cancer, but 32% were not satisfied. But it is interesting that the proportion satisfied was considerably higher among those who had never smoked cigarettes (71%) than among those who had smoked cigarettes (52%), while it was lowest of all among those who continued to smoke them (46%). Whether this is mainly because non-smokers are over-ready to believe ill of a vice they do not share, or that smokers are hesitant to condemn a personal pleasure, remains a psychological problem of some delicacy.

The reaction among doctors in the United States would appear to be similar to that in Britain.³ From the much more extensive American data, which covered some 4,000 Massachusetts physicians, it appears that rather more than one-third did not smoke cigarettes. Of those who did not smoke at all, 65% accepted "that heavy smoking of cigarettes may lead to lung cancer," while among those who smoked the proportion was only

56%. Separate figures were obtained for practitioners in the different branches of medicine, and it is perhaps of significance that the highest proportions of non-smokers were found among those engaged in preventive medicine and public health and among thoracic surgeons. Among both these groups, moreover, a high proportion accepted the aetiological connexion with smoking (72% and 78% of smokers and 83% and 100% of non-smokers respectively). Of these Massachusetts physicians, 20% had reduced the amount smoked, or changed over to a pipe or cigars (that is, nearly a quarter of those who had previously been smokers): 72% of the smokers had made no change in their smoking habits. In contrast to the British doctors, the great majority of those who had changed gave as their reason the risk of carcinoma. New data obtained in this survey related to the type of advice which should be given to heavy cigarette smokers. As many as 32% of the doctors believed that they should be advised to stop smoking, 58% that they should be advised to reduce smoking with or without changing over to filter-tipped cigarettes (14%) or to a pipe or cigars (10%). But, unless more evidence appears that doctors themselves follow this advice, it may be doubted whether the public will pay much heed to it.

BONE CHANGES CAUSED BY NERVE LESIONS

Long-standing paralysis produced by lesions of the spinal cord or nerve roots may be associated with bone changes, both in children and adults. Poliomyelitis probably affords the best example of this, a severely paralysed limb in a child often showing osteoporosis and shortening as a result of diminished and prematurely arrested local growth. Bone changes of this type are found in a number of other neurological conditions, including spina bifida and traumatic paraplegia. Their general resemblance to the skeletal changes resulting from prolonged immobilization¹⁻³ suggests that "disuse atrophy" is an important factor in their genesis.

Recently C. L. Jeannopoulos,⁴ of New York, has directed attention to abnormal fragility of bone in this type of case and compared it with the well-known bone fragility of osteogenesis imperfecta. He describes three cases, all children, in which paralysis and sensory loss in the lower limbs resulted from lesions of the spinal cord or nerve roots; these conditions were associated with extreme fragility of bone. Repeated pathological fractures occurred, sometimes without any known injury. As other workers have noted, Jeannopoulos found that these fractures healed rapidly. Indeed, it is of interest that fractures in paraplegic patients often produce

¹ Gill, G. G., *J. Bone Jt Surg.*, 1944, 26, 272.

² Green, W. T., and Anderson, M., *ibid.*, 1947, 29, 659.

³ Ross, D., *ibid.*, 1948, 30-A, 103.

⁴ Jeannopoulos, C. L., *N.Y. St. J. Med.*, 1954, 54, 3219.

⁵ Fairbank, H. A. T., and Baker, S. L., *Brit. J. Surg.*, 1948, 36, 1.

⁶ Gould, E. P., *Quart. J. Med.*, 1918, 2, 221.

⁷ Hernberg, C. A., and Edgren, W., *Acta med. Scand.*, 1949, 136, 26.

⁸ Hagelstam, L., *Acta chir. Scand.*, 1946, 93, 169.

⁹ Dent, C. E., *J. Bone Jt Surg.*, 1952, 34-B, 266.

¹⁰ McNeur, J. C., *Proc. roy. Soc. Med.*, 1954, 47, 14.

very bulky masses of callus somewhat resembling the exuberant callus seen in osteogenesis imperfecta, and described by Fairbank and Baker.⁵

In neurofibromatosis, too, pathological changes in the nervous system are associated with skeletal abnormalities. In addition to the direct encroachment of expanding neurofibromata on bone, interference with skeletal development and growth, as shown by scoliosis or inequality of leg length, is sometimes observed. The immediate cause of this growth disturbance is not clear, and even more mysterious is the occasional association of another skeletal abnormality—osteomalacia—with neurofibromatosis.⁶⁻⁹

Another interesting skeletal complication of paraplegia, this time described in adult cases of long duration, is ossification in the tissues surrounding the hip-joint.¹⁰ This lesion seems to have some relation to spasm in the flexor muscles of the hip, and sometimes extensive bony bridges appear in the muscles on the anterior aspect of the joint, completely preventing movement. The disorder is probably to be regarded as a traumatic myositis ossificans rather than a specific result of long-standing denervation.

SALIVA AND CARIES

Since W. D. Miller put forward his chemico-parasitic theory of dental caries in 1890,¹¹ saliva has been the focus of much speculation and research. As the initial attack of dental caries is on the tooth surface, and surface conditions are of prime importance to the process, saliva can scarcely be expected to play no part. Both the oral content of acidogenic bacteria and the buffer capacity of the saliva are correlated with the amount of dental caries. However, many other factors are involved also.

Contrary to expectations, the physical properties of saliva seem to have little influence on dental caries. The volume of saliva secreted probably has a profound effect, for extirpation of the salivary glands or diminution of their function after radiotherapy causes extensive and rampant dental caries. But measurement of the volume of saliva secreted over test periods of 5 or 10 minutes shows practically no relationship between the volume of saliva secreted and the amount of caries in the individual.

A large amount of research has produced inconclusive results or has established only low correlation between salivary contents and the incidence of dental caries. The presence in the saliva of enzymes, co-enzymes, and anti-enzymes, amino-acids, and many trace elements such as fluorine, magnesium, and chlorine, has been investigated. It is of interest, therefore, that J. C. Muhler and W. G. Shafer¹² have recently

produced experimental evidence that feeding with desiccated thyroid has a marked caries-preventing effect on the rat, whereas lowering the level of the thyroid hormone in the blood with thiouracil increases the incidence of dental caries.

E. J. Ryan and S. Kirkwood¹³ suggest that the probable mechanism by which the incidence of dental caries is affected is through alteration of salivary flow. They state that "a convenient explanation of the results of Muhler and Shafer would be that it is the increased concentration of iodide ion in the saliva and/or the increased saliva flow resulting from the stimulation of the degradative processes in the salivary glands that accounts for the effect of feeding desiccated thyroid," and when thiouracil was fed the increase in dental caries "may well have been caused by a decreased level of iodide in the saliva and a decrease in the rate of saliva flow." Moreover, some evidence¹⁴⁻¹⁷ suggests that the salivary glands in the rat control the level of thyroid hormone in the blood stream by degrading it to iodide ion.

PRETIBIAL MYXOEDEMA

Often unrecognized, pretibial myxoedema is apt to be thought extremely rare. Moreover, only occasionally does it give rise to discomfort or disability, so that it assumes little importance in practice, though its pathogenesis is of great interest. The first description of the condition would seem to have been by P. Watson-Williams in 1895¹; his patient was a woman with Graves's disease. Since then it has chiefly been of interest to dermatologists until Trotter and Eden² published their excellent paper on the subject in 1942.

Localized pretibial myxoedema seems never to appear without past or present thyrotoxicosis, and it differs from the rare lichen myxoedematosus both in this respect and in clinical appearance, for the latter condition consists of small papules filled with mucin. About 3% of patients with toxic diffuse goitre suffer from pretibial myxoedema; most commonly they are between the ages of 40 and 48, and the male-female ratio is 1:1.8 in contrast to the ratio of 1:4.4 in toxic goitre. The course of localized myxoedema is so similar to that of progressive exophthalmos that they probably have a similar aetiology.³ In W. R. Trotter and K. C. Eden's series some patients developed both conditions simultaneously after thyroidectomy, but in half of them the pretibial myxoedema appeared before treatment of the thyrotoxicosis.

The clinical features are fairly constant. Exophthalmos is noted and the patient may be hyper- or hypo-thyroidic. R. S. M. D. Inch and C. F. Rolland⁴ found that two of their three patients had gross finger clubbing. Occasionally there is indefinite aching in the

¹ Watson-Williams, P., *Clin. J.*, 1895, 7, 93.

² Trotter, W. R., and Eden, K. C., *Quart. J. Med.*, 1942, new series, 11, 229.

³ Curtis, A. C., et al., *Arch. Derm. Syph. (Chicago)*, 1949, 60, 318.

⁴ Inch, R. S. M. D., and Rolland, C. F., *Lancet*, 1953, 2, 1239.

⁵ Chandler, G. N., and Hartfall, S. J., *ibid.*, 1952, 1, 847.

⁶ Zuger, L., *New Engl. J. Med.*, 1954, 251, 973.

¹¹ Miller, W. D., *Microorganisms of the Human Mouth*, 1890, Philadelphia.

¹² Muhler, J. C., and Shafer, W. G., *Science*, 1954, 119, 687.

¹³ Ryan, E. J., and Kirkwood, S., *ibid.*, 1955, 121, 175.

¹⁴ Fawcett, D. M., and Kirkwood, S., *J. Biol. Chem.*, 1954, 209, 249.

¹⁵ ———, *Science*, 1954, 120, 547.

¹⁶ Kirkwood, S., *Proc. Amer. Goiter Ass.*, in press.

¹⁷ Thode, H. G., et al., *New Engl. J. Med.*, 1954, 251, 129.

¹ Pyke, D. A., *British Medical Journal*, 1955, 1, 1115.

² Doll, R., and Hill, A. B., *ibid.*, 1950, 2, 739.

³ Snegireff, L. S., and Lombard, O. M., *New Engl. J. Med.*, 1954, 250, 1042.

⁴ ———, *ibid.*, 1955, 252, 691.

legs. The lesions first appear on the antero-lateral aspect of the lower half of the legs, later extending sometimes as far as the knees and on to the back of the legs and the insteps. It is bilateral, and the skin is raised in irregular firm swellings, the surface being dimpled and faint pink or brown or unaltered in colour. Sweating at the site and the presence of coarse hairs have been noted. The lesions may disappear spontaneously in the course of years.

The aetiology is unknown. Hypothyroidism does not usually result in an increase of mucin in the skin, though the term "myxoedema" suggests that it does.² In pretibial myxoedema, however, a considerable amount of material is deposited which stains with thionine blue, a reaction regarded as specific for mucin. Exophthalmos does not appear to result from a similar deposition of mucin in the orbit but by retraction of the lids and oedema of the orbital tissues, though the problem of its cause is still unsolved.⁵ The common factor in the causation of exophthalmos and pretibial myxoedema has been thought to be overproduction of the thyroid-stimulating hormone of the anterior part of the pituitary gland.^{3,5} The hypothesis has also been suggested that localized myxoedema develops as the direct result of an unexplained insensitivity of the pretibial tissues to the action of the thyroid hormone. As Inch and Rolland⁴ point out, neither hypothesis has much evidence to support it at present.

The treatment of pretibial myxoedema is unsatisfactory. Thyroxine given by mouth or injected locally, radiant heat, massage, the injection of hyaluronidase—all have proved disappointing. Inch and Rolland⁴ found some temporary improvement from the combined systemic and local injection of cortisone acetate, but Zugerman⁶ failed to produce any notable improvement during three months in one patient treated with hydrocortisone acetate tablets and ointment. It is clear that we are still far from understanding this curious and interesting condition.

BIRTHDAY HONOURS

The advancement of Sir Horace Evans to G.C.V.O. in the Birthday Honours will be welcomed throughout the medical profession, especially by his colleagues at the London Hospital. The services he has rendered to the Royal Family with such distinction began with his appointment as physician to Queen Mary in 1946. His signature on a bulletin reporting King George VI's health first appeared in 1949 (he received the K.C.V.O. in the same year), and thereafter he shared with the King's other medical attendants the onerous duty of caring for his Majesty in the illnesses that afflicted him until his death in 1952. Since then Sir Horace has been physician to the Queen. Two doctors who have made signal contributions to public health in this country also receive promotion: Sir John Charles, chief medical officer at the Ministry of Health, becomes a K.C.B., and Sir Alexander Macgregor, formerly medical officer of health at Glasgow, becomes a K.B.E. The conferment of a knighthood on Mr. Geoffrey Keynes, consulting

surgeon to St. Bartholomew's Hospital, will give pleasure to his circle of friends and admirers both inside and outside the medical profession, for besides his attainments as a surgeon Mr. Keynes has earned distinction in the world of letters for his bibliographical and historical studies. In particular he is an authority on the poet and artist William Blake and on the portraiture of William Harvey. His contributions to surgical advancement have been unusually diverse, perhaps his principal interests being the treatment of breast carcinoma, blood transfusion, the surgery of the thyroid, and latterly the treatment of myasthenia gravis by thymectomy. In less obvious ways too he has rendered scholarly service to the profession by his devoted work at the Royal College of Surgeons, whose honorary librarian he was appointed in 1952.

Three Australians are also among the new Knights Bachelor. Mr. Albert Coates, until recently senior honorary surgeon to the Royal Melbourne Hospital, is at present Stewart lecturer in surgery at the University of Melbourne. In this capacity he has been in no small measure responsible for the establishment of the professorial chairs in medicine and surgery in the university. In the 1939-45 war Mr. Coates was senior surgeon to the Australian Imperial Force in Malaya, and his outstanding service as chief medical officer to the Allied Prisoner of War Hospital in Siam will never be forgotten by all who had the misfortune to be "guests of the Emperor of Japan" after the disaster of 1942. He has been twice president of the Victorian Branch of the B.M.A., and has played an active part in many other medical organizations. Professor Harold Dew, like Mr. Coates, is a graduate of Melbourne University. After service in the first world war he was engaged in research at the Walter and Eliza Hall Institute in Melbourne, notably with Sir Neil Hamilton Fairley. This work led to his classic monograph on hydatid disease (1928). Latterly he has been professor of surgery in the University of Sydney, and in recent years has been prominent in the development of medical education in New South Wales, at both student and postgraduate levels. He visited Britain last year as Sims Travelling Professor. Dr. Darcy Cowan graduated in Adelaide in 1908 and served throughout the first world war, for a time in the R.A.M.C. An honorary consultant physician to the Royal Adelaide Hospital, and an authority on diseases of the lungs, he was president of the South Australian Branch of the B.M.A. from 1935 to 1937. He has devoted a long professional career to the service of the community, and its recognition will be warmly welcomed by his colleagues.

Surgeon Rear Admiral S. G. Rainsford, Major General A. Sachs, and Dr. W. E. Chiesman (of the Treasury) receive the C.B. Among those appointed C.B.E. are Professor Max Rosenheim, director of the medical unit at University College Hospital, Mr. Frederick Roques, gynaecological surgeon to the Middlesex Hospital, and two members of the B.M.A. Council: Dr. Mary Esslemont for services to medicine in Scotland and Dr. J. A. L. Vaughan Jones for services to the Ministry of Labour; Dr. Roger Bannister also receives the C.B.E. for services to amateur athletics.

EMERGENCIES IN GENERAL PRACTICE SERUM AND ANAPHYLACTIC REACTIONS

BY

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Almost any protein material or organic compound, by combining with body proteins, may produce severe allergic reactions. Although the use of serum and consequently the reactions from serum have been considerably reduced, these reactions still occur, and new treatments have brought new hazards. There are no more distressing emergencies than those which result from one's own treatment; their avoidance is most desirable, while their prompt recognition and treatment are essential.

It is not the purpose of this paper to discuss reactions to those substances which are used only occasionally and which only very exceptionally cause reactions, but rather to those substances which the practitioner may well use often in the course of his work. Nor is the value, or otherwise, of serum sensitivity tests dealt with, as this subject was fully discussed by Laurent and Parish in a previous refresher course series.*

There are three main types of reactions: local reactions, anaphylactic reactions, and serum sickness.

Local Reactions

An area of local redness at the site of injection of an allergenic substance is not unusual and therefore gives rise to no concern, but when such reactions are large the gap between a local and a general reaction is being narrowed, and this must be remembered if further similar injections have to be given.

Anaphylactic Reactions

Anaphylactic reactions always come on soon after the injection of the allergen, sometimes immediately, and the earlier the reaction the more likely is it to be severe and dangerous. A reaction occurring within a few minutes of the injection will be severe, and possibly fatal, while a reaction occurring after thirty minutes to an hour, although it may be quite troublesome, is rarely, if ever, dangerous.

The earliest symptoms of severe and dangerous anaphylactic reactions may be sweating, a feeling of heat throughout the body, a generalized pruritus, or an urticarial rash rapidly becoming generalized; an irritating cough, dyspnoea and wheeziness, a choking sensation, substernal oppression, or a feeling of constriction in the chest; retching or vomiting with cramp-like pains in the abdomen, sometimes diarrhoea, occasionally severe abdominal distension; and/or headache, giddiness, or sudden unconsciousness, in some cases followed by convulsions; while acute circulatory collapse and death may occur rapidly. The pulse is at first of good volume, slow and bounding, but in the dangerously ill patient it becomes rapid, weak, and thready, and there is a marked fall in blood pressure.

Serum Sickness

In serum sickness the symptoms occur only after a definite incubation period, usually six to twelve days, commonly ten days. Symptoms may be mild or severe. They consist of fever, skin eruptions, glandular enlargement, and arthritis, often in this order. The fever ranges from 99 to 104° F. (37.2 to 40° C.). Skin eruptions are the commonest manifestation, the large majority being urticarial weals or, in the

severer cases, angioneurotic oedema. A morbilliform type of rash is also fairly common, and different parts of the body may present different appearances at the same time. The scarlatiniform type of rash occurs infrequently. When generalized angioneurotic oedema occurs the urine may contain albumin, but rarely blood. The presence of albumin need not cause undue concern, for after the serum disease has subsided the albumin disappears.

When severe pains in the joints occur it is almost always towards the end of the illness, and although these are a fresh and sometimes frightening addition to the patient's symptoms they usually herald the last phase, when the acute stage is nearing its end. In the more severe reactions there may be difficulty in swallowing and a feeling of a heavy lump behind the sternum, while cramp-like abdominal pains, with or without diarrhoea or vomiting or both, are also not uncommon and may last for several days.

Stiffness of the joints, especially after use, and an urticarial type of skin reaction after pressure may persist for weeks and sometimes for many months. One of my own patients, six months after his penicillin reaction, still developed pain and swelling of the feet and ankles after a brisk walk, and was unable to use his hands for heavy manual work.

Neurological complications are rare but of special interest. The commonest is an affection of the brachial plexus or part of the brachial plexus, resulting in a scapulo-humeral paralysis. The patient often complains of neuritic pains in the shoulder regions, and these are followed fairly rapidly by a flaccid paralysis with the usual tenderness and hyperaesthesia. Recovery usually occurs within six months.

Treatment of Anaphylactic Reactions

Before any therapy by injection is given, adrenaline should be near at hand; before any potent antigenic substance is used, adrenaline, intravenous aminophylline, and an intravenous antihistaminic, together with the necessary syringes, should be made instantly available. Immediately reaction occurs 5 to 10 minims (0.3 to 0.6 ml.) of adrenaline (1:1,000) should be injected subcutaneously. If practicable, a tourniquet should be applied above the site of the sensitizing injection, where a further 3 to 5 minims (0.2 to 0.3 ml.) of adrenaline should be injected. The dosage of adrenaline varies according to the severity of the reaction, and frequent doses may be necessary. In worsening cases the dose should be repeated in ten minutes or so and local massage used to help to expedite absorption. Intravenous adrenaline in a strength of 1:1,000 is contraindicated because of its danger.

In those cases not responding to adrenaline intravenous aminophylline and/or an intravenous antihistamine should be given. The intravenous aminophylline (0.48 g. in 20 ml.) should be given slowly over five to ten minutes. I have several times had most satisfactory results with this therapy. Intravenous antihistaminics—diphenhydramine hydrochloride, 50 mg., or promethazine hydrochloride, 25 to 50 mg.—must also be given very slowly. If intravenous therapy is impracticable intramuscular therapy with an antihistaminic (dosage and solutions are the same as for intravenous therapy) and/or aminophylline (0.5 g. in 2 ml.) is advisable.

Treatment of Serum Sickness

Antihistaminics and ephedrine, $\frac{1}{2}$ gr. (32 mg.) three times a day or as required, are the drugs most commonly used.

*British Medical Journal, 1952, 1, 1294.

In patients confined to bed the hypnotic effect of diphenhydramine hydrochloride, 25 mg. three or four times a day, or promethazine hydrochloride, 25 to 50 mg. at night with 10 mg. once or twice a day, is helpful; in severe cases larger doses, 50 mg. up to six times in twenty-four hours of the former or 50 to 75 mg. at night with 25 mg. once or twice a day of the latter, may be indicated. For those who are ambulant antihistaminics causing drowsiness might be reserved for use at night. During the day chlorecyclizine hydrochloride, 50 mg., or phenindamine, 25 mg., may be given as required.

In severe and persistent cases which do not respond to the above measures, corticotrophin (A.C.T.H. gel) 60-80 units or cortisone 25-50 mg. six-hourly may well be indicated and are very effective. Intravenous hydrocortisone gives promise of being the most rapid form of hormonal therapy. Before considering corticotrophin or cortisone it is well to exclude the presence of a contraindication, especially a history of gastric or duodenal ulcer or of tuberculosis.

Immunization to Tetanus

In the same way as diphtheria has been reduced to a rare disease by active immunization, so can tetanus be reduced. Certainly all allergic individuals should be given tetanus toxoid, which carries for them no special risk. L. Unger gives each of his patients a card to carry with them certifying that he or she is highly allergic and has received tetanus toxoid. "In case of injury," it reads, "do not give tetanus antitoxin; please inject instead 0.5 ml. of tetanus toxoid."

Administration of Horse Serum

Before serum is given inquiry must be made of any previous serum therapy, of any known sensitivity to horse-dander or horse serum, and of any personal or family history of asthma, infantile eczema, hay-fever, urticaria, or food or drug allergies.

When there is a negative history intramuscular serum is, for all practical purposes, safe, but observation for half an hour afterwards is always advisable. If there has been previous serum therapy a trial dose of 0.2 ml. of the serum is given half an hour before the full intramuscular dose.

Ideally, allergic subjects should not receive serum, but when necessary those without special sensitivity to serum or horse-dander should be given 0.2 ml. of the serum diluted one in ten subcutaneously, followed in half an hour by 0.2 ml. of the undiluted serum, followed in a further half an hour by the full dose and the usual post-injection observation. Never give intravenous serum before intramuscular serum has been tried—the interval between the two is ideally two hours. (The above is essentially an abstract from the article by Laurent and Parish.)

When there is a history of previous serum and horse-dander sensitivity, preliminary testing should be with 0.05 ml. of 1:20 serum subcutaneously with a few minims of adrenaline followed by half-hourly injections of small but increasing doses of serum (0.1, 0.2, 0.5, 1, 2, and 4 ml., until the total amount has been given) either with a few minims of adrenaline with each dose or with adrenaline every hour or as necessary.

Skin Testing and Hyposensitization of Allergic Patients

Severe anaphylactic reactions from skin testing do occur, especially in the highly allergic individual. It is therefore advisable to carry out skin tests by the prick method before doing any intracutaneous tests.

If a known allergen can be avoided hyposensitization should only rarely be advised. Hyposensitization is widely practised for hay-fever and with other inhalant allergens causing asthma. The initial dose should be one-tenth of that which just produces a definite positive intracutaneous reaction.

The injections are given subcutaneously, usually every few days or weekly. If any constitutional reactions occur, subsequent dosage must obviously be considerably reduced

and great care taken in subsequent increases. It is also important that any local reaction should be looked for and reported to the doctor before the next injection is given. If there is a local reaction the size of half a crown or more the next dose should be reduced to that which produced no reaction previously and subsequent increases in dosage made more gradually. The patient should be asked if he has a cold or sore throat or any other illness, for the presence of influenza or sore throat or other infection reduces the patient's tolerance to the allergen and it is as well temporarily to reduce the dose to at most one-tenth of that previously given, or even to omit the injection. After the infection has cleared the dose should be rapidly increased again. The dose should not be increased if the interval since the last injection is two weeks and should be reduced if the interval is over four weeks. The patient must be strongly advised not to leave the doctor's surgery for at least thirty minutes after any injection. As has already been pointed out, a reaction coming on half an hour or more after the injection is not likely to be dangerous, but one which comes on sooner usually requires immediate treatment.

It is vitally important when allergenic substances are being given that the label on the bottle should be carefully read and fully understood. If a nurse is giving such injections the doctor should check the bottle and the dose in the syringe; if a doctor has several bottles of different strengths for hyposensitization, only one at a time should be given to the nurse and the others kept under his personal care.

Another reason for constitutional reactions is too rapid absorption of the allergen, due either to the injection having been given in error intravenously or to "seepage"—that is, the rapid entrance of the allergen into small vessels pierced by the injecting needle. To minimize these possibilities, before any injection the plunger should always be pulled back and a momentary pause made to see that no blood appears. After the injection has been given firm pressure should be applied with a cotton swab immediately and for a few moments so that "seepage" into dilated vessels is unlikely. Patients should be advised against strenuous exertion for a few hours after the injection.

Reactions Following Penicillin

Severe anaphylactic reactions and death following penicillin therapy are, unfortunately, being reported with increasing frequency. The symptoms, the same as those already described under anaphylactic reactions, often come on with dramatic suddenness; the more violent reactions begin within minutes, or even seconds, of the injection. Post-mortem findings have recorded acutely distended emphysematous lungs, oedema of the glottis, and in some cases mucoid secretion in the bronchi and bronchioles.

These reactions occur more often in allergic than in non-allergic persons—that is, in those with a history of asthma, hay-fever, or of food, inhalant, or drug allergies. Those who had previous reactions from penicillin are especially at risk, particularly those with previous accelerated or immediate reactions.

Before injecting penicillin it is important to find out if the patient has had any previous penicillin therapy, any untoward incidents in connexion with penicillin, or any allergic illnesses. I do not, however, agree with the withholding of penicillin when indicated in an asthmatic unless there has been a previous reaction to penicillin.

Skin testing as a means of excluding those at risk is not altogether satisfactory, for a negative skin test does not invariably exclude a serious reaction, nor does a positive reaction indicate that an anaphylactic reaction will always occur. In view of the difficulties and lack of precision inherent in skin testing, Siegal has suggested giving orally a penicillin tablet (50,000 units) ten minutes before the intramuscular injection. Another practical suggestion is to inject at first only a drop or two of penicillin and wait for

forty-five seconds before completing the injection, in order to try to avoid those particularly severe reactions that come on suddenly. Injecting in the arm rather than in the buttock is also recommended so that a tourniquet can be applied if necessary.

"Serum sickness" reactions following penicillin therapy are now widely known and recognized. The incubation period and symptoms are exactly the same as in the classical serum disease, and in the same way the severity varies widely. Although penicillin is non-toxic, its administration carries a risk of hypersensitivity estimated at 2-8%.

The indiscriminate use of penicillin is to be condemned, for reactions occurring when there is little indication for penicillin are indeed unfortunate, nor must we forget the possible sensitizing effect of initial injections. It has been suggested that procaine penicillin is more allergenic than crystalline penicillin, but some authorities are not of this view.

Reactions to Insulin

Severe generalized systemic reactions are very rare, and so far as I know death has not been recorded. Reactions usually consist of local redness and swelling with pruritus which may be quite troublesome but which usually subsides after a few weeks with the continuation of insulin. Anti-histaminic drugs are helpful, both prophylactically and for symptomatic relief, until spontaneous recovery occurs.

Reactions to Bee- and Wasp-Stings

The frequency of death from a bee- or wasp-sting is difficult to estimate, although such reports in the lay press are not unusual. The post-mortem findings are the same as those found in anaphylactic deaths from other antigens—laryngeal oedema and acute pulmonary emphysema. The early signs and symptoms are the same as those occurring in any severe anaphylactic reaction.

Successive reactions often become progressively worse, and those who are allergic to bee- or wasp-stings should be advised of this possibility. Every person who knows that he is allergic to bee- or wasp-stings should do all he can to avoid being stung. If this risk cannot be avoided, he should carry with him some tablets of ephedrine ($\frac{1}{2}$ gr.) or isoprenaline sulphate (20 mg.) and an antihistamine such as chlorcyclizine hydrochloride (50 mg.). If he is stung he should at once take one or two tablets of ephedrine (or half to one and a half tablets of isoprenaline) and one or two tablets of the antihistamine. Successful hyposensitization has been carried out in individual cases and a scheme of hyposensitization is given by Mueller and Hill.* Bee venom is an extremely potent antigen, and such procedures may well be left to experts. Further work is required on bee and wasp hyposensitization before the risks and benefits can be accurately assessed.

Miscellaneous Reactions

Reactions to vaccines prepared from chick embryos, such as most influenza, typhus, and yellow-fever vaccines, have been observed in individuals who are extremely allergic to egg; in these patients avoidance of such vaccines is necessary.

That occasional but rare reactions to local analgesics such as cocaine occur has long been recognized, and before carrying out bronchograms sensitivity tests are common practice.

Severe anaphylactic reactions following the injection of vitamin B have been recorded, and indicate the advisability, whenever practicable, of giving therapy by mouth rather than by injection.

Next article on Emergencies in General Practice.—"Uterine Inertia," by Mr. Clifford Kennedy.

*New Engl. J. Med., 1953, 249, 726.

MEDICAL BIRTHDAY HONOURS

The names of the following members of the medical profession were included in a Birthday Honours List published in *Supplements to the London Gazette* on June 9:

G.C.V.O.

Sir HORACE EVANS, K.C.V.O., M.D., F.R.C.P. Physician to Her Majesty the Queen.

K.C.B. (Civil Division)

Sir JOHN ALEXANDER CHARLES, M.D., F.R.C.P., D.P.H. Chief Medical Officer, Ministry of Health, Ministry of Education, and Home Office.

K.B.E. (Civil Division)

Sir ALEXANDER STUART MURRAY MACGREGOR, O.B.E., M.D., LL.D., F.R.E.P.S., D.P.H. Medical Officer of Health for Glasgow from 1925 to 1946. For services to public health in Scotland.

Knighthood

ALBERT ERNEST COATES, O.B.E., M.D., M.S., F.R.C.S., F.R.A.C.S. For services to the medical profession in Australia. DARCY RIVERS WARREN COWAN, M.B., B.S., F.R.A.C.P. Honorary Consulting Physician, Royal Adelaide Hospital.

HAROLD ROBERT DEW, Sc.D., M.B., B.S., F.R.C.S., F.R.C.S.Ed., F.R.A.C.S., Professor of Surgery in the University of Sydney. For services to medicine in Australia.

GEORGE LANGDON KEYNES, M.D., F.R.C.P., F.R.C.S., F.R.C.O.G. Consulting Surgeon, St. Bartholomew's Hospital.

C.B. (Military Division)

SEYMOUR GROVE RAINSFORD, D.S.C., M.D., D.P.H. Surgeon Rear-Admiral. Honorary Physician to the Queen.

ALBERT SACHS, C.B.E., M.D., M.R.C.P. Major-General, late R.A.M.C. Honorary Physician to the Queen.

C.B. (Civil Division)

WALTER ERIC CHIESMAN, M.D., F.R.C.P. Medical Adviser, H.M. Treasury.

C.M.G.

BENJAMIN KEITH RANK, M.B., M.S., F.R.C.S., F.R.A.C.S. Chief Plastic Surgeon, Heidelberg Military Hospital, Victoria, Australia.

ALLAN ROBERT STANLEY VICKERS, O.B.E., M.B., Ch.M. For services to the Flying Doctor Service in Australia.

C.B.E. (Military Division)

ALBERT FREDERICK COOK, O.B.E., L.R.C.P.&S.I., D.P.H. Air Commodore, R.A.F.

ALLEN LEOPARD CROCKFORD, D.S.O., O.B.E., M.C., T.D., M.B., B.Chir. Brigadier, late R.A.M.C., T.A. Honorary Surgeon to the Queen. Secretary to St. Thomas's Hospital Medical School.

C.B.E. (Civil Division)

ROGER GILBERT BANNISTER, M.B., B.Chir. For services to amateur athletics.

PHILIPPE LESLIE CARO CARRIER, M.D., M.R.C.P., D.P.H. Senior Medical Officer, Home Office.

CHARLES WILLIAM ATKINSON EMERY, M.B., B.Ch. Principal Medical Officer, Ministry of Pensions and National Insurance.

MARY ESSLEMONT, LL.D., M.B., Ch.B., D.P.H. General Council Assessor to the University Court of the University of Aberdeen since 1947. President of the Medical Women's Federation, 1953-4. For services to medicine in Scotland.

RICHARD THOMAS BONDFIELD GREEN, M.D., D.Sc., D.T.M. Senior Bacteriologist, Institute for Medical Research, Federation of Malaya.

JOHN LEWERS GROVE, M.D. A prominent physician in Launceston, Tasmania.

JOHN ARTHUR LEWELYN VAUGHAN JONES, M.B., Ch.B. Regional Medical Adviser, East and West Ridings Region, Yorkshire. For services to the Ministry of Labour and National Service.

WILLIAM CALDWELL McCLELLAND, M.B., Ch.B. For services to sport in Australia.

FREDERICK GRANTLEY MORGAN, M.B., Ch.B. Director, Commonwealth Serum Laboratories, Royal Park, Victoria, Australia.

FREDERICK WILLIAM ROQUES, M.D., M.Chir., F.R.C.S., F.R.C.O.G. Consultant in Gynaecology to the Royal Air Force. Obstetric and Gynaecological Surgeon, the Middlesex Hospital and the Royal Masonic Hospital. President of Section of Obstetrics and Gynaecology, Royal Society of Medicine, 1954-5.

MAX LEONARD ROSENHEIM, M.D., F.R.C.P. Professor of Medicine in the University of London and Director of Medical Unit at University College Hospital Medical School.

JAMES LESLIE ALLAN WILL, M.B., Ch.B., F.R.C.S.Ed., F.R.A.C.S. Orthopaedic Surgeon, Christchurch General Hospital, New Zealand.

M.V.O. (Fourth Class)

WILLIAM HILGROVE LESLIE MCCARTHY, D.S.O., M.C., M.D., M.R.C.P., D.P.H. Coroner to the Queen's Household.

O.B.E. (Military Division)

GEORGE GREGG, M.D., F.R.C.P.I. Lieutenant-Colonel, R.A.M.C., T.A. Consulting Physician in Physical Medicine in charge of Department of Physical Medicine and School of Physiotherapy, Royal Victoria Hospital, Belfast.

LILIAN GERTRUDE MOORE, M.B., B.Ch., M.R.C.P.Ed. Wing Commander, R.A.F.

WILLIAM MUIR STEWART, M.B., B.Ch., D.P.H. Lieutenant-Colonel, R.A.M.C.

JAMES CLARKE TAYLOR, M.B., Ch.B., F.R.C.S., D.P.H., D.I.H. Wing Commander, R.A.F.

ALISTAIR ROBERT CAMERON YOUNG, M.R.C.S., L.R.C.P., D.M.R.D. Wing Commander, R.A.F.

O.B.E. (Civil Division)

WILLIAM ROY BILLINGTON, M.D. For medical services in Uganda.

ARTHUR DOUGLAS BRIGGS, M.B., Ch.B. Medical Superintendent, Stobhill Hospital, Glasgow.

DAVID ERIC CAMERON MEKIE, M.B., Ch.B., F.R.C.S.Ed. Professor of Surgery in the University of Malaya.

SIMON EZIEVUO ONWU, M.B., Ch.B., D.T.M.&H. Deputy Director of Medical Services, Eastern Region, Nigeria.

EDWIN ALFRED TRIM, M.D., D.T.M.&H. Deputy Director of Medical Services, Kenya.

M.B.E. (Military Division)

CLARK NICHOLSON, M.C., M.D. Major, R.A.M.C., T.A. Honorary Surgeon, Moreton-in-Marsh District Hospital.

CHARLES GEOFFREY WHITE, B.M., B.Ch. Squadron Leader, R.A.F.

M.B.E. (Civil Division)

NEVILLE GEORGE DAVID CAMPBELL, B.M., B.Ch. Medical Officer, Sierra Leone.

DONALD GORDON DUFF, M.C., M.B., Ch.B., F.R.C.S.Ed. Surgeon-Superintendent, Belford Hospital, Fort William, Inverness-shire.

MOHAMED FAQUIR, Medical Officer, Uganda.

SAMUEL MAURICE BARKLIE HILL, M.B., B.Ch. Regional Medical Officer, Northern Region, British European Airways.

ABIEZERI KYABASINGA KIBAYA, Medical Officer, Uganda.

VISHWANATH SITARAM NIJASURE. Senior Sub-assistant Surgeon, Tanganyika.

JOHN TODD, M.C., D.F.C., M.B., Ch.B. For medical and missionary services in Northern Rhodesia.

Miss Ina Lindsay Cook, M.A., LL.B., Assistant Secretary of the Royal College of Physicians of London, has been appointed M.B.E. (Civil Division).

Nova et Vetera

ROYAL SOCIETY OF MEDICINE SESQUICENTENNIAL

History has a habit of repeating itself, with necessary variations. Fifty years ago, on May 27, 1905, the then Prince of Wales (afterwards George V) was admitted an Honorary Fellow of the Royal Medical and Chirurgical Society, shortly afterwards to change its name by supplemental charter to "Royal Society of Medicine." There followed a banquet which we are told in the official history was a "tremendous success," attended by 457 Fellows and guests. On June 7, 1955, the Duke of Edinburgh was similarly admitted an Honorary Fellow, and again there was a banquet, this time with an attendance of close upon 1,000. The President 50 years ago was Sir Richard Douglas Powell; on this recent occasion he was Sir William Gilliatt.

The Duke of Edinburgh declared once again his admiration for the medical profession; he said that he believed the whole essence of medicine to lie in the personal relationship between doctor and patient. He was prepared to put

up with all the disadvantages and perils of this age—strikes and the threat of the H-bomb—"if I can be looked after by the kind and brilliant men around me." He went on to propose the health of the Society, which was responded to by Sir Francis Walshe, the immediate past president. Sir Francis described the Society as the inheritor and hard-pressed sustainer of the greatest medical library in the Old World as well as of an extremely active forum for the exchange of medical knowledge by discussion and communications, oral and written.

To the toast of "The Guests," proposed by Sir Arthur Porritt, there were two replies, one from the Marquis of Salisbury, Lord President of the Council, and the other from Lord Adrian, President of the Royal Society. The former paid a tribute to medical research, while the latter, in praising the Royal Society of Medicine, said that if it were dissolved there would be no immediate dramatic change in medical services, yet the loss would be immeasurable.

History of the Society

One feature of the dinner was the presentation to the Duke of Edinburgh of a copy of the handsome volume which has been written to commemorate the occasion.¹ The author is a medical historian of distinction, Dr. Maurice Davidson. His book takes us back to the origin of the Society, which was not 50 but 150 years ago. It began its life in a tavern in 1805, when 26 disgruntled members of the Medical Society of London, indignant at the autocracy of the seemingly irremovable president, one James Sims, decided to form a new society to be called the Medical and Chirurgical Society of London. Among those present at that determined meeting were John Abernethy and Sir Astley Cooper, but the real founders were William Saunders, the first president, Alexander Marcet, and John Yelloly, the first secretary, all Fellows of the Royal Society. The early meetings were held at Verulam Buildings, near Holborn. On May 28, 1806, a paper by Dr. Pearson, on the treatment of hooping cough [*sic*] was discussed, and a fortnight later the Society had a field night with discussions on tinea capitis, chronic croup, and the use of cold in gout, as well as a note on hydrophobia in a horse. The picture is in odd contrast with the sectional meetings of to-day, where, to take the most recent diary card, there are discussions in one week on the bacteriological diagnosis of pertussis, on antibiotics in bacillary dysentery, on intramuscular administration of "penidural," and on the treatment of paraplegic bladder.

The Royal Medical and Chirurgical Society—it became "Royal" in 1834 and William IV was its first patron—presently was concerned with bringing about a union with itself of the various specialist societies which began to be formed in the latter half of the nineteenth century. It took a lot of doing. In 1870, for example, some of the societies were prepared to come in, but others trembled on the brink. The idea was to have a comprehensive society under some such high-sounding name as the "Royal Academy of Medicine." The word "Academy" was still favoured by many, even down to the time of the actual amalgamation. This was in 1904, when at a meeting held at the Royal College of Physicians, with Sir William Church in the chair, 150 members of different societies resolved to fuse their societies into 16 sections in the newly named Royal Society of Medicine. The sections now number 26, the youngest being the Section of General Practice.

The Society's House and Library

Having got the name, it remained to find the local habitation. Some still living will remember the old meeting-place at 20, Hanover Square, now a commercial house. This building had been acquired by the Society in 1899, but very soon new premises were sought. A site was acquired at the corner of Wimpole Street and Henrietta Street, and the

¹ *The Royal Society of Medicine. The Realization of an Ideal. 1805-1955.* Published by the Royal Society of Medicine. Price £1 1s.

Correspondence

Coal-workers' Pneumoconiosis

SIR,—Dr. Horace Joules, in his letter (*Journal*, May 14, p. 1222) commenting on our article (*Journal*, April 23, p. 994), asks for the evidence on which "approved conditions" are based. When the Industrial Injuries Act came into force in 1948, provisional figures for approved levels of dustiness (in terms of particles of respirable size per cubic cm.) were agreed by the various interested parties after reviewing all the evidence, including that contained in the M.R.C. Special Reports Nos. 243 and 244 on "Chronic Pulmonary Disease in South Wales Coal-miners."^{1,2} Evidence that the provisional figures are indeed low enough can only be obtained by following up, by periodic x-ray examination, groups of miners in representative pits in all parts of the country in which continuous surveys of dust conditions are also being made. This is being done as part of the Pneumoconiosis Field Research Scheme of the National Coal Board, which is by far the most ambitious field investigation in pneumoconiosis being undertaken in any part of the world. As pneumoconiosis appears and progresses so slowly it is inevitable that a number of years must elapse before any valid conclusions can be drawn, but the earliest opportunity is being made to get an indication of the adequacy of the provisional figures by study of our own follow-up surveys, some of which now extend over a period of more than five years.

In his second paragraph Dr. Joules suggests that reliable figures for morbidity from chronic bronchitis are available nationally and it should, therefore, be possible to assess the effect of mining on this disease. We are actively investigating the problem, but believe that the answers are less easily obtained than his letter suggests. The national statistics apply to spells of sickness and not to individuals, and not to those over the age of 65, and thus do not include all retired miners, and they are also unfortunately not available broken down by occupation within the regions. As there are big differences in the mortality figures from chronic bronchitis in different areas, we believe that if we are to obtain reliable information it is necessary to compare miners and ex-miners with other men living in the same community who have never worked underground. Two community surveys of this type have been made—one in South Wales and one in Lancashire—and the results will be published shortly. The findings in these two areas are quantitatively different and, therefore, suggest caution is necessary in generalizing too widely from investigations in one area. Dr. A. L. Cochrane has recently analysed the death rates in relation to the category of pneumoconiosis in his "follow-up" of the Rhondda Fach. This also will be published shortly.

We support fully Dr. Joules's plea for a more intensive drive to eliminate tuberculosis from the mines, but we doubt whether it is practicable to employ the method used in the Rhondda Fach (which was essentially a research project) on a much wider basis. Success in eliminating tuberculosis by treating all infectious cases can only be achieved if all these are detected, which requires x-raying a very high proportion of the community. We wonder whether it would not be a good policy to follow the example set in certain States of Australia, where periodic x-ray examinations of the chest have been made compulsory in the community and, as a result, a much higher proportion of the population has been examined than was possible previously on a voluntary basis.

Dr. H. R. Thomson's description (*Journal*, May 21, p. 1280) of the type of chest pain among the Durham miners with pneumoconiosis coincides exactly with our observations in South Wales. We agree the symptoms are much commoner in the miners, and particularly those with complicated pneumoconiosis, than in cases of emphysema and bronchitis. We are often uncertain of its cause. It would be interesting to know whether it is related to the degree of pulmonary hypertension.—We are, etc.,

Penarth, Glam.

J. C. GILSON.
G. S. KILPATRICK.

REFERENCES

- ¹ *Spec. Rep. Ser. med. Res. Coun. (Lond.)*, 1942, No. 243.
² *Ibid.*, 1943, No. 244.

great building arose which was opened by George V in 1912. It appeared at the time to be ample for all the Society's needs, with its two meeting halls, its council chamber and committee-rooms, and the noble reading-room for the library. Sir Francis Walshe recalled the fact at the dinner the other evening that there were at that time 20 dressing-rooms where Fellows could change. But even then some far-seeing persons saw that future extension might be necessary, and provision was made for the raising of the roof. An extra floor was added, through the generosity of the Wellcome Trust, during Lord Webb-Johnson's presidency in 1950-2. It was certainly needed if only to house the ever-expanding library, which now contains over a quarter of a million volumes, has 50,000 occupants in the course of a year, and employs a staff of 26. What a contrast to the library at the time the Medical and Chirurgical Society was founded. It had between 400 and 500 books, was open two hours a week, and two books were allowed each member at one time. The Duke of Edinburgh was told that, like any other Fellow, he could now take out eight books at once.

Of the many personalities connected with the Society one name stands out conspicuously, that of Sir John Macalister, its secretary for 38 years. His work for the Society was a life's devotion; his hand was felt in every part of its organization, *Proceedings*, and library and all. To him is due perhaps more than to anyone else the successful emergence of the Society 50 years ago into a body covering every branch of medical practice and research. He was succeeded in the secretaryship in 1925 by Mr. Geoffrey Edwards, selected out of 462 applicants, under whom the Society flourished yet more and made several successful new ventures.

Dr. Davidson's commemorative volume ends with brief biographies of the 24 Presidents of the Society since 1907. To name only those who have passed on, and only a few of those—William Selby Church, Humphry Rolleston, John Bland-Sutton, St. Clair Thomson, James Berry, Dawson of Penn. The Society has been fortunate in commanding the disinterested service of some of the most distinguished medical men in succeeding generations.

APPROVED NAMES

Approved names are devised or selected by the British Pharmacopoeia Commission, and the intention is that if any of the drugs to which these approved names are applied should eventually be described in the *British Pharmacopoeia* the approved name should be its official title. The last supplementary list of approved names was published in the *Journal* of October 30, 1954 (p. 1045).

Approved Name	Other Names
Chlorhexidine	Bis - p - chlorophenyldiguanido-hexane. "Hibitane."
*Diethylthiambutene	3-Diethylamino-1:1-di-2'-thienylbut-1-ene. "Themalon."
*Dimethylthiambutene	3-Dimethylamino-1:1-di-2'-thienylbut-1-ene.
*Ethylmethylthiambutene	3-Ethylmethylamino-1:1-di-2'-thienylbut-1-ene.
Methyl phenidate	Methyl 1-phenyl-2-piperidylacetate. "Ritalin" is the hydrochloride.
†Phenindione	2-Phenylindane-1:3-dione. Phenylindanedione. "Dindevan."
Polymyxin	Antimicrobial substances produced by <i>Bacillus polymyxa</i> . (Specific substances are designated by a terminal letter; thus, polymyxin E.)
Streptonicozid	A compound formed by interaction of a suitable streptomycin salt and isoniazid. "Streptohydrazid."
Tripolidine	<i>trans</i> - 1 - 2'-Pyridyl-3-pyrrolidino-1-p-tolylprop-1-ene. "Actidil" is the hydrochloride.

*Not intended for use in human medicine; diethylthiambutene is of interest in veterinary medicine.

†Replaces phenylindanedione as the approved name.

Vagotomy with Gastroenterostomy for Duodenal Ulcer

SIR,—In their interesting article on "Vagotomy and Gastroenterostomy for Duodenal Ulcer" (*Journal*, May 14, p. 1183) Mr. M. J. Bennett-Jones and Mr. S. O'Donnabhain mention a patient, Mrs. M. B., aged 58, upon whom Professor Wells recently performed a revision gastrectomy operation, her fourth operation. Mr. Bennett-Jones agrees that it would be interesting to record the result of this procedure.

In 1951 vagotomy and gastroenterostomy were performed for duodenal ulcer. This was followed by epigastric pain unrelated to food, but relieved by the vomiting of bile. The gastroenterostomy was converted to a Billroth II gastrectomy, and this was later altered to a Billroth I anastomosis without improvement in the symptoms. In October, 1954, the gastrectomy was revised to the Roux-en-Y type. Pain and bile vomiting were immediately relieved, and the patient has, so far, remained free from dyspepsia. She has gained two stones in weight since the last operation.

It is our belief that certain cases of bilious vomiting following Polya gastrectomy are due, in part at least, to pre-existing retraction of the cardia with incompetence of the cardio-oesophageal sphincter mechanism. In such cases the operations of enteroanastomosis or jejunoplasty, which still allow bile to enter the stomach, may fail to relieve the symptom. Conversion of the gastrectomy to the Billroth I type, whilst improving an associated deficiency state, also permits bile reflux into the stomach and thence to the oesophagus. In the last year we have, in 12 cases of severe bilious vomiting after gastrectomy, diverted the duodenal contents from the stomach and provided free drainage of the afferent loop by conversion of the anastomosis to the Roux-en-Y type. If not already performed, abdominal vagotomy is also carried out.

The failure of this patient to gain relief from any procedure other than the Roux anastomosis seems to us to support the belief that gastro-oesophageal reflux was an essential factor in the causation of her symptoms. Attention has already been drawn to this possible combination of circumstances.¹ The series of twelve cases mentioned above, which overlaps those already reported, will be presented as a separate communication.—I am, etc.,

Liverpool, 3.

REFERENCE

- ¹ Wells, C. A., and Johnston, J. H., *Lancet*, 1955, 1, 937.

"Half-minute" Thermometers

SIR,—Your correspondent Dr. P. Gilbert (*Journal*, May 7, p. 1158) has raised a point of great importance. It is known that the times stamped on clinical thermometers bear no useful relation to the time taken to reach a constant reading, but it is not nearly well known enough to medical men and nurses. It is such a commonplace to have a thermometer inserted only for a bare half-minute that one cannot help having serious doubts about the value of temperature records in many hospitals, and in much of general practice. This trade practice of marking unrealistic times on clinical thermometers has been unfavourably commented on before, and it is time it was dropped.

May I suggest a standard "time-in-mouth" of two minutes? It would be easy to test all hospital thermometers, new or old, at two and five minutes in a constant-temperature bath under standard conditions. Any rising more than 0.1° F. after two minutes should be returned to the makers.

There is a related matter which seems to me worth attention. According to Best and Taylor¹ the range of normal oral temperatures in humans is 96.6°–100° F. (35.9°–37.8° C.). The medical profession seems to assume that the normal in all human beings is 98.4° F. (36.9° C.). This is inevitable in hospitals for new patients, never seen in health, and as a first approximation in general practice. Is it too much to expect one's practitioner to have some more accurate idea of one's normal temperature, especially when there are signs—for example, a high or low B.M.R.—

pointing to "abnormal normality"? (This is not a rhetorical question.)

These two factors combined, it seems to me, could lead to errors in diagnosis, possibly serious errors. I write from some experience; it is particularly irritating to be told, when feeling rather ill, that at 99.8° F. (37.7° C.) one has "not really got a temperature," when (a) it is really 100.6° F. (38.1° C.), and (b) one's normal figure is 97° F. (36.1° C.).—I am, etc.,

London, W.5.

D. J. CAMPBELL.

REFERENCE

- ¹ Best, C. H., and Taylor, N. B., *The Physiological Basis of Medical Practice*, 1955, 6th ed., p. 730. Baillière, London.

Potassium Permanganate Ulceration

SIR,—Further to the article by Drs. E. A. J. Alment and C. S. Nicol (*Journal*, October 3, 1953, p. 759) and the subsequent correspondence (*Journal*, October 31, 1953, p. 994), it may be of interest to record another instance of the misguided use of tablets of potassium permanganate as an abortifacient.

I saw recently a girl of 17 who said she had been bleeding profusely per vaginam since the morning and had passed many large clots; this was accompanied by severe continuous pain in the hypogastrium and she thought she was pregnant. Her last menstrual period had begun about five weeks previously and she had never been pregnant before. On examination she was poorly nourished and somewhat shocked; there was moderate rigidity to palpation in both lower abdominal quadrants, but no evidence of peritoneal irritation or of free fluid in the abdomen. Vaginal examination was inconclusive owing to lack of co-operation. Under anaesthesia several handfuls of clotted blood were removed from the vagina and the true state of affairs revealed. There was no pregnancy in the uterus, which was rather small, with a long thin cervix and nulliparous external os. The whole of the right lateral fornix and the vaginal wall on the same side were denuded of epithelium and presented several scattered black eschars. The right side of the cervix was largely eroded, leaving an area of deep ulceration with irregular but sharply defined margins terminating medially at the external os in a black eschar the size of a farthing and shading off laterally into the more superficial ulceration in the fornix. The following morning the haemoglobin was found to be 5 g., and the girl revealed that she had been given some tablets by her cousin which she had inserted herself and soon after had noted the onset of pain and bleeding.

Discussion with my colleagues confirms that this is not an unfamiliar clinical entity locally, and no doubt its popularity with the ignorant is due in part to the rapid onset of severe bleeding which follows insertion of the tablets. I am grateful to Dr. Edward I. Salisbury, medical director, United Fruit Company, Boston, for permission to publish.—I am, etc.,

Panama.

C. C. EWING.

Status Bonnevie-Ullrich

SIR,—Drs. J. B. Barlow and S. E. Levin (*Journal*, April 9, p. 890) in their article on status Bonnevie-Ullrich assert:

"In over a hundred patients reported in the English language literature, however, we have found reference to oedema in only two case reports. Silver (1951) stated that the feet of his patient, aged 2 years and 8 months, were described as having been 'swollen' at birth; and Vulliamy (1953), in his report of an 8-year-old girl, described 'unexplained oedema of hands and feet at birth, persisting in the feet for the first three years.' Pitting oedema was a very prominent feature in our patient and was, in fact, the reason that the mother sought medical advice. It is difficult to understand how, if it were present, such a conspicuous abnormality could have been so frequently overlooked. Ullrich (1949), however, stated that the swelling disappears during the first two years of life. As our patient is the first under the age of 2 years whose case is described in the English literature this may well explain why oedema has so seldom been mentioned."

Permit me to draw their attention to two important inaccuracies and to refer them to my article, "The Bonnevie-Ullrich Syndrome," published in the *Australian Medical Journal*.¹ In the case I published there was marked congenital lymphangiectatic oedema of the dorsum of the hands and feet, and, moreover, my patient was under 2 years of age. Therefore, when they state that in over 100 patients reported in the English language literature they found refer-

ence to oedema in only two case reports, they were incorrect in so far as my case brings the total to three cases. Furthermore, they are incorrect in asserting that their patient is the first under the age of 2 years to be described in English literature, as my patient was only 13 months.—I am, etc.,

Broken Hill,
New South Wales, Australia.

MICHAEL ELYAN.

REFERENCE

- ¹ Elyan, M., *Med. J. Aust.*, 1954, 1, 710.

Idiopathic Pulmonary Haemosiderosis

SIR,—Further to Dr. J. M. Cliff's letter (*Journal*, May 28, p. 1340), cases of idiopathic pulmonary haemosiderosis in adolescents are reported by Waldenström¹ and Walton and Williams² in which recurrent acute episodes resulted in death after about three years. These cases are similar to the original descriptions of the condition in children.

The cases described by Kerley,³ Cliff,⁴ and in my recent article (*Journal*, April 23, p. 1008) differ in showing long periods with minimal symptoms and no anaemia, though some had initial acute attacks. It is in these that it is suggested that the outlook is generally good. Clarification of the prognosis must, of course, await the publication of additional cases.—I am, etc.,

London, N.W.8.

N. A. J. HAMER.

REFERENCES

- ¹ Waldenström, J., *Acta radiol. (Stockh.)*, 1944, 25, 149.
² Walton, M., and Williams, A. A., *British Medical Journal*, 1951, 2, 390.
³ Kerley, P., in *Textbook of X-ray Diagnosis*, 1951, edited by S. C. Shanks and P. Kerley, 2nd ed., vol. 2, p. 178. London.
⁴ Cliff, J. M., *Brit. J. Radiol.*, 1953, 26, 102.

Megaloblastic Anaemia following Anticonvulsants

SIR,—The interesting article on two cases of megaloblastic anaemia following anticonvulsants by Dr. N. Berlyne, Dr. M. Levene, and Dr. A. McGlashan (*Journal*, May 21, p. 1247) prompts me to publish a preliminary note on similar observations on two patients treated with primidone.

(1) A woman, aged 37, was first seen by me on May 1, 1954, when she gave a typical history of temporal lobe epilepsy of 13 years' duration. Barbiturates and bromides had not controlled her fits, and she was therefore changed over to tab. primidone 250 mg. three times a day on May 4. Four and a half months later her general practitioner requested a consultation on account of the patient's lassitude, anorexia, weight loss, ulcerative gingivitis, and stomatitis. The fits had ceased. The patient appeared rather ill on September 15, when she had a smooth tongue, stomatitis, and a blood count as follows: red cells 1,420,000; haemoglobin 37%; colour index 1.3; white cells 4,550. A number of late megaloblasts were seen in the film. The bone marrow was megaloblastic. Free hydrochloric acid was present on gastric analysis. Glucose tolerance, fat balance, and liver function tests were within normal limits.

Folic acid 20 mg. daily was commenced on September 17, with a good reticulocyte response. On November 23 red cells numbered 4,500,000 with a haemoglobin of 91% and a colour index of 1. Folic acid was discontinued that day. Since admission to hospital she had received no primidone. This was, however, restarted on January 7, 1955, without addition of folic acid. Full blood counts have been carried out every fortnight since. On May 17 her red cells numbered 4,250,000, the Hb 94%, and the colour index was 1.1. The red cells appeared macrocytic.

(2) A woman aged 44. This patient gave a history of epileptiform fits since 1950, caused by an oligodendroglioma of the left hemisphere, proved on biopsy and treated by x-ray. Epilepsy persisted after x-ray treatment, but was much better controlled after September, 1952, when she was put on tab. primidone twice daily. In January, 1953, the dose was increased to four tablets daily, and prior to admission to hospital on February 3, 1955, she had taken five tablets daily. No phenytoin or any other drug was given to her after September, 1952. In autumn, 1954, she began to feel tired, lost her appetite, had dizzy spells, and became dyspnoeic. Her private doctor (Dr. Gibson) arranged for a blood count (December 2, 1954), which was as follows: red cells 1,200,000; haemoglobin 32%; colour index 1.3; film: occasional early and late megaloblasts seen. She was thought to be a case of pernicious anaemia, and received first "cytamen" and later "anahaemin" injections without benefit. A blood count on February 2, 1955, was reported as: red cells 1,030,000; haemoglobin 22%; colour index 1.1; white cells 4,850. She entered hospital on the following day, and was so ill that she had several pints of blood during the first week. A fractional test meal showed free hydrochloric acid. The bone marrow was megaloblastic.

Fat balance tests in the faeces gave normal results. The liver function tests were normal. She received 20 mg. folic acid daily as well as 750 mg. primidone from the day of admission. There was a good reticulocyte response and she recovered steadily. Her blood count at the end of April was: red cells 4,360,000; haemoglobin 92%; colour index 1.05; white cells 5,300. The patient left the hospital on April 25. The treatment was then changed from primidone to barbiturates with the intention of continuing so well beyond the period of protective effect of folic acid previously given. It is planned to prescribe primidone again later without additional folic acid but with the safeguard of fortnightly blood counts as in the case of our first patient.

Primidone is now widely used all over the world, and it was therefore somewhat of a surprise to find only one case of megaloblastic anaemia following primidone published by Chalmers and Boheimer.¹ This patient, however, had previously received various other anticonvulsants, including phenytoin. Case 2 of Berlyne, Levene, and McGlashan also had phenytoin until three to four months prior to development of a severe degree of anaemia. I entirely agree with the writers that the effect of phenytoin and primidone leading to a megaloblastic anaemia seems most probable in their cases, but further definite proof of this relationship is desirable.

Dr. Moorhouse and I hope to be able, by continued clinical and haematological review of the two patients mentioned in this paper, to obtain more detailed information about the potential danger of a most valuable drug in the treatment of epilepsy. Our two patients seem to be particularly suited for the investigation related to primidone, as no phenytoin had been prescribed previously in either case.—I am, etc.,

Liverpool

REFERENCE

- ¹ Chalmers, J. M. N., and Boheimer, K., *Lancet*, 1954, 2, 920.

Measles

SIR,—In reply to Dr. J. F. Lund's letter (*Journal*, May 21, p. 1279) I should like to support the opinion of your leading article (*Journal*, April 23, p. 1018) that the prophylactic use of antibiotics in measles is wasteful and unnecessary, provided that any complications that arise are treated early and effectively.

During the recent epidemic I have attended 105 cases of measles. None of these has had routine prophylactic treatment. Two cases developed signs suggestive of early bronchopneumonia, but responded quickly to antibiotics and neither developed the full clinical picture of bronchopneumonia. There was one case of acute otitis media, which resolved rapidly and completely with antibiotic treatment, and two or three mild cases of otitis media, which did not require any specific therapy.

I would submit that, in this small series of cases, these children have been saved trauma, their attendants trouble, and the country about £50; and that none of them is any the worse off as a result.—I am, etc.,

High Wycombe.

J. McLUSKIE.

SIR,—I should like wholeheartedly to support Dr. John Fry's stand (*Journal*, June 4, p. 1389) against the indiscriminate prophylactic use of antibiotics in the treatment of measles. Surely we require a little common sense in this matter. The only two complications of importance which antibiotics can prevent are acute otitis media and acute chest infection. The acute stage of measles, when these complications are likely to occur, lasts only some three to four days. This necessitates at least two visits from the general practitioner, on each of which occasions adequate warning of the onset of these complications can be obtained by the examination of ear-drums and chest respectively. Furthermore, the mother can be warned to inform the doctor immediately should the child complain of earache or should the cough worsen, when a further examination can be made.

The first visit is usually requested when the rash appears. If I find any injection of the drums or any signs in the chest on this occasion, I put the child on to oral penicillin, although this is seldom necessary. My second visit is made on the third day, when the rash is at its height or already

beginning to fade, when the same procedure is repeated. Any infection arising on the second day, even if it has passed unrecognized by a forewarned mother, is unlikely to have reached very severe proportions by the third day, when antibiotic treatment can be still highly effective.

Certain children are probably predisposed to secondary infection by factors which we do not yet fully understand. Administration of antibiotics prophylactically to these individuals will do nothing to increase their resistance to such infection; in fact it is more likely to have the opposite action. There is then a danger of infection with resistant organisms which have been allowed to flourish, owing to elimination of their antibiotic-sensitive competitors. We should aim for early and effective antibiotic treatment of complications in measles and should not allow any relaxation of our vigilance over them from a false sense of security in antibiotic prophylaxis.

On one point I would disagree with Dr. Fry. I consider that every case of acute infective otitis media, no matter how mild, should be treated with antibiotics. Although a number of these cases will clear up without such treatment, it is impossible to differentiate those which will go on to suppuration, with all its possible dangerous complications, from those which will not. It is just these cases which require intensive antibiotic therapy, and the earlier it is given the better. This also applies to the treatment of the inflamed throat when the infection is other than catarrhal. To withhold antibiotic therapy from a case of streptococcal tonsillitis, even if this infecting agent is only suspected, is to court the risk, however slight, of serious complications such as acute nephritis and acute rheumatism. There would seem to be no contraindication to the widespread use of oral penicillin for this purpose, as there have been no reports of any fatal reactions to penicillin by this route, such as have occurred, albeit rarely, after intramuscular injection.—I am, etc.,

Twickenham, Middlesex.

DAVID WHEATLEY.

Drug Eruption from Carbronal

SIR,—Our attention has been drawn to the article entitled "A Purpuric Drug Eruption Caused by Carbronal," by Dr. Peter Borrie (*Journal*, March 12, p. 645). In opening this article the author states that carbronal is closely related chemically to chloral. This might be taken to imply that it may therefore have some similar effects. Carbronal cannot possibly be described correctly as closely related chemically to chloral. The chemical relationship of these compounds gives no grounds, therefore, for expecting similar physiological action.—I am, etc.,

W. M. WOLF,

Darlington.

Director,
Chemical Compounds Ltd.

Varicella with Neurological Complications in an Adult

SIR,—Dr. M. S. Pathy's case report (*Journal*, May 28, p. 1324) of a patient under the above title recalls a similar experience of my own early last year.

A man of 43 (also a bank cashier) contracted varicella from his wife and daughter on January 8, 1954. Their attacks were both very mild, but he had a most severe haemorrhagic confluent rash, and developed a bronchopneumonia, with headache, weakness of arms and legs, and intense toxæmia. He was transferred to hospital on January 15. By that time he was almost comatose and incontinent—temperature 101° F. (38.3° C.). There was slight nuchal rigidity; knee and ankle jerks were absent, but arm tendon reflexes were normal. He was too ill for cerebrospinal fluid to be taken, but a virus pneumonia and encephalitis were diagnosed, and he was given 1 million units of penicillin four-hourly, and chloramphenicol, 2 capsules four-hourly. Two days later chlor-tetracycline 1 capsule four-hourly was substituted for the chloramphenicol, but penicillin was continued until January 21. He also received 50 mg. ascorbic acid three times a day, and "ribothion" 2 dr. (7.8 g.) every four hours from January 20 owing to a severe hypochromic anaemia (R.B.C. 3,000,000, Hb 52%, W.B.C. 10,700—polymorphs 91%, lymphocytes 5.5%, eosinophils 0.5%, monocytes 2%). For insomnia and restlessness he received 5 ml. paraldehyde intramuscularly.

By January 29 he was able to speak and incontinence had ceased; speech was slow and laboured, and there was delayed cerebation. He made a slow recovery, but was able to return home on March 7. He now exhibited a spasticity of both legs, which gradually recovered to a great extent, and a bilateral inferior hemianopia, with central sparing, making it impossible for him to read or to add up figures. The anaemia yielded to "ribothion," and his haemoglobin, which rose to 79% before discharge, was 95% in March, 1955. He now has still much exaggerated knee-jerks but no clonus; the fields of vision have not improved. He has had to relinquish his banking career, but is able, with his wife's help, to conduct a small business. His power of concentration, however, is still poor, as is his memory.

I am grateful to Dr. John Mills for treating him in hospital, and to Dr. Graveson and Mr. F. Heckford for their assistance and advice in treatment of his neurological and eye symptoms respectively.—I am, etc.,

Ryde, I.W.

L. FIRMAN-EDWARDS.

Professional Secrecy

SIR,—Dr. Robert Forbes (*Journal*, May 28, p. 1339) has criticized the new instruction on carnal knowledge of certified defective girls (H.M.(55)46), and, on the face of things, there must be support for the complaint in his last paragraph. It would have shown a fuller appreciation of all the aspects of the problem, and a suitable courtesy to those who guard the ethical standards of the profession, if at least some communication on the proposal had been made.

But reflection shows that the problem is not quite simple. Whatever may be the strict position in law or in medical ethics, the medical superintendent is not only the doctor who has medical care of the defective whose order has sent her to his hospital. He is also very much *in loco parentis*, as the patients themselves so often admit. They are very defenceless and very much children, and he must protect them in every necessary way. Again, there is no legal sanction at all for this, but it is necessary for the good of the service and the ultimate benefit of all patients that he should run his hospital so that it is recognized as giving a fair and honest as well as kindly deal to those entrusted to it.

Many years ago I was worried about a related problem and put it to a friend of much experience with the question, "Am I my brother's keeper?" The immediate reply was, "I'm afraid you are in this case," and I knew it was true. From this broader point of view, I think the medical superintendent must protect the particular patient, and, through her, all others who may suffer like trouble, by giving the police the chance to take action if there is a good case. Whether this is done indirectly through the Board of Control or directly by report to the police may not really be so very different a matter.—I am, etc.,

Wimbledon.

NOEL H. M. BURKE.

Anxiety Neurosis

SIR,—May I comment on one aspect of Dr. Ronald A. B. Rorie's excellent article (*Journal*, April 30, p. 1062) on "Anxiety Neurosis: Treatment by the General Practitioner"? Dr. Rorie describes the melancholy process by which the patient attends several specialists, the diagnosis being made "in a negative manner, by exclusion of organic disorder, rather than in a positive recognition of the various neurotic syndromes." While it is clear that prolonged investigations, which themselves cause worry and eventually trail away into a dismal anticlimax of phenobarbitone, are undesirable, it is even more harmful to ascribe early organic disorders to neurosis. The diagnosis is not always easy, and this way the major tragedy lies.

Further, to convince the modern anxious patient of the nature of his symptoms—and he is to-day rather sophisticated about x rays and the like—may require a negative barium meal, chest x-ray, blood count, and so on. Indeed, such investigations are often most desirable if the physician is to exclude organic diseases. How, then, can we avoid the pitfall of endless specialists?

In most cases the general practitioner quickly realizes the probability of functional aetiology; often his past

knowledge of the patient and family serves him here. Special investigations may be required. Now if the practitioner can arrange these himself directly with the appropriate pathological or radiological department, then he can explain the purpose of the tests to be done and their probable negative result, and throughout the investigation he, the G.P., remains the doctor in charge of the case. His patient's confidence in him is enhanced, and his explanations, advice, and reassurance are well received by a receptive, co-operative individual. It is therefore perhaps appropriate to end with a plea to the hospital authorities to make direct access to diagnostic facilities universally available, and to general practitioners to use them.—I am, etc.,

London, E.6.

DAVID H. LEWIS.

Dermatomyositis

SIR,—A recent personal study¹ of nine cases and a review of the literature of dermatomyositis has convinced me that this diagnosis covers at least three separate entities which can be distinguished on natural history and clinical features rather than biopsy findings.

(1) *Chronic progressive dermatomyositis* (Petges and Cléjati): This, the true pattern of dermatomyositis, may present acutely in children, but more commonly an insidious onset leads to irreversible changes before it is clearly recognized. Early features include low-grade fever and tachycardia, erythema and scaling mainly of exposed surfaces, transient oedema particularly of the orbits; and periarticular pain and tenderness from involvement of tendons. Later tender muscles undergo a slow inexorable progression to generalized atrophy, woody fibrosis, and contractures with grotesque deformities. In parallel the affected skin develops changes of the poikiloderma atrophicans vasculare type with leashes of telangiectasia especially of the eyelids and sternum. A peculiarly expressionless alabaster facies is common, later becoming almost cadaveric. Other inevitable features are the Raynaud phenomenon with secondary sclerodactylia and calcinosis, diffuse or as localized peritendinous nodules. Renal involvement does not occur, but polyserositis, splenomegaly, and involvement of the bowel wall may be seen. In more than one typically deformed patient evidence of pulmonary hypertension and right heart failure has appeared, and has been shown² by exclusion to be due to an obliterative process in the smaller pulmonary arteries. Long-term prognosis is poor, and A.C.T.H. or cortisone therapy seems only to give temporary symptomatic improvement without halting this progress of reparative fibrosis. Very rarely in these cases one sees the hide-binding of scleroderma, a variable cutaneous symptom of, and not a synonym for, progressive systemic sclerosis of which this type of dermatomyositis is probably a variant.

(2) *A symptom complex associated with coincident visceral neoplasm*: Since Bezecky's³ paper in 1935 there have been over 50 recorded examples in the relevant age group of the association of a relatively acute dermatomyositis with neoplasm of any organ or tissue, including Hodgkin's disease and other reticuloses. Two of my cases had bronchogenic carcinoma, one an oesophageal neoplasm. The skin lesions may resemble closely a disseminated lupus erythematosus in appearance and distribution, and atrophic weakness rather than tenderness is shown by the muscles, which tend to be those of the girdles and proximal limb groups. Associated visceral lesions can be attributed to the neoplasm or metastases. An awareness of this association, together with the fact of reported instances of recovery with successful treatment of the neoplasm, demands exhaustive visceral investigation of cases of dermatomyositis in this age group.

(3) *A polymyositic form of polyarteritis nodosa*: Typically this is a hyperacute, fulminating, or self-limiting condition, commonest in young adults, which quickly follows a recognized infection with or without treatment with sulphonamides, etc. Extreme early malaise, high fever, and disproportionate tachycardia are usual. A general distribution and extraordinary pleomorphism characterize the skin

lesions, which vary from erythema fugax, multiforme, or nodosum to livedo reticularis and haemorrhagic necrotic or gangrenous lesions. Painful and tender swellings occur and, if periarticular, make distinction difficult from acute polyarthritides, which occurs in some cases. Oedema is excessive but limited to the area of affected muscles or to the orbits, where the combination with erythema gives a heliotrope bloating which has been likened to cadaveric decomposition. Generalized oedema suggests renal damage or cardiac failure. Muscle involvement is generalized, causing exquisite pain on movement and marked tenderness and swelling. Polyneuritis may cause some of the ensuing weakness and wasting, which are, however, reversible. Ischaemia or infarction may affect any organ, and renal lesions commonly lead to hypertension and uraemia. Polyserositis, hepatomegaly with jaundice, splenic enlargement or infarction, and retinal lesions have been described. A high E.S.R. and a high polymorphonuclear leucocytosis are the rule—one of my cases had a W.B.C. total of 125,000/c.mm. without significant eosinophilia. Creatinuria is also excessive—1,000–2,000 mg. per day.

These cases are an urgent indication for the asbestos cover of A.C.T.H. or cortisone, and, as in systemic lupus erythematosus, the daily controlling dosage may initially be 150 mg. or more of A.C.T.H., or equivalent amount of cortisone, with slow reduction to prevent escape.

Dr. Hillas Smith⁴ has clearly described a case of this last type with, *inter alia*, an episode of bowel or mesenteric infarction and severe renal damage. I would plead that future authors should attempt—if only in retrospect—to classify their cases into these divisions which have, too, important therapeutic implications.—I am, etc.,

Aberdeen.

IAN W. CALDWELL.

REFERENCES

- 1 Part 2 M.D. Thesis, 1954, Aberdeen University.
- 2 *Ann. Derm. Syph. (Paris)*, 1906, 7, 550.
- 3 *Brit. Heart J.*, in press.
- 4 *Arch. Derm. Syph. (Wien)*, 1935, 171, 242.
- 5 *British Medical Journal*, 1955, 1, 770.

Mistaken Capsules

SIR,—The recent correspondence on the treatment of barbiturate intoxication prompts me to call attention to a cause of accidental barbiturate overdosage which I have not previously seen reported—the taking of "carbrital" capsules by mistake for "chloromycetin." The mistake is readily made, and two cases have been seen in this hospital.

The first occurred when a house-physician with a severe upper respiratory infection wished to treat herself with chloromycetin and helped herself from the ward stock. When she recovered consciousness she realized that she had taken capsules of carbrital in error. The second case was that of a woman with acute sinusitis for whom capsules of chloromycetin were prescribed by her doctor. After 24 hours of the treatment she became unconscious and was admitted to hospital, where marked drowsiness and nystagmus were the only abnormal signs. The cerebrospinal fluid was normal and the patient recovered spontaneously overnight. When she came to herself she was shown capsules of carbrital and capsules of chloromycetin, and unhesitatingly identified the former as those which she had been taking before she lost consciousness.

Carbrital contains pentobarbitone 1½ gr. (0.1 g.) and carbronal 4 gr. (0.26 g.) in a white capsule marked by a single navy-blue band. Chloromycetin is put up in a slightly smaller white capsule marked with a grey band. In a poor light the colours of the bands are not readily distinguishable. These cases show how easily confusion may occur and suggest that some more obvious distinguishing mark should be applied to the capsules, which are both marketed by the same firm.

I am grateful to Sister M. A. Woodman, who first made me aware of this problem, and to Dr. T. H. Boon for permission to report the two cases.—I am, etc.,

Newcastle-upon-Tyne.

R. E. IRVINE.

Care of McGill Tubes

SIR,—Complaints have been made from time to time about the poor attention given in operating theatres to the sterility of anaesthetist's appliances—for example, McGill tubes—but from the medico-legal report in the *Journal* of May 28 (p. 1347) it would appear that the pendulum has swung, and that these tubes are now being autoclaved. It is to be hoped that this practice will not spread, for many of the tubes now supplied are already of hard rubber with chisel-like ends, well calculated to do damage in the nose (false passages have been reported). I would suggest that McGill tubes must never be autoclaved, but that they should be well boiled to ensure that they are soft.—I am, etc.,

London, N.W.8.

R. J. CLAUSEN.

The Ban on Heroin

SIR,—May I add my protest against the intended ban of the manufacture of heroin? No drug gives such relief as does heroin in the advanced stages of tuberculosis both for the incessant cough and for the equally troublesome gastric symptoms. If our legislators inquire more fully into the merits of the drug they must be convinced of the foolishness of their ill-advised ban.—I am, etc.,

Birmingham, 33.

W. H. OSBORN.

Coat the Pill

SIR,—With the manufacturers of proprietary medicines constantly on the look-out for new preparations and new forms of old ones, may I, through your *Journal*, draw their attention to the need for a more palatable form of such antimalarial drugs as mepacrine and proguanil? These are notoriously bitter in taste, and I have known several children absolutely refuse to take their daily paludrine whichever way it has been served. I think this difficulty would easily be overcome if these tablets were sugar-coated.—I am, etc.,

Enugu, Nigeria.

F. M. OWERS.

Lumbago

SIR.—Mr. V. B. Green-Armytage asks (*Journal*, May 28, p. 1341) why men get lumbago so much more often than women—an observation that certainly tallies with my own experience. The reason appears simply that men lift heavy weights and thus, by attrition and compression, crack the annulus. Sudden subluxation of this loose fragment is then apt to cause lumbago—a recurrent phenomenon as in internal derangement at other joints.

Women, by contrast, do much stooping, which, in the course of years, causes a gradual retropulsion, leading to intermittent backache coming on after keeping the back bent for some time. Later, permanent backache from a small constant protrusion may result. In my view the different behaviour of the disk in the two sexes merely reflects the difference in the work men and women normally perform.—I am, etc.,

London, W.1.

JAMES CYRIAX.

Gorleston Holiday Camp for the Handicapped

SIR,—The above camp is to be held again this year in the last two weeks of September. There is already a waiting-list for both weeks, so it is obvious that the camp fulfils a long-felt want amongst disabled people.

I should like to ask for the co-operation of the family doctors of those who are going to attend the camp in sending me as full particulars as possible on the confidential form which each handicapped applicant has received. It is quite a serious undertaking to care for a large group of severely handicapped people, and any information about their medical condition and usual treatment would be invaluable to the local general practitioner who acts as medical officer to the camp. A clear statement of the exact nature

of the handicap will also be most helpful to the organizers, who have to allocate sleeping accommodation and arrange for voluntary help.

Any members of the British Medical Association who may be on holiday in the neighbourhood would be welcome visitors to the camp.—I am, etc.,

Norwich.

IRENE B. M. GREEN,
Vice-chairman, Norfolk Voluntary Association
for the Welfare of the Physically Handicapped.

POINTS FROM LETTERS**Hot-water Bottles**

Mr. M. J. HORGAN (Tralee, Co. Kerry) writes: The hot-water bottle is a dangerous convenience. . . . To the infant, aged, and anaesthetized it is a burning problem. It suffers sporadically and surprisingly from enuresis. Thirdly, and possibly uniquely, it has now been convicted of bony injury. I was recently consulted by a lady who told me that, lying half awake, she noticed something strange about her little toe. She made a quick movement with her leg which provoked excruciating pain in her little toe. She had insinuated it into the hole in the stopper of the bottle and the sharp movement had fractured the basal phalanx. Subsequent radiological examination showed a spiral fracture of the middle of the proximal phalanx. I make no claim to originality in this description. Presumably if others have encountered the condition they will let us know of it. In the meantime I should like to feel that I have described my only original syndrome. I shall christen it "hot-water bottle toe," or, perhaps more simply, "Horgan-toe."

Papilloma of the Bladder

Dr. C. HORWITZ (London, N.1) writes: I am wondering whether the following case constitutes a record in the number of diathermies for recurrent papilloma of the bladder? A man aged 56 years employed as a printing manager has been under my care since 1947 for recurrent papilloma of his bladder. He has been admitted to hospital on 29 occasions and on each he was found to be suffering from a recurrence. The last time he was admitted to hospital was on April 24 when for the first time he was found to be free from papilloma of his bladder. He is to be readmitted in three months' time for observation.

An Occupational Hazard

Dr. R. BAUER (Cardiff) writes: I should like to point out that the injury as described by Dr. Edith Faulkner (*Journal*, May 7, p. 1158) closely resembles those incurred by pig-slaughtermen, and known on the Continent as "pig-stabber's injury." The injured part is generally the femoral vein, and the fatal outcome caused by air embolism. In these cases if the injured man was not brought to hospital with his hip maximally bent, but with the leg stretched, the vein was kept open and air was aspirated.

The Changing Face of Medicine

Dr. W. F. BENSTED-SMITH (Newton Ferrers) writes: As a tail-piece to Mr. Clifford Kennedy's article on the changing face of medicine (*Journal*, April 30, p. 1045), might I suggest that if "the State" had to pay the costs of both sides in lost free legal aid cases a way would soon be found to thin out the number of such cases brought to court?

A Convenient Measure

Dr. MARY G. H. EDWARDS (New Milton) writes: I have always found it tiresome, especially when short of time, to measure the distance of the apex beat of the heart from the midline of the sternum. Tape-measures tend to fall off one's knee and the figures are not easy to see in a bad light at night. I have therefore adopted a simple, time-saving method. Adhesive strapping, one inch (2.5 cm.) wide, is stuck on the tubing of the stethoscope, covering alternate inches. Three bands, so placed, enable one to measure 5 inches (12.7 cm.). The stethoscope is always there. The marks are visible by any light and not a second is wasted.

Hospital Improvements

Miss OLIVE MATTHEWS (Coaley, Glos) writes: In response to my offer (*Journal*, May 14, p. 1223) to give away *Hospital Improvements*—how to improve the daily life of the patient in the ward—I am pleased to say that 28 doctors have written to ask for it (duly enclosing fourpence to cover cost of postage and envelope). I would like to ask the recipients to send me their comments, and especially any constructive criticism.

Obituary**JOHN EVERIDGE, O.B.E., F.R.C.S.**

Mr. John Everidge, consulting urological surgeon to King's College Hospital, died at his home in London on June 8. He was 71 years of age.

John Everidge was educated at King's College School and in the medical faculty of King's College, London, where he was junior scholar in 1904, winning the Alfred Hughes prize for anatomy. At King's College Hospital he won the senior scholarship in 1907, and qualified M.R.C.S., L.R.C.P. in the following year. After holding the appointment of house-surgeon at King's College Hospital, he became Sambrooke surgical registrar and surgical tutor in 1912, the year in which he obtained the F.R.C.S. During the first world war he served with distinction in France as a surgical specialist, with the rank of major, being mentioned in dispatches and, at the end of the war, being appointed O.B.E. for his services. "The Major" was the nickname by which he was known to students for several decades.

Everidge returned to King's in 1919 as junior urological surgeon, becoming the senior surgeon in his department and lecturer on urology when the late Sir John Thomson-Walker retired in 1929. From then on he gave up general surgery, though he never lost his interest in it. His fame as a urological surgeon spread far beyond his own hospital, and he held numerous consultant appointments in and around London, including those of consultant to Queen Alexandra Military Hospital, Millbank, and to the London County Council. The author of numerous papers on his specialty, he contributed articles to *Rose and Carless's Textbook of Surgery* and to *Modern Operative Surgery*, and for some years he was chairman of the editorial committee of the *British Journal of Urology*. He was also a member of the council of the British Association of Urological Surgeons, and for some years the treasurer of that body. His slight deafness made him refuse the presidency, but he worked hard for urological interests throughout his career. At the Royal Society of Medicine he was president of the Section of Urology in 1939-40. During the second world war he was one of the senior staff at Horton Emergency Hospital, and at the end of the war, when he was due to retire from the staff of King's, he was appointed active consulting urological surgeon, and in 1953 the title of emeritus lecturer was conferred on him by the council of King's College Hospital Medical School in recognition of his long and valuable services to the school. Three years before this he had been made a Fellow of King's College.

In his younger days Everidge was an accomplished tennis player, being a member of King's "six" in 1906, and in later life he showed a similar aptitude for golf, which, with fishing, became his favourite recreations. He married Miss Kathleen I. Robertson and had one son and one daughter.

We are indebted to Mr. J. G. YATES-BELL for the following appreciation: John Everidge was one of England's leading urological surgeons. At King's his splendid teaching, imparted with wit without crudity, attracted large throngs to his clinics. In surgery he was a pioneer in trans-urethral prostatic surgery as long ago as 1927, and played a part in the development of the modern resectoscope. He was always helpful to his juniors, and it was a matter of pride that so many of his old house-surgeons held consultant

posts. His personal charm was outstanding, and he was held in the highest esteem by his colleagues and friends; patients were devoted to him by virtue of his sympathy.

He had many interests outside his work, lawn tennis in his early days, and in more recent years golf at Epsom and Deal, while many week-ends were spent fishing with urologist friends. He was a member of the Flyfishers' Club.

He always remained young—in surgery by keeping up to date with new procedures, and in private life by his enjoyment of all student activities, dances, and fast cars. His after-dinner speeches were always polished and entertaining. He will be greatly missed as a surgeon and as a friend.

R. N. SALAMAN, M.D., F.R.S.

We record with regret the death on June 12 at his home at Barley, Hertfordshire, of Dr. Redcliffe Salaman at the age of 80. A scholar and research worker of great distinction, Redcliffe Nathan Salaman was for a short time director of the pathological institute at the London Hospital, but he soon turned towards genetic and agricultural research, and for the whole of his life had a host of other interests which brought him renown in many countries of the world.

We are indebted to Professor CHARLES SINGER for the following tribute: As I have known Redcliffe Salaman since childhood I venture to send you some account of this most remarkable man. His accomplishments are too varied for detailing here, but his distinguished career has points of medical interest, not least of which was his extraordinary success in combating his early disability. He was an unusually handsome man who, till a very few weeks ago, gave the impression of an alert, genial country gentleman, a lover of the open air, but also one with a wide knowledge and kindly estimate of men and of affairs. All these things he was, but he was much more. I wish that I could convey in words the impression of cheerful, breezy, combative, intelligent optimism that his presence exhaled.

He was a member of a Jewish family, the progenitors of which came to England from Holland in the mid-eighteenth century. Born in London in 1874, he was educated at St. Paul's School and at Trinity Hall, Cambridge, of which he was a scholar and later an Honorary Fellow. He took a first in the tripos and was much influenced by the physiologists Michael Foster and Gaskell, the anatomist Macalister, and the anthropologist Haddon, all of whom remained his friends throughout their lives. He entered the London Hospital as a student and found time for research even before becoming qualified in 1900. As house-physician to Henry Head, F.R.S., he was naturally drawn to experimental pathology, and spent the years 1901-2 in research on those lines at Würzburg and Berlin. On his return he became director of the pathological institute of the London Hospital and a little later pathologist to the Zoological Gardens. In these capacities he did much important work which he was actively publishing when,



(Walter Stoneman)

in 1904, he developed pulmonary tuberculosis. He immediately entered a sanatorium in Switzerland, where he remained for eighteen months. On his return to England he decided to live in the rural surroundings of Barley, in Hertfordshire. He took there a house which remained his dwelling for the rest of his life. With due care his health steadily improved and he began the series of activities which, by their variety and the vigour with which they were prosecuted, made him a well-known and much-liked, if sometimes controversial, figure in widely different circles.

Undoubtedly his most important scientific work was on the genetics of the potato, on which he became the leading authority. He began his researches on this line in 1906 and continued them to the end of his life; his last paper on it appeared in the present year. It is characteristic of the man that he treated the subject on the very broadest lines, at once theoretical and practical, economic and physiological, literary and historical. His largest single contribution was the fascinating volume of 1949, *The History and Social Influence of the Potato*. Recognized as a classic from the day of publication, it is a most attractive storehouse of original research and observation, fresh in outlook and presentation. It is no small achievement to have made a moving romance of this dull-looking vegetable.

From the middle nineteen-twenties Salaman took an interest in the rising study of viruses. In 1926 he became director of the Cambridge Potato Research Station, a position that he occupied until 1939. The scientific work done in this and kindred capacities led to his well-deserved election as Fellow of the Royal Society in 1935, and to his chairmanship of the National Institute of Agricultural Botany in 1928 and later years. His greatest positive agricultural achievement was the introduction of potato strains with relative immunity to certain viruses and a high yield. Altogether he was the author of over fifty scientific papers on various aspects of the biology of the potato. This by no means exhausted his contributions to agricultural science. Thus he wrote on the inheritance of fur-types in rabbits (1922), and contributed to a Royal Society discussion on ultra-microscopic viruses in animals and plants (1929) and on the state of the "Theory of Natural Selection" (1936). Elsewhere he developed the themes of virus diseases in plants in general (1936) and on economic application of Mendelian methods (1936). He had also an intense interest in anthropological problems, and was the author of a whole series of works dealing largely with the physical anthropology of the Jewish people. Of special medical bearing were his views on the relation of the virus diseases of man and animals to those affecting plants in a communication to the *Lancet* (1937), and on deformities and mutilations of the face in ancient Peruvian pottery in the *Journal of the Anthropological Institute* (1939).

Salaman always devoted a large portion of his activity to public service. He became a J.P. for Hertfordshire in 1907 and was on the bench for 43 years, during 23 of which he was chairman of one of the divisions, member of the quarter sessions appeal court, and member of the county agricultural committee. He was also a Commissioner of Taxes. He combined all this with innumerable other public enterprises. He was almost from the beginning in 1933 a very efficient and attentive member and for long the treasurer of the council of the Society for the Protection of Science and Learning. This body seeks to maintain in active work scholars and

scientists who are refugees from oppression of any sort, regardless of their race, religion, colour, or politics. Salaman's widely generous sympathies here found a very natural and useful outlet.

Something must be said on Salaman's special activities on behalf of the Jewish people, since his interest there, too, was specially in the encouragement of science and learning, and, not least, of higher health standards. He was president of the Jewish Historical Society (1920), and for the last forty years of his life was on the council of the Jews' College, a theological foundation. He was a founder of the Jewish Health Organization (1923), was largely responsible for the founding of a chair of Rabbinic studies at Cambridge (1925), and was a member of the board of governors of the Hebrew University of Jerusalem, which he visited many times and served in many capacities.

Salaman had a singularly happy domestic life. His first wife, Nina Davies, the daughter of a distinguished scholar, was a scholar and poetess in her own right. She was particularly successful in her translations of mediaeval Hebrew poetry and devotional literature, and many of her efforts have become standard. She was a lady of quite exceptional beauty, charm, and wisdom. She bore her husband five children, two of whom are medical men, and died in 1925. He was no less fortunate in his second union with Gertrude Lowy, who survives him.

JAMES HUDSON, M.D.

We record with regret the death on May 17 of Dr. James Hudson at his home at Watermillock, Penrith, Cumberland, at the age of 90. Dr. Hudson, who was in general practice at Newcastle-upon-Tyne for over fifty years until he retired in 1948, was a member of the Council of the British Medical Association for fourteen years and a past president of the North of England Branch.

James Hudson was born at Dumbarton on December 27, 1864, and studied medicine at Glasgow University, where he graduated M.B., C.M. in 1889, proceeding to the M.D. five years later. He first entered general practice as an assistant in a mining district in Lanarkshire, and for a time acted also as senior assistant medical officer to the Coltness Iron Company. In 1893 he settled at Newcastle-upon-Tyne and remained in practice there until 1948, when he retired to Watermillock.

Hudson, a man of boundless energy, always took an active interest in professional affairs, and by regularly attending medical meetings and lectures he kept himself well informed about current medical thought. He was honorary secretary of the Newcastle-upon-Tyne Division of the B.M.A. from 1915 to 1921 and chairman from 1915 to 1918, and president of the North of England Branch in 1925-6. From 1925 to 1938 he represented the Branch on the Council of the Association, and from 1928 to 1940 he was a member of the Central Ethical Committee. He also represented his constituency at eleven Annual Representative Meetings from 1921 to 1939. When the B.M.A. held its Annual Meeting at Newcastle-upon-Tyne in 1921 he acted as one of the honorary secretaries of the Section of Venereal Diseases, and in the following year at Glasgow he served as a vice-president of the Section of Medical Sociology. He was chairman of the local medical war committee throughout both the first and second world wars. He was also a life member and a past president of the Newcastle Medical Society and a past president and

treasurer of the North of England Glasgow University Club. He is survived by one daughter, Mrs. Hudson having died last year.

Dr. GEO. P. HARLAN writes: Much regret will be felt by very many people, both medical and lay, at the death of Dr. James Hudson. He retired to Watermillock after a long, useful, and active life spent in practice at Newcastle-upon-Tyne. He often told me of his experiences as an assistant in Lanarkshire, where, before the days of cars, he made his calls on horseback, then a previously untried form of transport for him. While he was in this assistantship he had to help to deal with a severe epidemic of typhoid fever. On another occasion a mother told him that all her children died in the first few weeks of life. He felt very sceptical of the mother's statement, having just delivered her of a fine healthy child, but after a time the apparently healthy infant developed spasms and died. The condition was diagnosed as tetanus, and infection had arisen from infected water drawn from a barrel which stood outside the door, the water having been used to bath the child and infection having occurred through the umbilicus. James Hudson did not agree with the panel system introduced under the National Insurance Act of 1911 and so remained in private practice, and he adopted the same attitude when the National Health Service came into operation in 1948. I appreciated very much his friendship, as he was an excellent example for a young man. He was of the finest type of general practitioner, for he was not only the doctor but also the friend of the family, and he has left behind him a reputation of which anyone might be proud. Many of his old patients still remember him and all he meant to them. In 1948 he retired to Watermillock to enjoy a well-earned rest. With his inherent enthusiasm and energy, however, he could not be idle, and so he identified himself with the affairs of the village, becoming one of its leaders. Certainly he will be very much missed by all the inhabitants. It is good to think that after his long and busy life at Newcastle-upon-Tyne he was able to exercise his many gifts for the welfare of others at Watermillock.

R. A. LYSTER, M.D., B.Sc., D.P.H.

Dr. R. A. Lyster, formerly county medical officer for Hampshire, died at his home at Bournemouth on June 3 aged 82.

Robert Arthur Lyster was educated at King Edward's School, Birmingham, and at Queen's College and Mason University College in the same city. He took the B.Sc. of London in 1893, and with the help of scholarships and exhibitions he went on to study medicine at Birmingham University, qualifying in 1900. Having determined on a career in public health, he continued to study bacteriology, chemistry, and hygiene as a post-graduate, taking the D.P.H. in 1901, the degrees of M.B., B.Ch. in 1902, and the B.Sc. (public health) in 1905, and proceeding M.D. in 1908. One of his first public appointments was as bacteriologist to the West Riding County Council, but in 1906 he returned to Birmingham as medical officer of health for the Handsworth Urban District. During these years he was lecturer in public health and forensic medicine to the University of Birmingham, but he had to give up this teaching work shortly after his appointment in 1908 as county medical officer, chief school medical officer, and chief tuberculosis officer for Hampshire. He retained this post until his retirement in 1929. During his years in Winchester he saw great changes in the public health service, and in particular he will be remembered for his efforts to extend the facilities available for the treatment of tuberculosis.

Lyster's enthusiasm for preventive medicine won him renown all over Britain. He was editor of the journal *Public Health* from 1918 to 1925, and president of the

Society of Medical Officers of Health during 1925-6 and of the Association of County Medical Officers of Health during 1926-7. An examiner in public health to several universities, he taught the subject himself at St. Bartholomew's Hospital and was a member of the faculty of medicine and board of studies in hygiene in the University of London. He also served on numerous advisory committees to Government departments, was a member of the Central Midwives Board from 1921 to 1930, and was sent as a delegate from this country to several international conferences. During the first world war he served in the R.A.M.C. as a specialist sanitary officer in the Winchester area.

Before he resigned from the public health service Lyster served on several B.M.A. committees, including the Public Health Committee, and was a member of Council from 1925 to 1927. In the years before the first world war he had attended several Annual Meetings as a Representative of his Division. In 1928 he was adopted as Parliamentary Labour candidate for Winchester, but he was unsuccessful in the elections of 1929 and 1931. He was also unsuccessful as the Labour candidate for Preston in 1935. After his retirement from the post of county medical officer of Hampshire in 1929 he went to live in Bournemouth, where he was a very active member of the town council for many years, serving as chairman of the general purposes committee.

E. C. CLEMENTS, C.B.E., M.R.C.S.

Group Captain E. C. Clements, formerly consultant in ophthalmology to the Royal Air Force, died at Horsmonden, Kent, on May 19, at the age of 81.

Edward Cecil Clements, who was born on April 20, 1874, received his medical education at the Middlesex Hospital, qualifying M.R.C.S., L.R.C.P. in 1901. He then studied ophthalmology at Moorfields, and later was engaged in ophthalmic practice at Lincoln. Appointed to a commission in the R.A.M.C. (T.A.) in 1908, he was mobilized on August 5, 1914, for service in the first world war, during which he served with the Royal Flying Corps. Later he was seconded to the Royal Air Force as an eye specialist.

He soon found in pilots the same tendency to lose the power to maintain binocular single vision as he had observed in civilian practice in bank clerks and technicians using precision instruments. Recognizing the importance of such a defect on the judgment of distance when landing aircraft, he set up in July, 1918, at the Hampstead Aviation Candidates Medical Board what is believed to have been the first school for the treatment of heterophoria in London, making use of the then recently invented Maddox rods for diagnosis and Black's amblyoscope for treatment.

In 1919 Clements was appointed to a permanent commission in the Medical Branch of the Royal Air Force in the rank of squadron leader. He was promoted wing commander a year later and group captain in 1928. Employed in his specialty throughout his service, he became consultant in ophthalmology in 1931. He was appointed O.B.E. in 1919 and promoted to C.B.E. in 1934, the year in which he retired.

Although his standards for acceptance for aircrew have been criticized as being too rigid, there can be no doubt that the orthoptic training instituted by Clements increased the confidence and reduced the wastage of pilots undergoing training. His pioneer work holds an honoured place in the records of aviation ophthalmology.

D. Y. SOLANDT, M.D., Ph.D., F.R.S.C.

Dr. Donald Young Solandt, who died in Toronto on March 30 at the age of 48, was professor and head of the department of physiological hygiene and professor of physiology, University of Toronto. An outstanding authority on the biophysical aspects of physiology, he made a special study of muscles, of the special senses, and of environmental conditions. His publications appeared in many medical and biophysical journals, and he was author of a textbook entitled *Highways to Health*.

Donald Solandt was born in Ottawa, Ontario, and entered the University of Toronto in 1925, remaining closely associated with the university until his death. He was a brilliant undergraduate, and his work gave promise of future achievements. He graduated in medicine in 1933, and his interests then led him to post-graduate research in the University of Pennsylvania and later in Britain. In 1936 he obtained his Ph.D. degree from the University of London and returned to Toronto to assume his duties in the department of physiology, where he was in charge of biophysical research. He retained his professorship in this department when, in 1941, he was appointed professor and head of the department of physiological hygiene. During 1941-5 he was on active duty with the Royal Canadian Navy as surgeon commander in the Medical Research Division. In recognition of his contribution to the protection of night vision he was awarded, in 1947, the Medal of Freedom with Bronze Palm by the U.S. Government.

Many committees of the National Research Council of Canada benefited from Dr. Solandt's active interest. He also served on the Advisory Committee of the Department of National Health (Canada) and on committees of the American Public Health Association. He was a member of several scientific societies in Britain, Canada, and the United States and was an honorary fellow of the American Medical Association.

A loyal friend, Solandt was held in high esteem by all who knew him. His great store of knowledge in many fields made him a stimulating companion. He will be remembered for his keenness and adaptability of mind and his never-failing courage in the ill-health which sapped his energy in his early undergraduate days and throughout the rest of his life. He is survived by his widow, formerly Barbara Garford, of London, and three daughters.

Professor RONAN O'RAHILLY writes from Wayne University, Detroit: As a former student, demonstrator, and friend of the late Professor D. T. BARRY (whose obituary was published on May 7, p. 1161), I would like to contribute my personal appreciation. In his long research career he was probably best known in the field of cardiac perfusion, and it was my good fortune to assist him in many experiments. He possessed an indefatigable enthusiasm for physiology and contributed numerous publications to a wide variety of scientific journals. In London, more than a dozen years after his retirement, he was still interested in receiving reprints. In his younger years he was a skilful exponent of chess, bridge, squash, and golf. He had a keen sense of humour, and to a student who informed him during an oral examination that she passed 1,500 litres of urine daily he merely remarked, "How very awkward!" Although students were sometimes awestruck in his presence, he was a very stimulating confrère to those who were fortunate enough to know him outside of the classroom. To these his friends, as to the long line of students who learned in his laboratory, his passing will be a sincerely felt loss.

Dr. B. HIRSH writes: I was deeply moved to read in the *Journal* of June 4 (p. 1393) that Dr. W. J. GRANT, of Shrewsbury, had passed away. I referred to his inspiring leadership in a speech at the recent Annual Representative Meeting. It is tragic for me to think that while I was referring to him he was already dead. Allow me to pay tribute to a great fighter—in the face of tremendous odds—against what we considered to be injustice.

Medical Notes in Parliament

Safety and Welfare Legislation

The Queen's Speech, with which the new Parliament was opened on June 9, promised active promotion of the development of nuclear energy for peaceful purposes, and legislation to safeguard the health and provide for the safety and welfare of those employed in agriculture and industry, and to reduce the pollution of the air by smoke and other causes.

Mr. ATTLEE, Leader of the Opposition, commenting on the health legislation, described it as an extraordinarily meagre instalment of the recommendations of the Gowers Report. The Trades Union Congress had been in consultation with Ministers for a long time, and had been led to believe that a far more comprehensive measure would be introduced to deal with office workers and non-industrial employees, who were totally unprotected.

Sir ANTHONY EDEN, the Prime Minister, explained that there had been a considerable increase in accidents in agriculture and forestry. This was due to the introduction of machinery on a scale unparalleled anywhere in the world. This country had the most highly mechanized agriculture there was. It therefore seemed necessary to the Government to start with this particular measure. But that did not mean that they proposed to stop there. They had considered whether proposals for the railways might be included, but as it was not certain that it would be possible to get the necessary separate Bill through in this session it was thought wiser not to include it in the programme.

The Ban on Heroin

Two Ministers were questioned on June 13 about the ban on the manufacture of heroin. Mr. SOMERVILLE HASTINGS (Barking, Lab.) and Mr. NIALL MACPHERSON (Dumfries, Nat. Lib. and Con.) asked the Minister of Health on what evidence the department held that there was an efficient substitute for heroin in the treatment of disease; what consultation he had had with medical practitioners before deciding not to license its manufacture; and on what grounds he took his decision.

Mr. IAIN MACLEOD said that the British Pharmacopoeia Commission were of the view in 1950 that a suitable alternative existed, and deleted the monograph on the drug from the 1953 edition of the *British Pharmacopoeia*. His Standing Medical Advisory Committee were specially consulted and entirely endorsed this view. As a result he advised the Home Secretary that there was no obstacle from this standpoint to his responding to the appeals of the World Health Assembly and the Economic and Social Council to prohibit the manufacture of the drug.

Mr. HASTINGS asked if there was any evidence of addiction in Britain, and whether the Minister had ever had, as he had had, an intractable cough which nothing but heroin would relieve. Mr. MACLEOD said that the answer, happily, was "No." There were people who believed that for a limited range of afflictions there was no true substitute for heroin. That had to be weighed against the larger claims of the Government playing their part in combating something which was a substantial social evil throughout the world. Although there might be little evidence of addiction in Britain it was entirely desirable that if they could get international agreement they should prohibit the manufacture of the drug everywhere.

Dr. EDITH SUMMERSKILL (Warrington, Lab.) asked whether the substitute was as effective as and much cheaper than heroin. Mr. MACLEOD said that was in dispute, but most people would agree with her. Mr. MACPHERSON asked whether supplies could not be made available to practitioners in those cases where it could be shown there was no adequate substitute, and whether, if he produced evidence of such cases, the Minister would consider it. Mr. MACLEOD said "Yes." The Home Secretary was going to receive a deputation from the British Medical Association, and these matters could be examined then.

Mr. WALTER ELLIOT (Glasgow, Kelvingrove, Con.) said that the drug was of great use in certain cases and could not be dispensed with. He urged the Minister to bend his utmost efforts to see that supplies were made available to reputable practitioners, as had been done before with many drugs as dangerous as this one. Mr. MACLEOD said that he would take that into account. All he could do was to take the best advice available: that was from his Medical Advisory Committee, which included the Presidents of the Royal Colleges, the Chairman of the Council of the B.M.A., and the President of the General Medical Council. Their view was one to which the greatest attention had to be given.

Deputation to Home Secretary

Sir ROBERT BOOTHBY (Aberdeenshire, East, Con.) asked the Home Secretary whether, in view of the protests of the British Medical Association and of the medical profession throughout the country against the threatened withdrawal of heroin, he would permit the manufacture of the drug in limited quantities for use by medical practitioners, and subject to a ban on its export. Sir HUGH LUCAS-TOOTH, Under Secretary, stated that the Council of the B.M.A. had asked the Home Secretary to receive a deputation on this subject, and he had agreed to do so.

Sir ROBERT BOOTHBY asked that the Home Secretary should bear in mind that, in the opinion of the majority of the medical profession, this drug alone could bring relief to certain types of pain, particularly connected with inoperable cancer. As there were only 40 heroin addicts known in this country, would he bear in mind that it was most undesirable that avoidable suffering should be inflicted on thousands of cases if adequate control of the drug could be devised? Sir HUGH LUCAS-TOOTH said the Home Secretary would prefer to discuss the matter with the deputation first.

Poliomyelitis Vaccine

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) asked the Minister of Health when it was proposed to vaccinate groups of children in Britain against poliomyelitis; and what type of vaccine was to be used. Mr. MACLEOD replied that a member of the staff of the Medical Research Council had just returned from a visit to the United States, where he had been studying the latest developments. His report was at present being considered. He expected to make a fuller statement to the House at an early opportunity. Dr. STROSS asked whether some of the tragic results of the use of the Salk vaccine in the United States had been due to the fact that the virus had not been completely killed. If it was used here, would the greatest care be taken to ensure that no such accident occurred? Mr. MACLEOD replied that it seemed probable that the explanation of the Cutter vaccine incident had been that it contained live virus. The Ministry of Health would be content only with the highest standards before they went ahead here.

Cost of Drugs Inquiry

Mr. A. BLENKINSOP (Newcastle-upon-Tyne, East, Lab.) asked the Minister what further progress had been made in discussions with the pharmaceutical industry regarding the cost of drugs and appliances prescribed through the Health Service. Mr. MACLEOD stated that the manufacturers both of standard drugs and of the main types of surgical dressings had been informed that the results of

the cost investigations did not suggest there was any call at present for intervention by the Government, subject in the latter case to certain assurances. As regards the prices of proprietary preparations, since the special provisional reductions which were mentioned on January 31 discussions had been continuing with the industry on the general principles to be followed. Basic drugs, which could not be dealt with separately, were still under investigation, and meantime the firms themselves had continued to reduce the prices of some important drugs. Mr. BLENKINSOP asked if the Minister could give any indication when the discussions would end. Mr. MACLEOD said that he did not particularly envisage them coming to an end at all. It seemed to be a continuing pressure that ought to be kept up over a long period. He added that he thought it would be possible to keep effective and reasonable control over the costs, but there were very considerable problems to reconcile with the need for economy.

Antibiotics

Dr. BARNET STROSS asked the Minister of Health what was the extent of the emergence of strains of diseases now resistant to the common antibiotics such as penicillin, and what was the extent to which uncontrollable allergies to penicillin were appearing. Miss PAT HORNSBY-SMITH, the Parliamentary Secretary, said the Minister was advised that it had been established that strains resistant to penicillin, and in varying degree to certain other antibiotics, were emerging, and that allergies to penicillin were appearing, although it was not yet certain how far any of these was uncontrollable. The Minister was not at present competent to give any more detailed figures or particulars in these matters.

Regional Board Audit Staff.—In answer to a question the Minister of Health said that the staff employed in the audit of the accounts of all National Health Service hospital authorities, executive councils, and certain other authorities conforms with comparable audit services in the Civil Service, where a professional accountancy qualification is not required.

Universities and Colleges

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

The following candidates were successful at the April examination for the Diploma in Obstetrics:

Jessamine M. Akhurst, J. Alexander, H. C. Allen, Anne J. Anderson, M. J. Barnard, C. T. H. Barrett, Renuka Basu, A. G. Blyth, J. G. Blyth, Beryl M. Bromham, J. W. Brown, Jane Buchanan, C. D. Campbell, Margaret E. Chitty, A. R. Chrispin, Elinor B. Clark, Priscilla A. Clark-Maxwell, J. S. Clayton, Elinor M. Cleland, W. M. D. Clements, Mary Clothier, W. G. Cooke, R. L. Coppock, D. C. Cornish, Florence M. Cousley, P. H. Crosskey, Lois R. Davidson, D. W. Davis, D. A. De Renzy-Martin, G. W. Donaldson, D. M. du Toit, C. E. Elliott, Constance H. Ellis, Lucy M. Ellis, E. W. Evans, Joan M. Evans, J. R. Eve, H. T. Fay, Helena M. Fehily, G. Findlay, Kathleen T. Flanagan, J. McC. Forrester, R. W. Galloway, W. F. P. Gammie, R. E. M. Geldart, J. A. Gibson, R. M. Goddard, H. R. Gompertz, J. R. Gough, Sheila M. Gough, J. L. Graham, F. V. Griffiths, A. B. Guest, A. T. G. Gunn, E. A. Haddock, H. N. Hardy, Adeline Kwee-Hong Heah, J. Heffernan, R. M. Hodges, W. S. Hossack, D. S. Iles, Katharine I. Jack, Elizabeth M. Jennings, A. H. John, Isabel D. Johnson, Vivian K. Jones, A. R. Jordan, K. Kelly, A. S. L. Kennedy, Esther S. Kerr, B. Kirsch, W. Lang, L. A. Lees, C. S. Leithhead, H. C. Leslie, E. R. Lester, N. H. Logan, P. Los, R. H. Mackay, B. N. McAdam, Kathleen M. McArthur, Doreen E. McConnell, W. E. H. Maekelberghe, J. M. Manners, Muriel J. Martin, J. F. A. Maskell, H. McL. Morgan, Eleanor Morrison, Mary I. Mossman, K. A. Naylor, Margaret A. Norman, Jean M. North, J. W. Parkin, Rena E. Partridge, W. F. Paveley, J. A. Payne, Mary Phillips, H. R. Playfair, T. A. Plumley, J. G. Powell, Elizabeth M. Price, M. N. Prichard, Margaret J. Purser, Olga M. Rampersaud, Amla Rama Rao, A. M. Reader, D. M. Reader, E. G. Rees, H. F. Reichenfeld, Rosalind M. Rewcastle, D. P. W. Roberts, Margaret J. L. Robinson, R. S. B. Rogers, J. N. Roper, A. D. Rowlands, Hilary M. Rowson, Margaret C. Russell, Dorothy Sanderson, T. A. Sanderson, K. Scott, R. W. Scott, Jane M. Scott-Brown, Jean M. Shields, M. J. Sill, H. R. Simpson, W. S. Sinton, G. H. Smerdon, R. J. Smith, J. H. Spurway, R. M. Stanford, Hilary K. R. Steen, Phyllis A. Stevens, Audrey B. Stevenson, D. Stewart, J. Stewart, T. F. Stoyte, Heather B. Thompson, J. Thompson, D. Tingle, Annemarie D. Tupper, J. Walker, Patricia G. Wallis, W. W. Watson, J. W. S. Webb, J. R. Welsh, B. F. Whiteley, Sheila Wighman, Gladys M. H. Williams, J. R. Wood, W. J. Wright, W. O. C. Young.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending May 28 (No. 21) and corresponding week 1954.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1955					1954				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria ..	10	1	6	0	1	13	0	9	0	0
Dysentery ..	1,385	55	455	18	2	1,136	142	321	6	2
Encephalitis, acute ..	2	0		0		6	1	0	0	
Enteric fever:										
Typhoid ..	1	0	1	2		1	0	0	0	0
Paratyphoid ..	10	0	2	6		2	0	1	0	0
Food-poisoning ..	306	16		1		173	20			
Infective enteritis or diarrhoea under 2 years ..					20				17	18
Measles*	25,470	923	211	259	301	2,046	42	218	175	314
Meningococcal infection ..	19	3	16	2		32	0	16	0	0
Ophthalmia neonatorum ..	64	4	8	0		50	4	9	1	
Pneumonia†	423	19	154	4		428	21	162	5	0
Poliomyelitis, acute:										
Paralytic ..	12	1				10	2		3	0
Non-paralytic ..	13	2	1	1		6	1			2
Puerperal fever‡	201	39	7	2		229	29	14	2	
Scarlet fever ..	609	36	100	49	19	911	60	135	37	51
Tuberculosis:										
Respiratory ..	744	79	126	21		862	99	213	31	
Non-respiratory ..	97	7	15	2		128	7	25	7	
Whooping-cough ..	1,455	71	122	61	35	2,207	81	304	36	27

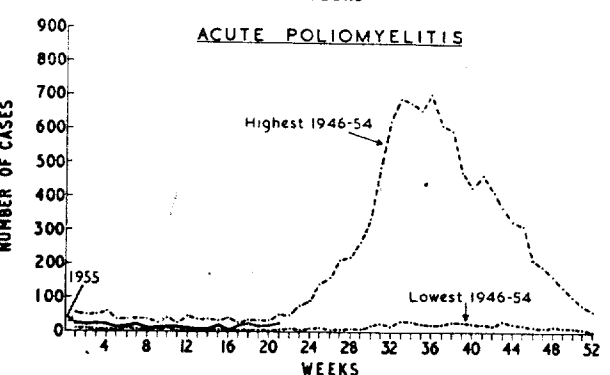
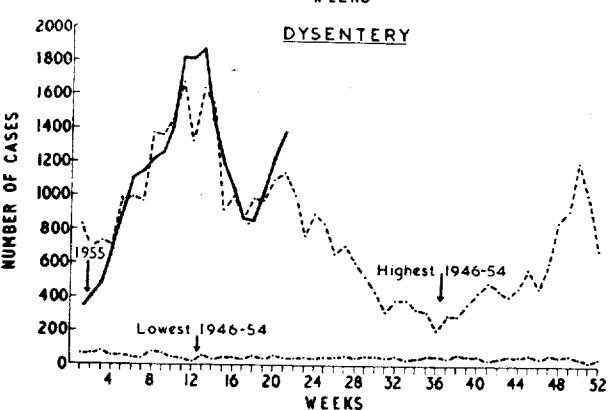
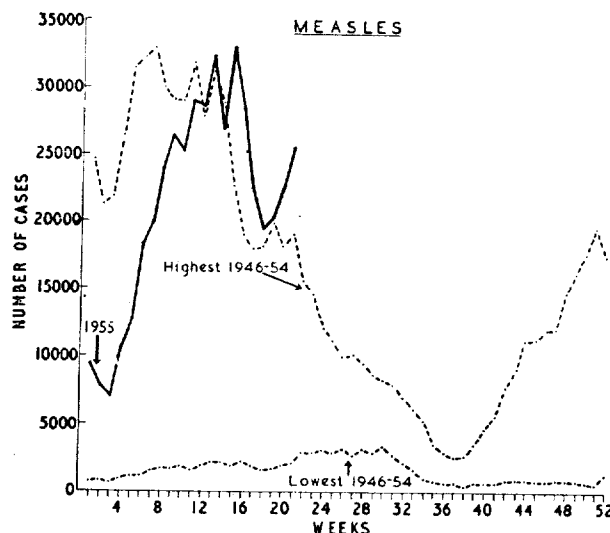
DEATHS in Great Towns	1955					1954				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute ..		0			0		0		0	
Enteric fever ..	1	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	6	0	2	0	1	9	1	2	1	1
Influenza ..	15	0	0	0	0	5	0	0	1	0
Measles ..		0	0	0	0		0	0	0	1
Meningococcal infection ..		0	0				0	1		
Pneumonia ..	198	21	23	10	8	210	34	20	8	6
Poliomyelitis, acute ..	1	0			0	0	0	1		0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory ..	72	16	5	4	5	81	11	12	5	7
Non-respiratory ..		2	2	1	0			2	2	0
Whooping-cough ..	0	0	0	0	0	0	0	1	0	0
Deaths 0-1 year ..	219	27	37	5	15	233	24	26	8	9
Deaths (excluding stillbirths) ..	5,247	716	548	103	173	5,108	679	595	115	185
LIVE BIRTHS ..	7,838	1,103	956	212	440	7,942	1,116	901	239	520
STILLBIRTHS ..	210	35	17			188	17	21		

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

Vital Statistics

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1946-54 are shown thus -----, the figures for 1955 thus ————. Except for the curves showing notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The largest fluctuations in the trends of infectious diseases in England and Wales, during the week ending May 28, were increases of 1,815 for measles, from 23,655 to 25,470, 153 for dysentery, from 1,232 to 1,385, 46 for acute

pneumonia, from 377 to 423, and decreases of 158 for whooping-cough, from 1,613 to 1,455, and 11 for scarlet fever, from 620 to 609. 10 cases of diphtheria were notified, being 7 fewer than in the preceding week.

25 cases of acute poliomyelitis were notified, and these cases were 4 fewer for paralytic and 10 more for non-paralytic cases than in the preceding week. The largest returns were Yorkshire West Riding 5 (Barnsley C.B. 2), Lancashire 4 (Liverpool C.B. 3), and London 3 (St. Pancras 2).

Medical News

Drug Addiction in U.S.A.—The Federal Narcotics Commissioner, Dr. HARRY J. ANSLINGER, testifying before a Senate Judiciary subcommittee in Washington on June 2, gave the number of narcotic addicts in the United States as about 60,000, according to the *New York Times*. This represents an incidence of slightly under 1 in 3,000 of the population, and is based on figures collected since 1953 by the Bureau of Narcotics. New York State accounted for 9,458 of the addicts, and New York itself was stigmatized by the commissioner as "the centre of much of the illicit traffic in heroin." Half the group of "confirmed addicts" were in the age group 21-30 years.

Official Report on the Salk Vaccine.—At 1 a.m. on June 10 the Department of Health Education and Welfare released Dr. L. A. Scheele's report on the Salk vaccine. This followed news that the copy of the report was already in the hands of the *New York Times*. Dr. SCHEELE, Surgeon-General of the U.S. Public Health Service, aided by a committee of experts, has been carrying out a five-week investigation into the reasons for the occurrence of paralytic poliomyelitis in over a hundred of the inoculated children. The report, according to newspaper accounts, makes it clear that inactivation of the three types of virus in the vaccine when undertaken on a commercial scale posed new and difficult problems, and this together with the haste in bringing the product to the public precluded complete safety. The report discloses that on several occasions before Dr. Salk's field trials last year live virus was recovered from some of the batches of vaccine. It seems that the five licensed manufacturing firms had similar troubles, but as such batches were not submitted to the Public Health Service for clearance the authorities were insufficiently aware of the hazard. To deal with this a new Division of Biological Standards has been created and the screening procedure tightened. The report is against the view that the cases of poliomyelitis were due to the injections themselves (post-inoculation poliomyelitis), on the grounds of their geographical distribution. Although no final decision is reached in the report on the question of the banned Cutter vaccine, no good alternative is offered to Professor Gebhardt's explanation that live virus was responsible (see *Journal*, June 11, page 1436). Indeed, in a television interview Dr. Scheele confirmed Professor Gebhardt's claim to have found live virus in one sample of Cutter vaccine.

American Medical Association.—Some 16,000 American doctors, with their wives, attended the 104th annual meeting of the American Medical Association at Atlantic City, New Jersey, from June 6 to 10. Besides the general scientific sessions and the twenty or so specialist sectional meetings, there were colour television programmes of operations and demonstrations from the Hospital of the University of Pennsylvania at Philadelphia, continuous film shows, and a large scientific exhibition. This last had 350 exhibits grouped under scientific sections. A very popular exhibit was the all-day demonstration by six pathologists on fresh post-mortem material; other exhibits were on such things as the chorio-retinal lesions from atomic bomb flash, syphilis in human volunteers, and the electronic analysis of gastrointestinal sounds. In another part of the exhibition the

American Academy of General Practice had cubicles where any doctor could have an immediate chest radiograph and an electrocardiogram. This is expected to become an annual feature. The three principal themes in the scientific sessions were the medical aspects of atomic energy, cardiac surgery, and poliomyelitis.

Nuffield Chair of Child Health at Durham.—Dr. S. D. M. COURT has been appointed to the Nuffield Chair of Child Health at Durham University, left vacant by the death of Sir James Spence a year ago. Dr. Court, who graduated at Birmingham in 1936, has been Reader in Child Health at Durham since 1948. He had previously held appointments at Great Ormond Street and the Westminster Hospital.

Sims Commonwealth Travelling Professors.—The Royal College of Surgeons announces the appointment of Mr. GEOFFREY KEYNES, consulting surgeon to St. Bartholomew's Hospital, and Sir LIONEL WHITBY, Regius Professor of Physic at Cambridge, as Sir Arthur Sims Commonwealth Travelling Professors for 1956. Mr. Keynes will visit Canada and parts of Africa. Sir Lionel Whitby will go to Australia and New Zealand.

Royal College of Surgeons.—At the council meeting on June 9 Mrs. MITCHNER presented the College with two badges of office for the vice-presidents, in memory of her husband, the late Mr. Philip Mitchner. The Jacksonian Prize was presented to Mr. C. W. D. LEWIS (Cardiff).

Lady Tata Memorial Trust.—In addition to the customary personal grants and scholarships for research on leukaemia and allied diseases, the trustees announce this year a block grant of £1,000 to the Social Medicine Unit at Oxford, directed by Dr. ALICE STEWART, for a pilot inquiry into possible environmental factors in leukaemia.

International Society for Human and Animal Mycology.—This society was founded last year during the eighth International Congress of Botany by a group of scientists from ten nations. The committee is as follows: president, P. REDAELLI (Milan); vice-presidents, C. W. EMMONS (Bethesda), G. T. AINSWORTH (Exeter), P. NEGRONI (Buenos Aires), G. SEGRÉTAI (Paris); general secretary, R. VANBREUSEGHEM (Antwerp). Those interested in joining the society are invited to write to Dr. R. Vanbreuseghem (Institut de Médecine Tropicale, 155, rue Nationale, Antwerp, Belgium) giving details of their qualifications and a list of their scientific publications.

Care of the Elderly.—The Medical Society for the Care of the Elderly made the following elections to the executive committee at the annual general meeting on May 7: president, Lord AMULREE; hon. vice-presidents, Dr. J. H. SHELDON, Dr. E. L. STURDEE; hon. treasurer, Dr. W. MORION; hon. secretary, Dr. A. N. EXTON-SMITH; hon. deputy secretary, Dr. P. ARNOLD; other members, Drs. J. AGATE, O. T. BROWN, K. J. G. MILNE, L. NAGLEY, O. OLBRICH, M. WARREN, T. S. WILSON, and Professor R. E. TUNBRIDGE.

Composition of Flour.—Persons or organizations wishing to put evidence before the Government Panel on the Composition and Nutritive Value of Flour are invited to send it in writing before July 9 to the secretary, Miss B. M. Shedden, 10, Whitehall Place, London, S.W.1. Sir HENRY COHEN is chairman of the panel (*Journal*, May 14, p. 1298).

Sweets and Dental Caries.—In the first five years of the Health Service about £100m. was spent on providing artificial teeth. This is stated in a Ministry of Health Circular (11/55) to Local Authorities on the Maternity and Child Welfare Dental Services. In an appendix on the promotion of dental health, the circular blames the greatly increased consumption of sweets as "undoubtedly one of the main causes of the increase in dental decay." The circular quotes in support of this charge the Swedish investigations showing that sugar between meals increases the incidence of caries (see *British Medical Journal*, May 21, p. 1265).

Tour in British West Africa.—There is an opportunity for several United Kingdom medical graduates under the age of 25 on October 31, 1955, to join a small party of young

people visiting British West Africa from November, 1955, to January, 1956. The tour is under the auspices of the Prime Minister's committee on overseas travel parties for youth, which administers moneys allocated from the South African Aid to Britain Fund. Those interested should apply immediately to the tour organizer at 37, Bedford Square, London, W.C.1.

COMING EVENTS

N.A.P.T. Commonwealth Health and Tuberculosis Conference.—The fourth conference will be opened on June 21 at 10 a.m. by the Minister of Health at the Royal Festival Hall, London. After the conference there will be visits to sanatoria, hospitals, and clinics.

Hospitals' Symphony Orchestra.—Concert in the Great Hall of B.M.A. House, Tavistock Square, London, W.C.1, on June 25 at 7.30 p.m. Works by Haydn, Brahms, Dvorak, Sibelius, and Berlioz. Tickets (10s. to 3s. 6d.) from Miss M. A. Whipp, Almoners' Department, St. Thomas's Hospital, London, S.E.1.

Oxford Graduates' Medical Club.—The Summer Dinner will be held in Oriel College, Oxford, on Friday, July 1, at 7 p.m. with Dr. F. G. Hobson, D.S.O., F.R.C.P., in the chair. Members may bring medically qualified guests of either sex. Tickets (price 35s.) from RONALD MACBETH, F.R.C.S., Department of Otolaryngology, Radcliffe Infirmary, Oxford.

Irish Medical Association.—Members of the B.M.A. will be welcome at the annual meeting of the I.M.A. at Trinity College, Dublin, July 4-8. Details of the clinical sessions from the secretary of the I.M.A., 10, Fitzwilliam Place, Dublin.

Collegium Internationale Allergologicum.—Symposium on migraine and vascular allergy at Basle, July 3-8.

Royal Medical Benevolent Fund.—Annual general meeting on July 28 at 5 p.m. at 11, Chandos Street, London, W.1.

NEW ISSUES

Journal of Neurology, Neurosurgery and Psychiatry.—The next issue (Vol. 18 (New Series), No. 2) is now available. The contents include:

STUDIES IN TRAUMATIC EPILEPSY, PART 3: VISUAL FITS. W. Ritchie Russell and C. W. M. Whitty.
THE ARTERIAL SUPPLY OF THE SPINAL CORD AND ITS SIGNIFICANCE. D. H. M. Wooliam and J. W. Millen.
ENCEPHALITIS IN LOA-LOA FILARIASIS. L. van Bogaert, A. Dubois, P. G. Janssens, J. Radermecker, G. Tverdy, and M. Wanson.
OBSERVATIONS ON THE REACTION TIME TO CUTANEOUS THERMAL STIMULI. P. P. Lee and D. C. Sinclair.
CHRONIC PROLIFERATIVE OSTEOITIS OF THE SKULL. J. E. M. Button and G. L. Alexander.
THE ASSOCIATION OF DEMENTIA WITH RADIOLOGICALLY DEMONSTRATED CEREBRAL ATROPHY. R. H. Gosling.
CHOROID PLEXUS PAPILLOMA CAUSING SPONTANEOUS SUBARACHNOID HAEMORRHAGE. J. Ertisling.
THE USE OF DEHYDROISANDROSTERONE IN PSYCHIATRIC PRACTICE. E. B. Strauss and W. A. H. Stevenson.
ISCHAEMIC SENSORY LOSS IN PATIENTS WITH SPINAL AND CEREBRAL LESIONS. R. W. Gilliat.
ANXIETY AND AN AUTONOMIC REACTION TO PAIN. Malcolm Piercy, Alick Elithorn, R. T. C. Pratt, and Margaret Crosskey.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

British Journal of Pharmacology and Chemotherapy.—The new issue (Vol. 10, No. 2) is now available. The contents include:

THE ACTION OF HYPNOTIC DRUGS ON FROG SKELETAL MUSCLE. J. P. Quilliam.
THE ACTION OF THIOPENTONE SODIUM ON SKELETAL MUSCLE. J. P. Quilliam.
ACTION OF PROGUANIL AND ITS METABOLITE ON NEUROMUSCULAR AND SYNAPTIC TRANSMISSION. Marcel J. Dallamagne and E. Philippot.
EXPERIMENTAL CHOLERA IN INFANT RABBITS: A METHOD FOR CHEMOTHERAPEUTIC INVESTIGATION. N. K. Dutta and M. K. Habbu.
PROTECTION AGAINST ANAPHYLACTIC SHOCK BY VARIOUS SUBSTANCES. H. Herxheimer.
A POSSIBLE MECHANISM OF ADRENALINE STABILIZATION IN THE ADRENAL GLAND. Douglas G. Humm, Martin Roeder, Miriam Landew, and Eloise E. Clark.
A SERIES OF POLYMETHYLENE BIS-ACETOXYETHYLDIMETHYLAMMONIUM SALTS. R. B. Barlow.
THE ANTICHOLINESTERASE ACTIVITY OF POLYMETHYLENE BIS-QUINOLINIUM SALTS. R. B. Barlow and Jean M. Himmis.
THE PHARMACOLOGICAL ACTIONS OF CAPSAICIN AND ANALOGUES. C. C. Toh, T. S. Lee, and A. K. Kiang.
OBSERVATIONS ON HISTAMINE-INDUCED PRURITUS AND PAIN. J. L. Broadbent.

MODIFICATION BY DRUGS OF THE RESPONSE OF THE RAT'S UTERUS TO ADRENALINE. Margarette Holzbauer and Marie Vogt.
THE SCHISTOSOMICIDAL ACTIVITY OF SYMMETRICAL DIAMINODIPHENOXY-ALKANES. C. G. Raison and O. D. Standen.
A SLOW CONTRACTING SUBSTANCE IN NORMAL HUMAN URINE. Fernando P. Gomes.
THE MODE OF ACTION OF SULPHONAMIDES, PROGUANIL, AND PYRIMETHAMINE ON PLASMODIUM GALLINACEUM. I. M. Rollo.
THE RELEASE OF HISTAMINE BY POLYMYXIN B AND POLYMYXIN E. S. R. M. Bushby and A. F. Green.
PHASE-BOUNDARY POTENTIALS AND GANGLION-STIMULANT ACTIVITY. K. A. Exley and P. Hey.
ACTION OF THE HISTAMINE-RELEASE POLYVINYLPIRROLIDONE ON CAPILLARY PERMEABILITY IN DOGS. B. N. Halpern, E. Musso, and Th. Nevchi.
BRONCHODILATOR AND BRONCHODILATOR ACTIONS OF ANTIHISTAMINE DRUGS. D. F. Hawkins.
A STUDY OF TWO METHODS FOR TESTING LOCAL ANAESTHETICS IN MAN. J. L. Mongar.
PRESENCE OF ACETYLCHOLINE IN THE MALAYAN JACK-FRUIT. ARTOCARPUS INTEGRA. Robert Chui Yu Lin.
RELEASE OF HISTAMINE BY A SUBSTITUTED BUTYLAMINE (I. 1955): COMPARISON WITH COMPOUND 48/80. W. Feldberg and J. Lecomte.
STUDIES ON THE MECHANISM OF PITUITARY-ADRENAL ACTIVATION BY MORPHINE. Robert George and E. Leong Way.

Issued quarterly; annual subscription £4 4s.; single copy 25s.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

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

Monday, June 20

BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—At Central Hospital, near Warwick, 2.30 p.m., clinical meeting.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. Lewis Dexter (Boston): Cor Pulmonale.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., ophthalmology lecture by Dr. D. R. Lucas: Retinal Dystrophy.

Tuesday, June 21

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. O. L. S. Scott: Hypostatic Ulcers.
ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Ernestine Henry Lecture by Dr. K. M. A. Perry: Pulmonary Disease Associated with Metallic Oxides.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Arnot Demonstration by Dr. S. Engel: Post-natal Development of the Child's Lung.
SOUTH-WEST LONDON MEDICAL SOCIETY.—At Bolingbroke Hospital, 8.30 p.m., annual general meeting.

Wednesday, June 22

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Subcutaneous Mycotic Infections.
ROYAL SANITARY INSTITUTE.—2.30 p.m., Mr. P. G. Shute: Role of Mosquitoes in the Spread of Myxomatosis and Some Suggestions for their Control.

Thursday, June 23

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: The Reticuloses.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. J. C. Gilson: Rheumatism and Lung Disease.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor A. C. Bingold: Benign Fibrous Tumours of Single Bones.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., postgraduate demonstration in psychiatry.
●WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At New Hall, Royal College of Surgeons of England, 7.30 for 8 p.m., annual banquet.

Friday, June 24

CAMBRIDGE MEDICAL SOCIETY.—At Addenbrooke's Hospital, 3 p.m., Mr. S. G. Clayton: Post-mortem.
●INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. P. F. Borrie: Leg Ulcers.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Dr. J. G. Scadding.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—(1) 2 p.m., Mr. J. Bruce: Regional Enteritis. (2) 4 p.m., Mr. P. McG. Moffatt: Use of the Ophthalmoscope in Medicine (II).

Saturday, June 25

CAMBRIDGE UNIVERSITY MEDICAL SCHOOL.—10.30 a.m., symposium: Laboratory Aids to Diagnosis and Treatment.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Clarke-Williams.—On June 8, 1955, at the General Hospital, Rochford, Essex, to Shirley (formerly Hinton), wife of Michael Clarke-Williams, M.B., M.R.C.S., a brother for Marion-Adam Richard.
Dobson.—On June 1, 1955, to Dr. Margaret J. Dobson (formerly Barker), wife of Sydney F. Dobson, Stockport Road, Marple, Cheshire, a second son.

MARRIAGES

Torley-Hausmann.—On December 21, 1954, at The Cathedral, Minden, John Torley, M.B., Ch.B., to Marlies Hausmann, of Minden, Westfalen, Germany.

DEATHS

Gribbell.—On April 13, 1955, at his home, "Torridon," Yelverton, Devon, William Ernest Gribbell, M.R.C.S., L.R.C.P., Surgeon Captain, R.N., retired, aged 78.
Griffiths.—On May 6, 1955, at Ruthin Castle, John Tudor Griffiths, L.R.C.P.&S.Ed., L.R.F.P.S., J.P., of Leaton, Gronam Road, Prestatyn, Flint.
Kilgour.—On April 25, 1955, at 37, Abercon Place, London, N.W., William Robert Kilgour, M.R.C.S., L.R.C.P., aged 71.
Marsh.—On May 4, 1955, at 85, Appleby Lodge, Manchester, Lancs, Frank Needham Marsh, M.B., Ch.B.

Any Questions?

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

Medical Hazards of Travel in France, Spain, and Italy

Q.—I am planning a motoring tour in France, Spain, and Italy. (a) Is the tap-water safe to drink, and, if not, what precautions are advised? (b) I am told that enteric upsets are particularly common in some parts of France and Spain. Would it be a good idea to take a supply of sulphaguanidine? (c) Am I likely to encounter malaria in these countries, and, if so, what prophylactic measures are advised?

A.—(a) Piped water supplies may generally be regarded as safe throughout France, Spain, and Italy. There is, however, a minimal risk entailed in drinking water from wells or pumps. The risk is so small that most travellers accept it, but it may be eliminated altogether by boiling the water before drinking. This is much more satisfactory than chlorination, which is uncertain and tedious to carry out. If, however, it is desired to chlorinate water, 30 mg. (½ gr.) chloride of lime (calcium hypochlorite) should be dissolved in 1 gallon (4.5 litres); the water is allowed to stand 30 minutes and to it 15 mg. (¼ gr.) sodium thiosulphate (hyposulphite) is then added. The crystals are thoroughly dissolved and the water allowed to stand for a further 30 minutes. The sodium thiosulphate does not play any part in sterilizing the water; it removes excess chlorine and renders it more pleasant to drink.

(b) Most enteric upsets acquired by travellers on the Continent are transient, settling down in a day or two without treatment, but some of them may be cut short by taking standard doses of sulphaguanidine or phthalyl sulphathiazole.

(c) The risk of contracting malaria in France, Spain, or Italy is now so small that it may be ignored.

Mild Hookworm Infections

Q.—If hookworm ova are found in the stools (of a European) is this a definite indication for treatment even though the infestation is light, the blood picture normal, and symptoms absent? What is the prognosis if the case is left untreated?

A.—No. In such cases the patient will suffer no harm from the presence of the parasites, and they are best ignored. The prognosis is good, though the natural life of the worm may be one of several years. Hookworm infections are difficult to eradicate completely, and to attempt this by repeated courses of treatment is not only usually unsuccessful but also causes anxiety to the patient.

Formalin Fumes

Q.—A sanitary inspector tells me that the fumes of strong formalin solutions can cause "softening of the brain," and he therefore advises his assistants to handle such solutions only in the open air. Is there any scientific basis for this belief? Are there any other dangers from formalin fumes?

A.—The vapour of formalin is a powerful upper respiratory irritant, and it is clearly advisable, whenever possible, to prevent a high concentration in a closed space. It is certainly a wise precaution to remove the risk by handling such solutions in the open air. The fluid produces dermatitis of the hands which varies widely in severity. In an appreciable proportion of those who handle fluid formalin an unmistakable degree of hypersensitivity develops, and under these conditions the vapour will aggravate the skin condition. There is no evidence of any association between the inhalation of formalin vapour and "softening of the brain."

Coitus Interruptus and Ejaculatio Praecox

Q.—What is your expert's opinion of coitus interruptus? A man who has been practising it for several years is now complaining of ejaculatio praecox. What, if any, is the association?

A.—Coitus interruptus is unsatisfactory because it is an unsafe method of contraception and because, in some couples, it leads to nervous tension and unsatisfied sex urge, with possible psychological and physical reactions. These occur mainly in the wife, but can also present in the husband. Nevertheless it must be admitted that coitus interruptus is the most commonly practised method of contraception, and few of its adherents seem to come to harm.

The suggestion that premature ejaculation in the man in question is a possible psychological reaction to the practice of coitus interruptus over many years is impossible to refute, but it is not very likely. Premature ejaculation is to be regarded as a form of impotence. In early marriage it is often caused by nervousness and inexperience, but after several years of marriage its more probable causes are advancing age with too frequent attempts at coitus, overwork, and the stresses of life in general. Perhaps coitus is attempted with too weak an erection. There may also be hidden factors of a sexual or emotional nature.

Post-mortem Diagnosis of Death from Air Embolism

Q.—A pathologist found a few air bubbles in superficial cerebral veins at post-mortem examination of a woman who had died suddenly seven hours after colporrhaphy. There was no other abnormality. The coroner accepted his opinion that the death was due to air embolism. Surely it is physiologically impossible for air introduced at the operation site to have reached the cerebral veins.

A.—It is possible for air to reach the cerebral veins as the result of air embolism in certain cases. This is particularly well seen in abortions due to the use of a Higginson's syringe, when the air is forced into the uterine veins under such pressure that it passes through the right heart and against the stream of blood in the jugular veins to reach the cerebral sinuses and veins. In these cases the sinuses contain very obviously frothy blood, and similar froth will be found in the right heart and jugular veins. The same changes can be found in air embolism due to attempted insufflation of the Fallopian tubes or faulty blood transfusions.

Air may be found in the cerebral veins at post-mortem examination as the result of the tearing of pial and meningeal vessels during the removal of the calvarium. Indeed, it is difficult to avoid the introduction of an occasional bubble of air into these veins, even when considerable care is exercised. For air to persist for seven hours in the cerebral veins between colporrhaphy and death is, in my opinion, impossible. For air to reach the cerebral veins it would have had to be introduced in such volume that it would kill immediately, and its presence would be blatantly obvious in other veins. While air embolism from suicidal cut throat and operations on the neck has occurred as the result of negative pressure in the jugular veins during inspiration, it is difficult to envisage anything like the same mechanism occurring during or after colporrhaphy even in a high Trendelenburg position. The actively contracting pregnant or recently pregnant uterus may trap air and force it into the circulation, but again such conditions do not obtain during colporrhaphy.

To justify a diagnosis of air embolism it should be possible to trace air from a recognized and probable portal of entry, through the veins (in this case the inferior vena cava), to the heart; or to have a clear clinical history of convulsions, transient palsies, haemoptysis, etc., such as are seen in air embolism resulting particularly from artificial pneumothorax procedures. In the absence of air elsewhere in the blood stream, the presence of a few air bubbles in superficial cerebral veins does not justify a diagnosis of air embolism.

Reason for Avoiding Bleeding During Smallpox Vaccination

Q.—A number of writers describe the technique for smallpox vaccination. All those I have consulted mention that blood should not be drawn in making the scratch. None state the reason. Is it because the blood dilutes the lymph and the vaccination is less likely to "take," or is it more likely that such a scratch will lead to a severe general reaction, with possible generalized vaccinia?

A.—In the scratch method of vaccination, bleeding is undesirable mainly because blood may wash the virus out of the scratch and also dilute the vaccine, thus reducing its effectiveness. It is unnecessary to scarify deeply, because the "dermal" virus strain employed is adapted to growth in the skin. When the epidermis only is penetrated, as is desirable, a slight oozing of blood-tinged serum may be observed, but little or no blood. The adoption of a technique involving a minimum of trauma may also reduce the risk of post-vaccinal encephalitis and other complications.

The multiple-pressure method of vaccination has now replaced the scratch as the technique of choice in Britain, the United States, and elsewhere. Its advantages include less general "messiness" (with no bleeding) and less risk of septic infection.

Itchy Eruption on a Woman's Shoulders

Q.—What investigations and treatment are indicated for a healthy woman of 25 whose shoulders are covered with the weals of scratches secondary to lichen simplex or neurodermatitis? The area of spread is over the shoulders and back (latterly improved), and now more marked over waist, hips, and thighs.

A.—This question does not allow a direct answer. The diagnosis depends as always on the history, including the past history of the patient and that of her family, as well as on the examination. In this way it may be determined whether the condition is a primary eczematous dermatitis or urticaria with secondary eczematization caused by scratching (weals are mentioned). Dermographism may be present. The possibility of lichen planus must be remembered.

If the condition is thought to be eczematous the possibility of allergic sensitization such as occurs with nickel dermatitis from suspender buckles with secondary spread, or rubber dermatitis from a corset or belt, should be considered. On the other hand, the condition may be "constitutional" and related to impairment of general health or to mental stress. The treatment depends on the diagnosis and cannot be discussed here.

Bacterial Flora of the Mouth

Q.—What is the normal bacterial flora of the mouth and throat? Should one endeavour to eliminate any bacteria found unexpectedly in a routine swab—for example, a *staphylococcus*?

A.—The mouth and anterior part of the throat have the most profuse and varied flora of any part of the body with the single exception of the colon, and the inquirer should consult a textbook for a full account of it. Among organisms regularly or frequently found are a great variety of streptococci, *Staphylococcus albus*, strains of *Neisseria*, *Haemophilus* and *Bacteroides*, and spirochaetes (*Treponema dentium*).

Whether an attempt should be made to eliminate any organism found depends: (1) on whether it is potentially pathogenic (a *staphylococcus* need not be considered further unless it is known to be coagulase-positive); (2) on the likelihood that its presence is connected with anything of which the patient is complaining. A third consideration is the possible risk to other people if a patient is shown to be a carrier of haemolytic streptococci of Lancefield's group A or of virulent diphtheria bacilli.

Kosher Diet and Peptic Ulcer

Q.—Is there any difference in the incidence of peptic ulceration in those on a strict kosher diet and those who are not?

A.—There is no direct evidence to suggest that the incidence of peptic ulcer is different in those who take a strict kosher diet and those who do not. Certainly peptic ulcer is common among orthodox Jews.

NOTES AND COMMENTS

Tuberculosis in Pet Monkeys.—Professor E. G. T. LIDDELL, F.R.S. (Oxford), writes: It is well to remember that monkeys in captivity ("Any Questions?" May 14, p. 1232) may be very heavily infected with non-pulmonary tuberculosis and will appear to be in quite good health until a day or two before death. The tuberculin test, even intradermal, is not entirely reliable.

OUR EXPERT replies: What Professor Liddell says is, of course, quite true, but in my reply I said that a negative tuberculin test did not exclude infection and that all pet monkeys should be examined clinically. Such an examination would, of course, include among other things a search for tubercle bacilli in the excreta. Pet guinea-pigs also can suffer from widespread tuberculous infection without showing obvious signs, and, like monkeys, can be a source of infection to their owners. Further, in guinea-pigs the tuberculin test is of little or no value in excluding tuberculosis. Indeed, pet animals of almost any kind are capable of harbouring infections pathogenic to man. I do not, however, consider that this is a valid reason for not keeping pets. Pet-keeping has so many advantages of its own, especially for children, and, provided these risks are realized, the chances of acquiring infection from pets are almost negligible. It is possible to be so obsessed with these risks as to preclude pet-keeping altogether.

Pityriasis Rubra Pilaris.—Dr. DAVID I. WILLIAMS (London, W.1) writes: In the answer to the question on the treatment of pityriasis rubra pilaris ("Any Questions?" May 14, p. 1233) vitamin A in doses of 24,000 units two or three times daily is suggested for treatment. I have found that this dose is often inadequate: a daily total of 480,000 units may be necessary to remove and control the clinical evidence of the disease. I am, of course, aware of the risks, which are not very great, of toxicity with a dose as great as this; but patients prefer to take any risk if their skin condition is completely controlled.

OUR EXPERT replies: The dose mentioned by Dr. Williams is very much higher than is normally considered advisable. It may be that the variable response to vitamin A therapy in this disorder results from inadequate dosage in some cases.

Lack of Beard.—Dr. G. G. SHERRIFF (London, W.8) writes: It was astonishing to read the suggestion of testosterone cream for the healthy man worried by his lack of beard ("Any Questions?" June 4, p. 1399). Surely better advice would have been reassurance and congratulations on his relative freedom from the nuisance of shaving.

Correction.—In the opening paragraph of Dr. M. S. Pathy's medical memorandum on varicella with neurological complications in an adult (May 28, p. 1324), the sentence beginning, "Of the 108 cases with neurological complications . . ." should have been, "Of the 138 cases with neurological complications. . . ."

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JUNE 25 1955

British Medical Association

ONE HUNDRED AND TWENTY-THIRD ANNUAL MEETING, TORONTO, CANADA, 1955

President's Address

LEST WE FORGET

"I will set down what comes from her, to satisfy my remembrance the more strongly."—Macbeth, v, i, 35.

BY

THOMAS CLARENCE ROUTLEY, C.B.E., M.D., LL.D., F.R.C.P.C.

On behalf of the members of the Canadian Medical Association may my first words be to welcome most heartily all who have paid us the compliment of coming to Toronto. The British Medical Association last met in this city forty-nine years ago, and on that occasion Professor Irving Cameron welcomed our visitors in the words of an old Indian greeting, which is so appropriate that I will repeat it to you now. "It is good for us, O Brothers, that you came so far to see us." To our open hearts and wigwams you are welcome! May the Gitche Manitou [the Great Spirit] have you in his keeping while you sojourn with us, and bring you, returning with filial piety and devotion to the care and protection of your own lares and penates, safe again home."

We in Canada are proud of our place in the British Commonwealth of Nations and are anxious to do our full share, whatever it may be, in strengthening the ties which bind us together. Last year our Prime Minister, the Right Honourable Louis St. Laurent, encircled the globe in order that he might extend Canada's greetings to various parts of the Empire (I still like that word) and learn, first hand, of the problems which await solution in promoting and building better understanding and closer co-operation between us. Surely a gathering such as this, which brings outstanding representatives of many parts of the Commonwealth together, can and will do much to foster and advance our common desires and aspirations.

Again let me say how very happy we are to extend the right hand of fellowship not only to our brothers and sisters of the Commonwealth but also to our only slightly more distant relatives from south of the border. In 1930 a speaker at the British Medical Association meeting in Winnipeg referred to the duty and also the privilege of Canadians to endeavour to interpret the British Commonwealth to the United States of America. We are happy to think that we do constitute a friendly link between these two important elements of the free world, and that we may play some small part in advancing harmony and understanding between them.

My next words must be to thank you most sincerely for the great honour you have done me in electing me

to the Presidency of the British Medical Association. I like to think of this honour as one that I share with the members of the Canadian Medical Association, who so kindly nominated me for the position, and who, together with me, constitute your hosts at this meeting. On their behalf I can promise one thing—that I shall serve you as best I can without holding back my time or my strength. I am yours to command for any service which you may consider to be appropriate to this high office.

Of the duties which you lay upon me in the coming twelve months, few will present such difficulties as the address which, by custom, the President gives at his installation. The *British Medical Journal* once said: "Presidents must find it increasingly difficult as year follows year to find anything to speak about that has not furnished matter for the eloquence of preceding orators. . . . There is not for the moment, in the somewhat narrow sphere which custom allows the President of the Association, any new thing on which he can discourse." These words were not written recently for my encouragement or comfort, but in 1897 when the B.M.A. first met in Canada. Since then, close upon sixty Presidential Addresses have been given, and the field has, if possible, been even further narrowed. If, then, there is nothing new that I can say to you with profit, let me take example from the Man of the Century, Sir Winston Churchill, and look into the past as a guide to the future.

The British Medical Association has met three times previously in Canada—in 1897 in Montreal, in 1906 in Toronto, and in 1930 in Winnipeg. Now to our great joy you come back to us again. The year 1897 seems very far away to us; perhaps I can indicate how far away and yet how near it is by relating it to one man whose name I have already mentioned, and whose career spans all of this epoch. In 1897 Winston Churchill was a soldier serving his country in India, and already had been mentioned in dispatches for his valour. In 1906, when last you met in Toronto, he had exchanged his cavalry saddle for the leather bench of Westminster and was Under-Secretary of State. In 1930 he had just relinquished the office of Chancellor of the Exchequer,

and to the undiscerning his day was done; for as the public said, "He is already middle-aged." How wrong the undiscerning were! How amazingly wrong people sometimes can be!

A Look into the Past

May we, then, take a look into the medical past and, without venturing too far into fields of science into which my feet are not accustomed to stray, recall something of the medical scene at the time of the three previous meetings in Canada.

It is interesting to note the names of some of the sections of these meetings. In 1897 all of the basic sciences—atomy, physiology, pharmacology, pathology, and bacteriology—were represented, although for some curious reason the anatomists were discussing anaesthesia. By 1906 the anatomists had parted company with the physiologists, and by 1930 they had bowed themselves off the stage altogether, while the physiologists had allied themselves with the pathologists and bacteriologists and had got the worst of the bargain, for there was little pure physiology on the programme. Now all these sections are gone. I do not quite understand what their departure portends unless it be that, though nameless themselves, they have assumed roles of importance within other sections.

In 1897 the subject we now call preventive medicine had a section called Public Medicine, and the talk was all of sanitation—pure water, pure milk, sewage disposal. We whose countries are represented at this meeting have outgrown that limited concept of public health, though I would remind you that elsewhere within our Commonwealth, and in a great many underdeveloped parts of the world, such problems still require solution, as witness the motto for World Health Day this year—"Clean water for better health." By 1906 the section had changed its name to State Medicine, suggesting that this was a part of medicine for which the State, and not the individual, should be responsible. Since those days the State has developed various ideas in various countries as to its responsibility, and the name of the section has veered round to what most members of the profession would consider to be its proper title—namely, Preventive Medicine.

Another significant change through the years has been the replacement of the name "Diseases of Children" by "Child Health," in line with the positive definition of health as propounded by the World Health Organization.

In 1897 there was a Section of Psychology, which discussed the evolution of the mind. By 1906 its field was what we might now call neuropsychiatry, for it discussed neurological topics like epilepsy, as well as hallucinations and delusions. By 1930 the separation of neurology from psychiatry had begun, and the section was called Mental Diseases and Neurology, though a discussion on mental changes at the menopause was opened by a neurologist. Now the divorce of the neurologists from the psychiatrists is complete, and I doubt whether either would care to invade the territory of the other.

Of the sectional newcomers to the field since 1930, one at least has a very ancient lineage. I refer to the Section of General Practice. As you know, of recent years the general practitioner has begun to realize that the branch of the profession which he follows is as much a specialty as the practice of surgery or psychiatry, and that he must give heed to the development of his specialty, to the training necessary for good general practice, and to the means of gaining the maximum intellectual satisfaction from his job. In the United States of America, in the United Kingdom, and in Canada he has taken steps by the formation of a College or Academy to foster these laudable aims. We are happy to see that this meeting is to make a contribution towards this fundamentally essential movement.

I should like to mention another section, that of Occupational Medicine, which has grown up since 1930. Like the practice of psychiatry, which has marked off its territory

and expanded out of all recognition in the last few decades, the specialty of occupational medicine, embracing a relatively new programme of rehabilitation which has been described as the third phase of medicine (preventive and curative being the first two phases), surely merits a section of its own. Indeed, might we not say that occupational hazards now confront not only the industrial worker, a person of growing importance in our economy, but also, with the increasing use of toxic pesticides, the agricultural worker, on whose efforts the wealth of Canada and many other parts of the Commonwealth so greatly depends? And fresh hope appears to be rising for that vast army of persons who, because of physical or mental disability, have so frequently been written off as expendable.

Two sections have disappeared since 1930. One, labelled rather strangely as "Medical Sociology and History of Medicine," concerns me personally, as I was invited to open a discussion at the Winnipeg meeting on migration within the Empire, a subject which, from time to time over the years, has attracted varying degrees of attention. In passing, one wonders whether, at our next conjoint meeting in Canada, there will be included a section on Social Medicine (not Socialized Medicine) as a successor of Medical Sociology, or whether the difficulty in defining this field will preclude its separation from the existing specialties. There is need for clear thinking and sound leadership by the medical profession in the broad field of social medicine, embracing as it does the important aspects of public relations and medical economics.

The other section no longer with us is that of Tuberculosis. Over many phases of the 1897-1906 meetings the white plague cast its dark shadow. In 1930 no fewer than three sessions were devoted to this disease; they met at a time when the Lübeck tragedy had just occurred. You will recall that, through a tragic error, a large number of Lübeck children met their death after B.C.G. vaccination. This event cast an unwarranted suspicion on a method which is currently being employed successfully on millions of persons every year. Since you last met in Toronto the picture of tuberculosis has been considerably modified, mortality having declined by more than 80%. Early diagnosis, the discovery of antibiotics, the progress in chest surgery, and the development of rehabilitation services have gone far towards lifting the terror from this one-time scourge and given us courage to think that tuberculosis can be conquered completely. However, until that happy eventuality occurs we must not be lulled into complacency and there must be no let-up in the attack upon the disease.

Surgery, 1897-1930

What were the surgeons talking about at these meetings? In 1897 the emancipation won for them by Lister, a most popular figure at the Montreal meeting, was being chiefly applied in abdominal surgery. Surgeons were vying with each other in daring excisions of abdominal organs. Christopher Heath, in an address, complained that surgeons were not troubling to diagnose but were operating "to clear up the case." A contemporary remarked that the names of the new gall-bladder operations were simply terrible and fit only for Welsh villagers! Surely this was a left-handed compliment to our Welsh friends, who are so adept in the handling of curious-looking words.

By 1906 the surgeons had begun to invade the skull, and the surgical star at the Toronto meeting was Sir Victor Horsley, the pioneer neurosurgeon of whom someone said, "He does not quote the literature; he is the literature."

By 1930 the surgeons had discovered the autonomic nervous system, and the age of "physiological repair" had begun. They had also penetrated the chest, and a major theme at the meeting was thoracic surgery. Now even the secret places of the heart are no longer a mystery to them, and one is pleased to note that the profession on both sides of the water is well represented on the symposium on cardiovascular surgery which is to be held this week. What worlds are left for surgery to conquer? I do not

know, but I am certainly not rash enough to suggest that there are none. Who in 1897 or 1906, or even as late as 1930, could have predicted some of the amazing advances that have taken place in the broad field of medical science since then? Hope springs eternal, and surely history reveals that hope has been considerably rewarded during the past 50 years in the fight against disease.

Revolutionary Changes in Therapeutics

In 1897 the President of the Section on Internal Medicine lamented the fact that scientific therapeutics had very little influence on treatment, but predicted hopefully and confidently a brighter future. In 1906 Dr. R. A. Reeve still lamented the fact and took a somewhat dim view of the progress being made. One might recall that even the first of the magic bullets of chemotherapy, salvarsan, was still unknown. Indeed, as someone said in 1897, "The microbe of syphilis is still wanted by the scientific police." The 1906 meeting was not sure that the spirochaete, then exacting a terrible toll we scarcely realize to-day, was the cause of this disease. As a sidelight on the revolutionary changes in therapeutics, one might point out that none of the ten drugs discussed at the British Pharmaceutical Congress of 1897 is regularly prescribed to-day, and some are absolutely unknown to modern students; not one of the hypnotics recommended in 1897 in the treatment of insomnia has stood the test of time.

In his delightful historical address appearing in the *British Medical Journal* of January 1, 1950, Sir Henry Dale, whose presence at this meeting is such a joy to us all, in discussing the progress of medical science for the first half of this century, reminds his readers that shortly after the turn of this century therapeutic empiricism was still strongly entrenched. Listen to his words. "Look back, those who can do so, to the beginning of this century, and recall again the state of medicinal treatment 50 years ago. Heart tonics, purgatives, diaphoretics, analgesics—such, indeed, were in use, and could be reasonably credited with the promotion of a natural function, or the relief of a distressing symptom; but there was a wide range of remedies then still current for which nothing more definite than a generally 'tonic' or even 'alterative' action could even be suggested. The idea that a remedy could directly remove or neutralize the cause of an illness was still a startling innovation, and neither physician nor patient had yet learned to expect a medication which would go thus to the root of the trouble."

Continuing, Sir Henry said: "Our successors, viewing the times in which we live from the longer perspective of history, are likely to recognize the first half of the twentieth century as the period in which civilization first began to feel, for good or ill, the full impact of progress in the natural sciences. . . . The end of the nineteenth century found medicine still a body of largely empirical knowledge." In 1900 it was "not unreasonable for the student then entering the wards to receive, as I did, the authoritative warning that it was his duty to forget the teachings of the experimental sciences of physiology and to accept those of medicine as still an empirical art."

"The remedies which were being administered in 1900 had almost all come into use as the result of empirical observation. . . . I don't pretend to explain it, but I have seen it do good."

Since that time the improvement in morbidity and mortality statistics pays glowing tribute to the advances made in medical science, and the acceptance of this knowledge by the medical profession.

The rapidity with which new and effective therapeutic agents appear is dramatically revealed by the fact that 70% of the drugs prescribed on this continent last year were unknown fifteen years ago.

At the Cross-roads

At the 1930 meeting the profession stood at the cross-roads with regard to the therapy of infections. The participants in the Winnipeg meeting were obviously sceptical of

therapeutic vaccines and sera, but for another five years, until Domagk produced the first sulphonamide, there would be nothing to put in their place. In 1906 typhoid fever was beginning to show signs of being on its slow way out, although the 1930 meeting referred to an epidemic in Canada of serious proportions in the previous year. In 1930 diphtheria was definitely losing its hold; and Canada, as represented in particular by the City of Hamilton, can take credit as a pioneer in its eradication by toxoid. And now, on the threshold of this meeting, comes the heartening news of the success which has attended the efforts of Salk and his fellow workers in the fight against anterior poliomyelitis. I am sure we all join with a grateful world in extending words of appreciation and praise to those responsible for this newest advance in the conquest of one of the most terrible of all diseases.

The Degenerative Diseases

As infections one by one were being brought under subjection, the degenerative diseases gained in importance. Obesity and coronary diseases are down for discussion at this meeting. In this connexion one might recall the dictum of Sir James Barr, in his address on overweight at the 1906 meeting, that "a life of indolence and luxury is more deleterious to the circulation than the work of a navvy." Coronary disease was still quite a novelty in 1930, while to-day the well-informed layman speaks of it with considerable familiarity.

There is one disease which has been with us at all previous meetings, is with us here, appears to have grown steadily commoner since 1897, and, sad to say, is still undefeated. I refer to cancer. We all long for the day when it will no longer appear on the scientific programmes as an unsolved problem; may that great day come soon. But the picture is not all dark. We know that bits and pieces of scientific knowledge gained in painstaking research are being put together, offering some hope that this death-dealing riddle may be solved in the not-too-distant future.

Medical Education

What of medical education? It has appeared in some shape or form on all three previous programmes here in Canada. I say in some shape or form because on no occasion was the subject discussed as an integral whole. Individual sections sniped at their medical schools, but largely from the standpoint of their own specialty. Thus, in 1897, Japp Sinclair, the obstetrician, said: "Students learn surgery which they will never practise, and will practise midwifery which they have never learned." In 1906 the anatomists agreed that they should "avoid entangling the student in a superfluity of detail." Obstetricians were still dissatisfied, and complained that poor teaching was a result of the "ingrained idea that labour is a natural process."

In 1930 the emphasis was on teaching in public health, but a full-scale discussion on the curriculum as a whole awaited the First World Conference on Medical Education organized by the World Medical Association, and held in London under the auspices of the British Medical Association in the autumn of 1953, and about which I propose to speak in some detail a little later on in this paper. In passing, it is interesting to note that there will be a Second World Conference on Medical Education held under the auspices of the World Medical Association on this continent four years hence. Meanwhile, I shall be surprised if someone at this meeting does not voice his dissatisfaction with the present curriculum.

Debt to the Motherland

At this point I should like to place upon the record the great debt we in Canada owe to the Motherland for the help, stimulation, and guidance given to medical education in this country. Indeed, history reveals that in the basic essentials many of our medical schools adopted from the

Motherland not only your methods of teaching and curriculum but also imported a considerable number of your graduates as faculty members. We are proud of the standard attained by our twelve medical schools, and we thank you for the part which you have played in helping to develop and strengthen them.

You may wish to recall something of the organizational aspects of the Association at the dates about which we have been speaking. In 1897 the British Medical Association was a flourishing organization, but it had its critics, for an editorial in *The Times* of London dismissed it as an "inert mass," and stated that it had done little "either for the benefit of the medical profession or for that of mankind." This is neither the first nor the last time that the Press has erred in the statements upon which it has based its criticism of the profession. However, here in Canada we are rather proud of our relations with the Press, though I would not for a moment wish to convey to you the impression that they always compliment us. On the contrary, they sometimes take us to task; but our knowledge of each other's obligations and responsibilities has increased and improved, particularly in recent years, and we rely upon the Press to assist us in spreading helpful information and facts bearing upon the health of the people.

In 1906 the British Medical Association was applying for a Royal Charter. It was also talking of reforming its constitution. I understand that such reform is again under consideration, though I have no intention of entering into the discussion.

Six years prior to the Winnipeg meeting the present relationship in which the B.M.A. and the C.M.A. became affiliated had been reached. In the words of the late Dr. Alfred Cox, "A marriage between the two Associations, with the word 'obey' left out, was arranged in 1924." And here let me say that much credit for the affiliation must be given to Sir Jenner Verrall and Alfred Cox, who, as ambassadors from the British Medical Association, visited Canada for the purpose of discussing the subject, and by their knowledge, skill, and diplomacy were very largely responsible for the consummation of a marriage which, for more than thirty years, has been so happy and harmonious.

At the 1930 meeting there was much preoccupation with medical costs. "The economic organization of medicine," said the President, Dr. Harvey Smith, "has not kept pace with scientific progress. In my judgment there is only one possible solution—voluntary health insurance, instituted, organized, and controlled by the medical profession, and widely applied."

Plans for health insurance were already under study in some of the western provinces of Canada, and the British Medical Association at home was discussing a medical service for the nation. On both sides of the Atlantic we have gone a long way since then; and later on in this meeting Canadians will hear with interest something of the present position in the United Kingdom. We in Canada have witnessed a remarkable growth in the voluntary plans of health care during the past 25 years, with more than one-third of the population now covered in whole or in part by such schemes.

International Medicine

Two outstanding international events in medicine have taken place since 1930, and it has been my privilege to play a small part in both, right from the beginning. I refer to the founding of the World Health Organization and the World Medical Association. A precursor of the former was the Health Division of the old League of Nations, which in the opinion of some observers formed the most effective part of the League, while the precursor of the latter was L'Association Professionnelle Internationale des Médecins, which was organized in 1926 with the support of a number of medical associations, mostly in Europe, and which did good work until forced to disband in 1939 with the outbreak of the second world war. It seems appropriate to say something about these two organizations on

this occasion for two reasons—firstly, because of their great importance in their respective fields, and, secondly, because of the vital part which the medical profession has played, and must continue to play, in their usefulness. Here may I interpolate that I am indebted to Dr. M. G. Candau, Director-General of the World Health Organization, for much of the information I have used in speaking of that organization.

The World Health Organization

Combining the functions of former organizations in the field of international co-operation on health matters, the World Health Organization, one of the specialist agencies of the United Nations, was founded at an International Health Conference in New York in 1946. For two years it functioned under the direction of an Interim Commission, emerging as a full-fledged organization in 1948, when its constitution had been ratified by the required number of nations. Dr. Brock Chisholm, a Canadian who had acted as Secretary of the Interim Commission, was appointed its first Director-General, a post which he filled with great distinction for five years. It is the first world-wide body of its kind in history. In amplifying its title, it defines health as "a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity." With this definition one thinks that the medical profession will concur, as the traditional frontiers of health are pushed forward and enlarged and the close relationship between health problems and economic and social conditions is fully recognized.

The Organization's objective is "the attainment by all peoples of the highest possible level of health." Its functions are: (1) to co-ordinate international health work; (2) to propose and administer international regulations on health matters; (3) to provide technical services, including reporting of epidemics; (4) to assist governments in strengthening their health services; (5) to foster mental health activities; and (6) to promote and conduct research in the field of health. It is important to note that the World Health Organization is not a supranational public health service. It works for, with, and through governments in raising health levels, and is responsible to the United Nations.

The Organization, although not 10 years old, may look with pride to a number of achievements. Time will permit of but a brief reference to some of them. It has promoted maternal and child health and welfare services in many parts of the world, particularly in the underdeveloped and war-devastated countries. In the fields of nutrition, sanitation, and environmental hygiene, and in the fight against widespread infections such as tuberculosis, venereal disease, malaria, and yaws, it has assisted in saving many thousands of lives. Opportunities by way of fellowships for advanced training in various branches of the healing arts have been provided to hundreds of students, many of whom have had the privilege of studying in foreign countries, thus gaining not only new technical knowledge but also a broader outlook on the world as a whole. In the fields of sanitation, vital statistics, medical nomenclature, and biological and pharmaceutical standards much useful work has been accomplished. And its work has only begun. Granted that it receives adequate financial support, adheres to its laudable purposes, is allowed to work out its destiny without undue political influence or interference, and continues to merit the respect, confidence, and support of the healing professions, it can look forward hopefully to a future of much usefulness.

The World Medical Association

Paralleling the development of the World Health Organization, the World Medical Association had its inception in London in the autumn of 1946, when, upon the invitation of the British Medical Association, 100 delegates from 32 national medical associations, meeting together for a week,

unanimously decided that a world-wide organization of national medical associations should be established so that medicine might speak with a united voice.

The aims and objectives of the Association may be summarized as follows:

To raise the standards of medical education and care throughout the world.

To raise the level of public health throughout the world.

To improve the standards of industrial and occupational health programmes in all countries.

To co-operate with the World Health Organization, the International Labour Organization, and similar bodies on matters of mutual interest.

To assist all mankind to attain to the highest possible level of health and in the pursuit of its objectives to promote world peace.

To-day, fifty-one national medical associations are members of the World Medical Association, and the number is growing yearly. As one of our outstanding members put it, "If there weren't a World Medical Association, one would have to be invented, because there is necessity for the medical profession to be heard at the international level."

The Association has no selfish motives, covets no preferment, and is not interested in a *quid pro quo*. Opportunities to protect and to improve health and to save lives is all that it seeks, fully believing that a healthier and happier world population is more likely to live at peace with its neighbours.

"Does the World Medical Association overlap the World Health Organization?" is a question one not infrequently hears. The answer is, decidedly not at all. On the contrary, W.M.A. is just as essential to W.H.O. as electric power is to a transmission line. Together they can accomplish much. And W.M.A. is committed in its constitution to co-operate fully with W.H.O. in those areas of mutual interest which require the services of the medical profession.

Among the accomplishments of the Association in its relatively short existence may be listed the following:

Establishment of a head office in New York City with a well-organized secretariat under the capable direction of Dr. Louis H. Bauer, a Past President of the American Medical Association.

Formulation and adoption of an International Code of Medical Ethics.

Adoption of a modified Hippocratic Oath, known as the Declaration of Geneva, which has found ready acceptance in most of the free world.

Publication of a bi-monthly journal in the three official languages of the Association—English, French, and Spanish.

Publication of reports of studies on medical education, medical man-power, medical advertising, social security, and others.

Aid in the establishment of new national medical associations in countries where hitherto none had existed.

Establishment of liaison with the World Health Organization, the International Labour Organization, the International Red Cross, and other international bodies who require the sympathetic co-operation of the medical profession to accomplish their purposes.

Supply of badly needed equipment to hospitals and medical schools in war-ravaged countries.

The holding of an Annual Assembly in a different part of the world each year, thus facilitating the discussion of medical problems on a global scale.

World Conference on Medical Education

To this list must be added one other accomplishment thought by many to be the most important activity yet undertaken by the W.M.A. I refer to the First World Conference on Medical Education, which was held in London

in August, 1953, devoted to undergraduate medical education. More than 600 delegates registered, representing 127 universities and medical schools from 62 different countries. Approximately 200 participated in the discussions, which, by simultaneous translation, were heard in English, French, and Spanish. The proceedings, now available in book form, provide for the first time not only an assessment of medical education on a global scale but also a stimulus and a guide to all medical educators who may be concerned about the quality and quantity of undergraduate medical education in their various countries.

The theme for the Conference was to be found in the admirable addresses of the President, Sir Lionel Whitby, and one of the honoured guests, Sir Richard Livingstone.

Sir Lionel said, "It is not difficult to draw a brief picture of the ideal medical student; cultured, broadly educated in the humanities, intelligent and intellectual, of transparent integrity, humane and sympathetic, and, above all, one who will love his profession as well as his fellow men and all their weaknesses, their joys, and their sorrows."

Speaking of the timber from which doctors are made, especially of what he happily chose to call the first-rate, Sir Richard Livingstone said, "The human being is a work of art, capable of a quality and beauty of its own, quite apart from any practical purposes to which its powers are put."

In the foregoing two quotations we find surely a superb definition of the ideal doctor. Is it too much to hope that in the days that lie ahead the glory and tradition of our noble profession will be enriched and elevated by generation upon generation of ideal doctors, who will be content with nothing less than the first-rate from themselves and their colleagues? One feels certain that the British Medical Association wholeheartedly and unreservedly stands committed to the support of such a laudable ambition.

Conclusion

And now, one more Presidential Address is ready for the archives. To those who have listened to it, and to any who may read it, let me say once again that while it may contain nothing new it will have served its purpose if it has portrayed, even in a sketchy way, some of the remarkable changes and advances which have been made in the science and the art of medicine since your first meeting in Canada, and also if it conveys to you the deep sense of pride and satisfaction of your Canadian colleagues that the British Medical Association has for the fourth time honoured us by meeting on our soil. Again let me say, "To our open hearts and wigwams you are welcome," now and always.

The Portsmouth Group Hospital Management Committee—one of the largest non-teaching groups in the country—has just issued for the first time a clinical report. This deals with the work of the hospital during the year 1953, and contains much of interest to clinicians and hospital administrators. For instance, the details given about infectious diseases illustrate the changes in the incidence and severity of these infections. The beds available for the treatment of infectious diseases numbered 126. During 1953 76 patients were sent to hospital with a diagnosis of poliomyelitis; in 20 of these cases the diagnosis was confirmed. Six patients admitted because of suspected meningitis proved to be cases of poliomyelitis. There was no case of diphtheria admitted to hospital during the year. Seventy-seven children with pertussis were treated, and three of these died, two of the deaths being in patients under 6 months of age. There were also three deaths from measles, but the total number of patients with this disease amounted to 110. Two hundred and three patients were admitted for the treatment of intestinal infections: the most important clinical group was the so-called acute infectious gastro-enteritis of infancy. Of 61 infants in this group under 3 months of age, four died.

CORTICOTROPHIN INTRAVENOUS INFUSION THERAPY IN RHEUMATIC CONDITIONS

BY

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It has long been known that temporary improvement may be observed in rheumatoid arthritis during pregnancy and jaundice due either to obstruction or to hepatitis. Less effective remissions have sometimes been associated with febrile reactions induced by the administration of foreign proteins. Comparable alleviation has also occasionally been observed following surgical procedures. Finally it must be recognized that from the very nature of the disease spontaneous remissions unrelated to any specific therapy may occur. This potential reversibility was discussed by Hench (1949), who indicated retrospectively the reasoning which led to the experimental administration of certain adrenocortical and anterior pituitary hormonal compounds in rheumatoid arthritis. It was in September, 1948, that the now classical experiment of the administration of the adrenal cortical hormone (17-hydroxy-11-dehydrocorticosterone) compound E, or cortisone, to a patient with severe rheumatoid arthritis was undertaken. In 1949 Hench *et al.* reported the rapid and striking improvement in the clinical and other features of the disease from both cortisone and corticotrophin (A.C.T.H.). Later, confirmation of these results followed with the experience of other groups—Thorn *et al.* (1949), Markson (1949), Elkinton *et al.* (1949), Ragan *et al.* (1949), Spies and Stone (1949), and Spies *et al.* (1949) with corticotrophin; Boland and Headley (1949) with cortisone; and Freyberg (1950), Hench *et al.* (1950), Rosenberg (1950), and the speakers at the Seventh International Congress on Rheumatic Diseases at New York, 1949 (1952) (Freyberg, Boland, Rosenberg, Holbrook, and Bauer), with corticotrophin and cortisone.

In all these original reports the corticotrophin was administered by intermittent intramuscular injections. However, a new therapeutic technique of prolonged administration by slow intravenous infusions was later described by Gordon *et al.* (1950), Renold *et al.* (1951), Mandel *et al.* (1951), and Jelliffe *et al.* (1951). The results obtained by these authors in rheumatoid arthritis and other conditions were so rapid and impressive as to suggest a superiority over the usual method of administration. This new method then seemed to be promising as a means of utilizing small amounts of corticotrophin and achieving maximum results. In this respect, 10–25-mg. doses of the ordinary soluble preparations available, administered slowly by the intravenous route, were reported as more effective than 100 mg. daily in divided doses by intramuscular injections. Moreover, it might be argued that this procedure seemed to imitate more closely the natural method of secretion as compared with intermittent (six-hourly) injections.

This paper records our experience with corticotrophin administered by slow intravenous infusion in the treatment of rheumatic conditions, as employed by us since August, 1951, at a time when both this hormone and cortisone were scarce.

The investigation was carried out amidst the ordinary day-to-day working of a busy rheumatic centre. For ethical reasons all the usually accepted methods of treatment have had to be employed—rest, correction of anaemia and other general measures, application of physiotherapeutic procedures, including manipulation, plaster corrective and occupational therapy, and general rehabilitation regimes. The corticotrophin infusions have thus been only a part of the general therapeutic scheme. However, the type of improvement is characteristic enough to present no great difficulty in differentiation and assessment. Our prime endeavour, therefore, was to ascertain how far the employment of the technique in conjunction with other routine methods would augment the total rehabilitation of the patient. A stage has now been reached where sufficient experience has been obtained to enable us to form some conclusions on the place and value of this method of treatment in the general problem of the therapy and rehabilitation of rheumatic patients. We have had to concern ourselves not only with the immediate response of the patients to the course of treatment as recounted here, but, in addition, with methods of maintaining the initial effects where favourable, their duration, and the incidence of relapse. These features will be the subject of further observations and later report.

Material Investigated

Our observations have extended from August, 1951, until October, 1953. All patients admitted to the rheumatic unit were considered for treatment; after diagnosis no selection was made either for the administration of the hormone or in the analysis of results. Although we were mainly concerned with the effects in rheumatoid arthritis, a few other rheumatic conditions were treated—psoriatic arthritis, ankylosing spondylitis, osteoarthritis, "frozen-shoulder" syndrome, and a miscellaneous group consisting of "fibrositis," Paget's disease, rheumatic fever, palindromic rheumatism, psychogenic rheumatism, and Raynaud's syndrome.

Altogether 425 patients (involving 516 separate periods of admission) were treated; their allocation to the various diseases according to sex and age groups is indicated in Table I.

TABLE I.—Different Diseases Treated

Disease	No. of Patients	Age Groups (Years)							
		20–29		30–39		40–49		50–59	
		M	F	M	F	M	F	M	F
Rheumatoid arthritis	90 239	5	19	15	43	26	56	33	77
Psoriatic rheumatism	7 4	—	—	—	—	2	1	—	—
Spondylitis	4 44	1	1	4	2	1	1	—	—
Osteoarthritis	4 44	—	—	—	—	2	12	2	19
Frozen shoulder	5 8	—	—	—	—	1	2	2	5
Miscellaneous*	3 15	—	—	1	3	—	—	1	5
Total	109 316	6	25	20	48	28	63	39	101
	425	31	68	91	140	78	17		

* Fibrositis, psychogenic rheumatism, Raynaud's syndrome, Paget's disease, rheumatic fever, palindromic rheumatism.

The rheumatoid arthritis group was the largest, comprising 90 males and 239 females—329 in all. A detailed description of these patients is presented in Tables II and III. The age groups most affected were 40–49 years (82 patients—26 males and 56 females) and 50–59 years (110 patients—33 males and 77 females). The duration of the disease was two to five years for 79 patients (23 males and 56 females), five to ten years for 88 patients (23 males and 65 females), and ten to twenty years for 76 patients (19 males and 57 females). Only 30 patients (10 males and 20 females) had the disease for less than one year.

TABLE II.—Rheumatoid Arthritis. Functional Capacity Before and After Therapy in Relation to Age Groups

Age Group (Years)		Class							
		I		II		II+		III	
		M	F	M	F	M	F	M	F
20–29	Before	—	—	—	—	—	—	—	—
	After	7	—	2	—	5	—	7	—
30–39	Before	—	—	—	—	—	—	—	—
	After	2	13	11	16	1	11	—	—
40–49	Before	—	—	—	—	—	—	—	—
	After	4	10	16	25	8	8	7	19
50–59	Before	—	—	—	—	—	—	—	—
	After	2	9	20	32	5	11	14	31
60–69	Before	—	—	—	—	—	—	—	—
	After	—	—	6	13	2	13	3	13
70+	Before	—	—	—	—	—	—	—	—
	After	—	—	—	—	—	—	—	—
Total	Before	—	—	—	—	—	—	—	—
	After	8	41	6	16	19	33	32	88

TABLE III.—Rheumatoid Arthritis.—Functional Capacity Before and After Therapy in Relation to Duration of Disease

Duration (Years)		Class							
		I		II		II+		III	
		M	F	M	F	M	F	M	F
–1	Before	—	—	—	—	—	—	—	—
	After	1	10	9	6	—	—	—	—
1–	Before	—	—	—	—	—	—	—	—
	After	3	5	8	11	—	—	—	—
2–	Before	—	—	—	—	—	—	—	—
	After	—	—	2	8	5	10	8	15
5–	Before	—	—	—	—	—	—	—	—
	After	2	5	17	35	3	16	6	21
10–	Before	—	—	—	—	—	—	—	—
	After	2	4	5	13	6	6	1	8
Over 15	Before	—	—	—	—	—	—	—	—
	After	—	—	4	12	3	9	2	14
Total	Before	—	—	—	—	—	—	—	—
	After	8	41	6	16	19	33	32	88

In the rheumatoid arthritis group the duration of inpatient treatment varied from one to sixteen weeks. The usual periods were two to four weeks for 122 patients (22 males and 100 females) and five to eight weeks for 115 patients (22 males and 93 females). Only 25 patients (7 males and 18 females) were admitted for longer than twelve weeks. In the above group of 122 patients gold had previously been administered to 60 (9 men and 51 women), and in the group of 115 patients to 56 (8 men and 48 women). In the whole rheumatoid arthritis group of 329 patients, 165 (44 males and 121 females) had received previous gold therapy. Readmission for further infusion therapy on account of relapse was considered necessary on one or more occasions for 59 patients. This must not be regarded, of course, as the full relapse proportion.

Treatment

The great majority of our patients received the Armour Laboratory preparation "acthar," others the Organon, Wilson, or Crookes Laboratory material; some patients received preparations from two different laboratories according to the availability of supplies. With the usual precautions the ordinary (intramuscular) powdered hormone was dissolved in sterile normal saline (about 2 ml.), which was injected into the manufacturer's rubber-capped phial (for the Organon hormone sterile water had to be employed, as this particular material was supplied diluted with sodium chloride). The corticotrophin solution was then transferred to the infusion flask containing the vehicle. Nearly two-thirds of the patients received a total quantity of one litre of fluid in each infusion, the remainder one pint (568 ml.). After preliminary trials with various vehicles, the final choice was normal saline. More than one-half of the patients received infusions with normal saline as the vehicle.

In the beginning blank infusions were administered for control and comparison in some cases. No benefit was obtained by the patients from such administrations. In fact, the difference was apparent to them as well as to us through the absence of certain trivial but well-recognized accompaniments of the corticotrophin infusions.

Variations were made in the amount of corticotrophin in the infusions ranging from 25 mg. down to 5 mg. in an attempt to find the optimum dose for maximal clinical effect. We observed clinical responses with low dosages, such as 5 mg. Eventually, in view of variations in individuals, as well as possibly in material, 20 or 25 mg. was regarded as the standard dose, administered in one litre of normal saline. The entire 425 patients treated received a total of 1,490 infusions, and the total amount of corticotrophin used was no more than 28.12 g. Of the 1,231 infusions administered to the rheumatoid arthritis group of 329 patients, 738 infusions each contained a 20-mg. dose of corticotrophin and 229 a 25-mg. dose.

During any one admission the number of infusions administered to a single patient varied from 1 to 11; the total dosage of corticotrophin ranged from 10 to 227.5 mg. The most usual practice was to administer three infusions; actually this was the procedure in nearly one-third of the admissions.

As there was some experimental evidence that infusions prolonged beyond eight hours were more effective in terms of adrenocortical stimulation, variations were also made in the duration of administration. In a few instances the administration was prolonged even up to 72 hours. On the whole, the patients tolerated this well. A few permitted themselves little sleep or movement in their desire not to disturb the needle and connexions; some became apprehensive about the successful delivery of the drip during such lengthy periods. Further, these prolonged drips often resulted in local venous thrombosis. When all these factors were taken into account the optimum period was considered to be 18 to 24 hours. Thus, in actual practice, of the 1,231 infusions administered to the rheumatoid arthritis group, 507 were of this duration; 484 were of shorter and 240 of longer duration.

Second and subsequent infusions were given according to the individual response and the possible tendency to early relapse. The usual number of clear days intervening between the cessation of one infusion and the beginning of the next was six (four to seven). The duration, frequency, and number of infusions given were individualized according to the aims of treatment in relation to the particular problem presented by each patient. The necessity for administration of another infusion was thus indicated by (1) an obvious decrease in the beneficial effect obtained by the previous infusion, or (2) the desire to continue therapy until no further real benefit was obtained, or (3) in some cases an attempt to obtain amelioration, if possible, in a residual refractory joint. It will be appreciated that, no matter how much relief of pain and freedom of movement is obtained from an infusion, repair and re-education of atrophied muscles necessarily require some considerable time. Thus this therapy must be complemented by physiotherapeutic and rehabilitation procedures, which in turn are facilitated by reinduction of a waning remission.

In the early stages efforts were made to minimize the most frequent complication—local venous thrombosis—first by the change of glucose-saline to saline as the vehicle, and secondly by the addition of heparin to the infusion solution. This latter procedure resulted in flocculation; as heparin readily unites with protein compounds, it was then felt that an undesirable chemical interaction might have occurred, and the method was abandoned. Later, however, Linquette *et al.* (1952) apparently successfully added heparin, 200–400 mg., to each infusion. Recently heparin has been added to the infusion material without any apparent *in vitro* reactions. As indicated above, we now routinely use normal saline as the vehicle. Local thrombotic complications are now much less frequent.

In the beginning, because of the fear of sodium retention and oedema, restriction of salt in the diet was enforced, but later, when this procedure was relaxed, no untoward effects were observed. A full generous diet was allowed to all patients, unless suffering from obesity.

Attempts have been made to maintain improvement achieved by the corticotrophin drip method by the subsequent employment of certain other measures—for example, intermittent injections of adrenaline in oil or hyperduric adrenaline, gold compounds, or long-acting corticotrophin compounds, oral administration of para-aminosalicylic acid, sodium salicylate, or phenylbutazone, and in some instances frequently repeated corticotrophin infusions or cortisone. These procedures are still being studied and modified, and it is hoped that the results will be reported later.

Accompaniments, Side-Reactions, and Complications of Therapy

In a total of 1,490 separate infusions no serious complications have arisen. On three occasions a moderately severe reaction took place, consisting of feelings of malaise and coldness, shivering, and pyrexia. This may have been due to impurity of the particular preparation in its protein content. Subsequently infusions were successfully given to these patients. More recently, a patient experienced a similar but very mild reaction with one particular preparation, but an alternative preparation of different manufacture was satisfactory.

The most annoying complication of the technique was the development of local venous thrombosis. Following multiple infusions this resulted in increasing difficulty. In advanced deformed and difficult cases, where repeated courses of treatment might be desired, it could be the limiting factor so far as the intravenous route was concerned. Full use therefore had to be made of the small veins on the dorsum of the hand in some cases. On one or two occasions it was necessary to resort to the venesection technique or to a subcutaneous infusion with the aid of hyaluronidase. The possibility that both corticotrophin and cortisone may alter the coagulability of the blood has received consideration by others. Rawls (1951), in a large series of patients treated with ordinary corticotrophin or cortisone, found the incidence to be 3%. Ragan (1952) and Chatterjea and Salomon (1954) also have drawn attention to the development of thrombo-embolic phenomena. During corticotrophin or cortisone therapy, Cosgriff *et al.* (1950) and Cosgriff (1951) observed an increased coagulability of the blood, which persisted for several weeks after withdrawal. However, the work of Smith *et al.* (1950) and McGraw *et al.* (1952) suggested two opposing coagulation effects; while Fahey (1951), and more recently Sussman *et al.* (1954), found no alteration in blood coagulability.

Oedema, production of hypertension, aggravation of existing hypertension, alteration in facial contour, and changes in mineral metabolism were not encountered. Abdominal cramps occurred in one patient during two successive infusions, but not in other patients receiving material from the same batch. At least three patients with a definite dyspeptic history were treated without ill-effect; one had had a partial gastrectomy, and one suffered from cardiospasm.

Mild glycosuria during the day of the infusion and sometimes part of the following day was often noted. No permanent disturbance of sugar tolerance was observed; indeed, we have applied the method to known diabetic arthritides without any particular troubles other than some slight modification of insulin dosage for a day or two.

Certain other accompaniments were often reported—a temporary feeling of fullness or tightness in the frontal and temporal regions of the head, a "salty" parched taste in the mouth, and feelings of heat and flushing, especially of the face and extremities, often with sweating, and lasting several hours during the infusions. A feeling of hunger some hours after the start of the administration was frequently mentioned. All the patients took their meals well,

and all but the very apprehensive generally slept well while the infusions were running.

We have had no experience of the development of potassium deficiency. Muscle weakness, fatigue, or paraesthesiae which would indicate such a complication were not complained of by the patients. Blood potassium serial estimations and electrocardiograms would be helpful if a particularly long course of frequent high-dosage infusions was contemplated.

In summary it may be said that the method has been found safe. There has been no hesitation in its use when this was justified by the rheumatic condition. It has been withheld only in extreme cases of congestive cardiac failure. Hypertension, diabetes mellitus, and impaired renal function have not been regarded as contraindications. Signs of hypercorticism were never induced. In this respect it may be noted that only after daily infusions in doses of 5 to 20 mg. for periods of 6 to 25 days, yielding total dosages of 68 to 500 mg. of corticotrophin, did Cohen and Sulman (1954) find mooning of the face in five out of eight patients. Early signs of hypercorticism were observed by Mandel *et al.* (1951), who also employed daily drips in a similar dose range and total corticotrophin amount. It will be observed that our total dosage range was much smaller than that employed by either of the above groups, and, moreover, was administered intermittently in fewer infusions spread over a longer period of hospital admission.

Scheme of Analysis of Results

In our recognition of the importance of using some generally appreciated standards by which judgment could be passed on the therapeutic efficiency of the technique, we decided to employ, with a slight modification, the scheme recommended by the American Rheumatism Association (Steinbrocker *et al.*, 1949) so far as the cases of rheumatoid arthritis were concerned. Thus, according to this scheme there has been recorded the anatomical stage (which rarely was altered), the activity, and the assessment of the functional capacity before and after treatment. It is, of course, well recognized that a considerable degree of functional improvement may occur and yet the anatomical stage of the disease remain unaltered. It is therefore the induced remissions and the improvement in pain, stiffness, mobility, and hence the functional capacity, which have been of most interest to us.

Briefly, the anatomical stages were delineated by the following criteria: in Stage I (early), no destructive changes, radiologically; in Stage II (moderate), radiological evidence of osteoporosis with or without slight subchondral bone destruction, slight cartilage destruction, and limitation of joint mobility without deformities; in Stage III (severe), radiological evidence of cartilage and bone destruction and osteoporosis and joint deformity; and in Stage IV (terminal), fibrous or bony ankylosis. While the rheumatoid process usually advances to an approximately similar degree in multiple joints, sometimes two or more stages may exist in different joints in the same patient. It has been recommended that the stage should be determined by the state of the worst joint. We have modified this in so far as one advanced single joint—for example, an ankylosed interphalangeal joint—or a terminal condition of certain joints in a patient requiring treatment because of active, less advanced, but progressive arthritis in other joints has not determined the anatomical stage for the patient as a whole.

For the classification of functional impairment, the American scheme has been modified by the division into three subgroups (II, II+, and III-) of Class 2 (functional capacity adequate to conduct normal activities despite the handicap of discomfort or limited mobility of one or more joints). The classification utilized in this investigation was therefore as follows:

Class I.—Complete functional capacity, with ability to carry on all usual duties without handicaps.

Class II.—Functional capacity adequate to conduct normal activities despite handicap of discomfort or limited mobility of one or two joints.

Class II+.—Functional capacity adequate to conduct most or all of the usual duties and activities with considerable discomfort or limited locomotor ability of joints.

Class III-.—Functional capacity adequate to conduct some of the normal duties with considerable discomfort or limited locomotor activity of joints or ability to carry out some handwork with little or no locomotor ability (for example, kneeling, climbing) or fair locomotor activity with little or no handwork.

Class III.—Functional capacity adequate to perform only little or none of the duties of usual occupation or self-care.

Class IV.—Largely or wholly incapacitated, with patient bedridden or confined to wheel-chair, permitting little or no self-care.

Some of the basic features, of which full details are given in Tables II and III, may now be summarized. Of the total 329 rheumatoid arthritis patients, 120 (32 males and 88 females) were graded as Class III- and 99 (28 males and 71 females) as Class III. In the age groups 40 to 49 years 26 patients (7 males and 19 females) were in Class III-, and 25 (7 males and 18 females) in Class III; and in the age group 50 to 59 years, 45 patients (14 males and 31 females) were in Class III-, and 32 (13 males and 19 females) in Class III.

In the 2 to 5 years' duration group, 23 patients (8 males and 15 females) were in Class III-, and 23 (7 males and 16 females) in Class III; and in the 5 to 10 years' duration group, 30 (8 males and 22 females) and 27 (6 males and 21 females) were in Class III- and Class III respectively.

Results

Where benefit accrued from the treatment, the majority of the patients experienced a striking improvement after the first infusion, which subsequent infusions maintained with little or no increase; however, as indicated above, recovery and repair of atrophied muscles show a relatively slow progress, and the maintenance of the improved status is necessary for rehabilitation. Some few others showed gradually increasing benefit from a succession of infusions. A few patients who had shown no improvement with intramuscular administration of the hormone derived benefit following infusions.

Euphoria was a feature induced in most patients. We regarded this as a valuable contribution in the rehabilitation of a patient previously depressed and apathetic. Relief of joint pain and tenderness were obtained with resulting ease of movement. In some cases the actual increase in the range of movement was not great, but the ease of movement, the resulting feeling of satisfaction, and the recognition of what was still functionally possible in the diseased joints were of extreme importance in the encouragement of the patients, the improvement of their outlook, and the simultaneous development of a physiotherapy regime. Other important features were the sense of increased physical well-being, improvement in appetite, and the dissipation of malaise.

Experimental confirmation of the effect on the peripheral circulation was obtained. The resting digital circulation, as indicated by serial skin temperatures, was increased, and the previously sluggish induction of peripheral vasodilatation in the thermal response test of indirect heating was improved following a corticotrophin infusion (Beattie and Woodmansey, 1953).

As might be expected in rheumatoid arthritis, in general the anatomical status of the patient was not notably altered. At most an occasional patient might be assessed as passing from one stage only to the one above. An alteration in the anatomical stages occurred 25 times among females and 11 times among males—a total of only 36.

In rheumatoid arthritis the greatest alteration occurred in the functional capacity. The detailed assessments before and after treatment are presented in Tables II and III with reference to age groups and duration of disease respectively. The overall improvement in the functional assessments can be appreciated from Fig. 1 and Table IV. No patient was designated as of Class I status functionally before treatment, but attainment of this class occurred in 15% of the whole group. An elevation after treatment up to Class II or I was

obtained in 57% of the whole group. Improvement of some degree was obtained in 89% of cases. Both males and females showed a similar response. Patients previously treated with gold reacted in a similar manner to those who had not had this therapy (Fig. 1).

Owing to the absence of selection of patients it was not possible for the results to be assessed in sufficient detail

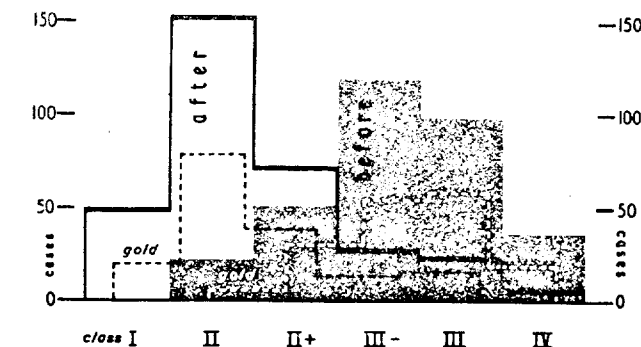


FIG. 1.—Change in functional capacity after treatment. The number of cases in the various classes previously treated with gold is indicated by the broken line, both in the shaded portion (before treatment) and the unshaded portion (after treatment) of the histogram.

TABLE IV.—Rheumatoid Arthritis. Alteration in Functional Capacity Per Class

Class Before Treatment	Class After Treatment											
	I		II		II +		III -		III		IV	
	M	F	M	F	M	F	M	F	M	F	M	F
I { M — F —												
II { M 6 F 16	1	7	5	9								
II + { M 19 F 33	3	11	15	18	1	4						
III - { M 32 F 88	3	15	23	48	5	25	1					
III { M 28 F 71	1	8	14	19	8	22	3	12	2	10		
IV { M 5 F 31			1	1	3	4		11	1	10		
Total	8	41	58	95	17	55	4	23	3	20	—	5

in the ordinary way, so that the attempt was undertaken by means of simple scoring, before and after treatment of each particular group as a whole. For this purpose tables of assessment and treatment data already compiled were utilized. The six functional classes—I, II, II+, III-, III, and IV—were allocated the arbitrary values of 6 to 1 respectively; the scores of each group before and after treatment were obtained from the product of the class values and the numbers in the classes; an improvement factor was represented by the difference in the scores before and after treatment, and this could be expressed as a percentage improvement factor. The fact that a group showed improvement does not, of course, imply that every member of the group improved by the same amount, but it does allow some comparison to be made between unselected groups.

Analysis along these lines showed the greatest improvement where the disease had been present for less than one year, with a gradual decline as the duration increased, but a further marked rise in improvement in cases of over 15 years' duration (Fig. 2). This latter effect may be related to the possibility that the disease at this time tends to be burnt out and that pain, soft-tissue stiffness, and apathy may be the cause of poor functional capacity. On the other hand, all age groups showed fairly comparable improvement (Fig. 3). For the functional classes as a whole, previous gold therapy did not affect the responses.

Again, using the simple scoring method, we investigated certain features regarding the infusions. Where the average duration of the infusions was about 18 to 24 hours the

response appeared to be maximal, and there was not much evidence of further improvement when the time was increased. There did not seem to be any clear evidence of greater improvement the larger the total amounts of corticotrophin administered. Increasing the overall average concentration above 0.9 mg. per hour did not result in increased efficacy. Further, there was no real evidence that increasing the number of infusions beyond three produced any better results. So far as the scoring figures go, they tend to support our clinical impression that the maximum effect was

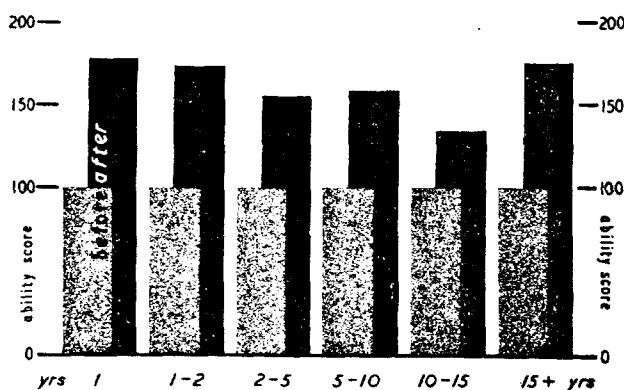


FIG. 2.—Improvement in functional capacity in relation to duration of disease.

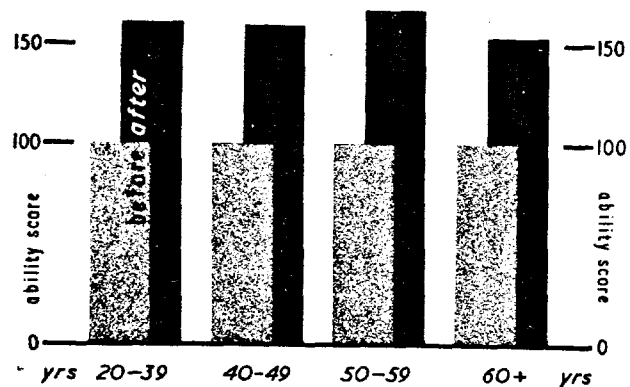


FIG. 3.—Improvement in functional capacity in relation to age groups.

practically obtained by one infusion of 18 to 24 hours' duration (containing 20 to 25 mg.). However, other factors, such as the poor condition of the muscles and pain, necessitated continuance of the infusion therapy while the appropriate remedial treatment proceeded. There was also some indication that the best interval between infusions was three to six days.

With regard to the other conditions treated, certain features are of interest. In two of the four cases of psoriatic arthropathy a dual remission was obtained, although the skin condition responded more slowly than the arthritic. In the other two cases the skin condition was resistant and the improvement in the arthritis was much less marked. Ankylosing spondylitis also showed some response. A remission occurred in two cases and considerable alleviation in seven others. An attempt was also made in osteoarthritis to apply the functional classification; considerable improvement was obtained in 25 patients, and 9 more were rendered symptom-free. Thus, in all, 34 out of 48 patients showed a favourable response to therapy. Of the 13 cases of the frozen-shoulder syndrome, six, all of whom were of the early acute type, showed complete or nearly complete relief. The response in the more chronic type was much less satisfactory.

Discussion

Apart from the initial classification of our material as shown in Table I, no further subdivisions of the rheumatoid arthritis group were attempted. As Sclater (1942-3) pointed

out, rheumatoid arthritis can no longer be described as predominantly a disease of young females, and the condition in about half the cases may start in joints other than the fingers and wrists. Further, Cecil and Kammerer (1951) found that in the aged (over 60) the condition does not essentially differ from that in the younger age groups. Our experience is in agreement with these views.

In all age groups and in both sexes satisfactory improvement was often obtained. The response in the older age group was especially gratifying. In fact, there was not much alteration in response in relation to the different age groups. However, at this stage we have not been able to say why some patients failed to respond. This lack of response did not appear to be related to any obvious clinical feature such as age, onset, acuteness, rapidity of development, or any other easily recognizable clinical feature.

Our clinical observations in this series, when compared with our previous experience of intermittent intramuscular injection therapy for these conditions, have confirmed the initial reports of Mandel *et al.* (1951) and Renold *et al.* (1951) regarding the superiority of the infusion technique in respect of the rapid and often striking symptomatic relief produced. The later reports of Linquette *et al.* (1952) and Prosiegel *et al.* (1953) have also produced similar evidence.

The duration of the disease in the past has been regarded as of importance in the determination of response to the usual lines of treatment. Sclater (1942-3) noted the steady anatomical deterioration with increasing duration, while the reports of others—for example, Cecil and Archer (1926), Steinbrocker (1946), and Short and Bauer (1948)—have indicated the more easily obtained and more satisfactory response of early cases. On the contrary, we have found that while there is a gradual decline in improvement with increasing duration, yet in cases where the disease has existed for a long time—over fifteen years—considerable functional improvement has been obtained. As indicated above, this latter effect may be associated with a burnt-out state of the disease at this duration and major disability resulting from pain, soft-tissue stiffness, and apathy.

It has not been possible to make a comparison between our present results in this short-term in-patient study of rheumatoid arthritis and those presented in our previous long-term out-patient survey with gold salts (Hartfall and Garland, 1935, 1936; Hartfall *et al.*, 1937). In the latter investigation the present newly adopted mode of classification was not used, and since then there have been changes in the social status of hospital patients as well as a greater realization of the importance of intensive rehabilitation.

It seems that corticotrophin does little or nothing to alter the established anatomical status of rheumatoid arthritis, except perhaps in the earliest stages. Applied to early cases, it may in some circumstances arrest and apparently induce suppression of the disease, at any rate temporarily. In most cases it appears to be a valuable method of producing alleviation of the symptomatic disabilities, of procuring maximum co-operation from the patient by indicating potentialities for improvement still resident in the body, and of promoting the early and intensive initiation of a rehabilitation regime. Quite apart from its use in the early, moderate, and severe cases in good anatomical and physical condition, there is a place for it in the more advanced and even crippled cases. In the latter, the main purposes are to reduce pain and induce euphoria. It is thus a valuable means of obtaining in some cases a quick and sometimes a striking temporary suppression of symptoms which may allow increased mobility and other forms of maintenance treatment, including a more rapid and more thorough development of a physiotherapeutic regime.

As a means of initiating a rapid response in any acute or subacute exacerbation the method has been very useful. We have employed it as a preliminary to some other form of maintenance therapy such as a phenylbutazone or chrysotherapy regime.

A useful field of employment has been to cover orthopaedic procedures, including manipulation for the breaking down of adhesions and for the correction of deformity.

In conjunction with cortisone therapy its use has been threefold: as a preliminary to routine cortisone maintenance to bring the patient under control quickly, from time to time to gain additional symptomatic improvement during the cortisone therapy, and to re-stimulate the pituitary-adrenocortical mechanism in those who seem to be losing ground on a dose hitherto nearly adequate to control symptoms.

With regard to the other conditions treated, it may be mentioned that in the few cases of psoriatic arthropathy the uncertain skin and joint responses observed were similar to those reported by Boland (1950a) and Hench *et al.* (1950) with ordinary corticotrophin therapy.

In osteoarthritis there may be theoretical arguments against the successful employment of corticotrophin (usually lack of inflammatory changes). We have treated 48 cases of osteoarthritis, and it seems clear that improvement has resulted. It may be, of course, that this has occurred in cases in which there has been some local superadded severe painful (inflammatory) condition, perhaps with accompanying effusion. We have no doubt that in painful osteoarthritis consideration should be given to the use of corticotrophin even if only as a temporary symptomatic therapeutic expedient. Dale (1950), Bauer (1950), and Dale and Amil (1953) have all noted a definite improvement following ordinary corticotrophin therapy in this condition.

In ankylosing spondylitis the method may be extremely valuable, the drips being interspersed in the course of a more prolonged therapeutic and rehabilitation plan. Infusion therapy has also been used by us in conjunction with deep x-ray therapy. Boland (1950b), McEwen and Bunim (1950), and Hart (1952) have found ordinary corticotrophin to be a potent weapon for short-term treatment of acute painful episodes in spondylitis. West and News (1954), however, thought that prolonged adrenal stimulation was justified only in the most severe cases.

In the acute cases of the frozen-shoulder syndrome with severe pain, occasionally a striking and rapid improvement is achieved, permitting the earlier initiation of a physiotherapeutic regime and sometimes producing an early termination of what is often a lengthy rehabilitation. In the more chronic cases with severe fixation or tissue calcification the results are usually poor and disappointing, and even when used before and after manipulation the results have not been impressive. Stein *et al.* (1953) were impressed with the acceleration of recovery when intravenous corticotrophin or an intramuscular long-acting preparation was used after manipulation.

About the small group of miscellaneous conditions we do not propose to make any definite comments except to say that we have not been successful in the relief of pain and stiffness in Paget's disease, but have had beneficial results in fibrositis and psychogenic rheumatism. From our general experience in cases with poor peripheral circulation we feel this technique might be useful in cases of Raynaud's syndrome.

In conclusion, it may be emphasized that there can be no doubt regarding the enhancement of the therapeutic effect when corticotrophin is administered by intravenous infusion. Moreover, a response can apparently be obtained upon occasions when no benefit has previously resulted from ordinary intramuscular administration. Further, there is a great economy in the material used and the labour involved when the regular intramuscular injections are superseded by the spaced intravenous infusions. There has also, upon analysis of our results, been confirmation of our clinical impressions that the more prolonged effusions of 18 to 24 hours were of greater efficacy; that there was no indication for dosages per infusion greater than 20 to 25 mg. or concentrations greater than 1 mg. per hour; that in general there was nothing to be gained by many frequently repeated infusions, the maximal effect being gained by the first few infusions; and that three to six days was a satisfactory interval period between infusions.

Summary

The application of a technique for corticotrophin therapy in rheumatic conditions by spaced intravenous infusions has been described.

The procedure has been found safe, economical, and free from side-effects such as hypercorticism, sodium retention, or permanent disturbance of carbohydrate metabolism.

Observations are recorded on the effects of this therapy, in conjunction with routine general supportive, physical, and rehabilitation regimes, on 425 patients.

The results obtained in the different conditions treated are presented: rheumatoid arthritis, 329 patients (90 males and 239 females); psoriatic arthropathy, 4 females; ankylosing spondylitis, 13 patients (7 males and 6 females); osteoarthritis, 48 patients (4 males and 44 females).

In the rheumatoid arthritis group, improvement of some degree was obtained in 89% of cases, and maximum improvement to complete functional capacity in 15% of cases.

The indications for the employment of this therapy and its value as part of the programme for rehabilitation in rheumatic conditions have been briefly considered.

For the supplies of corticotrophin made available in this investigation we are indebted to the Joint Committee of the Medical Research Council and Nuffield Foundation on clinical trials of cortisone, A.C.T.H., and other therapeutic measures in chronic rheumatic diseases. We wish to thank Dr. C. W. Dixon for statistical advice and Mr. H. G. Lumby for preparing the figures.

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TREATMENT OF PERIARTHRITIS OF THE SHOULDER WITH HYDROCORTISONE

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Periarthritis of the shoulder, first described by Duplay (1872), of Paris, is a chronic inflammation of the various soft tissues that form the shoulder-joint. Codman (1909) described it as a process essentially involving the rotator-cuff system of the muscles and subacromial bursa that surround the shoulder-joint, but pointed out that it was an extremely difficult condition to treat. It was also a generally held view that the prognosis was excellent and that there was nearly always complete recovery within a year (Codman, 1934; Wilson, 1943); but Simmonds (1949) showed that, in a series of cases followed up for three years, only 30% had regained normal function, a further 30% had some weakness or loss of movement, and as many as 40% had both weakness of the joint and persistent pain.

Heat, mobilization exercises, the injection of local analgesics, manipulation, arthrotomy for section of the adhesions, and excision of the acromion or even arthrodesis have been recommended in the past, and practised, usually with relatively poor results (Steindler and Marxer, 1946).

Pathology

The condition begins as an acute non-specific inflammation following major or minor trauma, and, when untreated, progresses in severe cases to the condition of "frozen shoulder" (see Fig. 1).

The microscopical appearances have been well described by Neviaser (1945) and by Simmonds (1949), the latter showing that the earliest lesion is an area of abnormal focal necrosis in a degenerative tendon. This is typified by the picture of extreme vascularity and round-cell infiltration. If unchecked it progresses to a generalized chronic inflammatory reaction of the whole rotator-cuff mechanism and the capsule of the shoulder-joint. At this stage the shoulder is immobilized by painful protective spasm and shows every sign of an acute inflammation. With rest this will subside, and as fibrosis ensues the "frozen shoulder" results.

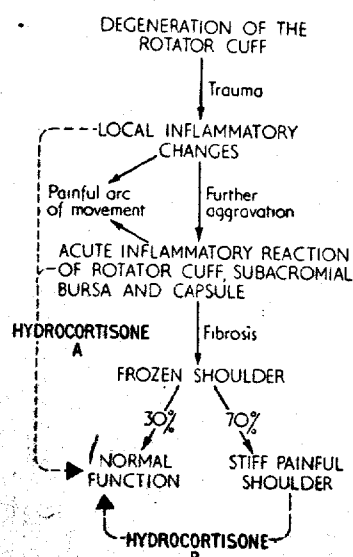


FIG. 1.—Diagram illustrating the pathology of periarthritis of the shoulder.

Theoretically such a pathological condition should respond to the effect of cortisone or hydrocortisone. The

actions of the hormone are twofold: anti-inflammatory and fibrinolytic; the former action might well be expected to take effect in the earlier stages of the cycle (A in Fig. 1) when the inflammation is acute, and the latter action in the late stages (B in Fig. 1), where fibrosis is already progressing as in the typical "frozen shoulder."

The first reports, however, of the treatment of such lesions with the hormone showed widely varied results. Cyriax and Troisier (1953) stated that hydrocortisone was of no value in the treatment of "freezing arthritis," whereas Robecchi and Capra (1953) considered that their results indicated that it had a place in the treatment of such lesions.

Early experience in this hospital showed mixed results (Crisp and Kendall, 1955), but with the evolution of a new technique greater success has been attained.

Technique

It is clear from the pathology that any local inflammatory lesion of the cuff rapidly becomes generalized; thus it has been our policy not only to inject the point of maximum tenderness or maximum pain on resisted movement, but to introduce the hydrocortisone into several points around the shoulder-joint to ensure the greatest possible contact with all

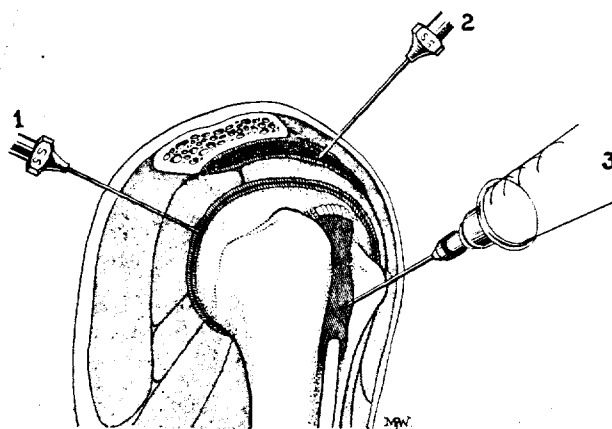


FIG. 2.—Showing injections of the shoulder-joint: (1) into the joint space, (2) into the subacromial bursa, and (3) into the region of the long head of the biceps.

layers of the rotator cuff and the capsule. The injections were therefore sited at three different points: anteriorly into the subacromial bursa; antero-laterally into the region of the long head of the biceps; and posteriorly into the joint capsule (see Fig. 2).

The injection itself comprised 50 mg. of hydrocortisone in a 2-ml. suspension, with the addition of 1,000 units of hyaluronidase to ensure maximum dispersion and contact. Also added to the injection was between 2 and 3 ml. of 2% procaine hydrochloride, which had the function of increasing the volume of the injection and which assisted the patient by temporarily relieving pain. Previous control experiments had already shown that procaine and hyaluronidase injected into the shoulder lesion gave little more than temporary relief; in fact, Simmonds (1949) attributes to it "all too frequently . . . a year or more of misery."

The acute cases received no other treatment except the advice to use the shoulder as normally as possible; the chronic "frozen shoulder" group were given vigorous actively assisted and manually resisted shoulder exercises regularly throughout the course of the injections, which were repeated at weekly intervals until recovery.

Results

For the purpose of analysing our results we have divided the cases treated into separate groups, the acute and the chronic. The former comprises all those in the earlier stages of activity, and includes such local conditions as supraspinatus and subscapularis tendinitis. The latter group refers to the long-standing cases in which fibrosis and

limitation of movements are the prime features and in which the symptoms of acute inflammation have subsided.

Of 50 acute cases treated (see Table), 36 obtained complete relief of symptoms from the injection of hydrocortisone alone within 7 to 14 days. Only three cases failed to improve at all.

Treatment of Periarthritis of the Shoulder with Hydrocortisone

	No. of Cases	Complete Recovery	Partial Improvement	No Change
Acute lesions	50	36	11	3
Chronic "	23	13	5	5

In the chronic group the results were not nearly so good, presumably as the inflammation had subsided and the fibrinolytic action was less powerful. Nevertheless 13 out of 23 cases progressed to a complete recovery with hydrocortisone injections and exercises over a period of four to six weeks.

Conclusions

In the treatment of the various acute and chronic soft-tissue lesions within and around the shoulder-joint hydrocortisone has led to a new method of approach to what was previously a most difficult therapeutic problem.

The majority of both local and generalized acute shoulder lesions showed a dramatic response to hydrocortisone injections into the various components of the rotator cuff.

Although we have had a lower percentage of cases with full relief of symptoms than Robecchi and Capra (1953), we nevertheless feel that the use of the hormone is indicated, at least for a trial period, in every acute case.

The results in the more chronic shoulder lesions, where fibrosis is a prominent feature, have not been so good. This would indeed be expected from consideration of the pathology. In association with routine physiotherapy, however, improvement of the condition has been obtained in a sufficiently high percentage of cases to warrant further trial of the method. Other forms of treatment, so notoriously unsuccessful in the experience of the majority of authors that we feel that hydrocortisone provides a marked advance in what Cyriax and Troisier call the "apparently endless search for effective treatment of 'freezing arthritis'."

Summary

The pathology of periarthritis of the shoulder-joint and the theoretical effects of hydrocortisone in its various stages are discussed.

The technique of treatment by the injection of hydrocortisone, hyaluronidase, and procaine hydrochloride is described.

Of the acute cases treated by this method 72% progressed to complete recovery in 7 to 14 days and a further 22% were improved.

Of the "frozen shoulder" type of case 56% regained full function in four to six weeks, following hydrocortisone injections and shoulder exercises; 22% were improved.

We consider that the use of hydrocortisone is a notable advance in the treatment of soft-tissue shoulder lesions.

Our thanks are due to Miss M. Waldron, of Guy's Hospital Department of Illustration, for Figs. 1 and 2.

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LOCAL HYDROCORTISONE IN DE QUERVAIN'S DISEASE

BY

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In 1895 Fritz de Quervain, a Swiss surgeon, described five cases of stenosing tenosynovitis at the radial styloid, the prominent symptom of which was pain in the region of the wrist-joint. Subsequent writers have observed that the pain may be referred up the arm as high as the elbow, or downwards to the dorsum of the thumb. The pain appears to be due to movements within the thickened and stenosed synovial sheath, containing the tendons of abductor pollicis longus and extensor pollicis brevis, as it passes under the extensor retinaculum of the wrist in the first dorsal compartment. The thickening of the sheath in some cases is so marked as to be easily visible, and in the majority is palpable. The condition is common, and often the cause of considerable disability to the housewife and worker. Analogous stenosis has been described in all the remaining five tunnels beneath the extensor retinaculum, in most of the sheaths of the flexor tendons, and in the tibialis anterior and peroneal tendons.

Most authorities agree that stenosing tenosynovitis is often due to mechanical factors or trauma, and that histologically the signs of inflammation in the sheaths or tendons are rare.

Since the original description many methods of treatment have been suggested, operation holding pride of place and having been suggested by de Quervain himself. Surgical treatment entails incision of the tendon sheath, or, if this is greatly thickened, excision of a portion. Other more conservative methods of treatment still in use are the injection of various substances, immobilization of the wrist and thumb in a plaster or elastic splint (Thompson *et al.*, 1951), and the application of physiotherapeutic measures. Injection of sheath with fluids and local analgesics had also been tried. Although strongly advocated by Ellis (1951), injection rarely seems to give a lasting cure, and the same applies to physiotherapy. Immobilization often relieves the pain, only to be followed by a recurrence of the symptoms when activity is resumed. According to Wiles (1949) it is doubtful whether many cases recover without operation.

The recent reports of the value of local hydrocortisone in "tennis elbow" and soft-tissue lesions seemed to merit the controlled trial of its use in the present condition. Howard *et al.* (1953) describe its use in three cases of de Quervain's disease and 11 cases of tenosynovitis, and Cyriax and Troisier (1953) report a favourable result in one case of tenosynovitis of flexor carpi radialis following two injections of hydrocortisone. In view of these findings it was felt to be justifiable to treat a number of patients by this method and compare the results with cases treated by injection of local analgesic alone.

Material

The series consists of 20 consecutive cases of de Quervain's disease referred to the Department of Physical Medicine and Rheumatism of the Middlesex Hospital.

Three criteria were held as essential before such a diagnosis was made. These were: (1) Tenderness on palpating the tendons of abductor pollicis longus and extensor pollicis brevis as they lie along the lower outer border of the radial styloid. (2) Pain, radiating up the forearm and down the thumb, on active abduction and extension of the thumb and aggravated by the resisted movement. Passive movements were invariably painless. (3) Pain on flexing the thumb into the palm and closing the remaining fingers around it. This is further aggravated by forced ulnar deviation of the hand at the wrist (Finkelstein's (1930) test). All cases in the present series conformed to these criteria.

In none of the 20 cases reviewed was there any obvious predisposing factor, although in three the symptoms were aggravated by occupational factors (tailor's cutter, sempstress, and poster artist) involving frequent repetitive movements of the thumb. Sixteen of the cases (80%) occurred in females. The right and left hands were affected approximately equally, although all the patients were right-handed. The age incidence varied from 18 to 74 years, there being rather more patients in the younger than in the older age groups. The symptoms had been present for periods varying from four weeks to three years (average six months).

It is interesting to note that crepitus was not elicited in any of these cases in the region of the tendon sheath, either on palpation or on active or passive movements. The thickening of the tendon sheath was visible only as a tumour in one patient, in whom it was very marked. This completely disappeared over a period of five weeks following one hydrocortisone injection with complete return of function, the patient returning to her work as a sempstress entailing continuous use of the thumb.

The patients were divided into two groups: (1) Group A, receiving 1 ml. (25 mg.) of a suspension of hydrocortisone acetate into the tendon sheath following infiltration with 1 ml. of 2% procaine hydrochloride; and (2) Group B, injected with 1 ml. of 2% procaine hydrochloride alone and observed over the ensuing period—when relief was no longer experienced these patients were treated in the same manner as Group A. There are therefore 20 cases in Group A and 10 in Group B, the latter acting as the control series.

Method

The method adopted in all these injections, whether of procaine or hydrocortisone acetate, was standardized as follows. With the patient seated facing the operator, the point of the needle was introduced through the skin about 1 cm. distal to the tip of the radial styloid in the line of the tendon of abductor pollicis longus. An intradermal bleb of local analgesic was raised, and through this the needle was passed, it being directed upwards over the radial styloid so as to enter the common sheath of the tendons concerned. The contents of the syringe were then discharged, with the production of a longitudinal "sausage-shaped" tumour, which was clearly defined and taken as evidence that the injected fluid had actually entered the tendon sheath. In those cases that received both procaine and hydrocortisone injections at the same attendance the procaine was given first, being immediately followed by the hydrocortisone, a second needle and syringe being used.

It was found easier to insinuate the needle into the tendon sheath if the patient adopted a position of moderate ulnar deviation. In all cases the skin was first swabbed with surgical spirit and a small dressing applied after the injection. Patients were instructed to use their wrists normally and informed that no special precautions were necessary.

Results

The patients treated with procaine and hydrocortisone injections (Group A) can be further subdivided into those treated in this manner initially and those treated following procaine injections alone. In seven out of the first ten

patients there was complete relief of symptoms for one hundred days or more following the combined injection. For the purposes of the report this was regarded as a clinical cure. The three remaining patients relapsed at intervals after injection, but were relieved by a further injection. One of these, because of his regular relapses, has been referred for surgery, and it seems that the other two may have to be referred in a similar manner.

The patients in Group B showed relief of symptoms varying from one hour to one to two days, gradually waning, so that after five days there was a complete relapse to the original state in all cases. The average duration of the relief was about two days. Although the pain disappeared in all cases immediately after the injection it was often accompanied by a dead feeling of the wrist, which was not experienced when hydrocortisone was used. These patients were subsequently added to Group A.

Of these latter patients when treated with hydrocortisone and procaine injections, one relapsed during the eighth week and is now symptom-free following a second injection. The remaining nine patients have no pain at periods varying from five and a half to fifteen weeks after the injection.

During the treatment of these cases no serious complications were encountered. In two cases there was a complaint of dull aching pain in the wrist following hydrocortisone injection, but this subsided in a few days without treatment. One case developed a superficial thrombophlebitis, which responded to strapping for ten days.

Discussion

The recent use of hydrocortisone in other soft-tissue lesions prompted this survey of its use in de Quervain's disease. The results of this small series are encouraging and seem to merit further trial of the method. It appears that hydrocortisone has a place in the treatment of this troublesome condition and may be used as an alternative to surgery in many cases. With supplies of hydrocortisone becoming more plentiful this simple method of treatment may become more widespread, thereby making it unnecessary for most patients to undergo operation. In those cases in this series in which treatment has succeeded, full function has been restored and all pain relieved almost immediately after the injection, although in one or two there was a time interval of several days before full relief was experienced. It is difficult to retain patients for long periods of observation when complete relief of symptoms has ensued. Nevertheless, although relief for one hundred days has been regarded as a cure for the purpose of this series, it is known that several patients have had no relapse for periods approaching six months. It is suggested that cases of de Quervain's disease should first be treated by local hydrocortisone injection, and that those who relapse within a short period be referred for operation in the usual way. It will also prove valuable in patients not wishing to undergo surgery and has the great advantage of leaving no scar. If further experience substantiates these findings it would appear to be the treatment of choice in de Quervain's disease and in tenosynovitis occurring at other sites.

Summary

De Quervain's disease is described and various methods of treatment are reviewed. Attention is drawn to the fact that analogous stenosis occurs in many other sites.

Twenty cases have been treated with local injection of 1 ml. (25 mg.) of a suspension of hydrocortisone acetate and 1 ml. of 2% procaine hydrochloride solution. Ten controls were treated with an injection of 1 ml. of 2% procaine alone.

The figures show an advantage in favour of local injection of hydrocortisone, 70% of the patients having remained free of symptoms for periods exceeding three months following one injection.

The results of this small series are encouraging, and seem to merit the further trial of hydrocortisone in de Quervain's disease and in tenosynovitis occurring at other sites.

I wish to thank Dr. A. C. Boyle for permission to quote these cases and for his interest and many helpful criticisms at all stages of the survey; Mr. Philip Wiles and Mr. P. H. Newman for kindly referring cases; and Roussel Laboratories for generously supplying all the hydrocortisone used.

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EFFECTS OF MODIFIED E.C.T. ON THE ELECTROCARDIOGRAM

BY

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There have been several investigations into electrocardiographic changes during electric convulsion therapy (E.C.T.). Most of them were carried out before the use of muscle relaxants, and consequently the records could be taken only after the end of the convulsion. The purpose of this paper is to record our findings in patients whose convulsions were attenuated by muscle relaxants to such an extent that the electrocardiogram (E.C.G.) could be recorded during the convulsion, thereby providing further information regarding the safety of the procedure.

Method

Relaxation was achieved by the use of suxamethonium chloride, but, as the slightest movement of the limbs during stimulation interfered with the tracings and made their interpretation difficult or even impossible, doses far in excess of those normally used for routine treatment had to be employed. Four milligrams of suxamethonium per stone (0.6 mg. per kg.) of body weight gives adequate attenuation of the fit for routine treatments in the majority of patients, but for our purpose it was necessary to administer up to 10 mg./stone (1.6 mg. per kg.) to obtain the degree of relaxation required.

Every patient was fasted for at least four hours and was given atropine, 1/100 gr. (0.65 mg.) hypodermically half an hour before treatment.

After explaining to the patient the nature of the investigation, a resting E.C.G. was taken. (At the beginning of the investigation the three standard leads were recorded on a three-channel Elmquist; later, a direct-writing Cambridge electric cardiograph was used and Lead II recorded.) A "sleep dose" of intravenous thiopentone was administered slowly, 0.25 g. seldom being exceeded. It was followed immediately by a large dose of suxamethonium from a different syringe, but through the same needle. As soon as apnoea developed the lungs were inflated with oxygen through a face-mask and bag. A second recording was then taken to assess the effect of the relaxant. As the changes noted were slight and were regarded as of no significance, the relaxant was discontinued after 74 records had been taken.

The electric convulsion shock was given with a Plexicon electroplex unit, while a further tracing was recorded. Except for a short period during the application of the electrodes and the insertion of the Multitone mouth gag as described by Back (1952), which at the same time permits the maintenance of a good air-way, the lungs were inflated with oxygen from the beginning of the apnoea until adequate respirations returned.

Material

We recorded 214 E.C.G.s from 105 patients who received E.C.T., 57 of the patients being investigated on more than one occasion. In 14 records, in spite of the use of the relaxant, there was interference gross enough to make interpretation difficult or even impossible; this occurred mainly in the early cases, before it was definitely known how much suxamethonium was needed to ensure complete inertia. In 50 records there was slight interference, which did not seriously affect the reading of the tracing, whilst 150 were good.

There were 37 males and 68 females in the series, and their ages ranged from 16 to 78. Just over 50% of the female patients were in the age group 30-50, and almost twice as many were under 50 as over 50, whereas amongst the males the cases were almost equally divided between those under 50 and those over 50, with the majority also about equally divided between the 30-50 and 50-70 age groups (see Table).

Age Incidence

	Under 30	30-50	51-70	Over 70	Total
Male	4	15	16	2	37
Female	10	35	19	4	68
Total	14	50	35	6	105

Most of these patients had normal hearts, but in 10 a cardiac abnormality had been recognized clinically or was suspected from the appearance of the control E.C.G. Two men, aged 57 and 77, gave a past history of cardiac infarction and had abnormal E.C.G.s, one showing a right bundle-branch block pattern. In a woman aged 61 there was also a right bundle-branch block picture but no history of cardiac pain and no other electrocardiographic abnormality. In three women, aged 50, 55, and 66, the control E.C.G. suggested old posterior cardiac infarction. Two women, aged 34 and 58, had clinical evidence of mitral stenosis, although not of a severe degree. In a man aged 60 there was evidence of left ventricular hypertrophy, and complete heart block was found in the control record of a woman aged 31.

Results

Effect of Suxamethonium

In the first 74 records the effect of the suxamethonium was studied. The rate became faster in 41, slower in 13, and remained unchanged in 20; in no case was the change in rate marked. There was slight depression of the ST segment or flattening of the T wave in 5 cases, possibly due to temporary inadequate oxygenation immediately following diaphragmatic paralysis. There were no premature beats and no significant conduction changes.

Effect of the Shock

Rate.—In the control records the pulse rate was under 100 in 48% and under 130 in 87%, although a sinus tachycardia of 160 was encountered in 4 cases and of 170 in one case. A marked tachycardia developed within a few seconds of the shock being given. This usually lasted about 30 to 45 seconds, and in 65% of the cases the rate was over 130. In 37% it was between 140 and 160 and in 10% it was over 160, the most rapid rate recorded being 180. In nearly all instances the rate had returned to pre-convulsion figures within two minutes. In a few cases the sinus tachycardia was preceded by a sinus bradycardia lasting two to three

seconds. In nine cases a marked sinus bradycardia occurred shortly after the convulsive stage. In 17 cases there was no appreciable change in rate, and in several of these there appeared to be no convulsion at all—that is to say, the electrical stimulus had produced a stun or sub-convulsion.

Arrhythmias.—In 7 cases premature beats were present in the control, five being ventricular and two auricular. Amongst the 200 records which were clear enough for analysis, arrhythmias were encountered in 79 (39.5%), all being due to premature beats, except for one case of nodal rhythm. In 55 (27.5%) the arrhythmias were ventricular in origin, in 22 (11%) auricular, and in one case nodal. The ventricular premature beats were often multifocal and occurred singly, in groups of three or four, or at every alternate beat, coupling resulting in 19 cases (9.5%). Both auricular and ventricular premature beats were found in the same records in two cases. In a number of cases unusual waves occurred. At first sight they resembled those of a ventricular tachycardia occurring regularly at 150 a minute, but they were due to muscle contractions in patients who had had doses of suxamethonium insufficient to prevent muscular activity. In others in which the attenuation was greater, but still insufficient, a picture resembling an auricular tachycardia was produced. None of these abnormal waves was seen when the convulsion was completely attenuated or when the convulsive stage had passed. They occurred between 5 and 30 seconds after the shock was given.

Disturbance of Conduction.—In the one case of complete heart block in the control record frequent ventricular premature beats and coupling developed during the convulsive stage. In only one case was the P-R interval abnormally lengthened, and then only temporarily, increasing from 0.16 sec. in the control to 0.24 sec. for four complexes. This occurred after a stun in a woman of 28; but on three subsequent occasions, shortly afterwards, when the shock was repeated in the same patient with a successfully modified convulsion, there was no disturbance of the P-R interval. In no case was prolongation of the QRS complex caused by the shock. In the two patients in whom there was a prolonged QRS complex in the control record it was not altered during the convulsion.

ST Depression.—Slight ST depression was present in the control records in 21 patients, in 16 of whom it was associated with tachycardia, while in 2 cases the presence of pathological Q waves suggested old infarction. Some degree of depression of the ST segment was found in 63 E.C.G.s recorded in 37 patients after the shock was given. In 42 records from 25 patients it was considered to be due to the Ta wave, secondary to tachycardia. In the other 21 from 12 patients the characteristics of the ST depression were such that it was judged to be ischaemic in origin. The age of these 12 patients ranged from 42 to 70, and in two the possibility of posterior cardiac infarction had been noted in the control curves.

T Waves.—As was to be expected, slight lowering of the T wave was often encountered with the development of tachycardia, but in 7 cases the waves were flattened, and in the case of a woman aged 40 they were inverted in two records.

U Waves.—In 91 records U waves became visible during the period of slowing following the cessation of the convulsive stage. They usually appeared when the rate had fallen below 100, and were often prominent even when they had been small or absent in the control. On no occasion was inversion of the U wave found.

Discussion

Anaesthesia and Relaxation

All the established muscle relaxants have been used to mitigate the fits which are produced during E.C.T.; but there are few anaesthetists who do not recognize the great contribution which has been made by the introduction of the ultra-short-acting group of relaxants, particularly when the frail and elderly patient is being treated. By the use of

these drugs complete relaxation can be ensured, if necessary throughout the whole period of stimulation, and yet rapid recovery can be expected. Because of this degree of relaxation we have obtained electrocardiographic tracings, free from interference, covering the period of treatment from beginning to end.

One of two relaxant drugs is now commonly employed; either suxamethonium chloride ("scoline," "anectine," succinylcholine chloride) or suxethonium bromide ("brevital E"). Suxethonium has the advantage of a slightly shorter action (Wolfers, 1953), but as the degree of relaxation it produces is less reliable than that produced by suxamethonium, we chose to use suxamethonium throughout this investigation.

Suxamethonium appears to be a safe relaxant for E.C.T. provided adequate oxygenation is maintained throughout its short period of action. Adderley and Hamilton (1953) stated that some rise in blood pressure invariably occurred after a single dose of the drug, but considered this to be of little importance. Calvert and Morgan (1954), in a study of 57 patients during 200 consecutive convulsions, were unable to find any rise in blood pressure after administering the drug, and they thought that any rise that does occur is due to carbon dioxide accumulation and not to a direct pressor action of the drug. Using suxamethonium as a continuous drip, Green (1953) found that in most patients no rise in blood pressure occurs until at least 500 mg. of the drug has been administered, provided adequate ventilation is maintained.

Attempts have been made to use this drug alone to modify the convulsion, but the painful contractions which precede the relaxation and the unpleasant sensation of progressive paralysis make the procedure too unpleasant for the patient, as retrograde amnesia following the shock is never sufficient to cover this period. The relaxant drug is therefore always preceded by thiopentone. It is not sufficient to mix the two drugs together, as then the suxamethonium begins to take effect before unconsciousness occurs. The thiopentone is given slowly and in minimal doses, particularly in the elderly, so as to avoid undue lowering of the blood pressure.

In spite of the large doses of relaxant used, no very prolonged period of apnoea was recorded, 12 minutes being the longest.

Cardiovascular Effects

E.C.T. in the treatment of psychiatric patients has been practised for 15 years, and from the first it was felt that it might prove a severe strain on the cardiovascular system (Myerson, 1942). In spite of the frequent use of this form of treatment, however, fatalities involving the heart have only rarely been recorded. Ebaugh, Barnacle, and Neuburger (1943) report the death of a 57-year-old man from coronary thrombosis an hour and a half after the convulsion; he had already had twelve treatments, and, although a previous E.C.G. had been regarded as normal, extensive coronary disease and a recent thrombosis were found at necropsy. Kauntze and Parsons-Smith (1948), in 63 electric convulsions on 51 patients, found no evidence of any serious cardiovascular effects, but thought that coronary disease was a strong contraindication. Plice and Pfister (1950) believed that certain electrocardiographic abnormalities were caused by psychiatric disturbances, and described improvement in ST segments and T wave changes following E.C.T. Magendantz and Shortleeve (1951) found that in many cases ST depression and T wave changes were due to anxiety and disappeared after rest and reassurance.

In our series ST and T wave changes were rarely present in the control records except in association with tachycardia, and even then they were slight. In the convulsive stage a marked auricular T wave associated with tachycardia occurred in 37 records (18.5%), but 21 records (10.5%) in 12 patients showed temporary ST depression which, adopting the criteria accepted by Wood *et al.* (1950), we regarded as ischaemic. Such a change can be due to anoxia from inadequate ventilation, but every effort was made to maintain adequate oxygenation, and in the six patients who had

more than one treatment the change was usually consistent. Furthermore, the ages of the 12 patients ranged from 42 to 70 years, with an average of 53; and, in two, changes suggesting coronary disease had been present in the control records. It was therefore concluded that the changes might possibly indicate latent coronary artery disease. It is, however, noteworthy that no ischaemic ST changes developed in the two patients who gave a history of cardiac infarction.

Lowering of the T wave was generally encountered only with considerable tachycardia, but an ischaemic cause was suggested by the inversion of T in Lead I in a woman of 40 in whom the control showed slight ST depression and a diphasic T in Leads I and II, for in this case the rate rose to no more than 120 a minute.

The frequency of U waves, which are thought to represent a process of repolarization of the interventricular septum (Zuckermann and Cabrera, 1947; Goldberger, 1953), is not considered to be of pathological significance, for they were upright in all cases; but it is interesting to note that they often became visible or accentuated in the stage of recovery following the convulsion. That they cannot be seen until the rate slows to less than 100 is of course due to the shortness of the T-P interval while tachycardia is present. Their increased prominence in many cases soon after the convulsion suggests a temporary change in the relative intraventricular pressures, for it has been shown that the U wave is influenced by changes which unilaterally alter the pressure on the septum (Zuckermann and Cabrera, 1947).

Anoxia was regarded by Kauntze and Parsons-Smith (1948) as the possible cause of the slight auriculo-ventricular conduction delay noted in half their cases and the intraventricular delay which occurred in 4%. In our series the P-R interval was abnormally prolonged in only one instance, and then after a sub-convulsion, and on no occasion did intraventricular delay result. The difference in these results can probably be accounted for by the greater ease with which we were able to inflate the lungs of our patients with oxygen during the convulsive stage.

Tachycardia was the principal effect of shock therapy, and this was always sinus in origin. In a few cases it was preceded by a sinus bradycardia for a few seconds, and in a few others bradycardia followed the convulsive stage; this was considered to be a vagal effect.

The absence of any change in rate was thought to be helpful in recognizing stuns, for their recognition is, of course, made more difficult by the use of large doses of muscle relaxants. In obvious stuns there is no change in rate, while only in a few cases with a definite convulsion was there no such disturbance.

The frequency of ectopic beats (39.5%) in our series is in contrast to that of Kauntze and Parsons-Smith, in which they occurred in only 8%. This is probably because in their series E.C.G.s could be taken only after the convulsive stage, during which the majority of the ectopic beats take place. Phillips (1954) has reported frequent ventricular extrasystoles following the administration of suxamethonium in the conscious patient, but only rarely when the relaxant was preceded by a sleep dose of a barbiturate. No premature beats were found after suxamethonium in our series of control records.

When two or more convulsions were studied in the same patient there was a relatively constant effect with regard to the presence and type of rhythm abnormality as well as to the degree of tachycardia which resulted. The rhythm changes, although frequent, were not marked, and in most cases were of short duration.

Conclusions

It seems probable that E.C.T. results in much less strain on the cardiovascular system than was originally anticipated. As in the majority of other recorded series, our cases have for the most part shown no evidence of any cardiac abnormality. The few that did show clinical or electrocardio-

graphic evidence of such abnormality suffered no ill effects from the convulsion. Nevertheless, if frequent premature beats can occur so readily in normal hearts, more serious arrhythmias which are potentially harmful might occur in diseased hearts. It is therefore suggested that quinidine or procainamide ("pronestyl") may prove of prophylactic value in such cases, and one of these should be readily available for intravenous injection should a serious arrhythmia occur. Severe coronary artery disease, and in particular recent infarction, and evidence of any considerable degree of heart failure should still be regarded as contraindications to the use of E.C.T. Should treatment be considered essential on psychiatric grounds, however, it is unlikely that there would be any serious outcome, provided the precautions were taken of using a short-acting muscle relaxant, of ensuring adequate oxygenation, and of preventing the development of serious arrhythmias by means of procainamide.

Summary

A series of 105 patients were submitted to 214 electric convulsions which had been modified by the intravenous injection of ultra-short-acting muscle relaxants. Electrocardiograms were taken before, during, and after the convulsive stage.

In 10 cases with clinical or electrocardiographic evidence of heart disease, no serious cardiovascular disturbance occurred.

A marked degree of sinus tachycardia was usual. Nodal rhythm developed in one case and premature beats were recorded in 39% of the cases.

In view of the frequency of premature beats, it is suggested that quinidine or procainamide may be used prophylactically in cases in which the onset of gross arrhythmia is expected or feared.

We are very much indebted to Dr. Desmond Curran for stimulating this investigation. We wish to thank the medical and nursing staffs of the Psychiatric Departments of St. George's Hospital and the Atkinson Morley Hospital for their kind co-operation, and Drs. N. C. B. Trapps, D. J. Coleman, and B. L. Day for administering some of the anaesthetics. We should especially like to acknowledge the great help given by Miss Bromley and Miss Hurst, who recorded all the electrocardiograms.

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Dr. J. A. MACFARLANE, dean of the Faculty of Medicine at the University of Toronto, has some remarks to make in his report on the 1953-4 session about the teaching problems raised by new trends in methods of investigation and treatment. "This school," he writes, "has tried to hold an even balance between the constantly changing and more complicated methods of laboratory investigation and the system of bedside teaching and theatre clinics, with emphasis on the careful taking of history and painstaking physical examination. There are so many human ills that cannot be measured by any laboratory calculation. The student of medicine has much to gain from sound clinicians who still practise the art of medicine with a full knowledge that the techniques of university laboratories and their experts are immediately available when they are indicated."

PHYSIQUE AND THE GRAMMAR SCHOOL ENTRANCE EXAMINATION

BY

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To obtain standards for somatotyping children by physical anthropometry at the age of 11, 371 boys and 421 girls were measured by one of us (C. K. W.) as an additional part of the routine medical examination in the City of Oxford schools during the period January, 1953, to March, 1954. Following the discovery of significant relationships between physique and final honours class results among Oxford undergraduates (Parnell, 1954a), it was decided to compare children's physique with their marks in the grammar school entrance examination. This report covers our findings: it reveals those somatotypes who are most often successful in gaining grammar school places, showing a trend towards more frequent selection of less-muscular children; it also shows that significant relationships exist between physique and performance on intelligence tests, while significant physical trends also appear in the proportion of children with better than average achievement in English and arithmetic.

Somatotyping Children

The children's physiques were classified according to Sheldon and Tucker's (1940) somatotype method, with two important differences. First, since it was impossible to photograph the children, the estimates were based on physical measurements alone, whereas Sheldon uses mainly photoscopic methods. Secondly, since he has not yet published photographic standards for children, it seemed dangerous to adopt his terminology; therefore, while keeping to a classification with three components each on a scale of half points from 1 to 7, the components themselves are renamed. The first component, endomorphy, was called Fat (F), the second, mesomorphy, indicating bone and muscle development, was termed Muscularity (M), and Linearity (L), was substituted for the third component, ectomorphy.

The somatotype estimates can be plotted on Sheldon's (1954) chart with its centre 444 and extremes of 711, 171, and 117. The sectors have been named according to the primary and secondary dominance of the types falling within these sectors by capital and small type respectively. Thus an Mf child would be one who was predominantly muscular, but also fat (cf. endomorphic mesomorph). Occasionally the estimates could not be plotted directly on Sheldon's chart. In these cases, while retaining relative dominance between the components, each component was reduced or increased by one-half—for example, 336 plotted as 2½2½5½, 3433½ as 4½4.

To estimate children's somatotypes a "deviation chart" was drawn up similar in design to that employed when

typing undergraduates by physical anthropometry (Parnell, 1953, 1954b). The first step was to calculate means and standard deviations of all the measurements. Next the results for boys and girls were combined on the empirical grounds that the differences between them were, except in the case of the fat measurements, too small to make separate scales practicable. The central column of the deviation chart (see Fig. 1) contains the mean value of each measurement. Values of these measurements at half standard deviation intervals are arranged on each side of the centre. There are six columns on each side, so that the outside columns correspond to measurements three standard deviations above and below the mean. In the case of fat measurements, logarithmic scales are employed to relieve skewness in the distribution.

A "profile" was drawn for each child by ringing the appropriate value for every measurement. This gave a general impression of the physique (see Figs. 1-4). Numerical estimates for each component were obtained as follows:

Fat (Endomorphy)

The total of the three fat measurements taken was plotted on a logarithmic scale (based on the mean total fat), and "F" estimates were given according to Table I.

Muscularity (Mesomorphy)

I. First Estimate.—For children of average height a "bone and muscle" point was found corresponding to the average standard score of the humerus, femur, and muscle girth measurements. A rating was given according to the number of columns (half-units) the "B.M." point lay from the central column of mean values, which was rated 4. Children *not of average height* presented a problem, because bone and muscle measurements are determined by size as well as by body shape. This was dealt with by calculating somatotype 444 bone and muscle measurements for each half-unit of height assuming a linear relation between height and bone muscle measurements—that is, by multiplying the mean bone and muscle measurements by actual height. From these 444 somatotype measurements a corresponding 444 "B.M." point was found for each height. Fig. 5 shows a section of the deviation chart with lines linking the 444 somatotype measurements with each unit of height. The muscularity rating was allotted according to the number of columns an individual's "B.M." point lay from the 444 point for his height. Thus a child of height 61.5 in. and with humerus 6.7 cm., femur 9.1 cm., biceps 20.5 cm., and calf 30.2 cm. would have a "B.M." point at the position of the cross (x), which is one column, or a half standard deviation, from the 444 point (marked 4); he would receive a provisional rating of 4 minus ½, or 3½, in muscularity.

II. Correction for Fat.—There is the further complication that measurements of bone and muscle girth are affected by the amount of fat present, bone slightly but girth rather more; unless allowance is made for this, fat people would be overestimated in muscularity, thin people underestimated. Corrections were made for fat according to the lower part of Table I. This was based on the assumption that there is a linear relation between the amount of fat and its effect on bone and muscle measurements. Since the F scale was based on logarithmic increases of fat, corrections for fat to the muscularity scale increase in the same way and have been rounded off for convenience.

TABLE I.—For Estimating F Rating, and Appropriate Correction for Fat to Estimate M for Muscularity

Total fat (mm.): Midpoint Limits	12 <12	14 13-15	17 16-18	20 19-22	24 23-26	29 27-31	35 32-38	42 39-46	50 47-55	60 56-66	72 67-79	87 80-95	104 96+
F rating	1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7
Correction to M rating	+	+	+	+	0	0	-	-	-	-	-	-	-

Linearity (Ectomorphy)

The ponderal index (height over the cube root of weight) was used as the basis for rating linearity as shown in Table II. The somatotype distributions of boys and girls may be compared in Figs. 6 and 7.

TABLE II.—For Estimating Linearity (L) From the Ponderal Index

Height (ins.)	12.1	12.4	12.7	13.0	13.2	13.4	13.6	13.8	14.0	14.2	14.4	14.6
Weight (lbs.)	12.0	12.3	12.6	12.9	13.1	13.3	13.5	13.7	13.9	14.1	14.3	14.5
Linearity	1	1½	2	2½	3	3½	4	4½	5	5½	6	6½

Standard Scale	1	1½	2	2½	3	3½	MEAN	4½	5	5½	6	6½	7
Height (ins.)	47.8	49.2	50.6	52.0	53.4	54.7	56.0	57.4	58.7	60.1	61.5	62.9	64.3
Weight (lbs.)	36.0	43.0	50.0	57.0	64.0	71.0	78.0	85.0	92.0	99.0	106.0	113.0	120.0
Bone: Humerus (cms.)	5.0	5.2	5.5	5.7	6.0	6.2	6.5	6.7	7.0	7.2	7.5	7.7	8.0
Femur (cms.)	7.0	7.2	7.5	7.7	8.0	8.2	8.5	8.7	9.0	9.2	9.5	9.7	10.0
Muscle: Biceps (cms.)	13.9	15.0	16.1	17.2	18.3	19.4	20.5	21.6	22.7	23.8	24.9	26.0	27.1
Calf (cms.)	20.6	21.8	23.0	24.2	25.4	26.6	27.8	29.0	30.2	31.4	32.6	33.8	35.0
Fat: Back (mm.)	3	4	5	6	7	8	9	10	11	13	16	20	25+
Abdomen (mm.)	4	5	6	7	8	9	11	13	16	19	23	28	34+
Over triceps (mm.)	6	7	8	9	10	12	14	16	18	21	25	30	36+
TOTAL FAT	12	14	17	20	24	29	35	42	50	60	72	87	104

FIG. 1.—A linear physique—sector Lf, type 2½47.

Standard Scale	1	1½	2	2½	3	3½	MEAN	4½	5	5½	6	6½	7
Height (ins.)	47.8	49.2	50.6	52.0	53.4	54.7	56.0	57.4	58.7	60.1	61.5	62.9	64.3
Weight (lbs.)	36.0	43.0	50.0	57.0	64.0	71.0	78.0	85.0	92.0	99.0	106.0	113.0	120.0
Bone: Humerus (cms.)	5.0	5.2	5.5	5.7	6.0	6.2	6.5	6.7	7.0	7.2	7.5	7.7	8.0
Femur (cms.)	7.0	7.2	7.5	7.7	8.0	8.2	8.5	8.7	9.0	9.2	9.5	9.7	10.0
Muscle: Biceps (cms.)	13.9	15.0	16.1	17.2	18.3	19.4	20.5	21.6	22.7	23.8	24.9	26.0	27.1
Calf (cms.)	20.6	21.8	23.0	24.2	25.4	26.6	27.8	29.0	30.2	31.4	32.6	33.8	35.0
Fat: Back (mm.)	3	4	5	6	7	8	9	10	11	13	16	20	25+
Abdomen (mm.)	4	5	6	7	8	9	11	13	16	19	23	28	34+
Over triceps (mm.)	6	7	8	9	10	12	14	16	18	21	25	30	36+
TOTAL FAT	12	14	17	20	24	29	35	42	50	60	72	87	104

FIG. 2.—A fat physique—sector Fm, type 731.

Standard Scale	1	1½	2	2½	3	3½	MEAN	4½	5	5½	6	6½	7
Height (ins.)	47.8	49.2	50.6	52.0	53.4	54.7	56.0	57.4	58.7	60.1	61.5	62.9	64.3
Weight (lbs.)	36.0	43.0	50.0	57.0	64.0	71.0	78.0	85.0	92.0	99.0	106.0	113.0	120.0
Bone: Humerus (cms.)	5.0	5.2	5.5	5.7	6.0	6.2	6.5	6.7	7.0	7.2	7.5	7.7	8.0
Femur (cms.)	7.0	7.2	7.5	7.7	8.0	8.2	8.5	8.7	9.0	9.2	9.5	9.7	10.0
Muscle: Biceps (cms.)	13.9	15.0	16.1	17.2	18.3	19.4	20.5	21.6	22.7	23.8	24.9	26.0	27.1
Calf (cms.)	20.6	21.8	23.0	24.2	25.4	26.6	27.8	29.0	30.2	31.4	32.6	33.8	35.0
Fat: Back (mm.)	3	4	5	6	7	8	9	10	11	13	16	20	25+
Abdomen (mm.)	4	5	6	7	8	9	11	13	16	19	23	28	34+
Over triceps (mm.)	6	7	8	9	10	12	14	16	18	21	25	30	36+
TOTAL FAT	12	14	17	20	24	29	35	42	50	60	72	87	104

FIG. 3.—A muscular physique—sector Mf, type 25½2.

Standard Scale	1	1½	2	2½	3	3½	MEAN	4½	5	5½	6	6½	7
Height (ins.)	47.8	49.2	50.6	52.0	53.4	54.7	56.0	57.4	58.7	60.1	61.5	62.9	64.3
Weight (lbs.)	36.0	43.0	50.0	57.0	64.0	71.0	78.0	85.0	92.0	99.0	106.0	113.0	120.0
Bone: Humerus (cms.)	5.0	5.2	5.5	5.7	6.0	6.2	6.5	6.7	7.0	7.2	7.5	7.7	8.0
Femur (cms.)	7.0	7.2	7.5	7.7	8.0	8.2	8.5	8.7	9.0	9.2	9.5	9.7	10.0
Muscle: Biceps (cms.)	13.9	15.0	16.1	17.2	18.3	19.4	20.5	21.6	22.7	23.8	24.9	26.0	27.1
Calf (cms.)	20.6	21.8	23.0	24.2	25.4	26.6	27.8	29.0	30.2	31.4	32.6	33.8	35.0
Fat: Back (mm.)	3	4	5	6	7	8	9	10	11	13	16	20	25+
Abdomen (mm.)	4	5	6	7	8	9	11	13	16	19	23	28	34+
Over triceps (mm.)	6	7	8	9	10	12	14	16	18	21	25	30	36+
TOTAL FAT	12	14	17	20	24	29	35	42	50	60	72	87	104

FIG. 4.—Physique with relatively little muscle—sector Fl, type 5½4½.

Standard Scale	1	1½	2	2½	3	3½	MEAN	4½	5	5½	6	6½	7
Height (ins.)	47.8	49.2	50.6	52.0	53.4	54.7	56.0	57.4	58.7	60.1	61.5	62.9	64.3
Weight (lbs.)	36.0	43.0	50.0	57.0	64.0	71.0	78.0	85.0	92.0	99.0	106.0	113.0	120.0
Bone: Humerus (cms.)	5.0	5.2	5.5	5.7	6.0	6.2	6.5	6.7	7.0	7.2	7.5	7.7	8.0
Femur (cms.)	7.0	7.2	7.5	7.7	8.0	8.2	8.5	8.7	9.0	9.2	9.5	9.7	10.0
Muscle: Biceps (cms.)	13.9	15.0	16.1	17.2	18.3	19.4	20.5	21.6	22.7	23.8	24.9	26.0	27.1
Calf (cms.)	20.6	21.8	23.0	24.2	25.4	26.6	27.8	29.0	30.2	31.4	32.6	33.8	35.0
Fat: Back (mm.)	3	4	5	6	7	8	9	10	11	13	16	20	25+
Abdomen (mm.)	4	5	6	7	8	9	11	13	16	19	23	28	34+
Over triceps (mm.)	6	7	8	9	10	12	14	16	18	21	25	30	36+
TOTAL FAT	12	14	17	20	24	29	35	42	50	60	72	87	104

FIG. 5.—Somatotype 444 measurements according to height.

For the purpose of the present analysis, sector Mf includes types 343, 252, etc.; Ml includes 344, 244, etc.; in other words, viewed from the central 444, each sector includes its right-hand margin.

Findings

The "11-plus" examination consisted in 1953 of three papers—an intelligence test, English, and arithmetic—to which the Peel test of practical ability was added in 1954.

Complete results were not available for two groups of children—those who scored less than 70 in the intelligence test and those absent from one or more papers. The former were automatically excluded by their low mark from taking any further papers, and therefore cannot figure in this sample: their physique distribution will, however, be analysed in the intelligence test section of the boys' part, since all these very low scorers were boys. Those who were absent will also be removed from the sample after discussion of their somatotype distribution.

Absence

Five per cent. of the girls and 6.2% of the boys were absent at one or more papers. Physique seemed to play a part here; among the girls with a fat rating of 6 or more (the body-build associated with an easy-going comfort-loving temperament), 16.2% were absent as against 3.9% in the remainder of the sample (Difference = 2.0).*

Analysis of the boy absentees yielded a similar result, but with a different emphasis: this time it was the linear boys (in sectors Lm, Lf, and Fl) who were noticeably present, with only 1.9% absent for one or more papers, as against 7.9% in the other sectors (Difference = 2.8).

Girls' Results

The children's results were analysed in terms of those scoring above and below the mean for each subject. In the girls' results the most outstanding feature was

*If two proportions differ by more than twice the standard error of the difference (S.E. Diff.), the difference is said to be "significant"—that is, such a difference would arise by chance, roughly, once in 20 times.

that the less muscular sectors (in particular Lf), consistently in all the tests, contained a greater proportion of girls scoring above the mean than the rest. The muscular-linear girls (Lm and Ml) varied in performance, while the muscular-fat ones (Mf and Fm) always had a lower percentage of high scorers than the whole sample. The results are given in detail in Table III.

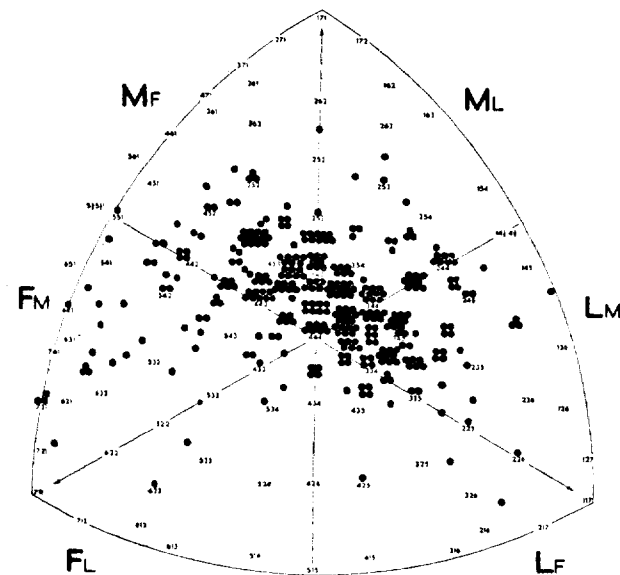


FIG. 6.—Somatotype distribution of 371 boys aged 11 years. (A schematic two-dimensional projection of the theoretical spatial relationships among the known somatotypes.)

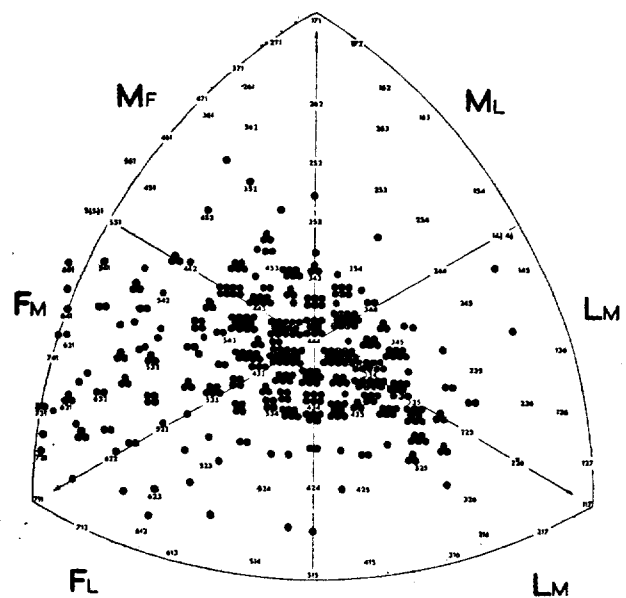


FIG. 7.—Somatotype distribution of 421 girls aged 11 years. (A schematic two-dimensional projection of the theoretical spatial relationships among the known somatotypes.)

The less muscular girls gained the most grammar and technical school places, not surprisingly considering their performance in the individual tests (Lf 35% compared with 18.5% of the rest; $\frac{\text{Diff.}}{\text{S.E. Diff.}} = 2.5$) (see Table IV). The fat-muscular girls received significantly few places (15.1% compared with 24.9%; $\frac{\text{Diff.}}{\text{S.E. Diff.}} = 2.4$).

In the intelligence test 66.9% of the Lf and Fl girls scored above the mean compared with 39.7% of the rest ($\frac{\text{Diff.}}{\text{S.E. Diff.}} = 5.3$). Histograms contrasting distribution of

TABLE III.—Proportion of Children with Above Average Scores, According to Physique

Sector	No. in Sector	Intelligence %	Arithmetic %	English %	Peel Test, 1954	%
<i>Girls</i>						
Mf	38	36.8	36.8	44.7	26	42.3
Ml	24	62.5	45.8	58.3	17	35.3
Lm	79	41.8	51.9	46.8	45	51.1
Lf	60	71.6	65.0	71.7	34	73.5
Fl	70	62.9	61.4	61.4	51	58.8
Fm	121	33.9	34.7	41.3	90	33.3
Central 444	8	50.0	50.0	62.5	4	50.0
Total	400	48.5	48.5	52.2	267	47.6
<i>Boys</i>						
Mf	83	38.6	47.0	50.6	70	42.9
Ml	87	50.6	50.6	48.3	61	52.4
Lm	83	48.2	38.6	39.8	53	58.5
Lf	13	69.2	69.2	76.9	10	80.0
Fl	5	20.0	0.0	40.0	4	25.0
Fm	58	51.7	60.3	62.1	45	55.5
Central 444	7	14.3	28.6	14.3	3	100.0
Total	336	46.7	47.9	49.4	246	52.8

TABLE IV.—Proportion of Children Gaining Grammar and Technical School Places According to Physique

Sector	Girls		Boys	
	No. in Sector	% G. and T.P.	No. in Sector	% G. and T.P.
Mf	38	10.5	83	22.9
Ml	24	20.8	87	25.3
Lm	79	19.0	83	24.1
Lf	60	35.0	13	46.1
Fl	70	25.7	5	0.0
Fm	121	16.5	58	34.4
Central 444	8	12.5	7	0.0
Total	400	21.0	336	25.9

TABLE V.—Difference in Proportion of Less Muscular and Other Girls with Above Average Test Scores

Test	Sectors Lf and Fl	Remainder	Diff. S.E. Diff.
Intelligence test (Moray)	% 66.9	% 39.7	5.3
House	63.0	41.5	4.1
Arithmetic	66.9	45.6	4.0
English	66.9	39.6	4.2
Peel practical ability test	64.6	39.6	4.2

I.Q.s between the better somatotype sectors and the others are shown in Fig. 8. There was a significantly large proportion of high scorers in the same less muscular sectors (Lf and Fl) in both the arithmetic and English tests (see Table V). A similar result was also found among those girls who took the Peel practical ability test.

In all these tests stocky and tubby girls in sectors Fm and Mf did significantly poorly compared with the others. It is interesting that many lean girls (Lm) did well in the intelligence and English tests, but few did so in arithmetic and the practical ability test. The slightly more muscular and less linear girls of sector Ml, on the

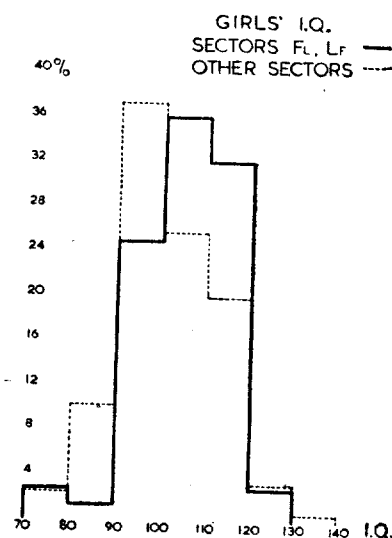


FIG. 8.—Histogram contrasting distribution of girls' I.Q.s in sectors Fl and Lf.

other hand, performed well at arithmetic and in practical ability, but poorly on English and the intelligence tests.

Boys' Results

The boys' results were not as highly significant as the girls'. This is almost unavoidable with samples of 13 and 5 in the two less muscular sectors. There was, however, a consistent trend throughout all the results. The fattest boys (Fm) were the most successful of the larger samples, and the muscular ones with secondary fat dominance the least successful. In the case of the two small groups, the Lf were outstandingly good (as among the girls), but out of the five boys in Fl none achieved a place at grammar or technical school, see Table IV. The neighbouring sectors were noticeably but not significantly successful in achieving places.

In the intelligence test 12 boys did not take the other papers because of intelligence quotients of less than 70. Of these, 7 were in the Mf sector, representing 7.8% of its population, compared with 1.9% of the rest of the boys ($\frac{\text{Diff.}}{\text{S.E. Diff.}} = 2.0$). Considering all the boys with I.Q. above the mean, again the Mf sector did comparatively badly with only 35.5% falling into this category, compared with 48.5% among the other physiques ($\frac{\text{Diff.}}{\text{S.E. Diff.}} = 2.2$).

In both the English and arithmetic test results, the fat and less muscular boys taken together (Lf, Fl, and Fm) contained more with marks above the mean than the rest of the sample. In arithmetic the proportions were 60% to 46.7% ($\frac{\text{Diff.}}{\text{S.E. Diff.}} = 2.0$), in English 63.1% to 45.3% ($\frac{\text{Diff.}}{\text{S.E. Diff.}} = 2.8$).

In the Peel test of practical ability (which was taken only in 1954) the most remarkable feature was the poor performance once again of "north-western" muscular boys with secondary fat (42.9% in Mf compared with 56.8% of the rest).

Athletic Ability

Ratings of athletic ability were obtained through the kindness of head teachers on 285 boys and 306 girls. There were thus several observers, and the proportion of children said to possess athletic ability varied widely from school to school. Only rough conclusions may therefore be drawn, but it was found that for the sample as a whole there was a higher proportion of children (both boys and girls) considered to be good at games among place winners than among the remainder.

Discussion

The finding that low-level performance of both boys and girls was specially associated with a fat-muscular (Mf) type of physique is in striking contrast to the high-level performance associated with fat-linear (Lf) types. Further subdivision of each sector into central and peripheral types showed the average score of central types in these sectors to be higher than those more peripheral. While the establishment of normal variation in intelligence scores according to finer shades of physical classification must await larger samples, it is interesting to note that central Lf boys had a mean I.Q. of 111.9, and 37 girls of similar physique a mean value of 105.6. The lower average scores for peripheral Mf children were: boys 99.3 (n=38) and girls 99.7 (n=16). That central Lf children did best is interesting because in an older group of undergraduates (Parnell, 1954a) the outstandingly good performers in final honours class examinations were endomorphic ectomorphs, whose physique was similar when determined by the appropriate deviation chart for their age. It cannot, of course, be

*Both proportions are below 50% owing to slight skewness in the distribution.

assumed that children typed at 11 would necessarily have the same type allotted to them at the age of 21 even when a comparable method is used; any attempt to compare the prevalence of this physique in school and university population in an exact way is likely to be unreliable; nevertheless, the impression has been gained that men of this physique are relatively much more common in the university population, a situation which could be brought about by progressive academic test selection. The trend is important because the high disposition to psychological difficulty and breakdown shown by men with this particular physique is now well established, whereas it is also known that student endomorphic mesomorphs at Oxford, whose physique is most comparable to that of Mf children, show little disposition to breakdown (Parnell, 1955).

Summary and Conclusion

Groups of 371 boys and 421 girls were measured at the age of 11 to obtain standards for somatotyping children by the deviation chart method.

The technique of this objective method of assessing physique in terms of fat, muscularity, and linearity is described, bringing out the points of similarity to and difference from Sheldon's method of somatotyping.

The grammar school entrance marks of 336 boys and 400 girls are compared according to their body build. The slightly smaller sample is accounted for by examination absentees and those who, having scored less than 70 in the intelligence test, did not complete the other papers.

The following conclusions are reached:

1. Absence from the examination was significantly greater among girls with a high fat rating; it was significantly uncommon in boys of linear build.

2. Less muscular girls, and especially those in sector Lf who were linear too, showed significantly high proportions with above-average scores. Their results were consistent for all tests—arithmetic, English, intelligence, and the Peel test of practical ability.

3. A similar trend was found among the boys, although the results were not so highly significant.

Among 12 boys with intelligence scores below 70, there were 7 in the Mf sector, and the lowest proportion of boys scoring above the mean was found in the same area. The same was true of the Peel practical ability test.

Fat and linear non-muscular boys (Lf, Fl, and Fm) did significantly better than the remainder in English and arithmetic.

4. In spite of the tendency to select less muscular children, there was evidence that a higher proportion of those selected, both boys and girls, were considered good at games compared with children failing to obtain places.

5. Certain points of similarity exist between test results at the age of 11 and those discovered in a group of Oxford undergraduates taking their final honours class examination. At both ages linear subjects with more than average fat for their weight were best at examinations. Undergraduates with this type of physique are known to possess comparatively high disposition to psychological breakdown; thus it is not altogether surprising to find high prevalence rates for psychological upset as an associated consequence of intensive academic selection.

We wish to thank Mr. C. F. L. Piggott, Chief Education Officer, City of Oxford, for allowing us access, for the purpose of statistical analysis, to the examination marks, which are otherwise confidential. Dr. J. F. Warin, Medical Officer of Health and

Principal School Medical Officer, City of Oxford, gave us valuable help and advice. Our thanks are also due to the head teachers, without whose kind co-operation the inquiry could not have proceeded so effectively. Miss W. Hunt, of the School Health Department, and Mr. A. D. Hewitt, of the Education Department, also assisted us greatly with practical details. Mrs. G. A. Rainbird kindly drew the diagrams. It formed one part of the research programme at the Warneford Hospital, Oxford, to study methods of physical assessment and the relationship between physique and behaviour, both normal and abnormal.

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FAVUS: A REPORT OF SEVEN RELATED CASES

BY

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Favus, or tinea favosa, is a ringworm infection of the scalp, skin, and nails rarely seen in Britain, though it commonly occurs in Eastern and Central Europe, in the Mediterranean countries, and in the Near East. The majority of British infections have been sporadic and have occurred in widely scattered areas, but small outbreaks have been reported from urban districts. It has been stated that favus is becoming progressively more rare in this country (Whittle, 1947). Walker (1950) isolated the causative fungus, *Trichophyton schoenleini*, on 42 occasions among 2,473 ringworm cultures. These were grown from specimens received from various parts of Britain. We have been unable to trace any reports of this disease in the London area during the last ten years, and it was not diagnosed mycologically among 760 consecutive patients suffering from ringworm infections seen at the Institute of Dermatology in London (Partridge, 1952). Recently, the diagnosis of favus in a London infant led to the discovery of six unsuspected cases and enabled the source of infection to be traced to another town. This outbreak is reported in order to stress the ease with which the nature of the disease may be overlooked.

In an attempt to trace the source of the infection, attention was directed to a day nursery attended by the affected infant (Case 1). All available contacts were examined under Wood's light, with the result that a second case of scalp infection was discovered (Case 2). Finally, it was learnt that the original child had spent three months in the home of a relative in Kent, where, on inquiry, one adult (Case 3) and four children (Cases 4, 5, 6, and 7) in a single family were found to be suffering from favus. Hairs taken from all six of these patients contained fungous mycelium, and *T. schoenleini* was cultured from five of them.

Case Reports

Case 1.—A female child aged 14 months, living in London, was first brought to hospital in October, 1952. She had suffered from a scurfy condition of the scalp since birth, and on examination was shown to have a number of crusted lesions, but no broken hairs, alopecia, scarring, or scutula. A provisional diagnosis of ringworm was made after microscopy had revealed fungous mycelium in extracted hairs, though cultures were unsuccessful. Whitfield's ointment appeared to control the scalp condition, and after six months only two scaly erythematous patches approximately 1 in. (2.5 cm.) in diameter remained. Under Wood's light, however, a greenish fluorescence was observed along the entire length of many hairs distributed in groups over the whole scalp. These hairs were found to contain fungus, and on this occasion *T. schoenleini* was grown from them. While the condition was being re-investigated local treatment was discontinued, and this resulted in the appearance of typical scutula on the scalp (Fig. 1); there was also spread of the infection to one knee.

Case 2.—This 1-year-old boy had a single small scaly patch $\frac{1}{2}$ in. (1.3 cm.) in diameter on the occipital region of his scalp. The lesion, which had been present for six months, was first observed two months after he had been attending the day nursery, where he was a close companion of Case 1. Though hairs growing from the affected area appeared normal, they fluoresced a dull green colour under Wood's light.

Case 3.—A woman aged 33, the aunt of Case 1, had suffered from scalp trouble since the age of 5, resulting in bald patches since she was 18. Various therapeutic measures had been tried without success. She had lived in Yorkshire, but had never resided outside Britain and was unable to explain the source of her infection. Examination showed a large scarred bald area—5 by 4 in. (12.5 by 10 cm.)—over the left parietal region with erythema, scaling, and



FIG. 1.—Case 1. Typical scutula on scalp.



FIG. 2.—Case 3. Large scarred bald area, with erythema, scaling, and scutula at its periphery.

scutula at its periphery (Fig. 2). The hairs in this zone were grey and lustreless, and under Wood's light fluoresced along their entire length. A definite "mousy" odour was detectable.

Case 4.—A girl aged 12, the eldest daughter of Case 3, had had crusting of the scalp since she was 6. She presented with several areas of atrophy and alopecia showing peripheral erythema and scaling, and long fluorescent hairs were again seen.

Case 5.—A second daughter of Case 3, aged 8, had suffered from a scaly scalp since shortly after birth. She had received hospital treatment for this during the previous year, but favus had not been suspected. On examination a widespread scaly condition of the scalp and several small scutula were found; long fluorescent hairs were demonstrable with Wood's light.

Case 6.—A third daughter of Case 3, aged 6, was found to have several scaly patches associated with scutula over the vertex of her scalp; within these areas long fluorescent hairs were found.

Case 7.—The twin sister of Case 6 presented no clinical evidence of favus. Careful examination of her scalp under Wood's light revealed two fluorescent hair stumps in the occipital region which showed the characteristic appearances of *T. schoenleini* infection when examined microscopically. The fungus was not grown.

All these patients, except the last, were treated by hair removal with x rays. Complete epilation was achieved except in Case 3, in which a few remaining infected hairs required removal with a diathermy needle. No infected hairs reappeared except in Case 5, in which some infected hair stumps developed; these were treated by follicular cauterization. Case 7 was successfully treated by manual epilation of the hairs involved.

Discussion

The familiar characteristics of a typical case of favus of the scalp represent late manifestations of the disease. Scutula, alopecia, and atrophy were present in Cases 3 and 4, in which the disease had persisted for 28 and 6 years respectively, but no alopecia or atrophy occurred in Cases 1, 2, 5, and 6. Broken hairs are rarely found in this disease, though they were the one diagnostic feature in Case 7. Initially the hairs are usually macroscopically normal, but later lack lustre; under Wood's light a dull, greenish fluorescence may be seen along their entire length—an invaluable method of detecting early infection. This feature is useful, too, in distinguishing favus from *Microsporum* infections, in which bright yellow-green fluorescent hair stumps occur, and from other *Trichophyton* infections where fluorescence is lacking. The mild symptoms and signs of this disease and its insidious progress lead to delay in seeking medical advice. The appearances may be unlike typical ringworm and may resemble those of psoriasis, impetigo, seborrhoeic dermatitis, folliculitis decalvans, and sometimes lupus erythematosus and lupus vulgaris. Consequently, failure to prescribe adequate treatment is not uncommon, and local applications prescribed haphazardly may further confuse the clinical picture.

In all doubtful cases, unequivocal evidence of favus can be obtained only by microscopy and culture. Microscopical examination of hairs in potash reveals mycelium and chains of spores within the shafts, and characteristic elongated air-spaces are seen at the sites of degenerated mycelium. Colonies of *T. schoenleini* grown at 26° C. on Sabouraud's agar are deep cream in colour, compact and glabrous, and have an irregularly corrugated surface. Their rate of growth is very slow, taking about three weeks to reach a size sufficient for macroscopic identification. Microscopical examination of the partially submerged growth may reveal characteristic antler-like hyphae after ten days.

Favus is essentially a human infection caused by *T. schoenleini*, and should not be confused with mouse favus,

caused by *T. quinckeanum*. When the latter infection occurs in man it produces acute, vesicular, and circinate lesions within a few days. In man, hair infections are rare, and the scutula seen in murine infections do not occur.

Unlike most other varieties of ringworm of the scalp, untreated favus may, as in Case 3, persist beyond puberty into adult life; spontaneous retrogression occurs only occasionally. Treatment is effective if administered before atrophy and permanent alopecia supervene; epilation with x rays is accepted as the most satisfactory method of treatment. Examination with Wood's light is necessary in order to detect infected hairs which have not fallen, and to exclude reinfection of new hairs. Local applications are sometimes successful in early cases but necessitate close supervision.

The group of infections in the family living in Kent appeared to be the source of disease in the first case. The fact that so few children were involved in the day nursery is explained by the low infectivity of the fungus. As in the outbreak described, it is a disease of the family rather than of the school. Every effort should be made to trace the source of infection, since the disease may otherwise go unnoticed and cause disfigurement.

Summary

Seven cases of favus of different degrees of severity are reported from the London and Kent areas. Their diagnosis and the identification of the source of infection are described.

Acknowledgment is made to Dr. G. B. Dowling, Dr. R. H. Meara, Dr. H. T. H. Wilson, and Dr. R. J. Cairns for access to their patients, and to Dr. R. W. Riddell for advice and criticism.

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A TABLET TEST FOR BLOOD IN URINE

BY

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Many chemical tests for blood in urine have been described (Caplan and Discombe, 1951), but because they are insensitive or inconvenient none is in general use. The most sensitive are modifications of the *o*-tolidine method, first described by Ruttan and Hardisty (1912): a blue colour results from the oxidation of *o*-tolidine owing to the peroxidase activity of haemoglobin. The modifications previously described include those of Zwarenstein (1949, 1952) and Baron (1951), but all require the use of glacial acetic acid and are therefore unsuitable for use at the bedside. In the test here described the reagents are compounded into a tablet, and it is only necessary to add water.

Experimental

Tablets were made, each containing citric acid, 50 mg.; barium peroxide, 35 mg.; *o*-tolidine, 12.5 mg.; and sodium carbonate, 2.5 mg. If the tablets are kept in a container with a screw cap, and the cap is replaced immediately one is removed, they have been found to retain their full sensitivity for at least twelve months.

Tablet Test.—Various quantities of urine were tried (see Table I), and the following method was selected as giving the best results. One drop of the urine to be tested (0.05 ml. from a teated pipette) is placed on an inch square (2.5 by 2.5 cm.) of filter paper (Whatman No. 1) and allowed to

TABLE I.—Various Methods of Performing the Test Compared (Time in seconds after moistening the tablet for a definite "positive" to appear)

Method Used	No. of Red Cells per c.mm.				
	500	50	25	12.5	0
1 drop urine followed by 2 drops cold water	40	110	200	240	15 min.
2 drops urine followed by 2 drops cold water	35	80	150	180	15 "
1 drop urine followed by 2 drops hot water (60° C.)	15	40	110	140	3 "
1 drop urine followed by 2 drops urine	60	140	180	200	15 "

spread. Then one reagent tablet is placed on the centre of the paper and two drops of cold tap-water are allowed to flow over the tablet. If a significant amount of haemoglobin is present a blue ring develops around the tablet within two minutes; any colour appearing in the paper after this interval and any discoloration of the tablet itself are disregarded.

Microscopy.—The tablet test was used to examine 100 specimens of urine sent to the laboratory for routine investigation, and the results were compared with those of microscopical examination. 10 ml. of urine was centrifuged at 1,500 revolutions per minute for five minutes, and after 9.5 ml. of supernatant fluid had been removed the deposit was examined as an ordinary wet film with the $\frac{1}{4}$ -in. (4-mm.) objective; twenty fields were examined and two or more red cells per field was considered abnormal.

Urine Specimens.—Blood from the same volunteer was added to freshly voided urine to produce a series of dilutions from 1:1,000 to 1:1,000,000, giving a concentration of 5,000 to 5 red blood cells per c.mm.

Results and Discussion

The results are shown in the tables, and, unless otherwise stated, all tests were performed by the described method on urine without alteration of pH or temperature.

A definite blue colour appears around the tablet within two minutes if the urine contains at least 50 red cells per c.mm. or the equivalent concentration of haemoglobin (150 μ g. per 100 ml.). If a smaller quantity is present a blue colour develops after two minutes; and if none is present the tablet and filter paper remain colourless for at least fifteen minutes.

The test is equally sensitive throughout the temperature range 4–37° C. If the urine is heated to 60° C. or boiled, the test is much less sensitive (Table II).

TABLE II.—Effect of Temperature (Time in seconds after moistening the tablet that a definite "positive" appears)

Treatment of Specimen	No. of Red Cells per c.mm.				
	500	50	25	12.5	0
Room temperature (20–25° C.)	40	110	200	240	15 min.
60 min. refrigeration at 4° C.	55	110	180	250	15 "
30 min. incubation at 37° C.	45	100	180	230	15 "
30 " " " 60° C.	100	15 min.	15 min.	15 min.	15 "
60 " " " 60° C.	15 min.	15 "	15 "	15 "	15 "
1 min. boiling	80	15 "	15 "	15 "	15 "
1 " " "	15 min.	15 "	15 "	15 "	15 "

TABLE III.—Influence of pH (Time in seconds after moistening the tablet that a definite "positive" appears)

pH	No. of Red Cells per c.mm.				
	500	100	50	25	0
10	15	90	180	300	15 min.
9	15	90	180	300	15 "
8	15	60	90	240	15 "
7	25	60	100	140	15 "
6	30	60	100	120	15 "
5	35	60	120	150	10 "
4	40	70	150	200	8 "
3	40	80	150	200	8 "

Variation of urinary pH within the range of pH 5–8 has no significant effect on the sensitivity, which is, however, slightly reduced if the urine is either very alkaline or very acid (Table III). This can be avoided, if necessary, by adjusting the pH until just acid or alkaline to litmus. In practice it is of little consequence.

If the ascorbic acid content of the urine being tested is high some false negatives may be encountered (Table IV). This is of little importance, however, for, unless ascorbic acid is being administered, the urinary concentration is rarely above 5 mg. per 100 ml. In order to achieve 10 mg. per 100 ml. it was found necessary to give 200 mg. daily for four days; and to achieve 100 mg. per 100 ml., 800 mg. daily for four days.

TABLE IV.—Effect of Ascorbic Acid (Time in seconds after moistening the tablet that a definite "positive" appears. All specimens incubated for one hour at 37° C. before testing)

Ascorbic Acid, mg. per 100 ml.	No. of Red Cells per c.mm.				
	5,000	1,000	500	50	25
0	5	20	35	110	200
5	5	20	40	120	240
10	35	80	100	300	15 min.
25	40	80	120	15 min.	15 "
50	40	100	240	15 "	15 "
100	40	120	280	15 "	15 "

False-positive results occurred if the urinary concentration of iodide was greater than 20 mg. per 100 ml., a level that is obtained if the patient is taking Lugol's iodine, 10 minims (0.6 ml.) three times daily, or such mixtures as mist. stramon. et pot. iod. N.F. $\frac{1}{2}$ oz. (14 ml.) three times daily. In such cases the urine should be boiled for one minute and immediately retested. If the colour is due to iodide it will now be deeper, whereas if due to blood a "negative" will be obtained.

Pus (unless red cells were also present), bromides, and sweat gave negative results, but any oxidizing agent will also give a false positive.

The desirable sensitivity of a chemical test for blood in urine depends upon the number of red cells that may be excreted by normal persons. It has been estimated by Larcom and Carter (1948) that up to 2 red cells per c.mm. may be present in the urine of normal adult males. Comparable figures for normal females are not available, but from the results obtained with the tablet (see below) it would appear that the figure may be ten times as great.

It has been shown that the tablet test will detect 50 red cells per c.mm. To demonstrate the rarity of significant haematuria below this level, and to show that a more sensitive test would give positive results with many normal urines, three separate series of experiments were made.

Series I.—One hundred specimens of urine sent to the laboratory for routine investigation were tested with the tablet and 42 gave positive results. Confirmation was obtained by microscopy of the centrifuged specimen. Neither false positives nor false negatives were encountered.

Series II.—Ordinary urine specimens from 100 male and 50 female patients, without known haematuria, were tested with the tablet and 13 gave positive results. In every case further investigation showed a pathological cause.

Series III.—It was found that, when 12.5 ml. of urine to which had been added 5 red cells per c.mm. was centri-

TABLE V.—To Demonstrate that Urine from Normal Females may Contain 5–50 Red Cells per c.mm. (Series III in text)

Before Concentrating				After Concentrating			
Male		Female		Male		Female	
Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.
0	50	0	50	0	50	32	18

The concentration of red cells in the urine specimens was increased tenfold by centrifuging 12.5 ml. at 3,000 revolutions per minute for ten minutes and removing 12 ml. of supernatant fluid.

fuged at 3,000 revolutions per minute for 10 minutes, and 12 ml. of supernatant fluid was pipetted off, the deposit gave a positive result with the tablet and presumably contained at least 50 red cells per c.mm. One hundred ordinary specimens, which on routine microscopy were not abnormal, were treated in this way and the deposits tested with the tablet. The results showed that urine from normal females frequently contains between 5 and 50 red cells per c.mm. (Table V).

Conclusion

The tablet has been used during the last six months as a routine test in a general medical ward and in the casualty department of a teaching hospital. In no case has haematuria been found by the pathological laboratory when the tablet had given a negative result. The tablet has been found particularly valuable as corroboratory evidence in a clinical diagnosis of cystitis or pyelitis, and as a daily test to discover when known haematuria ceases. It has also been found useful as an additional safeguard to prevent overdosage with anticoagulant drugs.

Summary

A tablet to detect the presence of blood in urine is described. The test is sensitive to a minimum concentration of 50 red cells per c.mm. or of 150 μ g. of haemoglobin per 100 ml. of urine. It is reliable and simple to perform.

The influence of pH and temperature is described, and has been found to be small.

It is considered that the tablet is useful as a screening test and to decide when known haematuria ceases.

I wish to thank Professor C. H. Gray and Dr. Arthur Jordan for their advice and encouragement, and Mr. J. E. Cocking, chief pharmacist at Sheffield Royal Hospital, for help in preparing the tablets. While this work was in progress it was discovered that Messrs. Ames Co. Inc. had prepared a similar tablet. This tablet has been examined and found identical in all its properties, except that a negative remains colourless for only five minutes. It is hoped that their product will be available soon. My thanks are due to Messrs. Ames Co. (London) Ltd. for their co-operation and for supplies of both their own and my tablet.

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Medical Memoranda

Myxoma of the Auricle

Upwards of one hundred cases of myxoma of the auricle have been reported in the literature; the present case is described not so much on account of its unusual features as to stress once again the importance of keeping in mind the possibility of a cardiac neoplasm. A diagnosis prior to necropsy is still virtually impossible, but the time must surely come when this condition will be revealed at thoracotomy in a case mistakenly diagnosed as mitral stenosis.

CASE REPORT

A well-nourished man of 35 was first seen in February, 1953, complaining of dyspnoea on exertion for the past month. He had had a brief attack a year before. He was troubled by nausea and fairly frequent vomiting, loss of weight, and a sensation of great weakness. There was no history of rheumatic fever. He had a slight malar flush and slight cyanosis; the pulse was small and regular; there was no thrill, and the apex beat was 3 $\frac{1}{2}$ in. (9 cm.) from the

midline in the fifth space. A faint blowing systolic murmur was heard at the apex, and the faintest diastolic rumbling murmur was heard just inside the apex only when the patient was lying on the left side. There was no evidence of congestive failure. Radiologically the transverse diameter of the heart was increased and its left border straightened. Screening with a barium swallow showed moderate simple enlargement of the left auricle. Neurofibromatosis was also present in the form of small nodules on arms and back, with café-au-lait patches. A diagnosis of mitral stenosis was made: the prognosis was considered to be favourable.

He was seen again a month later, by which time the vomiting had stopped and the diastolic murmur had become inaudible. He seemed well enough to carry on with his job as a fitter. On April 30 he was still at work. The systolic murmur had become much louder.

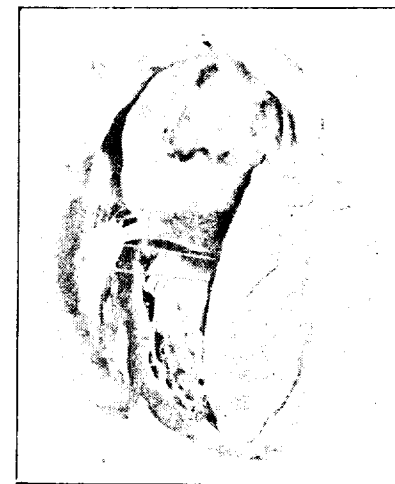
On July 23 he was admitted to hospital in cardiac failure with gross oedema of the ankles, raised neck veins, hepatomegaly, and an apex beat 4 $\frac{1}{2}$ in. (11.4 cm.) from the midline. The low-pitched diastolic murmur had reappeared and triple rhythm was apparent. He had had a "chill" in May and on getting up from bed after five weeks had first noticed that his ankles were swollen. He was treated with digitalis and mercurial diuretics but failed to respond, and after he had been ten days in hospital we began to doubt the accuracy of the diagnosis, casting about in our minds for an explanation of such acute cardiac failure without any new features in the heart sounds, apart from the triple rhythm, and without evidence of pericarditis or a recurrence of acute rheumatic carditis.

An x-ray film of July 29 showed gross generalized cardiac enlargement, small pleural effusions, and the appearance of an infarct in the right lower lobe. Little did we realize the true state of affairs. Steady deterioration, in spite of treatment, ended in death on August 16, the pulse remaining regular, and the anasarca increasing day by day.

NECROPSY REPORT

External Examination.—The body was that of a young man showing gross oedema from the waist downwards. There were scattered café-au-lait spots and occasional neurofibromatous nodules in the skin. Some cyanosis was present.

Internal Examination.—C.V.S.: There was excess clear yellow fluid in the pericardial sac. The heart was enormously enlarged, mainly from hypertrophy of the left auricle, right auricle, and right ventricle. The myocardium was somewhat flabby but free from obvious lesions. The valves were normal except for some incompetence due to the dilatation. The whole of the left auricle was occupied by a shiny, sessile tumour measuring 7.5 by 6 by 4 cm. attached to the interauricular septum above the rim of the annulus ovale (see photograph). So tightly was the wall of the auricle stretched over the tumour that it was impossible to approximate the cut edges after the tumour had been exposed. The main vessels were normal, but the aorta appeared hypoplastic. **Respiratory System:** The larynx, trachea, and main bronchi contained blood-stained mucus. Both lungs showed numerous large infarctions and were grossly oedematous. About one pint (570 ml.) of clear yellow fluid was present in each pleural cavity. There was some fibrinous deposit over



Photograph showing the tumour.

the larger infarctions. *Abdomen*: The liver showed chronic nutmeg change with early cardiac cirrhosis. The spleen was about one and a half times normal size. The remaining abdominal organs were normal. *Lymphatic System*: The glands of the neck and chest were grossly oedematous and much enlarged, but the cut surface appeared normal. The brain was not examined. Cause of death: (a) congestive cardiac failure, and (b) myxoma of left auricle.

COMMENT

Viewing this case retrospectively, it is unlikely, even if the true diagnosis had occurred to us as a possibility, that we would have been disposed to retreat from the diagnosis of mitral stenosis, since the clinical pattern could be fairly well correlated with its aetiological type and the signs of failure were not disproportionate to the physical findings. Like most cases of cardiac myxoma, however, this one presented with severe cardiac failure, relentlessly and rapidly progressing and failing to respond to any treatment. A large proportion of the cases in the literature presented with systolic and diastolic apical murmurs. Several of the features frequently found in myxoma of the heart were absent: namely, preference for lying flat for the relief of the dyspnoea; embolic phenomena from fragments of the tumour; sudden onset with fainting attacks; and sudden death.

The E.C.G. did not show enlarged P waves and right ventricular strain as reported in some cases.

The deceptive resemblance of this case to one of mitral stenosis, when considered feature by feature, was quite remarkable.

Our thanks are due to Mr. J. Corbett, of the Worcester Royal Infirmary, for the photograph. We are indebted to Dr. F. Kurrein for the necropsy notes.

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Sudden Operative Death Due to Tumour Embolism

Sudden and unexpected death on the operating table is, fortunately, a rare occurrence. The following unusual case is reported.

CASE REPORT

A man of 63 gave a history of repeated vomiting for nine months, during which time he had lost about 2 st. (12.7 kg.) in weight. There were no urinary symptoms.

On examination he was thin and had obviously lost weight. He was 5 ft. 4 in. (163 cm.) tall and weighed about 8 st. 12 lb. (56.2 kg.). There were two upper abdominal scars from previous operations. His first operation was probably for closure of a perforation and the second was a gastro-enterostomy performed in 1931. The right kidney was enlarged. The left kidney, liver, and spleen were not palpable. Clinical examination of the respiratory and cardiovascular systems showed no abnormality except mild hypertension (B.P. 160/90). The Hb was 83% (Sahli). The W.R. was negative. Pyelography revealed a gross filling defect of the right renal pelvis and calices, suggestive of a renal tumour. Chest x-ray examination showed no evidence of metastatic disease. As a result of these findings a right nephrectomy was undertaken.

The patient was given morphine, $\frac{1}{2}$ gr. (11 mg.), and atropine, 1/100 gr. (0.65 mg.), subcutaneously an hour before operation. Anaesthesia was induced with thiopentone, 400 mg., and D-tubocurarine chloride, 15 mg. After inflation of the lungs with oxygen, a cuffed endotracheal tube was passed under direct vision. Anaesthesia was maintained with cyclopropane and oxygen, respiration being assisted for about 10 minutes but controlled thereafter.

With the patient in the lateral position, an incision was made parallel to the right 12th rib, extending round into the right iliac fossa. The muscles were divided and the perinephric fat was exposed. A very large irregular hypernephroma presented; it was exceedingly difficult to mobilize.

On its surface were numerous large distended veins suggesting obstruction of the renal vein.

The patient's condition was quite satisfactory and his blood pressure was well maintained until about half an hour after the start of the operation, when his pulse ceased suddenly. Confirmation of the absence of the heart beat was obtained by palpation of the aorta. At this point the tumour had been mobilized and all but delivered through the incision. Methedrine (30 mg.) was injected intravenously, the veins being still prominent, and cardiac massage attempted, but without effect. Death was apparently immediate. There was no bronchospasm, since inflation of the lungs was uniformly easy at all times.

The main finding at necropsy was a large tumour embolus in the right pulmonary artery, completely occluding this vessel. There were no metastatic deposits in the lungs. The para-aortic glands, from the coeliac axis to the bifurcation of the aorta, were invaded by tumour, and metastases were present in the bodies of the 12th thoracic and first three lumbar vertebrae. The right kidney had been removed at operation. No tumour was discovered in the remaining small proximal portion of renal vein and there was no evidence of tumour in the inferior vena cava. Apart from the above findings and the presence of a long-standing gastro-enterostomy and one or two old adhesions between the duodenum and coils of jejunum, there were no other pathological findings.

The specimen removed at operation consisted of a kidney and tumour weighing 945 g. It measured 6 by 6 by 3 in. (15 by 15 by 7.5 cm.). Only the upper pole of the kidney with two pyramids remained intact. The rest of the kidney was invaded, and stretched over a mass of tumour which had compressed and distorted the renal calices and pelvis, but had not appeared to invade them. Externally the tumour had caused coarse lobulation of the kidney; much of it was necrotic and haemorrhagic, and the best-preserved portion consisted of lobules of soft greyish-white tumour tissue. The growth was confined laterally by a peripheral zone of renal substance and renal capsule; medially it had extended towards the midline and projected $2\frac{1}{2}$ in. (6.3 cm.) beyond the normal pelvi-ureteric junction. No invasion of renal veins could be seen on naked-eye examination of the specimen.

Microscopically the tumour was a renal carcinoma which, in the better-preserved areas, was composed of large cuboidal cells arranged both in a coarse papilliferous manner and in solid sheets of cells. The nuclei were vesicular, and many of them contained a single prominent nucleolus; mitotic figures, although present, were few in number. Necrosis and haemorrhage were widespread throughout the tumour. Although no tumour was seen in the renal vein on naked-eye examination, it was obvious microscopically that several larger veins at the hilum of the kidney had become involved.

The embolus in the pulmonary artery was composed of tumour cells similar in appearance to those of the primary growth in the kidney.

The cause of death in this case was a massive pulmonary embolus of tumour tissue which presumably had been dislodged from the renal vein during operation.

Comment.—We have been able to find only two published reports (Pettersson, 1941; Mimpriss and Birt, 1949) of death due to tumour embolism at operation, which is surprising in view of the frequency with which hypernephroma spreads into the renal vein and even into the inferior vena cava.

We wish to thank Mr. W. A. D. Adamson for permission to publish this case, and Professor A. M. Drennan and Dr. John Gillies for helpful advice.

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Reviews

PAEDIATRICS FOR PRACTITIONERS

Paediatrics for the Practitioner. Under the general editorship of Wilfrid Gaisford, M.D., M.Sc., F.R.C.P., and Reginald Lightwood, M.D., F.R.C.P., D.P.H. Volumes I, II, and III + Index. (Volume I—pp. 563 + xv + 34 pp. index; Volume II—pp. 533 + ix + 32 pp. index; Volume III—pp. 632 + xi + 38 pp. index; Index—pp. 119 + v. Illustrated. £13 10s. the set.) London: Butterworth and Co. Ltd. 1953, 1954, and 1955.

The last of the three volumes of this work has now appeared along with an index volume, and a set is completed that will be of value to practitioners in many lands. The articles are written by experts in the different subjects, and naturally the descriptions of diseases and their diagnosis and treatment are authoritative.

The books are said to be planned and written for the family doctor, but they constitute a small reference library to the present practice of paediatrics in its medical, dermatological, psychiatric, and other branches. Surgical conditions and the diseases of the eye, nose, ear, and throat are dealt with—and rightly so in a comprehensive work on the health and diseases of children. Tropical conditions and illnesses are well described. Throughout the work pathology, by intention, is dealt with very briefly, and only the more important references are given.

About sixty contributors from Britain and other parts of the Commonwealth have written the various chapters, but the volumes have been well edited and the multiple authorship is not very noticeable, although some of the articles are better written than others. Rubrics and the good index make the volumes easy of rapid consultation, and the plentiful photographs and radiographs will prove very helpful to practitioners.

The three volumes and the index are printed on good art paper and are well bound. The price is high, however, and one wonders if it could have been reduced by getting the articles and the index into, say, two volumes. The repetition of the appointments held by the contributors and the needless list of contents at the heads of the chapters, however small, might have been dispensed with and space thereby saved.

Family doctors will consult these good books with profit to their patients and pleasure to themselves, and the initial cost appears less when it is remembered that the work is to be kept up to date by regular supplements.

JOHN CRAIG.

RADIOBIOLOGICAL RESEARCH

Biological Effects of External X and Gamma Radiation. Part I. Edited by Raymond E. Zirkle. (Pp. 530 + xxvi; illustrated. 58s.) London, New York, Toronto: McGraw-Hill Book Company Inc. 1954.

This book is an account of some of the radiobiological research carried out in the United States at the Metallurgical Laboratory of the University of Chicago and the National Cancer Institute, Bethesda, during the war between September 1, 1942, and June 30, 1945. The various chapters are based on reports issued, with one exception, between June, 1946, and April, 1947; many of the reports have been included in the well-known MDDC series. In a number of the chapters more recent experimental evidence has been added. As the editor points out, the work was subject to the usual disadvantages of wartime research and development, especially haste and security regulations, but "on the other hand it proceeded under very advantageous financial support." It was inevitable that most of the writing was done rather hurriedly, because immediately after the war many of the authors were returning to their civilian positions.

The first six chapters deal with effects of long-continued total body gamma irradiation of mice, guinea-pigs, and

rabbits, and are a valuable summary of the experiments carried out by the late Egon Lorenz and his colleagues. Of particular interest is Chapter 4, on the effects of chronic irradiation on the breeding behaviour of mice. Chapters 7 to 13 deal with studies of total body irradiation of rabbits and are a useful summary of the work of Leon O. Jacobson and his colleagues. It is unfortunate that Chapter 13, entitled "Heparinemia (?) An Anticoagulant in the Blood of Dogs with Haemorrhagic Tendency after Total-body Exposure to Roentgen Rays," appears only in abstract form. Although it has been published in full elsewhere (*J. exp. Med.*, 1948, 87, 71), it is an interesting piece of work and it would have been useful to include it in this volume. Of the biochemical work reported in Chapters 14 to 20 the studies of the effects of x rays on the activity of enzymes and on tissue metabolism, by E. S. Guzman Barron, are now recognized as classical contributions. Interesting information not otherwise easily available is given in Chapter 21 on the effectiveness of drugs in preventing or alleviating x-ray damage.

It would be easy to criticize this book as hastily written and inadequately edited. However, such criticism would be unfair, because it would not have been possible to produce this volume without these inevitable and essentially minor defects. Although most of the work described is no longer new and has already been incorporated into current knowledge, it is useful to have these reports collected together in a single volume.

The book as a whole is a valuable contribution to radiobiology, and is a tribute to the wisdom of Professor Arthur H. Compton and Dr. Robert S. Stone in the planning and carrying out of a major wartime project of radiobiological research.

J. S. MITCHELL.

CLINICAL DIAGNOSIS

Clinical Diagnosis. By Elmer G. Wakefield, B.S.A., B.Sc., M.D., F.A.C.P. (Pp. 1,611 + ix; illustrated. \$22.50.) New York: Appleton-Century-Crofts Inc. 1955.

Professor Wakefield here presents an imposing and beautifully produced volume which really combines instruction in clinical methods with a description of diseases such as is normally encountered in a textbook of medicine. The arrangement of the contents is unusual and must be studied in order to obtain full value. Thus regional diagnosis with emphasis on history, examination, and descriptive terms is followed by chapters on systemic diseases. The third part is headed "The Body as a Whole," and here we must search for infectious diseases, allergy, and other constitutional maladies. The author through his work shows originality of thought and presentation and can rest assured of success.

A. H. DOUTHWAITE.

THE PULMONARY CIRCULATION

The Auxiliary Heart. By William Walter Wasson, M.D. (Pp. 184 + xix; illustrated. 75s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1954.

The "auxiliary heart" referred to in the title of this book is the pulmonary circulation. This monograph studies the events which take place in the thorax—breathing and so forth—to help the flow of blood from the right side of the heart to the left. Without these the author believes that the circulation through the lungs could hardly be maintained. The anatomy of the lungs is discussed and then the physiology. There are a number of good diagrams and pictures of models; also some sections oddly called microphotographs. Much importance is attached to measurements of the thickness of the wall of the right ventricle, but no explanation is given of the method of measurement—important when one remembers what the wall of the ventricle is really like. Here and in the chapter on physiodynamics there are plenty of facts, but they come ill arranged and lack clear and orderly presentation. There is nothing about the important matter of the control of the pulmonary

arterioles. The chapter on the evaluation of the x-ray film rather loses its value, for the films shown in illustration have little worth. The chapter on the diaphragmatic syndrome leaves one in the dark as to its nature. The name of Hitzenger is looked for in vain. The historical sketch omits the name of Osler in connexion with Servetus. It is satisfactory to note that someone in 1943 realized that Harvey discovered the pulmonary circulation; but this chapter is perhaps the best in the book.

TERENCE EAST.

EXTRACELLULAR FLUID

Chemical Anatomy, Physiology and Pathology of Extracellular Fluid: A Lecture Syllabus. By James L. Gamble. Sixth edition. (Pp. 164; 68 charts. 18s.) Cambridge, Massachusetts: Harvard University Press. London: Oxford University Press. 1954.

J. L. Gamble must be reckoned as one of the founding fathers of electrolyte studies, and the appearance of a new edition of his monograph on extracellular fluid represents the republication of a classic. His diagrams have been much used and widely copied, and their very excellence has now made "Gamblegrams" familiar. The present edition contains 68 charts, of which three are new. Chart 3 shows the "osmolar equality of body fluids"—a matter not beyond controversy. Chart 55 documents very clearly the reciprocal relationship between sodium and potassium balance. Chart 67 expresses the results of Carl Schmidt (1850) and von Bunge (1873) in modern terms. There has been some minor revision of the text, and in Chart 2 sodium has been admitted into intracellular fluid. Otherwise there is little alteration since the 1942 edition, and to some extent this reflects the stability of the foundations which were then laid.

In some ways revision could profitably have been more radical; in other words, it is now almost impossible to describe extracellular fluid in comparative isolation from cellular metabolism and renal tubule-cell function. Darrow's work on potassium depletion and extracellular fluid composition is not dealt with, nor are the studies of Pitts and others on the effects of fixed acid and alkali, and of carbon-dioxide tension, on the composition of the urine and so of extracellular fluid. These seem to me important omissions in judging a current monograph, but I would not wish to obscure the solid merits of a work which has served decades of students, and which many who have not been able to obtain previous editions will wish to possess.

D. A. K. BLACK.

CONSULTING-ROOM GYNAECOLOGY

Office Gynecology. By J. P. Greenhill, B.S., M.D., F.A.C.S. Sixth edition. (Pp. 517; illustrated. 60s.) Chicago: Year Book Publishers Inc. London: Interscience Publishers Ltd. 1954.

The prospective reader of this book should realize that it is not a textbook of gynaecology. It is an American volume written as a guide to those doctors (not necessarily gynaecological specialists) who have to deal with gynaecological problems in their practices. As its name implies, it gives an account of all those procedures of diagnosis and treatment which can be carried out in the consulting-room or "office." Naturally it reflects Transatlantic opinion, and in regard to the subject-matter more than in any other respect the differences between American and British practice can be judged, for it deals with some procedures—for example, culdoscopy—which gynaecologists in this country would scarcely consider suitable for the consulting-room.

The author's eminence in his specialty and his reputation in the literary field are well known. It is not surprising, therefore, that this book is now in its sixth edition. For this it has been thoroughly revised and enlarged, while the production remains of a high standard, and the illustrations are adequate. It contains much up-to-date and essentially practical information on the majority of gynaecological topics, while it deals with some matters—for

example, contraception, psychosomatic gynaecology, and premarital examination—which are not adequately dealt with in most gynaecological textbooks.

This is a "different" book which could be read with benefit by many practising gynaecologists. In particular it should prove useful to registrars, house officers, and others who may be embarking on the practice of gynaecology and require guidance on practical problems.

MOSTYN P. EMBREY.

WILLIAM AND CHARLES MAYO

The Doctors Mayo. By Helen Clapesattle. Second edition, condensed. (Pp. 426+xiii; illustrated. 38s.) Minneapolis: University of Minnesota Press. London: Oxford University Press. 1955.

William Worrall Mayo was an impetuous youth who left Salford to try his fortune in America. He had received some medical training in England and obtained a diploma in America. After many vicissitudes he settled in general practice in Rochester, Minnesota, where he began to do some surgery. He married Louise Abigail Wright, a wise and clever woman whose balanced judgment and common sense offset her husband's impatient and quixotic temperament. Their two sons, William and Charles, were brought up in a surgical atmosphere, and after qualification joined their father in practice. Surgery was just about to take a big leap forward, and the two sons were clever, modest, enterprising, eager to learn, courageous, and hard-working. Both were excellent technical surgeons, and their good results were freely discussed in the local papers. They travelled anywhere to learn new techniques, their reputations deservedly and rapidly increased, and their surgical clinic was run on business lines.

This might have sufficed for most men, but William Mayo was an administrative genius, a man with far-seeing vision who could "lay out broad policies," and gradually the busy clinic was organized on a gigantic scale. It was a business concern with large profits; but the mind of William Mayo was benevolent, and he and his brother were inspired by the teaching of their father that "any man who has physical strength, intellectual capacity, or unusual opportunity, holds such endowments in trust to do with them for others in proportion to his gifts." Thus arose the Mayo Foundation and the vast scheme for postgraduate medical education in connexion with the local university.

The story told in this interesting book is remarkable, but the opportunity could never happen again. We are sorry to see that the erroneous statement is made on page 75 that Henry Wellcome married the daughter of Mr. Burroughs. On page 247 we think "Peterson" should read "Paterson." Line 29 on page 236, which reads "professor of the common duct," is obviously wrongly set up.

We would like to recommend to all who are about to make a speech the advice given by William Mayo—advice which should be written in letters of gold on the walls of every hall in which meetings are held: "Begin with an arresting sentence; close with a strong summary; in between speak simply, clearly, always to the point; and, above all, be brief." William Mayo followed his own advice. He was a wise man.

ZACHARY COPE.

The Medical Directory for 1955 (J. and A. Churchill Ltd., London, 72s.), which is now available, follows the form adopted last year of listing the 83,192 names in alphabetical order without any topographical distinction. The first volume gives details about medical periodicals, medical trades, the General Medical Council, and so on. The second volume contains the "local lists," and the usual information about health departments, colleges, medical schools, postgraduate institutions, the hospitals of the various regions, and a "late list" of newly qualified practitioners and changes of address notified too late for inclusion in the main alphabetical list. Messrs. J. and A. Churchill are to be congratulated on the continuing high standard of accuracy of this work.

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THE PRESIDENTIAL ADDRESS

Dr. T. C. Routley's official career as General Secretary of the Canadian Medical Association having just ended, his colleagues in Canada have shown their appreciation of his notable services by nominating him President not only of the Medical Association of the great Dominion but also of the B.M.A.—the latter nomination receiving the unanimous endorsement of the Representative Body when it formally elected him at the Cardiff meeting in 1953. During the first four days of this week Dr. Routley has been presiding, at Toronto, over the Joint Annual Meeting of the British Medical Association, the Canadian Medical Association, and the Ontario Medical Association in Toronto, and the presidential address which he gave last Monday evening appears in our opening pages. This is the fourth time that the British Medical Association has met in Canada, and Dr. Routley, by examining the records of the three previous meetings—in 1897, 1906, and 1930—clearly shows how the rapid assimilation of new knowledge revolutionizes medical practice, yet at the same time complicates rather than simplifies the task of the doctor. In spite of great successes in the preventive and therapeutic fields, the weight of medical responsibility is probably heavier than it has ever been—the recent difficulties with the mass vaccination of children against poliomyelitis might be cited as a case in point—and it is therefore all the more important that the medical profession as a whole should be able to speak with one voice. In seeking to bring this about Dr. Routley has been a great and beneficent force in welding Canadian doctors into a harmonious unity and in promoting those things that matter in the life of an organization of professional men and women. But, more than that, he has been an ambassador at large for his own country wherever doctors have gathered together in professional conferences. For years he has been a familiar figure at the annual meetings of the American Medical Association, and he has many times been with us at our meetings in Britain.

Dr. Routley has never let his vision be distracted by over-preoccupation with the daily tasks of administration. He has wisely seen these as means,

not as ends. And the principal end has been co-operation among doctors the world over to promote health and to alleviate suffering; and also to foster relationships between medical men of differing nations—in other words to spread the idea of Commonwealth among the medical men and women of the world. So it was not unexpected to find him an active force in the formation of two important international medical organizations—the World Health Organization and the World Medical Association, both of them having their origins in bodies established in the years between the two world wars, and both of them, in effect, having a renaissance in the year after the end of the war, in 1946. Dr. Routley outlines the objects of these two organizations in the latter part of his address, and draws timely attention to the fact that co-operation with W.H.O. is an active aim of the W.M.A. The World Health Organization is an intergovernmental specialized agency of United Nations. It receives its funds from its member states; it has a large central administration in Geneva; its concern is principally with the promotion of public health measures. The World Medical Association is an international organization of national medical associations. Its funds come partly from the subscriptions of its member organizations and principally from benefactors and medical men and groups in the U.S.A. It has a small, hard-worked secretariat in New York; its concern is largely with the problems of medical care for the individual sick person, involving as this necessarily does the education of the doctor and his code of ethics. As Dr. Routley points out, these two international medical organizations are complementary to each other, not duplicating mechanisms. Their evolution owes much to the President of the B.M.A. for the coming year, and the W.M.A. in particular is a witness to his foresight and his faith in internationalism in medicine. The world of medicine is much indebted to him.

ELECTROLYTE BALANCE IN CARDIAC FAILURE

The disturbances of electrolyte balance in congestive cardiac failure are complex,¹ but retention of sodium by the kidneys is an early important feature. A proportional amount of water is also retained in an attempt to preserve the normal osmotic pressure of the extracellular fluid. This leads to expansion of the extracellular compartment, and a fall in the concentration of sodium. The passage of the excess sodium ions into the cells replaces potassium ions, which pass out of the cells and are

rapidly excreted. The passage of sodium ions out of the extracellular space in excess of chloride ions produces a relative acidosis. There is therefore sodium retention, potassium deficit, slight acidosis, and oedema, but the serum sodium is low because of dilution. In these circumstances the administration of mercurial diuretics and a diet low in salt is usually dramatically effective. The diuretics act on the renal tubules to produce diuresis primarily of chloride but secondarily of sodium and water.

But overenthusiastic use of mercurial diuretics, especially in conjunction with a diet very low in sodium, may result in disaster. H. A. Schroeder² described a syndrome consisting in falling urinary output, rising blood urea, low concentrations of serum sodium and chloride, restlessness, drowsiness, hypotension, and circulatory collapse due to excessive depletion of body sodium ("low-salt syndrome"). While this occurs occasionally, a much commoner electrolyte disorder following mercurial therapy is hypochloraemic alkalosis, caused by depletion of chloride in excess of sodium. This leads to alkalosis, often associated with hypopotaemia, and to resistance to mercurial diuretics. Attempts to force a diuresis by administering more diuretics are ineffectual and may even be dangerous, as D. Newman³ has recently pointed out. As well as cardiac failure persisting, the symptoms and signs of potassium deficiency may appear—weakness, hypotonia, and (especially if the patient is on digitalis) frequent ventricular ectopic contractions. Sudden death from a cardiac arrhythmia may then follow.

Some knowledge of the broad outlines of the biochemical deviations apt to accompany congestive failure is essential for the efficient management of patients with this condition. In general, it is wise not to administer mercurial diuretics more frequently than twice a week. A falling urinary output in patients so treated indicates the need to seek the cause of the failure to respond to mercurials rather than to increase the frequency of their administration. Usually some degree of hypochloraemic alkalosis will be the cause, and this can be corrected by administering acidifying agents, especially ammonium chloride, either regularly or before each injection of diuretic. Since hypopotaemia is apt to appear in congestive failure, and since mercurials cause a potassium diuresis, there is much to be said for administering potassium salts by mouth to patients receiving these drugs regularly: 2–3 g. a day can safely be given orally, provided renal function is not seriously im-

paired. Should these measures fail, oedema may be reduced by substituting cation exchange resins for mercurial diuretics. These resins inhibit the absorption of sodium from the gut, and also cause an acidosis. Indeed, diuretics and resins might be effectively alternated over periods of a few weeks.⁴ This regime would avoid the dangers both of prolonged resin and of prolonged mercurial diuretic therapy.

The grossly oedematous patient who fails initially to respond to mercurials often presents a formidable therapeutic problem. The electrolyte pattern of the body fluids is usually very abnormal: the blood urea is high, and the sodium and chloride concentrations of the extracellular space are considerably reduced, the chloride usually more than the sodium. Such a patient may be improved by the well-established practice of draining the oedema fluid through multiple punctures in the back of the feet while being nursed in the sitting position; diuretics must be discontinued. However, large amounts of electrolytes may be lost in the fluid drained in this way, and sodium, chloride, and potassium supplements to the diet may be necessary. When the oedema has largely resolved, and the electrolyte pattern and blood urea have returned towards normal again, diuretics may be cautiously begun.

Patients with long-standing congestive heart failure, or acute severe failure, terminally develop irreversible electrolyte disruption: they become severely oedematous, the serum sodium and chloride are markedly reduced (owing to dilution), the blood urea is raised, and all measures fail to avert a fatal outcome. It is often difficult to judge exactly when this state has been reached, but, when repeated readjustments of the therapeutic regime and attempts to correct the electrolyte imbalance produce either an increase in oedema or further depression of the extracellular electrolyte concentration, the heart is usually irreversibly damaged and the prognosis hopeless.

Newman³ points out that the so-called low-salt syndrome is probably the result of a combination of genuine salt deficiency and salt dilution. Salt deficiency can be due to loss of salt from sweating, diarrhoea, removal of ascitic or oedema fluid by paracentesis, or treatment with mercurial diuretics, combined with a low salt intake. Administration of excess of water without salt causes further dilution, and aggravates the condition. The syndrome differs from hypochloraemic alkalosis in that the deficiency is principally of sodium rather than of chloride, and there is therefore an acidosis rather than an alkalosis. Not infrequently the two conditions may be combined, and hypochloraemic alkalosis may lead to the low-salt syndrome. The treatment of the true salt-

deficiency syndrome consists in the intravenous administration of small amounts of hypertonic saline, but this may precipitate pulmonary oedema in a patient suffering from hypochloraemic alkalosis and salt dilution. Hypertonic saline is therefore rarely indicated, because true salt deficiency without dilution is a rare condition.

Much can be done to avert the biochemical complications of congestive cardiac failure and the hazards of excessive treatment by keeping them constantly in mind. When possible, facilities for biochemical analysis should be available if patients fail to respond to mercurial diuretics. Administration of these should be stopped until the biochemical abnormalities can be accurately assessed.

IN TORONTO

The paralysis along the quays of Liverpool and Southampton prevented only a few from reaching Toronto for the Joint Annual Meeting of the B.M.A., the Canadian Medical Association, and the Ontario Medical Association. Determined to get to their chosen destination, doctors and their wives gallantly journeyed back by road to their homes and thence to other ports or to airfields. Somehow or other they all got safely to Toronto, where the warmth of Canadian hospitality and the Ontario climate made them speedily forget their ordeal of travel.

A meeting of the British Commonwealth Medical Conference from June 14 to 16 preceded the main meeting, and the delegates from eleven Commonwealth countries met under the chairmanship of Dr. T. C. Routley to discuss such subjects as medical education, rehabilitation, public relations, and the medical care of native populations. It is hoped to publish subsequently an account of this conference, the value of which was much enhanced by a day's visit to the three divisions of the Connaught Medical Research Laboratories under the guidance of the director, Dr. R. D. Defries. The Commonwealth group were entertained throughout last week by the Academy of Medicine of Toronto, the Ontario Medical Association, the executive committee of the Canadian Medical Association, and the Connaught Laboratories. They were also entertained by the Lieutenant Governor of Ontario and Mrs. L. O. Breithaupt in the Parliamentary buildings of Toronto, and by Dr. J. A. MacFarlane, Dean of the Faculty of Medicine, in Hart House, a building in most beautiful surroundings which provides for students the same kind of facilities as do the Unions of Oxford and Cambridge. The foretaste the few had of Canadian hospitality and friendliness had prepared them for the magnificent arrangements that were to unfold themselves.

In the Royal York Hotel on June 20 the long queue of those waiting to register never seemed to diminish in spite of the most efficient system for this necessary operation. Even so, groups of 200 and more were attending the round-table conferences at 9 a.m., and

there must have been between 1,500 and 2,000 persons attending the first plenary session on "The Present Status of Chemotherapy of Bacterial Infections," a report of which appears at page 1525 this week. The morning's sessions over, a large company assembled at a luncheon held in honour of Sir Henry Dale, O.M., who was awarded the Medal of Honour of the Canadian Pharmaceutical Manufacturers' Association. Dr. G. F. Strong, President of the Canadian Medical Association, was in the chair, and he was accompanied at the high table by leading representatives of the pharmaceutical industry, of the Medical Exhibitors' Association of Canada, and what Sir Henry Dale subsequently described as a "posse of presidents." Mr. C. H. Wilkins, of Toronto, after giving a comprehensive survey of Sir Henry's career, presented him with a solid gold medal embossed with the figure of the Winged Goddess of Samothrace. After more sessions in the afternoon Monday came to a close with the induction of Dr. T. C. Routley as President of the British Medical Association for 1955–6. His induction as President of the Canadian Medical Association followed on Wednesday. The Presidential Address appears in our opening pages this week.

PRE-WAR DIET IN BRITAIN

Shortly before the outbreak of the second world war Sir John (now Lord) Boyd Orr planned an extensive dietary survey which was intended to provide further evidence on relationship between poverty and malnutrition. This survey was handsomely financed by the Carnegie Trust, and was carried out by a team under Mr. David M. Lubbock: its computers were stationed at the Rowett Research Institute, Aberdeen. Particulars of the amounts of various foodstuffs purchased, and of the money spent on food, were collected from over 1,300 households, comprising nearly 8,000 persons, in 16 areas in England and Scotland. The list of places included small country villages and large towns, with rural or industrial activities. On the outbreak of hostilities the survey was stopped and the team dispersed for war duties. After a lapse of seventeen years, however, Dr. D. Harvey, of the Commonwealth Bureau of Animal Nutrition, has shown commendable perseverance in compiling a comprehensive, if belated, report.¹

In a preface Lord Woolton commends the work of the survey, and previous observations by Orr, as having guided him in the food policy which assisted so much in preserving the health of the nation during the war. The report is indeed valuable for its detailed evidence of the amounts of food which were being eaten in 1938, before our consumption of the various foodstuffs (and their distribution between different social classes) was altered by the impact of the war and by official policy. In that year, as now, a low expenditure on food implied a low intake of "protective foods" such as meat, fruit, and green vegetables, but not of "energy foods" such as bread and potatoes. On modern standards, however, the evidence for widespread deficiencies of vitamins A

¹ Elkinton, J. R., and Squires, R. D., *Circulation* (N.Y.), 1951, 4, 679.

² Schroeder, H. A., *J. Amer. med. Ass.*, 1949, 141, 117.

³ Newman, D., *N.Y. St. J. of Med.*, 1954, 54, 3401.

⁴ *British Medical Journal*, 1953, 2, 611.

¹ *Family Diet and Health in Pre-War Britain*. Report by the Rowett Research Institute to the Carnegie United Kingdom Trust, 1955, Aberdeen.

and C is not very convincing. For vitamin C the estimate of the daily requirement was admittedly taken very high, and it was only just attained in the wealthiest class. For vitamin A the contributions made by the various foodstuffs were calculated from a table in an unfamiliar Danish textbook. No attempt seems to have been made to separate the highly potent carrots from the rest of "root vegetables, other than potatoes," which are all negligible as sources of vitamin A. Liver is not distinguished from other forms of meat. Few will dispute that in the days before the fortification of margarine the vitamin A intake of the poorer classes at least required anxious consideration. But the evidence included in this report does little towards converting this suspicion into solid historical fact.

MODIFICATIONS OF CORTISONE

Carefully controlled clinical trials¹⁻³ designed to study the value of cortisone in the treatment of rheumatoid arthritis have failed to show that it has any advantage over aspirin when two strictly comparable groups of patients are compared, the one receiving cortisone and the other aspirin in large doses. Despite some reports to the contrary, describing observations on uncontrolled groups of patients, there is now general acceptance of the view that, at least for something over 90% of patients with rheumatoid arthritis, there is no indication for instituting long-term cortisone treatment, and it clearly offers little in the way of direct help to the mass of sufferers. No decisive data are yet available on whether the same applies to prolonged adrenal stimulation by means of corticotrophin, and in view of the disappointing findings with cortisone this merits further trial: an encouraging report from Dr. J. W. Beattie and Professor S. J. Hartfall appears elsewhere in this issue (p. 1494). In the meantime the recognition that apparently minor changes in the structure of the steroid molecule may profoundly modify the clinical and biochemical effects of these substances has stimulated the chemists' imagination and led to the trial of numbers of such variants. The first successful one was hydrocortisone (Kendall's Compound F), which became available in 1951. Boland⁴⁻⁵ estimated that hydrocortisone (free alcohol) was 50% more potent milligram for milligram than cortisone acetate or cortisone (free alcohol), although hydrocortisone acetate was less effective than either, and he suggested that hydrocortisone was less likely to cause side-effects such as sodium retention. However, the advantages of hydrocortisone over cortisone have been almost entirely utilized for intra-

articular injections.⁶⁻⁸ The injection of hydrocortisone into soft-tissue lesions is also meeting with some success, and in this issue of the *Journal* we publish a paper by Drs. E. J. Crisp and P. Hume Kendall on its use in peri-arthritis of the shoulder (p. 1500) and another by Dr. B. G. B. Christie describing the treatment of twenty cases of de Quervain's disease with the local injection of hydrocortisone acetate (p. 1501).

The halogenated derivatives of hydrocortisone have also come in for some attention since animal studies suggested that these have a higher glycogenic activity: 9-alpha-fluoro-hydrocortisone had apparently ten times the activity of cortisone in this respect.⁹ Boland and Headley¹⁰ have reported that doses of 3 to 8 mg. per day—less than one-tenth of the equivalent effective dose of cortisone—had a considerable anti-rheumatic effect in patients. Unfortunately the salt- and water-retaining effect was enhanced also,¹¹ and to apparently a greater extent than its anti-rheumatic action, thus making the substance useless for practical therapy. This steroid was also effective when given by intra-articular injection,¹¹ but again so potent was its sodium-retaining property that this militated against its practical use. Another variant, hydrocortisone t-butyl-acetate, was, however, found by Hollander and his colleagues¹² to be more effective. Although of no immediate practical consequence, studies such as these did point the way to the possibility of improved clinical results. Against this background recent preliminary reports by Bunim and his colleagues,^{13,14} Dordick and Gluck,¹⁵ Gray and Merrick,¹⁶ and others,¹⁷ all from the U.S.A., are of interest. The variant tested apparently differs from cortisone only in the addition of one double bond and is known as metacortandrecin ("metacorten") or prednisone. It is reported to have, dose for dose, five times the initial beneficial effect of cortisone in rheumatoid arthritis and other rheumatic conditions, while electrolyte studies showed its salt-retaining properties to be slight and its effect on diabetes to be comparable to that of cortisone. However, in three of eighteen patients treated¹⁴ a duodenal ulcer developed, and in a fourth case a frank depressive psychosis was precipitated in an unstable subject. These are only preliminary studies, and it remains to be seen whether prednisone can overcome the fundamental difficulties in the way of controlling a disease such as rheumatoid arthritis by means of steroid administration, or whether the difference is largely quantitative rather than qualitative.

STERILIZATION OF ANAESTHETIC APPARATUS

On more than one occasion^{1,2} during the last few years doubts have been expressed about the efficacy of methods of sterilizing anaesthetic apparatus as they are carried out in daily practice, and a recent report³ by W. L. J. McDonald, H. J. Welch, and J. E. Keet does little to dispel them. The authors describe carefully controlled experiments designed to assess the value of

certain chemical methods of sterilizing endotracheal tubes and face masks. They smeared tubes and masks with sputum containing pathogenic organisms which had been isolated from the respiratory tract, and then, after cleaning and sterilizing the tubes and masks by standard techniques such as are commonly used in hospitals, took cultures from them. In most experiments the organisms were found to have survived. Of the methods used, the only one consistently to produce sterility of the endotracheal tubes was scrubbing the inside and outside of the tubes for one minute each with "PHisoHex solution," a preparation containing hexachlorophene. Unlike antiseptics containing phenol, PHisoHex when used in this way for over six months in clinical practice did not give rise to any mucosal or skin irritation.⁴

It is perhaps a pity that these authors did not include in their survey the practice common in Britain of boiling endotracheal tubes or of immersing them, after washing in running water, in a solution of biniodide of mercury. They dismissed autoclaving as described by M. S. Prenzlau and M. Karp⁵ as unsuitable because of its deleterious effect on rubber. So far as boiling is concerned, the life of rubber tubes sterilized in this way is appreciably shortened, even when non-greasy lubricants only are used. However, when tubes have been used on, for example, tuberculous patients, it is essential to make certain of sterility even at the expense of shortening the life of the endotracheal tube or face mask; any risk of cross-infection with tubercle bacilli must be eliminated.

That sterilization of anaesthetic equipment is desirable hardly needs statement. Items like endotracheal tubes come into intimate contact with perhaps highly infected parts of the patient. The need does not seem to be so much for effective methods of sterilization, since many by heat or chemicals are known, as for their proper use. For endotracheal tubes and similar rubber parts the ideal solution to the problem would be disposable units, like the "polymask" oxygen mask, and the infusion sets used in the United States. These would impose no extra strain on a busy operating-theatre staff. Until then the same care should be given to sterilizing anaesthetic equipment as is given to surgical instruments.

POST-MORTEM HOMOGRAFTS

The risk to life associated with extensive burns of the body is twofold. First is the phase of immediate shock: secondly, perhaps fifteen to twenty days later, comes the phase in which the loss of integrity of the skin cover is reflected in general systemic disturbances of great severity, which are aggravated by the ever-imminent risk of bacterial invasion. For the past fifteen years or so attention has been focused chiefly on the problems created by shock. More is now known both of the changes which occur and of the means of combating them, though the basic cause still remains unknown. However, increased knowledge does save the lives of an increasing number of patients, though it cannot be assumed that life is saved until the skin is completely healed again, for not until then is the patient safe.

In many cases either the area of the burn is so great that it leaves insufficient normal skin from which autografts may be taken, or the patient's general state will not permit of the simultaneous preparation of the recipient area and of the cutting of the necessary skin grafts. Nowadays the latter state is perhaps less important, but the former remains as a challenge to surgical skill and ingenuity. To solve the problem it is customary to tide the patient over the danger period by the application of homografts. These can be applied by themselves or in conjunction with autografts derived from such skin as the patient can provide for himself. The use of the homografts is merely a measure whereby time can be borrowed, for the "grafts" themselves will disappear within twelve to fifteen days: but the protection they afford during that period can notably improve the general state of the patient. There is the added advantage that the patient's own donor areas are again available for use at about the time when the homografts have disappeared.

The donors of homografts are often other patients already undergoing grafting. The skin can be stored for some weeks in an ordinary domestic refrigerator and will retain its viability if it is kept moist, sterile, and unfrozen. Other methods such as freeze-drying are under investigation, but it is too early to say whether the disadvantage of the graft's apparently slightly shorter "life" is outweighed by the advantage of its capacity for almost indefinite storage.

J. B. Brown and M. P. Fryer¹ suggest the use of skin derived from post-mortem sources, and affirm that if this skin is taken within a few hours of death it behaves in the same manner as a homograft from a living patient. The usual precautions must be taken to guard against the transmission of diseases, and clearly the consent of relatives must be obtained. Such a procedure could have national advantages. It is not difficult to envisage a state of affairs in which living but burned members of armed forces or even of a civilian population might have need of a greater amount of skin to save their lives than was available either from themselves or from such of their fellow survivors as could be spared to act as donors. The possibility of obtaining skin therefore from the recently dead deserves consideration, though administrative difficulties might be considerable. These could be overcome only by much preliminary public instruction and by much investigation and documentation to ensure the avoidance of any possible cross-contamination. Whether such an elaborate organization could be justified must depend upon the results of much more work by surgeons entrusted with the problems of treating burns, but if their findings are favourable there appears to be no reason why the process of cannibalization should not be taken further than it is to-day. We already borrow one man's blood to save the life of another: we borrow his skin, his bone, and his cornea to restore function to another. Until now it has been mainly the cornea which has been taken after death, but if the present work is substantiated a person who dies may, as Brown and Fryer point out, save the life of another person even after his own death.

¹ Brown, J. B., and Fryer, M. P., *J. Amer. med. Ass.*, 1954, 156, 1163.

¹ Medical Research Council and Nuffield Foundation, *British Medical Journal*, 1954, 1, 1223.

² *ibid.*, 1954, 1, 233.

³ *Ann. rheum. Dis.*, 1954, 13, 351.

⁴ *British Medical Journal*, 1952, 1, 559.

⁵ *Ann. rheum. Dis.*, 1953, 12, 125.

⁶ Hollander, J. L., et al., *J. Amer. med. Ass.*, 1951, 147, 1629.

⁷ *Ann. intern. Med.*, 1953, 39, 735.

⁸ Stevenson, C. R., et al., *Ann. rheum. Dis.*, 1952, 11, 112.

⁹ Borman, A., et al., *Proc. Soc. exp. Biol. (N.Y.)*, 1954, 88, 570.

¹⁰ *Ann. rheum. Dis.*, 1954, 13, 291.

¹¹ Liddle, G. W., et al., *Science*, 1954, 120, 496.

¹² *Ann. rheum. Dis.*, 1954, 13, 297.

¹³ *J. Amer. med. Ass.*, 1955, 157, 311.

¹⁴ Bollet, A. J., et al., *ibid.*, 1955, 158, 459.

¹⁵ Dordick, J. R., and Gluck, E. J., *ibid.*, 1955, 158, 166.

¹⁶ Gray, J. W., and Merrick, E. Z., *J. Amer. Ger. Soc.*, 1955, 3, 337.

¹⁷ Margolis, H. M., et al., *J. Amer. med. Ass.*, 1955, 158, 454.

¹ Bromage, P. R., *British Medical Journal*, 1952, 2, 1042.

² Clausen, R. J., *ibid.*, 1952, 2, 1206.

³ McDonald, W. L. J., et al., *Anesthesiology*, 1955, 16, 206.

⁴ Herwick, R. P., and Treweek, D. N., *J. Amer. med. Ass.*, 1933, 100, 407.

⁵ Prenzlau, M. S., and Karp, M., *Anesthesiology*, 1954, 15, 566.

EMERGENCIES IN GENERAL PRACTICE

UTERINE INERTIA

BY

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In recent years there has been a tendency to recognize in disordered uterine action an increasing number of separate and distinct clinical entities. It is perhaps not unnatural that this should be so when it is remembered that writers have described a complete atonia of the whole uterus, body and cervix, or, alternatively, a state of spasm which may affect the upper and lower poles at the same time. Again, an inefficient upper segment may be associated with increased tone in the middle and lower zones and with an associated resistance to dilatation of the cervix. And there are further variations of the types just mentioned.

It is not surprising, therefore, that attempts to arrange these disorders in their respective and appropriate groups have become more comprehensive, and for that very reason perhaps more confusing. The following classification is suggested:

1. *Inertia: Hypotonic (Uterus and Cervix).*
2. *Incoordinate Action (Uterus):* (a) hypertonic inertia, (b) normotonic inertia, (c) asymmetrical contraction, (d) constriction-ring dystocia.

3. *Incoordinate Action (Cervix):* cervical achalasia.

Such a division may represent an over-simplification of a highly complex and controversial subject, but there has been a tendency to over-elaborate and to give to minor clinical manifestations undue regard and emphasis, even to the extent of labelling them as quite separate conditions; those less obvious disorders are merely a stage of a more generally accepted form of disordered action. That is why "colicky" uterus and "spurious" labour have been omitted from the classification, for it is thought they are phases of, or at any rate incapable of being separated completely from, hypertonic inertia. Under the term "cervical achalasia" is included primary rigidity of the cervix, in the belief that it may be possible in the majority of cases to differentiate clinically one from the other. Secondary cervical rigidity has been deliberately omitted from the list because it is felt that here the problem is a mechanical difficulty rather than a neuromuscular upset.

Normal Uterine Action in Labour

Several writers using the tokodynamometer, with the receptors placed over the fundus, middle uterine segment, and lower uterine pole, have recorded the relative strength of the uterus at different levels. The resulting charts show a gradient of contractibility from above downwards—sometimes referred to as fundal dominance, gradient of activity, or uterine polarity. There has been much argument in recent years about the role of the cervix in labour. Nixon, Karlson, and Sauter believe that the cervix is able to contract, and the last two maintain that the cervix dilates in labour through contraction of its own muscular tissue; the more synchronous these contractions are with those of the uterine body, the quicker does the cervix dilate. This new conception is hard to accept. It is preferred rather to hold to the old view that the part played by the cervix in normal labour is entirely passive, and recent research gives strong support to this hypothesis. If such were not so, uterine polarity would have little or no place in labour.

Definition and Types of Uterine Inertia

In this article it is not proposed to discuss "secondary" uterine inertia, which may result from mechanical obstruction, and should be referred to as "uterine exhaustion," but rather to concentrate on the so-called "primary" inertia. This latter condition is difficult to define but might be described as a prolonged labour, in the absence of cephalo-pelvic disproportion, where the delay is the result of weak and infrequent or, on the other hand, disordered uterine contractions. It is urged, therefore, that when a lack of advance and slow cervical dilatation are evident at the end of 12-18 hours the patient should at once be labelled "inertia" and thereafter investigated and treated as such.

Three forms of inertia exist: hypotonic inertia, normotonic inertia, and hypertonic inertia. The first and last are the more important and more frequent varieties. Hypotonic inertia is characterized by a loss of tone in both upper and lower segments. It is therefore a true inertia with feeble activity of the uterus as a whole. In the hypertonic form, the commonest inertia, there is an increased tone and resistance to dilatation of the lower uterine pole associated with weak action of the upper segment. This is referred to as reversed polarity, and, although the condition comes within the ambit of inertia, it is more suitably classified as an example of incoordinate uterine action.

Aetiology

The aetiology is uncertain and must include many factors. There is a general consensus of opinion that primigravidae are more often affected than multiparae and that freedom from difficulty in subsequent labours indicates the temporary nature of those conditions as they may affect the uterus or its innervation. Because it is realized that in most cases the frequency and intensity of uterine contractions are influenced profoundly by the pressure of the presenting part on the lower segment, malposition, malpresentation, and deformed or contracted pelvis are said to predispose. It is probable that a lack of normal stimulus to the cervix and pelvic plexus may in such cases affect the upper segment by the nervous route. Indeed, a high presenting part may indicate incomplete lower-segment formation and may be a timely warning of impaired uterine action. Some maintain that the condition is encountered more often in the elderly primigravida, and that advanced age therefore plays a part, or where rupture of the membranes has occurred before or in the early stages of labour. The short and obese patient who shows masculine characteristics is more liable to fall victim to inertia. Extensive damage to the uterine wall, as in accidental haemorrhage, may prevent efficient contraction of the uterine muscle, but fibroids and underdevelopment are not in themselves adequate cause. Hydramnios and multiple pregnancy are said to be quite often associated with inertia, but I believe that this is not so, because the premature and short labours which characterize both conditions do not suggest any loss of tone. The third-stage bleeding which may follow a twin delivery is due not to inertia but rather to the mechanical difficulty in separating and in expelling the larger placenta.

The extent to which hormone activity may provoke or influence these disorders has inevitably excited speculation. Oestrogenic principles circulating during pregnancy are in an inactive state, and this suggests the existence of some mechanism which is protective in so far as the hormone is prevented from sensitizing the uterus prematurely. If such

be true, it may be that some cases of inertia are due to a persistence of this mechanism and any oestrogenic hormone given will be inactivated and rendered useless. Csapo and others have, however, provided a new approach to this subject. They have shown that the contractions of voluntary muscle depend very largely on the presence in the muscle of a fibrous protein complex called actomyosin and of a high-energy substance adenosine triphosphate (A.T.P.). This actomyosin-A.T.P. complex is present in the myometrium just as in striated muscle. It is thought that the main function of certain electrolytes and enzymes is the breakdown of these phosphates. In this way energy is released and restored to the contracted actomyosin, which is able to relax in a charged state ready for another contraction.

Compared with the non-pregnant uterus, the uterus just before labour has a relatively high actomyosin concentration and in labour this is much higher in the upper segment than in the lower. This is as it should be if the theory of uterine polarity be correct; indeed, it may go a long way towards explaining the difference in function of the two uterine poles. It has been shown further that oestrogens are responsible for the development of the biochemical contractile system of the uterus—actomyosin, high-energy phosphates, and the rest—and in pregnant rabbits the hypothetical curve of active oestrogen bears great similarity to that representing actomyosin concentration and A.T.P. activity. Progesterone, too, plays a part in that it modifies the energy-giving part of the contractile system by redistribution of the potassium ion through an alteration in permeability of the cell membrane.

It is believed, however, that fear is one of the most important causes of inertia. The patient has been terrified by the unknown ordeal which lies ahead, and by keeping this fear to herself she may have lived for months in a state of suppressed anxiety. It is probably true that there is nothing more difficult to assess than the mental attitude of the woman to her forthcoming labour, and it is often the woman who is casual and outwardly unperturbed by what lies before her, determined not to give way to her fears or to confess to them, who becomes the victim of inertia.

No one can describe with absolute certainty the nerve supply of the uterus and its function. It is accepted that the uterus, under appropriate conditions, can contract as an isolated organ. It is therefore difficult to understand the functions of its nervous connexions. Few now believe in the presence of an intrinsic nervous plexus, which was formerly thought to co-ordinate the actions of different parts of the uterus. There is, however, a rich supply of sympathetic (adrenergic) nerves which travel via the superior hypogastric plexus (presacral) nerve and the inferior hypogastric plexus. The motor fibres of those nerves appear to be largely inhibitory, in so far that contractions elicited by their stimulation mainly affect the lower segment. It is also said, although some doubt it, that the uterus receives a parasympathetic (cholinergic) supply from the second, third, and fourth sacral nerve roots, and that this also reaches the uterus via the inferior hypogastric plexus and the paracervical ganglia. Stimulation of these nerves is said to cause a contraction of the detrusor muscle of the upper segment.

According to this concept, the parasympathetic brings about evacuation of the uterus, whereas the sympathetic tends to prevent it, good uterine action depending on a balance between the two. It may be that sympathetic stimuli cause an increase in uterine tone while parasympathetic stimulation has the opposite effect. If uterine tone is reduced, then uterine contractions would increase in amplitude and efficiency. If, on the other hand, there is no parasympathetic supply to the uterus, efficiency must depend on a balance between the inherent muscle activity under the control of hormonal factors and the sympathetic nervous system. If the substance of this be true, there is the possibility that fear, acting on the sympathetic, maybe through adrenal stimulation, brings about a "tightening-

up" process in the region of the lower segment and circular fibres of the internal os area. Adrenaline B.P. consists of adrenaline and noradrenaline, and it has been shown that a solution of adrenaline will, in very low dosage, inhibit uterine action while noradrenaline stimulates it. It is possible that the pattern of uterine activity can be considerably distorted by some upset of balance between the two, and it is suggestive that the adrenaline level in the blood is raised in women showing a severe degree of uterine inertia.

This whole question is a very difficult one. For instance, the patient who is afraid and has a troublesome first labour should have a greater fear and even more difficulty in a subsequent confinement. This rarely happens and shows that fear is not the only factor involved. Again the division of the uterine wall into longitudinal and circular fibres is obviously incomplete when no account is taken of the oblique middle layer, the thickest of all. Likewise the variable response which the uterus gives to stimulation of the sympathetic under different conditions invalidates any general conclusion concerning the function of that part of the autonomic nervous system.

There is one further point. Three years ago Dr. T. L. Adamson and I carried out a clinical investigation into certain problems relating to uterine inertia. This showed, what some writers have denied, that the incidence of primary dysmenorrhoea was higher in the inertia group (28.3%) compared with the control group (16.6%).

Clinical Picture

The clinical picture naturally varies with the type of inertia, but it is true to say that a fairly accurate diagnosis can be made by the bedside of the patient without resorting to the tokodynamometer or other "backroom" method of assessment. The patient with hypotonic inertia has little or no pain, but when pain does occur it is felt mostly in the abdomen and only slightly in the back—in other words, the pain distribution of normal labour. It may be difficult to say definitely that labour has started, and certainty may come only with a very slow cervical dilatation, a "show" or rupture of the membranes. The patient's general condition remains good, there is no distress or tiredness, no elevation of the pulse or temperature, and not enough discomfort to cause the patient worry or any appreciable loss of morale, at any rate in the earlier stages. After 24 hours the bladder and colon may become distended, the result of an associated atonia.

With hypertonic inertia the picture is very different. Here part of the uterine wall is in spasm, and as a result the intrauterine pressure is raised. In normal labour this pressure between first-stage contractions is 5-6 mm. Hg, but where the uterine contractions are colicky the resting pressure may be raised to 15-18 mm. Hg or more. In other words, the interval pressure approaches the level of pain production. Constant pain is therefore one of the main features, this pain being present and becoming aggravated before a contraction is evident and remaining after the contraction has passed off. The contractions are intermittent and infrequent. Backache, which may have been present for several days before labour began, and which persists during labour, denotes a resistance to dilatation of the lower pole and gives the patient more distress than the abdominal discomfort. Cervical dilatation is slow. The desire to "bear down" in the first stage, a feature which is often quite disconcerting, is thought to be due to spasm of the pelvic colon or rectum. Little advance is made, and in time the patient becomes conscious of this. Her morale deteriorates, she begins to worry, she becomes more tense, and the vicious circle is complete. Eventually she becomes exhausted and the pulse and temperature rise.

Maternal and Foetal Risks

Badly chosen and ill-timed operative obstetric procedures—"heroic obstetrics" of which more will be said later—are responsible for severe trauma to the mother's soft tissues. Shock and haemorrhage may follow and have even greater significance in the woman already tired from

prolonged labour and depressed by a lengthy anaesthetic. Too much delay in deciding on the correct method of treatment and too many examinations and manipulations predispose to infection. The increased incidence of post-partum haemorrhage, retained placenta, and manual removal of the placenta must ever be borne in mind.

In prolonged labour there is also the chance of infection of the amniotic sac, with intranatal or neonatal death. Injury or death to the foetus may result from birth trauma or from uterine spasm: as already stated, when the uterine contractions are colicky, the resting intrauterine pressure is raised and is in fact often higher than the blood pressure in the placental sinuses. Such asphyxia may occur even with intact membranes.

Remote Prognosis and Prophylaxis

According to Holmes, about one-third of the women who have experienced uterine inertia deliberately avoid a further pregnancy. It is generally accepted that inertia does not often recur in subsequent labours, and that uterine efficiency improves with each pregnancy. This improvement would seem to depend largely on the degree of cervical dilatation reached in the previous labour. If half dilatation has been attained the probability is that efficient uterine action will be the rule.

Prophylactic treatment includes advice regarding mental and physical relaxation; exercises are not of much avail. Great attention should be paid to inquiring into and discussing any points about which the patient may be anxious. She should be reassured as far as is possible. It is important, too, although difficult to carry out always in hospital practice, that the patient should, during the antenatal period, get to know and trust the doctor who is to manage her confinement.

Treatment

It is of first importance that the patient with inertia should be dealt with in hospital. She should be transferred there if after 12-18 hours of labour she has made little or no advance. It is realized that a patient may have a "stuttering" type of labour for 12 hours or so and then suddenly true labour becomes established and she is soon delivered. Despite that a time limit is required and it is better to err on the safe side. There is no place for the treatment of inertia in the home if hospitalization is possible.

As soon as hospital is reached three things are done: (1) The physical and the mental conditions of the patient are assessed; (2) any mechanical factor such as malposition, disproportion, etc., is confirmed or excluded; and (3) the type of inertia is determined on clinical grounds; the tokodynamometer, if one is available, should take second place to clinical judgment.

It is of primary importance that each case should be considered on its own merits; it is therefore impossible to lay down a hard-and-fast scheme, but whichever type of inertia is present the general rules of any prolonged labour should be observed. Fluids and carbohydrates should be given freely, the bladder and rectum be emptied regularly, the pulse and temperature watched carefully, and every effort made to support morale. The patient should not be left unattended for too long.

Hypotonic Inertia

The following plan of management is recommended:

- (1) Allow the patient up during the day.
- (2) Sedatives at night may range from a mild barbiturate, such as butobarbitone "soneryl," 3 gr. (0.2 g.), to morphine, $\frac{1}{4}$ gr. (16 mg.).
- (3) Test the urine for acetone after 12 hours and four-hourly thereafter. If the test results are positive, 1,000 to 1,500 ml. of 5-10% glucose should be given intravenously.
- (4) Castor oil, 2 oz. (60 ml.), an enema, and a hot bath may be of advantage on the second day.
- (5) If labour has been allowed to drag on so long, prophylactic sulphonamide, 1 g. thrice a day, and penicillin,

250,000 units twice a day, may be indicated on the third day, or before that if the membranes rupture early.

(6) When labour advances to a certain stage—half dilatation of the cervix—malposition may be corrected or the membranes may be ruptured with good effect.

(7) There is a small place only for "heroic obstetrics"—for example, cervical incisions or manual dilatation of the cervix with subsequent forceps extraction, when the head is very low in the pelvis.

Two further points require special mention:

(8) If the uterus is hypotonic a pitocin drip infusion may be started at any time (30 drops a minute of a solution made up of 10 units of pitocin per litre of 5% glucose). This is a much safer method of administering pitocin than by injection, where there is not the same control; the infusion can be stopped at any moment and so the risk of maternal and foetal injury is minimized.

(9) The place of caesarean section is an important one. If the patient is an elderly primigravida, if the membranes have been ruptured for 24 hours or more, if the patient has been in labour for 36 hours, or if there is evidence of maternal or foetal distress, or if more conservative treatment has failed, section must be given very serious consideration.

Hypertonic Inertia

The same general rules as above obtain here, with the following additions:

- (1) The patient is best kept at rest.
- (2) Intense medication with morphine, pethidine, or other analgesics is essential. Pethidine, given in a dose of 100 mg. at three to four-hourly intervals up to a maximum of 400 mg. or intravenously (Jeffcoate has given as much as 800 mg. in 24 hours), is best throughout the day, and morphine at night.
- (3) Even more stress should be laid on detection and correction of acetonaemia.
- (4) Labour should not be allowed to proceed so long as to necessitate the administration of sulphonamides or antibiotics.
- (5) Here the uterus is already in spasm and the tone high, so a pitocin drip infusion is contraindicated.

Two final points should be stressed:

(6) In the last three years and in specially selected cases, dihydroergotamine has been used. This has a sympathocolytic effect and brings about a striking relaxation of the cervix. It reduces uterine tone without paralysing the uterine musculature and without interfering with normal contractions and rhythm. (The "strong and incessant contraction" described by Moir has not been noted. It is true, however, that as the basal tone is lowered the amplitude of the contractions is increased.) As already stated, fear produces an overactivity of the sympathetic, with a resulting inhibiting effect on the mechanism of labour, and the use of dihydroergotamine depends on this assumption. The drug has no effect on the inactive uterus, and therefore has no place in hypotonic inertia. It is advised that dihydroergotamine be given when the cervix is 5 to 6 cm. dilated. The dose recommended is 0.25 mg. administered by intramuscular injection. The action of the drug is often seen in about half an hour, but two hours may pass before the maximum effect is appreciated. A similar dose may be repeated with safety in four hours, as the action of the drug wears off within that period of time. Some writers condemn the use of dihydroergotamine.

(7) Caesarean section must again be considered for the indications already described. In hypertonic inertia, however, the morale and general condition of the patient deteriorate more rapidly and section may be demanded therefore at an earlier stage of labour.

Next article on Emergencies in General Practice.—
"Acute Retention of Urine," by Mr. Alec W. Badenoch.

British Medical Association, Canadian Medical Association, and Ontario Medical Association

JOINT ANNUAL MEETING, TORONTO, 1955

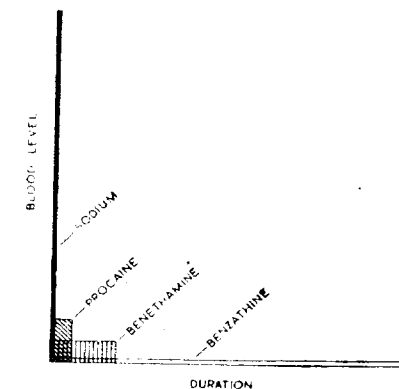
SUMMARY OF PROCEEDINGS

FIRST PLENARY SESSION—"THE PRESENT STATUS OF CHEMOTHERAPY OF BACTERIAL INFECTIONS"

The first of two plenary sessions was held in the Royal York Hotel on Monday morning, June 20, and was opened by Sir JOHN MCNEE, the outgoing President of the B.M.A., who introduced Professor L. P. GARROD (London) as the chairman and opening speaker.

Chemotherapy of Bacterial Infections

After giving a chronological diary of the "new chemotherapy," with the overlap between the sulphonamides and the antibiotics, Professor GARROD pointed out that the new



Preparations of Penicillin: Blood levels vary inversely with duration of effect

and older sulphonamides had similar antibacterial activities, whereas the various antibiotics were much more selective, except that members of the tetracycline family ("aureomycin," "terramycin," "achromycin") acted very similarly. Amidst the present profusion of chemotherapeutic drugs it was difficult for the clinician to decide which was the best to use. Even penicillin was prescribable in 46 different forms, and the doctor might give injections of penicillin preparations whose effect lasted for periods varying from a few hours to several weeks (see Figure). Professor Garrod was inclined to support Eagle in his preference for longer-acting preparations.

Indications for Different Antibiotics

The indications for the use of antibiotics in different diseases could be divided into the "immutable" and the "unpredictable." In the former category penicillin was a "safe bet" for scarlet fever, lobar pneumonia, gonorrhoea, and syphilis, and for certain infections derived from animals such as anthrax and actinomycosis; streptomycin was effective in plague and tularaemia, besides tuberculosis; chloramphenicol in typhoid fever; and the tetracyclines or chloramphenicol in typhus and other rickettsial infections. In the unpredictable group were the infections where the organism might or might not be sensitive to the drug of choice, as was the case with staphylococcal infections in a hospital environment; or the physician might have to deal with clinical syndromes caused by a variety of micro-organisms, such as bronchopneumonia, meningitis, urinary tract infections, and wound sepsis. Under these circumstances the wise course was to use at once the most likely drug, after having arranged for a suitable specimen to be bacteriologically examined and tested for antibiotic sensitivity with the disk technique. A result would be available within 24 hours or earlier if an urgent report were needed. The advantages of this procedure were improved therapeutic results and economy in the use of expensive drugs.

Drawbacks and Dangers

It was well to stress the drawbacks and dangers in the indiscriminate use of chemotherapy. The main misuses were in (1) the administration of these drugs to undiagnosed cases or to insusceptible infections, particularly those due to viruses, (2) their prescription for trivial conditions such as colds and catarrhs, and (3) their too frequent use prophylactically. Besides being wasteful misuse of these chemotherapeutic drugs could lead to drug-resistance in the parasite and sensitization in the host. There was also the risk of toxic effects with certain preparations, such as eighth-nerve involvement from prolonged use of streptomycin, aplastic anaemia as a rare complication of prolonged or repeated use of chloramphenicol, or staphylococcal enterocolitis following destruction of the normal flora of the gut by the tetracyclines.

Prophylactic Use

Professor Garrod felt that in surgery chemoprophylaxis might be limited to major chest, abdominal, and cranial operations, extensive injuries, and complicated labours. Penicillin or a similar drug was indicated during dental extractions or tonsillectomy in patients with rheumatic heart disease, and for long-term use in the prophylaxis of rheumatic fever relapses. Antibiotics should not be used in everyday surgery, normal labour, clean wounds, or mouth operations, although in Britain at present the hospital doctor was tempted to a wide prophylactic use of these drugs as a protection against litigation should any untoward incident happen.

Resistant Strains of Bacteria

Dr. T. E. ROY (Toronto) discussed the increasing incidence of antibiotic-resistant strains of bacteria. Many species once susceptible to certain antibiotics now appeared to be largely insensitive to these same drugs. The degree of change varied in different localities, depending on the frequency of use of each antibiotic. The change was seen particularly in staphylococci, which were becoming increasingly resistant to many of the commonly used drugs. In the Hospital for Sick Children, Toronto, among the pathogenic staphylococci isolated during 1954 nearly two-thirds were resistant to penicillin, and about one-third to streptomycin and the tetracyclines, whereas the incidence of strains resistant to chloramphenicol and erythromycin was still very low, partly perhaps because of their relatively infrequent use. Similar trends were apparent in *Bact. coli*, which showed an increasing resistance to streptomycin and the tetracyclines, while *Proteus* and *Ps. pyocyanea* were only occasionally sensitive. However, the situation was not too discouraging. Many important species were remaining uniformly susceptible to most of the drugs to which they were formerly sensitive. These included the β -haemolytic streptococcus, the pneumococcus, the meningococcus, the gonococcus, type B *Haemophilus influenzae*, the spirochaete of syphilis, and others.

The change was particularly evident within hospitals and was considerably less marked in the community at large. For example, in their experience at the Children's Hospital in 1954 about two-thirds of the staphylococci from in-patients and about one-third of the strains from out-patients were penicillin-resistant. The corresponding figures for the tetracyclines were 34% and 8%. There were indications that, as the practice of antibiotic use became stabilized, so did the incidence of resistant strains within and without hospitals.

The mechanisms underlying these changes depended partly on the degree of use of the drugs. Treatment with antibiotics selected resistant mutant cells and allowed them to survive treatment. It also failed to suppress any naturally resistant strains which might be present. The dissemination of these strains followed by way of healthy or convalescent carriers or by other processes of cross-infection.

Fully effective solutions of the problem were still not known. The avoidance of indiscriminate, inadequate, or prolonged courses of treatment, and the use of suitable drugs in combination, might help. The use in rotation of selected antibiotics for prolonged periods of time seemed impracticable and of doubtful value. Better techniques for the control of cross-infection and for dealing with healthy and convalescent carriers were needed.

Choice of Antibiotic

Dr. K. J. R. WIGHTMAN (Toronto) dealt with the various factors that the physician must consider in deciding on the drug of choice in a particular case. So far as the patient was concerned, the severity, character, and accessibility of the infective process, the local and general capacity of the host's tissue to deal with infection, and his previous reactions to antibiotic therapy all required careful evaluation. In severe infections a drug which could safely be given in large doses and could quickly reach effective concentration in the tissues should be used. If the lesion had a poor blood supply, or was accompanied by early necrosis, venous thrombosis, abscess formation, or fluid exudate, a highly diffusible and preferably bactericidal drug was needed, perhaps combined with local chemotherapy. Again, in a malnourished or cachectic patient, in an infant or elderly man, or in the blood dyscrasias, the body defences were poorly equipped to help in overcoming infection, and in some specific fevers an adequate antibody response seemed essential for recovery without relapse.

Apart from factors due to the host, preference should be given to the bactericidal drugs—e.g., penicillin and streptomycin. So far as drug sensitization was concerned, the chance of severe and even fatal reactions to penicillin and streptomycin was sufficiently common to cause alarm, and this complication could best be guarded against by careful questioning of the patient beforehand.

Although in many patients the clinical features of the case might indicate the drug of choice, Dr. Wightman stressed the need for close co-operation with the laboratory for rational and effective chemotherapy. In deciding on a particular drug, besides the sensitivity of the infecting organism, such factors as absorption and diffusibility, mode of action (bactericidal or bacteriostatic), the risk of toxic effects or of superinfection, the ease and flexibility of administration, and even the cost to the patient in cash and discomfort, all had to be considered.

Classification of Antibiotics

He divided the antibiotics into three broad groups according to their antibacterial spectrum. In the first group, particularly active against the Gram-positive bacteria, was penicillin in its various forms. Crystalline penicillin should be used in large doses for relatively inaccessible lesions like those of subacute bacterial endocarditis, procaine penicillin and the various penicillin esters for more prolonged effects. Erythromycin was an alternative drug for penicillin, useful particularly in penicillin-resistant staphylococcal infections, although the staphylococcus could also become erythromycin-resistant following prolonged use. Bacitracin, because of its nephrotoxic effect, should be used only in severe infections. It had a synergistic action with penicillin and was a useful drug for topical use because of the low risk of sensitization.

The second group active against Gram-negative organisms included streptomycin and dihydrostreptomycin, of limited applicability because of the early development of drug resistance and the risk of eighth-nerve involvement from

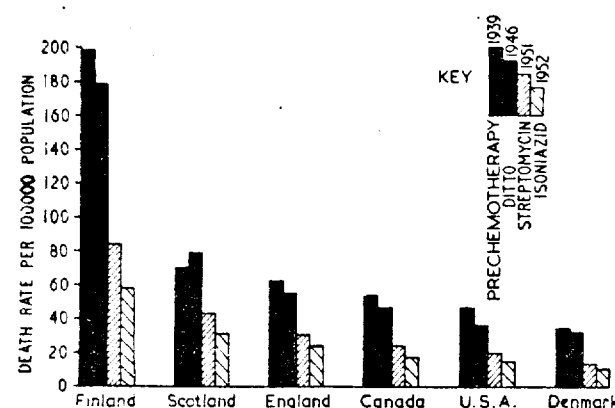
prolonged use; neomycin, a nephrotoxic drug to be used systemically only in very severe infections but like bacitracin useful for topical application; and polymyxin, also a toxic drug and active particularly against the pseudomonas family.

In the third group were the broad-spectrum antibiotics, bacteriostatic in action, apt to produce gastro-intestinal upset, and potentially dangerous because of the risks of superinfection in the alimentary tract with such organisms as the staphylococcus, coliform bacilli, and yeasts. This complication was much less likely to happen with chloramphenicol, and, as the risk of blood dyscrasias with this drug had perhaps been exaggerated, he recommended its use in any condition where the indications were clear.

Dr. Wightman also discussed the indications for combined chemotherapy, of which the two most important were to prevent the emergence of drug-resistant variants and to obtain a synergistic action as in the combined use of penicillin and streptomycin in resistant cases of bacterial endocarditis.

Chemotherapy of Tuberculosis

Professor J. W. CROFTON (Edinburgh) reviewed the present procedures in the chemotherapy of tuberculosis. After showing in graphic form the remarkable fall in mortality rates from pulmonary tuberculosis in different countries since 1947, when streptomycin was first used, up to the end of 1952, a year after the introduction of isoniazid (see Figure), Dr. Crofton summarized some of the results



The Figure shows the slight change in mortality for tuberculosis in the eight years 1939-46, the marked drop in the five years following the introduction of streptomycin, and the further drop in the year following the introduction of isoniazid. The mortality figures are from the paper by F. Blanco. (*Bull. Un. int. Tuberc.*, 1954, 24, 289.)

obtained from the large-scale Medical Research Council trials in Britain and from his personal experience.

With "good chemotherapy" the following claims might be made: (1) Tubercle bacilli could be eliminated from the sputum within six months with the emergence of practically no drug-resistance, and the sputum could be kept negative even in the presence of persistent cavities; (2) most patients could get back to work within 12 to 18 months, although chemotherapy might have to be continued in a modified form in a proportion of these cases. Under these conditions the relapse rate should be very low. "Good chemotherapy" included such combinations as streptomycin 1 g. once daily plus isoniazid 100 mg. twice daily, or streptomycin 1 g. daily plus P.A.S. 5 g. four times daily, for patients under 30 years of age. On this regime older patients were more likely to suffer from giddiness, and for them and indeed for patients of any age an alternative course of treatment would be streptomycin 1 g. twice weekly plus isoniazid 100 mg. twice daily plus P.A.S. 5 g. twice or four times daily. The combination of P.A.S. and isoniazid was recommended for the less severe cases or for the follow-up period. "Risky treatment" Professor Crofton characterized as streptomycin twice weekly with either isoniazid or P.A.S. in full doses daily, since with such treatment resistance to one

or both drugs would develop in a proportion of cases. "Bad treatment" was the use of any of these drugs by itself.

"Salvage treatment" was to be used in patients with tubercle bacilli resistant to one or more of the three main drugs. In such cases the drug to which the organism was still sensitive could be used along with viomycin or oxytetracycline or pyrazinamide. These latter drugs were both more costly and more toxic than those commonly used. Chemotherapy should be continued in most cases for 9 to 12 months, when tubercle bacilli would be eliminated as shown by cultural tests or so reduced in numbers that the patient could deal with the situation. If cavities were present, chemotherapy should be maintained for 9 to 12 months after the last positive sputum or until the cavity appeared to be closed.

With "good chemotherapy" deaths were rare unless the patients were treated very late or death occurred from cor pulmonale or post-operatively. Of 107 patients under his personal care, of whom 31 had advanced, 48 moderate, and 28 minimal phthisis, observed over a period of one to three years, only two deaths occurred. All others became sputum negative and 97% were fit for work.

THE SECTIONS

SECTION OF GENERAL PRACTICE

Monday, June 20

Management of Abortion

Dr. IAN D. GRANT (Glasgow) occupied the chair when Dr. JOHN MANN (Toronto) opened a symposium on "Problems in the Management of Abortion." He said that the incidence of spontaneous abortion was about 10% of all pregnancies. Most of these were due to defective germ plasm, and a simple explanation to this effect should be given to the patient. Hormonal imbalance and general and local maternal disease were of lesser aetiological importance. Various methods of treatment were all likely to be successful, because any vaginal bleeding early in pregnancy was ascribed to threatened abortion, whereas in fact it was often of extrauterine origin. Criminal abortion occurred as often as the spontaneous type, but accounted for almost all the mortality and the great majority of the morbidity attendant on abortion.

Dr. MARY ESSLEMONT (Aberdeen) discussed abortion as seen in an urban general practice in Scotland. She believed that emotional disturbances could sometimes initiate abortion, perhaps by interfering with the hormonal balance. The aetiological importance of retroversion and of fibroids was probably over-stressed. It was sometimes difficult to be sure of the diagnosis of threatened miscarriage, especially if one wished to avoid vaginal examination. In treatment, the psychological effect of close attendance on the patient might be more valuable than any specific form of therapy. It was also difficult to decide which cases of abortion could be treated at home. Social circumstances often made hospitalization necessary in her practice, and about 40% of abortions were transferred to hospital.

Mr. J. R. NICHOLSON-LEAILEY (Taunton) dealt with the problem of the recurrent abortion. He emphasized the need for careful history-taking and thorough examination of wife and husband, for if the cause could be found and treated the outlook was good. In particular he stressed the necessity for careful repair of any deep cervical laceration. During pregnancy trauma and excitement should be avoided and the patient should retire to bed at the times of the suppressed menses. Attention to diet and to the early detection of toxæmia were important. If the urinary output of pregnadiol were low the implantation of 120 mg. of progesterone obviated the necessity for repeated injections. He then outlined some problems in the differential diagnosis of abortion, and concluded by advising complete bed-rest and adequate sedation when abortion threatened. In answer to a question, he said that in inevitable abortion he preferred conservative treatment unless there was serious bleeding or infection.

Dr. JOSLYN W. ROGERS (Toronto) detailed the indications for therapeutic abortions performed in a large non-sectarian hospital. He said that gynaecological and obstetrical complications, except carcinoma of the cervix and early but severe toxæmia, rarely necessitated termination of an otherwise normal pregnancy. Psychiatric and neurological conditions presented the greatest difficulty. Modern methods of treatment had diminished the necessity for intervention in patients with cardiac disease or phthisis. Diabetes mellitus was an indication for interference only when nephritis co-existed or when retinitis proliferans was present but without complete loss of vision. He would perform therapeutic abortion for carcinoma of the breast, but there was controversy over the advisability of the operation when rubella complicated the first trimester of pregnancy. In most cases, where a pregnancy was terminated, sterilization was a natural corollary.

TORONTO'S WELCOME

The scientific discussions at the Joint Annual Meeting began on Monday, but for some days beforehand Toronto had been welcoming delegates to the British Commonwealth Medical Conference and members of the B.M.A. as they assembled for the meeting. Toronto doctors and their wives most generously opened their homes to the visitors and over the week-end showed them something of the friendly city and more especially of the meaning of Canadian hospitality. The city's official welcome to the members of the three Associations was on Saturday, June 18, when at a civic reception Mayor Nathan Phillips spoke of the pleasure given to the Corporation of the city of Toronto by the presence of so many distinguished medical visitors. After the reception a concert was given by the Hart House Orchestra, which was conducted by Dr. Boyd Neel, who is now Principal of the Royal Conservatory of Music at Toronto and Dean of the Faculty of Music at the University. On the previous evening Lady Eaton had invited members of the British and Canadian Medical Associations to a reception and supper at Eaton Farm Hall, King, Ontario. The journey out to King was made in motor buses—not without some unexpected excitements—and with a heat-wave on in Toronto Lady Eaton's guests were particularly appreciative of her lovely garden.

On Sunday evening after the official religious service in St. James's Anglican Cathedral and celebration of Solemn Vespers at St. Michael's Cathedral, visiting members and their wives met their Toronto colleagues at numerous informal supper parties.

NEW HONG KONG UNIVERSITY OBSTETRIC DEPARTMENT

NEW MATERNITY HOSPITAL

On June 13 His Excellency, Sir ALEXANDER GRANTHAM, opened the new Tsan Yuk Maternity Hospital which will be the centre for teaching obstetrics to medical students of Hong Kong University.

The University was incorporated under a local University Ordinance in 1911 and opened in 1912. Prior to this the Hong Kong College of Medicine, which owed so much to Sir Patrick Manson and Sir James Cantlie, was responsible for medical education. The founder of the Chinese Republic, Dr. Sun Yat Sen, was one of their students.

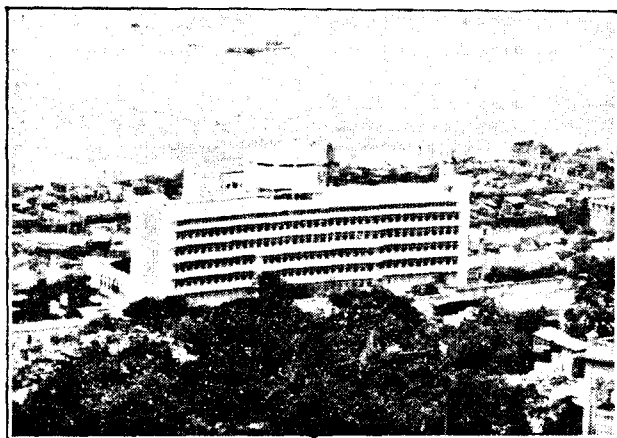
The Old Tsan Yuk Hospital

This hospital was opened in 1922 in a densely populated part of the city to provide a maternity service for the Colony and establish a training school for Chinese girls who wished to become midwives. It contained 30 beds, and admissions during the first year were 436. The original

staff consisted of a doctor, matron, two nurses, six student midwives, and five amahs.

Through the munificence of the Rockefeller Foundation in 1926 clinical chairs were established in medicine, surgery, and obstetrics. Professor R. E. Tottenham was appointed to the chair in obstetrics. Realizing the value of the Tsan Yuk Hospital for the training of medical students as well as midwives, he effected a liaison between this hospital and the Department of Obstetrics and Gynaecology of the University. In his report of 1929 he wrote, "To my mind the University Obstetric Department and the Tsan Yuk Hospital are dependent on one another, and their union should lead in time to the development of one of the best midwifery clinics in the Far East." This hope was fulfilled, and the link between the hospital and the university has been maintained by Professor W. C. W. Nixon and later by Professor Gordon King.

In 1934 the hospital, which had hitherto been administered as part of the Chinese Public Dispensary system, became a



Government hospital and the number of beds was increased to 60, and later, after the second world war, to 85. Over the years admissions have increased considerably, and in 1954 the record figure of 7,164 was reached, which is about 10% of the total births in the Colony.

Antenatal clinics were first started in 1929. During the period 1936-41 only 14.5% of mothers received antenatal care, and the remaining 85.5% were "emergency" admissions without antenatal supervision. During the period 1945-54 this position was reversed and 87% of the 50,149 admissions had antenatal care, leaving only 13% as "emergency" admissions. In 1954 as many as 97% of the mothers delivered in the hospital had attended the antenatal clinics.

Further analysis of these periods shows a remarkable reduction in mortality figures. Maternal mortality was 5.02 per 1,000 for the 25,678 deliveries during the period 1927-41, whereas from 1945-54 (47,029 deliveries) the rate dropped to 0.89 per 1,000—a figure which compares very favourably with that found in large maternity hospitals in other parts of the world. Over the years there has also been a steady reduction in perinatal mortality (stillbirths and neonatal deaths). For the year 1954 there was a remarkably low stillbirth rate of only 12.9 per 1,000 and a neonatal death rate of 17.4 per 1,000.

The New Hospital

In 1952 the Hong Kong Jockey Club decided to donate a sum of £250,000 to meet the cost of building a new maternity hospital on a site close to the old hospital. On October 28, 1952, the foundation stone was laid by Her Royal Highness the Duchess of Kent.

The new hospital is an 8-story building containing 200 beds, with accommodation for a resident staff of 7 doctors, a matron, 28 nurses, 72 pupil midwives, and 88 amahs. In

addition, residential facilities are provided for final-year medical students during their obstetric clerkship.

The antenatal department is on the ground floor, where there are six examining-rooms with equipment, so that eleven patients can be seen at a time. It is estimated that between 150 and 200 patients will be examined at each session of three hours' duration. Each examining-room has a coloured plaque on the door so that patients who cannot read are guided to the right room by a similar colour on their registration card and on the back of the seats in the waiting-hall. The x-ray department, blood bank, laboratory, administrative offices, and a lecture room, with a modern projector, are also on the ground floor.

The wards, named after great figures in British obstetrics, are on the first four floors. There are two wards to each floor, which is self-contained with its labour and delivery rooms. The first and second floors are for normal cases. The third floor is for antenatal cases and for those cases which might need operative delivery such as caesarean section. There is also on this floor a trial labour room, two operating theatres, a nursery with 18 electric incubators for premature babies, and a cooling-off room with six cots. The remaining two floors are the resident quarters for doctors and nursing staff.

The hospital's benefactors can be assured that their investment in this building will be of enduring benefit to countless mothers and children.

NEW YORK CONFERENCE ON NUTRITION IN INFECTIONS

A two-day conference on "Nutrition in Infections," sponsored by the Section of Biology of the New York Academy of Sciences, was held in New York on May 24 and 25 under the chairmanship of Dr. W. A. WRIGHT, medical director of Pfizer Laboratories. Some 200 doctors, veterinarians, and other scientists attended it, a number of them from abroad. The two sessional chairmen were Dr. NORMAN H. JOLLIFFE, director of the New York Health Department's bureau of nutrition, and Dr. HENRY WELCH, director of the antibiotics division of the Food and Drug Administration.

Nutritional Status and Resistance

The conference opened with a review by Dr. S. L. HALPERN (New York Medical College) of the role of nutrition in the prevention and treatment of disease. This was a subject on which there were conflicting views, he said, and critical evaluation of the evidence was overdue. The results of both basic and clinical research in nutrition were difficult to assess because of the many extraneous factors, and discredit followed over-optimism and the unrealistic application of new advances. However, despite these caveats, Dr. Halpern himself came down firmly in favour of the old beliefs. In his view "nutrition therapy" was often of primary importance in the treatment of disease. Indeed, he went even further, claiming that nutrition, "in a non-specific manner, participates in the prophylaxis against most acute infections." Dr. Halpern ended his address by warning against the injudicious application of nutrition therapy. The nature and phase of the illness, the drugs being administered, and the potential toxicity of the nutrient itself and its balance with other nutrients were all factors that must be taken into account.

Dr. FRANCISCO GRANDE (University of Minnesota, from Madrid), after reviewing some interesting Spanish experimental work on lathyrism,* cautioned against too ready acceptance of the dictum that good nutrition confers enhanced resistance to infectious agents. Opinions differed. In one recent textbook Dr. Ancel Keys could be found

*A condition similar to lathyrism had been produced in rats, which are resistant to *Lathyrus sativus* itself, by feeding them on two allied seeds, from one of which the responsible agent had been identified as β -amino-propionitrile. So far as Dr. Grande knew, however, this substance had not been demonstrated in *L. sativus*.

saying that there was no proof of this relationship in man, while elsewhere in the same book Dr. Tisdall held that nutrition was the main factor in determining resistance to infectious agents. The broad problem of infection had been narrowed to one of immunity, or formation of antibodies; unfortunately the problem was far more complex. In Germany, for instance, malnutrition had not been associated with any great increase of infectious diseases despite some minor changes in the immunological responses of individuals.

Local Vitamin Requirements and the Location of Lesions

Dr. M. K. HORWITT (Elgin State Hospital, Illinois) had been engaged in a series of two-year controlled investigations of single nutritional deficiencies in groups of 30 human subjects, but these did not help him to relate the course of most infections with any given nutritional state. Instead he presented what he called an interpretative paper. In nutrition there was a great need for sounder laboratory techniques. For instance, insufficient attention had been paid to the effects of partial as distinct from total deprivation of a nutrient, or the profound catabolic effects of bed-rest alone might have been forgotten in assessing results. Using his own experiences of experimental ariboflavinosis in man as a text, Dr. Horwitt then discussed the possible role of trauma in deciding the location of lesions. Signs of ariboflavinosis could regularly be obtained if daily intake were restricted to below 0.6 mg. riboflavin for five months. The most characteristic lesion in his experience was the scrotal dermatitis. This developed readily and was equally easily cured by the administration of riboflavin. But why was that site particularly affected? The only reasonable explanation seemed to be that the rugose skin of the scrotum was specially liable to friction and abrasion, with consequently a high local rate of epithelial destruction and repair. In the depleted subject the body's riboflavin reserves would be insufficient to meet this specially high demand, so that local metabolism would be interrupted and the lesion develop.

The nutrition of the aged was an ill-understood subject. Recent studies at the Elgin State Hospital suggested that the similarities between the nutritional needs of the young and the old were greater than the differences. But old people might find the quest for food a less satisfying experience, and violate the safety margins for protein and vitamin intake. The loss of muscle mass usual in advanced age was an indication of their decreased nutritional reserve against emergency. This long-term nitrogen loss—and the similar calcium loss—was very reminiscent of what was seen after short periods of bed-rest in younger people, and perhaps the decreased activity of the aged was an important cause.

Dr. WILLIAM W. FRYE (Louisiana State University School of Medicine) discussed host-parasite relationships, particularly as they affect parasites whose adult life is spent in the intestinal tract. Resistance to a parasite might be natural—that is, present at birth or developing with the host's maturity—or acquired after the first exposure. Dr. Frye reviewed experimental work on animals illustrating the effect of various dietary factors in modifying resistance to helminthic infections. This suggested that in omnivorous animals severe protein restriction and deficiencies of vitamins A, B complex, or D lower their resistance. He went on to discuss the question of protozoal infections, particularly *E. histolytica*, again with reference to the influence of diet, and also other factors such as inter-current infection and strain variation, on susceptibility to infection and its severity. Currently, he and his colleagues were studying the effect of giving dietary supplements and extra vitamins to children with amoebiasis and helminthic infections who were receiving antibiotic therapy.

The next two papers were by veterinary workers. Mr. C. H. HILL (North Carolina College of Agriculture and

Engineering) described original work on the effects of vitamins in high dosage on the resistance of chicks to fowl typhoid. In well-controlled tests with 40 birds to each experiment it was shown that high levels of all the known required vitamins increased the chick's resistance. However, the dosages varied considerably. To achieve maximum effect some vitamins, such as vitamin K, had to be increased over the growth requirement many more times than others. With these high dosages supplementary antioxidant was needed, and here diphenyl phenylene was as effective as ascorbic acid. It was also shown that over-supplementation with vitamins could reduce resistance below the maximum. Professor R. W. LUEKE (Michigan State College) read a paper describing the good effects of adding vitamin B complex and antibiotics to the rations of pigs with swine enteritis.

Specific Vitamin Deficiencies and Antibody Formation

Dr. A. E. AXELROD'S (University of Pittsburgh) paper on the relationship of vitamins to antibody formation was of outstanding interest. Although the immune response did not necessarily correlate with clinical resistance to infection, the classic antigen-antibody response was generally thought to play a significant part in this intricate mechanism. He and his colleagues had therefore studied systematically the effects of specific vitamin deficiencies on antibody production, using the albino rat as the experimental animal. Simple inanition was repeatedly shown to have no effect on antibody production, a finding parallel to that observed in field studies in man. Some specific deficiencies (e.g., of thiamine), while causing marked inhibition of the rat's growth, depressed antibody formation only slightly; other deficiencies (e.g., of pteroylglutamic acid) had exactly the reverse effect. Using purified diphtheria toxoid as antigen, they had found that deficiency of pantothenic acid, pyridoxine, biotin, and vitamin D all caused marked impairment of antibody synthesis, but thiamine and vitamin A deficiency had little effect. Further, deficiency of pantothenic acid resulted in a very low anamnestic (booster) response to a second dose of diphtheria toxoid. Although these striking effects on antibody production were obtained with certain specific vitamin deficiencies, serum complement levels were unaffected, a finding that suggested a different mechanism for its biosynthesis. Dr. Axelrod's paper was discussed by Dr. K. S. HETZEL (Dean of the Faculty of Medicine, Adelaide) and by Dr. A. B. STAVITSKY (Western Reserve University, Cleveland). Dr. Stavitsky, who had worked with Axelrod, had applied the latter's observations to tissue culture and homotransplantation experiments with rat spleen cells. Cells from normal immunized animals continued to produce antibody on transfer to animals whose own antibody production had been blocked—for example, by x rays, cortisone, or pantothenic-acid deficiency—but failed to do so in normal animals, perhaps owing to the production of antibodies against the foreign cells. Cells from immunized, but pantothenic-acid deficient, animals failed to produce antibody either on culture or on transplantation. Dr. Stavitsky interpreted these findings as providing evidence for the autonomy of the cells so far as antibody production was concerned.

Miscellaneous Studies

Dr. B. M. KAGAN (Michael Reese Hospital, Chicago) described the effects of sterile abscesses on the vitamin A levels of small numbers of albino rats. There was lowering of the serum and liver vitamin A levels, and in some animals an increase in urinary excretion. The results were the same whether turpentine or sweet almond oil was used to induce the abscesses. The liver vitamin A reserves were rapidly restored after oral dosage. The last paper of the day was by Professor JOACHIM KÜHNAU (University of Hamburg), who discussed fluid, electrolyte, and protein changes during infection.

During the second day, under the chairmanship of Dr. HENRY WELCH, there were two reports on small uncontrolled

clinical trials of combined broad-spectrum antibiotic and multiple vitamin preparations. Dr. AARON PRIGOT (Harlem Hospital, New York) had treated 35 severely ill surgical patients and remarked on the absence of side reactions. The other was by Dr. MAX B. MILBERG (Maimonides Hospital, Brooklyn) and Dr. MAX MICHAEL, jun. (State University College of Medicine, New York). They were interested in the gastro-intestinal complications of orally administered broad-spectrum antibiotics, and were trying out "fortified" oxytetracycline and tetracycline in a mixed group of medical conditions.

Among other subjects discussed at the conference were deficiency diseases in the Tropics, diabetes, and the nutritional care of surgical patients.

Recapitulation and Prospect

Dr. HOWARD A. SCHNEIDER (Rockefeller Institute for Medical Research, New York) had been chosen to sum up the proceedings, and he did so with frankness and charm. He confessed he found this a difficult task. He had been rather disappointed by the irrelevance of some of the papers to the real problems involved. There were three fallacies in nutritional research to be guarded against. First, the implicit assumption that the anthropocentric view was correct. Secondly, the view that "supernutrition leads to a happy end." This might not be true, and Dr. Schneider gave examples of work which had shown that vitamin, fat, or protein supplements could exert an adverse effect on the course of infections. Adding things was not necessarily harmless. The last fallacy was the assumption that there is such a thing as general resistance. There was no such thing. The question should be, resistance to what? There was still much to learn, Dr. Schneider concluded, but in order to succeed Nature must be obeyed, not commanded.

The members of the conference were entertained by the New York Academy of Sciences to dinner on the first day, and after it Dr. HANS SELYE gave a most entertaining account, illustrated largely from his personal experience, of some common pitfalls in the interpretation of scientific data. The proceedings of the conference are to be published by the New York Academy of Sciences.

JOINT MEETING OF BRITISH AND FRENCH ORTHOPAEDIC ASSOCIATIONS IN PARIS

The British Orthopaedic Association and the Société Française d'Orthopédie et de Traumatologie held a joint meeting in Paris from May 5 to 7, under the chairmanship of their respective presidents, Professor BRYAN MCFARLAND and Professor P. PADOVANI. The principal subjects discussed were the surgery of the paralysed lower limb and osteochondritis of the hip. This account is limited to a brief report on the papers on tendon transplantation given in the session on the paralysed lower limb and to the discussion on Perthes's disease.

Tendon Transplantation in the Paralysed Leg

Mr. J. M. P. CLARK (Leeds) discussed tendon transposition in the buttock and thigh. The revulsion that had followed the first enthusiasm for the work of Robert Jones and Tubby was now on the wane, he thought. But certain important principles must be realized: it was impossible to replace a completely paralysed muscle; no muscle training would ever alter muscle imbalance; and deformities might recur even after arthrodesis. Tendon transposition was best done to prevent deformity. Transplants needed protection for at least six months after operation.

Replacement of hip abductors was most difficult; the ilio-psoas transplant was satisfactory if a normal gluteus maximus and sartorius were present, but it was a severe

operation. In the presence of a good gluteus maximus the backward shifting of the origin of tensor fasciae femoris could help a weak gluteus medius. In adduction deformity, tenotomy, neurectomy, and osteotomy all had a place. In preventing recurrence of the deformity he had successfully tried a new procedure in which the adductor origin was detached from the pubis and mobilized with its nerve supply intact, transposed under the rectus femoris, and attached to the ilio-tibial band. In the case of the knee, transplants into the quadriceps could be done to prevent buckling, to allow a calliper to be discarded, or to prevent flexion deformity. They were most effective when the foot was stable, any knee deformity had been corrected, and in the presence of strong hamstrings and at least fair glutei. Semitendinosus and gracilis medially, and biceps laterally, were all used, but semimembranosus must be left intact. Mr. Clark stressed the importance of the normal coupled action of the hamstrings with the knee extensors in the last part of the movement of straightening hip and knee, which therefore made the transplant a good one. The use of sartorius and tensor fasciae femoris had not been satisfactory.

Mr. D. M. BROOKS (London) spoke on the use of tendon transplantation for the prevention of foot deformities. The operations were easy, could be done early, and did no irreparable damage, but unfortunately at least one-third failed in their purpose. It was necessary to know accurately the power of the muscles and which were causing deformity, a difficult matter to assess before the age of 5. It was useless to employ a muscle as a transplant whose automatic phase of function was at variance with that of the recipient; hence the futility of transplanting tibialis anterior to the calf. The essential principles were that full passive correction should be possible, the deforming force must be removed, and the paralysed muscle action must be replaced.

Of forty-nine transplants of the peronei to the calf in cases of calcaneocavus, with or without valgus, over half had been failures, continued Mr. Brooks. Transplanting extensor hallucis longus to the first metatarsal neck had failed in twenty-four out of thirty-nine cases of pronation of the forefoot, and in a similar proportion transposing peronei to the dorsum of the foot failed to improve plano-valgus. The most successful group were the equinovarus deformities, in which only nine out of twenty-two failed to show improvement, six of the failures being due to the detachment of the transplant from its new site. In all groups secondary deformity was not uncommon. However, in spite of the many failures, he thought tendon transposition a useful mitigating procedure in carefully selected cases, provided the cause of the original deformity had been eradicated; indeed, it was doubtful if it was ever worth shifting a muscle which was not itself causing the deformity.

Mr. T. T. STAMM (London) described the surgical measures for the relief of paralysis of the intrinsic muscles of the toes. After discussing the Lambrinudi procedure of multiple interphalangeal fusions he proceeded to review the indications for tendon transplantation operations. If there was fixed extension of the metatarso-phalangeal joints multiple tendon transplants of the long flexors of the toes to the extensors was a better operation, but was contraindicated in the presence of much fixed flexion of the proximal interphalangeal joints. The two procedures were complementary and should not be looked on simply as alternatives for any given case. The operation of transplanting the extensor tendons into the metatarsal necks was a poor one, he thought; it was unsound physiologically because the timing of the automatic action of these muscles was wrong for the new function required of them, and in any case the tendons seemed to return as if by magic to their original insertions.

In the subsequent discussion Mr. H. J. SEDDON (London) stressed the need for independent assessment of a surgeon's results from tendon transplants in the foot; the basic idea was good, but fewer cases than imagined were really worth operating on.

Perthes's Disease

Dr. J. LEMOINE opened the session by describing an experimental study by Dr. R. LAGRANGE and himself, largely done at Oxford. While ligation of the anterior circumflex vessels in 2-3-weeks-old rabbits produced only minimal changes, ligation of the round ligament was followed by varying degrees of enlargement of the femoral head, with flattening, increased radiological density, and often some subluxation. Angiograms showed an increased vascularity of the head. The neck of the femur often thickened, and both macroscopically and microscopically the changes were very similar to those seen in Perthes's disease in man.

Professor M. FÈVRE (Paris) reviewed a series of cases of Perthes's disease. Eighty per cent. had occurred in boys. The ages ranged from 4 to 13 years, with a maximum between 4 and 7 years. He had not found trauma or infection elsewhere to be important antecedents, nor pre-existing coxa valga. He divided cases into two groups, depending on whether changes started in the top of the femoral head or around the margins of the epiphysis. The former he considered due to interference with the blood supply from the round ligament, the latter with the supply from the circumflex vessels.

Dr. P. PETIT (Paris) discussed the association of Perthes's disease with congenital dislocation of the hip. He had seen 23 instances of osteochondritis in 87 congenitally dislocated hips, although some had reported an incidence as high as 50%. He had not seen the condition on the normal side. Prognosis was impossible during the first year of life, and in some of the youngest patients there had been complete disappearance of the head. Ten out of eleven cases under the age of 1 year treated by manipulative reduction and fixation in the Lorenz position had been complicated by osteochondritis. Among the possible causes of the condition, he considered important forcible reduction, too powerful traction (the condition being commoner in high dislocations), and above all pressure on the femoral head associated with poor articular contact and torsion of the capsule and its vessels from fixation in the extreme positions. The younger the patient the greater the danger of osteochondritis; the femoral heads of older patients seemed more resistant.

In the discussion Sir REGINALD WATSON-JONES (London) emphasized that Perthes's disease was a disorder from loss of local blood supply. Rest in bed for two or three years could prevent deformation of the femoral head, but one had to wait at least 20 years in order to know whether later degenerative arthritis had in fact been avoided. Still, three years' bed-rest in childhood was a small price to pay to avoid the 50 years of later disability which otherwise followed Perthes's disease with such certainty.

Professor J. TRUETA (Oxford), after illustrating the histological and vascular changes to be seen in experimental osteochondritis in the rabbit, proceeded to describe the development of the blood supply to the femoral head in man. At the age of 18 months none was provided via the round ligament; almost all came from the outer side. By the age of 4, vessels could first be seen entering the head from the round ligament, but only after fusion of the capital epiphysis did these vessels anastomose with the major supply from the outer side. After the age of 16 the anastomosis was adequate and the danger of Perthes's disease past. It had been shown by arteriograms that extreme positions of the hip obstructed the circulation to the femoral head.

Mr. A. H. C. RATLIFF (Edinburgh) gave the results of a late follow-up on 49 cases of Perthes's disease, followed for an average period of 17 years. Apart from a few who received no treatment, all had been treated by frame fixation. Three-quarters of them were fully active and free from pain, although only 38% had good x-ray appearances. Of the nine untreated cases only one had a good hip. The most important factor affecting the prognosis was the state of ossification of the head—the younger the child, the better the prognosis. A good immediate result was likely to be maintained for at least 25 years, even though half of such cases had an unsatisfactory x-ray appearance.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

The Changing Face of Medicine

SIR.—The publication of two articles, by Mr. C. Kennedy and Dr. C. P. D. Grant (*Journal*, April 30, pp. 1045 and 1049), has drawn attention to an uneasiness and cleavage in our profession which merits more discussion.

In our area we have a scheme whereby students in their final year are appointed to practitioners for a short time to observe practice. Whatever benefit it may confer on the student, it does provide the general practitioner with some contact with the modern student and an insight into his activities. One is impressed by the intensity of his course, with his remarkable knowledge of abstruse theories that seem unimportant to us, and, most of all, with a sense of relief that we are not beginning our medical career. Is there not a danger that the intense academic course will leave the student no time to relax or to engage in social and cultural activities? Are we tending to produce a doctor stuffed full of theories but unfitted for his task because he has been trained to deal with disease as distinct from human beings?

As a G.P. one is diffident about criticizing the appointment of full-time professors and teachers, but it is difficult to see how a teacher completely divorced from clinical medicine outside the hospital is of necessity the best teacher of medicine. G.P.s have been interested spectators of the merit awards, and I am sure their sympathies are with the hard-working conscientious clinicians who apparently are passed over for the "ready pens." Might we suggest that the committees who sit in diabolical secrecy might take note of the out-patient lists of consultants? The popularity of the latter is based on the service he provides for practitioner and patient—as good an assessment of merit as any, in my opinion. Is there any good reason why professors of medicine and surgery should be debarred from private practice? I suggest these points are well worthy of consideration, as they would benefit consultant, practitioner, student, and patient.

The increasing problem of medical litigation has been well set out by Mr. Kennedy. I feel strongly that the control of the doctor-patient relationship is to a great extent in the hands of the doctor himself. All that has been said and written about the teaching and training of the undergraduate has a direct bearing on this relationship. Having a limited experience on disciplinary committees of the executive council, I have been impressed with the numbers of cases that need never have come to committee hearing if the doctor concerned had exercised control of his temper and ordinary tact. I say this fully aware that it is only by the grace of God that I have escaped sitting in the defendant's seat, and also conscious of the great injustice to doctors when confronted by a malicious patient aided by free legal aid, but I am convinced that never was ethical conduct of medicine in the true Hippocratic tradition more necessary than it is to-day.

The G.P. perhaps hears criticism of hospital attention from his patients, and I have no doubt hospitals could say the same thing about G.P.s. But, here again, the divorce between hospital and general practice is almost complete, and most of the difficulties are minor and quite capable of being resolved by ordinary good ethical relationship between the doctors concerned. In my area we have a discussion group of neighbouring practitioners which meets monthly. We have tried in a small way to improve the hospital-G.P. relationship by inviting teachers from the medical schools to spend an informal evening with us. Perhaps we flatter ourselves, but it did seem that the enjoyment was mutual, and one of our full-time professors said he was delighted to have the only opportunity afforded him of meeting and getting to know practitioners in his area.

A word of praise for the stimulating article "Youth Looks at Medicine." The writer obviously accepted general practice as a challenge, and eventually found it absorbingly interesting and worth while in spite of the Welfare State. He is perhaps fortunate

in that he has had to make less adjustment to his obstetrical activities than the middle-aged practitioner. The facility with which maternal blood loss can be restored in hospital has profoundly affected the conduct of domiciliary midwifery, and we have been grateful for the clear-cut advice from consultants on what they consider to be the safe limits of domiciliary obstetrical procedure and instrumentation. While time has in no way dimmed my admiration for the skill and judgment of the G.P.s who introduced me to domiciliary midwifery, I have no hesitation in accepting the limits laid down by eminent obstetricians. An attempt is being made in our area to harmonize the relationship between local authority and practitioner. I believe that the service is capable of great improvement if the local authority is prepared to encourage practitioners in domiciliary midwifery and if the practitioner is prepared to accept the local authority's statutory commitments in the service.

I am ever grateful to the B.M.A. for affording me an opportunity of listening to other medical opinion. The penalty for expressing opinion in local B.M.A. sessions is to be stuck on various committees. Committee-sitting is time-consuming, occasionally boring, but seldom time-wasting. The committee-sitter has ample opportunity of studying lay reaction to his own profession, and he must always be impressed by the ability and almost superhuman tact and diplomacy exercised by these oft-maligned permanent Civil Servants of medical administration. I mention these outside activities because I feel that some of our difficulties are self-produced. Considerable space has been devoted in the *Journal* to the difficulties of the intermediate hospital groups. This problem must command general sympathy, but I think that these groups would command much more sympathy and support if they showed more enthusiasm in attending B.M.A. meetings, and more willingness to take part in the routine work of Divisions which affects the conduct of medicine as a whole.

One other factor in the doctor-patient relationship that we cannot ignore is the attitude of the Press. It is irritating to note our misdemeanours in the headlines, but it is the fact that "wrongdoers" are a minority that gives them news value. Our standards and ethics of medicine would perhaps get a better press if we were slightly less aloof. The public relations department of the B.M.A. has done much useful work, but half of this is wasted if the periphery does not avail itself of the advice freely given, and in any case medical news in the lay press must always be a challenge to our conduct and practice of medicine.

In concluding these random reflections of a middle-aged practitioner, I hope to have made some small contribution to the solution of difficulties.—I am, etc.,

Sheffield 6.

ANDREW STEPHEN.

SIR,—During the past few weeks your correspondence columns have contained various letters criticizing general practice from various aspects. Most of them have been from the younger or recently qualified practitioner, who would appear to have become rather embittered as he experiences the difficulties of obtaining the practice of his choice. Others have criticized general practice in more detail, and would appear to be dispirited as they experience the disparaging conditions under which general practice is sometimes conducted. I am sure that there are still remaining some practices which do show some of the happier features of general practice.

I do not claim that my practice is quite the *beau idéal*, but I do think that I am one of the few fortunate ones who are practising medicine under conditions as good as they are ever likely to be. Mine is a single-handed practice which leaves me some leisure for social and other activities. Other practitioners, who have the time, have the opportunities for anaesthetics, tonsils, or other specialties. The practice is, needless to say, situated on the south-west coast and in a seaside resort of some 18,000 people. The cottage hospital, in which all the practitioners in the district participate, has some 50 beds, including private and amenity beds, a children's ward, a first-class x-ray department, physiotherapy department, and a casualty but no out-patients

department. Each of us has the care of our own patients, and we diagnose and treat according to a standard which is comparatively high. The major surgery is performed by visiting surgeons, but some of the surgery is done amongst ourselves.

We have a first-class pathological service, and every modern investigation is available, from simple haemoglobin estimations to pathological investigations such as electrophoretic separation of serum proteins. First-class physicians, surgeons, neurologists, and psychologists, etc., are available for domiciliary consultations or consultations at our hospital. We are fortunate in the hospital in that it has the right number of beds for the district it serves, and it acts as a pleasing diversion for the consultant who cares to hold a session here. Again, it is fortunate in that we have no beds available locally for midwifery cases, and this has induced a very high standard of domiciliary midwifery. Here it is standard to have the W.R., Kahn, haemoglobin and full count, rhesus, and blood group performed in most pregnancies. Most of my midwifery cases are x-rayed at the 36th week, and an excellent midwifery service is helped by the co-operation of the district nurses. Rarely is emergency aid required under these conditions, and it remains a point of interest that very few mothers ask for or require hospital maternity care. We are able under these conditions, when further advice is needed, to refer the patients to the particular consultant at the county hospital complete with the x-ray films and any other pathological report likely to be needed.

These conditions help materially in the answer to that difficult question which, indeed, can be very personal: "Could anything more have been done?" This, I think, is competitive medicine working satisfactorily within the National Health Service. The purpose of this letter is to point out that there exist practices where keen, interesting clinical medicine still flourishes, and to stimulate the idea that some of these conditions could be encouraged in the more highly industrialized parts of the country.—I am, etc.,

Exmouth.

PHILIP WADE.

Prevention of Stasis in Trauma of the Ankle Joint

SIR,—Probably the most common immediate treatment for incomplete tears of the fibular collateral ligaments, where bone injury has been excluded, is the application of a cold compress, with or without the addition of some type of supportive strapping. When treating this type of injury among professional footballers I have found it most difficult, if not impossible, to strike a happy balance between tolerability and efficiency. Either the strapping is too tight to bear, particularly when the patient retires to bed, or it is too slack to perform its functions of support and the prevention of oedema. Besides being the cause of a large proportion of the discomfort felt by the patient, it is obvious that oedema about the site of the injury must considerably retard the rate of healing. While it is widely recognized that massage and elevation can disperse the swelling, only too soon after the foot is returned to its normal dependent position the oedema also returns.

It was in an attempt to find some method of increasing the speed of recovery of footballers suffering from this, probably their most common occupational injury, that, with the encouragement of Dr. E. J. Pike, the Portsmouth Football Club's medical officer, I experimented with a latex sponge rubber pad incorporated inside an elastic adhesive strapping. This, I thought, would exert compression to the sulci around the external malleolus, and perhaps also have a mildly beneficial auto-massage effect whenever the patient moved his foot. The results have exceeded my expectations. For example, a simple tear of the anterior talo-fibular ligament treated in this manner (details of which follow) shows no oedema at all when the strapping is removed the following day. Sharply delineated by the borders of the pad, however, is a variable but generally large

ecchymosis. The actual site of the tear is naturally tender on palpation, but below the area covered by the sponge pad there is no oedema.

Should there be a delay of, say, 24 hours before the patient is seen, and during which time the ankle has swollen to the recognized proportions, this type of compression support has precisely the same effect—namely, that within a further 24 hours a large area of ecchymosis is apparent

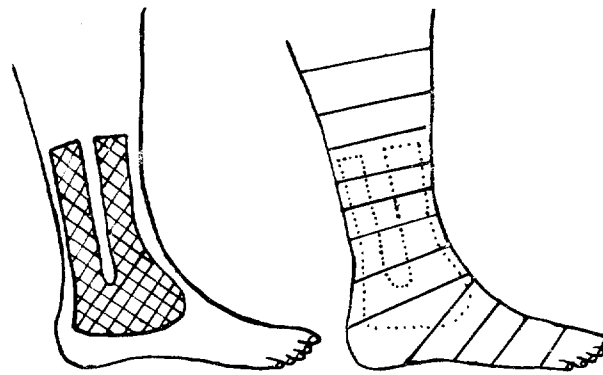


FIG. 1.—Latex pad in position. Edges other than those adjacent to fibula should be bevelled. FIG. 2.—With strapping applied.

and the oedema has disappeared. Consequently, not having to compete with a distended ankle, subsequent treatment to the partly torn ligament is quicker and much more effective. In addition, the possible or imagined assistance of the auto-massage effect occasioned by the tightening and relaxing of the supportive strapping on the sponge pad when the patient walks or moves his foot seems to act beneficially in hastening the process of healing.

In practice this method has the distinct advantage of being both comfortable and effective when applied. After the support has been in position for 9 to 12 days it can be removed and dispensed with. Generally the patient is then able to perform all activities other than the most strenuous. The more severe cases may demand a further period of support, but the majority will require very little, if any, further treatment to ensure their complete rehabilitation.—I am, etc.,

Southsea.

S. P. BARNARD.

Chronic Appendicitis

SIR,—I must comment on the letter of your correspondent Dr. W. Silber (*Journal*, May 28, p. 1341) when he supports the contention that "the clinical and pathological correlation of chronic appendicitis is still far from satisfactory." If the clinical investigation of the case has included a careful and sufficient x-ray examination then there should be no doubt at all about the normality or abnormality of an appendix. By a careful and sufficient x-ray examination I mean either a barium meal (or a caecal meal) followed through for at least 48 hours, or a barium enema with at least a picture taken on the following day, if not also on the second day. Either of these investigations will show the presence or absence of one or more of the following in connexion with the appendix: (1) Relative stasis, (2) segmentation, (3) inequality of the width of the lumen, (4) complete or partial fixation, (5) an irregularly bulbous end, (6) kinking, (7) definite non-filling, (8) tenderness on palpating over the structure. I maintain that the experienced radiologist will be able to give a correct diagnosis in practically 100% of cases with the help of the above information.

The reason why hospital investigation of the appendix is so often unsatisfactory is that, through lack of time, a 48-hour film is seldom taken in the case of a barium meal and a 24-hour film is seldom taken in the case of a barium enema. Also, in those cases where the appendix has not been visualized in a barium meal investigation, it is not supplemented sufficiently often by performing a barium enema investigation and vice versa. In conclusion, I am

convinced, from long personal experience, that a careful and sufficient x-ray investigation will always help the clinician to decide about the state of health of an appendix. I am, etc.,

London, W.1.

ISAAC EBAN.

Gonorrhoea Statistics

SIR.—As Chairman of the British Co-operative Clinical Group set up by the Medical Society for the Study of Venereal Diseases to obtain statistical information relating to all aspects of the venereal diseases in this country, I should like to place on record my disagreement with Drs. Gerald H. Knight and W. Fowler (*Journal*, June 11, p. 1430), who regard the study of the epidemiology of gonorrhoea as a relatively unimportant matter. The fact that, despite the excellent remedies available, the incidence of gonorrhoea is not falling in this and other countries is a very important matter for which the explanation is not apparent. Any investigation into this problem must include a study of the epidemiological factors concerned, and that is what the Co-operative Clinical Group had in mind in circulating a pro-forma to those in charge of V.D. clinics.

The problems enumerated by Drs. Knight and Fowler are all very important ones, but none of them seem to lend themselves to collective investigation of the type which the Group can undertake. The Medical Society for the Study of Venereal Diseases exists for the study and discussion of all these problems and holds meetings frequently. As President of that Society I can say that we should welcome more support from, and more frequent attendance of, our colleagues in Birmingham.—I am, etc.,

London, E.1.

A. J. KING.

Cyst Formation Following Hernia Repair

SIR.—With considerable interest I read the article by Mr. A. G. Rutter entitled "Cyst Formation Seven Years After a Cutis Graft Repair of Hernia" (*Journal*, April 16, p. 951). Mr. Rutter remarks that experimental work by Zimches¹ showed that a piece of skin inserted free into muscle tissue tends to curl up into a U shape and regularly to form an inclusion cyst. May I add that just half a century ago I proved this fact by experiments and histological work?²—I am, etc.,

Budapest, Hungary.

JOSEPH GUSZMAN.

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- ¹ Zimches, J. L., *Frankfurt. Z. Path.*, 1931, 42, 203.
- ² Guszman, N. J., *Vichows Arch. path. Anat.*, 1905, 181, 391.

Intramuscular Chloroquine

SIR.—Dr. Abdul Wahab Ariff's letter (*Journal*, May 14, p. 1218) and the increasing use of chloroquine by the parenteral route prompt me to place on record what I believe to be the first recorded fatality due to overdosage by chloroquine.

In April this year I performed a necropsy on a male Caucasian child, aged 1½ years, weight 10 kg., who had died following the inadvertent injection of two ampoules of "resorchin" solution (0.3 g. chloroquine base) by the intramuscular route. The history and clinical details made available to me are as follows. The patient, who had had an attack of malaria about 12 months previously, was admitted to an out-station hospital on the evening of April 11, 1955, with a temperature of 103° F. (39.4° C.), slight cough, no diarrhoea, no convulsions. The child had been given two tablets of resorchin the previous evening, which he had immediately vomited. A second medication of one tablet of resorchin given on the morning prior to admission had also been vomited. Clinical examination showed the child to be in good general condition with no abnormal physical signs. The next day the temperature was 100° F. (37.8° C.), W.B.C. 6,000, Hb 75% (Sahli). Scanty malarial parasites in a thick blood film. No albumin in the urine. An intragluteal injection of two ampoules of resorchin was given that evening. About four minutes later the patient momentarily rolled his eyes and moved the right arm in a strange way and then appeared normal and was laughing and eating. The rolling of the eyes was repeated two or three times. Five minutes later the child suddenly collapsed, was pale, deeply unconscious, respiration irregular, pulse rapid and

feeble. A few seconds later respiration ceased and in spite of artificial respiration the child died. A necropsy was performed 40 hours later. The only abnormal findings were a little vomitus in the trachea and bronchi and slight splenic enlargement. Histologically the lung tissue showed moderate congestion and no malarial parasites were demonstrated in the brain.

Chloroquine by the parenteral route is known to produce a fall in blood pressure, and presumably the high dosage in this case, four times the recommended dose, caused a pronounced hypotensive attack. It is essential to give this drug on the basis of 5 mg./kg. of body weight, at which dosage it is a safe and most effective antimalarial.—I am, etc.,

Kumasi-Ashanti.

F. C. HARRIS.

Labelling the Container

SIR,—I wholeheartedly support Dr. H. Ucko's plea (*Journal*, June 4, p. 1392) for the labelling of bottles. In consulting-rooms and clinics bottles are clearly labelled, but when dispensed for home use the bottle is labelled "the drops" or "the mixture." Patients are often advised to use two drugs—for example, atropine and sulphacetamide—at the same time, one of which is to be used, say, once a day and the other twice. Both solutions are colourless and mistakes can and do occur. In writing the prescription the direction "Label bottle with name of drug" may be given and it is carried out sometimes.

I have previously made the plea for labelling, but the matter was not pursued as I had hoped.—I am, etc.,

Liverpool, 1.

REFERENCE

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Measles

SIR,—Dr. J. F. Lund's letter (*Journal*, May 21, p. 1279) prompted me to review the incidence of complications in measles in our practice. We do not use sulphonamides or penicillin prophylactically. We merely prescribe aspirin gargle or some other sedative. But at the first suggestion of any complication—that is, pain in the ear or chest or any localizing physical signs in the chest—the patient is put on a full course of penicillin or sulphonamide.

My partner and I have notified 148 cases of true measles in the present epidemic, and, using the above criteria, we have not had to give any antibiotics to more than 10 patients, and in every case the single suspected complication has cleared immediately and the course of the measles has been unaffected. It would seem to us that careful observation by the medical attendant, with timely intervention, is called for rather than the routine use of antibiotics.—I am, etc.,

Enfield, Middlesex.

H. R. SHEPHERD.

SIR,—The use of antibiotics in measles obviously depends upon how serious we believe the disease to be and how probable the complications. I was brought up to regard it as a severe illness which was frequently followed by otitis media and sometimes by bronchopneumonia. Nor have I ever read anything to contradict this. But I am bound to say my 35 years of general practice have not confirmed these gloomy views. I cannot from my own experience regard the complications of measles as either frequent or serious. Perhaps I have been lucky. I have only had one death from measles bronchopneumonia—about 25 years ago in a mongol aged 2 years. In 1932 I attended 33 measles boys at a preparatory school; one had a recurrence of an old otitis media, but none of the others had complications. That was before the sulphonamides.

Is measles worse in infancy, childhood, or adult life? The question would be answered without hesitation by most doctors. I have known more than one mother catch measles from her children, and in every case she seemed to me to have it worse. Whether adults really suffer more than children one cannot say, but certainly they make very much more fuss. I have seen measles in an infant of one month, and it was so mild that I should not have diagnosed it had not three other children in the family been down with it.

Do people really get measles twice? The difficulty is one only has the patient's word for it. The present attack is measles, you are quite certain about that, but you did not see the previous illness. I have always kept notes, and since the Health Service started I have tried to record every single consultation and visit on the medical record card.

In November, 1948, I paid three visits to an only child, A, aged 1, with measles. Brother and sister, X and Y, were born in 1949 and 1950. On March 11, 1952, A developed measles again and on March 21 and 22 X and Y came out with it too. With my note of A's previous attack I went most carefully into all these cases. There could be no doubt about A's second attack, but what about his first? I subsequently discovered that only three other cases had been notified in November and December, 1948, none of them within two miles of my case. Further, on June 3, 1953, X and Y went down with rubella, but A did not get it. Was A's first "measles" really rubella? I did not think so at the time, and I have seen a lot of cases. To sum up: in 35 years I have documentary evidence of only one patient who I myself have seen twice with measles, and on re-examination of the evidence I cannot ask you, Sir, to accept it.

Ought one to attempt to isolate measles children (a pretty hopeless task in most houses), and should one be careful to keep children away from infection? Is quarantine worth while? I have not forgotten what I was taught, but my actual experience has not borne it out. Is it worth attenuating measles with convalescent serum? I was once asked by a consultant to do this for his son of 13; he then went off to London and left me to face the complaints of the boy and his mother. After the attack I had to collect 13 oz. (368 ml.) of blood from the boy to make more serum—a good way of starting convalescence! I have not done that any more. Is measles a serious disease in large English country towns at the present time? I cannot say that it is. "A bad cold plus a rash" is what I tell inquisitive patients, and we all know the rash does not matter.

Sir, I apologize for my heterodox opinions, but, let the statisticians say what they will, I suggest that one's views should be based upon observation rather than authority.—I am, etc.,

Norwich.

FREWEN MOOR.

SIR,—I have recently had the experience of seeing two children of the same family have measles twice with an interval of about 14 days between attacks.

There has been a general outbreak of measles in the village. The children concerned share a bedroom. The boy, aged 5, fell sick on May 18. He was a contact from the first case in the village, who was in the same form. I saw him on May 21 and diagnosed measles (cough, running eyes, and Koplik spots). The course of the disease was normal, though he only developed a very slight rash. On May 27, after two or three days up, he again returned to bed with malaise and cough and on May 31 the rash came out in full. Since then his convalescence has been slow but steady. The sister, aged 3, developed her first attack on May 26 and was up and about by June 5. On June 12 a second typical attack developed.

I am satisfied that none of the attacks could have been anything but true measles—certainly neither german measles nor scarlet fever. If the sister had not developed a second attack I should have suspected that I had made a mistake over the boy's first attack.—I am, etc.,

Freshwater, I.W.

P. A. KNILL JONES.

Neon Lighting in Hospitals

SIR,—Though in his letter (*Journal*, March 12, p. 666) Dr. William B. Bacon may have been mistaken in referring to fluorescent lighting as neon lighting, I readily endorse his poor opinion of it. With regard to the letter of Mr. C. F. Share (*Journal*, April 30, p. 1093), until recently I was working in a new twin theatre unit in the U.K. which was opened only last summer, and the design of which must have been the subject of close scrutiny by the architects of both the Ministry of Health and the metropolitan regional board concerned. The expenditure on its construction and equipment was lavish to an extreme degree. No daylight was

permitted in the operating theatres because of the alleged loss of heat through glass windows; the floor and lower half of the walls were lined with green terrazzo, and the ceiling and upper part of the walls were painted green. The only lighting in the actual theatre, apart from the central operating light, was provided by fluorescent tubes in the ceiling cornices, and the result was disastrous, being a worry to the anaesthetist and a danger to the patient. How much of this colour distortion could be attributed to reflection from the ceiling and walls, or how much was due to the colour of light from the fluorescent tubes, I could not be certain, but, judging from the position in the anaesthetic rooms, where a window was provided, I would lay the blame on both factors.

We have no need to simulate daylight over its whole colour range, but we are interested primarily in the red-pink part of the spectrum, and I have yet to be shown that for this an incandescent light can be improved upon. Could a lighting engineer corroborate this? We do need more direct and precise information and not second-hand administrative opinions.—I am, etc.,

Ibadan, Nigeria.

M. W. GLOSSOP.

Anterior Tibial Syndrome Following Arterial Embolism

SIR,—In his interesting article Dr. D. C. Watson (*Journal*, June 11, p. 1412) describes two cases of the anterior tibial syndrome following arterial embolism.

A similar case occurred some months ago in a middle-aged man who had suffered an acute myocardial infarct a few days previously. He had experienced severe pain in the front of the right leg. On admission to hospital he had a patch of icy cold and pallid skin overlying the anterior tibial compartment. The ankle pulses could not be felt, and dorsiflexion of the foot was impossible. He was treated with anticoagulants and also intra-arterial tolazoline. This was noted to produce a diffuse flush to the limb, but more particularly to the area of skin overlying the anterior tibial muscles. This area eventually became persistently flushed and eventually an area of demarcation formed, with eventual sloughing of the whole of the overlying skin. It was considered that an embolus from an endomural clot in the heart had been responsible for the entire damage, but the vasodilator may have caused excessive swelling in the anterior tibial compartment, and contributed to the local necrosis. The patient ultimately succumbed to another acute myocardial infarct.—I am, etc.,

Dewsbury, Yorks.

GODFREY B. TAIT.

B Vitamins in Toxic States

SIR,—I should be grateful if you would allow me to comment upon your annotation (*Journal*, June 11, p. 1421). In spite of the obvious advantage of applying a polyvalent concept to the cause of disease, Pasteur's idea of a "single aetiological agent" still largely dominates our thinking in medicine, although single causative factors have failed to explain fully even the aetiology of microbial diseases. Thus you reason that actual, or threatened, deficiency states form the only theoretically valid indication for vitamins of the B complex to be applied. Following this trend of thought you consider it unlikely that true deficiencies could arise in acute toxic states, as only prolonged deprivation can produce vitamin B deficiencies. In support of this view you quote the well-known observation that it takes several years before vitamin B₁₂ deficiency becomes manifest after total gastrectomy. But Mollin and Ross¹ have shown that in patients suffering from pernicious anaemia the serum vitamin B₁₂ levels may be below normal for at least 1 to 2 years before a definitely abnormal blood picture can be found. As the tissues of a healthy adult may contain 1,000–2,000 micrograms of vitamin B₁₂,² during the latent period between total gastrectomy and clinical manifestations of vitamin B₁₂ deficiency these reserves, mainly from the liver, will be utilized. Indeed, Pitney and Beard³ showed that, whilst the serum levels of vitamin B₁₂ became subnormal only between 8–16 months after total gastrectomy, it is wise to

assume a state of vitamin B₁₂ deficiency from the day of total gastrectomy.

I find also some difficulty in accepting your presentation of the use of B vitamins in liver diseases, though I am in agreement with you that no definite relation has been found as yet between liver disease and B vitamins. I may perhaps recall the manifold functions of the liver cell in storing glycogen, proteins, and also vitamins; as it happened, medical experience invoked glucose and protein administration in turn for the treatment of liver diseases during the past few decades—perhaps with little scientific justification. It is also probable that the success claimed by Ralli *et al.*⁴ in severe liver cirrhosis with ascites after intravenous administration of large doses of potent liver extracts was due to its high vitamin B₁₂ content, which enhanced the regeneration of the still intact liver cells. Even before Latner's publication⁵ I—and probably others—found B vitamins intravenously administered useful in such a desperate condition like acute hepatic failure. As to your remark on Reynell's⁶ results, he gave B vitamins not intravenously but by mouth and in experimental liver failure in rats. Moreover, he very cautiously commented on the extensive metabolic effects of liver injury. Similarly both Colwell⁷ and Campbell and Pruitt⁸ found in infective hepatitis a more rapid return to normal appetite after vitamin B₁₂ administration. As the therapy of infective hepatitis consists mainly of a diet rich in proteins and carbohydrates, quick recovery of the patient will obviously be accelerated by a quick restoration of his appetite. It appears therefore that, whilst in your opinion "there is little theoretical justification for their use," the ill patient is greatly helped by those B vitamins.

Lastly, Sir, B vitamins have been used with great success by many of us in severe and less severe toxic states. Together with Mr. R. S. Corbett and others, we gave large doses of B vitamins included in the drip as a routine in cases of post-operative confusional states since 1941 and the results were very satisfactory. There is no need to go into further details about the manifold application of B vitamins in other toxic states, as impressive accounts have recently been published by Gould.⁹—I am, etc.,

London, W.1.

Z. A. LEITNER.

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Coma Following Dental "Gas"

SIR,—Dr. J. G. Bourne (*Journal*, May 14, p. 1223) wishes to discover the cause, nature, and incidence of failure immediately to regain consciousness after nitrous oxide gas has been administered. Curiously enough, Dr. Bourne has supplied his own answer when he states at the end of the first paragraph that "the nitrous oxide is almost always given with oxygen, though, of course, the oxygen is very much restricted."

It is not, and never has been, permissible to produce anaesthesia with nitrous oxide, or any other agent for that matter, by reducing the oxygen content of the mixture below atmospheric concentrations. In days gone by, this was frequently the only way in which it was possible to obtain unconsciousness with nitrous oxide for dental procedures in the unpremedicated out-patient. To-day we have at our disposal a variety of supplementary agents which can be added in small doses to the nitrous-oxide-oxygen mixture, reinforcing it in such a way as to induce anaesthesia without the necessity of restricting oxygen, and yet not interfering with the speed of recovery and the patient's ability to return home. One of a variety of such supplementary agents available is trichlorethylene, which I have personally used as an adjuvant to nitrous oxide in many hundreds of dental out-patients with most gratifying results.

I am quite certain that there is no inherent property in nitrous oxide which will produce post-anaesthetic coma as long as nitrous oxide "anaesthesia" is induced and not nitrous oxide "asphyxia." The tendency of "very much restricting the oxygen" must be absolutely resisted.—I am, etc.,

Saskatoon, Canada.

GORDON M. WYANT.

"Half-minute" Thermometers

SIR,—Referring to Sir Henry Tidy's letter (*Journal*, June 11, p. 1426), isn't it about time this misleading and dangerous inscription was forbidden by law as are much less important inscriptions on food labels? As life or death may depend on correct temperature recording, it is really shocking that so little attention is given to it. In one large hospital I know temperature-taking is left to the student nurses, as it probably is in many others too, and to see them flicking thermometers in and out of patients' mouths is really laughable if it was not so serious. When I pointed out the futility of this procedure I was told: "Well, the thermometers are marked half-minute, and that is all the time we are allowed for taking temperatures."—I am, etc.,

Gosport, Hants.

G. W. FLEMING.

Press Publicity

SIR,—From time to time the Medical Defence Union are approached by members who have been affronted by the unauthorized and unwanted use of their names in the lay press. Only too often it is necessary to advise that there is no legal remedy. However, in the issue of the *People* of January 9 last there appeared, under the headline "Man's Heart Patched in Hospital Miracle," an account of an operation performed by a thoracic surgeon at the Churchill Hospital, Oxford. Not only did the surgeon in this case object to the unauthorized use of his name and to certain inaccuracies in the article, but perhaps still more unfortunate in his eyes was the fact that the tone of the article was such as to rouse unfair hopes in the minds of patients who might think he could perform similar "miracles" on them. In this case action was possible, for the article was libellous: proceedings were accordingly instituted and a correction and apology appeared in the issue of the *People* of April 24.—I am, etc.,

London, W.C.1.

ROBT. FORBES,
Secretary, Medical Defence Union.

POINTS FROM LETTERS

Swallowed Open Safety-pin

Dr. A. Fry (London, S.E.25) writes: Reading the recent correspondence in the *Journal* about swallowed hair-grips reminded me about a case which I had some years which may be of some interest. A female baby, aged 9 months, was brought with a history of having swallowed an open safety-pin. An x-ray film of the abdomen showed the open safety-pin present in the left lumbar area—probably in the stomach—with its angle downward and pointed end upward. There were no symptoms. Three days later the safety-pin was seen in the right iliac fossa—probably caecum. The pointed end was directed upwards. No aperients or other treatment was given. The following day the open safety-pin passed through the anus without any incident. It is remarkable that such a difficult foreign body should pass through the whole gastro-intestinal tract without any complications.

Forward Looking

Dr. REGINALD FISHER (Kings Langley) writes: Perhaps this case may be worth recording. A patient, who has suffered from arthritis of the spine for several years, has been fitted with a plastic jacket support which fixes the spine, both lumbar and cervical, and keeps her chin up. This relieved her pain but she could not see the ground nearer than 8 ft. (2.4 m.) from her feet, which made her walking difficult and uncertain, more so as she is of a nervous disposition. I thought that a prismatic lens in her spectacles might bring her line of sight nearer her toes. Mr. Hope Gunning kindly calculated the lenses required and Messrs. Clement Clarke made the spectacles, which have helped her a good deal. She now walks about with confidence. I had not heard of this complication before and perhaps others also may not have done. The prisms for distance were 5D base down and for reading 15D base down.

Obituary

D. B. BLACKLOCK, C.M.G., M.D.,
D.P.H., D.T.M.

We record with regret the death at his home at Mawnan, Cornwall, on June 10 of Professor D. B. Blacklock, who was professor of tropical hygiene in the University of Liverpool from 1934 to 1945. He had previously occupied the chair of tropical diseases of Africa and the chair of parasitology in the university. He was 77 years of age.

Donald Breadalbane Blacklock was born at Oban, Argyllshire, on January 7, 1879, the son of the Rev. John Blacklock, a minister of the Presbyterian Church. He was educated at Fettes College and at Edinburgh University, where, after a distinguished career both in studies and in sport, he graduated M.B., Ch.B. in 1902, proceeding to the M.D. in 1909. He took the Diploma in Public Health (London) in 1907, and the Diploma in Tropical Medicine (Liverpool) in 1911, when he was appointed research assistant to the Liverpool School of Tropical Medicine's research laboratory at Runcorn, then under the directorship of Warrington Yorke. He worked at the Runcorn laboratory until 1914, when he was appointed, first, director of the laboratory, and, later, lecturer in parasitology to the Liverpool School, where Warrington Yorke had recently been appointed Walter Myers professor of parasitology. During the first world war Blacklock served in the R.A.M.C. from 1915 until 1919. With the rank of lieutenant he was medical officer in charge of malaria wards at the Belmont Road auxiliary military hospital from 1916 to 1918, where he worked under the late Professor (temporary lieutenant-colonel) J. W. W. Stephens, F.R.S.; from 1918 to 1919 he held the rank of captain.

In 1921, when the Sir Alfred Lewis Jones Research Laboratory was opened by the Liverpool School at Freetown, Sierra Leone, Blacklock was created professor of tropical diseases of Africa by the University of Liverpool and was appointed the first director of the laboratory. He worked at Freetown for eight years, during which time he built up and established the laboratory on a firm and stable footing, and carried out and directed a very large volume of research, including work on beriberi, schistosomiasis, malaria, trypanosomiasis, goitre, *Onchocerca volvulus*, and metazoan immunity (for which a three-years' grant was made by the Empire Marketing Board), as well as carrying out a survey of the diseases of Sierra Leone on behalf of the Sierra Leone Government. His most noteworthy achievement was the proof that *O. volvulus* is transmitted to man by *Simulium damnosum*, a small biting fly. This for the first time allowed methods of control to be applied to a disease which causes much suffering in many parts of the tropical world. In 1929 he returned to Liverpool from Freetown, to succeed Professor Yorke in the



[Elliott & Fry]

Walter Myers chair of parasitology, a position which he held until 1934, when he was appointed the first holder of the newly established chair of tropical hygiene. On his retirement from the chair in 1945 the title of emeritus professor was conferred upon him.

In the second world war Blacklock was called upon by the Government in 1940 to undertake a special mission in Sierra Leone to investigate certain problems of malaria which had arisen there under war conditions. With the rank of surgeon-captain in the R.N.V.R., and at the same time holding an appointment as senior medical officer (special mission) under the government of Sierra Leone, he carried out investigations from August, 1940, until October, 1941. The work was eminently successful, and in 1942, in recognition of his notable services, he was appointed C.M.G. In September, 1945, after being in charge of the Liverpool School of Tropical Medicine for two years and four months, following the death of Professor Warrington Yorke, its previous director, Blacklock retired under the age limit. He was presented with the Mary Kingsley medal by the school in 1949.

He took part in the school's 32nd expedition, despatched in 1914 to Sierra Leone to study sleeping sickness and other diseases. In 1935 he was awarded a Leverhulme research fellowship to carry out "a study of the present practice of hygiene (including rural hygiene) in certain Eastern countries." Accompanied by his wife, who held a similar fellowship for "a comparative study of the organization for the improvement of health of women and children in Eastern countries," he visited China, Malaya, Burma, India, Ceylon, and Palestine on a tour which lasted from July, 1935, to January, 1936. When he retired from the chair of tropical hygiene in the Liverpool School of Tropical Medicine in 1945, after an association with the school lasting 34 years, he went to live in the West country.

Blacklock's clear and incisive mind marked him out as an excellent lecturer, and his textbook, *A Guide to Human Parasitology*, written in collaboration with T. Southwell, has gone through many editions, and bears witness to his powers as a teacher. A member of the British Medical Association for nearly 50 years, he was twice president of the Sierra Leone Branch (1923-5 and 1926-7). Earlier, he acted as one of the honorary secretaries of the Section of Tropical Medicine at the Liverpool Annual Meeting of the Association in 1912, and at Cambridge in 1920 he served as a vice-president of the same section.

In 1922 he married Dr. Mary Georgina Thompson, of Bellaghy, Co. Derry, whose work in medicine both at home and overseas was recognized by the Government in 1945 by her appointment as C.B.E. Mrs. Blacklock survives him. There are no children.

Professor G. MACDONALD writes: Blacklock enjoyed adventure, and he had plenty in the discovery of Africa both in the physical and medical senses. He was one of the most travelled persons in West Africa at a time when to travel was to walk and to be out of touch for long periods. He was fascinated by the country and its people and by the people's lives, habits, and humour. But most particularly he was fascinated by the riddle of the diseases which beset them, for even the broad outline of their pattern of incidence was almost unknown, and in many cases there were great gaps in our knowledge of aetiology, transmission, and epidemiology. His fascination led to many studies: a medical survey of the protectorate in which he took serological and cultural techniques to the remote village; researches on malaria, blackwater fever, schistosomiasis, trypanosomiasis, and other conditions, and experiments in

village sanitation in the almost unknown hinterland. In all of these he added to knowledge, but running through the diversity of interests there was one main stream of work—the study of *Onchocerca volvulus* and its transmission, which all the world now knows, through him, is by flies of the genus *Simulium*. His conviction of its importance at a time when most disregarded it completely anticipated the present estimation; his studies were necessarily largely carried out in almost inaccessible places and in temporary camps with limited equipment, but their design, the form of the work over several years, and the demonstration of findings were as precise as those of any purely laboratory experiment. This was his major single contribution to knowledge which entitles him to an honourable place among the pioneers of tropical medicine, for it was a brilliant work carried out under arduous conditions demanding the highest intellectual and technical ability. However, his establishment and management of the first British permanent medical research laboratory in Africa was in the end probably equally important; it led to the accumulation of much knowledge of which he was the origin though not necessarily the author. Those who worked with him in it will always remember his high intellectual stature, his warm-heartedness, and his good will to all whom he thought sincere. They remember too the support which Mrs. Blacklock gave him in his life and work and their joint kindness to all with whom they came into contact. The Blacklocks, by their scientific work, introduction of concepts of maternal and child care, and generous natures, left an indelible memory in a very wide circle of friends, African and European, who will sympathize very deeply with Mrs. Blacklock in her loss.

C. E. RHODES, M.B., B.S.

We record with regret the death on June 16 of Surgeon Lieutenant C. E. Rhodes at the age of 27. He lost his life in circumstances of great gallantry. Surgeon Lieutenant Rhodes, a National Service medical officer in the R.N.V.R., was serving in H.M.S. *Maidstone*, a submarine depot ship lying in Portland Harbour. When an explosion occurred in H.M. Submarine *Sidon*, which was alongside the *Maidstone*, he immediately boarded the submarine and without hesitation went below to help the injured. He succeeded in rescuing at least one of the crew, but when the order was given to abandon the sinking submarine he did not return. In the words of a colleague, "Either he never heard that order or he chose, true to his calling, to stay below tending the injured." The *Sidon* sank some twenty minutes after the explosion. Charles Eric Rhodes was born at Whitworth on April 3, 1928. He received his medical training at the London Hospital and qualified M.R.C.S., L.R.C.P. in 1952, taking the London degrees of M.B., B.S. in the same year. He then held the appointments of house-physician at the London Hospital and house-surgeon at Harold Wood Hospital before entering the R.N.V.R. as a temporary surgeon lieutenant on December 31, 1953, for the period of full-time national service. After a short time at R.N. Barracks, Portsmouth, he was appointed to H.M.S. *Maidstone* on February 8, 1954. He was sports officer of the depot ship and a keen yachtsman. He leaves a widow and a three-weeks-old daughter.

Dr. A. E. CLARK-KENNEDY writes: Rhodes was a student when I was dean of the London Hospital Medical College, and when he qualified he became my house-physician. So it was my privilege to know him well, and the good fortune of others to know him well, too. For through his personality he left his mark on the College, and, had this disaster never happened, he would still have been among those we all remember and always rejoice to meet again. Why was he so much liked? For his ready willingness to help others,

I think; for his kindly tolerance of incompetence in the beginner; for his ever readiness to organize activities so that others might enjoy themselves; for his ability as a leader often of the lesser men; for his quiet competence in getting things done; for his love of helping others to do the many things which he so rightly thought worth while doing himself. Reasons such as these led him to become the first non-playing secretary of rugby and, although exceedingly short-sighted, a pillar of the second fifteen. All in the know agree that our present high standard at the game is largely due to his energy and enthusiasm. But his intimate friends will remember him, not on the rugby field, rather on summer seas; in a dinghy instructing a beginner in the art on the estuary at Burnham, or more than pulling his weight in a larger boat on some ocean race. Quietly he organized me. His patients loved him, and he was always ready to give a helping hand to the diffident clerk. Intellectually he was not exceptional, but what mattered that? Far more important his energy and enthusiasm for everything he touched turned him into a first-class all-round doctor, and, had he lived, he would have found his rightful place among the *élite* of general practitioners. But that was not to be. His love of the sea took him, when the time came, into the Navy, and when the call came he did exactly what, as so many have said to me, they would have expected Rhodes to do under the circumstances with which he was so suddenly confronted. So he died true to the profession in which he had so recently started, true to the tradition of the Navy in which he was privileged temporarily to serve, above all true to himself as a man and to the sea on which his heart was set. The deepest sympathy of all at the London go out to his widow in her pride and her distress.

With the death of Dr. ARTHUR DAVIDSON on January 20 the medical profession in Australia, and in New South Wales in particular, has lost one of its most energetic workers and wisest counsellors. A member of the council of the New South Wales Branch of the British Medical Association from 1930 to 1946, he will be remembered by members of the United Kingdom delegation to the 103rd Annual Meeting of the Association at Melbourne in 1955 as the president of the Branch which first welcomed them on their arrival at Sydney. Born in October, 1891, Arthur Madgwick Davidson was educated at Brisbane Grammar School and at Sydney University, where he graduated M.B., Ch.M., in 1915. After active service with the Australian Imperial Force in the first world war, during which he was mentioned in dispatches and, in 1919, appointed O.B.E., he established the general practice at Enmore, New South Wales, which he was to serve until his death. Service was, indeed, the keynote of his career; he became honorary surgeon to the Marrickville District Hospital, honorary obstetrician to the Bethesda Hospital, senior medical officer to the Braeside Maternity Hospital, and honorary medical officer to the Moore Theological College, in addition to a variety of other appointments of a public nature. It was inevitable that a man of such tireless energy and attainments should acquire a most successful practice. Dr. Davidson had the ability both to think and to speak clearly and logically, and this ability enabled him to give opinions which were invariably sound and criticisms which were always constructive, qualities which were particularly valued by his colleagues of the Australasian Medical Publishing Company—the publishers of the *Medical Journal of Australia*—of which he was a director for a number of years. These qualities, coupled with his ready grasp of financial affairs and his experience of the problems of general practice, led to his being largely responsible for the formation of the British Medical Agency in New South Wales, and almost wholly responsible for the organization of Medical Finance, Ltd., a company formed with the object of assisting young graduates returning from service in the second world war to enter practice. Dr. Davidson leaves a widow, two daughters, and three sons, two of whom are members of the medical profession.

Dr. H. C. S. WOODWARD died in a Coventry hospital on March 22 at the age of 86. Born on July 15, 1868, the son of Canon Matthew Woodward, of Folkestone, Herbert Croker Sperling Woodward was educated at St. Edward's School, Oxford, and at Downing College, Cambridge, receiving his clinical training at St. Thomas's Hospital. At Cambridge he was junior demonstrator of anatomy for a time, and after graduating M.B., B.C. in 1903 he held the appointment of house-physician at the Victoria Hospital for Children, Chelsea. In 1904 he entered general practice at Worksop, Nottinghamshire, becoming also honorary assistant surgeon to the local Victoria Hospital and medical officer to the Post Office. He settled at Kingston Bagpuize, near Abingdon, Berkshire, in 1907, and there he was appointed district medical officer and public vaccinator. When he retired from practice in 1933 he continued to live in the same village and often took posts as a locumtenent, mainly for colleagues in the neighbouring counties. Dr. Woodward will be remembered by those who knew him as a fine example of a professional man of the old school. He leaves a widow and two sons.

The death has occurred in Edinburgh at the age of 73 of Dr. POLLOK DONALD, who was in medical practice at Leith for over 35 years. Pollok Donald was born on November 12, 1881, and was educated at George Watson's College and at Edinburgh University, where he graduated M.B., Ch.B. in 1907. Six years later he obtained the Manchester D.P.H. After serving as house-physician at Leith Hospital, he took up an appointment under the late Sir James Mackenzie in Burnley. During the first world war he served with the R.A.M.C. in Greece, and on demobilization he joined his father, the late Dr. George Donald, in practice at Leith, and continued to work there until his retirement last year. He succeeded his father as parish doctor to North Leith, and was visiting physician to the Poor House Hospital at Seafeld, now the Eastern General Hospital. He was on the board of management of Leith Hospital, and during the last war he was keenly interested in Civil Defence and commanded a first-aid unit.

Dr. C. C. ROBSON writes: As one who was privileged to be a close friend of the late Dr. Donald for the last thirty years, I was in a position to appreciate fully the richness of his character and the sincerity of his nature, which so endeared him to his many patients and friends. Throughout his long career of practice in Leith he was ever the wise and kindly counsellor, and the well-known term "family doctor" could be applied to Dr. Donald in the fullest and most lovable sense. His wide knowledge of medicine and of world affairs enriched his friends, and, as this knowledge was linked with an innate modesty and shyness, one seemed to value his advice all the more. When on holiday his favourite pursuits were golf and fishing, and he was also a water-colour painter of considerable merit. He practised all of these pleasures with a lightheartedness which made him the ideal holiday companion. After a long and distressing illness borne with that fortitude which one could expect from such a fine man, Dr. Donald has left behind him a memory which will live long in the minds of his many patients and friends, by whom he will be sadly missed. To his wife, to his son who has succeeded in the practice, and to his daughters is extended the fullest measure of sympathy in their irreparable loss.

The death occurred on June 2 of Dr. E. R. WEIR, who practised in Glasgow for many years. He was 81 years of age. Edward Roberts Weir was born on October 4, 1873, and was educated at Glasgow University, where he graduated M.B., Ch.B. in 1897. Two years later he obtained the Edinburgh degree of B.Sc. in public health. After graduation he held appointments at the Kennedy Street and Belvidere branches of the City of Glasgow Fever Hospital. Later, he worked in the Glasgow public health service before entering general practice in Glasgow, becoming also an assistant physician to H.M. prison at Barlinnie. Towards the end of the first world war he left Glasgow for Innellan.

Medical Notes in Parliament

Poliomyelitis Vaccine Trials Deferred

It has been decided to postpone trials in this country with the American poliomyelitis vaccine following the Medical Research Council's investigation of the Cutter vaccine incident. This decision was made known on June 17 by the Minister of Health in a written reply to Mr. D. W. WADE (Huddersfield, West, Lib.).

Mr. IAIN MACLEOD stated that a member of the staff of the Medical Research Council had just returned from a visit to the United States, where he had been studying the latest developments. No explanation for the Cutter vaccine incident had yet been found, but it was possible that certain batches contained live virus. He understood that the safety tests to be applied to the vaccine in the United States had been greatly multiplied, including a closer control of manufacturing processes. Pending the introduction and application of similar measures here, the Medical Research Council had, he understood, postponed the start of any field trials. This would probably involve a postponement until the late autumn of this year—that is, until after the normal epidemic season for the disease. There were a number of questions arising out of the production and use of poliomyelitis vaccine in this country, and its possible export abroad, such as the determination of the age groups to which the vaccine should be offered when mass immunization was possible. The Secretary of State for Scotland and he were asking the Central and Scottish Health Services Councils to advise them upon this and similar matters.

Mr. A. BLENKINSOP (Newcastle-upon-Tyne, East, Lab.), questioning the Minister about this decision on June 20, said that all welcomed the fact that they were to proceed with care and proper research before using the vaccine, and asked if the Minister was satisfied with the facilities and provision of appliances for the research. Mr. MACLEOD said that was one of the matters on which the Medical Research Council would advise. Mr. SOMERVILLE HASTINGS (Barking, Lab.) asked if the vaccine was still being manufactured here by the two firms the Minister had named. Mr. MACLEOD replied that he thought it was only in active production by one of them.

Heroin Addicts

The HOME SECRETARY informed Mr. SOMERVILLE HASTINGS (Barking, Lab.) on June 16 that 52 heroin addicts were known in England and Wales and two in Scotland. There were no persons in respect of whom addiction was suspected but not proved. Drug addiction was not compulsorily notifiable, but he had no ground for thinking that there was any substantial hidden addiction. From January 1, 1950, to date, 23 persons were convicted in respect of 24 offences involving heroin, one person having been convicted twice. Of these 23 persons, 15 were known heroin addicts and one person, who had since left the country, was suspected to be addicted to the drug.

The number of convictions for offences involving heroin since 1950 had been:

1950—3	persons convicted, all addicts.
1951—4	" " , of whom 2 were addicts.
1952—2	" " , of whom 1 was an addict and 1 a suspected addict.
1953—5	" " , of whom 3 were addicts.
1954—7	" " , (1 of them twice), of whom 3 were addicts.
1955—3	" " , of whom all 3 were addicts.

Price Reductions of Drugs

Mr. A. BLENKINSOP (Newcastle-upon-Tyne, East, Lab.) asked the Minister of Health whether he would give information regarding recent voluntary reductions of prices of proprietary and basic drugs and dressings prescribed under the Health Service. Mr. MACLEOD replied on June 17 that since May, 1953, of the 73 most expensive and frequently

Argyllshire, and from 1925 to 1932, when he returned to Glasgow, he was in practice at Dunoon, where he was also medical officer to the Duncutha and King Street Homes and to the Post Office. In his younger days Dr. Weir was a keen golfer, and up to the end of his life enjoyed a game of bowls. He took a considerable interest in politics, and he was a great lover of English literature, being widely read in Scott, Dickens, and R. L. Stevenson. By his death there has passed away a lovable and happy personality, and those who knew him best miss him most.—J. C.

Dr. J. J. SILKE, a well-known general practitioner of Sutton Coldfield and the Erdington district of Birmingham, died suddenly in Queen Elizabeth Hospital, Birmingham, on June 2 at the age of 53. James Joseph Silke was born on August 22, 1901, and graduated M.B., B.Ch. from the National University of Ireland in 1924. He was demonstrator in anatomy and physiology at University College, Dublin, and, later, house-surgeon at St. Vincent's Hospital and Dispensary, Dublin. He then came to England and was in practice at York from 1927 to 1933, when he moved to Coventry. In 1937 he settled at New Oscott, Erdington, where he remained in practice for the rest of his life. During the second world war Dr. Silke served as a medical officer in the Home Guard, and the local first-aid organizations and industrial ambulance services also received his whole-hearted support. A staunch Roman Catholic, he was a past president of the City of Birmingham Circle of the Catenian Association. In his younger days Dr. Silke was a notable athlete, winning a number of Irish sprint championships, and he also played Rugby football as a member of the Irish trial fifteen. He leaves a widow and two young children.

The obituary of Professor PETER PATERSON was printed in the *Journal* of March 19 (p. 735). Dr. GEORGE A. GRAND-SOULT writes from British Guiana: I should like to record my humble tribute—belated because I am several thousand miles away—to Professor Peter Paterson, an able surgeon and excellent teacher. I was one of his students before the first world war, and in the early days of the war was honoured when he made me his outdoor house-surgeon, during which period I acquired much knowledge from him and his assistant, the late Mr. Milne McIntyre. These two (P. P. and M. M., as they were endearingly spoken of) will always be revered by their students, many of them now scattered over the surface of the globe.

Medico-Legal

AMERICAN RESOLUTION ON A.I.D.

The following statement was approved by the American Society for the Study of Fertility at a meeting held in Atlantic City on June 4. The Society has a membership of 500 specialists.

"If it is in harmony with the beliefs of the couple and the doctor, donor artificial insemination is a completely ethical, moral, and desirable form of medical therapy.

"Conditions under which donor artificial insemination is acceptable include: (1) Urgent desire of the couple to have such therapy applied to the solution of their infertility problems. (2) Careful selection by the physician of a biologically and genetically satisfactory donor. (3) The opinion of the physician, after thorough study, that the couple will make desirable parents.

"Those physicians who have carried out donor insemination for several decades can attest that in many cases it is a more desirable procedure for acquiring a family than adoption. One great advantage of donor insemination is that it provides the opportunity for the husband to share the months of his wife's pregnancy and her childbirth. From observation over many years the membership is impressed by the almost universal good results achieved in respect to children and the entire family unit. The fact that, in some instances, patients have returned for as many as four children by donor insemination is further proof of the happiness it bestows."

prescribed proprietary preparations, 29 had been reduced in price (many by between 20% and 50%), some of these reductions reflecting in part reductions in the basic drug prices. In addition, special provisional reductions (mentioned in a reply on January 31), ranging up to 20%, were recently arranged with manufacturers in the prices of 19 proprietary preparations. During the same period the prices of certain important basic drugs and their corresponding products had been reduced, some of them several times. These voluntary reductions include some recent ones (since June, 1954), ranging up to 20%, in the prices of penicillin, streptomycin, chloramphenicol, hormone, and vitamin products. There had been no recent reductions in the prices of the main types of surgical dressings used in the Health Service.

A Birmingham Doctor's Action

Mr. J. BAIRD (Wolverhampton, North-east, Lab.) asked the Minister of Health on June 20 what position Dr. Brian Taylor, of Birmingham, held under the Health Service. Mr. MACLEOD said it was that of a part-time consultant to the Board of Governors of the United Birmingham Hospitals and to the Birmingham Regional Hospital Board.

Mr. BAIRD said that one of his constituents, a footplate-man who was on strike, whose wife was a patient of the doctor, received a letter from him saying, "I am afraid my principles prevent me from seeing patients on strike, except in cases of emergency. Do you mind postponing the visit with your wife? If you will phone for an appointment when the strike is over I will try to fix a convenient date." Was the attitude of the doctor not completely unethical, and was this not a case of political discrimination? Would the Minister ensure that the doctor changed his principles or that his name was withdrawn from the list?

Mr. MACLEOD said that Mr. Baird knew of the difficulty he was in. If there was any question of a breach of contract within the Service that was a matter for which he was answerable and which he would be glad to answer. The question of medical etiquette was not for him, nor was the matter of the private arrangements a doctor might wish to make with his private patients.

Mr. BAIRD said that the doctor had said that his principles did not allow him to see these people. Surely his principles must operate in the Health Service as a whole. What he was saying was that he would never see a patient on strike. Mr. MACLEOD said equally there was a matter of principle in his reply. He could not answer on matters for which there was no Ministerial responsibility. Mr. HERBERT MORRISON (Lewisham, South, Lab.) asked the Minister to consider whether a medical practitioner who made this discrimination about a man who was on strike—and on official strike—was suitable to be practising in the Health Service. Mr. MACLEOD said he did not think he could go beyond what he had said. He did not make the rules of the House, and if there was a matter in which there was no Ministerial responsibility he did not see how he could offer comment on it in the House. Mr. BAIRD gave notice that he would raise the matter again.

Mental Defectives and Sexual Acts

Mr. KENNETH ROBINSON (St. Pancras, North, Lab.) asked the Minister of Health why, under Circular H.M.(55)46, of May 10, 1955, he now required the police to be informed of sexual acts by certified mental defectives, in addition to the normal report to the Board of Control; whether he was aware that medical superintendents had been informed by his department that such reports to the police were still discretionary; and if he would revert to the earlier procedure by withdrawing the circular. Mr. MACLEOD stated that the circular was issued after consultation with the Home Secretary because the earlier procedure, which had only been in force since 1951, did not have sufficient regard to the duty of the police to investigate criminal offences. The circular advised but did not require cases to be reported to the police. He was aware of no good reason for its withdrawal.

Mr. ROBINSON observed that the Minister was surely not suggesting that the police should prosecute in cases like this. The old arrangement had been working satisfactorily. Why did the Minister want to place this additional obligation on medical superintendents? Mr. MACLEOD explained that there were cases which, under the 1913 Act, were criminal offences which came within the terms of the circular. They were getting back to the practice that applied before 1951. This was a matter of doctor-patient relationship, and the final decision whether the police should be notified was left with the medical superintendent.

Hospital Medical Officers.—In May, 1954, the latest date for which detailed information is available, there were 2,266 senior hospital medical officers in England and Wales.

Chiropody Service.—In Scotland 11 local health authorities are employing chiropodists to provide a service for old people, and nine others are making contributions to voluntary bodies who do so. In addition, many more voluntary bodies are undertaking the work with contributions from local authorities.

Vital Statistics

Infectious Diseases

Infectious diseases were less prevalent in England and Wales during the week ending June 4; the falls in the number of notifications included 873 for measles, from 25,470 to 24,597, 581 for dysentery, from 1,385 to 804, 252 for whooping-cough, from 1,455 to 1,203, 165 for scarlet fever, from 609 to 444, and 39 for acute pneumonia, from 423 to 384.

The largest falls in the incidence of measles were 584 in Yorkshire West Riding, from 2,092 to 1,508, 305 in Staffordshire, from 1,135 to 830, 259 in Kent, from 1,551 to 1,292, 238 in Leicestershire, from 1,480 to 1,242, 197 in Warwickshire, from 1,148 to 951, and the largest rises were 327 in Southampton, from 1,204 to 1,531, 221 in Essex, from 1,345 to 1,566, 150 in Bedfordshire, from 99 to 249, 138 in Derbyshire, from 361 to 499, 137 in Devonshire, from 356 to 493, 97 in Sussex, from 670 to 767. The number of notifications of whooping-cough was the lowest for two and a half years; the largest declines during the week were 79 in Lancashire, from 143 to 64, and 60 in Yorkshire West Riding, from 125 to 65. Scarlet fever reached the lowest level for almost nine months; the largest falls were 57 in Lancashire, from 97 to 40, and 41 in Yorkshire West Riding, from 76 to 35. 7 cases of diphtheria were notified, 3 less than in the preceding week, and 3 of these cases were notified in Birmingham C.B.

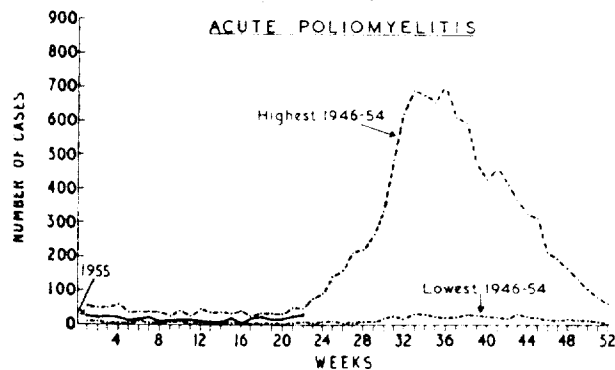
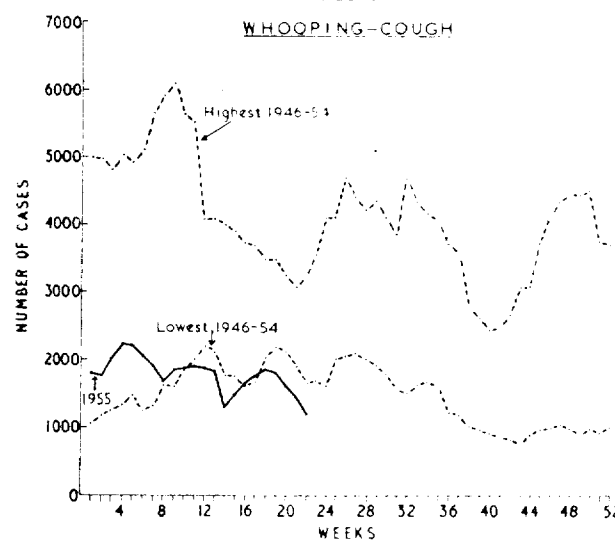
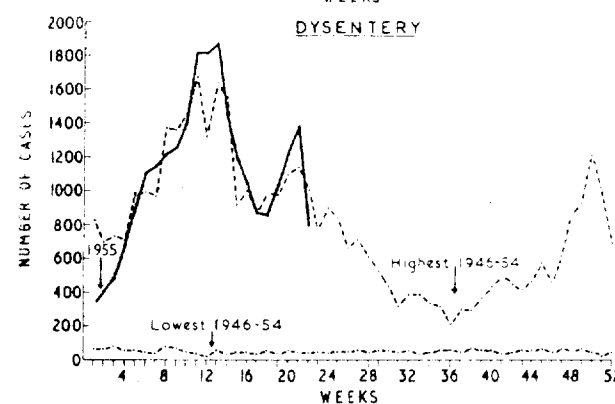
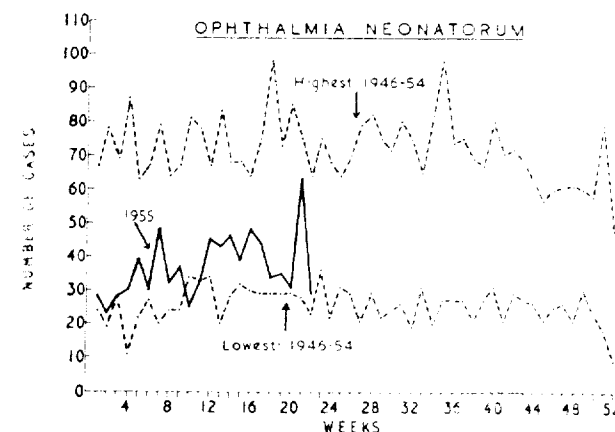
There was an increase in the week of 6 in the notified cases of acute poliomyelitis, from 25 to 31. There were 14 more for paralytic and 8 fewer for non-paralytic. The largest returns were Yorkshire West Riding 6 (Barnsley C.B. 6), Cheshire 4 (Stockport C.B. 3), London 4 (Bethnal Green 2), and Warwickshire 3 (Birmingham C.B. 3).

The number of notifications of dysentery was the lowest for 18 weeks. The largest centres of infection were Surrey 178 (Croydon C.B. 161), Lancashire 130 (Blackpool C.B. 24, Oldham C.B. 22, Manchester C.B. 16, St. Helens C.B. 13), Durham 78 (South Shields C.B. 18, Stanley U.D. 16, Seaham U.D. 10), Middlesex 50 (Heston and Isleworth M.B. 31), Yorkshire West Riding 49 (Huddersfield C.B. 22), London 47 (Southwark 10), Northumberland 39 (Newcastle-upon-Tyne C.B. 12), Cambridgeshire 28 (Cambridge M.B. 28), Norfolk 26 (Norwich C.B. 18), Yorkshire North Riding 21 (Middlesbrough C.B. 18), and Somersetshire 20 (Bath C.B. 20).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1946-54 are shown thus - - - - -, the figures for 1955 thus ———. Except for the curves showing

notifications in 1955, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending June 4 (No. 22) and corresponding week 1954.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1955					1954				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	7	1	5	0		18	0	8	0	1
Dysentery	804	47	368	25		1,017	112	266	6	2
Encephalitis, acute	1	0		0		8	0	0	0	0
Enteric fever:										
Typhoid	3	0	1	0	1	3	0	1	1	1
Paratyphoid	5	0	1	0	1	6	1	1	0	0
Food-poisoning	272	16		1		214	76	0	0	
Infective enteritis or diarrhoea under 2 years				7	6				16	25
Measles*	24,597	792	198	195	311	2,834	68	232	179	311
Meningococcal infection	24	1	15	4	1	17	1	26	0	0
Ophthalmia neonatorum	29	2	12	0		37	2	6	0	
Pneumonia†	384	18	187	14		417	19	140	6	1
Poliomyelitis, acute:										
Paralytic	26	4	0	5	1	25	1	0	5	0
Non-paralytic	5	0			2	9	0			1
Puerperal fever‡	182	38	8	2		231	51	23	0	1
Scarlet fever	444	31	79	49	34	793	52	112	31	29
Tuberculosis:										
Respiratory	532	66	147	12		809	93	140	35	8
Non-respiratory	80	9	36	1		136	5	22		
Whooping-cough	1,203	60	141	45	38	1,989	76	250	72	2

DEATHS in Great Towns	1955					1954				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	0	0		0		0	0		0	
Encephalitis, acute		0		0			0			0
Enteric fever	0	0	0	0		0	0	0	0	0
Infective enteritis or diarrhoea under 2 years	5	0	2	0	0	5	1	4	1	2
Influenza	5	1	1	0	1	4	0	0	0	0
Measles		2	0	0	0			0	0	0
Meningococcal infection		0	1				0	1		
Pneumonia	169	25	14	7	3	154	19	18	14	5
Poliomyelitis, acute	1	0		0		0	0			0
Scarlet fever		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory	65	11	16	3	7	80	11	9	1	8
Non-respiratory		0	3	0	1		1			1
Whooping-cough	2	0	1	1	0	0	0	0	0	0
Deaths 0-1 year	220	33	28	9	10	227	20	29	8	15
Deaths (excluding stillbirths)	4,910	669	575	107	149	4,714	625	571	112	150
LIVE BIRTHS	7,173	1,104	1,025	209	424	8,089	1,298	982	255	464
STILLBIRTHS	215	28	31			202	28	20		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenzal pneumonia.

‡ Includes puerperal pyrexia.

Medical News

450th Anniversary of R.C.S.Ed.—As part of the 450th anniversary celebrations of the Royal College of Surgeons of Edinburgh on June 20 and 21, the DUKE OF EDINBURGH was made an honorary Fellow of the College. Later, at the anniversary banquet he was presented with a silver replica of a bleeding-cup. A full account of the proceedings will appear in next week's issue of the *Journal*.

Golden Wedding.—Sir ROBERT and Lady HUTCHISON will celebrate the golden anniversary of their wedding on June 27, and all his old students and colleagues at the London Hospital and at the Hospital for Sick Children, Great Ormond Street, will wish to join us and their many other friends in hoping they will have a very happy day. Sir Robert Hutchison, who is a past President of the Royal College of Physicians of London, the Royal Society of Medicine, the British Paediatric Association, and the Association of Physicians of Great Britain and Ireland, is now in his 84th year. He first met Laetitia Norah Moore-Ede at the London Hospital Medical College, where she was a medical student, and they were married in 1905, the year after Dr. Moore-Ede obtained the London M.B. The singular success of this medical partnership has been a joy to all their friends.

Obstetric Medicine Research Unit at Aberdeen.—The Medical Research Council announces that, in collaboration with Aberdeen University and the North-eastern Regional Hospital Board for Scotland, it is establishing a unit for research in obstetric medicine at Aberdeen, under the honorary directorship of Professor DUGALD BAIRD. The term "obstetric medicine" in the unit's name is to indicate, in the words of the announcement, "that general health problems, of the type which are the concern of the research physician, have become as important as the surgical aspects of obstetrics." For some years now Professor Baird has headed a research team at Aberdeen which has been studying maternity problems by a combined epidemiological, clinical, and laboratory approach. The Scottish Hospitals Endowment Research Trust has promised a substantial grant to the university for the construction of a building adjoining the Aberdeen Maternity Hospital to house the unit.

Commonwealth Health and Tuberculosis Conference.—The fourth Commonwealth Health and Tuberculosis Conference was opened at the Royal Festival Hall, London, on Tuesday, June 21, and continued until Friday. Most of those present represented local authorities in the United Kingdom, but a very large number came from the British Dominions and Colonies, as well as from over 50 other countries. The Minister of Health, Mr. IAIN MACLEOD, opened the Conference. In many areas, he said, the waiting-list for tuberculosis beds had virtually disappeared and elsewhere waiting time had been substantially reduced. There were now twice as many mass radiography units operating as at the start of the National Health Service. In the future they must look more to the preventive side. The DUCHESS OF PORTLAND, chairman of council of the National Association for the Prevention of Tuberculosis, presided over the first session of the Conference, which had as its subject for discussion, "How social environment can combine with specific medical measures to prevent the disease." In later sessions child hygiene and infection and the choice of drugs in the medical and surgical treatment of tuberculosis were among the subjects discussed.

Measles Virus.—In an address at Harvard, U.S.A., last month Professor JOHN F. ENDERS, who shared the 1954 Nobel Prize for Medicine for his work on the culture of poliomyelitis virus, reported an important advance in the identification of measles virus. Using similar tissue culture

techniques, Professor Enders and his colleague Dr. T. C. PEEBLES reported in May, 1954, the successful propagation of cytopathogenic agents from the blood and throat washings of patients with typical measles (*Proc. Soc. exp. Biol.* 1954, 86, 277). These survived serial passage in cultures of human or monkey renal cells, and showed properties strongly suggesting that they were indeed measles virus. They produced a characteristic cytopathogenic effect *in vitro*, similar to that seen in the body in acute measles, and this effect was neutralized by the addition of convalescent measles serum. Further, antigen was evolved during cultivation which reacted specifically in complement fixation tests with convalescent serum. But final proof of identity was lacking. This has now been provided. Professor Enders now reports the production of clinical measles in wild cynomolgus monkeys after inoculation with tissue culture material that had undergone repeated passages *in vitro*. It was necessary to use freshly captured monkeys from the Philippine Islands as nearly all the laboratory monkeys examined were found to have measles antibody in the serum. This work may open the way to the development of a measles vaccine, particularly as so far there appears to be only one type of measles virus to contend with.

Clinic for Alcoholics.—The Society for the Study of Addiction, acting jointly with the National Association for Mental Health and the Church of England Temperance Society, has opened a clinic at 14, Gloucester Place, London, W.1 (telephone: Welbeck 5222) for the treatment of alcoholics. The clinic is staffed by a panel of doctors from the Society for the Study of Addiction, who provide their services free, and there is a full-time psychiatric social worker. Hours of attendance are from 2 to 5 p.m. on Tuesdays and Fridays, and there is no charge. Doctors referring patients to the clinic are asked to send clinical details beforehand.

New Journal on Alcoholism.—Blackwell Scientific Publications, Oxford, has just issued the first number of the *International Journal on Alcohol and Alcoholism*. It is the official organ of the International Institute for Research on Problems of Alcohol. Besides original papers in English, French, German, Italian, and Spanish, each issue will contain lists of contents of current journals on alcoholism, and it is intended to publish classified bibliographies of the world literature on special aspects of the subject. The journal will appear three times a year at an annual subscription of 30s.

Honorary Degrees at Toronto.—To mark the occasion of the joint meeting of the British, Canadian, and Ontario Medical Associations in Toronto, on June 17, the honorar LL.D. of the Toronto University was conferred on six of the participating doctors, three from Britain and three from Canada. They were Professor STANLEY GRAHAM, Dr. E. A. GREGG, Sir JOHN MCNEE, Dr. T. C. ROUTLEY, Dr. G. F. STRONG, and Dr. W. P. WARNER.

Clinical Thermometers.—On June 21 the British Standard Institution held a press conference at which the merits of the British Standard thermometer (No. 691) were stressed. The B.S. thermometer is marked "quick," "medium," or "stubby," and bears no reference to time on it.

Mementos of the War Memorial.—Picture postcards and some copies of *In Memoriam 1939-1945*, the illustrated booklet prepared for the unveiling ceremony of the War Memorial in the Court of Honour at B.M.A. House last November, are available from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1; at 6d. and 2s. 6d. each respectively (post free). Besides full-page photographs of the memorial and the individual statues with the sculptor's explanation of their symbolism, *In Memoriam* contains the names of the medical men and women of the British Empire and Commonwealth who are commemorated by the memorial.

Retirement of Coroner to Royal Household.—The retirement of Lieutenant-Colonel W. H. L. MCCARTHY as coroner to the Royal Household will take place on June 30. He

has held this position for 21 years. Educated at Trinity College, Dublin, and St. Thomas's Hospital, London, Colonel McCarthy served with distinction in the R.A.M.C. during the 1914-18 war, being awarded the D.S.O. and M.C. Later he was M.O.H. for Chelsea. Besides being medically qualified Colonel McCarthy is a barrister-at-law and a J.P.

Chairman of Royal Sanitary Institute.—Dr. A. PARKER, D.Sc., director of the Fuel Research Station of the Department for Scientific and Industrial Research, has been elected chairman of the Institute and will take office in October. Dr. Parker, whose subjects are physical chemistry and thermodynamics, has been closely connected with recent investigations into the causes of "smog."

Dr. L. G. Edey, until recently chief medical officer to the Ministry of Health, Gold Coast, and before that director of medical services there, has accepted a two-year W.H.O. appointment in Nepal. His job will be to establish a school for the training of health assistants in Katmandu.

COMING EVENTS

British Association.—The 17th annual meeting will be held this year in Bristol, August 31-September 7, under the presidency of Sir ROBERT ROBINSON, O.M., F.R.S. His presidential address will be on "Science and the Scientist." Preliminary programmes are available from the secretary, British Association for the Advancement of Science, Burlington House, London, W.1.

Vitamin E Congress.—Third International Congress in Venice, September 5-8. Details from Professor Dr. EMILIO RAVERDINO, Via Pietro Verri 4, Milan.

International Union of the Medical Press.—The second congress will be held at the Faculty of Medicine, Paris, on October 21 and 22, under the chairmanship of Professor LOEPER. Details from secretariat, I.U.M.P., 12, rue de l'Ecole de Médecine, Paris, 6^e.

NEW ISSUES

British Journal of Ophthalmology.—The new issue (Vol. 39, No. 6) is now available. The contents include:

INCIDENCE OF HUMAN INFECTION WITH ONCHOCERCIASIS IN DIFFERENT COMMUNITIES IN RELATION TO THE INCIDENCE AND TYPE OF THE OCULAR LESIONS. F. H. Budden.
SEDATION FOR OPHTHALMIC SURGERY. COMBINATION OF CHLORPROMAZINE, PROMETHAZINE, AND PETHIDINE. R. A. Burn, D. A. B. Hopkin, G. Edwards, and C. M. Jones.
BINOCULAR DIAPHRAGM. R. H. P. Fernandez, O. P. Edmonds, and T. A. Hunt.
ELECTRORETINOGRAM DURING DEVELOPMENT OF HEREDITARY RETINAL DEGENERATION IN THE DOG. H. B. Parry, Katharine Tansley, and L. C. Thomson.
KERATOME OR KNIFE INCISION FOR CATARACT. ASSESSMENT OF 180 CASES. Howard Reed.
SEX OF NUCLEI IN OCULAR TISSUES. Christopher Pedler and Norman Ashton.
CALIBRATION OF TONOMETERS. C. R. S. Jackson.
HEREDITARY POSTERIOR POLAR CATARACT WITH REPORT OF A PEDIGREE. C. G. Tulloch.
RETINAL IMAGE IN AXIAL AND REFRACTIVE AMETROPIA. Joseph I. Pascal.

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

British Journal of Preventive and Social Medicine.—The new issue (Vol. 9, No. 2) is now available. The contents include:

OBSERVATIONS ON 1,078 PERINATAL DEATHS. A. M. Stewart, J. W. Webb, and D. Hewitt.
MUSTARD GAS POISONING, CHRONIC BRONCHITIS, AND LUNG CANCER. AN INVESTIGATION INTO THE POSSIBILITY THAT POISONING BY MUSTARD GAS IN THE 1914-18 WAR MIGHT BE A FACTOR IN THE PRODUCTION OF NEOPLASIA. R. A. M. Case and A. J. Lea.
INJURIES IN THE AGED. A. J. Fisher.
SOME FEATURES OF LEUKAEMIA MORTALITY. D. Hewitt.
FERTILITY AND REPRODUCTIVE HISTORY OF MOTHERS OF MONGOLOID DEFECTIVES. A. Smith and R. G. Record.
SOCIAL MEDICINE STUDIES BASED ON CIVILIAN MEDICAL BOARD RECORDS. III. PHYSICAL AND OCCUPATIONAL CHARACTERISTICS OF MEN WITH CERTAIN SKIN DISEASES. A. M. Stewart, J. W. Webb, and D. Hewitt.
EMPLOYMENT OF RECOVERED TUBERCULOUS PATIENTS. A. Barr.
A FURTHER STUDY OF A-B-O BLOOD GROUPS AND DIFFERENTIAL FERTILITY AMONG WOMEN IN TWO AUSTRALIAN MATERNITY HOSPITALS. R. L. Kirk, J. W. Shield, N. S. Stenhouse, Lucy M. Bryce, and Rachel Jakobowicz.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

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

Monday, June 27

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. R. Bing (Alabama): Metabolism of the Heart.

Tuesday, June 28

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. P. D. Samman: Follicular Keratotic Disorders.

Wednesday, June 29

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: The Dyskeratoses.

Thursday, June 30

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. J. F. Goodwin: Mitral Valve Disease.

RENAL ASSOCIATION.—At 41, Portland Place, London, W.1, 4.30 p.m., Dr. Alexander Leaf and Dr. O. M. Wroong: Control of the Volume of the Body Fluids.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.30 p.m., otolaryngology lecture by Dr. T. A. Davies: Relationship of Syphilis to Otolaryngology.

Friday, July 1

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., radiological demonstration by Dr. J. W. Pierce.

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—3.30 p.m., Mr. Wallace Black: Congenital Deafness.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—(1) 2 p.m., Professor H. A. Magnus: Reticulosarcoma of Bone. (2) 4 p.m., Dr. W. W. Burdett: Rheumatic Carditis.

APPOINTMENTS

CROSBY, GEORGETTE, M.R.C.S., L.R.C.P., Assistant Medical Officer of Health, East Ham.
MCCARTHY, DENIS, M.B., B.Ch., Clinical Assistant at City Maternity Hospital, Gloucester.

MANCHESTER REGIONAL HOSPITAL BOARD.—P. Jewsbury, M.D., F.R.C.S., Consultant Thoracic Surgeon to Blackpool and Fyde Hospital Centre and to Northern part of the Region; G. K. Tutton, Ch.M., F.R.C.S., Consultant Neurosurgeon to Preston and Chorley Hospital Centre and to Northern part of the Region; D. A. Chadwick, M.B., Ch.B., F.F.A., R.C.S., Consultant Group Anaesthetist to North and Mid-Cheshire Hospital Centre; A. E. Smith, M.B., Ch.B., F.F.A., R.C.S., Consultant Anaesthetist, Bolton and District Group of Hospitals; S. S. Chatterjee, M.B., B.S., M.R.C.P., Whole-time Assistant Chest Physician, Baguley Hospital, Manchester; P. Chandra, M.Ch.Orth., F.R.C.S., Senior Casualty Officer, Burnley and District Hospitals; E. Cooper, M.B., Ch.B., Senior Casualty Officer, Stockport and Buxton Hospitals; J. R. Kirby, M.B., Ch.B., D.M.R.D., Consultant Radiologist to Wigan and Leigh Hospitals; J. O'Regan, M.B., B.Ch., D.P.H., Tuberculosis Physician (S.H.M.O.) to Preston and Chorley Hospitals; Thelma B. Hoyle, M.B., Ch.B., D.A., Assistant Anaesthetist (S.H.M.O.) to Burnley and District Hospitals; W. H. Helm, M.R.C.P., Consultant Chest Physician, Burnley and District Hospitals.

MANNING, ANGELA M. M., M.R.C.S., L.R.C.P., Assistant Medical Officer of Health and School Medical Officer, Warrington.

PARRY, WILFRID, H., M.B., Ch.B., D.P.H., Senior Assistant Medical Officer of Health for the City and Port of Liverpool.

PHILLIPS, THOMAS ALUN, M.B., Ch.B., D.P.H., Medical Officer of Health, Caernarfonshire Combined Sanitary Districts, Southern Division.

WILLSON, G. F., M.D., D.P.H., Deputy Medical Officer of Health and Deputy School Medical Officer to City of Oxford.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Middleton Price.—On May 31, 1955, at West Middlesex Hospital, Isleworth, to Daphne, wife of John Middleton Price, M.B., F.F.A.R.C.S., a daughter—Helen Rosemary.

Shotts.—On June 16, 1955, at West Middlesex Hospital, to Barbara (formerly Layman), and Alan Shotts, M.R.C.S., L.D.S., a brother for Paul—Jeremy Guy.

Welch.—On June 7, 1955, to Dr. Margaret Louise (formerly Fisher), wife of Dr. Gordon Welch, of Canfield Gardens, London, N.W., a daughter—Estelle Gillian.

Westcott.—On March 4, 1955, at Durham, North Carolina, U.S.A., to Joan (formerly Williams), wife of Dr. G. F. Westcott, a son—Robert David.

Wyman.—On June 11, 1955, at Westminster Hospital, London, S.W., to Joan (formerly Beighton), wife of Dr. J. B. Wyman, a sister for Peter and Michael.

DEATHS

Allan.—On May 11, 1955, at the Warneford Hospital, Oxford, Kenneth Bruce Allan, M.B., B.S., of 11, St. Mary's Road, Leamington Spa, Warwickshire.

Day.—On May 10, 1955, at Ryde, Isle of Wight, John Roberson Day, M.D., aged 98.

Ferguson.—On March 26, 1955, at Hanover, Germany, George Boothe Ferguson, M.B.E., M.D., of South Mountain, Ontario, Canada, aged 69.

Fowler.—On May 13, 1955, at the Royal Hospital, Putney, London, S.W., Isabella Jane Fowler, M.B., Ch.B., D.P.H., D.T.M.

Jackson.—On May 13, 1955, in hospital, James Eustace Jackson, M.R.C.S., L.R.C.P., of 8, Wilkie Road, Birmington, Kent.

Meachen.—On May 12, 1955, at Ashley Heath, Ringwood, Hants, George Norman Meachen, M.D., M.R.C.P., aged 79.

Miller.—On May 4, 1955, Ernest Alfred Miller, M.B., of Flat 17, Windermerc, Lynton Grove, London, S.W., late of Upper Richmond Road, London, S.W.

Milne.—On May 5, 1955, at 9, Carmel Road North, Darlington, Co. Durham, Robert Alexander Milne, M.B., C.M.

Penny.—On May 11, 1955, at Weymouth, Dorset, Frederick Septimus Penny, C.M.G., D.S.O., M.B., D.P.H., Colonel, A.M.S., retired, aged 85.

Wallace.—On May 1, 1955, at Derwen Dda, Crickhowell, Breconshire, Harold Douglas Wallace, M.B., Ch.B., M.F.Hom., late of Bredbury.

Any Questions ?

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

Prognosis after Puerperal Depression

Q.—I have a patient aged 26 who has had a puerperal depression following her second pregnancy. After her first pregnancy she was mildly depressed, but this cleared up without treatment. This time she had a course of E.C.T. (six treatments) which effected a considerable improvement, and she was then discharged. After a week (two weeks after the last shock) she was readmitted, as she had relapsed. She has now started on chlorpromazine. Her personality is described as hysterical. What is the prognosis with or without further pregnancies?

A.—The fact that this patient has suffered a depressive state after both her pregnancies suggests that the illness is unlikely to be related to temporary stress factors in her marriage, home, or career situation, and that constitutional factors must be playing a part. One would suspect a morbid family history in such a case, and certainly there will be a liability to further attacks of depression with or without further pregnancies, but the latter would be a serious risk. Puerperal depression recurring with each pregnancy tends to become more severe and to damage the personality as time goes on. In cases where there is a clear liability to manic depressive psychosis further pregnancies are contra-indicated because of the risk of a full development of this condition. In any case an interval of at least five years before the next pregnancy is to be recommended.

The prognosis for the present attack of depression will depend to a certain extent on the degree to which it is a response to adverse circumstances and to stresses in the life situation of the patient and the extent to which she has a severe hysterical personality disorder. If the depression continues and is associated with early morning waking, loss of appetite and weight, any degree of self-reproach, and there are no phobias, a further course of E.C.T. should be considered. Recovery should be anticipated in the absence of phobias and a severe personality disorder.

Salt and Water Requirements in the Tropics

Q.—How much salt and water should an average-sized man take in the Tropics each day? Are salt tablets recommended?

A.—It is not possible to lay down any firm figures for salt and water requirements which would be universally applicable. Sweating varies with temperature, humidity, exposure to radiation, and degree of activity. The only safe rule is always to drink enough water to produce 1 litre of urine per day, and this urine should never be chloride free. As a rough guide the sweat rate of a 70 kg. man in an "average" tropical climate will not exceed 100 g. per hour in bed at night; at midday indoors sweat losses may rise to 250 g. per hour, and in light shade resting outside it may be 500 g. per hour. Individual variation is high, but in general the sweat rate is proportional to the 2/3 power of the body weight. Exercise may increase the sweat rate to 750 or 1,000 g. per hour, but such high rates are generally not sustained for long. The radiation heat load, either direct from the sun or from hot bare land surfaces, may call forth as much sweat as a brisk walk; extra sweating may also result from the specific dynamic action of a heavy meal. Sweating is least in the early morning when the air is cool and the body temperature is low; exercise in the evening, when the body temperature is already slightly raised, results in more sweat-

ing than in the morning even though the air may be as cool. A moderately active man in a hot climate can easily lose 5 litres of sweat a day and possibly twice as much.

The salt losses in the sweat are not prodigious; the sodium chloride content ranges from approximately 0.15 to 0.30%, higher concentrations being found only in experimental situations and in abnormal subjects. Normal European diet as it comes to the table probably provides 10 g. or more of salt daily, hence there is little need for large amounts of extra salt. Salt tablets are not recommended; some brands are practically insoluble and may set up a gastritis; if they are freely soluble, there is a danger of the subject becoming "oversalted" unless he drinks plenty of water, and of his having a sudden collapse. In general the rule should be, no extra salt unless water is plentiful. Provided the adrenal cortex is properly functioning, the salt losses in the sweat are nicely adjusted to the salt intake. In vast areas of the world, in Asia and Africa, the indigenous tropical population consume considerably less salt than do Europeans in temperate climates but apparently do not suffer from salt deficiency; the high intake of salt by Europeans and their "inability" to get on with less may well be a craving for a luxury.

Loss of weight in hot weather sometimes occurs with a low salt intake, resulting in "salt deficiency dehydration"; but in general it is easier to take too much than too little salt. Losses of other minerals and of vitamins in the sweat are negligible and no allowance need be made for them.

Is Mouthbreathing Harmful?

Q.—What are the medical objections to mouthbreathing? When is active treatment indicated, and what should it consist in if there is no demonstrable nasal obstruction?

A.—Mouthbreathing indicates that all, or more often most, of the inspired air passes to the lungs without the benefits of nasal conditioning. A perfectly functioning nose delivers to the lungs air free from dust and living organisms, of constant temperature, and at optimum humidity. Partial or complete loss of any of these qualities renders the mouth, pharynx, and entire lower respiratory tract more vulnerable. Sudden lack of moisture in the inspired air, by causing ciliary paralysis in the trachea and bronchi, leads to a breakdown in local defence mechanisms. Such effects are observed after total laryngectomy, when the inspired air is not adequately moistened. In time, extra moisture produced by the trachea, but never in sufficient quantity to make up for the loss of nasal function.

Active treatment to restore loss of nasal function is always indicated where there is a chance of success, partial or complete. The causes and methods of treatment of nasal obstruction are well known. Mouthbreathing, in the absence of nasal obstruction, is due to defects in the development of the jaws. Loss of nasal function in such cases is usually partial, and orthodontic treatment should be carried out at an early age. It must be remembered that obstruction due to nasopharyngeal diseases and developmental defects is often difficult to demonstrate.

Preparing Theatre for Clean Surgery

Q.—What steps should be taken to render an operating theatre which has been used for "dirty" operations safe for "clean" abdominal surgery and orthopaedic operations the next day?

A.—The precautions to be taken under these circumstances are very ordinary common-sense ones such as are carried out regularly in an operating theatre which has to serve for both clean and dirty cases and which, in any case, are applied periodically in all theatres. It is presumed that the septic operations have been performed with reasonable care, to see that infected swabs, etc., are placed straight away after use in proper receptacles and removed from the theatre

at the earliest possible moment. The question seems to imply that it is the structure and permanent furniture of the theatre rather than the instruments, bowls, and dressings with which we are concerned. To some extent the method used will depend upon the nature of the walls and floor, but for the usual tiled walls and terrazzo floor washing with an antiseptic solution such as lysol or "dettol" is adequate. The metal surfaces of the operating table should be similarly dealt with and the Sorbo table-pad also, care being taken in this instance to dry the surface with a sterile towel to prevent undue action of the antiseptic on the rubber.

The interval of a night between operations is of great value in allowing dust to settle, especially if the floor of the theatre be left damp with antiseptic. If possible, therefore, this cleaning should be done on the evening before rather than the morning of the clean operations.

In some clinics ultra-violet light has been used to destroy bacteria, but it is doubtful if it is as efficient as the simple methods here indicated.

Idiosyncrasy to Barbiturates

Q.—A patient of mine who has an anxiety state is sensitive to barbiturates. I have already tried quinalbarbitone, amylobarbitone, and phenobarbitone, all of which have the desired sedative effect but produce a maculo-papular rash on the body. There are also joint pains. Is there any possible way of desensitizing this patient against barbiturates?

A.—Barbiturates may produce rashes of varying types in patients who have an idiosyncrasy. Usually the rash is of no great importance and disappears when administration of the drug ceases. Very rarely the rash may progress to produce an exfoliative dermatitis. Phenobarbitone is specially apt to give rise to a serious form of eruption which may continue to extend after administration has ceased. The rash may be accompanied by severe constitutional disturbance and the condition may end fatally.¹ It is clearly undesirable to continue to give barbiturates to patients who have developed acquired hypersensitivity even if this is shown solely by a skin rash and joint pains. There is no certain and safe way of desensitizing patients who are liable to rashes. It would seem better to try alternative sedative drugs such as chloral hydrate in small and repeated doses, carbromal, or methylpentynol.

REFERENCE

¹ Sneddon, I. B., and Leishman, A. W. D., *British Medical Journal*, 1952, 1, 1276.

Classification of Tuberculous Patients

Q.—What are the criteria for the classifications (i) "active," (ii) "quiescent," (iii) "arrested," and (iv) "recovered" in patients with tuberculosis? Is a case still having artificial pneumothorax refills "active"?

A.—(i) A case of tuberculosis is regarded as "active" if the disease is such that it requires a modification of the patient's mode of living, or active treatment, or if the patient may be a danger to others.

(ii) A case is regarded as "quiescent" if the general condition and exercise tolerance are good, having regard to the extent of the lesion; if there is no evidence of toxæmia; if no tubercle bacilli have been found on three consecutive monthly examinations by stained film; and if changes revealed by other clinical investigations and by serial radiographs point to retrogression of the tuberculous lesion.

(iii) A case is regarded as "arrested" if the disease has been quiescent for a continuous period of at least two years, or, if non-respiratory, the disease is "quiescent" and there is reason to believe it is unlikely to recur.

(iv) A case is regarded as "recovered" if the state of quiescence has continued uninterrupted for a period of five years. These descriptions are in accordance with Ministry of Health definitions. Nowadays most clinicians would

prefer the sputum to be negative on culture before calling the case quiescent. A case still having artificial pneumothorax refills can be regarded as quiescent if it falls within the above definition.

Effect of Previous Passive Immunization on Response to Active Immunization

Q.—What effect on the antibody response to active immunization have previous injections of the corresponding antitoxic serum?

A.—Active immunization with diphtheria or tetanus prophylactics may be less effective, or in some circumstances ineffective, if the first dose is given soon after, or at the same time as, an injection of the corresponding antitoxic serum. The antitoxin neutralizes some of the toxoid in the prophylactic, and thus brings about a reduction in the effective dose. The extent of interference with immunization is dependent on the number of units of antitoxin given and the time elapsing between this injection and the first dose of diphtheria or tetanus prophylactic.

There is little reliable evidence of the time intervals which should elapse between an injection of antitoxin and the first dose of a course of active immunization. It is, however, probable that: (1) If a dose of 1,500 units of diphtheria or tetanus antitoxin is given at the same time as, or at any time within three weeks before, the first dose of the corresponding prophylactic, the latter will have little effect, and should be followed by a full course of three injections starting one month later. If active immunization is delayed until four weeks or more after the injection of antitoxin, it should be satisfactory to proceed with the normal course. (2) If a dose of 5,000 units is given, active immunization should be delayed for seven weeks or more. (3) In cases where patients have received large therapeutic doses of 200,000 units of tetanus antitoxin, active immunization with tetanus toxoid should not be attempted until at least four months have elapsed since the last injection of antitoxin.

It is extremely important to ensure that a full course of active immunization is given, followed by the normal boosting doses.

Chlorine Gas Poisoning

Q.—I am medical officer to a factory where new processes are to be introduced which involve the possibility of chlorine gas poisoning. I should be grateful, therefore, if you could give me details of the latest methods of treating such cases.

A.—The latest treatment for gassing by chlorine is to be found on Label A of the excellent series of labels for gassing casualties issued by the Association of British Chemical Manufacturers, 166, Piccadilly, London, W.1, and the inquirer is recommended to obtain a supply of these labels, one of which should be attached to each case of gassing sent to hospital. The following are the details recommended on Label A:

First Aid Already Given (after Removal from Exposure).—(a) Remove contaminated clothing. Loosen remaining clothing. (b) Keep lying down and warm. (c) Mouth-wash and gargle with sodium bicarbonate (1 dessertspoonful to 1 pint (560 ml.) of water). This solution of water may be used for eye or skin irrigation when necessary. (d) Give hot drinks—for example, milky tea or coffee. (e) Transport by car, stretcher, or ambulance.

Immediate Treatment Recommended (in Addition to Above).—(a) Oxygen through a face mask. (b) Inhalation of friar's balsam (1 teaspoonful to 1 pint of water). (c) Linctus diamorphinae camphoratus (B.P.C., 1934) 1 drachm (3.5 ml.) repeated as often as needed. Of use in mild cases only. (d) Venesection 10–20 fl. oz. (280–560 ml.) blood where there is evidence of right heart embarrassment. (e) Cardiac stimulants if indicated—for example, nikethamide 1–3 ml.

Subsequent Treatment Recommended (after Immediate Distress has Subsided).—(a) Rest in bed until respiratory embarrassment has ceased. (b) Repeat oxygen inhalation if respiratory stimulation is necessary. (c) Careful observation for onset of pulmonary oedema. (d) Expectorant mixture as required.

Treatment of Disseminated Sclerosis with Histamine and Curare

Q.—I would be grateful if I could have some information about the treatment of disseminated sclerosis with histamine and curare. Have these drugs a place in rational therapy?

A.—Daily intravenous injections of histamine diphosphate were used in the treatment of disseminated sclerosis by Horton and his colleagues¹ in 1944. There was improvement in some patients especially in the early stages of the disease, and this was attributed to vasodilatation, but the difficulty of evaluating the results on account of the possibility of spontaneous remissions was realized. Curare has been used in an effort to reduce spasticity in cases of spastic paraplegia whether due to disseminated sclerosis or other disorders of the spinal cord. The results have on the whole been disappointing, and toxic side effects are fairly frequent.² A carefully controlled study³ of the use of D-tubocurarine in oil and wax given by intramuscular injection in the treatment of spasticity resulting from spinal cord injuries indicated that no beneficial results were obtained.

REFERENCES

- ¹ Horton, B. T., Wagener, H. P., Aita, J. A., and Woltman, H. W., *J. Amer. med. Ass.*, 1944, 124, 800.
- ² Clarke, C. A., and Houston, R. D., *British Medical Journal*, 1948, 1, 289.
- ³ Kuhn, R. A., and Bickers, D. S., *New Engl. J. Med.*, 1948, 238, 615.

Senile Warts

Q.—What is the cause and treatment of pigmented spots on the forehead of a woman which have appeared since the climacteric and are increasing in size? She is in excellent health, but her employment is such that she should look attractive. She can disguise the spots with make-up, but is worried about their increase in size.

A.—The pigmented spots are probably seborrhoeic (or senile) warts, which usually have a yellow, brown, or black greasy and slightly rough surface. If there is any doubt of their identity, biopsy would be wise. Seborrhoeic warts may be treated by gently rubbing the surface with a cotton applicator moistened, but not dripping, with trichloroacetic acid, the normal skin around being protected by a film of petroleum jelly and care being taken to protect the eyes. Alternatively, they may be curetted after the base of the lesion has been infiltrated with local analgesic. Freezing with solid carbon dioxide snow is sometimes useful.

Noradrenaline in Cardiac Infarction

Q.—Is noradrenaline useful in the treatment of shock following cardiac infarction? If so, how should it be given?

A.—Yes. The drug should be given by intravenous injection in a strength of 2 to 8 ml. of 1/1,000 L-noradrenaline bitartrate per half to one litre of 5% dextrose saline, and at a rate of 30 to 60 drops a minute. For further information see the recent paper by Dr. K. Shirley Smith and Dr. A. Guz.¹

REFERENCE

- ¹ *British Medical Journal*, 1953, 2, 1341.

Drug Claimed to Influence Cholesterol Metabolism

Q.—A French drug, containing phenylethylacetamide is alleged to have an inhibitory effect on endogenous cholesterol metabolism, and thus to be indicated in arteriosclerosis. Is there any scientific basis for such a claim?

A.—There is no scientific basis for the use of phenylethylacetamide which is in any way established, but a hypothesis has been put forward by Cottet, Mathivat, and Redel¹ suggesting that this substance might act in the body as a competitor for acetyl groups taking part in the formation of acetylcoenzyme A. They suggest that the combination phenylethylacetylcoenzyme A might be particularly stable. The formation of such a substance, stable but inactive, would lessen the formation of the higher fatty acids, and in some such way reduce the formation of cholesterol. The authors have administered phenylethylacetamide to groups

of patients who had a raised blood cholesterol, and they record a mean fall in the cholesterol in these groups during the course of four to eight weeks. The administration was oral, and was unattended by any side-effects apart from slight disturbances of digestion. The results would seem to require confirmation.

REFERENCE

- ¹ *Presse méd.*, 1954, 62, 939.

NOTES AND COMMENTS

Effects of Prolonged Thyroid Administration.—Mr. V. H. RIDDELL (London, S.W.1) writes: In the answer to the question under this heading ("Any Questions?" April 30, p. 1106) I think attention should be drawn to the danger of Graves's disease arising after prolonged thyroid administration. Seventy such cases have recently been collected and reported by E. C. Bartels and Gordon K. Huggins.¹

REFERENCE

- ¹ *Lahey Clin. Bull.*, 1955, 9, 81.

OUR EXPERT replies: As the effect of thyroid therapy on the thyroid gland is to render it inactive, I find it difficult to believe that such treatment may eventually result in overactivity of the gland and be, as Bartels and Huggins assert, an aetiological factor in the production of Graves's disease. If thyroid therapy were an aetiological factor we should see the occurrence of Graves's disease during and after its use far more frequently than is reported. In my opinion the occurrence of Graves's disease in these circumstances is fortuitous.

Prognosis in Aplastic Anaemia.—Dr. GEORGE DISCOMBE (London, N.W.10) writes: With reference to your question and answer on this subject (May 28, p. 1353) the following remarks may be of interest. I suggest that the patient who needs 50 pints (28 litres) of blood in four months suffers not merely from a pancytopenia but also from some occult haemolytic (or haemoclastic) process: since the average life of a red cell is about 116 days, the expected requirements of simple aplasia are about 1 pint every nine days, or about 14 bottles in four months. One of our patients was admitted almost in extremis and needed 17 bottles in the first 42 days after admission, but during the next 63 days he needed only 9 bottles; during the last 163 days he received only 19 bottles, and is earning his living, having received 65 bottles in 13 months.

When we find transfusions cause distress, due either to apprehension or to severe physical reactions, we cross-match every bottle of blood with the greatest care in saline, albumin, and by the antiglobulin technique; and administer, about an hour before the transfusion is started, an antihistamine such as mepyramine maleate (50 or 100 mg.) or promethazine hydrochloride (25 mg.). Apprehension is allayed and reactions are minimized.

In some drug-induced pancytopenias we have seen a similar picture of combined aplasia and blood destruction: the haemoclastic process was not accompanied by jaundice and was not affected by A.C.T.H. or cortisone. In one case splenectomy was followed by a dramatic reduction in the need for blood, though the platelet count remained low and the patient died a few weeks later from cerebral haemorrhage. Some patients with pancytopenia may be benefited by splenectomy, as emphasized by Whitby and Britton (*Diseases of the Blood*, 7th ed., p. 472).

Correction.—In the medico-legal report (*Journal*, May 28, p. 1347) and in Mr. R. J. Clausen's letter (*Journal*, June 18, p. 1478) "Magill tubes" were incorrectly referred to as "McGill tubes."

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SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 1 1955

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GENERAL MEDICAL SERVICES COMMITTEE STANDARD OF SURGERY AND WAITING-ROOM ACCOMMODATION

An all-day meeting of the General Medical Services Committee was held on December 16, with Dr. A. TALBOT ROGERS in the chair.

It was reported that, out of 138 local medical committees, 128 had up to now replied on the question of undertaking an inspection of surgery and waiting-room accommodation, and of this number 116 had agreed to co-operate. Various reasons were given by the few which had decided not to proceed on the lines suggested, the chief being that the investigation should be the responsibility of executive councils. The Deputy Secretary was asked to make a further appeal to these committees.

The Committee agreed as to its further procedure with an outline proposed by Dr. WAND: where the accommodation was found to be inadequate a request should be made to the practitioner to improve it; a progress report to be made to executive councils merely stating the number of surgeries inspected (without names), the fact that recommendations for improvement had been made in a given percentage, and that it was proposed to inspect these again at a later date; in due course a further investigation of these surgeries to be made to ascertain whether the necessary improvements had been effected, and, only as a final step, the names of doctors who had refused to take any action to be reported to executive councils. No names would be mentioned except in this very last stage, and then only to executive councils.

A further circular letter proposed to be sent to local medical committees on the subject was approved. Some discussion took place on the cost of the investigations, and it was held to be a proper local medical committee expenditure.

Matters of Report

The CHAIRMAN reported that he, with the chairman of the Private Practice Committee, had had an interview with the Minister of Health at which the Association's claim that private patients should be entitled to drugs and appliances under the N.H.S. had been pressed. It was common ground that this was a matter which would need an amendment of the Act. The Minister had promised at the interview that he would embody his views in a statement which would in the first instance be placed before the Council of the Association. A full report of the interview would also be made to the next meeting of the Committee.

The question of the closure of the Springfield Maternity Home, which had deprived general practitioners in the Blackburn area of their only accessible maternity beds, had been raised at the same meeting, and also would be the

subject of the statement from the Minister which would be reported at the next meeting.

The Committee had been invited by the Council to submit a report on the steps taken to implement the decisions of the Special Representative Meeting in 1951 on the reform of the National Health Service, and to indicate the success achieved, or the arguments advanced by the Ministry where no progress had been possible. The Deputy Secretary (Dr. STEVENSON) said that he had drafted a factual statement which the Committee might like to send to the Council and to the Amending Acts Committee. It was agreed that the statement be sent forward.

Another memorandum prepared by the Deputy Secretary concerned the question whether sufficient protection against the introduction of a whole-time salaried service was afforded by the existing safeguards in the N.H.S. (Amendment) Act, 1949, sects. 10 and 12. The CHAIRMAN considered that the present position was as strong as the profession was likely to secure, while yet allowing a certain elasticity whereby modifications could be made of regulations found to be unsatisfactory. It was decided to keep the memorandum as a committee statement and to make a short report to the Council.

Mileage in Scotland

Dr. C. J. SWANSON, chairman of the Scottish Subcommittee, asked for consideration of the present allocation of the mileage fund with a view to additional moneys being made available for the Highlands and Islands. He said that since the introduction of the Act the 200 or so practitioners in the Highlands and Islands had been receiving mileage payments not in accordance with any mileage scheme operating in other areas of Scotland or in England and Wales. They had been paid on estimates made by the Department of Health having regard to payments to practitioners before the introduction of the service, and also in the light of certain figures obtained from them in 1949. If the mileage schemes in operation elsewhere were applied to these practitioners an additional £20,000 would be required. He suggested that this additional money for the Highlands and Islands be made up from the rest of the mileage fund for the Lowlands and for England and Wales unless the total of mileage payments for the United Kingdom could be increased.

After discussion it was agreed to suggest to the Ministry of Health that this matter be referred to a joint meeting of the English and Scottish Mileage Committees.

Matters Discussed with the Ministry

Report was made on a number of matters which had been the subject of conversation between the Chairman and other members of the Committee and representatives of the Ministry of Health.

The Ministry had agreed to advise executive councils that on the formation of a new partnership they could allow the partners up to nine months to bring their lists within the maximum permitted by the allocation scheme.

On the elimination of inflation the CHAIRMAN said that the desirability of a central register had been pressed on the Ministry. He could not think of any other expedient of comparable value.

Members who had waited on the Ministry had pressed that with the rise in the cost of living and the increase in assistants' salaries some increase should be made in the salary grant paid to the trainee under the trainee general-practitioner scheme. The Ministry had promised to consider the request.

The Ministry had sent for comment the draft of an E.C.L. on the treatment as temporary residents of Service men on leave. The DEPUTY SECRETARY explained that the Ministry appeared to have extended the facilities and had made certain suggestions. The Ministry had suggested that in certain Army establishments where there was a medical officer but no hospital or medical inspection room to provide drugs the medical officer should be entitled to use form E.C.10. That was something against which the Committee had always held out, and he thought the Private Practice Committee would wish to comment on the proposal. The document was criticized on various grounds, and it was agreed that the Ministry be asked to convene a further meeting between representatives of the General Medical Services and the Private Practice Committees and officers of the Ministry of Health and the Service Departments concerned.

Acceptance of Patients of a Vacant Practice

At the last meeting of the Committee a statement was presented by its chairman and the chairman of the Central Ethical Committee setting out the position of a whole-time locum tenens specially engaged for the purpose of keeping a vacant practice in being until the appointment of a successor. The statement said that he "should not within a period of five years from the termination of the locum-tenency set up in opposition in the area of the practice concerned."

Dr. DAIN suggested that the Ethical Committee might be asked to reconsider this interval of five years. Although it appeared in the ethical rules, it was an unreasonable period and probably unenforceable in law. A reasonable time would be one year. Dr. L. RUSSELL agreed that one year would be reasonable; it was in the first few months that any considerable danger of illegitimate acceptance of patients occurred. Dr. NOY SCOTT pointed out that the five-year period had been accepted by the Annual Representative Meeting. Dr. M. SORSBY said that unless something very specific in the way of a time limit was put in a recommendation there would be doctors who would rebel at the narrow restriction and take other practitioners' patients. Dr. J. C. ARTHUR thought that the "reasonable period" would have to be defined having regard to local circumstances.

It was agreed to await the further views of the Central Ethical Committee. The general feeling was that the period should be much less than five years.

Employment of Salaried Assistants

A long discussion ensued on a resolution of the Assistants and Young Practitioners Subcommittee at its last meeting (see *Supplement*, December 11, p. 221):

That the General Medical Services Committee be informed that the Subcommittee is gravely disturbed that after three years, and in spite of substantial concessions on its part, the G.M.S. Committee has rejected *in toto* the proposals put forward in respect of the employment of salaried assistants. It further deplores the grounds upon which the objection was made. In view of the very strong feeling expressed by assistants and others on this matter, both in the *Journal* and in the subcommittee, it requests that the parent committee give an indication of what steps it proposes to take to find an equitable solution to the problem.

Dr. FRANK GRAY, chairman of the subcommittee, said that this was a very strong resolution. The young practitioners felt that they had been badly treated. They felt that the parent Committee had recognized their problem but had not treated it in the unbiased way which might have been expected and had turned down their proposals, and they asked that the Committee now put up its own solution.

The CHAIRMAN said that he did not like the suggestion that the debate which had previously taken place in the Committee was biased. So far as he was concerned he had tried all the time to avoid any bias. It was true that the majority decision was against the proposals of the young practitioners, but the fact that it had not been possible to convince a majority did not mean that unbiased consideration had not been given. If any alternative scheme were put forward it would receive full consideration.

Dr. GRAY, after a further protest had been made by Dr. WAND against any imputation of bias, said that nevertheless it was the view of the "unestablished" members of the subcommittee that the parent committee had shown such bias. The proposals of the subcommittee had been before them on a number of occasions, and had been referred back with suggestions, which had produced the impression that the Committee at least recognized that there was a problem in the maintenance of lists so large as to preclude the possibility of the assistant ever becoming a principal. Therefore, the complete rejection of their proposals at the October meeting had seemed to the young practitioners not to be in line with what had already been said.

The CHAIRMAN pointed out that there had been no undertaking that any scheme put forward would necessarily be accepted, but they were getting nearer to agreement and it must not be assumed that the matter was closed.

Dr. J. A. PRIDHAM said that obviously, from the correspondence columns in the *Supplement*, this was a matter which had engendered a considerable amount of heat. He suggested that in advance of the Conference, at which apparently this matter must come forward, the Committee should be furnished with a report of the whole history of the subject, and that this should be put down for discussion at the meeting after next. Some of the fires which had been burning would have a chance to cool.

Dr. DAIN said that they should look at this matter on its merits. Was it a good thing to employ assistants, and, if so, under what conditions? The advantages and disadvantages should be set out in a properly considered document at the Conference, and assistants should be asked to take part in the debate.

Dr. F. M. ROSE thought that the attitude of the young practitioners was justified. While he was in agreement as to the advantage of assistantships in general practice, he thought the young practitioners had made out a case that all was not well in the running of assistantships. The Committee should not throw the ball to the Conference, because the Conference was not the appropriate body to argue out a case of this sort. The final proposals must come from their own Committee, and in the interval a lot of thought should be given to the subject.

The CHAIRMAN said that they owed it to the young practitioners that there should be an opportunity to debate this matter at the Annual Conference in May. It was therefore necessary for something to be done before the March meeting of the Committee. At some time between now and the next meeting certain members of the Committee should work out a basis for discussion; a report on the history of the whole matter should be prepared.

Dr. L. RUSSELL, as representing the young practitioners, said that Dr. Gray had expressed most moderately the feeling in his subcommittee. The grounds on which the young practitioners' proposals had been turned down appeared to be loss of income for large-list practitioners. Surely the subcommittee was entitled, after having had this question sent back to them, to assume that the parent committee was genuinely seeking a solution and not just playing for time. There was a problem, although it was difficult to

formulate, but what his colleagues felt was that no practitioner should be in the position of being able to employ an assistant when his list was so large that he could take a partner. They also wanted to prevent any doctor exploiting an assistant.

Dr. SUTHERLAND suggested that four or five members of the Committee should meet the Young Practitioners Subcommittee, but the CHAIRMAN pointed out that already on that subcommittee there were three or four senior members of the parent committee.

Dr. WAND said that the subcommittee's resolution on which the present debate centred contained the words "... an equitable solution of the problem." He had asked Dr. Russell what the "problem" was, and he answered, "The problem of preventing a doctor maintaining a list of such extent as to preclude an assistant from becoming a principal," and he had suggested that that problem be investigated. But they should first ask the young practitioners whether they wished to eliminate assistantships. Did they feel aggrieved at supposed exploitation, or were they anxious about their entry into practice?

The CHAIRMAN said that originally the spokesmen for the young practitioners seemed to dislike assistantships altogether, but they had moved from that position and now recognized the value of assistantship, particularly as a method of entry into practice. They had also recognized that there were certain practices which, though not inordinately large, could not be carried on without the help of an assistant, and again that apparently there were some people who were willing to work indefinitely as assistants. They did not want it to be possible for a man to go on employing an assistant or a series of assistants when a permanent place could be made for another principal. He could follow them completely in that respect, but he was less happy about the word "exploiting." It was quite possible for a man to be exploited, not as an assistant, but as a partner. He had known senior partners exploited by their juniors.

Dr. GRAY said that the next move was with the General Medical Services Committee. "It is on your doorstep. The subcommittee should not be asked for anything more. They have put the challenge quite clearly to you."

It was agreed to set up a subcommittee to consider the whole problem and to report back to the parent committee at the March meeting.

The Committee sat from 10.30 a.m. to 6 p.m.

MEDICAL WHITLEY COUNCIL COMMITTEE "C"

ARBITRATION FOR PUBLIC HEALTH SERVICE MEDICAL OFFICERS' CLAIM

At a meeting of Committee "C" of the Medical Whitley Council held on December 21 Dr. John Riddell was elected chairman of the Committee for the session.

The claim put forward by the Staff Side, and submitted in a memorandum on October 29, for a review of remuneration of medical officers in the public health service was the only item of business. After prolonged and detailed discussion agreement was not reached. The Staff Side then formally requested that the matter should be referred to arbitration under the Industrial Courts Act. The Management Side agreed to this course, and the Joint Secretaries of the Committee were instructed to take the necessary formal action.

In Denmark drugs are classified into three main categories according to their importance. The more essential drugs are supplied free of charge, or on payment by the patient of a quarter of the cost. The patient is required to pay proportionately more for drugs in other categories. It is, however, possible for a doctor to certify that a particular drug in a low category is essential for a specific illness, and it may then be supplied free or at the minimum charge.

PRIVATE PRACTICE COMMITTEE

BONUS SHIFT ONE-DAY CERTIFICATES

A meeting of the Private Practice Committee was held at Headquarters on December 15, Dr. ALEXANDER BROWN presiding. Fully two hours of the meeting were occupied with a renewed discussion on one-day certificates for miners, following the resolution of the Annual Representative Meeting at Glasgow demanding the abolition of one-day certificates for absences from employment.

Information gathered from B.M.A. Divisions in colliery areas was laid before the Committee, and some members spoke of the uses and abuses of these certificates. One member, Dr. E. J. REES, who was absent, wrote that in his area the problem was a lessening one, that the majority of men applying for such certificates had been genuinely ill, and that very few practitioners would agree never to issue such certificates even should that become the policy of the Association.

In the course of discussion the abuses of the system were stressed. It was stated that in one practice 19% of the consultations in the course of one month related to these certificates. It was suggested by one or two members that the National Coal Board be approached with a proposal that the scheme be withdrawn, but Dr. R. FORBIS pointed out that this was a question of national politics, that the bonus shift system was inaugurated to accelerate production, and that the certificates were intended to protect the miner who was genuinely ill. He also said that, altogether apart from any bonus scheme, there was no reason why a doctor should not do as he had always done and issue one-day certificates.

The CHAIRMAN demurred at the proposal to approach the National Coal Board unless some alternative scheme could be put forward. Another argument which weighed with the Committee was that, although the withdrawal of the scheme would stop the abuses which were said to be so prevalent, it would penalize the genuine cases.

After a very long discussion it was proposed by Dr. A. BARKER that a report be made to the Council to the effect that the Committee had considered the whole question very thoroughly, and, in view of the lack of support in certain sections of the profession in the coal-mining areas for the abolition of the one-day certificate, recommended that at the present time no useful action could be taken to implement the resolution of the Representative Body. This was agreed to, and it was also agreed that the recommendation be accompanied by a balanced statement setting out the arguments on both sides.

As a rider to this it was proposed to suggest to the Council that an approach on this subject be made to the National Coal Board and possibly also to the Ministry of Fuel and Power, but this was not carried.

Reports to Employers

The DEPUTY SECRETARY (Dr. Stevenson) attended to report on a question which had engaged the attention both of the Private Practice Committee and of the General Medical Services Committee. The medical officer of a local authority had requested a practitioner to give an indication of the prognosis of a sick employee which would assist the authority in deciding whether to grant him additional monetary benefits. The practitioner supplied the information and rendered an account, whereupon it was explained to him that local authorities had no funds from which to meet charges of this nature; moreover, no question of a report, such as the practitioner had supplied, was in their minds, but only a brief indication of when the man might be expected to be back at work. The opinion of the General Medical Services Committee was that in this particular case, without prejudice to other cases in which the circumstances might be different, the information was such as a doctor might be expected to give on behalf of his patient without a fee.

The Private Practice Committee concurred in this view. If a full report was needed it would be a different matter.

Life Assurance Examinations

The CHAIRMAN gave an account of a meeting with representatives of the Life Assurance Offices' Association in connexion with the resolution of the Representative Body calling for an increase from 1½ guineas to a minimum of 2 guineas in the standard fee for medical examination and report for life assurance, and one guinea for report without examination. A long discussion had taken place and the reply was awaited.

A letter was read from a member calling attention to the practice of an assurance company when requiring a "report without examination" to ask for information about the parents of a person seeking assurance. It was pointed out that while the proposer could give the practitioner permission to discuss his health with other persons he could not, of course, give permission to discuss that of his relatives. It was agreed to take this up with the companies concerned.

Other Business

The action of the Ministry of Pensions in increasing the number of cases called to medical boards without prior consultation with the Association, to which attention was drawn at the previous meeting, evoked a long reply from the Ministry. The Ministry said that it considered it to be its duty to arrange the allocation of cases to sessions in such a way that so far as possible the proper time was made up. There was certainly no intention of making sessions run for longer than 2½ hours.

The Committee discussed the Treasury proposals for fees and salaries paid by various Government departments for part-time services provided outside the N.H.S. A number of amendments were suggested by the Committee and will be transmitted to the Treasury.

A satisfactory result was reported concerning concessions to doctors in "yellow band" areas in London (see *Supplement*, December 4, p. 212). The Commissioner of Police for the metropolis has issued a general order reminding the police that the "No waiting" and unilateral parking regulations provide exemption for anything done with the permission of a police officer in uniform, and that doctors are to be given whatever assistance is possible if they seek the advice of a police officer on where to leave a vehicle when visiting a patient or attending hospital or attending court to give evidence. The members of the deputation which waited upon the Commissioner were Dr. R. D. Summers, Dr. Annis Gillie, and the Assistant Secretary (Dr. W. Hedgcock). The form of the membership card, already approved in principle by the Council, was discussed in this connexion.

Slight exception was taken to a resolution of the Clinical Pathologists Group which had asked the Committee to recommend to the Home Office, in connexion with the signature of confirmatory certificates for cremation, that where there had been a post-mortem examination the pathologist who performed it was "the" appropriate person to sign the certificate. This was replaced by "an appropriate person." Dr. L. W. BATTEN said that the most appropriate person to sign the confirmatory certificate was a detached practitioner unconnected with the case who interviewed the people concerned.

Much other detailed business was before the Committee.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.

Non-County Borough Councils.—Crewe.

Urban District Councils.—Houghton-le-Spring.

OPHTHALMIC GROUP COMMITTEE

REFRACTIONS FOR SCHOOLCHILDREN

A meeting of the Ophthalmic Group Committee of the Association was held on December 10, with Mr. GAYER MORGAN in the chair. The business was brief and the meeting lasted less than an hour and a half. It was reported that the Minister of Health had agreed to receive a deputation from the Committee on the following Wednesday on the subject of the sight-testing fee.

The question was considered of seeking a revision of a paragraph in a Ministry memorandum concerning the refraction of schoolchildren. This paragraph stated that ophthalmologists and opticians would be working together as a team, and ophthalmologists in charge of eye clinics or departments should *normally* (our italics) delegate refraction work to ophthalmic opticians. Such an arrangement should not, however, preclude an ophthalmologist from himself refracting individual patients or examining them after refraction. Nor should any arrangement for delegation preclude an ophthalmic optician from referring back to the ophthalmologist patients concerning whom the optician felt he wished to have the benefit of medical advice.

The Deputy Secretary (Dr. STEVENSON) pointed out that it looked from the paragraph as though only in exceptional cases was the ophthalmologist expected to carry out the refraction himself. In theory it appeared that this work should be delegated.

Mr. E. G. MACKIE suggested that the word "normally" was their safeguard. Dr. V. H. INGRAM said that in his area (Newcastle-upon-Tyne) the hospitals had been circularized and with one exception had said that they did not want an optician service for this work. Dr. J. MARSHALL thought that an attempt should be made to get the paragraph altered on the ground that the ophthalmological staff objected to it. The CHAIRMAN pointed out that the reply might be made that they were questioning something which was quite unobjectionable. Dr. J. J. HEALY said that originally a memorandum was drawn up by the Committee and the Faculty in conjunction with the opticians and the Ministry, in which this point was discussed, and eventually a paragraph was inserted to the effect that all this work should be done by the ophthalmologist; but this was altered on the specific request of their own Group and of the Faculty, who said that it was impossible for ophthalmologists to be responsible for all schoolchildren; they must be able to delegate some work to opticians.

The CHAIRMAN asked whether they could say that no children should be seen by opticians unless specifically delegated by ophthalmologists. Mr. NIGEL CRIDLAND asked whether they were willing to let even that pass out of their hands. They should be able to control the school eye service.

The DEPUTY SECRETARY said that the general effect of the circular was probably along the lines they wanted. Was the small point of objection worth pressing? Mr. MACKIE said that the important thing was to get all school clinics under the hospital service. Dr. INGRAM said that in his area the hospital sessions were already full, and the Board would have to appoint more staff to cover the work.

It was decided to leave the paragraph as it stood and to await events.

A brief report was presented by Mr. NIGEL CRIDLAND of a meeting of the British Standards Institution, which he had attended, concerning standards for lenses and frames. It was not expected that anything would be in production for about two years.

It was intimated that the Council of the Association, which had met this year in advance of the meeting of the Group Committee, had left to the Committee the nominations for the Standing Ophthalmic Advisory Committee of the Central Health Services Council. Mr. Gayer Morgan and Mr. Tudor Thomas were nominated.

MEDICAL ETHICS

The Central Ethical Committee, meeting recently under the chairmanship of Dr. ROBERT FORBES, had a long agenda before it. One item was to consider a suitable form of wording for obtaining the consent of psychiatric patients to disclosure of their medical history to a medical officer of health in order that suitable "after care" visits might be arranged.

In accordance with the views of the Occupational Health Committee, it was agreed that there was no objection to an industrial medical officer issuing recommendations for sight tests provided that he obtained the consent of, or had a prior understanding with, the employee's own doctor. Also in the commercial field, the Committee considered that it would not be unethical for a medical practitioner to accept payment for carrying out clinical trials of a company's products, but that there should be an understanding that the practitioner would not be mentioned by name, and that he would have an opportunity of reading the text of any proposed advertisement prior to its publication.

In considering a question on the advisability of a doctor giving medical attention to a near relative, the Committee thought that this was not unethical, and it would not always be practical to make alternative arrangements, but it was undesirable to attend a near relative in a serious illness, and should be avoided wherever possible.

Other matters discussed included the International Code of Medical Ethics, a draft memorandum on the legal position of nurses, and certain medical aspects of the Mines and Quarries Bill.

MEDICAL STUDENTS' PROSPECTS

Writing in the December issue of the *Manchester University Medical School Gazette*, Mr. R. L. NEWELL, Dean of Post-graduate Medical Studies at Manchester University, discusses the prospects of the medical student. At present in this country there is one doctor to approximately 900 people, a higher ratio than in any country except the U.S.A. and Soviet Russia. Even so, many G.P.s and consultants are overworked, but this, Mr. Newell says, is inevitable if the freedom of the patient to consult the doctor of his choice is maintained. To destroy this freedom, Mr. Newell adds, would shake the foundations of medicine and of the principles of freedom on which this country has always existed.

Establishment Fixed

Mr. Newell thinks that economic factors will fix the medical establishment at about its present level for many years, and, however desirable an unlimited number of doctors and nurses might be, it would be difficult to justify any large increase in medical personnel. During the first four years of the Health Service 1,000 additional consultant appointments were made. There was an increase of 839 general practitioners in 1953, and the maximum list has been reduced from 5,000 to 3,500, averaging one doctor to 2,300 patients. More than half of the G.P.s are under 45, and 80% of partners are under 55. Even if the number of G.P.s were doubled to-morrow there would be the fear that a limit might be imposed on the Central Pool and a consequent lowering of the doctors' income. Mr. Justice Danckwerts made his award on the number of doctors in the Service at that time.

Excess Over Requirements

Mr. Newell goes on to quote the average yearly addition to the *Medical Register* over the last 10 years of 2,048. Allowing for normal wastage, there is an excess of registrations over requirements running into several hundreds a year. In 1959, if the medical schools continue their present intake, the cumulative excess might amount to 5,000 to 6,000 doctors. Mr. Newell thinks that the prospects in the consultant field are even more hazardous. He urges the Ministry to inquire into the situation without delay.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Local Health Authority Nursing Services

SIR.—The article on local health authority nursing services published recently (*Supplement*, November 20, p. 187) raises a number of questions, and there is much to challenge in many of the points put forward. Doubtful statistics and general statements are insecure foundations for constructive building. The writers were no doubt voicing their personal opinions, and I am encouraged to hear that these are not acceptable to many people, that not only district nurses but health visitors, doctors, and others are distressed by such views.

The most distressing factor in the article is the complete lack of regard for people as persons. The suggestion is that the ill person, or patient, whose needs are so many-sided, may be served by those whose limited intellectual capacities prevent their entrance to higher spheres of service. What would our great nursing leaders think of such an attitude, particularly one of our greatest, Mary Gardner, who, with the wider vision of an earlier age, wrote: "Nursing in its widest sense must include nurture of mind and spirit as well as of body; health education as well as administration to the sick; care of patients' environment, social as well as physical, and of health services to the family and community, as well as to individuals."

In the future, perhaps, we too may come to understand that it is not good that we should work entirely in the field of sickness, or of health, but that we shall do better service, both in keeping people well and in caring for them during temporary absence from health, if we, as nurses, serve the family as a whole, as the good doctor does, and has always done. Our patients may be old, may be needing injections only, may be suffering from long and handicapping illnesses, but they are *people*, not diseases, and need in those caring for them, in whatever capacity, the approach which comes from a sensitive human understanding of their needs as persons. The outlook shown by the writers of the article can do nothing but perpetuate the present division between hospital and domiciliary services, and must inevitably widen the gaps that exist in some places in the domiciliary services themselves. It is also a sad reflection on the attitude of one branch of the domiciliary nursing services towards another.—I am, etc.,

London, S.W.3.

DOROTHY GOODWIN.

Hospital Staffing

SIR.—All who are concerned with problems of senior hospital medical staffing have reason to be grateful to your correspondent who signs himself "Senior Hospital M.O." (*Supplement*, December 11, p. 227) for the points which he raises. As I understand him, he sees a simple choice before us: (a) to perpetuate the existing arrangement whereby many men are inadequately paid, or (b) to incorporate the S.H.M.O. grade into the ladder of promotion to consultant, with increased status and remuneration. I have no doubt that he credits himself with the social conscience referred to early in his letter, so one may legitimately conclude that the first alternative is repugnant to him. In the second alternative he seems to see a solution to our S.H.M.O. ills, and finds that the majority report of the Strachan sub-committee represents an honest attempt to solve the problem to this extent.

I have studied the Strachan report with some diligence, but I have failed to find any suggestion along the lines indicated by your correspondent. On the contrary, having listed the different categories, which together constitute

an intermediate grade between house officers and consultants, it goes on to define registrars and senior registrars as trainees for consultant rank, and says the intermediate grade should be sufficiently wide to provide a career grade for others of lesser talents or ambitions. While I do not question your correspondent's right to express any individual views which seem to him proper, or to use a pseudonym if he prefers to withhold his name, I think it should be pointed out that there is a complete lack of evidence that he is expressing the views of any considerable body of S.H.M.O.s when he asserts that there is a significant amount of support among them for the recommendations of the Strachan Subcommittee. Up to the present, the only means for the expression of their views and grievances have been through meetings convened for the purpose in London and elsewhere, and through press correspondence, and these have shown that they are overwhelmingly opposed to the Strachan recommendations. The most recent expression of S.H.M.O. opinion was reported in the *Supplement* of December 11 (p. 224). A large meeting of S.H.M.O.s agreed with your correspondent that the underpaying of men for consultant work was wrong, and that all promotion to consultant rank should be through a specialist grade so long as it existed. It was precisely because they agreed with his conclusions that they were resolved that the Strachan proposals should be rejected.—I am, etc.,

Cambridge.

C. B. V. WALKER.

Fining the Doctor

SIR,—I read with horror the recent proposal that a young G.P. should be relieved of £600 for alleged over-prescribing (*Supplement*, November 20, 1954, p. 191). As a doctor who has recently resigned from the National Health Service, having built up a reasonable N.H.S. list in a couple of years, and then been obliged for family reasons to move to another county, I am now able to see the N.H.S. set-up in perspective. Sir, we doctors are in a preposterous position. We are divided among ourselves, first, into consultant and G.P. services, then into those on committees and those not, into large- and small-list practitioners, and into smaller and smaller divisions, none of whom has any feeling but antipathy towards others, though sometimes if financial circumstances are suitable this is tinged with some patronizing interest.

In my own experience of building up a new practice in an industrial area, I did have to prescribe far more heavily than I had done as an assistant in a middle-class residential district in the same county. In a new practice one gets a far higher proportion of patients who are ill, far more panic calls from the helpless and hopeless, but none the less seriously ill, besides the inevitable "surgery butterflies" who flit to each doctor in turn, and the neurotics who lap up a beneficial but fortunately cheap diet of bromide and valerian.

The penalty was out of all proportion to the misdeed, if such it was, in Lancashire. Let us as a profession pull ourselves out of the hopeless muddle into which we have wandered. Let us realize that patients are not average, that doctors are, in the main, good men with a sense of decency, and that any man works better in an atmosphere of freedom and trust rather than in one which is reminiscent of the police State.—I am, etc.,

London, N.10.

D. MARJORIE HOWELLS.

SIR,—It was refreshing to read the vigorous common sense of Dr. Paul R. Saville's letter (*Supplement*, December 18, 1954, p. 241) on the question of fining doctors for improper prescribing. The few cases which achieve publicity—for example, 300 square yards of lint to provide curtains—are presumably only the small upper parts of the vast iceberg of wasteful and irrational medicine. Perhaps this passage in the letter from Drs. L. Ballon and W. Brown (*Supplement*, December 11, p. 226) illustrates the kernel of

the problem: "If . . . Mrs. A arrives at the surgery wanting treatment for a cold and a cough and is accompanied by her children John, James, and Mary, all of whom give orchestral corroboration of being infected, *if so requested* [my italics] the doctor must write out four prescriptions. If he refuses to do so he is rightly in peril of being charged with a breach of his terms of service. . . ." On the contrary, if the doctor considers medicine unnecessary, not only is he justified in refusing it, but prescribing it should be regarded as a breach of his terms of service.—I am, etc.,

London, W.8.

GEOFFREY G. SHERRIFF.

Merit Awards

SIR,—This correspondence seems likely to go on until your patience is exhausted; and there does not appear to be any chance that the Distinction Awards Committee will budge from its present position. Its members believe, so Sir Horace Hamilton says (*Supplement*, October 23, 1954, p. 153), that there is "certainly no evidence that consultants generally regarded the awards system as being worked unfairly." This is, of course, true because we are not allowed to know how it works. Sir Horace goes on to tell us that "if the names of consultants with awards were published, the public might press to be seen and treated by consultants with awards and that this might be unfair to those who had not yet got an award." If there is any substance in this, it would be well if Her Majesty be petitioned to keep the names of those doctors whom she honours *in petto*. I may say that I have never been invited to attend any meeting of consultants, nor have I been asked to act as (I hope Sir Horace will forgive the word) an informer.

Is there now any reason why Dr. Frederick Dillon's suggestion (*Supplement*, July 31, 1954, p. 85), that the names of recipients should now be published, is not carried into effect? One gets the impression that the members of the Committee have now taken up the attitude that, once the malcontents have blown off steam, the old system will be able to go on—and they are probably right: we are a docile lot. It is alleged that critics of the system of merit awards "do themselves a bit of no good," and, as this view, whether well founded or not, is widespread, it is only the elderly who are likely to write over their own names.—I am, etc.,

London, W.1.

A. PINEY.

Senior Hospital Medical Officers

SIR,—Dr. C. B. V. Walker's letter (*Supplement*, December 11, p. 227) deserves commendation and support. Many S.H.M.O.s have been doing consultant work without supervision since the Health Service began, and in some cases (my own included) before July 5, 1948. There is no doubt at all that the work we are doing differs in no respects from that of other consultants, and we know that the moment we leave our jobs they will be advertised as consultant posts. How our colleagues ever agreed to the S.H.M.O. grading is a mystery, unless one extends the old adage of "man's inhumanity to man" to "doctor's inhumanity to doctor."

Middle-aged S.H.M.O.s have very little to look forward to in the future: they are not only underpaid now, but, their superannuation payments being much less than their consultant colleagues', they must of necessity endure a poor pension in their old age.—I am, etc.,

Liverpool, 1.

S. CANTER.

The Medical Whitley Council Committee "B" has agreed that the terms and conditions of service for hospital medical staff should be amended so that the salary at which an officer becomes entitled to six weeks' leave a year, instead of four, should be raised to £1,050. The amendment will take effect in the annual leave year beginning April 1.

H.M. Forces Appointments

ARMY

Colonel E. J. S. Bonnett, late R.A.M.C., has retired on retired pay.

ROYAL ARMY MEDICAL CORPS

Captain E. Aldous-Ball to be Major.

ARMY EMERGENCY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Colonels J. Bruce, C.B.E., T.D., and M. L. Rosenheim to be Honorary Colonels of an Army Emergency Reserve unit.

Lieutenant-Colonel I. W. Buirski, from T.A.R.O., to be Lieutenant-Colonel.

Major J. H. Dean, from T.A.R.O., to be Major.

Captains (Acting Lieutenant-Colonels) R. A. Shanks and H. K. Meller, M.B.E., to be Majors.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Major T. T. S. Hall, M.B.E., T.D., has resigned his commission, retaining the rank of Major.

Captain (Acting Lieutenant-Colonel) D. D. Cranna to be Major.

Captain R. C. M. Dingwall to be Major.

ROYAL AIR FORCE

ROYAL AUXILIARY AIR FORCE

Squadron Leader E. C. Gross has relinquished his commission, retaining the rank of Wing Commander.

Association Notices

ASSISTANTS AND YOUNG PRACTITIONERS' SUBCOMMITTEE

The following practitioners have been elected to fill vacancies for representatives of assistants on the Assistants and Young Practitioners' Subcommittee of the General Medical Services Committee. With the exception of Region 4, the candidates were returned unopposed.

Region 1.—Dr. J. B. Gilmore (Plymouth). Region 3.—Dr. G. B. Brown (Wallasey). Region 4.—Dr. Mary I. Foreman (Derby).

OCCUPATIONAL HEALTH PRIZE

The Occupational Health Prize Essay Competition was established by the Association for the purpose of encouraging interest and research in the field of occupational health. The Council of the British Medical Association is prepared to consider the award of an Occupational Health Prize, which consists of a certificate and £50, in the year 1955. Any member of the Association who is engaged in the practice of occupational health, either whole-time or part-time, is eligible to compete for the prize. Candidates may select their own subject.

The essays submitted must include personal observation and experiences collected by the candidates in the course of their work. If no essay entered is of sufficient merit no award will be made. Candidates in their entries should confine their attention to their own observations rather than to comments on previously published work on the subject, though reference to current literature should not be omitted when it bears directly on their results, their interpretations, and their conclusions.

Essays, or whatever form the candidate desires his work to take, must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than January 31, 1955. No study or essay that has been published in

the medical press or elsewhere will be considered eligible for the prize, and a contribution offered in one year cannot be accepted in any subsequent year unless it includes evidence of further work. A previous prizewinner is not precluded from entering. If any question arises in reference to the eligibility of the candidate or the admissibility of his or her essay, the decision of the Council on any such point shall be final. Preliminary notice of entry for this competition is required, on a form of application to be obtained from the Secretary.

Each essay must be typewritten or printed on one side of the paper only, and accompanied by a note of the candidate's name and address. No definite limits are laid down as to the length of essays, but the Council anticipates that for this competition essays should consist of between 3,000 and 10,000 words. Inquiries relative to the prize should be addressed to the Secretary.

PRIZE ESSAY COMPETITION FOR MEDICAL STUDENTS, 1955

The Council of the British Medical Association is prepared to consider the award, in 1955, of prizes to medical students for essays submitted in open competition. The subject of the essay will be: "The Recreational Activities of a Medical Student."

The purpose of this competition is to promote systematic observation among medical students, and in awarding the prizes *due regard will be given to evidence of personal observation*. No study or essay that has previously appeared in the medical press or elsewhere will be considered eligible for a prize. Previous prizewinners are eligible for a second award.

Any medical student who is a registered member of a medical school in the United Kingdom, Commonwealth, or Empire at the time of submission of the essay is eligible to compete for a prize. If any question arises in reference to the eligibility of a candidate or the admissibility of his or her essay, the decision of the Council of the British Medical Association will be final. Should the Council decide that no essay entered is of sufficient merit, no award will be made. The prizes offered will normally be of the value of £25, but, in determining the number and exact amount of prizes to be awarded, the number and standard of essays received will be taken into consideration by the Council, which reserves the right to vary the number and amount of the prizes.

Essays must not exceed 5,000 words, and must be typewritten or legibly written in the English language on foolscap paper, on one side only, must be unsigned, and must be accompanied by a note of the name and the medical school of the entrant. Notice of entry for this competition is necessary and a form of application can be obtained from the undersigned.

Essays must be forwarded so as to reach the Secretary of the British Medical Association not later than January 31, 1955. Inquiries relative to the competition should be addressed to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

PRIZE ESSAY COMPETITION FOR PROVISIONALLY REGISTERED PRACTITIONERS, 1955

The Council of the British Medical Association is prepared to consider the award, in 1955, of prizes to provisionally registered practitioners for essays submitted in open competition. The subject of the essay will be: "A Discussion on the Influence of John Hunter on Medicine."

The purpose of this competition is to promote systematic observation among provisionally registered practitioners, and in awarding the prizes *due regard will be given to evidence of personal observation*. No study or essay that has previously appeared in the medical press or elsewhere will be considered eligible for a prize.

Any provisionally registered practitioner in the pre-registration year at the time of submission of the essay is eligible to compete for a prize. If any question arises in reference to the eligibility of a candidate or the admissibility of his or her essay, the decision of the Council of the British Medical Association shall be final. Should the Council decide that no essay entered is of sufficient merit, no award will be made. At least one prize of £50 is offered. In determining the number of prizes to be

awarded, the Council will take into consideration the number and standard of essays received.

Essays must not exceed 5,000 words, and must be typewritten or legibly written in the English language on foolscap paper, on one side only, must be unsigned, and must be accompanied by note of the name and address of the entrant. Notice of entry for this competition is necessary and a form of application can be obtained from the undersigned.

Essays must be forwarded so as to reach the Secretary of the British Medical Association not later than January 31, 1955. Inquiries relative to the competition should be addressed to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

SCHOLARSHIPS IN AID OF SCIENTIFIC RESEARCH

The Council of the British Medical Association is prepared to receive applications for research scholarships as follows:

An Ernest Hart Memorial Scholarship, of the value of £250.

A Walter Dixon Scholarship, of the value of £250.

Four ordinary research scholarships, each of the value of £200.

These scholarships are given to candidates recommended by the Science Committee of the Association as qualified to undertake research in any subject (including State medicine) relating to the causation, prevention, or treatment of disease.

In addition, applications are invited for the award of the following research scholarship:

The Insole Scholarship, of the value of £250, for research into the causes and cure of venereal disease.

Each scholarship is tenable for one year, commencing on October 1, 1955. A current scholar may apply to be re-appointed for a further year, though no scholarship will be renewed more than twice. A scholar is not necessarily required to devote the whole of his or her time to the work of research, but may be a member of H.M. Forces or may hold a junior appointment at a university, medical school, or hospital, provided the duties of such appointment will not, in the opinion of the Science Committee, interfere with his or her work as a scholar.

Applications for scholarships, including renewals, must be made not later than March 1, 1955, on the prescribed form, a copy of which will be supplied by the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, on application.

Applicants are required to furnish the names of three referees who are competent to speak as to their capacity for the research contemplated.

MIDDLEMORE PRIZE

The Middlemore Prize, which consists of a cheque for £50 and a certificate, was founded in 1880 by the late Richard Middlemore, F.R.C.S., of Birmingham, to be awarded for the best essay or work on any subject which the Council of the British Medical Association may from time to time select in any department of ophthalmic medicine or surgery. The Council of the British Medical Association is prepared to consider an award of the prize in the year 1955 to the author of the best essay on: "Allergy in Relation to Eye Disease." Notice of intention to enter for the competition should be made on the appropriate entry form, copies of which can be obtained from the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

Essays must reach the Secretary on or before February 1, 1955. Each essay must be unsigned and accompanied by a slip containing the name and address of the author. Previous prizewinners are not precluded from entering. In the event of no essay being submitted of sufficient merit, the prize will not be awarded in 1955, but will be offered again in the following year.

A. MACRAE,
Secretary.

Diary of Central Meetings

JANUARY

- | | |
|-----------|---|
| 3 Mon. | Armed Forces Committee, 2 p.m. |
| 4 Tues. | Arrangements Committee (Brighton, 1956), 10 a.m. (Time changed from 11 a.m.) |
| 4 Tues. | Staffing Committee, 12 noon. |
| 5 Wed. | Occupational Dermatitis Subcommittee, Occupational Health Committee, 2 p.m. |
| 6 Thurs. | Committee re Remuneration Policy, 2 p.m. |
| 6 Thurs. | Remuneration Subcommittee, Occupational Health Committee, 2 p.m. (Date changed from January 11.) |
| 7 Fri. | Joint Committee of the B.M.A. and Magistrates Association, 10.15 a.m. (Date changed from December 10.) |
| 7 Fri. | Joint B.M.A. and B.V.A. Committee, 11 a.m. |
| 10 Mon. | Medico-Legal Subcommittee, Central Consultants and Specialists Committee, 2.15 p.m. |
| 11 Tues. | Subcommittee on Assistants in General Practice, G.M.S. Committee, 2 p.m. |
| 12 Wed. | Central Consultants and Specialists Executive, 11.30 a.m. |
| 12 Wed. | Public Relations Committee, 2 p.m. |
| 12 Wed. | Registrars Group Executive Committee, 2 p.m. |
| 13 Thurs. | Medical Staffing Subcommittee, Central Consultants and Specialists Committee, 11.30 a.m. |
| 13 Thurs. | Amending Acts Committee, 2 p.m. |
| 14 Fri. | G.M.S. Service Committee and Tribunal Regulations Subcommittee, 2 p.m. |
| 17 Mon. | Psychological Medicine Group Committee, 2 p.m. |
| 17 Mon. | Geriatrics Joint Subcommittee, Central Consultants and Specialists, Public Health, and G.M.S. Committees, 2.15 p.m. |
| 19 Wed. | Council, 10 a.m. |
| 20 Thurs. | Evidence Committee on Divine Healing, 2 p.m. |
| 26 Wed. | Planning Subcommittee, Occupational Health Committee, 10 a.m. |
| 27 Thurs. | Rural Practices Subcommittee, G.M.S. Committee, 2 p.m. |
| 28 Fri. | Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m. |

Branch and Division Meetings to be Held

CAMBERWELL DIVISION.—At King's College Hospital, Denmark Hill, S.E., Sunday, January 9, 10.30 a.m., clinical meeting. Members of the Lambeth and Southwark Division are invited. Non-members are equally welcome.

EAST KENT DIVISION.—At Winter Gardens, Margate, Friday, January 7, 8.30 p.m. to 2 a.m., annual supper and ball in aid of the Royal Medical Benevolent Fund.

ENFIELD AND POTTERS BAR DIVISION.—At The Firs Hall Ballroom, Green Lanes, Winchmore Hill, N., Saturday, January 8, 6.45 p.m.: reception, 7.30 p.m. Dinner and dancing. Ladies and medical guests are invited. Principal guest, Dr. A. Macrae (Secretary, B.M.A.).

HASTINGS DIVISION.—At Nurses' Home, Royal East Sussex Hospital, Hastings, Tuesday, January 4, 8.15 p.m., meeting. Address by Dr. S. P. Hall-Smith: "Some New Concepts and Old Precepts in Dermatology" (illustrated by slides).

KENSINGTON AND HAMMERSMITH DIVISION.—At St. Charles's Hospital, Ladbroke Grove, London, W., Friday, January 7, 3.30 for 4 p.m., clinical meeting.

LEWISHAM DIVISION.—At Lewisham General Hospital, High Street, Lewisham, S.E., Friday, January 7, 8.30 p.m., meeting. Dr. W. R. S. Doll: "Social Factors in Mortality—The Registrar-General's Evidence."

SOUTH BEDFORDSHIRE DIVISION.—At Warden Tavern, Luton, Wednesday, January 5, 8.30 p.m., annual general meeting.

WEST HERTS DIVISION.—At Large Town Hall, Watford, January 5, 8.30 p.m. to 1.30 a.m., annual ball.

Meetings of Branches and Divisions

GLASGOW DIVISION

A meeting was held in the Institution of Engineers and Shipbuilders on October 27, 1954. Dr. W. D. Anderson took the chair and 24 members attended. Thanks were extended to Sir John McNee, Dr. Rennie, Mr. Kay, the Secretary-Conveners, the Corporation, and the University, and all who had contributed to making the annual meeting such a success. Dr. J. Baird Forrester reported that, of the sum of £700 collected for the Annual Meeting Hospitality Fund, £471 had been spent in various ways, including the provision of souvenir spoons. The honorary secretary read a letter from the Liverpool Division, in connexion with the questionnaires on peripheral organization sent out by the Association's Constitution Committee, asking for the larger Division's views with regard to the possible reductions in voting power and in the number of representatives. The final answer to the letter was deferred until after the executive meeting.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 8 1955

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AN ANALYSIS OF THE PROFESSION

The staff of the British Medical Association analysed the Emergency Register of the civilian medical profession in Great Britain as at December 31, 1953. The register is maintained by the Association on behalf of the National Medical Manpower Committee and the Central Medical Recruitment Committees. The profession was analysed by sex, six age groups, and twenty-one occupational categories. The following is a summary of the analysis.

Predominant Employment	Total Men and Women (to Nearest 100)
General practitioners:	
Principals in partnership with or without assistant(s)	11,200
Principals with assistants	1,000
Single-handed principals	8,700
Assistants	1,500
Consultants	6,400
Senior hospital medical officers	1,600
Senior registrars	1,200
Registrars	2,300
Junior hospital medical officers	200
Senior house officers and house officers (including provisionally registered practitioners holding house posts)	4,800
Research and teaching:	
Professors	300
Others	1,000
Other hospital and university medical staffs	200
Public health medical officers	2,400
Government service	600
Nationalized industries and industrial medical officers	400
Dentists (medically qualified)	400
Provisionally registered practitioners whose work is unknown	500
Partially retired	1,700
Wholly retired	5,100
Unclassified	7,100
	58,600

The group of 7,100 doctors who were unclassified on December 31, 1953, was subsequently analysed further, with the following result (figures correct to the nearest 50):

General practitioners (including 500 assistants)	800
Hospital and university medical staffs (including 250 consultants, 250 senior registrars and registrars, and 500 house officers)	1,200
Public health medical officers	50
Government service; nationalized industries and industrial medical officers; dentists (medically qualified); provisionally registered practitioners whose work is unknown	100
Retired	150
Unclassified occupations (including 700 doctors on leave from overseas; 350 locums, 350 doctors engaged in postgraduate study, 250 members of the staff of the Medical Research Council, 150 officials of medical organizations, and 100 ship surgeons)	3,000
Doctors about whose occupations no information was available between December 31, 1953, and August 31, 1954	1,800
	7,100

The age and sex breakdown of the Emergency Register was as follows:

Men:	Under 30	30-39	40-49	50-59	60-69	70 and over	Total
	5,700	14,000	10,000	8,800	5,000	4,200	47,700
Women:	Under 30	30-39	40-49	50-59	60-69	70 and over	Total
	2,500	3,200	1,600	2,500	700	400	10,900
							58,600

The Central Medical Recruitment Committees—one for England and Wales and one for Scotland—are representative of the whole profession and succeeded the Central Medical War Committees in 1952.

CENTRAL CONSULTANTS AND
SPECIALISTS COMMITTEE (SCOTLAND)

ANNUAL REPORT

The Central Consultants and Specialists Committee (Scotland), under the chairmanship of Dr. J. G. M. HAMILTON, with Dr. I. D. EASTON as deputy chairman, has published its annual report for the session ending October 1, 1954. The following members represented the Committee on the Central Consultants and Specialists Committee during the session 1953-4: D. M. F. Batty, J. Dunbar, I. D. Easton, A. T. R. Hamilton, J. G. M. Hamilton, D. M. Hart, A. Lyall, J. C. Macarthur, F. H. Robarts, and R. de Soldenhoff. The Committee's representatives on the Scottish Joint Consultants Committee were J. G. M. Hamilton, A. Lyall, H. MacLennan, and A. Smith.

Legal Liabilities of Hospital Authorities

The Committee has continued the consideration, which it began in its previous session (*Supplement*, December 12, 1953, p. 226), of the problem of the legal liabilities of hospital authorities under the N.H.S. (Scotland) Act, 1947. For some years in England a series of judgments in the courts has been establishing that a hospital authority can be held vicariously liable for the clinical actions of practically all members of its medical staff. Hitherto, under Scots law, the responsibility for his clinical actions has rested solely with the doctor; but a recent judgment in the Court of Session indicates, the Committee reports, that there is every likelihood that Scots law will be assimilated to English law in this respect. This would have the effect of placing the doctor in a master-servant relationship with the hospital board and fundamentally alter his relationship with his patients. The Committee was unanimous that such a change would be likely to be detrimental both to the status of the profession and to the actual medical service provided for the community. The Committee therefore invited the regional consultants and specialists committees to discuss the problem and submit an expression of opinion regarding the action which should be taken. At the same time the Scottish Joint Consultants Committee asked the Scottish royal medical corporations for their views on the subject. These inquiries showed that, with the exception of one of the corporations, which considered that discussion would serve no useful purpose at present, the opinions expressed were unanimously in favour of all possible steps being taken to preserve the present Scottish position. The Scottish Joint Consultants Committee informed the officials of the Department of Health of this opinion on April 29, 1954. The Chairman of the Joint Committee pointed out that the profession in Scotland naturally wished to avoid any interference with the patient's right to proper redress in case of grievance, but that undoubtedly a factor in the increase of litigation in both England and Scotland was the fact that the hospitals are now public bodies. Patients generally were less ready to sue the doctor than to sue the hospital. If the sole responsibility of the doctor were established, it might be necessary, in order to ensure that patients were assured of legitimate redress in proper cases, to make appropriate insurance a condition of appointment to medical posts in the hospital service.

The Committee was unable to report further on this matter except to say that it would take all possible steps to make known in appropriate quarters the deep concern felt by the profession.

The General Practitioner and the Hospital Service

The report says that discussions were held at the Department of Health's invitation between the Department and the Scottish Joint Consultants Committee on the implementation of the Scottish Health Services Council's recommendations on the general practitioner and the hospital service.

The Joint Committee was in general agreement with the Department, but stressed that not only should some general practitioners be encouraged to take up hospital work, but some holders of hospital posts must equally be encouraged to engage in general practice. The Committee therefore supported the introduction of a system of part-time registrarships. The future of most part-time registrars would probably lie in general practice, but the future consultant would also gain valuable experience if, during his hospital training, some time could be spent in general practice. The Committee suggested that a preliminary pilot survey might be made to determine the probable number of assistantships in general practice which might be combined with part-time hospital appointments. The Department agreed with this proposal, and surveys in some areas are proceeding.

Seconding Nurses to the Tuberculosis Service

The Committee reports that its Tuberculosis and Diseases of the Chest Subcommittee has gone into the urgent problem of obtaining nursing staff for sanatoria. Details were given to the Subcommittee of schemes for the secondment of student nurses from general hospitals to tuberculosis units, which are operating most successfully in the north-eastern and south-eastern regions. Chest physicians think that the main reasons for the small numbers of nurses volunteering for duty in sanatoria are (a) the proprietary attitude of some matrons in general hospitals towards their staff, and (b) the anxiety of parents about the risk of infection.

An attempt is being made to obtain a comprehensive survey of the incidence of tuberculosis among nurses in sanatoria during the last few years, together with facts and figures on the protection given by B.C.G. vaccination. It is felt that these figures may well show that the risk of infection is greater amongst nurses working in general hospitals, where the extra protection given to nurses in sanatoria is perhaps lacking. The Committee thinks that, should the survey prove this to be so, publication of the fact may encourage parents to allow their daughters to volunteer for work in the tuberculosis service.

The Subcommittee, in combination with the Public Health Subcommittee of the B.M.A.'s Scottish Committee, is also investigating the difficulties in resettling tuberculous patients. Yet another activity of the Tuberculosis and Diseases of the Chest Subcommittee, and noted in the Committee's report, is an inquiry into the difficulty in filling junior medical staff appointments in sanatoria.

Staffing Problems in Anaesthetics

The Committee's Anaesthetic Services Subcommittee has completed a survey of the anaesthetic service in Scotland. This shows that in the western region the senior staff establishment is far below requirements and out of proportion with other regions. The Subcommittee made the following points: (a) Many junior members of the anaesthetic staff are having to undertake work which should only be done by fully trained anaesthetists. (b) In the assessment of sessions for anaesthetic staff there should always be included notional assessment of the time necessarily spent in ward visits. This time allowance will vary according to circumstances and the type of work being undertaken in the hospital. (c) There is difficulty in defining the dividing line between an S.H.M.O. and a consultant in anaesthetics. The Subcommittee agreed to the following suggested definition: "An S.H.M.O. is competent technically and has enough experience to make him reliable. A consultant is competent technically, but with his wide experience is able to advise his colleagues about new techniques." (d) In view of the shortage of anaesthetists, general-practitioner anaesthetists should be employed in rural areas, but their employment should be limited in the cities.

The Profession and Hospital Authorities

Among other matters mentioned in a comprehensive report of the year's business is that a sympathetic Department of Health has once again been urged, and has agreed,

to press regional hospital boards to consult regional consultants and specialists committees on the administration of the hospital service, particularly in connexion with medical establishments. The disquiet of the profession in Scotland about the medical membership of regional hospital boards and boards of management was again taken to the Department of Health. The Department showed that the proportion of medical members appointed to hospital authorities remained substantially unaltered, but that, as a result of deliberate policy, regional hospital boards had been reduced in size. An undertaking was given that where medical representation was already small it would not be further reduced. The Committee intends to continue discussion on this problem.

BREACH OF TERMS OF SERVICE

E.C.10 FOR PATIENT NOT ON LIST

The East Suffolk County Executive Council agreed by a majority vote to the recommendation of its Medical Service Committee that 100 guineas be withheld from the remuneration of Dr. "A." Representation to this effect will be made to the Minister of Health.

Dr. "A" had been attending on a fee-paying basis a patient living in West Suffolk and registered on the list of a local doctor who had been certifying him regularly every 13 weeks as being unfit for work on account of schizophrenia. Dr. "A" was not under contract with the West Suffolk Executive Council to provide general medical services in its area. He had been attending the patient in question privately for about 10 years for "psychological reasons," seeing him regularly about every six weeks. Dr. "A" admitted that on one of his visits he had prescribed for the patient on the official form, because he had a cold; Dr. "A" agreed that form E.C.10 should not be used for private patients. The patient's own doctor said that he knew Dr. "A" was visiting his patient, but he did not request or authorize Dr. "A" to issue a script on his behalf, nor was he told that Dr. "A" had done so.

Service Committee Findings

The Medical Service Committee found that a breach of clause 7(10) of the Terms of Service for Medical Practitioners had occurred in that the script (form E.C.10) was improperly issued by Dr. "A" and without consultation with the patient's doctor who was responsible for treatment, and who was at the time certifying the patient as incapable of work. Either the patient's own doctor or his deputy had been available when required.

The Committee, in recommending the fine, advised the Executive Council to take a very serious view of the case.

Note.—Clause 7(10) of the Terms of Service reads as follows: "The forms provided shall not be used for persons other than the patients who are under treatment by him." Clause 1 of the Terms of Service interprets "patient" as meaning a person for whose treatment a practitioner is responsible under his terms of service.

COMPARATIVE PRESCRIBING STATISTICS

During this month general practitioners in some areas will receive a statement of their prescribing costs for the month of October, 1954, and comparable figures for the area. The statement will show the average number of prescriptions issued per person on the doctor's list during the month and the average for other doctors in the area, the average cost (in pence) per prescription issued by the doctor and by the others in the area, and the average cost—also in pence—per person on the doctor's list and that of his colleagues in the area.

This marks the start of arrangements whereby gradually every G.P. will receive from time to time a note of his prescribing costs and the average for his area for a particular month. It is a reintroduction of a practice followed under the National Health Insurance scheme and which doctors at that time found helpful.

PRESENT NUMBER OF SENIOR
REGISTRARS TO BE MAINTAINED
STATEMENT BY MINISTER AND JOINT
CONSULTANTS COMMITTEE

The Minister of Health has been reviewing the training plan for senior registrars instituted in 1951 in the light of the numbers actually employed and the factors which will affect the number of vacancies likely to occur in the higher grades in the period in which persons who enter the senior registrar grade in the next few years will be completing their training.

After discussion with the Joint Consultants Committee as representing the medical profession, the Minister has come to the conclusion that generally the intake of senior registrars in the various specialties is for the time being sufficient to meet future needs, and that the present number employed should be maintained pending the outcome of the discussions in which he and the Joint Committee are engaged on the general subject of the medical staffing structure of the hospital and specialist services.

Accordingly, in a letter of December 13, the Minister has asked hospital boards to maintain their senior registrar complement, in total and in each specialty, at the number at which it then stood, subject only to a few minor alterations.

Extension of Appointments

When a senior registrar completes the tenure of his present appointment, whether this is in a post within the training plan of 1951 or in a "transitional" post, the employing board is left free to extend his appointment for an additional year so that he may have more time to compete for a higher post if it is satisfied that his potentialities are such that he is likely, given more time, to obtain one. When a post becomes vacant, boards are expected to appoint to it a new senior registrar in the same specialty. As hitherto, there is nothing to prevent an existing senior registrar from obtaining another senior registrar post in the same or a different specialty and holding it for the usual term.

Senior registrars whose tenure is extended under these new arrangements will, of course, continue to be free to compete for higher posts. It is emphasized, however, that their retention as senior registrars will not give them any special claim or constitute any guarantee that they will be successful. The Joint Committee has expressed its agreement with these arrangements.

LIVERPOOL LOCAL MEDICAL COMMITTEE

Relations between the general practitioner and local authority health services in Liverpool have improved remarkably in the past year or two. In welcoming the change, the *Liverpool Local Medical Committee Bulletin* of December, 1954, states that no decision affecting both services is now made without discussion between the general practitioners' representatives and the medical officer of health.

With reference to the inspection of surgeries, the committee reports the passing of a resolution: "That all the members present at this meeting of the Liverpool Local Medical Committee are unwilling to inspect doctors' surgeries unless at the request of the doctor concerned." The committee explains its attitude to this matter by saying that where inspection is needed it should be done by the executive council, and that an official of the committee could accompany the inspectors if the doctor concerned wished, in order to see that his interests were properly safeguarded.

Commenting on proposals that general practitioners might with advantage draw up appointments systems, the committee says that, in spite of the incredulity with which such ideas are greeted by busy practitioners, reports continue to appear suggesting that an appointment system can work, and it would be interested to hear from any local practitioner who is running such a scheme. The *Bulletin* reminds its readers that 10 years ago an appointments scheme for hospital out-patients was considered a fantastic suggestion.

SENIOR HOSPITAL MEDICAL OFFICERS
GROUP

As reported in the *Supplement* (December 11, 1954, p. 224), the steering committee of the new S.H.M.O. Group recommended that a Group council should be elected, consisting of two representatives from each hospital region. Final approval of this plan must wait until after the next meeting of the Council of the Association, but, in anticipation of this, meetings of S.H.M.O.s in each region are now being arranged. These meetings, in addition to appointing representatives to serve on the Group council, will afford S.H.M.O.s an opportunity of discussing their immediate problems and future activities. An S.H.M.O. in each region has undertaken to act as convener for the initial meeting, and announcements will be made in the *Supplement* of times and places of the meetings. It is hoped that these will all take place during the months of February and March.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Anonymity in Broadcasting

SIR,—May I humbly suggest that the Central Ethical Committee's repeated warnings against broadcasting under one's own name (*Supplement*, December 25, 1954, p. 245) have no legal backing whatsoever? It would be impossible to prove that broadcasting under the conditions observed by the B.B.C. constituted advertising by a registered medical practitioner with a view to his own gain, and it is contrary to the public interest that responsible medical men should be prohibited from speaking or appearing in person in sound and visual broadcasting. I am even doubtful whether the Association would be justified in expelling a member on this account.—I am, etc.,

Oxford.

L. J. WITTS.

Local Health Authority Nursing Services

SIR,—I have read with great concern the article by Miss J. M. Akester and Miss F. M. Mawson (*Supplement*, November 20, 1954, p. 187), which I feel shows a tendency to underestimate the incomparable work done by district nurses and to indicate that this could be done by less intelligent and less highly trained women. Miss E. J. Merry in her letter (*Supplement*, December 4, p. 213) very rightly says: "At present the patients know what they are getting when the family doctor says he will send along the Queen's or Ranyard nurse." I should like to endorse this and to emphasize that the doctor, too, knows what he or she is getting.

As a consultant who has had the privileged experience of working for many years with district midwives and nurses, I find that it is because of the extent of their training and the breadth of their experience that I have such confidence in them. There are many cases one allows to remain at home, or to be sent home from hospital, because one knows that the district nurse has the qualifications to spot sudden changes, to report progress, and to carry out one's instructions so accurately that she can be trusted implicitly.

It seems strange to me that curtailment of this training should be suggested. To start with, how does one pick out the candidates for this? Surely, few girls make the choice of district nursing as their career until they have finished their training and seen what branch they prefer. I should be interested to learn why, in this article, the health visitors give the impression that they should be so much more highly intelligent and specialized in comparison with their colleagues. It is just as important that all the domiciliary staff should be intelligent and specialized. In many ways

they have far greater responsibilities and opportunities than nurses in hospital. A good percentage of their work is connected with social problems and health teaching. I can hardly believe that it could be possible for a nursing orderly to visit a patient for washing and for a health visitor to arrive shortly afterwards for teaching purposes. Who is better able to do it than the district nurse who spends so much time in the home at a moment when both patient and relatives are receptive to advice? Why, for instance, should the health visitor be the one to advise the household about admission of a patient to a sanatorium if the district nurse is already attending the case, as with the present district nursing training this side of the work is incorporated?

Their statement regarding the health visitor having to take Part 1 C.M.B. is astounding. At present, part of the duty of the health visitor is to advise on infant feeding after the midwife has unfortunately ceased to be responsible on the 14th day after birth. I consider that this work can only be done really adequately when the health visitor has not only taken Part 1 but has qualified and practised as a midwife. Domiciliary midwifery would also give them a far deeper "understanding of family life" than anything else. I think that I can speak for many obstetricians when I say that no antenatal advice or instruction should be permitted by any health visitor who has not practised midwifery; indeed, it should always be given by midwives where possible.

Miss Akester and Miss Mawson say that the duty of the district nurse is to care for the sick. Their duties are not only washing. However, what task needs more skill than the washing of a hemiplegic and the prevention of bed sores, or the washing of anyone so crippled with arthritis that any movement is agonizing, let alone an inexperienced movement? In addition there is the nursing of patients with diabetes, cardiac disease, and advanced carcinoma, and also much work is being done to rehabilitate the chronic sick and so save valuable hospital beds. As another correspondent has said (Dr. O. Ll. Lander, *Supplement*, December 11, p. 229), the district nurse often has far more responsibility than the ward sister.

With regard to the suggestion made that doctors should have lay attendants at their clinics, I feel that there are many doctors who would agree with me that this would be most unsatisfactory. Apart from possible medico-legal aspects and professional secrecy, the speed and efficiency with which one can conduct a clinic depend a good deal on the help and efficiency of the attendant nurse (in hospital it would be the out-patients sister). When a trained nurse and doctor work together there is also a valuable exchange of knowledge, and also, by being with the doctor when the patient is examined, the nurse is more able to give help afterwards to the patient or the parents.

What Miss Akester and Miss Mawson call "team leaders" surely exist at present in the persons of the superintendent of home nursing and the superintendent nursing officer. At present these "leaders" have wide experience in all branches of nursing, and also a specialized knowledge of the requirements of domiciliary work. To be a successful leader one must have had adequate experience, with the attendant understanding of difficulties, as well as academic knowledge of all the work to be done by those one has to lead. Their article does not appear to recognize this fact sufficiently. I should like to say that I have learned a very great deal from district midwives, nurses, and health visitors, and I am deeply grateful to them all, perhaps in particular to members of that great association of Queen's Nurses, who are, indeed, the specialists in domiciliary work.—I am, etc.,

Chichester.

EVERELL M. SHIPPAM.

SIR,—It would appear that considerable interest has been aroused by the article by Miss J. M. Akester and Miss F. M. Mawson (*Supplement*, November 20, 1954, p. 187) on the future training of nurses. This constructive contribution on the subject should surely not arouse any real anxiety as to the future standard of nursing. It is accepted as a

Fining the Doctor

SIR.—I agree with Dr. Paul R. Saville (*Supplement*, December 18, 1954, p. 241). Careless and extravagant prescribing does exist, and, with whatever motive it is done, it does constitute a sabotage by the offender against the Health Service and against his fellow-practitioners. Unchecked, it can wreck the scheme financially and it can also make life infinitely harder for a conscientious colleague. One can hardly blame a patient for demanding expensive and unnecessary antibiotics for some trifling ailment if he has been encouraged by another doctor to consider these essential. It is a common experience to hear that "the baby only had a cold after all, but the doctor gave penicillin as a precaution." A colleague of mine says that he knows which travellers have visited the surgery by the flood of "fancy prescribing" which then flows from the pen of his assistant.

Some check on costs of prescribing existed for years under the National Insurance scheme and I never heard then any bitter complaints of injustice. Some control was necessary then as it is necessary now, and for the same reason—that is, that, as Dr. Saville rightly says, we are not all saints and angels. Times may change and modes of practice with them, but human nature does not change.—I am, etc.,

London, E.12.

D. E. PEAKE.

SIR.—Certainly £600 seems a large fine, but there is one aspect which has not struck doctors who have so far written about it. It is quite evident that the executive council's opinion was that the doctor concerned had attracted patients by over-prescribing. It can be, and is being, argued that it is unreasonable to penalize a doctor for this, but, assuming for the moment that it is reasonable, is the fine excessive?

It is hardly likely that the executive council would have come to its conclusion unless it had thought that the number of patients attracted was somewhere in the region of 200 to 400, possibly more. The increased remuneration from these patients is not for one year only, and the true benefit to the doctor is probably, depending on how long he practises, something between $200 \times 17s.$ less tax for 10 years, and $400 \times 17s.$ less tax for 30 years—that is, between £925 and £5,550 (if income tax drops these sums would be larger). Even a fine of £600 can hardly be called a deterrent. Surely, too, other doctors in the district deserve some consideration. The loss of patients to some of them might well mean the loss of a holiday every year, or once in every two or three years.

I do not think the doctors who have written would be so ready to defend over-prescribing if they had come across it in a neighbour or a locum. One of my locums prescribed 40 proprietary tablets (I have forgotten the name) for vomiting of pregnancy. The chemist had to get a pack of 100 at a cost of just under £10. The patient took only five, as they did no good, and stopped vomiting on calcium lactate tablets which I gave her on my return. Another locum put all my heart cases on digitalin granules, costing four times as much as the digitalis preparation they had been having. Not one patient was any better, and one or two said they felt worse. No doubt freedom is essential to good practice, but is it any more a loss of freedom to be bound by at any rate some rules when prescribing than to be bound by rules of asepsis when practising surgery? Or are we, as one letter seems to suggest, to give medicines whenever a patient asks for them? Surely this is a worse loss of freedom.—I am, etc.,

Bracknell, Berks.

L. G. JACOB.

SIR.—While not attempting to comment on the particular case of Dr. "X" (*Supplement*, November 20, 1954, p. 191), it seems to me that the correspondence on the whole aspect of prescribing costs and their control prompts the following questions: (1) Can we prescribe adequately, even on occasion employing new and expensive substances when their use is indicated, and at the same time keep prescribing

fundamental principle that good nursing is essential to every branch of our profession, and, so far as the general practitioner is concerned, the statement by the Minister of Health—that we should be considered as the "leaders of the team"—has been implemented and given every encouragement in providing ancillary services, including those in the nursing field. In the latter, two working parties have been appointed—one is concerned with seeing to it that the highest possible standard of nursing will be available in what is almost entirely the family doctor service; the other, we may take it, will be investigating every possibility of implementing in our sphere the services of the health visitor. Let us not forget, too, that the Royal College of Nursing keeps a very watchful guard on the standard of nursing in all its phases.

With regard to the doctor-nurse relationship, surely it is everywhere acknowledged that the nurse in all her spheres is invaluable. So far as the health visitor is concerned, the value of her services is becoming much more widely recognized, and in the tripartite division of the public health nurse into the categories of district, obstetric, and health visitor she is taking her place with the others in a comprehensive health service.

In my own area, and adjacent ones, we keep a list on the desk of the manifold ways in which the health visitor can assist us, and we have facilities to telephone these problems direct to a nursing officer. May I add, too, that such list bears the authority of the medical officer of health and the local medical committee, which shows as nothing else can what an excellent liaison has been accomplished and that the scheme has the universal support of the profession.

One thing is certain—that in those areas and in those practices where the health visitor's duties are understood they are gratefully accepted and give much help to the busy doctor when faced with the problems of social and preventive medicine. It has been said that the fact that we are the guide, counsellor, and friend of the patient is in itself a justification for our existence. It is for that reason that we have been hallowed with the title of the "family doctor," and in these days, when for a diversity of reasons it is impossible to have the same contact that we did of yore, we need all the support we can get to help us know our families.—I am, etc.,

London, E.12.

STANLEY THOMAS.

Assistants in General Practice

SIR.—I gather "Principal's" main fear, in opposing the introduction of the Assistants and Young Practitioners Subcommittee's recommendation regarding the reduction in the size of a principal's excess list, is that the measure will not serve the best interests of assistants. The reduction of a principal's list in the manner recommended most certainly will help young doctors to gain entry into practice. While it is true that some of the "shed" patients may sign on with the next most popular doctor, this doctor may be anxious and willing to take in another man, and the influx of new patients may provide him with extra income to do so.

If some partnerships are unhappy affairs it is not infrequently due to the senior partner. Parsimonious shares and excessive wait for parity are potent causes of discontent which can be remedied by an enlightened senior. "Principal" recommends as a satisfactory way of entry into general practice that young doctors should put up a plate and be subsidized. The facts are that the few doctors who have made a success of this hazard have done so because of exceptional local conditions—new housing estates, etc. Most fail to a greater or lesser degree due to frustration and financial exhaustion. A significant cause of failure by this method of entry is the existing doctor-transfer arrangements, which reinforce the average patient's inertness and lack of mobility, even though he realizes he is not getting a square deal from his own doctor.—I am, etc.,

"ASSISTANT."

costs within reasonable limits? (2) Is it a fact that a small minority of our colleagues are not above trying to secure and maintain the good will of patients by prescribing lavishly, not caring overmuch about the real needs of the case?

If the answer to both these questions is "Yes," then as a profession we must continue to insist on clinical freedom to prescribe whatever we believe to be in the best interests of our patients. This does not mean that we must hold up our hands in horror if, in the future, action is taken against those who would squander public money in an attempt to further their own unethical ends.—I am, etc.,

Belfast.

H. J. CRONHELM.

SIR.—When a general practitioner is found guilty of excessive prescribing or some breach of his terms of service, an arbitrary sum may be deducted from his or her remuneration. If a hospital doctor is sued for neglect (expensive prescribing not coming into it, though it is he who often sets the ball rolling) his damages are paid either by the hospital or by his defence society, the bulk of whose contributions are paid by general practitioners. Where is the justice of this? The answer may be simple, but whether it is or not I should very much like to know it.—I am, etc.,

Brighton.

G. L. DAVIES.

SIR.—The recent report regarding the fining of a young general medical practitioner recommended by an executive council on account of reputed over-prescription has properly raised a considerable amount of protest, but it is doubtful whether the protest is thoroughly informed of the circumstances of the judgment. On the face of it it would appear as if the young practitioner built up his practice by industrious attention to his patients just as much as by over-generous prescription, and it should be remembered that such an inexperienced practitioner is liable to seek consultant advice frequently and that consultants are liable to prescribe expensive drugs. Indeed, a general-practitioner colleague of mine has been so alarmed by the numerous expensive drugs he has been advised to prescribe that he has taken to endorsing the prescription "as prescribed by Dr. So-and-So, consultant." This is a useful precaution which might well have protected the young practitioner in question from what is apparently gross "over-fining."

However, the point which I should like to make does not concern this judgment in particular, but concerns the control of the numerous committees with which the whole fabric of medicine is at present beset. I would suggest that all committees are required to publish the minutes of their meetings to those whom they are supposed to represent, and that in all cases such as the one under consideration the executive council should be required to make known the full details of the case and the grounds for judgment to the local general practitioners. It would then be possible for the local medical men at least to know whether one of their number has been victimized or properly chastised.—I am, etc.,

Burton-on-Trent.

RANDLE LUNT.

H.M. Forces Appointments

COLONIAL MEDICAL SERVICE

The following appointments have been announced: E. G. Q. Bannerman, M.B., Ch.B., Principal Medical Officer, Gold Coast; R. M. F. Charles, L.R.C.P.&S.Ed., D.P.H., Medical Officer, Grade A, Trinidad; G. Graham-Cumming, M.B., Ch.B., Deputy Director of Health Services, Hong Kong; F. C. Harris, M.R.C.S., L.R.C.P., D.C.P., Pathologist, Ministry of Health, Gold Coast; N. A. Nobbs, M.R.C.S., L.R.C.P., Assistant Tuberculosis Officer, British Guiana; E. B. Smart, M.B., F.R.F.P.S., D.P.H., Specialist, Hong Kong; P. W. W. Branch, M.B., B.S., Medical Officer, Barbados; J. D. Finlayson, M.B., Ch.B., Medical Officer, Sarawak; J. S. Hogg, F.R.F.P.S., Senior Medical Officer, Gilbert and Ellis Islands; J. Hunter, M.B., B.Ch., B.A.O., and W. J. D. Murphy, M.B., B.Ch., B.A.O., Medical Officers, Tanganyika; R. A. J. Webb, M.B., B.S., Medical Officer, St. Vincent.

Association Notices

Diary of Central Meetings

JANUARY

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| 10 Mon. | Medico-Legal Subcommittee, Central Consultants and Specialists Committee, 2.15 p.m. |
| 11 Tues. | Subcommittee on Assistants in General Practice, G.M.S. Committee, 2 p.m. |
| 12 Wed. | Central Consultants and Specialists Executive, 11.30 a.m. |
| 12 Wed. | Public Relations Committee, 2 p.m. |
| 12 Wed. | Amending Acts Committee, 2 p.m. |
| 13 Thurs. | Registrars Group Executive Committee, 2 p.m. |
| 14 Fri. | Medical Staffing Subcommittee, Central Consultants and Specialists Committee, 11.15 a.m. (Date changed from January 13 and time from 11.30 a.m.) |
| 17 Mon. | Psychological Medicine Group Committee, 2 p.m. |
| 17 Mon. | Geriatrics Joint Subcommittee, Central Consultants and Specialists, Public Health, and G.M.S. Committees, 2.15 p.m. |
| 19 Wed. | Council, 10 a.m. |
| 20 Thurs. | G.M.S. Committee, 10.30 a.m. |
| 20 Thurs. | Evidence Committee on Divine Healing, 2 p.m. |
| 25 Tues. | Medical Students and Newly Qualified Practitioners Subcommittee, Organization Committee, 2 p.m. |
| 26 Wed. | Planning Subcommittee, Occupational Health Committee, 10 a.m. |
| 27 Thurs. | Chairman's Subcommittee, Constitution Committee, 10.30 a.m. |
| 27 Thurs. | Rural Practices Subcommittee, G.M.S. Committee, 2 p.m. |
| 28 Fri. | Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m. |

Branch and Division Meetings to be Held

- BLACKPOOL AND FYLDE DIVISION.—At Savoy Hotel, Blackpool, Wednesday, January 12, 7.15 p.m., dinner; 8.30 p.m., lecture by Professor W. I. C. Morris: "Diseases of the Vulva."
- BURTON-ON-TRENT DIVISION.—At Bretby Golf Club, Ashby Road, Burton-on-Trent, Tuesday, January 11, 7.45 p.m., dinner. Address by Dr. J. H. Sheldon: "General Problems of Old Age."
- CHESTERFIELD DIVISION.—At Station Hotel, Chesterfield, Friday, January 14, 7.30 for 8 p.m., annual dinner; 9 p.m., talk by Mr. F. J. Milward: "The Diagnosis of Urological Disease."
- CROYDON DIVISION.—At 43, Wellesley Road, Croydon, Tuesday, January 11, 8.30 p.m., general meeting. Address by Mr. Ralph Marnham: "Modern Trends in Surgery."
- DARTFORD DIVISION.—Thursday, January 13, meeting. Mr. J. B. Blakley: "Domiciliary or Hospital Midwifery?"
- DUMFRIES AND GALLOWAY DIVISION.—Sunday, January 16, Mr. R. S. Venters: "Tinnitus and Aural Vertigo."
- DUNDEE BRANCH.—At Royal British Hotel, Dundee, Friday, January 14, 8.30 p.m., meeting. Mr. Martin Fallon: "Thoracic Surgery"; Dr. W. M. Shearer: "Anaesthesia in Thoracic Surgery." Members of Perthshire Branch are invited.
- EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, Herne Bay, Thursday, January 13, 7.30 p.m., dinner; 8.45 p.m., Dr. Alan Barker: "Shock in Obstetrics."
- GUILDFORD DIVISION.—At Mitchell Hall, Royal Surrey County Hospital, Guildford, Thursday, January 13, 8.30 p.m., meeting. Dr. G. H. Newns, Dr. J. P. M. Tizard, and Dr. S. J. R. Macoun: "Paediatric Brains Trust."
- HAMPSTEAD DIVISION.—At Hampstead General Hospital, Hampstead Hill, N.W., Wednesday, January 12, 8 p.m., clinical evening.
- HENDON DIVISION.—At Hendon Hall Hotel, London, N.W., Tuesday, January 11, 8.45 p.m., meeting. Dr. F. E. Camps: "The Gunman in London." Friends, of both sexes, are invited.
- KESTEVEN DIVISION.—At George Hotel, Grantham, Thursday, January 13, 7.15 for 7.45 p.m., dinner. Guest speaker, Sir Gordon Gordon-Taylor. All medical practitioners and their wives are invited.
- KINGSTON-ON-THAMES DIVISION.—At Kingston Hospital, Tuesday, January 11, 8 for 8.30 p.m., meeting. Dr. F. J. Bach: "Diagnostic and Therapeutic Measures that can be Applied in General Practice."
- METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C., Tuesday, January 11, 5 p.m., meeting. Lecture by Dr. T. Rowland Hill and Dr. A. Talbot Rogers: "The Difficult Years from Qualification to Establishment." All senior students and recently qualified practitioners are invited.
- SCARBOROUGH DIVISION.—At Out-patients' Hall, Scarborough Hospital, Thursday, January 13, 8.30 p.m., meeting. Lecture by Dr. Michael Ward: "Everest."
- SOUTH SHIELDS DIVISION.—At Ingham Infirmary, South Shields, Friday, January 14, 8.30 p.m., meeting. Address by Dr. W. C. Barnsley: "Bronchial Carcinoma."
- TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Tunbridge Wells, Tuesday, January 11, 8.30 p.m., meeting. Mr. T. Holmes Sellors: "Surgery of the Heart."

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 15 1955

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L.C.C. HEALTH REPORT DOMICILIARY SERVICES

In 1953 the number of domiciliary confinements in the county of London, which had been declining since 1948, again fell from 11,026 in 1952 to 10,472. In his report for the year 1953, recently published by the London County Council, the county medical officer of health and principal school medical officer attributes the decline partly to the decreasing birth rate and partly to the attraction of hospital confinements. He considers it problematical whether or not the recent increase in maternity benefits, particularly the introduction of the special home confinement grant of £9, will have any effect in halting this trend. Progress in the use of analgesia in home confinements has been rapid. In 1946 it was administered in 3% of cases and in 1953 to over 77%. Since 1950 all midwives employed by the L.C.C. have been qualified to administer analgesia.

District Nurses and Health Visitors

An average of 369 health visitors were occupied in connexion with the various health services, apart from the tuberculosis and school health services. Home visits numbered 832,500. The report shows continuing progress in integrating the work of health visiting and school nursing, and in extending the function of the health visitor to cover the care and welfare of the family as a whole. There was increased co-operation between health visitors, general practitioners, and voluntary and statutory organizations serving families.

Over 1,724,000 visits were made during 1953 by the district nursing associations which carry out home nursing on the council's behalf. This was an increase of about 110,000 over 1952. About 44% of persons whose treatment was completed during the year were over 60 years old. The average number of cases in the care of a nurse at any one time was 22.5. An exceptionally heavy demand for home nursing in the first quarter of the year was occasioned by a sharp rise in the number of respiratory diseases resulting from the severe fogs at the end of 1952 and beginning of 1953 and by an outbreak of influenza in February.

Extension of Home Help Services

The domestic help service was further expanded in 1953. At the end of the year nearly 3,000 full-time and part-time home helps were employed, and over 30,000 persons were assisted, three-quarters of whom were aged and chronic

sick. The report mentions two new extensions of the council's domestic help service. The first was a service of night helps to attend chronic sick patients in their own homes to relieve the patient's relatives of duties, other than nursing, normally performed by them for the patient, between 11 p.m. and 7 a.m. The second service provided child helps to care for two or more children in their own homes when temporarily deprived of the care of both parents and with no other adults in the home at night. The service aims at avoiding the emotional disturbance often caused to children by their having to be taken away from their homes in these circumstances.

Care of Mothers and Young Children

In the year under review 85% of children born in London attended a maternity and child welfare centre at least once in their first year of life as compared with 84% in 1952, 82% in 1951, and 79% in 1950. These children usually attend the welfare centres in their first year about 12-15 times. The report states that educational activities at these centres, including mothercraft training and health education, have been expanding year by year, and in 1953 there were record attendances of 34,977. The council's antenatal clinics were attended by 43% of all expectant mothers, others obtaining antenatal care through the hospitals or family doctors. At the end of 1953 there were 110 day nurseries accommodating over 6,000 children under 5. In addition, 854 children were being cared for by registered child-minders.

London Ambulance Service

The demand on the London ambulance service was again very great in 1953. Patients conveyed by the general section (including agency and supplementary services) numbered 868,826, compared with 810,002 in 1952. Over 5,000,000 miles were involved in these arrangements. In the accident section there were 90,896 calls with a mileage of 458,602.

School Health Service

In reviewing the L.C.C. school health service the report states that 449,597 medical inspections were carried out during the year, and 15.8% of the children examined required to be referred for further medical advice or treatment, compared with 16.2% in 1952, 17% in 1951, and 17.6% in 1950. The number of dental inspections in schools greatly increased in 1953, being about two and a half times the number in 1952. This resulted in an increased amount of dental attention for children.

RESIDENTIAL ACCOMMODATION FOR
HOSPITAL STAFF

Following discussions with the Joint Consultants Committee about the current shortage of junior hospital medical staff, during which representations were made to the Minister that provision of more residential accommodation might help to solve the problem, the Ministry of Health has issued a circular (H.M. (54)115) to hospital authorities noting the Minister's policy on this matter.

Although the Minister has powers to provide residential accommodation for hospital staff, he considers that, in view of the limitation on capital expenditure, as little as possible should be spent on acquiring or building such accommodation. Hospital authorities should provide residential accommodation only where the staff must, because of the nature of their duties, live on or near the hospital premises, or where the hospital is remotely situated and no other suitable accommodation can be obtained locally. Where these criteria apply, quarters may also be provided for married staff. The Minister suggests that hospital authorities should assist their staff in all possible ways to get accommodation when this is not provided by the hospital.

MEDICAL PRACTICES COMMITTEE

AMENDMENT OF CLASSIFICATION OF AREAS

The following have been reclassified by the Medical Practices Committee (October 1, 1954, to January 1, 1955) as "designated" areas:

Derbyshire.—Urban District of Heanor.
Ipswich.—Whole of County Borough.

The following as "intermediate" areas:

COUNTIES
Cumberland.—Cockermouth.
Derbyshire.—Borough of Chesterfield.
Durham.—Urban District of Blaydon.
Essex.—Borough of Romford.
Hampshire.—Rural District of Stockbridge.
Kent and Canterbury.—Urban District of Crayford; Urban District of Northfleet.
Lancashire.—Middleton (except Langley Estate).
London.—Borough of Kensington: Kensington North; Borough of Lambeth: Princes and Oval Wards; Borough of Lewisham: Culverley and St. Andrews Wards; Borough of Woolwich: Dockyard, St. Mary's, River, St. George's and Herbert Wards.
Middlesex.—Borough of Harrow: Harrow Weald Ward.
Urban District of Staines: Staines Ward.
Northumberland.—Shiremoor (Seaton Valley).
Wiltshire.—Swindon.
Yorks (W.R.).—Urban District of Bentley with Arksey.

COUNTY BOROUGHS

Kingston-upon-Hull.—East District.
Swansea.—East District.

The following as "restricted" areas:

Cornwall.—Perranporth.
Norfolk.—Rural District of Depwade.
Nottingham County and City.—Selston.
Somersetshire.—Rural District of Yeovil.

CLASSIFICATION OF PROPRIETARY
MEDICINES

A revised list of proprietary medicines classified by the Standing Joint Committee on the Classification of Proprietary Preparations and the Joint Committee on Prescribing in categories 1, 5, and 6, and dated November, 1954, has been issued by the Ministry of Health and the Department of Health for Scotland. The list replaces those issued in July, 1953, and January, 1954.

WHITLEY MACHINERY IN THE HEALTH
SERVICEPROFESSOR BEDSON'S ADDRESS TO LABORATORY
TECHNICIANS

The November, 1954, issue of the *Gazette of the Institute of Medical Laboratory Technology* reports an address by Professor S. P. Bedson to the London Branch of the Institute. Professor Bedson is adviser in pathology to the Ministry of Health, but he made it clear that on this occasion he was speaking as a private individual.

Professor Bedson, by request, talked mainly about the present conditions of service of laboratory technicians and, among other things, of Whitley machinery. With the advent of the National Health Service and with the week worked by the technician being regulated by statute, trade union practice, he said, now permeated the service. Professor Bedson gave some details about the operation of the Whitley Council for the Health Services. Some such machinery was necessary to ensure equitable and uniform terms and conditions of service, and it was also necessary to have a court of appeal to deal with alleged injustices. He thought that in theory at all events the Whitley Council was an adequate system for the purpose, but in practice he sometimes wondered whether the spirit in which Whitley negotiations were conducted was all that it might be. As a member of the Management Side of a Whitley Committee, Professor Bedson thought that his colleagues on the Management Side were fair-minded and anxious to come to the right decision. Delays, he thought, were probably due to lack of mutual trust, and he looked forward to the time when the Management and Staff Sides would approach their work with a sense of urgency and a spirit of co-operation.

Treasury Influence

Professor Bedson said that there was no doubt that one factor affecting Whitley Council deliberations was the influence of the Treasury, but, bearing in mind its responsibility, he hardly knew what could be done about that. Commenting in the same issue on the influence of the Treasury on Whitley negotiations, the *Gazette* remarks that it is a heavy one. All taxpayers, it says, can appreciate that the taxpayer's interests must be safeguarded, but "that argument by itself will not stand." "If the State takes over a service," the *Gazette* goes on, "it should not prove itself an indifferent employer on the grounds that there is insufficient money to be otherwise. If the State finds that it cannot meet its self-assumed obligations to the public and be a just employer, then, whatever may be the implications, it should say so. Some may think, in any case, that the Treasury exercises an uneven hand both within the National Health Service and as between the various Ministries."

"AUTHORITY" TO PRESCRIBE

General practitioners sometimes try to cover themselves against a possible charge of excessive prescribing by asking executive councils to "authorize" in advance the prescribing of some preparation of an expensive kind. Executive councils have no power to give this authority or to say what should or should not be prescribed. The responsibility for prescribing is entirely the doctor's. If a doctor is asked to justify to the local medical committee his use of a particular drug, and it is one which he prescribed on the advice of a consultant, the consultant's opinion should be given to the local medical committee in support of the case for justification.

The London Local Medical Committee has informed the London Executive Council that in the circumstances of a case referred to it for decision "sanatogen" was not prescribable as a drug under the N.H.S. Regulations.

C.B.E. FOR A CHAIRMAN

Mr. E. C. Elliott was among those who received the C.B.E. (Civil Division) in the New Year Honours. Mr. Elliott, a chartered accountant, is chairman of the Interdepartmental Committee on the Distribution of Remuneration of General Practitioners (England and Wales), which allocates to executive councils the sums required for the payment of G.P.s, and also of the International Distribution Committee, which allocates to England, Wales, and Scotland their share of the total money available in the central pool for the whole country. These committees are made up of representatives of the Ministry and of the general practitioners, and Mr. Elliott is an independent chairman.

NO SOCIALIZED MEDICINE

President Eisenhower said in his recent message to Congress on the state of the Union that his proposals for improving the health services would continue to reject socialized medicine. In *The Times* account of the speech, the President is reported as saying that his administration followed two simple rules: the Government should perform an essential task only when it could not otherwise be adequately performed; and in performing that task the Government must not impair the self-respect, freedom, and incentive of the individual.

The President will put forward a co-ordinated programme to strengthen and improve existing health services on January 24.

HOUSE OFFICERS' SALARIES

It has been agreed in Committee B of the Medical Whitley Council that, as all fully registered house officers will now have been qualified for one or more years, there should be one rate only—£525 per annum—for all fully registered house officers, whether or not they have held previous house appointments. Provisionally registered house officers are paid at the rate of £425 a year for their first post and £475 a year for the second; Committee B has also agreed that an employing hospital authority should have discretion to pay the second-post rate to a provisionally registered practitioner holding his first post if he has already had equivalent hospital experience outside the National Health Service—for example, in a hospital appointment in another country. In each case the deduction of £125 per annum for board and lodging will be made.

The Ministry has sent a circular (M.D.B. Circular No. 20) to this effect to hospital authorities.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.
Urban District Councils.—Houghton-le-Spring.

Questions Answered

Tax Relief for Clothing

Q.—What expenses are allowable for income-tax purposes with regard to clothing?

A.—Expenses must have been incurred wholly and exclusively for the purposes of the profession. For example, the cost of special garments for surgery use is allowable, but the cost of clothing of the normal kind is regarded as excluded from allowance.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Practice in the Highlands and Islands

SIR.—In forming a special Highlands and Islands Practitioners' Subcommittee to deal with the subject (*Supplement*, November 6, 1954, p. 171), the B.M.A. has shown itself aware of the special problems associated with medical practice in the remoter areas of Scotland. Having only a few weeks ago given up practice in Unst, the most northerly of the Shetlands, after five years there, perhaps I may be allowed to make a few remarks on the subject.

It is idle to say one is isolated professionally. No one who is not prepared for isolation should take up practice in such an area. But isolation brings in its train several unfortunate consequences, some but not all of which could be mitigated by administrative changes. Working single-handed on an island with a list of 1,000 one is literally never off the chain. My nearest colleague was on an adjacent island, but to ask him—a busy man—to stand in for me more than very occasionally would have presumed too greatly on his helpful attitude. In any case, the time it would have taken him to reach an emergency precluded one's leaving the island except very rarely. With no let-up or change of scene an annual holiday becomes almost essential to combat staleness, but the cost of this is beyond reason. Further, the present paucity and independence of local domestic labour make provision for a locum very difficult indeed, and, even though a locum is available on the mainland of Shetland (and there may well not be one), the steamer and railway fares for oneself, one's family, and probably the locum add up to a high total, and incidentally add at least a week to one's holiday time. It may be a dangerous principle to admit—but could the State not take cognizance of this unusually high expense and make some provision for it?

In outlandish parts it is recognized by the Department of Health for Scotland that it is impossible for a doctor to find his own accommodation. Accordingly the Department acquires a suitable house and rents it to the practitioner of the moment. A case can easily be made out for an extension of this principle to the provision of furnishings of the surgery and waiting-room. I envisage the Department owning such articles as a dispensing table, examination couch, and the minimum of chairs and cupboards and tables to make the whole a going, if frugal, concern. These would be rented along with the house at charges to be fixed by the Department. This would ensure that between doctors there would be no awkward interregnum until the incoming practitioner can arrange his affairs. It is manifestly impossible to give the incoming man first refusal of all furnishings, which, should he not require this or that, would be left on the hands of the outgoing doctor.

A great fillip to morale could be given if specialists visiting the local parent hospital would make a point of occasionally going round outlying areas—and doing so with an inquiring attitude of mind and not merely robot-like seeing a few patients and dashing off again. In my five years on the island one medical specialist took the trouble to come and see conditions for himself, and Professor Craig, of Aberdeen, came on from Lerwick and repeated a lecture he had given there and which I had been unable to attend. It should further be a point almost of honour that specialists appointed to the local hospital visit all outlying practitioners within, say, six months of appointment. I make these observations in no carping spirit, but merely in the thought that were these points conceded it would still further add to the attractions of practice off the beaten track.—I am, etc.,

Beer, Devon.

JAMES GUTHRIE.

Local Health Authority Nursing Services

SIR.—There have appeared in your columns recently several letters criticizing the local authorities health services, and the opinion expressed by those writers appears to be broadly that the work of the school medical officer might well be taken over by the general practitioner. Why this change is suggested does not seem quite clear. It is now generally accepted that the early detection and treatment, if necessary, of physical and mental abnormalities, and their prevention as far as possible, is beneficial to the individual and community as a whole. Many doctors agree that the medical examination of schoolchildren, with this end in view, should be carried out.

Who is the doctor best suited to undertake this? The family doctor certainly knows the background of many of those on his list, but what of those who have never consulted him on some specific point, or those who have felt that their problem must appear too trivial for the family doctor in his busy surgery to attend to? The school doctor can ascertain much, if required, from the health visitor, who will be with him at the examination, and from other departments if indicated. He can also consult the family doctor on any point. The school doctor also has the opinion of the teaching staff readily available on such things as speech defects or behaviour problems, and, of course, he has the parent with him at the examination.

As to the method and thoroughness in performing an examination, surely this varies with individual doctors, and efficient or inefficient work is not confined to any one branch of the medical profession. A good school doctor may be quite as able to examine a child as a general practitioner, and vice versa. Tact and discretion, too, are not the monopoly of any one section of doctors, and a school doctor may quite well know what to tell parents of children concerned. Indeed, surely it is part of their training to be able, if only in a small way, to help wisely to educate the public in health matters. Are not, too, two opinions sometimes helpful in considering the problems, mental and physical, of growing children? "Considerable anguish" may be caused by any inconsiderate doctor, whether he be working as a school doctor or general practitioner.

Should the extra duties of the school doctor be added to those of the general practitioner, some of whom appear to have considerable work already on their hands, where would the examination be held and at what times? Would there be a succession of general practitioners visiting the school during school hours to examine those schoolchildren on their lists, or would the family doctor send out appointments for parents to attend the surgery with their children? Would a busy practitioner wish to add this considerable amount of practice and clerical work to his already sufficient duties? Some overlapping of work is inevitable between various branches of a profession, and if it is seriously suggested that general practitioners should take over the school doctors' work, then it may equally well be considered whether school doctors should not be permitted to take over the treatment of schoolchild patients and preventive medicine affecting other groups of the community.—I am, etc.,

Norwich.

C. H. B. LAWFIELD.

SIR.—Dr. M. G. Philpott (*Supplement*, December 25, 1954, p. 247) does not present the purpose and obligations of the school health service in their modern setting. Its objects are to detect defects in their early stages (and to arrange suitable treatment) and to advise the schools and parents with regard to any special regime which a particular child may require for his well-being and education. The school medical inspection offers an ideal opportunity for the diagnosis of a number of conditions, the significance of which may not be realized by the parent and may be unknown to the family doctor. Among these are deafness (which may be progressive and become permanent), visual defects, orthopaedic troubles, and behaviour problems, partly medical and partly educational in origin; if not treated at the earliest stage possible, all these may result in loss of education and incapacity in adult life.

A second important function of the service is that of looking after those children who have been ascertained as

handicapped—a statutory group. I suggest that the school medical officer is the person best able to assess fully the educational requirements of these children and to advise the school authorities on their day-to-day management. The Ministry of Education shows considerable interest in this matter. Dr. Philpott mentions heart murmurs and the distress caused to parents when a consultant opinion is asked for. Most frequently these do turn out to be innocent murmurs, but there is the doubtful case where the school medical officer wishes to be assured that the stresses and strains of games and physical training are not going to be harmful.

I find it difficult to see how a busy general practitioner could find the time to examine every child on his list with these objects in mind, even though he will already be aware of some defects in children whom he has examined. Reciprocal interchange of information on these matters between the family doctor and the school medical officer is much more likely to serve the interests of the child than saddling the former with a host of further duties.—I am, etc.,

Wolverhampton.

N. A. JEVONS.

SIR.—The letter by Dr. M. G. Philpott appearing under the above heading (*Supplement*, December 25, 1954, p. 247) should not be allowed to pass without protest and challenge. The medical staffs of local authorities deal with the beginnings of defects in health in children by investigation and detailed medical examinations from the date of birth to school-leaving age. The main object of this work is prevention. As a medical officer of health and school medical officer with practical experience of general practice I submit that no G.P. is qualified to form an unbiased opinion on this work without having had practical experience in the work and a training in preventive medicine.—I am, etc.,

Southport.

S. T. BEGGS.

Hospital Staffing

SIR.—I have read the wholly commendable contribution by Dr. W. J. Abel and also the letter from Dr. G. D. Wild (*Supplement*, December 25, 1954, p. 247). Dr. Wild states that my previous letter (*Supplement*, December 11, p. 227) is "wrong factually"; this can hardly be so, since it is an expression of opinion and not of fact. He refuses to allow me to claim that there exists a significant degree of support for the recommendations of the Strachan Subcommittee "until the final proposals" are made, and then he goes on to express his opposition to the recommendations. This is hardly fair—if he makes the rules, he must abide by them. Further, he asserts that he has yet to meet an S.H.M.O. who favours the proposals—to this I would reply that he should travel more widely. Dr. Wild objects to the proposals because they do not take into consideration the impending pay claim for S.H.M.O.s. They could hardly do so, since this claim has yet to be considered. However, Dr. Wild admits that he would like to see the S.H.M.O. grade converted into "the necessary pre-consultant grade," so perhaps he is in favour of the Strachan proposals after all.—I am, etc.,

"SENIOR HOSPITAL M.O."

Assistants in General Practice

SIR.—May we, many of our members also being members of the B.M.A., make a brief comment on this subject, which has already produced a most interesting and provocative correspondence? The sympathetic support, by a large minority of the G.M.S. Committee, for the resolution to reduce the extra list allowed a practitioner who employs an assistant certainly shows an evolution in the attitude of the established profession to the assistant. This association, which started as the Unestablished Practitioners Group in 1948-9, has consistently campaigned for this reform, and encourages its members to take an active part in all bodies where suggestions for improvements in the status and service of general practice may be of help in formulating policy. The present assistantship system, as many detailed letters to

us from assistants prove, is a source of frustration and disappointment to many otherwise enthusiastic and useful young doctors. Their number is actually increasing annually, and their difficulties have been the subject of numerous articles in the daily papers. Now is not too soon for the problem to be faced and solved.—I am, etc.,

ROBERT JOHN,

President.

London, N.W.6.

The General Practice Reform Association.

Fining the Doctor

SIR.—I have followed with interest the correspondence in your columns under the above heading and would like to make a few comments. Apart from the high cost and the increasing use of the newer remedies that are continually being introduced, it would appear to me that there are other and more important factors at work leading to excessive prescribing and the consequent enhancement of the already high cost of the N.H.S.: (1) Since July, 1948, neither doctors nor patients have had any direct financial interest in the cost of medicaments prescribed. (2) The belief, which amounts almost to an instinct, pervading all classes of society, members of Parliament not excluded, that to swallow something is "good for you." In consequence doctors are under continual pressure to prescribe this something. (3) The conviction on the part of a great many patients that their demands for medicines, however unreasonable such demands may seem to the doctor, must unquestionably be met; and they often attempt to enforce their demands by hints or even threats that non-compliance will cause them to transfer their patronage elsewhere. (4) The doctor's income varies directly with the number of patients on his list. (5) The activities of a very small minority of black sheep in our profession who, by imposing on the ignorance, credulity, and superstition of the public, have deliberately exploited the N.H.S. in order to attract patients to their lists.

It is the conduct of these individuals that achieves the headlines of the lay press, but I believe that their activities, when compared with some of the other factors that I have mentioned, play only a small part in maintaining the high cost of the N.H.S. Nevertheless, I consider that it is only just that the fines to which some of your correspondents take exception should be levied, for it is only by "making the punishment fit the crime," or in other words by making it financially unprofitable for them to continue these practices, that they will be made to see the error of their ways.—I am, etc.,

Ebbw Vale.

F. BANDO.

SIR.—The number of letters which you have published concerning the fining of a doctor, recommended by the Lancashire Executive Council for excessive prescribing (*Supplement*, November 20, 1954, p. 191), is a measure of the deep disapproval which many doctors must feel at the savage penalty, a penalty, as is openly admitted, not to recover excessive expenditure but to teach the practitioner the error of his ways.

I write to emphasize the fact that this disapproval is not confined to general practitioners, and to express my repugnance of this principle that a practitioner's prescribing must conform to some "areal average" which ignores entirely the extent of treatment and responsibility for treatment which any individual doctor is willing to accept. It has been pointed out that some of the expensive drugs prescribed had been given on the recommendation of consultants. It would seem but common justice that such excess as can be so ascribed should be deducted from the fine and allocated to the individual consultants concerned.

Since any individual variation from the average is to be condemned, it is clear that an investigation is now called for into the comparative levels of prescribing in hospitals. An "areal average" must be calculated and those who infringe it suitably fined. It would be wise also to compare the number of radiological and laboratory investigations requested to be sure that these comply strictly to the mean.

Reasonable economy is our duty and well recognized by the vast majority of practitioners, but this process of leveling down to the lowest common denominator, appealing as it is to administrators, is a blow at the very foundations of our profession.—I am, etc.,

Heswall.

H. G. FARQUHAR.

SIR.—On this subject no one seems to have mentioned that it is apparently only the G.P. among the medical servants on the N.H.S. who is subject to be fined heavily for various misdemeanours—including excessive spending of the Treasury's funds in treatment. The consultant and the hospital medical staff seem singularly free or immune from this infection. Are they a more perfect species than the G.P.? Can Sir Cartwright-Tanker, senior surgeon of St. Matilda Hospital, be asked to explain why he uses twice as much catgut of proprietary brand as Sir Euan McLorne of Castleside Infirmary, who has always used that prepared in the hospital? Sir Euan might be asked to explain why his abdominal sections spend one and a half times as long in hospital at £X per week than Sir Cartwright's. Can the M.O.H. recover the excess cost from Sir Cartwright of his excessive use of proprietary catgut, and from Sir Euan the cost of keeping his patients in hospital longer than Sir Cartwright's, and also add a fine to each which will make them remember that "Big Brother is watching them" as well as the G.P.? Is this a subject for research by our new College of General Practitioners? In the meantime, should this college consider presenting white gloves to the sister colleges for the perfection of their members' behaviour?—I am, etc.,

Sheffield, 11.

JOHN P. HOPE.

The Individual in Health Service

SIR.—Lord Beveridge's address on the subject of the individual in health service (*Journal*, December 11, 1954, p. 1371), and his reference to the missing health centres, recalls to my mind a letter of mine published in the *Supplement* on December 2, 1944 (p. 134). In that letter I quoted some words on page 10 of the Government White Paper on the subject of a health service. "The subject of health, in its broadest sense, involves not only medical services but all those environmental factors—good housing, sanitation, conditions in school and at work, diet and nutrition, economic security, and so on—which create the conditions of health and prepare the ground for it. All these are fundamental . . . ; and from this I went on to say: "The Government gives away with both hands the disingenuous proposals of its White Paper. Surely there is someone in the Government who can tell his fellow conspirators that one does not begin to build anything without first laying the foundations. If all those things which create the conditions of health are fundamental, then why not begin with the fundamentals? The whole Paper suggests political trickery of the 'ninepence for fourpence' order." I wrote this with reference to the proposed attempt which was to be made to convert the profession into a branch of the Civil Service. And I wonder what's in the wind now. Perhaps Lord Beveridge knows. Of his interest in the health of the nation I suppose there is no room for doubt, for was not the "Beveridge Report" his? I feel grieved that his lordship did not follow up my letter with his powerful support.—I am, etc.,

London, S.W.3.

A. R. EATES.

HOSPITALITY

Austrian doctor, living near Austrian-Swiss border, would like daughters, aged 18 and 16, to stay with two families in southern England, not too far from one another, from July 15 to September 15. In return they would help in the homes, or two English girls could stay in Austria, possibly for winter sports. Would anyone interested please communicate with Brigadier H. A. Sandiford, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

B.M.A. LIBRARY

The Library service is available to all members of the Association resident in Great Britain and Northern Ireland (and by special arrangement to members of the Irish Medical Association). The only charge made is for postage of books. A copy of the Library Rules will be forwarded on application to the Librarian at B.M.A. House.

The following books have been added to the Library:

- Anning, S. T.: Leg Ulcers: Their Causes and Treatment. 1954.
Anoxia of the Newborn Infant. A Symposium Organized by the Council for International Organizations of Medical Sciences. 1953.
Bailey, H.: Demonstrations of Physical Signs in Clinical Surgery. Twelfth edition. 1954.
Bailey's Textbook of Histology. Thirteenth edition revised by P. E. Smith and W. M. Copenhaver. 1953.
Bakwin, H., and Bakwin, R. M.: Clinical Management of Behaviour Disorders in Children. 1953.
Bender, L.: Aggression, Hostility, and Anxiety in Children. 1953.
Boes, L. R.: Fundamentals of Otolaryngology. Second edition. 1954.
Bookmiller, M. M., and Bowen, G. L.: Textbook of Obstetrics and Obstetric Nursing. Second edition. 1954.
Brasier, S.: Maxillo-facial Laboratory Technique and Facial Prostheses. 1954.
British Pharmaceutical Codex. 1954. 1954.
Burch, G. E.: Primer of Congestive Heart Failure. 1954.
Charley, I. H.: Birth of Industrial Nursing: Its History and Development in Great Britain. 1954.
Chusid, J. G., and McDonald, J. J.: Correlative Neuroanatomy and Functional Neurology. Seventh edition. 1954.
Clarke-Kennedy, A. E.: Medicine in its Human Setting: Being Clinical Stories for Students, Nurses, and Practitioners. 1954.
Darmady, E. M., and Davenport, S. G. T.: Haematological Technique. 1954.
Davidson, M., and Rouvray, F. G.: The Brompton Hospital. 1954.
Doherty, L. J. (Editor): Parkinsonism and its Treatment. 1954.
Dublin, W. B.: Fundamentals of Neuropathology. 1954.
Elliott, H. C.: Textbook of the Nervous System. Second edition. 1954.
Gillis, L.: Amputations. 1954.
Greenstein, J. P.: Biochemistry of Cancer. Second edition. 1954.
Kauffmann, F.: Enterobacteriaceae. Second edition. 1954.
Kent Paediatric Society: Study in the Epidemiology of Health. Being an Investigation into the Incidence and Causation of Health Among 10-11-year-old Schoolchildren in the Borough of Bexley, Kent. 1954.
Krantz, J. C., and Carr, C. J.: Pharmacologic Principles of Medical Practice. Third edition. 1954.
Macintosh, R. R., and Mushin, W. W.: Local Analgesia: Brachial Plexus. Third edition. 1954.
Mackay, H. O.: Handbook of Diseases of the Skin. Third edition. 1954.
Mayes, B. T.: Practical Obstetrics. Second edition. 1954.
Mills, C. A.: Air Pollution and Community Health. 1954.
Murphy, J. P.: Cerebrovascular Disease. 1954.
Nabarro, J. D. N.: Biochemical Investigations in Diagnosis and Treatment. 1954.
Ormsby, O. S., and Montgomery, H.: Diseases of the Skin. Eighth edition. 1954.
Parish, H. J.: Antisera, Toxoids, Vaccines, and Tuberculin in Prophylaxis and Treatment. Third edition. 1954.
Perkins, G.: Foundations of Surgery. 1954.
Precope, J.: Medicine, Magic, and Mythology. 1954.
Ramón y Cajal, S.: Histologie du Système Nerveux de l'Homme et des Vertébrés. Tome I. 1952.
Reich, N. E.: Unknown Heart Diseases. 1954.
Reimann, H. A.: Pneumonia. 1954.
Stieglitz, E. J. (Editor): Geriatric Medicine. Third edition. 1954.
Thewlis, M. W.: Care of the Aged (Geriatrics). Sixth edition. 1954.
Thomas, E. W. C.: Synopsis of Forensic Medicine and Toxicology. Third edition. 1954.
Thwaites, J. G.: Into General Practice: A Guide for the Beginner and Others. 1954.
Tidy, Sir H. L.: Synopsis of Medicine. Tenth edition. 1954.
Vannotti, A.: Porphyrins: Their Biological and Chemical Importance. 1954.
Varley, H.: Practical Clinical Biochemistry. 1954.
Vaughan, W. T., and Black, J. H.: Practice of Allergy. Third edition. 1954.
Wilson, S. A. K.: Neurology. Second edition edited by A. Ninian Bruce. Volume I. 1954.

Association Notices

Diary of Central Meetings

- JANUARY
- 17 Mon. Psychological Medicine Group Committee, 2 p.m.
17 Mon. Geriatrics Joint Subcommittee, Central Consultants and Specialists, Public Health, and G.M.S. Committees, 2.15 p.m.
18 Tues. Rehabilitation Film Subcommittee, Rehabilitation and Film Committees, 4 p.m.
19 Wed. Council, 10 a.m.
20 Thurs. G.M.S. Committee, 10.30 a.m.
20 Thurs. Evidence Committee on Divine Healing, 2 p.m.
25 Tues. Staff Side, Committee B, Medical Whitley Council, 10.30 a.m.
25 Tues. Medical Students and Newly Qualified Practitioners Subcommittee, Organization Committee, 2 p.m.
25 Tues. Full Committee B, Medical Whitley Council, 2.30 p.m.

- 26 Wed. Planning Subcommittee, Occupational Health Committee, 10 a.m.
27 Thurs. Chairman's Subcommittee, Constitution Committee, 10.30 a.m.
27 Thurs. Rural Practices Subcommittee, G.M.S. Committee, 2 p.m.
28 Fri. Scientific Programme Subcommittee of Arrangements Committee, 11 a.m.
28 Fri. Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
28 Fri. Scientific Exhibition, Subcommittee of Arrangements Committee, 2 p.m.

FEBRUARY

- 2 Wed. Occupational Health Committee, 10 a.m.
2 Wed. G.M.S. Subcommittee to consider Report of Central Health Services Council's Committee on General Practice within the National Health Service, 2 p.m.
3 Thurs. Central Consultants and Specialists Committee, 10.30 a.m.
3 Thurs. Committee on Homosexuality and Prostitution, 2 p.m.
4 Fri. Library Subcommittee, Science Committee, 12 noon.
4 Fri. Science Committee, 2 p.m.
10 Thurs. Subcommittee on Service Committee and Tribunal Regulations, G.M.S. Committee, 2 p.m.
11 Fri. Joint Subcommittee on Professional Secrecy, Public Health and Central Ethical Committees, 11 a.m.

Branch and Division Meetings to be Held

ASHTON-UNDER-LYNE DIVISION.—At Broadoak Hotel, Ashton-under-Lyne, Wednesday, January 19, 8.45 p.m., meeting. Principal topic for discussion: "The Admission of Patients to Hospital and Especially Difficulties in Admission of Medical Patients."

BARNET DIVISION.—At Hadley Wood Golf Club, Friday, January 21, 7.30 for 8 p.m., dinner-meeting. Dr. F. E. Camps will speak on the Christie case.

BIRMINGHAM DIVISION.—At 154, Great Charles Street, Birmingham, Tuesday, January 18, 8.30 p.m., meeting. Lecture by Dr. W. H. P. Cant: "The Vomiting Infant."

DORSET DIVISION.—At Dorset County Hospital, Herringston Road Annexe (The Sanatorium), Dorchester, Friday, January 21, 8.30 p.m., meeting. Lecture-demonstration by Dr. A. E. K. Salvi: "Pulmonary Tuberculosis and Some Other Lung Conditions, with particular emphasis on Early Pulmonary Tuberculosis and the Cases Suitable for Surgery."

HALIFAX DIVISION.—At Alexandra Hall, Halifax, Wednesday, February 2, 8 for 8.30 p.m., annual dinner-dance.

KENSINGTON AND HAMMERSMITH DIVISION.—At St. Charles's Hospital, Ladbroke Grove, London, W., Friday, January 21, 3.30 for 4 p.m., clinical meeting.

NORTH MIDDLESEX DIVISION.—At Coroner's Court, North Middlesex Hospital, Silver Street, Edmonton, N., Tuesday, January 18, 8.45 p.m., meeting. Paper by Dr. D. F. Hutchinson: "General Medical Services." A discussion will follow.

OLDHAM DIVISION.—At Albion Club, Queen Street, Oldham, Monday, January 17, 9 p.m., meeting. Lecture by Sir Harry Platt: "Whither Medicine?"

SCUNTHORPE DIVISION.—At Scunthorpe and District War Memorial Hospital, Thursday, January 20, 8.30 p.m., meeting. Professor C. H. Stuart-Harris: "Use and Abuse of Antibiotics."

SOUTH ESSEX DIVISION.—(1) At Dagenham Civic Centre, Friday, January 14, 9 p.m., meeting. (2) At Warley Hospital, Brentwood, Sunday, January 23, 10.30 a.m., clinical meeting.

SOUTH-EAST ESSEX DIVISION.—At Southend General Hospital, Thursday, January 20, 8.30 p.m., meeting. Address by Dr. H. D. Crosswell: "Gastro-enteritis."

SUNDERLAND DIVISION.—At Royal Infirmary, Sunderland, Friday, January 21, meeting with Pharmaceutical Society, Sunderland and District. Address by Dr. H. Davis.

SUTTON COLDFIELD DIVISION.—At Town Hall, Sutton Coldfield, Tuesday, January 18, 9 p.m., annual dance.

SWANSEA DIVISION.—At Morriston Hospital, Swansea, Thursday, January 20, clinical meeting.

WEST LOTHIAN DIVISION.—At Bangour Hospital, Thursday, January 20, 8 p.m., meeting. Address by Dr. W. D. A. Callan: "Abnormal Uterine Bleeding."

WOOLWICH DIVISION.—At Woolwich Memorial Hospital, Shooters Hill, S.E., Tuesday, January 18, 8.30 p.m., meeting. Lecture by Dr. Colin C. Edwards: "Epilepsy." Members of the Greenwich and Deptford Division are invited.

S.H.M.O. Meeting

A meeting of Senior Hospital Medical Officers in the Sheffield Region will be held on Saturday, January 29, at 3.15 p.m. at the Lecture Hall of the Medico-Chirurgical Society, 64, St. James Street, Nottingham.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 22 1955

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CIVIL SERVICE MEDICAL OFFICERS

JOINT COMMITTEE'S EVIDENCE TO ROYAL COMMISSION

The Civil Service Medical Officers Joint Committee—a joint committee of the British Medical Association and the Institution of Professional Civil Servants—has given evidence on behalf of Civil Service medical officers to the Royal Commission on the Civil Service. There are about 600 medical officers employed whole-time in the Civil Service.

The salary scales proposed to the Royal Commission by the Joint Committee are set out in the following table, together with the present salaries for comparison.

Grade	Present Salary £	Claim £
Chief Medical Officer, Ministry of Health	4,000	6,000
Chief Medical Officer, Department of Health for Scotland	3,000	At a point immediately below Chief Medical Officer, Ministry of Health
Chief Medical Officers, Colonial Office, Ministry of Pensions and National Insurance, Treasury Medical Adviser	2,850	
Deputy Chief Medical Officers, Ministry of Health	3,000	4,500
Deputy Chief Medical Officers, Ministry of Pensions and National Insurance, Department of Health for Scotland, Senior Medical Senior Commissioner of Board of Control	2,600	Not less than £500 above Principal Medical Officers
Principal Medical Officers	2,300	3,500
Senior Medical Officers	2,200	3,100
Medical Officers	1,500 (age 35) 75-1,800 100-2,100 (Scale is age-pointed to age 40)	1,600 (age 35) 120-2,800

The Howitt Committee

In presenting its evidence the Joint Committee outlined the history of the negotiations for improved pay for Civil Service medical officers. It reminded the Royal Commission that in 1948 the Treasury had been asked in general terms to apply the findings of the Spens Reports to the medical Civil Service, and that the Treasury had denied that such an application should necessarily follow. The Joint Committee then referred to the setting up of the Howitt Committee to examine the rates of pay of medical officers in the Civil Service, and the condemnation of the terms of this Com-

mittee's report in August, 1951, by the Joint Committee and by the medical profession generally (*Journal*, November 17, 1951, p. 1206).

The evidence also called the Royal Commission's attention to the B.M.A.'s attitude as expressed in the resolution of the Representative Body in 1952 (*Supplement*, July 19, 1952, p. 53). "That, in view of the refusal of the Treasury to carry out an early review of the salary scales recommended by the Howitt Committee, all advertisements of civil medical appointments under Government departments be refused publication in the *British Medical Journal*; and that such appointments, if advertised elsewhere, be included in the 'Important Notice.'"

This ban on advertisements for Civil Service medical posts was not lifted until March, 1954, when an interim agreement was reached with the Financial Secretary of the Treasury under which increases of pay were given to Civil Service medical officers on the following understanding: (a) Both parties remain free to ask the Royal Commission on the Civil Service to consider any proposals they think fit to make about the remuneration of all grades in the medical officer class. This particularly applies to the rates of pay for senior and principal medical officers, the increases in which both sides regard as purely token. (b) The scale now agreed for the basic grade cannot be regarded as establishing any particular relativity between that grade and any grade or grades in other classes in the Civil Service. (c) No new arrangements made in the remuneration of medical work outside the Civil Service—for instance, in the remuneration of consultants or other hospital medical staff in the National Health Service—will be made the basis of a claim to the Treasury prior to the publication of the Report of the Royal Commission, but this in no way limits either party's freedom of action in using any such factors in its submissions to the Royal Commission, or in using any other new considerations in fresh representations either before or after the Royal Commission has reported.

The Joint Committee's Case

It was against what is described as "this very unhappy" historical background that the Joint Committee made its submissions to the Royal Commission. It had long been contended by the Institution of Professional Civil Servants that the information available on the remuneration of medical men outside the Civil Service should be applied to the salaries of those inside the Civil Service. This should be a reasonably clear and straightforward procedure of calculation, and now the Spens Committees had simplified the matter by establishing standards of remuneration for the medical profession. It was a reasonable inference, the Committee

argued, that the recommendations of the two Spens Committees should affect the whole profession, of which the Civil Service medical officers were a part. On this contention the Joint Committee based its evidence.

In support of its proposed salary scales, the Joint Committee took certain fixed points in the Civil Service salary scale where the relationship to remuneration in other branches of the profession seemed clear, and from these the intervening salary scales were filled in. The salary of the Chief Medical Officer of the Ministry of Health was taken as the first keypoint, and it was contended that it should at least equal that which could be attained by senior consultants in clinical practice. In making the comparison, the evidence allowed for a top merit award and for an amount earned in private practice by the consultant. The second keypoint taken was the salary of the deputy chief medical officers of the Ministry of Health. Taking this as three-quarters of that of the chief, the proposal of £4,500 was made. The third keypoint was that of the principal medical officers' salary. This, the evidence submitted, should correspond to a consultant with the smallest merit award. In each calculation an amount was allowed for the difference between the superannuation arrangements in the Civil Service and those in the National Health Service.

The next keypoint taken in the evidence was that of a basic grade medical officer. The salary proposed for them in the Joint Committee's evidence was calculated in relation to general practitioner earnings. It was submitted that, if recruitment was to be satisfactory, the lowest salary that could be offered to a medical officer aged 35 was £1,600, and that at the top of the scale (£2,800) it was right that the Civil Service medical officer should have the prospect of earning as much as he would have done had he remained in practice.

From these four fixed points the Joint Committee filled in its proposals for the remaining two groups, as shown in the Table.

Other Considerations

The Joint Committee also provided the Royal Commission with detailed information on the duties of the various medical branches of the Civil Service and the qualifications demanded of them. The evidence dealt at length, too, with the question of internal relativities within the Civil Service and gave reasons why the basic grade medical officer should have a higher salary than an assistant secretary.

In concluding its evidence, the Joint Committee said: "It is the submission of the Joint Committee that in making its representations on medical pay the Royal Commission should make explicit the natural tie between the medical profession inside the Civil Service with that outside, and that steps should be taken in fixing the remuneration of Civil Service medical officers that would preclude a recurrence of the five years of bitter controversy that has marked the relationship between the Treasury and the medical Civil Service."

Dr. A. J. Owston, senior medical officer of the Ministry of Supply, is chairman of the Civil Service Medical Officers Joint Committee.

SCOTTISH HEALTH SERVICES COUNCIL APPOINTMENTS

The following new medical and dental members of the Scottish Health Services Council have been appointed until December 31, 1957: Dr. J. T. Baldwin, general practitioner, Penicuik; Dr. C. Harrower, general practitioner, Glasgow; Dr. S. I. A. Laidlaw, medical officer of health, Glasgow; and Dr. Douglas Miller, obstetrician, Royal Infirmary, Edinburgh. Dr. P. K. McCowan, physician superintendent, Crichton Royal Mental Hospital, Dumfries, and Professor G. M. Wishart, Dean of the Faculty of Medicine, Glasgow University, have been reappointed following the expiry of their terms of office on December 31, 1954.

EXCHANGE VISITS WITH CANADA AND THE U.S.A.

The scheme for exchange visits between members of the American, British, and Canadian Medical Associations, which has the approval of the Bank of England, will be continued during the financial year April 1, 1955, to March 31, 1956.

Procedure

Three doctors from Britain may visit Canada in exchange for three doctors from Canada. Each doctor from Britain will be required to make all his own travel arrangements and will also be required to deposit up to £200 with the B.M.A. in London. On arrival in Canada he will receive the equivalent of his deposit in Canadian dollars. Similarly, each Canadian doctor on arrival in Britain will receive the sum deposited in sterling.

Three doctors from Britain may visit the U.S.A. in exchange for three doctors from the U.S.A. Each doctor from Britain will be required to make all his own travel arrangements and will also be required to deposit up to £200 with the B.M.A. in London. On arrival in the U.S.A. he will receive the equivalent of his deposit in U.S. dollars. Similarly, each U.S. doctor on arrival in Britain will receive the sum deposited in sterling.

Duration of Visits

The duration of the visits is left to the discretion of the doctors concerned. The American, British, and Canadian Medical Associations cannot accept any responsibility for a doctor who allows his visit to outlast the money placed at his disposal.

Applications are invited from members of the B.M.A. to take part in such exchanges. Medical practitioners in all branches of the profession, including general practice and public health, are eligible. Each applicant must state the object of his intended visit, and should also give the approximate date on which he hopes to depart. (Successful applicants will in due course be required to furnish exact dates and details of travel.) Applications must be received by the Secretary of the Association by March 1, 1955.

ARRANGEMENTS IN OUT-PATIENT DEPARTMENTS

MANCHESTER REGIONAL BOARD'S REPORT

Following some local comment last year, critical of the arrangements and the lack of proper appointment systems at certain hospitals, and the Ministry's memorandum on the same subject, the Manchester Regional Hospital Board has examined the present out-patient practice in all its general hospital groups. In a report approved by the General Purposes Committee of the Board, the Board is emphatic in its agreement that an out-patient appointment system should be universal—with the possible exception of the small, isolated rural hospital—and it hopes that a minority of previously unenthusiastic consultants will give their co-operation. Appointment systems of one kind or another are the almost invariable rule at the hospitals in the Manchester Region.

Dealing with the widely held belief that appointment systems lead to a considerable lengthening of the waiting time for an appointment, the Board does not accept that this need always be the case. If the organization of the parts is more efficient, the capacity of the whole appointment system should not be diminished thereby. If it is diminished the reasons should be studied, and such an investigation would be a piece of fruitful research. The Board avoids recommending any particular form of appointment system, such as the "individual" or the "block" type,

since the needs of hospitals vary, but management committees are asked to experiment.

Unpunctuality

The report goes on to discuss the punctuality of staff, and, while recognizing in this connexion the difficulties of medical work, asks management committees to be vigilant and report cases of persistent unpunctuality to the Board. In pointing out that patients can be sinners in the way of unpunctuality, an analysis by one management committee of 198 patients who attended a series of medical clinics is quoted as an example. This analysis showed that, of the 178 with booked appointments, only 48 attended at the specified time, 42 attended up to an hour early, 68 attended up to 1½ hours late, while the remaining 20 failed to attend at all.

In conclusion the Board has some words to say about the reception of patients, and that it can conceive of no more effective method of improving hospital service public relations than a well-organized and sympathetically run out-patient department.

HOSPITALITY

A French doctor in French West Africa would like his son, aged 18, and daughter, aged 16, to stay as paying guests with two English families, not too far apart, from July to mid-October, 1955. Would anyone interested in this request please contact Brigadier H. A. SANDIFORD, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

Questions Answered

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

New Premises

Q.—I have recently bought new premises for my consulting-rooms, and have had to pay for a considerable amount of alteration and decoration. How much of this expense is the inspector of taxes likely to allow?

A.—The cost of acquiring new premises, or of adding to or improving existing accommodation, is regarded as an outlay of capital and not as an expense allowable for income-tax purposes (there is a special allowance for new "industrial" premises which is not applicable to premises used for professional purposes). The additional premises will presumably be assessed in due course to property tax—that is, income tax under Schedule A—and the amount on which that tax is payable should be claimed as a *quasi* rent.

Car Expenses in Partnership

Q.—In calculating the net profits of a partnership for division between the partners in accordance with their shares for the time being, what is the usual method of dealing with the maintenance and running costs of the cars used by the partners?

A.—It is usual for each partner to be responsible for his own individual car expenses. He will, of course, claim tax relief on that proportion of the cost that is a practice expense. In other words, only those payments which are listed in the agreement as partnership expenses should be deducted from the gross receipts in order to arrive at the net profit for distribution.

It is perhaps not generally known that patients who have become permanent residents in a private nursing-home are entitled to domiciliary consultations under the National Health Service scheme.

Correspondence

Negotiating for the Profession

SIR.—It was with considerable interest that I read the short report (*Supplement*, January 8, p. 11) of the meeting held of the Joint Consultants Committee with the Minister of Health. It would appear to follow the pattern of so many others—the gentle political response which leaves the Committee in exactly the same place as it was prior to the meeting, and offers no satisfaction to the main body of consultants, even if it has appeased our representatives.

The political importance of medical men and their value as pawns should be realized, and I think it is time that once again the question of a more militant body to represent the profession should be considered. Doctors, as a body, no longer appear to have any great say in their own destiny, apart from one or two who, through personal contacts, would appear to have made decisions for the many without consulting them. It is time to appreciate the use of the weapons that the rest of the country's workers know so well how to use. We perhaps shall need them when the effect of the inflationary spiral in the salaries of industrial workers and railwaymen is felt by the rest of the country.—I am, etc.,

RICHARD DE SOLDENHOFF.

Anonymity in Broadcasting

SIR.—I am glad that at last someone has pointed out the absurdity of the Central Ethical Committee's attitude to broadcasts by doctors. Professor L. J. Witts (*Supplement*, January 8, p. 12) says it would be impossible to prove that broadcasting under B.B.C. conditions constituted advertising with a view to personal gain. He might have gone further and asserted that, where the doctor's income does not depend on the number of patients he sees, it cannot possibly do so.

On page 9 of the same issue of the *Supplement* you show that, of 58,600 practitioners, 22,400 are in general practice and 6,400 are consultants. The latter figure will include whole-time salaried consultants—but let us assume that the livelihood of all depends on their ability to attract patients. Subtract from the total the 400 medically qualified dentists, and it emerges that, of 58,200 doctors, 29,800 are either remunerated by salary or in retirement. In other words, over half of the profession (or at least of those whose occupations were analysed) could not conceivably increase their professional income by broadcasting or any other form of publicity.

So far as I know, no other profession has attempted to impose such a ridiculous restriction on the presentation to the public of the views and personalities of its members. To do so in the name of "ethics" is surely to impose a strain on the meaning of an honourable word. The decision on whether to broadcast under one's own name or not, if invited, is one which must be left to the judgment and good taste of the doctor concerned. In the conditions of fifty years ago there might have been some justification for the Central Ethical Committee's apparent fear that publicity would lead to his stealing his colleagues' patients; but the figures quoted show that the conditions of medical employment have changed profoundly, and the Committee should study them and recognize, too, that broadcasting provides unrivalled opportunities for the doctor as a health educator which are vitiated by anonymity.—I am, etc.,

Birmingham, 3.

F. H. TYRER.

Hospital Staffing

SIR.—The plans for the recruitment, training, and deployment of new consultants and specialists have gone sadly awry. The training scheme for aspiring consultants and specialists has been carefully worked out, but frustration and heartache lie ahead for the majority of keen, highly

trained, and technically efficient registrars, senior registrars, and S.H.M.O.s. They have reached a dead end, with no assured future. As a recently retired consultant with no axe to grind, I should like to suggest some constructive, if somewhat heterodox, proposals for improving the prospects in the hospital service.

Let us concede that, if opportunity allows, these men and women are capable of specialist responsibilities. To keep them hanging around the hospitals in subordinate posts is a futile waste of first-rate personnel. It is accepted that the number of consultant and specialist posts is well below that originally planned. I suggest therefore that first a differentiation is made between a consultant and a specialist and that then all vacancies in the Service be advertised as specialist (not consultant) posts with full clinical responsibility and charge of beds, and that the number of posts be increased forthwith up to the full needs of the Service as planned. To offset the cost of this, I suggest that the newly appointed specialists be given a salary range lower than the present consultant rates. I feel sure that all registrars and other grades would welcome this chance of clinical responsibility and freedom, albeit at a temporarily lower range of pay, and they would be able to give the best and most active period of their lives to unfettered work for the hospitals. A specialist should serve about ten years before he is considered for promotion to consultant status.

I would define a consultant as a man of 40-45, whose ten years as a specialist must have given him wide experience, an ability to profit by his mistakes, and a fund of wisdom as opposed to mere knowledge. Time will have shown whether he is a good mixer able to fit in with his colleagues and sympathetic to his patients. Technical skill and professional ability are easier to weigh up than personality, and the leap from senior registrar or S.H.M.O. to full consultant is indeed a hazardous gamble, but ten years in the fourth decade as a specialist should be long enough to show if a doctor is worthy of the status of consultant and to be recognized as such by colleagues and by patients. A minority of these ten-year specialists would not make the grade, but they would still have an assured career, with all the opportunities that hospital and private specialist practice allows. I have enough faith in my profession to believe that the work and not the pay is the governing factor in their philosophy of life.

The total number of consultants should be considerably restricted—possibly one-third of the present total, corresponding roughly to the numbers of those receiving merit awards. The scheme would have the important though incidental advantage of bringing out into the open the allocation of merit awards, for naturally they would be given to consultants only.

This plan does at least put forward constructive proposals with the dual aims of providing a first-class corps of consultants and of giving hope of assured prospects for the large body of trained registrars and S.H.M.O.s for whom under present conditions the future is indeed black. It is hardly necessary to add that no change in the position and prospects of those already in the consultant and specialist service is contemplated.—I am, etc.,

Coventry.

NORMAN DUGGAN.

SIR,—We are grateful to you for publishing the admirable survey of surgery given by Sir Heneage Ogilvie to the Manchester Medical Society (*Journal*, December 18, 1954, p. 1435). His assessment of recent advances and the outline of possible future developments were most stimulating and stirring, and all thoughtful surgeons are indebted to him. "This dangerous adventure calling to the stout of heart"—to use Sir Heneage's words—is now an integral part of a nationalized service. There would be to-day no hope for Mayo Robson and Rutherford Morison, as, in the machinery of State medicine as functioning to-day, there is no road from general practice to a surgical calling, any more than there is a path from surgical registrar to the place of surgical partner in general practice. The "heartbreaking problem" of the registrars is to some extent a problem of

S.H.M.O.s as well. It is not lack of ambition or talent, as has been suggested (para. 207, Supplementary Report of Council, *Supplement*, May 22, 1954, p. 250), that has led an increasing number of ex-registrars to accept an iniquitous designation, and to bury themselves voluntarily in a "dead-end" job. It has been the devotion to the "dangerous adventure" of their chosen surgical vocation which Sir Heneage rightly finds so necessary for the future of surgery that has made them accept such a status. Thus, when faced with the lack of consultant vacancies, they were at least able—even if sometimes in a limited sphere—to remain surgeons.

Is it not unfortunate that these men, many of whom gave long years of service to the Forces, should be condemned to the bleak prospect of remaining for the whole of their professional life under the supervision of a colleague? We feel that Sir Heneage's call for a grade corresponding to the major and specialist in the Army would provide the answer for S.H.M.O.s and registrars. This grade should have a dignified designation denoting the experience, skill, judgment, and qualifications of the holder, and surgical specialist or assistant surgeon would appear suitable. There should be responsibility for beds and out-patients, and the grade should be established as the normal stepping-stone to full consultant status. As suggested by Sir Heneage, access when required to an opinion of a more mature nature would be welcome to any reasonable surgeon. Let the specialist grade be worthily established, and then let it play its essential role within the hospital service, which even now would break down without the labours of this group of workers who have long passed their apprenticeships. This problem is not peculiar to surgery; it confronts those concerned with the future of medicine, obstetrics, and all other specialties.—We are, etc.,

H. J. HAMBURY.
J. H. THOMAS.

Swansea.

SIR,—I note with interest that in the annual report of the Central Consultants and Specialists Committee (Scotland) in the *Supplement* of January 8 (p. 10) the Anaesthetic Services Subcommittee had some little difficulty in distinguishing between the work of the S.H.M.O. and the consultant. They finally decided that a consultant "with his wide experience is able to advise his colleagues about new techniques."

With all due respect, I would like to point out that a good many S.H.M.O.s, particularly transferred officers, have also wide experience, and in many cases considerably more experience than a consultant appointed between the ages of 30 and 32 years, many examples of which can be given. The real answer is that until the S.H.M.O. grade can be abolished the Ministry is employing cheap labour to do its work. It is therefore up to the consultants to leave no stone unturned to help their colleagues in their dilemma and to ensure that the many injustices which have been done are rectified.—I am, etc.,

Coventry.

A. GORDON EVANS.

Local Health Authority Nursing Services

SIR,—As there seems to have been some misinterpretation of our paper "Local Health Authority Nursing Services" published on November 20, 1954 (*Supplement*, p. 188), we should like to correct any wrong impressions which may have been given by the correspondence.

We have no wish to lower district nursing standards, or give the public an inferior service. It was out of our concern for the patient and the community that this paper was written. It would be easy to plan an ideal service if we had an unlimited number of suitably educated candidates, but, as we have endeavoured to explain, nursing services must be planned against the background of the woman-power situation and the limited number of grammar school candidates available. For this reason we stressed the need for more assistants, or, as we would prefer to call them, enrolled nurses, and for their wider use, believing that

after a sound two years' training they can be, not an inferior grade, but bedside nurses in the truest sense of the word. We feel sure that full recognition of their present and potential value, both in hospital and outside, would substantially help to solve our staffing problems. Their range of duties would be more limited, but, within its scope, their work should be equal in standard to that of their registered colleagues. Because nursing, not teaching or social work, is their chief interest, they would serve the sick, particularly the chronic sick, better than health visitors would.

We are a little surprised that it should be necessary to remind some of your correspondents of the village nurse midwives—women of limited training who have yet served the villages with a true sense of vocation, and have, indeed, cared for the bodies, minds, and spirits of their patients. Women of this kind are still needed in district nursing, and it would be regrettable if the scramble for longer training, more qualifications, and improved status were to result in the loss of their services.—We are, etc.,

J. M. AKESTER.
F. M. MAWSON.

Leeds, 1.

SIR,—There must be many of us who are grateful to Dr. Everell M. Shippam (*Supplement*, January 8, p. 12) for so accurately putting into words our thoughts on this subject. As a country general practitioner of some 35 years' experience, about a third of it without nurse or midwife, I endorse all she writes and particularly her final paragraph.

One potent deterrent to the recruiting of district nurses is the ever increasing burden of "records" arbitrarily imposed by the local health authority. Duplicate registers, treble entries, a monthly questionnaire of 60 items are not likely to attract those who want to *nurse*. Incidentally, a modicum of planning and the use of carbon paper with loose-leaf journals would eliminate half the present scribbling, and abstracts should be done centrally and not at the periphery.

I have no direct knowledge of city conditions, but in the country health visitors are severely handicapped by not living among their patients. Unless you *know* your patient you are only half-way and can be completely misled.—I am, etc.,

Newton Ferrers.

W. F. BENSTED-SMITH.

Fining the Doctor

SIR,—The problem of "over-prescribing" at the cost of the taxpayer demands a fundamental ethico-economic solution. The guiding principle should be: "He who prescribes must be directly responsible for the cost."

As a mixed prescriber-dispenser I believe that the compromise adopted at present for the payment of dispensing doctors points the way. This scheme, however, only affects a small minority of the population—those who reside in the country outside the one-mile radius of a chemist. The doctor is paid an additional dispensing capitation fee of 9s. 9d. per annum for all such patients who prefer to obtain their medicines or dressings from the surgery. With various exceptions the doctor pays for everything supplied, and he may have to pay a dispenser's salary. The average lay politician, who can hardly be expected to understand the complexity of general practice, assumes that economy of medicines which profit the doctor must automatically penalize the patient. Consequently, the dispensing doctor is frowned upon as potentially dangerous and would be abolished if it were possible. However, such distrust of doctors must be paid for by voters, since pampered patients raise taxes. Any slight increase of income to economical doctors would nevertheless, under my principle, be infinitely cheaper to the State than the present system of free prescribing.

Let us frankly face the ethical question: "Do dispensing doctors 'under-dispense'?" Yes, I think they do, though such economy need have no ill effect on their patients. Politicians should realize that even doctors have consciences, and moreover they know that unsatisfied patients can always transfer their patronage elsewhere. But is it really in the

financial interests of doctors to retard the recovery of their patients? With petrol around 4s. 6d. a gallon would they deliberately risk over-visiting? With their income from capitation fees would they welcome long surgeries? No, the truth of the matter is that in general practice the details of treatment are relatively unimportant. Our medical function is sound diagnosis and co-operation with specialists where necessary. In most other directions the ancient art predominates over newfangled science.

I believe that neither empty appeals nor £600 threats will materially alter the present prescribing pattern. Human nature needs a more constant reminder, and I seriously commend to our legislators the extension of the principle of country dispensing—i.e., all capitation fees to be increased by 50% and every doctor to have deducted from his quarterly cheque the actual cost of his prescriptions.—I am, etc.,

Bungay, Suffolk.

HUGH CANE.

SIR,—We agree fully with Dr. Geoffrey G. Sherriff (*Supplement*, January 1, p. 6) that unnecessary prescribing is wrong, but fail to understand why he considered it necessary, in order to prove this axiom, to resort to the ancient device of isolating from its context a passage in our letter (*Supplement*, December 11, 1954, p. 226). We were not writing in defence of indiscriminate prescribing, as Dr. Sherriff would have noted had he read on; indeed, we mentioned the right of the doctor to refuse improper requests for prescriptions, but suggested that he should not be penalized merely on account of the number of prescriptions he issues, provided each is for a *bona fide* purpose. To pursue the example mentioned in our previous letter and quoted by Dr. Sherriff, one could, of course, treat one's cases of coryzal bronchitis with contempt—we treat ours with medicines, which may be more expensive but is certainly more effective.—We are, etc.,

LESLIE BALLON.
WILLIAM BROWN.

Huddersfield.

SIR,—Most of your recent correspondents on fining the doctor seem to have missed the most dangerous aspect of recent proceedings. I refer to the imposition of what may well be a vicious fine by an executive council on the advice of a local medical committee composed of the defendant's competitors and perhaps not wholly unbiased. The defendant may have been guilty of wanton extravagance, which may have merited the penalty imposed, but it is not enough that justice should be done, it must most clearly be seen to be justice. Surely the accused is entitled to a proper trial before a properly constituted court of law before being exposed to such vicious penalties.—I am, etc.,

Newick, Sussex.

J. R. CALDWELL.

SIR,—Having read the correspondence provoked by some recent executive committee decisions, one is impelled to ask why this petty tyranny is allowed to take place. Even in feudal times the unjust decisions of inferior tribunals were called up by the prerogative order of the Crown and quashed. Later the protection afforded to subjects by this supervision was even more firmly established when this power was transferred to the superior courts, which still exercise it by the great prerogative writs of the common law—e.g., mandamus and certiorari. Recent oppressive legislation has, however, drastically restricted the operation of this protection, and the powers given to executive committees and the restrictions on appeal to the courts from their decisions are a notorious example. It is inherent in our sense of justice that when a body is empowered to inflict serious punishment the accused person should be afforded the full protection of the law. However, doctors appearing before executive committees and denied legal representation are often in considerable jeopardy as a result of unjust procedure. I have in mind the case of a professional colleague who was accused by a patient of a breach in his terms of service. Although acquitted (the charge was without any foundation) he thought that the procedure adopted at the committee hearing was somewhat peculiar.

When he described it to me I was able to inform him that as a result of this extraordinary procedure he had been placed in considerable danger at the hands of a malicious patient, and that such a travesty of justice would not be permitted in any other country this side of the iron curtain. When Dr. Edwards referred in his letter to the Star Chamber (*Supplement*, November 20, 1954, p. 193) he may indeed have pointed to the last occasion in our history when arbitrary conduct of this kind was allowed to go unchecked.

As a legally qualified general practitioner I would urge all doctors serving under the National Health Service to pay close attention to two recent events of great importance to them. First, Lord Justice Denning has advocated the setting up of tribunals each consisting of a judge and two assessors with power to review certain types of executive decision. When an eminent member of the judiciary suggests a fundamental change in basic constitutional principles it is abundantly clear that there must be serious injustice taking place under the present system. Secondly, the Crichton Down affair, resulting from an executive decision which I consider to be no worse than some recent executive decisions affecting doctors under the National Health Service.

Intentional or reckless breaches of terms of service must be punished, and, provided a just procedure is followed and a bona fide case made out, a fine of as much as £600 is not excessive. It is, however, essential to correct the unjust methods used in reaching the decisions to inflict these penalties and to prevent the punishment of inadvertent breaches of terms of service.—I am, etc.,

Lowestoft.

JOHN HAVARD.

SIR.—The correspondence under the heading "Fining the Doctor" has shown that there is some misgiving amongst G.P.s concerning the way in which their terms of service are enforced. Two points, I think, stand out: the first, that these terms, especially in regard to prescribing, are too vague and must be set out in absolute form if we are to have any peace of mind; and the second is that the adjudication of these questions, involving sometimes fine points which require considerable elucidation, is not suitably entrusted to an untrained tribunal to settle in a few hours.

The executive councils are prosecutors in these matters, and they should not be responsible for appointing their own judges, with a right of appeal only to the Minister, who is *a fortiori* inclined to sympathize with the executive council. Our relationship with the executive councils is a contractual one, and, if a breach is committed by either side, there is a well-tried machinery in the county courts for dealing with it.

Most of us, I am sure, accept the need for some control over the way in which we carry out our duties and over the cost of prescriptions, but we must have some feeling of security as well. As long as the tribunals are left to make their own criteria and to adjudicate without regard to the principles of "natural justice," our anxiety for our own financial position will continue to choke our concern for the welfare of our patients. The "rule of law" has been part of our national heritage, but it is rapidly becoming a topic for nostalgic reference by constitutional lawyers.—I am, etc.,

Sheffield, 10.

H. H. PILLING.

** This correspondence is now closed.—Ed., B.M.J.

Association Notices

Diary of Central Meetings

JANUARY

- 25 Tues. Staff Side, Committee B, Medical Whitley Council, 10.30 a.m.
25 Tues. Medical Students and Newly Qualified Practitioners Subcommittee, Organization Committee, 2 p.m.
25 Tues. Full Committee B, Medical Whitley Council, 2.30 p.m.
27 Thurs. Chairman's Subcommittee, Constitution Committee, 10.30 a.m.

- 27 Thurs. Rural Practices Subcommittee, G.M.S. Committee, 2 p.m.
28 Fri. Scientific Programme Subcommittee of Arrangements Committee, 11 a.m.
28 Fri. Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
28 Fri. Scientific Exhibition, Subcommittee of Arrangements Committee, 2 p.m.

FEBRUARY

- 1 Tues. Organization Committee, 2 p.m.
2 Wed. Occupational Health Committee, 10 a.m.
2 Wed. G.M.S. Subcommittee on Assistants in General Practice, 10.30 a.m.
2 Wed. Central Ethical Committee, 2 p.m.
2 Wed. G.M.S. Subcommittee to consider Report of Central Health Services Council's Committee on General Practice within the National Health Service, 2 p.m.
3 Thurs. Central Consultants and Specialists Committee, 10.30 a.m.
3 Thurs. Committee on Homosexuality and Prostitution, 2 p.m.
4 Fri. Library Subcommittee, Science Committee, 12 noon.
4 Fri. Science Committee, 2 p.m.
8 Tues. Trainee General Practitioner Subcommittee, 2 p.m.
9 Wed. Private Practice Committee, 12 noon.
9 Wed. Public Relations Committee, 2 p.m.

Branch and Division Meetings to be Held

BOURNEMOUTH DIVISION.—At Royal Victoria Hospital, Bournemouth, Friday, January 28, 8.15 p.m., meeting. Symposium and discussion by Dr. A. S. Ogden, Mr. N. Ross Smith, Mr. H. A. Cowan, and Dr. Doris M. Odum: "Fibrositis—Does it Exist?"

BRISTOL DIVISION.—At Main Physics Lecture Theatre, Royal Fort, Wednesday, January 26, 8.30 p.m., meeting. Dr. Stewart Smith: "A Morbid View of the Over Sixty-fives" (illustrated).

CHELSEA AND FULHAM DIVISION.—At St. Stephen's Hospital, Fulham Road, Chelsea, S.W., Friday, January 28, 8.30 p.m., meeting. Annual B.M.A. Lecture by Dr. K. Shirley Smith: "Some Clinical and Therapeutic Aspects of Hypertensive Heart Disease." Members of the Kensington and Hammersmith Division are invited.

CITY DIVISION.—At Hackney Hospital (G5 Ward), Homerton High Street, E., Wednesday, January 26, 2 p.m., films: (1) "The Conjoined Twins of Kano"; (2) "Surgery of Varicose Veins."

DONCASTER DIVISION.—At Parkinson's Café, Doncaster, Tuesday, January 25, 7.30 for 7.50 p.m., dinner. Joint meeting with Doncaster Medical Society. Professor R. E. Tunbridge: "Some Problems of Diabetes Mellitus."

EAST NORFOLK DIVISION.—At Green Lounge, Bell Hotel, Norwich, Wednesday, January 26, 8 p.m., social evening.

GREENWICH AND DEPTFORD DIVISION.—At Miller General Hospital, Greenwich High Road, London, S.E., Wednesday, January 26, 8.30 p.m., meeting. Annual B.M.A. Lecture by Dr. F. S. Cooksey: "Rehabilitation." Demonstration of appliances used in the management of everyday disabilities.

HOLLAND DIVISION.—At The Galleon Restaurant, Sheep Market, Spalding, Saturday, January 29, 7.15 for 7.45 p.m., supper; 9 p.m., address by Mr. Ralph Shackman: "Some Aspects of Research in the Surgical Department of the Postgraduate Medical School, University of London" (illustrated by films).

LAMBETH AND SOUTHWARK DIVISION.—At Lambeth Hospital, Brook Drive, Kennington Road, S.E., Sunday, January 23, 11 a.m., clinical meeting.

MID-ESSEX DIVISION.—At Out-patient Department, Chelmsford and Essex Hospital, London Road, Chelmsford, Wednesday, January 26, 8 p.m., meeting. Film by Dr. Leonard Carr: "Allergic Diseases in Man," followed by a talk on "Allergic Diseases in Man—Their Diagnosis and Treatment."

MIDLAND BRANCH.—At General Hospital, Birmingham, Friday, January 28, 8.15 p.m., clinical meeting.

SHROPSHIRE AND MID-WALES BRANCH.—At Royal Salop Infirmary, Shrewsbury, Wednesday, January 26, 8 p.m., meeting of Clinical and Pathological Section. Discussion: "The Pneumonias."

SOUTH BEDFORDSHIRE DIVISION.—At Luton and Dunstable Hospital, Wednesday, January 26, 9 p.m., meeting. Professor Ian Aird: "The Conjoined Twins of Kano" (slides and film).

SOUTH STAFFS DIVISION.—At Star and Garter Hotel, Wolverhampton, Tuesday, January 25, 8 p.m., supper, followed by colour film and lecture: "Allergy."

SOUTHAMPTON DIVISION.—At Royal South Hants Hospital, Southampton, Wednesday, January 26, 8.30 p.m., extraordinary general meeting to discuss and complete the Questionary of the Peripheral Organization of the Association.

STOCKPORT DIVISION.—At Alma Lodge Hotel, Stockport, Thursday, February 10, 7.30 for 8 p.m., annual B.M.A. dinner and dance.

WEMBLEY DIVISION.—At Wembley Hospital, Fairview Avenue, High Road, Tuesday, January 25, 9 p.m., meeting. Film: "Cerebral Palsy," presented by Mrs. Eirene Collis and Dr. W. F. Dunham. Nursing staff and physiotherapists are invited.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 29 1955

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British Medical Association

PROCEEDINGS OF COUNCIL

A meeting of the Council of the Association was held on January 19, with Dr. E. A. GREGG in the chair. It lasted from 10 a.m. until 6 p.m.

The deaths of three former members of Council were announced—namely, Dr. G. W. Miller, of Dundee; Mr. R. J. Willan, of Newcastle; and Dr. J. B. Miller, of Bishopbriggs. The last-named was a vice-president of the Association and a past chairman of the Representative Body. The Chairman also referred to the death of Sir Arthur Keith, who had been so notable a figure in the medical profession. The members stood in silent tribute and authorized the Chairman to send letters of condolence to the families.

The congratulations of the Council were conveyed to the members of the Association—38 of them—whose names figured in the New Year Honours List. The Chairman drew attention to the inclusion of the Deputy Chairman of the Representative Body, Dr. A. Beauchamp, who received the O.B.E. for services to the Ministry of Health.

The Council sent a message of sympathy to Dr. Agnes Kelynaack, Assistant Secretary, in her illness, and its hope for her speedy recovery.

It was reported that a reception was given to the party of doctors from the U.S.S.R. who have been recently visiting London. The Chairman of Council, accompanied by the President of the Medical Women's Federation, had received the guests. A letter had been received from the chairman of the Medical Section of the Society for Cultural Relations with the U.S.S.R. stating that the visitors had asked him to convey their thanks for the hospitality. "They greatly enjoyed meeting you and your colleagues, were interested in what they saw of medicine in this country, and impressed by the need to increase future contacts between specialists in the two countries and the exchange of medical information."

Annual Meeting, 1957

The Secretary reported on his visit to Newcastle-upon-Tyne with a view to investigating the hotel accommodation and other facilities for the Annual Meeting, 1957, and the Deputy Secretary reported on a visit he paid to Manchester for a similar purpose. It was pointed out that the last meeting in Manchester was in 1929, whereas the last held in Newcastle was in 1921.

On the motion of Mr. WELDON WATTS it was agreed that the invitation to Newcastle for 1957 be accepted. The

Annual Meeting, 1956, will be held at Brighton, and the Annual Meeting, 1958, at Margate.

Medical Education

The Council considered the terms of reference for the proposed study group appointed to consider the *Proceedings* of the First World Conference on Medical Education and to make suggestions for the programme and deliberations of the Second World Conference. It was stated that Sir Lionel Whitby had agreed to act as chairman.

It was resolved to include in the terms of reference "such other matters as may be considered relevant." Another matter referred to this group or committee was one arising from a letter from the Registrar of the General Medical Council, who stated that the G.M.C. was proposing to consider the revision of the recommendations on the medical curriculum which they had adopted in February, 1947, and would be glad of any observations or suggestions, which the Association might wish to offer.

Part-time Consultants and Income Tax

A report was made on the position with regard to contributions from other bodies towards the cost of the legal actions which are to be instituted to test the validity of the assessment of part-time consultants under schedule E. It was stated that one of the defence societies was considering with its solicitor that day the extent of its proposed commitment in this respect.

Dr. ROWLAND HILL said that he hoped the urgency of this matter would be borne in mind. If it was not possible immediately, as had been proposed, to proceed with both test cases, he thought they should proceed with one case. He also urged that the Board of Inland Revenue be approached at once with a view to holding up the matter until the test case had been decided.

Dr. WAND suggested that the position was so complicated at the moment that any direct approach to the Board of Inland Revenue would be unwise. The matter should be left in the hands of a small body of people to proceed as they thought best according to developments.

It was agreed to give a free hand to the Chairman of Council in consultation with others to take such immediate action as might seem desirable in the light of the discussion with the legal advisers. The CHAIRMAN OF COUNCIL added

that this was a matter of such great importance that the Association would have to go through with it even though a considerable financial liability had to be faced.

Association Coat of Arms

Mr. S. F. L. DAHNE said that he was happy to report, in view of the Scottish controversy over the Association Coat of Arms which was mentioned at the last meeting, that he had had a very happy discussion with Dr. Hamilton, chairman of the Scottish Committee, and Dr. Walker, the Scottish Secretary, and that the Clarenceux King of Arms and the Lord Lyon King of Arms had now reached agreement about a suitable form of lion. He exhibited the revised design for the inspection of the Council. He was grateful to all concerned for their co-operation in arriving at a design acceptable to both heraldic courts. Dr. HAMILTON then moved formally:

That the Council approves the present design of the proposed armorial bearings of the Association, requests the Clarenceux King of Arms to make a grant of these arms to the Association, and requests the Lord Lyon King of Arms to matriculate these arms.

This was agreed unanimously.

Mr. TUDOR THOMAS said that the Council, and indeed the whole Association should be very grateful to Mr. Dahne for the great amount of work he had done in this connexion. It would be a very proud day when they had a design embodying such appropriate references to medicine and to their own Association.

Dr. HAMILTON said that he wished also to say how grateful he was for the co-operative and helpful manner in which Mr. Dahne had handled a situation which might have proved to be very troublesome. It was a credit to the Association to have a coat of arms pictorially decorative and heraldisically acceptable throughout the British Empire.

Provision of Drugs for Private Patients

Dr. TALBOT ROGERS, chairman of the General Medical Services Committee, reported that Dr. A. Brown, the Deputy Secretary (Dr. Stevenson), the Assistant Secretary (Dr. Hedgcock), and himself had met the Minister of Health to press the Association's claim that private patients should be entitled to drugs and appliances under the National Health Service.¹

The outcome was that, while the proposal was not repugnant to Conservative principles and the door was by no means shut, the Minister said he could give no undertaking that the change either could or would take place.

Dr. A. BROWN, as one who had attended the meeting with the Minister, said that the matter must be kept alive, but nothing was to be gained by proceeding in the matter further at the present time.

Dr. W. WOOLLEY said that he hoped they would not merely mark time until it was possible to do something with the Government. In the interim period something could be done in preparation for the passing of an Act allowing for such provision.

In reporting other matters from the General Medical Services Committee, Dr. TALBOT ROGERS said that his Committee had long maintained that one of the most effective methods of combating high prescribing costs would be a return to the system of areal averages which obtained before the National Health Service. Although it had not been possible to resume this practice on a national scale, he was pleased to report that a start was now being made by circularizing comparative prescribing costs to doctors in certain areas. Similar information would be collated and distributed for other areas from time to time.

"British Medical Journal"

Dr. J. G. HAMILTON, chairman of the Journal Committee, presented the Journal Budget for 1955. It showed a reduction in the surplus as compared with the expected surplus

¹ A report of the discussion with the Minister will be found at page 31 of this Supplement.

for 1954. The price of paper was increasing and other printing costs were up by something like 4%. In fact, the publishing activities of the Association were reaching a position in which a surplus might be problematical, and he considered it necessary for the Journal Committee to inform the Council of these trends. While there were grounds for optimism, prudence demanded that they should think only of a modest surplus if not a small deficit.

Association Finance

Mr. L. DOUGAL CALLANDER, the Treasurer, presented revenue and capital budgets for the Association for 1955. Total expenses were some £10,000 above the figure for 1954, the biggest estimated increase being in the cost of central and representative meetings. The total estimated surplus for 1955 was much below that for 1954. After making provision for special legal costs, redemption of loans, and contingencies, the balance to be earmarked for the general reserve fund was £16,306.

Dr. WAND said that if the increased expenditure due to the activities of the Association in many directions continued it might well become impossible to reduce the six guineas subscription. In that event it should be made clear to members that a reduction of subscription would mean a cheeseparing policy on the part of the Association.

On other matters arising on the Finance Report the TREASURER said that it was hoped to undertake this year the redecoration of the Council chamber and the improvement of its lighting, ventilation, and acoustics.

Industrial Health Advisers

Dr. J. B. TILLEY, chairman of the Public Health Committee, brought forward a report, with recommendations on one of which certain discussion arose. This was a recommendation supporting the application of the Society of Medical Officers of Health to the Minister of Labour that the Society be included in the list of nominating bodies, and thus ensure representation of the public health service on the Industrial Health Advisory Committee. At its last meeting the Council had adopted the recommendation of the Occupational Health Committee concerning the nomination of Dr. J. A. L. Vaughan Jones and Dr. L. G. Norman to fill the two places allocated to the B.M.A. for membership of the committee.

Dr. VAUGHAN JONES said that if there had been a request for a third member, to be appointed from the Public Health Committee, he would have supported it, but he was bound to point out that the policy of the Society of Medical Officers of Health in regard to occupational health had not run in agreement with the policy of the B.M.A. In its evidence to the Guillebaud Committee the Society had made certain statements in relation to occupational health which were not reconcilable with B.M.A. policy. He was prepared to support the recommendation now before the Council provided the Society fell in with B.M.A. policy in this respect. If they were going to have divided policies among the medical people on this Advisory Committee it was easy to foresee what would happen. An assurance should be obtained from the Society.

Dr. H. D. CHALKE said that Dr. Vaughan Jones was a little unfair when he said that the Society was opposed to the policy of the B.M.A. On many occasions the Occupational Health Committee and the Society had carefully considered each other's documents, and the Society had gone generally more than halfway to meet the views of the Committee. He felt that it would not be right to add to the present recommendation the proviso that the representative of the Society on the Advisory Committee should say only what the B.M.A. wanted him to say. There was no desire on the part of the Society for controversy, and the carrying of the recommendation would be a further means of cementing the arrangement between the two bodies.

Dr. TILLEY said that he had no knowledge of any substantial difference between the policy of the Society and of the Association.

The recommendation was carried.

Certain further matters arose on the Public Health Committee's report. One of these concerned the transfer of the functions of the Ministry of Food in relation to food hygiene. The Council expressed the strong view that the transfer should be to the Ministry of Health rather than to the Ministry of Agriculture and Fisheries.

The Association Library

The principal matter in the report of the Science Committee, presented by Mr. J. R. NICHOLSON-LAILEY, was a memorandum on the future of the Association's library. The Council had previously approved a recommendation that the library should remain in the Garden Court wing, that increased accommodation should be made available for it there as soon as possible, and that eventual reconstruction be considered. The Council had asked for a statement showing the use made at present of the lending and reference sections, and this was now forthcoming.

Dr. FRANK GRAY said that he fully supported the view that the Association's library should stand on its own feet and not merge with other medical libraries, but he thought there might be an opportunity for a central pool, to which it and other libraries would contribute, for old and rather rare books. He suggested that that point be considered.

Dr. WAND suggested that the Science Committee should consider the question of microfilming some of its books in order to save space. Mr. LAILEY said this was being considered.

One-day Incapacity Certificates

Dr. A. BROWN, chairman of the Private Practice Committee, submitted a report of which the principal item concerned the discussion on one-day incapacity certificates which occupied the meeting of the Committee on December 15 and was reported in the Supplement (January 1, p. 3). The Annual Representative Meeting in 1954 had called for the abolition of the one-day certificate for absence from employment, but after a careful consideration of the matter and a canvass of Divisions in colliery areas with a view to discovering what proportion of colliery practitioners would refuse to issue any one-day certificates at all (apart from those required for N.H.S. purposes) if so requested by the Association, the Committee had reached the following recommendation to Council:

That in view of the lack of support from a section of the profession, no action be taken at the present time to implement the resolution of the Representative Body.

Dr. J. C. ARTHUR said that this matter was occasioning a great deal of trouble in the North, and had been the subject of a resolution of the North of England Branch Council. The real demand for these certificates was extremely variable, but in certain areas, whether because of the attitude of the local branch of the National Union of Mineworkers or not, it was very definite. The National Coal Board disliked these one-day certificates just as much as the medical profession. He suggested that the Private Practice Committee should take the matter up again with the National Coal Board and seek a satisfactory solution.

Dr. A. BARKER considered that the recommendation was the only practicable course. The matter had been discussed at great length on many occasions. The answer of the National Coal Board would be, "If you, the doctors, are not satisfied, do not give the certificates."

Dr. I. D. GRANT said that the National Coal Board, for political reasons, was not prepared to help in any way. Their attitude was, "If you do not think you are justified in giving a certificate, don't give it," and to that, of course, there was no answer.

Mr. D. S. PRACY supported the recommendation. Dr. O. C. CARTER hoped that the Council would not lightly say that nothing more could be done.

An amendment that the recommendation be referred back to the Committee was lost, and the recommendation, that no action be taken at the present time, was agreed to.

On further recommendations from the Private Practice Committee it was agreed to ask the Treasury to increase

the sessional fees for members and chairmen of medical boards to three guineas and four guineas respectively, also for certain increases in fees for part-time medical services performed on a sessional or case basis on behalf of Government departments.

International Relations

Dr. J. A. PRIDHAM, chairman of the International Relations Committee, presented a report on the finances of the World Medical Association. The Secretary-General of the W.M.A. had circulated to member associations a questionnaire on financial contributions present and prospective, and Dr. Pridham said that his committee believed that the Council would wish to offer constructive advice when replying, and with this in mind had asked the Treasurer and Financial Comptroller of the B.M.A. to examine the financial statements and other relevant documents of the W.M.A. In the light of their report answers had been formulated to the questions. In the Committee's view the crisis which had come upon the W.M.A. was serious enough to justify an immediate and thorough examination of the organization and activities, and after effecting such economies as were practicable the council of the W.M.A. should work out a programme of activity within the revenue it could reasonably expect to receive.

The answers to the questionnaire as drafted by the International Relations Committee were approved.

It was agreed that the Council send two delegates and two alternative delegates to the meeting of the General Assembly of the W.M.A. at Vienna later this year, and that the chairman of the International Relations Committee be one of those appointed.

B.M.A. Lecture Scheme

General J. C. A. DOWSE, chairman of the Armed Forces Committee, in presenting a report, said that the suggestion had been made to his committee that the B.M.A. lecture scheme, under which each home Branch and Division of the Association was entitled to one B.M.A. lecture annually, should be extended to enable groups of Service medical officers in large Service establishments in the United Kingdom, in areas isolated from the main centre of a B.M.A. Division, to apply for such lectures. It was not proposed that it should apply to any but the larger isolated establishments such as Catterick. An expenditure of £150 in the first year was probably a generous estimate.

The Finance Committee took no exception to this, but suggested that for the "pilot" year the expenditure be limited to £100. General Dowse accepted this limitation, and the recommendation was agreed to.

Gift to the Association

Three beautiful examples of cloisonné ware, intended for the Hastings Room, the gift of Mr. D. S. PRACY, a member of the Council, were on exhibition in the Council chamber. They were formerly in the Bowes collection, and were first-class examples of Japanese work. The warm thanks of the Council were extended to Mr. Pracy.

The Toronto Meeting

The Council agreed that the officials of the Association, in addition to the Secretary and Editor, to be included in the official party for the Toronto Meeting, 1955, should be Dr. J. W. P. THOMPSON, Dr. W. HEDGCOCK, and Mr. W. S. GILES, and that Dr. Hedgcock be commissioned to visit the American Medical Association's scientific exhibition at Atlantic City during the week preceding the meeting.

It was reported that a considerable number of additional applications had recently been received from members wishing to attend the Toronto meeting, and the Treasury had agreed to increase from 250 to 350 the number of members for whom dollar exchange facilities would be provided.

Other Committee Business

For the Film Committee Dr. R. P. LISTON reported the setting up of a joint subcommittee of the Film Committee with the Rehabilitation Committee concerning a proposed film on rehabilitation. This film will be a long-term undertaking and, it is thought, will prove of great value to the injured and disabled. It is hoped to obtain the co-operation of other national bodies concerned with the problems of rehabilitation. Dr. LISTON is chairman of this subcommittee, which has three representatives from each parent committee.

On the recommendation of the Arrangements Committee for the Brighton Meeting, 1956, it was agreed that the Annual Meeting registration fee of one guinea should be abolished.

The following committees made interim or routine reports: the Constitution Committee, which is reviewing the structure and functions of the Representative Body; the Committee on Remuneration Policy, which is continuing the collection of information; the Amending Acts Committee, which is engaged on an uncompleted study of a memorandum by one of its members (Dr. A. C. E. Breach) on means of extending private practice; the Scottish Committee, which reported a successful conference of divisional and public relations secretaries in Scotland and its decision to hold a similar conference in 1955; the Public Relations Committee, which announced the appointment of Mr. P. M. Hubbard as senior assistant to the Public Relations Officer; the Committee on Homosexuality and Prostitution; the Evidence Committee on Divine Healing, which is now taking evidence, and the Joint Committee with the Magistrates Association, which is considering draft sections of its report on cruelty to and neglect of children.

It was agreed that the Secretary (Dr. Macrae) should attend a proposed conference of secretaries of National Medical Associations attached to the World Medical Association, to be held in New York immediately after the Toronto Meeting.

Dr. Mary Esslemont was appointed representative of the Association on the Council of the Queen's Institute of District Nursing, and Lord Horder as representative at the annual conference of the Cremation Society.

**EXECUTIVE COUNCILS' ASSOCIATION
(ENGLAND)****FURTHERING SECTIONAL PROFESSIONAL
INTERESTS DEPRECATED**

The Management Committee of the Executive Councils' Association (England) at a recent meeting considered extracts from reports of the Council of the British Dental Association to the Representative Board. One extract, printed in the *Supplement to the British Dental Journal* of November 16, 1954, stated that arrangements were made for the 15 dental delegates attending the Annual Conference of the Executive Councils' Association in Southport on October 14 and 15 to meet before the conference began so that the official policy of the association might be supported when certain resolutions dealing with the general dental services came before the conference, and went on to say that this meeting had proved most useful and it was hoped that similar meetings would be arranged in future.

The Management Committee deprecated strongly the introduction of sectional interests into the conference. It thought the National Health Service as a whole would view with disfavour any attempt to use the Annual Conference of the Executive Councils' Association as a means of furthering professional interests, and decided to send a protest to the British Dental Association.

The eighth Annual Conference of the Executive Councils' Association will be held at Brighton on October 20 and 21.

**JUNIOR HOSPITAL POSTS AFTER
NATIONAL SERVICE****OXFORD REGIONAL BOARD SCHEME**

The Oxford Regional Hospital Board, which has had difficulty in finding junior staff for some of its hospitals, is introducing into some of its hospitals a scheme to meet the needs of young doctors who, on completion of their National Service, desire to extend their experience before entering general practice or being selected for training as specialists. Many of these young doctors are married and find themselves unable for financial and other reasons to take up short tenure posts in the hospital service.

The scheme provides for the creation of a limited number of rotating intern posts in the salary grade of junior hospital medical officer (£775 by £50 to £1,075) to take the place of existing posts on the junior hospital staff. They will be tenable for from two to four years, and will be held in the Reading and Northampton Group of hospitals (four posts in each group). Every effort will be made to provide married accommodation in or near the hospitals at an economical charge. Holders of these posts will be expected to serve for approximately six months in each of the major departments of the hospital (medicine, surgery, paediatrics, and obstetrics) and to assist in the other departments as circumstances in the day-to-day running of the hospitals may require.

Alternative Choice

It is thought likely that the majority holding these posts for two or more years will enter general practice, and that a minority will wish to train as specialists. The latter (if selected by their consultant) will have the opportunity to take up posts in the special departments of their own or other hospitals in the region, retaining the salary increments in their grade.

The Regional Committee of the Executive Councils has expressed its interest in this project and willingness to co-operate in facilitating the entry of doctors trained under the scheme into general practice.

ANNUAL MEETING, BRIGHTON, 1956

The Arrangements Committee met recently under the Chairmanship of Dr. Alexander Hall to consider proposals for the Association's Annual Meeting to be held at Brighton in 1956.

The Religious Service

It was suggested that the official religious service should be held on the Sunday morning of the meeting, thus leaving the Tuesday afternoon normally reserved for the service free to be added to the scientific meeting—possibly for an extra plenary session. There would be no difficulty in holding this service on the Sunday morning, but it was clear that it would become part of the ordinary morning service. The feeling that the tradition of the Association's own dignified service should be continued led to the decision that the official service should, as in previous years, be held on the Tuesday afternoon, though there was support for the proposed change.

Several of the social functions of the meeting were reviewed, and it was decided to recommend that the annual dinner should be held as early in the meeting as possible, preferably on Tuesday evening.

The Registration Fee

A registration fee of one guinea was instituted for the first time at the Cambridge meeting in 1948. This fee has become increasingly unpopular, especially amongst members who were able to attend only one or two sessions, and the Committee agreed to recommend its abolition. In doing so, the Committee was mindful that it was likely that the recruitment of new members would be encouraged, especially

locally, in view of the fact that the meeting is restricted to members of the Association. The Council confirmed this recommendation at its meeting on January 19.

The Status of the Scientific Meeting

The annual scientific meeting of the Association is the largest scientific meeting of the whole profession in this country, but, in the Committee's view, its importance and status were not sufficiently recognized. It was decided to try to remedy this by propaganda, among scientific medical organizations and individual members of the Association through Divisions and Branches.

Subcommittees were set up to choose subjects and speakers for plenary sessions, to make nominations for officers of scientific sections, and to plan the detailed arrangements for the scientific exhibition.

DRUGS FOR PRIVATE PATIENTS**DEPUTATION TO MINISTER**

As reported in the Proceedings of Council on p. 28, the Minister of Health received an Association deputation last December (Drs. A. T. Rogers, A. Brown, D. P. Stevenson, Deputy Secretary, and W. Hedgecock, Assistant Secretary) on the question of drugs under the N.H.S. for private patients.

The deputation put the Association's views on this question with emphasis. Dr. Rogers said that the Association realized that an amendment of the Act would be required and that this might not be possible at the present time. He referred to the very considerable amount of feeling in the profession that the present state of affairs was inequitable. It seemed quite unnecessary to regard prescribing as an inseparable part of general medical services, and the profession had always been led to believe that patients would be free to use separately any part of the services which were provided under the Act. It would not be difficult to devise satisfactory machinery which would prevent any abuse, and the fear that it might lead to two standards in general practice was quite unfounded.

Dr. Brown said that he appreciated to the full the difficulties in the political field and the lack of time available for legislation at the moment. What he would like to know was whether the Government accepted the view that a private patient was entitled to drugs under the Service. Once that principle had been decided any administrative difficulties could be examined.

The Deputy Secretary said that the suggestion that the proposal would introduce two standards in general practice had given rise to considerable resentment in the profession, and, in his view, such a situation might well exist in reverse to-day when many private patients were unable to afford the drugs necessary for their treatment. The Association would be only too willing to discuss the introduction of measures to prevent abuse, and, indeed, some form of contract and some ultimate sanction had always been envisaged. As regards cost, it was quite possible that any increase in the drug bill would be offset, at any rate to some extent, by an increase in the amount of private practice, with a consequent reduction in the amount of public funds which went into the central pool.

The Minister's Reply

In answer, Mr. Macleod said that there had been no change either in the situation generally or in his own views on the subject. It had been suggested that there was a breach of faith on the part of the Government in not giving effect to a promise which was contained in an election manifesto. This was not so. The pamphlet issued by the Conservative Party which had advocated this right for private patients had appeared in July, 1949. This pamphlet was in no way a form of election manifesto, and, indeed, the proposal had been dropped completely from the Party's electioneering programme which appeared some six months later. Again, in

the 1951 election no mention of it had been made at all. The Conservative Party's reason for withdrawing from its original position was that it realized the impracticability of making any concession on the lines suggested when the full and mounting cost of the Health Service became apparent. So far as the Cohen Committee was concerned, the Parliamentary Secretary's reply in the House of Commons to the effect that the Cohen Committee was unanimous on this particular point was made in perfectly good faith. No minority report or anything of a similar nature had appeared when the report was published, and if any members of the Cohen Committee had had any reservations it would have been proper for them to have stated this when they were considering their report in its draft form.

Door Not Shut

From the Government's point of view the question raised three difficulties, those of legislation, finance, and administration. The door was by no means shut. The proposal which was made in the 1949 leaflet was withdrawn purely because of the financial position of the National Health Service, and it had never been restored. He found himself in no position to give any undertaking of any sort that the Government would commit itself to allowing private patients to be supplied with drugs under the Service either at present or any future time. So far as the administration difficulties were concerned, they were formidable but not insurmountable. He did not necessarily agree with the views of the Cohen Committee on this particular point, and, if the Government agreed to give private patients this right, then there was little doubt that any proposals would be discussed with the profession in advance.

In brief, Mr. Macleod said that the situation could be summarized—that the proposal was not repugnant to Conservative principles and that the door was by no means shut. He could, however, give no undertaking that the change either could or would take place.

DANISH DOCTORS' VISIT TO SCOTLAND

The Scottish Committee's invitation for a party of Danish doctors to visit Scotland in the Autumn of 1955 has been accepted by the Danish Medical Association. A programme of visits to the main medical centres between September 5 and 17 is being arranged.

HOSPITALITY

A Swedish doctor's daughter, aged 17, would like to stay as paying guest with a British medical family with children of similar age, from mid-June to mid-August, preferably near the sea.

A French girl, aged 21, would like to stay *au pair* for three months with a family in or near Cambridge. She would help with secretarial or household duties.

A German doctor's daughter, aged 18, living in Kiel, would like to arrange holiday exchange during summer with a boy or girl.

Would anyone interested please contact Brigadier H. A. Sandiford, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

The Minister of Pensions and National Insurance has fixed the dates from which the new increased pensions and other national insurance and industrial injuries benefits provided by the National Insurance Act, 1954, will be payable. The increased retirement pensions, widows' benefits, guardian's allowance, and industrial death benefits will be payable from the first pay-day after April 25; maternity benefits after May 16; unemployment, sickness, and industrial injury and disablement benefits after May 19. The higher National Insurance and Industrial Injuries contribution rates will be introduced on June 6.

Questions Answered

Income-tax Rebate Claims

Q.—Can you advise me on the income-tax rebate claims that may be made in the following circumstances, and the procedure for making them? I am commencing a full-time D.P.H. course lasting one academic year. During this time, for reasons of ill-health, I shall be using my car. I am married, with no children. My income will be derived from disabled Army officer's pension and allowances, interest from capital investments, and the rents from house property.

A.—As there will be no professional earnings during the next 12 months there is no income against which the motor expenses can be set, and no allowance can be claimed for them while those circumstances apply. The Army pension is apparently of the class which does not rank as income for tax purposes, and the only income during the next year will be from investments and property. The tax payable on that income is subject to the usual personal allowance of £210 and the deduction for National Insurance contributions. The questioner should, however, bear in mind that the income-tax year ends on April 5, and the 12 months of the D.P.H. course will presumably overlap into the two years ending April 5, 1955, and April 5, 1956. Earnings, if any, before the course began, in the income-tax year ending April, 1955, and earnings after the course finishes, in the income-tax year ending April, 1956, will have to be taken into account in the result of applying the personal allowances to the income of each financial year.

Replacement of Instruments

Q.—I have just commenced an assistantship with view to partnership, having already completed eight months in general practice. I wish to replace some old instruments. Would the tax authorities allow me relief now if I bought replacement instruments, or must I wait until I become a partner?

A.—One point to be borne in mind is that, while the cost of replacement of instruments is normally allowable—at least under Schedule D—in so far as the cost is incurred to improve the set of instruments as compared with the set replaced, that part of the cost is regarded as additional capital outlay and is not allowable. If, for instance, the original set was largely second-hand when acquired and is replaced by new instruments, only the cost of replacement by second-hand instruments is legally allowable. If the claim is made for replacement during a period of employment the statutory rule applicable is that embodied in Schedule E, and the claimant would have to show that the terms of his employment required him to maintain in suitable condition the instruments replaced. On the whole, and provided that it does not unduly postpone the replacement, it is thought advisable for the questioner to wait until he becomes a partner before incurring the cost.

Principal's House Expenses

Q.—I am a principal engaged in full-time general practice from my own house. What allowances can I reasonably expect to be made against income tax?

A.—The basis of the allowance of expenses which have a dual purpose is that the amount claimed as incurred for professional purposes shall be reasonable having regard to the actual circumstances of the case. Circumstances vary so much that it is not possible to lay down any specific ratio to be applied to such general expenses. For instance, a not uncommon ratio to be applied to rent and rates is one-half, but that may be inadequate in special cases where the rent includes a relatively high "site" factor in a professional quarter. In any case, the professional part of the premises, including the garage, will be on the ground floor, which is

the most valuable part of the premises. Other "dual-purpose" expenses, such as heating and lighting, domestic service, telephone, upkeep of furniture and decorations, can only be dealt with on an estimate based on the facts, but failing any other basis of calculation it may be possible to apply the ratio adopted for rent and rates, subject to such modifications as may be appropriate.

Local Government Superannuation

Q.—Normally the additional contributions required when years are added under Regulation 12 of the Local Government Superannuation (Benefits) Regulations, 1954, are payable up to 60 years of age. Do these added years count in assessing the pension payable if the employee retires prematurely on grounds of permanent incapacity, or if he dies before reaching 60 years of age and there is entitlement to a widow's pension?

A.—Yes. Provided the employee has completed at least 10 years' contributing service exclusive of the added years, the added years will be reckoned in full for the purpose of an incapacity or widow's pension, and no further contributions will be required from the employee (or his widow).

Q.—When an employee is granted added years under Regulation 12 of the Local Government Superannuation (Benefits) Regulations, 1954, do the additional contributions required qualify for income-tax relief?

A.—Yes. But if the normal contributions plus the additional contributions for added years amount to more than 15% of the employee's annual income, the excess does not qualify for relief.

Correspondence

University Teachers' Salaries

SIR.—We note that as yet there seems to have been no correspondence following your report on university teachers' salaries (*Supplement*, December 4, 1954, p. 213), and we can only assume that, lacking any dissentient voice, the opinions expressed by the Full-time Non-professional Medical Teachers and Research Workers Group Committee of the B.M.A. have the tacit approval of the profession.

We feel that the situation of the preclinical medical teachers is more serious than has been expressed in this report, and we should like to draw attention to the increasing discrepancies between the salaries of these teachers and those of other members of the profession. These differences in salary scale are becoming more evident as members of each group advance in seniority, and they are not merely perpetuated, but even accentuated, in the new salary scales recommended for the country (*Journal*, November 27, 1954, p. 1300). In some universities the increments are considerably less than in the clinical group, which means that the maximum is reached after a much longer time, with a consequential detriment to superannuation. We feel, as preclinical medical teachers, that the marked contrast in our financial circumstances as compared with those of our colleagues in other spheres of medicine will deter any young doctor, despite his innate interest in the subject, from entering academic anatomy or physiology. General practice, hospital clinical medicine, and even pathology, where the work is most similar to our own, will all appear much more attractive. Unless the profession is prepared to accept the position that the training of medical students in the basic medical sciences is to be almost entirely in the hands of teachers, otherwise however able, who have not themselves trained in medicine—a position that many would surely regard with disfavour—steps must be taken to ensure that the rewards are such as at least to attract a fair share of the best medical brains into the teaching of these subjects, certainly not to repel them.

Let no one suppose that, as the salaries might suggest, university terms give an academic worker an unpaid holiday for half the year and the opportunity to take up a more lucrative occupation in the vacations. Most university teachers are fully engaged during these periods in their own lines of research. It is essential for future advance in medical knowledge that they should be able to pursue such work free from undue financial strain. Research in pre-clinical medicine, unlike that in other more technological sciences, does not offer a commercial sideline, nor does it offer the opportunity of a merit award (if these are ethically desirable).

If this anomalous position is to be perpetuated, many teachers, in view of the expenses of the education of children and the increasing cost of ordinary living, must seriously consider their ability to afford to continue in academic pre-clinical medicine. This will become a "luxury" only possible to those, becoming fewer in number, who are provided with substantial private means. Certainly the perpetuation of such inferior salaries will soon so discourage recruitment that fewer and fewer of the more intelligent teachers and research workers will enter the unremunerative fields of academical preclinical medicine. Only to a limited degree can congenial surroundings be balanced against financial sacrifices, and this limit has already been reached.—We are, etc.,

M. M. BULL.

D. BULMER.

A. D. DICKSON.

H. L. H. H. GREEN.

J. W. MILLEN.

Cambridge.

ALEXANDER MONRO.

C. W. M. PRATT.

BERNARD TOWERS.

DAVID H. WOOLLAM.

G. H. WRIGHT.

Medical Service in the Armed Forces

SIR.—I was deeply interested in the B.M.A. Medical and Dental Services Committee report (*Supplement*, September 11, 1954, p. 111), but I would heartily disagree with Dr. J. Stuart Whiteley's comments (*Journal*, September 25, p. 128) that it is a corollary of present R.A.M.C. practice that commanding officers of a hospital or field ambulance should lack clinical ability. As a prematurely retired officer of the late Indian Medical Service, with nearly 12 years' service, I cannot recollect that I was ever in the position ascribed to these officers by Dr. Whiteley. I held appointments giving a very wide experience of the Army medical services, and in all the posts which carried both administrative and military responsibility I was able to devote a reasonable amount of time to professional work. Much of this was operative surgery, which at that time was my main interest, but far more was of the nature of general practice, and it is from this angle I would like to emphasize a few opportunities that a Service life provides.

General practice is the basic medical science, accepting all types of disease as they occur in nature, sorting them out for diagnosis and treatment or for reference. The general duty officer will have opportunity for a very wide experience of this type of scientific interest, and, more fortunate than his civilian colleagues, he will both be able and have time to study disease in relation to environment in an infinitely varied and interesting background. He will at times have opportunities to modify the background within limits and watch the result. He will find these occasions particularly in the task of regimental medical officer, an appointment which should not be given to the recently qualified, and which will be appreciated more when knowledge of men and medicine has increased with time. But whatever the appointment one can always find some aspect of medicine to study and practise in the Army if one's vision is wide enough. The disdained administrative work when carried out by doctors, as it should always be, is only another aspect of general practice applying medical principles to bulk problems of handling patients and their attendants, surroundings, and equipment. This is an aspect of general practice to which the officer with administrative responsibility must devote a good deal of time, but he will find it of real professional value.

Officers holding command, as I have proved, are always free to spend at least some time among the patients of their units. In the I.M.S. I think we preserved a tradition of this balance between administrative and clinical work, for I noticed that several commanding officers under whom I served did so habitually. Staff officers, in addition to finding ample clinical interest in the information reaching them day by day, have the opportunity of initiating research on a wide scale, with the help of senior specialists and advisers, whose valuable work must needs be administered by someone if it is to benefit large numbers. If, in addition, staff officers were to give one morning a week to clinical work they would carry a far more alert professional outlook into their administration, and above all on their tours of inspection, where they themselves face the critical eye of junior officers.

If a well-balanced attitude of this nature could be officially inculcated and encouraged throughout the Corps by the Army Medical Department at the War Office, and taught by the R.A.M.C. College to both junior and senior officers' courses, it could slowly and surely rehabilitate the professional standing and appeal of an Army medical career, without sacrificing any military or administrative efficiency. I have used the word "taught" deliberately, because it seems that many National Service M.O.s have no idea of any other type of medical work than that which they have seen in hospitals; and perhaps it is also true that some of the more senior officers have gradually given up this interest in clinical work for lack of encouragement and personal initiative. Both classes need to be shown the very wide possibilities of general practice type of medical work in all the usual spheres of Army life.—I am, etc.,

Nairobi, Kenya.

R. Y. TAYLOR.

Merit Awards

SIR.—I have not read all the correspondence on this matter, but need not apologize for putting forward the view that the method used for the distribution of merit awards concerns the profession as a whole. Prior to nationalization, the discussion groups of consultants and specialists were largely separated from those of general practitioners—the old story of "divide and rule." What Division of the B.M.A. would care to sponsor a resolution on the method of distribution of merit awards at the next A.R.M.? I surmise that a vote of the whole profession would produce a very different result than a vote confined to a group—the majority, recipients of these awards—but that by the way.—I am, etc.,

Belfast.

DOUGLAS BOYD.

Remuneration and Arbitration

SIR.—The daily press constantly reminds us at the present time that we are enjoying an era of unprecedented prosperity, and the *Sunday Express* of January 9 asks its readers on page 1: "Are you cashing in on the boom? The year 1955 promises to be the most prosperous in Britain's history." Many of your readers must have been impressed with the remarkable speed with which a solution has been found to the threatened railway strike, and the determination and alacrity manifested when the Government has been faced with any problem of remuneration which directly involves the convenience of the public and thus indirectly their voting potential. The interim report of the Court of Inquiry even goes as far as stating: "Having willed the end, the nation must will the means. This implies that employees of such a national service shall receive a fair and adequate wage. . . ."

It so happened that on the same morning I was looking through the *Supplement* of July 2, 1949, and there, on page 15, is reported the proceedings of the A.R.M. of that year in which the chairman of the Central Consultants and Specialists Committee of that time is reported as follows: "It was represented to the Ministry that the betterment factor was quite insufficient. The Minister had refused

to alter this factor, and what was more ominous was his statement concerning Whitley Council machinery. The present meeting had already given a very strong expression of opinion on the question of arbitration. He regarded this as of fundamental importance and a battle which they must win."

Six years later the battle has not been won, and, despite innumerable committee meetings consisting of the most eminent and presumably intelligent members of our profession, nothing more has been achieved than an *ad hoc* increase which was not retrospective, giving a consultant at the maximum of the scale a betterment factor of 24% over the scale recommended as applicable sixteen years ago. During this period a world war has come and gone, with its inevitable depreciation in the purchasing power of money and heavy increase in taxation.

We have not even obtained, as yet, the fundamental right to present our disputes for arbitration: a measure which is essential for a body of individuals whose occupation denies to them the resort of the working man—the strike. Surely, as a profession, we must stand condemned for all time as the most incompetent, inept, and inadequately represented of all nationalized occupations, and, whether we like it or not, this is precisely what we have become. We must indeed be the laughing-stock of all those bodies who negotiate with the Government on behalf of their members.

By nationalizing the medical and dental professions the Government is the owner and the employer, and we are the employees, induced to enter employment under specific terms and promises which have not been fulfilled, and, I would venture to suggest, never will be fulfilled unless a far more realistic policy is adopted in the future. Collective bargaining and concerted action are the first steps towards securing our future and putting an end to the political chicanery which has characterized negotiations in the past. Is it too much to hope that 1955 will see a clear ratification of the political pledges of 1948 and unbiased arbitration of our unassailable claims so that a just conclusion may be reached and peace of mind established in the future?

Lest it should be forgotten, we will not, in that case, be "cashing in on the boom" but securing at long last what has been denied to us for some seven years by political intrigue of the lowest order.—I am, etc.,

Andover.

N. L. ROWE.

Hospital Costing Returns

SIR,—You refer (*Journal*, January 8, p. 92) to "some interesting speculation" that the current issue of National Health Service costing returns may provoke, and point out some fallacies to be avoided. There would be less speculation on some items if clear instructions had been given as to what costs should be included in a particular column. When one studies columns 25, 26, and 28 under "Gross Salaries and Wages" for comparable mental hospitals, one finds the following extraordinary variations: (25) "Administrative and Clerical"—Zero to 4s. 11d. (26) "Professional and Technical"—9d. to 5s. 8d. (28) "Others"—2s. 5d. to 9s.

It is, pretty obvious that different groups have included utterly different items in the various columns. As these read now they are valueless and represent a waste of paper, print, and labour.—I am, etc.,

Basingstoke.

I. ATKIN.

REFERENCE

¹ *National Health Service Hospital Costing Returns, Year Ended March 31, 1954*, p. 65. H.M.S.O.

Hospital Staffing

SIR,—I have noted the recent correspondence in your columns on the Strachan report and in particular the letters of Dr. G. D. Wild (*Supplement*, December 25, 1954, p. 247) and "Senior Hospital M.O." (*Supplement*, January 15, p. 18). The report (*Supplement*, December 18, 1954, p. 236) of the meeting of the Central Consultants and Specialists Committee made it quite clear that the proposals were still under

consideration, and I therefore agree with Dr. Wild that no final decision on their merits can yet be reached. It is no secret, however, that the provisional S.H.M.O. Group, while recognizing the necessity for staff reorganization and appreciating the hard work put in by the Hospital Staffing Subcommittee, felt that the Strachan report as it stood originally was less than fair to present S.H.M.O.s. In that sense we did not approve of the report and our views have been confirmed by S.H.M.O.s individually and at meetings all over England and Wales. Every opportunity has been taken to put the views of S.H.M.O.s at Headquarters. We must now await the final proposals.—I am, etc.,

W. J. WILSON,

Hon. Secretary.

Sheffield, 10.

Provisional S.H.M.O. Group Committee.

Local Health Authority Nursing Services

SIR,—Miss Everell M. Shippam (*Supplement*, January 8, p. 12) considers that the work of advising a mother on infant feeding after the midwife has left on the fourteenth day can only be done adequately when the health visitor has not only taken part I but has qualified and practised as a midwife. May I ask why? Why should not advice in infant feeding be given by the health visitor, who has received in her training so much more instruction on this branch of nursing work than the midwife?—I am, etc.,

Smethwick.

HUGH PAUL.

Association Notices

SCHOLARSHIPS IN AID OF SCIENTIFIC RESEARCH

The Council of the British Medical Association is prepared to receive applications for research scholarships as follows:

An Ernest Hart Memorial Scholarship, of the value of £250.

A Walter Dixon Scholarship, of the value of £250.

Four ordinary research scholarships, each of the value of £200.

These scholarships are given to candidates recommended by the Science Committee of the Association as qualified to undertake research in any subject (including State medicine) relating to the causation, prevention, or treatment of disease.

In addition, applications are invited for the award of the following research scholarship:

The Insole Scholarship, of the value of £250, for research into the causes and cure of venereal disease.

Each scholarship is tenable for one year, commencing on October 1, 1955. A current scholar may apply to be re-appointed for a further year, though no scholarship will be renewed more than twice. A scholar is not necessarily required to devote the whole of his or her time to the work of research, but may be a member of H.M. Forces or may hold a junior appointment at a university, medical school, or hospital, provided the duties of such appointment will not, in the opinion of the Science Committee, interfere with his or her work as a scholar.

Applications for scholarships, including renewals, must be made not later than March 1, 1955, on the prescribed form, a copy of which will be supplied by the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, on application.

Applicants are required to furnish the names of three referees who are competent to speak as to their capacity for the research contemplated.

MIDDLEMORE PRIZE

The Middlemore Prize, which consists of a cheque for £50 and a certificate, was founded in 1880 by the late Richard Middlemore, F.R.C.S., of Birmingham, to be awarded for the best essay or work on any subject which the Council of the British Medical Association may from time to time select in any department of ophthalmic medicine or surgery. The Council of the British Medical Association is prepared to consider an award of the prize in the year 1955 to the

author of the best essay on: "Allergy in Relation to Eye Disease." Notice of intention to enter for the competition should be made on the appropriate entry form, copies of which can be obtained from the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

Essays must reach the Secretary on or before February 1, 1955. Each essay must be unsigned and accompanied by a slip containing the name and address of the author. Previous prizewinners are not precluded from entering. In the event of no essay being submitted of sufficient merit, the prize will not be awarded in 1955, but will be offered again in the following year.

Election of Representative Body, 1955-6

The Council hereby gives notice that Representatives and Deputy Representatives for 1955-6 must be elected by the Constituencies (see below) not later than Thursday, March 31, and their names received at the head office not later than Wednesday, April 20, 1955.

It is a matter for the Executive Committee of the Division (or, where a Constituency comprises more than one Division, for a joint meeting of the Executives of the Divisions) to decide whether the Representative(s) and Deputy Representative(s) shall be elected by a General Meeting of the Constituency or by Postal Vote. The meeting of the Constituency must be called (and, where the election is by voting papers, these must be issued) by the Secretary of the Division (or, in the case of Constituencies comprising more Divisions than one, by the Secretary of the Division containing the largest number of Members).

I. CONSTITUENCIES IN GREAT BRITAIN AND NORTHERN IRELAND

The Council has formed the Divisions in Great Britain and Northern Ireland into the Constituencies for election of the Representative Body, 1955-6, shown below.

II. BRANCHES IN THE REPUBLIC OF IRELAND

The Branches in the Republic of Ireland (Irish Medical Association) comprise one Constituency, entitled to not more than three Representatives.

III. CONSTITUENCIES NOT IN GREAT BRITAIN OR IRELAND

Each Branch outside Great Britain and Ireland is an independent Constituency.

CONSTITUENCIES IN GREAT BRITAIN AND NORTHERN IRELAND FOR ELECTION OF REPRESENTATIVE BODY, 1955-6

Divisions bracketed together form one Constituency

Aberdeen Aberdeen and Kincardine Counties Orkney Shetland City of Aberdeen	Dorset and West Hants Bournemouth Dorset	Northamptonshire East Northampton Northampton
Bath, Bristol, and Somerset Bath Bristol East Somerset West Somerset	Dundee City of Dundee County of Angus	Northern Counties of Scotland Banff, Moray, and Nairn Caithness Sutherland Inverness Outer Islands Ross and Cromarty
Bedfordshire North Bedfordshire South Bedfordshire	East Yorkshire	Northern Ireland Belfast County Armagh West Down Londonderry North-east Ulster Fermanagh Tyrone
Berks, Bucks, and Oxford Buckinghamshire Oxford Reading	Edinburgh and South-east of Scotland City of Edinburgh East and Mid Lothian West Lothian South-eastern Counties	North of England Bishop Auckland Durham Blyth Morpeth Consett Hexham Gateshead Newcastle-upon-Tyne North Northumberland South Shields Sunderland Tyneside
Border Counties Cumberland Dumfries and Galloway	Essex Mid-Essex North-east Essex South Essex South-east Essex	
Cambridge and Huntingdon Cambridge and Huntingdon Isle of Ely Peterborough	Fife	
Derbyshire Buxton Glossop Chesterfield Derby West Derbyshire	Glasgow and West of Scotland Argyllshire Ayrshire West Wigtownshire Dumfriesshire Glasgow Lanarkshire Renfrewshire and Buteshire	

CONSTITUENCIES (continued):

Gloucestershire	North Lancashire and Westmorland Blackburn Blackpool and Fylde Burnley Furness Lancaster Preston Westmorland
Hertfordshire Barnet East Herts Mid-Herts West Herts	North Wales East Denbigh and Flint West Denbigh and Flint North-west Wales
Isle of Man	Nottinghamshire
Kent Bromley Dartford East Kent Folkestone and Dover Maidstone Rochester, Chatham, and Gillingham Tunbridge Wells	Perth
Leicestershire and Rutland	Shropshire and Mid-Wales
Lincolnshire Grimsby Holland Kesteven Lincoln Scunthorpe	Southern Aldershot and Farnham Guernsey and Alderney Isle of Wight Jersey Poole Salisbury Southampton Winchester
Merseyside Birkenhead and Wirral Chester Liverpool St. Helens Southport Wallasey Warrington	South Lancashire and East Cheshire Ashton-under-Lyne Bolton Bury Crewe Hyde Leigh Wigan Macclesfield and East Cheshire Manchester Mid-Cheshire Oldham Rochdale Salford Stockport
Metropolitan Counties Camden Chelsea and Fulham City Enfield and Potters Bar Finchley Greenwich and Deptford Hampstead Harrow Hendon Kensington and Hammersmith Lambeth and Southwark Lewisham Marylebone North Middlesex Paddington St. Pancras South Middlesex South-west Essex Stratford Tower Hamlets Wandsworth Wembley West Middlesex Westminster and Holborn Willesden Woolwich	South Wales and Monmouthshire Cardiff Monmouthshire North Glamorgan and Brecknock South-west Wales Swansea
	South-western Barnstaple Cornwall Exeter Falmouth Torquay
	Staffordshire Burton-on-Trent North Staffordshire South Staffordshire Walsall and Lichfield
	Stirling
	Suffolk East Suffolk North-east Suffolk West Suffolk
	Surrey Croydon Guildford Kingston-on-Thames Reigate Richmond
	Sussex Brighton and Mid-Sussex Eastbourne Hastings West Sussex
	Teeside Cleveland Darlington Hartlepool Stockton
	Wiltshire Swindon Trowbridge
	Worcestershire and Herefordshire Hereford Worcester and Bromsgrove
	Yorkshire Barnsley Bradford Dewsbury Doncaster Goole and Selby Wakefield, Pontefract and Castleford Halifax Leeds Rotherham Scarborough Sheffield York

Diary of Central Meetings

JANUARY

- 25 Fri. Scientific Programme Subcommittee of Arrangements Committee, 11 a.m.
28 Fri. Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
28 Fri. Scientific Exhibition, Subcommittee of Arrangements Committee, 2 p.m.

FEBRUARY

- 1 Tues. Organization Committee, 2 p.m.
2 Wed. Occupational Health Committee, 10 a.m.
2 Wed. G.M.S. Subcommittee on Assistants in General Practice, 10.30 a.m.
2 Wed. Central Ethical Committee, 2 p.m.
2 Wed. G.M.S. Subcommittee to consider Report of Central Health Services Council's Committee on General Practice within the National Health Service, 2 p.m.
2 Wed. Radiological Services Subcommittee, Radiologists Group Committee, 2 p.m.
3 Thurs. Central Consultants and Specialists Committee, 10.30 a.m.
3 Thurs. Committee on Homosexuality and Prostitution, 2 p.m.
4 Fri. Library Subcommittee, Science Committee, 12 noon.
4 Fri. Science Committee, 2 p.m.
8 Tues. Trainee General Practitioner Subcommittee, 2 p.m.
9 Wed. Private Practice Committee, 12 noon.
9 Wed. Psychological Medicine Group Committee, 2 p.m.
9 Wed. Public Relations Committee, 2 p.m.
10 Thurs. Subcommittee on Service Committee and Tribunal Regulations, G.M.S. Committee, 2 p.m.
11 Fri. Joint Subcommittee on Professional Secrecy, Public Health and Central Ethical Committees, 11 a.m.
11 Fri. Public Health Committee, 2 p.m.

Meetings of Branches and Divisions

- ALDERSHOT AND FARNHAM DIVISION.—At Northfield Hospital, Tuesday, February 1, 8.15 p.m., meeting. Wing Commander F. Latham: "Medicine in Aviation."
COVENTRY DIVISION.—At Chace Hotel, London Road, Willenhall, Tuesday, February 1, 8 p.m., supper meeting. Lecture by Dr. A. C. Cooke: "Adrenalectomy for Hypertension."
FINCHLEY DIVISION.—At Finchley Memorial Hospital, Granville Road, N., Tuesday, February 1, 8.30 for 9 p.m., meeting. Dr. F. E. Camps: "Burning People Don't Sit Still."
GREENWICH AND DEPTFORD DIVISION.—At Miller General Hospital, Greenwich High Road, London, S.E., Wednesday, February 2, 8.30 p.m., meeting. B.M.A. Lecture by Dr. F. S. Cooksey: "Some Recent Developments in Medical Rehabilitation." Members' wives are invited. Also members of Lewisham and Woolwich Divisions. (The notice in the *Supplement* of January 22, stating that the lecture would be delivered on January 26, was printed in error.)
GUILDFORD DIVISION.—At Assembly Room, Lion Hotel, Guildford, Thursday, February 3, 7.30 p.m., informal dinner; 8.30 p.m., joint meeting with Guildford and District B.D.A. Squadron Leader D. G. V. Whittingham, R.A.F.: "Aviation Medicine."
HALIFAX DIVISION.—At Alexandra Hall, Halifax, Wednesday, February 2, 8 for 8.30 p.m., annual dinner-dance.
HAMPSTEAD DIVISION.—At Hampstead General Hospital, Haverstock Hill, N.W., Wednesday, February 2, 8.30 p.m., meeting. Mr. A. Lawrence, Abel: "Some Impressions from Overseas." (Illustrated by slides and a coloured talking film.)
HARROGATE DIVISION.—At Royal Bath Hospital, Cornwall Road, Harrogate, Friday, February 4, 8.30 p.m., meeting.
HARROW DIVISION.—At Rayners Hotel, Rayners Lane, Harrow, Tuesday, February 1, 8.30 p.m., meeting. Symposium: "Control of Blood Pressure." Speakers, Professor Clifford Wilson, Mr. J. P. Bentley, and Dr. J. Wilson Muggoch.
HASTINGS DIVISION.—At Royal East Sussex Hospital, Hastings, Tuesday, February 1, 8.15 p.m., meeting. Address by Dr. J. S. Anderson: "Infectious Diseases and the General Practitioner."
HYDE DIVISION.—At Pack Horse Inn, Mottram, Wednesday, February 2, 8.30 p.m., clinical meeting. Dr. S. H. Jackson: "Pathology and the General Practitioner—Hospital Facilities and Otherwise."
LEWISHAM DIVISION.—At Lewisham General Hospital, High Street, Lewisham, S.E., Friday, February 4, 8.30 p.m., meeting. Dr. Noel G. Harris: "The Uses and Abuses of Hypnotism."
MID-HERTS DIVISION.—At Noel Burke Hall, Cell Barnes Hospital, St. Albans, Friday, February 4, 9 p.m., meeting. Film of operation by Professor Ian Aird: "Conjoined Twins of Kano."
NORTH STAFFS DIVISION.—At North Stafford Hotel, Stoke-on-Trent, Thursday, February 3, 7.15 for 7.45 p.m., annual dinner-dance.
ST. PANCRAS DIVISION.—At Committee Room C, B.M.A. House, Tavistock Square, London, W.C., Tuesday, February 1, 8.30 p.m., meeting. Dr. Ethel Dukes: "Marriage Guidance." Members of the City Division are invited.

SCUNTHORPE DIVISION.—At Scunthorpe and District War Memorial Hospital, Thursday, February 3, 8.30 p.m., meeting. Dr. I. Reubin: "Tuberculosis—Modern Tendencies."

STRATFORD DIVISION.—At Queen Mary's Hospital, West Ham Lane, E., Tuesday, February 1, 9 p.m., meeting. Lecture by Dr. F. S. Cooksey: "Some Recent Aids for the Physically Handicapped."

WANDSWORTH DIVISION.—At Berkeley Rooms, Zeeta House, Putney, S.W., Friday, February 4, 8.30 p.m., joint meeting with South-west London Chemists' Association. Dr. Donald Teare: "Poisoning—Homicidal, Suicidal, and Accidental."

WEST SUSSEX DIVISION.—At Beach Hotel, Littlehampton, Thursday, February 3, 6.30 p.m., meeting. Lecture by Dr. G. B. Mitchell-Heggs: "Use of Cortisone and A.C.T.H. in Skin Disease."

WOOLWICH DIVISION.—At Woolwich Memorial Hospital, Shooters Hill, S.E., Tuesday, February 1, 2.30 p.m., seminar on paediatrics: "Problems for Diagnosis."

S.H.M.O. Meeting

A meeting of Senior Hospital Medical Officers in the South-east Metropolitan Region will be held on Saturday, February 5, at 2.30 p.m. at the Town Hall, Maidstone, Kent.

H.M. Forces Appointments

ROYAL NAVY

Surgeon Captain R. G. Anthony has retired.
Surgeon Commanders A. Long and J. M. Reese, O.B.E., to be Surgeon Captains.
Surgeon Commander L. P. Spero has retired.
Acting Interim Surgeon Commanders R. S. P. Hawkins, C. L. T. McClintock, R. W. Tipple, and G. A. S. Anthony to be Surgeon Commanders.
Surgeon Lieutenant-Commander F. R. Aston to be Surgeon Commander.
Surgeon Lieutenant S. D. Walsh to be Surgeon Lieutenant-Commander.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Lieutenant-Commanders G. M. Pearson, D. K. T. Wallace, M.B.E., and A. W. Haggart to be Surgeon Commanders.
Surgeon Lieutenant-Commander A. J. Ward has reverted to the Temporary R.N.V.R. in the rank of Temporary Acting Surgeon Lieutenant-Commander.

ARMY

Major-General J. C. Collins, C.B., C.B.E., Q.H.S., late R.A.M.C., having attained the age limit for retirement, has retired on retired pay.
Brigadier (Temporary Major-General) F. J. O'Meara, late R.A.M.C., to be Major-General.
Colonel (Temporary Major-General) E. H. Hall, O.B.E., late R.A.M.C., to be Brigadier.
Brigadier R. J. Rosie, C.B.E., Q.H.P., late R.A.M.C., has retired on retired pay.
Lieutenant-Colonel C. A. Levy, from R.A.M.C., to be Colonel.

ROYAL ARMY MEDICAL CORPS

Major R. P. Leake, E.R.D., to be Lieutenant-Colonel.
Captains J. M. Adam, E. T. O'Dwyer, and W. F. Belsham to be Majors.

Short Service Commissions.—Captain P. C. Barry to be Major.
Captain C. Voigt has relinquished his commission on account of disability, and has been granted the honorary rank of Major.

REGULAR ARMY RESERVE OF OFFICERS

Major-Generals W. Foot, C.B., M.C., and Sir Edward Phillips, K.B.E., C.B., D.S.O., M.C., late R.A.M.C., having attained the age limit of liability to recall, have ceased to belong to the R.A.R.O.

ROYAL ARMY MEDICAL CORPS

Captain (Honorary Major) T. H. Baillie has ceased to belong to the R.A.R.O., retaining the honorary rank of Major.

ARMY EMERGENCY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Major (Honorary Lieutenant-Colonel) J. A. Simons, from R.A.R.O., to be Major, and has been granted the acting rank of Lieutenant-Colonel.
Captain (Acting Major) J. Marshall, from A.E.R.O., National Service List, to be Captain, and has been granted the acting rank of Lieutenant-Colonel.
Lieutenant (War Substantive Captain) W. H. Myers, from Emergency Commission, to be Captain, and has been granted the acting rank of Major.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Majors E. Shipman and A. L. Stalker have been granted the acting rank of Lieutenant-Colonel.
Captain (Acting Major) R. T. G. Craig has relinquished the acting rank of Major.
Captain D. A. N. Hoyte has been granted the acting rank of Major.

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SWEDEN'S NEW HEALTH INSURANCE SCHEME

BY

DAG KNUTSON, M.D.

President of the Swedish Medical Association

Sweden has introduced a new and compulsory insurance system covering the whole population for sickness, industrial injuries, and motherhood. The principles of the scheme were accepted in 1946, but owing to financial and other circumstances its introduction was postponed. In the early spring of 1954, however, that year being a year of important elections, Parliament decided that the scheme should be introduced on January 1 of this year. As a number of questions involved in the new system remained unanswered, the time available was very short indeed.

Before the start of the new scheme, voluntary sickness insurance was financially, as well as administratively, separate from the insurance against industrial injuries. Eligibility was governed by state of health, age, and annual income—though the latter two conditions had become less rigid and the age limit as well as income limit had been raised repeatedly. About two-thirds of the population had joined this voluntary insurance scheme in a comparatively few years and the percentage was steadily rising. Costs were covered by contributions from the insured, from the communities, the State, and employers. Total expenses (1951) were about 200 million crowns (about £15m.), and of this amount 37% was spent on financial benefits, 8% on hospitalization, 15% on refunding part of doctors' fees, 5% on pharmaceutical benefits, and 12% on administration. Eight per cent. was allotted to maternity benefits and children's supplement. Industrial injury benefits, financially and administratively separate, were very much higher, and the evil effects of over-insurance had become noticeable. Under the new combined system sickness benefits have been increased in scope and value but compensation for industrial injuries has become lower. It remains to be seen whether, from political reasons, this arrangement

will last. Comparatively little has been said about this and the man in the street has up to now known as little about it.

Benefits Under the Scheme

Every Swede—and every foreigner living in Sweden—having attained the age of 16 has now to become insured. Children under 16 are automatically insured through their parents, generally the father.

The benefits are as follows:

(1) Medical benefit, which includes (a) payment towards cost of medical attendance, (b) free hospitalization, (c) payment of costs incurred travelling to a doctor or hospital and back home, and (d) pharmaceutical preparations free of cost in certain cases, and at a discount in others.

(2) Sickness benefit.

(3) Maternity benefit.

Medical Benefit

Reimbursement of the patient for costs of medical attendance is according to a schedule of fees. The patient receives a refund of three-quarters of the amount indicated if the fee is the same or higher than the tariff. If it should be lower, the patient gets three-quarters of the actual fee paid. The district doctors in rural areas, who for more than 200 years have been paid partly by salary and in return for this had their fees tied to tariffs, will continue to follow the new tariff. Others are free to charge whatever fee they feel to be justified. Thus the law has not encroached upon this freedom of the profession so far.

The principle of the new tariff of fees—but not the figures—has been put forward by the Swedish Medical Association and differs radically from the old idea of adding together individual and separately priced items. It is intended to form a basis for fixing the fees of the said district doctors, but also, in a more general way, to introduce a new system for reimbursement to patients from the sickness funds.

The new tariff of fees is divided into three main groups, scaled according to the type of service rendered. The first group includes uncomplicated services taking little time, or some simple service like re-dressing a wound or taking an albumin test. The second group includes an ordinary routine examination of a patient, such as is done on a patient's first visit to the doctor's office, and further examinations. The third group includes services involving special techniques and those which are especially time-consuming. This group is subdivided into three for easier classification of the kind of service rendered. The doctor may not charge fees for services under more than one group of the tariff for any one consultation. If services are rendered which come under two or more groups, the fee is based on that of the highest group.

Doctors not tied to any tariff—that is, all G.P.s other than the rural district doctors, and all practising specialists—are supposed to evaluate their services on the same principle which underlies the schedule. This gives them a considerable freedom, but also a responsibility.

The charges in the tariffs decided upon by the National Insurance Board are at a level which is supposed to correspond with to-day's average fees in general practice, and at a level higher than the district doctor's. As a result doctors in general, if not actually asked to adjust their fees to the reimbursement tariffs, are at least supposed to do so. The authorities have not found it possible, for the time being, to transform the medical profession into one within the Civil Service, but want on the other hand the closest possible relation between actual fees and reimbursement tariffs. How this will work out in practice it is, of course, too early to tell, but the general tendency has for a long time been evident—doctors have on the whole taken the reimbursement tariffs into consideration when they have set their fees, even under the old system with much lower tariffs.

Hospital Benefit

The insurance pays the costs for the insured person's treatment in a general ward of his "home hospital." If this institution for some reason cannot provide the treatment needed, the insurance pays for the patient in another hospital, though at the lowest possible rate only. If a patient wants to be placed in a private ward he has to pay the extra costs himself, and these are nowadays considerable, as costs of running a hospital bed have mounted to 50 crowns (about £3 15s.) or more a day.

Travelling Costs

The rules given for compensating travelling costs are complicated. In making a claim a patient has to declare that the main reason for the journey was to consult a doctor. The patient must also travel by the cheapest means available, and that which his state of health allows him to use. He cannot take a taxi if he is fit to go by tram. For the first trip to the nearest doctor the patient has to pay 4 crowns (about 6s.) out of the total cost himself, and for any further trip 1 crown (about 1s. 6d.). Of any costs above these the insurance pays 75%. If the patient is so ill that he has to be accompanied by another person, also an object for the doctor's certification, the costs incurred thereby are refunded in the same way. If the insured person is sent by a doctor to the nearest hospital or goes there after having been called, for instance in order to be taken into the ward, all the travelling costs are refunded. On going home again the insurance pays the total cost minus 4 crowns, which the insured has to pay himself—and so on.

The Swedish Medical Association has felt and is still feeling doubtful about the wisdom of all this, and nobody has really any idea what the cost will amount to. It may also be difficult for the doctor to refuse to endorse travelling expenses; the patient, and especially his relatives, may be panic-stricken and make the choice of means of transportation in perfect good faith before the doctor is seen, so the dilemma will often be his.

Pharmaceutical Benefit

Specified drugs, arranged according to active principles, for 15 listed "qualifying" diseases in need of prolonged treatment—such as diabetes, pernicious anaemia, asthma, bronchitis, heart failure, and various forms of cancer—are to be given free of charge. In prescribing these the doctor has to use a special form which the insured takes to the insurance office, there filling in another form, before the chemist can deliver the remedy. For any other remedy of a licensed nature—which in Sweden means that it is sold only at the licensed chemist's shop—the doctor uses a different form and the patient has to pay the cost up to 3 crowns (about 4s. 6d.) himself, the State paying 50% of any cost above that amount. An extensive administration has been made necessary, and endless discussions about who should provide the unavoidable documents have been held.

In practice this means, so far as the non-specified remedies are concerned, comparatively little to the insured. Statistics show that, out of 20 million prescriptions, over 7 million cost 3 crowns or less, and another third less than 5 crowns (about 7s. 6d.).

Sickness Benefit

The daily sickness allowance is another complicated matter. Every insured gets a basic sum of 3 crowns daily. On top of this there is for all persons with a salary exceeding 1,800 crowns (about £125) a year, but below 14,000 crowns (about £1,000) a year, an additional daily allowance graded in proportion to the size of the salary. Those earning 14,000 crowns or more have to pay extra contributions to insure themselves for an additional daily amount of 17 crowns (about £1 4s.), which, with the basic 3 crowns, comes to a total of 20 crowns (about £1 10s.).

Three points should be stressed. First, after 90 days the daily allowance is cut down for all classes except the lowest. The man who starts with 20 crowns thus finds himself reduced to 12 (about 18s.). Secondly, this allowance is free of tax. Therefore, a person who retains all or part of his salary during illness will suffer a deduction therefrom greater than the sum he receives as daily allowance from the insurance. Thirdly, during hospital care the daily allowance is reduced by 3 crowns, or, if this would mean more than half, just the half of it. Married women, students, and self-employed persons receive only the basic 3 crowns but may, up to certain amounts, voluntarily insure themselves for additional daily benefits.

The daily allowance is payable for one and the same disease for 730 days, which may be made up from periods added together if intervals are shorter than two years. For old-age pensioners, however, 90 days are set as the limit. If somebody has been working for more than two years at a stretch, slight and occasional illnesses not counted, a relapse into the old disease will be counted as a new affliction. No daily allowance is paid for the first three days of a disease, with certain exceptions for relapses within 20 days. Finally, a children's supplement from 1 to 3 crowns is added, in proportion to the number of children in the family.

Maternity Benefit

The maternity benefit is composed of two parts. One covers medical costs in connexion with childbirth, the other is on principle similar to the daily item and can be paid for 90 days to any woman who has an employment if she does not work during that period. All mothers receive, furthermore, a special grant of 270 crowns (about £18), increased to 405 crowns if the birth is multiple, and may claim, for the 10 first days, about 2 crowns per day if there are children under the age of 10 years at home.

General Considerations

This, then, is a condensed report on the new Swedish insurance system. New items of note are the allowance for travelling to and from doctors and hospitals, pharmaceutical

preparations in connexion with "qualifying" diseases free of cost, and the State contribution for licensed remedies. The outstanding features of the new scheme are that it is compulsory and covers all the population. Previously existing benefits have on the whole been increased in value, with the exception of those in connexion with industrial injuries.

Especially costly will be the daily allowance. This, where lower-income groups are concerned, and taking into consideration the children's supplement, will come dangerously near the point from which over-insurance starts.

Who Pays?

The reader will here ask how much the whole thing will cost, and who pays. Calculations—probably as reliable as they have been in other countries in similar circumstances—have come to a total of 816 million crowns (about £61m.), to which may have to be added some 20 or 30 million crowns (about £1½m. to £2¼m.) for pharmaceutical benefits. It is estimated that 44% will be borne by the insured themselves through contributions, 27% by the employers by adding 1.2% of their pay roll, and 29% by the State.

Under the old system the average annual contribution of the insured was, in 1951, 38 crowns (about £2 17s.), but, of course, benefits were smaller and insurance against industrial injuries was not included. Under the new system every insured person will have to pay 25 crowns (about £1 17s.) annually for medical attendance, hospitalization, and travelling, and a further 50 crowns (about £3 15s.) for the basic daily allowance. Every salaried person will have to pay an additional contribution for increased sickness benefit in proportion to his income—in the highest group about 100 crowns (about £7 10s.) or a little more—and this will come to somewhere in the neighbourhood of 200 crowns (about £15) a year. Non-salaried and self-employed people wanting to insure for extra sickness will have to pay 12 times its value, and this will result in the highest group paying somewhere in the neighbourhood of 300 crowns (about £22 10s.). On top of this comes, of course, the patient's proportion of the medical fee, travelling expenses, and medicine, and, finally, his contribution as a taxpayer. The latter item may be hidden somewhere in the tax papers, in the bottle or the packet of cigarettes, or, in fact, in everything else that leaves gold dust on the fiscal fingers.

Professional Reactions

The Swedish Medical Association fought the plans up to the day of the final decision, mainly for three reasons. The first one concerned the psychology of compulsion in the field of social security, and its consequences. The second one derived its strength from the fact that fields within the sphere of health care other than that of insurance sorely and urgently need what millions could eventually be made available. The third one concerned the certain increase of administrative work, which would come to weigh heavily on all concerned.

The Swedish Medical Association has of course been studying the experiences of other countries, and the relations between the medical profession and social security institutions where conditions seem to be at all comparable with those in Sweden; and it has not forgotten what the World Medical Association has had to say about medical aspects of social security. All this, together with practical experience already of extensive arrangements for the welfare of the people, created a scepticism whether the new system would contribute as noticeably to better physical, mental, and social well-being as it would towards an increase of costs—and demands.

VISIT TO WEST AFRICA

The secretary of the Overseas Committee, Dr. E. Grey-Turner, is to visit the three West African Branches of the Association in March. He is expected to be in the Gold Coast on March 4-5 and 8-10; in Sierra Leone on March 6-7; and in Nigeria on March 11-19.

GENERAL MEDICAL SERVICES COMMITTEE

A meeting of the General Medical Services Committee was held at Headquarters on January 20, with Dr. A. Talbot Rogers in the chair. A tribute was paid from the chair to the late Dr. J. B. Miller.

The CHAIRMAN mentioned that he had been invited by the Council to represent the Association at the Australasian Medical Congress in Sydney in August, following the meeting in Canada, which would entail his absence from three or four meetings of the Committee. On the proposition of Dr. I. Innes, seconded by Dr. Howie Wood, Dr. S. Wand was invited to be acting Chairman during that period.

General-practitioner Institutional Midwifery

The question of the Springfield Maternity Home, Blackburn, again came forward. The CHAIRMAN said that an interview had taken place with the Minister of Health, who, though obviously conversant with the background of the case and with the difficulties of general practitioners in the area who had been deprived of certain of their institutional maternity facilities, had indicated that he did not feel justified in overruling the decision which had been taken locally. He felt obliged to accept the position that beds could not be provided for this purpose in Blackburn itself without sacrificing very badly needed chronic sick beds or spending capital resources much more urgently needed for other purposes. But this did not mean any change of front on the part of the Ministry with regard to general-practitioner midwifery.

A situation which had arisen at the Portway maternity hospital, Dorset, was reported by Dr. J. A. PRIDHAM. Here, at the end of the war, a large obstetric department was opened, a specialist obstetrician and gynaecologist appointed, and the accommodation was such that every woman in the district who applied was freely admitted, the result being that general practitioners found that domiciliary midwifery had almost disappeared. The question of putting aside a ward for patients where they could be attended by their own general practitioners had been mooted, but objections had been made by the hospital management committee, the idea being to keep the institution as a training school for obstetricians and midwives.

It was agreed at Dr. Pridham's suggestion that a further approach should be made to the regional hospital board, and that the Deputy Secretary should visit the area on behalf of the Committee and give any assistance possible.

On the general question Dr. G. P. WILLIAMS said that local medical committees should be forewarned as to the possibility of the withdrawal of general-practitioner facilities in their area. Dr. WAND spoke on the need for co-ordination between local medical committees and hospital management committees and regional boards.

In reply to a suggestion that all general practitioners on hospital management committees should be circularized on the subject the DEPUTY SECRETARY pointed out that this would have little effect, as they were always in a minority. He suggested that it be represented to the Ministry that, quite apart from the case of Springfield, they were very much concerned about the future, and desired the Ministry itself to communicate with regional boards to the effect that local medical committees should be consulted before any changes were contemplated in the provision of general-practitioner beds and services. It was agreed to proceed on these lines.

Economy in Prescribing

The proposed arrangements for distributing doctors' prescribing statistics were discussed. These had been the subject of some general observations to the Ministry by the Deputy Secretary. It was pointed out that one adverse factor in arriving at a true picture was that in areas in and around London there was no guarantee whatever that patients would get their prescriptions dispensed in the area of the doctor's

surgery. Some way must be found of getting much more accurate information for London. The arrangements proposed would be of value only in a self-contained town.

It was agreed to bring to the notice of the Ministry the possibility of misleading impressions unless certain modifications were made.

Practice Vacancies

A local medical committee transmitted the copy of a letter which had been sent at its instigation by the executive council to the Ministry of Health protesting against the decision of the Medical Practices Committee to approve the application of a practitioner to practise in the area. This practitioner had been locumtenent in a death vacancy for a period of four months; he had been an unsuccessful applicant for the vacancy, the filling of which was delayed by the withdrawal of the candidate first selected. The proposed address of the applying practitioner (the former locumtenent) was only one-third of a mile from that of the practice, and it was thought that this would have a harmful effect on the practice, which had a list of only 1,600 patients. There were already eight doctors who had surgeries within one-third of a mile of the new doctor's proposed address.

It was agreed to set up a subcommittee consisting of the Chairman and Drs. Arthur, Mathias, and Wand to consider all aspects of the problem raised, of which this was by no means an isolated example.

Limited Lists

It was reported that the Scottish Subcommittee had been in consultation with the Department of Health concerning difficulties which had arisen in the case of practitioners with limited lists. It appeared that a limited-list practitioner—say a school medical officer—who had even only one patient outside the establishment to which his limited list applied might be remunerated as an unlimited-list practitioner. Dr. SWANSON said that a solution proposed was that when a practitioner with a limited list had other patients in addition, and when the numbers on his limited list exceeded 25% of the total of both lists, he should for the purpose of remuneration be deemed to have two lists, one carrying the restrictions provided by the distribution scheme and the other subject to no restrictions.

The CHAIRMAN said that in Scotland the Department of Health was prepared to agree to this. Was there a strong opinion that it should be taken up for operation in the rest of the country? Dr. WAND considered that if this were done they might be opening a very wide door, and on balance, while he sympathized with the Scottish anxiety to put matters on a proper level, he thought it would be unwise to make representations about it.

On the motion of Dr. Wand, seconded by Dr. Hutchinson, it was agreed to take no action.

Post-mortem Examinations

The Annual Representative Meeting had referred to Council for consideration the opinion that arrangements should be made for a practitioner to have a post-mortem examination made by a consulting pathologist on any patient who was of particular clinical interest to the practitioner, the cost to be borne by a research grant of the National Health Service.

Dr. A. B. DAVIES said that in the majority of cases with which he himself had dealt the post-mortem examination had been made at the request of the coroner, who had an interest overriding that of all other bodies—general practitioners, hospitals, police, etc. Many cases of clinical interest did come within the ambit of the coroner. A second large group were those within the ambit of the hospital—that is, cases of clinical interest in which the patient had died in hospital, and the registrar or consultant asked the consent of the relatives—which must be obtained and was

rarely refused—for a post-mortem examination. A third group consisted of ex-hospital cases with regard to which the general practitioner if in doubt could ask the hospital authorities to conduct a post-mortem examination, and a certificate could be given in proper form without reference to the coroner. The fourth class of cases were those which had been attended by a general practitioner for a time, and concerning which he could communicate with the coroner, who would order a post-mortem examination, the cost to be defrayed from public funds, and again a certificate might be given without an inquest. The fifth class comprised cases in which relatives or executors might wish for a post-mortem examination, and here it was wise and a matter of courtesy to advise the coroner. Dr. Davies thought that practitioners who felt that there was some public value or clinical information to be derived from a post-mortem examination should be able to obtain what they wanted through one of these channels.

The CHAIRMAN said that this would be reported to the Representative Body. They did not feel that there was any large residual group where there was difficulty in obtaining a post-mortem examination or that there was need for any further regulation.

W.M.A. and Social Security

Dr. PRIDHAM, chairman of the International Relations Committee, brought forward a memorandum on the relations between social security institutions and the medical profession. The memorandum had been prepared by the World Medical Association. He said that the W.M.A. had taken certain action with regard to doctors in European countries who thought that they were exploited under social security schemes. He hoped that the Association would give a considered reply in view of the outstanding experience of Great Britain in this field.

Dr. WAND suggested a number of ways in which the document might be modified to bring it into line with the British point of view, and it was agreed that these modifications first be submitted to the B.M.A.'s International Relations Committee for its comments, and then brought back to the General Medical Services Committee.

Other Business

Objection was taken to a clause in a development plan submitted by Birkenhead Borough Council in seeking an amendment of proposals originally made under Section 22 (Care of Mothers and Young Children) of the National Health Service Act. This plan required a woman who desired to book a domiciliary midwife first to see the medical officer of the antenatal clinic and then to be referred to her own doctor and advised to consult him. Exception was taken to the suggestion that it should rest with the medical officer to advise on arrangements for the confinement. The scheme interposed the domiciliary midwife between the patient and the doctor. It was agreed to inform the local medical committee of the objection to the proposed arrangement.

Dr. HOWIE WOOD brought forward the question of a circular which the Medical Practitioners Union had issued to assistant and trainee general practitioners concerning a proposed section of the Union which was to be inaugurated to look after their interests. It was stated in the circular that the professional organizations had failed, by and large, to see the problems of entry into general practice from the assistant's point of view. Dr. Howie Wood thought it a pity, since the two bodies were working together in the Committee, that such a circular should have been sent out without an opportunity for its perusal by the Committee. Dr. CARDEW, on behalf of the Medical Practitioners Union, said that it would not be fair to his organization to make a hurried reply. He undertook to consult his council about the representation which had been made, and it was agreed to place the matter on the agenda of a subsequent meeting.

Among other matters considered by the Committee was a memorandum prepared by the Pharmaceutical Society concerning the accidental poisoning of children; a dispute over the payment of temporary resident fees in a holiday camp in Wales; various applications for the inclusion of appliances in the prescribed list; and a draft E.C.L. on the treatment of Service personnel on leave, revised after a meeting of representatives of the General Medical Services and Private Practice Committees, the Ministry of Health, and the Service departments.

National Insurance Defence Trust

Sitting as trustees of the National Insurance Defence Fund, the members again considered, on a particular case, the use of the Fund for setting up financial arrangements to make possible the retirement from the service of aged and infirm practitioners whose means were straitened and against whom in consequence of such age or infirmity complaints had arisen or were likely to arise. A resolution that the fund be used in this way was carried at the 1938 Annual Conference but rescinded at the 1943 Conference.

Dr. H. G. DAIN said that in his view money should be used for this purpose. It was not a charitable purpose, but concerned the reputation of the service. He hoped the Conference would be asked to go back on its later decision, and to agree that some of the money—it would not be a large amount, and the need for it would disappear in the course of years—would be allocated for this useful service. Dr. F. M. ROSE expressed a contrary view. The fund consisted of moneys collected for a particular purpose, not a charitable one. Medical benevolence should be the object of a separate fund.

After a short discussion it was agreed that an endeavour be made to ascertain the number of such cases and the prospective liability, and to consider the matter again at a further meeting of the Trustees.

SCOTTISH MEDICAL PRACTICES COMMITTEE

SIXTH REPORT

For the first year since the National Health Service started the average number of patients on doctors' lists throughout Scotland has fallen below 2,000. The Sixth Report of the Scottish Medical Practices Committee reviews the year ending June 30, 1954. It shows that at that date there were 2,543 general-practitioner principals in Scotland compared with 2,503 in 1953 and 2,424 in 1952. There has been a steady trend towards partnership, and about 60% of doctors in 1954 were in partnerships of two doctors or more. More young doctors are being admitted as junior partners than are setting up on their own.

Over 800 Applicants

There were 26 vacancies during the year that were not partnership vacancies. These were filled after advertisement, and over 800 applications were received. Commenting on this, the Report says: "Some applicants will, of course, have applied for more than one vacancy. An analysis of the advertised vacancies shows the average age of successful applicants during the year was 36, the range of ages being from 27 to 56."

The Committee has not classified any executive council area or part of an area as being entirely closed to new doctors, since, in its view, each application for admission to a medical list should be considered in the light of circumstances prevailing at the time of application. But many areas continue to be, in the Committee's view, underdoctored. More doctors are needed in Cumnock/Auchinleck; Irvine; Dumbarton; Burntisland; Cowdenbeath/Glenraig/Kelty/Lochgelly/Cardenden; Crossgates; Cupar;

Stranraer; Airdrie; Bellshill; Larkhall; Motherwell; Shotts; Bathgate; Linlithgow/Bo'ness; Kirkwall; Johnstone; Renfrew; Falkirk; Polmont; and Grangemouth. In these districts the average number of patients on doctors' lists is 2,731.

Doctors who are interested in setting up practices in any of these areas are asked to write to the executive council concerned.

Goodwill Reminder

The Committee draws attention to the fact that an exchange of practices is one method of enabling an established doctor to move to another area, and if both executive councils approve of an exchange the Committee normally will not object.

Those concerned in partnership agreements are reminded that the sale of goodwill is prohibited no matter how indirect that sale may be. The performance of services for an unreasonably low return is deemed to constitute the sale of goodwill whatever the intention of the parties may be.

Notes and News

The Minister has directed that £300 should be withheld from the remuneration of Dr. "X" because of his excessive prescribing. The Lancashire Executive Council had represented to the Minister in this case that a deduction of £600 should be made from Dr. "X's" remuneration (*Supplement*, November 20, 1954, p. 191).

The Government Actuary in his first five-yearly review of the National Insurance scheme covering the period July, 1948, to March, 1954, reports that injury benefits, which are the main item of expenditure, although of short duration, are keeping steady at about 750,000 a year and are unlikely to increase much in the future. Before the National Insurance Act, 1954, raised the benefits, industrial injury insurance contributions were 14% less than was necessary in order to keep the scheme solvent. The increase in contribution rates which accompanies the increased benefits has been so comparatively slight that the rates are now 18% below solvency level, and the Actuary predicts that the accumulated balance is likely to be exhausted by 1984.

According to the *Manchester Guardian* the chairman of the Manchester Regional Hospital Board complained, at a meeting of the board, that information needed for replies to Parliamentary questions had to be obtained nearly always at very short notice over the telephone, and under great pressure. This was particularly so when detailed statistics were involved. He was commenting on a recent instance where the board had been asked by telephone in the morning to supply information about tonsil and adenoid operations and waiting-lists in Manchester by telephone the same evening to enable the Minister to answer questions in the House of Commons the next day. In order to do this the board's officers had to get many figures affecting eight hospitals, and in the hurry errors were made by two hospital management committees and passed on by the board.

The Royal Masonic Hospital is proposing to spend about £500,000 on building a large extension to the hospital premises, which will provide 80-90 extra beds. At the annual meeting of the hospital Mr. Justice Hilbery, who presided, said that it was hoped to start work on the extension before the end of the year, and that it should be ready for occupation by the end of 1958. During recent months the waiting-list for the hospital has been about 600. Patients admitted during the year ended June 30, 1954, numbered 2,685—185 more than the previous year.

Extract from a regional hospital board agenda (reports of committees): "Mr. ——— expressed the hope that a catchment area would be introduced for female patients in the very near future."

TELEPHONE NOT REQUIRED BY TERMS OF SERVICE

EXECUTIVE COUNCIL DECISION

In a case heard before the Medical Service Committee of the London Executive Council recently the complainant alleged the failure of the respondent practitioner to visit and treat her daughter when so required. After hearing the case, the committee found the following facts: (1) That Dr. "D," acting as deputy for Dr. "C," visited the 8-year-old daughter of the complainant on June 9, 1954, diagnosed tonsillitis, and prescribed accordingly; (2) that on June 11, 1954, the child's condition worsened and the attendance of a doctor was necessary; (3) that the complainant did not wish to leave the child alone, and as the respondent practitioner had no telephone available to patients she was unable to call him by that means, and another doctor was asked to visit; and (4) that the complainant incurred expenses for medicine and treatment in respect of treatment provided privately by the doctor who attended on June 11.

In view of conflicting statements by the parties, the committee was unable to find that the practitioner did not comply with the terms of service. A general medical practitioner was not required by his terms of service to provide a telephone at his residence or surgery, nor, if he has a telephone, was he required to permit its use by persons on his National Health Service list. The committee decided to recommend to the executive council that there was no failure on the part of the practitioner concerned to comply with the terms of service for medical practitioners participating in the National Health Service.

The London Executive Council at its last meeting agreed with this recommendation.

COMMITTEE ON HOSPITAL SUPPLIES

Following a recommendation made in the report of the Central Health Services Council's Committee on the Internal Administration of Hospitals, the Council has appointed a Committee on Hospital Supplies "to investigate and report on the organization of all forms of hospital supplies, including their purchase, storage and issue, throughout the National Health Service."

The members of the Committee are: Sir Frederick Messer (Chairman of the Council), Professor Sir Henry Cohen (Vice-Chairman of the Council), Alderman A. F. Bradbeer, Mr. P. H. Constable, Sir Basil Gibson, The Hon. Sir Arthur Howard, Mr. F. S. Stancliffe, Mr. H. Lesser, Sir George Martin, Mr. T. E. Parker, and Captain J. E. Stone.

Persons and organizations interested in the subject are invited to forward memoranda of evidence to the Secretary of the Committee, Mr. L. B. Jacques, Ministry of Health, Savile Row, London, W.1.

Correspondence

University Teachers' Salaries

SIR.—The forthcoming increase in salaries of university staff has raised interest once again in the discrepancies which are apparent in the remuneration of those whose work brings them into contact with both university and hospital. That the situation was causing concern was well seen at a recent meeting of the Full-time Non-professional Medical Teachers and Research Workers Group Committee of the B.M.A. (*Supplement*, December 4, 1954, p. 213). This group is representative of both non-clinical and clinical teachers and of full-time medically qualified research workers whether employed by a university or by an independent body such as the M.R.C. Even within this group there are considerable differences in remuneration between people with

approximately equal qualifications and responsibility. The main result of these discrepancies, which invariably lead to a lower rate of remuneration than that obtainable in the N.H.S., is an increasing difficulty in recruitment of suitable personnel either for training or to replace those already trained who have moved to more remunerative posts in other branches of medicine.

The young fit medical graduate must of necessity be 27 years of age before he can begin his training in one of the specialties. At this age he is not going to be greatly attracted by the commencing salaries offered by most university or research posts. These posts are more and more being filled by non-medical graduates to whom, at the age of 22 or 23, the remuneration is not unduly out of step with what they can get elsewhere. It would be a pity if in the future most of the medical research work and preclinical teaching were to be in the hands of non-medically qualified workers, and unless something is done to make the position more attractive this is likely to happen. Regarding the fully trained established worker, no medical graduate wishes other than that remuneration should be of the same order for both medical and non-medical, provided the work done and the responsibility undertaken is of a similar standard.—I am, etc.,

Newcastle-upon-Tyne, 1.

IAN RANNIE,

Chairman,
Full-time Non-professional Medical Teachers and
Research Workers Group.

Assistants in General Practice

SIR.—May I add my weight to the recent correspondence on the status and remuneration of the new entrant into general practice, for it seems that, in spite of the assistants' obvious plight, there are still eyes that do not recognize the insecurity, exploitation, and professional subjugation to which this branch of the medical profession is subjected.

In my opinion the entrant into general practice should, in a well-balanced community, be able to expect a preliminary settling-down period or assistantship of approximately 12 months, followed with a fair degree of certainty by a post in which he receives adequate and fair reward (sufficient to support a home, wife, and family), security of tenure, and scope to develop his own clinical judgment, ideas, and methods. It is obvious that few assistantships fulfil these requirements, but a junior partnership is much nearer the goal. Further, in order to maintain standards, I should say that in this partnership he should not be expected to look after more than 2,500-3,000 patients. This figure is now quoted by several authorities as being the maximum number that can properly be cared for.^{1,2}

To return to the criteria of the second paragraph. The question of remuneration has been gone into extensively of late, and I need now only add another voice of protest against the action of the General Medical Services Committee on October 21 (*Supplement*, November 6, 1954, p. 169) in turning down the recommendation of the Assistants and Young Practitioners Subcommittee. In an attempt to be constructive I would suggest that the G.M.S. Committee reconsider and adopt, instead of rejecting, this motion. Secondly, that as a long-term policy the whole capitation system should be geared to accent the attention given to individual patients rather than the collection of large lists. This could be done by an expansion of the principle of an extra fee for extra service—e.g., allow extra payment for, say, minor surgery in the same way that extra payment is made for obstetric care and anaesthetics. This would allow principals with moderate lists to be in a stronger financial position and encourage them to take partners without an addition to their lists. Thirdly, as an interim measure, the salaries of senior house officers should be on a par with those of an assistant in general practice (£850-£1,000 per annum without deductions for residential emoluments). This would make it possible for a married man with a family to spend longer in hospital and encourage him to take postgraduate qualifications to diploma standard. It

would also ease the shortage of hospital residents and absorb some of the excess assistants who are now drifting round general practice.

As for the future, if it is assumed that ideally lists are between 2,500 and 3,000 and that there is ideal distribution, then how many more doctors can general practice absorb? And at equilibrium after the ideal distribution has been reached how many more will be needed each year? How do these figures compare with the number of doctors qualifying each year? If the standards mentioned earlier cannot be maintained for every graduate because even with ideal distribution there are too many of them, then we must know about it so that those unable to obtain a post in civilian practice in the U.K. may consider emigrating, joining one of the armed Services, or joining the Colonial Service. I for one am no longer content to follow a peripatetic existence as an assistant. If there is hope then let us strive to reach our ideals, but if there is none, either through excess numbers or lack of sympathy on the part of those in control, then let us abandon general practice as a career and go elsewhere.—I am, etc.,

Oxford.

G. E. LANGLEY.

REFERENCES

- ¹ Taylor, S. (1954). *Good General Practice*, chapter 16. Oxford University Press, London.
- ² Craddock, D. (1953). *Introduction to General Practice*, p. 20. Lewis, London.

SIR.—For some time I have been a persistent applicant for assistantships with a view to partnership, and I wonder whether I may bring to your notice one aspect of these applications.

Despite a request for return of copies of testimonials and a stamped addressed envelope on each occasion, the applications to private advertisers seem almost invariably to vanish into thin air. I have seldom received either acknowledgment of the application, notification of (presumptive) failure, or the return even of my stamp. This contrasts markedly with the kindness of the retiring principals of executive council vacancies, from whom I have always received prompt and helpful replies to my requests for information. Copies of particulars and testimonials professionally prepared may cost two shillings or more each, and it would seem only courteous to notify a candidate of possible success or certain failure without delay, and comply with a request for return of testimonials, if he has provided the means without extra work or expense to the advertiser.

Applicants will wish to inform an advertiser if they are no longer interested in the vacancy and must, of course, arrange appointments for interview at the principals' convenience, keep them punctually, be prepared to take and communicate firm decisions without delay, and stand by these decisions. It is difficult to notify a prospective employer of withdrawal if one knows of him only as a "box number" some weeks ago in a journal. To hold oneself free for interview at short notice indefinitely may be financially impossible or disrupt an employer's arrangements, and a firm decision is made more difficult by uncertainty whether an application for a more attractive-sounding vacancy has been rejected or the principal merely procrastinating over short-listing.

I would suggest that for the sake of good relations within the profession the maximum of courtesy should be exhibited between advertiser and applicant, even if it be shown only by early return of papers and duplicated rejection slips.—I am, etc.,

"NIL DESPERANDUM."

Ship Surgeons

SIR.—I should like to raise the matter through your columns of the employment by shipping companies of non-uniformed doctor holiday trippers in place of ship surgeons—a Merchant Service post which has been in existence since the time of Drake—thus excluding from employment the regular surgeon. The situation is satisfactory from one point of view only, that of the holiday tripper himself,

and is justified from none. If shipping lines find it the easiest way to acquire a doctor this is offset by the disadvantage to the master, who has virtually no control over his "surgeon," and to the crew whom he has to treat free. A doctor dressed as a passenger will inevitably think of himself as a passenger and will act accordingly. Can one imagine any shipping company carrying a bookkeeper or accountant free or paid in return for his services as purser, or a telegraphist as a non-uniformed radio officer? Why, then, should the position of surgeon be treated with such casual offhandedness? Is there any other profession that would permit the encroachment into it of the amateur (nautically speaking)? Would the Navy take any doctor for a cruise to look after the crew? The biggest lines do insist on uniform, but many do not. Again, the Merchant Navy surgeon is debarred from employment on the Australian run of at least three companies, the Blue Star, Port Line, and China Navigation Company. I believe it is true to say that the first two never pay a surgeon but rely on doctors who want a free trip to the U.K. and back, and the latter uses Australian holiday trippers and pays them as much, and sometimes more, than it pays its regular surgeons retained for pilgrim ships. On the home line the Blue Funnel takes the holiday-maker and does not insist on uniform.

Casual labour inevitably brings the profession of Merchant Navy surgeon into disrepute, propagating the idea that anything is good enough for the job. But there are many doctors anxious to make the sea a career. As the B.M.A. tends the interests of doctors in other spheres, is it not time it turned its attention to this problem? A pool for surgeons might be formed to mutual advantage which would help eliminate the need of the holiday tripper and the retention of doctors who have retired from practice and seek the social life and cheap gin of ships (and there are not few of these). Again, too, the stabilization of wages would help to encourage the surgeon to remain permanent. The disparity of rates is great, nor is it often in any way comparable to shore wages. The lowest-paying line offers £45 a month, the highest starts the surgeon at £57, second voyage £67, and third £72, thus making in one year a difference of £27 a month in two shipping companies. Further, some lines refused the recent National Maritime Board pay award to their surgeons alone of officers out of their whole fleets, with the result that in at least one company the surgeon found himself (a 3-striper) paid less than the second mate (a 2-striper) who might or might not have a master's ticket.

The solution lies in the associated efforts of the National Maritime Board and the B.M.A. both for the benefit of the surgeon and for those whom he has to treat. At least three important points might first be dealt with: that rates of pay be stabilized as are those of other ships' officers; that no surgeon be employed on a ship without uniform; and that any surgeon found drunk while at sea should be treated no less severely than is a watch-keeping officer in similar circumstances. There is no other way that the status of the ship surgeon can be restored to its once-respected place from that of holiday tripper and the gin-drinking "Doc" of book and film.—I am, etc.,

Sydney, Australia.

MICHAEL DILLON.

Consulting-room Privacy

SIR.—A disquieting practice is increasing in hospital out-patient departments. It is now common for consultants to have a stenographer with them in their consulting-rooms whose duty it is to take down the letters to general practitioners, and even in some cases the actual clinical notes themselves. Apart from decreasing the privacy of the consultation, it appears to me to be obnoxious to dictate a letter in front of the patient (surely frankness must suffer sometimes or harm be done), and even worse to dictate it in front of another patient: this does happen, incredible as it may seem.—I am, etc.,

Bushy, Herts.

D. G. WILSON.

H.M. Forces Appointments**REGULAR ARMY RESERVE OF OFFICERS****ROYAL ARMY MEDICAL CORPS**

Colonel W. M. Evans, O.B.E., M.C., T.D., from Army Emergency Reserve of Officers, to be Colonel.

Major (Honorary Lieutenant-Colonel) P. H. Shorthouse has ceased to belong to the R.A.R.O., on appointment to the Southern Rhodesia Territorial Force.

ROYAL AIR FORCE

Air Commodore J. C. Neely, C.B.E., Q.H.S., to be Air Vice-Marshal.

Group Captains D. A. Wilson, A.F.C., and L. M. Corbet, C.B.E., to be Air Commodores.

Wing Commanders, S. R. C. Nelson, O.B.E., and J. B. Wallace, O.B.E., to be Group Captains.

Squadron Leaders T. N. N. Brennan, D. S. Grant, and D. M. Keir to be Wing Commanders.

Association Notices**SCHOLARSHIPS IN AID OF SCIENTIFIC RESEARCH**

The Council of the British Medical Association is prepared to receive applications for research scholarships as follows:

An Ernest Hart Memorial Scholarship, of the value of £250.

A Walter Dixon Scholarship, of the value of £250.

Four ordinary research scholarships, each of the value of £200.

These scholarships are given to candidates recommended by the Science Committee of the Association as qualified to undertake research in any subject (including State medicine) relating to the causation, prevention, or treatment of disease.

In addition, applications are invited for the award of the following research scholarship:

The Insole Scholarship, of the value of £250, for research into the causes and cure of venereal disease.

Each scholarship is tenable for one year, commencing on October 1, 1955. A current scholar may apply to be re-appointed for a further year, though no scholarship will be renewed more than twice. A scholar is not necessarily required to devote the whole of his or her time to the work of research, but may be a member of H.M. Forces or may hold a junior appointment at a university, medical school, or hospital, provided the duties of such appointment will not, in the opinion of the Science Committee, interfere with his or her work as a scholar.

Applications for scholarships, including renewals, must be made not later than March 1, 1955, on the prescribed form, a copy of which will be supplied by the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, on application.

Applicants are required to furnish the names of three referees who are competent to speak as to their capacity for the research contemplated.

A. MACRAE,
Secretary.

Diary of Central Meetings**FEBRUARY**

8 Tues.	Trainee General Practitioner Subcommittee, 2 p.m.
9 Wed.	Private Practice Committee, 12 noon.
9 Wed.	Psychological Medicine Group Committee, 2 p.m.
9 Wed.	Public Relations Committee, 2 p.m.
10 Thurs.	Estates Committee, 10.30 a.m.
10 Thurs.	Subcommittee on Service Committee and Tribunal Regulations, G.M.S. Committee, 2 p.m.
11 Fri.	Joint Subcommittee on Professional Secrecy, Public Health and Central Ethical Committees, 11 a.m.
11 Fri.	Public Health Committee, 2 p.m.
15 Tues.	Amending Acts Committee, 2 p.m.
17 Thurs.	G.M.S. Committee, 10.30 a.m.
18 Fri.	Tuberculosis and Diseases of the Chest Group Committee, 12 noon.
18 Fri.	Overseas Committee, 2 p.m.
24 Thurs.	Evidence Committee on Divine Healing, 10 a.m.

MARCH

2 Wed.	Council, 10 a.m.
8 Tues.	Constitution Committee, 11 a.m.

Branch and Division Meetings to be Held

CHESTERFIELD DIVISION.—At Walton Sanatorium, Chesterfield, Friday, February 11, 8.45 p.m., meeting. Talk by Dr. R. T. Gaunt: "Recent Advances in Medicine."

CROYDON DIVISION.—At 43, Wellesley Road, Croydon, Tuesday, February 8, 8.30 p.m., general meeting. Address by Dr. Samuel Oram: "Some Recent Advances in Cardiological Treatment."

DARTFORD DIVISION.—Thursday, February 10, clinical meeting. EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, Herne Bay, Thursday, February 10, 7.30 p.m., dinner; 8.45 p.m., symposium: "Management of Pain." Speakers, Miss Jean R. C. Burton-Brown, Dr. D. G. Sheffield, Mr. P. R. Wright, Dr. R. Wylie Smith, and Mr. W. E. C. Wynne.

ENFIELD AND POTTERS BAR DIVISION.—At St. Michael's Hospital, Chase Side Crescent, Enfield, Wednesday, February 9, 8.15 for 8.30 p.m., meeting. Clinical papers by (a) Dr. L. E. L. Ridge: "The Doctor's Bag"; and (b) Dr. A. Coady: "The Registrar in Out-patients."

GRIMSBY DIVISION.—At Scartho Road Infirmary, Grimsby, Tuesday, February 8, 8.30 p.m., meeting. Lecture by Dr. E. C. Ritter: "The Problem of Eczema." All medical practitioners in the area of the Division are invited.

GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, February 10, 8.30 p.m., meeting. Dr. M. Ball: "With Sir Edmund Hillary in the Himalayas."

HENDON DIVISION.—At Hendon Hall Hotel, London, N.W., Tuesday, February 8, 8.45 p.m., meeting. Mr. S. H. Wass: "Chronic Pain in the Right Iliac Fossa."

KENSINGTON AND HAMMERSMITH DIVISION.—At St. Charles's Hospital, Ladbroke Grove, London, W., Friday, February 11, 3.30 for 4 p.m., clinical meeting.

LEICESTERSHIRE AND RUTLAND BRANCH.—At Grand Hotel, Leicester, Saturday, February 12, 7.30 for 8 p.m., dinner-dance.

METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C., Monday, February 7, 5 p.m., meeting. Lecture by Sir Arthur Porritt: "The Olympic Games." All senior students and recently qualified practitioners are invited.

MONMOUTHSHIRE DIVISION.—At Westgate Hotel, Thursday, February 10, 7.30 for 8.15 p.m., annual chairman's dinner. Members are invited to bring wives and friends.

NORTH MIDDLESEX DIVISION.—At North Middlesex Hospital, Silver Street, Edmonton, E., Tuesday, February 8, 8.30 p.m., meeting. Paper by Dr. Macdonald Critchley: "The Reevaluation of Oscar Wilde's Guilt." Dr. Critchley will also show his collection of Wildeana. Members of the Division are invited to take one or two guests.

NORTH STAFFS DIVISION.—At Grand Hotel, Hapley, Tuesday, February 8, 8 p.m., supper meeting. Talk by the Lord Bishop of Lichfield, The Rt. Rev. A. S. Reeve: "Some Thoughts on the National Health Service."

REIGATE DIVISION.—At Redhill County Hospital, Tuesday, February 8, 8.30 p.m., meeting. Lecture-demonstration by Dr. A. A. Mason: "The Use of Hypnosis in Medicine."

SCARBOROUGH DIVISION.—At Scarborough Hospital, Thursday, February 10, 8.30 p.m., meeting. Mr. R. W. Nevins: "Ulcerative Colitis."

SOUTH-EAST ESSEX DIVISION.—At Southend General Hospital, Wednesday, February 9, 8.30 p.m., meeting. Film and address by Professor Ian Aird: "Conjoined Twins."

SOUTH ESSEX DIVISION.—At Oldchurch Hospital, Romford, Friday, February 11, 9 p.m., meeting. Annual B.M.A. Lecture by Dr. Melville D. Mackenzie: "World Health Organization."

SOUTH-WEST ESSEX DIVISION.—At Connaught Hospital (new Out-patient Department), Orford Road, Walthamstow, E., Wednesday, February 9, 8.30 p.m., meeting. Annual B.M.A. Lecture by Dr. J. Smart: "Carcinoma of the Bronchus."

SUNDERLAND DIVISION.—At Royal Infirmary, Sunderland, Friday, February 11, 8 p.m., address by Dr. A. W. Woodruff: "Management of Tropical Disease in Britain."

TEES-SIDE BRANCH.—At Darlington Memorial Hospital, Tuesday, February 8, 7 p.m., clinical meeting.

TUNBRIDGE WELLS DIVISION.—At Sevenoaks Hospital, Wednesday, February 9, 8.30 p.m., clinical meeting.

WEST SUFFOLK DIVISION.—At Everard's Hotel, Bury St. Edmunds, Tuesday, February 8, 8.30 p.m., annual meeting.

S.H.M.O. Meeting

A meeting of Senior Hospital Medical Officers in the North-east Metropolitan Region will be held on Tuesday, February 8, at 7 p.m. at the Finsbury Health Centre, Pine Street, E.C.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.

Non-County Borough Councils.—Crews.

Urban District Councils.—Houghton-le-Spring.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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OCCUPATIONAL HEALTH**REMUNERATION OF PART-TIME INDUSTRIAL MEDICAL OFFICERS**

An all-day meeting of the Occupational Health Committee was held at B.M.A. House on February 2. Dr. J. A. L. VAUGHAN JONES presiding. The Committee considered a revised draft statement on the remuneration of part-time industrial medical officers. Dr. J. ROGAN, chairman of the subcommittee concerned, said that, after careful comparison with the scales for whole-time officers already put forward to the Council, his subcommittee had felt that there was a rough equivalence. Payment of part-time industrial medical officers by annual salary rather than by sessional fees was preferable, as it seemed to offer a better opportunity for the part-time man to be integrated into the undertaking. His subcommittee had been in some perplexity over the question of consultants. It was difficult to define the role of a consultant in industrial medicine, and it must be appreciated that a number of industrial hazards might well call for the service of consultants who had had no experience in industrial medicine. The conclusion was reached that the remuneration of the consultant services to any industrial undertaking should be a matter of private negotiation between the consultant and the firm concerned.

The point of chief discussion in the draft statement was the setting up by the Association of an advisory panel of practitioners experienced in occupational health services which would be available to give guidance to individual managements if required. Professor I. G. DAVIES expressed some misgiving about this arrangement, which, he said, would call for the utmost care if the functions of the panel were not to be exceeded by recommending individual applicants for posts. Other members also disliked the suggestion of some central body being set up as arbiter in such situations.

Dr. ROGAN agreed that mismanaged and badly run advisory panels might become an abuse rather than a benefit. But it must be borne in mind that many managements did not know much about industrial medicine, and might be only too pleased to acquire merit in the eyes of the Government by setting up an unsuitable and ill-thought-out industrial medical service. He thought that managements should have some authoritative body from which they could obtain information about their commitments, the sort of appointments that would be necessary, and the nature of the team required. He was not advocating that any panel should adjudicate on individual appointments; this would be outside its terms of reference. Many managements, however, were in real difficulty and would welcome advice in general terms.

Dr. J. A. A. MEKELBURG said that, over the years, he had received quite a number of inquiries from managements on

what sort of service they should install, and he had sometimes been in a quandary as to the advice he should give. He was therefore much in favour of a panel restricted to giving advice on the sort of service required. He would not agree that the panel should recommend individuals for appointments.

The draft statement, with some verbal amendments, was approved.

Occupational Dermatitis

Dr. H. ALEXANDER brought forward recommendations from a subcommittee which had been considering occupational dermatitis in relation to the National Insurance (Industrial Injuries) Act. The first recommendation was that the Ministry of National Insurance should be informed that there was reason to believe that in certain areas not all persons claiming industrial injury benefit on the ground of occupational dermatitis were being referred to an examining medical practitioner, and called for an investigation of this position throughout the country; also that the Ministry should be asked for information about the proportion of cases of dermatitis which are accepted by insurance officers as occupational on certification by the industrial medical officer or a hospital.

Dr. C. H. WHITTLE said that the main interest in this matter was to get the employees seen at the commencement of the illness. This affected the ultimate prognosis as regards both the disease itself and the morale of the patient. The earlier consultation was entirely in the interests of the employee.

The recommendations were agreed to, and it was also agreed that further representations should be made to the Ministry that all cases claiming to be suffering from occupational dermatitis persisting after 21 days be referred automatically to a dermatologist. The Ministry is also to be asked to arrange for examining medical practitioners to receive notification of the dermatologist's diagnosis when they themselves had made no diagnosis or their decision had been reversed. Another request to the Ministry is to arrange for routine notifications, with the consent of the employee, to be sent by the insurance officer to the employing firm and to the local inspector of factories in any case in which there has been a diagnosis of the condition.

Certain other recommendations with regard to post-graduate study in a skin department for doctors without experience in dermatology who have been appointed as examining medical practitioners were referred to the Dermatologists Group Committee.

Sectional Representation in the R.B.

Dr. L. S. POTTER, secretary of the Organization Committee, attended for a discussion on a matter which has been before several committees of the Association concerning

the advisability of sectional representation in the Representative Body. The proposal had been made to the committee which is considering the Association's Constitution on the ground that, with entirely territorial representation as at present, minority opinion might not be able to find expression. On the other hand, it had been pointed out that the proper place for such sectional representation was on the standing committees, of which Occupational Health was one.

The CHAIRMAN said that sectional representation might lend itself to pressure group formation. Some members of the Committee expressed the view that the Representative Body was not as knowledgeable as it might be on matters of occupational health. Another point of view was that if any sectional representation were admitted there might be a demand from other quarters, including the specialist groups, for similar representation.

The general opinion of the Committee was adverse to the proposal; it was pointed out that the chairman of the Committee (or, failing him, the deputy chairman) was a member of Council and as such attended Representative Meetings, and this was considered to be a sufficient safeguard.

Other Business

The Committee considered the arrangements for the second conference of Advisory Councils on Occupational Health, to be held on April 20, when the topic for discussion will be "The Adolescent in Industry."

Suggestions were made for nomination as Mackenzie Industrial Health Lecturer for 1956. It was suggested that, as the meeting of the Association of Industrial Medical Officers will be held in London, the lecture should be held in the Great Hall of B.M.A. House in London, and with a view to attracting a lay audience.

It was reported that a Bill to make specific provisions for health, welfare, and safety in shops, offices, catering establishments, and other places had been introduced into the House of Commons, but had not yet been printed. The Committee agreed that at its next meeting, by which time presumably the Bill would be available, the committee should give it an early place on its agenda.

COST OF DRUGS AND MEDICINES

COMPTROLLER AND AUDITOR GENERAL'S REPORT

The results of a number of investigations by accountants of the Board of Trade on behalf of the Health Departments are noted in the Comptroller and Auditor General's report in the *Civil Appropriation Accounts, 1953-4*.¹ One investigation covered four selected main groups of basic drugs—antibiotics, hormones, insulin, and vitamins—which cost the health service in England and Wales some £10m. annually. A wide diversity of trading results was found for hormones and certain antibiotics, some firms appearing to have made losses while some of the larger suppliers seemed to have made 30% and 40% profit on selling prices. The manufacturers, however, expressed fundamental disagreement with the basis normally adopted by the Government for computing both costs and capital employed.

The Ministry of Health had told the Auditor General that it considered that the general level of prices charged by secondary manufacturers of non-proprietary drugs and wholesalers—averaging 7.4% on capital employed, the highest being 24%—not to be excessive. Discussions with the industry are continuing.

Proprietary Preparations

Reports were also received from the accountants on 19 firms covering 76 proprietary preparations out of the total of 91 selected for investigation. The cost to the National

¹ *Civil Appropriation Accounts (Classes I-V), 1953-4. H.M.S.O., London.*

Health Service of these 91 preparations had been estimated by the Ministry at £4.7m., apart from the hospital usage, the extent of which was not known. The investigating accountants found difficulties in segregating figures for particular products and for home and export markets, and in making appropriate allowances for expenditure on research, advertising and sales promotion, and for the financial arrangements of some firms with foreign associates. Their calculations of the profits obtained on the various preparations gave figures ranging up to 60% on selling prices. Where information was made available from which to calculate capital employed the returns ranged up to more than 100% on capital.

Memorandum from Industry

The Ministry informed the Auditor General that a memorandum had been received from the Association of British Pharmaceutical Industry dealing with the complexities involved in attempting to find an acceptable basis for calculating prices reasonable for the Exchequer to pay and at the same time economically fair to the industry. Because of the far-reaching effects upon the whole economy of the pharmaceutical industry of the prices paid for health service supplies, the Ministry was satisfied that the action to be taken and the principles to be applied required examination and discussion with the industry as a whole. Three firms had made priced reductions estimated to save the Exchequer about £850,000 per annum. Further price reductions were expected in response to a recent approach by the Ministry.

Prescribing Costs

The Comptroller and Auditor General reports that in England and Wales prescriptions of proprietary preparations rose from 18% of all prescriptions in 1950 to 27% in 1953, representing 44% and 58% respectively of the total costs of ingredients prescribed in those years. In February, 1954, a sample analysis indicated that the proportion of proprietaries had increased to 29%. The monthly average cost of prescriptions, after some decrease towards the end of 1953 and early months of 1954, rose in August, 1954, to 4s. 3.73d., the highest figure recorded since the inception of the N.H.S.; in 1949 the average cost was 3s. 1d.; in 1947, under the more limited scope of the National Health Insurance scheme, it was 1s. 8d.

In reply to an inquiry whether any further steps were to be taken to reduce prescription costs, the Ministry informed the Auditor General that the main cause of the increase in average prescription costs, apart from the element of the remuneration of chemists and appliance contractors at present under inquiry, was the introduction of an increasing range of expensive preparations designed to treat conditions that in the past had not been, or not to the same extent, medically treated. Antibiotics in particular had added to the cost of the general pharmaceutical service, and trusses and elastic hosiery had not been prescribable under the National Health Insurance scheme. Lastly, as the cost of some of the more widely prescribed preparations—for example, penicillin—was reduced additional and improved preparations were produced. These, while having certain medical advantages, were more expensive; and there was continuous publicity directed to doctors about new preparations.

The Ministry further stated that it continued to be its policy to bring all relevant facts to the notice of doctors and to ask for their co-operation. In addition to circulating the information referred to and periodical *Prescribers' Notes*, a start had been made in providing them at regular intervals with a cost of their prescriptions compared with the average cost in the area. More detailed reports would be prepared for those whose prescribing costs appeared unnecessarily high; these doctors would be visited by the regional medical officer and where it seemed justified a warning letter would be sent. Where there was no improvement, the matter would be referred to the local medical committee.

IRISH MEDICAL ASSOCIATION

At a recent meeting of the Irish Medical Association's Central Council Dr. J. C. McFeely was appointed as representative to the Council of the B.M.A. in response to an invitation by the British Medical Association. Drs. P. T. O'Farrell, P. Moran, and J. C. McFeely were appointed to attend the B.M.A.'s Annual Representative Meeting to be held in London on June 1-4.

The current issue of the *Journal of the Irish Medical Association* also reports that the association, at the request of the Minister of Health for Eire, has appointed Dr. A. McCarthy and Mr. T. C. J. O'Connell to act on an advisory committee which the Minister proposed to appoint in connexion with the institution of a national voluntary health scheme. Following a discussion on voluntary health insurance, the council of the I.M.A. passed two resolutions: (1) that a special subcommittee be appointed by the executive to advise on this matter; and (2) that the provisions of the Health Act, 1953, as it stands militate against the success of any voluntary insurance scheme.

EXCHANGE VISITS WITH CANADA AND THE U.S.A.

The scheme for exchange visits between members of the American, British, and Canadian Medical Associations, which has the approval of the Bank of England, will be continued during the financial year April 1, 1955, to March 31, 1956.

Procedure

Three doctors from Britain may visit Canada in exchange for three doctors from Canada, and three doctors from Britain may visit the U.S.A. in exchange for three doctors from the U.S.A. Each doctor from Britain will be required to make all his own travel arrangements and will also be required to deposit up to £200 with the B.M.A. in London. On arrival in Canada or the U.S.A. he will receive the equivalent of his deposit in dollars. Similarly, each Canadian and U.S. doctor on arrival in Britain will receive the sum deposited in sterling.

Duration of Visits

The duration of the visits is left to the discretion of the doctors concerned. The American, British, and Canadian Medical Associations cannot accept any responsibility for a doctor who allows his visit to outlast the money placed at his disposal.

Applications are invited from members of the B.M.A. to take part in such exchanges. Medical practitioners in all branches of the profession, including general practice and public health, are eligible. Each applicant must state the object of his intended visit, and should also give the approximate date on which he hopes to depart. (Successful applicants will in due course be required to furnish exact dates and details of travel.) Applications must be received by the Secretary of the Association by March 1, 1955.

TUBERCULOSIS AND NATIONAL SERVICE

In a Ministry circular (H.M. (55) 13) dated February 3, boards of governors and hospital management committees are asked to send to the appropriate local office of the Ministry of Labour and National Service particulars of all men born in 1937 who are shown by chest clinic registrars to have a tuberculous history.

The particulars, which are to be given on a special form, are to be treated as confidential. Information to be given includes full name, last known usual place of residence, year of birth, localization of disease, if treatment is still being received, and, if not, the last date of treatment. The form is to be signed by the physician in charge of the chest clinic.

REGRADE OF APPOINTMENTS

SUCCESSFUL APPEALS

A consultant anaesthetist's recent appeal to a regional hospital board against the grading of his S.H.M.O. appointment has been successful. In 1951 this anaesthetist's personal grading was changed on appeal from S.H.M.O. to consultant, but his improved status carried no increase in remuneration, as the grading of his appointment remained that of S.H.M.O. Although he had made representations to the board that the work he did was of a kind normally done by a consultant anaesthetist, involving all types of major surgery, it was not until the autumn of 1954 that his case was heard under the regional Whitley appeal machinery and the regional board reversed its previous decision and designated his appointment as a consultant appointment. The change was made retrospective.

A similar appeal took place in Bristol. An S.H.M.O. anaesthetist appointment was held by a consultant on the staff of a teaching hospital. The anaesthetist appealed for the regrading of his appointment, and after some delay this appeal also was allowed.

Questions Answered

Vaccination Certificates

Q.—I am sometimes asked by N.H.S. patients to vaccinate them or give T.A.B. injections because they are going overseas to work or for a holiday. Although I give these injections free under the N.H.S. can I charge for filling up the appropriate international certificate? Can the vaccine be prescribed on an E.C.10 form?

A.—The injections themselves come within the terms of service of a general practitioner if the patient is on his list, but the practitioner may charge a fee for the international vaccination certificate. The vaccine should be obtained from the local authority.

Hire Purchase of Car

Q.—I am an assistant in general practice and receive a car allowance which was settled at the time I accepted the post. I have since purchased a new car. Can I claim tax relief for the interest payable on hire-purchase terms and depreciation allowance on the car?

A.—The interest element in the payments to be made under the hire-purchase agreement and the annual allowance for depreciation of the car would be allowable—apart from any restriction for private use of the car—if the contract of employment placed on the employee the burden of the cost of keeping a car for professional use. But in this case the questioner receives an allowance for that purpose from his principal, and in general that would debar him from claiming the deductions mentioned. If he were employed by an authority on the normal terms that would be conclusive (see the decision in the case of Hamerton v. Overy), but in the actual circumstances the questioner might be able to prove that the allowance he receives is inadequate and could then claim the excess of the total allowable amount over the allowance paid to him—but the prospect of success is not thought to be very good.

Pre-registration Appointments

Q.—Is there a definite ruling that pre-registration candidates must be given preference in making an appointment to a post recognized for pre-registration purposes?

A.—There is no definite ruling that pre-registration candidates must be given preference. The Ministry of Health has, however, informed hospital management committees that in general it deprecates the appointment of registered practitioners to these posts to the exclusion of pre-registered practitioners.

Correspondence

Practice in the Highlands and Islands

SIR,—I should like to join with Dr. James Guthrie in his remarks (*Supplement*, January 15, p. 17), particularly in relation to holiday relief. He says: "It may be a dangerous principle to admit—but could the State not take cognizance of this unusually high expense and make some provision for it?" I cannot see the danger when the Department of Health used to contribute towards a locum's expenses for a month, I think every second year. This is something Dr. Guthrie may not know, or may have forgotten. The Department of Health's attitude would appear to be that we are now all in the same boat, and that a practice in the Highlands is the same as a practice anywhere else in the State service, so much so in fact that it seems to think it reasonable to pay the Highlander (on the average) 1s. 6d. a unit for mileage instead of the 2s. paid to the rest of the country; and this is still so after nearly seven years of State medicine. This may be rectified eventually, but all one can hope for is parity with the rest of the country. When one remembers that the roads are worse, petrol, oil, repairs, etc., are all dearer, that a car must be replaced more frequently because of the effects of road and climate, that there is even an extra £20 or £30 "delivery" charge, and that in most practices a second vehicle is necessary as a standby, parity still leaves the Highlander with the worse bargain.

The Highlander's list is limited, not from choice but by geography. He cannot "poach" a bigger list from his neighbour, and so fares badly under the "loading" scheme. He likewise cannot take advantage of the group practice loans, or the notional list, to provide a partner to share the load and give him a "locum free" holiday. Telephone bills, education costs, freight charges, etc., are all heavier than average, and are but a few of the extra financial burdens the Highlander must carry. His only obvious advantage is his house, but this is for the benefit of the practice, not the doctor; let there be no doubt about that. There is, of course, the inducement grant, but that is a vexed question which would take too long to go into here. Suffice to say it is not the answer.

There is no doubt (as the recent storms have surely proved) that the Highland doctor can and does work hard, and it takes a special type of doctor to look after the Highlands and Islands. I think that this job is best done by a man of the Highlands, trained in and for the Highlands, and I mean no offence, and make no apology for saying so. It is in the best interest of the Highlands and Islands not only to attract but to retain in these areas the most suitable men for them.

I feel that the reintroduction of the old Highlands and Islands holiday relief scheme, with (most important) the Department assuming responsibility for the locum, would go a long way to achieve this and to offset some of the adverse effects which the loading and notional lists, etc., have had on the Highland practices and practitioners.—I am, etc.,

Lochinver, Sutherland.

R. S. C. FERGUSON.

Assistants in General Practice

SIR,—The Assistants and Young Practitioners Subcommittee can certainly congratulate itself on the support it enlisted in the G.M.S. Committee (*Supplement*, January 1, p. 1), especially as no relevant statistics were forthcoming and its unsound claims and arguments were not difficult to rebut. Of course, the arguments are helped considerably by constant socialist propaganda which perceives in a reduction of lists a further step to a salaried State Service. The aversion of principals to airing their views, whether from feelings of delicacy or apathy, may be penalized by a small minority gaining its objective. Both the Working Party and the Central Health Services Council report¹ considered the present limits fair and reasonable. The principal with an

assistant and a full list has already suffered financial loss through the Danckwerts award without comment. It would seem advisable, before further reductions were contemplated, to approach the principals concerned to ascertain how many partnerships would eventuate after the reductions. The number might be negligible, and the only result to swell the lists of neighbouring popular practices. Patients who are forcibly transferred from the doctor of their choice are aggrieved and resentful.

I would suggest that any help should come from the profession as a whole—for example, abolition of the 14 days' waiting period to transfer, help to elderly practitioners to retire earlier from practice and to young doctors accepting small-list vacancies, notification of whether a view to partnership is offered (a long succession of assistantships with view being suspicious); in other words, positive rather than restrictive measures.—I am, etc.,

London, S.E.4.

T. RICHARDSON.

REFERENCE

¹ Central Health Services Council. Report of the Committee on General Practice within the National Health Service, 1954, para. 42. H.M.S.O., London.

Doctors' Telephones

SIR,—The recent statement by the London Executive Council that a doctor need not have a telephone (*Supplement*, February 5, p. 42) surely is not a decision of that council but a ruling of the National Health Service. The council could also have added that a doctor need not have a car—another ruling of the National Health Service. But the statement has caused one leading article in a national newspaper (*Daily Express*, January 29, 1955) to comment that: "Most doctors make arrangements to ensure that they can be reached by phone. All of them should do so. If that is hard on their leisure time, the alternative might be far, far harder for some unfortunate patient."

Do we really deserve this rebuke? If a doctor, in whole-time service, installs a telephone for the use of his patients and his hospitals, he does so at his own expense, and must meet almost all of the essential services and maintenance costs out of his own pocket. If, in addition, he purchases a motor-car and places this too at the full-time service of his job, he will be very considerably out of pocket each year. Since the ruling of the National Health Service is that neither "are essential to his employment," he will receive no consideration from the income-tax authorities. If the "full-timer" is a consultant surgeon and the director of a large and busy emergency hospital service, his telephone will be used constantly by his and other hospitals, general practitioners, patients, and, indeed, by officials of the health service itself. His car must be always available to his job. At the end of the year these services will represent a considerable amount from his gross income. If he has the time to jot down the pennies for the relatively few official calls he makes, or the energy to add up the mileage of his car when he returns home from an emergency, he may be returned 20% of the cost of these services.

Although these matters have been known in the National Health Service for years, a statement that a telephone or a car is essential to any medical man engaged in full-time clinical work is still refused. One wonders where such terms of service will lead medicine. Past generations have been trained to sacrifice their leisure time to their patients. If the National Health Service asks, in addition, a considerable financial sacrifice, what type of medical men will future generations know?—I am, etc.,

Birmingham 15.

WILLIAM GISSANE.

Drugs for Private Patients

SIR,—The present Minister of Health—Mr. Iain Macleod—has held his important office for a longer time than most of his predecessors, and I think the reason is that he has all the qualities which make for the success of the consultant physician. He told the delegation of doctors who waited upon him with regard to the question of N.H.S. drugs for private patients that the proposal was not repugnant to

Conservative principles, and that the door was by no means shut. On the other hand, he could give no undertaking that a change either could or would take place.

There was once a very successful physician who, when he came to give his prognosis to the awed and spellbound relatives of the patient involved, used to say that there were three courses the illness might take: (1) that the patient might get better; (2) that the patient might get worse; (3) that the patient might continue just as he was.—I am, etc.,

Camberley.

LESLIE HARTLEY.

H.M. Forces Appointments

TERRITORIAL ARMY

Lieutenant-Colonel (Brevet Colonel) (Acting Colonel) O. G. Prosser, M.C., T.D., R.A.M.C., to be Colonel.
Lieutenant-Colonels (Acting Colonels) E. H. Evans, C. J. Wells, M.B.E., and R. G. W. Ollerenshaw, T.D., R.A.M.C., to be Colonels.

Majors (Acting Colonels) J. B. Mackay, M.B.E., T.D., and W. Milburn, M.B.E., T.D., R.A.M.C., to be Colonels.

ROYAL ARMY MEDICAL CORPS

Colonel (Acting Brigadier) W. R. Ward, T.D., Q.H.S., to be Brigadier.

Lieutenant-Colonel J. V. Todd has been granted the acting rank of Colonel.

Majors (Acting Lieutenant-Colonels) M. I. Silvertown, T.D., M. N. S. Duncan, T.D., C. W. Healey, M.C., T.D., R. West, J. L. Cardwell, C. H. Tonge, T.D., D. D. Cranna, D. L. Nicholls, W. K. McCollum, T.D., S. A. Bower, T.D., and A. C. D. Parsons to be Lieutenant-Colonels.

Captain (Acting Major) C. Weymes has been granted the acting rank of Lieutenant-Colonel.

Captain J. Montgomery has been granted the acting rank of Major.

TERRITORIAL ARMY RESERVE OF OFFICERS; ROYAL ARMY MEDICAL CORPS

Colonels T. F. Arnott, O.B.E., T.D., and L. J. Haydon, T.D., have ceased to belong to the T.A.R.O., retaining the rank of Colonel.

Colonel M. MacEwan, D.S.O., O.B.E., D.F.C., T.D., having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O., retaining the rank of Colonel.

Lieutenant-Colonel (Honorary Colonel) J. A. Bingham, O.B.E., T.D., having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O., retaining the honorary rank of Colonel.

Lieutenant-Colonels F. R. Bettley, T.D., and R. A. Read, T.D., have ceased to belong to the T.A.R.O., retaining the rank of Lieutenant-Colonel.

Major (Honorary Colonel) A. C. Crawford, T.D., having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O., retaining the honorary rank of Colonel.

Majors (Honorary Lieutenant-Colonels) J. K. Steel, T.D., M. S. Good, T.D., D. MacD. Lyon, O.B.E., S. Gifford, B. G. Macgrath, R. B. Brew, T.D., R. J. Ormsby, J. M. Scott, O.B.E., I. MacPherson, R. D. Holloway, T.D., W. P. Purvis, T.D., J. J. M. Brown, O.B.E., D. L. C. Bingham, A. L. Potter, and M. B. Hallam have ceased to belong to the T.A.R.O., retaining the honorary rank of Lieutenant-Colonel.

Major (Honorary Lieutenant-Colonel) P. J. May, M.B.E., T.D., having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O., retaining the honorary rank of Lieutenant-Colonel.

Major W. G. Ferguson, from the Active List, to be Major, and has been granted the honorary rank of Lieutenant-Colonel.

Majors J. L. Fraser, T.D., T. McCarroll, M.C., and H. Bloom, from the Active List, to be Majors.

Majors A. W. Forrest, P. Walsh, T. A. Danby, T.D., and L. C. Bousfield have ceased to belong to the T.A.R.O., retaining the rank of Major.

Captain (War Substantive Major) (Honorary Colonel) M. E. D. Roberts has ceased to belong to the T.A.R.O., retaining the honorary rank of Colonel.

Captain (Honorary Lieutenant-Colonel) R. W. Hendry has ceased to belong to the T.A.R.O., retaining the honorary rank of Lieutenant-Colonel.

Captains (Honorary Majors) C. W. A. Kimbell, W. I. Walker, E. G. Collins, D. L. Charters, M.B.E., J. E. S. Stephens, J. C. Gibson, F. C. Angior, H. A. Constable, H. B. Stallard, M.B.E., R. Walmsley, J. Parkes, H. F. Patrick, and J. M. Henderson have ceased to belong to the T.A.R.O., retaining the honorary rank of Major.

Captain (Honorary Major) H. E. Blake, T.D., has relinquished his commission, retaining the honorary rank of Major.

Association Notices

ELECTION OF MEMBERS OF COUNCIL

Notice is hereby given that nomination of candidates for election as members of Council, 1955-6, (a) by the following Divisions and Branches, (b) by public health service members, and (c) by women members, must be forwarded in writing so as to reach me not later than Wednesday, March 16, 1955.

Forty Members by Branches in Great Britain and Northern Ireland

Group	England and Wales	No. of Members of Council to be Elected by Group
1	North of England Branch: Tees-side Branch	2
2	East Yorkshire Branch: Yorkshire Branch	3
3	North Lancashire and Westmorland Branch	1
4	Divisions in Cheshire: Birkenhead and Wirral; Chester; Crewe; Hyde; Macclesfield and East Cheshire; Mid Cheshire; Stockport; Wallasey	1
5	Lancashire Divisions of Merseyside Branch: Liverpool; St. Helens; Southport; Warrington. Isle of Man Branch	1
6	Lancashire Divisions of South Lancashire and East Cheshire Branch: Ashton-under-Lyne; Bolton; Bury; Leigh; Manchester; Oldham; Rochdale; Salford; Wigan	1
7	Derbyshire Branch: Nottinghamshire Branch: Lincolnshire Branch: Leicester and Rutland Branch	2
8	Midland Branch	1
9	Staffordshire Branch: Worcester and Hereford Branch	1
10	Berks, Bucks, and Oxford Branch: Northamptonshire Branch	1
11	Cambs and Hunts Branch: Norfolk Branch: Suffolk Branch	1
12	Divisions of Metropolitan Counties Branch in Middlesex	2
13	Marylebone Division	1
14	City Division: South-west Essex Division: Stratford Division: Tower Hamlets Division	1
15	Hampstead Division: St. Pancras Division: Westminster and Holborn Division	1
16	Chelsea and Fulham Division: Kensington and Hammersmith Division: Paddington Division	1
17	Camberwell Division: Greenwich and Deptford Division: Lambeth and Southwark Division: Lewisham Division: Wandsworth Division: Woolwich Division	1
18	Bedfordshire Branch: Essex Branch: Hertfordshire Branch	1
19	Surrey Branch	2
20	Kent Branch	1
21	Sussex Branch	1
22	Dorset and West Hants Branch: Southern Branch	1
23	Bath, Bristol, and Somerset Branch: Gloucestershire Branch: Wiltshire Branch	2
24	South-western Branch	1
25	North Wales Branch: Shropshire and Mid-Wales Branch	1
26	South Wales and Monmouthshire Branch	1
Scotland		
27	Aberdeen Branch: Dundee Branch: Northern Counties of Scotland Branch: Perth Branch	1
28	Edinburgh and South-east of Scotland Branch: Fife Branch	1
29	Glasgow and West of Scotland Branch (Glasgow Division)	1
30	Glasgow and West of Scotland Branch (County Divisions): Border Counties Branch: Stirling Branch	2
Northern Ireland		
31	Northern Ireland Branch	2

Public Health Service Members

Two members of Council are nominated and elected by members of the Association employed in the public health service as defined in By-law 1 (3). Candidates must be members of the public health service as so defined.

One Woman Member

One woman member of Council is nominated and elected by women members of the Association.

Nominations

The nominations must be on the prescribed forms, copies of which can be obtained on application to me. In the case of the 40 members to be elected by Divisions and Branches, the nomination may be by a Division or Division-Branch as such, or by not fewer than three members of any Branch in the Group.

A notice will be published by the Council in the *British Medical Journal Supplement* on March 26, 1955, of the candidates nominated. Where contests occur, voting papers containing the names of all duly nominated candidates will be issued on March 30, 1955, from the Head Office, British Medical Association, Tavistock Square, London, W.C.1. to each member in the Group, or to the public health service members, or to women members. A notice will be published by the Council in the *Supplement* of April 23, 1955, giving the results of the elections where there have been contests.

A. MACRAE,
Secretary.

Election of Members of the Council by Branches not in Great Britain or Northern Ireland

As a result of the nominations received for the election of members of Council by Branches overseas, the following have been elected for the three years 1955 to 1958:

Branches in the Republic of Ireland ..	J. C. McFreely, Dublin.
New Zealand and Fiji ..	C. J. C. Britton, London.
New South Wales and Queensland ..	Isaac Jones, London.
South Australian, Tasmanian, Victorian, and Western Australian ..	Myles L. Formby, London.
Grouped African Branches ..	P. C. C. Garnham, Slough, Bucks.
West Indian Branches ..	C. Belfield Clarke, London.

No nomination has been received in respect of the Far Eastern Group of Branches.

A. MACRAE,
Secretary.

Diary of Central Meetings**FEBRUARY**

11 Fri.	Ophthalmic Qualifications Committee, 1.30 p.m.
11 Fri.	Ophthalmic Group Committee, 2 p.m.
15 Tues.	Amending Acts Committee, 2 p.m.
16 Wed.	Office Committee, 3.30 p.m.
17 Thurs.	G.M.S. Committee, 10.30 a.m.
18 Fri.	Scientific Programme Subcommittee, Arrangements Committee, 10 a.m.
18 Fri.	Arrangements Committee (Brighton, 1956), 11 a.m.
18 Fri.	Tuberculosis and Diseases of the Chest Group Committee, 12 noon.
18 Fri.	Overseas Committee, 2 p.m.
22 Tues.	Subcommittee on Practice Vacancies, G.M.S. Committee, 2 p.m.
23 Wed.	Finance Committee, 2 p.m.
23 Wed.	Practice Accommodation Subcommittee, G.M.S. Committee, 2 p.m.
24 Thurs.	Evidence Committee on Divine Healing, 10 a.m.
24 Thurs.	Journal Committee, 2 p.m.
25 Fri.	Full-time Non-professional Medical Teachers and Research Workers Group Committee, 2 p.m.

MARCH

2 Wed.	Council, 10 a.m.
3 Thurs.	Homosexuality and Prostitution Committee, 10.30 a.m.
4 Fri.	Joint Committee of the B.M.A. and the Magistrates' Association, 10.15 a.m.
8 Tues.	Constitution Committee, 11 a.m.

Branch and Division Meetings to be Held

BIRMINGHAM DIVISION.—At 154, Great Charles Street, Birmingham, Tuesday, February 15, 8.30 p.m., meeting. Lecture by Dr. V. Mary Crosse: "Round the World with Premature Babies."

BUCKINGHAMSHIRE DIVISION.—At Griffin Hotel, Amersham, Friday, February 18, 8.30 p.m., meeting. Address by Dr. P. H. Addison (Assistant Secretary, Medical Defence Union): "The Law as it Affects Medical Practitioners."

CITY DIVISION.—At B.M.A. House (Committee Room C), Tavistock Square, London, W.C., Tuesday, February 15, 8.30 p.m., meeting. Annual B.M.A. Lecture by Sir Geoffrey Marshall: "The Problems of Chest Diseases in General Practice." Members of the St. Pancras and Tower Hamlets Divisions are invited.

DUDLEY DIVISION.—At Bell Hotel, Market Street, Stourbridge, Thursday, February 17, 7.45 for 8.15 p.m., annual dinner. Principal guest, Dr. A. M. Nussey.

EAST SOMERSET DIVISION.—At Reception Room, Bristol University, Friday, February 18, 5 p.m., public meeting for purpose of forming West of England Branch of Multiple Sclerosis Society. All medical practitioners in the area of the Division are invited.

GUILDFORD DIVISION.—At the Mitchell Hall, Royal Surrey County Hospital, Guildford, Thursday, February 17, 8.30 p.m., meeting. Dr. M. Ball: "With Sir Edmund Hillary in the Himalayas." Doctors may bring their wives. (Meeting postponed from February 10.)

KINGSTON-ON-THAMES DIVISION.—At Griffin Hotel, Kingston-on-Thames, Wednesday, February 16, 7.30 for 8 p.m., dinner meeting, followed by a Brains Trust. Panel, Mr. A. Lawrence Abel, Mr. Michael Barsley, His Honour J. D. Casswell, Q.C., and Mr. A. Dickson Wright. Guests are invited.

MID-ESSEX DIVISION.—At Out-patient Department, Chelmsford and Essex Hospital, London Road, Chelmsford, Wednesday, February 16, 8 p.m., meeting. Talk by Mr. M. Leigh-Taylor: "The Law and the Doctor—Legal Problems and Medical Practice."

NORTH OF ENGLAND BRANCH.—At Royal Victoria Infirmary, Newcastle-upon-Tyne, Thursday, February 17, 7.15 p.m., clinical demonstration by Dr. H. G. Miller: "Modern Treatment in Neurology"; 8.45 p.m., address by Professor C. A. Wells: "Clinical Applications of Research."

ROCHDALE DIVISION.—At Birch Hill Hospital, Monday, February 14, 8.30 p.m., clinical meeting. Symposium: "Diseases of the Gall Bladder." Short papers by Dr. R. J. Cowden, Dr. J. F. Knox, Dr. J. L. Taylor, and Mr. D. H. Teasdale. A general discussion will follow.

SHROPSHIRE AND MID-WALES BRANCH.—At Royal Salop Infirmary, Shrewsbury, Wednesday, February 16, 8 p.m., meeting of Clinical and Pathological Section. Films: (1) "Senile Obliterative Arteritis of the Legs"; (2) "Treatment of Infections of the Hand."

SOUTHAMPTON DIVISION.—At Royal Hotel, Southampton, Wednesday, February 16, 8.30 p.m., general meeting. Address by Dr. D. P. Stevenson (Deputy Secretary, B.M.A.).

SOUTH-EAST ESSEX DIVISION.—At Southend General Hospital, Thursday, February 17, 8.30 p.m., meeting. Dr. H. D. Crosswell: "Gastro-enteritis."

SOUTH SHIELDS DIVISION.—At Ingham Infirmary, South Shields, Thursday, February 17, 8.30 p.m., meeting. Medical films, followed by discussion and questions aimed at Dr. A. Gillis.

SUNDERLAND DIVISION.—At Bay Hotel, Sunderland, Thursday, February 17, annual dance.

SUTTON COLDFIELD DIVISION.—At Sutton Coldfield Hospital, Thursday, February 17, 9.15 p.m., meeting. Talk by Dr. Frangcon Roberts: "Food, Medicine, and Population."

SWANSEA DIVISION.—At Osborne Hotel, Swansea, Thursday, February 17, 7.30 for 8 p.m., informal supper. B.M.A. Lecture by Dr. G. B. Mitchell-Heggs.

WILLESDEN DIVISION.—At Cavendish Lounge, Willesden High Road, N.W., Friday, February 18, 8.30 p.m., joint meeting with Willesden pharmacists.

S.H.M.O. Meeting

There will be a meeting of Senior Hospital Medical Officers in the Welsh Region on Saturday, February 19, at 3.30 p.m. at B.M.A. House, Cardiff.

As from April 25, when the new retirement pensions become payable, residents in old people's homes will have their pocket money allowance raised from 6s. 6d. to 7s. 6d. weekly. At the same time the minimum weekly charge for board and lodging will be raised from 26s. to 32s. 6d. No additional cost will, however, fall on the old people themselves. Those who cannot pay the new minimum charges and at the same time retain 7s. 6d. as pocket money will be put in funds by the National Assistance Board. Homes for old people established under the National Assistance Act provide full board and lodging, together with clothing and other amenities. Except in the very few cases where a resident has sufficient resources to pay the full rate, the difference between the actual cost of maintenance and the amount paid by the resident is met wholly by the local health authority. The full cost of maintenance averages about £5 a week.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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CENTRAL CONSULTANTS AND SPECIALISTS**HOSPITAL JUNIOR STAFFING: REVISED REPORT**

An all-day meeting of the Central Consultants and Specialists Committee was held on February 3, with Dr. T. ROWLAND HILL in the chair. The business which led to the principal discussion of the day concerned a revised report on the question of hospital junior staffing. At the previous meeting the Committee had referred back to the Medical Staffing Subcommittee a report on this question for further consideration in the light of comments and criticisms which had been made.

Professor G. I. STRACHAN, chairman of the subcommittee, now presented a report, a number of paragraphs of which had been revised. The proposals were summarized as follows:

The medical staffing of hospitals should be based upon the following five grades:

- (i) House Officer.
- (ii) Junior Medical (or Surgical) Assistant.
- (iii) Medical (or Surgical) Assistant.
- (iv) Senior Medical (or Surgical) Assistant.
- (v) Consultant.

The appointment of Medical (or Surgical) Assistant should initially be for a term of four years, and thereafter on an indefinite basis, except in teaching hospitals, where the appointment should be determined after four years and not normally be renewable.

Posts of Medical or Surgical Assistant or Senior Medical (or Surgical) Assistant, and especially the latter, should be whole- or part-time according to the needs of the service and the preference of the officer.

Professor STRACHAN reminded the Committee of the occasions on which this subject had already been debated, the criticisms and alternative suggestions which had been made, and the minority report by one member of the subcommittee, representing the registrars, Dr. Forrester. An endeavour had been made to find a greater measure of agreement. Some of the differences were only in emphasis, and these had been put right so far as possible. He called special attention to one paragraph, which read:

"Responsibility for the treatment of hospital patients must remain in the hands of practitioners of consultant status. The first step to be taken, therefore, is to examine and review in every hospital the volume of work which should be undertaken only by consultants."

The question of nomenclature for the intermediate grades had received much consideration. Such titles as "intermediate hospital medical officer" and "senior medical

officer" had been discarded. Inasmuch as the medical staff in question would assist consultants in their work it was now proposed that they should be called "junior medical (or surgical) assistants," "medical (or surgical) assistants" and "senior medical (or surgical) assistants." It was to be understood that in no circumstances should the appointments in these higher categories, even in the highest levels of the proposed salary range, be regarded as an effective substitute for the appointment of consultants. Part-time appointments in these grades, particularly in the upper reaches, should be encouraged. Such posts would provide general practitioners with an opportunity to practise a specialty under general consultant supervision, but with an appropriate degree of clinical responsibility. They should also be stepping-stones for the general practitioner aspiring to become a consultant. All existing S.H.M.O.s should be redistributed between the consultant establishment and the new senior assistant establishment according to their qualifications and experience, while senior registrars and registrars should be redistributed in the various levels of the intermediate grade. He added that one point of great satisfaction was that after these further discussions Dr. Forrester and his colleagues had agreed to withdraw their minority report.

The CHAIRMAN said that in future discussions with the Ministry of Health a certain openness of mind would be necessary, for assuredly the Ministry would have its own proposals and arguments to bring forward.

Mr. J. R. NICHOLSON-LAILEY moved that the revised report be approved and forwarded to the Joint Committee. It had been discussed and amended, and he thought Professor Strachan and his subcommittee had done all they could to meet the criticisms. If this revised report had to meet the barrage of criticism again, he thought that nothing remained except to appoint a new subcommittee and start all over again.

The Registrar Point of View

Dr. R. M. FORRESTER said that his withdrawal of his minority report was a personal decision and not done under instruction. He had undertaken to get in touch with the secretaries of the regional registrars' groups, and the general opinion was that at that particular moment it was the right and proper thing to withdraw the minority report, because its continued existence was likely to cause division and to bar active discussions and negotiations at Joint Committee level. In response to a circular to the regional committees, two had stated that they could not accept the revised report and they stood by the minority report.

Others were prepared to go forward though making certain reservations. He drew attention to a statement in the revised report to the effect that the policy of specifying a certain category of medical staff for training of consultants and of fixing hospital establishments in relation to prospective consultant vacancies was wrong and should be abolished. But there was also a later statement, which went in at the instance of the registrars, that, in order to make it possible for the majority to remain in the hospital service long enough to reach the highest levels of the intermediate grade and ultimately achieve consultant status, the ratio between the numbers in the consultant and intermediate grades in each specialty should be agreed between the Ministry and the profession. Thus in one place in the report it was affirmed that the ratio was essential, and yet in another it was stated that it was purely the local needs of the hospital which should be the determining factor. He found it difficult to reconcile those two propositions. Dr. Forrester criticized the report in other respects. The proposals looked feasible on paper, but he feared that difficulties might arise in their practical application, and it was not easy to see how the future of hospital staffs would be made better as a result of this report.

A general discussion on the report then ensued, and Professor STRACHAN replied to detailed questions. Dr. ALEX SMITH, on behalf of the Scottish representatives, said that members of the Central Consultants and Specialists Committee (Scotland) had not had an opportunity of seeing the new document, nor had the regions seen it. It should receive proper consideration at the periphery before it went forward. He asked that it be referred to the Scottish Committee and to the regions. Meanwhile it might be sent to the Joint Committee for information.

A Basis for Discussion

In the course of further discussion, Mr. H. H. LANGSTON supported the view taken by Mr. Nicholson-Lailey. He did not imagine that this document would be the one ultimately discussed with the Ministry of Health, but he believed it was a document which in a general way they could approve as a basis for further discussion.

Mr. B. N. BROOKE appealed to the registrars to consider this whole problem on a much broader basis. Mr. A. STAVELEY GOUGH supported the reference to the Joint Committee, and stated that all who knew anything about hospitals, especially peripheral hospitals, were aware of the need for an intermediate grade. Mr. J. R. BLACKBURN pointed out that the reference to regions had produced only minor amendments. Members of the Committee represented regions and should be competent to make up their minds on the document. He felt it should come back to the Committee after discussion in the Joint Committee.

Mr. R. NEWTON expressed the opinion that the subcommittee had done nearly as much as was humanly possible. He supported the suggestion that the matter should be referred to Scotland, even if this involved delay. Eventually the view should be conveyed to the Joint Committee and to the Ministry that this report was not the whole answer. He expressed dislike of the name "senior medical or surgical assistant," and suggested that the words "assistant physician or surgeon" should be used instead.

Professor G. I. STRACHAN intervened to express his readiness to accept this suggestion.

Dr. S. R. F. WHITTAKER, dealing with the problem of general practitioners doing part-time work in hospitals, stated that it should not be too readily accepted that there was overwhelming enthusiasm on the part of all general practitioners for their colleague general practitioners in the area to be undertaking hospital work. He indicated that there was fear in some quarters of difficulties arising from general practitioners acting in a dual capacity in an area. It had already been asked that this point should be considered by the General Medical Services Committee.

Mr. A. N. GUTHKELCH, after asking for certain verbal amendments, agreed with the document on behalf of the

Manchester Region, as also did Dr. G. ORGANE, subject to the safeguard that it should not be regarded as a final one.

Registrars and General Practice

Dr. TALBOT ROGERS said that the minority report had drawn attention to the necessity for some integration between consulting and general practice, but the first report of the subcommittee had done nothing to make that easier. It was said that some registrars would never be competent enough to become consultants and that they would drift into general practice. He did not appreciate that point of view. It was true that the skills were different, but it did not follow that a registrar who was not competent to be a consultant would have the necessary competence for general practice, and it should not be taken for granted that a registrar who had been for many years in hospital could necessarily find a place in general practice satisfactory to himself or to others. He went on to speak of the opportunity which should be given to general practitioners in hospitals to practise a specialty and ultimately to become consultants. The CHAIRMAN pointed out that this was provided for in the report, in its reference to part-time appointments in this grade and the opportunity for general practitioners.

Professor STRACHAN said that his subcommittee had entertained no such idea as that people unfit for consultant practice would necessarily be fit for general practice. Dr. TALBOT ROGERS said that he happened to work in an area where the employment of general practitioners in hospital had been a matter of tradition, and there were still a number of general practitioners employed as S.H.M.O.s. One of them, for example, held the F.R.C.P.Ed.; that type of man could well be regarded as a consultant, and indeed he was looked upon by them as such.

Not Final

At the end of a long discussion the CHAIRMAN suggested to the Committee that the revised report be referred to the Joint Consultants Committee in the hope that the Central Committee would have the advantage of the Joint Committee's comments before submitting its proposals in final form; but that the report itself should not go forward as an official report to the Ministry until it had been fully approved by the Central Committee. In due course, when discussions with the Ministry of Health had reached an appropriate stage, any proposition from the Ministry should be referred to the Central Committee for consideration before implementation was considered.

The course suggested by the Chairman was formally proposed by Professor STRACHAN and agreed to by the Committee, none dissenting. It was also agreed to refer the report to the Central Consultants and Specialists Committee (Scotland) and to the regional committees.

The CHAIRMAN added that the Government was bound to desire discussions with the Joint Committee in the future, and the present report would be used, but it would not at this stage be brought before the Ministry as an official document.

The Expense Levy

Dr. ROWLAND HILL reported that the Executive Committee had given further thought to the method of introduction and operation of the proposed expense levy and its relation to the Hospital Medical Staffs Defence Trust. Their colleagues representing the Royal Colleges on the Joint Committee were anxious to play their part in bearing the necessary costs and in sponsoring an appeal for funds. The executive proposed accordingly to broaden the objects of the defence trust, to drop the word "defence" and rename the Trust the "Hospital Medical Staffs Trust," at the same time inviting representatives of the Royal Colleges in some way or other to join the trustees. Their work was done in close partnership with the Royal Colleges, and he thought the latter would agree to the body of trustees continuing as at present (the members of the Central

Committee), with two or perhaps three representatives from the other constituent bodies of the Joint Committee added to the Trust officers.

The Committee generally agreed to this course, and later, sitting as the trustees of the Hospital Medical Staffs Defence Fund, formally ratified the proposal.

"Moral Obligation" and Displaced Consultants

The CHAIRMAN said that cases continued to be brought to their attention in which consultants who had been displaced or had had their sessions reduced as a result of hospital reorganization had experienced difficulty in obtaining alternative employment because they had been required to apply in open competition for vacant appointments. When the "moral obligation" clause in para. 16 of the terms of service was agreed between the Joint Committee and the Ministry it was also agreed that in order to assist in finding alternative sessions for displaced consultants they should be offered suitable vacancies without advertisement. This decision was conveyed to the hospital boards, and the Ministry had on more than one occasion confirmed that this policy still applied.

It was agreed to ask the Joint Committee to remind the Ministry of this agreement and urge that instruction be given to hospital boards that consultants or S.H.M.O.s whose sessions were reduced owing to reorganization should, where suitable alternative employment existed, be offered the vacancy without the necessity of applying for the post in open competition.

Procedure for Appointments

The CHAIRMAN reported that the Joint Committee had discussed with the Ministry in general terms the question of revision of the N.H.S. (Appointment of Specialists) Regulations with a view to giving the senior medical staff of the hospital concerned a greater voice in the appointment of their future colleagues. The Ministry had asked for specific proposals, and the matter had been referred to a subcommittee for detailed consideration.

Mr. NICHOLSON-LAILEY stressed the importance of having some means of getting across to selection committees the point of view of the people who had to work with those newly appointed. Mr. C. E. KINDERSLEY said that it was sometimes forgotten that the happiness of the medical staff reflected on their work, and unless the staff had some voice in the selection of their colleagues it would not conduce to happiness.

The CHAIRMAN said that he was sure the Joint Committee was right in its proposed action. After all, the consultant was a man chosen on the advice of his own profession.

Disciplinary Procedure

Dr. S. COCHRANE SHANKS, chairman of the Medico-Legal Subcommittee, said that his subcommittee had been considering a suggestion for the setting up of an informal disciplinary machinery by regional consultants and specialists committees, but it was unanimously of opinion that any such arrangement would be inadvisable, as it might endanger the present discussions regarding the procedure for investigating complaints involving the personal conduct or professional competence of members of hospital medical staffs.

The Committee concurred in the view that this question should not be pursued.

On a question raised at a previous meeting concerning an instruction by a regional hospital board that consultants should not delegate to the nursing staff the duty of making appropriate entries in hospital operations registers, Dr. SHANKS said that his subcommittee took the view that it was of no legal significance whether the surgeon and anaesthetist completed the entries in the register personally or delegated them, provided that in the latter event the entries were verified and initialled by the surgeon and anaesthetist concerned.

It was agreed to pass on this opinion to the regional committees.

Constitution of the Committee

Finally the Committee discussed its own constitution. Mr. H. H. LANGSTON presented a report from the subcommittee which has been considering the structure of the Central Committee with a view principally to reducing its size. Strong opposition had been expressed by the group committees to the proposed complete abolition of group representation. Therefore it was now suggested that groups should retain their representation in the Central Committee, each group appointing one representative, but that group representatives should have no voting power. It was also recommended that the number of representatives appointed by the Central Consultants and Specialists Committee (Scotland) should be reduced from ten to six, that the provision for the election of five members engaged partly in consultant practice and partly in some other branch of medical practice—a provision which had never come into force—should be withdrawn, and that in future the number of registrars' representatives should be reduced from two to one, to bring them into line with S.H.M.O.s, who have only one representative.

The registrars' representatives objected to this last proposal, pointing out that they were the representatives with the shortest duration of office, and that if their representation were halved there might well be a break in continuity.

The whole matter was referred back to the subcommittee for further consideration.

JOINT CONSULTANTS COMMITTEE

A meeting of the Joint Consultants Committee was held on January 26 at the Royal College of Physicians under the chairmanship of Sir RUSSELL BRAIN. The Committee was largely occupied in reviewing the progress of discussions with the Minister of Health and officers of his Department on a number of outstanding subjects.

Medical Advisory Machinery

The Committee welcomed the Minister's assurance that he sympathized with its wish for close co-operation between hospital boards and their consultant staffs through the establishment of satisfactory medical advisory machinery, and noted his request for evidence of the unsatisfactory nature of the present arrangements. It was reported that the B.M.A.'s Central Consultants and Specialists Committee was endeavouring to obtain such information through its regional organization.

The Committee felt that it would be helpful if it could be given an opportunity of discussing the problem with the chairmen of hospital boards, and it decided to ask the Ministry whether this could be arranged.

Development of Consultant Services

Figures supplied by the Ministry in the course of discussions on hospital establishments had given the Committee some cause for concern at the lack of balance between the estimated number of consultant sessions and the number of senior registrars in training in the various specialties. It had seemed to the Committee that there was a need for improved overall planning of the consultant services of the country. This view had been put to the Ministry, which had expressed its desire for consultation on all aspects of the question. The Ministry's offer to supply all available information to enable the Committee to study the problem further was noted.

Provision of Residential Accommodation

At a previous meeting with the Ministry the importance of residential accommodation, and particularly married quarters, in connexion with the problem of shortage of hospital medical staff had been stressed. The Committee therefore welcomed the Ministry's circular (*Supplement*,

January 15, p. 16) encouraging hospital authorities to take all practicable steps to increase residential accommodation, and suggesting that hospital authorities should approach local housing authorities and other landlords on behalf of members of their staffs. The Committee decided that the question should be borne in mind for further discussion with the Ministry in connexion with the forthcoming negotiations on hospital staffing.

Option for Whole-time or Part-time Service

It was reported that the Ministry had undertaken to consider the publication of an agreed statement in the medical press for the information of the profession on the granting to consultants of the option of whole-time or part-time service. A draft statement which had been submitted to the Ministry for its approval was presented to the Committee.

Domiciliary Consultation Arrangements

The Committee received a report from its subcommittee which, after discussions with representatives of the General Medical Services Committee of the B.M.A., had urged the Ministry to extend domiciliary consultation arrangements to patients in nursing-homes. The Ministry had been told of the hardship inflicted upon patients of modest means who entered nursing-homes for domestic reasons and because of lack of adequate hospital accommodation, and were deprived of the benefit of consultant advice under the National Health Service. Although the Ministry was considering the proposal, its first reaction was reported to be that the Minister's statutory obligation to provide a domiciliary consultant service was specifically limited to the patient's home.

Appointment of Consultants and S.H.M.O.s

A report was received upon the discussions with the Ministry on the procedure for the appointment of consultants and S.H.M.O.s. The Ministry, while acknowledging that the existing procedure was open to criticism, was reluctant to amend the Regulations if improvements could be achieved by administrative action. It had asked the Joint Committee for specific suggestions so that the question could be studied further. The matter was referred to a subcommittee for detailed consideration.

Other Matters

Other matters discussed by the Committee included the employment of hospital staff on pneumoconiosis medical panels, the recommendations of the Bradbeer Committee on hospital administration, the loan of hospital records to Government departments, and the possibility of arranging facilities for the interchange of registrars between the United Kingdom and countries overseas.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.
Urban District Councils.—Houghton-le-Spring.

There are about 14,500 hospital beds in New Zealand—seven for every 1,000 people. Health Department annual statistics show that the average number of persons occupying beds at any time is 5.5 per 1,000. Over 10% of the population received treatment as hospital in-patients during the year. The number of out-patients who received treatment was more than one-third of the population. There are 6,631 nurses in public hospitals, of whom 2,700 are trained, and 129 male nurses.

COST OF MEDICAL CARE IN THE U.S.A.

As reported in the *Journal* (February 5, p. 365) President Eisenhower has again asked Congress to enact a health programme expanded a little from the one which it rejected last year. The main purpose of the programme is to encourage private insurance companies to offer better protection against the expenses of illness and to extend sickness insurance to cover more of the population.

An article in the *New York Times* of February 6 says that last year the nation's medical bill ran to over \$10 billion, an increase of \$3 billion since 1948. Of this amount only about 25% was covered by some form of prepaid health insurance. To ease the financial strain the President has proposed a Federal health reinsurance plan. Broadly speaking, the plan would commit the Government to assume much of the financial risk that private health insurance groups might incur by extending coverage and benefits. It was substantially the same proposal that was defeated in the last Congress under criticism by the Democrats that it would achieve little, and warnings by the American Medical Association that it might give "socialized medicine" a foot in the door. Nor were the insurance companies enthusiastic.

The *New York Times* article points out that, in spite of the rapid growth of private health insurance in the United States, it has not caught up with the increasing costs of treatment, and there is a lengthening between the total bill and the insurance cover. It is reported that the number of persons covered jumped by 38,000,000 between 1948 and 1953, but in the same period private medical bills not covered by insurance increased by \$1.4 billion. Sixty million people have no coverage. Despite the figure of 100,000,000 people covered in some way, only 4,500,000, or 3% of the population, have anything like complete protection.

For the remainder of the population coverage ranges from what the article calls "good to skimpy." Only 24% of the nation has hospital, surgical, and physician's bill protection; 28% has only hospital and surgical, and 8% hospital insurance only. On the average a person covered by hospital insurance in 1953 had to pay 19% of his bill out of pocket. The average person covered by a plan for meeting doctors' bills that year got benefits paying 46% of his bill. Those protected by both hospital and physician's insurance were covered on only 64% of the bill. Rural areas are virtually untouched by private plans, and only 25% of those with annual incomes under \$2,500 have any degree of protection.

In principle the idea behind the Federal health reinsurance scheme, the article explains, is that the Government should insure more liberal policies by the private insurance funds to pay more of the costs of serious and expensive illness than most present policies. The administration would set up a \$100 million fund for this purpose. The administrative agency would offer to insure new and more extensive plans for private funds which at present hesitate to offer broader, cheaper coverage without security against the increased risk of abnormal loss. The private funds would pay a Government premium for Federal reinsurance, and this would go to create a revolving fund to free the plan ultimately of Federal subsidy. In return the Federal reinsurance agency would assume responsibility for a high percentage of the private companies' abnormal losses on the more liberal coverage.

The President has also asked for an appropriation of \$20 million for public assistance cases. Other proposals are for better medical facilities and nursing staffs; vigorous measures to combat mental illness; improved services for crippled children and for maternal and child welfare; Federal grants for the prevention and treatment of juvenile delinquency; better protection of consumers under existing pure food and drug laws; and improved measures against water and air pollution.

GENERAL MEDICAL SERVICES SUBCOMMITTEE (SCOTLAND)

A meeting of the General Medical Services Subcommittee (Scotland) was held at the Glasgow B.M.A. Regional Office on January 27, with Dr. C. J. SWANSON in the chair.

Dr. SWANSON announced that Drs. W. D. Anderson (Glasgow) and A. E. Sandison (Dumfries) had resigned from the subcommittee owing to their no longer being in general practice, and a resolution was passed recording appreciation of their services.

Mileage Payments

The amount made available from the mileage fund for payment to practitioners in the Highlands and Islands area was again discussed, and proposals were considered for submission to a forthcoming meeting of the Scottish and English mileage subcommittees of the advisory distribution committees. These proposals are designed to bring the payments made to practitioners in the Highlands and Islands area into line with those being made in other parts of the United Kingdom.

Surgery and Waiting-room Accommodation

Further proposals from the Department of Health in connexion with a survey of surgery and waiting-room accommodation were considered. Dr. SWANSON reported that the matter had been discussed very fully with the Department. The subcommittee agreed with the Department's suggestion that in areas where no review of accommodation had already been carried out it should be undertaken by executive councils in consultation with local medical committees.

Notification of Change of Address

It was reported that the Department had agreed to the subcommittee's proposed alteration of the medical card to enable the holder to notify the executive council of a change of name and/or address. In addition, the Department had undertaken to provide tear-off pads for doctors to use for notifying executive councils of changes of name and address of patients. It was hoped that these arrangements would help to keep practitioners' lists more accurate and up-to-date. The subcommittee has also suggested to the Department that registrars of marriage should notify executive councils of changes of name.

Doctors' Houses in the Highlands and Islands

The CHAIRMAN reported that he and the Assistant Scottish Secretary, together with two representatives of the Highlands and Islands Practitioners' Subcommittee, had had a meeting with the Department of Health to discuss the general question of maintenance of houses owned by executive councils and leased to practitioners.

General Practitioners and the Hospital Service

The subcommittee endorsed a recommendation by the Joint Subcommittee with the Central Consultants and Specialists Committee (Scotland) requesting the Department to advise the setting up of joint committees between executive councils and hospital boards to examine the relationship of general practitioners and the hospital service.

Agreement has been reached between the Association of Scientific Workers and a Committee on Technical Staffs, set up by the Committee of Vice-Chancellors and Principals, for an increase in the pay of laboratory and workshop staffs employed in universities and university colleges in the British Isles. The scales of pay are increased by £25 a year, rising to £30 a year—juniors receiving increases of 5s., rising to 7s. 6d. a week.

YOUNG PRACTITIONERS OF LEEDS

B.M.A. GROUP FORMED

In common with other university centres, the Leeds Division of the B.M.A. has for some years past entertained the newly qualified doctors to lunch. This year it has gone further in the interests of young practitioners and has formed a special group for them within the Division. The young practitioners group is open to all members of the profession under 35 years of age working in the area in whatever form of practice.

The first meeting of the group was held on January 19, and 32 members listened to a talk by Dr. L. S. POTTER, B.M.A. Assistant Secretary, on the problems of the young practitioner. A committee of 10, representative of all branches of medicine, has been elected and the committee in turn has elected a chairman and secretary.

Another project, fostered by the Leeds Division, and which now, after three years, has become an established event, is a joint meeting of final-year students with the members of the Division executive committee. An address on careers in medicine is given, and the students are able to question not only the speaker but also the committee members over cups of coffee.

SERVICE PERSONNEL ON LEAVE

TREATMENT AS TEMPORARY RESIDENTS

It has been agreed between the Health Departments and the Service Departments, in consultation with the representatives of the profession, to allow under certain circumstances Service personnel on leave and those temporarily living away from their units to use the National Health Service for treatment. The arrangements, which will come into force on April 1, are set out in a circular to executive councils.

Under the new arrangements Service personnel on leave, if they are more than two miles from the nearest Service hospital or unit at which a Service medical officer is posted for duty, may be accepted and treated as temporary residents under the National Health Service arrangements.

Personnel Temporarily Living Away from Units

It has also been agreed that Service men or women living temporarily away from barracks, command stations, or other Service establishments or units, who are also more than two miles from the nearest hospital or unit at which a Service medical officer is posted for duty, and who seek treatment from civilian doctors, may be accepted for treatment within the National Health Service as temporary residents.

Where Service personnel are away for over three months from medical facilities provided by Service Departments, it may be necessary for doctors to accept them on their permanent lists. In these exceptional circumstances executive councils will ask the persons concerned to return their cards and notify the council as soon as they move, or otherwise wish their names to be removed from the doctor's list.

Provision of Drugs

Where Service personnel are accepted as temporary residents or taken on a doctor's list, the doctor will be entitled to prescribe for them on form E.C.10 or to supply drugs or appliances if he is a dispensing doctor. Prescription charges will be payable by the patient in respect of medicines, but a receipt on form E.C. 57 should be given on request so that the question of refund can be taken up with the Service unit.

It has also been agreed that, at Service stations where in particular cases the provision of drugs from Service sources is not possible, Service doctors and civilian doctors under contract with the Services may use the prescribing machinery

of the National Health Service. For this purpose special Services prescription forms similar in lay-out but different in colour from those used in the National Health Service will be used, and chemists in contract with executive councils will dispense prescriptions on these forms and submit them for pricing in the usual way. Service doctors will be advised of the general conditions which apply to prescribing in the National Health Service.

General

There are a small number of Service personnel who are not members of the regular Army but who are employed full-time as adjutants/quartermasters with the Territorial Army or Home Guard units. These persons are not serving members of the regular Army and will not need therefore to be regarded as coming within the arrangements mentioned above. They may, of course, be accepted for treatment as civilians under normal N.H.S. arrangements. The dependants of Service personnel are, as they always have been, at liberty to apply to doctors for treatment within the National Health Service.

SERVICE PERSONNEL ON LEAVE

TREATMENT BY PRIVATE PRACTITIONERS

In conjunction with the agreement with the Ministry of Health on the treatment of Service personnel on leave as temporary residents, agreement has also been reached with the Service Departments on the fees to be paid to private practitioners who provide treatment of this kind. Previously the fees of 5s., 7s. 6d., and 15s. for a surgery attendance, day visit, and night visit respectively have included the provision of all except specially expensive drugs and dressings necessary for treatment. As from April 1, 1955, however, the actual cost of drugs and dressings dispensed will be claimed from the Service Department by the private practitioner concerned. Non-dispensing doctors will issue private prescriptions where necessary. For the treatment itself the fees will be:

	s.	d.
For attendance at the surgery	6	0
For a day visit	10	0
For a night visit	15	0

In addition, the private practitioner will be able to claim mileage at 1s. per mile each way in excess of two miles, and a fee of 1s. for a certificate. The claim forms used by the Services are being amended accordingly.

When on leave Naval personnel will continue to be instructed to report sick to the nearest Admiralty surgeon and agent, if at all possible, and in all cases the appropriate mileage allowance will be paid by the Admiralty if the agent visits men who are resident more than two miles from the doctor's surgery and no payment for mileage has been received from any other source.

SUPPLEMENTARY ESTIMATE FOR HEALTH SERVICE

In the Supplementary Estimate¹ for the year ending March 31 next the Government asks for a further £4,848,000 for the Health Service in England and Wales and £1,233,000 for Scotland. The main items for which extra money is required are for increased expenditure of regional hospital boards (£2,172,000 England and Wales and £987,000 Scotland), pharmaceutical services (£2,028,000 England and Wales and £250,000 Scotland), and general dental services (£1,701,000 England and Wales and £200,000 Scotland). But for expected savings in the year of £3,009,000 and £88,000, south and north of the border respectively, the supplementary estimates would have been higher.

This is the first supplementary estimate for the National Health Service since 1949-50.

¹ Supplementary Estimate, Civil Estimates, and Estimates for Revenue Department. H.M.S.O., London. 5s.

HOSPITAL BUILDING PROGRAMME, 1956-7 AND 1957-8

It has been decided, subject to the voting by Parliament of the necessary funds, to begin an expansion of the hospital building programme in 1956-7 and 1957-8. This initial expansion will take two main forms: (i) a programme for the replacement or redeployment of worn-out, obsolete, or inefficiently disposed plant involving the expenditure of £2m. in 1956-7 and £4m. in 1957-8; and (ii) the starting of major building projects to a total value of £7½m. in 1956-7 and £10m. in 1957-8.

It is intended that the programme under the first section shall so far as possible be completed within the two-year period.

PRIVATE PRACTICE COMMITTEE

The meeting of the Private Practice Committee on February 9, with Dr. A. BROWN presiding, was as usual occupied with a variety of detailed matters—treatment of Service men on leave, the position of professional premises under the new Landlord and Tenant Act, the assessment of professional premises as business premises, fees for private certificates, fees for the examination of Borstal boys and of boarded-out children, fees for police calls, as well as such standing subjects as bonus-shift certificates and the use of E.C.10 in prescribing for private patients. On this last point a report of the recent discussion with the Minister was before the Committee, and note was taken of Mr. Macleod's statement (*Supplement*, January 29, p. 31).

Admiralty Surgeons

Some time was spent on the remuneration of Admiralty surgeons and agents, a matter referred to the Committee from the London Local Medical Committee. Dr. A. N. MATTHIAS suggested certain detailed increases. For visiting patients on board a ship which was not alongside he contended that payment should be calculated on a time basis from the doctor's residence or the landing-stage. For each patient seen while on board the fee should be 12s. 6d. by day and £1 1s. by night as a minimum. Vaccination fees should be 7s. 6d. for each item. For examination for fitness for special duties, which might be most complicated, an appropriate fee should be assigned to each type of examination.

It was agreed to approach the Admiralty on these matters. The Committee considered a letter from the honorary secretary of the Medical Officers of Schools Association, which had been asked for its views concerning arrangements made by some boarding schools for all pupils to be put on the N.H.S. list of the school medical officer. The view of the school medical officers was that all pupils and such staff and dependants as elected to do so should be placed on the list of the school medical officer, but it was acknowledged that this was a matter for the individual school to decide.

After considerable discussion it was resolved to invite the honorary secretary of the Medical Officers of Schools Association to the next meeting and meanwhile to invite the comments of the General Medical Services Committee.

Alcohol and Road Accidents

At a previous meeting the Committee had decided to refer to the associations of local authorities certain recommendations made by the Alcohol and Road Accidents Committee calling for the encouragement of doctors to undertake the work of examining intoxicated motorists by the appointment of doctors suitably qualified for this purpose; the prevention of unnecessary loss of doctor's time in court, and the provision of adequate facilities at police stations for the conduct of examinations. The views of the relevant associations of local authorities were that each police authority must decide for itself whether and to what extent it should apply the recommendations in its area.

It was decided that the B.M.A.'s recommendations should be brought to the notice of the appropriate Divisions and Branches so that they might be taken up with the local police authority.

On the question of examination of boys for fitness for Borstal it was agreed to approach the Treasury with a view to laying down a minimum fee of one guinea per case. The present fee for a single examination is 15s., but there is a maximum of £3 15s. in respect of all examinations carried out on one day.

The Committee considered the proposals for sectional representation in the Representative Body referred by the Constitution Committee and expressed itself satisfied that no useful purpose would be served by altering existing arrangements.

PUBLIC HEALTH COMMITTEE

A meeting of the Public Health Committee of the Association was held on February 11, with Dr. J. B. TILLEY in the chair.

The Committee endorsed the action of its Chairman in proposing to the Council that the appropriate Government departments should be informed that in the Association's view the functions of the Ministry of Food relating to food hygiene should be taken over in due course by the Ministry of Health.

It was reported that representatives of the Committee had discussed with the Society of Medical Officers of Health the revision of the various Milk Regulations dating from 1949, and that full agreement had been reached.

Salaries Claim

It was further reported that the Staff Side claim for a revision of salaries of medical officers in the public health service had not been agreed between the Staff and Management Sides of Whitley Committee C, and it had been decided to take steps to refer the differences to the Industrial Court (*Supplement*, January 1, p. 3).

A letter was considered claiming a need for London weighting on the ground that the cost of living for doctors in London was in excess of that in other parts of Great Britain. The letter was accompanied by much detailed information about house purchase, rent, domestic help, telephone rentals, gas, coal, electricity, travel, car insurance, and entertainment, all of which were higher in London than in four cities taken as examples. The Public Health Committee accepted the figures, but agreed to leave the matter for the present. It was thought that the present time was inopportune to press such a claim.

The D.P.H. Course

A letter was read from the registrar of the General Medical Council inviting the Association to send representatives to discuss certain general questions concerning the revision of the rules for courses and examinations for the D.P.H. It was agreed to accept the invitation, and representatives and deputies were appointed.

On a question, which had previously been before the Committee, concerning the possible effect on the health of the public of the proposed introduction of additional diesel-oil buses in London, inquiry had been made about action being taken by the Medical Research Council. The Public Health Committee decided to recommend that the matter be referred in the first instance to the Association's Science Committee.

The Committee had before it a report that a local authority had taken no action to remedy its failure to implement the decision of a regional appeals committee. It was decided to invite the authority to agree to a reference of the dispute to the Industrial Court.

School Medical Service

Dr. S. C. GAWNE presented the report of the Consultant, General Practitioner, and Public Health Liaison Committee, and said that the recommendations of the Public Health Committee concerning the school medical service and co-ordination with general practitioners and consultants had been approved. This matter had been referred to the Joint Consultants Committee with a view to its being brought to the notice of the Ministry. The first of a number of recommendations was that when a general practitioner referred a schoolchild to a consultant for investigation or treatment, and when special treatment or any facility provided by the local authority was necessary, a copy of the report sent to the general practitioner should also be forwarded to the school medical officer.

Dr. H. D. CHALKE, chairman of the Geriatrics Joint Subcommittee, presented the lengthy report of that body, and the report, with a minor amendment, was approved for submission to the Council.

Dr. J. FENTON, a member of the Committee, supplied some interesting information on the risk to public health involved in the use of bacterial pesticides. A letter was read on this subject from Professor G. S. Wilson, director of the Public Health Laboratory Service. The Committee agreed to take up with the Ministry of Agriculture the possibility of discouraging and ultimately preventing the use of bacterial rodenticides. In the meantime so long as they continue to be manufactured certain limitations and safeguards should be imposed.

Questions Answered

Two Cars

Q.—For over 20 years I have run two cars in practice and been allowed depreciation on both every year. My present accountant is of the opinion that I cannot claim for two cars. Am I entitled to depreciation on both or not?

A.—If, in fact, both cars are used in the practice the capital allowance for wear and tear applies to both. If, on the other hand, one of the cars is held in reserve or for private use and is not actually used in the practice the allowance would not apply to that car. A point to be borne in mind is that the Inland Revenue officers might regard the ownership of two cars as indicating a more substantial private use than if only one car were kept, and that might affect the proportion of the annual depreciation by wear and tear of the cars regarded as applicable for income-tax purposes.

Hire Purchase of Car

Q.—I am an assistant in general practice. I have bought a car through a hire purchase company, to be paid for by 36 monthly instalments of £24. What income-tax allowances am I entitled to?

A.—When a car is bought on hire purchase terms the ordinary practice is to regard the cash price of the car as the basis for calculating the amount of the capital allowances, and the difference between the cash price and the total amount payable as an allowable expense. That difference would be spread equally over the period of payment, and the amount allowable for any one year would be the aggregate of the amounts becoming due during that year. The hire purchase contract will no doubt show the appropriate figures. If, for instance, the cash price of the car was £690 and £750 the total amount payable, the difference of £60 would be allowable at the rate of £20 per annum over the three years covered by the contract. If, however, the questioner's principal makes him a car allowance, the Revenue authorities will take the view that it includes the necessary cost of running a car, including depreciation, and a capital allowance will be refused on the strength of the decision in the case of *Hamerton v. Overy*.

Correspondence

Ship Surgeons

SIR.—As one of Dr. Michael Dillon's despised "holiday trippers," I feel that I am in a position to make a few comments on his unjustified complaints (*Supplement*, February 5, p. 43). My experience only relates to the Australia-England route, but, from the shipping companies mentioned, I feel that this covers most of the field. The ships on this route may be divided into two classes: the large passenger ships and the cargo ships (with or without passengers). The former carry two surgeons, one more or less permanent, uniformed, and usually signed on in England, the other a "holiday tripper." The cargo ships almost always have a "holiday tripper." The term "holiday tripper" is so wide of the mark as to be too ludicrous for words. Should Dr. Dillon care to make even a few inquiries he would soon ascertain that 95% or more of his "holiday trippers" were in fact young graduates travelling to England to seek postgraduate training in one or other of the various branches of medicine. This is about the only way that the postgraduate student is able to get to England (except a fortunate few), for his lot is not a very pecunious one, particularly if he is married.

There is a very important point which Dr. Dillon seems to have overlooked. It is by these "holiday trippers" coming from the Dominions to England, where they learn what is new in the various branches of medicine, that first-hand knowledge of these advances can be taken back to the Dominions, thereby enabling them to keep abreast of the rest of the world in medical progress. In this respect the shipping companies are to be highly commended for providing these opportunities for postgraduate students (my thanks go to the Shaw Savill line). If Dr. Dillon were to persist in his bid to drive these men from the seas, he would only be standing in the road of medical progress.

Whilst uniforms are desirable in the interests of discipline, from personal experience they are by no means essential. Just as a uniform is not necessary for a good sailor, so the standard of one's medicine should not be dependent on the number of "rings" on one's sleeve. With regard to making medicine at sea a life career, from experiences as assistant surgeon on one of the not so large passenger ships I would say that anyone so desirous must ask to be called a "holiday tripper." The duties are not arduous (total daily surgery would rarely exceed three hours) with ample time to enjoy the tropical sun and, if so inclined, the cheap gin. No, if the title "holiday tripper" must be bestowed on anyone it should be on those who seek permanent employment at sea; definitely not on the impecunious postgraduate student. Finally, I would like to add that at least two professors of the Melbourne Medical School were once "holiday trippers."—I am, etc.,

Chertsey, Surrey.

D. McLAREN.

SIR.—It is rarely that I am moved to writing letters to the press, but the ideas expressed by your correspondent, Dr. Michael Dillon, under the title "Ship Surgeons" (*Supplement*, February 5, p. 43) are such that might stimulate criticism from the most placid of readers capable of viewing more than one side of a question.

In that he proposes just rates of pay and adequate discipline (concerning drink) I have no argument with him, but I am impelled to take him to task over the matter of those to whom he refers as "doctor holiday trippers" and "casual labour." I have no doubt that there are those who avail themselves, as ship surgeons, of free trips for purely holiday purposes, but your correspondent has completely failed to mention, even unfavourably, the boon of ship surgeon positions to those of moderate means who wish to travel abroad for the purpose of postgraduate study. Of those desiring "a free trip to the U.K. and back," the majority travel

there to further their professional experience, and many of these would be unable to do this if it were necessary for them to pay for their passage.

The "doctor holiday tripper" is also referred to as an "amateur (nautically speaking)," and it is stated that the bookkeeper or telegraphist would never be similarly employed as purser or radio officer. These latter ship's officers, however, are concerned with the vital function of the ship, with its provisioning, finance, and communications, without due attention to which the ship would be greatly hampered. They are then, surely, more truly "nautical" than the doctor can ever be. The surgeon's function is "medical," and this function, ideally, should vary little whether the doctor is on sea or on land. In that his primary duty is to his individual patient rather than to the ship as a whole, one would rather see the doctor who is a nautical amateur than the one who is a medical amateur. Some shipping firms have preferred temporary surgeons for the reason that the wider experience available on shore may have enabled them to avoid becoming medical amateurs. The best way to preserve the reputation of the ship surgeon may, therefore, be to allow him frequent access to the experience available on land.

Finally, may I add that this preoccupation with the matter of uniform rather suggests too great an interest in the hierarchy of the sea and ships? I say this in no defamatory sense, but simply suggest that a love of the life at sea might better be requited by embarking upon a nautical than a medical career.—I am, etc.,

London, W.1.

W. H. WOLFENDEN.

SIR.—As one of those doctors retired from practice (in my case, 21 years in West African service), with no special aversion to the social life and cheap gin of ships, whom Dr. M. Dillon wishes to eliminate from the Merchant Navy, I must express disagreement with nearly everything he says (*Supplement*, February 5, p. 43). I would ask him to come down from the clouds and consider the following points. (1) Shipping companies are commercial concerns which have to pay their way by giving and getting the best value they can for money. That "there are many doctors anxious to make the sea a career" would mean nothing at all to them. (2) With the rising tide of medical unemployment, and the increasing number of refugees from the N.H.S., there is no shortage of applicants. Hence the bargaining position is not strong. (3) Only on ships over 14,000 tons, carrying 400 or more passengers, does the actual medical and health work of the surgeon constitute a full-time job, comparable with average practice or hospital work. There are about sixty such ships in the fleet. (4) On the cargo passenger liners, carrying 40 passengers or less, the work of the surgeon will rarely exceed one or two hours a day. Would anybody consider sitting on such ships for 40 years a career? No one can expect full-time emoluments, whether in cash, kind, or status, for what is often considerably less than full-time work. (5) Many such cargo-passenger liners carry surgeons, not because their owners or commanders consider them essential, but because every ship with over 99 souls aboard is legally obliged to carry a surgeon. Were this figure changed to 49, a large number of niches would vanish, now pleasantly occupied by young holiday-trippers, or elderly doctors who like to feel they are part of something useful. (6) The "doctors who want a free trip to the U.K. and back" are mostly young Australian graduates coming over to take higher qualifications. Many might otherwise have difficulty in finding £200 to £300 for fares. (7) No reputable company would have anything to do with a surgeons' pool. It would do nothing to raise status. Rather it would tend to lower it towards that of those stewards, etc., who hop from ship to ship, and have no feeling for or interest in the company they are serving at the moment. (8) Surgeons get fees from passengers, while other officers do not. Hence, stabilization of rates of pay would be a difficult problem, there are so many different factors involved. Generally, the more valuable ships go by seniority in a company's service and merit; which is fair

enough. (9) A commander, chief officer, purser, or anyone else who commits such a breach of the Articles as "being found drunk while at sea" is much more likely to get away with it and continue his career uninterrupted than is a surgeon.

I would say that no young doctor should consider making the sea a career, except in the Royal Navy. A third to a half of his working life, at the beginning or the end, in the Merchant Navy perhaps; but not the whole. It should not be forgotten that merchant seamen see less of their wives and families than almost any other class of worker, and that medical staff are outside the superannuation schemes. Certainly there are points in terms of service and general treatment which the B.M.A. should take up with the leading companies, but such effort should be confined to what is reasonable and practicable.—I am, etc.,

Bristol, 8.

GEORGE L. ALEXANDER.

Remuneration Policy

SIR.—I should like to put forward a suggestion for the consideration of the Committee on Remuneration Policy ("the Hamilton Committee"). It is essential to have, in the medical negotiating machinery, the means of comparing and equating remunerations and conditions of service for consultant staffs, general practitioners, and public health and Civil Service medical officers. It is desirable to have similar machinery in respect of medical and dental remunerations. This cannot be obtained by the present three independent Committees A, B, and C, on the medical side, and an independent dental committee. It is essential to have a national Whitley Council Committee for negotiating medical and dental salaries and conditions. This it would do through subcommittees A, B, and C, and perhaps D for dentistry, E for the Civil Service, and F for university medical staffs. But the decisions of each subcommittee would be submitted to the main committee for approval, and the balance would thus be held between the various branches of medicine, and between them and dentistry.

Without such an arrangement, the various groups of medical and dental practitioners will continue the struggle to go one better than their colleagues in other branches. A struggle of this kind cannot be the best thing for all. Some group will always be left behind, and the pay of such a group will always be a target to which those anxious for retrenchment will seek reductions.—I am, etc.,

Elgin.

I. C. MONRO.

"Dictated but not Read"

SIR.—When one asks a consultant for a considered opinion and advice it is somewhat disconcerting (and rather insulting) to read the above at the end of his letter. Is this an attempt to avoid responsibility, or simply a sign of "bad manners"? The sooner it stops the better for the hitherto honourable profession of medicine.—I am, etc.,

"DICTATED BUT UNSIGNED."

Merit Awards

SIR.—Dr. A. Piney (*Supplement*, January 1, p. 6) predicts that the Distinction Awards Committee will remain indifferent to criticism—"silent upon a peak in Darien." If so, will this not be just an attempt to postpone the day of judgment? There are, it is true, impressive precedents for the policy of imperviousness. When the cook in *Alice* threw the frying-pan at the Duchess, Her Grace just went out of the room, evidently treating the incident with disdain. A frying-pan, however, has distinct limitations as an instrument of controversy, particularly in its inability to convey the *mot juste* and any sort of finesse. Informed criticism, on the other hand, such as has been brought to bear on the subject, is liable to puncture self-satisfaction and complacency.

It will surely now be evident, in the light of the correspondence on the subject, that Lord Moran (*Supplement*,

July 17, 1954, p. 69) was over-optimistic in felicitating the profession on the "remarkable achievement" of the success of the merit awards scheme. Sir Horace Hamilton's arithmetical argument (*Supplement*, October 23, 1954, p. 153) that as only seven consultants, up to the date of his letter, had written criticizing the system there would seem to be no widespread dissatisfaction with the way it was working, could clearly be countered, if necessary, by pointing out that, as no one (except the chairman and vice-chairman, of the committee) had written approving of the scheme, there would seem to be no widespread enthusiasm for it. The truth is that the Distinction Awards Committee has been given an impossible task and should relinquish, with what grace it can, an invidious duty designed to create and maintain discord within the profession—not least because of the secrecy with which it is deemed necessary to enshroud its decisions. It might have been manifest from the outset that a scheme such as this would inevitably lead to disagreement among colleagues. There are better things, I would suggest, that could be done with the sum of money in question.—I am, etc.,

London, W.C.1.

FREDERICK DILLON.

SIR.—Dr. Douglas Boyd's letter (*Supplement*, January 29, p. 33) suggests that the question of merit awards concerns the whole profession. Surely it concerns the whole community? The whole concept is an abomination: a few superior persons, aided by secret informers, are doling out a million and a quarter pounds of the taxpayers' money yearly to unknown specialists for unspecified services. Why, there has been nothing like that on that scale in this country since the most corrupt period of the eighteenth century!—I am, etc.,

Rye.

C. G. LEAROYD.

The Incentives of Freedom

SIR.—In 1949 during the Congress in Rheumatology in New York it was of great interest to listen to the enthusiastic questioning by the Americans on our personal opinions of the welfare services so recently started in England. Without hesitation I urged those I met who asked me, to resist the State control of all medicine in America. Obviously this was one lone voice in a desert of non-committal silence.

At the Annual Meeting of the American Medical Association, which occurred during the same period as the Congress, and which discussed the possibility of a whole-time medical service in America, the American audience appeared to be apathetic to the dangers of such a service. Therefore it was with delight that I read of President Eisenhower's recent message epitomized in the *Supplement* of January 15 (p. 17) and in *The Times* that week. May he long continue this strength of character to fight for freedom and the individual incentive; encouraging the patients to choose for themselves the greater dignity of paying for treatment, and the doctors with the incentive which goes with private or voluntary treatment.

A free gift is never so much appreciated as something paid for, except in the case of the deserving poor. Oh, that the people of England would ask for less and give more time and trouble to their own work, without the sole incentive of greater remuneration! Many more doctors would then have their vocation as their greater pleasure.

There is much waste of money on expensive and luxurious drugs and appliances, when as efficient though more economical treatments would serve as readily to bring health to the patient. How can the present indiscriminate prescribing without due regard for cost encourage the continuation of private practice; the few remaining high-spirited British private patients having to pay for an expensive preparation which is given *ad lib.* to State-aided ones for 1s. per time? Sometimes the greater part of the medicine is thrown away, the recipient not realizing its financial worth. What is little paid for will be little valued. Well done, America!—I am, etc.,

London, W.1.

M. M. DOBSON.

H.M. Forces Appointments**COLONIAL MEDICAL SERVICE**

The following appointments have been announced: H. M. Carson, M.B., B.Ch., and H. B. L. Russell, M.R.C.S., L.R.C.P., D.P.H., Senior Medical Officers, Ministry of Health, Gold Coast; J. Lomaz, M.B., Ch.B., Medical Officer (Anaesthetist), Federation of Malaya; M. T. Read, M.R.C.S., L.R.C.P., Administrative Medical Officer, Grade A, Federation of Malaya; G. J. Clarke, M.R.C.S., L.R.C.P., Senior Medical Officer, St. Helena; E. C. B. Hall-Craggs, M.B., B.Ch., Medical Officer, Uganda; P. N. Griffin, M.B., Ch.B., Medical Officer, Dominica, Windward Islands; S. R. W. Moore, M.B., B.Ch., B.A.O., Medical Officer, Sierra Leone; C. W. E. Murphy, M.B., B.Ch., B.A.O., D.P.H., Special Grade Medical Officer (Anaesthetist), Aden; Margaret J. Purser, M.B., B.S., Medical Officer, South Pacific Health Service, Fiji; T. Rajcoomar, M.B., B.S., D.T.M.&H., Medical Officer, Mauritius; R. A. F. Schoyerer, M.D., Medical Officer, Gold Coast.

Association Notices**SCHOLARSHIPS IN AID OF SCIENTIFIC RESEARCH**

The Council of the British Medical Association is prepared to receive applications for research scholarships as follows:

An Ernest Hart Memorial Scholarship, of the value of £250.

A Walter Dixon Scholarship, of the value of £250.

Four ordinary research scholarships, each of the value of £200.

These scholarships are given to candidates recommended by the Science Committee of the Association as qualified to undertake research in any subject (including State medicine) relating to the causation, prevention, or treatment of disease.

In addition, applications are invited for the award of the following research scholarship:

The Insole Scholarship, of the value of £250, for research into the causes and cure of venereal disease.

Each scholarship is tenable for one year, commencing on October 1, 1955. A current scholar may apply to be re-appointed for a further year, though no scholarship will be renewed more than twice. A scholar is not necessarily required to devote the whole of his or her time to the work of research, but may be a member of H.M. Forces or may hold a junior appointment at a university, medical school, or hospital, provided the duties of such appointment will not, in the opinion of the Science Committee, interfere with his or her work as a scholar.

Applications for scholarships, including renewals, must be made not later than March 1, 1955, on the prescribed form, a copy of which will be supplied by the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, on application.

Applicants are required to furnish the names of three referees who are competent to speak as to their capacity for the research contemplated.

A. MACRAE,
Secretary.

Diary of Central Meetings

FEBRUARY	
22 Tues.	Subcommittee on Practice Vacancies, G.M.S. Committee, 2 p.m.
23 Wed.	Catering Committee, 11 a.m.
23 Wed.	Finance Committee, 2 p.m.
23 Wed.	Practice Accommodation Subcommittee, G.M.S. Committee, 2 p.m.
24 Thurs.	Evidence Committee on Divine Healing, 10 a.m.
24 Thurs.	Journal Committee, 2 p.m.
25 Fri.	Medico-Legal Subcommittee, Central Consultants and Specialists Committee, 11.30 a.m.
25 Fri.	Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
25 Fri.	Full-time Non-professional Medical Teachers and Research Workers Group Committee, 2 p.m.
25 Fri.	Medico-Legal Subcommittee, Central Consultants and Specialists Committee, with Ministry of Health (at 23, Savile Row, London, W.), 2.30 p.m.

MARCH

2 Wed.	Council, 10 a.m.
3 Thurs.	Homosexuality and Prostitution Committee, 10.30 a.m.
4 Fri.	Joint Committee of the B.M.A. and the Magistrates' Association, 10.15 a.m.
8 Tues.	Constitution Committee, 11 a.m.
10 Thurs.	Psychological Medicine Group Committee, 2 p.m.
17 Thurs.	Charities Committee, 2.15 p.m.
30 Wed.	Committee re Remuneration Policy, 2 p.m.
31 Thurs.	Conference of Honorary Secretaries of Divisions and Branches, 10.30 a.m.

Branch and Division Meetings to be Held

BATH, BRISTOL, AND SOMERSET BRANCH.—At Royal United Hospital, Bath, Wednesday, February 23, 8.30 p.m., meeting. Professor Bryan L. McFarland: "Congenital Deformities."

BOURNEMOUTH DIVISION.—At Board Room, Royal Victoria Hospital, Boscombe, Friday, February 25, 8.15 p.m., meeting. Address by Dr. R. M. B. MacKenna: "Common Skin Diseases" (a lantern lecture).

COVENTRY DIVISION.—At Out-patient Department, Coventry and Warwickshire Hospital, Tuesday, February 22, 8.15 p.m., clinical meeting.

DARLINGTON DIVISION.—At Darlington Memorial Hospital, Tuesday, February 22, 8.30 p.m., meeting. Lecture by Dr. Robert Orton: "Menopausal Depressive States."

DARTFORD DIVISION.—At Livingstone Hospital, Dartford, Thursday, February 24, 8.45 p.m., business meeting.

DEWSBURY DIVISION.—At General Hospital, Dewsbury, Friday, February 25, 8.30 p.m., meeting. Mr. John Foster: "Early Diagnosis of Intraocular Disease."

DONCASTER DIVISION.—At Danum Hotel, Doncaster, Thursday, February 24, jointly with Doncaster Medical Society, annual dinner and dance.

DUNDEE BRANCH.—At Queen's Hotel, Dundee, Tuesday, February 22, 8.15 for 8.45 p.m., annual dinner-dance.

EASTBOURNE DIVISION.—At Princess Alice Memorial Hospital, Eastbourne, Tuesday, February 22, 8.30 p.m., meeting. Talk by Dr. T. A. Morrison: "Organization at the Periphery," with special reference to the advantages of co-operation between Division and Branch.

ISLE OF WIGHT DIVISION.—At St. Mary's Hospital, Newport, Thursday, February 24, 8 p.m., meeting. Address by Dr. R. Forbes (Secretary, Medical Defence Union): "Medical Litigation—A Dagger." An open discussion will follow. Members of the legal profession are invited.

KENSINGTON AND HAMMERSMITH DIVISION.—(1) At Princess Louise (Kensington) Hospital for Children, St. Quintin Avenue, W., Tuesday, February 22, 8.30 p.m., meeting to which all medical practitioners in the area of the Division are invited. (2) At St. Charles's Hospital, Ladbroke Grove, London, W., Friday, February 25, 3.30 for 4 p.m., clinical meeting.

KESTEVEN DIVISION.—At Red Lion Hotel, Grantham, Thursday, February 24, 7.15 for 7.45 p.m., dinner; 9 p.m., Dr. Marjory W. Warren: "Geriatrics and Future Developments."

LINCOLN DIVISION.—At Board Room, County Hospital, Lincoln, Thursday, February 24, 8 p.m., meeting to discuss questionnaire on peripheral organization of the Association, Part III.

MIDLAND BRANCH.—At Dudley Road Hospital, Birmingham, Friday, February 25, 8.15 p.m., clinical meeting.

OLDHAM DIVISION.—At Albion Club, Queen Street, Oldham, Monday, February 21, 9 p.m., meeting. Lecture by Dr. L. A. Liversedge: "Some Medical Complications of Sport."

SOUTH-WEST WALES DIVISION.—At Boar's Head Hotel, Carmarthen, Saturday, February 26, 7 for 7.45 p.m., dinner. Annual B.M.A. Lecture by Sir Heneage Ogilvie: "Bile and the Biliary Passages."

TOWER HAMLETS DIVISION.—At St. Andrew's Hospital, Devons Road, Bow, E., Friday, February 25, 3 p.m., clinical meeting. Mr. J. R. M. Whigham: "Bleeding from Duodenal Ulcer."

WEMBLEY DIVISION.—At Gymnasium, Wembley Hospital, Tuesday, February 22, 9 p.m., meeting. Lecture by Dr. R. Donald Teare: "Modern Poisoning." Members of the Willesden and Hampstead Divisions are invited.

WEST LOTHIAN DIVISION.—At Lea Park Hotel, Grangemouth, Wednesday, February 23, 7.45 for 8 p.m., second annual dinner-dance.

S.H.M.O. Meetings

There will be a meeting of Senior Hospital Medical Officers in the Western Region of Scotland on Wednesday, February 23, at 4.15 p.m. in the Hall of the Royal Faculty of Physicians and Surgeons, St. Vincent Street, Glasgow, C.2.

A meeting of Senior Hospital Medical Officers in the South-west Metropolitan Region will be held on Saturday, February 26, at 11 a.m. at B.M.A. House, Tavistock Square, London, W.C.

A meeting of Senior Hospital Medical Officers in the Cambridge Region will be held on Saturday, February 26, at 3.15 p.m. at the Rutland Arms Hotel, Newmarket.

A meeting of Senior Hospital Medical Officers will be held in the Oxford Region on Sunday, February 27, at 3 p.m., at the Maternity Department Lecture Theatre, Radcliffe Infirmary, Oxford.

ANNUAL MEETING: TORONTO, JUNE 20-24

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 26 1955

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British Medical Association, Canadian Medical Association,
and Ontario Medical Association

JOINT ANNUAL MEETING—TORONTO, JUNE 20-24, 1955

President-Elect: THOMAS CLARENCE ROUTLEY, C.B.E., LL.D., M.D., F.R.C.P.(C).

PRELIMINARY SCIENTIFIC PROGRAMME**Monday, June 20****Round Table Conferences**

9 to 10.15 a.m.—(a) The Management of Prostatic Obstruction. Chairman: Dr. C. L. Gosse,* Halifax. (b) Pain. Chairman: Dr. Frank Turnbull,* Vancouver. (c) The Role of the General Practitioner in the Diagnosis and Treatment of Glaucoma. Chairman: Dr. A. J. Elliot,* Toronto. (d) The Problem of the Anaemias. Chairman: Dr. E. S. Mills,* Montreal.

Plenary Session

10.30 a.m. to 12.15 p.m.—The Present Status of Chemotherapy of Bacterial Infections. Chairman and Opening Speaker: Professor L. P. Garrod, London. Speakers: Dr. T. E. Roy,* Toronto; Professor J. W. Crofton, Edinburgh; Dr. K. J. R. Wightman,* Toronto.

Tuesday, June 21**Round Table Conferences**

9 to 10.15 a.m.—(a) Surgery of the Lungs. Chairman: Dr. R. M. Janes,* Toronto. (b) Is Prenatal Care Worth While? Chairman: Dr. Elinor F. E. Black,* Winnipeg. (c) The Prevention and Treatment of Poliomyelitis. Chairman: Dr. C. E. Van Rooven,* Toronto. (d) Alcoholism in Industry. Chairman: Dr. W. Harvey Cruickshank,* Montreal.

General Session

10.30 a.m. to 12.15 p.m.—(1) The Blackader Lecture—Professor Stanley Graham, Glasgow. The Changing Pattern of Paediatrics. (2) Professor Sir Geoffrey Jefferson, Manchester. Title to be announced. (3) Dr. R. M. B. MacKenna, London. Acne Vulgaris and Adult Pre-menstrual Acne.

Wednesday, June 22**Round Table Conferences**

9 to 10.15 a.m.—(a) The Management of Coronary Thrombosis. Chairman: Dr. Harold Segall,* Montreal.

Canadian speakers are denoted by an asterisk ().

(b) Deafness. Chairman: Dr. W. J. McNally,* Montreal. (c) The Management of Rheumatoid Arthritis. Chairman: Dr. Wallace Graham,* Toronto. (d) The Recognition and Management of Depressive Reactions. Chairman: Dr. R. O. Jones,* Halifax.

Plenary Session

10.30 a.m. to 12.15 p.m.—The Clinical Application of Physiology to Medicine and Surgery. Chairman and Opening Speaker: Professor Sir Henry Cohen, Liverpool. Speakers: Dr. Joseph Doupe,* Winnipeg; Sir Henry Dale, London; Dr. J. S. L. Browne,* Montreal.

Panel on National Health Service

3 p.m.—Chairman: Dr. R. W. Richardson,* Winnipeg. (1) Dr. E. A. Gregg, London. Background of the Service. (2) Dr. A. Talbot Rogers, Bromley. The Family Doctor Service. (3) Dr. T. Rowland Hill, London. The Hospital Service. (4) Dr. S. C. Gawne, Preston. The Public Health Service.

Thursday, June 23**Round Table Conferences**

9 to 10.15 a.m.—(a) The Management of Bronchia. Asthma. Chairman: Dr. Bram Rose,* Montreal. (b) The Care of Premature Infants. Chairman: Dr. J. F. McCreary,* Vancouver. (c) Anaesthesia for the Aged Patient. Chairman: Dr. Harold Griffith,* Montreal. (d) Problems in Dermatology. Chairman: Dr. George S. Williamson,* Ottawa.

General Session

10.30 a.m. to 12.15 p.m.—(1) Professor Sir Robert Macintosh, Oxford. A Plea for Simplicity in Anaesthesia. (2) Professor Dugald Baird, Aberdeen. Indications for the Use of Caesarean Section. (3) Dr. William Pickles, Aysgarth, Yorks. The General Practitioner and the Laboratory.

Friday, June 24**Round Table Conferences**

9 to 10.15 a.m.—(a) The Value of Mass Radiography. Chairman: Dr. G. C. Brink,* Toronto. (b) The Treatment

of Burns. Chairman: Dr. S. D. Gordon,* Toronto.
(c) Lumbar Pain. Chairman: Dr. R. I. Harris,* Toronto.
(d) Rehabilitation Following Industrial Injury. Chairman:
Dr. Bruce Young,* Toronto.

General Session

10.30 a.m. to 12.15 p.m.—(1) The Gordon Richards Memorial Lecture—Mr. J. Ralston Paterson, Manchester. Why do Cancer Patients Delay? (2) Sir Heneage Ogilvie, London. What Not to Do in Gall-bladder Surgery. (3) Dr. Desmond Curran, London. The Place of Psychology and Psychiatry in Medical Education.

SECTIONAL MEETINGS**ANAESTHESIA***Wednesday, June 22*

2 to 5 p.m.—(1) Dr. C. Langton Hewer, London. Physiology and Complications of the Trendelenburg Position. (2) Dr. H. R. Griffith,* Montreal. Whither Now in Anaesthesia? (3) Dr. A. R. Hunter, Stockport. Antidotes to Curarizing Drugs. (4) Dr. Leon Longtin,* Montreal. A New Technique of Intubation for the Prevention of Contralateral Infection During Lung Surgery. (5) Quiz Session. Moderator: Dr. B. C. Leech,* Regina.

Thursday, June 23

2 to 5 p.m.—(1) Dr. D. A. Buxton Hopkin, London. Chlorpromazine. (2) Dr. H. J. Shields,* Toronto. History of Anaesthesia in Canada. (3) Dr. Ronald Jarman, London. The Anaesthetic and the Anaesthetist. (4) Dr. Fernando Hudon,* Quebec. Considerations on Recovery Rooms. (5) Dr. R. W. Cope, London. Anaesthesia for Children and the Newborn. (6) Dr. Philip R. Bromage, Emsworth. Spirometry in the Assessment of Analgesia after Abdominal Surgery.

CHILD HEALTH*Tuesday, June 21*

2 to 5 p.m.—Some Problems of the Neonatal Period:—(1) Dr. Mary Crosse, Birmingham. Dr. Jean Webb,* Ottawa. Vital Statistics—Causes of Neonatal Mortality and Morbidity. (2) Professor W. S. Craig, Leeds. Anoxia and Respiratory Failure. (3) Dr. Peter Spohn,* Vancouver. Retrofetal Fibroplasia. (4) Dr. Bruce Chown,* Winnipeg. Erythroblastosis. (5) Dr. Wm. Donohue,* Toronto. Causes of Death in Prematurity. (6) Professor Alan Moncrieff, London. Congenital Malformations, Causation and Prevention. (7) Mr. Denis Browne, London. Congenital Malformations, Surgery.

Wednesday, June 22

2 to 5 p.m.—(A) Problems of Gastro-enteritis:—(1) Dr. Frances Pressick,* Montreal. Bacteriology. (2) Dr. B. E. Schlesinger, London. Drugs and Antibiotics. (3) Dr. W. W. Payne, London. Fluid and Electrolyte Balance. (B) Respiratory Diseases:—(1) Professor W. F. Gaisford, Manchester. Experiences with B.C.G. (2) Dr. Gladys Boyd,* Toronto. Bronchiectasis.

DERMATOLOGY*Wednesday, June 22*

2 to 5 p.m.—(1) Dr. D. I. Williams, London. The Whitfield Tradition in Modern Therapy. (2) Dr. R. Mason Bolam, Newcastle-upon-Tyne. Acute Skin Diseases in General Practice. (3) Dr. Britain Sanders,* Toronto. Ringworm of the Scalp. (4) Dr. B. Usher,* Montreal. Further Studies on the Pathogenesis of Rosacea.

Thursday, June 23

2 to 5 p.m.—Clinical session at Toronto General Hospital presented by the Section of Dermatology, Academy of Medicine, Toronto.

GENERAL PRACTICE*Monday, June 20*

2 to 5 p.m.—Symposium:—The Management of Abortion in General Practice. Moderator: Dr. John Mann,* Toronto. Participants: Dr. Joslyn Rogers,* Toronto. Additional speakers to be announced.

Thursday, June 23

2 to 5 p.m.—(1) Dr. Ian D. Grant, Glasgow. Problems in the Management of the Aged. (2) Dr. Alistair McCrone, Glasgow. Let me see your Tongue: Why? (3) Dr. F. M. Rose, Preston. Problems of Hypertension in General Practice. (4) Dr. Harold F. Robertson,* Toronto. Occluding Arterial Lesions of the Leg. (5) Dr. J. A. McDonald,* Glace Bay. Subject to be announced.

MEDICINE*Monday, June 20*

2 to 5 p.m.—(1) (a) Dr. H. Garfield Kelly,* Kingston. The Mechanism of Heart Failure. (b) Dr. Stephen Whittaker, Warwick. The Treatment of Heart Failure. (2) Dr. Paul David,* Montreal. Indications for and Results of Mitral Valvulotomy. (3) Dr. Hugh Stansfield,* Vancouver. Electrocardiographic Patterns in Atypical Acute Coronary Occlusion. (4) Dr. Kenneth Harris, London. Clinical Aspects of Atypical Coronary Disease. (5) Dr. William Evans, London. Treatment of Cardiac Infarction—Immediate and Late.

Wednesday, June 22

2 to 5 p.m.—(1) Dr. E. R. Cullinan, London. The Essential Nature, Effects, and Treatment of Simple Obesity. (2) The Sprue Syndrome: (a) Professor A. C. Frazer, Birmingham. Idiopathic Steatorrhoea. (b) Dr. Douglas Cameron,* Montreal. Secondary Steatorrhoea. (3) Dr. A. W. Bagnall,* Vancouver. Post-Menopausal Osteoporosis. (4) Dr. Guy E. Joron,* Montreal. Diagnosis and Treatment of Acute Pyelonephritis in Diabetes Mellitus.

Thursday, June 23

2 to 5 p.m.—(1) Dr. David A. Long, London. The Aetiology of Rheumatic Fever. (2) (a) Dr. E. C. Warner, London. The Nature of the Physiological Disturbance in Chronic Pulmonary Emphysema. (b) Dr. T. H. Aaron,* Edmonton. The Modern Treatment of Chronic Pulmonary Emphysema. (3) Dr. William I. Morse,* Boston. Investigation of the Haemorrhagic Diatheses. (4) Dr. John P. Gemmell,* Winnipeg. Choice of Treatment in Hyperthyroidism.

NEUROLOGY*Monday, June 20*

2 to 5 p.m.—(1) Dr. Hugh Garland, Leeds. Diabetic Neuropathy. (2) Sir Charles Symonds, London. Cough Headache—A Benign Syndrome. (3) Dr. E. H. Botterell,* Toronto. Hypothermia in Cerebral Vascular Surgery. (4) Dr. W. M. Loughheed,* Toronto. Hypothermia for Neurological Surgery: Evaluation of the Method. (5) Dr. W. Ritchie Russell, Oxford. Observations on Interstitial Neuritis. (6) Dr. T. Rowland Hill, London. Some Problems of Peripheral Neuropathy.

Wednesday, June 22

2 to 5 p.m.—(1) Mr. D. W. C. Northfield, London. The Results of Treatment of Cervical Spondylosis with Neurological Manifestations. (2) Professor Sir Geoffrey Jefferson, Manchester. The Integration of Coma. (3) Dr. Wilder Penfield,* Montreal. The Results of Cortical Excision in the Treatment of Focal Epilepsy. (4) Dr. Macdonald Critchley, London. Observations on Aphasia. (5) Dr. Douglas McAlpine, London. Some Observations on the Diagnosis and Treatment of Multiple Sclerosis.

OBSTETRICS AND GYNAECOLOGY*Tuesday, June 21*

2 to 5 p.m.—(1) Dr. Douglas Frew,* Edmonton. What is Adequate Prenatal Care To-day? (2) Mr. S. Bender, Liverpool. Infertility. (3) Dr. F. L. Johnson,* Hamilton. The Management of Breech Presentations. (4) Mr. John Peel, London. The Management of the Diabetic Patient in Pregnancy. (5) Dr. Otto Schmidt,* Winnipeg. Induction of Labour—Its Use and Abuse.

Thursday, June 23

2 to 5 p.m.—(1) Dr. Carl Tupper,* Halifax. The Management of Spontaneous Abortion—A Combined Approach. (2) Mr. Malcolm Donaldson, London, and Dr. Paul Latour,* Montreal. The Early Diagnosis of Cancer of the Cervix. (3) Miss Gladys Hill, London. Functional Bleeding. (4) Professor David Stewart, Jamaica. Treatment of Suppression of Urine Following Eclampsia.

OCCUPATIONAL MEDICINE*Tuesday, June 21*

2 to 5 p.m.—(1) Dr. A. H. Sellers,* Toronto. The Procuring of Comparable Industrial Medical Statistics. (2) Dr. J. E. Goodwin,* Toronto. Indicating in Advance a Susceptibility to Noise. (3) Dr. Ian Urquhart,* Toronto. Problems of Resuscitation in Industry. (4) Dr. J. H. Baillie,* Toronto. Some Considerations of Sickness Absenteeism in a Non-hazardous Industry. (5) Dr. J. J. O'Dwyer, London. The Contribution of the Doctor to the Management Team.

Thursday, June 23

2 to 5 p.m.—(1) Dr. John Rogan, London. The Health of the British Coal-miner. (2) Dr. R. Appleford,* Oakville. The Detection of Diabetes on Preplacement Blood Examinations. (3) Dr. C. G. Shaver,* St. Catharines. Silicon Carbide as an Industrial Hazard. (4) Dr. S. G. McLean, London. Some Aspects of Health in the Oil Industry. (5) Surgeon Commander F. P. Ellis, R.N., Washington. Environmental Health in the Royal Navy. The Changing Scene.

OPHTHALMOLOGY*Monday, June 20*

2 to 5 p.m.—(1) Mr. James H. Doggart, London. Vessels of the Ocular Fundus as a Guide to Prognosis. (2) Mr. J. W. Tudor Thomas, Cardiff. On Advising a Corneal Graft. (3) Dr. I. Lloyd Johnstone, Worcester. The Operative Treatment of Abducens Palsy. (4) Dr. Charles Dyson, London.* Chordomata of Ocular Interest. (5) Dr. Howard Reed,* Winnipeg. Some Observations on the Results of Cataract Extraction. (6) Dr. C. D. Baird,* Chatham. Diseases of the Meibomian Glands.

ORTHOPAEDIC SURGERY*Wednesday, June 22*

2 to 5 p.m.—(1) Mr. H. Jackson Burrows, London. Replacement of Bone by Internal Prostheses. (2) Dr. J. Bateman,* Toronto. Management of Acute Nerve Injuries. (3) Dr. J. M. Janes,* Rochester. Peripheral Vascular Surgery from the Standpoint of the Orthopaedic Surgeon. (4) Mr. J. P. Jackson, London. Results of Chemotherapy in Bone and Joint Tuberculosis. (5) Dr. George Pennal,* Toronto. The Thomas Splint. (6) Mr. H. H. Langston, Winchester. A Plea for a Rational Outlook on the Internal Fixation of Fractures. (7) Dr. A. Jousse,* Toronto (Chairman). Symposium on Traumatic Paraplegia.

Thursday, June 23

2 to 5 p.m.—(1) Mr. Philip Wiles, London. The Aetiology of Postural Defects. (2) Mr. Denis Browne, London. The Causation of Certain Congenital Deformities and Their Treatment by Controlled Movement. (3) Dr. L. P. Roy,* Quebec. Bone Tumours. (4) Dr. F. P. Patterson,* Vancouver. Complications of External Pin Fixation in Orthopaedic Surgery.

(5) Dr. G. L. Burke,* Vancouver. Some Observations on the Feet and Legs in Childhood. (6) Dr. A. A. Butler,* Montreal. Evaluation of the Use of Hydrocortone in Orthopaedic Surgery. (7) Mr. J. P. Campbell, Nottingham. Treatment of Osteoarthritis of the Hip by Osteotomy. (8) Dr. R. Garipey,* Montreal. The Surgical Management of Osteoarthritis of the Knee-Joint. (9) Dr. J. N. Swanson,* Toronto. Some Orthopaedic Problems Connected with Gouty Arthritis.

OTOLARYNGOLOGY*Tuesday, June 21*

2 to 5 p.m.—(1) Dr. David H. Ballon,* Montreal. Review of Foreign Body Endoscopy Over a Period of Thirty Years. (2) Dr. R. E. Greenway,* London. Results of Cobalt Therapy in Malignancies of the Nose and Throat. (3) Dr. J. A. Sullivan,* Toronto. Clinical Testing of Vertigo. (4) Mr. Victor Negus, London. Air Conditioning Mechanism of the Nose.

Wednesday, June 22

2 to 5 p.m.—(1) Mr. Terence Cawthorne, London. Facial Palsy. (2) Mr. Ronald Macbeth, Oxford. The Treatment of Oesophageal Varices in Portal Hypertension by Means of Sclerosing Injections. (3) Dr. Edward Tremble,* Montreal. A Few Highlights Concerning Respiratory Cilia. (4) Dr. Howard McCart,* Toronto. Parotid Tumours.

PREVENTIVE MEDICINE*Monday, June 20*

2 to 5 p.m.—(1) (a) Professor R. Cruickshank, London. The Epidemiology of Upper Respiratory Tract Infections. (b) Dr. G. Dempster,* Toronto. Acute Respiratory Disease. (c) Dr. Elizabeth Chant Robertson,* Toronto. Ultra-violet Radiation in the Control of Respiratory Disease. (2) *Occasional Paper*—Dr. John Gardiner,* Toronto. The Heart Registry.

Wednesday, June 22

2.30 to 5 p.m.—(1) Dr. H. J. Parish, London. Combined Immunization. (2) Dr. A. R. Foley,* Quebec, and Dr. James M. Mather,* Vancouver. Combined Immunization from the Viewpoint of the User in the Field. (3) Dr. P. J. Moloney,* Toronto. Antigenic and Immunological Aspects of Combined Immunization.

PSYCHIATRY*Tuesday, June 21, and Thursday, June 23*

2 to 5 p.m.—(1) Dr. A. E. Moll,* Montreal. The Psychopathology of Suicide. (2) Dr. G. C. Sisler,* Winnipeg. The Treatment of Suicidal Attempts. (3) Dr. Wm. C. Gibson,* Vancouver. Basic Sciences in Psychiatry—Physiology. (4) Dr. John W. Lovett Doust,* Toronto. Basic Sciences in Psychiatry—Psychology.

(Names of contributors from the United Kingdom not yet available.)

RADIOLOGY*Wednesday, June 22*

2 to 5 p.m.—*Diagnosis*:—(1) Dr. L. R. Harnick,* Toronto. Diodrast Arthrography of the Knee, and Surgical Correlation. (2) Dr. R. A. Macpherson,* Winnipeg. Ulceration of the Duodenal Bulb without Deformity—A Clinical-Radiological Correlation in (number) Cases. (3) Dr. Guillaume Gill,* Montreal. Ureteral Block and Kidney Function.

(Names of contributors from the United Kingdom not yet available.)

Thursday, June 23

2 to 5 p.m.—*Therapy*:—(1) Dr. Ethlyn Trapp, Vancouver. (2) Dr. Jean Bouchard,* Montreal. (3) Dr. Ronald Burr,* Kingston. Intracavity Irradiation of Carcinoma of the Bladder.

(Names of contributors from the United Kingdom not yet available.)

SURGERY

Monday, June 20, and Tuesday, June 21

2 to 5 p.m.—Two sessions of the Section of Surgery are planned for Monday, June 20, and Tuesday, June 21. The complete list of speakers from the United Kingdom and Canada is not yet available.

UROLOGY

Wednesday, June 22

2 to 5 p.m.—(1) Mr. H. P. Winsbury-White, London. Early Signs of Bladder-neck Disease. (2) Dr. John K. Lattimer, New York. The Role of the General Practitioner in the Treatment of Genito-urinary Tuberculosis. (3) Mr. Leslie N. Pyrah, Leeds. The Use of the Ileum in Genito-urinary Surgery. (4) Mr. A. W. Badenoch, London. Haematuria. (5) Dr. Thomas Russell,* Toronto. Urinary Tract Infections.

GENERAL MEDICAL SERVICES COMMITTEE

EXTRAVAGANT PRESCRIBING: DISCIPLINARY MACHINERY

At the monthly meeting of the General Medical Services Committee on February 17, Dr. A. TALBOT ROGERS presiding, discussion took place on the disciplinary machinery designed to discourage extravagant prescribing. The matter arose on a resolution from the Birmingham Local Medical Committee expressing disquiet at the apparent viciousness of the fine recommended in a recent case reported in the *Supplement* (November 20, 1954, p. 191, and February 5, p. 41), and requesting the General Medical Services Committee to consider this important matter very fully.

The CHAIRMAN said that, altogether apart from the case cited, the disciplinary machinery in these cases deserved some attention. It had to be acknowledged that in spite of every effort made by the Committee and by the Ministry there had been in the last recorded year a further increase of 4,500,000 in the number of prescriptions issued, and a rise of one penny—a smaller rise than usual—in average cost. The "big fine" case reported in the *Supplement* had led to a good deal of correspondence, and dissatisfaction had been expressed at the way in which it was dealt with. But there might have been factors in the case which were not brought out in the report; for example, it was not stated whether the practitioner had received any previous warning. He reminded the Committee that if there was reason to believe that a practitioner was grossly over-prescribing his attention was first drawn to the matter by a visit from the regional medical officer. This was followed some months later by another examination of the practitioner's prescribing, and in the great majority of cases, of course, the records showed that the practitioner had profited by the warning. He understood that it was only if it could be shown, after that first informal visit and the subsequent re-examination, that the practitioner's extravagance had continued that disciplinary action was taken.

Dr. D. F. HUTCHINSON said that he suspected that the procedure which the Chairman had just outlined was unknown to the majority of practitioners, and Dr. HOWIE WOOD suggested that opportunity should be taken to circulate local medical committees on the subject.

It was agreed that the procedure followed in the investigation of alleged over-prescribing—the preliminary warning and the disciplinary action only after the warning had been shown to have no effect—should be publicized as widely as possible.

Payments to Elderly Doctors

The question of supplementary annual payments for elderly doctors came forward on a report by the Chairman of a discussion which he and the Deputy Secretary had had at the Ministry with Dame Enid Russell-Smith. The suggestion had been previously made to the Ministry on the recommendation of the Working Party that the central com-

mittee should rely on the views of local medical committees in deciding whether or not doctors of 75 years and over were providing full general medical services. The Ministry had expressed some dubiety at this, feeling that members of local medical committees would be reluctant to take any action which might penalize their elderly colleagues. It was stated that there were about 80 practitioners of 75 and over in single-handed practice who appeared to be eligible for consideration. So far over 50 of these had applied for supplementary payments, and in no instance had the executive council or the local medical committee expressed doubt concerning the applicant's fitness.

The CHAIRMAN stated that at the interview he and Dr. Stevenson had pointed out that it would not be possible, except in the most patent cases, for any visitor from the central committee to decide the fitness of a practitioner. Members of the local medical committee would be in a much better position to make an assessment of all the circumstances.

The Committee endorsed the action taken by the Chairman, the understanding being that the initiative rested with the local medical committee, and only when doubtful cases came forward would it be proper for a member of the central committee to join with a member of the local committee in seeing the practitioner. It was pointed out that in these cases much depended upon the locality of the practice and the degree of local competition. If there were other doctors available and an elderly doctor was obviously unfit, the patients themselves would more or less solve the problem. It was also felt that the elderly man, given adequate deputizing arrangements and relieved from night work, could quite happily carry on and no difficulties were likely to arise. The view was expressed that the medical profession had no need to adopt the arbitrary retirement age of the Civil Service, which was intended, not to displace inefficient seniors, but to facilitate the promotion of juniors. It was also questioned whether the criterion of fitness to carry on should be solely that of age, and one member suggested that if it came to a question of retirement there were some younger practitioners who might well be retired. It was agreed that appropriate advice on the matter should be sent to local medical committees.

Employment of General Practitioners in Hospitals

Dr. A. N. MATHIAS, who had been requested to attend as a representative of a meeting of the Medical Staff Subcommittee of the Central Consultants and Specialists Committee, reported that two members had raised an apparently quite serious objection affecting the association of general practitioners with hospitals in the smaller towns—namely, that general practitioners not on the staffs of the hospitals were sometimes unwilling to send patients to a hospital staffed by specialists who were also general practitioners in the area.

The CHAIRMAN said that the policy of the Committee had always been to encourage the employment of general practitioners in hospitals in any capacity for which their training and experience fitted them, even to the extent of taking clinical charge of a department or out-patient clinic. A consultant mentioned to him one general practitioner whose training and experience were such as to make him a considerable asset to the hospital, but objection had been taken by two other practitioners of a rival firm, both of whom held appointments in the hospital. The Chairman asked whether, if this were at all a general attitude, they were justified in hoping for the integration of general practice with hospital posts. He did not wish to be the spokesman of a policy there was no hope of implementing.

Several members gave their experiences in this respect. Mr. NICHOLSON-LAILEY said that there had always been some general practitioners who had objected, just as there were some consultants who would banish general practitioners from hospitals altogether. Notwithstanding that, they had in his area some first-class general practitioners in hospitals, and some of the hospitals could not have continued without

their help. Dr. H. C. FAULKNER said that the attitude of these few general practitioners was incomprehensible. This was a red herring which ought not to affect their judgment. Many general practitioners enriched their clinical experience by taking part in hospital work.

On the motion of Dr. MATHIAS, the Committee reaffirmed its policy.

The Assistant in General Practice

Dr. BRUCE CARDEW introduced the report of a subcommittee which was appointed at the December meeting to investigate the employment of assistants. He said that this problem had been under discussion in the Committee for two years. The real problem did not lie in the size of the list; it was encountered equally in the case of a principal with quite a small list. Exploitation of assistants was more likely to occur when the assistant was obliged to undertake more than a fair share of the work of the practice or was not paid a salary commensurate with the work he did, and no reduction of the extra list could remedy cases of that sort. The subcommittee held the view that there was nothing improper in a principal enjoying a monetary reward in respect of the indefinite employment of an assistant, provided that the salary and allowances paid were commensurate with the responsibility undertaken and that the assistant had had no reason to believe that the appointment would lead to a partnership.

From this the subcommittee had proceeded to try to find a solution to deal with cases which did not conform with these provisos. Its first recommendation, an uncontentious one, was that further efforts should be made, through the deans of medical schools, to ensure that final-year students and newly qualified practitioners were fully informed of the importance of entering into a formal agreement when accepting a post of assistant. Secondly, it was found to be in the power of an executive council to lay down how many extra names on his list a principal should be permitted by virtue of employing an assistant, and it was recommended that executive councils should, in consultation with local medical committees, periodically review all cases in which consent had been given, and should have power, again on advice of local medical committees, and after reasonable warning, either to withdraw their original consent to the employment of an assistant or to modify the number of additional patients permitted. It was proposed also that an appropriate letter be sent to local medical committees drawing their attention to the proposed arrangements and offering general guidance when advising their executive councils. The final recommendation was that a principal implementing a "view" registered with the executive council should have the right to claim retrospective payment on the basis of notional lists for a period up to a maximum of one year. In presenting the report Dr. Cardew paid a tribute to the Deputy Secretary, who was responsible for its drafting.

The CHAIRMAN said that the report would go to the Assistants and Unestablished Practitioners Subcommittee for its observations, and Dr. L. RUSSELL, representative of assistants on the main Committee, said that he would reserve any comments for the subcommittee. Certain amendments of phraseology in the recommendations were suggested. Dr. C. M. SCOTT wanted it to be stated that the number of additional patients permitted to a principal by virtue of the employment of an assistant should normally be 2,000, but Dr. Cardew said that he could not agree with this suggestion; he did not think this was the proper place to insert anything about the size of the list. Dr. WAND said that he felt it should be indicated in the recommendations that the normal situation still remained—that is, a figure of 2,000 additional patients for an assistant—although action in the terms set out might be taken by the executive council in individual instances. One member used the word "concessions" in relation to the report, but Dr. J. A. PRIDHAM, a member of the subcommittee, took objection to this, saying that the subcommittee had made what it thought to be a proper statement of the position, with certain recommendations.

After various suggested rephrasings it was agreed to refer the report to the Assistants and Unestablished Practitioners Subcommittee for its comments.

Other Business

On the motion of Dr. KATE HARROWER, seconded by Dr. A. BEAUCHAMP, it was unanimously agreed to invite the Minister of Health to address the Annual Conference in May.

A letter was read from the secretary of the Medical Research Council in reply to the resolution of the Representative Body on the subject of general-practitioner representation on the Clinical Research Board. Sir Harold Hims-worth said that the Council was most anxious to encourage medical research by each and every branch of the profession. Membership of the Board was based on representation of fields of medical knowledge and personal merit in research. Both these principles were compatible with a general practitioner being appointed, but neither was compatible with a proposal that any particular branch of the profession should have a pre-emptive right to a seat on the Board. The CHAIRMAN said that this was a helpful letter, and it was up to general practitioners as a section of the profession to show that there were general practitioners who justifiably might be considered for their own merit.

Following a matter which arose at the last meeting, a letter and circular by Dr. Cardew, secretary of the Medical Practitioners' Union, concerning the establishment by the Union of a section to deal with assistants was before the Committee. It stated that the policy of the new section would be determined by its members, and the final policy agreed on by the section and the council of the Union would be submitted to the General Medical Services Committee for its consideration. In view of the misunderstanding which had arisen the Union had postponed a meeting which had been arranged. This did not imply any change of policy with regard to the new section, which was now in being. The CHAIRMAN said that he himself was very gratified by the letter, and the incident closed without further discussion.

Following a joint meeting of representatives of the Mileage Subcommittees for Scotland and for England and Wales, consideration was given to a claim for an increase in the amount of mileage allocated to the Highlands and Islands, which constitutes a charge on the global mileage fund for Great Britain. It was recommended, and the Committee agreed, that the allocation be increased by the sum of £20,000.

POSTGRADUATE COURSES IN THE BAHAMAS

With the agreement of the Chief Medical Officer of the Bahamas, a scheme has been launched to provide short postgraduate courses (mainly for general practitioners) at Nassau, Bahamas, from April, 1955. Accommodation, including an auditorium, will be available in the British Colonial Hotel, and cases will be shown in the Bahamas General Hospital. Prospective applicants are asked to indicate the subjects in which they would be interested. Inquiries should be addressed to Dr. B. L. Frank, 1290, Pine Avenue West, Montreal, Canada.

REMUNERATION OF MEDICAL OFFICERS IN PUBLIC HEALTH SERVICE

March 29 has been fixed as the date of the hearing by the Industrial Court of the dispute in Committee C of the Medical Whitley Council over the remuneration of medical officers in the public health service referred for arbitration (*Supplement*, January 1, p. 3).

CONSULTANT AND OTHER SPECIALIST STAFF IN NATIONAL HEALTH SERVICE HOSPITALS

The tables printed below have been made available by the Ministry of Health and Department of Health for Scotland. All the figures relate to Great Britain.

Table I shows the age distribution in 1954 of consultants and senior hospital medical officers practising in the various specialties. Some, especially those in the older age groups, have contracts for only a small number of sessions, and it therefore does not follow that each retirement would provide a vacancy for a new recruit.

Table II shows the increase in the number of consultants in each of the specialties between the end of 1949 and June 30, 1954.

The corresponding figures for senior hospital medical officers are not available.

Table III shows the number of senior registrars in each specialty in 1954 at the various stages of their training. The column headed "Others" includes those holding "transitional" posts.

TABLE I.—Age Distribution in 1954 of Consultants and S.H.M.O.s in Each Specialty (Great Britain)

Year of Birth	General Medicine	Diseases of the Chest	Mental Health	Neurology	Pædiatrics	Radiology	Radiotherapy	Physical Medicine	Pathology	Infectious Diseases	Dermatology	Venerology	Ophthalmology	General Surgery	Anæsthetics	Neurosurgery	Plastic Surgery	Thoracic Surgery	Orthopaedic Surgery	Ear, Nose, and Throat Surgery	Obstetrics and Gynaecology	Miscellaneous	Totals	Year of Birth
1883	1								1			1	1	1									2	1883
1884	1								1			1	1	1									2	1884
1885	1								1			1	1	1									2	1885
1886	2								2			2	2	2									3	1886
1887	2								2			2	2	2									3	1887
1888	7	6	1	1	1	5		1	2			1	5	3	1								14	1888
1889	11	2	1	1	1	5		1	7			1	5	3	1								17	1889
1890	13	2	1	3	1	6		1	8			2	6	17	4	1							43	1890
1891	18	2	3	3	1	6		1	11			3	10	16	8	1							59	1891
1892	11	9	9	8	10	10		3	9			3	7	23	2								103	1892
1893	24	7	10	1	3	11		3	7			6	11	20	8	2							134	1893
1894	15	9	13	2	8	12		2	7			3	17	24	12								144	1894
1895	20	12	13	1	3	11		1	18			2	15	23	13								151	1895
1896	23	8	19	1	5	11		3	16			7	15	22	15								157	1896
1897	32	11	27	1	4	14		3	21			6	11	27	17								205	1897
1898	31	10	30	3	6	17		3	14			6	7	24	27								235	1898
1899	27	16	35	4	2	17		7	8			6	4	30	50								246	1899
1900	48	24	42	2	10	14		4	17			6	11	49	38								302	1900
1901	41	20	34	5	12	12		3	10			5	10	51	45								377	1901
1902	29	32	42	5	12	12		3	10			5	10	42	37								339	1902
1903	38	27	30	5	6	11		3	10			5	10	54	42								345	1903
1904	40	21	32	5	10	10		4	10			5	11	49	38								316	1904
1905	35	26	42	1	6	13		3	25			11	14	57	29								296	1905
1906	37	20	42	1	7	11		3	25			11	15	57	32								302	1906
1907	63	27	38	6	11	10		3	22			6	16	38	27								309	1907
1908	43	20	40	4	11	10		6	3			6	16	38	27								360	1908
1909	49	22	31	6	14	13		3	27			4	4	22	39								347	1909
1910	52	26	39	6	15	20		3	35			10	9	24	68								412	1910
1911	49	42	43	2	11	28		4	30			8	18	47	38								405	1911
1912	45	23	46	2	11	28		4	30			8	18	47	38								366	1912
1913	52	42	39	3	9	25		4	43			5	13	50	41								440	1913
1914	55	41	46	2	10	29		12	4			5	18	57	46								454	1914
1915	60	44	48	5	14	26		4	7			8	23	50	46								481	1915
1916	52	53	42	3	17	31		6	5			3	24	34	60								446	1916
1917	34	28	36	4	13	17		11	4			1	5	22	29								359	1917
1918	20	33	24	2	16	18		10	35			12	2	14	20								281	1918
1919	28	22	28	2	6	20		9	32			7	2	13	14								242	1919
1920	19	24	31	4	4	14		4	1			4	2	8	18								206	1920
1921	3	13	15	1	7	7		1	1			2	9	8	2								155	1921
1922	3	13	15	1	7	7		1	1			2	9	8	2								60	1922
1923	1	8	7		1	4		1	7			1	8	11	7								43	1923
1924	3	1	1			1			2			1	8	11	7								19	1924
1925	1	2	1										3	1	1								15	1925
1926	1	1											3	1	1								4	1926
1927													1										1	1927
Total	1,139	756	1,000	73	248	521	151	95	810	135	196	172	594	1,189	1,082	49	46	92	391	387	580	2	9,708	Total

Note.—Consultants and S.H.M.O.s practising in more than one specialty have been included under each.

TABLE II.—Numbers of Consultants in Each Specialty at Various Dates Since December 31, 1949 (Great Britain)

	General Medicine	Diseases of the Chest	Mental Health	Neurology	Pædiatrics	Radiology	Radiotherapy	Physical Medicine	Pathology	Infectious Diseases	Dermatology	Venerology	Ophthalmology	General Surgery	Anæsthetics	Neurosurgery	Plastic Surgery	Thoracic Surgery	Orthopaedic Surgery	Ear, Nose, and Throat Surgery	Obstetrics and Gynaecology	Totals
31/12/49	755	216	449	53	166	327	85	49	495	50	127	89	331	927	496	37	30	49	252	312	424	5,719
31/12/50	831	250	504	53	202	378	93	57	526	52	136	101	341	943	602	39	32	57	269	328	439	6,213
31/12/51	857	266	532	59	208	400	101	61	541	48	135	99	342	948	655	42	33	66	293	341	449	6,476
31/12/52	904	310	566	61	214	414	108	70	581	51	142	97	351	986	714	44	36	81	320	339	473	6,862
31/12/53	905	340	595	67	222	436	112	75	631	60	145	94	342	982	748	46	43	89	328	346	473	7,079
30/6/54	916	341	600	66	225	439	113	74	634	59	147	93	338	986	767	48	45	90	330	348	477	7,138

Note.—Consultants practising in more than one specialty have been included under each.

TABLE III.—Number of Senior Registrars in Each Specialty in 1954 (Great Britain)

Specialties	Training Plan					Others	Grand Total
	1st Year	2nd Year	3rd Year	4th Year	Total		
General medicine	44	33	25	22	124	77	201
Diseases of the chest	24	18	4	9	55	10	65
Mental health	51	29	12	10	102	27	129
Neurology	3	3	5	4	15	4	19
Pædiatrics	11	5	7	1	24	17	41
Radiology	28	21	8	4	61	1	62
Radiotherapy	5	7	2	3	17	2	19
Physical medicine	4	3	2	1	10	2	12
Pathology	21	21	14	7	63	27	90
Infectious diseases	2	2	—	—	4	3	7
Dermatology	3	1	—	—	4	10	14
Venerology	12	14	9	11	46	11	57
Ophthalmology	50	40	24	20	134	69	203
General surgery	31	15	12	1	59	8	67
Anæsthetics	2	5	—	—	7	5	12
Neurosurgery	2	2	6	4	14	3	17
Thoracic surgery	8	3	3	4	18	12	30
Orthopaedic surgery	13	14	13	10	50	22	72
Ear, nose, and throat surgery	13	12	8	2	35	13	48
Obstetrics and gynaecology	16	15	17	13	71	35	106
Others	1	—	—	—	1	1	2
Total	356	269	177	141	943	363*	1,306*

* Includes 61 honorary and 41 part-time senior registrars.

DRUG PRICES NOT EXCESSIVE TREASURY'S VIEW

A Treasury minute in a report from the Committee of Public Accounts of the House of Commons states that the investigation of the cost of standard drugs and preparations has been completed. A scrutiny of the margin of profit, turnover, and capital employed of a sample of 19 companies with an annual turnover of about £24m. showed that the annual percentage of profit to capital employed was 13.6%.

The minute says that the problem of deciding what prices the Health Service should fairly and reasonably pay for pharmaceutical products is one of considerable complexity. Only one-third of the output of the pharmaceutical industry is supplied to the Health Service, the rest being privately sold or exported. The proportions are difficult to ascertain accurately, and prices fixed for Health Service supplies must also apply to supplies to other purchasers, including exports.

Bearing in mind the substantial volume of business unrelated to the Health Service included in the turnover of the firms concerned, the minute continues, it seemed to the Departments and to the Treasury "that the general level of profits earned did not suggest that the level of prices in this field had been excessive or that intervention by the Departments was called for."

Discussions with the industry on the general principles on which it would be reasonable to fix prices for proprietary preparations are continuing.

NUMBERS OF DOCTORS

As reported in this week's Parliamentary news (*Journal*, p. 546) the Minister of Health and the Secretary of State for Scotland have appointed a committee of inquiry into the numbers of doctors likely to be needed in the future. In January, 1954, the Council of the Association approached the Minister of Health asking him to set up a Working Party for this same purpose. The following letter, explaining the Minister's decision to appoint a committee and not a Working Party as suggested by the B.M.A., has been received by the Secretary of the Association from Sir John Hawton, Permanent Secretary of the Ministry of Health.

"Since you wrote to me on January 20, 1954, the Minister and Secretary of State for Scotland have given careful consideration to the suggestion, made by the Council of the Association, that

¹Special Report from the Committee of Public Accounts, Session 1954-5, 1955. H.M.S.O., London.

the Association and various other bodies concerned should appoint representatives to a working party to make a detailed inquiry into the future number of medical practitioners and students.

"So far as the need for a detailed inquiry is concerned, the Ministers are in full agreement with the view expressed by the Council. They do not, however, consider that a representative working party of the kind suggested in your letter would be the best method of undertaking such an inquiry. Your letter mentioned by name an appreciable number of bodies that have an interest in this matter, but you made it clear that the list you gave was not intended to be exhaustive, and in the Ministers' view it would be quite impracticable, on the basis of full representation for all interests, to secure a body sufficiently compact for an efficient detailed study of a problem of this nature. The Ministers have therefore come to the conclusion that it would be preferable for them to appoint a small committee, before whom all the interested bodies can be given full opportunity of laying their views.

"As you will recollect, this method of proceeding was informally discussed with officers of the Association before a final decision was taken, and, following a suggestion that was then made, the Ministers agreed that the committee—although small—should include two general medical practitioners. As, however, it was felt to be proper that in accordance with the usual practice the first announcement of the Ministers' intentions should be made to the House of Commons, prior consultation with the Association could not take place in any more formal manner. For the same reason and because of the large number of bodies that could claim an interest in future medical manpower, it was not practicable to have formal consultations about the membership of the committee."

See annotation at p. 529.

SENIOR HOSPITAL MEDICAL OFFICERS GROUP

The following is a list of S.H.M.O.s who are acting as regional conveners for the recently formed S.H.M.O. Group of the Association:

<i>Region</i>	<i>Name and Address</i>
Newcastle	Dr. A. T. G. Evans, 26, Roker Park Road, Sunderland, Co. Durham.
Leeds	Dr. James Tyrrell, 23, Woodthorpe Lane, Wakefield, Yorks.
Sheffield	Dr. Gwyn Howells, 11, Shaldon Drive, Littleover, Derby.
East Anglia	Dr. C. B. V. Walker, Church Lane, Shepreth, Royston, Herts.
North-west Metro- politan	Mr. R. Hochhauser, Barnet General Hospital, Barnet, Herts.
North-east Metro- politan	Dr. P. J. Feeny, 150, Harley Street, London, W.1.
South-west Metro- politan	Dr. F. A. Nash, Mass Radiography Service, Grove Hospital, London, S.W.17
South-east Metro- politan	Dr. D. L. Pugh, 85B, London Road, Maidstone, Kent.
Oxford	Dr. J. Rankin, "Hunter's Moon," Shinfield Green, Reading.
South-western	Mr. George Lowe, Clare House, Tiverton, Devon.
Wales	Dr. G. M. L. James, 10, Long Oaks Avenue, Swansea, Glam.
Birmingham	Dr. F. E. Griffiths, 21, Station Road, Kenilworth, Warwick.
Manchester	Dr. T. F. McCarthy, The Residence, Nab Top Sanatorium, Marple, Cheshire.
Liverpool	Dr. W. D. Gray, 5, Brockholme Road, Mossley Hill, Liverpool, 18.
Western (Scotland)	Dr. J. F. Swan, Eldon Place, Greenock, Scotland.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Doctors' Telephones

SIR,—I could not agree more with my friend Mr. W. Gissane (*Supplement*, February 12, p. 48) that a telephone is necessary to a whole-time clinician. In pre-war days the L.C.C. had a ruling that a non-resident whole-time physician or surgeon must be on the telephone. If this rule were shown to one's income-tax inspector the rental was allowed as a necessary expense.

Mr. Gissane's logic, however, is not clear over the question of a motor-car. A whole-time director of a hospital service must get to his hospital, sometimes quickly, and not always at regular times. This, in legal eyes, is only a question of getting there and he is not in the performance of his duties until he is within the curtilage of the hospital. If a whole-time consultant could claim, as a necessary expense, the cost of travelling from his home to hospital, the logical deduction from this is that every single worker in Britain should be allowed to claim his fares for travelling from home to his place of employment. This point was argued in the High Court of Justice in 1930 (case of *Norden v. Walters*). If the consultant has to make an urgent journey to hospital outside his regular sessions he is entitled to reclaim the cost of this journey from the regional board or board of governors.

It is sometimes stated that a consultant holding a part-time contract under the N.H.S. is treated differently in this matter. If the consultant lives (as many do) some considerable distance from his consulting-rooms where he carries on practice, then he is not legally entitled to claim travelling expenses from his home to his "place of work." If this principle were allowed one could foresee, in the not-far-distant future, a surgeon, wishing to live many miles from his hospital and having a perfect right to claim as expenses the cost of travelling to hospital by helicopter or aeroplane.—I am, etc.,

London, W.1.

HENRY K. VERNON.

Filling Practice Vacancies

SIR,—Since you publish practice vacancies in your columns you may be interested in the following account. If not, perhaps some of your readers who apply for similar vacancies may like to know how things are likely to go.

A practice was recently offered for a husband and wife, experienced general practitioners. From about 70 candidates a short list of 9 couples were interviewed. Four of these were husband and wife partnerships, two couples at least having spent over five years in general practice already. The "sitting tenants" were asked to make a recommendation, and they chose a couple who had been seven years in general practice with obstetric experience, and both, incidentally, with a record of war service. The executive council finally allotted the practice to two men, one who had been one year in general practice and the other who was still a registrar in hospital. At the interviews heavy weather was made of the fact that the wives had children. But this surely is not unusual among married couples, nor even need it be a handicap. All the wives admitted to having good domestic help, and, as there were not two full lists but only one and a half, the practice need not have suffered.—I am, etc.,

"WOMAN PRACTITIONER."

Correction.—The member of Council for Branches in the Republic of Ireland for 1955-8 is J. C. McFeely, not J. C. McFreely as printed in the *Supplement* "Association Notices" (February 12, p. 50).

Association Notices

Diary of Central Meetings

MARCH

- 2 Wed. Council, 10 a.m.
- 3 Thurs Homosexuality and Prostitution Committee, 10.30 a.m.
- 4 Fri. Joint Committee of the B.M.A. and the Magistrates' Association, 10.15 a.m.
- 8 Tues. Constitution Committee, 11 a.m.
- 8 Tues. Joint Meeting of the Coroners and Medical Witnesses Subcommittees, Private Practice Committee, 2 p.m.
- 10 Thurs. Psychological Medicine Group Committee, 2 p.m.
- 16 Wed. Occupational Health Committee, 10 a.m.
- 17 Thurs. Charities Committee, 2.15 p.m.
- 30 Wed. Committee re Remuneration Policy, 2 p.m.
- 31 Thurs. Conference of Honorary Secretaries of Divisions and Branches, 10.30 a.m.

Branch and Division Meetings to be Held

BROMLEY DIVISION.—At Bell Hotel, Bromley, Wednesday, March 2, 7.45 p.m., annual general meeting; 8.15 p.m., discussion on the examination of surgery premises introduced by Dr. Stephen Taylor.

HARROW DIVISION.—At Rayners Hotel, Rayners Lane, Harrow, Tuesday, March 1, 8.30 p.m., clinical meeting. Symposium: "Modern Therapeutic Agents in Psychiatry." Speakers, Dr. W. A. H. Stevenson, Dr. D. E. Sands, and Dr. Jonathan H. Gould.

HARTLEPOOL DIVISION.—At Staincliffe Hotel, Seaton Carew, Wednesday, March 2, 8.30 p.m., meeting. Lecture by Dr. Michael Ward: "Physiology of Everest."

HASTINGS DIVISION.—At Nurses' Home, Royal East Sussex Hospital, Hastings, Tuesday, March 1, 8.15 p.m., meeting. Address by Mr. Norman Capener: "The Changing Pattern of Orthopaedics."

LAMBETH AND SOUTHWARK DIVISION.—At Lambeth Hospital, Brook Drive, Kennington Road, S.E., Sunday, February 27, 11 a.m., clinical meeting.

LEWISHAM DIVISION.—At Lewisham General Hospital, High Street, Lewisham, S.E., Friday, March 4, 8.30 p.m., meeting. Dr. Alistair R. French: "Medico-Legal and Ethical Problems, or When Doctors meet Lawyers."

MID-HERTS DIVISION.—At Wellington Court Clinic, Bricklet Road, St. Albans, Friday, March 4, 8.45 p.m., meeting.

ST. PANCRAS DIVISION.—At Committee Room C, B.M.A. House, Tavistock Square, London, W.C., Wednesday, March 2, 8.30 p.m., meeting. Miss Gladys Hill: "Menstrual Disorders"; Dr. Mary E. Egerton: "Vaginal Smear Techniques in the Treatment of Some Cases of Menorrhagia." Members of the City Division are invited.

SCUNTHORPE DIVISION.—At Scunthorpe and District War Memorial Hospital, Wednesday, March 2, 8.30 p.m., meeting. Professor H. N. Green: "Cancer—The Present Position."

TODMORDEN DIVISION.—At the Medical Centre, Todmorden, Thursday, March 3, 4.15 p.m., business meeting.

WOOLWICH DIVISION.—At St. Nicholas' Hospital, Plumstead, S.E., Tuesday, March 1, 8 p.m., clinical meeting. Members of Greenwich and Deptford Division are invited.

S.H.M.O. Meetings

A meeting of Senior Hospital Medical Officers in the Liverpool Region will be held on Monday, February 28, at 8 p.m. in the Medical Institution, Mount Pleasant, Liverpool, 3.

A meeting of Senior Hospital Medical Officers in the Leeds Region will be held on Friday, March 4, at 5.30 p.m. at the Clinical Lecture Theatre of Leeds General Infirmary.

A meeting of Senior Hospital Medical Officers will be held in the Birmingham Region on Saturday, March 5, at 3 p.m. in the Nurses' Lecture Room at Marston Green Maternity Hospital, near Birmingham. The hospital is best approached from A452 between Castle Bromwich and Stonebridge.

Meetings of Branches and Divisions

CHELSEA AND FULHAM DIVISION

The annual B.M.A. lecture was held at St. Stephen's Hospital, London, S.W.10, on January 28. Colonel Harnett took the chair and 40 members were present. The lecture was delivered by Dr. K. Shirley Smith, who spoke on "Some Clinical and Therapeutic Aspects of Hypertensive Heart Disease."

ANNUAL MEETING: TORONTO, JUNE 20-24

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

LONDON SATURDAY MARCH 5 1955

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THE EMPLOYMENT OF ASSISTANTS

NEW PROPOSALS WELCOMED AS A FIRST STEP

For nearly three hours on February 25 the Assistants and Young Practitioners Subcommittee (which consists of representatives of assistants and unestablished principals elected on a regional basis and of certain members of the General Medical Services Committee) considered a report of a special subcommittee under the chairmanship of Dr. Bruce Cardew on the employment of assistants in general practice. This report was considered at the last meeting of the G.M.S. Committee and referred to the Assistants and Young Practitioners Subcommittee for its comments (*Supplement*, February 26, p. 65).

Safeguards against Exploitation

The special subcommittee's recommendations, briefly summarized, were as follows:

A. That further efforts should be made, through the medical schools and local medical committees, to ensure that final-year students and duly qualified practitioners were fully informed of the need for entering into a formal agreement when accepting an assistantship.

B. That an amendment to the terms of service should be sought to make it clear that executive councils (acting in this as in other respects in consultation with local medical committees) shall periodically review all cases in which consent had been given to the employment of an assistant; and that it be pointed out to executive councils that, while the normal maximum additional list by virtue of the employment of an assistant is 2,000, the councils have power, again after consultation, where they are satisfied that reasonable cause exists, to withdraw the original consent to such employment or modify the number of additional patients admitted under their allocation scheme.

C. That the attention of local medical committees be drawn to the proposed arrangements and that they be offered general guidance on the principles they should adopt in advising executive councils.

D. That a principal implementing a "view" registered with the executive council should have the right to claim retrospective payments on the basis of notional lists for a period up to one year.

Dr. L. RUSSELL, who, with Dr. H. P. Hilditch, represents on the General Medical Services Committee the interests of assistants and young practitioners, said that he saw no major objection to these proposals, except that he thought they were unlikely to provide a full solution to the problem. He would not even go so far as to say that they presented a basis for discussion; no alteration of mere wording within this framework would solve the problem. There must be further steps.

The CHAIRMAN: You mean this is only the *hors d'œuvre*? Dr. HILDITCH said that if this went to the Conference it must not be presented as offering a full solution.

Dr. STEVENSON (Deputy Secretary) reminded the subcommittee that the parent body had been so impressed by its

representations that it had taken the unusual step of setting up this new subcommittee. If now the assistants were going to say that the report was unacceptable they would be putting back the clock.

Dr. TALBOT ROGERS, chairman of the General Medical Services Committee, said that discussions would have to take place between the Committee and the Ministry, perhaps necessitating the calling together of the Working Party, so that even if the scheme were accepted by the forthcoming Conference months would be required to obtain full agreement.

Dr. RUSSELL repeated that he and his colleagues had no objection to the report as it stood, except on the ground of adequacy. The proposals might prevent glaring cases of exploitation, but on the whole they would be ineffective.

It was agreed, however, to proceed with the discussion of the recommendations. On the question of a formal agreement when accepting a post, with or without a "view," the view of the Subcommittee was that this was always desirable.

Incomplete Answer

The Subcommittee accepted all the recommendations set out above, with one or two verbal amendments. The CHAIRMAN, explaining the last of the recommendations (D), said that it was intended as an inducement to a principal to take the assistant into partnership.

The main discussion having concluded, the Chairman asked the assistants' representatives to decide whether they were going to say that the recommendations were inadequate and they were going to consider further proposals straight away, or that if the recommendations when implemented proved inadequate they would then proceed further.

Dr. RUSSELL replied that while he and his colleagues accepted the recommendations they did not think they were the complete answer, and therefore, without waiting for their implementation, they should consider and put forward certain alternative proposals. He was unwilling that the report should go forward even as offering an interim solution. It must not be taken to the Conference as conveying that implication.

The CHAIRMAN said that they could not ask the General Medical Services Committee to put up something to the Conference as only a part solution; the Conference would send it back at once, and indeed he doubted whether it would get through the Committee.

Dr. J. GILMORE moved the following resolution:

That the Subcommittee welcomes the recommendations contained in the report as a first step in the solution of the problem, which it will continue to study.

Although a number of amendments were moved, this resolution was finally carried without dissent. It will go to the next meeting of the G.M.S. Committee.

FURTHERING PROFESSIONAL INTERESTS

BRITISH DENTAL ASSOCIATION'S DENIAL

The Management Committee of the Executive Councils' Association (England) at a meeting last December (*Supplement*, January 29, p. 30) criticized an extract printed in the *Supplement* of the *British Dental Journal* of November 16, 1954, stating that arrangements were made for the 15 dental delegates attending the Annual Conference of the Executive Councils' Association in Southport on October 14 and 15 to meet before the conference began so that the official policy of the British Dental Association might be supported when certain resolutions dealing with the general dental services came before the conference.

The Secretary of the British Dental Association has now written to the honorary secretary of the Executive Councils' Association expressing regret that the action which it took in connexion with the Executive Councils' Association's last Annual Conference might have been misunderstood. The aim of the council of the British Dental Association throughout, the letter states, has been solely to serve the best interests of the patient and in no sense to further sectional or professional interests. The letter goes on to say: "Your Management Committee will recall that there were three Resolutions affecting dentistry before your last Annual Conference. The first proposed to increase the contributions payable by many patients towards the cost of dental treatment; the second proposed to abolish the right of the patient to be supplied with immediate dentures under the general dental services; and the third was not controversial. It was clear to my [the B.D.A.'s] council that, if the proposals in the first two resolutions were adopted, the result would be to do damage to the dental health of the population as a whole. For that reason my council felt bound to take steps to ensure that dentists who were delegates to the Conference should be given an opportunity of hearing the council's objections to the policies which the resolutions proposed."

A copy of the memorandum which the British Dental Association sent to each dentist delegate at the time of the Conference was enclosed with the letter with the comment that the executive committee of the Executive Councils' Association would be able "to verify therefrom that our objections to these resolutions were certainly not based upon the fear that they might damage the interests of the dentist."

MEDICAL ETHICS

The Central Ethical Committee, under the chairmanship of Dr. Robert Forbes, had a long and detailed agenda before it at a recent meeting. The main business centred in a discussion on ethical policy concerning certain of the medical profession's main points of contact with the general public. After a lengthy debate, ranging over broadcasting on medical subjects, publications for the lay public, and professional secrecy, it was decided to set up a special subcommittee to review all these important matters of policy, and other related subjects. It was anticipated that this would take time and that a report to the main Committee would not be available for some months.

The ethical problems caused by the interval between the resignation of a general practitioner in the National Health Service and the installation of a successor have been the subject of protracted discussion between the Central Ethical and the General Medical Services Committees. Their agreed views have recently been referred back by Council for further consideration. The Central Ethical Committee has now decided to delay reviewing this difficult problem until the special Subcommittee set up by the General Medical Services Committee to examine the problem has reported. Dr. Forbes is a member of this Subcommittee.

Other matters under consideration include the relation of registered medical practitioners to those who offer spiritual aid; and also problems of cancer registration schemes.

NURSES' PAY INCREASE

The Industrial Court has awarded an increase in salary to nurses and midwives employed in the National Health Service by hospital and local authorities. Their current salary scale is increased by £25 a year, and at the same time board and lodging charges are put up. Assistant nurses get a £20 increase. The award is retrospective to December 1, 1954, and will cost about £4m.

Scottish News

SOUTH-EASTERN COUNTIES DIVISION

A meeting was held at Peel Hospital, Selkirk, on December 12, 1954. Dr. CLARK took the chair and 24 members were present. Dr. FLEMING, from the Department of Health, as guest speaker, opened a discussion on the future development and relationship of the specialist, public health, and general medical services within the National Health Service. The increasing expense of the hospitals was a major problem, said Dr. Fleming, and he suggested that economy could be effected in hospitals if there were some control of prescribing as with general practitioners, and thought a "hotel charge" for hospital accommodation should be considered. The unnecessary use of beds could, to this extent, be remedied by carrying out certain investigations in out-patient departments, and closer co-operation with the general practitioner would enable more convalescent and incurable patients to be treated at home. He stressed the importance of adequate diagnostic facilities for general practitioners, and of the "time factor" in general practice, and suggested that lists should be still further limited. General practice should attract the best recruits. Dr. Fleming pleaded for greater co-operation between the three services, and for full implementation of ideals a complete reintegration of the Health Service might be necessary. Dr. BORTHWICK, for the specialists, deplored the trend towards ultra-specialization and the widening gap between G.P. and specialist. He thought health centres might help to co-ordinate the work of specialist and general practitioner. He criticized the overcrowding in hospitals, and the insecure position of registrars which was having an adverse effect on adequate staffing of junior specialist posts. He thought it might be feasible to have general practitioners on the hospital staffs. Dr. MCCOUBREY, for the medical officers of health, also pleaded for greater co-operation between the services. He said that local authority medical officers were doctors first and officials afterwards, and that their whole outlook was that of the former. Dr. MACGREGOR, of Kelso, as a general practitioner, felt alarm at the increasing abuse of the Service by many of the public, whose demands on the doctor were becoming more and more unreasonable; he wondered if a fee per service would help to mitigate this nuisance, and advocated a "vital list of drugs" which alone could be prescribed free. He preferred the idea of diagnostic centres to health centres, which he thought were too impersonal.

A discussion followed, in which Drs. BALFOUR, MCGREGOR, of Hawick, STEWARD, GLOVER, and DUFF took part. The abuse of the Health Service was stressed, and there was one plea for a salaried service. But by and large, it is reported, the clamours remained hidden in the thatch and the heather unignited. The discussion was serene in its orthodoxy.

In answer to a question on February 15 the leader of the London County Council, Mr. I. J. Hayward, said that the General Purposes Committee was inviting the views of other committees of the council on the possibility of returning to metropolitan borough councils certain of the personal services including maternity and child welfare, vaccination, day nurseries, and foot clinics. Also the exercise of concurrent powers with the council for the provision of domestic help and the employment of health visitors for the purposes of the services which borough councils would administer.

MEDICAL PRACTICE IN INDIA

There are 60,000 qualified doctors for a population of 360,000,000 in India, as against a probable 600,000 practitioners of other types. Dr. S. C. Sen, president of the Indian Medical Association, makes this statement in an article in the January 6 issue of the *New England Journal of Medicine*, in which he reveals some of the problems of modern medical practice in India.

"Quackery flourishes in India for various reasons," writes Dr. Sen, "the main ones being poverty of the people, lack of education, faith in age-old methods and imperfection of the modern system. It must be remembered that modern medicine—in both its diagnostic and its therapeutic aspects—is very expensive and not within easy reach of the poor." Except in two States in India, there is no restriction on medical practice; anybody, whether trained or untrained, qualified or unqualified, can set up in practice openly and can compete with the best qualified people. Even indirect restrictions against unqualified practice are not effective, since birth and death certificates are not compulsory in most parts of India.

Of the 60,000 properly qualified physicians practising modern medicine, about 15% are in some form of public service such as Government hospitals and dispensaries and municipal health services. Some are full-time and others are salaried but with the right of private practice. The remainder are in private practice.

Much Work—Little Return

The consultants in private practice who hold honorary hospital appointments have a difficult time because the hospitals, mostly Government maintained, are usually open free of charge to rich and poor alike, particularly to Government servants. The consultants therefore do a great deal of free work even for the richer section of the community. There are but 100,000 hospital beds of all kinds in the country. Most doctors are, however, in general practice and do their own dispensing. Dr. Sen writes that fees are low and the G.P. has to work very hard and look after more patients than he can do justice to. The crux of the problem lies in the poverty and ignorance of the people, the rising costs of medical care, and the flourishing competition of the unqualified practitioners.

A social security scheme has been started in a few centres only. On the whole the payment offered to doctors in the health part of the scheme was so low that the medical associations rejected it. The Indian Medical Association has offered its services to help establish a "panel system." The authorities, however, are in favour of a whole-time salaried service, and it is as yet uncertain which system will ultimately prevail.

Correspondence

Practice in the Highlands and Islands

SIR,—Recent letters to the *Supplement* have drawn attention to the problems of practice in the Highlands and Islands area. We are a very small body—about 200, mostly island practitioners and certainly all remote—living simply and, proud of our great traditions, maintaining under conditions sometimes of great difficulty a standard of general practice nowhere excelled. We came probably in search of freedom, certainly not wealth, and all that we ask is that our specific problems should be examined and recognized as they were under the old Highlands and Islands medical service. Hitherto this has been denied us by the Department of Health, which, with the passion of the Civil Service for establishing drab uniformity, has bulldozed us into the national scheme regardless. It may surprise many to learn that no compensation was paid to the Highlands and Islands practitioner when taken over. He had a free house or

housing allowance. In 1951 this too was without warning taken from him. The house was tied and rent arbitrarily demanded. Under the old H. and I. scheme daily mileage was recorded and payment made accordingly. After vesting date a mileage grant was fixed for each practice, presumably on the old records, and has remained unaltered to this day. The grant, which represents payment for time as well as travelling expenses, is, needless to say, now miserably inadequate.

In my own case, according to the last census, I am at risk for over 1,300 persons, although the number with which I am credited is under 1,200. During the summer season the population is at least doubled. My mileage grant is £300 per annum. That represents the entire difference between the payment I receive and that which an urban practitioner would receive for the same number. Considering that the working time involved is probably treble in my case it will be seen how inequitable is the position. To make this point clear, I am attending at present a midwifery case 11 miles distant. The fee I shall receive for that is 7 guineas, and a temporary resident at an isolated farm nine miles away involving a six-miles very rough walk will bring an addition of exactly 17s. to my quarter's cheque.

I have been called to a meeting of the Highlands and Islands Committee in Glasgow this month. This will entail absence for two days from practice and payment of a locum for three days. I shall receive from the B.M.A. a cheque probably for over £6 towards personal expenses, but over and above that I shall have to meet the locum's costs—£15 to £20. This is a measure not only of our difficulty in securing release from duty but also of our difficulty in organizing any effective representation.

It is impossible in a letter to deal with the varying aspects of this many-sided problem. The problem in itself varies from practice to practice. I think it should be obvious that our case should command urgent consideration. Furthermore, as a result of our fewness and difficulty in organization we must look to our colleagues and to the B.M.A. for support in securing justice.—I am, etc.,

Isle of Islay.

ALASDAIR MCL. SMITH.

Springfield Maternity Home, Blackburn

SIR,—We, the general practitioners of Blackburn, wish to bring to the notice of the profession the following facts.

On January 8, 1954, Springfield Maternity Home, Blackburn, was closed by the Blackburn and District Hospital Management Committee. This decision was made by the hospital management committee without consultation with the executive council and the local medical committee. This projected decision had already been the occasion of a storm of protest from the public bodies concerned. The actual closure of the home was effected as follows. The secretary of the hospital management committee visited the wards of the home at 8 p.m. on January 7 and announced, to the great surprise of the patients, that they had the option of being transferred the following morning to a maternity home seven miles away or of being returned to their own homes. Some of the medical advisers of these patients were informed by the same person at 9 a.m. the following morning by telephone that their patients were in the process of transfer. One doctor, whose patient had been delivered a few hours previously, on hearing a rumour that Springfield was closing, telephoned the home at 10 a.m. for information. He was informed by the secretary that the transfer of patients was already in progress. His energetic protest that his patient was not fit to be moved was brushed aside, with the observation that his views were irrelevant.

In spite of deputations to the Ministry and the Minister himself from local B.M.A. representatives and the G.M.S. Committee of the B.M.A., and strong protests from the floor of the House of Commons, this flagrant overriding of the doctor's clinical responsibility for his patient by a lay official has been consistently condoned by the Minister of Health. This unprincipled attack on the fundamentals of medical practice raises issues of national import. We

therefore feel it our duty to state that we have no confidence whatsoever in the present Minister of Health, and wish to alert the profession to this new tendency to subordinate the doctor's clinical judgment to the irresponsible dictates of the lay administrator.—We are, etc.,

D. O'DRISCOLL, H. SOUTHWORTH, T. J. BURKE, F. C. REIDY, B. D. MALLICK, A. C. NEWMAN, J. A. MCCRAITH, J. TUDOR, J. KYLE, N. M. GREEVES, J. D. CONDON, E. ISHERWOOD, C. M. BRADLEY, I. E. DOUGLAS, A. H. DUNCAN, F. LIVESSEY, R. G. ROONEY, H. T. CANK, R. V. RHODA, C. L. HOLDEN, P. ZIMMERMAN, J. A. NOBLETT, W. BROCK, P. G. JONES, A. R. MERRILL, A. ROBINSON, A. WISPIANSKY, L. M. C. DUTHIE, I. R. DUTHIE, H. HARRISON, A. H. GREGSON, J. A. SELLARS, J. CARTER, T. A. I. MCQUAY, P. N. RAMPAL, J. J. SEARSON, J. J. O'CALLAGHAN, E. L. CARTER, A. HARGREAVES, J. B. LEIGH, J. W. LYALL, J. L. JOHNSTON, H. HARDMAN, R. PENDLEBURY, D. KELLEHER, A. C. SMERDON.

Blackburn.

Assistants in General Practice

SIR.—Dr. G. E. Langley (*Supplement*, February 5, p. 42) has spoken for many of us. At the moment there are too many assistants, the number being given as about 1,500, which I take to mean assistants pure and simple (an apt phrase). We are the displaced persons of the Health Service. Presumably this situation will improve after 1958, but I believe till then we should adopt the best of Dr. Langley's suggestions—that is, that as an interim measure registrars should be given better salaries, enabling them to support a wife and stay in hospitals without being forced to leave early because of financial pressure. Meanwhile, as an indefinite and ever-changing body, we have little say. Unlike the railwaymen (or even the Sabine women) we cannot down tools. We may query the sense of the large university classes, or watch the exploitation of our kind, but I personally feel it is unlikely we shall ever have enough political or professional influence to alter our conditions.

To end on a lighter note, as I intend to sign this, it is only fair to my employers to say that I am neither overworked, underpaid, nor disgruntled, but consider myself lucky. I am an assistant without view, and it would be interesting to hear a few figures from people in my position. In 18 months I have made seven or eight applications, been interviewed once (out of 120 applicants), and am still hopeful of finding paradise. This to my mind is in the country or a country town midway between an Auxiliary Air Force squadron, a motor racing circuit, a good book-shop, and a comfortable pub or hotel.—I am, etc.,

Wisbech, Cambs.

G. R. C. D. GIBSON.

Association Notices

Diary of Central Meetings

MARCH

8	Tues.	Constitution Committee, 11 a.m.
10	Thurs.	Psychological Medicine Group Committee, 2 p.m.
11	Fri.	Joint Meeting of Coroners and Medical Witnesses Subcommittees, Private Practice Committee, 2.30 p.m. (<i>Change of date and time.</i>)
16	Wed.	Occupational Health Committee, 10 a.m.
17	Thurs.	Ethical Review Subcommittee, Central Ethical Committee, 2 p.m.
17	Thurs.	Charities Committee, 2.15 p.m.
23	Wed.	Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
24	Thurs.	Central Consultants and Specialists Committee, 10.30 a.m.
30	Wed.	Evidence Committee on Divine Healing, 10 a.m.
30	Wed.	Committee re Remuneration Policy, 2 p.m.
31	Thurs.	Conference of Honorary Secretaries of Divisions and Branches, 10.30 a.m.

Branch and Division Meetings to be Held

BURTON-ON-TRENT DIVISION.—At Bretby Golf Club, Ashby Road, Burton-on-Trent, Wednesday, March 9, 7.45 p.m., dinner. Annual B.M.A. Lecture by Mr. N. R. Barrett: "Indications for Cardio Surgery."

CITY DIVISION.—At Committee Room C, B.M.A. House, Tavistock Square, London, W.C., Tuesday, March 8, 8.30 p.m., meeting. Mr. D. W. C. Northfield: "A G.P.'s Problems as Seen by a Neurological Surgeon."

COVENTRY DIVISION.—At Gymnasium, Coventry and Warwickshire Hospital, Wednesday, March 9, 8.30 p.m., meeting. Lecture by Dr. K. Sicher: "Applications and Results in the Treatment of Radiotherapy."

CROYDON DIVISION.—At 43, Wellesley Road, Croydon, Tuesday, March 8, 8.30 p.m., general meeting. Address by Dr. F. E. Camps: "Medical Aspects on Detection of Crime."

DARTFORD DIVISION.—At Royal Clarendon Hotel, Gravesend, Wednesday, March 9, 8 for 8.15 p.m., annual dinner.

DUMFRIES AND GALLOWAY DIVISION.—Sunday, March 13, Professor L. J. Davis: "Bronchitis and Emphysema."

EAST HERTS DIVISION.—At Hertford County Hospital, Tuesday, March 8, 8.30 p.m., meeting. Medical films.

EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, Herne Bay, Thursday, March 10, 7.30 p.m., dinner; 8.45 p.m., Mr. A. Lawrence Abel: "Some Common Diseases of the Rectum and Anal Canal."

ENFIELD AND POTTERS BAR DIVISION.—At Chase Farm Hospital, The Ridgeway, Enfield, Wednesday, March 9, 8.15 for 8.45 p.m., meeting. Films: (1) "Relief of Pain in Childbirth"; (2) "The Conjoined Twins of Kano." Members of the North Middlesex and East Herts Divisions and nurses and student nurses in the area are invited.

FINCHLEY DIVISION.—At Finchley Memorial Hospital, Granville Road, N. Finchley, N., Tuesday, March 8, 8.30 for 9 p.m., meeting. Talk by Mr. V. J. Downie: "The Virtues of Going to Bed."

FURNESS DIVISION.—At Duke of Edinburgh Hotel, Barrow-in-Furness, Friday, March 11, 7.30 for 8 p.m., annual dinner; Principal speakers, Sir Ian Fraser, who will propose the toast of the B.M.A., and Dr. D. P. Stevenson (Deputy Secretary, B.M.A.), who will reply.

GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, March 10, 8.30 p.m., meeting. Lecture by Dr. W. G. Oakley: "Modern Treatment of Diabetes."

HAMPSTEAD DIVISION.—At New End Hospital, Hampstead, N.W., Tuesday, March 8, 8.30 p.m., meeting. Discussion: "Present-day Views on Thyroid Disease." Speakers, Dr. Rosalind Pitt-Rivers, Ph.D., F.R.S., Mr. J. E. Piercy, and Dr. W. R. Trotter.

HENDON DIVISION.—At Hendon Hall Hotel, London, N.W., Tuesday, March 8, 8.45 p.m., meeting. Dr. W. E. Snell: "The Changing Scene in Tuberculosis."

KENSINGTON AND HAMMERSMITH DIVISION.—At St. Charles's Hospital, Ladbroke Grove, London, W., Friday, March 11, 3.30 for 4 p.m., clinical meeting.

KINGSTON-ON-THAMES DIVISION.—At Kingston Hospital (Nurses' Home), Tuesday, March 8, 8 p.m., meeting. General practitioners' debate: (a) "Blood Pressure"; (b) "Is Penicillin Abused in General Practice?"; (c) "Is the Home the Ideal Place to Have a Baby?"; (d) "The Common Cold and Influenza."

LAMBETH AND SOUTHWARK DIVISION.—At Brockwell Primary School,ulse Hill, London, S.W., Thursday, March 10, 8.15 p.m., meeting. Film by Professor Ian Aird: "Conjoined Twins of Kano" and also his extra slides of still photographs. Mr. Selwyn Taylor will talk about the film and operation. Nurses and health visitors are invited.

LANCASTER DIVISION.—At Midland Hotel, Morecambe, Saturday, March 12, 7.30 for 8 p.m., annual dinner.

LEIGH DIVISION.—At Courts Hotel, Church Street, Leigh, Tuesday, March 8, 8.30 p.m., meeting. Address by Dr. E. E. Prebble: "Non-specific Urethritis."

REIGATE DIVISION.—At Redhill County Hospital, Tuesday, March 8, 8.30 p.m., meeting. Annual B.M.A. Lecture by Professor J. Chassar Moir: "Immediate Hazards of Childbirth."

SCARBOROUGH DIVISION.—At Scarborough Hospital, Thursday, March 10, 8.30 p.m., meeting. Lecture by Professor R. E. Tunbridge: "Rehabilitation" (illustrated with lantern slides).

SOUTH BEDFORDSHIRE DIVISION.—At Luton and Dunstable Hospital, Friday, March 11, 9 p.m., meeting. Annual B.M.A. Lecture by Sir Heneage Ogilvie: "Pitfalls in Surgical Diagnosis."

TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Tunbridge Wells, Tuesday, March 8, 8.30 p.m., meeting. Dr. E. A. Bennet: "Treatment in the Neuroses."

WILLESDEN DIVISION.—At Wykeham School, Aboynce Road, Neasden, N.W., Thursday, March 10, 8 p.m., public meeting on Air Pollution. To be addressed by Dr. Horace Joulès, Dr. S. Leff, Mr. R. S. Forster, and Councillor S. C. Piddington.

S.H.M.O. Meeting

There will be a meeting of Senior Hospital Medical Officers in the North-west Metropolitan Region on Saturday, March 12, at 3 p.m. at B.M.A. House, Tavistock Square, London, W.C.

Correction.—In the answer headed "Vaccination Certificates" under "Questions Answered" (*Supplement*, February 12, p. 47) it should have been added that T.A.B. vaccine for prophylactic injection may be prescribed on form E.C.10.

ANNUAL MEETING: TORONTO, JUNE 20-24

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY MARCH 12 1955

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British Medical Association

PROCEEDINGS OF COUNCIL

Wednesday, March 2, 1955

A meeting of the Council was held at the House of the Association, Tavistock Square, London, on March 2, with Dr. E. A. GREGG in the chair.

Preliminary Business

The deaths of two former members of Council, Sir Charles James Martin and Dr. A. E. Hamerton, were reported, and the Chairman was authorized to send letters of condolence to the relatives.

The Council sent congratulations to the former Sir Godfrey Huggins, Prime Minister of Southern Rhodesia, a member of the Association, on being made a Viscount.

It was instructed that letters of sympathy be sent to Dr. I. G. Innes, a member of Council, on an accident which had befallen him, and to Dr. Agnes Kelynnack, Assistant Secretary, on her prolonged illness.

The CHAIRMAN reported that he had invited Dr. T. Rowland Hill to represent the Association at the International Hospital Congress in Lucerne; that Lord Horder had agreed to act as the Association's representative at the annual conference of the Cremation Society, and that Dr. L. S. Gibbons had accepted his invitation to serve as one of the Association's representatives on the Medical Advisory Board of the National Marriage Guidance Council, in place of Dr. W. S. Macdonald.

Dr. H. D. Chalke was appointed the Association's representative to the Commonwealth Health and Tuberculosis Conference, arranged by the National Association for the Prevention of Tuberculosis, to be held in London in June.

Professor Bryan McFarland, president of the British Orthopaedic Association, who would be in South Africa at the time for a meeting of the South African Orthopaedic Association, was asked to represent the B.M.A. at the annual meeting of the Medical Association of South Africa in Pretoria in October.

It was decided to recommend to the Representative Body that Sir John McNee, who would then be the Immediate Past-President, should be invited to act for the President on all appropriate occasions during the session 1955-6, in the absence of the President, Dr. T. C. Routley, of Toronto.

The Council agreed that the dates of future Annual Meetings should be as follows: 1957, July 11 to 19, at Newcastle-upon-Tyne; 1958, June 19 to 27, at Margate; 1959, July 16 to 24, at Edinburgh.

It was reported that the South African delegate to the British Commonwealth Medical Conference, to be held in Toronto in June, proposed to suggest the discontinuance of the holding of this conference triennially in one of the Commonwealth countries. The South African view was that it might take the form of an annual meeting of the delegates from Commonwealth countries at the time of the General Assembly of the World Medical Association. It was pointed out in the Council, however, that some Commonwealth countries were not members of the W.M.A., and might not wish to send a delegate to a meeting following the Assembly in perhaps a European capital. On the proposition of Dr. S. WAND it was agreed to recommend that the Medical Conference continue to be held in a Commonwealth country.

It was agreed that the Chairman of Council and the Chairman of the Consultants and Specialists Committee should be delegates to the General Assembly of the W.M.A. in September next; that the Chairman of the International Relations Committee and the Secretary should be alternate delegates, and that Dr. Mary Esslemont be invited to attend as an observer.

The Council received and approved the 20 nominations from certain committees of the Association for membership of the Central Medical Recruitment Committee for England and Wales. The Council itself appoints a further seven members, and the following six were reappointed: Dr. Janet Aitken, Sir Zachary Cope, Lord Haden-Guest, Mr. H. H. Langston, Dr. W. Rees Thomas, and Dr. D. I. Williams. The seventh retiring member, Dr. A. Weston, did not wish to stand again, and in his place the Council appointed Dr. Morgan Evans, of Hounslow.

The Advisory Bureaux

Mr. L. R. BROSTER, chairman of the Empire Medical Advisory Bureau and of the International Medical Visitors Bureau, attended to present the annual reports of those two organizations. Summaries of the work of these Bureaux

will appear in the Annual Report of Council to be published in the *Supplement* of March 19. Mr. Broster said that both of them could report an increased number of inquiries and visitors, a greater dissemination of information, and intensification of activities in every direction. He paid a warm tribute to the work of Brigadier H. A. Sandiford, the medical director of both Bureaux.

The CHAIRMAN OF COUNCIL said that these were extremely interesting and encouraging documents. He thanked Mr. Broster for his work as chairman and associated himself and the Council with the tribute paid to Brigadier Sandiford. The Council also received the annual report of the Medical Practices Advisory Bureau, which stated that the volume of work in all departments had been maintained. The number of assistants successfully introduced during the year with a view to partnership was 139, and the number of other assistants and trainees, 449. The number of locum tenens supplied to general practitioners and to hospitals during the year was 2,427, corresponding with the average for the past four years.

The Chairman expressed the Council's thanks to Dr. L. S. Potter, Medical Director of the Bureau, for the tremendous amount of detailed work involved.

"Family Doctor"

Dr. O. C. CARTER, chairman of the Family Doctor Committee, in presenting the report, said that the Council would note with satisfaction that there was a surplus on the *Family Doctor* account at the end of the financial year. He thought he could say that the periodical got more and more widely accepted and approved, though it still had to achieve the solid basis of circulation they desired. Increasing support was given by medical officers of health throughout the country by permitting the magazine to be sold direct to the public in their clinics and maternity and child welfare centres. It was now on sale in approximately 800 such centres. A further extension of the *Family Doctor's* activities in the field of health education was in the form of the fourteen pamphlets now available, of which 17,500 copies had been sold in 1954.

Dr. Carter also drew attention to the *Family Doctor* exhibit at the current *Daily Mail* Ideal Home Exhibition, an exhibit due to the enterprise of the Business Manager, Mr. Edsall. The stand had caught the interest of H.M. The Queen when she attended the preview two days previously.

During this year *Family Doctor* was looking forward to an increase in the number of pages. Printing and paper costs would be increased, but it was hoped that this would be more than offset by the additional revenue.

Dr. VAUGHAN JONES congratulated Dr. Carter and his committee and all associated with him on last year's results. Dr. D. F. HUTCHINSON said that he had visited the Ideal Home Exhibition and had been most impressed with the *Family Doctor* exhibit. Dr. E. C. DAWSON and Dr. F. M. ROSE spoke in similar congratulatory terms.

The CHAIRMAN OF COUNCIL added his congratulations to the Chairman, the Committee, and the staff.

Danger of Whole-time Salaried Service

Dr. H. H. D. SUTHERLAND, chairman of the Amending Acts Committee, said that the question had arisen whether section 10 of the National Health Service (Amendment) Act, 1949, afforded the profession sufficient protection against the introduction of a full-time salaried service. His committee's conclusion was that under that section as now worded it would be possible for any Government to introduce by legislation and without amendment of the Act a service in which practitioners received up to 50% of their remuneration by way of salary. This would be contrary to the resolution adopted by the Special Representative Meeting in December, 1951: "that the remuneration . . . shall not be by fixed salary." Accordingly, his committee proposed that the opinion of counsel be sought regarding the extent of the protection afforded by the section.

Dr. TALBOT ROGERS said that, whatever the opinion of counsel, it was not likely that any Government would give the profession greater protection than it had at the moment. He did not think that at present there was any danger.

Dr. D. F. HUTCHINSON said that the General Medical Services Committee was of opinion that it would be very unwise to make any movement in this connexion at the present time. The important thing was to ensure that there was complete unanimity in the profession on this matter. That was where their strength would lie should any future Government try to bring in such a regulation.

Dr. FRANK GRAY said that they all knew perfectly well that possibly another Parliament might take a long step in this direction. If any Government wanted to introduce a salaried service it could do so by amending legislation. If counsel's opinion was that the section did not afford sufficient protection, what could they do about it? They were all—except a negligible minority—opposed to any salaried service, and their strength lay in their unity.

Dr. SUTHERLAND, in reply, reminded the Council that the Guillebaud Committee had not yet reported. Its report might be the starting-point for new activity.

The recommendation to take counsel's opinion was lost.

Decisions of Special Representative Meeting, 1951

The Amending Acts Committee asked the Council to give consideration at an early date to methods of arranging co-ordinated action with the Ministry of Health when the time arrived to put forward suggestions for amendment of the National Health Service Acts, bearing in mind the resolutions of the Special Representative Meeting, 1951. Dr. SUTHERLAND said that his committee had noted with anxiety that a number of the resolutions of that meeting had not yet been implemented, although more than three years had elapsed since their adoption, and in some instances decisions had been taken which were contrary to the wishes of the Representative Body.

Dr. WAND said that the phrase "co-ordinated action" had been used. They might look once again at the decisions made in 1951. Take the matter of arbitration: it seemed to him that they would have to consider that once more. The first interim report on the reform of the National Health Service, as approved by the Representative Body in 1951, laid it down that the court of arbitration should be composed of a legally qualified independent president appointed by the Lord Chancellor on a permanent basis, with other members having special knowledge of the subject matter and being selected in equal numbers by the Lord Chancellor from panels nominated respectively by the Management Side and the Staff Side of the Whitley Council. If, being equal numbers on both sides, they disagreed, who was to give the final decision? A nominee of the Government, someone appointed by the Lord Chancellor. That might be a dangerous thing. Before the recommendation of the Amending Acts Committee for co-ordinated action was considered they should look again at the recommendations passed in 1951 and decide which of them required action to be taken, which should be altered, which were now out of date, and which had already been implemented. He proposed that the recommendation be referred back.

Dr. HALE-WHITE said that it was in the minds of many of them that they ought to be able to say something to the Representative Body about what had happened to the resolutions passed more than three years ago.

Dr. WAND hoped that the Council would refer the recommendation back rather than turn it down, first because it would be more courteous, and secondly because if it were turned down it might be interpreted as meaning that they had in mind no action on the other items decided by the Representative Meeting in 1951.

The motion to refer back was agreed to.

Evidence to Royal Commission

Dr. NOEL H. M. BURKE, chairman of the Psychological Medicine Group Committee of the Association, attended to

present the draft memorandum of evidence proposed to be given by the Association to the Royal Commission on the Law relating to Mental Illness and Mental Deficiency. The memorandum was of considerable length and contained some 70 recommendations. Dr. Burke said that in its preparation his committee had maintained a close liaison with the Royal Medico-Psychological Association, and although it had approached the problem from a wider angle than purely psychological medicine it nevertheless found a very considerable measure of agreement with the R.M.P.A., and the memorandum varied little from that already submitted by the latter body. He then briefly summarized the recommendations, which related to out-patient and in-patient treatment of mental disorder, the protection of persons exercising duties, the handling of temporary and reception order patients, the powers and duties of the medical superintendent, criminal patients, mental disorder in old age, and the provisions for the mentally defective. A special section dealt with psychopathic states. It was recommended that the powers of courts under the Criminal Justice and Magistrates Courts Acts should be extended to enable psychopathic offenders to be placed under care and treatment, and that there should be provision, subject to special safeguards, for dealing with psychopathic persons who could not be charged with any particular offence, but whose behaviour was such that they required care and treatment, for the protection of others. It was also recommended that treatment should be provided for alcoholics and drug addicts. Until special institutions were available use should be made of specially selected hospitals.

Dr. W. E. DORNAN congratulated the Committee and its chairman on the production of the memorandum. It was difficult to get a complete grasp of all its implications. About a quarter of the matter in this document was substantially different from the memorandum of evidence of the Royal Medico-Psychological Association, and if there was no great urgency he hoped that final approval might be left to the next meeting of Council, by which time the members would have had an opportunity of digesting what was put forward. Dr. A. BROWN spoke to the same effect. Dr. BURKE, however, said that the Commission had already extended the date of submission and expected to receive the evidence by the end of March.

Dr. S. F. L. DAHNE thought the memorandum a most excellent one and that it could go in as it stood. Dr. J. A. PRIDHAM called attention to the proposals relating to patients under judicial order. It was proposed to have two medical recommendations for an order, one by a practitioner specially approved, and the other by a practitioner not connected in any way with the mental hospital. Why should not the second practitioner be the family doctor? The same applied to the second medical practitioner who supported a request for admission without order.

Dr. F. M. ROSE wondered whether the powers proposed for the protection of the patient's property were sufficient.

Dr. ROBERT FORBES said that there was a suggestion in the memorandum that there should be an extension of protection at present afforded to doctors against unfounded litigation. But the Committee did not say in what way it considered other doctors giving advice or information should be protected.

Dr. WAND, who had been a member of the Committee, asked Council not to delay approval of this document. The differences between the Committee and the R.M.P.A. were very small, at least as concerned matters of principle. This was a very humane document and one that would stand out in the history of the treatment of mental diseases in this country. When compared with the sort of document which would have appeared 30 or 40 years ago it marked a great advance.

Dr. BURKE, in reply, said that it was, of course, the intention that the second recommendation should be by the family doctor. The trouble was that it was difficult to define the family doctor. With regard to protection, the Committee thought that protection should be extended to all

persons concerned in giving advice or information in a professional capacity in connexion with the procedure under the Act. The various points brought forward would be borne in mind in giving the oral evidence.

The memorandum was approved for submission to the Royal Commission. Dr. Burke was warmly thanked for his presentation, and he with Dr. M. J. Brookes, Dr. H. M. Cohen, Dr. Doris Odum, and Dr. S. Wand were appointed to give oral evidence.

Association Finance

The TREASURER (Mr. L. DOUGAL CALLANDER) presented the draft annual financial statement. He said that during the year the Association had been able to keep within its budget. The income last year was £270,797, made up of subscriptions, rents, and interest on investments, and the surplus for the year, earmarked for debt redemption and carried to the accumulated fund, was £65,074. In reply to questions Mr. Callander said that, having regard to the commitments of the Association, they could not possibly consider any proposal for the reduction of subscription at present.

Dr. I. D. GRANT asked whether the Treasurer could say that if the basic subscription was maintained at six guineas, this, together with rent and investments, would provide sufficient income to run the Association as they would wish to see it run. In future they must not expect the same windfalls from the *Journal* as in the past. If the *Journal* made money, well and good, but they must not arrange their affairs on that assumption.

Mr. CALLANDER said that, without extravagance, the Association could be run on the income Dr. Grant had suggested.

Dr. TALBOT ROGERS said that in recent years the expenses of the General Medical Services Committee had been met from the N.I.D.T. Fund except for a sum of £1,000 which was provided by the Association. There was now a suggestion that this latter sum be raised to the level at which it stood before the financial crisis occurred.

Dr. HAMILTON, chairman of the Journal Committee, considered that members of the Association should be warned that there was no guarantee that the large surpluses on the publication account to which they had been accustomed in former years would be continued.

The CHAIRMAN OF COUNCIL drew attention to a paragraph which will appear in the Annual Report:

" . . . while the Council will keep the matter continually under review, it regrets that in present circumstances it cannot advise the Representative Body that it would be wise to contemplate a reduction in the standard rate of subscription in the immediate future."

Those words, which were the result of careful consideration in the Finance Committee, covered the whole matter.

The draft annual financial statement was approved, subject to audit.

Private Practice

Dr. A. BROWN, chairman of the Private Practice Committee, submitted a report of his committee. The matters dealt with were mostly covered in the report of the meeting on February 9 (*Supplement*, February 19, p. 56). A recommendation that practitioners engaged predominantly in private practice be asked whether they wished to prescribe for private patients on Form E.C.10, and, if so, would agree to submit to any reasonable safeguards, was withdrawn after Dr. TALBOT ROGERS pointed out that this concerned also practitioners in the National Health Service who had private patients, and that the General Medical Services Committee would like to study the repercussions of it.

It was agreed that representations be made to the Treasury concerning a scale to be adopted for the medical supervision of Government establishments, and to the Admiralty for increased fees for certain items of service.

Dr. BROWN said that representatives of the Committee had met representatives of the Life Offices Association in Edinburgh and had arrived at an agreement for the payment of

a fee of two guineas for an ordinary examination and report for life assurance as from March 15. This was regarded as satisfactory, and it was also agreed to recommend to members of the Association that a suitable minimum fee for a report without examination for purposes of life assurance was one guinea.

Hospital and Consultant Services

A very long report from the Consultants and Specialists Committee was presented by Dr. T. ROWLAND HILL. On his proposition it was agreed that a Forensic Medicine Subcommittee of the Private Practice Committee be appointed, consisting of three members of the Private Practice Committee, three police surgeons, and three forensic pathologists, with power to co-opt, to represent members of the Association engaged in forensic medicine and to advise the Council on matters affecting practice in that field.

The Council had before it the revised report on Hospital Medical Staffing, the work of the subcommittee of which Professor G. I. Strachan is chairman, and which was referred to in the report of the meeting of the Consultants and Specialists Committee (*Supplement*, February 19, p. 51). The Committee had decided, in view of the importance of this matter and its serious implications for the profession, to take no final decisions before seeking the views of its constituents. It had therefore forwarded the report to the Regional Committees and to the Scottish Central Consultants and Specialists Committee, and, to avoid delay, had also sent it to the Joint Committee as a basis for discussion.

Dr. S. F. L. DAHNE, as one who had been very critical in the past of the original Strachan report, said how much he admired the revised report. If it was eventually accepted, with very minor modifications, it would give new hope to everyone in the hospital service, breaking the dead ends alike in the Registrar and in the S.H.M.O. groups. With a pardonable mixture of metaphors, Dr. Dahne said that it would "give more reasonable rungs to the ladder and abolish various bottle-necks."

Dr. ROSE hoped the Committee would consider the feasibility of arranging for some period in general practice before the hospital officers concerned reached the final grade.

Dr. ANNIS GILLIE specially welcomed the suggestion that some of the routine clinical work could well be done on a part-time basis by married women doctors who could spare the time from their domestic duties for regular sessions. Steps should be taken to encourage women doctors to come forward and do this work.

On another matter raised in the report from the Central Consultants and Specialists Committee, concerning the resolution adopted by the Representative Body last year, that diagnosis should not be disclosed on domiciliary consultation certificates, the report stated that "the matter is being pursued by the Ministry, but there is no great strength of feeling among consultants that a change should continue to be pressed. There are bigger issues than this to tax our energies."

Dr. W. WOOLLEY, as a member of Council elected by the Representative Body, took grave exception to this attitude. Surely issues raised by the Representative Body should not be dismissed in this fashion. Dr. Rowland Hill had spoken earlier of "the consultants' world." Dr. Woolley wondered sometimes whether the consultants' world was part of this world.

Dr. O. C. CARTER also took exception to these words, and Dr. ROWLAND HILL agreed to their deletion.

Questions were asked and answered on various other sections of the Committee's report, which included S.H.M.O. posts, medical advisory machinery, internal administration of hospitals, general-practitioner maternity hospital beds, senior registrars and additional consultant posts, and accommodation of medical superintendents outside the hospital, all of which will be found set out in the Annual Report in the next issue of the *Supplement*.

Organization

Dr. J. A. PRIDHAM introduced the report of the Organization Committee, which contained a number of recommendations designed to clear up little anomalies and difficulties, in most cases by an amendment of the by-laws. One proposal was for a composite subscription for the first five years of membership after qualification. The idea was that a practitioner joining on qualification might have an option to pay the subscriptions for the first five years in one sum of ten guineas, thus saving two guineas over the period.

Dr. FRANK GRAY took exception to this proposal. Some kind parent might pay the first subscription, so that the young practitioner joined the Association without himself having paid any subscription whatever, and then at the end of the period he would be asked for six guineas. If he had previously paid something he would have become subscription-minded, but if he had paid nothing he might be put off by this sudden demand to the extent of resigning from the Association.

Dr. R. G. GIBSON said that the great difficulty before the Organization Committee was to attract the newly qualified man or woman; if he or she could be got in for the first five years, membership was more likely to be continued.

On a show of hands the recommendation was carried.

Dr. PRIDHAM reported that the membership was now 66,537, as compared with 65,553 at the corresponding date last year, an increase of nearly 1,000. The percentage of membership in the United Kingdom to the total profession was 71, and to the working profession (that is, excluding retired), 80.

Science Activities

Mr. J. R. NICHOLSON-LEALEY presented the report of the Science Committee, which contained recommendations for the award of the Association prizes, and these were approved. The Science Committee was empowered to set up an *ad hoc* committee to inquire into the problem of accidental death and ill-health from coal-gas poisoning, and to make recommendations. The problem had been brought to the notice of the Committee by the Consulting Pathologists Group.

Dr. R. S. F. Schilling, editor of the *British Journal of Industrial Medicine*, was invited to deliver the 1956 Mackenzie Industrial Health Lecture, to be given at the B.M.A. House in London.

On the subject of crash helmets, which had been discussed at two previous meetings of Council, the Science Committee now brought forward a recommendation, which was adopted without discussion, approving the taking of all possible steps, including a press conference, to promote the more general wearing of crash helmets by motor-cyclists and their pillion and side-car riders.

Other Committees

Dr. TALBOT ROGERS briefly reported for the General Medical Services Committee, which had held two meetings since the last meeting of Council (*Supplement*, February 5, p. 39, and February 26, p. 64). The only recommendation, which was carried, was one renominating Dr. P. J. Gibbons, of Liverpool, for a further period on the Standing Pharmaceutical Advisory Committee.

Dr. VAUGHAN JONES, in reporting for the Occupational Health Committee (*Supplement*, February 12, p. 45), presented a revised statement on the remuneration of part-time industrial medical officers, which was recommended to the Representative Body for approval. The memorandum on "Terms of Service for Industrial Medical Officers," previously approved by the Council, had been revised in two particulars, and the revised memorandum was approved.

General J. C. A. DOWSE submitted a report from the Overseas Committee. This stated that a delegation from the Committee had met Colonial Office officials to discuss the revision of salaries in the Government Medical Service in East Africa. It had been agreed that new scales should

be given a fair trial and the situation reviewed after about a year, when it might be possible to assess the effect of the new terms upon recruitment. General Dowse said that his committee had learned with much pleasure that the annual meeting of the Middle East Branch this month in Damascus would be addressed by Sir Charles Symonds. This was the first appearance of the Branch in Syria, and the Committee considered that the Branch was fulfilling a most important function in maintaining the prestige of British medicine in that part of the world.

Dr. J. G. M. HAMILTON, for the Journal Committee, presented realization statements for last year for the *British Medical Journal* and the various special journals and other publications, compared with the budget figures for 1954 and the actual figures for 1953. Attention was drawn to the increasing cost of production.

A report was submitted from the Arrangements Committee for the Brighton Meeting, 1956. The subjects proposed and accepted for the three plenary sessions were, respectively, handicapped children, the present position of A.C.T.H. and cortisone, and recent advances in the knowledge of cancer.

Dr. MARY ESSLEMONT, for the Evidence Committee on Divine Healing, stated that the Committee had given further consideration to the preparation of the evidence and had received additional memoranda from members of the profession with special experience of the subject.

Dr. ROBERT FORBES, for the Central Ethical Committee, brought forward a statement on the loan of hospital records to Government departments. He said that it really amounted to a modification of the resolution which was passed by the Annual Representative Meeting in 1954. The Council agreed to recommend the revised statement to the Representative Body, and it will be found set out in the Annual Report of Council.

On the report of the Public Health Committee, presented by Dr. H. D. CHALKE, the Council agreed to support the recommendations of the Working Party on precautionary measures against toxic chemicals used in agriculture, with a view to the ultimate banning of bacterial rodenticides, and to raise this matter with the Ministry of Agriculture and Fisheries.

Further Business

It was agreed that a banner bearing the Coat of Arms of the Association be presented to the Canadian Medical Association at the Joint Annual Meeting in Toronto.

The Chairman of Council reported that a meeting of the Legal Actions Committee had been held in the course of the day, and it had been decided to go forward with the proposed appeal to the Courts to test the validity of the assessment for income tax of part-time consultants under Schedule E. It had yet to be determined which of a number of cases should be chosen to go forward as test cases.

Messrs. Hempsons were reappointed solicitors to the Association for one year from April 1, 1955.

It was reported that the Joint Committee of the B.M.A. and the British Veterinary Association had considered the revised memorandum on meat production and control submitted by the latter body, and that several amendments proposed by the B.M.A. representatives, clarifying points on which the policy of the Associations appeared to differ, had been accepted by the B.V.A. The possibility of a meeting of the representatives of the two bodies and of the Society of Medical Officers of Health and the Sanitary Inspectors Association, with a view to obtaining further agreement on the control of meat inspection and the responsibilities of veterinary surgeons and sanitary inspectors, was being explored.

A letter was read from the New York Academy of Medicine asking for the co-operation of the Association in arranging for a number of addresses by prominent British medical men to be included in the postgraduate radio-programme of the Academy. The co-operation of the B.B.C. had been promised to the extent of providing a talks director and a recording studio. The Academy suggested certain names of speakers and topics which would be particularly welcome for

broadcast talks in America. The Council approved the idea of co-operation and decided to request some further information about the arrangements.

The question of admission of students to medical schools was discussed at the last meeting of Council. A report was now presented to Council on the setting up by the Minister of Health and the Secretary of State for Scotland of a committee of inquiry into the number of practitioners likely to be engaged in all branches of the profession in the future, and the consequential intake of medical students required.

It was decided that the presentation of Association prizes, which ordinarily takes place at the Adjourned Annual General Meeting, to be held this year in Toronto, should take place during the next Council meeting in London.

The Council rose at 6.40 p.m., having begun its sitting at 10 a.m.

NATIONAL OPHTHALMIC TREATMENT BOARD ASSOCIATION

At the 38th meeting of the committee of the National Ophthalmic Treatment Board Association held on February 11 variations in the interpretation by ophthalmic services committees of the ruling on re-examination in *non-tolerance* cases was discussed. It was unanimously agreed not to seek any alteration in the ruling laid down in E.C.L.25/50 dated March 1, 1950, under Section (b), which reads:

To ensure that sight is not tested without the permission of the Ophthalmic Services Committee, if it has been previously tested within the preceding twelve months, except in those cases in which (i) in the view of the ophthalmic medical practitioner or ophthalmic optician the need for a further sight test appears to be urgent, or (ii) the patient's general medical practitioner has been informed that the patient should revisit his ophthalmic medical practitioner or ophthalmic optician with a view to a further examination within six months of the previous sight test.

Following a suggestion that a spare pair of glasses should be authorized through the National Health Service in certain approved cases where adults had a very low visual acuity and spectacles were essential, it was decided that the administrative difficulties were too complex to enable a workable scheme to be drawn up, and further that it was primarily the duty of the adult in question to accept his disability and to make arrangements accordingly. Dispensing members pointed out that in an emergency some appliance could usually be provided which aided such a patient.

Formation of Area Committees

Consideration was also given to a recommendation to set up area committees of the association to increase local interest and to hold area meetings on the lines of the helpful meeting held last year in Birmingham. It was decided to send fuller details to all members and refer both points to the annual general meeting.

The date of the annual general meeting was arranged for April 1 at B.M.A. House, London, and the preliminary agenda was drawn up for early issue.

FRIENDLY SOCIETIES IN 1953

The Chief Registrar of Friendly Societies reports¹ that those societies without branches, that provide sickness benefits, had a further small drop in membership, from 2,952,000 to 2,893,000, in 1953. An encouraging feature, however, was the rise in juvenile membership, which had suffered the sharpest fall during recent years.

In spite of the general decline in membership, the friendly societies' funds have continued to increase. The total for all societies without branches was £155,811,000 at the end of 1953 compared with £151,869,000 at the end of 1952. During 1953 these societies paid £3,205,000 sickness benefits, an increase of £230,000 on the previous year.

¹ Report of the Chief Registrar of Friendly Societies for the Year 1953, 1955, Part 2. H.M.S.O., London.

OPHTHALMIC GROUP COMMITTEE

A meeting of the Association's Ophthalmic Group Committee was held on February 11, with Mr. O. GAYER MORGAN in the chair.

Sight-testing Fee

When the salary scales of medical staff in the hospital service were revised in April, 1954, the Ophthalmic Group Committee, as previously reported (*Supplement*, June 12, 1954, p. 317), submitted a claim to the Ministry of Health for an increase in the sight-testing fee, and a deputation went to the Ministry in July to discuss the matter. The Ministry, however, was not prepared to admit the validity of the claim. The Committee pressed for a reconsideration of the matter and finally requested a personal interview with the Minister. This was granted, and a deputation consisting of the chairman (Mr. O. GAYER MORGAN), Mr. G. W. BLACK, Mr. J. H. DOGGART, and the deputy secretary of the Association (Dr. D. P. STEVENSON) met the Minister and senior officers of the Ministry and the Department of Health for Scotland on December 15, 1954.

The Minister later replied that, in consultation with the Secretary of State for Scotland, he had given careful consideration to the facts and arguments put before him, but could not agree that there were grounds for increasing the fee.

The Ophthalmic Group Committee regretted that, in spite of the strongest possible representations, it was not able to report a satisfactory conclusion of the negotiations.

Registration of Opticians

A memorandum from the N.O.T.B. Association invited the Group Committee to reconsider a number of points in connexion with the recommendations of the Crook Committee on the statutory registration of opticians. The general feeling of the Committee was that as the whole matter had already been carefully considered no useful purpose would be served by reopening it at this stage. In any case the Committee will have a further opportunity of reviewing its attitude when the terms of any draft Bill are available.

Sight-testing of Children

The Committee's attention was drawn to a report that in one area of the country the local education authority had decided that preliminary sight-testing of schoolchildren at 5 years of age should be discontinued and carried out later, between the ages of 7 and 8, by the head teacher's clerk or someone else called in by the head teacher for the purpose.

In the Committee's opinion the discontinuance of sight-testing at 5 years of age was a retrograde step, and, although the work was of a comparatively unskilled nature, being solely preliminary testing to ensure that a child could see reasonably well, it should be undertaken by a nurse or health visitor who had first received a certain amount of training.

The Committee decided to write to the school medical officer on both these points.

Supplementary Ophthalmic Service Records

The Committee discussed correspondence with the Ministry of Health about the period for which records of prescriptions under the supplementary ophthalmic service should be retained by executive councils. The Ministry stated that it had noted the Committee's request that it would like to be consulted in connexion with any proposals which might be made for changing the present procedure.

Service Ophthalmologists

The Committee was informed that the Ophthalmic Qualifications Committee was endeavouring to find a solution to the difficulty experienced by Service ophthalmologists in qualifying for admission to the central list of medical practitioners entitled to test sight in the supplementary ophthalmic service. Discussions on this matter are proceeding with the Government departments concerned.

EXPLAINING ABOUT OUT-PATIENTS

To explain the problems of out-patient departments and why time-tables get upset, the Bromley Group Hospital Management Committee has produced a handbook for patients attending hospitals in the Bromley Group. In a foreword the chairman of the Committee says that more than three-quarters of the Group's out-patients are seen within half an hour of the time booked for them. The booklet shows how patients can help to overcome the difficulties in the way of still greater improvement, and explains the basis on which the appointments system works and how it is affected by the types of cases seen and by emergencies. Ten patients out of every hundred given an appointment fail to attend without sending word.

FEES FOR LIFE ASSURANCE REPORTS

As reported in the proceedings of Council, under "Private Practice," at page 75 of this *Supplement*, agreement has now been reached with the Life Offices Association that the fee for medical examination and report on the ordinary form carried out on or after Tuesday, March 15, 1955, will be increased to two guineas. This is an increase on the present fee of £1 11s. 6d. agreed in 1947. As in the previous agreement, it has been accepted that the new fee shall cover the giving of subsequent information (whether or not involving a further examination) required by an office in elucidation of, or to remedy omissions in, the original report. A suitable fee, however, should be forthcoming when information additional to that sought in the original report is required.

Reports without Examination

During the recent negotiations the Association also proposed that the fee for a report without examination should in future be at least £1 1s. The Life Offices would not accept this suggestion, and thus the present position is unchanged. At the recent meeting of Council it was agreed to recommend to B.M.A. members that a suitable minimum fee for a report without examination for purposes of life assurance is £1 1s.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Consultant and other Specialist Staff in N.H.S.

SIR,—I have found the tables giving figures for consultant and other specialist staff in National Health Service hospitals (*Supplement*, February 26, p. 66) interesting and alarming.

It would appear that the training plans for senior registrars are geared to the total number of consultants in the Service and not to the number of appointments likely to become available. The crux of the problem lies in the very uneven age distribution of consultants, and this applies particularly to the more recently developed specialty, such as my own of orthopaedics. It will be seen from Table I that in the years 1956 to 1965 53 orthopaedic surgeons can be expected to reach retiring age, whereas the two following ten years show 155 and 170 respectively. The present training plan for senior registrars (Table III) would appear to provide for an even flow of approximately 125 trained consultants every 10 years. Some allowance can be made for the premature demise of myself or some of my colleagues, and further allowance can be made for the fact that some of the senior registrars have come from overseas and can be expected to return home on completion of their training. Even so, it would appear that there will be at least 100

trained orthopaedic surgeons available for no more than 60 posts. Examination of the next 10-year period shows an entirely different picture, and during this time the present training plan will fall short by some 50 candidates for the appointments likely to become vacant.

It is suggested, therefore, the solution might be to establish 50 temporary consultant appointments in orthopaedics during the next 10-year period, these appointments to cease in 1970. This scheme would have the twofold advantage of retaining in orthopaedics those who have completed their training as consultants, and would eventually even up the age distribution throughout the specialty. Unless this is done we are going to be faced with a recurring difficulty.—I am, etc.,

London, W.1.

GUY RIGBY-JONES.

SIR,—In your *Supplement* (February 26, p. 66) you publish some tables concerning the employment of specialist staff, issued by the Ministry of Health. Study of Tables I and II allows some deductions to be made relating to the proportion of S.H.M.O.s in the various specialties.

Plastic, thoracic, and neurosurgery are almost 100% consultant specialties, and doubtless rightly so (but spare a thought for the four outcasts in these groups not so graded). General physicians and surgeons and pathologists are about 80% consultant grades, with radiology and the orthopaedic surgeons a little higher at about 83%, and paediatricians right up with the leaders at 95%. Of the "poor relations," anaesthetists can manage little over 70% consultant status, and mental health a precise 60%. And then to the bottom of the ladder, with chest physicians having only 45% consultant grades, their sole companions in misfortune being the small, and often associated, specialty of infectious diseases physicians.

While it is neither practical nor desirable that all specialties should be similarly graded, yet it does appear that the chest service is very much the "Cinderella," and the prospect at present offers very little attraction to prospective recruits, and even less hope to its established servants of S.H.M.O. rank who had aspired, one day, to achieve consultant rank. Surely an urgent review is called for, that not only may justice be done, but, unlike the instance of the merit awards, it may also be seen to have been done.—I am, etc.,

Exmouth.

G. E. ADKINS.

Assistants in General Practice

SIR,—In the *Supplement* (November 20, 1954, p. 193) there appeared a letter from Dr. W. L. Templeton referring to the difficulty of entry into general practice for young doctors, and suggesting a remedy—that is, that the older doctor should not be compelled to work for ten years before qualifying for a pension, but should be allowed to retire at any date before the termination of ten years, being paid a proportionate pension.

I agree that the delayed retirement of older practitioners must be handicapping some of the younger, but I rather fear that the proposed remedy would never meet with acceptance from central authority, as it definitely breaks the accepted contract. Would there be any objection to an alternative scheme which has occurred to me—that is, that any doctor over 65 should be allowed to retire at will, receiving his compensation on retirement and also receiving his full pension at the end of ten years, provided that for each year intervening between retirement and pensionable qualification he should have paid to the Ministry of Health a sum equal to the superannuation paid in his last working year? The interval in question could in no case be more than three years, as the change could clearly not become operable before July, 1955, and might in many cases be two years or only one.

This plan would have the advantage of staggering the retirement of the older practitioners, many of whom would doubtless welcome retirement but are compelled to remain at work under existing conditions controlling pensions, and it would also facilitate the entry of younger practitioners

into settled practices and, so far as I can see, would in no respect lessen the obligation of the retired doctor to the Ministry of Health.

It might be argued that it would be difficult for some practitioners to find the money to pay the superannuation if they were no longer working, but to take the necessary amount from the capital received in compensation would surely be an advantageous investment in the long run.—I am, etc.,

Oxford.

ISABELLE M. LITTLE.

Facilities at Headquarters

SIR.—Suburban and provincial practitioners must find the B.M.A. quite useful as a rendezvous for lunch, etc., when in town; but many London G.P.s would welcome, I am sure, its use as a club one or two nights a week after the evening surgery. The talking of shop after dinner at home could be transferred to our, rather expensive, club, and an exchange of ideas is always useful. May I suggest an open common room from 8.30 to 10.30 p.m. on Wednesday and/or Thursday?—I am, etc.,

London, E.1.

N. D. WAYNE.

Doctors' Telephones

SIR.—Mr. H. K. Vernon (*Supplement*, February 26, p. 68) reiterates a common fallacy when he writes of a consultant using his car, and states that in certain circumstances "he is entitled to reclaim the cost of this journey from the regional board" (my italics). It is not the cost but the mileage allowance that one is entitled to claim; the former exceeds the latter by a considerable margin; the consultant pays the difference out of his own pocket. In the case of the whole-time consultant neither this personal contribution to the cost of the N.H.S. nor any part of the cost of a telephone is recognized for tax purposes as a necessary professional expense.—I am, etc.,

Ipswich.

R. MAYON-WHITE.

Doctors on the Dole

SIR.—From time to time letters appear in the *Journal* airing the grievances of various branches of the profession. Consultants complain about merit awards, S.H.M.O.s are dissatisfied with their status, G.P.s resent their exclusion from hospitals, and senior registrars and assistants in general practice express anxiety about their prospects of advancement and establishment. It is desirable that these grievances should be aired and that each section of the profession should be aware of the problems facing other sections and the profession as a whole.

I wish to draw attention to the plight of those at present seeking entry into general practice. Advertisers for assistants regularly receive upward of a hundred applications; one recently had over 200, and no view was offered. Admittedly some of these applicants will already be assistants seeking a change, but the majority have no steady employment in the meantime. It is obvious that under present conditions these persistent triers can have no reasonable expectation of a permanent post in the foreseeable future. Meanwhile, locum work is available in the summer, but the winter is fraught with unemployment and hardship, and the situation for most becomes financially impossible. A glance at the "Assistants Available" column shows that some of these doctors have been qualified for several years, most are widely experienced, and many are married with families to support.

My own experience is that in the past 10 months I have applied for 23 assistantships, and have had 12 replies, in eight cases getting as far as an interview. During these 10 months I have had 13 weeks of total unemployment and a further three weeks of part-time work only. I am not one of those who believe that the world owes them a living, but surely there is something far wrong when, nine years after the war and nearly seven years after the inception of the Health Service, so many young doctors should be denied a

means of livelihood and the security of a job with some degree of permanency in the largest single branch of medical practice.

The announcement by the Minister of Health of the appointment of a committee to look into future requirements of medical manpower shows official awareness of the problem, but offers little comfort to those affected in the present "surfeit" (?) of doctors. The figures given above apply to Scotland, but I understand that the position in England and Wales is comparable. It would be interesting if the members of the B.M.A. staff who undertook the recent analysis of the profession (*Supplement*, January 8, p. 9) could provide an indication of the number of doctors unemployed at that time.—I am, etc.,

Jeppa, Midlothian.

W. A. ELLIOTT.

H.M. Forces Appointments

ARMY

Brigadier W. L. Spencer-Cox, O.B.E., M.C., late R.A.M.C., has retired on retired pay.

Colonel (Temporary Brigadier) R. V. Franklin, O.B.E., late R.A.M.C., to be Brigadier.

Lieutenant-Colonel W. H. Hargreaves, O.B.E., from R.A.M.C., to be Colonel, remaining seconded.

HOUSEHOLD CAVALRY

Surgeon Major E. W. Hayward, O.B.E., to be Surgeon Lieutenant-Colonel.

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel J. G. M. A. Brunet, O.B.E., has retired on retired pay, and has been granted the honorary rank of Colonel.

Lieutenant-Colonel S. G. M. Lynch, having attained the age for retirement, is retained on the Active List.

Majors A. Bennett, R. G. Davies, and J. B. M. Milne, O.B.E., to be Lieutenant-Colonels.

Short Service Commission (Specialist).—Major I. E. Harries has retired, receiving a gratuity.

Short Service Commission.—Major D. R. Hood, T.D., has retired, receiving a gratuity.

Captain S. H. Janikoun to be Major.

Association Notices

Diary of Central Meetings

MARCH

- 16 Wed. Occupational Health Committee, 10 a.m.
- 16 Wed. Central Consultants and Specialists Executive, 2.30 p.m.
- 17 Thurs. G.M.S. Committee, 10.30 a.m.
- 17 Thurs. Charities Committee, 2.15 p.m.
- 22 Tues. Joint Consultants Committee, 11 a.m.
- 22 Tues. Working Party Subcommittee (to follow meeting of Joint Consultants Committee).
- 22 Tues. Orthopaedic Group Committee, 2 p.m.
- 23 Wed. Office Committee, 10 a.m.
- 23 Wed. Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
- 24 Thurs. Journal Committee (at St. Albans), 2 p.m. Cars leaving B.M.A. House at 10 a.m.
- 24 Thurs. Central Consultants and Specialists Committee, 10.30 a.m.
- 25 Fri. Public Health Committee, 2 p.m.
- 30 Wed. Evidence Committee on Divine Healing, 10 a.m.
- 30 Wed. Committee re Remuneration Policy, 2 p.m.
- 31 Thurs. Conference of Honorary Secretaries of Divisions and Branches, 10.30 a.m.
- 31 Thurs. Ethical Review Subcommittee, Central Ethical Committee, 2 p.m. (Date changed from March 17.)
- 31 Thurs. Committee on Homosexuality and Prostitution, 2.15 p.m.

APRIL

- 1 Fri. Scholarships Subcommittee, Science Committee, 11.30 a.m.
- 1 Fri. Science Committee, 2 p.m.
- 4 Mon. Armed Forces Committee, 2 p.m.
- 20 Wed. Conference of Advisory Councils on Occupational Health, 12 noon.
- 25 Mon. Staff Side, General Whitley Council (at 14, Russell Square, London, W.C.), 10.30 a.m.
- 25 Mon. General Whitley Council (at 14, Russell Square, London, W.C.), 2.30 p.m.

Branch and Division Meetings to be Held

ALDERSHOT AND FARNHAM DIVISION.—At Cambridge Hospital, Aldershot, Wednesday, March 16, 8.15 p.m., meeting.

BIRMINGHAM DIVISION.—At 154, Great Charles Street, Birmingham, Tuesday, March 15, 8.30 p.m., joint lecture by Dr. Hugh M. D. Shepherd and Mr. F. G. Allan: "Rheumatoid Arthritis."

CAMBERWELL DIVISION.—At St. Giles' Hospital, Camberwell, S.E., Tuesday, March 15, 8.45 p.m., meeting. Sir Zachary Cope: "Actinomycosis, a Frequently Misdiagnosed Condition."

DEWSBURY DIVISION.—At Batley General Hospital, Friday, March 18, 8.15 p.m., clinical meeting.

DORSET DIVISION.—At the Clinic, Glyde Path Road, Dorchester, Monday, March 14, 8.30 p.m., meeting. Lecture by Dr. A. S. Hall: "The Differential Diagnosis of Eruptions of the Extremities."

EAST NORFOLK DIVISION.—At the Green Lounge, Bell Hotel, Norwich, Wednesday, March 16, 8 p.m., meeting. Films: (1) "Clinical Uses of Hyaluronidase" (sound and colour). (2) Full colour silent picture: "Diseases of the Ear, Nose, and Throat in General Practice." A discussion will follow each film.

HALIFAX DIVISION.—(1) At Whitworth Hall, Royal Halifax Infirmary, Tuesday, March 15, 7.30 p.m., meeting. Film: "Separation of the Conjoined Twins of Kano." Admission by ticket only. (2) At Out-patient Department, Halifax General Hospital, Wednesday, March 16, 8.30 p.m., clinical meeting, followed by Mr. J. N. I. Emblin: "Trilene Anaesthesia in General Practice."

LINCOLN DIVISION.—At County Hospital, Lincoln, Saturday, March 19, 3.30 p.m., meeting. Paper by Dr. G. Armour: "Stress and its Relationship to Treatment in Rheumatoid Arthritis," followed by discussion; 5 p.m., paper by Dr. Trevor Wright: "Haemolytic Disease in the Newborn," followed by discussion; 7 for 7.30 p.m., dinner at Great Northern Hotel, Lincoln.

MID-ESSEX DIVISION.—At Out-patient Department, Chelmsford and Essex Hospital, London Road, Chelmsford, Wednesday, March 16, 8.15 p.m., meeting. Talk by Mr. J. Wentworth Day: "The Amazing Dr. Salter."

NORTH OF ENGLAND BRANCH.—At Royal Victoria Infirmary, Newcastle-upon-Tyne, Thursday, March 17, 7.15 p.m., film: "Conjoined Twins of Kano"; 8.45 p.m., address by Mr. J. L. Anderson, F.F.A., F.I.A.: "The Acceptance of Life Assurance Risks."

NOTTINGHAMSHIRE BRANCH.—At 64, St. James's Street, Nottingham, Wednesday, March 16, 8.30 p.m., meeting. B.M.A. Lecture by Dr. D. G. French: "Clinical Research in General Practice." The Nottingham Medico-Chirurgical Society has been invited.

ROCHDALE DIVISION.—At Birch Hill Hospital, Rochdale, Monday, March 14, 8.30 p.m., clinical meeting. Dr. M. C. G. Israels (Manchester): "Recent Advances in Treatment in Haematology."

SOUTH-EAST ESSEX DIVISION.—At Southend General Hospital, Friday, March 18, 8.30 p.m., meeting. B.M.A. Lecture by Dr. W. D. Wylie: "Anaesthesia and General Practice."

SOUTH SHIELDS DIVISION.—At Ingham Infirmary, South Shields, Wednesday, March 16, 8.30 p.m., meeting. Clinical Symposium by Consultant Staff of Ingham Infirmary.

SOUTH-WEST ESSEX DIVISION.—At New Out-patient Department, Connaught Hospital, Orford Road, Walthamstow, E., Wednesday, March 16, 8.30 p.m., general meeting.

STOCKPORT DIVISION.—At Stockport Infirmary, Tuesday, March 15, 8.30 p.m., Dr. J. D. Allan: "Modern Trends in Paediatrics."

SUNDERLAND DIVISION.—At Royal Infirmary, Sunderland, Friday, March 18, 8 p.m., address by Dr. W. N. Pickles: "Epidemiology in Country Practice."

TEES-SIDE BRANCH.—At Sparks Café Royal, Middlesbrough, Tuesday, March 15, 8.30 p.m., meeting. Lecture by Sir Daniel Davies: "The Doctor and To-day."

WEST LOTHIAN DIVISION.—At West Port Hotel, Linlithgow, Thursday, March 17, 8 p.m., meeting. Address by Mr. William Mair: "Legal Pitfalls of Medical Practice."

WEST SUSSEX DIVISION.—At Burlington Hotel, Worthing, Wednesday, March 16, 6.30 p.m., meeting. Papers by Dr. W. A. Bourne, Mr. N. C. Tanner, and Dr. J. Lipsey: "Peptic Ulcer," 8 p.m., dinner. After dinner, discussion of papers with Drs. Bourne, Tanner, and Lipsey.

WINCHESTER DIVISION.—At Nurses' Home, Royal Hampshire County Hospital, Thursday, March 17, 8.15 for 8.30 p.m., joint meeting with E.C.I. Club. B.M.A. Lecture by Dr. Raymond Greene: "Hormone Therapy and the General Practitioner."

Meetings of Branches and Divisions

SOUTH STAFFORDSHIRE DIVISION

Meetings of the Division were held at the Star and Garter Hotel, Wolverhampton, on November 24 and December 15, 1954, and January 25, 1955. Mr. Leslie Thomas took the chair at the first meeting, at which Dr. Robert Morrison delivered the B.M.A. lecture on "Radiotherapy in Malignant Disease." At the meeting on December 15 Dr. R. S. V. Marshall took the chair, and was presented with a chairman's badge of office by Mr. Leslie Thomas. Mr. A. L. d'Abreu gave a lecture on "The Indications for Cardiac Surgery." Dr. Marshall again took the chair on January 25, when Dr. F. H. Milner gave a lecture on "Allergy."

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY MARCH 19 1955

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British Medical Association

ANNUAL REPORT OF COUNCIL, 1954-5

Every member is asked to keep this Supplement, which contains matters referred to Divisions, until the subjects have been discussed by his Division.

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PRELIMINARY

Chairman of Council

1. Dr. E. A. Gregg has been appointed Chairman of Council for the sessions 1954-5 and 1955-6.

Council Dinner

2. On November 2 a Council Dinner was held in the Great Hall of B.M.A. House. The chief guest was H.R.H. The Duke of Edinburgh, K.G., K.T., who was presented by the Chairman of Council with a Certificate of Honorary Membership of the Association designed and executed by a distinguished artist, Miss Margaret Alexander, and enclosed in a red leather case made by Mr. G. W. Frewin, of the Central School of Arts and Crafts in London.

His Royal Highness proposed the traditional toast of the "Common Health," and the Minister of Health replied.

Dedication of War Memorial

3. The War Memorial in the Court of Honour of B.M.A. House in Tavistock Square was dedicated by the Archbishop of Canterbury on Tuesday afternoon, November 2, 1954. The service of dedication was simple but impressive. The singing was led by the choir of the Queen's

Chapel of the Savoy, and the music played by the band of the Royal Army Medical Corps. In addition to the Archbishop, the Moderator of the General Assembly of the Church of Scotland, a representative of the Free Church Federal Council, and the Vicar of St. Pancras took part in the service.

The President of the Association (Sir John McNeel), at the invitation of the Chairman of the War Memorial Committee (Dr. H. Guy Dain), unveiled the memorial plaque, which bears the following inscription:

"In Memoriam 1939-1945

In Honour of the Medical Men and Women of the British Empire and Commonwealth of Nations who gave their lives in the Second World War."

Wreaths were laid by the Chairman of Council (Dr. E. A. Gregg) and the President of the Medical Women's Federation (Dr. Annis Gillie).

A large number of relatives of the fallen, members of Council, and other members of the Association (in academic robes) and distinguished guests were seated in the courtyard for the ceremony.

The Memorial, which was designed by Mr. James Woodford, O.B.E., R.A., in collaboration with Mr. S. Rowland Pierce, F.R.I.B.A., takes the form of a central fountain.

with two symbolic heroic-size figures on the west and two on the east side, all in Portland stone. The design of the bronze fountain jet is based on the shape of the staff of Aesculapius. The four statues have as their themes Sacrifice, Cure, Prevention, and Aspiration.

The cost of the Memorial has been defrayed from voluntary donations totalling over £8,000 as a result of an appeal by the Chairman of Council, and, in accordance with the wishes of some of the donors, a proportion of the funds has been set aside for assisting in the education of the children of the fallen.

The Roll of Honour of members who fell in both World Wars—542 names having been added for the 1939–45 War—is available for inspection in the Hastings Room.

A twenty-page illustrated brochure containing photographs of the Memorial and the names of the fallen may be obtained, price 2s. 6d.

Joint Annual Meeting, Toronto, 1955

4. The Annual Meeting of the Association will be held this year in Toronto from June 20 to 24 as a Joint Meeting of the B.M.A. and the Canadian Medical Association. The Council is pleased to be able to report that upwards of 250 members from the United Kingdom will be taking part in the meeting. A full programme of plenary sessions, scientific sections, and other scientific meetings has been arranged. (See *British Medical Journal Supplement* of February 26.)

The President, 1955–6

5. Dr. T. C. Routley, who will be President of the Association next session, is resident in Canada. The Council therefore recommends:

Recommendation: That in the absence of the President during the session 1955–6, Sir John McNee, who will then be the Immediate Past-President, be invited to act for the President on all appropriate occasions.

Future Annual Meetings

6. As already announced, the Annual Meeting in 1956 will be held in Brighton from July 5 to 13.

The Council has accepted an invitation from the Newcastle-upon-Tyne Division to hold the Annual Meeting in Newcastle-upon-Tyne in 1957 (July 11–19), and an invitation from the East Kent Division to hold the Annual Meeting in Margate in 1958 (June 19–27).

The Annual Meeting in 1959 will take the form of a Joint Meeting of the B.M.A. and the Canadian Medical Association, and will be held in Edinburgh at the invitation of the City of Edinburgh Division from July 16 to 24.

Annual Representative Meeting, 1955

7. The Annual Representative Meeting will be held in London this year from June 1 to 4. The Council has accepted the kind offer of the Metropolitan Counties Branch to arrange a Cocktail Party for members of the Representative Body and their ladies on the eve of the A.R.M., and to make provision for a Ladies' Club. There will be a joint dinner for Representatives and their ladies at the Dorchester Hotel on the evening of June 1.

Representatives at Conferences of Other Bodies

8. The Council appointed the following to represent the Association at the Conferences named:

Third International Conference on Gerontology, London, July, 1954	Dr. H. D. Chalke
Danish Medical Association Annual Meeting, Aarhus, August, 1954	Dr. K. Cowan
Fifth International Congress on Mental Health, Toronto, August, 1954	Dr. J. T. McCutcheon
National Smoke Abatement Society Annual Conference, Scarborough, September, 1954	Dr. Doris Odium
	Dr. C. Metcalfe Brown

Sanitary Inspectors' Association Annual Conference, Southport, September, 1954

Columbia University Bicentennial, October, 1954

Royal Sanitary Institute Health Congress, Bournemouth, April, 1955

International Hospital Federation's Ninth International Congress, Lucerne, May, 1955

Annual Cremation Conference, Ayr, June, 1955

Commonwealth Health and Tuberculosis Conference, London, June, 1955

Australasian Medical Congress (B.M.A.), Sydney, August, 1955

Sanitary Inspectors' Association Annual Conference, Scarborough, September, 1955

Annual Meeting of Medical Association of South Africa, Pretoria, October, 1955.

Coat of Arms

9. In order to meet certain criticisms, it has been necessary to make some changes in the original design of the Association's armorial bearings. The lion in the design proved unacceptable to the Lord Lyon King of Arms and has been replaced by a blue lion passant. The crest has been improved and now takes the form of two torches of learning in saltire, with the rod and serpent of Aesculapius in a central position. A pomegranate has been substituted for the apple in the right hand of Hippocrates. It is hoped that the armorial bearings will be granted to the Association in the near future, and the Council proposes to incorporate them in a banner to be presented to the Canadian Medical Association at the Joint Annual Meeting in Toronto.

The Council again wishes to place on record its indebtedness to Dr. S. F. Logan Dahne, whose invaluable help and expert knowledge of heraldry have been placed so freely at the disposal of the Association.

Staff

10. Mr. P. M. Hubbard, M.A., has been appointed to the post of Senior Assistant to the Public Relations Officer.

Mr. A. W. Jarvie has been appointed to the post of part-time Press Officer to the Association in Scotland, which had been rendered vacant by the resignation of Mr. Alexander Bowman.

The Council records with deep regret the death of Dr. Alfred Cox, who gave distinguished service to the Association as Medical Secretary from 1912 to 1932.

Columbia University Bicentennial

11. In 1954 Columbia University, in the City of New York, celebrated the two hundredth anniversary of the grant of its original Charter by King George II. An Address, handwritten on parchment, signed by the officers of the Association, sealed with the seal of the Association, and enclosed in a leather case bearing the Association's crest, was presented by the Association's President-Elect (Dr. T. C. Routley) at the Anniversary Convocation last October.

Swedish Medical Association

12. The Swedish Medical Association celebrated its fiftieth anniversary in June, 1954, and to mark the occasion the Council presented a piece of silver on behalf of the British Medical Association.

The Medical Profession in the U.S.S.R.

13. Last August the Council repeated its invitation (which was declined two years ago) to the President of the Academy of Sciences of the Union of Socialist Soviet Republics to arrange for six Russian doctors to visit Great Britain as guests of the Association. No reply has yet been received.

In November last a party of 10 distinguished Russian doctors on a visit to Great Britain was entertained in B.M.A. House. The guests were received by the Chairman of Council, who was accompanied by the President of the Medical Women's Federation (Dr. Annis Gillie). They presented to the Association a number of books in the Russian language, and at their request various publications of the Association were sent to them.

Cricket

14. A return match was played at Hurlingham on May 30, 1954, between teams representing the Association and the Law Society, and was won by the Law Society team. A further match between teams representing the two organizations will be played in 1955.

The Council is again indebted to Dr. R. P. Liston (Tunbridge Wells) for kindly making the necessary arrangements on behalf of the Association.

Gift to the Association

15. The Council has pleasure in reporting that one of its members, Mr. D. S. Pracy, has kindly presented to the Association three pieces of cloisonné for the Hastings Room. These were formerly in the Bowes Collection and are first-class examples of Japanese work.

GENERAL MEDICAL SERVICES

Remuneration

Size of the Central Pool

16. Negotiations have continued on the application of the various factors which must be taken into account in order to assess the size of the Central Pool each year. The method of calculating the number of doctors in the Service has finally been agreed in detail, and the G.M.S. Committee is satisfied that the formula adopted should provide an accurate result. It has also been agreed that a practice expense ratio of 32.3%, which is slightly higher than the actual ratio which emerged from a new Inland Revenue inquiry into 1951–2 accounts, will be applied to the calculation of the 1952–3 Pool. The Pool for that year has now been finally determined and shows a small balance due to the profession.

A further inquiry by the Board of Inland Revenue into accounts for the year 1952–3 for application to the 1953–4 Pool is now under way, but the Board has indicated that it may not be possible to undertake similar inquiries every year.

The G.M.S. Committee rejected a suggestion by the Ministry that a Working Party of experts should be established for the purpose of keeping the expense ratio up to date in those years when the Board of Inland Revenue is unable to undertake a full inquiry, and this and other points will be settled by direct negotiation with the Ministry of Health, as has been the case in the past.

No satisfactory method of estimating the income received by general practitioners from private practice has been found apart from a full-scale inquiry, which the Board of Inland Revenue would not be able to undertake. The G.M.S. Committee has therefore informed the Ministry that it will be prepared to accept the figure of £2m. for the year 1953–4. It is hoped that the size of the Pool for 1953–4 will shortly be determined, and that the final settlement for that year will be substantially in excess of the amount for 1952–3.

The Danckwerts Award and the Small-list Practitioner

Last year the Conference of Local Medical Committees and the Representative Body approved the second report of the Working Party, and the Ministry, in consultation with the G.M.S. Committee, introduced the new scheme of Supplementary Annual Payments for small-list practitioners. The G.M.S. Committee insisted that the criteria laid down

for the purposes of the scheme should not be too rigidly applied, and particularly that borderline cases should not be rejected merely because they failed to conform with the criteria in some small respect. The Ministry readily agreed that the scheme should be as flexible as possible, and the Central Committee has been given specific power to vary the application of the criteria to meet borderline cases.

This Central Committee, consisting equally of representatives of the profession and the Ministry, has already reviewed a number of doubtful cases, and the Committee is glad to report that the new arrangements are working satisfactorily. More recently the Ministry has agreed that claims for Supplementary Annual Payments will also be considered from general practitioners who have retired since the new scheme came into operation on April 1, 1953, and also from the estates of those general practitioners who have died since that date.

Exchange of Practices

17. Discussions have taken place with the Medical Practices Committee on certain suggestions made by the special subcommittee which was established last year to examine ways and means by which established practitioners could more easily change the area of their practices. As a result of these discussions, the Medical Practices Committee has issued a circular letter to executive councils in which it is suggested that, when it is apparent that a further vacancy in another area may be created by the appointment of a particular doctor, executive councils may feel that this is one of the factors to which favourable consideration might be given.

Medical Practices Committee

18. The G.M.S. Committee is pleased to report that F. Lishman (Crook, Co. Durham) has been appointed a member of the Medical Practices Committee.

Group Practice

19. The Group Practice Loans Committee, composed equally of representatives of the G.M.S. Committee and the Ministry, has held several meetings and considered a number of applications submitted under the Group Practice Loans Scheme. An encouraging start has been made, and the Committee believes that the Fund has a valuable part to play in facilitating group practice.

Committee on General Practice of the Central Health Services Council

20. A detailed study has been made of the Report of the Committee on General Practice within the National Health Service which was set up by the Central Health Services Council. The G.M.S. Committee's detailed comments and criticisms were circulated to local medical committees, who were invited to express their own views on any part of the Cohen Committee's Report. A consolidated document setting out the views of the Committee and of local medical committees is now in course of preparation.

Drugs for Private Patients

21. It will be remembered that in the last Annual Report an account was given of the representations which had been made by the G.M.S. Committee in support of the Association's policy that private patients should be permitted to obtain their drugs and appliances under the National Health Service on Form E.C.10.

Following these discussions with officers of the Ministry, a deputation, representing the G.M.S. and Private Practice Committees, was received by the Minister. An account of the meeting is set out in Appendix II.

Prescribing of Proprietary Preparations

22. Following the Minister's announcement in the House of Commons that doctors would be asked not to prescribe

certain proprietary preparations in cases where it had not been possible to reach satisfactory price arrangements with the manufacturers, the G.M.S. Committee was asked for its comments on a draft circular letter which the Ministry proposed to send to all general practitioners, giving details of the proprietary preparations which were affected. The Committee obtained an assurance from the Ministry that the Minister's announcement in no way departed from the agreed policy that a general practitioner is quite free to prescribe whatever he decides to be necessary in the best interests of his patient, but it was pointed out that the phraseology in the draft circular by no means made this clear.

After further discussion, the Ministry agreed to amend its circular to meet the G.M.S. Committee's wishes, but the Ministry was left in no doubt as to the Committee's view that it was unfortunate that the Minister had opened his campaign by referring to a group of well-known proprietary anti-asthmatics which, though more costly, were frequently more efficacious and better tolerated than the equivalent standard preparation. The Committee has also secured more adequate representation of general practitioners on the new Standing Joint Committee on the Classification of Proprietary Preparations.

Economy in Prescribing

23. It has long been maintained by the G.M.S. Committee that one of the most effective methods of combating high prescribing costs would be a return to the system of areal averages which operated before the National Health Service. Although it has not been possible to resume this practice on a national scale, a start has now been made by circularizing comparative prescribing costs to doctors in certain areas. Similar information will be collated and distributed for other areas from time to time. The Committee intends to keep a careful watch on the way in which these figures are compiled.

Standard of Accommodation in Surgeries and Waiting-Rooms

24. Early in the new session statements in Parliament and in the Press again focused public attention on the standard of surgery and waiting-room accommodation provided by general practitioners. Although in October, 1953, a circular letter on the subject by the Chairman of the G.M.S. Committee was sent to every general practitioner in the Health Service, no precise information was available to either confirm or deny the allegations which had been made from time to time of inadequate or unsatisfactory practice accommodation. Furthermore, it was clear that a general survey under arrangements to be made by the Ministry and executive councils was both inevitable and imminent.

The G.M.S. Committee, feeling that this was a matter which was primarily of concern to the profession rather than one which called for official action under the regulations, discussed the problem with the Ministry of Health, and in consequence it was agreed to seek the co-operation of local medical committees in carrying out surveys of the practice accommodation in their own areas.

The vast majority of local medical committees in England and Wales have agreed to co-operate to the full, and it is hoped that within a reasonable time the G.M.S. Committee will have an accurate picture of the general situation throughout the country.

Provision of Diagnostic and Ancillary Facilities

25. The course of events at the Springfield Maternity Home at Blackburn has given rise to concern that proposals to withdraw or vary clinical facilities which have been granted to general practitioners—both the provision of general-practitioner beds and of diagnostic and similar ancillary services—can reach an advanced stage before they come to the notice of the G.M.S. Committee or the Ministry.

Proposals of this sort are generally initiated in a committee of the regional hospital board or in the hospital management committee, and, although there may be a general-practitioner member of the board or management committee itself, he may not necessarily be a member of its committees or subcommittees.

The Ministry's attention has therefore been brought to the desirability of instituting centrally early and full discussions on any proposals affecting facilities for general practitioners. The Ministry has undertaken to raise the matter with senior administrative medical officers of regional hospital boards. The opportunity will also be taken of reminding them of the desirability of including general-practitioner representation on hospital management committees.

Amendment of the Service Committees and Tribunal Regulations

26. Discussions are still proceeding with the Ministry on the proposals made by the G.M.S. Committee for amending the Service Committees and Tribunal Regulations. It is hoped that the few points outstanding will soon be resolved and that it will be possible to report the final outcome of these discussions in the Supplementary Annual Report.

Representation of General Practitioners on Boards of Governors of Teaching Hospitals

27. Whilst there is now at least one general practitioner on every regional hospital board, in the case of the teaching hospitals the situation is far from satisfactory, and, to quote the London area as an example, on only six of the boards of governors is a general practitioner included in the membership. Whilst in the case of regional hospital boards the Ministry is required to consult such organizations as may be recognized as representative of the medical profession in the area, no similar obligation exists in the case of boards of governors. It appeared, however, that there was no reason why the Association should not take advantage of section (d) of Part III of the Third Schedule to the Act, which requires the Minister to consult with such organizations as appear to him to be concerned, and through Branches and Divisions of the Association and the local medical committees in the area, or preferably a combination of these bodies, nominate general practitioners to serve on boards of governors.

It is therefore proposed that in future years Branches and Divisions will be invited to consult with local medical committees and put forward, through Headquarters, to the Ministry the names of general practitioners who are willing to serve on boards of governors. It is emphasized that this procedure will in no way modify the existing method of obtaining consultant representation on boards of governors of teaching hospitals.

General Practitioner Refresher Courses Grants for Locums

28. The Ministry has agreed with the G.M.S. Committee's view that the grant which is made towards the expenses of engaging a locum during the period that a general practitioner is attending a postgraduate course is inadequate having regard to present-day conditions. The Ministry has agreed to increase the grant to 16 guineas per week, and the new rate will be payable from September 1, 1954.

Assistants

The Ministry has agreed that, from September 1, 1954, assistants in general practice will be eligible to attend postgraduate courses, the cost of which will be borne from public funds. The G.M.S. Committee accepted a suggestion by the Ministry that, in order to be eligible for a grant, an assistant should have been qualified as a medical practitioner for at least three years.

Maternity Medical Services

General Practitioners and Institutional Midwifery

29. It will be remembered that the G.M.S. Committee, in association with the Blackburn and Lancashire Local Medical Committees, had made strong representations to the Ministry of Health against the closure of the Springfield Maternity Home at Blackburn. A deputation was received by the Permanent Secretary to the Ministry, who, although he held out little hope of reversing the decision of the regional board to close Springfield, gave an assurance that the board would be asked to consider carefully the provision of alternative accommodation which would be reasonably accessible to general practitioners in Blackburn. Later a meeting of the board took place at which representatives of the various interests concerned were invited to be present and were given an opportunity to state their views as to the provision of alternative accommodation. Subsequently, the Board announced that it had reached the conclusion that the provision of additional general-practitioner maternity beds in Blackburn to replace those no longer available at Springfield was impracticable.

The G.M.S. Committee then suggested that, in an attempt to meet the opposing views of both sides to the dispute, the situation should be investigated on the spot by representatives of the Ministry and the G.M.S. Committee. This proposal was rejected by the Ministry and, in consequence, a personal interview was sought with the Minister on the subject. The deputation emphasized not only the inaccessibility and unsuitability of the accommodation offered, but also the fact that general practitioners were clearly entitled to expect that adequate consultation should take place with local medical committees before decisions of this nature were taken by the hospital management committee.

During the course of the interview with the Minister it was clear that he was unwilling to intervene in a matter which he considered to be within the competence of the regional hospital board and the hospital management committee. Nevertheless, an assurance was received that the whole situation would be reviewed in the full light of the facts. Subsequently, however, the G.M.S. Committee was informed that the Minister did not feel justified in intervening in this particular case.

Whilst it is felt that there is little further action which can usefully be taken in this instance, on the general issue, much anxiety is felt that where proposals are afoot to vary the facilities available to general practitioners the local medical committees concerned are not always consulted at a sufficiently early stage. Possible methods of remedying the situation are being considered by the Liaison Committee which exists between the G.M.S., Central Consultants and Specialists, and Public Health Committees.

Use of Pethidine in Midwifery

It will be remembered that the Representative Body last year expressed some misgivings about a circular letter which had been submitted to the G.M.S. Committee drawing attention to the possible dangers of a midwife using a supply of pethidine which had been supplied by a general practitioner when she was already in a position to obtain a supply herself through the medical officer of health.

Following consultation between the Ministry of Health and the Home Office, the original draft was withdrawn and a circular issued in which it was stated that, whilst it was legally in order for a midwife working with a general practitioner to use a supply prescribed by the doctor or issued directly to him, nevertheless, to prevent confusion and waste it was desirable that the general practitioner should not himself prescribe but should rely upon the midwife's supply obtained through the medical officer of health. It was felt that the revised form of the circular met the objections which were raised to the original draft and it has since been issued.

Treatment of Services Personnel on Leave as Temporary Residents

30. Agreement has now been reached between the G.M.S. Committee, the Ministry of Health, and the Service departments on the arrangements whereby Services personnel on leave will in future be treated as temporary residents under the National Health Service. Adequate assurances have been received that the interests of private practitioners and special groups, such as Admiralty surgeons, will be protected. Similarly, an assurance has been given by the Ministry of Health that the arrangement will not in any way affect the size of the central pool.

Acceptance of Patients of a Vacant Practice

31. Both the G.M.S. and Central Ethical Committees have for some time been seeking a satisfactory solution of the problem of protecting the position of the appointed successor to a death or retirement vacancy. The need to find some practical method of overcoming the difficulty has been emphasized by several instances in recent months which have demonstrated the extent to which the practice of the successor can be adversely affected by the transfer of patients to the practitioner temporarily looking after the practice. The situation was complicated by the fact that any solution must be capable of dealing, not only with the full-time locum, but also with neighbouring practitioners already on the medical list who may have been looking after the practice temporarily pending the appointment of a successor. At the same time, the freedom of the patient to change his doctor at will must be borne in mind.

In view of these factors, a special subcommittee has been appointed to examine all aspects of this difficult problem.

Remuneration of Trainee General Practitioners

32. The G.M.S. Committee has asked the Ministry to increase the salaries of trainee general practitioners on the ground that there has been an upward trend in the salaries paid to assistants generally.

General Practitioner Representation on the Clinical Research Board

33. The G.M.S. Committee, in conjunction with the College of General Practitioners, has again made strong representations that general practitioners should be entitled to representation on the Clinical Research Board.

The Board is by no means unsympathetic, and the matter will be raised again when the term of office of the present members has expired.

General Dental Services

Dental Anaesthetics

34. On a number of occasions attention has been drawn to the inadequacy of the fee paid to general practitioners for providing dental anaesthetics. This matter has been discussed with the British Dental Association, which pointed out that the dentist can hardly be expected to pass on to the doctor a higher fee than he in fact receives from the Dental Estimates Board, and that the only remedy lies in a general upward revision of the scale of fees paid to dentists.

The Committee has therefore offered the B.D.A. its full support in any negotiations with the Ministry for an increase in the dental anaesthetic fees at present paid by the Dental Estimates Board.

Dental Haemorrhages

After long discussion with the Ministry the regulations have now been amended to enable a general practitioner to claim a fee for attending a case of haemorrhage following a dental extraction. Unfortunately there remain two circumstances in which a practitioner is unable to obtain a fee—namely, where the haemorrhage follows extraction in hospital and where the haemorrhage follows dental treatment given privately.

The G.M.S. Committee has been able to make little headway in the first set of circumstances, but, following discussions with the Ministry of Health, it is understood that the dental scale of fees now makes it possible for a dentist to make a claim when the arrest of haemorrhage follows an extraction carried out privately, provided that he is also taking part in the general dental services. When the dentist is in purely private practice no claim can be made on the National Health Service.

The Ministry is also looking into the possibility of paying more than one fee where more than one practitioner is called upon to arrest dental bleeding following the same extraction.

National Insurance Contributions

35. A motion referred to the Council by the Representative Body last year suggested that it was unfair to call upon an individual to pay a full week's National Insurance contribution when the contributor was unfit for work for only part of the contribution week in question. This matter has now been taken up with the Ministry of National Insurance, who maintain that any revision on these lines would completely upset the actuarial basis of the National Insurance scheme. The Ministry's arguments appear conclusive, and there seems little justification for pursuing the matter further.

Post-mortem Examinations

36. The Representative Body last year called for arrangements to be made which would enable a practitioner to have a post-mortem performed by a consultant pathologist on any case of particular clinical interest—the cost being borne by the National Health Service. Because of possible legal implications, the G.M.S. Committee sought advice on the situation generally, but, unfortunately, the various enactments on the subject are by no means clear and are possibly out of keeping with present-day conditions. The G.M.S. Committee believes that it would serve no useful purpose to raise this matter officially with the Government departments concerned, and is satisfied that from a practical point of view the position is adequately covered. In general, post-mortems can be divided into five main groups, namely:

- (1) Those undertaken at the request of the coroner, which represent the majority of cases, and where the coroner has an overriding interest over all other persons. Many cases of clinical interest come within this category.
- (2) Another fairly large group—those carried out in hospital, where many cases of clinical interest occur. Consent of the relatives is necessary in these instances, but in most cases it is readily forthcoming.
- (3) A group which can be described as ex-hospital cases. Here, if the general practitioner is in doubt he can ask the hospital authorities to conduct a post-mortem and the certificate will be given in the proper way without reference to the coroner.
- (4) Those where a general practitioner has attended the patient for some time. In these instances he can communicate with the coroner, who can order a post-mortem, where the cost is defrayed from public funds. Here again a certificate can be given without an inquest.
- (5) Lastly, there is a group where the relatives or executors wish for a post-mortem. In all these cases it is wise, as a matter of courtesy, to advise the coroner—the cost falls upon the relatives or executors making the request.

Within the limit of the instances which are cited above, any general practitioner who is in doubt over a case involving matters of clinical interest or public policy can achieve his objective through one or other of these channels. It is felt, therefore, that in view of the adequate arrangements which can already be made in the vast majority of cases no further action is called for at the present time.

Insulin Syringes

37. The G.M.S. Committee, in consultation with the Diabetic Association, is representing to the Ministry of Health that the recently introduced 1½-cm. type of insulin syringe is not suitable for the purpose for which it was designed. Not only is it an extremely clumsy instrument from the point of view of self-administration, but its capacity is too

small for the larger doses of insulin which are frequently ordered. The Ministry is being asked to provide a 2-cm. syringe of the same length as the present 1-cm. syringe, but with a wider barrel. There is no criticism of the 1-cm. syringe, which has proved most satisfactory in use.

At the same time, the G.M.S. Committee has pointed out that it would be of considerable advantage if a spirit container were provided with these two syringes in an endeavour to reduce the many breakages which occur and to facilitate sterilization.

COMPENSATION AND SUPERANNUATION

Compensation

38. The Council has reviewed the question of the advance payment of compensation in circumstances which do not qualify for payment on grounds of hardship arising out of a debt incurred in purchasing a practice before the appointed day. In the opinion of the Council, it is still not opportune to reopen this question with the Ministry of Health. There has been no change in the position since the matter was discussed with the Department recently.

Superannuation—Determination of Questions

39. During last session the Council contemplated an approach to the Ministry of Health with a view to amendment of regulation 60 of the N.H.S. Superannuation Regulations, 1950, which states that any question on the rights or liabilities of persons under the regulations shall be determined by the Minister, there being no appeal against the Minister's decision. Action was deferred, however, pending the outcome of an appeal to the High Court and subsequent recourse to the Appeal Court against a decision of the Minister under regulation 60. These appeals were lost, but comments made by Mr. Justice Cassels and also by Lord Justice Denning have given support to the Council's view that there should either be a statutory Appellate Tribunal to determine these questions, or at least a Tribunal which can hear evidence relevant to matters in dispute and advise the Minister before questions are finally determined. Appropriate representations have been made to the Ministry.

Amendment of N.H.S. Superannuation Regulations

40. The Ministry of Health has been informed that the Council has no comments to make on draft regulations to amend still further the N.H.S. Superannuation Regulations, 1950. In the main, the amending regulations deal with anomalies which have come to light during the past five years. The Ministry has been asked, however, to incorporate further amendments so as to reverse the present procedure for assessing the contributions paid by a partnership, and to allow the superannuation contributions relating to a hospital appointment held by one partner to be shared between the partnership in accordance with their shares, contributions being deducted by the executive council.

Assessment of Pension of Practitioners

41. The advice of the Actuary has been sought in an attempt to ascertain whether there is likely to be any disparity between a pension assessed on eightieths of average remuneration over the last three years of service and one assessed on the "practitioner" basis of 1½% of superannuable remuneration for all years of service. The Council is satisfied that no true comparison can be made until information is available on the effect of the new distribution scheme on the average remuneration curve of a practitioner, or until the result is available of the first actuarial investigation into the N.H.S. Superannuation Scheme, due in July, 1955. The Council proposes to reconsider this question at a later date in the light of the Government Actuary's report.

Short Service and Death Gratuities

42. The Ministry of Health suggested that, in the case of practitioners, short-service and death gratuities should be

assessed on total superannuable income instead of on the average remuneration over the last three years of service. This change would result in a reduced gratuity in some cases, particularly where a gratuity is paid in respect of a young practitioner. As a result of representations by the Council the Department will continue the present method, but the definition of average remuneration will be modified slightly in order to simplify the calculation.

Relief from Tax on Minister's 8% Contributions

43. Arising out of a decision of the High Court, tax is payable on the 8% contribution made by the Minister to those who exercised the option to continue life policies instead of joining the N.H.S. Superannuation Scheme. The Council has considered the reports of the Millard Tucker Committee, which deal *inter alia* with tax relief on superannuation provisions by self-employed persons, and regards efforts to obtain early implementation of the recommendations of the Millard Tucker Committee as the best means of removing this anomaly.

Local Government Superannuation

44. The Council has kept local government medical officers informed of the options available under the Local Government Superannuation (Benefits) Regulations which came into operation on October 1, 1954. It has also expressed its concern at the action taken by one authority in passing a general resolution which excludes doctors from the provision of added years under regulation 12. Representations have been made both to the authority concerned and to the Ministry of Housing and Local Government, and the situation is being closely watched.

HOSPITAL AND CONSULTANT SERVICES

Negotiating Machinery

45. The Council has considered the following resolutions of the Representative Body:

(a) **Resolved:** That the following motion be referred to the Council:

That this meeting recommends that a negotiating committee be elected (representative of all sections of the profession) to conduct all future negotiations on the subject of terms of service or remuneration of any section of the profession.

(b) **Resolved:** That the best actuarial and legal advice be given to the negotiators, all of whom should be members of the Central Consultants and Specialists Committee, either by election or *ex officio*.

(c) **Resolved:** That in view of the damaging restrictions which make it impossible to have present on the Staff Side at meetings of Whitley Committee "B" expert legal and actuarial advisers, in future it is essential that the Staff Side should have available all the facilities for special legal or other advice both prior to and during the conduct of negotiations.

With regard to the motion referred to it by the Representative Body, the Council is of the opinion that, provided there is adequate machinery for co-ordination and discussion between the three main sections of the profession, as indeed exists at present, it is much more effective for each section to have its own negotiating machinery than to establish a negotiating committee for the whole profession.

The Council has noted the view of the Representative Body regarding the need for the Staff Side of Committee "B" to have available expert legal advice. The Staff Side did in fact take legal advice during the negotiations on remuneration, and the course and policy of these negotiations was largely determined by the advice of the late Mr. F. Grant, Q.C. There is no reason to doubt that the Staff Side will seek legal or other expert advice in the future whenever it judges such advice to be helpful.

With regard to the composition of the negotiating body, it must be remembered that in the field of Whitley negotiations the "Staff Side" must be formed by agreement with all the interested professional bodies. It is the opinion of the Council that there would be serious disadvantages and diffi-

culties in disturbing the agreement entered into in 1948 between the Association and the Royal Colleges and Corporations for the preservation of the principle that consultants should speak with "one voice." The real issue is to secure improvement in the Whitley machinery, and this is a matter to which the Central Consultants and Specialists Committee is now giving serious consideration. In fact, the Staff Side of the General Whitley Council for the Health Services has set up a subcommittee to study the working of the Whitley machinery and to make recommendations for its improvement. The Staff Side of the Medical Whitley Council is represented on this subcommittee.

Remuneration of Hospital Medical Staff

46. The Council has not yet been able to complete its consideration of a number of resolutions of the A.R.M., 1954, concerning the remuneration of hospital medical staff, but will include a statement on this subject in its Supplementary Report.

Hospital Medical Staffing

47. During the past session further consideration has been given to the problem of hospital medical staffing.

The first report on this subject, prepared by a special subcommittee of the Central Consultants and Specialists Committee, contained far-reaching proposals for altering the structure of hospital staffing, a brief account of which was given to the Representative Body last year. This report has been circulated to Regional Consultants and Specialists Committees and has occasioned widespread interest and comment among members of the profession throughout the country. A revised report has now been prepared in the light of the views expressed by the Representative Body in 1954, and of the comments and criticism received from Regional Committees and other bodies. This second report has been referred to Regional Consultants and Specialists Committees, to the Scottish Central Consultants and Specialists Committee, and to the Joint Committee for their consideration.

If possible, a final report will be submitted to the Representative Body in the Supplementary Annual Report of Council.

The Joint Consultants Committee has already been asked by the Ministry of Health to discuss medical staffing problems with them.

Part-time Consultants and Income Tax

48. Prior to the introduction of the National Health Service it was customary for income-tax inspectors to assess practitioners engaged in private practice wholly under Schedule D, even where part of the professional income was derived from a paid appointment. This custom continued in the early years of the National Health Service, but recently there has been a move throughout the country for income-tax inspectors to assess the hospital income of part-time consultants under Schedule E where this income is the major part of the professional earnings.

At first sight there appeared to be little hope of contesting successfully this new policy, but the Association's solicitor suggested that there was sufficient doubt in the matter to justify seeking the opinion of an eminent tax counsel. This has been done, and in the light of the advice given by counsel steps are being taken to test the validity of this basis of assessment in the courts.

Senior Registrars and Additional Consultant Posts

49. The Council has given consideration to the following resolution of the Representative Body:

Resolved: That this meeting is of opinion that the Minister should increase the number of part-time consultant posts in general medicine and surgery and in psychiatry.

It is the policy of the Central Consultants and Specialists Committee that the consultant establishment should be expanded as and where it may be necessary in order to

provide an adequate consultant service in all specialties throughout the country. This policy has been borne in mind in the consideration given to the problem of hospital staffing, and will be dealt with in greater detail in the report on this subject. (See para. 47.) It is also the Committee's policy that where a new virtually full-time post is created the appointed candidate should have the option of accepting the post on a whole-time or maximum part-time basis.

There has been greater expansion in the consultant establishment in psychiatry than in general medicine and general surgery during the past few years, and it is understood that there is likely to be no dearth of consultant and S.H.M.O. vacancies for senior registrars in psychiatry now completing their training. Unfortunately the reverse is the case in general medicine and surgery, where there are considerably more senior registrars in their fourth or subsequent years than can hope to be absorbed into the consultant establishment in the near future. Discussions between the Joint Committee and the Ministry have revealed that there is a disturbing discrepancy between the number of expected consultant vacancies and the number of senior registrars in training in the various specialties. The Joint Committee is impressed with the need for overall planning in the development of the consultant services and is now discussing the matter with the Ministry. In the meantime, and pending the forthcoming discussions on hospital staffing, agreement has been reached with the Ministry that hospital boards should be allowed to extend the appointment of senior registrars who have completed their normal tenure, where they are satisfied that, given more time, the senior registrar is likely to obtain a higher post.

Medical Advisory Machinery

50. During the past year further opportunities have been sought to impress upon the Ministry the importance attached by the profession to the establishment of satisfactory medical advisory machinery at regional board level.

The subject was discussed at a meeting between the Joint Committee and the Minister of Health on December 1, when the Joint Committee drew attention to the defects in the methods adopted by some boards for obtaining professional advice. The Minister expressed his complete sympathy with the Committee in its desire for close co-operation between hospital boards and their consultant staffs, and his wish to secure improvement in the medical advisory machinery where this was found to be necessary. He asked the Committee to provide examples of what was wrong with the existing advisory machinery and of the kind of mistakes which the Committee thought could be avoided with more effective machinery. This information is now being sought from Regional Consultants and Specialists Committees, and the Joint Committee has asked the Ministry for an opportunity of discussing the problem directly with the chairmen of regional hospital boards.

S.H.M.O. Appointments

51. The Council has considered the following resolution of the Representative Body:

Resolved: That no further S.H.M.O. posts be established and that existing posts should be subject to biennial review with a view to upgrading.

The limited field in which S.H.M.O. posts may now be established was agreed between the Joint Committee and the Ministry in 1950. The question of the future use of this grade is bound up with the discussions now taking place on the subject of hospital medical staffing, and must therefore await the outcome of these discussions.

Grading of S.H.M.O.s

52. The Council has had before it the following resolution of the Representative Body:

Resolved: That this meeting draws attention to the complete lack of uniformity in different regions, and sometimes within the same region, in the use of the grade of S.H.M.O., particularly in

relation to, and to the detriment of, the tuberculosis service; and that Council be requested to treat the correction of this injustice as a matter of priority and to employ every means in the power of the British Medical Association to ensure the grading as consultants of those S.H.M.O.s who are at present inappropriately and unfairly graded.

As stated in the previous paragraph, the field in which posts in the S.H.M.O. grade can be established is limited by agreement between the Ministry and the Joint Committee, and defined in Circular R.H.B. 50/96 issued to hospital authorities in October, 1950. Advertisements for S.H.M.O. appointments submitted for publication in the *British Medical Journal* are carefully scrutinized with a view to detecting in advance any possible abuse of the grade.

With regard to the last part of the Representative Body's resolution, the Staff Side of Committee "B" of the Medical Whitley Council has recently proposed to the Management Side that S.H.M.O.s occupying consultant posts should be remunerated on the consultant salary scale.

Domiciliary Consultation Arrangements

53. The Council has had before it the following resolution of the Representative Body:

Resolved: That this meeting is of opinion that the diagnosis should not be disclosed on domiciliary consultation certificates.

The obligation of disclosing the diagnosis on the domiciliary consultation certificate falls upon the consultant, and an inquiry addressed to regional consultants and specialists committees some time ago revealed that there was considerable divergence of opinion among consultants on the question. Some took the view that the disclosure of the diagnosis amounted to a breach of confidence, and should be resisted, while others felt that it was not unreasonable that hospital boards should know for what purpose their consultant services were used. The matter has, however, been under discussion between the Joint Consultants Committee and the Ministry, the attitude of the Joint Committee being that there is no point in asking consultants to disclose the diagnosis unless it serves some useful purpose. The Ministry has therefore been asked for specific examples of the purposes for which the diagnosis has proved to be of value, but although the Ministry has stressed its importance no explanation acceptable to the Joint Committee has so far been produced. The matter is still being pursued with the Ministry.

The Council has also noted the following resolution of the Representative Body:

Resolved: That facilities for domiciliary visits under the National Health Service be made available to all patients in private nursing-homes.

The Joint Committee has urged upon the Ministry the desirability of extending the domiciliary consultation arrangements in this way, and the Ministry's attention has been drawn to the hardship inflicted upon patients of modest means who enter nursing-homes for domestic reasons or because of the lack of adequate hospital accommodation, and who are deprived of the benefit of consultant advice under the National Health Service.

The Ministry is considering the proposal, although its initial reaction is that the domiciliary scheme could not be extended as suggested without amending legislation, in view of the fact that the Minister's obligation to provide a domiciliary consultant service is specifically limited to the patient's home.

Internal Administration of Hospitals

54. The Committee appointed by the Central Health Services Council in 1950 under the chairmanship of Alderman A. F. Bradbeer to consider the internal administration of hospitals, issued its report in August, 1954.

The theme of the report is that hospital administration should be on a tripartite basis—medical, nursing, and lay—and that this conception of partnership should determine the lines of all future development in the hospital service.

As regards the medical administration of hospitals, the Bradbeer Committee has largely accepted the evidence submitted to it by the Central Consultants and Specialists Committee. It recommends that medical administration should be carried out through the committee system, the detailed day-to-day administration in general hospitals being undertaken by the chairman of the medical staff committee or, in the larger hospitals, by a consultant specially appointed for the purpose and selected from the existing consultant staff by the medical staff committee and the hospital management committee and regional board jointly. The Committee recommends that this appointment should be for a limited period, and that no reduction should be made in the consultant's salary for the time devoted to administrative work. In order to provide hospital junior staff with experience in medical administration, combined with reasonable prospects of promotion in the clinical field, the Committee suggests the creation of a new R.M.O./R.S.O. grade with clinical and administrative duties. The report recommends that medical administration in mental hospitals and institutions and sanatoria should continue to be carried out through the appointment of a medical superintendent.

An important recommendation of the Bradbeer Committee which will be welcomed by the profession is that regional boards should be encouraged to appoint up to one-fifth of the total membership of hospital management committees from names submitted by the senior medical and dental staffs of the hospitals concerned.

It is understood that the Ministry is now studying the report, and an assurance has been given to the Joint Consultants Committee that, before issuing any advice to hospital authorities on matters affecting the profession, the Department will consult the Joint Committee.

The Joint Consultants Committee has informed the Ministry of its broad approval of the Bradbeer Report, and of its hope that action will be taken upon its recommendations. It is to be noted that the Committee has clearly been influenced by evidence given before it by the Central Consultants and Specialists Committee.

Machinery for the Appointment of Consultants and Registrars

55. The Council has noted the following resolutions of the Representative Body:

Resolved: That this meeting considers that, at the appointment of registrars and consultants, both the hospital management committee and the assessors should have equal voting power, while the chairman should retain a casting vote.

Resolved: That the Representative Body considers that local group medical and lay committee members should have more say in the appointment of consultant staff.

The Central Consultants and Specialists Committee and Joint Consultants Committee have felt for some time that the machinery for the appointment of consultants is unsatisfactory and should be amended to give the senior medical staff at the hospital concerned a greater voice in the selection of their future colleagues. The matter is now under active discussion between the Joint Committee and the Ministry.

It is the view of the Central Consultants and Specialists and Joint Committees that registrars should be appointed locally by the hospital management committee, and representations have been made to the Ministry accordingly. It has been agreed, however, that any change in the existing procedure should be left in abeyance pending the discussions on hospital medical staffing.

Medical Representation on Regional Hospital Boards and Hospital Management Committees

56. Regional Consultants and Specialists Committees, Local Medical Committees, and Divisions and Branches of the Association have been invited to nominate practitioners to be recommended by the Council for the consideration of the Minister of Health in filling the vacancies arising on

regional boards in March, 1955, when the term of office of one-third of the members expires.

The Council has had before it the following resolution of the Representative Body:

Resolved: That this meeting is of the opinion that medical members of regional hospital boards and hospital management committees should be elected by their professional colleagues.

The view expressed by the Representative Body accords with the policy of the Central Consultants and Specialists and Joint Consultants Committees. At a recent meeting with the Minister of Health the Joint Committee urged that the constitution of regional boards should be amended to provide, as in the case of boards of governors, that up to one-fifth of the members should be appointed on the recommendation of the senior medical and dental staff of the board's hospitals. The Joint Committee also expressed the hope that the Minister would accept the same principle in the case of hospital management committees, as recommended by the Bradbeer Committee.

The Minister replied that he would take note of the Joint Committee's view, but reminded the Committee that the persons appointed to regional boards and hospital management committees were chosen as individuals and not as representatives of professional or other interests. He pointed out that the N.H.S. Act did not permit the nomination of members of regional boards and management committees, but added that he was always ready to consider candidates whose names were brought to his notice, from whatever source.

Whole-time or Part-time Service

57. The Council is fully in sympathy with the following resolutions of the Representative Body:

Resolved: That regional hospital boards should permit whole-time salaried consultants to become part-time when they so desire.

Resolved: That all consultants should be given the option of being on a part-time or whole-time basis after giving adequate notice.

At the outset of the Service the Ministry instructed hospital boards that when granting permanent contracts to consultant staff they should offer individual consultants an option of whole-time or part-time service, so far as this was consistent with the needs of the service. Since that time this has remained the policy of the Ministry in connexion with new appointments, and it has been faithfully observed by some regional boards.

The question of the preservation and, where necessary, extension of the principle that consultants should have an option for whole-time or part-time service has been under discussion between the Ministry and the Joint Committee for some time past. One result of these discussions has been the recent issue of a circular by the Ministry extending the offer of an option for whole-time or part-time service to chest physicians, whose employment hitherto has traditionally been on a whole-time basis.

More recently the Ministry has undertaken to consider the issue of an "agreed" statement of policy on the granting of an option for whole-time or part-time service, for the information of the profession, and this is now under discussion.

Remuneration of Medical Teachers

58. The Council has noted the following motion, referred to it by the Representative Body in July, 1954:

That this meeting considers it to be prejudicial to the best interests of medical teaching in this country that there should be such a large discrepancy, accentuated by the recent agreement on hospital staff remuneration, between the salaries of consultants paid by hospital boards and those employed full-time by universities, particularly since both may be carrying out similar duties in the same hospitals. It is urged that immediate steps be taken to improve the financial position of medical members of university teaching staffs.

At that time an approach had already been made to the University Grants Committee to ascertain what steps were

being taken to improve the remuneration of medical teachers following the increases of salary granted to hospital medical staff in April, 1954.

In November last the Chancellor of the Exchequer announced that he proposed to ask Parliament to provide additional funds amounting to some £2½m. to enable universities to bring into effect, as from October 1, improved rates of remuneration for full-time university teaching staffs, including both clinical and non-clinical medically qualified teachers. The position will be further reviewed when information is available regarding the new salary scales introduced by the different universities.

The Staff and Management Sides of Committee "B" have now agreed upon a revised basis for the payment of distinction awards to whole-time clinical teachers or research workers with honorary hospital contracts. This provides that where the teacher or research worker spends on the average 21 or more hours per week in clinical work he shall receive the whole of the award as at present. Where the time devoted to hospital work is less than 21 hours per week the following fractions of the award will be paid:

17½ hours or more but less than 21	16/20ths
14 " " " " " "	17½ 13/20ths
10½ " " " " " "	14 ½
7 " " " " " "	10½ 7/20ths
3½ " " " " " "	7 5/20ths
For an assessable amount of time below 3½ hours	3/20ths

Review of Consultant Organization

59. During the past session the Central Consultants and Specialists Committee has continued its review of the consultant organization, and in this connexion the following resolution of the Representative Body (1954) has been noted:

Resolved: That in subparagraph (3) of para. 206 of the Annual Report, the last words should be amended to read "who are graded as consultants, senior hospital medical officers, and G.P. 10(b)s."

[The subparagraph referred to is as follows:

"The electorate of regional committees should consist of those members of hospital medical staffs and all other specialist units in the region (for example, blood transfusion and mass radiography) who are graded as consultants and senior hospital medical officers."]

The Committee has not yet completed its deliberations on the subject.

Regional Hospital Board Administrative Medical Staff and Medical Superintendents

60. A claim has been lodged in Committee "B" of the Medical Whitley Council for an increase of salary for senior administrative medical officers and regional psychiatrists, parallel to that granted to consultants in April, 1954. Proportionate increases are being sought for junior grades of administrative medical staff.

A claim for an increase in the administrative scales applicable to medical superintendents has also been made.

Fees for Part-time Work for Local Authorities

61. In 1954 the Representative Body referred the following motion to the Council:

Resolved: That in the opinion of this meeting all scales of fees for special sessions—for example, dental anaesthetics, etc.—should be immediately revised.

After careful consideration the Council feels that it would be wiser to defer seeking any revision of the sessional fees payable by local authorities to consultants and general practitioners pending the outcome of the negotiations on the remuneration of public health medical officers.

Fees for Part-time Work for Government Departments

62. Following representations to the Treasury an improvement in the fees paid by Government departments

for part-time services undertaken by consultant members of the profession has been obtained, as set out below. It meets, in full, the claims of the Central Consultants and Specialists Committee. A scale of fees for work undertaken by S.H.M.O.s, introduced by the Treasury for the first time, is receiving consideration:

	Previous Scale	New Scale for Consultants	Proposed Scale for S.H.M.O.s
Medical boards:			
One case	£2 12 6	3 gns.	2 gns.
2 cases	£3 5 0	4 "	2½ "
Session (between 2½-3½ hours*)	£4 4 0	5 "	3½ "
Examination and advice on individual cases:			
One case	From 2-5 gns.	From 3-5 gns.	From 2-3½ gns.
Medical appeal tribunals Day or part of day ..			7 gns. (cons. 10 gns.)
Appeal boards:			
One case			3½ gns. (cons. 5 gns.)

* Previously 2½ hours.

Waiting Time in Hospital Out-patient Departments

63. In June, 1954, the Ministry issued a circular to hospital boards and committees drawing attention to widespread criticism regarding unnecessary waiting in out-patient departments, and calling upon hospital authorities to review their out-patient arrangements. This circular led to some criticism of the profession in the daily press. The Joint Committee protested to the Minister of Health at his action in issuing the circular without prior consultation with the profession, in view of the fact that the matter was one with which the profession was intimately concerned. The Minister apologized for not consulting the Joint Committee.

The Central Consultants and Specialists Committee, believing that the reasons for patients being kept waiting in out-patient departments are largely to be found in the deficiencies of existing hospital staff and facilities, coupled with an increased demand for out-patient treatment, is studying the problem with a view to making constructive suggestions.

The Ministry's circular advised hospital authorities that so far as possible each patient should be given an appointment for the time when he was expected to see the doctor, and that multiple or "block" bookings should be discontinued. It was pointed out to the Minister that with present staff and facilities this might well lead to a reduction in the number of patients seen at each out-patient session, and to a lengthening of waiting-lists. The Minister replied that he thought the Committee was interpreting the advice he had given too literally. Although he was certainly opposed to the block appointments system whereby all the patients were called for the beginning of the session, he had no objection to the practice of calling, say, two or three people at intervals throughout the session.

Consultants and Specialists Defence Fund

64. The Council has noted the following resolution of the Representative Body:

Resolved: That this Representative Body requests Council to take steps to ensure that an adequate Defence Fund is established by the consultants and specialists.

It is recognized that the Fund already in existence should be of larger dimensions than it is. It is proposed shortly to issue a strong and reasoned appeal signed by the leaders of the various consultant organizations, in order to interest all consultants and S.H.M.O.s in the Fund, so that it can be greatly enlarged by dint of a modest subscription from a high proportion of members of hospital senior medical staffs. It is hoped to broaden the purposes for which the Fund is to be enlarged.

Remuneration of Locums

65. Following the revision of the salary scales of hospital medical staff in April, 1954, increased rates of remuneration for hospital locums have been agreed between the Staff and Management Sides of Committee "B," as set out below:

	Old weekly rate	New weekly rate
Senior Registrars	£22	£24
Registrars and J.H.M.O.s ..	£16	£17 10s.
Senior House Officers	£13	£14 10s.
House Officers	£8	£9 10s.

The new rates are retrospective to April 1, 1954.

The Staff Side has also endeavoured to secure an increase in the remuneration of locums replacing consultants or S.H.M.O.s, but so far this has been resisted by the Management Side on the ground that the existing rates are generous even in relation to the new consultant and S.H.M.O. salary scales.

It has also been agreed in Committee "B" that locums employed continuously for periods of upwards of six months shall be given annual leave, and that employment as a locum (for not less than three months) shall count towards sick leave entitlement.

General-practitioner Maternity Beds in Hospital

66. The Council has considered the following resolution of the Representative Body:

Resolved: That this meeting urges that regional hospital boards be instructed to refrain from reducing the number of general-practitioner maternity beds in hospitals and to endeavour to provide more.

It has been decided to ask the Joint Consultants Committee to urge upon the Ministry that regional hospital boards should be instructed to consult local medical committees and local health authorities in connexion with the planning or review of maternity services.

Geriatric Units

67. The Council has had before it the following resolution of the Representative Body:

Resolved: That this meeting is alarmed at the absence of any organization in some areas for ensuring prompt admission to hospital of aged persons in need of full-time attention, and suggests that the early appointment of a doctor able to assess the needs of each and authorized to arrange admission is essential.

This resolution reiterates the concern expressed by the Representative Body in 1953 at the lack of a co-ordinated geriatric service. As reported to the Representative Body last year, a Geriatric Subcommittee was appointed by the Joint Liaison Subcommittee of the Central Consultants and Specialists, General Medical Services, and Public Health Committees to study the problem, and it is anticipated that its report will be ready for the information of the Representative Body in the Supplementary Report of Council. It was an instruction to the Geriatric Subcommittee to try to arrive at practical recommendations which could be later negotiated with the authorities.

Facilities for Hospital Medical Staffs to Attend Meetings of a Professional Body

68. The Council has considered the following resolution of the Representative Body:

Resolved: That this meeting requests the Council to urge regional hospital boards and boards of governors of hospitals to grant every facility to hospital medical staff for the purpose of attending the Annual Representative Meeting.

The Council is not aware that widespread difficulties have arisen in this matter. It suggests that any local difficulties which may arise should be brought before the Regional

Consultants and Specialists Committee, which, if necessary, will in its turn pass it on to the Central Consultants and Specialists Committee for appropriate action.

Accommodation of Medical Superintendents Outside the Hospital

69. The Council has considered the following resolution of the Representative Body:

Resolved: That the Council be asked to investigate the possibility of medical superintendents being given the opportunity to live outside the hospital if they so desire.

There is no central ruling that medical superintendents shall reside at their hospitals, and the Council feels that the matter is one which is best dealt with locally.

The Control of Hospital Management

70. The Council has noted the following resolution of the Representative Body, with which it is fully in sympathy:

Resolved: That this meeting would deprecate the return of hospital management from independent to municipal control.

Staffing of Radiological Departments

71. Increasing difficulties are reported in the staffing of hospital radiological departments, and the Council has authorized the Radiologists Group Committee to undertake a survey of the radiological services throughout England and Wales, with a view to making recommendations for improving the existing situation.

Hospital Medical Staff on Pre-Act Terms of Service

72. Following representations by the Staff Side of Committee "B," the Management Side have agreed that hospital medical staff who in 1949 opted to retain their old conditions of service should be given a further option of transferring to the standard terms and conditions of service as from April 1, 1954, when the revised salary scales were introduced.

REFORM OF THE NATIONAL HEALTH SERVICE

73. The Council has received from the Standing Committees concerned reports on the action taken to give effect to the decisions taken by the S.R.M. of December, 1951, in connexion with the recommendations made in the Interim Report of the Council on the Reform of the National Health Service. It is now studying these reports.

ARBITRATION MACHINERY

74. Last year the Representative Body, in confirmation of its previously established policy, resolved "that there should be the unilateral right to arbitration."

The Council regrets that it cannot at present report progress in this matter. It will include a statement on the subject in its Supplementary Report after further study of the problem.

OCCUPATIONAL HEALTH

Remuneration of Industrial Medical Officers

75. In accordance with the undertaking given to the Representative Body in 1954, the Council has reviewed the basis of the Association's recommendations for the remuneration of whole-time industrial medical officers, and in this connexion valuable assistance has been received from a number of industrial medical officers with experience in a variety of industries. It is considered that everything should be done to encourage the right kind of practitioner to make his career in industrial medicine.

There is an increasing tendency for firms, particularly in Scotland and Northern Ireland, to appoint part-time medical officers, on a temporary basis, who may spend up to half their time in postgraduate study, perhaps in other fields. No reference to this particular type of appointment has

been made in the revised recommendations because they are only temporary and do not necessarily lead to permanent appointments in occupational health.

The Council does not consider that any revision is necessary of the existing recommended scale for the remuneration of part-time industrial medical officers, as it appears to compare favourably with the suggested revised whole-time scale. It is considered, however, that certain explanatory notes should be appended to the part-time scale.

As there is no single organization with which the salaries of industrial medical officers can be negotiated, it is felt that the position can best be met by the preparation of a revised statement for the guidance of managements on the definitions, qualifications, and remuneration of industrial medical officers.

The needs of individual industries vary considerably by virtue of their peculiar hazards and requirements, and it has not been possible to prepare precise definitions covering all industries. It is therefore suggested that an Advisory Panel, composed of medical officers with wide experience of industry, be set up by the Association to give guidance to managements, where desired, regarding the type of medical service required in individual undertakings.

Recommendation: That the revised statement on the remuneration of industrial medical officers set out in Appendix III be approved.

Terms of Service for Industrial Medical Officers

76. The Council has revised the statement on the Terms of Service for Industrial Medical Officers which it published in its Annual Report for the year 1950-1. The revised statement is set out in Appendix IV to this Report.

Industrial Health Advisory Committee

77. The Minister of Labour and National Service announced in the House of Commons on November 11, 1954, the setting up of an Industrial Health Advisory Committee as a standing committee to advise him on measures to further the development of industrial health services in workplaces covered by the Factories Acts. The following organizations were invited to submit nominations for membership of the Committee:

British Employers' Confederation	..	..	..	3
Trades Union Congress	..	..	..	3
British Medical Association	..	..	..	2
Association of Industrial Medical Officers	..	..	..	1
Association of Certifying Factory Surgeons	..	..	..	1
Nationalized Industries	..	..	..	1
Royal College of Nursing	..	..	..	1
British Occupational Hygiene Society	..	..	..	1
Committee of Vice-Chancellors and Principals of the Universities of the United Kingdom	..	..	..	1

The attention of the Ministry was drawn to the difficulty which the Association would experience in covering all interests with only two nominees. However, as the Minister wishes the Committee to be an active working body, he has purposely limited its membership, and he was unable to agree to an increase in the number of the Association's nominees.

Regret was expressed to the Ministry that the Committee's terms of reference did not cover offices, shops, and other places of work mentioned in the Gowers Report, but in view of the fact that the Committee has been established by the Minister of Labour and National Service, it must confine its activities within the Ministry's statutory powers.

The Council nominated Dr. L. G. Norman and Dr. J. A. L. Vaughan Jones for membership of the Committee, and it suggested that members of the Committee should be appointed for three years. This suggestion was adopted by the Ministry of Labour and National Service.

Advisory Councils on Occupational Health

78. In its last Annual Report the Council referred to the first Conference of Advisory Councils on Occupational Health, which had been held in April, 1954. The Council

has agreed to sponsor the second Annual Conference, and it is to be held at B.M.A. House on April 20, 1955, under the chairmanship of Mr. C. F. Gothard, of the Burton and District Advisory Council. The subject for general discussion will be, "The Adolescent in Industry."

The 1954 Conference recommended that a central body should be established consisting of representatives of the British Medical Association, the British Employers' Confederation, and the Trades Union Congress, together with representatives from local advisory councils. The Council agreed that an approach should be made to the British Employers' Confederation and the Trades Union Congress concerning the possibility of establishing a tripartite central committee, but the British Employers' Confederation felt that developments in connexion with the setting up of the Industrial Health Advisory Committee should be awaited before reaching any final conclusions. The Confederation has not, however, ruled out the possibility of direct discussion with the British Medical Association on subjects of mutual interest should it prove desirable.

A Joint Committee of the British Medical Association and the Trades Union Congress is already in existence.

Future of Occupational Health Services

79. The Joint Committee of the B.M.A. and T.U.C. has discussed the Association's report on the future of occupational health services, and the major issue raised concerned preplacement medical examinations and examinations on return to work after absence from sickness or injury.

The Trades Union Congress maintains that, unless an employee is suffering from a disease which renders him a danger to his colleagues, he should not be prevented on medical grounds from taking up or retaining a post. Though the industrial medical officer might advise a man of the probable consequences should he continue in his occupation, the man himself must decide whether or not to accept the advice.

The Association's representatives on the Committee have stressed the importance of the doctor-patient relationship, which cannot be overlooked, and have suggested that adequate safeguards for the employee can be provided by a right of appeal. In view of the importance of this issue both sides have agreed to give further consideration to it.

The Council has decided that, in future discussions with the Trades Union Congress, the following policy should be adopted in regard to preplacement and subsequent examinations in the field of occupational health:

Preplacement Examinations:

(a) On medical grounds preplacement examinations are desirable and necessary.

Subsequent Examinations:

(b) An employer has a right to instruct an employee to be medically examined by the industrial medical officer, but the medical officer should not undertake this examination without the employee's consent.

(c) If consent is withheld, any decision as to the worker's future employment is the concern of the management.

(d) If consent is given, the industrial medical officer, on completion of the examination, should recommend that the employee is fit or unfit, but should not disclose any details without his consent.

All other issues are non-medical and should be dealt with between management and worker, or his union.

Administration of Morphine by Nurses in Industry

80. The Royal College of Nursing has expressed anxiety to the Council regarding the inability of State-registered nurses under present legislation to administer morphine in emergency in industry.

The whole problem of the legal position of a nurse who undertakes functions hitherto regarded as outside her professional scope has been the subject of joint discussion, but

it is felt that this particular aspect of the problem is of sufficient importance and urgency to be dealt with separately. Meetings between representatives of the Association and the Royal College of Nursing have been held and a joint statement is being prepared.

Toxic Chemicals in Agriculture

81. A request was received from the Association of British Insecticide Manufacturers for the assistance of the British Medical Association in preparing notes on first-aid and medical treatment in the event of poisoning, for circulation with containers of toxic chemical preparations used in agriculture. The comments of the Ministry of Agriculture were sought in view of the discussions which took place between the Ministry and the Association in 1951, resulting in the issue to the medical profession of notes on the clinical aspects of insecticide poisoning.

The Council has approved the suggestion that all containers of toxic chemical preparations should be labelled in this way, provided that the information is standardized and prepared by experts.

It has recommended that (i) medical officers of health should be provided with copies of the information set out on the labels, for their permanent records, so that reference could be made rapidly if inquiry were received about a case of poisoning; (ii) that suppliers and distributors of toxic preparations should be provided with copies of the same information for a similar purpose; (iii) that the Joint Formulary Committee should be asked to consider the inclusion of relevant information in the *National Formulary* for the use of general practitioners and hospital medical officers.

Occupational Dermatitis

82. The Council has appointed a deputation to approach the Ministry of Pensions and National Insurance with a view to discussing a number of points which have arisen in connexion with the work of examining medical practitioners and occupational dermatitis in its relation to the National Insurance (Industrial Injuries) Act.

Duties and Ethical Rules for Industrial Medical Officers

83. The Council has considered the following motion, which was referred to it by the Representative Body in 1954:

That this meeting urges Council to take further active steps to try to compile a comprehensive list of industrial medical officers, or, failing this, to circulate among all non-members of the Association a copy of "The Duties and Ethical Rules for Industrial Medical Officers," and also to publish them at periodic (say three yearly) intervals in the *Supplement*.

A list of whole-time industrial medical officers is already being maintained, and consideration has been given to possible methods of compiling a list of part-time industrial medical officers, including the question of a request for information from local medical committees. However, there appears to be no source from which constant and complete information can be obtained, particularly as some doctors are reluctant to disclose details of their part-time appointments.

During last session a notice was published in the *Supplement* to the *British Medical Journal* drawing attention to the duties and ethical rules for industrial medical officers, copies of which are available on request. Consideration has been given to the question of publishing the duties and ethical rules in the *Supplement* from time to time, but, apart from this, the Council is of the opinion that, for the present, no further action can be taken on this motion.

Medical Standards for Road, Rail, and Air Transport

84. Discussions have taken place between representatives of the Association and representatives of the Ministry of Transport on the recommendations contained in the Association's Report on Medical Standards for Road, Rail, and Air Transport.

Mule Spinning (Health) Special Regulations, 1953

85. In the last Annual Report of Council reference was made to the representations which had been submitted to the Ministry of Labour and National Service that the fee for examinations under the above regulations should be 12s. 6d. for the first examination and 5s. for subsequent examinations undertaken on the same occasion. The Ministry has not yet accepted the Association's views on the matter, and the position is being watched, but, as it appears that no final decisions have yet been made on the arrangements for and the scope of these examinations, no further action is proposed at this stage. The position will be reviewed during the next session.

International Committee on Occupational Health Services

86. Information regarding the occupational health services of this country has been sent to the World Medical Association on a questionnaire received from that association entitled "Council Investigation of Possibilities for W.M.A. Co-operation in International Occupational Health Services." Nominations were invited for one or more medical specialists in the field of occupational health to serve on the International Committee on Occupational Health Services. The Council nominated Dr. J. A. L. Vaughan Jones, the Chairman of the Occupational Health Committee.

PUBLIC HEALTH

Remuneration in the Public Health Service

87. A comprehensive review of the salary scales of all categories of medical officers in the Public Health Service has been undertaken by the Staff Side of Committee "C" of the Medical Whitley Council. The recommendations of the Staff Side for improving these scales and for bringing them into closer relationship with the remuneration of the rest of the profession were submitted to the Management Side, but it was not possible to reach agreement during the negotiations. The matter has been reported to the Ministry of Labour and National Service, which has referred the dispute to the Industrial Court for settlement.

When the award of the Court is known, consideration will be given to the possibility of revising the 1947 agreement on sessional fees payable by local authorities to general practitioners and consultants.

The fee for the annual medical examination of boarded-out children has been increased to 25s. in certain cases (see para. 119).

Superannuation

88. The attention of all medical officers in the Public Health Service has been drawn to the present position in regard to local government superannuation (see para. 44).

Appeals Machinery

89. The rulings given by Whitley Regional Appeals Committees have all been in favour of the medical officers concerned, and, with one exception, have been implemented by the employing authorities. Steps are being taken to have the case which is still outstanding referred to the Industrial Court, with the agreement of the employing authority concerned.

The Council continues to press the Northern Ireland Ministry of Health and Local Government to establish suitable machinery for dealing with appeals.

Constitution of the Public Health Committee

90. Careful consideration has been given by the Council to views expressed at the A.R.M., 1954 (Minute 153), regarding the representation of junior grades of the Public Health Service on the Public Health Committee.

The main responsibility for electing members of the Committee lies with the Representative Body and the Council, but the Committee, under its constitution, has power to co-opt three members "to secure representation of a

particular class of experience not otherwise represented on the Committee." When co-opting in the past and in the present session the Committee has borne in mind the need for adequate representation of all categories in the Public Health Service, including junior grades. The Council is of the opinion that there is adequate representation of these grades on the Committee.

To improve liaison, the Council has decided that the constitution of the Public Health Committee should be amended to provide for the inclusion of a representative of the Occupational Health Committee (see Appendix VI).

Rules for D.P.H. Courses

91. At the invitation of the General Medical Council, views have been formulated by the Council of the Association on the revision of the G.M.C.'s Rules as to Courses of Study and Examination for Diplomas and Degrees in Sanitary Science, Public Health, or State Medicine. These rules were last revised in 1945, and their possible amendment in the light of changing circumstances is now under consideration. Representatives of the Association have, in the course of discussions with the special committee of the General Medical Council, amplified written recommendations which had already been submitted (see Appendix V).

Infectious Diseases

92. After consultation with the Association, the Ministry of Health has issued the Puerperal Pyrexia (Amendment) Regulations, 1954, operative as from March 1, 1955, which amend the form of notification by adding the words "Cause, if known." This has been done as many notifications arise from pyrexia due to known causes which do not involve any epidemiological hazard.

The Council hopes to refer in its Supplementary Report to the outcome of discussions with the Ministry of Health on the follow-up of cases of venereal disease and the tracing of contacts, with particular reference to the importance of social work.

Bacterial Pesticides

93. The Working Party on Precautionary Measures against Toxic Chemicals used in Agriculture recommended, among other matters, that the firms and Government departments concerned should give consideration to the expert view that it is desirable to avoid the use of bacterial rodenticides. The Council has supported this recommendation of the Working Party with a view to the ultimate banning of bacterial rodenticides, and has taken this matter up with the Ministry of Agriculture and Fisheries.

School Health Service

94. Satisfactory arrangements have already been formulated and widely adopted to ensure (a) that the concurrence of the general practitioner is obtained before medical officers employed by local authorities refer schoolchildren for special investigation (other than an ophthalmic examination) or treatment, and (b) that copies of any special reports on the child received by the medical officer are sent to the child's own doctor. Consideration is now being given to the possibility of providing the medical officer with copies of reports sent to general practitioners in cases where the child was referred by his own doctor to a consultant, and where special treatment or other facilities provided by the local education authority or local health authority are advised.

Health Visitors

95. The Council's suggestions for improving co-operation between general practitioners and health visitors, which were formulated last year, have been the subject of discussion by Divisions and Branches, and numerous local meetings have been held at which medical officers of health and health visitors have been present. In some areas improved co-operation has already been reported, whilst in others the assessment of results is awaited. The local authority health

and welfare services have been made more widely known to general practitioners as a result of action by medical officers of health.

Food Hygiene

96. The Council has submitted to the Ministry of Food certain suggestions for improving the draft Food Hygiene Regulations and Codes of Practice to be made under the Food and Drugs (Amendment) Act. The appropriate Government departments have been informed that, in the Council's opinion, the functions of the Ministry of Food relating to food hygiene would now most appropriately be taken over by the Ministry of Health.

Milk

97. Detailed comments have been sent to the Ministry of Food as a result of discussions between representatives of the Association and the Society of Medical Officers of Health on the revision of the Milk and Dairies Regulations 1949-54, Milk (Special Designation) (Raw Milk) Regulations, 1949-54, and the Milk (Special Designation) (Pasteurized and Sterilized Milk) Regulations, 1949-53.

Industrial Health Advisory Committee

98. Support has been given by the Council to the application of the Society of Medical Officers of Health to be included in the list of nominating bodies, and thus ensure representation of the public health service on the Industrial Health Advisory Committee which is being set up to advise the Ministry of Labour and National Service on measures to further the development of industrial health services in workplaces covered by the Factory Acts.

Durham County Council—Health Consultative Joint Committee

99. The Council has decided against participating in the Durham County Council's proposed Consultative Joint Committee for the Health Services on the ground that negotiations on remuneration of medical officers in the public health service and the terms of service are the responsibility of Committee "C" of the Medical Whitley Council.

Aberdeen Corporation Order

100. The Council has petitioned against Clause 25 of the draft provisional Aberdeen Corporation Order, under which the medical officer of health would be precluded from exercising the right conferred by the Local Government (Scotland) Act, 1947, of appointing his own deputy.

Functions of the Medical Officer of Health

101. In accordance with the agreement between the Association and the Society of Medical Officers of Health, the Council has had the opportunity of examining a memorandum prepared by the Society on the functions of the medical officer of health. The Council has informed the Society that it does not wish to submit any comments on this memorandum, which does not contain any new medico-political principle which has not been previously discussed between the two bodies.

REMUNERATION POLICY

102. In accordance with the wishes expressed by the Representative Body last year, the Council has appointed an *ad hoc* Committee to examine the whole question of medical remuneration with the object of establishing a general Association policy on the remuneration of the profession in all its many branches.

The Committee has held a number of meetings and discussed the many complex problems which are associated with the Representative Body's decision.

The Committee felt that its first task should be to endeavour to collect factual information, showing not only the present rates of remuneration enjoyed by the various branches of the profession, but also the number of doctors

within the different remuneration scales inside the different branches. The collection of comprehensive data of this nature necessarily involves a considerable amount of research, and the Committee is seeking expert statistical advice on how best the data may be presented. The Council hopes to make a detailed report to the Representative Body in 1956.

MEDICAL ETHICS

Loan of Hospital Records to Government Departments

103. The Council has revised the statement approved by the A.R.M., 1954, on the Loan of Hospital Records to Government Departments. The original statement contained the following paragraph, which refers specifically to industrial accidents, whereas many of the claims which have to be considered do not relate to accidents of this nature:

(b) That the form of consent signed by or on behalf of the patient should include a statement that the patient agrees to his hospital records being made available to the medical board in order to assist them in determining the degree of disablement and whether it is related to his industrial accident.

This paragraph has been amended and is now in a form which is acceptable to the Government departments concerned. Paragraphs (a) and (c) of the statement remain unchanged.

Recommendation: That the following statement on the loan of hospital records to Government departments be approved:

(a) That medical records be lent to the medical officers employed by Government departments only when written consent has been given by or on behalf of the patient.

(b) That the form of consent signed by or on behalf of the patient should include a statement that the patient agrees to his hospital records being made available to the medical board in order to assist them to consider and assess claims.

(c) That, wherever practicable, and particularly where disclosure of information may have an adverse psychological effect upon the patient, the practitioner who compiled the record or, if he is not available, one nominated by the hospital authority for the purpose, should be consulted on the wisdom of disclosing to the patient all of the confidential information contained therein, and should take the opportunity of reviewing the notes before they leave the hospital.

Professional Secrecy

104. Problems relating to professional secrecy continue to arise, and advice has been given on matters such as disclosure of mass radiography records and registration schemes to assist cancer research. The accepted policy of the Association is that information obtained in the course of the professional relationship should not be disclosed without the consent of the patient or, if this is not practicable, the consent of the nearest competent relative or the legal representative of the patient. The Council is constantly concerned with minimizing the risk of leakage of information through the handling of records.

Publicity through Press, Radio, and Television

105. The Council has under review the question of the publicity arising when medical practitioners take part in radio and television programmes or contribute to the Press.

Ethical Inquiries

106. The local and central machinery for investigating complaints regarding professional conduct has operated on several occasions during the current session. Rules of procedure have been agreed with the British Dental Association by means of which inquiries could be held into complaints involving a doctor and a dentist.

International Code of Medical Ethics

107. The Council has considered a suggestion from the World Medical Association regarding the proposed inclusion in the International Code of Medical Ethics of a section relating to the "Duties of Doctors to Society." The Council has informed the World Medical Association that it con-

siders this unnecessary, as there is no evidence that doctors in this country fail to discharge their obligations to society.

Medical Attention Given by a Doctor to a Near Relative

108. In the opinion of the Council it is neither illegal nor unethical for a doctor to treat a near relative during a serious illness, and in certain circumstances this may be unavoidable. The Council considers, however, that a doctor acts imprudently in taking sole responsibility for the treatment of a serious illness of a near relative when it is unnecessary for him to do so.

PRIVATE PRACTICE

One-day Incapacity Certificates

109. The Council has given full and careful consideration to the following Minute 28 of the A.R.M., 1954:

Resolved: That this meeting demands the abolition of the one-day certificate for absence from employment.

Although this resolution is of a general nature the attention of the Council was directed more particularly to the special problem of the one-day incapacity certificate required by miners in order that they may qualify for a proportionate bonus when absence from the pits is due to illness. The A.R.M., 1953, disapproved of the issuing of bonus-shift certificates to a miner unless he had actually been attended by the doctor during illness, but nevertheless many doctors continue to give, and the National Coal Board to accept, as evidence that the man considers he has a claim to proportionate bonus, a certificate which merely repeats the man's statement: "... states he was unable to attend work because of ...".

To implement the above resolution in the case of the mining industry (a) there must be a decision on the part of the industry as a whole not to require or to accept such medical certificates or (b) the National Coal Board and the National Union of Mineworkers must agree between themselves to a change in the bonus-shift scheme. In the opinion of the Council an essential prerequisite to any attempt to persuade the interested parties to carry out (a) or (b) is that the profession itself must agree to withhold these one-day certificates. In order to gauge the support for this, Divisions in colliery areas were asked what proportion of colliery practitioners would refuse any one-day certificates at all (apart from those required for N.H.S. purposes) if so requested by the Association.

The replies were in complete contrast with the spirit of the resolution of the Representative Body: according to the information provided, only 10% of these Divisions would be prepared to follow the lead of the Association in this matter. In view of this lack of support from a large section of the profession it is the view of the Council that it would be inappropriate to attempt to implement the resolution at this stage.

The Council has no reason to believe that in the case of other one-day certificates the response from the profession would be any more encouraging.

Life Assurance: Fees for Medical Reports

110. As recorded in Minute 33, the A.R.M., 1954, resolved that the standard fee for medical examination and report for life assurance should be increased from £1 11s. 6d. to a minimum of £2 2s. and that the fee for reports without examination should be £1 1s. Representations were accordingly made to the Life Offices' Association, and agreement was reached that the fee for the ordinary form of life assurance would be increased to £2 2s. for examinations undertaken on or after March 15, 1955. As in the previous agreement of 1947, it was accepted that should it be necessary for a Life Office to ask for supplementary information in elucidation of, or to remedy omissions in, the original report, no further fee should be forthcoming when information additional to that sought in the original report is required.

The Life Offices' Association would not accept the suggestion that the fee for medical attendance reports (reports on

the medical history of the proposer without a medical examination) should be a minimum of £1 1s. The position is thus unchanged; a fee for these reports is offered by the Life Office and the practitioner is free to seek a higher fee if he wishes. In the opinion of the Council a suitable minimum fee for a report without examination for purposes of life assurance is £1 1s.

Medical Witnesses in Law Courts

111. The Lord Chancellor's Department has agreed to receive a deputation from the Council for discussions on ways of removing the delay which so often occurs in the hearing of court cases involving medical evidence, and which was the subject of Minute 41 of the A.R.M., 1954.

Fees for Services to the Police

112. Minute 42 of the A.R.M., 1954, called upon the Council to take action with the Association of Local Authorities in support of local claims where adequate remuneration is not paid for services rendered to the police. The Council is seeking information on the present position in a number of Divisions where the recommended scale of fees has not been adopted by the police authorities. Whenever it is requested by the local Division the appropriate action will be taken by the Council.

Remuneration of Members of Medical Boards

113. The A.R.M., 1954, expressed the opinion that the time had come for an increase in the remuneration of members of Governmental medical boards (Minute 43). Representations have accordingly been made to the Treasury that the fees for chairmen and members of medical boards should be increased to £4 4s. and £3 3s. per session respectively. Corresponding increases have been requested in the fees for the examination of one case by an individual chairman or member, and also in other cases where Government Departments require medical reports.

Supply of Medicines to Private Patients

114. In Minute 208, the Representative Body, 1954, instructed the Council to continue to press the Minister to take immediate steps to allow the issue of medicine on Form E.C.10 to private patients. The Minister has since met representatives of the Council and he was fully informed of the views of the Association on this matter.

A report of the discussion at the meeting is contained in Appendix II. The Council has reconsidered the matter at some length in the light of this report and has concluded that, although this question must be kept under constant review, no further action can usefully be taken at the present time.

Parking of Doctors' Cars

115. A satisfactory solution of the problem of parking doctors' cars in "yellow band" areas of London (to which reference was made in Minute 238 of the A.R.M., 1954) has followed a meeting with the Assistant Commissioner of Police for the Metropolis. The police were concerned at the impairment of essential services, including those of doctors and midwives, caused by this and other aspects of the London traffic problem, but they did not consider it desirable to have special legislation for a particular class of driver. They agreed, however, to issue a general order to all Metropolitan police reminding them that the no-waiting and unilateral parking regulations provide for exemption for anything done with permission of a police officer in uniform, and stating that doctors are to be given assistance if they seek the advice of the police on this problem. Publicity for this agreement was given in the *Supplement* of December 4, 1954.

National Insurance Medical Boards

116. During part of 1954 the Ministry of Pensions and National Insurance arranged in a number of areas to call six cases instead of five to National Insurance medical

boards. This experiment showed that in all these areas the average duration of sessions remained at less than two and a half hours. In fact, in only one area were there reports of boards taking longer than two and a half hours, and then only in 11% of the sessions did this occur. The terms of appointment to the medical board panel state that boards should ordinarily occupy about two and a half hours and should not, save in exceptional circumstances, necessitate a member's attendance for more than three or less than two hours. The Council is satisfied that there is no reason to suppose that these conditions will not be fulfilled if six cases are called to all sessions in future, provided that the Ministry exercises care not to call more than a proportion of the more difficult cases to any one session. An assurance to this effect has been received and the Department has also stated that where, owing to local difficulties, six cases are too many for medical boards, the number of cases called will be limited to five.

Occasional Treatment of Service Personnel

117. In conjunction with the agreement with the Ministry of Health on the treatment of Service personnel on leave as temporary residents (see para. 30) agreement has also been reached with the Service departments on the fees to be paid to private practitioners who give occasional treatment of this kind. Previously the fees of 5s., 7s. 6d., and 15s. for a surgery attendance, day visit, and night visit, respectively, have included the provision of all except specially expensive drugs and dressings necessary for treatment. As from April 1, 1955, however, the actual cost of drugs and dressings will be claimed from the Service Department by the private practitioner concerned, and for the treatment itself the fees will be:

	s.	d.
For attendance at the surgery	6	0
For a day visit	10	0
For a night visit	15	0

In addition, the private practitioner will be able to claim mileage at 1s. per mile each way in excess of two miles and a fee of 1s. for a certificate. The claim forms used by the Services are being amended accordingly.

Naval personnel will continue to be instructed to report sick when on leave to the nearest Admiralty surgeon and agent, if at all possible, and in all cases the appropriate mileage allowance will be paid by the Admiralty if the agent visits men who are resident more than two miles from his surgery and no payment for mileage has been received from any other source.

The Council regards these arrangements as satisfactory.

Treatment of Merchant Seamen under the National Health Service

118. It has come to the notice of the Council that in some areas practitioners treating merchant seamen under the National Health Service are paid the full temporary resident fee for only the first, second, or third seaman examined on one day and that for all others seen on the same day a fee of only 5s. is paid. It was the intention of the Council that the lower rate of payment should be restricted to those cases in which a practitioner examines a number of seamen on one ship at the time of his visit to the ship. The practitioners concerned have therefore been advised to raise this matter through the local medical committee.

Boarded-out Children: Fees for Medical Examinations

119. Both the County Councils Association and the Association of Municipal Corporations have now agreed that the full fee of 25s. will be paid for the "subsequent" examination of a boarded-out child in a case where the doctor did not carry out the initial examination, provided he is not a partner of, an assistant to, or a locum tenens employed by the doctor who made the original examination. In other cases the fee for the subsequent examination remains at 12s. 6d.

National Society for the Prevention of Cruelty to Children

120. Following a request made by the Council, the National Society for the Prevention of Cruelty to Children has agreed to increase by 100% the fees paid for medical reports on children and for attending at court to give evidence on behalf of the Society. At the same time the Society has recorded its very warm appreciation of the services which have been and are being rendered by many doctors without charge.

Allowances at Criminal Courts

121. The Council has continued to press the Home Office to increase the allowances payable to professional witnesses at criminal courts. A meeting has been held with the Department to discuss proposals made by the Home Office and counter-proposals made by the Council. It is understood that increased allowances will not now be long delayed.

Memorandum on Dangerous Drugs

122. A draft of a revised memorandum by the Home Office on the duties of doctors under the Dangerous Drugs Act and Regulations has been studied and the Department has agreed to amend the memorandum to meet objections raised by the Council.

Election of Direct Representatives to the General Medical Council

123. The next election of direct representatives of the profession to the General Medical Council is due in April, 1956. In accordance with the approved procedure the selection of the eight members who will receive the support of the Association in England and Wales will be dealt with in the following manner.

One nominee will be selected by the Welsh Committee. One woman practitioner will be selected by women members of the Association resident in England and Wales.

The remaining six will be selected by the Representatives at the Annual Representative Meeting in June, 1955. Divisions in England and Wales are being asked to submit nominations for this purpose.

Remuneration of Admiralty Surgeons and Agents

124. The Council has made representations to the Admiralty for an increase in the fees paid for many of the services performed by Admiralty surgeons and agents.

Examination for Fitness for Borstal: Fees

125. The present fee for the medical examination of boys for fitness for Borstal training is 15s. for each examination, subject to a maximum of £3 15s. when more than five boys are examined on one day. The Council has asked the Treasury to increase the fee to £1 1s. and to remove the daily maximum.

Alcohol and Road Accidents

126. The report on the publication "The Recognition of Intoxication" contained recommendations on the appointment and remuneration of doctors to undertake the examination of intoxicated motorists, on the facilities available at police stations, and on the procedure for the determination of alcohol in urine. These recommendations were referred, in the first place, to the local authority associations concerned. Both the Association of Municipal Corporations and the County Councils Association have now expressed the opinion that each police authority should decide whether, and to what extent, to apply the recommendations in its own area. The Council is therefore requesting the Branch or Division, as appropriate, to take up the matter with the police authority locally.

Coroners Act, 1954

127. The Council is in correspondence with the Home Office on the fees and allowances payable to witnesses at coroners courts, and to medical practitioners who perform post-mortem examinations at the request of the coroner, which are to be included in the regulations to be issued under the Coroners Act, 1954.

"BRITISH MEDICAL JOURNAL"

128. It is satisfactory to record an increase in the circulations of the specialist periodicals published by the Association, with a consequent improvement in their financial position. There has, too, been a steady increase in the circulation of the *British Medical Journal* in other countries, where it would appear to be read more than ever before. A recent contributor was so impressed by the requests he received from workers abroad for reprints that he sent them to the Journal office for inspection. This foreign circulation not only enhances the prestige of British medicine, and so of the Association, but also helps to counteract a financial situation which in other respects is less favourable, owing to a rise in the cost of production and a decline of revenue from classified advertisements (those relating to appointments). Since 1943, with the exception of one or two years, the revenue from the *British Medical Journal* has exceeded the cost of production, but present trends are less favourable than they have been.

The number of papers submitted for publication continues at a high level, and on grounds of space alone some two-thirds of these have to be rejected. The sale of the books containing a selection of questions and answers from the "Any Questions?" section of the *Journal* and of the "Refresher Course" books shows that these parts of the *Journal* are widely appreciated.

For the past three years the Editor has been responsible for organizing the medical editors' conference held during the general assembly of the World Medical Association, and has thus had the opportunity of becoming acquainted with medical editors in other countries. Members of the editorial and publishing staff of the *Journal* undertook the responsibility of editing and producing the *Proceedings of the First World Conference on Medical Education*, now published by the Oxford University Press—another instance of active support of the work of the W.M.A. from the member association principally responsible for its establishment.

"FAMILY DOCTOR"

129. In the Report of Council last year it was stated that the intention of the Family Doctor Committee was to conduct *Family Doctor* during 1954 at no cost to the Association, and this aim has been achieved. In fact, there has been a small surplus which is sufficient to cover the net loss to the Association in the 1953 trading year. In effect, therefore, *Family Doctor* has been run at no cost to the Association during the past two years.

In the first quarter of 1955, the advertisement revenue shows an increase of approximately £6,000 over the corresponding period in 1954. The total advertisement revenue for 1954 was £10,000 higher than the advertisement revenue for 1953. Advance bookings for advertisements in 1955 already exceed the value of the entire advertisement revenue for 1954.

All advertisements in *Family Doctor* continue to be subject to the closest scrutiny, and during the whole of 1954 a policy of the most careful selection has been exercised. The advertisement pages now reflect the growing confidence in the magazine of leading firms in the country.

The distribution of the magazine on a national scale presents a variety of problems, but *Family Doctor* is now on sale in newsagents' shops and bookstalls in most parts of the United Kingdom, and in many centres overseas. The magazine is also sold in many clinics and maternity and child welfare centres. Distribution has been brought about in this way in clinics controlled by over 100 different local

authorities, and the number of local authorities co-operating in this type of distribution is increasing. This is an especially satisfactory development, as it gets *Family Doctor* into the hands of young mothers, a section of the population of first importance from the point of view of health education.

A total of 15 *Family Doctor* pamphlets have been published, and these are being sold in increasing numbers to the public in single copies and to local authorities in bulk quantities. Increasingly often an individual reader is told by his or her own doctor that a particular pamphlet may help. The prices of these pamphlets have been kept down to a level which it is hoped will keep them within the reach of almost everyone. Nevertheless, they are distributed at no cost to the Association and, indeed, make a small surplus. There is a further small surplus each year on the sale of *Family Doctor* binders and indexes.

In March, 1955, *Family Doctor* arranged one of the largest feature stands ever to have appeared at the *Daily Mail* Ideal Home Exhibition. This had the dual function of drawing the public's attention to *Family Doctor* and making copies available to them there, as well as carrying a health education message translated into popular terms and directed specifically at housewives.

This exhibit was supported by press advertising in both national and provincial newspapers, and, of course, the entire cost of all this promotional activity is borne by *Family Doctor's* revenue from sales and advertisements.

Family Doctor has become the most widely quoted magazine in Great Britain. Every month national and provincial newspapers quote from *Family Doctor* articles. It is fair to say that this reflects a growing appreciation by the Press of the accuracy, authority, and reliability of the articles and features which are published in *Family Doctor* and over the imprint of the British Medical Association.

The B.B.C., both in its home and overseas broadcasts, from time to time makes use of *Family Doctor* material, and publications throughout the world regularly purchase material from *Family Doctor* for reproduction in their own local press. Arrangements for the regular reproduction of *Family Doctor* articles exist in particular in South Africa, Australia, and most European and Scandinavian countries.

The influence of *Family Doctor* and its acceptance by the Press of this country is further reflected in the growing number of press inquiries made on the interpretation of medical material. Advice is sought regularly by editors, journalists, and publishers on medical and para-medical subjects, on articles on medicine which appear in other publications, and on a variety of related topics in the field of popular medical writing.

During 1954 the magazine has become more firmly established and is now widely accepted by the public and advertisers. It is the intention of the *Family Doctor* Committee during 1955 further to develop the influence of the magazine by increasing its circulation and by enlarging the facilities which it now offers in the field of health education.

It is intended that, once again, the magazine and all its other activities shall be conducted at no cost to the Association.

FINANCE

(As the auditing of the Association's accounts has not yet been completed, the Annual Financial Statement will be published in the Council's Supplementary Report.)

130. Throughout the past year the Council has exercised a close control of Association expenditure, with the object of achieving a stabilization of the financial position. From the frequent scrutiny of the budgets of the departments and "spending" committees by the Finance Committee and the Financial Advisory Committee, the Council has ensured that the estimates for the year have been closely followed and every economy exercised.

Income

131. The income from membership subscriptions reached the anticipated level of £250,000 after providing for losses arising from resignations and deaths.

Rents from the accommodation let to medical and other organizations produced a net revenue of £15,650, after charging the establishment charges attributable to the tenants' accommodation.

With an additional income of £5,000 from investments and bank interest the total revenue for the year was £270,800.

Expenditure

132. In the budget for 1954 provision was made for a total expenditure under all headings—with the exclusion of the Publications Account—of £230,222. It is satisfactory to note that the completed accounts for the year show that there was an actual expenditure by the departments and "spending" committees of £226,400. The Association recovered a part of the cost of the Central Medical Recruitment Committee, which is included in this figure.

Direct expenditure on the periphery amounted to over £41,000, represented by the cost of the Regional and Scottish Offices and the capitation grants to Divisions and Branches during the year. The library facilities were operated at a cost of approximately £11,000.

There is evidence that the service given by the Medical Practices Advisory Bureau, which is available to both members and non-members, has become more widely known and appreciated. The cost of this department in 1954 was £10,800, which was only a small increase on that of the previous year. Expenditure by the Empire Medical Advisory Bureau and the International Medical Visitors Bureau was kept within the amount set aside in the budget.

Approximately £20,000 was expended on Central Meetings, including Council Meetings and the Representative Meeting. This was an increase on the previous year, as it included the cost of new committees. The Trustees of the National Insurance Defence Trust again undertook responsibility for all but £1,000 of the expenses of the General Medical Services Committee, and the Council gratefully acknowledges this help.

Publications Account

133. There was an improvement on budget expectation in the case of the publications of the Association, although the surplus for the year, to which *Family Doctor* contributed for the first time, was smaller than that for the previous year.

Whilst the results achieved during the past year can be regarded as satisfactory, the Council, when preparing the Budget for the coming year, has taken note of the fact that there may be little, if any, surplus on the Publications Account. It has been necessary to make this forecast in view of the increasing costs of production.

Trust Funds and Medical Charities

134. During the year the Office Staff Superannuation Fund was revalued by an independent actuary, and the Council is pleased to report that the financial position of the Fund is considered to be quite satisfactory. There was a marked improvement in the market value of the investments held by the Trust Funds, and there has been sufficient income to pay the customary prizes. With the help of additional bequests the Charities Trust Fund collected and distributed the sum of over £12,500 during the past year, which exceeded the previous year's distribution by £600.

Revenue Budget for Twelve Months Ending December 31, 1955

135. Based on estimates submitted by the "spending" committees and departments, the Council has approved a master budget of income and expenditure for the twelve months ending December 31, 1955.

It is estimated that the total income from membership subscriptions, rents, and investments will be £278,900.

Out of this sum it will be necessary to meet expenditure under the various budgets amounting in all to £234,600. Provision has been made also for loan redemption and for

contingencies, including the Association's probable contribution towards the cost of the legal actions which are to be instituted in connexion with assessing the income of part-time consultants under Schedule E.

After making these provisions it is anticipated that the net surplus for the year will be £16,300, which the Council has earmarked for a General Reserve Fund.

Membership Subscription

136. The Council has carefully considered the following resolution of the Annual Representative Meeting, 1954:

That this meeting notes with satisfaction the greatly improved financial position of the Association which has resulted in part from the increase in subscription from four to six guineas in 1952, and instructs the Council to consider the desirability of reducing the subscription to five guineas within two years.

It should be remembered that the increase in the subscription rates became necessary because of increased costs generally and not solely as a result of the phenomenal rise in the price of paper which led to a heavy deficit on the Association's publications in 1951. While it is satisfactory that the Association is now out of debt and that the publications, for the time being, are self-supporting, the Council considers it important that the Association should not be content merely to confine its expenditure within its income, but should aim at building up ample reserves so that it may never again be faced, as a result of unforeseen and unforeseeable contingencies, with a critical financial situation. This policy, which ordinary prudence would dictate, was strongly recommended by the expert management consultants who investigated the Association's affairs some years ago.

So far as can be judged at present, only a moderate annual surplus is to be expected, even if the annual subscription remains at the present rate. Therefore, while the Council will keep the matter continually under review, it regrets that in present circumstances it cannot advise the Representative Body that it would be wise to contemplate a reduction in the standard rate of subscription in the immediate future.

ESTATES

Maintenance of Headquarters Building

137. The first stage of the schedule approved by the Council with the object of ensuring that the interior and exterior structure of the Headquarters building is maintained in a good state of repair was carried out during the past year. Prior to the unveiling of the war memorial, the whole of the exterior facing the Court of Honour was decorated, and the memorial gates were overhauled and repainted. The appearance of the courtyard was greatly improved by the use of a coloured tarmac surround to the memorial.

In the Garden Court Wing, the rooms occupied by the library were redecorated during the holiday period, and at the same time the opportunity was taken to replace a number of the interior doors and fittings of an "austerity" pattern, installed during the war by the Ministry of Works.

Scottish House

138. The reconstruction of the interior of the Scottish House in Edinburgh was begun in August of last year, and considerable progress has been made in the necessary preliminary work. It is anticipated that the final stage of the alterations will be carried out early in 1956.

The Library Accommodation

139. The claims advanced on behalf of the library for adequate and appropriate accommodation are regarded by the Council as of the highest priority, as there is evidence from the growing use of the library services that they are greatly appreciated by members of the Association. The Council is examining the position with a view to deciding on a policy in regard to the immediate and long-term planning of the library accommodation.

Burton Street Site

140. In the early months of 1954 negotiations with the Bedford Estate on the acquisition of the Burton Street site were resumed on the basis of the terms originally proposed in 1952. Subsequently, in August of last year, the agreement with the estate was completed, under the terms of which the Association will be granted a lease of 169 years when it has obtained vacant possession of adjacent houses and can clear the site and erect a building which will be linked with B.M.A. House.

Meantime the Council is considering the development of the site. It is recognized that when the new building is completed it will be possible to ensure that all departments of the Association are properly housed. At the same time the financial position is being carefully watched, as it is the intention of the Council to ensure as far as possible that the rental income from office accommodation will give the Association an adequate return for the capital sums invested in the new building.

SCIENCE

Functions of the Science Committee

141. The Council has reviewed the existing scope, functions, and constitution of the Science Committee, whose main responsibility is to advise and, when so directed, to act for the Council "in all such matters as are not specially referred to other committees and concern the work of the Association for the promotion of the medical and allied sciences." The Council is anxious that the Association should be recognized by the profession and the public as having a vital concern for the nation's health, and it considers that from time to time, through the Science Committee, inquiries might be initiated into, and reports made on, medico-scientific matters which would not only be of great value in themselves but would also redound to the credit of the Association and enhance its reputation.

In order to strengthen the Science Committee and to make available to it the fullest information on scientific developments and national needs in relation to medicine and health, the Council proposes that the Committee should have power to co-opt up to three additional members, thus enabling persons recognized as authorities in special fields to serve upon it and raising its status and increasing its prestige.

The suggested amendment of the Schedule to the By-laws is contained in Appendix VI.

With a view to maintaining a closer liaison between the Science Committee and *ad hoc* committees set up to consider particular subjects with a scientific bearing, the Council has decided to provide for the appointment of at least one member of the Science Committee to all such *ad hoc* committees.

The Council wishes to stimulate local scientific activities in Branches and Divisions. It may appear that, in some areas where there are very active medical societies, it is difficult for the local unit of the Association to arrange well-attended lectures or scientific meetings, but it is suggested that in such areas Branches and Divisions should offer to co-operate with the medical societies, with a view to extending the local scientific activities.

Other suggestions relating to the scientific activities of the Association are under consideration.

Crash Helmets

142. In view of the very large number of fatal and serious accidents in which motor-cyclists and their passengers receive head injury, the Council has been exploring means of promoting a much wider adoption of the practice of wearing crash helmets. It made representations to the Commissioners of Customs and Excise for the removal of the purchase tax on crash helmets, and it appointed a deputation to meet the Commissioners.

The Commissioners have accepted all the evidence given relating to the advantages of the wearing of crash helmets

by motor-cyclists, and to the dangers of not wearing them, but they have not agreed that the extra cost which purchase tax involves is a real deterrent to their more general use.

It is estimated that at present only about 20% of civilian motor-cyclists normally wear crash helmets. There is no purchase tax on helmets used by miners and quarrymen, but all other forms of protective clothing (including firemen's and policemen's helmets) are subject to tax.

Decisions with regard to the abolition of purchase tax must be made by the Government, and the Commissioners have undertaken to acquaint the Chancellor of the Exchequer with the views expressed by the Association.

The Council proposes to take all possible further steps to promote the more general wearing of crash helmets by motor-cyclists and their pillion and side-car riders.

Coal-gas Poisoning

143. In view of the numerous reports of accidental death and ill-health from coal-gas poisoning, the Council considers that the extent of the problem should be investigated and also possible methods of rendering the escape of coal gas more easily detectable. A special subcommittee is being appointed to inquire into the matter and to make recommendations.

The Library

144. In 1954 there was an increase in the recorded number of members using the Library and in the number of books borrowed, as compared with 1953.

During last year over 150 books and journals were presented to the Library, and the Council is most grateful to the donors.

The mutual borrowing arrangements with other medical libraries throughout the country have continued to work satisfactorily.

In 1951, as an economy measure, the Council agreed that, until further notice, members borrowing books from the library by post should be required to pay the cost of the outward postage as well as the cost of the return postage. It has decided that, as from January 1, 1956, it will revert to the practice of bearing from Association funds the outward postage on books borrowed, except in London postal areas adjacent to B.M.A. House—namely, N.1, N.W.1, W.C.1, W.C.2, E.C.1, E.C.4, and W.1.

The Library is still expanding, and the Council has agreed that increased accommodation should be made available for it as soon as possible in the Garden Court Wing of B.M.A. House.

Consideration is being given to possible methods of restricting the amount of storage space which will ultimately be required by the Library.

Association Prizes

Sir Charles Hastings and Charles Oliver Hawthorne Clinical Prizes

145. The Sir Charles Hastings Clinical Prize, established to stimulate systematic observation, research, and record in general practice, has been awarded for 1955 to C. A. H. Watts, of Ibstock, Leicestershire, for his essay on "Some Observations on Depression in General Practice." The award consists of a certificate and a cheque for £75.

The Charles Oliver Hawthorne Prize of a certificate and a cheque for £50, which is given to the author of the second best essay in this competition, has been awarded to D. S. McLaren, of London, for his work entitled "A Study of the Factors Underlying the Special Incidence of Keratomalacia in Oriya Children in the Phulbani and Ganjam Districts of Orissa, India."

Katherine Bishop Harman Prize

The Katherine Bishop Harman Prize, established for the encouragement of study and research directed to the diminution and avoidance of the risks to health and life that are apt to arise in pregnancy and child-bearing, has for 1955 been awarded jointly to A. F. Rogers, of Bristol, for his

essay on "The Physiology of the Umbilical Arteries," and to J. K. Wilson, of Liverpool, for his essay on "The Investigation of the Placental Stage of Labour by Cord Injection Placentography" (prepared in conjunction with John MacPherson). Each prize consists of a certificate and a cheque for £37 10s.

The Council wishes to express its appreciation of the services given by the examiners in these competitions.

B.M.A. Lectures

146. Experts in various fields of medicine have continued to give B.M.A. Lectures to Branches and Divisions at the invitation of the Council. The number of Lectures arranged so far for the session 1954-5 is 98.

The Council wishes to record its thanks to the following, who have kindly consented to give Lectures during the current session:

Mr. A. Lawrence Abel
Professor Ian Aird
Mr. H. J. B. Atkins
Dr. C. G. Baker, O.B.E.
Dr. Roger Bannister
Mr. N. R. Barrett
Dr. D. Evan Bedford
Lord Boyd-Orr of Brechin
Mearns, D.S.O., M.C.
Dr. F. Camps
Dr. R. G. Cochrane
Dr. F. S. Cooksey, O.B.E.
Sir Zachary Cope
Dr. Macdonald Critchley
Sir Daniel Davies, K.V.C.O.
Mr. W. W. Davey
Mr. H. Dodd
Dr. W. R. S. Doll
Professor J. B. Duguid
Professor D. M. Dunlop
Mr. Harold Edwards, C.B.E.
Mr. R. Charles Evans
Dr. R. Forbes
Dr. T. F. Fox
Dr. A. W. Frankland
Dr. A. R. French
Dr. D. G. French
Professor J. Glaister
Dr. J. D. Allan Gray, T.D.
Dr. R. Greene
Sir David Henderson
Dr. E. A. Johnston
Dr. A. Trevor Jones
Dr. F. Avery Jones
Dr. J. A. L. Vaughan Jones
Professor R. J. Kellar, M.B.E.
Mr. Geoffrey Knight
Sir William MacArthur,
K.C.B., D.S.O., O.B.E.

Dr. J. A. W. McCluskie
Dr. Melville D. Mackenzie,
C.M.G.
Professor W. A. Mackay
Sir Geoffrey Marshall,
K.C.V.O., C.B.E.
Dr. G. B. Mitchell-Heggs,
O.B.E., T.D.
Professor J. Chassar Moir
Mr. A. M. A. Moore
Mr. Robert Morrison
Professor Ian Murray
Sir W. Heneage Ogilvie, K.B.E.
Dr. W. N. Pickles
Sir Arthur Porritt, K.C.M.G.,
C.B.E.
Dr. L. G. C. E. Pugh
Mr. E. W. Riches, M.C.
Dr. F. F. Roberts
Professor M. L. Rosenheim
Dr. B. Schlesinger, O.B.E.
Mr. T. Holmes Sellors
Dr. C. Keith Simpson
Dr. Eliot Slater
Dr. J. Smart
Dr. G. Stewart Smith
Dr. K. Shirley Smith
Professor C. H. Stuart-Harris
Mr. N. Leigh Taylor, M.B.E.
Professor R. E. Tunbridge,
O.B.E.
Sir Cecil Wakeley, Bt., K.B.E.,
C.B.
Dr. S. Wand
Dr. M. Ward
Professor L. J. Witts
Dr. Paul Wood, O.B.E.
Dr. W. D. Wylie

Mackenzie Industrial Health Lecture

147. Dr. R. S. F. Schilling has accepted an invitation to deliver the 1956 Mackenzie Industrial Health Lecture. At the invitation of the Association of Industrial Medical Officers, the Lecture will be given in conjunction with next year's Annual Meeting of that Association, which will be held in London from September 24 to 29. The Lecture will be given at B.M.A. House on Tuesday, September 25, 1956.

PUBLIC RELATIONS

Broadcasting and Television

148. Following a meeting between the Chairman of the Public Relations Committee and the Postmaster-General certain safeguards against improper advertising of medical goods and services were included in the Television Act, 1954, which set up the Independent Television Authority. Subsequently, the Association was invited to nominate a representative to serve on the expert Advisory Committee on Advertising established by the Authority, and the Chairman of the Public Relations Committee (Dr. H. Guy Dain) was appointed. The Advisory Committee has held several meetings during the session.

Public Relations Activities in Divisions

149. Out of 221 Divisions, only 10 have now no provision for Public Relations work. In 83 Divisions a separate Honorary Public Relations Secretary has been appointed. In 128 Divisions the post is combined with that of Honorary Secretary.

A successful Conference of Honorary Public Relations Secretaries was held, at which the morning session was devoted to a general survey of the Public Relations position, while during the afternoon a number of distinguished journalists answered questions submitted by Divisions on the subject of "Doctors and the Press." In future a Conference of Honorary Public Relations Secretaries will be held biennially, the next Conference taking place in 1956.

A statement has been prepared giving an outline of the functions of an Honorary Public Relations Secretary. The statement suggests ways in which the Honorary Public Relations Secretary can act as a liaison between the profession and the public (including the Press) on behalf both of the Division and of Headquarters. A copy will be sent to every Honorary Public Relations Secretary.

The Public Relations Officer has made many visits to the periphery during the year and has addressed meetings of Divisions, consultants committees, and other groups in the profession on various aspects of public relations. It is planned to expand this side of the Department's work with a view to strengthening the relations locally between the profession and the organs of public opinion, including the Press.

Advance Copies of "British Medical Journal" to Local Division Officers

150. Local Division Officers are often approached by local press reporters with a request for a comment on or explanation of items of public interest which are to be published in the *British Medical Journal*. These officers were frequently in a difficult position owing to the fact that they themselves had not received their *Journals* when the reporter telephoned. In order to assist them in their public relations duties, arrangements have been made by the Journal Committee for a strictly limited number of membership copies of the *Journal* to be posted to Honorary Division Secretaries and Honorary Public Relations Secretaries in advance of general publication.

Press Arrangements

151. The Public Relations Department's close and friendly relations with the Press have been maintained and strengthened during the past year. A record number of press representatives attended the Glasgow A.R.M.; part of the proceedings were televised. The number of inquiries by telephone and correspondence from the Press, professional organizations, and members of the public continues to increase.

A number of Press Conferences in connexion with the publication of Association Reports and decisions on policy have been held during the year. These included one to introduce the Report on "The Recognition of Intoxication," when arrangements were made for a recorded interview between the Chairman (Professor Wayne) and a B.B.C. reporter, which was broadcast in "Radio Newsreel" the same evening. When the proposed scheme of inspection of doctors' surgery and waiting-room accommodation was announced, it was considered essential that the public should be aware that the inspection was being undertaken on the initiative of the profession itself. A Press Conference was accordingly held at which the Chairman of the General Medical Services Committee (Dr. A. Talbot Rogers) explained the scheme. The Conference was well reported and many laudatory editorials and other comments appeared in the Press congratulating the profession on having taken the initiative in this matter. A Press Conference was also

arranged in connexion with the publication of the Report of the Committee on "The Rehabilitation and Resettlement of Disabled Persons."

World-wide publicity was obtained for the dedication by the Archbishop of Canterbury of the B.M.A. War Memorial. The ceremony was reported, in word and picture, through the Press, the newsfilms, the radio and television, and, through the news agencies and the B.B.C.'s services overseas, to Branches and Divisions abroad.

Register of Medical Conferences

152. The Register of Medical Conferences maintained in the Department continues to expand, and there is evidence to show that, by preventing overlapping of dates and in other ways, it is of much value to professional organizations when they are arranging their annual conferences. In addition to the Register, a selected list of conferences, giving on an average particulars of about 150 meetings, is issued quarterly to professional organizations.

ARMED FORCES

B.M.A. Lectures for Large Service Establishments in the United Kingdom

153. The Council has approved a suggestion that the Association's lecture scheme for home Branches and Divisions should be extended to enable groups of Service medical officers in large establishments in the United Kingdom to apply for one lecture annually.

Principally for financial reasons the medical societies formed by these groups, which are often isolated, are unable to invite distinguished members of the profession to visit them, and it is hoped that the extension of the Association's lecture scheme will overcome this difficulty.

Specialist Training in the R.A.M.C.

154. The Council is pleased to report that arrangements are now being made by the War Office under which, each year, five Army medical officers will be permitted to attend full-time courses, without cost to themselves, enabling them to take the appropriate postgraduate examinations and ultimately to be classified as senior specialist officers, serving at home or abroad may apply, and those selected will be expected to remain in the Service for five years after completing the course.

ORGANIZATION

Association Membership

155. The Council sends the following report upon the membership of the Association for 1954:

New members	3,477	
Resignations withdrawn		
Reinstated		3,607
Removed in arrears	2,902	
Less paid arrears	1,324	1,578
Deaths		592
Resignations		1,404
		3,574
		Increase 33
Membership, December 31, 1953	67,506	
Membership, December 31, 1954	67,539	

The membership of the Association in the United Kingdom represents 71% of the total profession and 80% of the working profession. The membership on March 8, 1955, was 66,647.

Despite the increase in subscription, the Association's membership has not only remained stable but is again showing an upward trend. The Council, however, has no intention of relaxing its efforts, and, with the co-operation of Honorary Secretaries of Divisions, a special drive is being made to recruit non-members to the Association and to secure the return of ex-members.

Honorary Secretaries

156. The Council, on behalf of the general body of members of the Association, desires again to express its grateful thanks to the Honorary Secretaries of Divisions and Branches, upon whose loyal co-operation the effective local organization of the Association so largely depends. The general increase in activity, particularly on the clinical and social sides, has been maintained.

Annual Conference of Honorary Secretaries

157. The Annual Conference of Honorary Secretaries in 1955 will be held at B.M.A. House on March 31. Dr. J. E. Morrison, Honorary Secretary of the Stirling Branch, will be in the chair.

The Newly Qualified Practitioner

158. The position of the newly qualified practitioner and the problems with which he is faced as a result of the introduction of the Medical Act, 1950, have continued to receive attention. Every effort is being made to bring the young practitioner into closer contact with the Association during his pre-registration year, and the part which the Divisions might play in promoting this contact was fully discussed at the 1954 Conference of Honorary Secretaries of Divisions and Branches. A pamphlet giving details of the Library facilities has been prepared for distribution to newly qualified and other members of the Association.

Certain grievances of house officers, such as difficulty in obtaining pre-registration posts, off-duty periods, and married quarters, have been freely ventilated, and the co-operation of the Licensing Bodies has been sought in avoiding any unnecessary delay in the issue of the certificates essential for the purpose of full registration.

Areas of Branches and Divisions

159. Approval has been given, after due notice in the *Supplement*, to the reconstitution of the Borneo Branch into one of three Divisions, and the transfer of the Salisbury Division from the Wiltshire Branch to the Southern Branch. Other changes in home Division areas are under consideration.

Autonomous Bodies

160. Pending the report of the Constitution Committee and any changes in procedure which may result therefrom, Minute 27 of the A.R.M., 1950, remains operative. This Minute requires that the autonomous powers of the General Medical Services and Central Consultants and Specialists Committees "in so far as they derive from the Representative Body" shall be specifically renewed by successive Annual Representative Meetings. The Council recommends:

Recommendation: That the autonomous powers of the General Medical Services Committee and the Central Consultants and Specialists Committee be renewed in respect of the year 1955-6.

That the Representative Body looks to these Committees to ensure (1) that no action be taken by either which may prejudice the interests of another part of the profession without full prior consultation with the appropriate interests, and (2) that their autonomous powers will be used so as to expedite and not delay the work of the Association.

Membership of Divisions and Branches

161. In accordance with the decision recorded in Minute 143 of the A.R.M., 1954, the Council has taken steps to implement the proposal made in Minute 255 of the A.R.M., 1953, namely:

That members of the Association shall ordinarily be allocated, as hitherto, to the various Divisions (and Branches) purely on an address basis, but where by reason of ease of access, professional association, or for any other reason, a member finds it more convenient to attend the meetings of some other Division (or Branch), that member may, on application to Head Office, be transferred to the Division (or Branch) of his choice.

The necessary alterations of the Articles and By-laws are contained in Appendix VI.

Associates

162. In 1936, at the instigation of certain overseas Branches, the constitution of the Association was altered to permit Branches of the Association overseas to elect as Associates persons legally recognized as members of the medical profession in the country in which they were resident but not eligible for ordinary membership under the Rules of the particular Branch. Since 1948, after consultation with the solicitor on the interpretation of the relevant by-laws, the privilege of Associateship has been extended to practitioners from overseas temporarily resident in this country and not eligible for ordinary membership. The number of these "home" Associates is limited, but the extension of what was originally intended to be a local arrangement overseas has resulted in anomalies. Difficulties arise, particularly when an Associate elected by a Branch in this country changes his address and goes to an area overseas where the Branch has made no provision under its Rules for the election of Associates, or where the practitioner goes to an area abroad where there is no Branch of the Association. In the opinion of the Council, the regulations of the Association should be amended to restrict the election of Associates to Branches overseas, as was the original intention. The position in the United Kingdom is already covered by the provisions of By-law 12, which gives to Divisions and Branches the power to elect as Complimentary Members qualified medical practitioners resident within their area who are not eligible for Ordinary Membership of the Association. The Council recommends:

Recommendation: That in view of the provision under By-law 12 for the election of Complimentary Members of Divisions and Branches, the election of Associates be restricted to overseas Branches.

The necessary amendments of the Articles and By-laws to give effect to this recommendation are contained in Appendix VI.

Installation of President of Association

163. The Annual Meeting of the Association this year will be held in Toronto some weeks later than the Annual Representative Meeting in London. Under By-law 68 as now worded, the President is elected annually at the Annual Representative Meeting and enters upon the duties of his office on his installation at the next Annual Representative Meeting. This means that in 1955 the President would have to be installed at the Annual Representative Meeting in London at the beginning of June instead of, as is desirable, at the Adjourned Annual General Meeting in Toronto. The Council recommends the amendment of By-law 68 contained in Appendix VI.

Subscription for Newly Qualified Members of the Association

164. In the course of its discussions on methods of securing and maintaining the interest of newly qualified practitioners in the Association, the Council has considered the subscription rate paid by such members during the first five years after qualification. Under By-law 16 (1) B this is two guineas for the first two years and three guineas for the next three years. In the normal course, newly qualified practitioners, after full registration, proceed on National Service for a period of two years, and during this period they may be expected to have little contact with the Association. They may therefore defer joining the Association until the period of National Service has been completed or allow membership to lapse during that period. To meet the situation, the Council proposes that the subscription of the newly qualified practitioner should be two guineas for the first three years and three guineas for the following two years, and, as a further attraction to young practitioners to take up and retain membership of the Association, that they should have the option of paying the subscriptions for the first five years, which would normally amount to twelve guineas, in one sum of ten guineas, thus saving two guineas over the period.

It also proposes that the requirement that the newly qualified practitioner, to be eligible for the reduced subscription, must be admitted to membership before the expiration of two years from qualification, should be discontinued. Examination of the proposed amendments to give effect to these suggestions has disclosed confusion in the wording of By-law 16 in respect of some categories of members eligible for reduced subscription, and it is proposed to take the opportunity of clarifying the position.

The recommendations for amendment of the Articles and By-laws to meet the above proposals are contained in Appendix VI.

Extraordinary Members

165. By-law 12, which lays down the procedure for the election of Extraordinary Members, has given rise to misunderstanding. Extraordinary members may not receive notices of "General Meetings," but no indication is given as to whether these are General Meetings of the Association or of the Division or Branch. The general meetings referred to are those of the Association. In order to remove doubt the necessary recommendation for amendment of the By-law is contained in Appendix VI.

Election of Officers of the Services

166. By-law 7, which governs the election of officers of the Services to membership of the Association, refers *inter alia* to the "Colonial Medical Service." This Service is now known as "H.M. Oversea Civil Service," and a recommendation for amendment of the By-law is contained in Appendix VI.

Amendments of Articles and By-laws

167. Proposals are made in various paragraphs of this Report which necessitate alterations of the Articles and By-laws. Amendments of the Schedule to the By-laws in respect of certain Standing Committees are also necessary to give effect to decisions of the Council relating to the constitution of these committees. The Council recommends:

Recommendation: That the Articles and By-laws of the Association be altered in the manner shown in Appendix VI, and that the Council be instructed to submit the amendments of the Articles concerned to an Extraordinary General Meeting of the Association.

The B.M.S.A. and the B.M.A.

168. The Association continues to maintain its close connexion with the British Medical Students Association. At its annual general meeting in November, 1954, the B.M.S.A. acknowledged its "continued indebtedness to the B.M.A. for all its help, both in the administration of B.M.S.A. affairs and discussion and advice on student problems." It also expressed its thanks for the enlarged office accommodation made available in B.M.A. House and the clerical assistance placed at its disposal.

Association Groups

169. *Senior Hospital Medical Officers.*—The Council has approved the formation within the Association of a Group of Senior Hospital Medical Officers. This Group will be organized on the lines of the Registrars Group formed in 1949.

Spa Practitioners.—This Group, which has been inactive for some years, has now been dissolved and its members transferred to the Physical Medicine Group.

CONSTITUTION OF THE ASSOCIATION

170. The Committee appointed by the Council on the instructions of the Annual Representative Meeting, 1953, "to examine and report on the present structure and constitution of the Association with special reference to the re-organization of the Representative Body" is engaged in a review of the constituent parts of the Association's administration and the changes necessary to bring them into accord with present-day circumstances and needs. The Committee first turned its attention to the peripheral organization of

the Association. Certain provisional conclusions have been circulated to the Divisions and Branches with a request for their comments and any additional suggestions they may care to make. After studying the views expressed, the Committee will formulate definite proposals. It is now reviewing the structure and functions of the Representative Body and of the Council and committees of the Association, including the autonomous bodies and the special groups and group committees. Later it will study the Annual General Meeting procedure, the scientific activities of the Association, and the relationship of the Association with other professional bodies.

SCOTLAND**Chairman and Deputy Chairman of Scottish Committee**

171. Dr. J. G. M. Hamilton and Dr. W. M. Knox were appointed Chairman and Deputy Chairman respectively of the Scottish Committee for the session 1954-5.

Reconstruction of Scottish House

172. Good progress is being made with the alterations to Scottish House. It is anticipated that the new accommodation for the staff and the caretaker's flat will be completed during the summer, and the common room, reading room, and snack restaurant by early next year.

Visit to Scotland by Danish Doctors in 1955

173. Following two very successful visits paid to Denmark by parties of Scottish doctors it has been decided to arrange, through the Danish Medical Association, a reciprocal visit to Scotland by Danish doctors during September, 1955. The Hospitality Subcommittee of the Scottish Committee has therefore drawn up a programme for the visitors which includes visits to the main medical centres and also sight-seeing tours. As Association funds cannot be used for the purpose, local medical committees in Scotland have been invited to contribute to a fund to defray the expenses of the visit, either by direct contribution or by guarantee, and several have already undertaken to do so. The Central Consultants and Specialists Committee (Scotland) has agreed to assist with the expenses of the tour by guaranteeing a sum of £300 from its Central Fund.

Conference of Honorary and Public Relations Secretaries of Branches and Divisions in Scotland

174. Twenty-nine honorary secretaries and public relations secretaries of Branches and Divisions in Scotland attended a most successful conference held in Scottish House on October 13, 1954. The following also attended by invitation: Chairman of the Scottish Committee; Chairman, General Medical Services Subcommittee (Scotland); Chairman, Public Health Subcommittee, Scottish Committee; Chairman and Secretary of the Central Organization Committee; the Secretary of the Association; the Scottish and Assistant Scottish Secretaries; and the Association's Public Relations Officer. The main items discussed at the conference included "B.M.A. Organization in Scotland," "The Relationship of Local Medical Committees to the Divisions of the Association," and "The Association and the Young Doctor." The Public Relations Officer also gave a survey of the work of his department.

The honorary secretaries passed a resolution recommending to the Scottish Committee that a similar conference should be held in the autumn of 1955 and that further conferences should be held at regular intervals thereafter. This recommendation has been approved by the Scottish Committee and referred to the Organization Committee. A full report of the conference appeared in the *Supplement* of November 13, 1954.

Building Legislation Committee

175. The Scottish Committee was invited to submit evidence to a committee set up by the Secretary of State for

Scotland to examine the existing law for the general regulation of building in Scotland in so far as it relates to the control of building standards, and to make recommendations. The Public Health Subcommittee, to whom the matter was remitted, has, in conjunction with the Scottish Branch of the Society of Medical Officers of Health, submitted written evidence and answered a questionnaire from the Committee.

Maternity Services Subcommittee

176. The Maternity Services Subcommittee has considered a number of matters in connexion with the organization and administration of the Maternity Services under the National Health Service (Scotland) Act, 1947. It has, with the approval of the Scottish Committee, issued a circular to local medical committees suggesting that they should consider drawing attention to the facilities which are available locally to general practitioners for the blood-testing of their maternity cases.

Public Health Subcommittee

177. The Public Health Subcommittee has had under consideration the National Health Service (Scotland) (Superannuation) Amendment Regulations, 1954, as they affect doctors employed by local health authorities.

Adoption of Children

178. The Chairman's Subcommittee has for some time had under consideration certain problems relating to the preservation of anonymity in adoption cases, particularly the difficulty that may arise where it is desired that the identity of the mother should not be disclosed. It is felt that this point is not fully dealt with in the Hurst Committee's Report. It is thought that discussions with the Scottish Home Department might be helpful, and action of this kind is under consideration.

Auditor and Financial Adviser

179. The Treasurer of the Association has authorized that the Association's auditor in Scotland shall receive an additional fee for the services which he is rendering as financial adviser to the Scottish office.

Scottish Health Services Conference

180. The Committee indicated to the Royal Institute of Public Administration that it welcomed the holding of a conference on the Scottish Health Services and was prepared to commend it to members of the Association. The Scottish Secretary is attending the Conference, which is to be held at Peebles on March 31 and April 1 and 2, 1955, as the Association's representative.

Committees which Report to the Scottish Committee

(a) General Medical Services Subcommittee (Scotland)

181. Dr. C. J. Swanson and Dr. Kate Harrower have been appointed respectively chairman and deputy chairman of the Subcommittee.

In view of the various difficulties experienced by practitioners in certain remote areas of the Highlands and Islands it has been decided to set up a special subcommittee of the General Medical Services Subcommittee (Scotland) "to consider and to report to the G.M.S. Subcommittee (Scotland) on matters pertaining specially to the medical service in more sparsely populated areas of the Highlands and Islands." Amongst the subjects considered by this subcommittee are inducement payments, practitioners' houses, mileage, and ambulance service.

The Subcommittee has revised the memorandum on "Medical Partnerships under the National Health Service (Scotland)."

Considerable attention has been given to a proposal by the Department of Health for a survey of the standard of

surgery and waiting-room accommodation, and the Subcommittee has now agreed that a general survey should be carried out in areas where this has not already been undertaken. The Subcommittee is of the opinion that the review should be the responsibility of executive councils, who would in practice act in close consultation with local medical committees.

(b) Central Consultants and Specialists Committee (Scotland)

Dr. J. G. M. Hamilton was reappointed chairman of the Committee for the session 1954-5 and Dr. A. Smith was appointed deputy chairman.

Sufficient copies of the Report on Hospital Junior Staffing prepared by the special subcommittee of the Central Consultants and Specialists Committee were issued to Scottish Regional Consultants and Specialists Committees for distribution to members of their constituent bodies. The contents of the report, together with comments received from the regions, were discussed at meetings of the Central Committee, when it was agreed that further consideration of the report was required before any definite decision could be given regarding the suitability of its proposals for adoption in Scotland. The Committee's own Medical Establishments Subcommittee is also giving active consideration to the whole problem of hospital medical staffing in Scotland.

The Committee is obtaining information regarding the interpretation by the regional hospital boards of the discretionary clause in the terms and conditions of service relating to the placing on the salary scale of newly appointed consultants.

It has been remitted to the Chairman's Subcommittee to examine and report on the present structure and organization of hospital medical staff representation in Scotland. The Chairman's Subcommittee, in its consideration of this matter, is seeking the views of the Scottish members of the Joint Consultants Committee.

In addition to issuing its annual report, the Committee is circulating to members of hospital medical staffs in Scotland the bulletins issued from time to time by the Central Consultants and Specialists Committee, to which, when necessary, is attached a statement of the position in Scotland relative to the items contained in the bulletin, together with other information of current interest to the hospital medical staffs in Scotland.

The Committee has asked the Joint Consultants Committee (Scotland) to discuss with the Department of Health the question of maintaining an adequate representation from hospital medical staff committees on hospital boards.

The Joint Consultants Committee (Scotland) has also been asked to discuss with the Department of Health the policy to be adopted when establishing new S.H.M.O. posts in Scotland.

The specialist subcommittees of the Committee have under consideration various administrative problems connected with their own particular fields, and the Tuberculosis and Diseases of the Chest Subcommittee is co-operating with the Public Health Subcommittee of the Scottish Committee in an investigation into the resettlement schemes for the tuberculous.

WALES

182. The Welsh Committee, which includes representatives of all the Divisions and Branches in Wales and Monmouthshire, has met in Shrewsbury under the chairmanship of Dr. Leslie W. Jones. It provides opportunities for discussion of all matters affecting Welsh members.

The Annual Welsh Dinner is to be held in London on Friday, June 3.

OVERSEAS

Reorganization of the Colonial Service

183. The Council has welcomed the creation, as from October 1, 1954, of Her Majesty's Overseas Civil Service, and hopes that the measures taken by the Government in this direction will go some way to allay the feeling of

insecurity which has recently existed among expatriate members of the Service, particularly those posted to territories which are already far advanced towards self-government.

The United Kingdom Government, in acknowledging the continued need for officers from Great Britain and the Commonwealth countries to fill many posts in the professional, technical, and higher administrative branches, has recognized that it has a special obligation towards such officers. It has accordingly made known its intention, if and when a Colony attains self-government, to secure by formal agreement with the government of that territory the observance of the following conditions *inter alia*: terms of employment no less favourable than those upon which an officer is already serving; the safeguarding of pension rights and similar benefits; eligibility for transfer; and compensation from the government of the territory in which an officer is serving in the event of premature retirement resulting from constitutional changes. The agreement would also cover the continued payment of pensions already awarded to officers and their dependants.

East Africa

184. The Council has considered the report of the Commission appointed to examine Civil Service salaries and conditions of service in East Africa, and the new salary scales subsequently adopted by the East African Governments. Negotiations on various detailed aspects of the proposals have been carried on locally by the Kenya, Tanganyika, and Uganda Branches, and discussions have also taken place centrally with representatives of the Colonial Office. Attention has been drawn to certain points which were not *prima facie* considered to be wholly satisfactory, and, in particular, the Council has stressed the need for remuneration to be adequate to attract sufficient recruits of the right calibre, bearing in mind that it is necessary to maintain a high standard, and that there are a number of factors, over which the Colonial Office has no control, which act as deterrents to recruitment.

Cyprus

185. The Council has considered the report of the Commissioner appointed to examine the salary structure of the Civil Service of Cyprus and also the memorandum issued by the Government of Cyprus setting out new salary scales which have been introduced with effect from July 1, 1954. The new scales are a considerable improvement on those previously in force, but there are still a number of points upon which the Council is not satisfied. Until these have been further considered, the Council has felt unable to remove the Government of Cyprus from the "Important Notice."

Medical Appointments Overseas

186. Misunderstandings have arisen in the past due to accurate information not always being available to candidates in this country applying for medical posts in certain areas overseas, particularly those areas where there is no local Branch of the Association. The Council has decided therefore that advertisements for certain posts shall be accepted for publication in the *British Medical Journal* only if the advertiser agrees to the inclusion of the following footnote:

Information about conditions of medical practice in may be obtained from the Secretary of the British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

EMPIRE MEDICAL ADVISORY BUREAU

187. The Empire Medical Advisory Bureau, on behalf of the Association, welcomes and provides a personal advisory service to medical practitioners from the Dominions and Colonies visiting the United Kingdom.

The Committee of Management has met three times during 1954, and the Advisory Committee held its seventh Annual Meeting on May 28, 1954. The attendance of members at

meetings and their help throughout the year with the problems of individual visitors is much appreciated.

The use made of the Bureau by overseas inquirers and visitors continues at the same high level as in previous years. The numbers of visitors remain about the same, but there has been a marked increase in new correspondents seeking advice. Nearly 2,000 visits were paid to the Bureau during the year by old and new visitors.

The various aspects of postgraduate medical education are of main concern to the majority of new inquirers, and information is given on higher qualifications, courses of instruction, hospital appointments, examinations, and medical registration and defence.

The "Summary of Regulations for Postgraduate Diplomas and Courses of Instruction in Postgraduate Medicine," compiled and produced by the Bureau, has been revised and reprinted, as is usual each year. The "Summary" has been dispatched overseas to all Branches of the Association, affiliated Associations, deans of medical faculties of Commonwealth universities, postgraduate committees, and editors of medical journals. These copies are intended for reference by overseas inquirers, and many tributes to their usefulness have been received.

Between three and four hundred doctors inquired about junior hospital appointments, and advice was given on the types, grades, and availability of these.

Some of the more senior visitors wish to see methods and developments in the particular field of medicine in which they are interested. Visits to hospitals, clinics, and special centres have been arranged through the co-operation of consultants and hospital authorities.

Many visitors have been met personally by the port health medical officers on arrival, and a letter of welcome from the Bureau is sent to every visitor whose place and date of arrival are known. There is no doubt that these attentions are much appreciated by the newly arrived visitor. Through the kindly co-operation of authorities arranging courses of instruction, the Bureau is enabled to contact those overseas visitors, already arrived in the country, who do not know of the Bureau's facilities; liaison letters are sent to all these visitors and in many cases result in the Bureau being able to be of service and to invite the visitors to social functions.

All requests by visitors for accommodation to be arranged in readiness for their arrival in the country have been met. In addition, the Bureau has helped visitors, after their arrival, to secure furnished houses and flats. It is known that nearly 300 doctors and families have been successfully assisted with the problem of accommodation.

The majority of visitors have inquiries which fall into the wide field of "General Information," and every endeavour is made to answer these or to assist the inquirer to find the answer.

Overseas visitors have been enabled to meet their fellow practitioners from all parts of the Commonwealth, including senior members of the profession in the United Kingdom, at social functions arranged by the Bureau. "At homes" were held in London, Edinburgh, Liverpool, and Glasgow, and a total of nearly 1,200 overseas doctors and wives were able to attend these. Many expressions of appreciation from guests have been received, especially of the opportunities to make contacts which the "at homes" afford.

Many expressions of appreciation for the Bureau's services have been received, and the Council is glad to report that our medical colleagues from the other parts of the British Commonwealth are made welcome in the United Kingdom and receive the assistance they require to make the most of their visit.

INTERNATIONAL MEDICAL VISITORS BUREAU

188. The International Medical Visitors Bureau, established in 1950, provides a personal advisory service for medical practitioners desiring to visit the United Kingdom from countries other than those of the British Commonwealth.

New inquirers making use of the Bureau during the year totalled more than 300 and came from 36 countries.

In addition, requests were received from approximately 250 United Kingdom and Continental doctors or their families for "holiday exchanges" or *au pair* visits.

Many of the overseas inquirers wanted information concerning postgraduate courses of instruction and diplomas. Others sought information about hospital appointments in order to obtain experience of British medicine, and it is known that several have been successful in obtaining hospital appointments and temporary registration.

Visits to hospitals, clinics, and other institutions were desired by some of the more senior visitors. The Bureau is much indebted for the co-operation of heads of departments, consultants, and other authorities in arranging these visits.

Suitable accommodation has been found in London and the provinces for all visitors requesting this.

Many inquiries in the field of "General Information" have been received and dealt with, and visitors are encouraged to make requests with a view to making their visits successful.

Inquiries about "holiday exchanges" for themselves or their families or children and about *au pair* visits were received from many doctors in Europe and in the United Kingdom. With the co-operation of national medical associations, the Bureau endeavoured to put the inquirers in touch with suitable professional contacts, and it is known that more than forty "exchanges" were arranged.

Inquirers have much appreciated the help received from the Bureau, and the Council is glad that visiting colleagues can obtain assistance to make their visits pleasant and useful.

MEDICAL FILMS

189. The Council is glad to report that increasing use has been made of the Association's Film Library during the past year. Twenty films have been added to the Library, and a third addendum to the Film Catalogue has been issued. Information on a large number of recent medical films has been received as a result of a questionnaire sent to medical photographers.

Appraisal panels have met from time to time to view medical films which have been brought to the notice of the Association, and the Council wishes to express its thanks to the members of the profession who have served on these panels.

The Council is greatly indebted to the following, who have kindly presented films to the Association in the past year or have placed copies of their films in the Library on indefinite loan: Davis and Geck Inc., Imperial Chemical Industries Ltd., Kleenex and Kotex Ltd., G. D. Searle and Co. Ltd., and T. J. Smith and Nephew Ltd.

Consideration has been given to the possibility of lending films to the Overseas Branches, and it is hoped to introduce overseas hirings on a small scale during the coming year. This project would be separate from the home library service.

The Council is exploring the possibility of making a general film on rehabilitation for showing to lay audiences, followed by a series of films on special aspects of rehabilitation.

INTERNATIONAL RELATIONS

Anglo-American and Anglo-Canadian Exchange Scheme

190. The scheme which enables a small number of British doctors to visit the U.S.A. and Canada in exchange for visits to this country by American and Canadian doctors has been continued. Five British doctors have visited the U.S.A. and Canada during the year, and their reports show that the existence of the scheme is much appreciated.

The World Medical Association

191. Dr. J. A. Pridham, who had been a member of the W.M.A. Council since the foundation of the W.M.A. in 1947, has retired from that office. The Councils of the W.M.A.

and the B.M.A. have expressed their appreciation of his services. The Council of the W.M.A. has appointed Sir Lionel Whitby to fill the vacancy.

The Association was represented at the Eighth General Assembly of the W.M.A., which was held in Rome in October, 1954. The Council has considered a report of the proceedings of the General Assembly, and a number of matters referred to member-associations. The latter included a series of resolutions adopted by the International Social Security Association concerning the relations between the medical profession and social security institutions, a proposal to form an International Occupational Health Committee, a resolution on human experimentation, and inquiries on the allowance of professional expenses for purposes of income tax, the proposed abolition of the use of heroin, and the establishment of national standards for identification of ampoules, solutions, and packages of dangerous drugs. As is stated in paragraph 203, the W.M.A. has invited member-associations to appoint groups to study the *Proceedings of the First World Conference on Medical Education*, and to make recommendations concerning the Second Conference to be held in 1959.

The next General Assembly will be held in Vienna from September 20 to 26, 1955. The Association will be represented by the Chairman of Council and Dr. T. Rowland Hill as Delegates, with Dr. J. A. Pridham and the Secretary as Alternate Delegates. Dr. Mary Esslemont will attend as an observer.

Financial Position of the W.M.A.

192. The council of the W.M.A. has reported to member-associations that the association is in serious financial difficulties, and it has proposed a substantial increase in the rate of subscription. The difficulties are mainly due to the widening scope and increasing cost of W.M.A. activities, and to the fact that many national associations do not pay their full membership subscription. The B.M.A. Council has carefully considered how it can best help the W.M.A. It is convinced that the W.M.A. serves a useful and necessary purpose in presenting the views of the medical profession to international governmental bodies such as the World Health Organization and the International Labour Office, and moreover, as the B.M.A. was largely responsible for the creation of the W.M.A., the Council feels that it must do all in its power to ensure the W.M.A.'s continuance.

The Council has accordingly made an unconditional gift of £1,000 to the W.M.A. to help it over its immediate difficulties. It has also studied the W.M.A.'s financial statements with a view to offering constructive advice. It has suggested to the W.M.A. council that the crisis is serious enough to justify an immediate and thorough examination of the finances, organization, and activities of the W.M.A., and that, after effecting such economies as are practicable, the council of the W.M.A. should work out a programme of activity within the revenue that it can reasonably expect to receive. It has recommended that the proposed increased rate of subscription should be reconsidered, partly because, if certain member-associations do not pay their full subscriptions even at the present rate, it is unlikely that they will pay any substantially higher rate.

OTHER ASSOCIATION ACTIVITIES

Medical Practices Advisory Bureau

193. The volume of work in both the Advisory and the Agency Departments of the Bureau has been fully maintained during 1954. Approximately 600 partners, assistants, and trainees have been introduced, and the number of appointments and practices overseas with which the Bureau has been asked to deal has shown a marked increase. Very close liaison is maintained between the headquarters of the Bureau in London and the branch offices in Manchester, Edinburgh, and Glasgow.

In the field of exchange of practices the results of much work and the dissemination of a great amount of information have been very disappointing, but the facilities for

arranging exchanges are considered adequate and will continue to be available to members.

The number of requests for advice on partnership problems, including the drawing up of partnership agreements, is very much greater than the number of openings for assistants "with a view" on the books of the Bureau. This confirms the inference from the statistics available that while a partnership does not always follow as a matter of course the offer of a view, the fact that no view is offered does not exclude the possibility of a partnership where circumstances permit.

During 1954 nearly 2,500 locums were introduced. Every effort is made to satisfy the demand, but during certain periods of the year this is not always possible.

"National Formulary"

194. The Formulary Committee, which was appointed jointly by the Association and the Pharmaceutical Society, has completed the revision of the *National Formulary* issued in 1952. Copies of the new issue, published on January 1, 1955, are being distributed to hospitals and general practitioners under arrangements made by the Ministry of Health after sufficient time has elapsed to allow wholesale and retail pharmacists to adjust their stocks. The new edition will replace the 1952 *National Formulary* on April 1.

British Commonwealth Medical Conference

195. The Fourth British Commonwealth Medical Conference will be held in Toronto in June, 1955, immediately before the Joint Annual Meeting of the British Medical Association and the Canadian Medical Association. Delegates will be coming from Australia, Canada, Ceylon, India, Ireland, New Zealand, South Africa, Southern Rhodesia, and the United Kingdom. (The Pakistan Medical Association has not yet stated whether it will be sending a delegate.) The United Kingdom delegation will be composed of the Chairman of Council, the Chairman of the Representative Body, and the Editor of the *British Medical Journal*. The Secretary will also attend in his capacity as Honorary Secretary and Treasurer of the Conference.

The purpose of the Conference is to afford an opportunity for informal discussion of problems of common interest to the National Medical Associations in the British Commonwealth. The subjects to be discussed in Toronto will include: Lessons from the First World Conference on Medical Education, Medical Licensure and Registration, Rehabilitation—the Third Phase of Medicine, the Medical Care of Native Populations, the Public Relations of the Medical Profession, and Medical Journalism. The programme will also include a visit to the School of Hygiene of the University of Toronto and the Connaught Medical Research Laboratory.

Control of Medical Manpower

196. As in the past, the Council has provided secretarial and clerical assistance and other facilities for the two Central Medical Recruitment Committees, and will recover three-quarters of the cost from the Government.

The new regional medical recruitment committee for the Western Area of the South-west Metropolitan Hospital Region, the establishment of which was proposed by the Council last year, has been brought into existence by the Ministry of Health.

A summary of the detailed analysis (as at December 31, 1953) of the emergency register of the medical profession, which is maintained by the Association on behalf of the Central Medical Recruitment Committees, was published in the *Supplement to the British Medical Journal* of January 8.

Catering

197. Throughout the past year the Council has exercised a close scrutiny of the catering services provided in the Members' common room and the staff dining-room. It is satisfied that, as a result of the measures taken in regard to staffing and equipment, there has been a marked improvement in these services. Furthermore, it has become possible

for the catering department to undertake catering for large receptions and meetings held in the building.

The particular problem which the Council is meeting in common with all catering establishments is the increasing cost of labour and foodstuffs. As it is necessary to ensure that, so far as the Members' service is concerned, the catering does not become a financial liability, the charges for lunches and teas may have to be moderately increased.

Admission of Students to Medical Schools

198. In its last Annual Report the Council described at some length the difficulties encountered in an endeavour to estimate the number of students entering medical schools, the number qualifying from the schools, and the number of newly qualified practitioners likely to be absorbed into the various branches of the profession. In view of these difficulties the Council asked the Minister of Health to set up a working party to review the whole problem.

In a letter from the Permanent Secretary of the Ministry to the Secretary of the Association, published in the *British Medical Journal Supplement* of February 26, 1955 (page 67), it was explained that the Minister and the Secretary of State for Scotland, whilst in full agreement as to the need for a detailed inquiry, did not consider that a representative working party of the kind suggested by the Council would be the best method of undertaking such an inquiry. The Ministers decided that it would be preferable for them to appoint a small committee to which all interested bodies could present their views. The terms of reference and the members of the Committee appointed by the Ministers are as follows:

Terms of Reference: To estimate, on a long-term basis and with due regard to all relevant considerations, the number of medical practitioners likely to be engaged in all branches of the profession in the future, and the consequential intake of medical students required.

Members: Mr. Henry Willink, Q.C. (Chairman), Dr. J. T. Baldwin, Sir Harold Boldero, Sir John Charles, Sir Henry Cohen, Sir Andrew Davidson, Dr. A. B. Davies, Mr. J. P. Dodds, Sir Geoffrey Jefferson, Mr. L. G. K. Starke, Mr. A. B. Taylor.

Civil Service Medical Officers

199. In its last Annual Report the Council announced that the long dispute with the Treasury regarding the salaries paid to medical officers in the Civil Service had concluded in a satisfactory interim agreement between the Treasury and the Civil Service Medical Officers' Joint Committee. The agreement reached provided for increases in pay in certain grades of the medical officer class in the Civil Service, both sides remaining free to ask the Royal Commission to consider any representations they might see fit to make regarding the remuneration of any of the medical grades. The scales resulting from this interim agreement are set out below:

Grade	Age	Salary Scales (Basic plus Pay Additions)			
		Old scale		New scale	
		£	s. d.	£	
Basic	35	1,331	5 0	1,500	
	36	1,382	10 0	1,575	
	37	1,433	15 0	1,650	
	38	1,485	0 0	1,725	
	39	1,536	5 0	1,800	
	40	1,600	0 0	1,900	
Senior Medical Officer		1,675	0 0	2,000	
		1,750	0 0	2,100	
		1,825	0 0		
Principal Medical Officer		£1,900 × £100 to			
		£2,100		2,200	
		£2,250		2,300	

Following this agreement the Civil Service Medical Officers' Joint Committee, consisting of representatives of the Association and the Institution of Professional Civil Servants, prepared a memorandum of evidence for submission to the Royal Commission on the Civil Service. Representatives from the Joint Committee subsequently gave oral evidence to the Commission, and details of the claim made on behalf of medical officers in the Civil Service

were reported in the *Supplement* to the *British Medical Journal* of January 22. The salaries sought for the various medical posts in the Civil Service, together with the present scales, are set out below:

Grade	Present Salary £	Claim £
Chief Medical Officer, Ministry of Health	4,000	6,000
Chief Medical Officer, Department of Health for Scotland	3,000	At a point immediately below Chief Medical Officer, Ministry of Health
Chief Medical Officers, Colonial Office, Ministry of Pensions and National Insurance, Treasury Medical Adviser	2,850	
Deputy Chief Medical Officers, Ministry of Health	3,000	4,500
Deputy Chief Medical Officers, Ministry of Pensions and National Insurance, Department of Health for Scotland, Senior Medical Senior Commissioner of Board of Control	2,600	Not less than £500 above principal medical officers
Principal medical officers	2,300	3,500
Senior Medical officers	2,200	3,100
Medical officers	1,500 (age 35) > 75—1,800 > 100—2,100 (Scale is age-pointed to age 40)	1,600 (age 35) x 120—2,800

Joint Committee of the B.M.A. and the Magistrates' Association

200. This Committee has continued its study of the problem of cruelty to, and neglect of, children, and has received both written and oral evidence from a number of bodies and individuals. The report of the Committee is now in preparation, and it is expected that it will be completed during the autumn of this year.

Air Pollution—The Beaver Committee

201. The Association was invited by the chairman (Sir Hugh Beaver) of the Air Pollution Committee, set up by the Minister of Housing and Local Government, the Secretary of State for Scotland, and the Minister of Fuel and Power, to give evidence to that committee on the many forms in which danger to health arises from, or is thought to arise from, pollution of the air, and on the evaluation of such danger. Time did not permit of the production of a formal memorandum of evidence, but a subcommittee, under the chairmanship of Mr. J. R. Nicholson-Lailley (chairman of the Science Committee), considered the matter and gave oral evidence to the Beaver Committee in September, 1954. Sixteen points were specifically brought to the committee's notice and the whole subject was discussed at great length. The committee expressed its gratitude for the opportunity of discussing the matter with the Association's representatives.

Ministry of Healing

202. The Archbishop's Commission on Divine Healing and Co-operation with the Clergy having sought the assistance of the Association, a special Committee was established by the Council to prepare evidence for the Commission. A questionnaire was published in the *Supplement* to the *British Medical Journal*, and copies were sent to honorary secretaries of Branches and Divisions with a request that they should bring the matter to the notice of doctors interested in the subject. A number of replies have been received and have been considered by the Committee, which has also received oral and written evidence and memoranda. The Committee has confined its inquiries entirely to the medical field.

The Archbishop's Commission is hoping to complete its report by the autumn of next year, and it is anticipated that the Association's memorandum of evidence will be submitted to the Commission by the Council towards the end of 1955.

Medical Education

203. The *Proceedings of the First World Conference on Medical Education*, which was held in London in August, 1953, were published in October, 1954. The World Medical Association is now making arrangements for a Second World Conference on the same subject to be held in the United

States in 1959, and it has invited member-associations to appoint study groups to study the *Proceedings* of the First Conference and to make recommendations concerning the structure and content of the Second Conference. The Council has accordingly appointed a special Committee for this purpose under the Chairmanship of Sir Lionel Whitby.

The General Assembly of the W.M.A., on the recommendation of the council of that body, has expressed warm thanks to the Editor of the *British Medical Journal* and his staff for their invaluable services in connexion with the publication of the *Proceedings* of the first Conference.

Homosexuality and Prostitution

204. The Council has been invited to submit evidence to the Departmental Committee set up "to consider

(a) the law and practice relating to homosexual offences and the treatment of persons convicted of such offences by the courts; and

(b) the law and practice relating to offences against the criminal law in connexion with prostitution and solicitations for immoral purposes;

and to report what changes, if any, are in their opinion desirable."

The Council has appointed a special Committee to prepare evidence on the medical aspects of the subject. The Chairman of the Committee is Dr. R. G. Gibson, of Winchester.

The Law on Mental Illness and Mental Deficiency

205. Following the appointment of the Royal Commission on the Law relating to Mental Illness and Mental Deficiency, the Council requested the Psychological Medicine Group Committee to prepare a memorandum of evidence for submission to this body. The Committee was augmented for the purpose by the co-option of representatives of the Central Consultants and Specialists, General Medical Services, and Public Health Committees, a nominee of the Royal Medico-Psychological Association, and an eminent legal expert on mental law and procedure.

Throughout the preparation of evidence a close liaison was maintained with the Royal Medico-Psychological Association, which was itself preparing a memorandum for submission to the Royal Commission, and there has been a very large measure of agreement with that association.

The Council has recently considered and given its approval to the memorandum of evidence which has been drawn up, and this has now been submitted to the Royal Commission.

Hypnotism

206. The Council included in its Supplementary Annual Report for 1952 (para. 235) a statement of the views of the Psychological Medicine Group Committee on hypnotism. This had been prepared because of the frequent inquiries received by the Association on the subject, which at that time was receiving wide publicity and which had received no consideration by the Association since the report published in 1892.

The 1952 statement, however, dealt only briefly with the subject, and on further consideration it was felt desirable to undertake a fuller investigation.

The Psychological Medicine Group Committee therefore appointed a special subcommittee, which included a representative of the Science Committee, with the following terms of reference:

To consider the uses of hypnotism, its relation to medical practice in the present day, the advisability of giving encouragement to research into its nature and application, and the line upon which such research might be organized.

A report is now nearing completion and will shortly be submitted for the Council's consideration.

Control of Meat Inspection

207. The British Veterinary Association has submitted to the Council a revised memorandum on meat production and control. The original memorandum outlined a plan which

would have had the effect of removing the responsibility for meat inspection from the local authority and would have excluded entirely any supervision by the medical officer of health. The revised memorandum sought to make it clear that this is not the intention of the British Veterinary Association, but further joint discussions with the B.V.A. were considered necessary to clarify other points on which the policy of the Associations appeared to differ. Some measure of agreement has already been reached and discussions are continuing.

E. A. GREGG,
Chairman of Council.

APPENDIX I

RETURN OF ATTENDANCES OF COUNCIL

Name	Attendances	
	Actual	Possible
E. A. Gregg, London (Chairman of Council)	5	5
Sir John McNee, London (President)	2	5
I. D. Grant, Glasgow (Chairman of the Representative Body)	5	5
L. Douglas Callander, Doncaster (Treasurer)	5	5
J. W. Tudor Thomas, Cardiff (Immediate Past-President)	5	5
T. C. Roudley, Toronto (President-Elect)	1	1
A. Beauchamp, Birmingham (Deputy Chairman of the Representative Body)	4	5
Abel, A. Lawrence, London	4	5
Alexander, H., London	4	5
Arthur, J. C., Low Fell, Co. Durham	4	5
Barker, A., Whitstable	5	5
Barnes, W. E., Brighton	5	5
Britton, C. J., London	4	5
Brown, Alexander, Linton, Cambs	5	5
Brown, D., Liverpool	5	5
Brownfield, O. D., Petersfield, Hants	5	5
Carter, O. C., Bournemouth	5	5
Chalke, H. D., London	5	5
Clarke, C. Belfield, London	4	5
Cottrell, J., Grimsby	4	5
Cowan, K., Edinburgh	4	5
Dahne, S. F., Logan, Caversham, Berks	5	5
Dain, H. Gay, Birmingham	5	5
Davies, T. W., Swansea	5	5
Dawson, E. C., Derby	5	5
Dickson, N. S., Templepatrick, Co. Antrim	2	5
Dornan, W. E., Sheffield	5	5
Douglas, N., Hamilton, Lanarks	5	5
Dowse, J. C. A., London	5	5
Edwards, J. T., Rice, Newport, Mon	5	5
Esslemont, Mary, Aberdeen	4	5
Forbes, R., London	3	5
Formby, Myles L., London	3	5
Fraser, Ian, Belfast	1	5
Garnham, P. C. C., Farnham Common, Bucks	5	5
Gibbons, L. A., Reigate	5	5
Gibson, R. G., Winchester	4	5
Gillie, Annis, London	5	5
Golding, H. M., Westbury-on-Trym	5	5
Gough, A. Staveley, Watford	5	5
Gray, F., London	4	5
Hale-White, R., London	5	5
Hamilton, J. G. M., Edinburgh	5	5
Heywood-Waddington, W. B., Littlehampton	4	5
Hill, T., Rowland, London	5	5
Hutchinson, D. F., London	5	5
Innes, Ian G., Hull	4	5
Ireland, G. W., Ford, Midlothian	4	5
Jones, Isaac, London	4	5
Jones, J. A. L., Vaughan, Leeds	5	5
Jones, Leslie W., Anglesey	5	5
Knox, W. M., Glasgow	4	5
Langston, H. H., Winchester	4	5
Liston, R. P., Tunbridge Wells	4	5
Macarthur, J. C., Carlisle, Lanarks	3	5
Milne, J. L., Manchester	5	5
Moody, J. A., Ilford	5	5
Nicholson-Lailley, J. R., Taunton	5	5
O'Farrell, P. T., Dublin	3	5
Owen, D. R., Chester	2	5
Pracy, D. S., Atherstone, Warwicks	5	5
Pridham, J. A., Weymouth	4	5
Rees, J. O. M., Guildford	5	5
Rogers, A., Talbot, Bromley	5	5
Rose, F. M., Preston	5	5
Russell, A. V., Wolverhampton	5	5
Scott, Alexander, Ayr	5	5
Scott, S. Noy, Plympton, Devon	5	5
Sutherland, H. H. D., London	5	5
Tilley, J. B., Newcastle-upon-Tyne	4	5
Wand, S., Birmingham	5	5
Watts, Weldon P. T., Newcastle-upon-Tyne	5	5
Weston, A., Greenford, Middlesex	5	5
Winchester, J. W., Omagh, Co. Tyrone	2	5
Woolley, W., Bristol	5	5

* Resigned, August, 1954.
† Appointed, August, 1954.

APPENDIX II

NOTE OF A DISCUSSION WITH THE MINISTER OF HEALTH ON DECEMBER 9, 1954, ON THE PROVISION OF DRUGS FOR PRIVATE PATIENTS

Present: A. Brown, A. Talbot Rogers, D. P. Stevenson, and W. Hedgcock.

1. Dr. Rogers said that, in pursuing this question, the Committee did so with the full knowledge that its implementation would require an amendment of the Act and that this might not be possible at the present time. Dr. Rogers referred to the very considerable amount of feeling in the profession that the present state of affairs was inequitable. It seemed quite unnecessary to regard prescribing as an inseparable part of general medical services, and the profession had always been led to believe that patients would be free to use separately any part of the services which were provided under the Act. It was believed that it would not be difficult to devise satisfactory machinery which would prevent any abuse, and, in the opinion of the Association, the fear that it might lead to two standards in general practice was quite unfounded. Whilst appreciating the present difficulties, the Committee would like to know what the Government's policy would be at a time when amending legislation became a practical proposition.

2. Dr. Brown amplified Dr. Rogers's statement, and said that when the Act was introduced the impression gained ground that patients would be able to take advantage of the Service either in part or in whole. Now it was found that the supply of drugs was tied up with treatment and that an amendment to the Act would be necessary to give effect to this part of the Association's policy. Dr. Brown said that he appreciated to the full the difficulties in the political field and the lack of time available for legislation at the moment. What his Committee, the Private Practice Committee, would like to know was whether the Government accepted the view that a private patient was entitled to drugs under the Service. Once that principle had been decided any administrative difficulties could be examined.

3. The Deputy Secretary said that there were four particular points which he would like to make. Two arose out of the recently published Report of the Cohen Committee on General Practice. Firstly, the suggestion that the proposal would introduce two standards in general practice had given rise to considerable resentment in the profession and, in his view, such a situation might well exist in reverse to-day when many private patients were unable to afford the drugs necessary for their treatment. Secondly, it had been stated that many doctors in private practice would be unwilling to accept the imposition of any necessary safeguards. The Association, which represented the whole of the profession, would be only too willing to discuss the introduction of measures to prevent abuse, and, indeed, some form of contract and some ultimate sanction, such as the removal of a licence to prescribe on Form E.C.10, had always been envisaged. The Association was not, of course, aware of the source of this statement, but, for its part, it recognized that if its point was met the Association would be only too glad to devise adequate safeguards.

4. The third point concerned finance. Although time alone would show the cost of allowing private patients their drugs on Form E.C.10, it was quite possible that any increase in the drug bill which resulted would be offset, at any rate to some extent, by an increase in the amount of private practice, with a consequent reduction in the amount of public funds which went into the Central Pool.

5. There remained the political aspect, and it was here that it was hoped that the Minister would explain the Government's policy.

6. Mr. Macleod said that there had been no change either in the situation generally or in his own views on the subject. It had been suggested that there was a breach of faith on the part of the Government in not giving effect to a promise which was contained in an election manifesto.

7. This was not so. The pamphlet issued by the Conservative Party which had advocated this right for private patients had appeared in July, 1949. This pamphlet was in no way a form of election manifesto, and, indeed, the proposal had been dropped completely from the Party's electioneering programme which appeared some six months later. Again, in the 1951 election no mention of it had been made at all. The Conservative Party's reason for withdrawing from its original position was that it realized the impracticability of making any concession on the lines suggested when the full and mounting cost of the Health Service became apparent. As far as the Cohen Committee was concerned, the Parliamentary Secretary's reply in the House of Commons to the effect that the Cohen Committee was unanimous on this particular point was made in perfectly good faith. No minority report or anything of a similar nature had appeared when the report was published, and, if any members of the Cohen Committee had had any reservations, it would have been proper for them to have stated this when they were considering their report in its draft form.

8. From the Government's point of view the question raised three difficulties, those of legislation, finance, and administration. The door was by no means shut. The proposal which was made in the 1949 leaflet was withdrawn purely because of the financial position of the National Health Service, and it had never been restored. He found himself in no position to give any undertaking of any sort that the Government would commit itself to allowing private patients to be supplied with drugs under the Service either at present or at any future time. As far as the administrative difficulties were concerned, they were formidable but not insurmountable. He did not necessarily agree with the views of the Cohen Committee on this particular point, and, if the Government agreed to give private patients this right, then there was little doubt that any proposals would be discussed with the profession in advance.

9. In brief, Mr. Macleod said that the situation could be summarized—that the proposal was not repugnant to Conservative principles and that the door was by no means shut. He could, however, give no undertaking that the change either could or would take place.

10. The Minister agreed that his officials, in consultation with Dr. Stevenson, should formulate and agree a statement for publication which would set out the Government's view on the question.

APPENDIX III

DEFINITIONS, QUALIFICATIONS, AND REMUNERATION OF WHOLE-TIME INDUSTRIAL MEDICAL OFFICERS

1. In the view of the Association whole-time industrial medical officers should be graded in the following four categories:

Assistant Medical Officer.—A practitioner training for a career in occupational health and under the control of a more senior medical officer.

Medical Officer.—A practitioner in charge of the medical services of a small firm, or a constituent unit of a larger firm, working either single-handed or with an assistant.

Senior Medical Officer.—A practitioner in charge of the medical services of a medium-sized firm or, in the case of a large organization, of one of its constituent groups. A senior medical officer would usually have one or more medical officers, whole-time or part-time, under his control, but industrial medical officers who carry special responsibility by virtue of the hazards peculiar to the industries concerned, even when working single-handed, should be included in this grade.

Chief Medical Officer or Director of Medical Services.—A practitioner responsible for, or in charge of, the medical services of a large industrial undertaking.

2. Medical officers, senior medical officers, chief medical officers, and directors of medical services should be responsible to the highest level of management, locally or centrally, as may be appropriate.

3. As requirements for occupational health services vary widely from industry to industry, it is not possible for the Association to lay down precise definitions of the type of industrial medical officer required in all industries. The Association has, however, established an advisory panel of practitioners experienced in occupational health services which is available to give guidance to individual managements, if required. Requests for the assistance of the Advisory Panel should be addressed to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

Qualifications

4. The qualifications required for entry into each of the above grades should be:

Assistant Medical Officers

One year in pre-registration house appointments, preferably one house-surgeon and one house-physician appointment; two years' military service; and a further two years engaged in general practice, in public health, or in additional hospital work. Applicants for such appointments will usually be about 30 years of age. Attention should be paid to any specialist appointments which the practitioner may have held—for example, in chest medicine, dermatology, ophthalmology, etc.—which have a bearing on the problems of the particular industry concerned.

Medical Officers

Applicants should have held an appointment for a minimum of two years in the assistant medical officer grade, or have postgraduate experience in a branch of medicine likely to be of value to industry additional to that required for assistant medical officers.

The following higher qualifications would be regarded as an additional recommendation:

Membership of one of the Royal Colleges of Physicians.
Fellowship of one of the Royal Colleges of Surgeons.
Doctorate of Medicine.
Diploma in Industrial Health.
Diploma in Public Health.

Senior Medical Officers

Applicants for appointment in this grade would normally be practitioners who had distinguished themselves in the medical officer grade or had special experience in addition to that required for the medical officer grade of the industry concerned. Particular regard should also be paid to administrative ability.

Chief Medical Officers or Directors of Medical Services

These medical officers would normally be appointed from practitioners who had distinguished themselves in the senior medical officer grade, except where a special requirement of the industry made it necessary to appoint an experienced medical practitioner from outside the industry.

Remuneration

	Range
Assistant Medical Officers	£1,200 to £1,500
Medical Officers	£1,400 to £2,300
(A practitioner in this grade who gave satisfactory service would be expected to reach his maximum in his early 40's, but the practitioner giving outstanding service would be expected to receive more rapid advancement.)	
Senior Medical Officers	£2,000 to £3,000
Chief Medical Officers or Directors of Medical Services	From £3,000, according to the size of the undertaking and the responsibilities involved.

5. The salary in each grade should be reviewed at intervals not exceeding two years.

6. The Association regards these salary ranges as suitable for pensionable appointments. Where no pension scheme is in operation the salary should be adjusted accordingly.

REMUNERATION OF PART-TIME INDUSTRIAL MEDICAL OFFICERS

1. In the view of the Association, part-time industrial medical officers should be paid an annual salary, in preference to sessional fees, based on the average number of hours work per week at rates not lower than those set out in the

table below. The medical practitioner so appointed will have a recognized position in the industrial undertaking and thus should be able to maintain a continuing interest in it:

Hours per week	Minimum Annual Salary
Up to 1 hour	75
1 " 2 hours	150
2 " 3 "	225
3 " 4 "	300
4 " 5 "	350
5 " 6 "	400
6 " 7 "	450
7 " 8 "	500
8 " 9 "	550
9 " 10 "	600
10 " 11 "	650
11 " 12 "	700
12 " 13 "	750
13 " 14 "	800
14 " 15 "	850
15 " 16 "	900
16 " 18 "	950
18 " 20 "	1,000

2. It is pointed out that this scale constitutes minimum salaries, and in individual cases the value of the medical service given to firms will be such that managements may consider higher remuneration justifiable and appropriate.

3. Where a part-time industrial medical officer is required to travel beyond a radius of two miles in the course of his duties, a mileage rate of 1s. a mile each way is recommended.

4. A number of practitioners are fully occupied in occupational health by virtue of holding several part-time appointments. The aggregate salary of such a practitioner should be comparable with that of a whole-time industrial medical officer of similar standing.

5. The remuneration of a consultant in occupational health, or in any other appropriate specialty, called in by a firm to advise as an expert in some particular occupational health problem or problems, should be a matter for private negotiation, as in similar situations in other fields.

6. As requirements for occupational health services vary widely from industry to industry in regard to part-time appointments in the same way that they vary for whole-time industrial medical officers, it is not possible for the Association to lay down precise definitions on the type of industrial medical officers required in all industries. The Association has established an Advisory Panel of practitioners experienced in occupational health services which is available to give guidance to individual managements, if required. Requests for the assistance of the Advisory Panel should be addressed to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

APPENDIX IV

TERMS OF SERVICE FOR INDUSTRIAL MEDICAL OFFICERS

This memorandum is presented for the guidance of medical practitioners who are offered, or who apply for, appointments as medical officers in industrial or commercial undertakings, both private and nationalized.

The Duties and Ethical Rules for Industrial Medical Officers have been published and form the basis of the work of the medical practitioner in an occupational health service. The needs of occupational groups vary very considerably from group to group, and it is not possible to lay down hard and fast rules to cover all groups, but it is possible to enumerate certain fundamentals.

The medical officer should, whether his work is full-time or part-time, be directly responsible for the organization, administration, and staffing of the service to which he is appointed. In those organizations in which more than one

medical officer is employed he would obviously be responsible to the principal medical officer. With this exception the medical officer should be responsible only to the highest level of management.

The questions of salary, hours of work, holidays, study leave, research, and the publication of medical papers are matters which can best be discussed on a mutual basis to the satisfaction of both parties. It is, however, considered desirable that an industrial medical officer should be given leave of absence after six or seven years' satisfactory service, in order to undertake postgraduate training.

In some industries it is necessary to provide a service to cover all emergencies within the 24 hours. This would be a matter which would require special arrangements, for while a doctor would not expect to cease work at the end of the "working day" he could not be expected to cover the whole day.

Practitioners applying for part-time occupational health appointments should satisfy themselves that their other professional commitments would allow them time to carry out to the full the duties of the occupational health appointment.

It is suggested that practitioners accepting appointments as industrial medical officers should seek a contract of appointment. In any agreement entered into between a doctor and an employer it would be desirable to have an arrangement whereby either may terminate the agreement within a specified and reasonable time.

The practice of medicine in industry or commerce necessitates the closest co-operation with other professional and non-professional men and women, and the success or failure of a doctor in such an appointment will depend very largely on his ability to work with these colleagues.

APPENDIX V

RULES FOR D.P.H. COURSES

Recommendations in regard to the proposed revision of the General Medical Council's rules as to courses of study and examinations for diplomas and degrees in sanitary science, public health, and State medicine.

Recommendation (a): That the Certificate in Public Health as it now exists be discontinued and that a course leading to the Diploma in Public Health be arranged as a continuous whole.

Recommendation (b): That the authorities of teaching bodies be recommended to adopt a general requirement that a period of not less than two years after permanent registration should elapse before a practitioner becomes eligible to sit for the D.P.H. examination.

If the General Medical Council sees fit to adopt these recommendations certain consequential amendments would become necessary in the existing rules. It is suggested that paragraph 4 of the introduction might be amended on the following lines:

The only public health officers who are required by law to hold diplomas or degrees registered under the section are medical officers of health (and supervisors of midwives who are registered medical practitioners). It has been widely recognized that the possession of the D.P.H. is of value to all engaged in the practice of preventive medicine.

The discontinuance of the C.P.H. as it now exists would mean that paragraphs 5-13 would no longer be applicable and would require redrafting to make it clear that there should be a continuous course of instruction for the complete diploma. In these circumstances it would be necessary to make provision for existing holders of the C.P.H. to complete the course for the diploma.

The Council of the British Medical Association is of the opinion that there should be reasonable flexibility regarding the time of entry for the course. Adoption of Recommendation (b) would enable one year to be devoted to the course and one year to other professional activities, which in the case of male candidates could include their National Service.

After considering the content of the course of instruction, the Council of the British Medical Association wishes to recommend:

Recommendation (c): That the existing Rules 1 (3)-10 be redrafted and extended to cover systematic instruction in the undermentioned subjects:

1. Public Health History, Law, and Administration

The history of public health, public assistance, and social services. The evolution of central and local authorities. The law relating to public health and social security. The existing functions of central and local authorities and voluntary organizations, including committee work; the nature and objects of the public health and medical services they administer. The operation of international health organizations. The principles of administration of medical departments and institutions. Social security and the agencies for the relief of poverty and the promotion of social welfare.

2. Health and Welfare Services

Antenatal care, maternal and child welfare, school health service, care of the aged, child guidance, and problem families.

3. Epidemiology

The principles of the epidemiology of infection. The causal agents of infection, their sources and control. Administrative measures in relation to communicable disease, including personal hygiene. The epidemiology of non-infectious diseases. The administrative measures in relation to their control. Vulnerable groups. Social aspects of disease.

4. Influence of Heredity on Health

5. Medical and Population Statistics

The nature and sources of information bearing on the health of the people, and its numerical presentation; the preparation of memoranda and scientific articles containing statistical data, and exercises in their preparation. The principles of medical statistics and the statistical method and their use in social research.

6. Environmental Hygiene

The influences of environment on physical and mental health. The principles of public health engineering, including sanitation, water supplies, housing, town and country planning.

7. Health Education

The principles of education, with particular reference to the methods of educating the public as to the promotion and maintenance of health, including the study of nutrition, dietetics, and physical education.

8. Mental Health

The principles of psychology and mental health. The study of human behaviour and the significance of custom and habit on a group. Laws relating to mental deficiency and mental illness. The principles of mental assessment and the development of the normal child. The ascertainment of mental subnormality.

9. Occupational Health

The principles of occupational health. The evolution of industrial health services. Epidemiological and social aspects of occupational disease. The prevention and rehabilitation of industrial injuries and the legal aspects.

The duration of the course of instruction should remain at 850 hours.

Recommendation (d): That the existing Rule 12 be redrafted to ensure that candidates must produce:

(a) Evidence of having attended satisfactorily theoretical and practical instruction in the subjects listed above.

(b) Certificates of having (i) received adequate clinical instruction in infectious diseases; (ii) personally studied the work of health departments.

(c) A day-book in which regular entries have been made relating to subjects in which practical instruction is given during the course and brief observations on the objects of such instruction and the conclusions to be drawn therefrom.

(d) A dissertation on an approved subject.

Rules 13-18 would not require any alterations other than those arising from changes in the preceding rules.

APPENDIX VI

AMENDMENT OF ARTICLES AND BY-LAWS

Amendments of Articles

1. By altering Article 5 as follows: After "Each Branch" add "of the Association not in Great Britain or Ireland".

2. By altering Article 6 as follows: After "1st January, 1938," delete "but so that this proviso" and add "Provided Further that the Regulations and By-laws may provide that any Member admitted to membership before the 31st December next occurring after the date of the grant to him of a qualifying diploma within the meaning of the Medical Acts may compound his subscriptions for such period as may be prescribed by the payment of a lump sum but so that each of the foregoing provisos".

3. By altering Article 10(c) as follows: After "or (vi)" add "in the case of an Associate on the 31st day of December next following after he shall have ceased to reside within the area of the Branch by which he was elected or (vii) . . .".

4. By altering Article 18 as follows: At the beginning insert "Subject as hereinafter provided". After the words "Corporate Group and of no other" insert "Provided Always that any Member whose address as registered for the time being in the Register of Members of the Association is within Great Britain or Northern Ireland who has become a member of a Division other than that in which he resides in manner provided by the By-laws shall be an Ordinary Member of such first mentioned Division and of no other".

Amendments of By-laws

1. By altering By-law 5 as follows: (i) By deleting in para. (1) "each Branch and Division concerned" and inserting "the Branch and Division in whose area the candidate resides".

(ii) By inserting following new By-law 5(a):

"Change of Division

"5(a). (1) Any Member whose address as registered for the time being in the Register of Members of the Association is within Great Britain or Northern Ireland may apply to become an Ordinary Member of a Division other than that in whose area he resides on one of the grounds hereinafter mentioned. Every such application shall be forwarded to Head Office accompanied by a statement of the reason or reasons therefor and shall (together with such reason or reasons) forthwith be notified by Head Office to the Secretaries of the Divisions concerned. If within one month from the receipt of such notification either such Division shall send to Head Office any objection to such proposed change of Division or if there be doubt whether adequate reasons exist for such proposed change the matter shall be decided by the Council but subject as aforesaid such proposed change shall become effective at the expiration of the said period.

"(2) The grounds on which any such application may be made are:

"(a) that for any reason the member concerned can attend meetings of the Division of which membership is sought with greater convenience than meetings of the Division in which he resides, or

"(b) that the member concerned has a greater community of professional interest with other members of the Division of which membership is sought than with Members of the Division in which he resides.

"(3) The result of any such application shall be notified forthwith by Head Office to the Secretary of each of the Divisions concerned and (where appropriate) the necessary entries shall forthwith be made in the Register of Members of the Association."

2. By substituting in By-law 7 for the words "Colonial Medical Service" the words "H.M. Oversea Civil Service".

3. By altering By-law 12 as follows: (i) In line 12 of the By-law, insert after "General Meetings" the words "of the Association" and in line 15 the word "such" after the words "notices of".

(ii) At the end of the By-law add the following words: "Provided that a Division or Branch may either generally or in any special case authorize Extraordinary Members to receive notice to attend and speak (but not to vote) at meetings of such Division or Branch and to receive the Journal."

4. By inserting in the first paragraph of By-law 13 after the words "in which he is" the words "for the time being".

5. By inserting at the beginning of paragraph 1 of By-law 14 the words "subject as hereinafter provided" and at the end the words "Provided Always that any Member who has become a member of a Division other than that in which he resides in manner provided in By-law 5(a) hereof shall be a member of such first-mentioned Division and shall not be a member of the Division in which he resides."

(i) 6. By altering By-law 16(1) as follows:

In the table: Under the column 1 at the end of the matter after A add "who does not fall within classes B or C below described".

Under the column 1 at the end of the matter after B before "(i)" delete "class A above described" and substitute "classes A above or C below described".

Under the column 1 at the end of the matter after "B(vi)" add "whose joint subscriptions would but for this provision be greater than 7 guineas".

In both columns delete "B(vii)" and all matters appearing against it.

Under the column 1 alter "B(viii)" to "B(vii)".

Under the column 1 after "within the group" add a new paragraph:

"C. Any member admitted to membership before the expiration of five years from the date of the grant to him of a qualifying diploma within the meaning of the Medical Acts."

Under the column 2 against the foregoing entry in the column 1 add:

"Two guineas until the 31st December next occurring after the expiration of three years from the date of such qualification and three guineas for the following two years thereafter."

Under the column 1 alter the existing letter "C" to "D".

(ii) After the proviso following the table ending with the words "subscription for that year" add the words "Provided Always that any member admitted to membership before the 31st December next occurring after the date of the grant to him of a qualifying diploma within the meaning of the Medical Acts may by one further payment of ten guineas made during the calendar year in which he is admitted to membership compound all subscriptions due from him to the Association in respect of the five calendar years next occurring after the calendar year in which he is admitted to membership but so that no part of such sum shall in any event become payable to such member . . .".

(iii) In the next paragraph of the By-law delete from "but so that this proviso" down to and including "to his obligations" and insert in its place "Provided Always that nothing in this By-law before contained shall in the case of a Member who is a Member of a Corporate Branch or of a Corporate Group prejudice his obligations . . .".

By-law 16(B) would then read as follows:

1 Members Entitled to Reduction of Subscription	2 Reduced Subscription Payable
A. Any Officer on the Active List of any of the medical branches of the armed Forces wherever resident, who does not fall within classes B or C below described	Three guineas
B. Members of the following descriptions resident in Great Britain or Northern Ireland and not falling within classes A above or C below described:	
(i) Any Member of not less than 40 years' standing as such	Two guineas
(ii) Any Member of not less than 10 years' standing as such who has definitely and permanently retired from the active practice of the medical profession and has signed and transmitted to the Treasurer a declaration to that effect	Two guineas
(iii) Any Member who is not engaged in medical practice whether as consultant or otherwise and is a whole-time non-professional member of the teaching staff of a university or medical school and has signed and transmitted to the Treasurer a declaration to the foregoing effect in relation to the year for which the subscription is due	Three guineas

1 Members Entitled to Reduction of Subscription	2 Reduced Subscription Payable
(iv) Any Member who is not engaged in medical practice whether as a consultant or otherwise and occupies a chair at a University or Medical School as a non-clinical professor and has signed and transmitted to the Treasurer a declaration to the foregoing effect in relation to the year for which the subscription is due	Three guineas
(v) Any Member who is not engaged in medical practice whether as consultant or otherwise and whose whole time is occupied in the investigation of scientific problems as distinguished from routine laboratory work and has signed and transmitted to the Treasurer a declaration to the foregoing effect in relation to the year for which the subscription is due	Three guineas
(vi) Two Members jointly being a husband and his wife residing together, whose joint subscriptions would but for this provision be greater than 7 guineas	Seven guineas
(vii) Any Member who is engaged in full-time salaried employment the salary of which is not more than £1,500 per annum (or such other sum as the Council may from time to time determine) and who has signed and transmitted to the Treasurer a declaration in specified form that he comes within this group in relation to the year for which the subscription is due. (The Council have the power to decide in case of doubt whether the Member comes within the group.)	Four guineas
C. Any Member admitted to membership before the expiration of five years from the date of the grant to him of a qualifying diploma within the meaning of the Medical Acts	Two guineas until the 31st December next occurring after the expiration of three years from the date of such qualification, and three guineas for the following two years thereafter
D. Any Member resident outside Great Britain and Northern Ireland and not falling within Class A above described	Two guineas

"Provided also that any Member, wherever resident, who is admitted on or after the 1st July in any year, shall pay only half his current subscription for that year. Provided Always that any member admitted to membership before the 31st December next occurring after the date of the grant to him of a qualifying diploma within the meaning of the Medical Acts may by one further payment of ten guineas made during the calendar year in which he is admitted to membership compound all subscriptions due from him to the Association in respect of the five calendar years next occurring after the calendar year in which he is admitted to membership but so that no part of such sum shall in any event become payable to such Member.

"A person who shall have been a Member of the Association for a period of 50 years shall not be required to pay any annual subscription as from the 1st January next succeeding the expiration of such period or in the case of existing Members who have been Members for more than 50 years then as from the 1st January, 1938. Provided Always that nothing in this By-law before contained shall in the case of a Member who is a Member of a Corporate Branch or of a Corporate Group prejudice his obligations, as such Member of the Corporate Branch or of the Corporate Group."

7. By deleting in By-law 68 the words "on his installation at the next Annual Representative Meeting" and inserting the words "at his installation at the Annual General Meeting in the year following that of his election".

Amendment of Schedule to By-laws

1. In the Schedule to the By-laws relating to the Public Health Committee, add in the fifth column ("Otherwise Appointed") the words "I to be appointed by the Occupational Health Committee".

2. In the Schedule to the By-laws relating to the Science Committee, insert at the end of the existing entry in the sixth column ("Duties, Powers, etc.") the words "The Committee shall have power to co-opt up to three additional members to secure representation of a particular class of experience not otherwise represented on the Committee".

WELSH DINNER

The Annual Welsh Dinner will be held at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2, on Friday, June 3. All Welsh representatives, Welsh graduates, and others with Welsh associations, accompanied by their ladies, will be welcome at this Dinner.

Tickets will be 30s. per head (exclusive of wines), and those wishing to attend are asked to apply, with remittance, to Dr. S. J. Hadfield, B.M.A. House, Tavistock Square, London, W.C.1.

LOCAL GOVERNMENT SUPERANNUATION

EXERCISE OF OPTIONS

Two of the options granted to local government officers under the Local Government Superannuation Act, 1953, and the Benefits Regulations (1954) made under it, expire on March 31, 1955. An officer who previously elected to retain the benefits provided under the 1937 Act, or a local Act, and who still wishes to retain those benefits must notify his employing authority in writing before April 1, 1955. Similarly, local government medical officers who were contributory employees of a local authority on October 1, 1954, have until March 31, 1955, to apply for added years under Regulation 12 of the 1954 Regulations.

Further details of these options appeared in the *Supplement of the British Medical Journal*, December 11, 1954, page 221.

MEDICAL PRACTICES COMMITTEE

AMENDMENT OF CLASSIFICATION OF AREAS

The following areas have been reclassified by the Medical Practices Committee (January 2 to March 7, 1955) as "designated":

Essex.—Urban District of Hornchurch.
London.—Borough of Lambeth: Prince's and Oval Wards.
Birmingham.—Stockland Green.

The following areas as "intermediate":

Cheshire.—Crewe and Haslington.
Lancashire.—Worsley.
London.—Borough of Hackney: Chatham Ward.
Middlesex.—Borough of Twickenham; Borough of Willesden: Stonebridge Ward.
Wiltshire.—Downton.
Kingston-upon-Hull.—West District.
Leeds.—North-west Area.
Glamorganshire.—Urban District of Caerphilly.

The following areas as "restricted":

Lancashire.—Carnforth.
Sussex (East).—Winchelsea, Guestling and Pett (remainder of Battle Rural District and Rye Borough to remain classified as "intermediate").
Sussex (West).—Pulborough.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.
Urban District Councils.—Houghton-le-Spring.

Dangerous Drugs Act: Withdrawal of Authority

The Home Office announces that Dr. George Norman Reed (Grimsby, Lincs) is no longer authorized to be in possession of or to prescribe those drugs to which the Dangerous Drugs Regulations apply.

HOSPITAL PRESCRIBING COSTS

From information available to the Ministry of Health, most general hospitals need to purchase about 3,000 different drugs, but of these the first 30 in order of total cost may well account for some 80% or 90% of the bill; the expenditure on antibiotics alone may comprise between 35% and 50% of the total. The Ministry has therefore written to hospital authorities suggesting that every committee and board should prepare its own list of the 30 or so most expensive items, and that the medical committees of the hospitals concerned should be invited to examine their prescribing of these items to see whether economies can be made without prejudice to the treatment of patients. It suggests that medical staff might also be informed of the relative costs of antibiotics so that if there is a choice they may know which is the more economical. For example, intramuscular penicillin for three days at 1,000,000 units daily costs about 4s. 6d. With aureomycin or oxytetracycline the cost is about six times as much, and with erythromycin slightly less than 10 times as much, if these antibiotics are given in a daily dose of 1.5 g. Treatment with 2 g. chloramphenicol daily costs about five times as much as with penicillin.

Another field in which the Ministry suggests that investigation might be profitable is expenditure on vitamins. In one hospital enough 50-mg. tablets of vitamin C were issued to the wards daily to provide three tablets for each of 550 occupied beds, but it was found that after the medical staff had been informed by circular of the quantities being used consumption fell by 25%. It is believed that economies could be made in surgical dressings also.

The Ministry suggests that medical and pharmaceutical staffs in each hospital or group of hospitals be asked to devise means of preventing excessive prescribing and of making economies. Hospital medical staffs, it says, might also usefully be asked to bear in mind the likely consequences of their prescribing methods on the further treatment of patients after their discharge from hospital to the care of the general practitioner.

Questions Answered

Cost of Added Years

Q.—I am a whole-time medical officer of health nearly 61 years of age. I have been granted 10 added years under the Local Government Superannuation (Benefits) Regulations, 1954, but I have to find a lump sum of £2,415 as my share of the cost of these added years. I am told that I cannot obtain any tax relief on this amount whether this is paid in a lump sum or by instalments of a lump sum. Is this correct?

A.—Yes. The answer given on page 32 of the *Supplement* of January 29, 1955, dealt with the position where additional contributions for added years are paid as a percentage of remuneration over future service, as will usually be the case. It now seems clear, however, that in the case of officers over 60 years of age the Government Actuary is insisting that payments should be made in a lump sum, or by instalments of a lump sum. Such payments do not qualify for tax relief.

Notes and News

Several German medical families would like to arrange holiday exchanges for their children with British children during the summer. Would any British families interested please communicate with Brigadier H. A. Sandiford, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

Correspondence

Shortage of Hospitals

SIR.—The programme of new hospital building which was outlined in the House of Commons (*Journal*, February 19, p. 486) must have shocked family doctors and all who read the articles published by the *Manchester Guardian* about a year ago showing the dreadful suffering caused by the shortage of hospitals and nurses. May I suggest that it is the duty of the medical profession to educate the public in this matter and that the best course would be for the B.M.A. to appoint a small committee to make recommendations?

The first step for such a committee would be to find out how many beds are required. They would get estimates from the consultants in all the different kinds of hospitals—for example, they would ask the psychiatrists how many more beds were required in the mental hospitals. They would then get into touch with family doctors, health visitors, and district nurses and find out from them how many beds were required for different classes of patients, such as infirm old people, defective children, convalescents. Another form of inquiry would be to take a decade before and after the last war and compare the expenditure in various localities on housing estates, schools, and hospitals; it would probably be found that the number of new schools is out of all proportion to the number of new hospitals.

The second stage would deal with the improvements that are required in the hospitals. Probably the best course would be to compare hospitals and factories—the buildings, accommodation, lighting, ventilation, amenities, and so on. The committee would note whether the equipment, apparatus, and appliances were all the latest and best obtainable. The next step would be to arrange for some of the engineers and instrument-makers who have built and fitted out the latest factories and commercial laboratories to inspect some of the older hospitals and report on the improvements that could be made.

No doubt it will be said that the primary need is not for more hospital beds but for more hospital nurses. It will be argued that a great many beds are empty because there are not enough nurses to staff them. And there is the further point that if there were more district nurses a great many patients who are sent to hospital could be nursed at home, to the great advantage of everybody concerned. All that is perfectly true, but that is not to say that we must wait until we have more nurses before we build any more hospitals. The shortage of nurses and the shortage of hospitals are parts of one problem; they are signs of some obscure social disorder. The root of the trouble goes very deep, and some day it will have to be dealt with. Looking ahead, it seems very doubtful whether the problem can be solved without a comprehensive national nursing service and perhaps some form of conscription. But that is a long story, and the need for more and better hospitals is urgent: my point is that we can hardly expect to get them until we can show how many new ones are required and to what extent the old ones need reconditioning.—I am, etc.,

Wetherby, Yorkshire.

R. L. KITCHING.

Doctors' Cars and Telephones

SIR.—Mr. H. K. Vernon's letter (*Supplement*, February 26, p. 68) shows a complete misconception of the basis of the whole-timer's claim for car expenses. Mr. William Gissane (*Supplement*, February 12, p. 48) must have a car at hand wherever he goes so that he can respond to an emergency call without delay—that is why he travels to work in it. If it is necessary for him to take his car to hospital because of his work, surely he should be given a travelling allowance for the journey? It is quite irrelevant to drag in (as Mr. Vernon does by implication) the case of the clerk who sits on an office stool all day. He has no need to travel to work by car and no need to use it during the course of his day's work.

When Mr. Vernon mentions the part-time consultant who lives at a distance from his consulting-room, and gets no travelling allowance for journeys between it and his home, he forgets that the part-timer visits his consulting-room to see private patients and gets income-tax relief on his travelling expenses. He surely does not expect a travelling allowance from the N.H.S. as well. Part-timers with a "consulting-room" in their own homes need not see one private patient a year in it to be able to claim a travelling allowance of up to £190 a year for routine visits to hospital. What is the logic in that? Mr. Vernon's flights of fancy about consultants travelling to work in aeroplanes fall rather flat. Surely he knows that payment for routine journeys to one's headquarters is limited to 10 miles in either direction.

Why should a whole-time consultant who uses his car to attend special clinics, medical meetings, and conferences for the benefit of his hospital patients be denied income-tax relief on his expenses, while a part-timer can set them off against his receipts from private practice?

If Mr. Vernon wants a legal viewpoint let me quote Mr. A. A. H. Marlowe, M.P. (*Journal*, April 17, 1954, p. 938), who asked the Chancellor of the Exchequer "whether he was aware that consultants incurred many expenses for which they could make no income-tax rebate claim on Schedule E assessments; and whether he would introduce legislation to remedy this hardship." Mr. Marlowe also said there was a conflict of opinion between the appointing authorities, who would not appoint a consultant unless he had a motor-car, telephone, and secretary, and the Revenue authorities, who did not allow these expenses. Why does the B.M.A. not refuse all advertisements for whole-time consultant posts until this matter is put right?

Unfortunately, as Dr. K. W. Beetham has said (*Supplement*, July 31, 1954, p. 83), "The profession is making it too obvious that the paramount consideration is the preservation of private practice, and such a policy can only adversely affect our terms and conditions of service in the end." How prophetic were his words. A couple of months later the Labour Party announced its intention of abolishing pay beds, and then came Sir Henry Cohen's indictment of the two standards of treatment in general practice.—I am, etc.,

Orpington, Kent.

LEO GILCHRIST.

SIR.—My friend, Mr. Henry K. Vernon, states (*Supplement*, February 26, p. 68) that if a motor-car is considered essential to the work of any doctor then "every single worker in Britain should be allowed to claim his fares for travelling from home to work." I have heard this argument before and failed to appreciate its logic. It is known that many full-time employees in industry and in many professions are either provided with motor-cars by their firms or have a clause in their contracts stating that a car is essential to their work. Therefore it is accepted that a car is essential to certain forms of non-medical full-time employment. Why then is it denied to any form of full-time medical practice?

I am particularly interested in the development of hospital accident treatment services. During the last decade a great volume of evidence has been published from clinical and research departments¹⁻⁸ proving that life can often be saved after serious injuries by very early and often massive blood transfusions, but only if surgery follows quickly and at the right time. Since serious accidents occur at any time of the day or night, this means that telephones and cars are as essential to the efficiency of the treatment services as they are to the quick ambulance transport of the seriously injured from the accident site. At the moment the Ministry of Health does not take this view. Yet, if a long view is to be taken, the Ministry must, on the evidence, consider not only the detailed planning and strategic siting of large accident departments but also the terms of service of personnel, at all levels, needed to staff such departments over the 24 hours of each day.

Our annual mortality toll from accidents is a large one. Accidents in 1953 accounted for 23% of all deaths among boys aged 1 to 4 years, 37% of all deaths among boys aged 5 to 14 years, and 42% of all deaths among boys aged 15 to 19 years. The vast majority of these deaths occurred in hospitals, days, weeks, even months after the accident. The published clinical and research evidence is that if the right quality and tempo of treatment are provided immediately after the accident, not only could our present mortality figures be appreciably lessened, but the long "illness of trauma" could often be prevented. Surely it is not illogical to consider that telephones and cars are quite essential to some forms of full-time medical practice. In a long-term view efficiency and overall economy are generally inseparable.—I am, etc.,

Birmingham.

WILLIAM GISSANE.

REFERENCES

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³ Emerson, C. P., and Ebert, R. V., *Ann. Surg.*, 1945, 122, 745.
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⁷ Prentice, T. C., *et al.*, *Surg. Gynec. Obstet.*, 1954, 99, 542.
⁸ Bull, J. P., and Fisher, A. J., *Ann. Surg.*, 1954, 139, 269.

Association Notices

Diary of Central Meetings

MARCH

- 21 Mon. S.H.M.O.s Group Council, 2 p.m.
 22 Tues. Joint Consultants Committee, 11 a.m.
 22 Tues. Working Party Subcommittee (to follow meeting of Joint Consultants Committee).
 22 Tues. Orthopaedic Group Committee, 2 p.m.
 23 Wed. Office Committee, 10 a.m.
 23 Wed. Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
 23 Wed. Committee on Arbitration Machinery, 3 p.m.
 24 Thurs. Journal Committee (at St. Albans), 2 p.m. *Cars leaving B.M.A. House at 10 a.m.*
 24 Thurs. Central Consultants and Specialists Committee, 10.30 a.m.
 25 Fri. B.M.A. Committee on Medical Education, 2 p.m.
 25 Fri. Public Health Committee, 2 p.m.
 29 Tues. Amending Acts Committee, 2 p.m.
 30 Wed. Evidence Committee on Divine Healing, 10 a.m.
 30 Wed. Committee re Remuneration Policy, 2 p.m.
 31 Thurs. Conference of Honorary Secretaries of Divisions and Branches, 10.30 a.m.
 31 Thurs. Ethical Review Subcommittee, Central Ethical Committee, 2 p.m. *(Date changed from March 17.)*
 31 Thurs. Committee on Homosexuality and Prostitution, 2.15 p.m.

APRIL

- 1 Fri. Scholarships Subcommittee, Science Committee, 11.30 a.m.
 1 Fri. Science Committee, 2 p.m.
 4 Mon. Armed Forces Committee, 2 p.m.
 15 Fri. Joint Committee of the B.M.A. and Magistrates' Association, 10.15 a.m.
 20 Wed. Conference of Advisory Councils on Occupational Health, 12 noon.
 21 Thurs. Trustees of the Dain Fund, 1 p.m.

Branch and Division Meetings to be Held

BOLTON DIVISION.—At Victoria Hotel, Hotel Street, Bolton, Tuesday, March 22, 8.30 p.m., annual general meeting.
BOURNEMOUTH DIVISION.—At Royal Victoria Hospital, Boscombe, Friday, March 25, 8 p.m., annual meeting, followed by ordinary meeting. Address by Dr. J. A. L. Vaughan Jones: "Rehabilitation of the Handicapped Patient."
BRADFORD DIVISION.—At Medical Society's Room, Bradford Royal Infirmary, Wednesday, March 23, 8.15 p.m., meeting. Address by Mr. A. Lawrence Abel: "Common Diseases of the Rectum and Anal Canal."
CHELSEA AND FULHAM DIVISION.—At Centre for Spastic Children, 61, Cheyne Walk, Chelsea, S.W., Friday, March 25, 8.30 p.m., meeting. Address by Dr. W. F. Dunham and another speaker from the Centre for Spastic Children. Members of the Kensington and Hammersmith Division are invited.

CHESTERFIELD DIVISION.—At Ophthalmic Department, Chesterfield Royal Hospital, Friday, March 18, 8.45 p.m., meeting. Clinical demonstration by Mr. H. C. Muirhead and Mr. Lumsden.
DARTFORD DIVISION.—At Nurses' Home, West Hill Hospital, Dartford, Thursday, March 24, 8.45 p.m., meeting. Dr. C. G. Baker: "Home Treatment of Coronary Thrombosis."

DONCASTER DIVISION.—At Parkinsons' Café, Friday, March 25, annual general meeting: (1) 8.30 p.m., Doncaster Medical Society; (2) 9 p.m., Doncaster Division, B.M.A.
EAST HERTS DIVISION.—At Haymeads Hospital, Bishop's Stortford, Thursday, March 24, 8.30 p.m., meeting. Address by Mr. V. J. F. Lack: "Menorrhagia."

EAST SOMERSET DIVISION.—At Bath Arms Hotel, Cheddar, Wednesday, March 23, 8.30 p.m., general meeting.
EASTBOURNE DIVISION.—(1) At the George Hotel, Hailsham, Wednesday, March 23, 7 for 7.15 p.m., dinner; 8.30 p.m., discussion to be opened by Dr. F. Gray: "The Difficulties of the Country Practitioner." (2) At the Gildredge Hotel, Friday, March 25, 8.30 p.m., combined meeting with Eastbourne Branch of the Pharmaceutical Society. Talk by Sir Hugh Linstead, M.P.: "Credits and Debits of the National Health Service."

GLASGOW DIVISION.—At Glasgow Regional Office, 234, St. Vincent Street, Glasgow, Wednesday, March 23, 8.30 p.m., annual meeting.
HALIFAX DIVISION.—At Royal Halifax Infirmary, Tuesday, March 22, 8.30 p.m., general meeting.

KENSINGTON AND HAMMERSMITH DIVISION.—At St. Charles's Hospital, Ladbroke Grove, London, W., Friday, March 25, 3.30 for 4 p.m., clinical meeting.
KESTEVEN DIVISION.—At George Hotel, Grantham, Thursday, March 24, 7.15 for 7.45 p.m., dinner. Address by the Lord Bishop of Lincoln, the Rt. Rev. Maurice Harland, on Spiritual Healing: "Doctor and Parson." Representatives of other denominations and non-members of the B.M.A. are invited.

MANCHESTER DIVISION.—At Fallowfield Hotel, Wilbraham Road, Manchester, Tuesday, March 22, 8.30 p.m., "Medical Forum." Subject: "The Future of the Profession." To be opened by Dr. S. Almond.
MIDLAND BRANCH.—At Birmingham Accident Hospital, Friday, March 25, 8.15 p.m., clinical meeting.

MONMOUTHSHIRE DIVISION.—At 20, Stow Hill, Newport, Thursday, March 24, 8 p.m., extraordinary general meeting.
NORTH MIDDLESEX DIVISION.—At Coroner's Court, North Middlesex Hospital, Silver Street, Edmonton, N., Tuesday, March 22, 8.45 p.m., annual general meeting.

OLDHAM DIVISION.—At Albion Club, Queen Street, Oldham, Monday, March 21, 9 p.m., meeting. Lecture by Dr. J. M. Greenwood: "Care of the Aged and Chronic Sick."

OXFORD DIVISION.—At Maternity Department Lecture Theatre, Radcliffe Infirmary, Oxford, Wednesday, March 23, 8.15 p.m., meeting. Talk by Mr. A. Dickson Wright: "Famous Operations in History."

SCARBOROUGH DIVISION.—At Scarborough Hospital, Thursday, March 24, 8.30 p.m., annual general meeting.

SHROPSHIRE AND MID-WALES BRANCH.—At Royal Salop Infirmary, Shrewsbury, Wednesday, March 23, 8 p.m., general meeting; 8.30 p.m., meeting of Clinical and Pathological Section. Talk by Dr. E. J. Richardson: "Radiotherapy of Certain Conditions." Illustrated by colour films and x-rays.

SOUTH ESSEX DIVISION.—At Cinema, Oldchurch Hospital, Romford, Friday, March 25, 9 p.m., film show. (1) "Gait." (2) "Trichomonal and Monilial Vaginitis" (colour and sound film).

SOUTH MIDDLESEX DIVISION.—At Anchor Hotel, Shepperton, Wednesday, March 23, 9 p.m., meeting. Address by Dr. Robert Forbes: "Recent Developments in Medical Litigation."

SOUTHAMPTON DIVISION.—At Polygon Hotel, Friday, March 25, 7.30 for 8 p.m., annual dinner dance.

SWANSEA DIVISION.—At Osborne Hotel, Swansea, Thursday, March 24, 7.30 for 8 p.m., informal supper. Lecture by Sir Arthur Porritt.

TOWER HAMLETS DIVISION.—At Mile End Hospital, Bancroft Road, E., Friday, March 25, 3 p.m., clinical meeting.

TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Tunbridge Wells, Tuesday, March 22, 8.30 p.m., meeting.

WANDSWORTH DIVISION.—At St. James' Hospital, Sarsfield Road, Balham, S.W., Tuesday, March 22, 8.30 p.m., A.G.M.

WEMBLEY DIVISION.—At Century Hotel, Wembley, Wednesday, March 23, 7.30 for 8 p.m., third annual dinner and dance.

WIGAN DIVISION.—At Lewis's Restaurant, Wallgate, Wigan, Thursday, March 24, 8.15 p.m., general meeting. 9.15 p.m., clinical meeting. Professor T. N. A. Jeffcoate: "Forceps Delivery."

WILLESDEN DIVISION.—At Willesden General Hospital (in the Rehabilitation Department), Harlesden Road, London, N.W., Tuesday, March 22, 9 p.m., meeting. Annual B.M.A. Lecture by Professor Ian Aird: "The Conjoined Twins of Kano." Members of the Wembley, Hampstead, and Paddington Divisions, members of the Willesden General Hospital Medical Society, the nursing staff of the Willesden General Hospital, the district nurses, and the local authority midwives are invited.

WOOLWICH DIVISION.—(1) At Woolwich Memorial Hospital, Shooters Hill, London, S.E., Friday, March 18, 3 p.m., meeting. Seminar on Paediatrics: Children with Feeding Disorders. (2) At Woolwich Memorial Hospital, Shooters Hill, London, S.E., Tuesday, March 22, 8.30 p.m., meeting. Annual B.M.A. Lecture by Dr. W. R. S. Doll: "Cancer of the Lung and Smoking." Members from local Divisions are invited.

ANNUAL MEETING: TORONTO, JUNE 20-24

SUPPLEMENT TO THE
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REFORM OF THE ASSOCIATION'S
CONSTITUTION

BY

N. ROSS SMITH, M.B., Ch.M., F.R.C.S.

Reform of the Constitution of the Association is now being considered by a special committee set up by the Annual Representative Meeting in 1953 and by Divisions and Branches, to which a questionnaire has been sent with a request for suggestions. It might be helpful also for individual opinions on this subject to be expressed. The following are the personal views of one who has been a member of the Association for 35 years, Secretary of a large Division for six years and a representative for some 10 years, and was a founder member of the consultants and specialists organization.

The Need for Reform

The document (*Supplement*, October 23, 1954, p. 147) prepared by the Constitution Committee which accompanied the questionnaire is concerned only with the peripheral organization of the Association and proposes in effect that that should be left much as it is. Although recognizing that "there have been revolutionary changes in most fields of medical practice" in the half-century since the present constitution was established, there does not seem to be in this document sufficient appreciation of the need to alter the organization of the Association both at the periphery and the centre—for consideration of these cannot really be made separately—to meet the effects of those changes.

The decline in attendance at local meetings—a more sure index than the mere numbers of membership—since 1948 has, however, shown a loss of confidence of members that their interests can be maintained by the Association as at present constituted and that there can be effective action through their Divisions or Branches and the Representative Body. In reality, the changes which, with the coming of the National Health Service, have occurred in the employment and representation of the majority of the profession in Great Britain have already in the realm of medical politics and negotiation on terms of service brought about the side-tracking of the Divisions and Branches, the Representative Body, and the Council itself. Inevitably machinery has had to be set up for the representation of those engaged in each

of the three sections of the profession concerned in the N.H.S., so that the many special and detailed points affecting each section may be dealt with expeditiously.

The Autonomous Bodies

The old machinery of the Association was and is too slow, unspecialized, and inflexible to deal with the affairs of these great groups, which felt obliged to claim and obtain autonomy in determining policy and action for themselves, though using the Association's administration and remaining financially dependent on the Association. Indeed, the process of taking away from the Association responsibility for representation of a section of its members has gone even further in the case of hospital medical staffs, control of whose affairs has passed to a body, the Joint Consultants Committee, responsible to neither the Association nor the members of hospital staffs themselves, except in a minor and indirect way through the Central Consultants and Specialists Committee.

With this change of representation of those employed in the N.H.S. the proceedings of Divisions and Branches in any matters to do with the N.H.S. have been conducted in an atmosphere of unreality, as have those also of the Representative Body. It has been largely waste of time and effort for Divisions to formulate motions in this sphere for the Representative Body and for representatives to attend the meetings of that body to debate such motions. Although, according to the constitution, the Representative Body has remained responsible for the making of policy, its resolutions upon subjects concerning the N.H.S. are in fact passed to the appropriate autonomous committee for general practitioners, hospital staff, or public health officers, where they may or may not be endorsed. Further, the Council, as the executive of the Association, cannot seek to implement such resolutions nor do more than receive and discuss the reports of the autonomous committees and give or withhold its support for any action which may have been decided.

Bringing in the Autonomous Bodies

For practical reasons the autonomous organizations are essential. It is suggested, however, that what is needed in reform is to bring these bodies more closely within the Association both at the centre and the periphery, and thus to arrange the means whereby the Association may act more

effectively in the interests of the profession as a whole or of any section. For this, certain radical reforms both of structure and of function would be needed.

The Council

The geographical basis upon which the majority of the Council are elected can have nowadays little importance, the problems of the profession being mainly national. On the other hand, the autonomous General Medical Services and Consultants and Specialists Committees are represented in the Council by their chairmen alone and the public health service by two members. It is suggested that the geographical basis of representation should go and that the Council should be formed on a sectional basis by representation from the autonomous committees, the members in the Armed Forces, and of the Overseas Branches, together with members elected by the Representative Body whereby private practice and various other interests could be safeguarded and the corporate views of the Divisions represented.

In addition to its executive function, the Council should logically be given also authority to determine policy on all matters affecting the profession as a whole, replacing the Representative Body in this respect and strengthening its effectiveness as a medico-political machine. It should elect its own chairman and also the treasurer, and appoint the standing committees.

The Representative Body

The Representative Body has in reality already largely ceased to be the maker of policy it was designed to be under the present constitution. It has lost power in this respect to the autonomous committees. But apart from this the R.B. has become too large to be a sound deliberative assembly, at any rate on points of detail. Meeting only annually, or by special calling and at great expense, it is unsuited to the pace of modern affairs. In the course of three or four days of an annual meeting it considers hundreds of motions, all potentially points of policy, as well as reports of standing committees, official and financial statements, and observes certain formalities.

It is suggested that the need nowadays is for an Annual Conference of delegates from Divisions and Branches. This would receive and discuss the reports of Council and the autonomous and other standing committees, and consider resolutions for reference to the Council upon any subject of professional interest. The Conference would elect its chairman and deputy chairman, the president and vice-presidents of the Association, and a certain number of its members drawn from England, Scotland, Wales, and Northern Ireland to be members of the Council, and would make nominations also to the standing committees.

Like the present Representative Meeting, the Annual Conference should be held at the same place and time of year as the Scientific Meeting, preferably indeed on the same days at morning and afternoon times respectively. The Scientific Meeting, though providing through the publication of some of its proceedings in the *Journal* the best medium for reviews of current medical knowledge, has no longer, for specialists at least, its former importance. There are now associations in every specialty and it is easier and more valuable for the specialist to attend the meetings of his own association than the section of the Scientific Meeting. It is suggested that the Scientific Meeting should be reduced to three or four sessions for discussions upon subjects of general interest. The Annual Conference and Scientific Meeting, with the official and social events which accompany them, might thus be held within a period of three or four days instead of the nine they now occupy.

Local Reorganization

Integration of the organizations for general practitioners, hospital staffs, and public health officers should be made also locally in the executive committees of Divisions. The

main function of the Division must be, as the Constitution Committee states, "to foster and maintain personal contact between the members and to provide a forum for the discussion of their problems." It can "co-ordinate professional opinion in all fields of medical practice."

For these purposes the area of a Division should be determined primarily by the convenience of members to attend meetings. A secondary consideration is that the area should be coterminous with that of the local N.H.S. executive council, so that the general-practitioner membership of the local medical committee and of the Division would correspond. Size is a third consideration which need apply only in densely populated areas.

To co-ordinate professional opinion in medical politics, the committee of Divisions should be reconstituted in the same way as for the Council. It should contain members drawn from the local medical committees, from the local consultants and specialists group, and from the public health officers of the area, as well as members elected directly by the Division. The local consultants and specialists group could well be constituted within the Division. The local medical committee presumably could not be brought in this way into the Division, because it is a statutory body within the N.H.S., but it could nevertheless be represented in the committee of the Division.

The Second Tier

There appears to be no real need for a second-tier unit such as a Branch to exist between the Division and the Council, except perhaps in the great cities where there are many Divisions which may have need for co-ordination of their policies and actions. Elsewhere, some Branches at least have long ceased to be of value and to be active. Of the stated work of Branches there appears to be none which could not be done by the Divisions or from the headquarters or regional offices of the Association. Nor should there be a need for a permanent constitutional structure to enable neighbouring Divisions to meet in functional groups when they want to, and it is difficult to imagine the circumstances in which such a need would arise.

For hospital staffs there is the need, due to the regional administrative structure for hospital services, for a second tier between the periphery and the centre, which has already been met by formation of regional consultants and specialists committees. Unfortunately, hospital staffs suffer from too many tiers of committees dealing with their affairs—four, including the Joint Consultants Committee, or five if the Whitley Council Committee B is counted. Other sections of the profession should be warned of the delaying and stultifying effect of such a multiplicity of committees. Generally, the more tiers there are in an organization the more difficult it is to get anything done.

It is suggested that Branches are no longer needed in Great Britain, that their functions should be taken over by the Divisions. Any temporary need for co-ordination of neighbouring Divisions could be met, if need be, by arrangement through the headquarters and regional offices of the Association.

At present non-members of the Association are represented by the autonomous organizations, and may take part in their committees as much as subscribing members. It is hard to see why there should be this curious provision or that it really strengthens the negotiating power of the committees, as is claimed. One does not hear of it in the associations which protect the interests of other professions and of those in other occupations. If continued, this provision might make more difficult the closer integration of the autonomous organizations into the structure of the Association which has been suggested.

It is hoped that the views which have been expressed in this memorandum may be helpful and of interest to all those who are concerned to see that the Association shall be the integrated and strong body which it should be in the conditions of to-day.

Summary

1. Certain radical reforms of structure and function of the committees and assemblies of the Association are needed to integrate the autonomous organization for general practitioners, hospital staffs, and public health officers more closely into the Association, whereby it may act more effectively in the interests of the profession.

2. The Council should be constituted on a sectional basis, representative of the autonomous organizations, the Armed Services, the Overseas Branches, and the Representative Body.

3. The Council, like the committees of the autonomous organizations, should have authority to determine policy as well as action.

4. The Annual Representative Meeting should be replaced by a conference of delegates from Divisions and Branches, which would receive and discuss the reports of the Council and standing committees, elect certain officers, and consider as recommendations to the Council resolutions upon any subject of professional interest.

5. The Scientific Meeting should be held within the same period as the Annual Conference and should be abbreviated to three or four sessions of general interest.

6. The autonomous organizations should be integrated closely into the Association locally as well as centrally. The committees of Divisions should contain effective representation of the local sections of the autonomous bodies as well as members elected directly by the Division.

7. There is no need for a second-tier unit between the Division and the Council. The functions of Branches in Great Britain could be taken over by the Divisions. Any temporary need for co-ordination of neighbouring Divisions could be dealt with by the Headquarters or regional administrative officers.

ISLE OF MAN HEALTH SERVICES

A Commission appointed by the Lieutenant-Governor (Sir A. Flux Dundas) in August last to inquire into the working of the Isle of Man Health Services recommends that they should be retained in the present pattern. The Commission reports: "We are satisfied that the only method by which a substantial reduction in the expenditure of the health services could be effected would be by remodelling the entire service by eliminating some parts of it. We are satisfied that there is no desire whatever on the part of any responsible person or body of persons in the Isle of Man that this should be done."

The Commission recommends that a maintenance charge of 3s. 6d. a day should be made to patients in a general hospital if they stay longer than 28 days, but not to patients in a tuberculosis sanatorium. The charges should be capable of being remitted upon a certificate from the Social Services Board.

It is also recommended that the Legislature consider altering the law so as to ensure that, if a person is in a hospital through an injury caused by the use of a motor vehicle in such way that the patient recovers damages, the hospital may recover a reasonable sum for the cost of the services it has given.

The Commission considers that the doctors in the Isle of Man occupy a position which is in all respects comparable to the position of doctors in the United Kingdom, and therefore it is in the public interest that their remuneration and conditions should be similar.

The Secretary of State for Scotland has reappointed Dr. A. Lamont, Foyers, and Dr. T. Scott, Inverness, to the standing Advisory Committee on Health Services in the Highlands and Islands. Dr. R. Scott, director of the general practice teaching unit, Edinburgh University, has been appointed to the standing Advisory Committee on Local Authority Services.

INVESTIGATION OF EXCESSIVE PRESCRIBING

BY

D. F. HUTCHINSON, O.B.E., M.R.C.S., L.R.C.P.

Secretary of the Middlesex Local Medical Committee

Under paragraph 7 (10) of the Terms of Service for General Medical Practitioners, "A practitioner is required to order on a form provided by the Council for the purpose, such drugs and appliances as are requisite for the treatment of any patient." This applies, of course, only to prescribing doctors. Later in the Terms of Service, in paragraph 7 (14, d), it says, "A practitioner is required to answer any inquiries of the medical officer with regard to any prescription or certificate issued by the practitioner or to any statement made in any report under these terms of service." All general practitioners in contract with an executive council to provide general medical services under the N.H.S. are bound by these requirements.

The Central Investigation Unit

For examining prescribing costs the Ministry has set up what is known as the "Central Investigation Unit." To this unit goes information from the various pricing bureaux on the prescribing statistics of individual doctors in an executive council area, together with the areal average of the prescribing of all the doctors in that area. From these figures the Central Investigation Unit (staffed by employees of the Joint Pricing Committee) examine individual doctors' prescribing costs. Under actuarial advice, and in agreement with the General Medical Services Committee of the B.M.A., the Ministry normally refers cases for further investigation only where the practitioner's average exceeds by a substantial amount the average for his executive council area. The areal average includes the doctor's own high figures, and is therefore likely to be higher than an average which excludes his figures.

The Procedure for Investigation

For those cases where it is decided that further investigation of a doctor's prescribing is necessary, the Ministry, in agreement with the profession, has devised a procedure for use in England and Wales, and the following account of this procedure may be helpful to those unfamiliar with it.

R.M.O.'s Visit

As a first step, the doctor is sent a copy of the details of his prescribing for the month under review, and an appointment is made for a visit by the regional medical officer.

This visit is for a friendly and helpful discussion of the doctor's prescribing and for suggesting ways of reducing his costs towards the areal average, yet without detriment to the patients' treatment. Explanations given may, of course, make it clear that the prescribing has been entirely reasonable. There might, for instance, be some special peculiarity of the practice.

Where the regional medical officer's report shows that there is a likelihood of bringing a doctor's prescribing costs to normal no further action is taken. And it must be emphasized that in the past these cases may have arisen from prescriptions written as much as eight months previously; but this period of time is now in the region of three months.

The most recent year for which published figures are available is that which ended December 31, 1953, and the report of the Ministry of Health for that year stated that, as a result of information given by the Central Investigation Unit, regional medical officers visited some 328 general practitioners to discuss with them their prescribing costs. The report goes on to say, "In the majority of cases the

doctor has found, after discussion with the regional medical officer, that he can effect economies in his prescribing without prejudice to the treatment of his patients." It was necessary in only four cases to refer the matter to the appropriate local medical committee, and in all these cases the committee found there had been excessive prescribing.

Second Visit

The doctor's prescribing figures are reviewed three to six months after the regional medical officer's visit, and, if necessary, he is asked to make a further visit. In this case the statement of prescribing particulars sent to the doctor with a request for an appointment will always relate to a recent month. This second visit may be of a more formal nature, and, if so, the regional medical officer informs the doctor that he may, if he wishes, invite a representative of the local medical committee to be present. The regional medical officer asks the doctor to explain his figures and discusses with him a number of his prescriptions. A copy of the explanations he has given is subsequently sent to the doctor, and he is asked to alter this in any way he wishes and sign it.

Subsequent procedure depends on whether it is thought that the doctor's costs are likely to be further reduced satisfactorily; in which case he is sent a suitable letter, and his figures are checked again by the Central Investigation Unit after a period of about three months.

Where a doctor's prescribing remains unduly high, and there appears no likelihood of a reasonable reduction, the case is referred to the local medical committee under the National Health Service (Services Committees and Tribunal) Regulations, 1948, 12 (1). This reference is made only after careful consideration of the case by senior medical officers at the Ministry of Health and never at divisional level.

The Local Medical Committee

Regulation 12 (1) states:

"Where it appears to the Minister after an investigation of the orders for drugs and appliances given by a medical practitioner to persons on his list and of the accounts furnished by the practitioner for drugs and appliances supplied to these persons that there is a *prima facie* case for considering that by reason of the character or quantity of the drugs or appliances so ordered or supplied the cost is in excess of what was reasonably necessary for the proper treatment of those persons, the Minister may refer the matter to the local medical committee for their consideration."

The local medical committee's duty is to decide whether the cost of what was prescribed was in excess of what was reasonably necessary for the proper treatment of the patients referred to.

The local medical committee must first of all send the practitioner a notice indicating the matters on which a statement from him is required, and he must be given a reasonable opportunity of appearing before the committee or of submitting a statement. The Minister is also entitled to send a representative to any such hearing.

The local medical committee has to decide not only whether any cost has been incurred in excess of what was reasonably necessary but also, if there was excess, what was the amount of the excess. It must then inform the executive council, the practitioner, and the Minister of its findings, and may add a statement of any considerations to which, in its opinion, the council and the Minister should have regard in making any recommendation or decision on the withholding of money from the practitioner.

Appeal

The practitioner may appeal against the decision of the local medical committee by sending notice to the Minister within one month. The Minister is then required to appoint a person or persons (not exceeding three in number, and not being officers of the Ministry of Health), of whom at least one should be a medical practitioner, to hear the appeal. The Minister also has the right, if he is dissatisfied with the decision of the local medical committee, to set up a similar tribunal to re-hear the case.

The tribunal consists usually of a lay chairman and two practitioners, one of whom at least is a general practitioner in active practice and appointed from a panel nominated by the General Medical Services Committee of the B.M.A.

The Executive Council

When the executive council receives the findings of the local medical committee (or if an appeal has been made, the result of the appeal) the council is required, if the decision is that excessive cost has been incurred, to make a recommendation to the Minister on the amount of money that it thinks should be withheld from the practitioner's remuneration as a penalty. The Minister considers the recommendation of the executive council and directs the council to withhold such sum as he thinks fit.

The practitioner has the right to make oral or written representations to the Minister with regard to the sum which the Minister proposes to withhold. If oral representations are made the Minister must appoint the persons to hear them; he usually appoints a general practitioner from the panel mentioned above, with a regional medical officer and a lay officer from the Ministry.

MEDICAL PRACTICES ADVISORY BUREAU

ENTRY INTO PRACTICE

Some of the problems of entry into general practice are discussed in the annual report of the Medical Practices Advisory Bureau of the B.M.A. for the year ending 1954. Dr. L. S. Potter, the Medical Director, says that it is impossible to give exact figures of how many doctors are trying to get into practice. But an analysis of those registered with the Bureau gives a fairly reliable indication of the present position. Of those seeking openings, a proportion cannot hope to compete on fair terms owing to age and other factors, and quite a number are merely wishing to improve their permanent prospects, and are particular as to the kind of opening for which they will apply. Nevertheless, the report states, the number of young practitioners in "blind alley occupations" is much too great. The number of men of all ages on the books of the London office of the Bureau seeking to be partners, assistants, or trainees is about 850. Just under half (414) are only seeking posts offering the status of principal, and of these only 30% are prepared to go anywhere or to any type of practice. Of the remainder, all but an insignificant number will only consider an opening in the South (Severn-Wash line), and 50% will only consider country or country town practices.

Restrictions imposed by principals, such as nationality and religion, are not nearly so important as age as factors making entry into practice difficult. The Bureau reports that after 35, and certainly after 40, difficulties become greater every year. Seventy per cent. of principals stipulate that introductions should be limited to those not over 35. Experience and qualifications are not so important, though where a view is offered the prospective candidate must have some G.P. experience to compete with others. A previous appointment in midwifery is of value. Higher qualifications are no handicap, but on the other hand they do not confer any advantage (except in a very few cases).

Assistantships

The following table shows the number of assistants and trainees successfully introduced by the Bureau.

	1953	1954
Prospective partnerships (Assistants with view)	175	139
Assistants and Trainees	483	449

The proportion of trainees was about 40% of the total of assistants and trainees.

All the figures obtainable by the Bureau suggest that the number of so-called permanent assistants is falling. There is, however, an apparent anomaly in that the records of

Bureau over the past four years, which cover the period before and after the impact of "notional lists," show that number of offers with a view to partnership has gradually declined whereas the number of openings for assistants out view has steadily increased. Experience during the year, the report says, confirms the view held in the previous report that there is an increasing tendency among principals seeking partners to withhold the firm offer of a partnership. The reason for this, Dr. Potter thinks, is that it is difficult to give notice to an assistant who proves unacceptable, who is unwilling to accept the terms of a provisional partnership, when no view has been offered. If no promise has been made, the motives of the principal are unlikely to be questioned. The Bureau considers that this practice is unsatisfactory and even potentially dangerous to the assistant, for to attain the status of a principal is at present difficult that an assistant may feel bound to accept terms of partnership which he does not regard as satisfactory rather than risk a fresh start. It is a great advantage for an assistant to know the main terms of the prospective partnership before entering on the probationary period.

Unemployment

Unemployment is frequently stated, says the report, that there are large numbers who cannot obtain appointments or openings in general practice and that this has been taken as implying there is widespread unemployment among doctors. The fact that the Bureau does not support this. It would appear that there is very little actual unemployment, including those "resting" between appointments and those who, because of age, physical handicap, or other disability, must perforce rely on casual or temporary appointments, it is estimated that the number out of work involuntarily is rather less than 5% and that this percentage is not rising.

In January, 1954, the Bureau was asked to introduce an assistant (without view) to a partnership in an industrial area on the outskirts of Birmingham. The salary offered £1,100 per annum (including car allowance), and accommodation for a single man was stated to be available. During the year 140 introductions have been made, but the post remains vacant for lack of applicants.

A doctor in an industrial area in East London asked the Bureau to introduce an assistant. The minimum salary offered was £750 plus £150 car allowance, together with a house and garage rent and rates free. These particulars have been sent to nearly 200 applicants, but after a fortnight the principal has only received two inquiries.

The Medical Director of the Bureau thinks that these figures, although admittedly of vacancies in less attractive areas, are a convincing answer to the statement that doctors cannot get posts in general practice.

ADVANCE PAYMENT TO DOCTORS

Under the scheme for the distribution of general practitioners' remuneration it is possible, in certain circumstances, for payments to be made to doctors in advance. A doctor applying to be paid in advance is required to satisfy the executive council that he would be in difficulty or hardship if he had to wait until the normal time of payment at the end of the quarter.

After consultation with the G.M.S. Committee of the B.M.A., the Minister has agreed that it should be open to executive councils to accept as satisfactory evidence a doctor's statement of the nature of his hardship or difficulty without insisting on detailed proof. The doctor may also state at the same time the number of quarters during which he expects his difficulty or hardship to continue, and suggest to executive councils that normally they should accept the doctor's application as being effective for the number of quarters indicated.

Ministry circular (E.C.L. 13/55) has been sent to all executive councils advising them of this new agreement.

Scottish News

CENTRAL CONSULTANTS AND SPECIALISTS COMMITTEE (SCOTLAND)

A meeting of the Central Consultants and Specialists Committee (Scotland) was held at the B.M.A. Scottish Office, Edinburgh, on March 7, with Dr. J. G. M. HAMILTON in the chair.

It was reported that the Joint Consultants Committee (Scotland) had agreed to discuss with the Department of Health the difficulties to which the Tuberculosis and Diseases of the Chest Subcommittee had drawn attention in connexion with the secondment to special hospitals of nurses in training.

Dr. HAMILTON reported that the Joint Consultants Committee (Scotland) had decided that in view of the probable reorganization of hospital medical staffing no useful purpose would be served meantime by further approaches to the Department of Health in connexion with future reviews of S.H.M.O.s; the Committee agreed.

The Committee considered and approved the report and recommendations of the Chairman's Subcommittee on the Structure and Organization of Medical Staff Representation in Scotland. The recommendations were:

- (1) That no change be proposed in the present structure of hospital medical staff representation in Scotland.
- (2) That it be recommended to the Joint Consultants Committee (Scotland) that the number of members elected to the Committee by the Central Consultants and Specialists Committee (Scotland) be increased from four to six.
- (3) That the above recommendations be referred to the regional committees for consideration before further steps are taken.

It was agreed that the report of the Chairman's Subcommittee be sent to all regional committees for consideration and comment.

Structure of Hospital Medical Staffing

The Committee had before it for comment the revised report of the Medical Staffing Subcommittee of the Central Consultants and Specialists Committee (Strachan Report), along with its own Medical Establishments Subcommittee's commentary on hospital staffing and the remuneration of hospital doctors. The latter criticized certain features of the Strachan proposals and set out the Subcommittee's own recommendations. Of these recommendations, the one which differed most from those of the Strachan Report was that the description of salary grades by title should be abandoned and replaced by a system of numbered salary scales or grades within the total range, from which would be selected, by a procedure approved by the profession, the one appropriate to a particular appointment. A number of advantages were claimed for this arrangement.

Among the Subcommittee's recommendations are the following:

- (1) There should be a comprehensive review of the present consultant establishment.
- (2) There should be a ratio of appointments in the two "grades" below consultant appointments, so designed that their holders all have the opportunity of successful application for senior appointments when they have acquired the necessary skill and experience.
- (3) Appointments in the higher of these two grades should be of indefinite tenure and those in the lower of limited tenure, perhaps five years, and renewable where the circumstances of the hospital make this appropriate.
- (4) The full appointments procedure, applicable to consultants, should apply to appointments in those two grades.
- (5) It should be emphasized that the young doctor must accept full responsibility for planning his own training and career.

After a long debate the Committee adopted the commentary of the Medical Establishments Subcommittee and agreed to forward it, together with a summary of the proposals, to the Central Consultants and Specialists Committee.

Dr. HAMILTON gave a brief summary of the meetings of the Joint Consultants Committee (Scotland).

The Committee agreed to ask the Joint Consultants Committee (Scotland) to propose to the Department of Health that regional consultants and specialists committees should be amongst the organizations consulted in connexion with nominations for membership of boards of management.

The Committee welcomed the memorandum prepared by Dr. MACARTHUR on the relation of the general practitioner to the hospital service, and in particular the proposal that the trainee general practitioner scheme should be extended to include a period of training in the hospital service.

GENERAL MEDICAL SERVICES SUBCOMMITTEE (SCOTLAND)

A meeting of the General Medical Services Subcommittee (Scotland) was held on March 8, 1955, with Dr. C. J. SWANSON in the chair.

It was reported that the representations made on the allocation of the mileage fund to practitioners in the Highlands and Islands area had been successful, and that the General Medical Services Committee had now agreed that the total amount should be increased by the sum of £20,000.

The General Practitioner and the Hospital Service

The Joint Subcommittee of the General Medical Services Subcommittee (Scotland) and the Central Consultants and Specialists Committee (Scotland) is still considering practical means of implementing some of the recommendations contained in the Scottish Health Services Council's Report on the General Practitioner and the Hospital Service. Consideration is being given to the possibility of extending the trainee general practitioner scheme to include some training in the hospital service. In connexion with the latter proposal, a memorandum was prepared by Dr. J. C. MACARTHUR, and a draft scheme was received by the G.M.S. Subcommittee (Scotland) from Aberdeen Local Medical Committee.

Notification of Change of Name

With reference to the suggestion that registrars of marriage should notify executive councils of change of name on marriage, a reply has been received from the Department of Health that the Registrar General's office is not prepared to accept this additional obligation. As the Subcommittee, however, is anxious to reduce inflation as much as possible and is not prepared to accept the decision of the Registrar General's office, it was decided to ask the Department to approach the Registrar again with a request that further consideration be given to the proposal.

Form E.C.10A

The Subcommittee has agreed to the Department's proposal that in cases where drugs governed by the D.D.A. Regulations are ordered on Form E.C.10A, either the order form should be completed in duplicate by means of a carbon copy or the practitioner should sign the chemist's register.

Scottish Medical Practices Committee

The Subcommittee has been informed that the Secretary of State has appointed Dr. BENJAMIN HUTCHISON, of Cambuslang, a member of the Scottish Medical Practices Committee in place of Dr. W. JOPE, Blantyre, whose term of office expires on March 31. The Secretary of State has also appointed Mr. STEWART E. BELL, Advocate, Edinburgh, as the legal member of the Committee in place of Mr. SHEWAN, Q.C., who has resigned.

The Subcommittee recorded its appreciation of the services rendered by Dr. Jope as a member of the Scottish Medical Practices Committee since its inception.

Other Business

Negotiations are still proceeding with the Department of Health on the amendment of Form R.M.2(A) dealing with reference of cases to regional medical officers. The Subcommittee is also negotiating with the National Union of Mineworkers regarding modification of the certificate used by their members in connexion with claims for benefit in respect of pneumoconiosis.

OCCUPATIONAL HEALTH

A short meeting of the Occupational Health Committee was held at B.M.A. House on March 16, with Dr. J. A. L. VAUGHAN JONES presiding. A discussion took place on the procedure to be followed at the forthcoming conference of Advisory Councils on Occupational Health, to be held on April 20, and the construction of the agenda.

On the report that the Council of the Association had appointed a Committee on Medical Education to consider the proceedings of the First World Conference and the programme for the Second, Dr. VAUGHAN JONES suggested that some specific representation of occupational health would be desirable, also that the Association of Industrial Medical Officers should be asked to nominate a representative.

It was pointed out that Dr. H. Alexander, a member of the Occupational Health Committee, had been appointed to the new committee by the Council and that there were other appointees such as Dr. Charles Fletcher, who had considerable occupational health interests. It was agreed, however, on the motion of the CHAIRMAN, seconded by Dr. J. B. WRATHALL ROWE, to suggest to the Council that the A.I.M.O. be invited to nominate.

Industrial Health and the Medical Curriculum

It was also agreed that representations should be made to the Council on the announced intention of the General Medical Council to consider the revision of the recommendations for the medical curriculum which were adopted in 1947. The Association's views on this revision had been invited by the General Medical Council, and the Chairman felt that the place of industrial health in educational facilities should receive its proper emphasis in such discussions.

Dr. ROWE said that he regarded industrial health as a branch of general practice. It was dealt with by the general practitioner to a greater extent than by any other branch of the profession, and the proposed new curriculum should be viewed from that aspect as well as others.

It was agreed to set about framing proposals, and the question was placed in the hands of the existing D.I.H./D.P.H. subcommittee reinforced for the purpose.

Information was placed before the Committee on the various regulations and courses for the diploma in industrial health of the Royal Faculty of Physicians and Surgeons of Glasgow, the English Conjoint Board, and the Society of Apothecaries of London.

The Committee considered a private Member's Bill, the Non-Industrial Employment Bill, which proposes to extend the statutory minimum standards of conditions of employment which now apply to miners, factory workers, and quarrymen to categories of employment outside the scope of these Acts. These include agricultural workers, office and shop workers, transport workers, employees in the catering trades, and many others. The Committee agreed that no exception could be taken to what was proposed in the Bill.

On the question of administration of morphine by nurses in industry, which had been before the Committee on previous occasions, it was stated that a further meeting was being arranged with the Royal College of Nursing.

It was announced that Dr. R. S. F. Schilling had accepted the invitation to give the 1956 Mackenzie Industrial Health Lecture.

WELFARE IN LONDON

A new book published by the London County Council, *Welfare in London*,¹ tells the story of the L.C.C.'s welfare service as it is to-day. New ideas are being developed for the replacement of the old institution by smaller and more homely places where old people can be cared for in pleasant, comfortable surroundings. The latest development is an experiment to be made in Hackney to combine specially designed flats for old people with a small welfare home. Of interest, too, are the arrangements to help unmarried mothers and their children to find security and happiness.

The booklet says that a great problem facing Londoners since the war has been homelessness, and reports that 11,000 families have been helped through temporary accommodation in homes and half-way houses. Also described is the pioneer scheme for helping and training difficult families whose way of life is such that no landlord will accept them.

Other new services are those provided for the physically handicapped in their own homes. For many years a great deal has been done for blind people, and now similar help, including the provision of clubs, is being given to those with other handicaps such as spastics, haemophiliacs, and poliomyelitis cases.

The book is illustrated by selected photographs, and detailed facts and figures for the whole welfare service are given in several appendices.

INDUSTRIAL HEALTH ADVISORY COMMITTEE

The first meeting of the Industrial Health Advisory Committee appointed by the Minister of Labour and National Service (*Supplement*, December 11, 1954, p. 223) took place on March 18. The Committee is to advise the Minister on measures to further the development of industrial health in work-places covered by the Factories Acts. Among the practical tasks before the Committee are the determination of priorities for action in the field of industrial hazard, including dust and fumes, dermatitis, and radioactivity; the method of conducting surveys; advice on problems of research and investigation; and methods of organizing group health services for small factories.

The Minister of Labour is chairman of the Committee, and Sir Guildhaume Myrddin-Evans, deputy secretary of the Ministry of Labour, vice-chairman. The medical members are Professor R. E. LANE (Royal College of Physicians, in agreement with the Royal Colleges of Surgeons and Obstetricians and Gynaecologists and the Society of Apothecaries); Dr. J. A. L. VAUGHAN JONES and Dr. L. G. NORMAN (British Medical Association); Dr. R. S. F. SCHILLING (Association of Industrial Medical Officers); Dr. R. NIGHTINGALE (Association of Certifying Factory Surgeons); Dr. R. S. AITKEN (Committee of Vice-chancellors and Principals of the Universities of the United Kingdom); Dr. T. BEDFORD represents the British Occupational Hygiene Society, and Mrs. I. G. DOHERTY the Royal College of Nursing. The eight lay members are representative of the British Employers' Confederation, the T.U.C., nationalized industries, and local authorities.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.

Non-County Borough Councils.—Crewe.

Urban District Councils.—Houghton-le-Spring.

¹ *Welfare in London*, 1955, price 2s. 6d. London County Council.

GENERAL MEDICAL SERVICES COMMITTEE

FEES FOR TEMPORARY RESIDENTS

A meeting of the General Medical Services Committee was held on March 17, with Dr. A. TALBOT ROGERS in the chair.

A lengthy discussion took place on fees for temporary residents. The Ministry had referred to the Committee for its comments an explanatory draft E.C.L., which stated that some difficulty had apparently arisen over the phrase "in regular attendance." The Ministry suggested that these words applied generally to places where 10 or more people resided temporarily, at which the doctor had an arrangement to attend at a fixed time and place, irrespective of any request to treat any particular patients, and where the doctor had been provided with some surgery facilities. Dr. WAND suggested that the words "at a fixed time and place" be omitted; the "arrangement to attend" would govern all genuine cases. This proposed alteration was agreed to.

Another difficulty related to the wide difference between the full fee (17s.) and the fee at the lower rate (5s.). The Ministry stated that it was open to an executive council, in consultation with the local medical committee, to decide, when using their discretion, that, for example, the first patient be treated at the full rate and other patients seen on the same occasion at the lower rate. After some discussion, during which the DEPUTY SECRETARY suggested that all holiday camps should be regarded as qualifying for the lower fee, at a rate intermediate between the present 17s. and 5s., on the ground that a distinction should be drawn between such camps and patients who called in a doctor under the temporary-resident arrangement, it was agreed in principle—the phrasing to be worked out later—again on the suggestion of Dr. WAND, that the option should be left to the local medical committee of determining full payment for the first (the number to be decided later) patients treated at any one particular time, the remainder to be at the lower fee.

Holiday Camps

Before these decisions were actually taken Dr. A. D. F. MENZIES, of Skegness, chief medical adviser to Butlin's Ltd., attended by invitation and gave an account of the medical arrangements at Butlin's camps. He said that it remained with the executive council and the local medical committee to propose any desired alteration of the regulations, but after it had been decided in Lindsey that at the holiday camp in Skegness the higher fee should be paid, the Ministry turned down the proposal and the fee remained at 5s. At some camps in the country 17s. was paid and the lower fee at others. Another point was that no mileage was paid for temporary residents in the Lindsey area, and Butlin's camp was three or four miles from the town of Skegness, a town which had a population of 12,000, with eight doctors, who depended to a large extent on temporary residents. He gave the Committee a number of figures relating to Skegness and other camps. In August, 1954, the busiest month of the year, 327 campers and 230 members of the staff were seen by doctors at their surgeries (the staff was 90% local and most of them probably on permanent lists); the number of visits of doctors to the chalets was 41 for campers and 4 for staff, and there were 48 visits of doctors outside surgery hours. Twelve campers were admitted to hospital and nine to the sick bay. Dr. Menzies added that he felt that the seaside doctor had had a raw deal. It might mean three miles out and return to see a case for 5s.

After Dr. Menzies had withdrawn the Committee discussed whether the differentiation between the higher and lower fee could be justified, and, if so, whether the two figures (17s. and 5s.) should not be brought nearer together. It arrived at the conclusions stated above with regard to the proposed E.C.L., and agreed that the whole matter be discussed with the Ministry.

Sectional Representation in Representative Body

This question, at the request of the Constitution Committee, was discussed in some detail. The CHAIRMAN said that general practitioners had never felt the need for sectional representation but would not oppose such representation of other sections of the profession if the Constitution Committee so recommended, though in that event they would reserve the right to sectional representation for themselves also. Dr. D. F. WHITAKER said that the wheel had come full circle since the turn of the century, when general practitioners complained that they were not getting a fair deal in the Association; now it was the consultants who were saying that they were not getting their proper representation. Dr. O. C. CARTER said that the Representative Body was the mouthpiece of the Association, and he hoped its principle of democratic election would continue. Dr. J. A. PRIDHAM said that he thought it would be a pity for the Committee to make any decision; it should await the report of the Constitution Committee, while reserving its rights.

The Committee made no definite decision, on the understanding that, should sectional representation be accorded to other branches of the profession, the matter would be reconsidered.

Specially Expensive Drugs

Dr. C. F. R. KILLICK, chairman of the Rural Practices Subcommittee, brought forward a recommendation for a particular case to be taken up with the Ministry of Health. This turned upon the principle that where a doctor supplied a drug in combination with other drugs not included in the special list it should be permissible for him to make a claim for that portion of the preparation which was included in the special list for which he was entitled to payment over and above the dispensing capitation fee. One member in the North Riding, who had prescribed caps. epanutin and phenobarbitone and had claimed for that portion of the cost relating to the former, had had his claim rejected. The CHAIRMAN considered it a good case for taking up with the Ministry.

It was reported that negotiations were continuing with the Association of the British Pharmaceutical Industry and the National Pharmaceutical Union on the question of discount on drugs.

Care of the Aged

Dr. H. D. CHALKE presented a report of the Geriatrics Committee, a report prepared by a committee of the Council in which members of the G.M.S. Committee had collaborated.

Dr. K. S. MAURICE-SMITH said that he was glad to note the emphasis on the desirability of keeping old people in their own homes as long as possible. In East Anglia the only service which appeared to be functioning smoothly so far as old people were concerned was district nursing; elsewhere the Welfare State was largely a paper matter, at least in rural areas. He suggested that old people might get meals through the school health service. Dr. MAX SORSBY drew attention to what he considered to be one serious omission from the report—namely, the question of ophthalmic services. Many old people were suffering from long-standing glaucoma and cataract, and their partial or entire blindness was not discovered. Dr. CHALKE said that there should be a nation-wide survey to find out exactly the dimensions of the problem of the aged.

It was agreed that the report, with a proposal for a slight verbal alteration, should go to the Council with the Committee's approval.

Service Committee and Tribunal Regulations

Dr. H. G. DAIN presented the report of a subcommittee which has been working for a very long time on a review of the constitution and procedure of medical service committees. Dr. Dain said that he was very satisfied with this report, whereby he thought both service committees and the

doctors concerned would get a fair and reasonable showing. If this procedure was carried out properly there would be no complaint that injustice was likely to happen in these inquiries. This new machinery should last for ten years or longer without need for further revision. He paid a tribute to the work of the Deputy Secretary (Dr. Stevenson), and also to Mr. Scrivener and Mr. Currer, past and present clerks of the Committee.

The report contained as many as 23 recommendations, but so well had the subcommittee done its work that they were now all agreed by the parties concerned. The CHAIRMAN expressed the great gratitude they all felt to Dr. Dain for the work he had done in this connexion, and also commended the help received from the representatives of the dentists and the pharmacists on the subcommittee. The report was approved for submission to the Annual Conference in May.

Assistants in General Practice

Dr. BRUCE CARDEW presented the revised report of the subcommittee on assistants in general practice. The report had its "first reading" at the previous meeting, when it was referred for comment to the Assistants and Young Practitioners Subcommittee, which had welcomed the recommendations as a first step in the solution of a problem which it proposed to continue to study (*Supplement*, March 5, p. 69). Dr. Cardew said that he was very glad to have this decision. He fully agreed that the report did not represent complete finality or close the door to subsequent proposals. But it was, in his view, a practical solution to the problem. The action of local medical committees would determine to a very large extent the effectiveness of the proposals.

Dr. FRANK GRAY, chairman of the Assistants and Young Practitioners Subcommittee, said that the report was examined with great care, and the four recommendations were considered separately. It would be wrong to suppose that they were satisfied that this was a final solution of the problem. Certain doubts were expressed, but it was appreciated that something had been done towards a solution.

Dr. L. RUSSELL, representative of the young practitioners on the parent committee, was invited to speak but did not do so, and the report was approved as a document to go to the Conference.

Other Business

For the subcommittee which had been set up to consider the report of the Central Health Services Council's Committee on general practice within the health service (Cohen Committee), Dr. WAND reported that comments from local medical committees had been very carefully considered, and such action as was necessary would be taken at the proper time.

Referring to the Minister of Health's decision (*Supplement*, February 26) to appoint a small committee to report on the future intake of medical students, the CHAIRMAN said that the personnel of the committee appointed by the Minister and the Secretary of State for Scotland was, he thought, satisfactory from the general practice point of view. Two of its members, Dr. J. T. BALDWIN and Dr. A. B. DAVIES, were members of the former Working Party. It was hoped that the precedent of the Guillebaud Committee would be followed and that each principal committee of the Association would draw up a memorandum, and thus through a steering committee and the Council an authoritative presentation of the views of the Association could be made.

A compendious document was laid before the Committee showing the result of the sample inquiry undertaken by the Inland Revenue into doctors' expenses. The figures had been worked out in 16 groups according to size and type of practice. The Committee remitted the study of these figures to its expert advisers and to a special subcommittee appointed for the purpose.

Correspondence**Springfield Maternity Home, Blackburn**

SIR,—The letter from Blackburn general practitioners (*Supplement*, March 5, p. 71) might be interpreted as indicating that Mr. Dewhurst, Secretary to the Blackburn and District Hospital Management Committee, acted arbitrarily and on his own initiative in the closing of Springfield Maternity Home. The letter warns against the "tendency to subordinate the doctor's clinical judgment to the irresponsible dictates of the lay administrator."

In justice to Mr. Dewhurst, and without further comment on the accuracy or comprehensiveness of the account as given in the letter referred to, we wish to make it perfectly clear that in visiting Springfield Maternity Home on January 7, 1954, and in interviewing patients, Mr. Dewhurst was in the process of carrying out the decision of the Regional Hospital Board to close the home; a decision which followed the H.M.C.'s recommendation to the same effect. His visit on the day in question was at the request of the first two signatories to this letter and with the concurrence, from a medical point of view, of the third signatory.

Mr. Dewhurst is a most responsible and capable officer, with a lifetime's experience of hospital administration, and enjoys the complete confidence of his Committee.—We are, etc.,

WILLIAM E. WOOLLEY,
Chairman, Blackburn and District
Hospital Management Committee.
W. BRIGGS,
Member, Blackburn and District
Hospital Management Committee.
H. S. WATERS,
Senior Consultant Obstetrician
to the Hospital Management Committee

Blackburn.

Practice in the Highlands and Islands

SIR,—As Chairman of the Highlands and Islands Practitioners Subcommittee of the General Medical Services Subcommittee (Scotland), I read with considerable surprise the statement by Dr. Alasdair McL. Smith in the *Supplement* of March 5 (p. 71) that "no compensation was paid to the Highlands and Islands practitioners." Dr. Smith's letter was discussed at a meeting of the Highlands and Islands Practitioners Subcommittee on March 15, when I was asked to write to you expressing the Subcommittee's dissociation from the views expressed by Dr. Smith. The Subcommittee wish it to be made quite clear that Dr. Smith was writing as an individual and had no authority whatsoever to create any impression that he was representing the views of the Subcommittee. The Medical Practices Compensation Committee took great care to deal fairly with practitioners from the Highlands and Islands. The Scottish member of that Committee, a senior practitioner with wide knowledge of practice in Scotland, undertook the major part of the work of investigation on behalf of the Committee.

Practices in the Highlands and Islands fell into two main categories. First, those in which the doctor was not under agreement with the Secretary of State but received a payment from the Highlands and Islands Medical Service Fund in respect of mileage for insured persons. These doctors were not restricted in the scale of fees which might be charged to non-insured patients, and their practices, being saleable, were assessed for compensation in the ordinary way. Secondly, those under agreement with the Secretary of State to provide medical services for all persons in their areas (both insured and non-insured). A limit was imposed in these areas on the fees which might be charged to crofters, cottars, and persons in similar economic circumstances. These practices, being virtually appointments, created more difficulty, but each case was considered individually and on its merits.

There was a right of appeal from the decisions of the Medical Practices Compensation Committee, and some of

THE PRICE OF STANDARD DRUGS

Following the Ministry of Health's investigation into the margin of profit, turnover, and capital employed of a sample of 19 pharmaceutical manufacturing companies with an annual turnover of about £24m. (see *Supplement*, February 12, p. 46, and February 26, p. 66), the Association of British Pharmaceutical Industry has received a letter from the Ministry saying that the investigation does not suggest "that the general level of prices which manufacturers receive for unbranded drugs and preparations is excessive." The letter goes on to say that the Ministry is satisfied "that there is at present no occasion for the Health Departments to seek to influence the level of prices received by manufacturers for unbranded standard drugs and preparations, or the earnings which are being obtained in wholesale distribution."

Notes and News**HOSPITALITY**

A French doctor's daughter, aged 18, would like to stay *au pair* with a medical family in Kent or Surrey for three months from August to October in return for helping to look after children.

A Portuguese doctor would like to arrange an exchange for his son, aged 11, with a British boy during July and August.

A German doctor and his wife, living in a small town in Southern Germany, would like to arrange exchange hospitality with a Scottish doctor and his wife for a few weeks. The German doctor would like to visit Scotland in 1956, preferably at the time of the Edinburgh Festival, and the Scottish doctor could visit Germany in 1955.

There are a few other outstanding requests which have been received from France, Austria, and Germany regarding hospitality exchanges.

Would anyone interested please communicate with Brigadier H. A. SANDIFORD, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

The new increased pension and benefit rates will shortly be payable (*Supplement*, January 29, p. 31). From May 16 the maternity and home confinement grants will be raised to £10 and £4 respectively and the maternity allowance to 40s. weekly; from May 19 sickness and unemployment benefits are to be increased from 32s. 6d. to 40s., and the industrial injury benefit from 55s. to 67s. 6d.

those practitioners not eligible for compensation received the privilege of having their services in the Highlands and Islands regarded as qualifying service for a pension under the National Health Service Act. Dr. Smith in his letter implies that the Department of Health have not been as co-operative as they might have been, and I feel that this impression should not be allowed to go unchallenged. It is fair to say that, when we have approached the Department in connexion with any difficulties that may have arisen in the Highlands and Islands areas since the inception of the National Health Service Act, we have always been met with understanding and a readiness to co-operate.—I am, etc.,

Aberfeldy, Perthshire.

C. J. SWANSON,
Chairman, General Medical Services
Subcommittee (Scotland).

Separate Prescriptions

SIR,—I doubt the wisdom of the present strict enforcement of Clause 10 of our Terms of Service, by which each patient must have a separate Form E.C.10, if it is applied to several young members of a family suffering from an epidemic complaint. The reasons are as follows: (1) It is certain that "other members of a family" will receive doses out of the sick person's bottle if they produce the same symptoms. In the seasons of coughs and colds they nearly always do. Therefore it is immaterial what names are written on Form E.C.10. (2) If members of a family who cough once to the patient's thrice demand and receive separate bottles of medicine there will be a 200% to 300% increase in the legion of half-empty bottles of medicine lying around in family cupboards. One acid commentator in the press has noted already that there is enough unused medicine in this country to float a battle fleet. Why, then, should we be encouraged to prescribe four bottles of mist tuss. nig. when one communal bottle will suffice? Why must we add waste to waste and scrape the very bottom of an empty public purse? Cannot Clause 10 be amended? —I am, etc.,

Plymouth.

LESLIE DEXTER.

Prescribing Averages

SIR,—The figures for my prescribing average for November sent to me by the executive council and based on a report from the Joint Pricing Committee for England may be of some interest, particularly to anyone "in danger."

Owing to illness, I was not doing full work in November, but even so I was astonished to find I had only issued 12 scrips in the month, and simply staggered that they were priced at 28s. each. It seemed that I deserved a gold medal for economy of numbers and a heavy fine for extravagance per scrip. A protest brought an amendment that the 12 scrips should have been 120 and the 28s. should have been 3s. But investigation showed that I had paid 150 visits and done most of my usual surgeries.

It hardly sounds convincing that about 30 of these 150 visits and four weeks' surgeries produced no scrips. But when the revised figures stated that my average number of scrips per patient on list are over three times those of a partner whose list is nearly identical, and just three times those of the third partner, it begins to appear that statistics can prove anything.—I am, etc.,

Kington, Herefordshire.

G. W. DRYLAND.

Furthering Professional Interests

SIR,—In the *Supplement* of March 5 (p. 70) there appeared a few paragraphs under the heading "Furthering Professional Interests."

I would like to comment on the first of the three resolutions affecting dentistry which came before the last Annual Conference of the Management Committee of the Executive Councils Association (England). This proposed to increase the contributions payable by many patients towards the cost of dental treatment. I do not know what type of treatment the Committee had in mind. If it was relating to the cost of some types of prosthesis I have some sympathy for it,

but if it was an increased charge for conservative treatment and relief of pain I consider it very wrong. To draw an analogy, if a patient is suffering pain from a fishhook in a finger most would think it outrageous if his N.H.S. doctor should have to demand a fee in his surgery before he could treat the condition. What of an acute alveolar abscess? Does this not require urgent treatment and should the individual be required to pay? (It is only fair to state that certain classes are exempt from a charge. This concession was due to good work put in by B.D.A. officials.)

Regarding conservative treatment most dental practitioners in the National Health Scheme will have patients who should be attending 6-monthly for inspections who do not do so now under 18 months or 2 years. By that time certain teeth are often difficult to save (if at all) but, what is more important, are more expensive to save (a crown or gold inlay costs the taxpayer more than an amalgam restoration).

I submit that the £1 charge is a deterrent, and to think of increasing this charge is, in my view, the absolute end. I would like to feel that any delegates to councils debating future policies consider very carefully whose interest is being served best. It is surely in the interest of all that good regular treatment be provided, but above all that pain should be relieved promptly.—I am, etc.,

London, S.E.9.

N. P. BRONSDON.

Assistants in General Practice

SIR,—The plight of assistants in general practice and the shortage of hospital staff have produced a flood of correspondence in the *Journal*. The impression gained from all these letters is a pathetic one. The cry goes up from the unemployed pre-registered doctor, from the disillusioned assistant, is carried on by the disgruntled registrar, and finished off by the disappointed consultant who has not got his merit award. These pressing problems have received the widest publicity in the *Journal*, many recommendations have been made, but little or no action has been taken.

In a letter in the *Supplement* (August 14, 1954, p. 94) I suggested the establishment of rotating appointments, similar to the American intern system. Such a scheme has now been introduced by the Oxford Regional Board (*Supplement*, January 29, p. 30) and deserves earnest consideration. These posts are tenable for from two to four years and the holder will serve for approximately six months in each of the major departments (medicine, surgery, paediatrics, and obstetrics). The salary scale (equivalent to that of an assistant in general practice) and the provision of married accommodation (where possible) will be a great inducement for the married man to remain longer in hospital. The regional committee of the executive councils has expressed its interest in the project, and is willing to facilitate entry of doctors, trained under the scheme, into general practice.

I feel that this lead given by the Oxford Regional Board should be quickly followed by other areas. The scheme provides for greater hospital experience without financial loss or social disharmony, and this experience will not be an adverse factor when entering general practice. As an interim measure it will also help to absorb a number of excess assistants.—I am, etc.,

Leicester.

G. F. STONE.

SIR,—We, members of the executive committee of the General Practice Reform Association, consider the report of the special subcommittee on the employment of assistants, introduced in the General Medical Services Committee recently by Dr. B. Cardew (*Supplement*, February 26, p. 64), to be quite inadequate. In our opinion, the proposals (*Supplement*, March 5, p. 69) would fail to help solve the difficulties of thousands of present and future doctors with regard to salary, conditions of employment, and prospects. We see no reason to believe that the proposed reviews and possible actions by executive councils, in consultation with local medical committees, could significantly further the careers of the vast majority of assistant practitioners. Moreover, the recommendation on "the right to claim

Association Notices

COUNCIL OF THE B.M.A.

Election of 40 Members by Grouped Branches in the British Isles, of 2 Public Health Service Members, and of 1 Woman Member

The following have been elected unopposed for the session 1955-6:

North of England and Tees-side Branches:	J. C. Arthur, Gateshead. Weldon P. T. Watts, Newcastle-upon-Tyne.
East Yorkshire and Yorkshire Branches:	W. E. Dornan, Sheffield. Ian G. Innes, Hull. J. A. L. Vaughan Jones, Leeds. F. M. Rose, Preston.
North Lancashire and Westmorland Branch:	D. R. Owen, Chester.
Divisions in Cheshire—Birkenhead and Wirral; Chester; Crewe; Hyde; Macclesfield and East Cheshire; Mid-Cheshire; Stockport; Wallasey:	David Brown, Liverpool.
Lancashire Divisions of Merseyside Branch—Liverpool; St. Helens; Southport; Warrington. Isle of Man Branch:	J. I. Milne, Manchester.
Lancashire Divisions of South Lancashire and East Cheshire Branch—Ashton-under-Lyne; Bolton; Bury; Leigh; Manchester; Oldham; Rochdale; Salford; Wigan:	J. Cottrell, Grimsby. E. C. Dawson, Derby.
Derbyshire, Leicester and Rutland, Lincolnshire, and Nottinghamshire Branches:	D. S. Pracy, Atherstone, Warwickshire. A. V. Russell, Wolverhampton.
Midland Branch:	S. F. Logan Dahne, Caversham, Reading. Alexander Brown, Linton, Cambs. R. Hale-White, London, N.W.1. J. A. Moody, Ilford.
Staffordshire, and Worcester and Hereford Branches:	H. H. D. Sutherland, London, W.10.
Berks, Bucks and Oxford and Northamptonshire Branches:	H. Alexander, London, S.W.18.
Cambs and Hunts, Norfolk, and Suffolk Branches:	A. Staveley Gough, Watford.
Marylebone Division:	L. A. Gibbons, Reigate. J. O. M. Rees, Guildford. A. Barker, Whitstable. W. B. Heywood-Waddington, Littlehampton. R. G. Gibson, Winchester.
City, South-west Essex, Stratford, and Tower Hamlets Divisions:	J. R. Nicholson-Lailey, Taunton.
Chelsea and Fulham, Kensington and Hammersmith, and Paddington Divisions:	W. Woolley, Bristol. S. Noy Scott, Plympton, Devon.
Camberwell, Greenwich and Deptford, Lambeth and Southwark, Lewisham, Wandsworth, and Woolwich Divisions:	Leslie W. Jones, Anglesey.
Bedfordshire, Essex, and Hertfordshire Branches:	J. W. Tudor Thomas, Cardiff.
Surrey Branch:	Mary Esslemont, Aberdeen.
Kent Branch:	J. G. M. Hamilton, Edinburgh.
Sussex Branch:	W. M. Knox, Glasgow.
Dorset and West Hants and Southern Branches:	
Bath, Bristol and Somerset, Gloucestershire, and Wiltshire Branches:	
South-western Branch:	
North Wales and Shropshire and Mid-Wales Branches:	
South Wales and Monmouthshire Branch:	
Aberdeen, Dundee, Northern Counties of Scotland, and Perth Branches:	
Edinburgh and South-east of Scotland and Fife Branches:	
Glasgow and West of Scotland Branch (Glasgow Division):	

retrospective payment on the basis of notional lists" could actually cause a delay in the materialization of a partnership and cannot be easily justified on logical grounds. We are also unable to agree that the first recommendation is uncontroversial, since many doctors, including ourselves, consider that the present model assistantship agreements are outdated and one-sided. The absence of any assistant practitioners on the special subcommittee is noteworthy.

The General Practice Reform Association is opposed to the maintenance of the assistantship system in N.H.S. general practice, and consequently we believe the view held by the special subcommittee that there is "nothing improper in a principal enjoying a monetary reward in respect of the indefinite employment of an assistant" is fundamentally incorrect, irrespective of any provisos, and contrary to the real and long-term interests of the profession as a whole, and of the health services. Our approach to the assistantship question and related problems follows quite different lines from those proposed in the report of the special subcommittee, and may be summarized as follows: (1) the abolition (by stages, if necessary) of the extra list at present permitted for employing an assistant practitioner; (2) the introduction of a comprehensive training scheme for doctors new to N.H.S. general practice, the trainee to be employed by an appropriate authority instead of privately by another doctor; (3) the reduction, by stages, of the permitted maximum number of N.H.S. patients per practitioner, eventually to 2,000 or 2,500; and (4) equal opportunity for entry into health centre practice for established and unestablished practitioners.—We are, etc.,

H. P. HILDITCH. A. C. J. SAUDEK.
R. JOHN. J. J. SEGALL.
L. RUSSELL. F. TOMLINS.

London, N.W.6.

B.M.A. LIBRARY

The Library service is available to all members of the Association resident in Great Britain and Northern Ireland (and by special arrangement to members of the Irish Medical Association). The only charge made is for postage of books. A copy of the Library Rules will be forwarded on application to the Librarian at B.M.A. House.

The following books have been added to the Library:

- Ashley, F. L., and Love, H. G.: Fluid and Electrolyte Therapy. 1954.
Beale, G. H.: Genetics of Paramyotonia Congenita. 1954.
Benivieni, A.: De Abditis Nonnullis ac Mirandis Morborum et Sanationum Causis. Transl. by Charles Singer, with a Biographical appreciation by Esmond R. Long. 1954.
Bickers, W.: Menorrhagia—Menstrual Distress. 1954.
Brams, W. A.: Your Heart and You: A Study of Coronary Thrombosis. 1954.
Buenti-Bäumel, C.: Funktionelle Röntgendiagnostik der Halswirbelsäule. 1954.
Button, J. C., jun.: Hope and Help in Parkinson's Disease. 1953.
Chapman-Huston, D., and Cripps, E. C.: Through a City Archway: The Story of Allen & Hanbury's, 1715-1954. 1954.
Cocker, D. E.: Aids to Tropical Nursing. Third edition. 1954.
Courville, C. B.: Contributions to the Study of Cerebral Anoxia. 1953.
Elwyn, H.: Diseases of the Retina. Second edition. 1954.
Fine, J.: Bacterial Factor in Traumatic Shock. 1954.
de Forest, I.: Leaven of Love: A Development of the Psychoanalytic Theory and Technique of Sándor Ferenczi. 1954.
Garland, J. (Editor): The Physician and His Practice. 1954.
Gates, I.: Any Hope, Doctor? 1954.
Gregory, J. E.: Pathogenesis of Cancer. Second edition. 1952.
Groves, E. W. H.: Synopsis of Surgery. Fourteenth edition, edited by Sir Cecil Wakeley. 1954.
Harris, I.: Man's Place in the Universe. 1954.
Herbut, P. A.: Surgical Pathology. Second edition. 1954.
Herriott, R. M. (Editor): Symposium on Nutrition. 1953.
Hess, W. R.: Diencephalon: Autonomic and Extrapyramidal Functions. 1954.
Hollinshead, W. H.: Anatomy for Surgeons. Vol. I. The Head and Neck. 1954.
Jones, E.: Sigmund Freud: Life and Work. Vol. I. The Young Freud, 1856-1900. 1954.
Kux, E.: Thorakoskopische Eingriffe am Nervensystem. 1954.
Logan, J. A.: The Sardinian Project: An Experiment in the Eradication of an Indigenous Malarious Vector. 1953.
Mackie, T. T., et al.: Manual of Tropical Medicine. Second edition. 1954.
Maloney, W. J.: George and John Armstrong of Castleton. 1954.
Mitchell's Pediatrics and Pediatric Nursing. Fourth edition by R. A. Lyon and E. M. Wallinger. 1954.
New York Academy of Medicine: Effect of A.C.T.H. and Cortisone upon Infection and Resistance. 1953.
Odium, D. M.: Psychology, the Nurse and the Patient. 1954.
Parsons, Sir L., and Barling, S. (Editors): Diseases of Infancy and Childhood. Second edition. 2 Volumes. 1954.
Podolsky, E. (Editor): Music Therapy. 1954.

Glasgow and West of Scotland Branch (County Divisions), Border Counties, and Stirling Branches:
Northern Ireland Branch:

N. Douglas, Hamilton.
Alexander Scott, Ayr.

N. S. Dickson, Templepatrick.
Ian Fraser, Belfast.

The following candidates have been nominated for the Groups in which there are contests:

Divisions of Metropolitan Counties Branch in Middlesex (two seats):

D. F. Hutchinson, London, W.C.1.
J. B. Wrathall Rowe, Harrow.
Angus Weston, Greenford.

Hampstead, St. Pancras, and Westminster and Holborn Divisions (one seat):

F. Gray, London, W.C.1.
J. L. McCallum, London, W.C.1.

Voting papers will be issued to the members of these Groups on March 30, 1955.

Public Health Service

The following candidates have been nominated for the two seats:

C. O. S. Blyth Brooke (London, E.C.1).
H. D. Chalke (London, N.W.4).
J. B. Tilley (Newcastle-upon-Tyne).

Voting papers will be issued to all public health service members on March 30, 1955.

Woman Member

Annis Gillie, London, W.2, has been elected unopposed.

A. MACRAE,
Secretary.

ELECTION OF MEMBER OF COUNCIL BY FAR EASTERN GROUP OF BRANCHES

No nomination having been received for the election of a member of Council to represent the Far Eastern Group of Branches for the period 1955-8, the Council has decided, in the exercise of its power under By-law 62, again to invite the Branches in the Group, named below, to submit nominations:

Assam	Malaya
Baluchistan	North-west Frontier
Borneo	Punjab
Ceylon	Sind
Hong Kong and China	

Nominations must be forwarded so as to reach the Secretary not later than May 14, 1955, and must be in the following form, or one to the like effect:

We, the undersigned, hereby nominate.....
of..... (full name and address to be given) for election
by the..... (state the names of the Branches
in the Group) Branch as a member of the Council of the Association for the three years 1955-8.

Signatures and addresses of three nominators.....

Branches.....

Date.....

In the event of a contest, voting papers will be issued from the Head Office, British Medical Association, Tavistock Square, London, W.C.1, to each member in the Group.

By Order,
A. MACRAE,
Secretary.

Diary of Central Meetings

MARCH

29 Tues.	Amending Acts Committee, 2 p.m.
30 Wed.	Evidence Committee on Divine Healing, 10 a.m.
30 Wed.	Committee re Remuneration Policy, 2 p.m.
31 Thurs.	Conference of Honorary Secretaries of Divisions and Branches, 10.30 a.m.
31 Thurs.	Ethical Review Subcommittee, Central Ethical Committee, 2 p.m. (Date changed from March 17.)
31 Thurs.	Committee on Homosexuality and Prostitution, 2.15 p.m.

APRIL

1 Fri. Scholarships Subcommittee, Science Committee, 11.30 a.m.
1 Fri. Science Committee, 2 p.m.

Branch and Division Meetings to be Held

BROMLEY DIVISION.—At Bell Hotel, Monday, April 4, 8 p.m., joint meeting with Pharmaceutical Society of Great Britain, West Kent Branch. Lecture by Dr. F. E. Camps: "Dangerous Drugs from a Medico-Legal Aspect."

CITY DIVISION.—(1) In Committee Room A, B.M.A. House, Tavistock Square, London, W.C., Tuesday, March 29, 8.30 p.m., annual general meeting. (2) At Hackney Hospital (G5 Ward), Homerton High Street, London, E., Wednesday, March 30, 2 p.m., films: (1) "Early Diagnosis of Anterior Poliomyelitis"; (2) "Development of Locomotion"; (3) "Development of Movements of the Hand."

COVENTRY DIVISION.—At Sibree Hall, Monday, March 28, 8 p.m., meeting. Miss Vera Pitman, S.R.N., Sister Tutor from the Christian Medical College, Vellore, S. India, will talk about the work of the College. This will be illustrated by slides.

DONCASTER DIVISION.—At Parkinson's Café, Doncaster, Tuesday, March 29, 7.30 for 7.50 p.m., joint meeting with Doncaster Medical Society. Dr. John Hunt: "Future of General Practice and its Relationship to Other Branches of Medicine." Members of Rotherham and Wakefield, Pontefract and Castleford Divisions are invited.

DUNDEE DIVISION.—At Queen's Hotel, Dundee, Friday, April 1, 8.30 p.m., business meeting.

GRIMSBY DIVISION.—At Scartho Road Infirmary, Grimsby, Friday, April 1, 9 p.m., meeting. Dr. James Cyriax: "Lumbar Disk Lesions." All medical practitioners in the area of the Division are invited.

HALIFAX DIVISION.—At Royal Halifax Infirmary, Thursday, March 31, 8.30 p.m., meeting. Annual B.M.A. Lecture by Professor M. L. Rosenheim: "The Treatment of Nephritis."

HASTINGS DIVISION.—At Bexhill Hospital (Out-patient Department), Tuesday, April 5, 8.15 p.m., clinical meeting.

LEICESTERSHIRE AND RUTLAND BRANCH.—At Leicester Royal Infirmary, Wednesday, March 30, 8.45 p.m., meeting.

LEWISHAM DIVISION.—At Lewisham General Hospital, High Street, Lewisham, S.E., Friday, April 1, 8.30 p.m., meeting.

NORFOLK BRANCH.—At Assembly House, Theatre Street, Norwich, Saturday, April 2, 8 p.m., meeting. B.M.A. Lecture by Mr. T. Bourdillon, M.A.: "The Ascent of Mount Everest, and the Problems of Life at High Altitudes," with a demonstration of equipment. Members' wives are invited.

NORTH WALES BRANCH.—At Ruthin Castle, Thursday, March 31, 3 p.m., spring meeting. Short papers by Dr. Philip Evans: "The Medical Treatment of Peptic Ulcer"; Dr. Dorothy Lancaster: "Some Dermatoses of the Perineum"; Mr. V. Kent Drennan: "Some Problems of the Foot."

REIGATE DIVISION.—At Reigate Hill Hotel, Reigate, Tuesday, March 29, 8.30 p.m., meeting.

RUGBY DIVISION.—At Grand Hotel, Rugby, Friday, April 1, 8 for 8.30 p.m., informal supper; 9.30 p.m., B.M.A. Lecture by Dr. C. G. Baker: "Mitral Valvotomy (with a six-year follow-up)."

SCUNTHORPE DIVISION.—At Crosby Hotel, Scunthorpe, Wednesday, March 30, 8.15 p.m., meeting. Dr. F. J. S. Esher: "An Approach to the Problem of Delinquency." Members of the legal and clerical professions are invited.

SHEFFIELD DIVISION.—At University Medical Library, Sheffield, Friday, April 1, 8.30 p.m., annual general meeting.

SOUTH ESSEX DIVISION.—At Railway Hotel, Hornchurch, Tuesday, March 29, 9 p.m., meeting.

SOUTH-WEST ESSEX DIVISION.—At Board Room, Whipps Cross Hospital, Leytonstone, E., Wednesday, March 30, 8.30 p.m., meeting. Lecture by Sir Russell Brock: "Cardiac Surgery."

SOUTH-WEST WALES DIVISION.—(1) At Cliff Hotel, Gwbert-on-Sea, Cardigan, Saturday, April 2, 7.15 for 7.45 p.m., dinner-meeting. Mr. Rainsford Mowlem: "Burns." Members' wives are invited. (2) At St. David's Hospital, Carmarthen, Sunday, April 3, 2.30 p.m., meeting.

SUSSEX BRANCH.—At Hotel Metropole, Brighton, Sunday, April 3, 12.30 for 1 p.m., luncheon; 2.15 p.m., B.M.A. Lecture by Dr. T. F. Fox (Editor, *The Lancet*): "Medicine in Soviet Russia." A discussion will follow. Members' wives and other guests are invited.

WEMBLEY DIVISION.—At Wembley Hospital, Tuesday, March 29, 9 p.m., meeting. Lantern lecture by Dr. S. M. Rivlin: "Bad Legs."

WEST HERTS DIVISION.—At Shrodells Hospital, Vicarage Road, Watford, Friday, April 1, 8.30 p.m., joint meeting with Watford and West Herts Medical Society.

WEST MIDDLESEX DIVISION.—At Paul's Restaurant, New Broadway, Ealing, London, W., Tuesday, March 29, 8.30 p.m., annual general meeting. Members' wives are invited.

S.H.M.O. Meeting

There will be a meeting of Senior Hospital Medical Officers in the Newcastle Region on Tuesday, March 29, at 8 p.m. at B.M.A. House, 7, Windsor Terrace, Newcastle-upon-Tyne.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 2 1955

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British Medical Association

GENERAL MEDICAL SERVICES COMMITTEE

REPORT OF THE GENERAL MEDICAL SERVICES COMMITTEE TO THE ANNUAL CONFERENCE OF REPRESENTATIVES OF LOCAL MEDICAL COMMITTEES, 1955

PERSONNEL OF GENERAL MEDICAL SERVICES COMMITTEE, 1954-5

Ex-officio: Sir John McNee, London (President); I. D. Grant, Glasgow (Chairman of Representative Body); E. A. Gregg, London (Chairman of Council); L. Dougal Callander, Doncaster (Treasurer); A. Beauchamp, Solihull, Warwicks (Chairman of Conference of Local Medical Committees).

Elected by A.R.M. of B.M.A. (1954): England and Wales: A. Brown, Linton, Cambs; J. A. Brown, Birmingham; H. Guy Dain, Birmingham; F. Gray, London. *Scotland*: J. T. Baldwin, Milton Bridge, Midlothian. *Northern Ireland*: J. Bleakley, Belfast (*Deputy*: H. J. Cronhelm).

Direct Representatives of Local Medical Committees: W. Neil Darling, Edinburgh (Group A.1); C. J. Swanson, Aberfeldy, Perthshire (Group A.2); W. M. Knox, Glasgow (Group A.3); R. C. Hamilton, Kilmarnock (Group A.4); F. Lishman, Crook, Co. Durham, and D. T. McDonald, Belford, Northumberland (Group B); H. F. Hollis, Leeds, and H. Thorp, Todmorden, Yorks (Group C); A. Campbell, Accrington, Lancs, F. S. Catto, Manchester, and P. J. Gibbons, Liverpool (Group D); Miles Parkes, Crewe, Cheshire (Group E); T. J. Hargest, Swansea, and G. P. Williams, Anglesey (Group F); E. W. Goodwin, Leicester, and A. S. Wilson, Gosberton, Lincs (Group G); A. B. Davies, Walsall (Group H); F. A. Smorffitt, Southam, Warwickshire (Group I); C. F. R. Killick, Williton, Somerset (Group J); R. W. McConnel, Wendover, Bucks (Group K); J. D. R. Murray, Exmouth, Devon (Group L); K. S. Maurice-Smith, Ely, Cambs (Group M); H. S. Howie, Wood, Shanklin, Isle of Wight (Group N); D. F. Whitaker, Guildford, Surrey (Group O); R. Green, Hurstpierpoint, Sussex (Group P); A. Talbot Rogers, Bromley, Kent (Group Q); D. F. Hutchinson, Middlesex, and A. N. Mathias, London (Group R); C. M. Scott, Barnet, Herts, and H. N. Rose, Ilford, Essex (Group S); H. H. D. Sutherland, London, and Max Sorsby, London (Group T); J. B. Young, Belfast (Group U).

Elected by Annual Conference of Local Medical Committees, 1954: J. C. Arthur, Gateshead; I. G. Innes, Hull; J. A. Pridham, Weymouth; F. M. Rose, Preston; S. Noy Scott, Plympton, Devon (in place of W. Woolley, who resigned in November, 1954); S. Wand, Birmingham.

Nominees of Other Bodies: T. Rowland Hill, London, and J. R. Nicholson-Lalley, Taunton (Central Consultants and Specialists Committee); Kate Harrower, Glasgow (Medical Women's Federation); H. D. Chalke, London (Public Health Committee and Society of Medical Officers of Health); B. Cardew, London, and H. C. Faukner, London (Medical Practitioners' Union).

Co-opted Members: O. C. Carter, Bournemouth; H. P. Hilditch and L. Russell (Assistants and Young Practitioners Subcommittee); D. C. Bowie, London.

Observer from the British Dental Association: L. Everest, London (in place of G. M. Hickley, who resigned in October, 1954).

Observer from the Registrars Group: F. T. Page, London.

CHAIRMAN

1. A. Talbot Rogers was appointed Chairman for the session 1954-5.

OBITUARY

2. The Committee regrets to report the deaths during the past session of Dr. Mabel Ramsay, the first representative of the Medical Women's Federation on the Insurance Acts Committee, who served in that capacity for some 15 years; Dr. Alfred Cox, former Medical Secretary of the Association; and Dr. J. B. Miller, a Vice-President of the Association and former chairman of the Representative Body.

THE WORK OF THE COMMITTEE

3. Although the past session has been necessarily shorter than usual, the Committee has met monthly, and in addition much detailed work has been undertaken by special sub-

committees appointed to consider a number of important matters which have arisen during the course of the year.

4. Negotiations with the Ministry of Health on the application of the principles established by the Danckwerts award to the calculation of the size of the Pool have continued, and the final settlement for the financial year 1952-3 agreed. Discussions on the final settlement for the year 1953-4 are at an advanced stage.

5. A start has been made upon a re-examination of the Trainee General Practitioner Scheme, and another special subcommittee is investigating the difficulties experienced by general practitioners in securing practice accommodation. It is hoped that detailed reports on both these subjects will be available before the Annual Conference in 1956.

6. Another major task has been an examination of the report of the Committee on General Practice within the National Health Service, which was established by the Central Health Services Council in 1951, and the Committee wishes to acknowledge the great help it has had from local medical committees, who themselves made a detailed study of the report.

7. Proposals for the revision of the disciplinary machinery have also been discussed with the Ministry of Health in the light of the decisions taken by the Conference in 1953 arising out of the Committee's earlier recommendations on the subject.

8. The Committee has also kept in close touch with the Medical Practices Committee, the College of General Practitioners, and the British Dental Association. Through its liaison with these bodies, and with representatives of other branches of the profession, it has been possible to discuss with advantage many matters of mutual interest. The Committee is also pleased to report that the Registrars Group has appointed an observer to the Committee, and this arrangement has facilitated discussions on many problems which are common to young practitioners both in general practice and in the hospital field.

9. Representatives of the Committee have played a full part in the deliberations of a Joint Subcommittee with the Central Consultants and Specialists and Public Health Committees which has been studying the question of the establishment of an integrated service for the treatment and rehabilitation of chronic disablement arising from age or illness.

10. As is its normal custom representatives of the Committee have met officers of the Ministry at regular intervals throughout the session to discuss the many detailed points of administration of the Service which continue to arise. These regular meetings are of the greatest value in solving the problems appearing in the day-to-day working of the Service, and the Committee wishes to record its appreciation of the ready help it at all times received from the Ministry.

11. The Assistants and Young Practitioners Subcommittee has continued to study a number of problems which face assistants and those newly established in practice. The opportunity which the Committee thus has of hearing the views of these two sections of the profession has again proved of considerable value during the past session.

12. The attendances of members of the Committee and the subcommittees appointed during the past session are recorded in Appendix A. It should be noted that this record covers only the period from the commencement of the present session—June—to the March meeting of the Committee, and that it does not include attendances of members at meetings of other Association committees upon which they serve as representatives of the G.M.S. Committee.

REPRESENTATION ON B.M.A. COMMITTEES

13. The G.M.S. Committee is represented on the following B.M.A. committees: Private Practice (A. N. Mathias; Deputy—C. M. Scott); Public Health (C. M. Scott; Deputy—K. S. Maurice-Smith); Central Consultants and Specialists (A. Talbot Rogers and D. F. Hutchinson; Deputies—F. A. Smoritt and J. D. R. Murray); Ophthalmic

Group (M. Sorsby); Occupational Health (F. Lishman; Deputy—A. Brown); Public Relations (A. Talbot Rogers, D. F. Hutchinson, F. M. Rose, and W. Woolley; Deputies—P. J. Gibbons, R. W. McConnel, and H. H. D. Sutherland); Compensation and Superannuation (A. B. Davies, A. N. Mathias, and S. Wand); Joint Committee of B.M.A. and Pharmaceutical Society (A. Talbot Rogers, F. Gray, and E. W. Goodwin); Consultants, General Practitioners, and Public Health Liaison Committee (A. Talbot Rogers, A. Beauchamp, A. B. Davies, D. F. Hutchinson, A. N. Mathias, J. D. R. Murray, and S. Wand); Joint Formulary Committee of B.M.A. and Pharmaceutical Society (H. Guy Dain, A. B. Davies, M. Sorsby, and D. F. Whitaker); Arrangements Committee (A. Talbot Rogers, I. G. Innes, and F. M. Rose; Deputy—A. Beauchamp); Pharmacopoeia Subcommittee of Science Committee (A. B. Davies); Committee on the Relation of Drunkenness and Alcohol to Road Accidents (A. B. Davies).

NOMINEES ON MINISTRY OF HEALTH DISTRIBUTION COMMITTEES

14. The following nominees were accepted by the Ministry for appointment on Central Distribution Committees for 1954-5:

International Distribution Committee: F. Gray (London), E. R. C. Walker (Scottish Secretary), G. P. Williams (Holyhead), and D. P. Stevenson (Deputy Secretary).

Distribution Committee for England and Wales: A. Talbot Rogers (Bromley, Kent), F. Gray (London), S. Wand (Birmingham), G. P. Williams (Holyhead), and D. P. Stevenson (Deputy Secretary); together with A. Brown (Linton, Cambs), J. D. Wells (Billericay, Essex), and C. F. R. Killick (Williton, Somerset) when questions concerning mileage are under consideration.

BRITISH DENTAL ASSOCIATION'S GENERAL DENTAL SERVICES COMMITTEE

15. Close liaison with the General Dental Services Committee of the British Dental Association has been maintained during the past year.

16. G. M. Hickley, who has attended meetings of the Committee since 1952 as an observer from the B.D.A., resigned in October, 1954, and his place has been taken by L. Everest (London).

17. F. Gray (London) has continued to attend meetings of the General Dental Services Committee of the B.D.A.

OBSERVER FROM THE REGISTRARS GROUP COMMITTEE

18. The Committee felt it would be helpful to promote a closer liaison with the Registrars Group Committee of the Association. This was felt to be particularly desirable in view of the number of hospital registrars who were seeking openings in general practice, and because of the many problems common to both fields.

19. At the invitation of the Committee the Registrars Group Committee appointed Dr. F. T. Page (London) as an observer. An observer from the Registrars Group (A. Poteliakhoff) has also been invited to attend meetings of the Assistants and Young Practitioners Subcommittee.

LIAISON BETWEEN THE GENERAL MEDICAL SERVICES, CENTRAL CONSULTANTS AND SPECIALISTS, AND PUBLIC HEALTH COMMITTEES

20. It will be remembered that last year the Committee reported that it had been decided to invite the Public Health Committee of the Association to appoint representatives to the Liaison Committee which then existed between the G.M.S. and Central Consultants and Specialists Committees of the Association.

21. This arrangement came into operation during the present session, and the Committee is pleased to report that it has proved a successful means of furthering co-operation in the three main branches of the National Health Service.

22. A number of meetings have been held during the year. The Chairman is appointed from each of the three constituent bodies in rotation.

MEDICAL PRACTICES COMMITTEE

23. The Committee has learnt with considerable pleasure of the appointment of one of its members, Dr. F. Lishman, to the Medical Practices Committee.

24. It would also like to place on record its appreciation of the valuable services given by Dr. J. C. Pearce (Diss, Norfolk), who was Dr. Lishman's predecessor on the Medical Practices Committee.

25. Through its Liaison Committee, and by close contact at officer level, many points of mutual interest to the two committees have been satisfactorily dealt with during the past year.

REMUNERATION

Size of the Central Pool

26. In its report to the last Conference the Committee dealt at some length with the various steps which must be taken each year in order to reach agreement with the Ministry on the detailed application of the variable factors which are involved in calculating the size of the Central Pool, namely:

- (1) the number of doctors in the Service;
- (2) the level of practice expenses;
- (3) the earnings of general practitioners from Government sources, apart from general medical services;
- (4) receipts from private practice.

27. The Pool is calculated on a provisional basis at the beginning of every financial year, and its size cannot be finally determined until detailed information in respect of all these factors has been obtained. Indeed, until agreement is reached with the Ministry on every one of these points, no calculation of the final settlement can be made. Because of the complexity of the various inquiries which must be made it is inevitably some time before any balance can be announced and distributed.

28. During the past session agreement has been reached on the size of the Central Pool for the financial year 1952-3, but, as the Committee anticipated, the balance due to the profession by way of a final settlement for that year was extremely small.

29. The Committee is now negotiating on the final settlement for the financial year 1953-4, and it is hoped to reach early agreement. Although the final position has not yet emerged, present indications are that in this, the first year of the new distribution scheme, a substantial amount will be due to the profession. The Committee will do all it can to ensure that these sums are distributed as quickly as possible.

30. As far as the variable factors are concerned, the following paragraphs set out in detail the action which has been taken by the Committee in each case:

Number of Doctors in the Service

31. It will be remembered that last year the Committee reported that general agreement had been reached on an equitable method of calculating the precise number of doctors in the Service so as to ensure that not only would account be taken of those whose names appeared on the medical lists at the dates upon which the actual count took place, but that due regard should be paid to applications for admission to the list which are then under consideration. There were, however, four small groups of practitioners—whose names appear in the medical lists—whose

position the Ministry felt should be specially considered before they were included in the calculation, namely:

- (1) those practitioners with no patients at all;
- (2) doctors with very few N.H.S. patients;
- (3) salaried partners; and
- (4) partners whose share in the practice is less than one-third of the share of any other partner.

32. The Committee is pleased to report that agreement over these questions has now been reached, and it is satisfied that the general principles upon which the number of doctors in the Service is calculated each financial year are equitable from the point of view of both parties.

Practice Expenses

33. Although Mr. Justice Danckwerts accepted an expense ratio of 38.7% and this percentage was used for the purpose of calculating the size of the Pool up to and including the financial year 1951-2, it was clearly desirable that the ratio should be brought up to date. Consequently, arrangements were made for a further review of the level of practice expenses, and an inquiry was undertaken by the Board of Inland Revenue based upon doctors' accounts for the financial year ended during the March quarter of 1952. The results of this inquiry have now been discussed with the Ministry of Health and agreement has been reached that for the financial year 1952-3 an expense ratio of 32.3%, which is slightly higher than the actual ratio which emerged from the inquiry, should apply.

34. The apparent "reduction" in the ratio is, of course, due to the fact that as a result of the Award the overall Pool is substantially larger than the original sum of money on which the old expense ratio of 38.7% was calculated.

35. A further inquiry undertaken by the Board of Inland Revenue on accounts ending in the March quarter of 1953 for use in connexion with the 1953-4 calculation of the Pool has now been completed. The results are being discussed with the Committee's expert advisers.

36. The Board of Inland Revenue has now decided that it will not be possible for it to undertake similar inquiries in every subsequent year, and the Committee, in consultation with the Ministry, is looking into ways and means of keeping the practice expense ratio up to date in those years when it is not possible for a factual inquiry to be carried out. The Ministry's first thoughts on this difficult problem are now under consideration by the Committee.

37. The Committee has felt unable to accept a suggestion by the Ministry that a small Working Party of experts should be established specifically for this purpose, and the matter will continue to be dealt with, as formerly, by direct negotiation.

Earnings from other Government Sources

38. In order to determine the amounts received by general practitioners in the National Health Service from other Government sources, the Ministry obtains returns from the various authorities concerned. Thus, the sums so disclosed are factual. Inquiries in respect of the 1952-3 Pool were completed during the past year and a similar investigation for use in the 1953-4 calculation is now proceeding.

Receipts from Private Practice

39. In its last report the Committee referred to the Ministry's suggestion that the Inland Revenue inquiry into practice expenses should be used to obtain an estimate of the receipts of general practitioners from private practice. This proposal was rejected by the Committee as it was advised that the actual method which the Ministry proposed to adopt could not result in any accurate assessment of private practice receipts.

40. After very careful consideration, and in the light of views expressed by its expert advisers, the Committee has concluded that nothing short of a full-scale inquiry based on the tax returns of all practitioners could reveal what general practitioners are earning from this source. The

Ministry feels, with some justification, that an inquiry of this magnitude would be quite impracticable at the present time. This view is endorsed by the Board of Inland Revenue.

41. In consequence, both sides have agreed that the figure of £2m. accepted by Mr. Justice Danckwerts should continue to be used for the purpose of calculating the Pool for the financial year 1952-3. So far as future years are concerned, the Committee sees no alternative than to stand firm on its assertion that the figure of £2m. should remain unless and until a full-scale inquiry on the lines indicated above proves this figure to be wrong.

THE DISTRIBUTION SCHEME

Supplementary Annual Payments

Implementation of the Working Party's Second Report

42. Following the acceptance by the Conference of the Second Report of the Working Party, which set out the proposals for dealing with the problem of the small-list practitioner, the Ministry has issued instructions to executive councils to implement the new scheme. The Committee has every reason to hope that the new arrangements will eliminate any cases of hardship arising from the operation of the distribution scheme, which came into effect in April, 1953.

Central Appeals Committee

43. Although certain criteria were laid down to assist executive councils in administering the new scheme, the Committee was anxious to ensure that no small-list practitioner who could justifiably claim that his position had been prejudiced as a result of the new distribution arrangements should be debarred from enjoying the benefits of the Supplementary Annual Payments scheme merely because he failed in some small respect to conform with the established criteria. To this end a practitioner has a right of appeal to a Central Appeals Committee, consisting equally of representatives of the Committee and the Ministry. This Central Committee has now been established, and has discretion to allow appeals in borderline cases. The Committee has every reason to believe that this machinery is working well.

44. The Committee subsequently agreed with the Ministry that this Central Appeals Committee should also be used for a number of other purposes under the distribution scheme—namely, to determine appeals against:

- (1) the refusal of an Initial Practice Allowance;
- (2) the refusal of payment on the basis of notional lists; and
- (3) the refusal of a hardship payment under the old arrangements.

Eligibility for Supplementary Annual Payments

45. Since the original E.C.L. on the subject was issued some doubt has arisen as to the circumstances in which a doctor will be automatically eligible for a supplementary annual payment. A new circular on this subject has made it clear that a doctor over 60 years of age will not be automatically eligible unless he has been conducting single-handed for the last 10 years the particular practice in respect of which his application was submitted. Similarly, the position of a doctor with a fluctuating list has been clarified. Whilst under the scheme a practitioner may lose his supplementary annual payment because his list falls below 300 or decreases by more than 10% over four consecutive quarters, executive councils have now been told that where this happens but the practitioner subsequently builds up his list again he is eligible to reapply for a supplementary annual payment. Payment may then be granted if the list has remained over 300 for four consecutive quarters and, in the case of doctors under 60 years of age, has increased by at least 10% over those four quarters. The opportunity was also taken of clarifying a number of other minor points about the scheme, and the Committee hopes that, as a result,

no small-list practitioner will be in any doubt as to his position under these arrangements.

46. The Committee was unable to accept a suggestion put forward by the Ministry that, in the case of applications for supplementary annual payments from general practitioners over the age of 75, the regional medical officer should visit the doctor concerned in order to be sure that the practitioner is, in fact, providing full general medical services. The Committee feels that this is a matter which can best be judged by the local medical committee in consultation with the practitioner's own local colleagues, but it has been agreed that, in cases of doubt, it would be appropriate for a medical member of the Central Appeals Committee to interview the doctor, in consultation with a member of the local medical committee or a near-by colleague. A circular letter setting out the arrangements which the Committee feels should be made in these circumstances has been sent to local medical committees.

Supplementary Annual Payments for Doctors No Longer on the Medical List

47. Following representations made by the Committee, the Ministry has informed executive councils that, if under the new scheme a doctor satisfied the criteria for a supplementary payment on April 1, 1953, but had since resigned from the list or died, application could be accepted for a supplementary payment for the period from April 1, 1953, up to the date when he ceased to be on the list.

Initial Practice Allowances

48. In its report to the Conference last year the Committee drew attention to an anomaly in the method of assessing income in connexion with claims for initial practice allowances, and pointed out that, in the case of doctors filling vacancies in small single-handed practices, executive councils were required to take all payments for dispensing into account. The Committee felt that some allowance should be made for the fact that in the case of dispensing doctors the amounts involved included a substantial element in respect of the actual cost of the drugs supplied, and, following consultation with the Ministry, it was suggested that the total sums paid for dispensing should be disregarded.

49. The Ministry, though at first sympathetic to the proposal, felt on further reflection that it would be fairer to regard as remuneration for this purpose the same proportion of dispensing payments as is used for superannuation purposes—namely, 50%. The Committee felt that the arguments put forward by the Ministry had force. It believed that the proposal was equitable and has agreed to it.

50. Similar arrangements will be adopted in connexion with hardship payments.

Back Debits and Back Credits

51. It will be remembered that last year, having considered the views of the Committee on the subject of back debits and back credits, the Conference decided not to seek their abolition but rather to accept the Ministry's suggestion than an overall time limit of two years should be imposed. Since then the Scottish Subcommittee has again raised the question and drawn the Committee's attention to the comparative ease with which back debits may be made and the difficulty of obtaining back credits. This frequently means that the individual doctor is penalized.

52. The Committee has a good deal of sympathy with the Scottish view that the most equitable method of dealing with the situation would be to secure the total abolition of both back debits and back credits, and without commitment is seeking the Ministry's comments on the subject.

53. The Committee itself has an open mind on the subject, but, remembering the decision taken by the Conference last year, and the views since expressed by the Scottish Subcommittee, it feels that it should report what has transpired and give local medical committees an opportunity of second thoughts on a most difficult problem.

Monthly Payments

54. The Committee has discussed with the Ministry the views expressed by the last Conference that general practitioners should be paid monthly should they so wish without any specific plea of hardship. Whilst the Ministry feels unable to go as far as the Conference wishes, it has agreed that a doctor having once established a case for receiving monthly payments should not be required to make a similar request each succeeding quarter. It has therefore, by means of a circular letter to executive councils, suggested that monthly advance payments to a doctor once granted might continue to be made without the need for further application each quarter, and that a doctor should not be asked to supply actual details of hardship in support of his original application.

55. The Committee is satisfied that this action, by and large, gives effect to the Conference's wishes on this matter.

Limited Lists

56. As local medical committees will be aware, the terms of the distribution scheme debar practitioners with limited lists from receiving loaded capitation fees. The Committee has considered how this condition should operate in cases where a practitioner has a limited list in the area of one executive council and an unlimited list in the area of another.

57. The Committee feels that in these circumstances the practitioner should not be held to be providing full general medical services in those areas where he has a closed list only, and that his open list alone should rank for loaded capitation fees.

58. The matter is to be discussed with the Ministry on these lines.

Partnership Lists

59. It will be remembered that the Conference last year expressed the view that practitioners in partnership should be allowed a fixed period of nine months to bring their individual lists within the prescribed maxima, and that any extension of this period should be permitted only with the Minister's consent. It was suggested that, during this period of grace, a partner should be paid for the actual number of patients on his individual list.

60. This problem was particularly pertinent where a new partnership was formed and it would otherwise have been necessary for block transfers to be effected.

61. The Ministry has agreed to advise executive councils that, on the formation of a new partnership, the partnership will be allowed up to nine months to bring their lists within the maxima permitted by the allocation scheme. If, however, at the end of this period one particular partner's list is still excessive, executive councils will insist upon the immediate transfer of the excess patients.

TEMPORARY RESIDENT FEES

62. In its report to the last Conference the Committee referred to the difficulties which had arisen over the application of the criteria laid down for the purpose of deciding which cases should attract the lower temporary resident fee of 5s. It will be remembered that executive councils, in consultation with local medical committees, are required to classify holiday camps and institutions into those in which it would be appropriate to pay the higher temporary resident fee of 17s. and those where the lower fee of 5s. should be paid. The decision as to whether an institution is to be classified for the purposes of payment at the lower rate depends largely upon whether the doctor is in regular attendance and has facilities for seeing a number of patients at a fixed time and place.

63. The matter has been discussed at some length with the Ministry of Health and, before making any radical alteration to the present scheme, the Committee decided to seek further information as to the size of the problem and the extent to which the lower rate of payment was being

applied. Having considered the matter again in the light of the further information supplied by the Ministry, the Committee feels that a case does exist for giving local medical committees discretion to pay a fee for temporary residents which would modify the present somewhat rigid rates of payment. The matter is to be discussed with the Ministry on this basis.

TREATMENT OF SERVICES PERSONNEL ON LEAVE

64. It will be remembered that the Conference last year expressed its general agreement with the proposal made by the Service departments that Services personnel on leave should be treated as temporary residents under the National Health Service. Before these arrangements could be put into effect it was necessary for the Committee to seek certain assurances about the position of private practitioners who undertook this work. The Private Practice Committee of the Association is quite satisfied with the assurances which have been given, and the Committee has itself received an undertaking that the new arrangements will in no way affect the size of the Central Pool.

65. Now that these difficulties have been overcome the Committee has agreed to the publication of details of the new scheme, which will come into operation at the beginning of the next financial year—that is, April, 1955.

MILEAGE—SCOTLAND

66. Pending an early investigation into the present method of allocating the total Mileage Fund between England and Wales and Scotland, the Committee has agreed to an increase of £20,000 in the present mileage allocation of £140,000 for the Highlands and Islands. The increase in the Highlands and Islands mileage allocation will be met as a first charge on the total Mileage Fund for the two countries.

GROUP PRACTICE

67. In its report to the last Conference the Committee gave a very full account of the discussions which had taken place on ways of allocating the sum of £100,000 which the Working Party recommended be set aside from the Pool each year to encourage group practice. It will be remembered that the proposals were to provide financial assistance by way of an interest-free loan recoverable by quarterly deductions from the remuneration payable by executive councils to individual members of the group.

68. The Group Practice Loans Committee, consisting of four members of the Committee and four officers of the Ministry of Health, together with legal advisers, has since been established and has considered and approved a number of applications for interest-free loans under the scheme.

69. Applications for loans to the Group Practice Loans Committee necessarily involve its members in a considerable amount of time and travel both in attending meetings of the Committee and in investigating the circumstances and practice premises of the groups concerned. Although the Ministry of Health pays a modest subsistence allowance, the Committee felt that a good case existed for its own representatives on the Group Practice Loans Committee to be compensated for a heavy burden of work undertaken on behalf of the profession. On its recommendation, the Trustees of the National Insurance Defence Trust decided to pay an honorarium of 7 guineas per day to the Committee's representatives.

ADMISSION OF STUDENTS TO MEDICAL SCHOOLS

70. As the Conference will remember, on the recommendation of the Committee the Council of the Association invited the Ministry of Health to set up a Working Party to examine on a long-term basis, and with the widest possible terms of reference, the future number of medical practitioners likely to be required in all branches of the profession and to correlate the intake of students to the teaching schools to these estimated needs.

71. After a considerable lapse of time the Minister has announced in Parliament the establishment of a small Committee with the following composition and terms of reference.

Terms of Reference: To estimate on a long-term basis, and with due regard to all relevant considerations, the number of medical practitioners likely to be engaged in all branches of the profession in the future, and the consequential intake of medical students required.

Personnel: The Right Hon. Henry Willink, M.C., Q.C. (Chairman); J. T. Baldwin, Esq., M.B., Ch.B.; Sir Harold Boldero, D.M., F.R.C.P.; Sir John Charles, M.D., F.R.C.P., D.P.H.; Professor Sir Henry Cohen, M.D., F.R.C.P., J.P.; Sir Andrew Davidson, M.D., F.R.C.P.Ed., D.P.H.; A. B. Davies, Esq., M.B., Ch.B.; J. P. Dodds, Esq., C.B.; Professor Sir Geoffrey Jefferson, C.B.E., M.S., F.R.C.P., F.R.C.S., F.R.S.; L. G. K. Starke, Esq., C.B.E., F.I.A.; and A. B. Taylor, Esq.

72. The Ministry has sent the following letter to the Association explaining why the Minister had not felt able to agree to the suggestion of a Working Party.

"Since you wrote to me on 20th January, 1954, the Minister and Secretary of State for Scotland have given careful consideration to the suggestion, made by the Council of the Association, that the Association and various other bodies concerned should appoint representatives to a working party to make a detailed enquiry into the future number of medical practitioners and students.

"So far as the need for a detailed enquiry is concerned, the Ministers are in full agreement with the view expressed by the Council. They do not, however, consider that a representative working party of the kind suggested in your letter would be the best method of undertaking such an enquiry. Your letter mentioned by name an appreciable number of bodies that have an interest in this matter, but you made it clear that the list you gave was not intended to be exhaustive, and in the Ministers' view it would be quite impracticable, on the basis of full representation for all interests, to secure a body sufficiently compact for an efficient detailed study of a problem of this nature. The Ministers have therefore come to the conclusion that it would be preferable for them to appoint a small committee, before whom all the interested bodies can be given full opportunity of laying their views.

"As you will recollect, this method of proceeding was informally discussed with officers of the Association before a final decision was taken, and following a suggestion that was then made, the Ministers agreed that the committee—although small—should include two general medical practitioners. As, however, it was felt to be proper that in accordance with the usual practice the first announcement of the Ministers' intentions should be made to the House of Commons, prior consultation with the Association could not take place in any more formal manner.

"For the same reason and because of the large number of bodies that could claim an interest in future medical manpower, it was not practicable to have formal consultations about the membership of the committee. The Ministers are, however, confident that those invited to serve will bring a wide and comprehensive background of knowledge and experience to the work of the committee, and that they will command the full confidence of all branches of the profession.

"The House of Commons has today been informed of the conclusions the Ministers have reached in this matter, and I am enclosing a copy of the statement that has been made. You will see that it sets out all the details of the membership and terms of reference of the new committee."

73. Whilst the Committee naturally regrets that the Minister felt unable to accept its original suggestion that an inquiry of this nature should be conducted by means of a Working Party, it nevertheless welcomes the decision to make a thorough investigation of this most important problem.

74. Early consideration is to be given by the Committee to the question of preparing evidence to be given to the Willink Committee.

PRE-REGISTRATION PERIOD

75. The Committee has been concerned to hear that there have been numerous complaints about the difficulties and delays which provisionally registered practitioners experience in obtaining pre-registration posts in approved hospitals required under the Medical Act of 1950. It was therefore gratified to learn that it was proposed to convene a conference between the Association, the Licensing Bodies, and the Ministry of Health on the general question of pre-registration appointments.

76. The Committee will be represented at this Conference.

CLASSIFICATION OF AREAS

77. At the last Annual Conference some concern was expressed that the Medical Practices Committee did not always pay due regard to the full circumstances prevailing in a particular area when undertaking the task of classification. Indeed, during the course of the debate it was suggested that, for the purpose of classifying an area as "closed," the minimum figure should be higher than the 1,500 which is the datum line now used by the Medical Practices Committee.

78. The Committee has discussed this matter with the Medical Practices Committee and has received an assurance that the greatest regard is paid both to the recommendations of the local bodies concerned and to the overall position in each individual area. The minimum figure of 1,500 is by no means rigidly applied, and the Medical Practices Committee pointed out that its action is already in accordance with the spirit of the motion which was proposed by Surrey at the last Conference. Where a difference of opinion exists between the Medical Practices Committee and the local medical committee as to whether or not an area should be closed, representatives of the local medical committee are, if they so wish, afforded an opportunity of placing their problems personally before the Medical Practices Committee.

79. In view of this fact, the Committee feels that the situation is adequately safeguarded and calls for no further action on its part.

MACHINERY FOR FILLING PRACTICE VACANCIES

80. One of the major questions upon which the Committee was awaiting the views of the Committee on General Practice concerns the machinery for filling practice vacancies. It will be remembered that the Conference last year once more urged that all necessary steps should be taken to secure that, in respect of appointments to vacancies in general practice, the actual appointment should be made by executive councils in consultation with local medical committees; and that any appeal should lie with the Medical Practices Committee. The Committee noted with regret that in its recently published report the Cohen Committee has failed to support this view. The wishes of the Conference must now be pressed in further discussion with the Ministry.

81. The Committee's attention has been drawn to a decision of the Medical Practices Committee that, before making further appointments from applicants in respect of advertised vacancies, the Medical Practices Committee expects local executive councils to take up the references of the short-listed applicants. The Committee understands that the reasons for this step are twofold. Firstly, the Medical Practices Committee prefers to rely upon confidential references taken up in accordance with the wording of Form E.C.16A, which specifically invites all applicants for a vacancy to furnish the names of referees, and, secondly, it hoped to avoid delay between the period of short-listing and the interview with the Medical Practices Committee.

82. The Committee, believing these considerations to be valid, feels that this procedure is not unreasonable.

EXCHANGE OF PRACTICES

83. The Conference last year approved the report of a special subcommittee set up to examine ways and means by which established practitioners could more easily change the area of their practices. The Committee has discussed the implementation of the report with the Medical Practices Committee, and as a result a circular letter has been sent to executive councils suggesting that, when it is apparent that a further vacancy in another area may be created by the appointment of a particular doctor, executive councils may feel that this is one of the factors to which favourable consideration should be given when making their recommendations, and certainly the fact that the candidate is already established in another area should not be counted against him. The Committee hopes these same considerations will be borne in mind by local medical committees when consulted by executive councils about the names of applicants suitable for short-listing.

84. The Committee hopes that, with such assistance from executive councils and local medical committees, changes between one area and another will be facilitated.

ACCEPTANCE OF PATIENTS OF A VACANT PRACTICE

85. In its last Annual Report the Committee referred to the discussions which had taken place with the Central Ethical Committee of the Association on the problems which arise when the patients of a vacant practice seek acceptance by other doctors in the vicinity who have been temporarily looking after the practice.

86. The Committee, in seeking a solution to this difficult problem, found considerable difficulty in reconciling the right of the patient to select his own doctor with the obligation of the acting practitioner to hold the practice together for the appointed successor.

87. During the year the problem has been accentuated by a number of instances in which a full-time locum has, in fact, secured admission to the medical list of the area to the detriment of the appointed successor. In the event of the area being classified as "open," the Medical Practices Committee has no option but to grant the application. The attention of the Committee also has been drawn to occasions when, following the appointment of a successor, an inordinate number of patients have been found to have transferred to the list or lists of local doctors who have been appointed to take care of the practice pending the appointment of the successor.

88. The Committee has therefore established a special subcommittee which, with the aid of legal advice, is studying all aspects of the problem, and will report its recommendations to the Conference next year.

ALLOCATION OF PATIENTS TO GENERAL PRACTITIONERS

89. At the last Annual Conference it was recommended that, when a patient was being attended by a registered practitioner other than his or her N.H.S. practitioner and without the latter's consent, the N.H.S. practitioner should be permitted, if he so desired, to have the patient removed from his list immediately.

90. The Committee has considered this matter in consultation with the Private Practice Committee of the Association. The conclusion has been reached that the present arrangements for the removal of a patient from a doctor's list are quite adequate for their purpose and that no change is called for.

REMOVAL OF NAMES FROM DOCTORS' LISTS

91. The Committee has now discussed with the Ministry a proposal put forward by the Conference last year that the executive council should be responsible for tracing

patients on the list of a practice in those cases where a death or retirement vacancy had recently been filled. It was felt that in these circumstances the executive council should satisfy itself that every possible method of inquiry had been made before removing the patients from the practice list.

92. The Committee has been assured that executive councils do, in fact, make every effort to trace missing patients, and the Ministry maintains that so far as this aspect of their work is concerned it is not practicable to place any additional responsibilities on executive councils. The Committee therefore suggested that where a vacancy is filled, in the absence of any direct proof to the contrary, the list should not be purged for two years. The Ministry has undertaken to look at this suggestion, but has pointed out that it might well increase the dangers of inflation and might therefore prove inadvisable.

REINSTATEMENT OF EX-SERVICE MEN ON DOCTORS' LISTS

93. The Committee has once again asked the Ministry to arrange for the automatic reinstatement of Services personnel on doctors' lists on discharge from the Forces, and the views of the Conference on this subject have been represented in the strongest possible terms. The Ministry felt, however, that the proposal had to be resisted on two grounds—firstly, that its administration would be both costly and complex, and, secondly, that the practice would inevitably increase the already substantial degree of inflation of doctors' lists. It pointed out that a sample check carried out in the area of one large executive council had revealed that some 31.3% of ex-Service men registered within one week of release, 73% within one month of release, and 88% within three months of release.

94. The Committee, whilst impressed by these figures, felt that they were insufficient to enable it to reach any conclusion on the situation generally and asked for further inquiries to be carried out in other sample areas. This further check showed the following results in the areas named:

Executive Council Area	Registration within:		
	1 month	3 months	6 months
Birmingham	70%	87%	96%
Essex	55%	86%	96%
London	50%	75%	Not known
Reading	80%	90%	100%

95. In addition, an independent inquiry carried out at the Central Registry showed that 56% registered within one month, 78% within three months, and 92% within six months. The figures are of particular significance in this instance because they represent an average for the whole country.

96. The Committee feels that, in view of the situation as it is now shown to exist, it would not be justified in pursuing the suggestion that special machinery should be established for the purpose of automatic reinstatement.

ELIMINATION OF INFLATION

97. The Committee has long regarded the establishment of an alphabetical index as essential to the efficiency of the Central Registry, and is convinced this step is necessary to check the present inflation of lists and to safeguard the provisions of the distribution scheme. This view was emphasized by the Conference last year and the Ministry was asked to take immediate steps to establish an alphabetical index. Unfortunately the Committee is not able to report any satisfactory progress and it is hoped that the Conference will again reaffirm its views on this subject.

98. A resolution passed by the Conference last year suggested that instructions should be printed on the medical card requesting the patient to notify the executive council of any change of address. The Ministry has undertaken to

consider this matter in consultation with the Committee when other amendments to the medical card are under consideration.

COMMITTEE ON GENERAL PRACTICE OF THE CENTRAL HEALTH SERVICES COUNCIL

99. The Committee has made a detailed study of the Report of the Committee on General Practice within the National Health Service, which was set up by the Central Health Services Council.

100. The Committee's detailed comments and criticisms were circulated to local medical committees, who were themselves invited to express their own views on any part of the Cohen Committee's report. Many local medical committees took advantage of this opportunity, and the task of collating the views of local medical committees with those already expressed by the G.M.S. Committee has now been completed with a view to any necessary action being taken.

TRAINEE GENERAL PRACTITIONER SCHEME

Review of the Scheme

101. In response to the views expressed by the Conference last year the Committee has set up a special subcommittee to re-examine the Trainee General Practitioner scheme. This subcommittee has now completed its general review of the scheme and an interim report setting out the conclusions and recommendations reached will be sent to local medical committees later this year. At the same time, local medical committees will be asked to submit their own views on the subject, particularly from the point of view of how the present scheme has worked out in their own areas. A final report will be submitted to the 1956 Conference.

Remuneration of Trainee General Practitioners

102. The Committee has sought an increase in the maximum salary which the Ministry of Health pays, through the principal, to the trainee general practitioner. It has been pointed out that the present rate is inadequate having regard to present-day circumstances, and the Ministry has undertaken to give the matter careful consideration.

103. The Committee is also to discuss with the Ministry the possibility of making monthly payments to the trainer in respect of the trainee's salary.

ASSISTANTS AND YOUNG PRACTITIONERS SUBCOMMITTEE

104. The Assistants and Young Practitioners Subcommittee has continued to examine a number of problems which face assistants and unestablished principals.

105. One matter which has received the most careful consideration during the past session has been the whole question of the employment of "permanent" assistants in general practice. A report of a special subcommittee which was set up to examine the matter was submitted to the Subcommittee and its views are referred to later in this report.

PRESCRIBING AND DISPENSING

Joint Committee on Prescribing

106. In its last report the Committee referred to the decision of the Central and Scottish Health Services Councils to appoint a Joint Standing Committee on the Classification of Proprietary Preparations under the chairmanship of Sir Henry Cohen. This Joint Committee would undertake the classification of new proprietary preparations as they were introduced and would take the place of the original Joint Committee on Prescribing on Form E.C.10.

107. The Association was invited to nominate a general practitioner to serve on this Committee, but, before doing so, further inquiries were made as to its constitution and precise terms of reference. As a result, the Committee is satisfied that the new Joint Committee has not the power—

given to its predecessor—"to consider the desirability of placing any restriction on prescribing by general practitioners." Nevertheless, the Committee felt that the proposed constitution did not allow sufficient representation of general practitioners. This view was accepted by the Central Health Services Council, and, at the suggestion of the Committee, the Council of the Association nominated three general practitioners to serve on the Joint Committee. The Committee is pleased to report that these nominees were accepted and have now been appointed to the Joint Committee.

Prescribing of Proprietary Preparations

108. Following the Minister's announcement in Parliament that doctors would be asked not to prescribe certain proprietary preparations in cases where it had not been possible to reach satisfactory price arrangements with the manufacturers, the Committee was shown a draft circular letter to doctors in which the Ministry set out details of the proprietary preparations which were affected. An immediate assurance was sought from the Ministry that the Minister's announcement in no way departed from the agreed policy that the general practitioner would be free to prescribe whatever he thought necessary in the best interests of his patient. This assurance was readily forthcoming, but the Committee pointed out that the phraseology in the draft circular by no means made this clear.

109. After further discussion the Ministry agreed to amend its circular to meet the Committee's wishes, but the Ministry was left in no doubt as to the Committee's view that it was unfortunate that the Minister had opened his campaign by referring to a group of well-known proprietary anti-asthmatics which, though more costly, were frequently ones which individual patients had found from experience were best tolerated and most efficacious in their particular case. A change of drug in such a case might have a bad psychological effect.

Prescribing of Preparations Which are not Drugs or Medicines

110. The Committee agreed with the Ministry that there was no longer any need for the Ministry to be informed of cases in which executive councils decided to take no action where a prescription was referred to them by Pricing Bureaux. Similarly, it was agreed that, where the practitioner did not wish to exercise his right to appear before the local medical committee, the Minister on his part would not submit representations and that, in consequence, the arrangement whereby local medical committees were asked to give the Ministry 14 days' notice of any cases of this nature could be discontinued.

111. To avoid misunderstanding, however, the Committee would like to emphasize that the Regulations themselves are unaltered and that the results of these cases must be notified to the Ministry.

Remuneration of Medical Practitioners for the Supply of Drugs and Appliances

112. Now that Pricing Bureaux are more up to date with their work, the Ministry felt that the arrangements whereby advance payments on account were made in respect of drugs and appliances supplied were no longer necessary and that the normal system of settlement in arrear could be resumed.

113. The Committee raised no objection to this proposal, but experience has shown that there is still considerable delay before dispensing doctors paid on the basis of the Drug Tariff receive the moneys due to them each quarter. In consequence, the Committee has represented to the Ministry that, as the practitioner is usually expected to settle his account with his supplier monthly, he should, in order to avoid hardship, still be able to obtain on application advance payments from the executive council.

List of Appliances

114. The Committee is seeking the addition of the following articles to the list of appliances prescribable by general practitioners in the National Health Service:

- (1) Pessaries (Simpson's shelf, celluloid ring, india-rubber ball).
- (2) Tubular gauze.
- (3) "Algetyn" nonad tulle.
- (4) Finger cots.
- (5) "Cellanband" bandages.
- (6) Two-way-stretch knee-caps.

List of Specially Expensive Drugs

115. At the request of the Committee the Ministry has added the following substances to the special list of expensive drugs:

- "Mysoline."
- Piperazide preparations.
- Streptomycin.

Prescriptions for Items on the Specially Expensive List

116. It will be remembered that the Committee accepted the Ministry's proposal that a Form E.C.10 printed on coloured paper might be introduced for use by dispensing doctors who wished to issue prescriptions for items on the special list for which payment was made over and above the dispensing capitation fee. The Ministry has now suggested that the use of these coloured forms should be extended to all dispensing doctors whether paid by drug capitation fee or on the basis of the Drug Tariff. In this way the Ministry hoped that all prescriptions issued to patients on dispensing lists would be readily identifiable.

117. The Committee sees no objection to this proposal and the Ministry has been so informed.

Form E.C.10

118. Although the Committee had recommended to the Ministry that there should be an early return to the practice of making up pads of Form E.C.10 by means of staples, it was suggested at the Conference that the present type of pad which is secured by means of an adhesive material had a number of advantages which made its retention advisable.

119. The Committee therefore asked the Ministry to arrange, as soon as practicable, for the issue of pads of both types so that practitioners might choose whichever type of pad they found most convenient. The Ministry maintains that, to do as the Committee wishes, might well lead to supply difficulties, but the matter is still under consideration.

Methylpentynol

120. The Committee's attention has been drawn to the fact that methylpentynol (marketed under the name of "oblivon"), because it was not a scheduled poison, was freely available to members of the general public. In view of the dangers inherent in the free sale of oblivon, the Committee felt that some restriction should be placed upon it. The Committee was informed that the Pharmaceutical Society was then in process of circulating its members to the effect that, in view of the dangers of indiscriminate use or use in excessive quantities, the Council of that Society felt that the drug should be available only on medical or dental prescription.

121. The Committee feels that, in the absence of the inclusion of methylpentynol in the scheduled poisons, this is the most effective method of controlling its free sale. It wishes to record its appreciation of the prompt action taken by the Pharmaceutical Society.

"Casilan"

122. The Committee has discussed with the Ministry of Health the suggestion made by the Annual Conference last year that high protein substances such as "casilan" should be regarded in all cases as foods.

123. The Ministry, whilst willing to offer general guidance on the subject, felt, as did the Committee itself, that it would be undesirable to depart from the principle that the

general practitioner must remain free to prescribe such substances in individual cases where he felt it to be justified. The Department did not think it practicable to single out any particular product nor to go beyond what the Definition of Drugs Joint Subcommittee had felt able to say.

124. In consequence, it was agreed that the best method of meeting the situation was the insertion of an explanatory statement in *Prescribers' Notes* based on those cases where the decisions of referees on appeal had given a clear lead.

Cod-Liver Oil and Malt

125. As a result of a suggestion that there was an increasing number of references of prescriptions for cod-liver oil and malt, the Committee has discussed a proposal made by the Representative Body of the Association that prescriptions for this substance should not be questioned unless they exceed 4 lb. The Committee is given to understand that in no case is a prescription under 4 lb. challenged by Pricing Bureaux, and that, even so, where it subsequently transpires that a patient is suffering from tuberculosis, no further action is taken. The Committee feels that these arrangements are not unreasonable.

Insulin Syringes

126. The Committee, in consultation with the Diabetic Association, is representing to the Ministry of Health that the recently introduced 1½ c.c. type of insulin syringe is not suitable for the purpose for which it was designed. Not only is it an extremely clumsy instrument from the point of view of self-administration, but its capacity is too small for the larger doses of insulin which are frequently ordered. The Ministry is being asked to provide a 2 c.c. syringe of the same length as the present 1 c.c. syringe, but with a wider barrel. There is no criticism of the 1 c.c. syringe, which has proved most satisfactory in use.

127. At the same time, the Committee has pointed out that it would be of considerable advantage if a spirit container were provided with these two syringes in an endeavour to reduce the many breakages which occur and to facilitate sterilization.

ECONOMY IN PRESCRIBING

Areal Averages

128. The Committee reaffirmed its view that the only effective method of combating excessive prescribing would be an early return to the system of full pricing and areal averages whereby the individual doctor is notified of his own prescribing costs, together with the area and national averages.

129. Although the arrears of work which faced Pricing Bureaux made it impossible for the system to be introduced at once on a national basis, the Ministry agreed that, as an interim measure, in those areas where pricing averages could be computed, a system of areal averages would be re-instituted in the first place for groups of counties selected in rotation. The first of these statistics have now been compiled and circulated to general practitioners in the areas selected.

130. The Committee hopes that the availability of figures which will enable the doctor to compare his prescribing costs with those of his colleagues in the area will do something to reduce the cost of prescribing. The Committee has now had an opportunity to examine the actual statistics which the Ministry has been able to produce, and they are clearly open to criticism in one or two respects. The Committee intends to discuss these points of criticism with the Ministry to ensure that future figures are compiled on a completely realistic basis.

Stock Orders

131. It will be remembered that the Conference last year expressed its full support of the Committee's view that the immediate introduction of stock orders for doctors' immediate prescribing needs would result in substantial savings in the pharmaceutical service. Unfortunately, it had not then proved possible to secure the co-operation of the chemists, without whose participation the scheme could not

be operated, and the Conference expressed the wish that further efforts should be made to overcome the difficulties which were preventing the implementation of the stock orders arrangements.

132. The Committee is pleased to record that the need for finding a solution to this problem was also stressed in the recently published report of the Committee on General Practice. The matter is to be discussed again with the Ministry of Health, and the Committee will do all it can to give effect to the Conference's wishes in this matter.

SUPPLY OF MEDICINES TO PRIVATE PATIENTS

133. The Chairman of the Committee, accompanied by the Chairman of the Private Practice Committee, met the Minister of Health to press the Association's claim that private patients should be entitled to drugs and appliances under the National Health Service. A very full discussion took place and a report of this meeting is set out in Appendix B.

DISCOUNT ON DRUGS

134. Further discussions have taken place with the National Pharmaceutical Union and the Association of British Pharmaceutical Industry in an effort to secure an equitable rate of discount for dispensing doctors. The Committee has, for some considerable time, protested against a situation which in some instances results in the doctor suffering actual financial loss when supplying certain items to his patients. The chemists were made very well aware of the very considerable feeling in the profession on this issue.

135. Subsequently, the Committee was informed that the Association of British Pharmaceutical Industry would be prepared to recommend to its constituent members that manufacturers and wholesalers should increase to a material extent the professional discount allowed to N.H.S. dispensing doctors on ethical proprietary preparations.

136. This offer is to be considered by the Rural Practices Subcommittee, whose views will be reported to the Conference by the Chairman of that Subcommittee.

CHARGES FOR PRESCRIPTIONS

137. The Committee and its Rural Practices Subcommittee have given careful consideration to the view expressed at the last Conference that dispensing doctors should be placed in the same position as chemists in the matter of collecting prescription charges. The Committee has however reached the conclusion that it would be unwise to disturb the present position. Briefly, the chemist has deducted from his remuneration a number of "shilling charges" equivalent to the number of prescriptions which he submitted to the Pricing Bureau less 4d. (4d. in the case of rural pharmacists) in respect of each Form E.C.10 to cover any losses he may sustain through being unable to collect the charges. Taking the rural chemist, who is in the most advantageous position from this point of view, the tolerance allowed is in the region of 3%—a comparatively small margin. The dispensing doctor, on the other hand, is not fettered by any hard or fast limits and suffers no arbitrary deduction from his remuneration—a position which was established only after lengthy and difficult negotiations with the Ministry when prescription charges were first imposed. Moreover, should the executive council consider that a doctor is collecting insufficient charges he has the right to justify himself before his own colleagues on the local medical committee.

138. Again, the instructions to executive councils stress that charges of this nature should not be brought unless they have good reason to believe that a substantial breach of the regulations is involved. Even when the local medical committee finds against the doctor, he still has the right of appeal to a body upon which dispensing doctors are represented. The Committee feels that in view of all these facts the position of the dispensing doctor is far better than that of the chemist, and it can see no grounds for believing that to place the dispensing doctor in the same position as the chemist would be to the former's advantage in any way.

139. During the course of the past session the Committee has been asked to give some guidance to local medical committees on the margin which the dispensing doctor should be allowed before any conclusion was reached that he had not complied with the regulations. The Committee feels that in this, as in many other instances, each case must be judged on its individual merits and in the full light of the circumstances of the practice concerned. It feels that this is a matter which is best left to the discretion of local medical committees.

POSTGRADUATE COURSES

Grants for Locums

140. Following representation to the Ministry the Committee is pleased to report that it has been agreed that the grant which is made towards the expenses of engaging a locum during the period that a general practitioner is attending a postgraduate course should be increased to 16 guineas per week.

141. The new rate is payable from September 1, 1954.

Assistants

142. The Ministry has also agreed that, from the same date, assistants in general practice will be eligible to apply for a grant under the refresher course arrangements. The Committee accepted a suggestion by the Ministry that in order to be eligible for a grant an assistant should have been qualified as a medical practitioner for at least three years.

Courses in Specific Subjects

143. The Committee has received several requests that courses in specific subjects should be available under the scheme—notably, obstetrics. The matter has been discussed with the Ministry, who have assured the Committee that, providing the course in question is recognized by the university concerned, there will be no difficulty about it ranking for a grant under the scheme. In consequence, if any local medical committee feels that there is a call for any course in a particular subject in its own locality, they should approach the university authorities. Similarly, difficulties arose in one area over the recognition of a refresher course consisting of evening sessions. Here again the Committee understands that, provided the university authorities give prior recognition to such a course, the grant will be payable.

Subsistence Allowance

144. The Committee has concluded that the rates of subsistence allowance granted to general practitioners attending refresher courses are inadequate. It intends to ask the Ministry to bring the allowances more into line with present-day circumstances.

CERTIFICATION

Certification for Surgical Corsets

145. Following the decision of the Conference last year to seek the abolition of medical certificates to secure exemption of surgical corsets from purchase tax, the Committee has discussed the matter once again with the Board of Customs and Excise. After a frank discussion the following letter was received from the Board of Customs and Excise:

"In your letter of 25th October you made further representations about the abolition of medical certification to secure exemption of corsets from Purchase Tax; and on 6th December a deputation from the General Medical Services Committee came to see me to discuss this question.

"We have given careful consideration to the points which you and your colleagues made at the meeting and I am now writing to put our views on record.

"In the first place I should like to make it clear that there is no tax exemption for corsets as such. The general position is that tax is not chargeable on surgical appliances; and there are of course many articles which by reason of their physical characteristics are clearly identifiable as surgical appliances. In the field of clothing, however, there is

a range of articles, chiefly abdominal and other belts, which are not so readily identifiable. Here the crux of the matter is how to give the benefit of the exemption to those articles which are genuinely surgical appliances and at the same time to exclude those which are no more than ordinary made-to-measure garments. It is difficult to see how this distinction can be made except by the method we now adopt, but equally I am sure you would agree that it would be extremely difficult to justify withdrawing the tax exemption for all surgical appliances merely because of some minor difficulties of identification in the case of corsets.

"Had the exemption from Purchase Tax for surgical appliances become completely redundant as a result of the National Health Scheme we might agree that the time had come to consider its withdrawal, but experience shows that this is in fact not so. There are apparently still many people who are prepared to buy their appliances without going to hospital and there are good reasons why it would be undesirable to upset this state of affairs. These people save the country expense and considerably ease the burden on the hospitals. As you will appreciate, the political difficulties of getting an exemption of this kind withdrawn would indeed be formidable.

"At the moment, therefore, I think we must take it that removal by legislation of the tax exemption on surgical appliances is a non-starter. This being so, we in this Department have to recognize that we have neither the power nor the right to refuse the benefit of the exemption to any individual who is entitled to it. Nor can we insist on his attending hospital where it is not his wish to do so. But it is certainly not our wish that the administrative side of the exemption should place any undue burden on the doctors. It was for this reason that we removed severe enteroptosis, gastropnoxis, etc., from the list of conditions for which certificates would be accepted. It was fully appreciated that those conditions had given rise to abuse and were leading to unnecessary calls on the doctors. We think you would agree that since these steps were taken the position has much improved and demands on doctors had dropped considerably this last year or two. But we should like to assure you and your members that we are fully conscious of their views on the question of certificates and we are anxious to do all we can to ease the situation. With this in view we now propose to discontinue the need for further medical certificates when replacement appliances are required. We are notifying the suppliers concerned accordingly. This additional measure should reduce still further the demands made on the doctors and I trust that it will go a good way to meeting your members' complaints."

146. Thus although the Board has not been able to agree to the total abolition of certificates it has offered to discontinue the need for further medical certificates when replacements are required.

147. The Committee feels that with the implementation of this proposal the steady decline already noticed in the number of certificates required will continue and this will substantially reduce the burden which has fallen on general practitioners in the past.

Hospital In-patient Certificate

148. A suggestion was made by the Northampton Local Medical Committee at the last Conference that the hospital in-patient certificate (Form Med.10) should be redrafted to state the fitness or unfitness for work of the patient. In view of the fact that these hospital intermediate certificates are normally issued by lay personnel, the Committee feels unable to support the proposal. It has, however, suggested to the Ministry of Pensions and National Insurance that the footnote now printed on this certificate form should be amended so as to remind the patient that an intermediate certificate issued by the hospital is valid for eight days after discharge. This step should reduce the calls made upon general practitioners.

149. The amended footnote will read as follows:

"If a final certificate is not issued on discharge from hospital you (the claimant) should obtain a further certi-

ficate from your doctor within a week of discharge. You should obtain a final certificate before resuming work."

STANDARD OF ACCOMMODATION IN SURGERIES AND WAITING-ROOMS

150. Early in the new session, statements in Parliament and in the press again focused public attention on the standard of surgery and waiting-room accommodation provided by general practitioners. Although in October, 1953, a circular letter on the subject by the Chairman of the Committee was sent to every general practitioner in the National Health Service, no precise information was available either to confirm or deny the allegations which had been made from time to time of inadequate or unsatisfactory practice accommodation. Furthermore, it was clear that a general survey under arrangements to be made by the Ministry and executive councils was both inevitable and imminent.

151. The Committee, feeling that this was a matter which was primarily of concern to the profession rather than one which called for official action under the regulations, discussed the problem with the Ministry of Health, and, in consequence, it was agreed to seek the co-operation of local medical committees in carrying out surveys of the practice accommodation in their own areas.

152. The vast majority of local medical committees in England and Wales have agreed to co-operate to the full and it is hoped that within a reasonable time the Committee will have an accurate picture of the general situation throughout the country.

PRACTICE ACCOMMODATION

153. A special Subcommittee has been set up to look at the general question of practice accommodation. Cases have arisen from time to time when general practitioners succeeding to death or retirement vacancies have been faced with considerable difficulty in obtaining suitable accommodation, whilst the establishment of new housing estates, the clearance of slum areas, and redevelopment schemes generally have added to the problems which doctors face in acquiring suitable new or alternative surgery premises. The conditions under which local authorities should rent premises to general practitioners calls for particular examination in present-day circumstances, and this and a number of associated problems are under active consideration. In view of the many complicated factors involved it is unlikely that the Subcommittee's full report on these matters will be available until the 1956 Annual Conference.

SERVICE COMMITTEES AND TRIBUNAL REGULATIONS

154. Negotiations have continued with the Ministry of Health on the recommendations made by the special subcommittee which has been reviewing the Service Committees and Tribunal Regulations. The Committee is pleased to report that agreement has now been reached on the various matters under discussion, and the Subcommittee's report of these negotiations appears in Appendix C. The Committee recommends:

Recommendation A: That the Report of the Subcommittee on Service Committees and Tribunal Regulations be approved.

MATERNITY MEDICAL SERVICES

Ante- and Post-natal Care

155. In the last report the Committee referred to the difficulties which had arisen in a number of areas over the payment of fees to general practitioners undertaking the ante- or post-natal care of patients who had elected to be confined in hospital. Special arrangements had been agreed with the Ministry whereby, although the confinement was to take place in hospital, in exceptional cases where, in the opinion of the general practitioner, it was inconvenient for the patient to attend hospital for her antenatal or post-natal care, or where at the hospital's request the general practitioner undertook these services, the latter should be entitled to claim appropriate fees from the executive council.

156. It was clear that these arrangements were not working smoothly in all areas, and the Committee has therefore discussed the whole problem with the Ministry of Health, who have agreed to circulate a further memorandum to hospital authorities on the subject. The Committee has had an opportunity of examining a draft of the memorandum and has informed the Ministry that in its view the guidance given does not adequately emphasize the general practitioner's role in the maternity services. Discussions are continuing.

Maternity Record Card

157. The Conference last year suggested that practitioners should be provided with maternity record cards of a size suitable to fit inside the medical record envelope. The Committee fully supports this proposal and appropriate representations have been made to the Ministry of Health.

Use of Pethidine in Midwifery

158. A draft circular was submitted to the Committee early last year drawing attention to the possible dangers of a midwife using a supply of pethidine which had been obtained by a general practitioner by prescription on Form E.C.10 when she was already in a position to supply herself through the medical officer of health.

159. Following consultation between the Ministry of Health and the Home Office, the original draft has since been withdrawn and a circular has been issued in which it is stated that, whilst it is legally in order for a midwife working with a general practitioner to use a supply prescribed by the doctor or issued directly to him, nevertheless, to prevent confusion and waste, it is desirable that the general practitioner should not himself prescribe but should rely on the midwife's supply obtained through the medical officer of health.

160. The Committee considers that the revised form of the circular meets the criticisms which were made of the original draft.

Submission of Claims

161. The Committee is suggesting to the Ministry that, in the case of claims for services given following an emergency aid call from a midwife, the present period for submitting claims should be extended to six months. It is not always possible for the general practitioner to give the final post-natal examination within the three months now allowed, and it is important that more tolerance should be given in the submission of claims.

The Obstetric List

162. The Committee is grateful for the support given to it by the Conference last year for its contention that the Obstetric List served no useful purpose and should be abolished. This matter is being pressed with the Ministry of Health.

General Practitioners and Institutional Midwifery

Springfield Maternity Home, Blackburn

163. The Committee has made a strong protest to the Ministry about the decision by the hospital management committee to close the Springfield Maternity Home at Blackburn. Not only was the decision to close Springfield taken without adequate consultation with the local general practitioners, but the actual evacuation of the patients was carried out with complete disregard for their responsibility for the patients then in the home. The alternative accommodation offered was neither convenient nor practicable as far as the doctors in Blackburn itself were concerned, and representatives of the Blackburn and Lancashire Local Medical Committees were invited to accompany a deputation to the Ministry on the subject.

164. This deputation was received by the Permanent Secretary to the Ministry, who, whilst holding out little hope of reversing the decision of the regional hospital board to close Springfield, gave an assurance that the Board would be asked to consider carefully the provision of alternative accommodation which would be reasonably accessible to general practitioners in Blackburn. Later, a meeting of the

Board took place at which representatives of the various interests concerned were invited to be present to state their views as to the provision of alternative accommodation. The Board subsequently announced that it had reached the conclusion that the provision of additional general-practitioner maternity beds within the boundaries of the County Borough of Blackburn to replace those no longer available at Springfield was impracticable.

165. In view of the very strong feeling in the area, the Committee suggested that, in an attempt to meet the opposing views of both sides to the dispute, the situation should be investigated on the spot by representatives of the Ministry and the G.M.S. Committee. This proposal was not accepted by the Ministry, and in consequence a personal interview was sought with the Minister on the subject. It is, however, apparent that the Minister is unwilling to intervene in a matter which he considers to be within the competence of the regional hospital board and the hospital management committee. The Committee feels that it has taken every step open to it, but is both disappointed and disturbed that so little has been achieved as a result of its efforts.

Portway Maternity Hospital, Dorset

166. The Committee has similarly made representations in support of the provision of general-practitioner maternity beds at the Portway Maternity Hospital, Dorset. Efforts by the local medical committee have proved unavailing and the Committee, in consultation with the local bodies, is making a direct approach to the regional hospital board.

PROVISION OF DIAGNOSTIC AND ANCILLARY FACILITIES

167. In view of the unfortunate experience at the Springfield Maternity Home, Blackburn, and in other parts of the country, it is not surprising that a good deal of concern has been expressed that proposals to withdraw or vary clinical facilities which have been granted to general practitioners can reach an advanced stage before they come to the notice of the Committee. Such variations concern the provision of both general-practitioner beds and of diagnostic and other ancillary services. Proposals of this sort are generally initiated in a committee of the regional hospital board or in the hospital management committee, and, although there may be a general-practitioner member on the board or management committee itself, he may not necessarily be a member of the particular committee or sub-committee concerned. The Committee therefore drew the Ministry's attention to the desirability of instituting centrally early and full discussions on any proposals affecting facilities for general practitioners.

168. The Ministry expressed its full agreement that local medical committees should be informed and consulted at an early stage when any proposal was made on the hospital side affecting facilities available to general practitioners. It has undertaken to raise the matter with both senior administrative medical officers and secretaries of regional hospital boards. It will, at the same time, remind them of the desirability of including general-practitioner representation in all hospital management committees. The Ministry has also undertaken to take similar action so far as boards of governors of teaching hospitals are concerned.

REPRESENTATION OF GENERAL PRACTITIONERS IN HOSPITAL ADMINISTRATION

169. The Committee has continued its efforts to secure adequate representation of general practitioners in all spheres of hospital administration.

170. In the case of regional hospital boards, the Committee is pleased to report that there is now at least one general practitioner on every Board. In the teaching hospitals, however, the situation is far from satisfactory and, to quote the London area as an example, on only six of the Boards is general-practitioner representation at present included in the membership.

171. In appointing the members of regional hospital boards, the Ministry is required by the Act to consult such

organizations as may be recognized as representative of the medical profession in the area. Unfortunately, no similar obligation exists in the case of boards of governors of teaching hospitals. The Committee felt, however, that there was no reason why the Association should not seek to submit nominations under the provisions in the Act which require the Minister to consult with such other organizations as appear to him to be concerned, and, through Branches and Divisions of the Association and the local medical committees in the area, or preferably a combination of these bodies, nominate general practitioners to serve on boards of governors of teaching hospitals. This procedure would in no way modify the arrangements under which nominations are sought from the regional hospital board and medical staff of the hospital concerned.

172. The Committee therefore recommended to the Council that, in future years, Branches and Divisions of the Association, in consultation with local medical committees, should be invited to forward to Headquarters for transmission to the Minister the names of suitable general practitioners who were willing to serve on boards of governors of teaching hospitals. The Council has accepted this recommendation and the new arrangements will be put into effect next year.

EMPLOYMENT OF GENERAL PRACTITIONERS IN HOSPITAL

173. In its report to the last Annual Conference the Committee gave a detailed account of the negotiations which had then been taking place between the Joint Committee for Consultants and the Ministry of Health on the terms upon which general practitioners should be employed in N.H.S. hospitals. The G.M.S. Committee maintained that no practitioner working as a clinical assistant under supervision should be paid less than the rate laid down under paragraph 10(b) of the terms and conditions of service for hospital staff—that is, £175 per annum per weekly half-day. Subsequently, the Ministry put forward a proposal that a rate of pay of £125 per annum per weekly session would be appropriate. At that time negotiations were proceeding in Committee "B" of the Medical Whitley Council for a review of the remuneration of hospital medical staffs, and it was agreed between the Staff and Management Sides that the actual rate of payment for practitioners working as clinical assistants should be left in abeyance until the major question was resolved.

174. Nevertheless, although the remuneration of hospital medical staffs has since been revised no final decision has been reached on the rate laid down in para. 10(b) of the terms of service. The Committee is keeping in close touch with the Central Consultants and Specialists Committee of the Association on this issue, and it has been agreed that it would be advisable to defer any final decision until agreement has been reached on the future pattern of junior hospital staffing.

175. In the meantime the Ministry has agreed that general practitioners undertaking these duties should continue to be paid at the rate laid down in paragraph 10(b)—that is, £175 per annum per weekly half-day.

176. The Committee has been led to understand that, in some circumstances, there has been reluctance on the part of general practitioners in sending their patients to a hospital staffed by specialists who are also practising in the same area as general practitioners. The Committee is not unappreciative of this point of view and of difficulties which might arise, but hopes that every endeavour will be made at local level to overcome any obstacles which might militate against securing for the general practitioner his proper place in the hospital service.

APPOINTMENT OF CASUALTY OFFICERS IN HOSPITALS

177. The Committee's attention has been drawn to the difficulty which is being experienced by many hospitals in obtaining the services of casualty officers. During the course

of discussions with the College of General Practitioners it was suggested that consideration might be given to making it a requirement of entry into general practice that the practitioner should previously have held a casualty post. The Committee did not feel able to support this requirement. Whilst sympathetic with the position of the hospital authorities, the Committee feels that, to a large extent, the shortage of casualty officers is bound up with the reluctance of hospital authorities to admit general practitioners on a sessional basis. The Committee feels that the position would be eased and the hospital assisted if general practitioners were invited to undertake hospital sessions in rotation under arrangements which could be made locally. In this way general practitioners could gain useful experience within the limits of time which their respective practice commitments might allow.

178. These views have been placed before the Ministry.

ASSISTANTS IN GENERAL PRACTICE

179. Early in 1953 the Assistants and Young Practitioners Subcommittee drew the Committee's attention to the difficulties which were being experienced by assistants in attaining principal status in the National Health Service. A number of suggestions for solving the problem have been put forward by the Subcommittee—directed in the main to a reduction of the additional list of patients allowed by virtue of the employment of an assistant.

180. In the view of the parent Committee, none of the suggestions advanced would have successfully solved the main problem—that of the principal who advertises successive posts "with a view" and then has a series of assistants, none of whom is taken into partnership. The Committee, therefore, established a special subcommittee to examine the problem and to see what action could most usefully be taken to meet the views advanced by the Assistants and Young Practitioners Subcommittee. Its report is set out in Appendix D.

181. Before reaching any final conclusion on the recommendations made by the Subcommittee, the Committee remitted the whole report to its Assistants and Young Practitioners Subcommittee for its comments. After a very full discussion, the Assistants and Young Practitioners Subcommittee passed the following resolution:

"That the Subcommittee welcomes the recommendations contained in the report as a first step in the solution of the problem, which it will continue to study."

182. The G.M.S. Committee feels that the recommendations contained in the report would do much to solve the problems now facing assistants in general practice. It therefore recommends:

Recommendation B: That further efforts should be made, through the deans of medical schools, and through honorary secretaries of local medical committees, to ensure that final-year students and newly qualified practitioners are fully informed of the importance of entering into a formal agreement when accepting a post as an assistant, either with or without a view.

Recommendation C: That the Ministry of Health should be asked:

(i) To insert an additional section in paragraph 8 of the Terms of Service of General Practitioners so as to make it clear that local executive councils shall, in consultation with local medical committees, periodically review all cases in which consent has been given to the employment of an assistant;

(ii) By means of a circular letter to executive councils to point out that, whereas under the regulations the normal maximum additional list of patients permitted by virtue of the employment of an assistant is 2,000, local executive councils have power, where after consultation with local medical committees they are satisfied that a reasonable case exists for so doing, either after due notice to withdraw their original consent to the employment of an assistant or modify the number of additional patients otherwise permitted under their allocation schemes.

Recommendation D: That an appropriate letter be sent to local medical committees, drawing their attention to the proposed arrangements, and offering general guidance upon the principles they should adopt when advising their local executive

councils that in a particular instance it would be appropriate to withdraw the consent already given to the employment of an assistant, or to modify the size of list.

Recommendation E: That a principal implementing a "view" registered with the executive council should have the right to claim retrospective payment on the basis of notional lists for a period up to a maximum of one year.

GENERAL-PRACTITIONER REPRESENTATION ON THE CLINICAL RESEARCH BOARD

183. The Committee, in conjunction with the College of General Practitioners, has again made strong representations that general practitioners should be entitled to representation on the Clinical Research Board.

184. The Board is by no means unsympathetic, and the matter will be raised again when the term of office of the present members has expired.

GENERAL DENTAL SERVICES

Dental Anaesthetics

185. On a number of occasions the Committee's attention has been drawn to the inadequacy of the fee paid to general practitioners for providing dental anaesthetics. This matter has been discussed with the British Dental Association, who pointed out that the dentist can hardly be expected to pass on to the doctor a higher fee than he in fact receives from the Dental Estimates Board, and that the only remedy lies in a general upward revision of the scale of fees paid to dentists.

186. The Committee has therefore offered the British Dental Association its full support in any negotiations with the Ministry for an increase in the dental anaesthetic fees at present paid by the Dental Estimates Board.

Dental Haemorrhages

187. After long discussion with the Ministry the regulations have now been amended to enable a general practitioner to claim a fee for attending a case of haemorrhage following a dental extraction. Unfortunately there remain two circumstances in which a practitioner is unable to obtain a fee—namely, where the haemorrhage follows extraction in hospital and where the haemorrhage follows dental treatment given privately.

188. The Committee has been able to make little headway in the first set of circumstances, but, following discussions with the Ministry of Health, it is understood that the dental scale of fees now makes it possible for a dentist to make a claim when the arrest of haemorrhage follows an extraction carried out privately, provided that he is also taking part in the general dental services. When the dentist is in purely private practice no claim can be made on the National Health Service.

189. The Ministry is also looking into the possibility of paying more than one fee where more than one practitioner is called upon to arrest dental bleeding following the same extraction.

POST-MORTEM EXAMINATIONS

190. It has been suggested that arrangements should be made which would enable a practitioner to have a post-mortem performed by a consultant pathologist on any case of particular clinical interest—the cost being borne by the National Health Service. Because of possible legal implications, the Committee sought advice on the situation generally, but, unfortunately, the various enactments on the subject are by no means clear and are possibly out of keeping with present-day conditions. The Committee believes that it would serve no useful purpose to raise this matter officially with the Government departments concerned and is satisfied that, from a practical point of view, the position is adequately covered. In general, post-mortems can be divided into five main groups, namely:

(1) Those undertaken at the request of the coroner, which represent the majority of cases. Here the coroner

has an overriding interest over all other persons. Many cases of clinical interest come within this category.

(2) Another fairly large group—those carried out in hospital—covers many cases of clinical interest. Consent of the relatives is necessary in these instances, but in most cases is readily forthcoming.

(3) A group which can be described as ex-hospital cases. Here, if the general practitioner is in doubt, he can ask the hospital authorities to conduct a post-mortem and the certificate will be given in the proper way without reference to the coroner.

(4) Those where a general practitioner has attended the patient for some time. In these instances, he can communicate with the coroner, who can order a post-mortem, where the cost is defrayed from public funds. Here, again, a certificate can be given without an inquest.

(5) Lastly, there is a group where the relatives or executors wish for a post-mortem. In all these cases it is wise, as a matter of courtesy, to advise the coroner—the cost falls upon the relatives or executors making the request.

191. Within the limit of the instances which are cited above, any general practitioner who is in doubt over a case involving matters of clinical interest or public policy can achieve his objective through one or other of these channels. It is felt, therefore, that in view of the adequate arrangements which can already be made in the vast majority of cases no further action is called for at the present time.

NOTIFICATION OF PUERPERAL PYREXIA

192. The Committee has agreed to a suggestion by the Ministry of Health that the form of notification of puerperal pyrexia should be amended by adding the words "cause if known." The change was suggested because many notifications arose from pyrexia due to some known cause and not involving any epidemiological hazard.

REPORTS OF ACCIDENTS TREATED AT HOSPITAL CASUALTY DEPARTMENTS

193. The Committee's attention has been drawn to difficulties which are experienced by doctors in cases where patients present themselves for treatment stating that they have been involved in an accident and received treatment at a hospital casualty department. In the absence of any information about the nature of the injuries sustained and the treatment which has been afforded by the casualty officers, considerable inconvenience is caused to both patient and doctor.

194. The Committee, in consultation with the Central Consultants and Specialists and Public Health Committees of the Association, is investigating the possibility of asking hospital casualty departments to send short reports of these cases to the family doctor.

MEDICAL BOARDS

195. The Committee has been examining the possibility of facilitating the exchange of information between National Service medical boards and general practitioners where a patient is rejected as unfit for National Service.

196. The question of automatic notification has previously been discussed but found to be impracticable. The Ministry of Health suggested that it would be helpful if the patient was informed that the reasons for his particular grading were available to his general practitioner on request and that the address to which inquiries should be sent was notified at the same time.

197. The forms in question will be suitably amended and the Committee hopes that the action taken will prove to some degree a solution to this problem.

REPORTS FROM GENERAL PRACTITIONERS

198. The Committee has been asked for its views on the desirability of a general practitioner charging a fee for a report called for by a patient's employer. The Committee

takes the view that a distinction should be made between those cases where the report is required in the patient's own interests (for example, where a firm is prepared to make an *ex gratia* payment of salary if they can have some assurance that the employee is likely to return to work "within a reasonable time") and those where reports are required by an employer for administrative convenience in organizing the work of his firm or undertaking. In the former case, where only a brief statement as to the patient's fitness or unfitness for work is all that is required and it is in the patient's own interests that it should be given, it is the view of the Committee that no fee should be charged. In other circumstances the Committee feels that the general practitioner is fully justified in charging a fee.

APPOINTMENT OF AN ADVISER IN GENERAL PRACTICE TO THE MINISTRY OF HEALTH

199. The Committee, having learned of the appointment of an adviser in general practice to the Ministry of Health, sought an undertaking from the Ministry that such an appointment would in no way affect its own position as the source to which the Ministry looked for advice on all questions affecting general medical services.

200. The Ministry has assured the Committee that the new appointment should in no way be interpreted as implying any reflection on the arrangements for consultation on general practice problems which have developed so successfully since the Service began, nor will it in any way diminish such consultation in the future.

"HANDBOOK FOR GENERAL MEDICAL PRACTITIONERS"

201. Following the publication of the consolidated N.H.S. (General Medical and Pharmaceutical Services) Regulations, 1954, the Ministry has revised its *Handbook for General Medical Practitioners*. The Committee was given an opportunity of examining the *Handbook* in draft and it should be issued within the next few months.

202. The Ministry has been asked to consider whether the new edition of the *Handbook* cannot be published in loose-leaf form as is the case in Scotland, since there have been suggestions that, by so doing, it will facilitate any future revisions which may prove necessary should the regulations again need amendment.

CHILDREN'S COMMITTEES

203. At the last Annual Conference the Committee was asked to take such steps as were open to it to persuade local authorities, firstly, to co-opt general-practitioner representatives to Children's Committees, and, secondly, to encourage the attendance of a local authority medical officer at the meetings of these committees. The Committee understands that it is already within the powers of the local authority to arrange for the attendance of a medical officer of health or one of the authority's medical advisers at meetings of Children's Committees, and that in many instances full advantage is taken of this arrangement.

204. As far as general-practitioner representation is concerned, the Committee, through the Ministry of Health, has been in touch with the Home Office. The Home Office feels that it would not be proper for it to put any pressure on local committees to use their powers of co-option, but rather that in any particular areas where difficulty was being experienced the matter should be taken up on a local basis.

205. The Committee accepts this suggestion as the most practical way of dealing with the situation.

LOCAL MEDICAL COMMITTEES AND PRIVATE PRACTICE APPOINTMENTS

206. The Committee's advice has been sought on the propriety of local medical committees selecting practitioners for private appointments. In a particular case in point, the

Admiralty asked the executive council to submit the name of a practitioner suitable for appointment as an Admiralty surgeon and the executive council, in turn, referred the request to the local medical committee.

207. After careful consideration, the Committee has concluded that, whilst it would be quite proper for a local medical committee to circularize all doctors eligible for appointment when such a course is more satisfactory than advertising on a national basis, it feels that, once the local medical committee has obtained the names of those practitioners who wished to apply for the post, then all should be forwarded to the employer, with whom the final selection must rest. The Committee does not feel it desirable for any preliminary selection to be made by the local medical committee when posts outside the National Health Service are involved.

GENERAL PRACTITIONERS AND LOCAL AUTHORITY SERVICES

208. The Committee, together with the Public Health Committee of the Association, has under consideration a draft circular letter which the Ministry is proposing to circulate to local authorities on the subject of the facilities made available to the general practitioner by local authorities.

VACCINATION AND IMMUNIZATION

209. In its last report the Committee referred to the Ministry's proposal that a further circular letter should be issued setting out its policy on vaccination. It will be remembered that this action was suggested because the Committee had been disturbed to learn that a number of local authorities were proposing to discontinue the payment of fees for records of successful vaccination in the case of adults. The Ministry's circular, which the Committee had an opportunity of examining in draft, has now been issued and the Committee hopes that it will prevent similar difficulties arising in the future.

Vaccination Pad

210. Following representations by the Committee that the existing vaccination pad had proved to be unsatisfactory, the Ministry has introduced a new type of pad. The small square pad in which a piece of "cellophane" prevents contamination of the dressing when the tabs are removed is an improvement upon the old type, and the Committee decided not to press its original request for a type of single-strip dressing.

LEGAL POSITION OF THE NURSE

211. The Committee has been consulted by the Royal College of Nursing on the preparation of a memorandum on the legal position of the nurse who undertakes procedures outside her professional scope.

ACCIDENTAL POISONING OF CHILDREN

212. Discussions have continued with the Pharmaceutical Society about the protection of children against accidental poisoning by medicinal preparations. It is felt that no absolute safeguards can be provided by legislation, and the main duty of protection must always rest with the parent or guardian of the child. The Committee proposes to issue a joint memorandum on the subject at an early date and to initiate as much publicity as possible for it.

THE DEFENCE TRUSTS

213. The balance sheets and statements of income and expenditure of the National Insurance Defence Trust and the General Medical Services Defence Trust for the year ended December 31, 1954, are appended (Appendices E and F).

214. A statement showing the contributions so far received from each area is being sent to local medical committees.

A. TALBOT ROGERS,

Chairman,

General Medical Services Committee.

**GENERAL MEDICAL SERVICES SUBCOMMITTEE
(SCOTLAND)****Chairman and Vice-Chairman**

215. C. J. Swanson, Aberfeldy, and Catherine Harrower, Glasgow, were appointed Chairman and Vice-Chairman respectively for the Session 1954-5.

Subcommittees

216. The following Subcommittees were appointed for the session: Chairman's, Rural Practitioners', Colliery Practitioners', Dispensing Capitation Fee, Joint Subcommittee with the Central Consultants and Specialists Committee (Scotland) on Relation of General Practitioners to Hospitals, Special Subcommittee to consider the effect of the Working Party's Proposals on General Practitioner Remuneration in Scotland, Subcommittee to consider Medical Service Committees and Tribunal Procedure, and the Highlands and Islands Practitioners' Subcommittee.

Representation

217. Representatives of the Subcommittee were appointed to the following committees: Central Consultants and Specialists Committee (Scotland), and their Anaesthetic Services, Ophthalmic Services, and Radiological Services Subcommittees; Maternity Services, Public Health, Partnership Advisory, and N.H.S. (Scotland) Review Subcommittee of Scottish Committee; Assistants and Young Practitioners' Subcommittee of G.M.S. Committee; Staff Side of Medical Subcommittee of Scottish Advisory Committee (Whitley); Liaison Committee with Scottish Association of Executive Councils; International and Scottish Advisory Distribution Committees; Editorial Committee of *Prescribers' Bulletin*; Scottish Central Medical Recruitment Committee; Group Practice Loans Committee; Medical Advisory Committee under Regulation II of the Medical and Pharmaceutical Committees and Tribunal Regulations; Scottish General Dental Services Committee of the British Dental Association.

Partnership Practice

218. The Special Subcommittee which was set up to revise and redraft the Partnership Memorandum has now completed its task, and the Memorandum has been reprinted. The Subcommittee is glad to report that its publication has been well received. Copies may be obtained on application to the Scottish Office, British Medical Association, 7, Drumsheugh Gardens, Edinburgh, 3, or the Glasgow Regional Office, British Medical Association, 234, St. Vincent Street, Glasgow, C.2.

Remuneration

219. (a) *Distribution Scheme*. The Subcommittee which has under consideration the effects of the Working Party's Proposals on remuneration of general practitioners in Scotland has submitted a report to the G.M.S. Subcommittee to the effect that the new Distribution Scheme is working satisfactorily. The position will be reviewed in a year's time.

220. (b) *Supplementary Annual Payments*. The Central Supplementary Annual Payments Committee, which is composed of representatives of the Department and the General Medical Services Subcommittee (Scotland), has already met to consider certain applications for payments. The representatives of the Subcommittee on this Committee are C. J. Swanson, Catherine Harrower, and J. T. Baldwin, with J. T. McCutcheon in attendance as an observer.

Group Practice Loans

221. The Scottish Group Practice Loans Committee first met on April 5, 1954, and has now held four meetings and considered 21 applications. The Scottish share of the sum available for granting interest-free loans to doctors setting up group practices is £12,000. As no loans were approved in the financial year 1953-4, £24,000 was available for distribution in 1954-5. Loans totalling £21,250 have been

approved to 14 groups of applicants. Three applications were refused, three withdrawn, and one held over for further consideration.

Mileage

222. The Subcommittee is pleased to report a satisfactory outcome of the negotiations regarding a reallocation of the mileage fund in so far as the Highlands and Islands area is concerned. It is anticipated that this will now result in practitioners in this area receiving mileage payments at the same rate as their colleagues elsewhere. This matter is referred to in the General Medical Services Committee's Report, paragraph 66.

Laboratory Service

223. Proposals have been submitted to the Subcommittee by the Pharmaceutical Society for the setting up of a laboratory service for general practitioners. Local medical committees have been consulted with regard to the facilities at present available in their particular area. The matter has been referred to a Joint Subcommittee of the General Medical Services Subcommittee (Scotland) and the Central Consultants and Specialists Committee (Scotland), who are examining the proposals further in consultation with representatives of the Pharmaceutical Society.

**Medical Service Committees and Tribunal Procedure—
Regulations**

224. A preliminary discussion was held with the Department regarding certain proposed amendments to the above Regulations. The Subcommittee is, however, awaiting the Report of the General Medical Services Committee on this subject before considering further proposals.

Standard of Surgery and Waiting-room Accommodation

225. Proposals from the Department of Health in connexion with a survey of surgery and waiting-room accommodation have been considered, and the matter has been discussed fully in the Subcommittee and with representatives of the Department. It has now been agreed that the survey should be the responsibility of the executive councils, acting in consultation with local medical committees, provision being made for any local medical committee to undertake the review themselves should they so desire.

Admission of Assistants to Medical List

226. The Subcommittee has had discussions with the Scottish Association of Executive Councils on the desirability of adopting the English procedure whereby only a part-time assistant building a list of his own may be admitted to the list of an executive council. The matter is still under discussion.

Inducement Payments

227. The Subcommittee has been considering, in consultation with the Department of Health, the general question of inducement payments, with particular reference to a "target" net income below which practitioners in the great majority of cases would qualify for inducement grants, and also the possibility of fixing an inducement payment to a particular practice so that when a vacancy is advertised it should be possible to include in the advertisement the amount of inducement grant payable.

Form E.C.10A

228. Discussions are being held with the Department regarding the method to be adopted to ensure that prescriptions, which include drugs covered by the Dangerous Drugs Regulations, on stock order forms comply with these Regulations. It is probable that the discussions will result in Forms E.C.10A having to be completed in duplicate by means of a carbon so that a copy may be retained by the chemist.

Superannuation Regulations

229. The Subcommittee has been represented at a meeting in London between representatives of the General Medical Services Committee and the Ministry of Health, and in Scotland with representatives of the Central Consultants and Specialists Committee (Scotland) and the Department of

**APPENDIX A
ATTENDANCES AT MEETINGS OF GENERAL
MEDICAL SERVICES COMMITTEE AND ITS
SUBCOMMITTEES (TO MARCH 17, 1955)**

Health, regarding certain proposed amendments to the Superannuation Regulations. The three main points under consideration are: superannuation deductions in partnership practice, part-time hospital appointments held by general practitioners, and short service and death gratuities.

Ambulance Service

230. The Subcommittee has agreed with the Department of Health's proposals which resulted in the setting up of regional ambulance committees—which include representatives of local medical committees—in an effort to ensure the smooth and economical working of the ambulance service.

Form R.M.2(A)

231. Representations have been made to the Department of Health regarding the possible re-drafting of this form, and a meeting was held recently at which the various suggestions of the Subcommittee were considered. The Department's observations on the proposals are awaited.

Back-debits and Back-credits

232. Discussions have been held with the Department regarding the possibility of abolishing both back-debits and back-credits, and both sides appeared to favour such an arrangement. Representations were duly made to the G.M.S. Committee, but, while that Committee received the proposals favourably, it could not agree to support our suggestion for the abolition of back-debits and back-credits on a U.K. basis, since the Annual Conference of Local Medical Committees in 1954 had resolved in favour of the continuance of this system. This matter is referred to in the Report of the G.M.S. Committee, paragraphs 51-3.

The General Practitioner and Hospital Service

233. After much discussion by the Joint Subcommittee of the General Medical Services Subcommittee (Scotland) and the Central Consultants and Specialists Committee (Scotland), the Subcommittee has now received and endorsed recommendations by the Joint Subcommittee designed to accelerate the introduction of some of the recommendations contained in the report of the Scottish Health Services Council on this subject. It has been suggested to the Department that they should advise the setting up of joint committees between executive councils and hospital boards to examine the situation.

Change of Name and/or Address

234. A suggestion was made to the Department of Health for an amendment of the medical card whereby a space could be provided to enable patients to notify direct to executive councils a change of name and/or address. In addition, it was suggested that tear-off pads might be provided for the use of practitioners in notifying such changes. The Department has now agreed to the proposals.

Small Practice Vacancies

235. In connexion with this matter, which was mentioned in last year's Report, very little progress has been made. The question has again been discussed by the Liaison Committee with the Scottish Association of Executive Councils and the Department, but so far nothing definite has materialized. The matter is still under discussion.

Maternity Services

236. The Maternity Services Subcommittee of the Scottish Committee has again suggested to the Department some amendment of the maternity record card and the claim forms. In addition, the attention of the Department has been drawn to the difficulties which exist in some cases because of the requirement for practitioners to carry out antenatal examinations at the 36th and 38th week of pregnancy. As a result of the representations it is hoped that any difficulties which may have been experienced will no longer exist.

CHARLES J. SWANSON,
Chairman,

General Medical Services Subcommittee (Scotland).

Name	G.M.S.C.		Subcommittees, Deputations, etc.	
	Actual	Possible	Actual	Possible
Arthur, J. G.	7	8	1	1
Baldwin, J. T.	6	8	—	—
Beauchamp, A. (Chairman of Conference of L.M.C.s)	6	8	2	5
Bleakley, J.	6	8	—	—
Bowie, D. C.	8	8	4	4
Brown, A.	8	8	6	6
Brown, J. A.	4	8	—	—
Callander, L. Dougal	8	8	—	—
Campbell, A.	1	8	1	1
Cardew, B.	8	8	4	5
Carter, O. C.	5	8	—	—
Catto, F. S.	8	8	—	—
Chalke, H. D.	7	8	2	2
Cronhelm, H. J. (Deputy for J. Bleakley)	—	2	—	—
Dain, H. Guy	8	8	3	3
Darling, W. N.	5	8	—	—
Davies, A. B.	7	8	6	7
Everest, L.	6	6	—	—
Faulkner, H. C.	7	8	—	—
Gibbons, P. J.	5	8	3	5
Goodwin, E. W.	6	8	1	2
Grant, I. D.	5	8	—	—
Gray, F.	8	8	15	16
Green, R.	6	8	1	2
Gregg, E. A.	3	8	—	—
Hamilton, R. C.	8	8	—	1
Hargest, T. J.	4	8	1	2
Harrower, Kate	2	8	—	—
Hickley, G. M.	2	8	3	3
Hilditch, H. P.	2	6	—	—
Hill, T. Rowland	—	8	—	—
Hollis, H. F.	7	8	4	5
Hutchinson, D. F.	—	8	—	—
Jones, I. G.	6	8	3	6
Killick, C. F. R.	4	8	—	—
Knox, W. M.	7	8	1	1
Lishman, F.	8	8	1	1
McConnell, R. W.	8	8	—	—
McDonald, D. T.	1	8	—	1
McNee, Sir John	—	8	—	—
Mathias, A. N.	8	8	1	2
Maurice-Smith, K. S.	8	8	2	4
Milloy, J. M. (deputy for J. R. Nicholson-Lesley)	1	1	—	—
Murray, J. D. R.	6	8	—	1
Nicholson-Lesley, J. R.	4	5	1	1
Page, F. T.	2	4	—	—
Parkes, M.	6	8	—	—
Pridham, J. A.	7	8	3	3
Rogers, A. Talbot (Chairman)	8	8	25	28
Rose, F. M.	7	8	4	6
Rose, H. N.	8	8	3	3
Russell, L.	6	8	3	3
Scott, C. M.	8	8	1	2
Scott, S. Noy	4	4	—	—
Smoritt, F. A.	6	8	2	2
Sorsby, M.	8	8	—	—
Sutherland, H. H. D.	8	8	2	3
Swanson, C. J.	8	8	—	7
Thorp, H.	7	8	—	—
Ward, S.	8	8	7	12
Whitaker, D. F.	7	8	—	1
Williams, G. P.	8	8	—	1
Wilson, A. S.	8	8	1	4
Wood, H. S. Howie	8	8	3	4
Woolley, W.	1	4	—	1
Young, J. B.	—	8	—	—
Adams, K.	—	—	2	2
Anderson, D. T.	—	—	1	1
Brown, G. B.	—	—	1	1
Browne, H. J.	—	—	1	1
Doherty, I. H. P.	—	—	2	2
Elliot, J. E.	—	—	1	1
Forbes, R.	—	—	1	1
Foreman, Mary I.	—	—	1	1
Gethen, R. C. R.	—	—	1	1
Gilmore, J.	—	—	1	1
Gould, G. M.	—	—	2	2
Hughes, D. M.	—	—	1	1
Jenkins, A. E.	—	—	—	3
Lawrence, R. A. A. R.	—	—	1	1
Maiden, A. M.	—	—	—	1
Marshall, J. B.	—	—	2	2
Mathews, R. G.	—	—	—	1
Milner, A.	—	—	1	1
Murray, M. V.	—	—	1	1
Paton, A. D.	—	—	—	2
Poteliakhoff, A.	—	—	3	3
Sawdon, Eleanor M.	—	—	—	1
Sim, D.	—	—	—	3
Stewart, J. A.	—	—	—	3
Taylor, C.	—	—	1	1
Vickers, H.	—	—	—	1
Weils, J. D.	—	—	—	1

ATTENDANCES AT MEETINGS OF GENERAL MEDICAL SERVICES SUBCOMMITTEE (SCOTLAND) AND ITS SUBCOMMITTEES

	G.M.S. Subcom- mittee (Scotland)		Subcommittees and Deputations	
	Actual	Possible	Actual	Possible
Alston, D. M.	—	—	1	1
Anderson, J. R.	3	4	4	7
Anderson, W. D.	2	3	—	—
Auchterlonie, N.	1	4	1	1
Baird, W. A.	2	4	1	1
Baldwin, J. T.	2	4	8	9
Bowman, F. J. S.	4	4	—	—
Cable, J. Ewen	2	4	5	6
Cameron, Angus	4	4	—	—
Campbell, Angus	—	—	2	2
Campbell, J. M.	—	—	1	1
Cumming, A.	—	4	—	—
Darling, W. Neil	2	4	2	3
Dunbar, J.	2	4	—	—
Emslie, W. Ingram	2	4	3	3
Erskine, G.	1	4	1	1
Fergusson, R. S. C.	—	—	1	1
Fordyce, A. B.	—	4	—	2
Fulton, W. W.	3	4	—	—
Gardner, W. S.	1	4	—	—
Gibson, W.	2	4	—	—
Girvan, A. M.	4	4	2	2
Grant, I. D.	1	4	—	3
Hamilton, J. G. M.	—	4	—	3
Hamilton, J. N.	—	4	—	2
Hamilton, R. C.	1	4	1	7
Harrower, Catherine	4	4	7	10
Henderson, S. J.	—	—	—	1
Hutchinson, B.	4	4	2	3
Ingram, F.	1	1	—	—
Jamieson, G.	—	—	1	1
Jope, W.	—	—	—	1
Knox, W. M.	3	4	6	7
Kuenssberg, E. V.	4	4	—	—
Lang, A. F.	—	—	1	1
Langmuir, J. R.	1	4	1	3
Logan, D. Dale	4	4	1	1
Macarthur, J. C.	4	4	3	3
Macaulay, J. L.	1	4	2	2
McCallum, J. D.	—	—	1	1
McGregor, A. M.	—	—	1	1
McGregor, R. M.	4	4	1	1
Mackie, A. W.	—	—	1	1
MacLeod, A. J.	—	—	1	1
McMillan, J. C.	4	4	1	1
Millar, A. F. Wilkie	3	4	3	4
Mitchell, A. D.	—	—	1	1
Nelson, Noel	3	4	—	—
Nisbet, B. R.	4	4	—	—
Philip, P. W.	4	4	3	3
Pitkeathly, A. J.	—	4	—	—
Reid, E. Neil (deputy for B. R. Nisbet)	—	—	—	—
Ross, W. B.	—	—	1	1
Rogers, A. T.	—	4	—	—
Sandeman, C. S.	3	4	2	2
Sandison, A. E.	2	2	—	—
Scott, A.	—	4	—	—
Sinclair, F. McE.	—	—	1	1
Smith, A. M.	—	—	1	2
Smith, W. E.	4	4	2	2
Strathern, H.	3	4	1	1
Swanson, C. J.	4	4	14	15
Thow, G.	3	4	1	1

APPENDIX B

NOTE OF A DISCUSSION WITH THE MINISTER OF HEALTH ON DECEMBER 9, 1954, ON THE PROVISION OF DRUGS FOR PRIVATE PATIENTS

Present: A. Brown, A. Talbot Rogers, D. P. Stevenson, and W. Hedgcock.

1. Dr. Rogers said that, in pursuing this question, the Committee did so with the full knowledge that its implementation would require an amendment of the Act and that this might not be possible at the present time. Dr. Rogers referred to the very considerable amount of feeling in the profession that the present state of affairs was inequitable. It seemed quite unnecessary to regard prescribing as an inseparable part of general medical services, and the profession had always been led to believe that patients would be free to use separately any part of the services which were provided under the Act. It was believed that it would not be difficult to devise satisfactory machinery which would prevent any abuse, and, in the opinion of the

Association, the fear that it might lead to two standards in general practice was quite unfounded. Whilst appreciating the present difficulties, the Committee would like to know what the Government's policy would be at a time when amending legislation became a practical proposition.

2. Dr. Brown amplified Dr. Rogers's statement, and said that when the Act was introduced the impression gained ground that patients would be able to take advantage of the Service either in part or in whole. Now it was found that the supply of drugs was tied up with treatment and that an amendment to the Act would be necessary to give effect to this part of the Association's policy. Dr. Brown said that he appreciated to the full the difficulties in the political field and the lack of time available for legislation at the moment. What his Committee, the Private Practice Committee, would like to know was whether the Government accepted the view that a private patient was entitled to drugs under the Service. Once that principle had been decided any administrative difficulties could be examined.

3. The Deputy Secretary said that there were four particular points which he would like to make. Two arose out of the recently published Report of the Cohen Committee on General Practice. Firstly, the suggestion that the proposal would introduce two standards in general practice had given rise to considerable resentment in the profession and, in his view, such a situation might well exist in reverse to-day when many private patients were unable to afford the drugs necessary for their treatment. Secondly, it had been stated that many doctors in private practice would be unwilling to accept the imposition of any necessary safeguards. The Association, which represented the whole of the profession, would be only too willing to discuss the introduction of measures to prevent abuse, and, indeed, some form of contract and some ultimate sanction, such as the removal of a licence to prescribe on Form E.C.10, had always been envisaged. The Association was not, of course, aware of the source of this statement, but, for its part, it recognized that if its point was met, the Association would be only too glad to devise adequate safeguards.

4. The third point concerned finance. Although time alone would show the cost of allowing private patients their drugs on Form E.C.10, it was quite possible that any increase in the drug bill which resulted would be offset, at any rate to some extent, by an increase in the amount of private practice, with a consequent reduction in the amount of public funds which went into the Central Pool.

5. There remained the political aspect, and it was here that it was hoped that the Minister would explain the Government's policy.

6. Mr. Macleod said that there had been no change either in the situation generally or in his own views on the subject. It had been suggested that there was a breach of faith on the part of the Government in not giving effect to a promise which was contained in an election manifesto.

7. This was not so. The pamphlet issued by the Conservative Party which had advocated this right for private patients had appeared in July, 1949. This pamphlet was in no way a form of election manifesto, and, indeed, the proposal had been dropped completely from the Party's electioneering programme which appeared some six months later. Again, in the 1951 election no mention of it had been made at all. The Conservative Party's reason for withdrawing from its original position was that it realized the impracticability of making any concession on the lines suggested when the full and mounting cost of the Health Service became apparent. As far as the Cohen Committee was concerned, the Parliamentary Secretary's reply in the House of Commons to the effect that the Cohen Committee was unanimous on this particular point was made in perfectly good faith. No minority report or anything of a similar nature had appeared when the report was published, and, if any members of the Cohen Committee had had any reservations, it would have been proper for them to have stated this when they were considering their report in its draft form.

8. From the Government's point of view the question raised three difficulties, those of legislation, finance, and

administration. The door was by no means shut. The proposal which was made in the 1949 leaflet was withdrawn purely because of the financial position of the National Health Service, and it had never been restored. He found himself in no position to give any undertaking of any sort that the Government would commit itself to allowing private patients to be supplied with drugs under the Service either at present or any future time. As far as the administrative difficulties were concerned, they were formidable but not insurmountable. He did not necessarily agree with the views of the Cohen Committee on this particular point, and, if the Government agreed to give private patients this right, then there was little doubt that any proposals would be discussed with the profession in advance.

9. In brief, Mr. Macleod said that the situation could be summarized—that the proposal was not repugnant to Conservative principles and that the door was by no means shut. He could, however, give no undertaking that the change either could or would take place.

10. The Minister agreed that his officials, in consultation with Dr. Stevenson, should formulate and agree a statement for publication which would set out the Government's view on the question.

APPENDIX C

REPORT OF THE SUBCOMMITTEE ON SERVICE COMMITTEES AND TRIBUNAL REGULATIONS

Preliminary

1. The Subcommittee was reappointed by the General Medical Services Committee at its meeting on July 22, 1954, with the following terms of reference and personnel:

Reference: That a Subcommittee be appointed to review the constitution and procedure of Medical Service Committees and to report with recommendations to the parent Committee.

Personnel: A. Talbot Rogers, B. Cardew, H. Guy Dain, F. Gray, R. C. Hamilton, Kate Harrower, D. F. Hutchinson, W. M. Knox, A. N. Mathias, F. A. Smorffitt, and H. H. D. Sutherland; together with three representatives of the dentists and one representative of the pharmacists when matters of common interest are under discussion.

Chairman

2. H. Guy Dain was appointed Chairman of the Subcommittee.

Revision of the Service Committees and Tribunal Regulations

3. During the past session the Subcommittee has continued its discussions with the Ministry of Health on the recommendations for the revision of the Service Committees and Tribunal Regulations which were approved by the Annual Conference in 1953. Representatives of the British Dental Association and the National Pharmaceutical Union have been present throughout the negotiations.

4. Unfortunately, there has been some delay in completing these discussions. In the first place, the Ministry had to consult the Executive Councils' Association on the changes proposed, and, secondly, the Committee was asked to consider a number of new proposals put forward by the Ministry itself. Nevertheless, agreement has now been reached on the majority of the points under discussion, and the Subcommittee is pleased to report that most of its own recommendations have been accepted by the Ministry and will be met either by a revision of the regulations or, where more appropriate, by the addition of further guiding paragraphs in the *Handbook on Service Committee Procedure*.

5. Only in a few instances has the Subcommittee decided, after discussion with the Ministry, not to pursue its original recommendations.

6. The stage has now been reached where drafts of amending regulations have been prepared and regulations will be made and laid before Parliament if the various steps proposed are approved by the G.M.S. Committee and the Conference.

7. A summary of the present position setting out the outcome of the negotiations to date is set out below:

I. Recommendations which have been Agreed with the Ministry of Health (Subject, in some instances, to Minor Modification)

Appointment of Chairman and Deputy Chairman

Recommendation A: That Regulation 3(3) should be modified so as to leave the field open to non-members of the executive council, it being understood that notwithstanding the wider field of selection envisaged, the person appointed should be acceptable to both parties represented on the Service Committee.

8. The Ministry has accepted the suggestion that the post of chairman of a Service Committee should be open to non-members of the executive council with a proviso, to which the Subcommittee has agreed, that he should not be a member of one of the professions concerned.

Position of an Interested Person who is a Member of the Service Committee

Recommendation B: That provision should be made in the regulations for a requirement that a member of a Service Committee who is an interested party in the matter under consideration shall be required to disclose his interest either to the Chairman before the meeting or at the commencement of the proceedings.

9. Although in broad agreement with the Subcommittee's suggestions, the Ministry held that failure to disclose any interest should not invalidate the proceedings of the Committee. The Subcommittee did not feel able to accept this position and maintained that, not only should members of Service Committees be required to disclose their interest prior to the meeting, but that a record of replies made should be included in the Minutes of the proceedings.

10. After further discussion, the Ministry suggested that the situation should be met by ensuring that the notices calling meetings of Service Committees refer in comprehensive terms to the duty of each member to disclose any interest which he may have in the case concerned.

11. This has been accepted as an equitable solution to the problem.

Deputy Chairman

Recommendation C: That consideration be given to the practicability of appointing a deputy chairman for a defined group of executive council areas adjacent to each other.

12. The Ministry felt difficulty in this suggestion as tending to divorce the deputy chairman from the actual proceedings of any one Service Committee. The Subcommittee made a somewhat modified proposal, that in a group of executive council areas the chairman of each Service Committee should act as deputy chairman for other committees in the group. The Executive Councils' Association is being consulted about arrangements on these lines.

Investigation by Service Committee

Recommendation D: (1) That the following proviso be inserted after Regulation 4(1):

"Provided that no such complaint shall be investigated as aforesaid unless made by a person for whose treatment the medical practitioner is responsible in respect of treatment afforded to him by such medical practitioner or person authorized by him in writing to make such complaint or his spouse or in the case of an infant his parent or guardian or in the case of a person unable to make such complaint owing to mental infirmity a close relative or in the case of a deceased person his personal representative(s), or in the case of the Ministry of National Insurance a responsible official of that Department."

(2) That the following be inserted in place of Regulation 4(3):

"Subject as hereinafter provided the Dental Service Committee shall investigate any complaint that a dental practitioner has failed to comply with the terms of service made by a person for whom the dental practitioner has undertaken or agreed to undertake treatment."

"Any complaint made under this regulation shall be made by the person for whom the dental practitioner has undertaken or agreed to undertake treatment; provided that on being satisfied that any such person is deceased or that he is unable

through age, infirmity or other reasonable cause himself to make the complaint the Committee may investigate a complaint made by some other person on his behalf."

13. Considerable discussion has taken place on this recommendation and the Ministry, at first, would not agree that the right of complaint should be limited in the way proposed. Subsequently, however, it was agreed that both the procedure and the regulations should be amended to indicate that, where the patient is able to express an opinion on his treatment, complaints should not be pursued except by his spouse or with his endorsement. Where the complaint has not been made by the patient or a properly authorized person, then the chairman of the executive council will have discretion to refer the case to the council for investigation under Regulation 4(5). The amendments which are being made in this instance largely give effect to the Subcommittee's original recommendation.

Procedure of Service Committee

Recommendation F: That the substance of the following paragraph of the *Handbook on Service Committee Procedure* should be incorporated in the regulations:

"7. Similarly if a practitioner's observations on alleged acts of omission or commission are sought by the executive council prior to possible reference of a case to a Service Committee under Regulation 4(5) the source from which the information has come should be indicated and also any provisions in the terms of service alleged to have been broken. If no term of service is affected the reason why the conduct of the practitioner is being investigated should be clearly set out."

14. It has been agreed that the matter should be specifically covered in the regulations.

Professional Adviser to Chairman

Recommendation G: That the Chairman of a Service Committee should be required to confer with a professional adviser who is not a member or a deputy member of the Service Committee but selected by the Service Committee from a panel nominated by the local professional committee, when deciding whether a statement made by a complainant discloses prima facie ground of complaint.

15. The Ministry is prepared to give executive councils strong advice on the subject in the *Handbook*, but does not think it appropriate to include specific provision to this end in the regulations.

16. The Subcommittee accepted this view.

Rules of Procedure—I(1)(a)

Recommendation H: That the Clerk should be required only to inform the complainant of the procedure which will be followed if a further statement is not received within seven days, namely, that the case will be brought before the Service Committee, which has power to dispense with the hearing.

17. The Subcommittee's recommendation, now accepted by the Ministry, was intended to overcome the wording of the rule which required the Clerk to invite the complainant to submit a further statement. Under the amendment now proposed, the complainant will merely be asked whether he wishes to submit a further statement within seven days.

Rules of Procedure—I(1)(b)

Recommendation I: That any communication from an executive council to a practitioner informing him that a complaint has been lodged against him by or on behalf of a patient, shall embody a clear warning that his reply will be produced at any inquiry which might follow and may there be used in evidence.

18. The Ministry has accepted this recommendation, and it will be dealt with by an appropriate amendment to the Rules of Procedure.

Rules of Procedure—I(1)(c)

Recommendation J: That the period of three days referred to in Rule 1(1)(c) be extended to seven days and a further requirement of the Clerk be added to ensure that copies of the documents are sent to the secretary of the local professional committee.

19. The Subcommittee's recommendation has been accepted and an appropriate amendment will be made to the Rules of Procedure.

Rules of Procedure—I(1)(h)

Recommendation L: That Rule 1(1)(h) be amended so as to make it obligatory to adjourn the committee if a new issue is admitted.

20. The Ministry could not accept this recommendation as it stood, but suggested strengthening the position of a respondent by laying on him the responsibility for asking that there should not be an adjournment, and giving the Chairman express discretion whether to adjourn the meeting. As a further measure, however, the Subcommittee sought an amendment to Rule 1(1)(h) to make it clear that whenever a new issue is brought in there should be an opportunity for the respondent to consult his professional representative (if present), during which time the case should stand adjourned.

21. The Ministry has agreed to amend the Rules of Procedure to this effect and, furthermore, has undertaken to include in the *Handbook* advice to the Chairman of the Service Committee that, if a new issue should arise when there is no professional representative available for consultation, the Chairman should advise the respondent to seek an adjournment and that the case should only be proceeded with if the respondent so requests in the face of the advice by the Chairman.

Report of Service Committee

Recommendation M: That the Rules of Procedure should be amended so that a Service Committee is not required to report in detail on those cases where there is no prima facie ground of complaint.

22. The Subcommittee has agreed that this recommendation could within the existing regulations be met by modifying the form of report which is used in these cases.

Reference to Previous Cases

Recommendation N: That an amendment be sought to Regulation 5(4) so as to ensure that reference to previous cases should be made only when failure to comply with the terms of service was found in those cases and is also found in the present case.

23. After very full discussion, the Ministry has accepted the position that previous convictions should only be taken into account after the Service Committee had found that the respondent had breached his terms of service. An appropriate amendment will be made to Regulation 5(4).

Representations of Executive Council to Tribunal

Recommendation O: That the words "any relevant findings" in Regulation 8 be amended to read "any relevant findings of fact."

24. This recommendation has been accepted.

Procedure on Appeal

Recommendation P: That in cases where the practitioner has been found not guilty of a breach of the terms of service and a patient then appeals against the decision of the executive council, the persons appointed to hear the oral representations shall include a medical or dental practitioner, as the case may be, selected from the panel of practitioners referred to in Regulation 11.

25. The Ministry has agreed to this proposal and the regulations are being amended accordingly.

Procedure on Withholding Money—Regulation 11(1)

Recommendation R: That Regulation 11(1) be amended to provide that the Minister should not be empowered to impose a fine following either a hearing by a Service Committee, or an appeal against the findings of a Service Committee, which results in a verdict favourable to a practitioner.

26. It has been agreed that the regulations should be suitably amended with regard to action following decisions of executive councils on Service Committee proceedings.

Procedure on Withholding Money—Regulation 11(6)

Recommendation S: That Regulation 11(6) be amended by

- (i) the addition of the words "so far as may be in rotation" after the word "Minister" in line 4;
- (ii) the insertion of the words "for that purpose" after the word "nominated" in line 6.

27. This suggestion has been accepted and the regulations are being amended accordingly.

Appeals—Dental Estimates Board

Recommendation T: (i) That Regulation 18(2) be amended by the addition of the following:

"The Minister may, on the application of any person desiring to appeal, extend the time for giving notice of appeal and may do so although the application is not made until after the expiration of one month from the date on which notice of the Board's decision was received."

(ii) That the following be substituted for Regulation 18(3):

"The Minister shall appoint two dental practitioners, of whom one shall be selected from a panel of dental practitioners who are or have been engaged in the provision of general dental services nominated for that purpose by organizations which are, in the Minister's opinion, representative of the dental profession. The practitioners so appointed shall hear the representations of the appellant and the Dental Estimates Board and determine the appeal."

28. This recommendation has been accepted in principle by the Ministry and the regulations have been re-drafted to meet the Subcommittee's wishes.

II. Recommendations which the Subcommittee has Decided not to Pursue

Time Limit for Making Complaints

29. In its report the Subcommittee indicated firstly that the period of six weeks normally allowed for a complaint to be lodged was unnecessarily long; secondly, that any application made to the Minister for permission to investigate a complaint should be supported by a majority vote of the members of the Service Committee; and, thirdly, that when the Minister was called upon to reach a decision on any application which was made for permission to consider a complaint which had been received after the time limit for making complaints had expired he should have the benefit of independent advice similar to that which is given by the Medical Advisory Committee constituted under Regulation 11(4). The Subcommittee therefore put forward the following detailed recommendations:

Recommendation E: (i) That the period of six weeks referred to in Regulation 4(4)(a) be reduced to four weeks;

(ii) That the period of two months referred to in 4(4)(c)(i) be reduced to six weeks;

(iii) That any application to the Minister for permission to investigate a complaint, notice of which is received more than six weeks after the event, should be supported by a majority vote of the members of the Service Committee, and that in the event of a decision to refer the case the Minister should, before reaching a decision, be advised by a committee having a similar constitution to that of the Medical Advisory Committee constituted under Regulation 11(4);

(iv) That the following be substituted for Regulation 4(4)(b):

"The person desiring to make a complaint under this regulation against a dental practitioner shall within six months after the completion of treatment, or within four weeks after the event which gave rise to the complaint, whichever is the sooner, give written notice to the clerk of the council stating the substance of the matter which it is desired to have investigated";

(v) That the following be substituted for Regulation 4(4)(c)(ii):

"(ii) in the case of a complaint against a dental practitioner the complaint is made within six months after the completion of the treatment or within six weeks after the said event, whichever is the sooner, or";

(vi) That Regulation 4(4)(c)(iv) be modified so as to make it clear that the practitioner's representations relate solely to the question of the departure from the time limit for making the complaint.

30. The Ministry pointed out that the various proposals contained in the Recommendation could well be interpreted as a curtailment of the rights of the patient and, as such, could not be accepted.

31. In particular, it did not feel that the period of six weeks allowed for making a complaint could properly be reduced. Partly to meet the Subcommittee's suggestions

and partly in pursuance of one of its own proposals, the Ministry suggested that the special provision relating to complaints made within two months might be replaced by giving the patient a right to appeal to the Minister against the decision of an executive council not to investigate a complaint made after the expiration of the six-week period.

32. The Subcommittee did not consider that a right of appeal by the complainant to the Minister against the refusal of an executive council to hear a complaint received out of time was necessary—particularly where the complaint was out of time due to misdirection.

33. As a result of further discussions, the Ministry agreed to withdraw its suggestion, and the appropriate paragraphs in the *Handbook on Service Committee Procedure* will be strengthened to bring to the notice of the executive council that permission should not normally be refused in these circumstances. The Subcommittee has not pressed its own recommendations.

34. In amending the regulations, the time-limits on reference under Regulation 4(5) have been applied more specifically to correspond with the periods stipulated in Regulations 4(4)(a) and (b).

Rules of Procedure—I(1)(f)

Recommendation K: That the words "such" and "as the Committee may think" be deleted from Rule 1(1)(f) so that it reads:

"Either party shall be entitled to be present at the hearing and to give and call evidence relevant to the matters at issue, and may put questions relevant to the matter in dispute to the other party or to any witness called by him, either directly, or, if the committee so direct, through the chairman of the committee. Subject as aforesaid, the procedure at the hearing shall be such as the committee may determine."

35. The Ministry's view was that, as the rule stands, the Service Committee has full discretion whether to admit evidence and that a very substantial protection exists in the practitioner's right of appeal to the Minister. In addition, the respondent has the right to demand an oral hearing if it is proposed to withhold money from his remuneration or impose a similar penalty, whilst the right of appeal is in terms wide enough to cover an appeal on the grounds of the admission of irrelevant evidence. Further in the case of an oral hearing, the case is heard *de novo* by way of a re-hearing.

36. The Subcommittee feels that, in view of the Ministry's assurances on this point, its original recommendation need not be pursued.

Appeal to the Courts

Recommendation Q: That the present appeals machinery be amended so as to provide that the person appointed under Section 42 of S.I. 507 (1948) to hear the appeal should be appointed by the Lord Chancellor, and should be a practising barrister or solicitor of not less than ten years' standing, not being a member of the staff of the Ministry of Health.

37. Following discussion, the Subcommittee received the following letter from the Ministry of Health on this point:

"We cannot accept this point on procedure on appeal from a decision of the National Health Service Tribunal. Such an appeal is heard in practice by a member of the legal staff of the Department, assisted by a practitioner selected from the appropriate panel, and it has been suggested that the Minister's officer should be replaced by a practising barrister or solicitor of not less than ten years' standing, not being a member of the staff of the Ministry, and appointed by the Lord Chancellor. The case will already, however, have been before the National Health Service Tribunal whose chairman must under the National Health Service Act, 1946, possess the qualifications now proposed for the person to hear an appeal. The appeal is not, under the Act, from one Tribunal to another, but from the Tribunal to the Minister, who can only decide to confirm or revoke a direction of the Tribunal that a practitioner's name be removed from the list: he has no jurisdiction where they have not directed removal.

"The function of the person hearing the appeal (who has been in practice, a barrister of not less than 20 years' standing) is to prepare, from the facts and contentions placed before him, a report which the Minister refers to the appropriate Advisory Committee for recommendations, which he considers, together with the report, before reaching his decision. It is, of course,

open to the Minister to seek any further advice which he may consider desirable on any point arising and if matters of law arose it would be open to him where he thought it necessary to seek the views of the law officers of the Crown.

"On this explanation of the Minister's functions and the way in which they are exercised he thinks it will be agreed that the appointment of a barrister or solicitor in the manner suggested would hardly be appropriate."

38. The Subcommittee is satisfied that, in the light of the Ministry's explanation, there is no necessity for seeking a revision of the appeals machinery.

Employment of Counsel

Recommendation U: That Regulations 12, 13, 14, 15, and 16 be amended so as to make it clear that a practitioner may be represented by counsel or other paid advocate, or may call witnesses.

39. On reflection, the Subcommittee agreed with the view expressed by the Ministry that the employment of counsel would be inappropriate in these cases.

Determination of Question of Whether Substance was a Drug

Recommendation V: That any question under Regulations 16 and 17 as to whether a substance ordered by a practitioner was a drug or not may only be investigated within a period of six months subsequent to the date of issue of the prescription, and that in the event of the practitioner appealing against the decision of the local medical committee the results of such appeal shall be notified to the practitioner within one month from the date of the appeal.

40. After a very full discussion, the Subcommittee accepted the view advanced by the Ministry, that the requirements of Regulations 16 and 17 with regard to the use of referees makes the imposition of statutory time limits inappropriate. It has therefore not proceeded with this recommendation.

Notices Under the Regulations

Recommendation W: That all documents required or authorized by the regulations to be sent to persons concerned with the hearing, should be sent by registered post.

41. The Ministry maintained that the acceptance of this recommendation would involve substantial expense and, in consequence, it could be considered only if strong evidence was forthcoming of defects in the present machinery.

42. The Subcommittee accepted this point of view and, although the matter will be carefully watched, it has not been pursued for the present.

III. Proposals Made by the Ministry of Health and Accepted by the Subcommittee

43. In the introductory paragraphs of this report, reference was made to a number of amendments which the Ministry itself wished to see incorporated in the revised regulations.

44. Although as a result of discussions between the Ministry and the Subcommittee a number of these proposals have not been pursued, in some instances the Subcommittee has accepted the Ministry's views that it would be desirable to alter the disciplinary machinery in the manner suggested. These matters are set out below, and, subject to the approval of the General Medical Services Committee and the Annual Conference, appropriate action will be taken to put them into effect.

Procedure With Regard to Frivolous or Vexatious Complaints

45. The Ministry originally proposed to amend the rules of procedure so as to make it clear that complaints which had gone so far that the observations of the practitioner or chemist had been obtained had ceased to be "frivolous" and should go to a hearing. The Subcommittee felt that this suggestion could not be justified and it put forward the alternative that the regulations should be so amended that the chairman could rule at any stage that the case was frivolous or vexatious, although if he approached the

respondent at all he should do so only after the complainant had seen any reply and had had a definite period in which to furnish any further observations, and after the chairman had considered any further observations which might be supplied by the complainant. This suggestion was accepted by the Ministry.

Procedure on Appeal

46. The Subcommittee accepted proposals that the regulations should be amended to say explicitly that the proceedings at an appeal to the Ministry shall be in private and to make clear that only a practitioner who appeals has a right to an oral hearing in the circumstances already determined. Under the present regulations it is arguable that a complainant on appeal has such a right if a recommendation has been made to withhold remuneration, and he wishes more drastic action to be taken.

Procedure on Withholding Money

47. The Subcommittee accepted a proposal by the Ministry that the procedure of making separate representations on a monetary withholding in addition to the right to appeal should apply only where the Ministry proposed to deduct a larger amount than that recommended, or when the quantum of the amount was not stated in the report of the Service Committee, as approved by the executive council. This suggestion involves an amendment of Regulation 7(1) to add to the notification to the parties of their right to appeal a notification to the practitioner or chemist of his right alternatively to make representations against a deduction recommended by the executive council, orally or in writing.

Appeal from the Dental Estimates Board

48. The Subcommittee has agreed to certain amendments in Regulation 18 in addition to those made on its own initiative (see Recommendation T). The persons hearing the appeal will have their powers clearly restricted to making an award which is permissible under the regulations; and provision will be made for any appeal, which involves a question whether a person is entitled to receive a particular type of service, to be dealt with by the Ministry outside this particular appeals machinery.

Constitution of Medical and Dental Advisory Committees

49. Regulation 11 provides for the constitution of these advisory committees, and each consists of three practitioners in the service of the Ministry of Health and three from outside. The Ministry pointed out that no express provision is made to meet the position where one of the members fails to arrive or has, for some reason, been so associated with the case referred to the committee that he may feel unable to take part in the committee's deliberations on the point.

50. The Subcommittee has agreed to the revision of this regulation so that the advisory committees can function when a quorum consisting of one practitioner from the Ministry, two practitioners from the panel, and the chairman, are present.

IV. Consequential Amendments to the Regulations

51. Inevitably, the various measures listed above have necessitated a number of consequential amendments to the regulations. The Subcommittee has examined these in considerable detail and, having taken legal advice, is satisfied that no objection can be taken to the additional amendments proposed.

V. Responsibility for the Acts and Omissions of Deputies

52. It will be remembered that the Conference last year passed the following resolution:

53. **Resolved:** That arrangements should be made whereby the general practitioner who appoints a deputy, locum, or assistant should not be liable for any breaches of the terms of service by the deputy, locum, or assistant.

53. Although this matter has been carefully considered by the Subcommittee and strong representations made to the Ministry, the latter does not feel able to agree that a principal's immunity for the acts and omissions of his deputies should extend to locums and assistants. As it has not been possible to pursue the point further, the Subcommittee has sought to secure an amendment to the regulations on the lines of the principles enunciated during the course of earlier discussions with the Defence Societies and set out in the Report to last year's Conference—namely, that where the deputy is also a principal on the medical list in any executive council area, whether as a partner or not, the deputy should be responsible for his own acts and omissions unless it can be shown that there is prima facie evidence that the principal himself had acted in breach of his terms of service.

54. Unfortunately, whilst the Ministry accepted these suggestions in principle, it felt that practical difficulties would arise should an executive council wish to take disciplinary proceedings against a deputy who was not on its own medical list. Cases where the deputy is not on the same list as the principal must be very rare and the Subcommittee has therefore agreed that, subject to this modification, the regulations should be amended on the lines of its own proposals.

APPENDIX D

REPORT OF THE SUBCOMMITTEE ON ASSISTANTS IN GENERAL PRACTICE

Preliminary

1. The Subcommittee was appointed by the General Medical Services Committee at its meeting on December 16, 1954, with the following terms of reference and personnel:

Reference: To investigate the matter of the employment of assistants, and to make recommendations.

Personnel: A. Beauchamp, A. Brown, B. Cardew, T. J. Hargest, J. A. Pridham, F. M. Rose, C. M. Scott, C. J. Swanson, S. Wand, together with the Chairman of the Committee, *ex officio*.

Subsequently, but prior to its first meeting, S. Wand withdrew from the Subcommittee.

Meetings

2. The Subcommittee has met on two occasions—January 11 and February 2, 1955.

Chairman

3. B. Cardew was appointed Chairman of the Subcommittee.

The Problem and its General Background

4. The Subcommittee at its first meeting considered a factual statement of the various attempts which had already been made to find a solution to the problem. The Assistants and Young Practitioners Subcommittee first considered the subject and submitted its original recommendations to the G.M.S. Committee in January, 1953, and the protracted nature of the discussions, and the widely divergent views expressed, make it clear that no solution on the lines previously considered is likely to find acceptance. The Subcommittee is equally clear, however, that some solution must be found if only to promote a happier understanding of the problems of principals and assistants alike.

Size of the Problem

5. Although it has not been possible to obtain a complete picture of the size of the problem, a good deal of information can be extracted from the Ministry of Health's Report for 1953. The figures in this Report show that the problem is probably not as extensive as had been imagined and that, if anything, it is tending to diminish. There were, in July, 1953, 1,596 assistants in England and Wales, of whom 724 were employed by partnerships and 872 by doctors in single-handed practice. Whilst the Ministry's report does not divide the number of partnerships employing assistants into cate-

gories by size of list, this data is available for single-handed practitioners, and the figures as at July 1, 1953, are set out below:

Size of Doctor's Lists	Assistants Employed
0-1,500	22
1,501-2,500	97
2,501-3,600	213
3,601 and over	540
	872

In July, 1952, the corresponding figures were:

Size of Doctor's Lists	Assistants Employed
0-1,500	16
1,501-2,500	96
2,501-3,600	149
3,601 and over	720
	981

6. Thus there has been a fall of 109 in the number of assistants employed by single-handed practitioners during a relatively short period—a period, moreover, where the full effect of the Working Party's proposals might not be apparent.

7. The Subcommittee has also noted that out of a total of 872 single-handed practitioners employing assistants only 238 have lists of 4,700 and over.

Possible Solutions

8. Recent attempts to reconcile the opposing viewpoints on this subject have been confined to a consideration of the size of the additional list of patients which a principal may have by virtue of employing an assistant. In the Subcommittee's view, the size of the list itself is but incidental to the real issues involved. The major question of principle is whether exception can properly be taken to one doctor employing another in circumstances which make it possible for him to derive financial advantage from so doing.

9. Those who oppose the present regulations claim that they inevitably lead to exploitation of assistants, whilst others, who see no justification in seeking any change in the existing allocation scheme, maintain that very little financial incentive exists for a principal to employ an assistant even when the full extra list of 2,000 patients has been attained.

10. The Subcommittee believes that both points of view are inconclusive, for a principal would be unlikely to consider the employment of an assistant unless there were good grounds for believing that the venture would be to his advantage in one way or another, and it does not necessarily follow that an assistant is exploited just because his principal derives some financial benefit from the arrangement.

11. Exploitation is much more likely to occur when the assistant is obliged to undertake more than a fair share of the practice work or is not paid a salary commensurate with the work he is asked to undertake. No reduction in the extra list could remedy cases of this nature.

12. On the general issue the Subcommittee holds the view that there is nothing improper or unethical in a principal enjoying a monetary reward in respect of the indefinite employment of an assistant, provided that the salary and allowances paid are commensurate with the responsibility and work undertaken and that the assistant has had no reason to believe that the appointment offered would lead to a partnership.

13. In the first place, the assistant is usually a man who is new to general practice and is learning his job preparatory to taking a full part as a principal in the Service, not necessarily in the practice to which he is first appointed as an assistant. Secondly, overall responsibility for all the patients rests with the principal. Thirdly, to make it economically impracticable to employ an assistant would react to the disadvantage of the small minority who prefer to remain as assistants and still further increase the difficulties which young men face on entry into general practice. The Subcommittee is convinced that it would be wrong to recommend any step which might limit the opportunities for young men to acquire a probationary period in general practice as assistants, and for all these reasons has decided that it cannot recommend any change in the figures at present laid down in the Allocation Scheme.

14. Having reached this conclusion the Subcommittee decided to consider other possible ways of meeting some of the criticisms which have been made, and has examined the problem under three separate headings, namely:

- (1) the "permanent" assistant;
- (2) the assistantship "with view";
- (3) admission to partnership.

(1) "The Assistant who has no wish to become a Principal"

15. Those who elect to remain assistants in general practice throughout their working lives do so of their own free will and usually for personal reasons. For such practitioners the remedy is clearly in their own hands if they feel that they are being unfairly treated. Insistence upon a written agreement setting out equitable terms of employment is the only possible safeguard, and, in the Subcommittee's view, any attempt to legislate further for this group is impracticable and undesirable.

(2) Assistantship "With a View"

16. It is in these circumstances that most complaints of unfair treatment arise. The principal who advertises successive posts "with a view" and then has a series of assistants, none of whom are taken into partnership, constitutes the real core of the problem. Here again, however, the Subcommittee holds that a formal agreement in the first instance will afford some safeguard to the assistant. Although similar advice has already been given elsewhere—notably in the Association's *Handbook*—there is no doubt that there is room for greater publicity, particularly among final-year students and the newly qualified. To this end the Subcommittee is convinced that further efforts should be made through the deans of medical schools to see that these elementary safeguards are impressed upon the young doctor about to start upon his career. It therefore recommends:

Recommendation: That further efforts should be made, through the deans of medical schools and honorary secretaries of local medical committees, to ensure that final-year students and newly qualified practitioners are fully informed of the importance of entering into a formal agreement when accepting a post as an assistant, either with or without a view.

17. It is however clear that even a formal agreement will provide no real safeguard against a principal determined not to take his assistant into partnership, and the Subcommittee has therefore examined the present N.H.S. regulations on the employment of assistants.

18. At present any principal must secure the consent of the executive council or, on appeal, the Medical Practices Committee, before he can employ an assistant for more than three months, and he is also required to notify the executive council of the name of each assistant engaged. In addition, the regulations do not debar an executive council, having once given consent to the employment of an assistant, from subsequently withdrawing that consent, and it is known that at least one executive council regularly reviews the position of principals to whom consent has been given on first application. Thus, although at present the executive council may not be aware whether an assistant is taken on "with a view," it will know of those cases in which a series of assistants have been engaged and where a partnership might reasonably have been expected to follow. In this way flagrant disregard of the principle of fair treatment could be an influencing factor when the executive council is deciding whether to renew its consent, and it would be appropriate for the local medical committee to take an active part in advising the executive council of those instances where it would be appropriate for them to intervene.

19. Apart from any question of an executive council's power to review the consent already given to employ an assistant, it is quite clear from Section 13(3) of Part IV of the General Medical Services Regulations, 1954, that a practitioner who has obtained consent to the employment of an assistant has no automatic right to increase his list up to the full maximum of 2,000 patients. This section of the regulations reads as follows:

Where a practitioner or partnership of practitioners employs one or more permanent assistants, the number of persons for

whose treatment the practitioner or practitioners may be responsible may, and, if the Minister so directs, shall, be increased to an extent allowed by the scheme, not exceeding 2,000 in respect of each assistant.

Thus, apart from withholding consent to employ an assistant, executive councils already have discretion to decide what additional number of patients a practitioner may have by virtue of the employment of an assistant.

20. A combination of these methods, whereby the assistant is from the start in no doubt as to whether or not he has a "view" and the executive council (advised by the local medical committee) is left in no doubt as to its powers either to review regularly the permission already given to employ an assistant or to modify the size of the additional list permitted, would, in the Subcommittee's opinion, provide all the safeguards which can reasonably be expected.

21. The Subcommittee therefore recommends:

Recommendation: That the Ministry of Health should be asked:

(i) to insert an additional section in paragraph 8 of the Terms of Service of General Practitioners so as to make it clear that local executive councils shall, in consultation with local medical committees, periodically review all cases in which consent has been given to the employment of an assistant;

(ii) by means of a circular letter to executive councils to point out that, whereas under the regulations the normal maximum additional list of patients permitted by virtue of the employment of an assistant is 2,000, local executive councils have power where, after consultation with local medical committees, they are satisfied that a reasonable case exists for so doing, either after due notice to withdraw their original consent to the employment of an assistant or modify the number of additional patients otherwise permitted under their allocation schemes.

Recommendation: That an appropriate letter be sent to local medical committees drawing their attention to the proposed arrangements, and offering general guidance upon the principles they should adopt when advising their local executive councils that in a particular instance it would be appropriate to withdraw the consent already given to the employment of an assistant, or to modify the size of list.

22. At present a principal who is refused consent to employ an assistant has a right of appeal to the Medical Practices Committee. The Subcommittee recommends that this right should continue and be extended to include those cases where, on review, the executive council has decided either to withdraw its consent or to modify the permitted number of additional patients.

23. The Subcommittee believes that there is one aspect of the first recommendation set out in Paragraph 21 above upon which the parent Committee would wish to have further guidance—namely, the interpretation to be placed upon the words "periodically review." After considerable thought the Subcommittee suggests that a period of two years would be both appropriate and reasonable.

(3) Admission to Partnership

24. The Subcommittee believes that there is another important factor which deters a principal from taking his assistant into partnership. Even where the principal is satisfied that the assistant is in all respects ready for partnership, and that there are good grounds for believing that the partnership will eventually be satisfactory from both the professional and the financial points of view, the fear of a considerable drop in income over the first few years is a serious deterrent to the principal.

25. The obvious solution would be the adoption of an earlier suggestion by the G.M.S. Committee that a general practitioner taking another into partnership should thereupon be entitled to at least some part of the compensation moneys due to him. Unfortunately, both the Government and the Cohen Committee have failed to support this proposal and the Subcommittee has therefore looked for other methods which could be carried into practice without undue difficulty at the present time.

26. One suggestion which it considers would give some definite incentive and, at the same time, mitigate to some extent any financial hardship on the part of the principal would be to evolve a system whereby a principal, on implementing a "view" offered to an assistant, would have the

right to claim payment on the basis of notional lists retrospectively to the date that the assistant was first engaged as "with a view to partnership." Clearly, some overall time limit would be necessary and a method of establishing a claim for retrospective payment evolved. As far as the former question is concerned, the Subcommittee suggests a period of one year. To establish a right to payment it proposes that the principal, upon taking an assistant, should, possibly by making a declaration on the form used for notifying the executive council of the appointment, register the "assistant's view" with the council. Retrospective payment to the principal on the basis of notional lists would then start to accrue for up to a maximum period of one year from the date upon which the view was first registered. It would be paid only in respect of the individual assistant registered as "with a view" and who was subsequently taken into partnership.

27. The Subcommittee wishes to make it clear that there would be no compulsion upon the principal to register any assistant at any particular time. The sole purpose of optional registration would be to qualify for the additional payment and no right would arise until the assistant was so registered.

28. The adoption of this proposal would require a revision of the distribution scheme and so necessitate amending regulations, but the Subcommittee is convinced that it would provide a real incentive to partnership practice. The Subcommittee therefore recommends:

Recommendation: That a principal implementing a "view" registered with the executive council should have the right to claim retrospective payment on the basis of notional lists for a period up to a maximum of one year.

Summary of Recommendations

That further efforts should be made, through the deans of medical schools and through honorary secretaries of local medical committees, to ensure that final-year students and newly qualified practitioners are fully informed of the importance of entering into a formal agreement when accepting a post as an assistant, either with or without a view.

That the Ministry of Health should be asked:

(i) to insert an additional section in paragraph 8 of the Terms of Service of General Practitioners so as to make it clear that local executive councils shall, in consultation with local medical committees, periodically review all cases in which consent has been given to the employment of an assistant;

(ii) by means of a circular letter to executive councils to point out that, whereas under the regulations the normal maximum additional list of patients permitted by virtue of the employment of an assistant is 2,000, local executive councils have power where, after consultation with local medical committees, they are satisfied that a reasonable case exists for so doing, either after due notice to withdraw their original consent to the employment of an assistant or modify the number of additional patients otherwise permitted under their allocation schemes.

That an appropriate letter be sent to local medical committees drawing their attention to the proposed arrangements, and offering general guidance upon the principles they should adopt when advising their local executive councils that in a particular instance it would be appropriate to withdraw the consent already given to the employment of an assistant, or to modify the size of list.

That a principal implementing a "view" registered with the executive council should have the right to claim retrospective payment on the basis of notional lists for a period up to a maximum of one year.

APPENDIX E

National Insurance Defence Trust

Income and Expenditure Account for the Year ended December 31st, 1954

	1954 £	1953 £		1954 £	1953 £
Conferences of Representatives of Local Medical Committees	1,708	3,133	Dividends and Interests Received (gross)	15,379	14,462
Railway Fares	2,880	3,126			
Contribution towards Committee Expenses	3,146	2,940			
Honoraria: Central Medical Advisory Committee	238	226			
Group Practices Loan Committee	419	—			
Payments in connexion with the retirement of aged and infirm practitioners	300	280			
Public Relations Department—					
Proportion of cost	2,715	2,882			
Small List Inquiry	—	67			
Surgery Accommodation Circular	—	273			
Legal and other charges	683	342			
Charges incurred in purchase of investments	187	158			
Audit Fee	52	52			
Sundries	2	122			
Income Tax: Based on surplus for year	1,587	—			
Adjustment of prior years	730	—			
Surplus transferred to Accumulated Fund	2,317	731			
	732	130			
	<u>£15,379</u>	<u>£14,462</u>			

Balance Sheet as at December 31st, 1954

	1954 £	1953 £		1954 £	1953 £
Accumulated Fund—			Investments in Government and other Trustee Securities—at cost	462,583	455,961
Balance—January 1st, 1954	475,356	475,226	(Market Value at December 31st, 1954, £160,334—1953, £137,034)		
Add: Surplus from Income and Expenditure Account	732	130	Inland Revenue: Estimated claims for recovery of income tax	4,581	16,501
Net Surplus on Purchases and Sales of Investments during the year	254	—	Balances at Bank—		
Balance—December 31st, 1954 (subject to depreciation of £2,229 in market value of investments—1953, £18,927)	476,342	475,356	Deposit Account	8,000	—
Sundry Creditors	2,551	3,417	Current Account	3,749	—
	<u>£478,893</u>	<u>£478,773</u>		<u>11,749</u>	<u>6,311</u>
				<u>£478,893</u>	<u>£478,773</u>

In our opinion and to the best of our information and according to the explanations given to us the above balance sheet and income and expenditure account give a true and fair view of the state of the affairs of the National Insurance Defence Trust as at December 31st, 1954, and of its income and expenditure for the year ended on that date.

3, Frederick's Place,
Old Jewry, London, E.C.2.
March 16th, 1955.

(Signed) PRICE WATERHOUSE & CO.
Chartered Accountants

APPENDIX F

General Medical Services Defence Trust

Income and Expenditure Account for the Year ended December 31st, 1954

	1954	1953		1954	1953
Grants to practitioners affected by floods	—	£ 372	Subscriptions Received	£ 82,664	£ 37,601
Charges incurred in purchase of investments	133	96	Dividends and Interests Received (Gross)	2,699	1,601
Income Tax based on Surplus for year	12,956	13,943			
Surplus for the year transferred to Accumulated Fund	23,274	24,791			
	<u>£36,363</u>	<u>£39,202</u>		<u>£36,363</u>	<u>£39,202</u>

Balance Sheet as at December 31st, 1954

	1954	1953		1954	1953
Accumulated Fund—			Investments in Government and other Trustee Securities—at Cost	£ 89,298	£ 54,663
Balance—January 1st, 1954	73,306	48,515	(Market value at December 31st, 1954, £90,306—1953, £54,312)		
Add: Surplus from Income and Expenditure Account	23,274	24,791	Loan—British Medical Association	—	25,000
Surplus on Sale of Investments during the year	300	—	Balances at Bank—		
Balance—December 31st, 1954	96,880	73,306	Deposit Account	13,000	—
Amount set aside for future taxation (1955-6 Assessment)	11,970	13,205	Current Account	6,552	—
	<u>£108,850</u>	<u>£86,511</u>		<u>19,552</u>	<u>6,848</u>
				<u>£108,850</u>	<u>£86,511</u>

In our opinion and to the best of our information and according to the explanations given to us the above balance sheet and income and expenditure account give a true and fair view of the state of the affairs of the General Medical Services Defence Trust as at December 31st, 1954, and of its income and expenditure for the year ended on that date.

3, Frederick's Place,
Old Jewry, London, E.C.2.
March 16th, 1955.

(Signed) PRICE WATERHOUSE & CO.
Chartered Accountants

Questions Answered

Senior Registrar's Expenses

Q.—(1) As a full-time senior registrar am I entitled to an allowance in respect of the rent of my telephone, as I have to have one in order to be on call for the hospital? (2) As part of my duties includes the teaching of medical students, am I entitled to any allowance in respect of medical textbooks, journals, membership of the B.M.A., Royal Society of Medicine, etc.?

A.—The allowability of expenses incurred by individuals in connexion with their work for an employer is governed by the statutory Rule which Vaisey J. referred to in the case of *Lomax v. Newton* as "notoriously narrow and rigid." (1) In the case of *Hamerton v. Overy* the judge accepted the reasoning of Vaisey J. and refused to allow to an employee of a regional hospital board the expense incurred in maintaining a telephone in his home. No doubt the Inland Revenue would successfully rely on that decision in this case. (2) The same reasoning would apply to the question of technical books, etc.—i.e., the expense would not be regarded as incurred "wholly, exclusively, and necessarily in the performance of the duties," but rather as incurred to put the individual concerned into the position necessary to obtain the appointment and perform the duties.

Tax on Merit Award

Q.—During the present income-tax year I was allocated a merit award, back-dated to January 1, 1952. Can I claim that this year's payment be spread out over the past three income-tax years?

A.—The questioner should have no difficulty. It is thought that the Inland Revenue will take the same view as himself—i.e., that the amount of the award should be spread over the period from the date as from which the amount payable has been calculated—as was done, for instance, in the case of the Danckwerts awards.

Examination at Police Station

Q.—A patient on my list was taken into custody for being in charge of a car while under the influence of alcohol. He insisted upon sending for me late at night, which entailed my driving about eight miles and examining him and drafting out a report for the police. Am I allowed to send him an account, as the service does not appear to come within my service under the N.H.S.?

A.—In "The Recognition of Intoxication," the report of a special committee of the B.M.A., published in 1954, it is stated that:

"A driver of a motor vehicle who finds himself at a police station on the suspicion of being under the influence of alcohol is there either because he has been involved in a road accident or because the suspicions of the police have been aroused by his unusual behaviour while driving or by his apparently abnormal condition while in charge of a stationary vehicle. On arrival he is informed that a doctor will be called to examine him. He has the right to refuse examination and to request the police to call on his behalf a doctor of his own choice. In the latter case he must pay the doctor's fee himself, as this service is not provided free under the National Health Service."

If the doctor is called to advise only on his patient's sobriety, and in the course of examination no evidence is found of a mental or physical abnormality or pathological process to account for the patient's suspicious behaviour, there is no objection to charging a fee. If, however, the doctor's presence is requested on the ground that the patient considers that his state is due to a mental or physical condition other than that caused by alcohol or drugs or should such a condition be detected at examination, no fee should be charged.

With regard to the question of a report to the police, it seems necessary to quote again from the B.M.A. committee's report as follows:

"If the examination has been made at the request of the detained person, the doctor should tell him his conclusions if asked. He should not, however, disclose any information to the police unless his patient insists."

If a report is submitted to the police with the patient's consent, as it is not one of those reports or certificates which have to be issued free under the National Health Service, the doctor is not precluded from charging a fee.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Consultant and Specialist Staff in N.H.S.

SIR.—I would like to amplify the comments made by Dr. G. E. Adkins (*Supplement*, March 12, p. 79) in which he states that the chest service is the "Cinderella" of the Health Service. The chest service is only a small part of the hospital service, but in no other branch has there been more bitterness about grading, or about prospects of promotion out of the dead-end S.H.M.O. grade. The following facts, all taken from the tables published in the *Supplement* of February 26 (p. 66), should be known to all doctors, consultants, and general practitioners alike, as well as to the Ministry, the regional board administrators, and the general public.

Now, Sir, S.H.M.O.s in the chest service: (1) are greater in number than in any other branch, at 415, the next highest being mental health at 400 and anaesthetics at 315; (2) are virtually equal highest with infectious diseases (56%) in their proportion of the total of consultants and specialists, at 55%; the next highest is venereology at 46%; the mean of all groups is 26%; (3) have the third poorest chance of promotion during the next ten years, as shown by the ratio of those due to retire at age 65 to the total in the specialty, at 16% of the present total over ten years. Plastic surgery has pride of place at 7% (number of S.H.M.O.s equals 1), and thoracic surgery is second at 9% (number of S.H.M.O.s equals 2). The mean is 24%. The other branches sharing the 16% are neurosurgery (number of S.H.M.O.s equals 1), orthopaedic surgery (number of S.H.M.O.s equals 61), and radiotherapy (number of S.H.M.O.s equals 38). It is appreciated that it is not possible to say from the table what proportion of those due to retire are themselves S.H.M.O.s, but the figures show the trend. Thus the chest service S.H.M.O. comes in one of the first three places in each of the above disadvantageous groups, but in no case do the other two specialties in any group figure in the first three of either of the other two groups.

Need more be said? Is not action necessary?—I am, etc.,

Portsmouth.

J. D. LENDRUM.

Sessional Fees

SIR.—The British Medical Association insists that local authorities using the services of practitioners on a sessional basis should pay £2 5s. per session. Individual general practitioners appear to pay their colleagues one guinea per session when taking surgeries. It would appear equitable that a suitable standard fee should be agreed for both.—I am, etc.,

London, W.1.

W. S. PARKER.

Shortage of Hospitals

SIR.—I should like to support Dr. R. L. Kitching's remarks (*Supplement*, March 19, p. 115) on the subject of shortage of hospitals. One aspect of the problem has been insufficiently emphasized: Prior to 1948 it was broadly true to say that hospitals were primarily intended for persons of lower income levels. With the introduction of the N.H.S. these became available as a right to all members of the community. It is a matter for surprise that the state of chaos is not greater. We are told constantly that expenditure is in excess of "estimates," and therefore the money is not available. Truth to tell, the so-called "estimates" have been little better than guesswork and bear little relation to needs. With long waiting-lists of "cold" cases

and doctors having difficulty in obtaining admission for emergencies, the Ministry of Health has failed to meet requirements.

In spite of long waiting-lists, many hospitals are overcrowded to an extent which is a danger to health and adds greatly to the difficulties of the medical and nursing staffs. I suggest that this is a factor which should not be overlooked in discouraging recruits to the nursing profession. At one hospital with which I am associated, overcrowding is so serious that the General Nursing Council has drawn the attention of the committee to the fact that the efficient training of nurses is seriously affected; and yet, with a long waiting-list, improvement is impossible. I am, etc.,

Horley, Surrey.

T. W. PRESTON.

POINTS FROM LETTERS

"Dictated but not Read"

DR. SIDNEY BOCKNER (London, W.1) writes: Your correspondent who complains (*Supplement*, February 19, p. 59) of consultants whose letters finish with "Dictated but not read" clearly is unaware of the reason for this practice. If a consultant visits a hospital only once a week, he will not see the letters he has dictated after an out-patient clinic until a week later. It is better to send an immediate reply signed "Dictated but not read" than to delay the letter a whole week so that it may be read.

MR. E. H. RAINER (Chislehurst) writes: This expedient should, and surely is, only resorted to in cases where a consultant attends the hospital at infrequent intervals of a week or more. The purpose is to avoid delay in the dispatch of letters to practitioners. But shorthand typists are not infallible and mistakes, even serious ones, may be made in transcribing. A better method, surely, is to have one's letters sent on for correction and signature before dispatch.

B.M.A. LIBRARY

The Library service is available to all members of the Association resident in Great Britain and Northern Ireland (and by special arrangement to members of the Irish Medical Association). The only charge made is for postage of books. A copy of the Library Rules will be forwarded on application to the Librarian at B.M.A. House.

The following books have been added to the Library:

- Carling, Sir E. R., *et al.* (Editors): *British Practice in Radiotherapy*. 1955.
 Clifton, M. J. (Editor): *Handbook of Medical Treatment*. Fourth edition. 1954.
 Donald, L.: *Practical Obstetrical Problems*. 1955.
 Faust, E. C.: *Amoebiasis*. 1954.
 Hers, J. F. P.: *Histopathology of the Respiratory Tract in Human Influenza*. 1955.
 Institute of Biology: *Biology of Deserts*. Proceedings of a Symposium. 1954.
 Irons, E. E.: *Story of Rush Medical College*. 1953.
 Ishikawa, M.: *Experimental Allergic Reactions Induced by Simple Chemical Compounds*. 1953.
 Kreig, W. J. S.: *Connections of the Frontal Cortex of the Monkey*. 1954.
 Laughlin, J. S.: *Physical Agents of Betatron Therapy*. 1954.
 Lowden, T. G.: *The Casualty Department*. 1955.
 McDonagh, J. E. R.: *Further Study in the Nature of Disease*. 1954.
 MacLeod, D. H., and Read, C. D.: *Gynaecology*. Fifth edition (of Eden and Lockyer). 1955.
 Martin, L., and Hynes, M.: *Clinical Endocrinology*. Second edition. 1954.
 Mozley, A.: *Introduction to Molluscan Ecology*. 1954.
 Nash's *Surgical Physiology*. Second edition revised and edited by Brian Blades. 1954.
 Oschinsky, L.: *Racial Affinities of the Baganda and Other Bantu Tribes of British East Africa*. 1954.
 Palumbo, L. T.: *Low Back Pain and Sciatica*. 1954.
 Pearson, A. C.: *Elements of Physics*. 1954.
 Perry, J. W.: *Self in Psychotic Process: Its Symbolization in Schizophrenia*. 1953.
 Pneumococcus Abstracts. Volume 2, 1939-50. 1954.
 Potter, R. D.: *Your Rheumatism: What You Can Do About It*. 1954.
 Preston, B.: *Focus on Road Accidents*. 1954.
 Palaski, E. J.: *Surgical Infections*. 1954.
 Pullar-Strecker, H.: *Proverbs for Pleasure*. 1954.
 Race, R. R., and Sanger, R.: *Blood Groups in Man*. Second edition. 1954.
 Rashid, A.: *Guide to the Diseases of the Nose and Throat*. 1954.
 Rashid, A.: *Guide to the Diseases of the Ear*. 1952.
 Rashid, A.: *Guide to the Examination of the Ear, Nose and Throat*. 1949.
 Reitman, F.: *Insanity, Art and Culture*. 1954.
 Rhinhardt, D. A.: *Roentgenographic Technique*. Fourth edition. 1954.
 Rigler, L. G.: *The Chest: A Handbook of Roentgen Diagnosis*. 1954.
 Rowland, J.: *Arrest of Bleeding*. 1954.
 Sachs, E.: *Prerequisites of Good Teaching and Other Essays*. 1954.
 Salle, A. J.: *Laboratory Manual on Fundamental Principles of Bacteriology*. Fourth edition. 1954.
 Schiff, L.: *Clinical Approach to Jaundice*. 1954.

- Schoenmackers, J., and Vieten, H.: Atlas Postmortaler Angiogramme. 1954.
- Shirley, H. F.: The Child, His Parents and the Physician. 1954.
- Shumway, W., and Adamstone, F. B.: Introduction to Vertebrate Embryology. Fifth edition. 1954.
- Smith, C. A. B.: Biomathematics. Third edition. 1954.
- Society for Experimental Biology: Symposia No. IV. Physiological Mechanisms in Animal Behavior. 1950.
- Society for Experimental Biology: Symposia No. V. Carbon Dioxide Fixation and Photosynthesis. 1951.
- Society for Experimental Biology: Symposia No. VI. Structural Aspects of Cell Physiology. 1952.
- Society for Experimental Biology: Symposia No. VII. Evolution. 1953.
- Society for Experimental Biology: Symposia No. VIII. Active Transport and Secretion. 1954.
- Srivastava, G. P.: History of Indian Pharmacy. Second edition. Volume I. 1954.
- Stafford, E. S., and Diller, D.: Textbook of Surgery for Nurses. Second edition. 1954.
- Starr, P.: Hypothyroidism: An Essay on Modern Medicine. 1954.
- Stevenson, L. G.: Nobel Prize Winners in Medicine and Physiology, 1901-1950. 1953.
- Street, L.: I Was a Drug Addict. 1954.
- Swanson, M. J. M.: Textbook of Chiropractic. Second edition. 1954.
- Walker, K., and Strauss, E. B.: Sexual Disorders in the Male. Fourth edition. 1954.
- Walker, W. F., jun.: Vertebrate Dissection. 1954.
- Walshe, F. M. R.: Diseases of the Nervous System. Eighth edition. 1955.
- Willard, H. S., and Spackman, C. S.: Principles of Occupational Therapy. Second edition. 1954.
- Williams, J.: Psychology for Student Nurses. 1954.
- Williams, R., and D.: Family Doctor. 1954.
- Wolff, H. L.: Epidemiological and Virological Study of Influenza: Proefschrift de Rijksuniversiteit te Leiden. 1954.
- Wolff, J. W.: Laboratory Diagnosis of Leptospirosis. 1954.
- Wright, A. E.: Aethetropic Logic: A Posthumous Work Presented by G. J. Romanes. 1953.
- Wright, H.: More About the Sex Factor in Marriage. Second edition. 1954.
- "Zeta": Diagnosis of the Acute Abdomen in Rhymc. Third edition. 1955.
- Zimmer, E. A.: Technique and Results of Fluoroscopy of the Chest. Translated by E. W. Loos. 1954.

H.M. Forces Appointments

ROYAL NAVY

Surgeon Commander W. J. Cranley has retired.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Lieutenants P. Millyard, I. D. Innes, T. S. Matheson, and R. P. C. MacDonald to be Surgeon Lieutenant-Commanders.

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel C. R. Christian, having attained the age limit for retirement, has retired on retired pay.
Major F. J. Ingham to be Lieutenant-Colonel.
Major H. D. G. Hetherington has retired, receiving a gratuity.
Captain J. Lapper to be Major.

REGULAR ARMY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Colonel E. G. Sibley, E.R.D., from Army Emergency Reserve of Officers, to be Colonel.
Lieutenant-Colonel J. G. E. Vachell, having attained the age limit of liability to recall, has ceased to belong to the R.A.R.O.
Captain (War Substantive Major) J. B. Lloyd, having attained the age limit of liability to recall, has ceased to belong to the R.A.R.O., and has been granted the honorary rank of Lieutenant-Colonel.

ARMY EMERGENCY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonels A. J. Webster, T.D., T. E. Jones-Davies, and A. H. Charles, T.D., have been granted the acting rank of Colonel.
Major (Acting Lieutenant-Colonel) H. K. Meller, M.B.E., T.D., to be Lieutenant-Colonel.
Major A. D. Bourne has been granted the acting rank of Colonel.
Major P. W. Kippax, R.A.R.O., to be Major, and has been granted the acting rank of Lieutenant-Colonel.
Major A. C. F. Green, from R.A.R.O., to be Major.
National Service List.—Captain (Acting Major) A. A. Sharp, from T.A. National Service List, to be Captain, retaining the acting rank of Major.
Captain A. M. Huntley, from Emergency Commission, to be Captain, and has been granted the acting rank of Major.

HER MAJESTY'S OVERSEA SERVICE

The following appointments have been announced: W. M. Daly, M.B., Ch.B., B.A.O., Medical Officer, Uganda; Constance E. Field, M.D., Paediatric Specialist, Singapore; E. W. R. Hackett, M.B., Ch.B., B.A.O., D.L.O., and M. A. Majekodunmi, M.D., M.R.C.P.I., D.C.H., Senior Specialists, Federation of

Nigeria; W. Serle, M.B., Ch.B., D.P.H., Principal Medical Officer, Southern Cameroons, Federation of Nigeria; L. E. Wynter-Wedderburn, M.B., Ch.B., M.R.C.P., D.C.H., Medical Specialist (Paediatrics), Jamaica; K. D. Young, M.R.C.S., L.R.C.P., Medical Superintendent, Hargeisa Group Hospital, Somaliland Protectorate; L. P. Younglao, M.B., B.Ch., B.A.O., M.P.H., Deputy Director of Medical Services, Trinidad; P. W. E. Downes, M.B., Ch.B., W. G. MacKintosh, M.B., Ch.B., and R. C. Short, M.B., Ch.B., Medical Officers, South Pacific Health Service, Fiji; P. K. Ganguli, M.B., D.M.R.D., Radiologist, Trinidad; T. G. Humby, M.R.C.S., L.R.C.P., Medical Superintendent, Barbados; A. E. MacKinnon, M.B., D.R.C.O.G., Medical Officer, Northern Region, Nigeria; W. A. W. Maney, F.R.C.S., Surgical Registrar (Orthopaedic), Singapore; C. C. Tredway, M.B., B.Ch., Medical Officer, Kenya; M. C. Latham, M.B., B.Ch., B.A.O., A. W. Tranter, M.B., B.S., D.C.H., I. H. Wyndell, M.B., B.S., Medical Officers, Tanganyika; M. A. Fawkes, M.B., B.Ch., Medical Officer of Health, Federation of Nigeria; B. E. C. Hopwood, M.R.C.S., L.R.C.P., Senior Medical Officer, Uganda; J. M. Liston, M.B., Ch.B., Director of Medical Services, Tanganyika; C. M. Ross, M.B., B.Ch., Specialist (Leprologist), Northern Region, Nigeria; W. A. dos Santos, M.B., B.Ch., D.Bact., Superintending Medical Officer (Specialist), Trinidad; J. C. Williams, L.R.C.P.&S.I., Medical Officer (Health), Jamaica; D. B. E. Hennessy, M.R.C.S., L.R.C.P., Resident Medical Officer, Kenya; A. B. P. H. Koch, M.D., Medical Officer, Gold Coast; M. K. Panikkar, M.R.C.S., L.R.C.P., District Medical Officer, Windward Islands; Elizabeth E. Johnson, M.R.C.S., L.R.C.P., D.T.M.&H., Medical Officer, Sierra Leone.

Association Notices

Diary of Central Meetings

APRIL

- 4 Mon. Armed Forces Committee, 2 p.m.
6 Wed. Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
13 Wed. Council, 10 a.m.
15 Fri. Joint Committee of the B.M.A. and Magistrates' Association, 10.15 a.m.
15 Fri. Compensation and Superannuation Committee, 2 p.m.
20 Wed. Conference of Advisory Councils on Occupational Health, 12 noon.
20 Wed. Registrars Group Executive Committee, 2 p.m.
21 Thurs. Trustees of the Dain Fund, 1 p.m.
25 Mon. Staff Side, General Whitley Council (at 14, Russell Square, London, W.C.), 10.30 a.m.
25 Mon. General Whitley Council (at 14, Russell Square, London, W.C.), 2.30 p.m.
27 Wed. Welsh Committee (at Raven Hotel, Shrewsbury), 2.15 p.m.
29 Fri. D.I.H./D.P.H. Subcommittee. Occupational Health Committee, 10.30 a.m.

Branch and Division Meetings to be Held

CLEVELAND DIVISION.—At Sparks Café Royal, Middlesbrough, Thursday, April 7, 8.30 p.m., meeting. Lecture by Professor C. H. Stuart-Harris: "Influenza."
COVENTRY DIVISION.—At Pilot Hotel, Burnaby Road, Radford, Coventry, Tuesday, April 5, 8 p.m., supper. Talk by a Ministry of Labour Representative: "Rehabilitation Centres." Films: (i) "Diseases of the Ear, Nose, and Throat"; (ii) "Daily Varicose Vein Clinic"; (iii) "Endocrinology of the Menstrual Cycle."
DUDLEY DIVISION.—At Board Room, Corbett Hospital, Stourbridge, Tuesday, April 5, 9 p.m., ordinary meeting.
EASTBOURNE DIVISION.—At Princess Alice Memorial Hospital, Eastbourne, Wednesday, April 6, 8.30 p.m., annual meeting.
HENDON DIVISION.—At Hendon Hall Hotel, London, N.W., Tuesday, April 5, 8.45 p.m., annual general meeting. Address by Dr. Robert Forbes: "Six Strange Cases."
HYDE DIVISION.—At Pack Horse Inn, Mottram, Wednesday, April 6, 8.30 p.m., clinical meeting. Film: "The Conjoined Twins of Kano," followed by a discussion.
METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C., Tuesday, May 3, 3 p.m., annual general meeting. President's address by Dr. R. Hale-White: "Patients, Politics, or Both?"
SOUTH WARWICKSHIRE DIVISION.—At Board Room, Warneford General Hospital, Leamington Spa, Tuesday, April 5, 8 p.m., meeting.
SWANSEA DIVISION.—At Neath General Hospital, Swansea, Thursday, April 7, clinical meeting.
TUNBRIDGE WELLS DIVISION.—At Pembury Hospital, near Tunbridge Wells, Tuesday, April 5, 8.30 p.m., clinical meeting.

Correction.—The new edition of the *National Formulary* will replace the 1952 *Formulary* on May 1, not April 1 as stated in paragraph 194 of the Annual Report of Council (*Supplement*, March 19, p. 81).

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 9 1955

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CONFERENCE OF HONORARY SECRETARIES

The annual Conference of Honorary Secretaries of B.M.A. Divisions and Branches was held in the Great Hall of B.M.A. House, London, on March 31. The chair was taken by Dr. J. E. MORRISON (Stirling Branch), and there was an unusually large attendance.

Welcome by Chairman of Council

Dr. E. A. GREGG, Chairman of Council, described the Conference as one of the most important gatherings in the Association year. The value of the work of the secretaries of the Divisions and Branches was fully recognized at Headquarters. If there was not a good secretary in an area there would not be a good Division. Reviewing the present state of affairs, Dr. Gregg said that the danger that most impressed him was the spirit of sectionalism creeping into the profession. There was only one body—the B.M.A.—which could properly claim to represent the profession in this country. There was no other body in which a doctor in a particular neighbourhood, by reason of his being a doctor, was able to associate himself with others engaged in the same work, who could discuss together, irrespective of what kind of doctors they were, matters of importance in promoting the medical and allied sciences and the honour and interests of the medical profession.

"Do set your faces against sectionalism every time you see it raising its stupid head. Woodrow Wilson once said that he disliked hyphenated Americans; I dislike hyphenated doctors. It is just as doctors that we meet together in the British Medical Association, whether in the Divisions and Branches or in the Representative Body. We do not want to have anything to do with any hierarchy of medicine. Let us do all we can to resist this tendency to sectionalism. Every secretary must try to draw together all the doctors in his area whatever the nature of their practice."

Turning to other matters, Dr. Gregg said that they had held recently in that building a meeting with representatives of the Press organizations, and he hoped it would be some satisfaction to those present to know that they had covered a good deal of ground and that further meetings would be held (see *Journal*, page 906). Finally, turning to the financial side of the Association's affairs, he said that very careful consideration had been given by the Council to the membership subscription, and it would be wrong of him to hold out an idea that within any short time the question of a reduction of the subscription would be regarded as possible.

The Division and its Country Members

Dr. J. E. CRANE (South-west Wales Division) opened a discussion on the Division and its country members, and described the reorganization of his own Division. They were told that the function of the Association was to foster the getting together of members and to provide a forum

for their discussions. But in a Division like his own, which was 50 miles in diameter, the usefulness of getting people to meet from over a wide area was not quite the same as it was in a town. Instead of looking at a Division from the point of view of size, they should regard it from the functional aspect—physiologically rather than anatomically. All their clinical activities were based on hospitals. The functional unit for a Division should be the area of the hospital, where consultants worked, and this usually more or less coincided with the executive council, the local medical committee, and the public health authority areas. If it was necessary for a Division to be larger than this area it should be in multiples of such functional units. In his own area the country doctor was the main member to be considered, and they had to see that the country member had his due share of activities. The greatest obstacle in South-west Wales was distance; the Division covered three agricultural counties. Communications were never easy, and in winter were hazardous. Attendance at meetings was problematical. He hoped he was alone in having the recurring nightmare of calling a Divisional meeting which was attended only by himself and the invited speaker. In his Division they had now decentralized their meetings. They had meetings in each of the three counties. They had reorganized the Division on the assumption that each functioning unit wanted to get together, and co-operation between members in the unit was the important thing. Carmarthen had an active medical society based on the hospital and working in close co-operation with the B.M.A. It had a 50% attendance at meetings. Pembrokeshire wanted a similar body to Carmarthen: the formation of a discussion group was considered, but they preferred to call themselves the Pembrokeshire Medical Society within the Division. There had been for years a certain rivalry between Divisions and medical societies, and in any clash the medical society had usually come off better. That was because it was a functional unit and commanded a loyalty which was stronger than that of a Division. The Pembrokeshire Medical Society which had been launched would discuss not only clinical but political matters so far as these affected their problems. The functional units were of a convenient size to be represented at the Annual Representative Meeting and to invite B.M.A. lecturers. Increased activity in the Division on these lines tended to unify the Division and to improve the work it did.

Dr. R. P. HENDRY (Rugby) asked whether it would not be convenient in a large and scattered Division to transform it into a Branch with perhaps four or five Divisions, or some other intermediate unit which might be called a group within the Branch. It was most important that members should have reasonable opportunity to get to meetings, and a journey of 50 miles was discouraging from that point of view.

Dr. DUDLEY IRELAND (Shropshire and Mid-Wales), who also came from a widely scattered district, said that there was one difficulty which Dr. Crane had not mentioned, that of getting speakers, other than the official B.M.A. lecturers, from outside the Division. A city Division had access to a wide choice of consultants. In his area the local medical society was in competition with the B.M.A. Division. The society was an old-established body, and the consultants went to that society, and to a large extent could not be got to attend general meetings of the Division in the absence of some special speaker. They were about to try the experiment of carrying the meetings round to different places in the Division.

Dr. J. C. G. MERCER (East and Mid-Lothian) said that his was another scattered Division spread over two counties. There was a medical society of old standing in East Lothian. A large number of members in his Division were consultants attached to the Edinburgh hospitals and living on the outskirts of Edinburgh, being only nominally in the Division and not interested in Divisional meetings at all. They were very much troubled with the sectionalization of the profession.

Formation of Local Groups

Dr. W. LIVINGSTONE (North Staffordshire) said that in his Division they had decided to form local groups. Geographically this local grouping rather suited them. This was Arnold Bennett's "Five Towns" area (six towns really), and it was hoped that each town would form its local group. The groups were not large, perhaps not consisting of more than 15 doctors, but a full attendance was reached, and the leader of each of the groups was a member of the local executive of the Division and also a member of the local medical committee. He also felt that when a Division was large it ought to have more than one secretary.

Dr. J. S. ROSS (East Hertfordshire) said that his Division stretched for 30 or 40 miles along the eastern side of the county. Over the years the Division had been built up in a way that had maintained the loyalty of its members, and he felt now that if they started lopping off pieces of it in order that they might more conveniently fit in with hospitals they were likely to break the loyalty to the Division and create more difficulties than they solved.

Dr. F. A. BELAM (Guildford) said that a large area was not always the reason for a small attendance. His own area was not unduly large, but a 10% attendance was about usual, in spite of special efforts. At clinical meetings at the hospital they did not get a representative attendance from the Division; they got only those around the hospital. They had now substituted a general practitioners' clinical meeting to which those who came brought cases or case notes.

Dr. J. G. WARNOCK (Tees-side Branch) said that his Branch was formed of four Divisions, with a total membership of 500. A scientific secretary had been appointed to each Division and to the Branch. This had resulted in better attendances at clinical meetings. The secret of success was to bring both consultants and general practitioners into what amounted to a clinical society.

Dr. F. V. ALLEN (Scarborough), from a small and scattered Division, averaging about 25 to a meeting, pleaded for more speakers from the centre, with payment of fares. The same plea was made by Dr. C. W. EVANS (Derbyshire). Dr. A. B. KETTLE (East Somerset) said that the country doctor would attend medico-political meetings if the business touched him, but not ordinary clinical meetings or lectures which he was able to get from other sources. Dr. G. P. MARSHALL (North-east Ulster) considered that what were wanted were not lectures, but lecture-demonstrations, the sort of thing they could get in teaching hospitals.

Dr. J. W. E. CORY (West Suffolk) said that in his Division they had managed to stimulate some interest by inviting representatives of ancillary professions to give lectures on subjects of common interest.

Dr. P. S. STEEN (South Essex) said that consultants at his local hospital at Romford were anxious to form a medical society. Many of the consultants lived outside the

Division and therefore did not receive notices of Division meetings. He thought that perhaps the Association tied itself too tightly in geographical limitations. Could not new members be asked which Division they would like to join instead of being required to join the Division in whose area they lived?

Dr. J. A. PRIDHAM (chairman of the Organization Committee), speaking on this last point, said that at the last Annual Representative Meeting a resolution was passed asking for an arrangement whereby any member could choose his Division if he lived outside the area. An appropriate alteration of the by-laws would be submitted to meet that difficulty. The procedure would be quite simple.

Mr. L. DOUGAL CALLANDER (Treasurer), taking up the point with regard to lecturers' expenses, said that the Division was allowed one B.M.A. lecture a year, for which a fee of 10 guineas and expenses were paid. The arrangements for all such lectures must be made at Headquarters. As for other lecturers or openers of discussions at clinical or scientific meetings, the travelling expenses of the person concerned might be paid by the Division out of the Association funds in its possession.

On a show of hands, a large majority of those present were against splitting Divisions into smaller groups.

The Division and the Young Practitioner

Dr. J. H. E. MOORE (Leeds) gave a report on what his Division did for the young practitioner. One custom, which had been established for three years, was a joint meeting of final-year students with members of the Division executive committee; an address on careers in medicine was given. In common with other university centres the Leeds Division has for some years past entertained the newly qualified doctors to lunch. This year it had gone further and had formed a Young Practitioners Group. Membership was limited to practitioners under the age of 35. It included men and women in every branch of medicine. He circulated the whole membership, inviting those under 35 to come forward, and he got 77 replies and 32 turned up at the meeting. A chairman and secretary of the group were elected and points for discussion were considered, the first of them being hospital admissions and health officers' problems. The group was very enthusiastic; he did not know what it was going to lead to, but he was very hopeful and any problems would be settled as they came along.

Dr. T. LODGE (Sheffield) said that in his Division a representative panel had been set up the members of which would give addresses to students or act as members of a "Brains Trust." He also suggested that young practitioners should be made aware of the financial facilities offered by the Medical Insurance Agency.

Dr. R. B. L. RIDGE (Metropolitan Counties Branch) said that his Branch ran a course of lectures for fifth-year students on a variety of subjects. A point was made of issuing a personal invitation, carrying the student's name. Dr. F. M. MACDONAGH (Grimsby) suggested that more might be done by the Divisions in seeing that the living conditions and hours of work of hospital residents were as good as possible.

Dr. J. A. PRIDHAM said that the Organization Committee had a subcommittee for students and the newly qualified. They had suggested to individual secretaries that they should co-opt one or two residents or young practitioners on to the divisional executive. The question of a survey of hospitals and perhaps of making a "black list" of those in which living conditions were not satisfactory had been considered.

Recruitment of New Members

Dr. PRIDHAM, as chairman of the Organization Committee, gave some of the latest membership figures. On the previous day the membership stood at 66,954. There had been a slight drop during 1954 in the United Kingdom membership. The percentage of membership in the United Kingdom to the total profession in 1953 was 72%, and in 1954 it was 71%. The percentage of membership in the working

profession (that is, excluding retired) was 80% in 1954 as compared with 81% a year ago.

Dr. A. MACRAE (Secretary of the Association) then spoke on the recruitment drive, giving a factual statement on the methods used for maintaining the membership of the Association. A recruiting circular was issued twice a year, in June and December. It had been the practice hitherto to send the same recruiting letter to all non-members, but he felt a little unhappy about that blunderbuss method. The person who had never been a member of the Association needed a rather different method of approach from one who had lapsed. He had therefore produced two forms of recruiting letter. Lapses, by the way, were in many cases not due to deliberate resignation, but to carelessness.

As for the results achieved by the two recruiting letters sent out last December, up to date there had been applications from 205 non-members and from 122 lapsed members who wanted to resume their membership, and applications were still coming in. The result achieved made the labour well worth while. As for the newly qualified, lists of names were sent to the Divisions every six months, and they liked to think that the honorary secretaries, when they got information about new people, took some steps to give them information. Various communications were sent from Headquarters to the newly qualified themselves, including leaflets about services available, and these if necessary were followed up two months later by a letter, and again after an interval by another letter. Once the newly qualified man had joined the Association he received a welcoming letter giving him the name and address of the local honorary secretary.

The Association Subscription

Dr. G. WARING TAYLOR (Leicestershire and Rutland) suggested that a year was a long time to allow a member to remain in arrears with his subscription. At the end of the year the member was confronted with a demand for the subscription for the year which had elapsed, and was also informed that the subscription for the coming year was due, and the requirement to pay 12 guineas might be rather a shock to him. He thought that the member in arrears might be approached earlier and informed that his cessation from membership would take place at some date during the year instead of at the end of it. His idea was that membership, including the sending of the *Journal*, should cease at the end of nine months instead of twelve.

After some discussion the conference gave its opinion that the period of grace should be six months instead of twelve. Dr. MACRAE said that he could not see that making the period six months instead of twelve would be any disadvantage from the administrative point of view.

Dr. R. P. HENDRY (Rugby) said that there was a bigger problem in these membership figures than had so far been stressed. In 1951 the net gain in the Association membership was 1,877, and in 1952 it was 1,841. Then came the raising of the subscription, and in 1953 there was a net decrease of 399, and in 1954 a derisory increase of 33. In other words in 1951-2 there was a net increase of 3,718, and in 1953-4 a net decrease of 366. That represented a very serious problem. Among other suggestions with regard to recruitment, he said that it would be useful if each Division had a little money available for hospitality for new members or non-members coming into the area.

Chairmanship of Conference

On a ballot, with four candidates, Dr. R. B. L. RIDGE, joint honorary secretary of the Metropolitan Counties Branch, was elected Chairman of the Conference of Honorary Secretaries, 1956.

On the motion of Dr. F. A. BELAM, a hearty vote of thanks was accorded to the Chairman of the day, Dr. J. E. MORRISON.

The Hon. Secretaries lunched at B.M.A. House as guests of the Council. Dr. J. COTTRELL proposed the health of the Chairman, Dr. MORRISON, who, in his reply, paid a tribute to the Headquarters staff, which was acknowledged by Dr. A. MACRAE, the Secretary of the Association.

CONSULTANTS AND SPECIALISTS

An all-day meeting of the Central Consultants and Specialists Committee was held on March 24. Dr. T. ROWLAND HILL presiding.

Consultant Organization

The question of holding an annual conference of representatives of hospital groups, after the pattern of the annual conference of local medical committees, was considered. Dr. D. F. HUTCHINSON pointed out that the latter conference was a policy-making body; the advantage of such a conference was that in any matter which arose with the Ministry or other body the backing of conference resolutions carried more weight than the opinion of a central committee. Mr. HOLMES SELLORS mentioned the possible dangers of policy-making by large bodies which were subject to emotional appeal.

It was agreed to refer the question to the regional committees with a view to ascertainment by them of the opinion of the hospital groups in their region.

Remuneration of Hospital Medical Staff

The CHAIRMAN drew the attention of the Committee to a number of resolutions adopted by the Representative Body in 1954, criticizing the Whitley agreement for the revision of hospital staff remuneration, and calling for further action to secure a more adequate implementation of the Spens Report. Dr. Rowland Hill reminded the Committee that at its last meeting it had accepted a suggestion from its executive that the time had come when some survey should be undertaken to find out what were the effects of the 1954 salary revision, and in the light of this information to decide what the reaction would be to any further claim based on the altered value of money. It had been suggested, added Dr. Rowland Hill, that the Spens Report was being abandoned because the Committee did not continue to press for a 100% increase in the Spens recommendations on the ground of the altered value of money. It was well known, however, that the Government had made the strongest appeals for restraint in the matter of remuneration. No one would deny that consultants had a strong claim, but it was a question whether it was not more in the interests of consultants to seek improvements in terms and conditions of service by making claims in various directions where they were most justified. It was for this reason that attention was being focused on such questions as the conditions of whole-time officers, S.H.M.O.s, etc.

Dr. Rowland Hill referred to certain criticisms at the recent meeting of the B.M.A. Council of the section of the draft annual report of Council under "Remuneration of Hospital Medical Staff," which was referred back. It was proposed that the Committee give power to the Chairman and Secretary to reword that section of the Annual Report of Council so as to clarify it, and this was agreed to.

The discussion ended with a vote of confidence in the Chairman.

Hospital Medical Staffing

Professor G. I. STRACHAN introduced the subject of hospital medical staffing. Various comments had been received from regional and group committees arising out of the report of the subcommittee. A resolution from the Newcastle Regional Committee and from the Psychological Medicine Group Committee had put into other words what his subcommittee had in mind.

The CHAIRMAN said that the revised report had been sent to the Joint Committee, not as a final document, but for assistance in discussion. There was broad agreement between the report and another by the Royal College of Physicians on junior staffing. Everyone desired to maintain the utmost elasticity. The Joint Committee would be meeting Ministry officials on this subject, and he had asked that the results of any discussion should be referred to their own Committee.

Scottish representatives on the Committee amplified a long statement which had been put in by the Central Consultants and Specialists Committee (Scotland). It was the Scottish view that for the present system of named salary grades there should be substituted a system of numbered scales or grades within the total range, from which would be selected the one appropriate to each appointment. Individual authorities would be free to employ such names as they wished for their appointments, the status of which would be indicated by the salary grade selected; also there should be an agreed ratio of the appointments to which the first three salary scales or grades would apply, and appointments in the second scale would be permanent staff appointments, and those in the third of limited tenure and renewable where the circumstances of the appointment made this desirable. Scotland also thought that the assumption that it was necessary in the interests of the service to have whole-time appointments of the present restrictive character should be examined.

Professor STRACHAN thought the Scottish proposals more complicated than those of his subcommittee.

Dr. R. M. FORRESTER, representing the Registrars Group, said that his own original minority report stood withdrawn, but he considered the report of the subcommittee not strong enough in certain directions. It left some aspects of hospital staffing undiscussed. Dr. T. F. MCCARTHY, the S.H.M.O. representative on the Committee, believed that the proposals were a substantial contribution to the solution of the problem, but everything depended on the spirit in which they were interpreted. He asked that it should not be forgotten that S.H.M.O.s would like to have a voice in all future discussions on the subject.

The Committee agreed, without dissent, to accept the revised report and authorized its representatives on the Joint Committee to enter with their colleagues into negotiation with the Ministry, always bearing in mind the principle laid down that responsibility for the treatment of hospital patients must remain in the hands of practitioners of consultant status, and that the first step to be taken, therefore, was to examine and review in every hospital the volume of work which should be undertaken only by consultants.

It was also agreed to pass on to the Joint Committee, without necessary endorsement, the various contributions to the discussion which had been made, particularly by the specialist groups. Thanks were expressed to Professor Strachan and his subcommittee for their hard work.

Remuneration of Medical Teachers

Mr. B. N. BROOKE, on behalf of the Full-time Non-professional Medical Teachers and Research Workers Group Committee of the Association, drew attention to the dissatisfaction with the new scales for university teachers which were announced by the Chancellor of the Exchequer in November last (*Supplement*, December 4, 1954, p. 213). He said that the discrepancy between the medical teacher and his colleague of equal status, and often with identical duties, in the hospital service was in many cases now greater than before. Under the old N.H.S. and university scales, introduced in 1949, a consultant in the hospital service at the minimum of his scale received about 13% more than a reader or senior lecturer in clinical subjects, also at the minimum of his scale. Under the new scales the difference was 20%. At higher points in the scales the discrepancy was wider, and at the maximum a consultant received nearly 30% more than a reader or senior lecturer. The new scales brought university medical staff approximately to the level occupied by hospital medical staff in 1949. For preclinical medical teachers the comparison was even more unfavourable. The financial disadvantage which attached to these discrepancies more than offset the vocational attraction of university work, and might have an adverse effect on recruitment.

It was agreed, on the Chairman's suggestion, to send these representations to the Joint Committee. The CHAIRMAN added that it had been thought well to obtain information

from the universities concerning the fees paid to part-time clinical teachers, and this information was placed before the Committee. The rates varied very considerably. It appeared that no increase was contemplated in any case. It was agreed to send this information also to the Joint Committee.

Investigation of Complaints

Dr. S. COCHRANE SHANKS, chairman of the Medico-Legal Subcommittee, reported that a meeting had been held with the Ministry for further discussion on the procedure for investigating complaints involving the personal conduct or professional competence of members of hospital medical staffs. With regard to competence, the subcommittee had reiterated its view that hospital authorities should be given more precise advice regarding the composition of committees of inquiry; these committees should be composed of medical and lay members in equal numbers, with an independent chairman. The Ministry had readily agreed to a substantial element of medical representation, so long as there was also some lay representation. Another matter concerned the reporting of accidents in hospitals. A revised draft of the circular from the Ministry regarding the procedure to be followed had been studied and in the main agreed upon.

Hospital Private Beds and Provident Schemes

Reference was made to the reported increase in the membership of provident schemes covering private treatment in hospitals. It was evident that there was a very large section of the public who were prepared to make this anticipatory provision to ensure private accommodation in sickness. Mr. KINDERSLEY urged the Committee to go further into this matter and endeavour to obtain complete information. This was agreed to.

Miscellaneous Business

It was agreed to resist a proposal from the Treasury that Government departments, such as the Ministry of Pensions, should pay S.H.M.O.s a lower scale of fees for professional specialist services than they paid consultants, a practice which must result to the disadvantage of both grades, tending to create a cheap form of specialist service.

Dr. H. D. CHALKE introduced the report of the Geriatrics Joint Subcommittee, describing it as a document which, while not telling the world anything particularly new, did lay emphasis where it was needed. The report was sent to the Council with the Committee's approval.

A regional committee wrote that the senior administrative medical officer of the region had issued a circular letter to all consultants and S.H.M.O.s asking that for one month a detailed check of hours be kept at each of the hospitals visited. The CHAIRMAN said that from the beginning of the service it was agreed that consultants should in no circumstances be exposed to the procedure of "clocking in," and the Ministry had always upheld that principle. He suggested that the report in this case be sent to the Ministry, but he reminded the Committee that sometimes these regional instructions were supposed by those who received them to be more rigid or to have a purpose other than was intended by those who issued them.

The rates of remuneration in respect of employment by the War Office of civilian consultants on a sessional basis were referred to the executive for consideration.

The report on the medical use of hypnotism came forward from the Psychological Medicine Group Committee and was approved for submission to the Council. The Group Committee asked that the Council be recommended to take the lead in furthering research on the subject of hypnotism, and to bring to the notice of suitable research foundations the need for such research. It was agreed to make the recommendation.

A letter was read from the Newcastle Regional Committee objecting to the Ministry's circular HM (54) 51, on medical arrangements for dealing with major accidents, on the chief

ground that many of the recommendations were impracticable. Reference had already been made to this circular by the Chairman of the Joint Committee when protesting to the Minister on the issue of circulars affecting medical staff without prior consultation with the profession. There had been no prior consultation in this case. It was agreed to forward the Newcastle objections to the Joint Committee.

A letter from the Medical Superintendents Society was received concerning the Bradbeer report on the internal administration of hospitals. It was agreed to defer consideration of the points raised until the report itself came to be discussed with the Ministry. The CHAIRMAN said that an undertaking had been given by the Under-Secretary of the Ministry that before any portion of the Bradbeer report was put into operation it would be discussed with the profession.

A letter from the Sheffield Regional Committee pointing out some difficulties with regard to skilled secretarial assistance in hospitals was referred to the Joint Committee and also to the Scottish Joint Committee for discussion with the departments.

The Consulting Pathologists Group had been considering the resolution of the Representative Body that arrangements should be made for a practitioner to have a necropsy performed by a consultant pathologist on any patient who was of particular clinical interest to the practitioner. The Group supported this, provided it was made clear that the appropriate place for such post-mortem examinations was the post-mortem department of the hospital to which the pathologist was attached, and the Committee concurred in this view.

RIISING COST OF HEALTH

ADDRESS BY SIR JOHN CHARLES

Sir John Charles, Chief Medical Officer of the Ministry of Health, addressed the West London Medico-Chirurgical Society recently on the rising costs of the National Health Service. He took the year 1949-50, the first complete year of the service, as the base-line. During the five years which had followed, the general medical services, the hospitals, and the pharmaceutical services had registered substantial increases in cost, whereas the cost of the general dental service and the supplementary ophthalmic service had decreased, though not to such an extent as to offset the increases in the other services.

Some Figures

The cost of running the hospitals in the five years under review had gone up by £64m., an increase of 32%. Medical salaries, including those of specialists, had risen by 27%; nursing salaries by about 37%, and all other salaries and wages by over 47%. Whole-time medical staff had increased by 19%, part-time medical appointments by 17%, whole-time nurses and midwives by 14%, and administrative and clerical staff by 12%. The number of hospital beds had risen during four years, 1949 to 1953, by rather more than 5.5%; the rate of occupancy at the end of the period, at 90%, was a little higher than it had been at the beginning, while the turnover—that is, the number of in-patients treated per annum per available bed—had increased from 6.5 to 7.5. The number of in-patients had risen from nearly 3 million in 1949 to over 3.5 million in 1953.

Sir John Charles spoke at some length on proper bed use. The main causes of uneconomical use were delay in filling vacant beds, the lag in starting diagnostic procedures and treatment, and procrastination in the discharge of patients. A good deal depended on the effectiveness of the arrangements for the treatment of patients after their hospital stay had ended and they had returned home.

Turning to the general medical services, he said that in July, 1953, there were nearly 19,000 practitioners practising as principals and providing general medical services for some 42,400,000 persons, giving each principal on the average a list of 2,330. The annual cost fluctuated around £51m.

The Drug Bill

In considering the cost of the pharmaceutical services, said Sir John Charles, they entered a region of great possibilities for improvement. The net expenditure upon this service, after deducting the revenue obtained from the charges levied since 1952, had risen from £31.5m. in 1949-50 to £42.2m. in 1954-5, a rise of nearly 34% in six years. The main reason for the increased cost was that the content of prescriptions had undergone modification. The most striking changes were in the proportions of mixtures and proprietary preparations. At the commencement of the service mixtures accounted for 34% of the total number of prescriptions and proprietary preparations for 16%. In 1953 the mixtures had dropped to 24% and the proprietary preparations had risen to 27%. As a result the overall gross cost of the pharmaceutical service—that is, the cost of prescriptions dispensed by chemists and the dispensing done by dispensing doctors—was now nearly as high as the cost of general medical services. The figures were: for the pharmaceutical service nearly £49m. (including £6m. from patients' payments); for general medical services, £53m.

The number of prescriptions issued each year was 220 million, being, on the average, over five prescriptions per annum for every individual enrolled in the service. At a cost of 4s. 2d. per prescription this amounted to over a pound a head in a year.

Is it Necessary?

Was all this expenditure really necessary? Was this medicinal appetite a healthy one? He believed that considerable economy was attainable without detriment to the patient. One direction might be by prescribing smaller quantities of drugs. It was seldom that the patient's condition during acute illness called for the administration of the same drug or mixture for any considerable time. Again, drugs remaining after the patient had died could not be returned to the pharmacy for reissue and were very often thrown away. The use of antibiotics was at first confined to hospitals where facilities existed for the ascertainment of bacterial sensitivity, and treatment with the antibiotic was kept under continuous bacteriological surveillance. These precautionary measures had tended to lapse, and antibiotics were frequently used in cases when less expensive drugs would be equally effective.

Apart from so-called proprietary substances for which there was no therapeutic equivalent and whose use in appropriate cases was beyond criticism, doubt might be expressed, along with the Cohen Committee, whether the average proprietary preparation had so much greater therapeutic value. He knew, however, that there were cases where the cost of the proprietary was no more than that of the standard.

Sir John Charles concluded his address by saying that, if the service was to realize its great potentialities, waste must be rigorously controlled, and he quoted Bacon: "It is no baseness for the greatest to descend and look into their own estate."

Sir John Charles's address will be published in full in the April issue of the *West London Medical Journal*.

GROUP PRACTICE LOANS

The Group Practice Loans Committee has advised the General Medical Services Committee that, owing to the rate at which applications are now coming in, and because the new money which comes into the fund in any one financial year is limited to £100,000 for Great Britain as a whole, future applicants may, if successful, find that there will be some delay before payment can actually be made. The Committee has decided that it will continue to consider all applications which are submitted to it, but it will, in giving its decision, inform doctors if there is likely to be any delay before money is available for payment.

S.H.M.O.s GROUP

The first meeting of the S.H.M.O.s Group Council, which was attended by representatives from every region in England and Wales and the Western and Northern Regions of Scotland, took place on March 21 at B.M.A. House. The members were welcomed by Dr. A. MACRAE, Secretary of the Association. G. WARING ROBINSON was appointed Chairman. The following have been appointed as the regional representatives on the Group Council: N. STRANG and A. T. G. EVANS (Newcastle); P. J. O'CALLAGHAN and J. A. DICK (Leeds); GWYN HOWELLS and G. WARING ROBINSON (Sheffield); C. B. V. WALKER and P. McCAULEY (East Anglia); L. H. ASHKEN and R. HOCHHAUSER (North-west Metropolitan); P. J. FEENY and W. DERWENT R. THOMPSON (North-east Metropolitan); J. D. LENDRUM and F. A. NASH (South-west Metropolitan); D. L. PUGH and T. REEVES (South-east Metropolitan); R. T. JAMES and J. A. RANKIN (Oxford); G. LOWE and J. C. McMASTER (South-western); G. M. L. JAMES and J. H. THOMAS (Wales); A. GORDON EVANS and F. E. GRIFFITHS (Birmingham); W. GRIFFEL and T. F. MCCARTHY (Manchester); W. D. GRAY and E. SNELL (Liverpool); A. A. DEWAR and J. F. SWAN (Western Scotland); R. W. BAXTER (Northern Scotland).

It was reported that, so far, about 450 S.H.M.O.s had applied to join the Group.

Hospital Medical Staffing

The report of the Medical Staffing Subcommittee of the Central Consultants and Specialists Committee was discussed and the following resolution passed for submission to the Central Consultants and Specialists Committee:

"That the S.H.M.O.s Group Council welcomes the amended proposals of the Medical Staffing Subcommittee, but wishes to emphasize (1) that the success of the scheme will depend entirely on the way in which it is interpreted; in the opinion of the Group Council it is essential that S.H.M.O.s, who form more than one-third of the consultant and specialist body, should have representation on all committees which may be concerned with the interpretation and implementation of the scheme; this will ensure that such committees have full information of the S.H.M.O. viewpoint and will be a token of the good faith of all concerned; and (2) that the position of S.H.M.O.s should be safeguarded so that no individual as a result of the implementation of the proposals suffers a loss of status or responsibility."

Organization of Group

It was proposed that nominations for future elections of the Group Council should be invited at regional meetings of S.H.M.O.s held each year between April and June, and that in the event of more than two nominations a postal ballot be held. Representatives should normally hold office for two years, the two representatives from each region to retire in alternate years, retiring members being eligible for re-election.

The present Group Council will continue in office until next year.

The Group Council appointed an executive committee of 12 members, including representatives of Scotland and Wales, with power to co-opt additional members if necessary for special purposes. The following members were appointed: S. F. LOGAN DAHNE, GWYN HOWELLS, G. LOWE, T. F. MCCARTHY, F. A. NASH, D. L. PUGH, T. REEVES, G. WARING ROBINSON, E. SNELL, J. F. SWAN, J. H. THOMAS, and W. J. WILSON.

Representation on Consultants and Specialists Committees

The question of representation of the Group on the Central Consultants and Specialists Committee was referred to the executive committee, and it was decided in the meantime to ask the Central Consultants and Specialists Committee to agree to the appointment of a second representative in addition to T. F. MCCARTHY.

It was also decided to ask the Central Consultants and Specialists Committee to recommend each regional con-

sultants and specialists committee to permit the appointment to it by local S.H.M.O.s of two direct representatives. Reciprocal arrangements for liaison with the Registrars Group were also approved.

Matters Referred to Executive Committee

Several items were referred to the executive committee for attention, including the question of collecting information on the nature and extent of consultant supervision, and a request from the Central Consultants and Specialists Committee for the views of the Group on proposals from the Treasury on fees for work carried out on behalf of Government departments.

A report was given to the Group Council on representations which were being made by the Staff Side of Whitley Committee B with the object of securing improvements in the remuneration of S.H.M.O.s.

The meeting concluded with a vote of thanks to W. J. WILSON for the valuable work which he had put in as Honorary Secretary of the Provisional Group; and also a vote of thanks to the Chairman.

HEALTH SERVICE ESTIMATES 1955-6

It is estimated¹ that an extra £22m. will be spent on the National Health Service, England and Wales, during 1955-6, making a total of £411m. Payments to hospitals will increase by nearly £20m. to £305m., an increase which includes an extra £460,000 in advances to hospital boards for capital account (total £10m.) and an increase of £19m. for advances for revenue account (total £285m.). The estimates for teaching hospitals and regional hospital boards expenditure are £40m. and £254½m. respectively.

General medical, dental, pharmaceutical, and supplementary ophthalmic services are expected to cost £133m., an increase of £3½m. Out of this £133m. it is estimated that payments to general practitioners will be nearly £55m., an increase of £2m., and the pharmaceutical service is expected to cost £42m. (after deducting £6m. for payments by patients), an increase of £24,000. The cost of the supplementary ophthalmic service will increase by £648,000 to £8m. (after deducting £5½m. for payments by patients). Compensation for the loss of right to sell medical practices is estimated at £2½m., a decrease of £56,000.

Scotland

The increase in expenditure on the National Health Service, Scotland, is estimated at £2m., making £52m. in all. The hospital estimates are increased by nearly £2m., advances to boards on revenue account being increased by £1½m. to a total of £35m. Advances to boards on capital account remain the same as for 1954-5—that is, £2m. Expenditure on general medical, dental, pharmaceutical, and supplementary ophthalmic services is estimated at £16m. (£407,000 increase), of which £7m. is for general medical services, £5m. for pharmaceutical services, and £760,000 for supplementary ophthalmic services (increases of £237,000, £30,000, and £40,000 respectively).

Other Items

It is estimated that £2,186,160 will be required for a grant in aid of the Medical Research Council and for a grant to the Council in respect of research schemes under conditional aid arrangements, an increase of £211,291 over the previous year. The estimate for the Polish Health Services under the Polish Resettlement Act, 1947, is £542,880 (a decrease of £21,320).

Subscription to the World Health Organization is increased by £40,950 to £384,900.

An annotation on the subject of the Health Service estimates appears on page 899 of the *Journal*.

¹ 1955-56 *Civil Estimates*, 1955. Class V: Health, Housing, and Local Government. H.M.S.O., London.

MEDICAL VISITORS FROM OVERSEAS

B.M.A.'S HELP AND ADVICE

Nearly 200 guests accepted invitations to attend the B.M.A. Empire Medical Advisory Bureau's "at home" on March 29. Sir Arthur and Lady Porritt received the guests. During 1954 nine social functions were held by the Bureau and were attended by 1,154 overseas and 506 United Kingdom doctors and their wives. Five "at homes" were held in London, and two were held in Edinburgh, at the Association's Scottish House and at the Royal College of Physicians, Edinburgh.

The main aims of the Bureau are to welcome and provide a personal advisory service for practitioners from the Commonwealth countries, and to encourage them to turn to the Bureau for any help and advice they need during their stay in the United Kingdom.

Last year 1,235 new inquirers made contact with the Bureau, as compared with 1,108 during 1953. Of these, 1,158 came from the following Commonwealth countries abroad: South Africa (217), East Africa (10), West Africa (24), Australia (277), Canada (103), Ceylon (22), India (330), Malaya (17), Malta (3), New Zealand (48), Pakistan (43), Rhodesias (7), British West Indies (20), British Guiana (2), Borneo (1), Cyprus (10), Hong Kong (11), Mauritius (5), Sudan (5), Zanzibar (1), and two were unclassified. Among the 1,810 inquiries made during the year, 432 related to courses of instruction, diplomas, and examinations, and 443 to hospital appointments, part-time employment, and locums.

Finding accommodation for visitors in houses, flats, hostels, hotels, and boarding-houses is also an important part of the Bureau's work. Inquirers are encouraged to write about accommodation some months before arrival, and in 1954 294 doctors were helped in this way.

International Medical Visitors' Bureau

The International Medical Visitors' Bureau of the B.M.A., which offers a service similar to that of the Empire Medical Advisory Bureau, but to foreign doctors, was consulted by 314 new inquirers from 36 countries during 1954, compared with 320 from 33 countries during 1953. About 250 requests were also made for information about "holiday exchanges" by doctors or their families in the United Kingdom or in foreign countries. It is known that at least 40 such exchanges have been arranged as a result of contacts made after inquiry at the Bureau. The majority of inquirers during the past four years came from U.S.A. (92), South America (3), France (17), Germany (35), Austria (13), Netherlands (5), Denmark (3), Norway (5), Sweden (8), Switzerland (19), Italy (15), Israel (8), Iraq and the Near East (18), and Egypt (15). Many inquiries for help with accommodation were met.

Pamphlets describing the objects and facilities of the International Medical Visitors' Bureau (IMVB 10/5) and of the Empire Medical Advisory Bureau (EMAB 10/12) are available to inquirers and visitors of the Bureaux.

A report of the work of the two bureaux was published in the Annual Report of Council (*Supplement*, March 19, p. 105).

REMUNERATION OF MEDICAL OFFICERS
IN PUBLIC HEALTH SERVICE

The arbitration hearing by the Industrial Court of the dispute in Committee C of the Medical Whitley Council over the remuneration of medical officers in the Public Health Service took place on March 29 and 30. The Court will announce its decision in due course.

Mr. B. J. N. MACKENNA, Q.C., and Mr. S. B. R. COOKE, instructed by Messrs. Hempsons, appeared for the Staff Side.

Correspondence

Reform of the Association's Constitution

SIR,—Mr. N. Ross Smith's article (*Supplement*, March 26, p. 117) is a valuable contribution to the consideration of this important subject and merits the closest study. He is a man of wide experience, but, as with all of us, this experience is limited by his own environment. What he says by way of the need for reform may well be true of Bournemouth and suchlike areas, but I do not think that it will be accepted as a statement of fact in the more populous midlands and north.

He suggests that there is little importance for the Council being elected on a geographical basis. This presupposes that problems facing different parts of the profession are identical throughout the country, but this is not so, and when attending national executive meetings of various bodies in London I am often impressed by this fact. It would do great harm to the B.M.A. if members felt that their part of the country was not represented on the Council by somebody who knew local conditions and with whom they were in touch (or could be if they so desired). I can see no advantage in a Council constituted as suggested by Mr. Ross Smith. It would be a most retrograde step to allow Council to determine policy without reference to the general body of members.

So far as the Representative Body is concerned, I fail to see where the suggested annual conference of delegates is any improvement. Many of us feel that the case for the need to reform the Representative Body has not been proved, but, if it had, Mr. Ross Smith's idea does not appear to solve the present alleged difficulties. There is possibly more to be said for his suggestions about the scientific meeting. When it comes to local reorganization I think that local conditions vary so enormously that any reforms need to be most flexible and that what suits a compact area like Liverpool may be unsuitable to Hampshire, and vice versa. But, wherever the area's situation, I think that the local machinery needs strengthening and that it would be helpful to the strength of the organization if the secretaries could spend more time in the Divisions. In a compact area like Merseyside I believe that the Branch is fulfilling a useful co-ordinating function which could not be so well carried out in London. I speak as secretary of the Branch and past chairman of the Liverpool Division.

What Mr. Ross Smith sees as a weakness in the relationship between the B.M.A. and the autonomous bodies I see as a source of strength—namely, that non-members of the B.M.A. are willing to accept these bodies as their mouth-piece. It seems self-evident that under these circumstances these bodies can claim to represent the profession and not just the B.M.A. when speaking to authority. It is not desirable that there should be a closer integration of the autonomous organizations into the structure of the Association. Before we make radical alterations in our Constitution let us be convinced that what we are doing is really an improvement and is not going to be a cause of greater disunity. Attendances at B.M.A. meetings, though depressingly poor, are no worse than attendances at meetings of non-medical bodies, and are not likely to be increased by any of their suggested alterations.—I am, etc.,

Liverpool, 9.

V. COTTON-CORNWALL.

Dispensing Doctors

SIR,—With the introduction of form E.C.10(D) another bale of straw has been loaded on the back of that uncomplaining camel, the dispensing doctor. We are told that this form has been introduced "with the agreement of the profession" in order to simplify investigations into prescribing of items for which extra payment is allowed. Why must our masters insist on going to Birmingham by way of Beachy Head? How many of the members of our profession who so blithely agreed to this new imposition have

the slightest conception of the complexities of rural dispensing practice? Already we have our difficulties of delivery (where should we be without those stalwarts, the milkman and the postman?), the collection of shillings, forms E.C.57, and the list of "expensive" drugs. Many of us have patients in two counties, and most of us no doubt have a proportion of "prescribing" patients; it may therefore be necessary to carry round in the bag four separate pads of prescription forms as well as a list of who is and who is not on our dispensing list. The net result is certainly to bring closer the day we go to Paradise by way of Kensal Green.

Yet it could all be so simple. Over two years ago in a letter to the *Supplement* (September 20, 1952, p. 138) I gave the outlines of a scheme which would reduce paperwork to a minimum, simplify the investigation of prescribing costs, and abolish the manifest anomalies of the list of "expensive" drugs (for how many months did we supply methyltestosterone to our patients on the instructions of gynaecologists, at 1s. the tablet of 10 mg., before this drug finally achieved its place on the "expensive" list?). The essence of this scheme is that the dispensing capitation fee should be designed to cover (a) the labour of dispensing, and (b) the cost of containers; and a very fair figure would be 5s. per caput per annum. All drugs, cheap, expensive, proprietary, or official, should be supplied on indent, and the cost paid by the Ministry; let the Ministry haggle over its discount; after all, we are not in competition with the chemists—we provide a service in areas where they find it uneconomic to trade. I would suggest one further simplification: introduce a standard form E.C.10 valid throughout the country, instead of one for each county, but stamp the back with the doctor's name, as with certificates of incapacity. How simple this would make the task of investigators into prescribing costs; for dispensing patients, check the cost of indents against stocks held, adding in the capitation fee; for prescribing patients, collect and price the scripts legibly stamped with the doctor's name.

Who can possibly object to this scheme? Large-list firms who pay a dispenser and are paid on the basis of the Drug Tariff at present, can still pay their dispenser and not be out of pocket. The small-list single-handed dispensing doctor need no longer read up the appendix to E.C.N.151 in fear and trembling when his patient returns from out-patients with the encouraging advice of the consultant, "I am writing to your doctor to arrange your treatment," ringing in his ears. Indeed, this scheme might well bring home some of the responsibility for excessive prescribing costs to sources hitherto uninvestigated and inviolate.—I am, etc.,

Chieveley, Berks.

JOHN RICHARDS.

Certificate of Public Health

SIR,—I am very concerned about the action the Council proposes to take—that is, to discontinue the Certificate of Public Health (recommendation (a), appendix V, Annual Report of Council, *Supplement*, March 19, p. 111). I wonder if the chief purpose of the C.P.H. has been fully considered by the Public Health Committee. I strongly advocated the C.P.H. for the purpose of training the medical student in preventive medicine by making it one of the subjects for qualification in the "final." From my long association with G.P.s I am convinced that their attitude to preventive medicine will not change till this subject is given the same prominence in the curriculum as medicine, surgery, and obstetrics. I contend that the weakness of the National Health Service in prevention has led up to the excessive drug bill.

A point which does not seem to have been considered in framing the Diploma of Public Health course is the status of the medical officer of health. The M.O.H. is a specialist officer and he should be on the same footing as other specialists in the profession. I contend that this calls for a regrouping of the higher qualifications in public health and preventive medicine and placing them on the same level

as the qualifications of other specialists. The D.P.H. should be a doctorship (and not a diploma). A fellowship should be instituted for original research and new investigation in the public health field. This would place the M.O.H. in his rightful place as one of the consulting staff in teaching hospitals and in a professorship in the university staff.

As the administrative officer of his area the M.O.H. could be brought into closer touch with the profession by passing all certification under the National Health Service through the department of the medical officer of health for analysis and tabulation. This would give the M.O.H. fuller information on the state of health of his area. Further, as an administrator the M.O.H. should be represented on all local committees dealing with the profession.—I am, etc.,

Southport.

S. T. BEGGS.

Association Notices

Diary of Central Meetings

APRIL

- | | |
|-----------|---|
| 13 Wed. | Council, 10 a.m. |
| 15 Fri. | Joint Committee of the B.M.A. and Magistrates' Association, 10.15 a.m. |
| 15 Fri. | Compensation and Superannuation Committee, 2 p.m. |
| 20 Wed. | Conference of Advisory Councils on Occupational Health, 12 noon. |
| 20 Wed. | Registrars Group Executive Committee, 2 p.m. |
| 21 Thurs. | Trustees of the Dain Fund, 1 p.m. |
| 25 Mon. | Staff Side, General Whitley Council (at 14, Russell Square, London, W.C.), 10.30 a.m. |
| 25 Mon. | General Whitley Council (at 14, Russell Square, London, W.C.), 2.30 p.m. |
| 27 Wed. | Welsh Committee (at Raven Hotel, Shrewsbury), 2.15 p.m. |

Branch and Division Meetings to be Held

CAMBRIDGE AND HUNTINGDON DIVISION.—At Lecture Room, Addenbrooke's Hospital, Cambridge, Friday, April 15, 3 p.m., annual general meeting.

CHESTERFIELD DIVISION.—At Walton Sanatorium, Chesterfield, Friday, April 15, 8.45 p.m., meeting. Talk by Dr. A. W. D. Leishman: "Some Aspects of Hypertension."

DARTFORD DIVISION.—At Bexley Maternity Hospital, Thursday, April 14, 8.45 p.m., annual general meeting.

EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, Herne Bay, Thursday, April 14, 7.30 p.m.; dinner, 8.45 p.m., Dr. H. Sterndale: "Toxaemia of Pregnancy."

GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, April 14, 8.30 p.m., meeting. Lecture by Dr. R. Forbes: "Recent Developments in Medical Litigation."

HARROW DIVISION.—At Myllet Arms Hotel, Western Avenue, Perivale, Saturday, April 16, 8 for 8.30 p.m., dinner. Members and ladies and medical guests and ladies are invited.

KINGSTON-ON-THAMES DIVISION.—At Epsom District Hospital, Dorking Road, Epsom, Surrey, Tuesday, April 12, 7.45 p.m., clinical meeting.

LEWISHAM DIVISION.—At Lewisham General Hospital, High Street, Lewisham, S.E., Sunday, April 17, 10.45 a.m., clinical meeting.

MID-HERTS DIVISION.—At Wellington Court Clinic, Bricket Road, St. Albans, Friday, April 15, 8.45 p.m., meeting.

MONMOUTHSHIRE DIVISION.—At St. Mellon's County Club, Thursday, April 14, 7.30 for 8.15 p.m., dinner lecture meeting. Address by Mr. Dd. M. Lloyd, M.A. Members' wives are invited.

NORTH STAFFS DIVISION.—At Grand Hotel, Hanley, Tuesday, April 12, 8 p.m., supper meeting. Talk by Professor R. E. Tunbridge: "Rehabilitation."

ST. PANCRAS DIVISION.—At Committee Room A, B.M.A. House, Tavistock Square, London, W.C., Thursday, April 14, 8.30 p.m., meeting. Dr. R. T. Brain: "Some Dermatological Problems in Children" (illustrated by colour slides). Members of the City Division are invited.

SOUTH STAFFS DIVISION.—At Medical Lecture Hall, Royal Hospital, Wolverhampton, Friday, April 15, 8.30 p.m., annual general meeting.

SUTTON COLDFIELD DIVISION.—At Sutton Coldfield Hospital, Thursday, April 14, 9.15 p.m., annual general meeting. Short film by Dr. F. H. Milner, Ph.D., F.R.I.C.: "Allergy."

WEST DENBIGH AND FLINT DIVISION.—At Talardy Hotel, St. Asaph, Thursday, April 14, 8 p.m., annual general meeting.

WEST HERTS DIVISION.—(1) At West Herts Hospital (Physiotherapy Department), Hemel Hempstead, Tuesday, April 12, 8.30 p.m., general meeting, followed by a clinical meeting. (2) At Stanboroughs Hydro, Watford, Wednesday, April 13, 8.30 p.m., annual general meeting. Film: "Return to Action," followed by speaker from Ministry of Labour on same subject.

WESTMINSTER AND HOLBORN DIVISION.—At Holborn Town Hall, London, W.C., Thursday, April 14, 8 p.m., ordinary meeting.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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A NEW HOUSING ESTATE PRACTICE IN RELATION TO ESTABLISHED PRACTICES

AN ANALYSIS AFTER TWO YEARS

BY

A. LILKER, M.D.

The problem of providing general medical services on new housing estates rarely fails to arouse a heated controversy, and the clash of conflicting interests often reverberates on the pages of the *Supplement*: its echo was even heard recently at a meeting of the G.M.C. (*Supplement*, December 11, 1954, p. 217). Long before the first house is roofed the local authority raises the question, and places the local medical committee in the invidious position of devising a solution which would satisfy the executive council and the population without incurring an accusation of favouritism or offending the legitimate interests of established practices.

The wisdom of creating and filling "vacancies" has been contested, and in many towns housing estates were provided with branch surgeries with or without a resident caretaker. The relative merits of independent practices and branch surgeries of established practices are still being debated, and it is hoped that our experience of two years on the Stockport main estate of 2,000 houses under construction will contribute to the solution of such problems elsewhere.

Growth of the Practice

The Stockport vacancy, advertised in the usual way, was filled by me 27 months ago, when I found about 350 houses built and occupied. To date (December, 1954) 700 houses are occupied, and the occupation rate is approximately 180 a year. At the end of my first four months (December, 1952) I had 250 patients on my list, a year later (December, 1953) 1,000, and now about 1,500.

In order to assess the extent and the rate of losses of individual Stockport practices as a result of transfer of patients to me, names preceding my own on 1,455 medical record cards (E.C.6) available were inspected and the patients classified.

On 33 cards the name of the previous doctor did not appear. First registrations accounted for 93 patients. (Many children up to 3 years of age, though having received attention from a previous doctor, were not registered.) In 160 cases the patients came from doctors outside the Stockport area. This leaves 1,169 patients coming from 33 main Stockport practices with 48 principals. The average loss per principal after 27 months is therefore 24 patients. As the average number of patients per principal in Stockport is about 2,500, this loss would represent 1%.

Further analysis shows:

13	principals	lost	1-10	patients
14	"	"	11-20	"
6	"	"	21-30	"
6	"	"	31-40	"
8	"	"	41-50	"
1	principal	"	85	"

For the purpose of this survey 18 practitioners, including 7 out of the 8 with losses between 41 and 50, employing five assistants, with lists ranging from 3,400 to 5,000 per principal, were kind enough to disclose to me the size of their lists.

Their losses per 1,000 patients approximately were:

5	principals	lost	5	patients
2	"	"	6	"
1	principal	"	7	"
4	principals	"	9	"
6	"	"	14	"

This gives an approximate average of 9 patients per 1,000 per principal.

A serial correlation test for randomness in this table shows a bias ($r=0.422$) in the movement of patients, undoubtedly to be found in the 14/1,000 group. All six principals practise in densely populated industrial areas, have big practices, and several of them encourage their patients to transfer. While statistically significant, this proportion remains unimportant from a practical point of view and would compare favourably with the usual movement of patients between practices over a similar period (27 months).

In the case of the single practitioner who lost 85 patients, an unusual factor, which need not be disclosed here, has now ceased to operate and his further losses are expected to be minimal.

Some Observations

I have noted, particularly during the last few months, a lower rate of transfers as related to the growth of the estate, after taking into account the decreasing proportion from houses occupied at the time of starting the practice. This is not necessarily connected with a personal factor, and can be easily explained by improved travelling and telephone facilities and therefore easier contact between the patient and his medical attendant in town. This tendency to retain one's doctor after removal is very marked: I estimate that about 50% of those who moved into their new homes three years ago have not re-registered. With the increase of the population of the estate this well-perceptible social trend is gaining force, and it can be predicted with reasonable accuracy that the average loss of established practices of 5 per 1,000 in the first calendar year, and 3.3 per 1,000 in the last, will be reduced to the negligible proportion of 2 or fewer patients per 1,000 in forthcoming years. Such losses represent only a fraction of the usual shift of patients in most industrial practices.

I have no doubt that this low proportion of losses will surprise many. I have asked several practitioners: "In your estimate, how many of your patients have transferred to me?" Invariably the estimated number was four or five times greater than the actual.

And here are a few other interesting and often unexpected observations arising out of this survey:

Healthy families show a greater tendency to transfer on changing their residence than those used to frequent medical attendance.

The rate of transfer in summer, when the incidence of illness is low, is significantly higher than in winter, and is at its lowest during a mild epidemic.

Patients advised by their doctor to transfer on account of distance are not any readier to do so than those whom their doctor is prepared to retain. Practitioners known to take great pains to retain their patients do not show any significant decrease of losses.

Two principals who employed me as an assistant for two years and one year respectively—and who kindly consented to my practising in their neighbourhood—sustained losses well within the average.

Hardly any psychosomatic or neurotic patients, usually so ready to change their doctor, came to me from council houses; in "compensation" I receive a fair share of them from practices in my immediate neighbourhood.

Summary

A practice on a new and easily accessible housing estate built up in over two years drew most of its 1,500 patients from 48 principals in 33 practices in a proportion ranging from 5 to 14 patients per 1,000 with an average of 9 per 1,000. The trend of transfers suggests that further losses of other practitioners are not likely to exceed an average of 2 per 1,000 a year.

The significance of this paper will be enhanced if it is recorded that, though a comparative stranger, I have received nothing but kindness, co-operation, and indulgence from most of my colleagues and every assistance from the Local Medical Committee, Stockport Executive Council, and Stockport Corporation.

REMUNERATION OF GENERAL PRACTITIONERS

DISTRIBUTION OF FINAL SETTLEMENT

Following discussions between the G.M.S. Committee and the Ministry of Health, it has at last been possible to determine the size of the Central Pool for the year 1952-3, and therefore the amount of the final settlement for that year.

The payments made during the financial year 1952-3 were based on the old distribution scheme, and at that time every effort was made to distribute the total pool, so far as it could be calculated, during the course of the year. Thus, as the G.M.S. Committee anticipated, the final settlement is very small, but the amount payable to individual doctors will be included in the June quarterly cheque.

The amount of the final settlement for the year 1953-4 is likely to be substantial, and it is hoped that payment will be made within the next 12 months.

ASSISTANTS AND YOUNG PRACTITIONERS SUBCOMMITTEE

FREEDOM OF OPINION

A meeting of the Assistants and Young Practitioners Subcommittee of the General Medical Services Committee was held at B.M.A. House on April 6. Dr. F. GRAY occupied the chair.

The first item on the agenda was the consideration of a letter published in the *Supplement* of March 26 (p. 126) under the heading, "Assistants in General Practice." Two of the six signatories of this letter, Dr. H. P. HILDITCH and Dr. L. RUSSELL, were members of the Subcommittee and also its representatives on the G.M.S. Committee. The letter had expressed views on the report of the G.M.S. Committee's Subcommittee on the employment of assistants, and these views, in the chairman's opinion, were inconsistent with the resolution welcoming the report passed by the Assistants and Young Practitioners Subcommittee at its last meeting (*Supplement*, March 5, p. 69).

Dr. GRAY said that the publication of this letter made it necessary that the Subcommittee should clarify its position.

Did it mean that the Subcommittee had changed its mind since its last meeting and wished to go back on its resolution? If so, the G.M.S. Committee would want to know. Dr. L. RUSSELL said that he and Dr. Hilditch—he felt he could speak for Dr. Hilditch, who was unable to be present—had no intention of involving the Subcommittee when they signed the letter. They were writing in a personal capacity and on behalf of another organization, and he thought that what was written had made that obvious.

After some discussion, in which it emerged that none disputed the right of any member of the Subcommittee publicly to express a personal view contrary to that held by the Subcommittee, provided it was made clear that it was a personal view and not that of the Subcommittee, a resolution was passed in the following terms:

"That the Subcommittee, in order to clarify any doubts which may have arisen as a result of the publication of the letter in question in the *British Medical Journal*, reaffirms its previous decision."

The Subcommittee also affirmed its confidence in Drs. Russell and Hilditch.

Change of Doctor

The Subcommittee considered a resolution by Dr. ELEANOR SAWDON that the procedure for change of doctor for a person who had not changed his address should be simplified. Dr. Sawdon thought that the present restrictions, and especially the 14-day waiting period, were cumbersome and irritating to patients, doctors, and executive councils. She proposed that a person should be able to change doctors by sending his medical card to the executive council together with a letter informing the council of his intention to transfer, and that the council should return the card with a transfer slip attached which would authorize immediate transfer. At present the earliest date on which transfer could take place was 14 days. Dr. Sawdon did not wish to disturb the existing arrangement by which a person can transfer immediately by getting his doctor's consent recorded on the medical card.

The majority of the Subcommittee were against any change in the 14-day interval, and the resolution was not agreed to.

SUPPLEMENTARY ANNUAL PAYMENTS

The Ministry of Health has sent a circular (E.C.L.17/55) to executive councils giving further guidance on certain points in the arrangements for supplementary annual payments to single-handed small-list practitioners. The arrangements for these payments were first set out in a previous circular (E.C.L.50/54) and were summarized in the *Supplement* (September 4, 1954, p. 107).

Doctors Over Sixty Years of Age

The intention of the supplementary annual payment scheme was that a doctor over 60 years of age should not be automatically eligible for a supplementary payment unless he had been conducting single-handed for the last ten years the practice in respect of which he was applying for a supplementary payment. To make this clear the Ministry is amending the first sentence of paragraph 5(a) of the original E.C.L. to read as follows: "He should be 60 years of age or over, have a list of at least 300 patients at the beginning of the quarter and have been in single-handed practice for the last ten years in the practice from which his application is made."

Where these conditions are not fully satisfied, but the practitioner was in practice in the area before April 1, 1953, the executive council, states the new circular, should refer the case to the central committee set up for the purpose for a formal decision. In other cases it is open to the practitioner to ask the council to refer his application to the central committee for a decision. It is also stated, to avoid any doubt, that a doctor who is in receipt of a hardship payment under the old arrangements is not eligible for a supplementary annual payment as well.

Resignation or Death after April 1, 1953

If a doctor satisfied the criteria for a supplementary annual payment on April 1, 1953, but has since resigned from the list or died, a supplementary annual payment should, on application, be granted up to the date when he ceased to be on the list.

Re-entry to the Scheme

A practitioner may lose his supplementary annual payment because his list falls below 300 or decreases by more than 10% over four consecutive quarters. The Ministry points out that where this happens, but the practitioner subsequently builds up his list again, he is eligible to reapply for a supplementary annual payment, which may be granted if the list has remained over 300 for four consecutive quarters, and, in the case of doctors under 60 years of age, has increased by at least 10% over those four quarters.

The Ministry also includes in the circular some information on the effect of dispensing payments on the calculation of income for purposes of hardship payments and initial practice allowances. The information in the circular will be sent shortly to all general practitioners in the Service in an executive council notice.

Northern Ireland News

NORTHERN IRELAND BRANCH CONFERENCE

A conference of chairmen, honorary secretaries, honorary treasurers, and representatives of Divisions of the Northern Ireland Branch was held on March 6 in the Grand Central Hotel, Belfast. Dr. L. S. POTTER, Assistant Secretary of the B.M.A., was also present. Dr. S. M. BOLTON, President of the Branch, took the chair.

A discussion took place on the membership of the Association, and Dr. POTTER said it stood at 65,829 at January 19. Sixty-five per cent. of the profession were Association members in Northern Ireland as compared with 70% in England. The Divisional figures were: Belfast 60%; County Armagh 73%; Fermanagh 66%; Londonderry 70%; North-East Ulster 70%; County Tyrone 60%; and West Down 56%. These figures showed that four Divisions were above average and three slightly below.

Recruitment

At the Conference of B.M.A. Honorary Secretaries in 1954 it had been suggested that a great deal could be done to recruit ex-members by personal approach by the honorary secretary of the Division or by a member of the divisional executive committee. Dr. POTTER stated that specimen draft letters had been sent to honorary secretaries of Divisions to send to non-members and ex-members, and the regional office would undertake to carry out the work involved. It was therefore only a question of asking the office to send out the letters.

Newly qualified practitioners were entitled to a reduced subscription for the first five years from the date of qualification. Every effort was made to welcome the newly qualified to the Association. The luncheons given by the Northern Ireland Branch Council to new medical graduates in July and December had proved very useful in obtaining new members. Dr. Potter pointed out that divisional secretaries should get in touch with new members in their Divisions, and particularly those attached to hospitals, and inform them of the Association's activities. The Constitution Committee in a recent questionnaire had inquired whether it was more desirable for the executive committee of a Division to elect members than for the Branch Council to do so. Dr. CHAPMAN, honorary secretary of the Belfast Division, thought that the Division should elect new members.

Attendance at Meetings

Dr. D. L. HEMMINGWAY, honorary secretary of the County Armagh Division, asked if there was any way in which divisional secretaries could encourage members to attend divisional meetings. He inquired if the *Journal* would consider publishing notes on the activities of the Northern Ireland Branch, and Dr. POTTER suggested that honorary secretaries should forward information about meetings, lectures, and social functions to the *Journal*.

Dr. WATSON, honorary secretary of the Tyrone Division, stated that in his area there were two active medical clubs which met once a month. These meetings were very popular and it was difficult to get members to attend B.M.A. meetings. It was suggested that the medical clubs might be asked to run a meeting in conjunction with the Division. Several members thought that light refreshments should be provided at B.M.A. meetings as it would give members an opportunity to talk informally.

Dr. H. J. CRONHELM, honorary secretary of the Branch, stressed the importance of keeping the Headquarters film library up to date, and Dr. POTTER assured the meeting that this was being done.

During a discussion on the divisional areas in Northern Ireland, Dr. W. J. C. HILL, honorary secretary of the North-East Ulster Division, spoke of the advantages of composing the Division on county lines. Dr. N. F. KELLY, of Belfast, said that members in the North-Down area, who were included in the Belfast Division, found it difficult to attend meetings. It was decided that the Branch Council should be requested to appoint a committee to consider the problem of the divisional areas, and where a member was on the fringe of two Divisions he should be given the choice of joining either.

Correspondence

Assistants in General Practice

SIR,—I read with interest the proposals of the General Practice Reform Association mentioned by Dr. H. P. Hilditch and his colleagues (*Supplement*, March 26, p. 126). The proposal to abolish assistants altogether would obviously create real unemployment, as well as abolishing the only sane way to embark on general practice. I suppose, however, the idea of reducing the maximum list to 2,000-2,500 is that out of these "clippings" enough practices would be created to absorb all those disgruntled assistants—an idea which a little plain arithmetic would quickly disprove.

As a principal I too would like to propose reforms, the chief being that assistants should think less about their grievances and more about whether they are really worth the generous salaries which are at present being offered. Replies to advertisements for locums throw a good deal of light on the mental attitude of many unestablished practitioners. Out of many replies few give any useful evidence of their experience or qualifications, most write only to inquire what salary, conditions, and "off-time" are offered.

The report of the Medical Practices Advisory Bureau in the same issue (p. 120) proves that very little real unemployment exists, but that vacancies in unattractive areas cannot be filled even if the salary is satisfactory. I am afraid the unestablished practitioners are still living in Cloud Cuckoo Land, in which they want the world handed them on a plate, and the sooner they snap out of their orgy of self-pity the better. Apparently disgruntled by the fact of being assistants, they are, however, unwilling to serve the apprenticeship of hard grinding work in unattractive areas which most principals have had to face before they attained their present enviable (?) position.—I am, etc.

London, E.2.

D. E. PEAKE.

SIR,—I feel very sorry indeed for the number of competent young doctors striving unsuccessfully to become principals in general practice. It is likely that in the course of

the next few years we may see a number of doctors with experience in hospitals and as assistants who are actually unemployed, or unable to find a post offering them remuneration sufficient to keep the wife and family they have not unnaturally acquired by this time.

One of the main reasons for this is so obvious that I am amazed that it has escaped official and frequent comment for so long. In order to take another doctor into partnership a principal has to offer him a minimum of £1,500 a year, without being able to charge him any capital sum to offset this very considerable loss of income. To find such a sum is particularly difficult for single-handed practitioners, who may even be put in the ludicrous situation of having to borrow money in order to pay it out to a partner. Moreover, there is the unwritten obligation to increase the new partner's share until within 6-10 years it becomes an equal one, or risk the vague but ever present charge of "hidden sale of goodwill." In many country districts sheer geography limits the chance of ever doubling the size of the practice, so that taking a partner may well mean that the principal will never again earn an income equal to his former one. It is surely this, rather than the other and less creditable reasons advanced, that blocks the way for so many young men.

The solution to the problem is a simple one. Compensation for the value of our practices was fixed on the 1946-8 incomes; it is a safe assumption that, when those of us who are young or middle-aged come to retire, this sum will bear very little relation to the true value of our practices. Indeed, in a great many cases the income from practices has greatly increased, even doubled, since 1948, and we shall be quite uncompensated for this increased value. Let the Minister allow principals to sell to incoming partners a share of their practice equivalent to not more than the increase in practice income since 1948, at an official rate, say one and a half years' purchase. This will solve the problem more quickly and with more fairness than a whole number of new restrictions and regulations limiting the freedom of action of doctors.—I am, etc.,

Theale, Berks.

H. S. SAMUEL.

CLAIRE WAND FUND

ESSAY COMPETITION

The Trustees of the Claire Wand Fund invite entries for an essay competition which the Fund is sponsoring during the present year on the following subject: "Postgraduate Education of Newly Qualified Doctors in Preparation for Entry into General Practice." The competition is open to any qualified medical practitioner. The prizes offered are: First prize 200 guineas; second prize 75 guineas. Certificates will also be presented to the first and second prizewinners; other special prizes and/or certificates may be awarded if the entries merit such a course.

Should the Trustees decide that no essay submitted is of sufficient merit, a particular prize will not be awarded. The decision of the Trustees will be final. It is a condition of entry for the competition that the copyright in any essay for which a prize or certificate is granted shall be the property of the Trustees. The first and second prizes will be presented at the Annual Conference Dinner in June, 1956. The competition will close on January 31, 1956.

Essays should be not less than 6,000 words and not more than 10,000 words in length. Each essay, which must be unsigned, must be typewritten or printed on one side of the paper only and accompanied by a note of the candidate's name and address.

Entry forms should be obtained from the Secretary, Claire Wand Fund, B.M.A. House, Tavistock Square, London, W.C.1, to whom all inquiries relative to the prizes should be addressed.

R. H. CURRER,
Secretary,
Claire Wand Fund.

Association Notices

AREA OF MOMBASA DIVISION OF KENYA
BRANCH

Notice is hereby given of a proposal by the Mombasa Division, endorsed by the Kenya Branch, to include within the area of the Division, which at present covers the Island of Mombasa, the Coast Province of the Colony and Protectorate of Kenya.

Any member affected by the proposal and objecting thereto is requested to write to the Secretary of the Association by May 31, stating the objection and the ground therefor.

A. MACRAE,

Secretary.

Diary of Central Meetings

APRIL

- 18 Mon. Registrars Group Executive Committee, 2 p.m.
(Date changed from April 20).
20 Wed. Conference of Advisory Councils on Occupational Health, 12 noon.
20 Wed. Committee on Homosexuality and Prostitution, 2 p.m.
20 Wed. Central Consultants and Specialists Executive, 2.15 p.m.
21 Thurs. G.M.S. Committee, 10.30 a.m.
21 Thurs. Trustees of the Dain Fund, 1 p.m.

Branch and Division Meetings to be Held

CROYDON DIVISION.—At the Greyhound, Croydon, Thursday, April 21, 7.30 for 8 p.m., annual dinner and dance.

DEWSBURY DIVISION.—At Board Room, General Hospital, Dewsbury, Friday, April 22, 8.30 p.m., meeting. Annual B.M.A. Lecture by Dr. R. E. Bonham-Carter: "Bronchospasm."

DUNDEE BRANCH.—At Department of Surgery, Queen's College, Dundee, Friday, April 22, 8.30 p.m., joint meeting with East of Scotland Faculty of College of General Practitioners; lecture by Professor A. Mair: "General Practice and Medical Education." Members of the Perth Branch are invited.

GREENWICH AND DEPTFORD DIVISION.—At St. Alfege's Hospital, Vanbrugh Hill, Greenwich, S.E., Wednesday, April 20, 8.30 p.m.; clinical meeting.

HOLLAND DIVISION.—At Johnson Hospital, Spalding, Friday, April 15, 9 p.m., annual meeting.

KENSINGTON AND HAMMERSMITH DIVISION.—At St. Charles's Hospital, Ladbroke Grove, London, W., Friday, April 22, 3.30 for 4 p.m., clinical meeting.

KESTIVEN DIVISION.—At Bristol Arms Hotel, Sleaford, Thursday, April 21, 7.15 for 7.45 p.m., meeting. Dr. Douglas French: "Opportunities for Research in General Practice."

METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C., Tuesday, May 3, 3 p.m., annual general meeting. President's Address by Dr. R. Hale-White: "Patients, Politics, or Both?"

NORTH-EAST ESSEX DIVISION.—At Nurses' Recreation Hut, Maternity Home, Lexden Road, Colchester, Wednesday, April 20, 8.15 p.m., meeting. Two films: (1) "The Four-minute Mile, an account of Roger Bannister's record-breaking mile"; and (2) "The General Practitioner and Rheumatic Disease."

NORTH-WEST WALES DIVISION.—At Royal Hotel, Caernarvon, Saturday, April 23, 7.30 p.m., annual meeting, followed by a dinner and social meeting. Medico-political discussion: "The National Health Service." Guest speakers, Mr. Goronwy O. Roberts, M.P., and Mr. Cledwyn Hughes, M.P. Ladies are invited to the dinner and discussion.

NORTH OF ENGLAND BRANCH.—At Royal Victoria Infirmary, Newcastle-upon-Tyne, Thursday, April 21, 7.15 p.m., a radio-logical evening.

OLDHAM DIVISION.—At Albion Club, Queen Street, Oldham, Monday, April 18, 9 p.m., meeting. Lecture by Dr. R. S. F. Schilling: "Industrial Pulmonary Diseases Caused by Vegetable Dusts—Particularly Byssinosis."

SCARBOROUGH DIVISION.—At Scarborough Hospital, Thursday, April 21, 8.30 p.m., general meeting.

SCUNTHORPE DIVISION.—At the Blue Bell Hotel, Scunthorpe, Thursday, April 21, 8 p.m., annual general meeting.

SOUTHAMPTON DIVISION.—At Royal South Hants Hospital, Southampton, Wednesday, April 20, 8.30 p.m., annual general meeting. Retiring Chairman's Address by Dr. W. L. M. Bigby: "Anaesthetic Risks."

SOUTH-EAST ESSEX DIVISION.—At Southend General Hospital, Friday, April 22, 8.30 p.m., annual general meeting.

TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Tunbridge Wells, Wednesday, April 20, 8.30 p.m., A.G.M.

WEST DENBIGH AND FLINT DIVISION.—At North Wales Hospital for Nervous and Mental Diseases, Denbigh, Tuesday, April 19, 2.30 p.m., clinical meeting.

WINCHESTER DIVISION.—At the Museum, Winchester College, Tuesday, April 19, 9 p.m., meeting. "Winchester Address" by the Rt. Hon. Lord Beveridge.

ANNUAL MEETING: TORONTO, JUNE 20-24

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 23 1955

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British Medical Association

SUPPLEMENTARY ANNUAL REPORT OF COUNCIL, 1954-5

Every member is asked to keep this Supplement, with the earlier one of March 19, until the subjects have been discussed by his Division

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PRELIMINARY

Award of the Gold Medal

208. In South Australia there is a greatly honoured member of the Association, Sir Henry Simpson Newland, C.B.E., D.S.O., LL.D., M.S., F.R.C.S., F.A.C.S., F.R.A.C.S., who combines high professional distinction with a long and very notable record of service to the Association and the medical profession. Sir Henry is a Past President of the Royal Australasian College of Surgeons and of the Australian B.M.A. Federal Council. He has received the Gold Medal of the Federal Council. The latest honour conferred on him in his own country is the foundation of the Henry Simpson Newland Oration, which will be delivered for the first time in August this year during the Australasian Medical Congress (B.M.A.) in Sydney.

Many years ago the Representative Body elected Sir Henry a Vice-President of the Association. The Council has much pleasure in reporting that it has now decided to award him the highest honour that it can bestow, the Gold Medal of the Association for Distinguished Merit.

Dr. A. Talbot Rogers will represent the parent body at the Congress in Sydney next August, and it is hoped that on this occasion there may be an opportunity for him to present the Medal to Sir Henry on behalf of the Council.

Election of Vice-Presidents

209. For Sessions 1951-2 and 1952-3 the Representative Body elected overseas Presidents, one from the Medical

Association of South Africa (Dr. A. W. S. Sichel) and the other from the Irish Medical Association (Dr. P. T. O'Farrell). The Council considers that the services rendered by Dr. Sichel and Dr. O'Farrell fully warrant their being honoured by election to the office of Vice-President, and that this would also be a graceful compliment to their Associations. The Council has much pleasure in recommending:

Recommendation: That A. W. S. Sichel, LL.D., M.D. (Cape-town), be elected a Vice-President in recognition of his valuable services to the Association.

Recommendation: That P. T. O'Farrell, LL.D., M.D., F.R.C.P.I. (Dublin), be elected a Vice-President in recognition of his valuable services to the Association.

The War Memorial

210. The Council has decided to reproduce a photograph of the War Memorial in postcard form, with a short description of its symbolism. The postcard will shortly be available at Headquarters and at regional offices at the price of 6d.

Central Midwives Board

211. The constitution of the Central Midwives Board provides that it shall include six persons appointed by the Minister after consultation with such bodies as appear to him to be concerned, one of the six being a general practitioner. The Minister invited the Association to make a nomination and has appointed the Council's nominee, Dr. I. G. Innes (Hull).

Representatives at Conferences of Other Bodies*(Continuation of para. 8 of Annual Report)*

212. Mr. J. W. Tudor Thomas, the Immediate Past-President of the Association, has been appointed an official delegate of the Association at the Annual Meeting of the American Medical Association, to be held in Atlantic City in June. Mr. Tudor Thomas has been invited by the A.M.A. to take part in the proceedings at its Annual Meeting.

Professor Alex. Haddow, Director of the Chester Beatty Research Institute at the Royal Cancer Hospital, has accepted an invitation to take part in the Annual Meeting of the Medical Association of South Africa, and has been appointed as an official delegate from the B.M.A.

GENERAL MEDICAL SERVICES**Remuneration***(Continuation of para. 16 of Annual Report)**The Size of the Central Pool*

213. The further inquiry undertaken by the Board of Inland Revenue into practice expenses for application to the 1953-4 Pool has now been completed. The results are under consideration by the Committee in consultation with its expert advisers, and further discussions will take place with the Ministry so that the final settlement for that year can be determined.

The Committee has also received the Ministry's tentative proposals on possible methods of keeping the expense ratio up to date in those years when the Board of Inland Revenue is unable to undertake a full inquiry. The Committee is considering these proposals in consultation with its advisers.

The Danckwerts Award and the Small-List Practitioner

Since the issue of the original E.C.L. on the scheme of supplementary annual payments some doubt has arisen as to the circumstances in which a doctor can automatically qualify for one of these payments. Further instructions are now being sent to executive councils to clarify the situation, and the opportunity is also being taken of dealing with a number of other minor points arising from the scheme. The G.M.S. Committee hopes that, as a result, no small-list practitioner will be in any doubt as to his position under these arrangements.

The G.M.S. Committee was unable to accept the suggestion put forward by the Ministry that, in the case of applications for supplementary annual payments from general practitioners over the age of 75, the regional medical officer should visit the doctor concerned in order to be sure that the practitioner is, in fact, able to provide full general medical services. The Committee felt that this was a matter which could best be judged by the local medical committee in consultation with the practitioner's own local colleagues, but it has agreed that in cases of doubt it would be appropriate for a medical member of the Central Appeals Committee to interview the doctor in consultation with a member of the local medical committee or a near-by colleague. A circular letter setting out the arrangements which the Committee feels should be made in these circumstances has been sent to local medical committees.

Committee on General Practice of the Central Health Services Council*(Continuation of para. 20 of Annual Report)*

214. The G.M.S. Committee has prepared a document setting out the views of the Committee and of local medical committees on the various recommendations contained in the Report of the Committee on General Practice within the National Health Service, which was set up by the Central Health Services Council. This document will form the basis on which further discussions can take place with the Ministry on all aspects of the Cohen Report.

Group Practice*(Continuation of para. 19 of Annual Report)*

215. The Group Practice Loans Committee has advised the Council that, owing to the rate at which applications are now coming in and because the new money which comes into the fund in any one financial year is limited to £100,000 for Great Britain as a whole, future applicants may, if successful, find that there will be some delay before payment can actually be made. The Group Practice Loans Committee will continue to consider all applications which are submitted to it, but, when giving its decision, will inform doctors if there is likely to be any delay before the money is available for payment.

Assistants in General Practice

216. Early in 1953 the Assistants and Young Practitioners Subcommittee drew the G.M.S. Committee's attention to the difficulties which were being experienced by assistants in attaining principal status in the National Health Service. A number of suggestions for solving the difficulties have been put forward by the Subcommittee—directed in the main to a reduction of the additional list of patients allowed by virtue of the employment of an assistant. In the view of the G.M.S. Committee, however, none of the suggestions advanced would have successfully solved the main problem—that of the principal who advertises successive posts "with a view" and then has a series of assistants, none of whom is taken into partnership. The Committee therefore set up a special subcommittee to examine the problem and see what action could usefully be taken to meet the views advanced by the Assistants and Young Practitioners Subcommittee. This special Subcommittee has now completed its task and its report, which has the approval both of the G.M.S. Committee and of the Assistants and Young Practitioners Subcommittee, is being submitted to the Annual Conference. The Subcommittee's report is set out in Appendix VII.

Temporary Resident Fees

217. The G.M.S. Committee has continued to consider the difficulties which have arisen over the application of the criteria laid down for the purpose of deciding which cases should attract the lower temporary resident fee of 5s.

It will be remembered that executive councils, in consultation with local medical committees, are required to classify holiday camps and institutions into those in which it would be appropriate to pay the higher temporary resident fee of 17s., and those where the lower fee of 5s. would be more appropriate. The decision as to whether an institution is to be classified for the purposes of payment at the lower rate depends largely upon whether the doctor is in regular attendance and has facilities for seeing a number of patients at a fixed time and place.

The matter has been discussed with the Ministry of Health and, before making any radical alteration in the present scheme, the Committee decided to seek further information as to the size of the problem and the extent to which the lower rate of payment was being applied. Having considered the matter again in the light of the further information supplied by the Ministry, the Committee feels that a case does exist for giving local medical committees discretion to pay a fee for temporary residents which would modify the present somewhat rigid rates of payment. The matter is to be discussed with the Ministry on this basis.

Amendment of Service Committees and Tribunal Regulations*(Continuation of para. 26 of Annual Report)*

218. Negotiations have continued with the Ministry of Health on the recommendations made by the special Subcommittee which has been reviewing the Service Committees and Tribunal Regulations. The G.M.S. Committee

is pleased to report that agreement has now been reached on the various matters under discussion, and, subject to the approval of the Annual Conference, any necessary action, whether by means of amending regulations or otherwise, will be taken by the Ministry of Health.

Discount on Drugs

219. Negotiations have continued between the G.M.S. Committee, the National Pharmaceutical Union, and the Association of British Pharmaceutical Industry in an effort to secure an equitable rate of discount for dispensing doctors. The Committee has now been informed by the A.B.P.I. that it is prepared to recommend to its constituent members that manufacturers and wholesalers should increase to a material extent the professional discount allowed to N.H.S. dispensing doctors on ethical proprietary preparations. This offer is under consideration by the Rural Practices Subcommittee, since it is rural areas which are mainly concerned with this issue, and the Subcommittee's views will be reported to the Annual Conference and to the Representative Body in due course.

Employment of General Practitioners in Hospitals

220. The Representative Body last year expressed the view that there should be no reduction in the remuneration of general practitioners working in hospitals.

This matter has been considered by the G.M.S. Committee in consultation with the Staff Side of Committee "B" of the Medical Whitley Council.

The Council is glad to report that an attempt to lower the existing rates has been successfully resisted. The matter is, however, very much bound up with the investigation now being undertaken by the Central Consultants and Specialists Committee into the whole question of junior hospital staffing.

As soon as this investigation is completed it will be possible to fit general practitioners into the pattern proposed and at that point to consider the appropriate remuneration for the posts which they hold.

Representation of Regional Hospital Boards and Hospital Management Committees

221. At the Representative Meeting last year, several resolutions were passed, all aimed at securing more adequate representation of general practitioners at all levels of hospital administration.

This matter has been considered by the G.M.S. Committee, and in discussions with the Ministry every opportunity has been taken to stress the importance which the profession attaches to adequate general-practitioner representation. The G.M.S. Committee is watching the position carefully and will review the matter again when the results of the nominations for the next group of general-practitioner vacancies on regional hospital boards are available.

Rh Tests and Blood Grouping

222. Last year the Council was asked to ensure that when Rh tests and blood grouping are carried out a card should be supplied suitable for preservation by the patient. The G.M.S. Committee has now discussed this matter with the Ministry of Health and has been given to understand that group cards are normally given to all donors and antenatal patients throughout the country. There have apparently been difficulties in some areas and the Ministry has undertaken to give what help it can in these specific localities.

HOSPITAL AND CONSULTANT SERVICES**Remuneration of Hospital Medical Staff***(Continuation of para. 46 of Annual Report)*

223. The Council has considered the following Minutes of the A.R.M., 1954:

68. **Resolved:** That this meeting is dissatisfied with the recent consultant award, and the reasons given therefor.

70. **Resolved:** That this meeting deplores the inadequacy of the recent agreement reached on the remuneration of hospital medical staffs, and urges that steps be taken to reopen this matter immediately with a view to obtaining the implementation of the Spens Report as applied to consultants and specialists and obtaining adequate betterment. In the event of disagreement, the matter should be referred to arbitration.

71. **Resolved:** That a further attempt be made to make the present settlement retrospective to the date of commencement of negotiations.

90. **Resolved:** That the S.H.M.O. remuneration should be raised forthwith to approximate more nearly to that of consultant.

92. **Resolved:** That the value of the emoluments of house officers should remain at £100.

93. **Resolved:** That practitioners on the staffs of hospitals at present remunerated on G.P. 10(b) rates should also receive an increase in remuneration.

210. **Resolved:** That this meeting views with great concern any possible reduction in the remuneration of general practitioners working in hospitals.

The decisions of the Representative Body were conveyed, through the Central Consultants and Specialists Committee, to the Staff Side of Whitley Committee "B." The Staff Side has submitted claims to the Management Side:

(i) For a further increase in the remuneration of S.H.M.O.s;

(ii) for an increase in the remuneration of non-clinical medical superintendents;

(iii) for the payment of domiciliary consultation fees to members of hospital staffs holding whole-time contracts;

(iv) for an increase in the salary scales for regional hospital board headquarters medical staff to correspond with the increase given to hospital medical staff;

(v) for certain improvements in the emoluments of house officers.

In addition, the Staff Side is discussing with the Management Side the assessment of the residential emoluments of registrars. It has considered also the advisability of pressing for arbitration on the long-standing dispute concerning allowances for the professional expenses of whole-time officers, but has postponed a decision on this pending the outcome of the claim for the payment of domiciliary consultation fees.

The Staff Side considers it impracticable to press for retrospective payment of the increased salaries agreed upon last session, as the operative date was accepted as part of the agreement.

The discussions which led to the agreement of April, 1954, took no account of the remuneration of general practitioners under the provisions of paragraph 10(b) of the Terms and Conditions of Service, since this was the subject of separate negotiations which are still being conducted by the Staff Side of Committee "B" in consultation with the General Medical Services Committee.

As regards a further review of hospital medical remuneration in general, the Central Consultants and Specialists Committee proposes, as a first step, to conduct a comprehensive inquiry, with such expert aid as is necessary, into the present incomes of members of hospital medical staffs from all professional sources. It is hoped that this proposal will be endorsed by the Staff Side of Committee "B." The inquiry would show how the total professional income of hospital medical staffs has been affected by the various changes which have taken place since 1939, and its results would influence the decision as to what further claims might reasonably be made. The Council considers that this is a wise policy. It doubts whether further negotiations concerning the remuneration of hospital medical staff could be pursued effectively without supporting statistical evidence, such as is not available at the present time, as to the total incomes earned in this branch of the profession as compared with those earned in other branches. The Council therefore asks the Representative Body to await with patience the results of the proposed inquiry.

Hospital Medical Staffing*(Continuation of para. 47 of Annual Report)*

224. The revised report on hospital medical staffing, approved by the Central Consultants and Specialists Committee, is set out in Appendix VIII. This report modifies the original report on this subject in the light of the views expressed by the Representative Body, Regional Consultants and Specialists Committees, and other bodies.

The report, which has already received preliminary consideration by the Joint Consultants Committee, will be considered further by that Committee in conjunction with reports from other constituent bodies and from the Central Consultants and Specialists Committee (Scotland), and comments from the Special Group Committees regarding the application of general principles in different specialties. The Joint Committee will then be in a position to enter into discussions with the Ministry, and to report back to its constituent bodies in the light of the Ministry's reactions.

Remuneration of Medical Teachers*(Continuation of para. 58 of Annual Report)*

225. There is as yet little information as to the action being taken by different universities to revise the salary scales of their medical teaching staffs following the provision of additional moneys by Parliament for this purpose.

Except in the case of clinical professorial posts, however, the new ranges announced by the Chancellor of the Exchequer do no more than narrow the gap between the remuneration of medical teachers and hospital staff following the increase in salary given to the latter in 1954. They do nothing to remove the former discrepancy in remuneration in the two spheres, which in some cases is now greater than before.

For example, under the old scales a consultant in the hospital service at the minimum of his scale received 13% more than a reader or senior lecturer in clinical subjects of consultant status also at the minimum. Under the new scales the difference is 20%. At higher points in the respective scales this discrepancy is even wider, and a consultant on the maximum receives nearly 30% more than a reader or senior lecturer will receive at his new maximum.

The new scales bring university medical staff approximately to the level occupied by hospital medical staff in 1949. For example, the range for readers and senior lecturers is now £1,750-£2,400 (£2,750 for lecturers with special responsibility) and the consultant scale in the hospital service, fixed in 1949, was £1,700-£2,750.

The comparison for preclinical medical teachers is even more unfavourable, as their scales are lower than those of clinical teachers.

The scales announced by the Chancellor of the Exchequer are the maximal scales the universities may now adopt, and are not necessarily the scales they will in fact apply to their medical teaching staffs. The little evidence so far available indicates that salaries are likely to be revised on a less favourable basis than the ranges announced by the Chancellor of the Exchequer.

These discrepancies are a financial disadvantage which more than offsets the vocational attraction of university work and must therefore have an adverse effect on recruitment.

While clinical teachers have the remedy of applying for posts in the hospital service, preclinical teachers—for example, anatomists—may not be able to go back into clinical work. Furthermore, they are generally appointed at a late age, at least 27, so that their salary position for several years is well below that of non-medical colleagues.

The position is largely similar in the field of pure research. In this field, even at the highest levels, established and virtually irreplaceable medical workers are taking other types of post because of the higher rewards obtainable, and owing to the great difficulty of recruiting medical men to replace them more and more non-medical workers are being appointed for work which belongs strictly to medicine.

If the present anomalies are allowed to continue the academic and research fields will cease to attract their fair share of the best brains in medicine, and the authorities must decide whether this inevitable outcome is in the best interests of medicine and the nation.

There is no machinery available to the profession for negotiation with the universities, and previous approaches to the University Grants Committee and the Vice-Chancellors' Committee have proved fruitless.

The position is being brought to the notice of the Ministry with a request that it should use its influence in the matter.

Fees for Part-time Work for Government Departments*(Continuation of para. 62 of Annual Report)*

226. As stated in the Annual Report, the Treasury has recently introduced two scales of payment for specialist services undertaken for Government departments, one scale for consultants, and another, and lower, scale for S.H.M.O.s. It is considered that there is no justification for this discrimination and representations are being made to the Treasury accordingly.

Geriatric Units: Treatment and Rehabilitation of Chronic Disablement*(Continuation of para. 67 of Annual Report)*

227. The report of the Joint Subcommittee appointed to study the establishment of an integrated service for the treatment and rehabilitation of chronic disablement arising from age or illness is set out in Appendix IX.

The Council has approved the report in principle, and during the coming session will consider how best to secure its implementation.

Medical Use of Hypnotism*(Continuation of para. 206 of Annual Report)*

228. The report of the special subcommittee on hypnotism has now been approved by the Council and is set out in Appendix X.

The Council proposes to bring the report to the notice of suitable research foundations in the hope of fostering research on the lines indicated in the report.

Untoward Incidents in Hospital and Complaints Involving Medical Staff

229. It was reported to the Representative Body last year that agreement had been reached between the Ministry of Health and the medical defence organizations regarding the apportionment of damages in legal actions in which hospital authorities and members of their medical staffs were involved. During the past year discussions have taken place with the Ministry on the procedure to be adopted in reporting upon accidents or other untoward incidents in hospital, or in investigating complaints involving the personal conduct or professional competence of members of hospital medical staffs. A large measure of agreement on these questions has already been reached, and it is hoped that satisfactory arrangements will soon be made which will safeguard the interests of medical staffs.

Civilian Consultants Employed by the War Office

230. Representations are being made to the War Office for an increase in the fees payable to civilian consultants employed on a sessional or per case basis, to bring them into line with the revised scale of fees adopted by the Treasury for work done for Government departments.

REFORM OF THE NATIONAL HEALTH SERVICE

231. The Council has now considered reports from the Standing Committees concerned on action taken by them arising from the decisions of the S.R.M., of December, 1951, on the interim report of the Council on the Reform

of the National Health Service. Appropriate action has been taken with the departments concerned on a number of the recommendations and these matters have been dealt with in previous reports of the Council; others necessitate amending legislation.

ARBITRATION MACHINERY*(Continuation of para. 74 of Annual Report)*

232. The Council has made a careful study of the problems involved in giving effect to the resolution adopted by the Representative Body last year "that there should be the unilateral right to arbitration."

There are at least two ways by which this objective could be achieved: first, by seeking an amendment of the Industrial Disputes Order, 1951, which at present precludes the reporting of disputes by professional organizations which are not trade unions or arbitration on a case affecting only one officer; and, secondly, by seeking satisfactory arbitration arrangements as a "top tier" to the Whitley Council structure.

In pursuing the first of these alternatives the Council has reminded the Minister of Labour and National Service that during the war, when the Conditions of Employment and National Arbitration Order (1305) was introduced, and up to 1951, any professional organization, whether a trade union or not, had a right to refer a dispute to the Minister and through him to the National Arbitration Tribunal. This position was changed by the Industrial Disputes Order, 1951, and although the Council has repeatedly urged the Minister of Labour and National Service to amend the 1951 order by including professional associations, little progress has been made. The Minister's latest statement on the subject is in the following letter, sent to the Association in December, 1954:

"You wrote to me on 14th December asking about the amendment of the Industrial Disputes Order, 1951.

"I fully appreciate your Council's concern on this matter, and if I could give you a forecast of early action, I should be glad to do so, but I must in candour admit that I cannot hold out hopes of an early amendment of the Order."

On the second alternative, in spite of repeated representations by the Staff Side of the General Whitley Council, no progress has been made. The absence of an agreement on facilities for arbitration in the Whitley structure is a direct result of the refusal of the Management Side to agree (i) that there should be the right of unilateral reference; (ii) that any ruling by the court or arbitrator should be binding on both sides.

Faced with this unyielding attitude on the part of the Management Side of the General Whitley Council, the Chairman of Council sought an interview with the Minister of Health, and conveyed to him the very strong views held by the profession on this important issue. In recent correspondence, however, the Minister has stated his view that this very difficult matter must be thrashed out in the General Whitley Council.

During the course of these protracted negotiations the Council has given further consideration to the possible implications of the resolutions adopted by the Representative Body and has examined the attitudes towards arbitration of the three sections of the profession represented by the Constituent Committees of the Medical Whitley Council. These may be briefly summarized as follows:

General Practitioners

General practitioners, though represented on the Medical Whitley Council and the General Council, have never conducted their negotiations through Whitley machinery. Following the pattern adopted in the days of National Health Insurance, general practitioners have continued to negotiate directly with the Ministry of Health, and through the Danckwerts Adjudication secured a settlement which is generally believed to be more favourable than any which might have been obtained through Whitley procedure.

There is no disposition upon the part of general practitioners to modify this method.

Hospital Medical Staffs

Hospital medical staffs were advised to enter into permanent contracts based upon the Terms and Conditions of Service on the strength of the following assurances given by the Permanent Secretary of the Ministry in 1949:

(a) That no changes would be made in the Terms and Conditions of Service without discussions in the appropriate part of the Whitley machinery.

(b) That remuneration was regarded as a subject suitable for arbitration.

(c) That, save in exceptional circumstances and after the conciliation machinery of Whitley had been exhausted, issues of remuneration remaining in dispute would go either to arbitration or for inquiry and report by a Committee.

The Staff Side of Committee "B" of the Medical Whitley Council has been granted arbitration on a number of occasions and was offered a Committee of Inquiry during the recent dispute on consultant remuneration. It would be wrong to say that it is entirely satisfied with the way in which negotiations are conducted in the Whitley Council, but it does not feel that the unilateral right to arbitration would necessarily strengthen its position.

Public Health Service Medical Officers

In this field it is felt that there might be a possible advantage in attempting to secure the unilateral right of arbitration, though so far there has been no difficulty in securing arbitration by agreement.

After careful consideration of the whole position the Council is of the opinion that the profession would be well advised to rely, for the present, on *ad hoc* arbitration arrangements when disputes occur.

PUBLIC HEALTH**Remuneration in the Public Health Service***(Continuation of para. 87 of Annual Report)*

233. The case for a review of the remuneration of all grades of medical officers in the Public Health Service was heard in the Industrial Court on March 29 and 30. The Award of the Court is now awaited.

Aberdeen Corporation Order*(Continuation of para. 100 of Annual Report)*

234. The Council has been informed that the Aberdeen Corporation does not intend to proceed with Clause 25 of the draft provisional Aberdeen Corporation Order, against which the Association had petitioned on the ground that the medical officer of health would be precluded from exercising the right conferred by the Local Government (Scotland) Act, 1947, of appointing his own deputy. The Council has therefore withdrawn the Association's Petition.

FINANCE

235. The Balance Sheet and Income and Expenditure Account for the year 1954, as audited by Messrs. Price, Waterhouse and Co., appear as an Appendix to this Report (Appendix XI).

SCIENCE**Association Prizes and Scholarships***(Continuation of para. 145 of Annual Report)***Middlemore Prize**

236. "Allergy in Relation to Eye Disease" was the subject set for the 1955 Middlemore Prize Essay Competition. (The Middlemore Prize was established in 1880 to be awarded for the best essay or work on any subject which the Council might select from time to time in any department of ophthalmology.) The Prize for 1955, consisting of a certificate and a cheque for £50, has been awarded to Norman Ashton, of the Institute of Ophthalmology, London.

Provisionally Registered Practitioners' Prize

A Prize Essay Competition for Provisionally Registered Practitioners was introduced by the Council for 1955. The subject chosen for the competition was "A Discussion on the Influence of John Hunter on Medicine." The Prize of a

certificate and a cheque for £50 has been awarded to F. W. Jones, of Outwood, Wakefield.

It has been decided to make the Prize Essay Competition for Provisionally Registered Practitioners an annual event.

Medical Students' Prizes

The subject chosen for the 1955 Prize Essay Competition for Medical Students was "The Recreational Activities of a Medical Student." The Council has awarded the following prizes in this competition:

£30 and certificate—A. M. Nhonoli (Makerere Medical School, Uganda).

£25 and certificate—I. S. Begg (Edinburgh University).

£20 and certificate—M. G. Davey (Sydney University).

£15 and certificate—K. M. Parry (Bristol University).

£10 and certificate—J. Lutwama (Makerere Medical School).

£10 and certificate—W. S. Stephen (Bristol University).

£10 and certificate—Gabrielle M. O'Sullivan (Sydney University).

£5 and certificate—S. J. Steele (Middlesex Hospital Medical School).

Occupational Health Prize

The Council offered an Occupational Health Prize for 1955, consisting of a certificate and a cheque for the sum of £50, for the best essay on any occupational health subject submitted by a member of the Association engaged in this branch of medical practice. The Council reserved the right to make no award if no entry of a sufficiently high standard was received. Only four entries were submitted in this competition, and the Council decided not to award the prize for 1955, as it did not consider that any entry was of sufficient merit.

Association Research Scholarships

The following research scholarships, tenable for one year from October 1, 1955, have been awarded:

Ernest Hart Memorial Scholarship (£250).—Christopher Ounsted, Oxford, for research into the aetiology and outcome of behaviour disorders in epileptic children.

Walter Dixon Memorial Scholarship (£250) (Renewal).—G. W. Taylor, London, for research into the aetiology, pathology, and treatment of idiopathic lymphoedema.

Insole Memorial Scholarship (£250).—F. Lanceley, Liverpool, for research into the possibility of different strains of organism in trichomonad vaginitis.

Ordinary Research Scholarship (£200).—R. Kilpatrick, Sheffield, to study the excretion of adrenaline and noradrenaline in the urine following insulin hypoglycaemia in patients with hypertension and those who have had bilateral sympathectomy for hypertension.

P. J. Lawther, London, for research concerned with the investigation of the clinical effects of air pollution.

Anne G. Mullins, London, to follow up selected cases of haemoptysis without obvious cause, with a view to discovering an aetiology and prognosis.

M. W. Reece, Sheffield, for research into post-operative formation of a venous thrombosis and pulmonary embolism.

B.M.A. Lectures

(Continuation of para. 146 of Annual Report)

237. Since the preparation of the Council's Annual Report, a further seven B.M.A. Lectures have been arranged, making a total of 105 for the session 1954-5. The Council wishes to record its thanks to the following, who have kindly consented to give Lectures during the current session, in addition to those named in paragraph 146 of the Annual Report:

Dr. K. G. Bergin | Mr. Douglas Miller
Mr. I. Bourdillon | Dr. J. C. Sawle Thomas

ORGANIZATION

Affiliation of Ceylon Medical Association to B.M.A.

238. The Council has received from the Ceylon Medical Association, which is a Corporate Branch of the British Medical Association, the following resolution:

This Association resolves that the Ceylon Medical Association, incorporated Branch of the British Medical

Association, should be an independent body affiliated to the British Medical Association.

The necessary action is being taken under Article 16 to terminate the existing arrangement, after which it will be possible to proceed with consideration of the proposed affiliation.

MEDICAL BENEVOLENCE

239. The sum received during 1954 by the Charities Trust Fund of the Association for medical charities was £12,838, which is £149 less than that received during 1953. The following statement shows the amounts collected and distributed during the twelve months:

To	1954 £
Subscriptions and Donations collected for:	
(a) Distribution at the discretion of B.M.A. Charities Trust Fund	4,583
(b) Royal Medical Benevolent Fund	2,931
(c) Royal Medical Foundation of Epsom College	891
(d) Royal Medical Benevolent Fund Society of Ireland	65
(e) Sir Charles Hastings Fund	96
(f) Dain Fund	1,887
Bequests received and allocated to Medical Charities	2,096
Subscriptions and Donations in respect of 1955, paid in advance	289
	£12,838

By	1954 £
amounts distributed to:	
(a) Royal Medical Benevolent Fund:	
Earmarked contributions	2,931
From Charities Trust Fund	1,928
	4,859
(b) Royal Medical Foundation of Epsom College:	
Earmarked contributions	891
From Charities Trust Fund	2,465
	3,356
(c) Royal Medical Benevolent Fund Society of Ireland:	
Earmarked contributions	65
(d) Sir Charles Hastings and Christine Murrell Funds:	
Earmarked contributions	96
From Charities Trust Fund	1,278
	1,374
(e) Dain Fund:	
Earmarked contributions	1,887
From Charities Trust Fund	1,008
	2,895
Total distribution	12,549
Payments in advance carried forward	289
	£12,838

Other Benevolent Funds

240. The Council is gratified to learn of the continued support given to the Dain Fund and the Sir Charles Hastings Fund by members of the profession. The purpose of the Sir Charles Hastings Fund is to assist doctors who, through no fault of their own, are in financial difficulty of a purely temporary nature; the Dain Fund gives financial assistance for educational purposes to the sons and daughters of medical practitioners.

The Council has continued to co-operate with the other medical benevolent funds, keeping in close touch with the committees of the Royal Medical Benevolent Fund and the Royal Medical Foundation of Epsom College.

The Council is hopeful that members of the Association will continue their support and interest in the medical benevolent funds.

Epsom College Centenary Appeal

241. The Council wishes to draw the attention of all members to the Epsom College Centenary Appeal, to which it hopes they will give sympathetic consideration. Funds are urgently needed to carry on the day-to-day work of the College, and the Council has allocated £1,000 to this Appeal from the 1955 subscriptions to the Charities Trust Fund.

SCOTLAND

(Continuation of para. 181(b) of Annual Report)

Hospital Medical Staffing

242. The Central Consultants and Specialists Committee (Scotland) at their meeting on March 7 adopted a Com-

mentary on Hospital Staffing and the Remuneration of Hospital Doctors prepared by their own Medical Establishments Subcommittee. This has been forwarded to the Central Consultants and Specialists Committee in response to an invitation to comment on the revised report of their Medical Staffing Subcommittee (the Strachan Report). Reference is made to this commentary in the report of the meeting appearing in the *Supplement* to the *B.M.J.* of March 26, and the following is a summary of its proposals:

1. For the present system of named salary grades there should be substituted a system of numbered scales or grades within the total range, from which would be selected by approved procedure the one appropriate to each appointment. Individual hospital authorities would be free to employ such names as they wished for their appointments, the status of which would be indicated by the salary grade selected.

2. There should be an agreed ratio of the appointments to which the first three salary scales or grades would apply.

3. A necessary first step in the working out of this ratio is a comprehensive review of the present consultant establishment.

4. Appointments in the second salary scale or grade should be of indefinite tenure—that is, permanent staff appointments. Those in the third should be appointments of limited tenure and renewable where the circumstances of the appointment make this desirable.

5. The full appointments procedure as now applied to consultant appointments should be applied for all appointments within the first three salary scales or grades.

6. The assumption that it is necessary in the interests of the Service to have whole-time appointments of the present restrictive character should be examined.

E. A. GREGG,
Chairman of Council.

APPENDIX VII

REPORT OF THE SUBCOMMITTEE ON ASSISTANTS IN GENERAL PRACTICE

Preliminary

1. The Subcommittee was appointed by the General Medical Services Committee at its meeting on December 16, 1954, with the following terms of reference and personnel:

Reference: To investigate the matter of the employment of assistants, and to make recommendations.

Personnel: A. Beauchamp, A. Brown, B. Cardew, T. J. Hargest, J. A. Pridham, F. M. Rose, C. M. Scott, C. J. Swanson, S. Wand, together with the Chairman of the Committee, *ex officio*.

Subsequently, but prior to its first meeting, S. Wand withdrew from the Subcommittee.

Meetings

2. The Subcommittee has met on two occasions—January 11 and February 2, 1955.

Chairman

3. B. Cardew was appointed Chairman of the Subcommittee.

The Problem and its General Background

4. The Subcommittee at its first meeting considered a factual statement of the various attempts which had already been made to find a solution to the problem. The Assistants and Young Practitioners Subcommittee first considered the subject and submitted its original recommendations to the G.M.S. Committee in January, 1953, and the protracted nature of the discussions, and the widely divergent views expressed, make it clear that no solution on the lines previously considered is likely to find acceptance. The Subcommittee is equally clear, however, that some solution must be found if only to promote a happier understanding of the problems of principals and assistants alike.

Size of the Problem

5. Although it has not been possible to obtain a complete picture of the size of the problem, a good deal of information can be extracted from the Ministry of Health's Report for 1953. The figures in this Report show that the problem is probably not as extensive as had been imagined and that, if anything, it is tending to diminish. There were, in July, 1953, 1,596 assistants in England and Wales, of whom 724 were employed by partnerships and 872 by doctors in single-handed practice. Whilst the Ministry's report does not divide the number of partnerships employing assistants into categories by size of list, this data is available for single-handed practitioners, and the figures as at July 1, 1953, are set out below:

Size of Doctor's Lists	Assistants Employed
0-1,500	22
1,501-2,500	97
2,501-3,600	213
3,601 and over	540
	872

In July, 1952, the corresponding figures were:

Size of Doctor's Lists	Assistants Employed
0-1,500	16
1,501-2,500	96
2,501-3,600	149
3,601 and over	720
	981

6. Thus there has been a fall of 109 in the number of assistants employed by single-handed practitioners during a relatively short period—a period, moreover, where the full effect of the Working Party's proposals might not be apparent.

7. The Subcommittee has also noted that out of a total of 872 single-handed practitioners employing assistants only 238 have lists of 4,700 and over.

Possible Solutions

8. Recent attempts to reconcile the opposing viewpoints on this subject have been confined to a consideration of the size of the additional list of patients which a principal may have by virtue of employing an assistant. In the Subcommittee's view, the size of the list itself is but incidental to the real issues involved. The major question of principle is whether exception can properly be taken to one doctor employing another in circumstances which make it possible for him to derive financial advantage from so doing.

9. Those who oppose the present regulations claim that they inevitably lead to exploitation of assistants, whilst others, who see no justification in seeking any change in the existing allocation scheme, maintain that very little financial incentive exists for a principal to employ an assistant even when the full extra list of 2,000 patients has been attained.

10. The Subcommittee believes that both points of view are inconclusive, for a principal would be unlikely to consider the employment of an assistant unless there were good grounds for believing that the venture would be to his advantage in one way or another, and it does not necessarily follow that an assistant is exploited just because his principal derives some financial benefit from the arrangement.

11. Exploitation is much more likely to occur when the assistant is obliged to undertake more than a fair share of the practice work or is not paid a salary commensurate with the work he is asked to undertake. No reduction in the extra list could remedy cases of this nature.

12. On the general issue the Subcommittee holds the view that there is nothing improper or unethical in a principal enjoying a monetary reward in respect of the indefinite employment of an assistant, provided that the salary and allowances paid are commensurate with the responsibility and work undertaken and that the assistant has had no reason to believe that the appointment offered would lead to a partnership.

13. In the first place, the assistant is usually a man who is new to general practice and is learning his job preparatory to taking a full part as a principal in the Service, not

necessarily in the practice to which he is first appointed as an assistant. Secondly, overall responsibility for all the patients rests with the principal. Thirdly, to make it economically impracticable to employ an assistant would react to the disadvantage of the small minority who prefer to remain as assistants and still further increase the difficulties which young men face on entry into general practice. The Subcommittee is convinced that it would be wrong to recommend any step which might limit the opportunities for young men to acquire a probationary period in general practice as assistants, and for all these reasons has decided that it cannot recommend any change in the figures at present laid down in the Allocation Scheme.

14. Having reached this conclusion the Subcommittee decided to consider other possible ways of meeting some of the criticisms which have been made, and has examined the problem under three separate headings, namely :

- (1) the "permanent" assistant;
- (2) the assistantship "with a view";
- (3) admission to partnership.

(1) "The Assistant who has no wish to become a Principal"

15. Those who elect to remain assistants in general practice throughout their working lives do so of their own free will and usually for personal reasons. For such practitioners the remedy is clearly in their own hands if they feel that they are being unfairly treated. Insistence upon a written agreement setting out equitable terms of employment is the only possible safeguard, and, in the Subcommittee's view, any attempt to legislate further for this group is impracticable and undesirable.

(2) Assistantship "With a View"

16. It is in these circumstances that most complaints of unfair treatment arise. The principal who advertises successive posts "with a view" and then has a series of assistants, none of whom are taken into partnership, constitutes the real core of the problem. Here again, however, the Subcommittee holds that a formal agreement in the first instance will afford some safeguard to the assistant. Although similar advice has already been given elsewhere—notably in the Association's *Handbook*—there is no doubt that there is room for greater publicity, particularly among final-year students and the newly qualified. To this end the Subcommittee is convinced that further efforts should be made through the deans of medical schools to see that these elementary safeguards are impressed upon the young doctor about to start upon his career. It therefore recommends:

Recommendation: That further efforts should be made, through the deans of medical schools and honorary secretaries of local medical committees, to ensure that final-year students and newly qualified practitioners are fully informed of the importance of entering into a formal agreement when accepting a post as an assistant, either with or without a view.

17. It is however clear that even a formal agreement will provide no real safeguard against a principal determined not to take his assistant into partnership, and the Subcommittee has therefore examined the present N.H.S. regulations on the employment of assistants.

18. At present any principal must secure the consent of the executive council or, on appeal, the Medical Practices Committee before he can employ an assistant for more than three months, and he is also required to notify the executive council of the name of each assistant engaged. In addition, the regulations do not debar an executive council, having once given consent to the employment of an assistant, from subsequently withdrawing that consent, and it is known that at least one executive council regularly reviews the position of principals to whom consent has been given on first application. Thus, although at present the executive council may not be aware whether an assistant is taken on "with a view," it will know of those cases in which a series of assistants have been engaged and where a partnership might reasonably have been expected to follow. In this way flagrant disregard of the principle of fair treatment could be an

influencing factor when the executive council is deciding whether to renew its consent, and it would be appropriate for the local medical committee to take an active part in advising the executive council of those instances where it would be appropriate for them to intervene.

19. Apart from any question of an executive council's power to review the consent already given to employ an assistant, it is quite clear from Section 13(3) of Part IV of the General Medical Services Regulations, 1954, that a practitioner who has obtained consent to the employment of an assistant has no automatic right to increase his list up to the full maximum of 2,000 patients. This section of the regulations reads as follows :

Where a practitioner or partnership of practitioners employs one or more permanent assistants, the number of persons for whose treatment the practitioner or practitioners may be responsible may, and, if the Minister so directs, shall, be increased to an extent allowed by the scheme, not exceeding 2,000 in respect of each assistant.

Thus, apart from withholding consent to employ an assistant, executive councils already have discretion to decide what additional number of patients a practitioner may have by virtue of the employment of an assistant.

20. A combination of these methods, whereby the assistant is from the start in no doubt as to whether or not he has a "view" and the executive council (advised by the local medical committee) is left in no doubt as to its powers either to review regularly the permission already given to employ an assistant or to modify the size of the additional list permitted, would, in the Subcommittee's opinion, provide all the safeguards which can reasonably be expected.

21. The Subcommittee therefore recommends :

Recommendation: That the Ministry of Health should be asked:

(i) to insert an additional section in paragraph 8 of the Terms of Service of General Practitioners so as to make it clear that local executive councils shall, in consultation with local medical committees, periodically review all cases in which consent has been given to the employment of an assistant;

(ii) by means of a circular letter to executive councils to point out that, whereas under the regulations the normal maximum additional list of patients permitted by virtue of the employment of an assistant is 2,000, local executive councils have power where, after consultation with local medical committees, they are satisfied that a reasonable case exists for so doing, either after due notice to withdraw their original consent to the employment of an assistant or modify the number of additional patients otherwise permitted under their allocation schemes.

Recommendation: That an appropriate letter be sent to local medical committees drawing their attention to the proposed arrangements, and offering general guidance upon the principles they should adopt when advising their local executive councils that in a particular instance it would be appropriate to withdraw the consent already given to the employment of an assistant, or to modify the size of list.

22. At present a principal who is refused consent to employ an assistant has a right of appeal to the Medical Practices Committee. The Subcommittee recommends that this right should continue and be extended to include those cases where, on review, the executive council has decided either to withdraw its consent or to modify the permitted number of additional patients.

23. The Subcommittee believes that there is one aspect of the first recommendation set out in Paragraph 21 above upon which the parent Committee would wish to have further guidance—namely, the interpretation to be placed upon the words "periodically review." After considerable thought the Subcommittee suggests that a period of two years would be both appropriate and reasonable.

(3) Admission to Partnership

24. The Subcommittee believes that there is another important factor which deters a principal from taking his assistant into partnership. Even where the principal is satisfied that the assistant is in all respects ready for partnership, and that there are good grounds for believing that the

partnership will eventually be satisfactory from both the professional and the financial points of view, the fear of a considerable drop in income over the first few years is a serious deterrent to the principal.

25. The obvious solution would be the adoption of an earlier suggestion by the G.M.S. Committee that a general practitioner taking another into partnership should thereupon be entitled to at least some part of the compensation moneys due to him. Unfortunately, both the Government and the Cohen Committee have failed to support this proposal and the Subcommittee has therefore looked for other methods which could be carried into practice without undue difficulty at the present time.

26. One suggestion which it considers would give some definite incentive and, at the same time, mitigate to some extent any financial hardship on the part of the principal would be to evolve a system whereby a principal, on implementing a "view" offered to an assistant, would have the right to claim payment on the basis of notional lists retrospectively to the date that the assistant was first engaged as "with a view to partnership." Clearly, some overall time limit would be necessary and a method of establishing a claim for retrospective payment evolved. So far as the former question is concerned, the Subcommittee suggests a period of one year. To establish a right to payment it proposes that the principal, upon taking an assistant, should, possibly by making a declaration on the form used for notifying the executive council of the appointment, register the "assistant's view" with the council. Retrospective payment to the principal on the basis of notional lists would then start to accrue for up to a maximum period of one year from the date upon which the view was first registered. It would be paid only in respect of the individual assistant registered as "with a view" and who was subsequently taken into partnership.

27. The Subcommittee wishes to make it clear that there would be no compulsion upon the principal to register any assistant at any particular time. The sole purpose of optional registration would be to qualify for the additional payment and no right would arise until the assistant was so registered.

28. The adoption of this proposal would require a revision of the distribution scheme and so necessitate amending regulations, but the Subcommittee is convinced that it would provide a real incentive to partnership practice. The Subcommittee therefore recommends:

Recommendation: That a principal implementing a "view" registered with the executive council should have the right to claim retrospective payment on the basis of notional lists for a period up to a maximum of one year.

Summary of Recommendations

That further efforts should be made, through the deans of medical schools and through honorary secretaries of local medical committees, to ensure that final-year students and newly qualified practitioners are fully informed of the importance of entering into a formal agreement when accepting a post as an assistant, either with or without a view.

That the Ministry of Health should be asked:

(i) to insert an additional section in paragraph 8 of the Terms of Service of General Practitioners so as to make it clear that local executive councils shall, in consultation with local medical committees, periodically review all cases in which consent has been given to the employment of an assistant;

(ii) by means of a circular letter to executive councils to point out that, whereas under the regulations the normal maximum additional list of patients permitted by virtue of the employment of an assistant is 2,000, local executive councils have power where, after consultation with local medical committees, they are satisfied that a reasonable case exists for so doing, either after due notice to withdraw their original consent to the employment of an assistant or modify the number of additional patients otherwise permitted under their allocation schemes.

That an appropriate letter be sent to local medical committees drawing their attention to the proposed arrangements, and offering general guidance upon the principles they should adopt when advising their local executive councils

that in a particular instance it would be appropriate to withdraw the consent already given to the employment of an assistant, or to modify the size of list.

That a principal implementing a "view" registered with the executive council should have the right to claim retrospective payment on the basis of notional lists for a period up to a maximum of one year.

APPENDIX VIII

REVISED REPORT OF SPECIAL SUBCOMMITTEE
ON HOSPITAL MEDICAL STAFFING

INTRODUCTION

1. The Subcommittee was appointed by the Central Consultants and Specialists Committee in June, 1953, to inquire into the causes of the shortage of hospital (junior) medical staff, and to make recommendations for dealing with the problem. Professor Strachan was elected chairman of the Subcommittee.

2. At the time of its appointment the Ministry of Health had approached the Joint Consultants Committee for its advice upon this subject, and the Joint Committee—rather than appoint another subcommittee to study the problem—decided to await the deliberations of this Subcommittee. The Joint Committee accordingly made available to the Subcommittee a considerable amount of statistical and other information bearing on the subject, which had been furnished by the Ministry, and this has greatly facilitated the work of the Subcommittee.

REPORT

Size of the Problem

3. There is no doubt that the difficulty of recruiting junior medical staff to hospitals is one which has steadily increased since the beginning of the National Health Service. It was first noticed in connexion with house officer appointments, more particularly those in relatively isolated hospitals, and for a time was held in check by advancing the salary (as provided for under the Terms of Service) or by upgrading posts to S.H.O. This device no longer provides the solution. More recently the difficulty of recruitment has spread to registrars, and even to senior registrars. The staffing shortage has now become widespread and urgent.

4. The Subcommittee had before it the following information regarding the actual shortage:

	Establishment (December, 1952)	Posts Filled	Shortage
House officers	3,104	2,775	329
S.H.O.s	1,654	1,548	106
Registrars (May, 1953)	2,388	1,986	402
	7,146	6,309	837

5. This shortage of 837 did not of itself, however, give a real indication of the seriousness of the problem. Of the 3,100 house officer posts, 2,110 were approved by the licensing bodies for the pre-registration year, but the number of medical students qualifying in England and Wales each year was only approximately 1,800. The surplus from Scotland and Ireland was not likely to do more than meet the deficiency of 300 in approved posts. This meant that some 1,000 house officer and 1,650 senior house officer posts must be filled by fully registered practitioners.

6. It was also significant that a substantial number of unfilled vacancies were in the registrar grade. In 1950, when the Ministry first announced its intention to reduce the senior registrar and registrar establishments in order to relate them to the number of consultant vacancies, there were upwards of 1,400 in each of these two grades. The number of senior registrars has since been reduced to approximately 1,000, but in the same period the number of registrars has grown to nearly 2,000 and is still some 400 short of the number needed by the hospitals. This suggests that the problem is one which affects the whole of the medical staffing structure below the consultant, and not merely the lowest ranges.

Reasons for the Shortage

7. The causes of the shortage are complex, and to some extent interrelated, and it is necessary to appreciate them before seeking a remedy.

Increased Demand

8. Underlying the whole problem is the fact that in recent years the demand for medical staff in hospitals has increased enormously. This is due primarily to progress in medicine itself, but the demand has been intensified by the development of the services provided by many peripheral hospitals since the introduction of the National Health Service. This increased demand is not only for house officers, but also for more experienced practitioners.

Staffing Structure

9. With the inception of the National Health Service the system traditional in the teaching and ex-voluntary hospitals of making all posts below the consultant (or S.H.M.O.) short-term appointments was adopted also in the ex-municipal hospitals. Moreover, this system has been applied much more rigidly than hitherto even in the teaching and voluntary hospitals. Inevitably this makes a heavy demand on medical man-power which must be related to career prospects in the hospital service and in other forms of medical practice. One of the major questions with which the Subcommittee has been faced is whether the increased demand for hospital medical staff can continue to be met adequately by comparatively short-term appointments (which may not offer the prospect of a permanent career).

Relative Prospects in Teaching and Non-Teaching Hospitals

10. The figures supplied by the Ministry support the general impression that the shortage of medical staff is far greater in the non-teaching hospitals than in the teaching hospitals. There is in fact a definite falling off in recruitment in the non-teaching hospitals. This is believed to be partly due to the impression widely held among young practitioners that posts in non-teaching hospitals offer little prospect of eventual promotion to consultant rank. This problem, and the wider problem of prospects generally, the Subcommittee has had to consider.

Integration with General Practice

11. Another aspect of the problem is the almost complete breakdown of the old custom whereby a practitioner combined an appointment on the staff of his local hospital with a general practice. This has deprived the hospital service of a source of medical man-power which it can ill afford to lose.

National Service

12. An added difficulty is the introduction of national service, which leads to a break in the continuity of hospital employment.

General Comments upon the Problem**Demand and Distribution**

13. A significant feature of the problem is the fact that the number of practitioners qualifying each year is between 2,000 and 3,000 less than the number of house officer and senior house officer posts. These are and, in the opinion of the Subcommittee, must remain short-term posts. Any attempt to fill the gap by training additional doctors would speedily result in gross overcrowding of the profession. The problem must therefore be solved in other ways.

14. In a memorandum on the distribution of hospital junior staff the Ministry has drawn attention to the fact that between 1949 and 1952 there has been a greater increase in junior staff in non-teaching hospitals (taken as a whole) than in teaching hospitals. This the Subcommittee feels is due in large measure to the development of the non-teaching hospitals, which in many cases now participate in the teaching of graduates and undergraduates, and undertake a variety

of clinical work previously only carried out in the teaching hospitals. The Ministry also draws attention to the fact that, despite the substantial increase of junior staff in the non-teaching hospitals, the London teaching hospitals (and to a lesser degree the provincial teaching hospitals) still have a relatively higher proportion of junior staff than the non-teaching hospitals. The number of junior staff per 1,000 occupied beds in the teaching hospitals is three and a half times as large as in the non-teaching hospitals. Even allowing for the special needs of the teaching hospitals, a ratio of not more than 2:1 would seem to the Subcommittee to be more appropriate. The Subcommittee believes that the teaching hospitals have a disproportionate share of the available man-power.

15. The Ministry, while emphasizing that it does not consider that the numbers of junior staff are anywhere excessive, has suggested that it would be better for the Service as a whole that teaching hospitals and some of the better-staffed regional hospitals should suffer a slight reduction of staff rather than that the less-favoured regional hospitals should be allowed to become dangerously short of staff. For this reason it has suggested that there should be a 5-10% reduction in the junior staff of the teaching and better-staffed regional hospitals. While the Subcommittee sympathizes with the underlying motive, it feels that if this proposal were carried into effect before the defects in the present staffing structure are remedied the probable result would be a lowering of the staffing standard in the teaching hospitals without any compensating improvement in hospitals elsewhere. Some reduction in the total number of junior posts could probably be achieved, and a redistribution of posts as between teaching and non-teaching hospitals would undoubtedly assist if recruitment to the non-teaching hospitals could be assured. At the present juncture, however, the solution of the problem lies in removing the causes for the falling off in recruitment, particularly in the non-teaching hospitals, in providing inducements for young practitioners to continue in hospital employment for a longer period, and in utilizing to a far greater extent the part-time services of practitioners established in other forms of medical practice—for example, general practice or the public health service. When this has been done hospital authorities should be reminded of the need for economy in the use of medical man-power, and instructed to institute a searching review of their staffing needs.

Staffing Pattern, Prospects, and Recruitment

16. The Subcommittee is convinced by the experience of the past few years that the rigidity of the existing staffing structure, the apparent lack of equality in promotion prospects in different types of hospital, and the growth of the hospital service as a separate entity largely closed to practitioners in other forms of medical work, underlie most of the present difficulties.

17. In the past it was very much easier for a young practitioner to move freely from hospital to general practice, or vice versa, or to combine the two types of work. Moreover, a few years' experience in hospital was regarded as a sound basis for other forms of medical work, particularly in the case of a young practitioner who aspired to obtain a general practice or partnership in a town where there was the possibility of a hospital appointment. Nowadays, by the pressure of circumstances, the young practitioner feels compelled to choose his career at a fairly early stage, with consequent repercussions in the hospital service. If he intends to make his career in general practice there is no apparent advantage in spending time in hospital appointments, because the longer he does so the further he falls behind his competitors for general practice vacancies who have had experience in that sphere. Further, his hospital experience offers far less attraction to many a prospective principal or partner than it did in the days when it carried with it the probability of further hospital work which would enhance the value and prestige of the practice.

18. The break in continuity of hospital employment caused by national service also discourages the intending general

practitioner from devoting more than the minimum time to hospital appointments. Remuneration in the Services is appreciably higher than that of a house officer or senior house officer. Unless he is determined to seek a specialist career, and to make certain sacrifices in achieving his ambition, a man returning to civilian life at the age of 28 or 29 (in many cases with family responsibilities) is naturally reluctant to accept a substantial reduction in income, especially if doing so is unlikely to benefit his ultimate career.

19. If, on the other hand, a newly qualified practitioner intends to make his career in the hospital service he tends, if he can, to avoid appointments in non-teaching hospitals, and tries to "climb the ladder" within a teaching hospital. The recent policy—not universally practicable—of making senior registrar posts interchangeable between teaching and non-teaching hospitals has done little to alter this tendency, since there is a widespread impression that promotion to the senior registrar level is unlikely except through the teaching hospitals. The Subcommittee feels that there are sufficient grounds for this anxiety on the part of young practitioners, and this is supported by advertisements which have appeared for senior registrars, in which it is stated that preference will be given to candidates with experience as registrars in teaching hospitals.

20. In the nature of things it has probably always been the case that many of the most suitable candidates for consultant rank are those who are chosen for junior appointments in the teaching hospitals. The impression now, however, is that the number of consultant vacancies are so few, in comparison with the number of competitors, that the candidate from outside the teaching hospital has virtually no chance at all.

21. All these factors have an important bearing on the staffing structure. There is at the present time a consultant establishment in England and Wales of a little over 6,000, or, with S.H.M.O.s (the only other "career" grade), between 8,000 and 9,000. This, with provision for expansion within the hospital service and opportunities for consultant careers outside the National Health Service, provides the opportunity for promotion for approximately 200-250 men annually. Below this level there are some 7,500 junior medical staff the tenure of whose appointments varies between six months and four years.

22. Obviously the consultant establishment must be fixed in relation to the need for consultants and not to provide prospects for younger men. At the same time there is only one source of recruitment, and if the hospitals are to be staffed adequately the junior posts must either (a) offer reasonable prospects of a career wholly within the hospital service itself, or in combination with other medical work, or (b) be regarded as useful stepping-stones to other forms of practice.

23. Among the chief characteristics of the present staffing structure are its lack of security, and the rigidity of the training ladder, which takes little or no account of the varying time taken by individuals to achieve the necessary standard for consultant rank. The recent problems of the senior registrar system have probably been exceptional, but in the view of the Subcommittee any system is unsound under which an aspiring consultant may be discarded merely because the opportunity for promotion does not come within a limited specified period. This is a particular difficulty in the numerically small specialties; in these it is impossible to relate a limited period of training to the irregularly occurring consultant vacancies. Consultant vacancies may occur, say, two in one year, and none for a year or so; consequently there must be a "holding post" to take up the differential of production and absorption. In the past many suitable candidates have been content to serve in a subordinate capacity on their hospital staffs for quite long periods awaiting the chance for a vacancy on the honorary staff—and in the meantime have performed much of the medical work of the hospital.

24. Coupled with the lack of security is the question whether the present demand for medical staff can adequately be met by short-term appointments normally held on a

whole-time basis. The Subcommittee feels strongly that a system which includes permanent appointments or appointments of indefinite tenure is desirable and probably essential and that a greater use should be made of part-time staff.

PROPOSALS**Immediate Remedies**

25. The Subcommittee directed its attention in the first place to the possibility of finding some remedies capable of immediate application which might go some way towards easing the existing difficulties whilst a long-term plan could be evolved, discussed, and put into operation.

26. It considered the possibility of deferring the call up of young practitioners for national service until, say, 18 months or two years from qualification, in order that hospitals should not be deprived of their services immediately upon completion of their first two house appointments. After very careful consideration this possibility was discarded as an immediate remedy for the following reasons:

(a) The Subcommittee is informed that at the moment the needs of the Service Departments are such that a general deferment of call up could not be contemplated.

(b) General deferment of call up would not materially alleviate the present shortage of hospital junior staff owing to the fact that a high proportion—for example, between 45% and 55%—of newly qualified practitioners have already completed their national service.

There is evidence, however, that this state of affairs may be modified in the near future (from mid-1957 onwards) owing to the increasing number of men qualifying who will not have completed their national service. Deferment is therefore not ruled out as a means of amplifying house officer requirements.

27. The Subcommittee next considered the criticism that it would be impossible to attract young practitioners back into the hospital service after national service unless the remuneration they could expect approximated to that received in H.M. Forces. The suggestion was made that ex-Service practitioners should receive a salary higher than that normally attached to the post, but this would involve two rates of pay for the same post. The Subcommittee discarded this suggestion because it had envisaged that practitioners returning to the hospital service after military service would normally be appointed to posts above the house officer grade, and on the scale recommended later in this report.

28. One of the biggest obstacles in the way of inducing young practitioners to continue in resident appointments after marriage, or, more particularly, attracting practitioners back into the hospital service after their period of military training, is the inadequate provision of married quarters. Except in the mental hospital service very few hospitals offer married quarters for junior medical staff. Many practitioners return from the Services to civilian life as married men, often with young children, and in addition to the handicap of the expense of maintaining two homes on the salary of a junior hospital appointment they are naturally reluctant to be separated from their families.

The provision of married quarters is therefore a matter of pressing urgency, and it is doubtful whether hospital boards and committees are sufficiently aware of this. Unfortunately the standard of food and accommodation at present provided for resident staff is deplorably low in some hospitals and acts as a deterrent rather than an incentive. The erection of special accommodation presents obvious problems, but in many areas there is suitable existing property which could be adapted for the purpose without much difficulty. Moreover, the adoption of the university system of "approved" lodgings would probably go some way to meet the problem. The Subcommittee welcomes the recent circular issued by the Ministry encouraging hospital authorities to provide residential accommodation. Nothing should be allowed to stand in the way of such measures as are necessary in this direction to ensure the adequate staffing of hospitals.

29. Some of the routine clinical work of hospitals could well be done on a part-time basis by married women doctors who could spare the time from their domestic duties for regular sessions, and steps should be taken to encourage women doctors to come forward to do this work.

Long-term Solution

30. The Subcommittee considers that the policy of specifying a certain category of medical staff for the training of consultants, and of fixing hospital establishments wholly in relation to prospective consultant vacancies, is wrong, and should be abolished. The hospital medical establishment should depend upon the type and amount of medical work (including research and teaching) required to be done in the hospital and should be determined in consultation between hospital boards and their consultant staffs. At the same time it will be necessary to lay down the overall ratio between consultants and junior staff in order to secure that the balance between them is satisfactory on the one hand to secure a sufficient number of men aspiring to higher posts, and on the other to ensure that their prospects of promotion are reasonable.

31. *Responsibility for the treatment of hospital patients must remain in the hands of practitioners of consultant status. The first step to be taken, therefore, is to examine and review in every hospital the volume of work which should be undertaken only by consultants.* This having been determined, the consultant establishment should then be adjusted to accord with the requirements. It seems likely that such a review will support the opinion advanced for some years by the Joint Committee that redistribution of and increase in the consultant establishment is necessary. In no circumstances should the consultant establishment be such that consultant work is being regularly carried out by those who are not consultants. Whereas this principle should be everywhere applied, it should not exclude the occasional performance by those training or aspiring to be consultants of duties normally carried out by consultants, and under their general supervision.

32. In a hospital much of the clinical work is too responsible for house officers, but often does not require the personal services of a consultant, provided it is carried out under his responsibility.

33. The Subcommittee therefore suggests that there is still a need for an intermediate grade of hospital officer who shall bear responsibilities consistent with the performance of much of the regular medical, surgical, and other treatment which makes up the work of the hospital, while he is preparing for a consultant post. As hitherto these officers should be of such standing and experience as to be able to exercise supervision over the house officers.

34. Since 1948 a number of different grades of medical staff have in fact constituted such an intermediate grade—that is, senior house officers, registrars, senior registrars, J.H.M.O.s, and S.H.M.O.s. Some of these have had a special position; for instance, registrars, and senior registrars have been regarded more as trainees for consultant rank than as intermediate officers appointed to carry out the work of the hospital.

35. It is essential that in the future the partial restoration of an old principle should be sought; that is, that at all levels in the hospital, from house officer to consultant, appointment to a post should be for the purpose of carrying out the work of the hospital at that level. A man aspiring to be a consultant should in the course of his hospital work achieve the means of training himself to be a consultant—training, that is, by active experience of the work, it being always emphasized that his primary function is to carry out the work of the hospital.

36. The intermediate grade of medical staff should be wide and flexible. This grade will be the training ground for all those who aspire to consultant rank, and it is envisaged that the majority who remain in the hospital service long enough to reach the highest levels of this grade will ultimately achieve consultant status. In order to achieve this and to ensure adequate supervision the ratio between the numbers

in the consultant and intermediate grades in each specialty should be agreed between the Ministry and the profession. In considering this ratio the numbers of university staff should be taken into account. Further, arrangements should be made to ensure that such agreed ratio shall be put into operation by the Boards. A considerable proportion of hospital junior staff will, of course, eventually make their careers in some other field of medicine, but there will still remain a small number who fail to reach consultant rank yet who prefer hospital practice, and who, because of their training and experience, have a valuable contribution to make to the work of the hospital. It is essential that provision should be made for this small number of practitioners to make a permanent career in the hospital service.

37. The Subcommittee has had the greatest difficulty in finding suitable titles for the posts in the intermediate grade. It has considered, and discarded, such titles as intermediate hospital medical officer, senior medical officer, etc. Inasmuch as the medical staff in question will assist consultants in their work, the Subcommittee now proposes that they should be called junior medical (or surgical) assistant, medical (or surgical) assistant, and in the highest salary range senior medical (or surgical) assistant.

In order that the new grade shall meet the requirements the Subcommittee suggests that the overall range of salary should be from £800 to £2,200, but that this should be "broken down" into three broad ranges of £800–£1,000, £1,100–£1,400, and £1,500–£2,200. In the lowest scale appointment should be initially for a period of three years, with the opportunity of reappointment or renewal. Appointments in the middle range should be initially for four years and thereafter renewable for an indefinite tenure at £1,400 per annum. Posts in the highest range should be for an indefinite period. Provision should be made to allow of periods of leave—up to one year for research or higher study at home or abroad without loss of seniority or tenure.

38. The establishment at all levels should be fixed according to the needs of the hospital. It should clearly be understood, however, that in no circumstances should the appointment of medical (or surgical) assistants or senior medical (or surgical) assistants, even in the highest levels of the proposed salary range, be regarded as an effective substitute for the appointment of consultants. The former should carry out his work in association with the consultant, to whom he will be in a position of reference at all times, the consultant retaining the ultimate responsibility. Such appointments should not therefore be made where such supervision is impracticable.

39. Part-time appointments in this grade, and particularly in the upper reaches, should be encouraged. Such posts would provide general practitioners with an opportunity to practise a specialty under general consultant supervision, but with an appropriate degree of clinical responsibility. They could also be the stepping-stone for the general practitioner aspiring eventually to become a consultant. An extension of part-time appointments would also enable practitioners engaged in other spheres of medical work—for example, teaching, research, public health, industrial medicine, or private practice—to contribute to the needs of hospital staffing. Such contribution the Subcommittee would regard as valuable, not only from the point of view of the hospital service but in linking the hospital service and general practice to the benefit of all concerned, more particularly the patient.

40. The man who wishes to have further hospital experience before entering some other branch of medical practice would perhaps remain for three years or so and then take his departure, having gained very valuable experience and at the same time contributed usefully to the hospital service.

41. The man who wishes to become a consultant would, assuming that he had sufficient to commend him, be able to apply for such posts as were advertised at higher levels in this grade, and the time he takes to merit consultant status would depend largely upon himself. There would be no rigid time scale. For example, having done his house officer appointments he could achieve an appointment at £800 a year. After two or three years in such an appointment he

might apply for a post at £1,100 a year in his own or another hospital. During his three years he might have read for and acquired higher degrees and in various ways built up a reputation as a potential consultant. By this means he might well be appointed to a more senior post, which he would hold for a year or two, always looking out for a consultant vacancy for which he might apply. Thus, the introduction of this long grade would not preclude an able man from taking such short cuts to consultant appointment as the necessary length of training will allow and his talents enable him to take. On the other hand, it would provide for the practitioner who took rather longer to reach consultant standard and ensure that he was not "discarded" solely by the passage of time.

42. It is probable that the teaching hospitals will prefer in general to retain the system of short-term appointments, and the Subcommittee sees no reason why this should not be done within the staffing structure recommended. Indeed, the Subcommittee strongly recommends that posts of junior medical (or surgical) assistant or medical (or surgical) assistant in teaching hospitals should be limited in tenure to four years, and not normally be renewable. This would encourage intermediate medical staff at teaching hospitals to seek other posts in the intermediate grade in the non-teaching hospitals while awaiting promotion. It would also provide an opportunity for a greater number of men to hold teaching hospital appointments, and in these ways secure that aspirants for consultant appointments had the fullest opportunity of experience in both teaching and non-teaching hospitals. The number of intermediate posts in teaching hospitals should also be so limited in number as to ensure that the intermediate officers in non-teaching hospitals have a reasonable opportunity of competing successfully for consultant posts. It is envisaged that the posts of senior medical (or surgical) assistant, which would be the normal channel of promotion to consultant, would not be held at teaching hospitals.

43. All existing S.H.M.O.s should be redistributed between the consultant establishment and the new senior medical (or surgical) assistant establishment, according to their qualifications and experience.

Senior registrars and registrars should be redistributed within the various levels of the intermediate grade.

44. The foregoing proposals are summarized below:

A. The medical staffing of hospitals should be based upon the following five salary grades:

- (i) House officer £425 to £525;
- (ii) Junior medical (or surgical) assistant £800 by £100 to £1,000;
- (iii) Medical (or surgical) assistant £1,100 by £100 to £1,400;
- (iv) Senior medical (or surgical) assistant £1,500 by £100 to £2,200;
- (v) Consultant £2,100 to £3,100.

B. The appointment of medical (or surgical) assistant should initially be for a term of four years, and thereafter on an indefinite basis, except in teaching hospitals, where the appointment should be determined after four years and not normally be renewable.

C. Posts of medical or surgical assistant or senior medical (or surgical) assistant, and especially the latter, should be whole- or part-time according to the needs of the Service and the preference of the officer.

APPENDIX IX

REPORT OF THE GERIATRICS JOINT SUBCOMMITTEE

The Committee and the Terms of Reference

In July, 1953, the Representative Body of the British Medical Association adopted the following resolution:

That this meeting, realizing the pressing need for co-ordination of the various authorities caring for the aged, recommends the Minister to consider the establishment of geriatric units for that purpose, under the guidance of an experienced physician.

Consideration was given to this resolution by the Consultants and General Practitioners Liaison Committee. On their recommendation a Joint Subcommittee, consisting of representatives of the Central Consultants and Specialists, General Medical Services, and Public Health Committees was appointed with the following terms of reference:

To give further study to the question of the establishment of an integrated service for the treatment and rehabilitation of chronic disablement arising from age or illness.

In carrying out the terms of reference the Subcommittee has had constantly before it the views expressed in the previous report issued by the Association, and has taken into consideration other recent reports on the subject. It has concentrated its efforts upon seeking out and pointing out those features of the services for the treatment and rehabilitation of chronic disablement in the elderly which seem to require urgent and close attention and improvement, and which if put into effect would quickly and substantially increase the facilities available for this purpose. In concentrating on this approach, it is realized that there are other features of the service which may appear to have received rather scant attention. This is not to be interpreted as meaning that the Subcommittee disapproves of or considers unimportant certain other features which have already been dealt with fully in the previous report.

Members of the Subcommittee.—H. D. Chalke, London (Chairman); P. C. P. Cloake, Birmingham (resigned, June 1954); J. Fenton, London; W. G. Harding, London; R. Jones, Ipswich; C. F. R. Killick, Williton, Somerset; K. S. Maurice-Smith, Ely; D. H. Mills, Lymington, Kent; Llywelyn Roberts, Sheffield; A. Talbot Rogers, Bromley; M. Sorsby, London; D. Wilson, Bognor Regis.

Co-opted Members.—Lord Amulree, London; R. N. Curnow, Truro; Trevor H. Howell, London; H. L. Glyn Hughes, London; R. Crosbie Walsh, London.

Observers.—C. A. Boucher, London; E. B. Brooke, Southampton.

During its deliberations the Subcommittee had the benefit of the views of representatives of the Medical Society for the Care of the Elderly.

Preamble

The growing demands of an ageing population and the economic position of the country require that measures to meet the needs of the elderly and infirm must rest firmly upon certain broad principles.

Temporary sickness, permanent disability, and social needs are common to all age groups, the needs of the elderly differing only in degree. The particular problems of the elderly call for special measures when, on account of infirmity and not of age, independence has to give way to dependence upon others.

Because of the natural desire to remain at home, national economic necessity, and the occasional ill-effects of uprooting, it should be a basic principle that the care of the elderly should be centred on the home and the general practitioner. The aim should always be to make any admission to hospital a temporary interlude only. To this end, adequate domiciliary services of many kinds must be easily available, and the general practitioner must be able to command immediate support from the hospital and welfare services when the need arises.

Patients requiring admission to hospital should be admitted irrespective of age and assessed and treated in a general hospital until discharged or found to be in need only of long-term nursing care.

There must be liaison at local level in order to ensure effective co-ordination of existing services. In each group or area there should be someone to whom general practitioners can turn and in whose hands rests the responsibility for deciding the temporary and permanent disposal of all the elderly sick and infirm.

I. INTRODUCTION

1. A Joint Subcommittee was set up by the Central Consultants and Specialists, General Medical Services, and Public Health Committees of the Association to consider

the establishment of an integrated service for the treatment and rehabilitation of chronic disablement arising from age or illness. The Subcommittee, whilst fully aware of the problems relating to disabled persons of all age groups, decided that the urgency occasioned by the increasing magnitude and complexity of the problem of the aged warranted prior consideration of their needs.

2. This report therefore deals with the elderly only and the Committee suggests that a further report be prepared covering the wider problem of the care and treatment of disabled persons generally.

3. In 1947 the Association published a report entitled "The Care and Treatment of the Elderly and Infirm." In short, a co-ordinated geriatric service was recommended, based on geriatric departments in selected general hospitals. A supplement to the Report issued at a later date under the title "The Right Patient in the Right Bed" underlined the need for the provision of accommodation under various headings so that the old and infirm should not occupy beds in a general hospital for extended periods. The value of out-patient facilities for elderly patients was stressed as an important method of relieving the pressure on hospital beds.

4. At an early stage in its deliberations the Subcommittee realized that the recommendations of the above-mentioned reports were not being implemented as fully as was hoped. There is, however, a definite trend towards and awareness of the need to achieve "the right patient in the right bed." The sum of hospital, halfway house, and residential accommodation has increased and is increasing, and at the same time a certain amount of necessary redistribution of both beds and patients has taken place.

5. In arriving at its recommendations the Subcommittee has taken into consideration the replies received in response to extensive inquiries of a number of practitioners working in the field—general practitioners, consultants, medical officers of health, as well as welfare authorities in many parts of the country. These show that there are considerable differences in various parts of the country in the extent and efficiency of the services available for elderly and infirm persons, although there is little co-ordinated statistical information on the subject. There is a need for a nationwide survey which would bring to light the various schemes in operation, and would help those authorities planning for the future to provide an efficient and co-ordinated service.

6. The approach to the problem that was suggested and accepted by the Subcommittee was the urgent need to do more than merely provide institutional accommodation for the elderly and infirm. It seemed of prime importance that, given adequate hospital services, steps should be taken to prevent as many as possible from needing them, and that means should be recommended that might delay the need for admission in every individual case. The underlying principle should be that where admission proves to be necessary the stay in hospital should be regarded as a transient phase and discharge should be anticipated.

Need for Early Application of Services

7. It follows that there is a responsibility resting upon all those in touch with the elderly to make known as early as possible the need for help, so that the available services may be utilized to enable elderly people to remain in their own homes. There is no clearly defined statutory obligation on any person or body to maintain contact with elderly people and make known their needs. Co-ordination between the local statutory and voluntary services should clearly be in the hands of the medical officer of health and his staff. Some of the ways in which this can be achieved are indicated in the report of the British Medical Association on the "General Practitioner and the Health Visitor" (Sub-Appendix I).

Responsibility of Relatives

8. The Subcommittee has considered the general attitude of relatives to their responsibilities for the care of the elderly and chronic sick. Although relatives should (and in the majority of cases do to the best of their powers)

accept their responsibilities, yet at the present time this may involve real difficulties, particularly of finance and accommodation. The prime responsibility for the care and welfare of the elderly must, however, be fairly placed upon the relatives, who should ensure that the services of statutory and voluntary bodies are called in where necessary.

Public Responsibility

9. Local authorities should bring to the notice of the public the increasing complexity of the problem of the ageing population and should educate them in the part they must play, at the same time acquainting them with the local facilities available.

10. The Subcommittee has been impressed by an account of a scheme carried out in connexion with the physical medicine department of a large provincial hospital. By close local liaison with clergy and others a lively interest in old people has been stimulated and has resulted in practical co-operation (see Sub-Appendix II).

II. ACCOMMODATION

11. All community planning should take into account the natural desire of the majority of the aged to continue to live at home as long as possible and to do so in the district in which they have spent most of their lives.

12. It may well be that one of the easiest and most effective ways of achieving these ends is to arrange that the redistribution of accommodation in accordance with the family's need should take place earlier than is customary at present—that is, when the children have grown up and have left the parental home. If the parents (at that time by no means old) move into more compact, more easily run, and more accessible accommodation then the need for special old people's accommodation would be less. The move would take place at a time at which people are still reasonably adaptable. It is not suggested that housing authorities should have power to remove people in this way, but medical officers of health should encourage housing authorities and individuals to consider this possibility.

13. A number of authorities provide special housing facilities for elderly people. Much more could be done through redistribution and adaptation of existing accommodation while other accommodation is being erected. Suitable accommodation should be provided on housing estates so that the residents, when they become elderly, may have young and active neighbours who can assist them in time of need. Alternatively there should be a resident warden to give help as required. Where young people wish to take elderly parents to live with them housing authorities should be sympathetic and allot them suitable accommodation.

14. Accommodation for the elderly may be provided in the following ways: (a) Suitable houses, flats, and bungalows, with necessary adaptations to furniture and fittings, for the ambulant able to look after themselves, and with the necessary domiciliary services for those able to remain at home but needing occasional nursing and/or semi-skilled help. (b) Residential accommodation under Part III of the National Assistance Act for those in need of care and attention which is not otherwise available to them. (c) Homes for the frail ambulant needing the attention of semi-skilled staff and occasional nursing in sick-bay accommodation. (d) Hospital beds for those requiring frequent medical attention and skilled nursing.

Private Homes

15. The Subcommittee would encourage the extended use of charitable and private homes for elderly people of limited private means. To ensure the maintenance of the required standard, the procedure for the registration of private homes should be reviewed by county and county borough councils in order that adequate inspection may take place before registration, and that regular visits may be made subsequently. Although authorized under Section

39 of the National Assistance Act, 1948, it appears that visits after registration are not universally carried out.

16. There is a group of elderly people able and willing to pay something towards maintenance in voluntary or private homes, and the possibility of subsidizing such homes from public funds in order to balance payments made by individuals should be explored. A recent survey has shown that out of 500 elderly persons on a hospital waiting-list (many of whom were in private nursing-homes), 7% later had to be admitted to hospital because of financial considerations. The above suggestion would enable more beds to become available and would prevent hospital beds being used where not entirely necessary on medical grounds.

Foster Homes

17. The frail ambulant (and perhaps some of the ambulant) might be accommodated by a scheme of fostering. There may be families prepared to take into their homes a moderately active old person. The difficulties of such a scheme are recognized—increasing frailty, the necessity for careful selection of homes, and the need for subsequent supervision—but arrangements of this nature are already working satisfactorily in certain areas.

Structural Alterations and Appliances

18. Whatever form of housing is provided, valuable results, both to the individual old person and to those trying to solve the general problem, will accrue from efforts to make the accommodation more easily manageable by its elderly occupant. More attention should be paid by local authorities to the need for structural modifications in the home, whether in new construction or by adaptation of existing accommodation, to meet the requirements of the aged. These include the provision of ramps, and sheds for housing of invalid chairs, the erection of hand-rails and steps, and suitable alterations to lighting, heating, and cooking systems.

19. At the present time there is a division of responsibility for the supply of appropriate appliances and gadgets, and for making alterations to household equipment for the elderly. Broadly speaking, alterations to the house, including structural alterations and the provision of hand-rails, may be undertaken by the welfare authority. Gadgets enabling the elderly with a persistent disability to live more easily are usually made in the local hospital workshop, or they are provided by the welfare authority. Nursing appliances for those sick at home are supplied on loan by the local health authority, often by arrangement with the British Red Cross Society or with a hospital. There is room for simplification and extension of these arrangements.

Old People's Clubs

20. Finally, it is essential to ward off senility and incapacity by interesting the aged in their surroundings, and to combat loneliness and any tendency towards the hermit attitude. The value of old people's clubs is particularly stressed. Apart from being social centres they provide a means of enabling those responsible for voluntary and statutory services to keep in touch with the elderly. Many of these clubs provide ancillary services such as chiropody, and arrange transport for those who would otherwise be housebound. They also serve as centres for a meals service. If a club is closely linked to an old people's home it enables the ambulant residents to share the facilities and to maintain outside interests longer than might otherwise be the case.

III. THE PLACE OF THE GENERAL PRACTITIONER

21. It is important that the services available for elderly people should be supplied with the least possible delay to those in need of help; early notification is therefore essential. The family doctor, having in most cases the closest knowledge of the condition, circumstances, and needs of an old person, should be kept informed of all the local

authority and other services on which he can call. The Subcommittee recommends that local health authorities should publish a brochure giving these details. It should be in pocket size and should be circulated to every general practitioner in the area, as well as to others concerned with the care and welfare of the elderly. In addition, the general practitioner will find the services of the health visitor useful in dealing with the social needs of the patient, meeting their needs and bringing the necessary agencies into action.

Domiciliary Services: Visiting

22. Most local health authorities make some provision for visiting of the aged infirm, and generally much essential assistance is given by voluntary organizations. Whilst the health visitor is statutorily the field worker who visits the family, including its aged members, there is much scope for voluntary effort in the way of friendly visits to lonely old people. Voluntary workers should of course be told to whom they should turn in case of need—the family doctor, the health visitor, clergy, and so on. Where staffing permits health visitors do try to make regular visits to the aged infirm known to the authority. It is the opinion of the Subcommittee that visiting should be left for local arrangement and agreement, but it is essential to have machinery by which all elderly people requiring attention come to be visited by some responsible person so that there is no delay in notifying the need for and obtaining other services when required. Such early visiting is considered by the Subcommittee to be of the utmost importance in the prevention of the need for admission to or of long stay in hospital.

23. In some areas, local co-operation is achieved through case committees representative of the health and social services in the area, including voluntary organizations. This provides a means of assessing the requirements of individuals and arranging for them to be met.

Home-nursing and Domestic Help

Recruitment of Nursing Staff

24. The inquiries made suggest that although the home nursing service would probably be adequate if the establishment posts were filled, in most areas nursing staffs are below strength. Efforts to keep elderly people in their own homes will make even greater demands on the home nursing service, and establishments should be reviewed in the light of the needs of the elderly sick and infirm. It is recommended that a greater number of male nurses should be recruited to these services. In addition, a proportion of both male and female State Enrolled Assistant Nurses should be employed for duties within their scope under the supervision of State Registered Nurses.

25. It is reported that some housing committees are unwilling to make concessions for nursing staff. This adds to the difficulty of procuring and maintaining an adequate nursing service. In order to ensure satisfactory recruitment of male nurses as well as other nurses, they should be given priority in the allocation of housing accommodation; where necessary, local housing committees should consider the purchase of property for renting to nursing staffs.

Linen Supply

26. Local health authorities are entitled to keep a store of linen which district nurses may issue on loan for the use of elderly people. This is an essential service.

Night Patrol Service

27. The Subcommittee has considered the possible value of a night patrol service in urban areas. Its use would be limited and would depend to a large extent on the amount of responsibility accepted by families, but there must be a number of areas in which there are sufficient old people living alone who would benefit from one or more visits during the night from a patrolling home help. In these areas the establishment of a service of this type appears to be warranted.

Sitter-up Service

28. Other elderly people might require a sitter-up for the night, although where this service is available the demand is not reported to be great. It might well be that if such services, where established, were better known to general practitioners there would be increased call upon them. The best use of night sitters is probably on a temporary basis when they can give periods of rest to relatives on one or two nights per week or for short holidays. Hospital beds might well be saved in this way. Where there are no relatives available and the requirement is for a permanent night sitter the case should be regarded as one for institutional accommodation.

29. Friends and neighbours often undertake this duty and they make a valuable contribution to the problem, but it is unlikely that an adequate or consistent service will be maintained solely on a voluntary basis. It is suggested, therefore, that the provision of such a service should at any rate be partly the responsibility of the local health authority, supplemented by such volunteers as are prepared to help.

Home Help Service

30. The home help service can be an important factor in avoiding admission to hospital, institution, or a home. It may play a major part in delaying the onset of senility or complete incapacity, by relieving patients of the more arduous tasks beyond their capacity, by ensuring that they get proper nourishment, and by enabling them to carry on in an atmosphere free from the more telling cares of running a household. The employment of male home helps is an essential part of an efficient home help service.

31. Figures from the Ministry of Health Annual Reports show that whereas the number of whole-time home helps has declined somewhat since 1949, there has been a large increase in the number of part-time home helps, and consequently in the number of hours of service available. This accounts for the steady annual increase in the number of cases attended. Although the home help system appears to be operating satisfactorily, it is, as yet, far from adequate in many places, and problems of recruitment are variable. Periodic half-day meetings at which talks are given by officers of the public health department are of value in raising the standard of home help efficiency; they may also help recruitment. Conditions of service should be so adjusted as to ensure adequate recruitment and maintenance of a high standard of service.

Teaching How to Manage the Home

32. There may be in some cases scope for one of the team, preferably the health visitor, to familiarize old persons with the easier ways of doing certain things in the home, so that with the aid of a few mechanical modifications they may become independent once again. This could go a long way in overcoming the bleak forebodings that must occupy the minds of old people when they realize they can no longer manage as they did formerly.

Meals

33. One of the great needs for old people living alone is a meals service. Clinicians are agreed as to the occurrence of malnutrition; this is hardly surprising when the old person has let himself or herself slip into the habit of taking the easier course of avoiding food preparation and existing very largely upon tea and bread-and-butter. There is little doubt that the provision of a well-cooked nourishing meal daily, or even two or three times a week, would improve the state of nutrition and maintain the strength of many elderly persons so that they may the longer look after themselves.

"Meals on Wheels"

34. A meals-on-wheels service should be organized in all areas. At present this can only be accomplished through voluntary organizations, who arrange and operate the ser-

vice, and who receive grants from local authorities under the provisions of Section 31 of the National Assistance Act, 1948. Whilst such arrangements exist in a number of areas, nevertheless the service can hardly be considered adequate even for present needs, and it is seldom that a meal is provided every day. The school meals service is available in many places, and arrangements for the joint use of this service might well be the best way of providing for the elderly. Meals might often have to be delivered to individual houses. This could be arranged from a local centre. In some places a communal meal could be provided for ambulant old people in a village hall or other accommodation used by old people's clubs. (This already happens in some areas.)

"Invalid Kitchens"

35. The "invalid kitchens" service is another means whereby adequate meals may be available to those who are sick. This service, which is at present restricted to the London area, where it is administered by a voluntary organization receiving a grant from the county council, should be extended.

36. Attention is drawn to one important aspect of any mobile meals service—namely, the value of the regular contact between the deliverers of the meals and the individual old people. The same applies when a home help attends and is able to cook for the elderly person.

IV. PREVENTIVE AND RECUPERATIVE SERVICES

37. Early recognition and treatment of eye, ear, dental, and other defects can do much to stave off the establishment of severe and irreversible disabilities. Owing to their gradual onset, with consequent adaptation by the patient to the defect, elderly patients often present themselves for treatment too late. The onset of these defects can be detected early in some cases by those who visit the elderly in either a voluntary or statutory capacity. If these visitors are aware of the possibilities of treatment, it is likely that much hardship and disability among elderly people will be prevented. The booklet suggested in paragraph 21 should be the source of information.

Ophthalmic Services

38. There is a high incidence of cataract and glaucoma in the aged. This is reflected in the fact that, of the newly registered as blind, some 70% are over the age of 70. Over 80% of those registered as blind from cataract have had no treatment and a smaller, although still considerable, percentage of those blind from glaucoma have likewise had no treatment. Some method whereby treatment is more readily sought by patients or is more readily available to them appears to be needed. It is recommended that routine examination by an ophthalmologist should be part of the services given to elderly patients. It is further recommended that the advice given by the Ministry that blind certification should normally be only on the authority of an ophthalmologist of consultant status should be implemented as fully as possible. Examination by a consultant may well lead to more applicants for blind registration taking advantage of the facilities available for treatment.

Holidays and Convalescence

39. At present local health authorities may grant recuperative holidays, but not convalescence, to old people recovering from an acute illness, but not all do this. A "recuperative holiday" is defined as a rest after illness when no regular nursing and medical care is required, and a charge can be made according to the means of the individual. Convalescence is arranged by a hospital as an extension of hospital treatment when the person is in need of regular medical and nursing care, and no charge is made. In their capacity as welfare authorities, local authorities may facilitate the taking of holidays by handicapped persons and defray any expenses. The schemes for this are covered by

the National Assistance Act and are subject to the approval of the Ministry of Health, as outlined in their circular 32/51. Many Old People's Welfare Associations (which receive grants from local authorities under the provisions of the National Assistance Act) have established holiday schemes for old people. This practice may well be extended.

Special Types of Holiday Home

40. Greater use should be made of the powers which local health authorities already possess in order to cater for old people with special disabilities (blindness, diabetes) who require a special type of holiday home accommodation.

Chiropody

41. Many investigators have drawn attention to the inadequacy of the chiropody arrangements for old people. Surveys of the housebound elderly in receipt of home help have shown that about 10% were in need of chiropody but were not receiving it. It has been estimated that foot defects play a significant part in the restriction of normal activity in about a quarter of the older population. The lack of treatment of foot conditions which can be remedied or ameliorated by chiropody is in many cases the sole reason why old persons are confined to the house. Whilst there is danger in over-emphasizing the necessity for chiropody at the expense of other essential services, the evidence suggests that an extension of this service is desirable. The present position is that, whilst the relatively few local authority schemes in operation before July 5, 1948, may continue, they may not be extended, neither can new ones be established. Many voluntary organizations in receipt of local authority grants are providing chiropody for old people (this is particularly valuable when available at an old people's club), but this only partly offsets the lack of adequate provision by hospital and local health authorities. The Subcommittee recommends that general practitioners should be able to refer their patients direct to hospital chiropody clinics.

Laundry Service

42. Statutory provision should be made for expenditure by local sanitary authorities when necessary on a laundry service for soiled linen. Some authorities already provide such a service for the incontinent. In a few cases facilities at a laundry attached to a hospital group are made available for the use of the local sanitary authority. This practice, which could usefully be extended, is an example of the need to establish the strongest links between the local authorities and the hospitals in this matter of caring for old people. In some areas a laundry allowance is payable (under the National Assistance Act), so that old people make their own arrangements for the actual work of laundering to be done.

V. THE PLACE OF THE HOSPITAL

43. The term "chronic sick" has become misleading. Patients requiring hospital care must be admitted to a hospital where full facilities for assessment and treatment are available. They may need to remain there for a short or a long period, but whilst active treatment is necessary there they should remain. A number of these patients will be left with a final disability which may require simple nursing care only, in accommodation which must remain under the control of the general hospital.

Hospital Geriatric Units

44. Hospital units have an important place in the treatment and rehabilitation of the aged sick, and they have carried out pioneer work in this field. The Minister of Health has stated recently that in England and Wales there are now 59 geriatric units for active treatment. These account for 20,500 of the total beds (53,871) normally available for the chronic sick.

45. These units, together with various departments of general hospitals, should, as well as providing active treatment, serve as assessment units to which elderly people may be admitted and from which they may be later transferred to other appropriate accommodation (e.g., general hospital, long-stay hospital, Part III accommodation, or home), thus releasing beds for other admissions. After a short stay some patients will be able to return home and receive further help and treatment through the domiciliary services.

46. Close association with the general practitioner, the local health and welfare authorities, and voluntary services is imperative. It is recommended that the medical staff of the unit should include local general practitioners appointed as paid clinical assistants or in some other capacity. It is essential that an adequate number of social workers should be available to work in association with geriatric units. The health visitor is an invaluable member of the team, for her activities in connexion with the home and the family unit enable her to provide essential information; if her services are utilized to the full, home visiting by hospital almoners (which is not recommended) becomes unnecessary. It is reported that in one area a health visitor has been seconded for duties in connexion with a geriatric unit, the hospital management committee concerned sharing her salary. Arrangements such as this make for co-ordination and smooth running of the services already in existence.

47. The physician in charge of the unit should not necessarily be confined to duties within the unit, but might also act as adviser on the medical problems of old age to a hospital area—i.e., to a hospital management committee group or groups.

48. Whilst the extension of special geriatric units is advocated by many, others favour the treatment of the elderly in general wards. There is a place for hospital facilities of both types provided that they are closely linked with the services concerned with the home and home life.

Medical Education and Nursing Training

49. One important aspect of the unit attached to a teaching hospital is the part it plays in the training of doctors and nurses, and, for this reason, a geriatric unit should be attached to every teaching hospital. Although treatment of the elderly need not be looked upon as an additional specialty, it is advantageous, both for treatment and for teaching purposes, to assemble a number of patients with similar complaints. It is recommended that medical education should ensure that all doctors entering practice are aware of the importance of active treatment of the elderly; in this way a number will become sufficiently interested to devote part of their time to a study of the medical problems of elderly people. Similarly, the training of all nursing staffs must include reference to the care and treatment of elderly people, and arrangements should be made for a few months' duty in this sphere of hospital life.

50. Facilities for postgraduate training and experience should also be made available both for medical practitioners and for nurses.

Admissions to Hospital

51. Whatever arrangements are made locally for admission to hospitals, the procedure should not be a rigid one. If there is no vacancy at a hospital in a particular area, the use of any available beds in an adjoining area should be possible.

Ancillary Services

52. An extension of ancillary services (physiotherapy, occupational therapy, and chiropody) will, in the first place, entail a certain financial outlay, but experience has already shown that, by reducing the length of stay of some patients, an eventual economy will result and a higher turnover be effected and maintained.

VI. THE PLACE OF THE WELFARE HOME

53. There is a continuing need for residential accommodation for aged people who are unable any longer to live in

their homes. The Subcommittee welcomes the increased provision of small welfare homes in recent years, many of them so sited and administered that the old people may feel that they remain part of the community. Such homes, for reasons of staffing alone, can only accommodate reasonably fit old people. There will remain the need for larger homes for the infirm who require more care and attention, quite apart from the necessity for "intermediate" beds in long-stay annexes of hospitals where full nursing facilities need not be provided.

54. To serve the large number of "borderline" cases the establishment of joint-user institutions to be used together by regional hospital boards and welfare authorities is often advantageous; this avoids the unnecessary stress to the old people of moving into unfamiliar surroundings, and also eases staffing problems.

55. Even where such joint-user institutions cannot be set up—at any rate in the near future—closer linkage between the staffs of geriatric units and welfare homes is to be encouraged. In a later section we refer to the appointment of a consultant for the purpose of co-ordinating the services. Similarly, in the field of nursing the joint employment of skilled staff should and could be developed. An example would be daily visits to welfare homes by a male nurse from the geriatric unit to give bladder wash-outs.

56. Many elderly people are still being cared for by their relatives, and some authorities make arrangements for them to be admitted to welfare homes or long-stay annexes for short periods in order to relieve the relatives. This is a commendable practice and should be taken into account when planning joint-user institutions or other establishments. The admission of a patient in these circumstances will often prevent a prolonged period in a hospital or welfare home, because the relatives will be more willing to continue the care of the elderly persons with these occasional breaks and the aid of domiciliary services.

VII. ADMINISTRATION

57. In the present circumstances the provision of services for the elderly and infirm are not and cannot be under one authority. Hospitals, local authorities (with all their departments and services), and general practitioners are deeply concerned, as also are voluntary organizations.

Liaison

58. Apart from contact between officers themselves, there are plans in some areas to effect liaison between the public health medical officers, welfare officers, hospital service, and voluntary organizations, either through a joint committee or through regular conferences. The practice of appointing the medical officer of health as honorary medical adviser to the local old people's welfare association is most advantageous. He, together with a senior health visitor and district nurse, should serve on the committee. This is quite a common practice, but there should also be consultant and general-practitioner representatives. A further link may also be effected between voluntary and statutory bodies by arrangements for the attendance of health visitors at old people's clubs, to give advice and talks.

Liaison Committees

59. The formation of a liaison committee, representing all statutory and voluntary interests, is an essential means of achieving the best arrangements. Such a committee can correlate existing services; can determine weak points requiring special attention; can make united recommendations to the constituent bodies; and will, in short, be able to consider the whole chronic sick (geriatric or otherwise) problem of any given area as a comprehensive whole.

Local Health and Welfare Services

60. The operation of the National Assistance Act is, in the majority of cases, in the hands of the Welfare Department. In a minority the services are administered by the Health

Department. The social and the medical factors, especially prevention, must be considered as one, and the services that can be rendered to elderly people by these two departments are so closely interlocked that, in the view of the Subcommittee, they should be under the same administrative head—i.e., the medical officer of health.

61. It is clear, however, that the best results will be obtained, and the least frustration be experienced on the part of all concerned, when the establishment of a closely co-ordinated service is, by gradual development, brought to fruition.

Co-ordination Through a Practitioner Appointed for the Purpose

Need for Correct Allocation of Beds

62. Much has been said about the need for more hospital beds for accommodating the aged sick, but the evidence obtained suggests that there is a great deal of unnecessary hospital admission owing to the failure of the social services to make home conditions satisfactory. Another cause is the lack of Part III and "intermediate" accommodation. Much of the Part III accommodation of welfare authorities is occupied by aged persons, but, in general, there is far too little linkage in the allocation of this accommodation with that in general hospitals and long-stay annexes. It is therefore advocated that the practitioner who assesses priorities for admission to hospital beds for the assessment and treatment of the elderly should advise, through the medical officer of health, on admission on medical grounds to Part III accommodation. (This, of course, would in no way affect the responsibilities of the medical officer of health for compulsory removal under Section 47 of the National Assistance Act, 1948.)

Joint Appointments

63. The Subcommittee has taken note of the arrangements in one county whereby the county council shares the services of a consultant with the regional hospital board. Difficulty was being experienced locally (as it is in so many areas) in classifying patients as "chronic sick" or "frail ambulant," which decision determines whether they become the responsibility of the regional hospital board or the welfare authority.

64. The consultant who acts for a board and for a major local authority can, without delay, direct the patient to the right services, deciding whether or not admission to hospital for overhaul or assessment is necessary, and working in close conjunction with the general practitioner and the medical officer of health in regard to domiciliary services. Co-ordination on these lines is needed everywhere. The best machinery for achieving it would depend on local circumstances. This question as it affects rural areas is discussed in paragraph 90.

VIII. LEGISLATION

65. The legislation which concerns older persons, either directly or indirectly, has been considered carefully by the Subcommittee. It is not recommended that there should be any new legislation to deal with the problems of an ageing population, but rather that the provisions of existing Acts should be used to greater advantage. For example, greater encouragement should be given to local health authorities to submit proposals to the Minister under Section 28 of the National Health Service Act, 1946, with particular reference to the supply of meals. This would be a form of preventive service in that physical deterioration would be prevented.

66. Local authorities under Section 31 of the National Assistance Act, 1948, may "make contributions to the funds of any voluntary organization whose activities consist in or include the provision of recreation or meals for old people." It is suggested that this section might be extended and widened to include direct participation by sanitary authorities in these matters, and to embrace activities other than meals and recreation.

67. Some doubt exists as to the legality of using the Public Health Act, 1936 (Section 84), or the Public Health (London) Act, 1936 (Section 122), for the setting up of a laundry service for old persons in particular need of one—for example, the incontinent. A decision should be made on this important matter.

68. Wider use should be made of the Physical Training and Recreation Act, 1937, in providing employment and holiday schemes for the elderly, and in equipping old people's clubs.

IX. MENTAL HEALTH

69. The provision for the aged mentally infirm is a major problem. At the present time the general practitioner finds it extremely difficult to deal with the borderline patient who cannot and should not be certified, and who, at the same time, is hardly suitable for admission into the welfare home of the local authority. Many old persons would not need to be certified if suitable accommodation of a simpler nature was available. If this could be obtained it would enable more patients to benefit from the specialized treatment available at mental hospitals.

70. There should be greater differentiation between senile dementia and mental sickness, and steps should be taken to ensure that the admission of elderly people to mental hospitals is restricted to those who are mentally sick. Long-stay annexes should be attached to general hospitals rather than to mental hospitals.

71. Increased facilities for preventive psychiatry and for observation would enable recovery to take place in some cases and would thus reduce the number of admissions. The preventive approach could be applied in the observation wards of geriatric units, which would render considerable assistance to mental hospitals, both in this way and by facilitating early admission. Mental confusional cases could be sent as acute cases to geriatric units, for in many instances all that is required before they are able to return home is medical treatment. Senile confusional subjects and demented should also be admitted to geriatric units for assessment. Assessment may show whether the patient is in need of active treatment as provided in a mental hospital, or of admission to a long-stay annexe, or is able to return home or to be admitted to Part III accommodation (some of which should be specially adapted and staffed for such cases). Those returning home might benefit from supervision by local health authority mental health services, or by mobile psychiatric teams. This form of preventive psychiatry has been introduced in Amsterdam with excellent results.

72. It appears that there is very little system in operation for the follow-up of senile patients discharged from mental hospitals. It seems desirable that there should be someone who should act as mental health visitor to these patients after their discharge. In one area, the duly authorized officer undertakes this duty, and this practice might well be adopted elsewhere.

73. Replies to inquiries made by the Subcommittee have indicated that additional Part III accommodation is urgently required to accommodate correctly many patients at present in mental hospitals.

X. RESEARCH

74. Medical knowledge about the specific problems of senescence is still limited and the infirmities which come with old age are imperfectly understood. There is wide scope for more research in this field, not only in geriatric units and long-stay hospitals but also in general practice. This latter is probably the most important, for in general practice the onset of symptoms of infirmity due to old age can be seen early and studied. Every encouragement should be given to research in this field as it is likely to produce valuable results. There is a need for the provision of adequate facilities for pathological investigation and research.

75. Side by side with research into medical problems should be carried out research into the social aspects of

old age. In all spheres of life medical and social factors are closely allied, but there is little doubt that in the problems associated with the elderly these factors have outstanding importance.

XI. EMPLOYMENT

76. It is most important that the termination of the employment of an individual should be related to the "biological factor" rather than to the "chronological factor." It follows that the policy of automatic retirement is unrealistic and uneconomic. When an individual should cease work cannot be satisfactorily stated in terms of years. Although a modification of duties or a transfer to lighter work may be necessary it is clear that employment encourages the maintenance of the general health. The Subcommittee has heard with pleasure the fact that certain employing authorities are putting into practice the recommendations made by the National Advisory Council to the Ministry of Labour in its report on the "Employment of Older Men and Women," published in October, 1953. Furthermore, in a recent circular (No. 69 54, October, 1954) the Minister of Housing and Local Government draws attention to this report, and asks to be informed of the results of the reviews made by local authorities in the light of the report.

77. There is very little provision for the employment of elderly people in special employment schemes. It is believed that one of the best means of maintaining the health of elderly people is to keep them occupied, either in light employment or, when it is necessary to give up work, through handicrafts or other occupational and diversional activities. It is therefore suggested that statutory and voluntary bodies should be encouraged to provide occupational and diversional facilities. The question of transport to the centres providing these facilities should also be considered.

XII. EXAMINATION DURING HEALTH

78. The question of the routine medical examination of older people has been considered. The advantages of this are the early detection, and in many cases the amelioration, of disabilities, including eye, ear, dental, or other defects, which, if untreated, might make the patient house-bound and bedridden prematurely. The general practitioner has the first responsibility in this matter, but his work can be assisted greatly by the health visitor, who, with her knowledge of the families in her district, can advise the old person to consult the family doctor early; she can also save the practitioner's time by visiting homes of old people on his list and informing him when she considers a visit to be advisable. Routine medical examination in health is also an essential part of research into the problems of ageing.

79. The establishment of more "Examination in Health" clinics either in local health authority or in hospital premises is worthy of careful consideration. The former is probably more advantageous, provided chiropody and physiotherapy facilities can be made available and the services of an experienced physician are obtained.

XIII. THE RURAL ASPECT

80. Although much of this report relates to rural as well as other areas, the Subcommittee felt it important to include some particular reference to the problem in rural areas.

Domiciliary Services

81. In rural areas, too, the domiciliary services must be strengthened to ensure that patients are not admitted to hospital unnecessarily. As in urban areas, the cost of better organized domiciliary services needs to be looked at in the light of the diminished strain on the hospital services which would result, and the increased demands on the local authority purse. In view of the special implications in rural areas it appears that there may be a case for a central grant.

Home Help Service

82. There are special recruitment problems in rural areas in respect of the home help and night-sitter services. Although it is likely that help of this nature will in many cases be carried out in rural areas on a voluntary basis (often by friends or neighbours), steps should be taken to ensure that an adequate service is available. This may mean that modification of the conditions of service will be necessary.

Ancillary Services

83. Apart from the general necessity for an extension of ancillary services, there is a special problem in rural areas which could largely be met by the extension of peripheral physiotherapy services to cover those patients who, in the opinion of the consultant, could best be treated near their own homes. The Subcommittee was much impressed by a report of the work done by the department of physical medicine of a large provincial hospital. A brief account of the work carried out is contained in Sub-Appendix II.

Admissions to Hospitals

84. Whereas in urban and industrial areas long-stay hospitals and general hospitals are often only a mile or two apart, in rural areas long-stay hospitals may be at distances ranging from 10 to 100 miles, or even more, from a major general hospital with full facilities for investigation.

85. In rural areas, therefore, the Subcommittee suggests that where direct admission to a general hospital (or active geriatric department, or local or general-practitioner hospital) is not practicable, admissions to long-stay hospitals are best arranged: (a) Direct with the long-stay hospitals concerned. (b) Through the hospital management committee bed bureau, or similar organization. (c) Direct from a general hospital.

86. By one or other of these methods telephone calls, especially long-distance ones, are reduced to a minimum, time is saved, and local knowledge is made available. Furthermore, where removal from home surroundings is essential for elderly patients with, say, vascular or cerebral emergencies, the shorter the journey to hospital the less prejudiced are their chances of survival.

87. Notwithstanding the above considerations, there should be no system which restricts the admission of a patient to a particular area. Any such rigidity should be capable of modification to permit the use of beds in an adjoining area when necessary.

88. When the more urgent symptoms have subsided, arrangements should permit of any of these patients—if further investigation is required—being transferred for this purpose for, say, seven to fourteen days in a general hospital. If the original bed in the long-stay hospital is kept available (but not necessarily empty) the patient can be returned to it immediately investigations are completed, thereby ensuring that the general hospital bed is not "blocked" for an indefinite period with a chronic sick case.

Assessment of Priority

89. It is obvious that when a long-stay hospital admits from an extensive area—for example, a hospital management committee area or areas—the question of priority of admission must arise. Cases admitted direct from a general hospital have already been investigated and full clinical notes are available. These can be passed on via the hospital almoner when a patient is taken on to a long-stay hospital waiting-list. With patients being admitted from their own homes, the general practitioner has made a diagnosis, which may or may not be the final one, but in addition he is fully cognizant of the social environment of the case.

90. The Subcommittee recommends, therefore, that for rural long-stay hospitals the medical officer in charge of the hospital should assess cases for admission. He will be in the favourable position of knowing his local colleagues, the types of home from which patients will come, and will,

at the same time, be in frequent touch with his other colleagues on the staff of the general hospital or hospitals in the locality. He will also be fully familiar with the resources of his own hospital. His appointment may be with a regional hospital board or with the local health authority, or a joint one.

91. The appointment of lay admissions officers is not recommended. Their necessarily different approach to the problem of the chronic sick, whether aged or otherwise, may result in strained feelings between them and the medical practitioners.

Liaison Committees

92. Present weaknesses are probably due to the fact that a number of responsible authorities are involved with the care of the elderly and infirm, with a resulting division of both responsibility and authority. In rural areas, in particular, the establishment of liaison committees, as advocated in paragraph 59, is an important step towards a satisfactory service.

XIV. SUMMARY OF RECOMMENDATIONS

Recommendation 1.—In dealing with the problem of the elderly in its many aspects, the overriding basic principle should be—that whenever possible every elderly person shall remain in his or her own home as long as possible; and that all necessary ancillary services shall to this end be fully provided. (Preamble.)

Recommendation 2.—Suitable accommodation for the elderly should be erected either on housing estates or in a group with accommodation available for a warden (para. 13).

Recommendation 3.—Registration of private homes should be followed up by regular inspection in all cases (para. 15).

Recommendation 4.—The possibility of welfare authorities making full use of private establishments for the care of the elderly, and the possibility of boarding-out arrangements in private houses, should be further explored (paras. 16, 17).

Recommendation 5.—Where practicable, greater attention should be paid to the making of adaptations to existing accommodation to assist the elderly in their own homes—for example, by altering the height of kitchen equipment, the provision of handrails, etc. (paras. 18, 19).

Recommendation 6.—Local health authorities should issue periodically, for the use of those concerned with the care and welfare of elderly people, a brochure (in pocket size) giving details of all services available for elderly people in the area (para. 21).

Recommendation 7.—Greater use should be made of the health visitor as a member of the domiciliary team (paras. 21, 46, 78).

Recommendation 8.—(a) Every possible step should be taken to fill the establishment of district nurses, and the establishment should be reviewed in the light of the requirements of the elderly sick and infirm (para. 24). (b) In all areas it would be helpful for the nursing duties to be so arranged as to allow the employment of a proportion of State Enrolled Assistant Nurses on duties within their accepted scope. Authorities should also be encouraged to employ male nurses and male S.E.A.N.s in greater numbers (para. 24). (c) Male nurses, as well as others, should be given priority in the allocation of housing accommodation (para. 25).

Recommendation 9.—There should be a substantial expansion of the home help service, including male staff (paras. 30, 31).

Recommendation 10.—Adequate arrangements should be made in all areas to provide meals for elderly people (paras. 34, 35).

Recommendation 11.—(a) Routine examination by an ophthalmologist should be part of the service given to elderly patients (para. 38). (b) The advice given by the

Ministry of Health that blind certification should normally be only on the authority of an ophthalmologist of consultant status should be implemented as fully as possible (para. 38).

Recommendation 12.—There should be an extension of the chiropody services for elderly people (para. 41).

Recommendation 13.—Provision should be made in all areas for a laundry service for the incontinent (para. 42).

Recommendation 14.—Geriatric units, where established, should be in the care of a consultant, with adequate medical staff, including local general practitioners (paras. 46–48).

Recommendation 15.—(a) Every teaching hospital should have a unit concerned with the treatment of elderly people (para. 49). (b) Undergraduate medical education and nursing training should include instruction in the care and treatment of the elderly and there should be facilities for post-graduate study (paras. 49, 50).

Recommendation 16.—The rigidity of the admissions system which restricts the admission of a patient to a particular area should be modified to permit the use of beds in an adjoining area when necessary (paras. 51, 87).

Recommendation 17.—There should be an increase in Part III accommodation to meet present and future needs (paras. 53, 62, 73).

Recommendation 18.—(a) There should be greater co-ordination of the local health authority and welfare authority services for the elderly. This should be effected either by amalgamation or by unified administrative control, under the medical officer of health (para. 60). (b) (i) A practitioner, to whom cases from general practice would be referred, should be responsible for the assessment of priorities for admission of the elderly to hospital beds, and should advise through the medical officer of health on admission on medical grounds to Part III accommodation. The practitioner would be appointed jointly by the local authority and the regional hospital board (paras. 62–64). (ii) In rural areas, assessment of priority for admission to long-stay hospitals should be the responsibility of the medical officer in charge of the hospital (para. 90). (c) Area liaison committees, representing all statutory and voluntary interests, should be established throughout the country (paras. 59, 92).

Recommendation 19.—There should be increased facilities for preventive psychiatry, as well as additional observation wards and hospital accommodation for the mentally ill (paras. 69–71).

Recommendation 20.—Practitioners should be encouraged to undertake research into the medical and social problems associated with old age, and should be afforded adequate facilities for the purpose (paras. 74, 75).

Recommendation 21.—(a) The present general policy of retirement on reaching a specific age must be reconsidered (para. 76). (b) Special employment schemes should be introduced for those no longer able to undertake full work (para. 77).

SUB-APPENDIX I: THE GENERAL PRACTITIONER AND THE HEALTH VISITOR (B.M.A. REPORT, 1954)

The need for the closest co-operation between general practitioners and health visitors is fully accepted by the Association, and in conjunction with the Society of Medical Officers of Health detailed consideration has been given to the most effective means of securing this co-operation.

It is appreciated that in many areas reasonably satisfactory arrangements already exist with resultant benefit to all concerned, but it is apparent that in other areas the necessary degree of co-operation has yet to be attained.

It is the view of both bodies that harmonious relations can be established if good will and interest are shown by all concerned and if the following principles are accepted:

1. Co-operation between general practitioners and the medical officer of health and his staff regarding the health, care, treatment, and aftercare of all patients is essential.

2. The local health authority has certain statutory obligations regarding the health of the community, and the health visitor who is employed by the local health authority is under the direction of the medical officer of health. This, however, in no way prevents the health visitor from working closely with the general practitioner and under his guidance in the care of individual patients.

3. Direct consultations should take place between general practitioners and health visitors with a view to the exchange of information regarding individual patients.

4. The general practitioner is primarily responsible for the health of the individual and the family, while the health and welfare of the family in relation to the community is a responsibility of the medical officer of health and his staff. The close association of all concerned, as members of one team, is of vital importance if these responsibilities are to be adequately fulfilled.

The Association and the Society realize that to a great extent the question of co-operation is a local problem and the means by which such co-operation can be obtained are for local consideration and arrangement. It is strongly recommended that urgent consideration be given to this matter in all areas. It is only in this way that the general practitioners, medical officers of health, and health visitors can work in partnership towards that co-operation which will ensure efficient and all-embracing care for the patient, whatever his age or state of health.

APPENDIX TO SUB-APPENDIX I

The following suggestions of some of the ways by which greater co-operation between general practitioners and health visitors could be better understood and improved may be helpful:

1. In the first place discussions to this end should take place between the medical officer of health of the local health authority, together with senior members of his staff, and representatives of the B.M.A. Branch or Division and the local medical committee.

This is essential, for the detailed arrangements will vary, not only between local health authorities but in different parts—that is, rural and urban—of a local health authority.

Agreement on the principle of co-operation at this level should ensure full implementation elsewhere.

2. Close personal contact and exchange of information between individual general practitioners and health visitors is essential. In this way both parties will understand and appreciate the other's duties and responsibilities.

In rural areas where the one individual is home nurse, midwife, and health visitor, there is usually that understanding between her and her general-practitioner colleagues. In urban areas, particularly in the large towns and cities, and where in most cases the health visitor does not act as home nurse or midwife, general practitioners do not know personally the health visitors working in the area.

3. Complaints have been made by general practitioners that at times contradictory advice is given to patients by health visitors. It is clear that this must be avoided, and here close consultation and co-operation between general practitioners and health visitors is essential.

4. In addition to their statutory duties, health visitors are available, at the discretion of the medical officer of health, for visiting patients when requested by general practitioners. Full consultation between the parties will result in efficient and economic use of health visitors.

5. Many general practitioners are unaware of the many facilities which can be made available for their patients through the local authority health and welfare services. Some medical officers of health regularly circulate all general practitioners in their area with detailed information, and it is strongly recommended that this should be done in all areas. It can be of great value to the general practitioner to know what assistance can be provided by his local authority. The full use of health visitors would tend to obviate repeated visits on the part of the general practitioner and would facilitate his work by securing rapid assistance through the local authority.

In all these ways the health visitor can supplement the service of the general practitioner, and by working in partnership they can weld together both the clinical and preventive aspects of the service, within the existing arrangements under Parts III and IV of the National Health Service Act.

6. In certain areas a health visitor has been allocated by the medical officer of health to work with a group of general practitioners. This has proved to be a satisfactory arrangement, but its practicability depends on local circumstances. It is recommended that this arrangement could well be extended wherever possible.

SUB-APPENDIX II: DEPARTMENT OF PHYSICAL MEDICINE, ROYAL HAMPSHIRE COUNTY HOSPITAL, WINCHESTER

As stated in the report (paras. 10 and 83) the Director of the Department of Physical Medicine at the Royal Hampshire County Hospital has, by close liaison with parish priests and others, been able to stimulate an interest in old people. This has resulted in practical co-operation. Voluntary helpers have amongst other things assisted with cleaning, cooking, and gardening, have made adjustments to furniture or equipment in the homes of the elderly so that they may manage more easily, and have also helped when it has been advisable to move bedroom furniture to the ground floor. Patients are, of course, admitted to hospital where necessary, but with co-operation between the parish and the hospital this is often avoided.

The hospital runs a mobile physical medicine team and has three vans which visit village centres on various days in the week to give treatment. All patients are seen at the main hospital every few weeks so as to make certain that the treatment they are receiving is satisfactory and is still required. The main department and 10 peripheral centres are staffed by 20 physiotherapists. The mobile service was set up and the department re-equipped seven years ago. At the same time a hot pool was installed at the main hospital. It is particularly useful for patients who have been bedfast for long periods, and who are able to regain a certain amount of movement in the pool.

In addition, there is at the main hospital a demonstration kitchen and bedroom with specially designed furniture and equipment for the disabled. This was built because it was realized how important it is that elderly people should be taught and encouraged to use these special aids before having them in their own homes.

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APPENDIX X

MEDICAL USE OF HYPNOTISM

Report of a Subcommittee appointed by the Psychological Medicine Group Committee of the British Medical Association

Appointment of Subcommittee

1. The Subcommittee was appointed in November, 1953, by the Psychological Medicine Group Committee of the British Medical Association, its terms of reference being as follows:

To consider the uses of hypnotism, its relation to medical practice in the present day, the advisability of giving encouragement to research into its nature and application, and the lines upon which such research might be organized.

2. The Subcommittee consisted of Professor T. Ferguson Rodger (chairman), Dr. E. A. Bennet, Professor Alexander Kennedy, and Dr. S. Noy Scott (representing the Science Committee of the B.M.A.).

Work of Subcommittee

3. The Subcommittee held 10 meetings at which evidence, both oral and written, was received.

4. The following questions were put in advance to those who were invited to give evidence:

- Is hypnosis a useful method of treatment?
- What safeguards are indicated in the use of hypnosis?
- How should hypnosis be taught?
- Does the medical hypnotist need special qualifications?

5. The Subcommittee wishes to record its appreciation of the assistance given by those who provided memoranda, or other written observations, or who attended meetings to give oral evidence—namely, Dr. G. J. Ambrose, Dr. G. E. Badman, Sir Russell Brain, Bt., P.R.C.P., Mr. G. H. Buckley, F.R.C.S., Dr. G. W. T. H. Fleming, Dr. H. W. Gordon, Mr. E. Dudley Grasby, M.R.C.O.G., Dr. A. A. Mason, Dr. G. F. Newbold, Dr. S. J. Van Pelt, Mr. E. E. Wookey, L.D.S. R.C.S., and Professor O. L. Zangwill.

6. The Subcommittee is also greatly indebted to Drs. W. R. Bion, N. G. Harris, W. Moodie, and E. B. Strauss, who attended a meeting of the Subcommittee and assisted in the final stages of the formulation of this report.

7. Members of the Subcommittee have studied much of the literature on hypnotism, and Sub-Appendix C gives a short list of selected works which provide a general introduction to the subject and a guide to the literature.

The Subcommittee has also considered certain recent publications by practising hypnotists and has formed the opinion that they fail to do justice to the complexity of the subject.

The Subcommittee is firmly of the opinion that publications which convey to the layman the impression that hypnotism is a panacea cannot be discouraged too strongly.

Need for a Statement on the Present Status of Hypnotism

8. Having considered the report of the Committee appointed by the Council of the B.M.A. in 1892 "to

investigate the nature of the phenomena of hypnotism, its value as a therapeutic agent, and the propriety of using it" (Sub-Appendix A), the Subcommittee, while substantially in agreement with the views then expressed, considers that the results of further study of the subject and the advances in and changes of attitude towards psychological treatment in general during the last 60 years justify the formulation of an up-to-date statement. This statement will therefore be concerned with the nature and uses of hypnotism, its relation to medical science and to psychological medicine in particular, the proper attitude of the medical profession towards the inevitable popular interest which it creates, its place in the medical curriculum, and the advisability of making a fuller knowledge of its phenomena and uses available to those training for certain specialties.

According to the available evidence, hypnotism in one form or another was known and used as a means of healing, mainly in a religious setting, by the major ancient civilizations. This has remained true through the Christian era, and the phenomena of hypnotism have been interpreted in accordance with the ideas of the time and locality, whether animistic, occultist, religious, physiological, or psychological. Its induction and practical control were well understood long before the present period in which the treatment of mental disorder has become part of the province of medical science. Since the time of its therapeutic use by Mesmer hypnotism has been of great importance to the growth of modern psychotherapy. Its subsequent development as a means of treatment within the framework of the Hippocratic tradition by Charcot, Bernheim, Liébeault, and many others, and the work of serious investigators of the calibre of Braid, Elliotson, Janet, Forel, Breuer, and Freud laid the foundation for present-day ideas of unconscious motivation and psychotherapeutic method.

The remarkable and striking nature of the phenomena induced in hypnotism and the fact that no satisfactory unifying hypothesis has yet been evolved to account for them, and the ease with which they may be induced, has led on the one hand to exploitation in the hands of charlatans and on the other to an intense public curiosity which scientific inquiry is still unable fully to satisfy. In the past hundred years this has given rise to a situation in many countries in which it has been felt necessary to hold commissions of inquiry to consider means of regulating the use of hypnotism. In some cases these inquiries have led to laws being passed, usually to fall into disuse later. The committee set up by the Paris Academy of Sciences in 1826 deliberated for five years and came to conclusions which in the opinion of the Subcommittee showed remarkable foresight and are mainly applicable to-day (see Sub-Appendix B for extracts from report), and this also applies to the report of the British Medical Association in 1892. It is evident, therefore, that hypnotism and the problem of its therapeutic and its improper uses is a subject which achieves prominence in cycles in those countries in which there is a regard for the advance of medical science and for public safety. The passing of the Hypnotism Act of 1952 marks such a cycle. It is therefore appropriate that the medical profession, some of whose members may have formed only tentative judgments on hypnotism, should make its attitude clear.

9. When hypnotism was first practised in this country official medical and scientific bodies expressed scepticism and open hostility to those who drew attention to it and its clinical applications. This attitude still influences medical opinion to a certain extent. It has no doubt been intensified, possibly with justification, by the use of hypnotism as a public entertainment and by excessive claims made for it by persons with little knowledge of morbid psychology who are unaware of the possibilities of other methods of treatment and of the limitations of hypnotism.

The Subcommittee is satisfied after consideration of the available evidence that hypnotism is of value and may be the treatment of choice in some cases of so-called psychosomatic disorder and psychoneurosis. It may also be of value for revealing unrecognized motives and conflicts in

such conditions. As a method of treatment, in the opinion of the Subcommittee it has proved its ability to remove symptoms and to alter morbid habits of thought and behaviour.

The Subcommittee therefore regards hypnotism as a proper subject for inquiry by the tried methods of medical research.

10. The striking nature of some of the immediate effects of hypnotism is such that medical men with knowledge of the subject may be invited to give information other than through the scientific and technical journals. The Subcommittee is agreed that the customary refusal of medical practitioners to publicize their work should be maintained, and that doctors do disservice to medicine and to themselves by making communications upon hypnotism to the lay press in a manner inconsistent with medical tradition and ethics. At the same time the very proper reticence of the medical profession towards the subject may well have led to uncertainty on the part of the public as to the attitude of medical men, and for this reason an authoritative statement is offered.

What is Hypnotism?

11. The following definition appears in the Hypnotism Act, 1952:

"Hypnotism" includes hypnotism, mesmerism, and any similar act or process which produces or is intended to produce in any person any form of induced sleep or trance in which the susceptibility of the mind of that person to suggestion or direction is increased or intended to be increased but does not include hypnotism, mesmerism, or any such similar act or process which is self-induced.

This definition is necessarily concerned with the purpose of the Act, which is to regulate the demonstration of hypnotic phenomena as a form of public entertainment, and the Subcommittee considers that a more comprehensive statement is desirable.

12. Although a great deal of information is now available about the manifestations of hypnotism and the physiological changes which accompany them, an exact definition is impracticable. The hypnotic state may, however, be described as follows:

A temporary condition of altered attention in the subject which may be induced by another person and in which a variety of phenomena may appear spontaneously or in response to verbal or other stimuli. These phenomena include alterations in consciousness and memory, increased susceptibility to suggestion, and the production in the subject of responses and ideas unfamiliar to him in his usual state of mind. Further, phenomena such as anaesthesia, paralysis and rigidity of muscles, and vasomotor changes can be produced and removed in the hypnotic state.

13. There is a wide range of hypnotic manifestations which are by no means confined to the so-called trance.

If all types of phenomena are taken into account it may be stated that the majority of people can be hypnotized but in only a minority is it possible to induce a deep trance in a single session.

Importance to Psychiatry and General Medicine

14. While, as has been stated (paragraph 9), hypnotism is of value in the treatment of so-called psychosomatic disorder and psychoneurosis some enthusiastic supporters of this form of treatment fail to enumerate the contraindications, and give the impression that it constitutes an approach which should replace all other forms of psychiatric treatment. In the opinion of the Subcommittee this view is mistaken. Like other remedies hypnotism has its indications and contraindications, and considerable knowledge and expert judgment are required to decide when hypnotism is likely to help the patient, and whether it should be used by itself or as a complement to other methods of psychotherapy.

For these reasons the Subcommittee is of the opinion that hypnotism should not be regarded as a specialty independent of psychological medicine.

15. In addition to the treatment of psychiatric disabilities, there is a place for hypnotism in the production of anaesthesia or analgesia for surgical and dental operations, and in suitable subjects it is an effective method of relieving pain in childbirth without altering the normal course of labour. It has been claimed that the shock of operative procedures can be mitigated when these are carried out under deep hypnosis, but further research is desirable. The amount of work necessary to prepare a patient to undergo surgical operation under hypnotism limits its usefulness.

Dangers of Hypnotism—Ethical Aspects

16. The dangers of hypnotism have been exaggerated in some quarters. The Subcommittee is convinced, however, that they do exist, especially when it is used without proper consideration on persons predisposed, constitutionally or by the effects of disease, to severe psychoneurotic reactions or antisocial behaviour. The commission of crimes involving even danger to life is not entirely to be ruled out.

17. Hypnotism may involve the rapid or immediate development of a relationship between hypnotist and subject of the same order and intensity as is produced more slowly in the course of psychotherapy. The trained psychotherapist must be aware of this relationship as part of the therapeutic process and must recognize its potentiality for harm and be able to deal with it. The application of the hypnotic technique without such knowledge and experience provides no control of the powerful emotions which may be released. For this reason the Subcommittee considers that harm can be done by the application of hypnotism in unsuitable subjects, particularly when it is used by persons indifferent to the well-being of the subject or ignorant of the morbid complications of the hypnotic state. It is recommended, therefore, that the use of hypnotism in the treatment of physical and psychological disorders should be confined to persons subscribing to the recognized ethical code which governs the relation of doctor and patient. This would not preclude its use by a suitably trained psychologist or medical auxiliary of whose competence the medical practitioner was personally satisfied, and who would carry out, under medical direction, the treatment of patients selected by the physician.

Place in Medical Education

18. It is recommended that a description of hypnotism and its therapeutic possibilities, limitations, and dangers should be given to medical undergraduates during their psychiatric course.

19. Instruction in the clinical use of hypnotism should be given to all medical postgraduates training as specialists in psychological medicine and possibly, say, to trainee anaesthetists and obstetricians, so that they will understand its indications and practical applications. The Subcommittee holds that no special "gift" is required to induce it: there are various techniques of equal efficacy.

Need for Research

20. As its work progressed the Subcommittee became convinced of the need for further research into hypnotism. Medical men have hesitated to take a serious interest in a procedure which is so unlike the orthodox methods of medical science. Nevertheless, it is thought that since hypnotism can achieve good results in certain cases, and since present theories as to its nature and mode of action are speculative, it constitutes a challenge to medical science.

21. The Subcommittee wishes to draw attention to the fact that, although a very considerable amount of satisfactory research work is on record, investigations must necessarily continue until the problems of the hypnotic state have been solved and the best means of its application to bodily and mental disorder have been worked out.

It regards hypnotism as a proper subject for scientific inquiry. The main fields which might particularly engage the attention of serious medical research workers are thought to be as follows:

(1) Continuation of neurophysiological and psychological observations on hypnotism induced under controlled conditions, to explore its relation to consciousness, attention, the formation and extinction of conditioned responses, the communication between different parts of the central nervous mechanism, and conditions which favour its easy induction.

(2) Controlled observation of its therapeutic effects in functional nervous disorders. It is possible that the relative simplicity and brevity of hypnotic techniques provide a form of psychological treatment the result of which could more easily be subjected to statistical analysis.

(3) The investigation of somatic disorders in the aetiology of which psychological factors are thought to play a major part. Profound and easily measurable changes of physiological function can be induced under hypnotism, and thus it offers a means of direct observation of psychosomatic relations.

(4) Since hypnotism very readily produces an intense relationship between patient and doctor it provides a means of research into the general problem of the patient-doctor relationship.

Further, because of the relative brevity of treatment with hypnotism, such research may contribute to a solution of the problem created by the very large number of people requiring psychotherapy, and this possibility should be explored in the clinical field.

(5) The investigation of the relation of hypnotism and similar states to non-medical methods of treatment, including healing through religious agencies.

22. Since research of this kind requires co-ordination of laboratory, clinical, and other studies it might best be organized through university departments and research foundations.

SUB-APPENDIX A

Statement of 1892 by a Committee appointed by the Council of the B.M.A. to investigate the nature of the phenomena of hypnotism; its value as a therapeutic agent; and the propriety of using it.

The Committee, having completed such investigation of hypnotism as time has permitted, have to report that they have satisfied themselves of the genuineness of the hypnotic state. No phenomena which have come under their observation, however, lend support to the theory of "animal magnetism."

Test experiments which have been carried out by members of the Committee have shown that this condition is attended by mental and physical phenomena, and that these differ widely in different cases.

Among the mental phenomena are altered consciousness, temporary limitation of will power, increased receptivity of suggestion from without, sometimes to the extent of producing passing delusions, illusions, and hallucinations, and exalted condition of the attention, and post-hypnotic suggestions.

Among the physical phenomena are vascular changes (such as flushing of the face and altered pulse rate), deepening of the respirations, increased frequency of deglutition, slight muscular tremors, inability to control suggested movements, altered muscular sense, anaesthesia, modified power of muscular contraction, catalepsy, and rigidity, often intense. It must, however, be understood that all these mental and physical phenomena are rarely present in any one case. The Committee take this opportunity of pointing out that the term hypnotism is somewhat misleading, inasmuch as sleep, as ordinarily understood, is not necessarily present.

The Committee are of opinion that as a therapeutic agent hypnotism is frequently effective in relieving pain, procuring sleep, and alleviating many functional ailments. As to its permanent efficacy in the treatment of drunkenness, the evidence before the Committee is encouraging, but not conclusive.

Dangers in the use of hypnotism may arise from want of knowledge, carelessness, or intentional abuse, or from the too continuous repetition of suggestions in unsuitable cases.

The Committee are of opinion that when used for therapeutic purposes its employment should be confined to qualified medical men, and that under no circumstances should female patients be hypnotized except in the presence of a relative or a person of their own sex.

In conclusion, the Committee desire to express their strong disapprobation of public exhibitions of hypnotic phenomena, and hope that some legal restriction will be placed upon them.

F. NEEDHAM,

Chairman.

T. OUTTERSON WOOD,

Honorary Secretary.

SUB-APPENDIX B

Extracts from the report on the experiments in animal magnetism made by a committee of the medical section of the French Royal Academy of Sciences.

(This committee was appointed in 1826 and made its report at the meetings of June 21 and 28, 1831. An adverse report on animal magnetism had been made by the Royal Society of Medicine and by the French Academy of Sciences. This report was not unanimous, and in the light of later observations it was decided to appoint a new committee. This was to have had Laennec as its rapporteur, but he was taken ill and his place was taken by Husson. A series of experiments were made under conditions of rigorous control. The committee was unanimous in its conclusions, from which the following are extracted.)

"We have related with impartiality that which we have observed with distrust. . . . Far from setting limits to this part of physiological science, we hope, on the contrary, that a new field has been opened up to it. Considered as a cause of certain physiological phenomena, or as a therapeutic method, magnetism should be admitted within the sphere of the medical sciences, and, consequently, physicians only should practise it, or superintend its use, as in the northern countries."

In presenting its report to the Académie des Sciences, the committee said:

"Indeed, we dare not flatter ourselves with the hope of having you participate entirely in our conviction of the reality of the phenomena which we have observed, and which you have neither seen nor studied along with us. We do not demand of you a blind belief of all that we have reported. We conceive that a great proportion of these facts are of a nature so extraordinary that you will not be able to accord them full belief. Perhaps we ourselves might have manifested a similar incredulity if our places were reversed, and you had come to announce the same facts and conclusions to us, and we were in the position of never having seen or had the opportunity of studying anything of the same kind."

Signed by:

BOURDOIS DE LA MOTTE (President).

FOQUIER.

ITARD.

GUENEAU DE MUSSY.

J. J. LEROUX.

GUERSENT.

MARC.

HUSSON.

THILLAYE.

SUB-APPENDIX C

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**Appendix XI—Financial Statement
Balance Sheet—December 31, 1954**

1954		1953	
£	£	£	1953
Accumulated Fund:			
...	...	...	...
Balance at January 1, 1954	561,894	...	...
Add: Surplus for year	86,719	...	...
...	...	...	...
Balance at December 31, 1954	617,543	...	...
...	...	...	...
Reserve for future taxation	80,380	...	...
...	...	...	...
Current Liabilities and Provisions:			
Loans	...	...	...
...	...	...	...
Bank Overdraft	...	...	...
Creditors and accrued expenses	63,311	...	...
...	...	...	...
Amounts received in advance (including 1955 subscriptions)	56,085	...	...
Current Taxation	8,986	...	...
Provisions for:	...	...	...
Dilapidations and redecoration of premises	36,661	...	...
Pensions	9,183	...	...
...	...	...	...
194,206	192,796	...	...

Note.—The Association is a company limited by guarantee, the liability of members being limited (except as provided in paragraph 6 of the Memorandum of Association) to 1 guinea each.

Loan to I

Current Assets:

Stocks of paper for publications, stationery, etc.	...	...	...	24,276
Payments in advance	...	...	...	5,617
Debtors (including unpaid subscriptions), less provision for losses	...	...	...	98,140
Cash at bank—Deposit Account	...	...	...	14,000
Current Account	...	...	...	10,825
Cash in Hand	...	...	...	2,989

155,537	125,249
<u>£809,179</u>	<u>£785,620</u>

E. A. GREGG, Chairman of Council

ANGUS MACRAE, Secretary.

In our opinion and to the best of our information and according to the explanations given to us the above balance sheet and the annexed income and expenditure account give a true and fair view of the state of the Association's affairs as at 31st December, 1954, and of its income and expenditure for the year ended on that date.

3, Frederick's Place, Old Jewry, London, E.C.2.
18th April, 1955.

PRICE WATERHOUSE & CO.,
Chartered Accountants.

Income and Expenditure Account for the Year ended December 31, 1954

1954	1953
£	£
Secretariat and Financial Departments	...
Medical Practices Advisory Bureau	...
Library	...
Public Relations Department	...
Empire Medical Advisory Bureau and International Film Library	...
Medical Visitors' Bureau	...
Film Library	...
Scottish Offices	...
Regional Offices	...
Central Meetings Expenses	...
Capitation Grants	...
Scholarships and Prizes	...
Subscriptions and Delegations to International Organizations and Overseas Branches	...
Hospitality to Medical Conferences	...
Pensions and Grants to former employees	...
House Services, including Catering	...
Financial Charges, including Auditors' Remuneration	...
£735 (1953-£735) and Interest on Loans £772 (1953-£642) ...	...
Maintenance and Depreciation of Office Furniture and Equipment	...
Sundry Expenses	...
Less: Grant towards cost of Central Medical Recruitment Department	...
Net Surplus on Publications (including British Medical Journal, Family Doctor, Special Journals, Abstracts of World Medicine, and Books)-Subject to Taxation	...
11,830	44,707
£2227,522	£214,924
3,573	7,448
3,822	3,563
985	...
£167,998	£159,144
19,923	16,577
15,456	12,977
2,539	2,159
3,393	1,598
809	500
3,128	3,353
5,702	7,124
105,819	100,328
10,810	10,642
11,252	10,051
6,210	5,468
6,509	6,045
983	953
15,551	14,351
10,865	11,303
£170,985	£136,021
58,537	78,003
£170,985	£136,021

Taxation :
Based on—

Q

Net surplus for year on publications (includes Profits Tax)

Income for year from properties and investments

Less: Relief for losses incurred in prior years and other adjustments ...

Surplus for year, applied in part to debt redemption,
carried to Accumulated Fund

(Note—Depreciation, (including Sinking Fund Instalment) amounting to £12,657 (1953—£12,819) has been allocated to the appropriate headings of expenses.)

£272,811

British Medical Association

PROCEEDINGS OF COUNCIL

A meeting of the Council of the Association, the last before the Annual Representative Meeting, was held at Headquarters on April 13, with Dr. E. A. GREGG, Chairman of Council, in the chair.

In view of the fact that the Annual Meeting is not being held in this country this year, so that the usual ceremonial presentation of prizes cannot take place, the PRESIDENT (Sir John McNee), during a break in the Council proceedings, presented such of the prizes as had already been awarded. The prize-winners were: Professor N. B. CAPON (Liverpool), the Sir Dawson Williams Prize; Dr. A. F. ROGERS (Bristol) and Dr. J. K. WILSON (Liverpool), the Katherine Bishop Harman Prize; Dr. C. A. H. WATTS (Ibstock, Leicestershire), the Sir Charles Hastings Clinical Prize, and Dr. D. S. McLAREN (London), the Charles Oliver Hawthorne Clinical Prize.

Personal

The deaths of the following former members of Council were announced: Dr. C. J. A. WOODSIDE (Belfast), Surgeon Rear Admiral O. D. BROWNFIELD (Petersfield), and Dr. J. C. PEARCE (Diss). The Chairman was authorized to send letters of condolence to the relatives.

Dr. A. V. KELYNACK, Assistant Secretary, was heartily welcomed on her return after a lengthy illness.

The Council tendered its congratulations to the Rt. Hon. CHARLES HILL, M.P., former Secretary of the Association, on his appointment as Postmaster-General.

It was reported that Professor BRYAN MCFARLAND had accepted the Council's invitation to represent the Association at the Annual Meeting of the Medical Association of South Africa in Pretoria in October. It was also reported that Professor ALEXANDER HADDOW, director of the Chester Beatty Research Institute, was taking part in the same meeting, and the Council nominated him as a second official delegate.

It was stated that Mr. TUDOR THOMAS, Immediate Past President, would be attending the American Medical Association meeting in Atlantic City next June, and it was resolved to ask the American Medical Association to receive him as an official delegate.

It was reported that the Chairman had put forward the name of Dr. C. A. H. WATTS, Sir Charles Hastings Clinical Prizewinner, for a vacancy on the Standing Mental Health Advisory Committee, the Minister having expressed a wish to appoint a general practitioner.

The Council considered the method of preparing the Association's evidence to the Departmental Committee, under the chairmanship of the Rt. Hon. Henry Willink, on manpower in the medical profession. It was decided to set up a small steering committee similar to that appointed to co-ordinate the evidence for the Guillebaud Committee. Dr. ANNIS GILLIE was anxious that the outlook of women students should be considered, and Dr. D. F. HUTCHINSON urged the claims of the Medical Recruitment Committee to representation. The CHAIRMAN, in whose hands the appointment of the committee was left, said that these and other points would be taken into consideration.

Public Relations

Dr. H. G. DAIN, as chairman of the Public Relations Committee, brought forward a memorandum prepared by the committee for use at an appropriate time as the foundation of the Association's case for the continued existence of private beds in National Health Service hospitals. After discussion the memorandum was approved.

A report on Press representation at the Annual Representative Meeting was also before the Council from the Public Relations Committee. The arguments for and against invit-

ing the Press were set out, and the view was taken in the report that the arguments for admitting the Press outweighed the arguments on the other side.

Dr. O. C. CARTER drew attention to one passage in the report in which it was stated that at its present level of general public appeal the scientific part of the Annual Meeting did not deserve much newspaper space. The Association was a body of high academic and scientific standing, but the impression might arise that it was a kind of trade union concerned primarily with questions of remuneration.

Dr. A. V. RUSSELL said that it was important to increase the interest of the scientific side of the Annual Meeting. Dr. I. D. GRANT said that the Annual Representative Meeting was, after all, the parliament of the profession. Moreover, as to the scientific side he thought that at the last two Annual Meetings the plenary scientific sessions had been of great value and had attracted much Press publicity.

The report was approved.

General Medical Services

Dr. TALBOT ROGERS, in presenting the report of the General Medical Services Committee, said that a detailed study had now been made of the report of the Committee on General Practice (the Cohen Committee), set up by the Central Health Services Council. His Committee had been struck by the "somewhat negative" nature of the report. Matters of major policy with which the Committee was in agreement had already been discussed with the Ministry, and other questions would inevitably be raised sooner or later in routine meetings. As regards four major issues—namely, drugs for private patients, the obstetric list, the machinery for filling practice vacancies, and stock orders—opportunity had already been taken to press the Association's views.

Dr. Rogers drew special attention to the work of the special subcommittee under the chairmanship of Dr. Dain which had been reviewing Service Committee and Tribunal regulations. Agreement had been reached on the various matters under discussion and, subject to the approval of the Annual Conference, any necessary action, whether by amending regulations or otherwise, would be taken by the Ministry. Three years of careful work had been put into this by the subcommittee, and a very large number of constructive amendments had been put forward, most of which had been accepted.

The Council warmly endorsed Dr. Rogers's congratulations to Dr. Dain on the work of his subcommittee.

The Ban on Heroin

Dr. R. HALE-WHITE referred to the fact that the Government had decided to implement the recommendation of the Economic and Social Council of United Nations regarding the manufacture and use of heroin. It had had the effrontery to ban heroin in this country without making any approach to the medical profession.

Mr. LAWRENCE ABEL spoke to the same effect, and urged that this matter should be taken up by the General Medical Services Committee with the Ministry.

The CHAIRMAN said that this came about as a result of international pressure. It was from its world-wide aspect that the problem was brought to them. Dr. S. WAND said that as a member of the Medical Advisory Committee concerned he came to this subject feeling that the ban was uncalled for; but having heard the arguments and knowing from his personal experience that there were drugs which replaced heroin very adequately, he was persuaded that if this country stayed out of the international agreement it would intensify a grave international problem. During the last six or eight years a number of pain-relieving drugs had been introduced which led to the lessened use of heroin.

It was agreed that an approach on the subject should be made to the Government as to the present position with regard to heroin, and that the Government should be informed of the opinions expressed on the subject.

Medical Use of Hypnotism

Dr. ROWLAND HILL, Chairman of the Central Consultants and Specialists Committee, presented a report on the "Medical Use of Hypnotism," prepared by a subcommittee appointed by the Psychological Medicine Group Committee. The report appears as an appendix to the Supplementary Report of Council at page 190. Professor T. FERGUSON RODGER, chairman of the Subcommittee, was invited to give an outline of the report. He said that as long ago as 1892 a statement had been put forward by a committee appointed by the Council of the Association to investigate the phenomena of hypnotism, its value as a therapeutic agent, and the propriety of using it. The subject had often been before the public, and, of course, it had been the happy hunting ground of the charlatan. The present report attempted a definition of hypnotism, touched on its importance to psychiatry and general medicine, and its place in medical education, stressed its dangers and the ethical aspects of its use, and set out the main fields which might particularly engage the attention of serious research workers.

On the motion of Dr. ROWLAND HILL the report was approved, and it was agreed that a lead should be taken in furthering research on the subject of hypnotism, and that the need for such research on the lines indicated in the report should be brought to the notice of universities and research foundations. Mr. LAWRENCE ABEL hoped that the research would not proceed on entirely academic or psychiatric lines, but that the general practitioner would be in some way integrated with it.

Professor Ferguson Rodger and his subcommittee were warmly thanked for their work.

Geriatrics

Dr. ROWLAND HILL moved approval of a report of the Geriatrics Joint Subcommittee. He explained that the subcommittee was appointed by the Liaison Subcommittee of the General Medical Services, Central Consultants and Specialists, and Public Health Committees to consider how the establishment of a co-ordinated geriatric service could best be achieved. The report appears as an appendix to the Supplementary Report of Council at page 181.

Dr. H. D. CHALKE, chairman of the subcommittee, said that this was a comprehensive report. It was felt that the problem of chronic sickness could not be separated from that of old age. The subcommittee, which embraced members of different branches of the profession, had noted the earlier report entitled "The Care and Treatment of the Elderly and Infirm," published by the Association in 1947, but they were soon aware that the recommendations of that report had not been implemented as fully as they might have been. The present report conveyed nothing new, but the main point was that they had emphasized or reiterated that the whole problem of the aged was centred on the home. Another point was that so many agencies were appointed for the care of old people that it was felt that a central co-ordinating medical authority should be set up. In starting its work the subcommittee had tried to find the extent of the problem, and sent out a large number of questionnaires, but this was found to be statistically impossible. In some parts of the country the services were adequate and in others grossly inadequate.

Dr. FRANK GRAY moved the reference back. He considered that this was not a report which could possibly be approved in its present form. It was an unfortunate result of liaison among different bodies. No advance had been made on the earlier Association report in 1947; in fact they had gone back on it. The old report began with a classification of the elderly, but the present subcommittee had blurred that classification. It stated at one point that the main responsibility must be with the relatives, yet the rest of the report ignored the relatives and proceeded as if there were no such people. There were, broadly speaking, two classes of hospital accommodation for the reception

of the elderly—the modern geriatric unit and the "dump," in which latter they had no treatment and were left to lie in bed.

What the report had to say about the place of the general practitioner (Dr. Gray continued) was unsatisfactory. He "should be kept informed of all the local authority and other services on which he can call." He was, apparently, given no other role. There was just another reference in the preamble: "In each group or area there should be someone to whom general practitioners can turn." The bulk of the report seemed to be composed of the enumeration of local health authority services.

An assumption in the report was that, although life might be lengthened, the average health over the age of 60 would remain exactly the same. That was an assumption which should not be accepted. Again, the report stated that the termination of an individual's employment should be related to the biological rather than to the chronological factor, and that the policy of automatic retirement was unrealistic and uneconomic. With that he agreed, but it would be immediately pointed out that there was an automatic age for retirement of members of the B.M.A. staff. A distinction should be made between those who were merely elderly and those who had associated illness or disability. The subcommittee seemed to have no conception of preventive medicine.

Dr. W. E. DORNAN seconded the reference back. The great trouble, not emphasized enough in this report, was that some geriatric institutions, though essentially first rate in their conception and organization, completely lacked sufficient numbers of trained nursing staff to apply the ordinary methods of treatment.

Dr. R. G. GIBSON said that this was one of the best reports he had ever read. It did not take anything away from the general practitioner. He drew attention to what was said in the report about routine medical examination of older people in which the general practitioner would have first responsibility. Dr. H. M. GOLDING said that if all the recommendations in this report were implemented the old people he looked after would be much better off. Mr. S. F. L. DAHNE said that the report laid the emphasis in the right place. Dr. A. BARKER hoped the report would be accepted.

Dr. MARY ESSELMONT, while not supporting all Dr. Gray's criticisms, hoped that the report would be referred back. It did not seem to go much further than the report issued eight years ago. Economic factors were not sufficiently stressed. Dr. J. A. PRIDHAM liked the report, but wished that more emphasis had been given to the home help service, which was hardly mentioned at all. Dr. J. C. ARTHUR said that the heart of the problem was that in very many cases the relatives were not prepared to take up the responsibility, and that ought to be emphasized a little more. Dr. W. WOOLLEY and other members spoke in appreciation of the report.

Dr. CHALKE said that Dr. Gray had indulged in armchair criticism. This report did not concern every person over 60 or 65. It referred only to the relatively small percentage who were in need of care and in whom relatives were not interested. With regard to the criticism that the role of the general practitioner was not sufficiently emphasized, his own fear was that it was being emphasized too much. The question of employment of the elderly had been dealt with in a recent Government publication, and the subcommittee had not considered it necessary to go into it at length.

The amendment to refer back was lost, and the report was approved.

Hospital Medical Staffs

Dr. ROWLAND HILL reported on various matters which had been before the Central Consultants and Specialists Committee (*Supplement*, April 9, p. 159). In dealing with the remuneration of hospital medical staff, he said that his committee had reiterated its recommendation that a survey of current hospital medical staff income from all professional sources should, with such expert aid as was necessary, be undertaken. The recommendation would be placed

before the Staff Side of Whitley Committee "B" in April, and the results of the survey when complete should be an influencing factor in any further action to be taken in connexion with overall remuneration in relation to falling values of money.

The revised report of the subcommittee on hospital medical staffing under Professor Strachan's able chairmanship had been considered by the Joint Committee, and a large measure of agreement had been reached. Before any changes in structure of hospital medical staff were put into effect a review of establishments would take place in order to ascertain what consultant expansion was necessary. The Royal College of Physicians had prepared a report on junior hospital staffing. The policies were fundamentally in agreement, though differing in detail.

Dr. R. P. LISTON expressed some disquiet concerning the position of the Representative Body, which, it seemed to him, might be presented with a *fait accompli*. Dr. HILL replied that he did not think any question would be ripe for decision by the time of the Annual Representative Meeting this year. The point he was anxious to make was that the body which would be ultimately responsible for reaching agreement with the Government on this matter was the Joint Consultants Committee. The Central Committee had told the Joint Committee that before any decisions were reached with the Government there must be a reference back to the constituent bodies on this particular issue. The position was one which called for understanding and co-operation.

Dr. J. A. PRIDHAM said that a very important point of principle was involved. The Representative Body was the voice of the British Medical Association, and he would like it emphasized that any resolutions by that body would have the most careful consideration before any action was taken with the Government.

Mr. LAWRENCE ABEL said that he sympathized with this point of view, and he could assure the Council that although the report of the Strachan subcommittee had been accepted in principle there was no immediate likelihood of any final commitment by any body or collection of bodies, and that any resolutions of the Representative Body would be taken most fully into account. A compromise might have to be reached eventually, but everything was being done in the most democratic way, and in this field the hospital staffs needed the help of the general practitioner and of the Association as a whole.

Dr. ROWLAND HILL endorsed Mr. Abel's remarks. He agreed fully on the importance of discussion in the Representative Body.

Dr. WAND drew attention to the statement in the report that a number of points remained open for discussion, and that it would now be left to the Joint Committee to enter into preliminary discussions with the Ministry on agreed principles. It seemed to him that no matter what action was taken by the Representative Body it might not relate to those points remaining open for discussion.

Mr. ABEL said that there was unanimous agreement that before any changes in the structure of hospital medical staffing were brought into effect a review of establishments must take place. That was the first step and nothing could possibly follow until that was done.

Dr. HUTCHINSON said that it was made quite clear in the Central Committee that this document was sent to the Joint Committee for discussion only, not for agreement with the Government, and that the report must come back to the Central Committee.

Dr. ROWLAND HILL said that Dr. Hutchinson's interpretation of the position was the correct one. Nothing would be agreed between the Joint Committee and the Ministry without previous reference back to the constituent bodies.

The discussion on this subject then dropped. Other matters of report brought forward by Dr. Rowland Hill were set out in the report of the meeting of the Committee (*Supplement*, April 9, p. 159).

It was stated that the Central Committee was making representations to the War Office regarding fees payable

to civilian consultants employed on a sessional basis, and was also reviewing the terms and conditions of service of whole-time consultants employed by the War Office.

Remuneration of Medical Officers of Health

Dr. H. D. CHALKE, in the absence of the chairman of the Public Health Committee, presented a report of the business at its last meeting. He reported that on March 29 and 30 the case for a review of the remuneration of all grades of medical officers in the Public Health Service was heard in the Industrial Court. The staff case was very ably presented by counsel, Mr. B. J. M. MacKenna, Q.C., and Mr. S. B. R. Cooke, instructed by Messrs. Hempons. The award of the Court was now awaited.

Gold Medal of the Association

A proposition was before the Council to award the Gold Medical of the Association to Sir HENRY SIMPSON NEWLAND, Past President of the Royal Australasian College of Surgeons and of the Australian B.M.A. Federal Council, and a Vice-President of the B.M.A. since 1932.

Mr. MYLES FORMBY, representative on the Council of certain of the Australian Branches, said that he knew that this proposal would be warmly welcomed in Australia. He was sure it would be a most popular award.

The motion, formally proposed by the CHAIRMAN OF COUNCIL, that the Gold Medal of the Association be awarded to Sir Henry Newland, was, as required by the regulations, voted on by ballot, and was approved.

The Council agreed to recommend to the Representative Body that Dr. A. W. S. SICHEL, of Capetown, President of the Association in 1951-2, and Dr. P. T. O'FARRELL, President in 1952-3, be elected Vice-Presidents in recognition of their valuable services.

Other Business

On the proposition of Dr. J. A. L. VAUGHAN JONES, chairman of the Occupational Health Committee, it was agreed that the constitution of the Committee on Medical Education be altered to include a nominee of the Association of Industrial Medical Officers. He said that his committee was anxious that occupational health interests should be adequately represented. His colleague, Dr. H. Alexander, was one of the members of the new committee, but it was considered that it would be advantageous if the Association of Industrial Medical Officers were represented directly in the same way as the Society of Medical Officers of Health. Other matters in the report of the Occupational Health Committee were set out in the account of its meeting (*Supplement*, March 26, p. 122).

Dr. H. H. D. SUTHERLAND, chairman of the Amending Acts Committee, again brought forward the question of the implementation of the decisions of the Special Representative Meeting of December, 1951. The suggestion had been made that before any decision as to future action be reached the recommendations passed in 1951 should be reviewed by the Council. He moved that the Council should take action at the appropriate time on the resolutions passed by the Special Representative Meeting and should keep the Representative Body informed of all actions taken or proposed. Dr. DAIN pointed out that this resolution was unnecessary. What it asked for was exactly what the Council was sent there to do. The motion was not carried.

Dr. J. G. HAMILTON reported for the Committee which is considering remuneration policy. A good deal of information had been collected and the help of an eminent statistician had been obtained. The Committee would be meeting again in May to consider the implications of these figures.

Dr. Hamilton also reported for the Scottish Committee. Here the chief matter concerned the advice given to a regional hospital board by the Department of Health that special leave with pay should not be granted to members of hospital staff to enable them to attend meetings of the Scottish Committee. Apparently the Department regarded

Scottish News

CO-OPERATION IN THE HEALTH SERVICE

CONFERENCE AT PEEBLES

[FROM A SPECIAL CORRESPONDENT]

Under the auspices of the Royal Institute of Public Administration a two-day conference on the health services was held at Peebles on April 1 and 2. This, the third such conference, was the first in Scotland, and about 220 delegates from local authorities, hospital authorities, executive councils, and interested voluntary bodies attended. Sir CHARLES CUNNINGHAM, Secretary of the Scottish Home Department and chairman of the Edinburgh Group of the Institute, welcomed the delegates.

Dr. MAY BAIRD, chairman of the North-eastern Regional Hospital Board and convener of the Health and Welfare Committee of Aberdeen Corporation, was chairman of the conference. The theme was "working together," and she suggested most advantage would accrue from discussions directed to improving the present administrative set-up rather than suggesting radical alterations which were not practicable.

The Personal Touch

Sir HUMPHREY BROWN LINDSAY, chairman of the South-eastern Regional Hospital Board, in his address entitled "The General Theme," dealt with the ways in which the activities of the different branches might best be co-ordinated. Such co-ordination, he considered, depended essentially upon the personal and friendly co-operation between those working the service, at whatever level. In his experience formal co-ordinating committees had not been very effective. He felt that *ad hoc* committees, called together to deal with a specific subject, for which members could be specially chosen were better. As a member of the Scottish Health Services Council, Sir Humphrey felt that it was too remote from the field of action to be as useful as it might be.

Sir Humphrey referred to the control and treatment of tuberculosis, where it now seemed that results were being obtained, and he considered that this illustrated the close co-operation possible between local authorities, hospitals, and general practitioners. The general impression was that in the maternity services more could be done to ensure continuity of care in the antenatal, confinement, and post-natal periods. While emphasizing that there was no room for complacency, Sir Humphrey did suggest to the delegates that the achievements of the Health Service were worthy of recognition.

Provost Mrs. M. EWART, of Hamilton, queried the use of regional hospital boards—a view which found no support amongst other delegates.

Speaking as a general practitioner, Dr. J. O. McDONAGH, Perth, president of the Scottish Association of Executive Councils, thought that basically the organization was sound, but they should not be afraid to be critical. He considered that there was at present automatic co-operation between the three branches and a little overlapping caused no harm. He did not think that co-ordinating committees were necessary. They had no executive functions, and that was their weakness. If there had to be co-ordinating committees they should be formed for specific purposes and be dissolved when they had done their job. A surfeit of committees would choke the service quicker than anything. Dr. McDonagh said that general practitioners should have cottage hospitals available to them.

Most speakers were critical of the formal co-ordinating committee. Common membership of the different bodies automatically encouraged co-ordination, and personal contacts were of vital importance. All speakers stressed the key position of the general practitioner, which he derived from his knowledge of the patient and the branches of medicine.

the concession, which was granted to the Central Consultants and Specialists Committee (Scotland), as in relation to the National Health Service work of a particular committee, and did not consider that the Scottish Committee fulfilled the criterion. The matter was to be taken up with the Department.

On the report of the Journal Committee, Dr. HAMILTON mentioned that requests had come from Istanbul for permission to translate into Turkish the volumes in the Refresher Course series, and from Argentina to translate into Spanish the third volume of "Any Questions?" The Committee had agreed in principle.

Dr. O. C. CARTER, in presenting the report of the Family Doctor Committee, said that there was some difficulty about applying to *Family Doctor* staff the grades and scales which worked quite well from the point of view of B.M.A. clerical staff, but bore little relation to the normal practice in commercial publishing. The Council agreed that in future all appointments to the staff of the *Family Doctor* should be independent of B.M.A. grades and salary scales, and should be made, within the approved budget, in terms appropriate to corresponding commercial publishing levels.

The Treasurer (Mr. L. DOUGAL CALLANDER), in a brief statement on the financial position of the Association, mentioned that the issue of the application for the 1955 membership subscriptions was completed at a later date than in the previous year, and consequently the amount collected in advance was considerably less in 1954 than in the corresponding period of 1953. Nevertheless, the 1955 subscriptions received by February 28 exceeded the figure for the corresponding date in 1954.

It was announced that the Ceylon Medical Association, which was a corporate Branch of the Association, desired to alter its status and to become an independent body affiliated to the B.M.A. The Council passed a formal resolution to enable this to be done.

The report of the Armed Forces Committee, presented by Major-General J. C. A. DOWSE, described the proposed arrangements for the extension of the B.M.A. lecture scheme to enable large groups of Service medical officers at selected establishments in the United Kingdom to apply for one lecture annually.

The recommendations of the Science Committee, brought forward by Dr. NOY SCOTT, were concerned wholly with the awards in the essay competitions and research scholarships. The high standard of the essays in the Medical Students Prize Essay Competition, in which eight prizes and certificates were awarded, was mentioned.

Dr. H. M. GOLDING, for the Charities Committee, said that the amount of both earmarked and unearmarked subscriptions in 1955 was greater than in 1954. Recommendations for the allocation to medical charities of the unearmarked subscriptions were agreed to.

A report was made on the first meeting of the Medical Education Committee, of which Sir Lionel Whitby is the chairman. Four subcommittees had been appointed in fields corresponding to those of the four sections of the First World Conference. The subcommittees would report to the full committee towards the end of the year.

A similar programme-of-work report was made on behalf of the Constitution Committee. It was stated that it would be some little time before it was in a position to make recommendations.

The Council, which had met at 10 a.m., completed its business at 5.15 p.m.

CHILDREN'S SPECTACLE FRAMES

A circular to executive councils and ophthalmic services committees (E.C.L.15/55) states that the Minister, on the advice of his Standing Ophthalmic Advisory Committee, has decided to make frames No. C.521 and C.525 available to all applicants whatever their age. The charges authorized by the National Health Service Act, 1951, will continue to apply when these frames are chosen.

Mental Health Services

Dr. JOHN JARDINE, chairman of the General Board of Control, spoke of mental health. He emphasized the changed medical and social outlook on mental disease. He laid stress on the value of the voluntary organizations. The family doctor must play an increasingly important part in the prevention of mental illness and in securing early treatment. Local authority officials, mental welfare officers, health visitors, probation officers and the like could all play a part. Many speakers referred to the unsatisfactory state of mental hospitals, and it was refreshing to hear the physician-superintendent of Craig Dunain Hospital, Inverness, Dr. M. M. WHITTER, describe how much could be done by inculcating a humane attitude in all grades of staff and what could be done by simple measures to brighten up unsuitable buildings.

Delegates from local authorities were much concerned about the difficulties arising from mental cases being retained in local authority institutes owing to the shortage of hospital beds. It was thought that more use could be made of the method of boarding out mental cases.

The Care of the Aged

The third session was devoted to a paper on the "Care of Old People." Dr. TAYLOR BROWN, consultant physician for geriatrics in the Eastern Region, gave an interesting account of the provision for geriatrics in this region. He emphasized that it had been possible to develop a co-ordinated scheme, the main aim of which was to keep old people in their own homes where possible.

Day-to-day matters of difficulty were "ironed out" by the co-operation of the different officials. An effective co-ordinating committee representing the different interests in the area had been established. Dr. Taylor Brown said that the function of the hospital should be essentially to rehabilitate and enable people to return to their normal life, although he admitted that many beds would have to continue to be used for persons in their terminal days who required more than simple nursing.

The general trend of the discussion which followed was that there was already developing a very adequate co-operation between the three branches of the Health Service in this field; and the shift of the emphasis to domiciliary provision rather than institutional provision was considered a sound one. The need for auxiliary medical services, especially chiropody and physiotherapy in the patient's own home, was fully recognized.

Conclusion

The CHAIRMAN, in summing up the conference, said that criticism had been constructive. The general impression was that most delegates felt the existing administrative set-up could be made to work effectively and much had been accomplished. It was significant that no satisfactory alternative to the present system had been put forward. Much of the discussion was focused on the relative position of the general practitioner and local health authority services. There was a unanimous opinion that both were needed and were complementary to each other, but that the exact field covered by each must depend on circumstances.

HEALTH SERVICES IN SCOTLAND**INCREASE IN WORK**

The statement that demands on the curative services continue at a high level and show no signs of abating is made in the *Reports of the Department of Health for Scotland and the Scottish Health Services Council, 1954*.¹ In spite of indications of improvement in the national health and improvements in housing and environmental conditions generally, the volume of visits to hospitals and doctors and

¹ H.M. Stationery Office, 4s. 6d.

the extent of the drug bill show no improvement to speak of, but rather the reverse. The number of patients in hospital (on the basis of discharges) was 30% higher in 1953-4 than in 1949-50. During those four years outpatient attendances have increased by one-third, and in 1954 numbered nearly seven million. As for drugs, prescriptions dispensed in the pharmaceutical service numbered just under 21 million, an increase of 454,000 over the 1953 figure. Many factors, it is said, may have contributed to this result; the most optimistic is that people are learning to seek early medical advice. A healthier nation, but a more health- or disease-conscious one.

General Medical Services

The total number of doctors employed in the National Health Service in Scotland—in hospitals, by local authorities, in general practice—was 5,350, an increase during the year of 178. In the general medical services under the Act 2,558 principals were taking part, 1,513 of them in partnership, and 251 assistants were employed. The number of complaints against doctors investigated by executive councils was 27, and in 10 of these the doctor was found to be in breach of his terms of service. The health centres at Sighthill, Edinburgh, which has just completed its first year, and at Stranraer, which is newly opening, are stated to be experimental only, and it is not proposed at present to build any further centres of similar type.

Prescribing statistics show a wide variation in average cost per patient between doctors working in different executive council areas. For prescriptions dispensed in December, 1953, the highest average cost per patient was 2s. 4d. in Glasgow and Dumbarton, and the lowest 1s. 5d. in Inverness, against a national average of 2s. 1d. The average cost of each prescription in Scotland was 5s. 5d., a penny more than the year before. There did not seem to be as marked a seasonal incidence in prescriptions as might be expected. The number issued in September was 1,646,000, and in February 1,809,000.

Local Authority Services

The local health authority services in Scotland report substantial increases in the number of B.C.G. vaccinations. Primary injections against diphtheria numbered 83,200, about the same as in 1953. A major activity in the school medical service in some areas is the treatment of minor ailments. In Edinburgh during the year over 12,000 cases of this kind were treated. The majority were bruises and the like, but a good proportion were diseases of the skin (impetigo appears to be on the increase in Scotland), as well as diseases of the eye and ear.

The total number of domiciliary births was 28,886 (28,600 in 1953), and the number of births in which a doctor and midwife were engaged under the arrangements of the N.H.S. was 27,514, as compared with 954 in which a midwife only was engaged.

Hospital and Specialist Services

The annual running costs of hospital and specialist services increased from £24.6m. in 1949-50 to £30.2m. in 1953-4. A large part of this is represented by higher salaries and wages, but it is reported that there has also been a significant increase in volume of treatment and standard of care. The total number of consultants at the end of last year was 827, of whom 394 were part-time and 433 whole-time. This is an increase of 59 on the year, almost wholly among the whole-time. Senior hospital medical officers numbered 337, of whom 100 were part-time and 237 whole-time, a decrease in total of 23. The total number of posts in hospitals approved for the purpose of the pre-registration year for newly qualified doctors increased by 30 to 589. It is mentioned that in some areas and in certain types of hospital a shortage of house-officers continued throughout the year. Consequently, on the whole, newly qualified doctors found little difficulty in obtaining pre-registration posts. The employment of general

practitioners in hospitals has been the subject of discussion, but progress has been somewhat slow.

In the Northern Region there is a joint training scheme under which senior house officers, engaged for a period of two years, are attached in rotation to various units in hospitals, and are also allocated to general practitioners in Inverness and district for periods of training in all aspects of general practice. Of the first four senior house officers who completed their training under this scheme, three took up appointments in general practice, while the fourth remained in the hospital service. In certain specialties, particularly tuberculosis and psychiatry, the regional boards have found it necessary to create new consultant posts to cope with the increased work associated with the development of the service.

Geriatric services are being developed in several localities, but little has been done to increase the accommodation for mental cases. The cost of maintaining a patient in a Scottish hospital last year was 23s. 6d. a day, but this is the average over a wide range, from 44s. 1d. in maternity hospitals to 12s. 7d. in mental deficiency institutions.

The report of the Scottish Health Services Council is largely occupied with two matters. One is the staffing of mental deficiency institutions. Here the problem is not at present acute, but the council recommends that greater emphasis should be placed in the General Nursing Council syllabus on practical training in occupational and games therapy. The other is the role of the assistant nurse in the National Health Service. Here the council makes a number of recommendations concerning training, enrolment, and employment. One of them is that the present requirement of one year in chronic sick nursing should be reduced to six months, and that the training should be more broadly based.

The number of doctors in Scotland engaged in family practice, or on executive council lists, is 2,528, according to a census carried out on January 1, 1954, reported by Dr. W. Robertson in *Health Bulletin*, April, 1955. They have 4,895,054 people, or 96% of the population, on their lists. Though the average distribution of patients is 1.936 per doctor, the ratio varies widely with the geographical region. The lowest numbers are in the north, the minimum being in Sutherland with 1.096 persons per practitioner, and the highest are in the west, where the highest Scottish figure, 2.372, is found for Lanark; and Dumbarton, Renfrew, Ayr, Stirling, and Clackmannan—a joint return—are also above the national average. The ratio in the four principal cities is Aberdeen 2.138, Dundee 1.971, Glasgow 1.920, and Edinburgh 1.706. The census also examined the length of the postgraduate life of Scotland's doctors, and 20 years was found to be the average time since the gaining of first medical qualifications. Only 14 doctors, 0.6% of the total in practice, qualified in the last century, and only 3.3% qualified in 1950 or later. Glasgow University has provided 44.2% of Scotland's family doctors, Edinburgh 22.5%, the Colleges 13%, Aberdeen 11.4%, and St. Andrews 5.3%. Only 1.9% initially took English qualifications.

HOSPITALITY

A Swedish doctor, living on the west coast of Sweden north of Gothenburg, who has four boys aged 4, 12, 13, and 14 and a girl aged 10, would like to arrange a holiday exchange in the summer for his eldest son with one or perhaps two children, aged 10-15, of a British doctor. Would anyone interested please communicate with Brigadier H. A. Sandiford, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

Occasional requests are received from Continental doctors who would like to arrange for their children to stay with medical families in Britain as paying guests, particularly during the summer vacation. At present about six requests from French doctors (including one living in French Morocco) are outstanding. Would anyone interested please communicate with Brigadier H. A. Sandiford, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

FUTURE NUMBER OF DOCTORS

The Ministry of Health has announced that the committee set up by the Minister of Health and the Secretary of State for Scotland, under the chairmanship of Mr. Henry Willink, to estimate the future number of medical practitioners and the appropriate intake of medical students (see *Journal*, February 26, p. 548), is now ready to receive evidence.

Invitations are being sent to selected organizations, but the committee will also consider written evidence from other sources. Any person or organization wishing to submit views should send them in writing to the committee's secretary, Mr. Phillip Muston, Ministry of Health, Savile Row, London, W.1.

MIDDLE EAST BRANCH

The Middle East Branch of the B.M.A. held its fifth annual meeting in Damascus from March 14 to 16, 1955. Doctors from Syria, the Lebanon, Jordan, Iraq, and the Gulf attended the meeting. Dr. W. M. FORD ROBERTSON was elected president, and Dr. E. H. R. ALTOUNYAN honorary secretary and treasurer for the year 1955-6.

The opening address of the scientific discussions was given by the Minister of Health for Syria, and the following papers were read: "Modern Methods in the Diagnosis and Treatment of Epilepsy" (Sir Charles Symonds, London); "Emphysematous Gastritis" (M. W. Sawwaf); "Pulmonary Resection in the Treatment of Tuberculosis" (J. L. Wilson); "Industrial Medicine in Iraq" (A. M. Critchley); "Medical Treatment of Hypertension" (M. A. Khiami); "Surgical Treatment of Hypertension" (Abdus Sattar Adi); "A New Prosthetic for the Head of the Femur" (H. Fruchaud); "The Physiology of the Duodenum" (K. Roberts); "Maternal and Child Welfare Throughout Arab History" (F. Zaim); "Twenty-five Years' Medical and Surgical Practice in the Euphrates Valley" (A. M. Bertsch); "Modern Aspects of the Treatment of Fractures" (G. Perkins, London); "Diaphragmatic Hernia" (P. Ponthus); "Tuberculosis Control Among Refugees in Syria" (J. Puyet); "Treatment of Cerebral Palsy" (H. Pirker); "Bronchiectasis" (A. F. Mouchantat); "Obstetrical Advances in Kuwait" (N. L. Owen); "Surgical Treatment of Pulmonary Hydatid Disease" (J. G. Sournia); "Tonsillectomy in Children" (I. S. Ayoub); "Congenital Pyloric Stenosis" (Abdul Ghani Al-Kathemi); "Some Notes on the Medical History of Aleppo" (A. Poche); "Medical Ethics" (E. H. R. Altounyan). Professor Carleton Coon gave a lecture on anthropology.

On March 14 Sir John and Lady Gardener held a reception at the British Embassy for all doctors and their wives attending the meeting. The annual dinner of the Branch was held at the Orient Club on March 16. A special air excursion to Palmyra was organized on March 17.

FILM LIBRARY

The following additions have been made to the B.M.A. film library.

Pancreatic Secretion.—Presented by Imperial Chemical Industries Ltd. Colour, sound, 34 minutes. 1954.

Venepuncture in General Practice.—By S. L. Drummond-Jackson. Colour, sound, 16½ minutes. 1954.

Taking a Swab.—By Nucleus Films Ltd. Black and white, silent, 10 minutes. 1950.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.

Non-County Borough Councils.—Crewe.

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Association Notices

ELECTION OF COUNCIL, 1955-6

The following are the results of the election for members of Council in those Groups where there were contests:

Group 12 (Divisions of Metropolitan Counties)

Branch in Middlesex	
D. F. Hutchinson (London, W.C.1)	407 Elected
J. B. Wrathall Rowe (Harrow)	376 Elected
Angus Weston (Greenford, Middlesex)	331
No. of voting papers issued	2,020
No. returned	614
Spoiled papers	3

Group 15 (Hampstead, St. Pancras, and Westminster and Holborn Divisions)

Frank Gray (London, W.C.1)	90
J. L. McCallum (London, W.C.1)	128 Elected
No. of voting papers issued	939
No. returned	218
Spoiled papers	2

Public Health Service

C. O. S. Blyth Brooke (London, E.C.1)	216
H. D. Chalke (London, N.W.4)	408 Elected
J. B. Tilley (Newcastle-upon-Tyne)	516 Elected
No. of voting papers issued	1,783
No. returned	606
Spoiled papers	2

A. MACRAE,
Secretary.

Diary of Central Meetings

APRIL

25 Mon.	Staff Side, General Whitley Council (at 14, Russell Square, London, W.C.1), 10.30 a.m.
25 Mon.	General Whitley Council (at 14, Russell Square, London, W.C.1), 2.30 p.m.
26 Tues.	Staff Side, Committee "B", 10.30 a.m.
26 Tues.	Full Committee "B" (at 14, Russell Square, London, W.C.1), 2.30 p.m.
27 Wed.	Welsh Committee (at Raven Hotel, Shrewsbury), 2.15 p.m.
29 Fri.	D.I.H./D.P.H. Subcommittee, Occupational Health Committee, 10.30 a.m.

MAY

3 Tues.	S.H.M.O.s Group Executive Committee, 2 p.m.
4 Wed.	Office Committee, 11 a.m.
4 Wed.	Committee re Remuneration Policy, 2 p.m.
4 Wed.	Physical Medicine Group Committee, 2 p.m.
4 Wed.	Private Practice Committee, 2 p.m.
5 Thurs.	Committee on Homosexuality and Prostitution, 2 p.m. (date changed from April 20).
5 Thurs.	Rural Practices Subcommittee, G.M.S. Committee, 2 p.m.

Branch and Division Meetings to be Held

BIRKENHEAD AND WIRRAL DIVISION.—At Arrowe Park Hotel, Birkenhead, Saturday, April 23, 9 p.m., meeting. Lecture by Mr. W. W. Davey: "Is Your Gastrectomy Really Necessary?"

BLACKBURN DIVISION.—At White Bull Hotel, Church Street, Blackburn, Tuesday, April 26, 8.15 p.m., annual general meeting.

BOURNEMOUTH DIVISION.—At Royal Victoria Hospital, Bournemouth, Friday, April 29, 8.15 p.m., meeting. Address by Dr. Macdonald Critchley: "The Body Image." (Illustrated with lantern slides.)

BRADFORD DIVISION.—At Bradford Royal Infirmary, Wednesday, April 27, 8.15 p.m., meeting. Address by Mr. G. A. Craig: "Home or Hospital."

CAMBERWELL DIVISION.—At Dulwich Hospital, East Dulwich Grove, S.E., Tuesday, April 26, 8.45 p.m., annual general meeting. Address by Dr. F. E. Camps: "Investigation of Crimes of Violence in America and England." Visitors are invited.

CARDIFF DIVISION.—At Pathology Lecture Theatre, Welsh National School of Medicine, Royal Infirmary, Cardiff, Wednesday, April 27, 8.15 p.m., meeting. Address by Dr. Eric Waddington: "Leg Ulcers." Members may bring medical guests.

CITY DIVISION.—At Hackney Hospital (G5 Ward), Homerton High Street, London, E., Wednesday, April 27, 2 p.m., film meeting.

DERBY DIVISION.—At Derbyshire Royal Infirmary, Thursday, April 28, at 8.30 p.m., annual meeting.

EAST DENBIGH AND FLINT DIVISION.—(1) At Chester, Thursday, April 28, 7.30 p.m., annual dinner. (2) At Mold, Sunday, May 1, 3 p.m., annual meeting.

EAST HERTS DIVISION.—At Hertford County Hospital, Thursday, April 28, 8.30 p.m., annual general meeting.

EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, Herne Bay, Thursday, April 28, 7.30 p.m., dinner; 8.45 p.m., special and annual general meeting.

ENFIELD AND POTTERS BAR DIVISION.—At St. Michael's Hospital, Chase Side Crescent, Enfield, Friday, April 29, 8.15 for 8.30 p.m., fifth annual meeting.

FURNESS DIVISION.—At Duke of Edinburgh Hotel, Barrow-in-Furness, Tuesday, April 26, 8 p.m., annual general meeting.

GLASGOW DIVISION.—At Glasgow Regional Office, 234, St. Vincent Street, Glasgow, Wednesday, April 27, 8.30 p.m., meeting.

GREENWICH AND DEPTFORD DIVISION.—At Miller General Hospital, Greenwich High Road, London, S.E., Wednesday, April 27, 8.30 p.m., annual general meeting.

GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Saturday, April 30, 7 to 9 p.m., sherry party. Ladies are invited.

HENDON DIVISION.—(1) At Hendon Hall Hotel, London, N.W., Wednesday, April 27, 8.45 p.m., annual general medico-political meeting. (2) At Colindale Hospital, Colindale Avenue, London, N.W., Saturday, April 30, 2.30 p.m., meeting. Demonstration by Dr. W. E. Snell.

LANCASTER DIVISION.—(1) At Moor Hospital, Lancaster, Saturday, April 23, 8 p.m., meeting. B.M.A. lecture by Dr. W. N. Pickles: "Epidemiology in General Practice." Lay friends of members are invited. (2) At Midland Hotel, Morecambe, Thursday, April 28, 8.30 p.m., annual general meeting.

METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C., Tuesday, May 3, 3 p.m., annual general meeting. President's Address by Dr. R. Hale-White: "Patients, Politics, or Both?"

PERTH BRANCH.—At Murray Royal Hospital, Perth, Thursday, April 28, 8 p.m., meeting. B.M.A. Lecture by Dr. Douglas Miller: "Common Obstetric Injuries and their Sequelae." Members from neighbouring Branches are invited.

REIGATE DIVISION.—At Dorking General Hospital, Horsham Road, Dorking, Surrey, Tuesday, April 26, 8.30 p.m., clinical meeting on "Tuberculosis."

SHEFFIELD DIVISION.—At Royal Victoria Hotel (Assembly Room), Friday, April 29, 8.30 p.m., meeting.

SOUTH BEDFORDSHIRE DIVISION.—At Luton and Dunstable Hospital (in the Board Room), Friday, April 29, 9 p.m., meeting. Dr. Clifford E. Allen: "Homosexuality and Sexual Abnormalities."

STOCKTON DIVISION.—At Stockton and Thornaby Hospital, Monday, April 25, 8.30 p.m., meeting. Lecture by Mr. F. J. Burke: "Modern Aspect of Gynaecology."

TOWER HAMLETS DIVISION.—At St. Andrew's Hospital, Devons Road, Bow, E., Friday, April 29, 3 p.m., clinical meeting. Dr. W. R. Bett: "The General Practitioner and Medical Writing."

WANDSWORTH DIVISION.—At South London Hospital for Women and Children, South Side, Clapham Common, London, S.W., Sunday, April 24, 9.30 a.m., clinical meeting.

WEMBLEY DIVISION.—At Wembley Hospital, Tuesday, April 26, 9 p.m., annual general meeting.

WEST DERBYSHIRE DIVISION.—At Smedley's Hydro, Wednesday, April 27, 8.30 p.m., joint meeting with West Derbyshire Medical Society. Annual B.M.A. lecture by Professor John Glaister: "The Ruxton Case." A general discussion will follow.

WESTMINSTER AND HOLBORN DIVISION.—At Westminster City Chambers, Thursday, April 28, 8 p.m., ordinary meeting.

WILLESDEN DIVISION.—At Willesden General Hospital, Harlesden Road, N.W. (Department of Physical Medicine), Friday, April 22, 9 p.m., annual general meeting.

WINCHESTER DIVISION.—At Royal Hampshire County Hospital, Wednesday, April 27, 8.45 p.m., general meeting.

ANNUAL MEETING: TORONTO, JUNE 20-24

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 30 1955

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British Medical Association

ANNUAL REPRESENTATIVE MEETING, LONDON, JUNE 1-4

PROVISIONAL TIME-TABLE

Tuesday, May 31	Friday, June 3 (continued)
8.30 to 10.30 p.m.—Cocktail Party (by invitation of the Metropolitan Counties Branch), Royal College of Surgeons, Lincolns Inn Fields, W.C.2.	10.00 a.m.—Annual Representative Meeting resumes. 1.00 p.m.—L. Small private fork luncheon parties, followed by visits to places of interest around London.
9.00 a.m.—Annual Representative Meeting Inquiry Office opens—Committee Room A.	7.30 p.m.—Welsh Dinner, Royal College of Surgeons, W.C.1. Ticket £1 10s. (excluding wines).
9.00 a.m.—Ladies' Club opens—Hastings Room.	7.30 p.m.—Glasgow Graduates' Dinner, Bush House Restaurant, Aldwych, W.C.2. Ticket £1 10s. (excluding wines but including cocktails).
10.00 a.m.—Annual Representative Meeting begins—Great Hall.	7.45 p.m.—Edinburgh Graduates' Dinner, Savoy Hotel, W.C.2. Ticket (excluding wines) £1 11s. 6d.
a.m.—L. Visits to Houses of Parliament, S.W.1 (time to be announced later).	
7.00 for 7.30 p.m.—*Dinner, followed by a dance, for members of the Representative Body and their ladies, at the Dorchester Hotel, W.1. Single ticket £1 18s. 6d. (including cocktails but not wines).	
Thursday, June 2	Saturday, June 4
9.00 a.m.—Annual Representative Meeting Inquiry Office open.	9.30 a.m.—Annual Representative Meeting resumes.
9.00 a.m.—L. Whole day coach and river excursion to Henley-on-Thames, visiting Runnymede and Windsor. Lunch and tea on launch. Inclusive ticket £1 2s. (starting from and returning to B.M.A. House).	12.30 p.m.—Annual General Meeting and Extraordinary General Meeting—Great Hall.
9.30 a.m.—Annual Representative Meeting resumes.	At conclusion of A.R.M.—Council Meeting—Council Chamber.
9.30 a.m.—Ladies' Club open.	3.00 p.m.—Overseas Conference (open to all overseas representatives)—Committee Room C.
9.45 for 1.00 p.m.—Overseas Luncheon, Hotel Russell, W.C.1.	
5.30 p.m.—"At Home" for overseas representatives, given by the Empire Medical Advisory Bureau.	
9.40 p.m.—Ceremony of the Keys at the Tower of London (limited to 50). Tickets obtainable at Ladies' Club.	
Friday, June 3	
9.00 a.m.—Annual Representative Meeting Inquiry Office open.	
9.00 a.m.—Council Meeting—Council Chamber.	
9.30 a.m.—Ladies' Club open.	

KEY

*Evening Dress (Tails or Dinner Jacket).
 L. Events arranged for ladies accompanying members of Representative Body.

WELSH DINNER

The Welsh Dinner will be held at the Royal College of Surgeons, Lincolns Inn Fields, London, W.C.2, on Friday, June 3. All Welsh representatives, Welsh graduates, and others with Welsh associations, accompanied by their ladies, will be welcome at this dinner.

Tickets will be 30s. per head (exclusive of wines), and those wishing to attend are asked to apply, with remittance, to Dr. S. J. Hadfield, B.M.A. House, Tavistock Square, London, W.C.1.

GENERAL MEDICAL SERVICES COMMITTEE REMUNERATION AND PRACTICE EXPENSES

An all-day meeting of the General Medical Services Committee was held on April 21, with Dr. A. TALBOT ROGERS in the chair. It was announced that, owing to the General Election, the Minister of Health would not be able to address the Annual Conference of Local Medical Committees on May 19. For the same reason the meeting of the Committee fixed for May 26 was cancelled.

A message was sent to Dr. T. McDONALD, who is not standing for re-election to the Committee, thanking him for his services.

A report by Professor R. G. D. ALLEN commenting on the Ministry's proposals for estimating the practice expense ratio in subsequent years when the Board of Inland Revenue was unable to undertake another factual inquiry was placed before the Committee. The Ministry in its original letter suggested methods by which the expense factor might be kept up to date. In its opinion the only way in which an analysis could be made was to ask, by way of a questionnaire, the doctors who had been included in the Inland Revenue's figures for 1952-3 to supply information about the make-up of their professional expenses for the later year.

Dr. D. F. HUTCHINSON considered that a questionnaire of this kind would be an unfortunate thing from the point of view of intra-professional relations. He still hoped that the Ministry might bring pressure to bear upon the Board of Inland Revenue to undertake yearly inquiries.

The CHAIRMAN pointed out that the Board of Inland Revenue had always been extremely impartial in this matter, and its unwillingness to undertake further inquiries was solely due to pressure in its offices. There was certainly no wish on the part of anyone to unload on to certain doctors the duty of reporting on unnecessary items of expenditure, and he believed that in the Ministry's proposed questionnaire there were questions the answers to which would not be relevant to future payments.

Dr. J. C. ARTHUR suggested that any doctor who employed an accountant could without difficulty get out a sufficient analysis. A compromise might be reached on the basis of a much less detailed "breakdown" than the Ministry had suggested in its draft questionnaire.

It was agreed that representatives of the Committee should discuss the matter with the Committee's advisers and report back.

Dentists' Remuneration

Mr. L. EVEREST, the member of the Committee representing the dentists, gave a brief account of the arrangements which had been made concerning dentists' remuneration. During the last three years the profession had asked that the amount of the cut of 10% in their remuneration, made in 1950, should be restored, and the Minister had now accepted their proposals and was withdrawing the 10% cut at an early date, but he held the right to alter the figures in unforeseen circumstances. It was estimated that the restoration would cost the country about £4m. and would give an average increase of £400 a year gross to each practitioner. The Representative Board of the British Dental Association had accepted the proposals. Mr. Everest reminded the Committee that the average expense ratio in the dental profession was 53%.

The Willink Committee

The CHAIRMAN stated that the Council of the Association had accepted the suggestion that the preparation of evidence for the Willink Committee on the admission of students to medical schools should follow the course adopted in the case of the Guillebaud Committee.

The Committee took a ballot as the result of which nine of their members were appointed to prepare evidence from the general-practitioner point of view.

Maternity Medical Services

Dr. D. P. STEVENSON (Deputy Secretary) reported on a visit he had paid to the Portway Hospital in connexion with

the general-practitioner maternity services in the Weymouth area. He had met the chairman and other members of the hospital management committee. The points elicited were that the allocation of a dozen beds to general practitioners would not affect the status of the hospital as a training school for midwives. Secondly, much play had been made of the fact that if general-practitioner patients were admitted there would be difficulty in obtaining nursing staff; but this matter was gone into, and it was found that one pupil midwife would have to be replaced by a trained midwife. Dr. Stevenson had been asked to submit a memorandum to the committee of management, and had done so, and the result was awaited. Dr. PRIDHAM spoke appreciatively of Dr. Stevenson's visit, and the appreciation was endorsed by the Committee.

Dr. D. P. WILLIAMS made a report on the outcome of his interview with the chairman of the Flintshire and Denbighshire Local Medical Committee on the standards of surgery and waiting-room accommodation.

Other Business

The minutes of the meeting of the General Medical Services Subcommittee (Scotland) of March 8 were received.

Dr. CATHERINE HARROWER said that the Ministry's attention had been drawn to an anomaly whereby a doctor contracting to provide full maternity medical services received only seven guineas whereas two doctors who each contracted to undertake only Part I or Part II services separately received in total fees amounting to eight guineas. The reply of the Ministry on this point was that it was not thought that the reason for this arrangement had ever been stated, but probably the reason why the two parts added up to more than the whole was that when a doctor contracted only for Part I or Part II it was considered that he was likely to have a little more trouble in respect of the particular part than in the normal case.

It was agreed to discuss at the next meeting with the Ministry the need for some clarification concerning a proposed amendment dealing with partnership lists. This had been the subject of previous communications with the Ministry, which was prepared to agree to an amendment that where a partnership continued to employ an assistant the additional list of patients allowed in consequence would not be affected by the necessity for bringing the partnership lists within the maximum permitted by the allocation scheme. The Ministry felt it should be made clear that, where a practitioner or partnership of practitioners employed one or more permanent assistants, the number of persons on the list might be increased to the extent which the allocation scheme allowed.

It was reported that the London Executive Council had passed a resolution calling for the help of the General Medical Services Committee in pressing for a more effective system of registration in order to avoid inflation of lists. The General Medical Services Committee expressed its gratification that the London Executive Council should have asked the Committee for its assistance, especially as it was asking for what was in line with the Committee's own policy.

A question concerning the entitlement of doctors, improving their surgery accommodation, to draw upon any sum held to their credit on account of compensation was referred to the Compensation Subcommittee. A resolution to this effect had been passed by the Hertfordshire Executive Council and submitted to the Management Committee of the Executive Councils Association.

Discussion arose on a letter from the Ministry concerning the position of deputy chairmen of service committees and the possibility of arrangements by which chairmen of service committees of one executive council should be deputy chairmen of service committees of adjacent councils. The recent report of the subcommittee on service committee and tribunal procedure, under Dr. Dain's chairmanship, had put forward certain decided views regarding the position and functions of deputy chairmen, and it was agreed that a letter setting forth the views of the Committee should be sent to the Ministry.

The "National Formulary"

Dr. A. B. DAVIES presented a copy of the new edition—the third—of the *National Formulary*, which replaces the 1952 edition and is operative from May of this year. Dr. Davies and the other members associated with him in this work were warmly thanked by the Committee.

CLASSIFICATION OF PROPRIETARY MEDICINES

The Ministry of Health and the Department of Health for Scotland announce the following additions to the lists of proprietary medicines classified by the Standing Joint Committee on the Classification of Proprietary Preparations dated November, 1954, which were circulated to doctors in the National Health Service.

Additions to Category 1.—"Antrenyl" tablets, "calcium disodium versenate" injection, "carbo-resin," "convenil" (Hommel), "diparcol" injection, "elarine chloride pulvules," "imferon" injection, "lergine" tablets, liver extract crude (Lilly) injection, "merbentyl" tablets, "monodral" tablets, parathyroid hormone (Pabryn), "wyovin" tablets.

Additions to Category 5.—"Antibacsyn" injection, "antibacsyn" oral, British bee venom for desensitization, "cholinvel," hesperidin tablets V.L., inositol tablets V.L., "pabavel" tablets, pantothenic acid tablets V.L., "secretin-mebiol."

Additions to Category 6.—"Bisposod," "cremalgin," "digesto" laxative tablets (Sumner), "hepa-desicol," "heparglandol-B" injection, linctus cocerlanus (Legat), "lextron pulvules," "lextron ferrous pulvules," linctus cocerlanus & codein (Legat), "moldomia" drops, "moldomia" elixir, "moldomia" tablets, "okasa gold," "okasa silver," sodium oleate compound tablets (Gale Baiss), "tetraglandin pulverette," "vitaphos" tonic.

Deletions from Category 6.—The following preparations have been transferred to categories 2, 3, or 4: "ung. renaglandin," "ung. renaglandin" anaesthetic, "visiblin."

CO-OPERATION BETWEEN DOCTORS AND CLERGY

The Association's committee which is preparing evidence for the Archbishops' Commission on Divine Healing and Co-operation with the Clergy has been asked by the Secretary of the Commission for the following information about groups of doctors and ministers meeting together from time to time in various localities: (1) What is the total membership of the group? (2) What is the average attendance? (3) How often does the group meet? (4) Who are its members? How many? (5) How many? (6) How many? (7) How many? (8) How many? (9) How many? (10) How many? (11) How many? (12) How many? (13) How many? (14) How many? (15) How many? (16) How many? (17) How many? (18) How many? (19) How many? (20) How many? (21) How many? (22) How many? (23) How many? (24) How many? (25) How many? (26) How many? (27) How many? (28) How many? (29) How many? (30) How many? (31) How many? (32) How many? (33) How many? (34) How many? (35) How many? (36) How many? (37) How many? (38) How many? (39) How many? 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extended to old people not actually in hospital? He thought that they might. Lord Beveridge also thought that there should be means for making certain that, as old people living alone failed gradually, their failing was discovered before it became a tragedy.

The whole problem was one for the next thirty to fifty years. The distortion of the age structure would pass, said Lord Beveridge, but that was all the more reason for making sure that it caused no needless suffering while it lasted.

Dr. R. G. GIBSON (Winchester) thanked Lord Beveridge on behalf of the large and appreciative audience. Dr. Gibson referred to the B.M.A.'s concern for the welfare of the elderly and to its recently published report (*Supplement*, April 23, p. 181) on the establishment of a service for the treatment and rehabilitation of chronic disablement arising from age or illness.

Questions Answered

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Surgery Repairs and Rebuilding

Q.—The accommodation of my practice is in need of very extensive repair. Is it true that if I rebuild my surgery I can expect no income-tax relief, but that if I spend an equal sum on repairing an old surgery it would be allowed?

A.—The Revenue authorities take the view that while the cost of repairing a building used for business or professional purposes is allowable the demolition and reconstruction of a building is not allowable, even to the extent that such action may have rendered unnecessary expenditure on repairs. In other words, the construction of a new building is a matter of capital expenditure, different essentially from repairing the building, and the law does not enable the notional cost of the latter to be regarded as included in the former type of expenditure. It is not known whether there has been any legal judgment of a court in this country on that specific point, but it was discussed and decided in favour of the Revenue in an Irish case, and though, of course, that judgment would not govern the views of an English court the same grounds and reasoning would apply. It is assumed from the questioner's letter that the surgery is a separate structure. If it were part of the main premises, or, because of its situation, design, etc., could be so regarded, it would be possible to argue that the replacement of a part of the premises—i.e., the surgery—was in effect only a repair of the whole. A simple analogy would be the re-soling of a pair of boots.

Registrar Working at Two Hospitals

Q.—Can I claim income-tax relief on the purchase price of a car and its maintenance when, as surgical registrar, I work at a hospital some miles from the main hospital of the group? For the first six months I shall be resident in the hospital, but doing out-patient sessions in the main hospital. For the next eighteen months I shall be non-resident and on call for emergencies. Are any other expenses—e.g., telephone, subscriptions, etc.—allowable for income-tax purposes?

A.—It is assumed that for the period during which the questioner is required to attend two hospitals he will receive a cash allowance intended to meet such expense as may be necessary for the travel between the main hospital and the outlying hospital. The question therefore relates to the cost of travel between residence and one of the two hospitals. In so far as that expense is not met by the cash allowance no deduction for income-tax purposes is due. That results from the statutory Rule under Schedule E that

to be allowable expenses must have been incurred "wholly, exclusively, and necessarily in the performance of the duties." The High Court has held in a series of cases that the cost of travel between residence and the place where the duties are performed is not incurred "in the performance of the duties." The decisions apply also to such expenses as maintenance of telephone, subscriptions to medical societies, etc.

Car Purchase before Entering Practice

Q.—I am considering purchasing a car in May for personal use until I enter general practice in October. Will I be able to claim any income-tax relief in October when I start in practice?

A.—It is assumed that the questioner will be practising on his own account or in partnership and not as an assistant. The allowance is made from the assessment on the profits of the practice and is calculated as follows: (a) initial allowance at 20% of the cost, and (b) annual allowance—for the first year of the allowance on cost and thereafter on the written-down value—at 25%. The first financial year for which the allowances will be due is the year for which the amount of the assessment is determined by the profits of the practice year in which the car is first used in the practice. If—as apparently in this case—the car is purchased before it is taken into the use of the practice, the "cost" referred to above must be calculated at the written-down value as at the date it is applied to that use. For instance, if the car is purchased for, say, £800 on May 1, 1955, and is taken into practice use on October 1, 1955 (five months after purchase), the commencing value, it is considered, should be taken as £800—5/12 of 25% of £800 = £83—that is, £717.

Examinations for National Service Medical Boards

Q.—I examine and report on three or four young men referred by National Service medical boards every week. Some cases require very detailed examination and reports, and may lead to major surgery. What statutory obligation is there for consultants to do this type of work, and why is no payment made?

A.—Examination and report in hospital of young men referred by National Service medical boards is a service coming within the hospital and specialist service under Section 3 of the National Health Service Act, 1949. Consequently it must be regarded as part of the contract of a consultant. Such work should be taken into account in assessing a consultant's work. Where major surgery or other treatment is required, this, of course, will also come under the ordinary hospital and specialist services.

Prize for Medical Thesis

Q.—Is a sum of money awarded to me as a prize for a medical thesis liable to taxation? I am a full-time hospital officer, and the work was done in my own time and at my own expense.

A.—It is assumed that the prize was not awarded by the authority by which the questioner is employed. If it was, other considerations might apply. The general charging section of Schedule D brings into liability to tax "annual profits or gains," and an isolated receipt of this kind, which has no reference to payment for a fraction of a year, or indeed for any period whatever, is thought to be outside the scope of the tax.

Hospital in-patients under the National Health Service are regarded as being maintained free of charge for National Insurance purposes. In a memorandum to hospital authorities (H.M. (55) 31) the Ministry states that unless a patient is paying the whole cost of the services provided (other than the cost of treatment) the rate of National Insurance benefit payable to him is liable to reduction, after the first eight weeks in hospital, by 15s. a week if he has no dependants, and by 7s. 6d. a week if he has dependants.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Patients of a Vacant Practice

SIR.—In the report of the G.M.S. Committee (*Supplement*, April 2, p. 129), paragraphs 85 and 86, one reads of "other doctors in the vicinity who have been temporarily looking after the practice" and of "the obligation of the acting practitioner to hold the practice together for the appointed successor." May we have some clarification of this concept? Upon whom, precisely, does the obligation rest? By whom, precisely, has it been imposed? We no longer own the goodwill of practices. We have "lists" of patients and we are under contract with the Ministry, subject to severe pains and penalties, to render them as good medical service as may be reasonably expected of us. Where can one find in our terms of service reference to any obligation to ensure that these lists are transferred whole and complete to the contractual care of anyone else?

In days gone by we bought the goodwill of our practices, using our own or borrowed money for the purpose. Which of us with any claim to common sense imagined that the purchase money guaranteed us the full income of our predecessor? Why should the nominee of a local executive council be in a very much more privileged position than the youngster who had "bought a practice"? The Minister can bring in regulations to "freeze" any list, thereby setting at naught "the right of the patient to select his own doctor," but I can think of no reason why we should be expected to undertake this odious task on his behalf.

Lest it be thought that I have any large axe to grind in this matter, I may be permitted to mention that I am the oldest practitioner, with one exception, within a radius of more than a dozen miles. I write because I am one of those who believe that "1984" is very much nearer than most are able to see or willing to admit. Any interference with the freedom of the patients of a vacant list or with the colleagues of the practitioner who has left it vacant is in my submission a typical big-brotherism.—I am, etc.,

Launceston, Cornwall.

DONALD M. O'CONNOR.

Ship Surgeons

SIR.—Having only just arrived back in Britain this is the first opportunity I have had of seeing some of the correspondence provoked by my letter (*Supplement*, February 5, p. 43) on ship surgeons. If it is not too late now I should like to make a few points.

The boon to Australian postgraduates of a free passage to the United Kingdom is irrelevant to the argument from the logical viewpoint, seeing that the point at issue is the principle of employing "casual labour." However, I should like to mention that the Australian house-surgeon just qualified earns £A1,100 a year (£880 sterling), compared to the £2 a week I earned thus in Dublin—and I find it difficult to believe that they cannot save £100 (fare P. & O. tourist out-of-season £96, emigrant ship cheapest fare £76). Uniform involves the psychology of dress, which is slowly being recognized; a ship surgeon dressed like a passenger will be hard put to think of himself as other than a passenger.

The top-line shipping companies prefer the permanent surgeon, as application will prove; it is only certain companies that are prepared to employ the "non-uniformed holiday trippers," despite Dr. G. L. Alexander's assertion (*Supplement*, February 19, p. 58); and also he underestimates the problem of cheap gin. Again, the top-line companies gladly give their regulars three months' leave for refresher courses periodically. Dr. D. McLaren (p. 58) falls back on the *argumentum ad hominem* fallacy and refers the term "holiday tripper" back on the regular, so does not aid his own argument; he also accrues to himself

the right to assess the value of different branches of medicine, and Dr. W. H. Wolfenden (p. 58) thinks of the surgeon's job in terms solely of dispensary hours—in which many surgeons would agree with him. All three letters rebound back to the point that I have been trying to make—that is, that the surgeon is not at present a respected member of the ship's company. The difference of opinion seems rather to be regarding whether he should be or not. Shipping lines who are interested in the welfare of their crews know that "the best value they can get for their money" is the regular man who regards himself as a member of the Merchant Service and is proud of it.

Finally, if there is a rising tide of medical unemployment perhaps Dr. Alexander would be glad to know that Hong Kong, Singapore and Malaya, Sarawak and Borneo, Australia, etc., are crying out for doctors and offer good salaries.—I am, etc.,

Folkestone.

M. DILLON.

Assistants in General Practice

SIR.—Although I also am a principal, the attitude of Dr. D. E. Peake (*Supplement*, April 16, p. 167) towards the under-dogs of our profession, the unestablished practitioners, struck me as deplorable. I would like to support the proposals of the General Practice Reform Association for abolishing assistants. Whatever the assistant's salary, to hold a fellow doctor in a subject position—his livelihood subject to his principal's pleasure—longer than is necessary for the ascertainment of whether or not he is a suitable partner, constitutes exploitation and should not be allowed. Such practices degrade our profession to a trade and doctors to medical tradesmen.—I am, etc.,

Wallasey, Cheshire.

LENNOX JOHNSTON.

Compensation for Loss of Goodwill

SIR.—I think the time is now opportune for general practitioners to take concerted action re the above. A Liberal M.P. has recently termed National Savings schemes (voluntary) a colossal swindle. I wonder what he would have to say about compensation for goodwill of practices (compulsory). For every £2,000 involved £3,000 would scarcely be adequate compensation at the moment, because of inflationary tendencies countenanced by the Government.

The National Health Service should be prepared to take a realistic view of the position and increase compensation figures by 50%, or restore to the practitioner the right of sale or purchase of goodwill. The same right would restore many of the valuable privileges he has lost, not least a choice of freedom of locality in which to practise with due regard to personal and family requirements. The same privilege would help younger aspirants to principalships to achieve their aim.—I am, etc.,

Fraserburgh.

J. MACLEOD.

Inspection Invited

SIR.—I have recently had built here a house consisting of a waiting-room, a consulting-room, a separate examination room, patients' toilet, and garage on the ground floor, and living accommodation on the first floor; all in an external building area of 30 by 33 ft. (9 by 10 m.). To achieve a suitable design was not as simple as might be imagined, even with the greatest co-operation of an excellent architect. I should therefore be happy to allow any member who is contemplating building a similar property to inspect the house and plans, in case such may be of assistance.—I am, etc.,

325, Baring Road,
Grove Park, London, S.E.12.

GEOFFREY HARRIS.

In a circular to hospital authorities (H.M. (55) 11) the Minister of Health calls attention to the advisory service on hospital domestic management provided by the Ministry. He recommends boards and committees to consult the advisers freely on matters connected with organization, training, and efficient use of domestic and ancillary staff.

Association Notices

AFFILIATION OF CEYLON MEDICAL ASSOCIATION
TO BRITISH MEDICAL ASSOCIATION

In accordance with Article 16 of the Articles of the B.M.A., the Council gives notice to all concerned that it is proposed, as from December 31, 1955, to discontinue the Ceylon Medical Association as a Corporate Branch of the British Medical Association in order that steps may be taken to affiliate the Ceylon Medical Association to the British Medical Association.

ANNUAL GENERAL MEETING

Notice is hereby given that the Annual General Meeting of the Association will be held in the British Medical Association House, Tavistock Square, London, W.C.1, on Saturday, June 4, 1955, at 12.30 p.m. Business: (1) Minutes of last meeting held on July 5, 1954; (2) Balance Sheet and Income and Expenditure Account for the year ending December 31, 1954; (3) appointment of auditors.

EXTRAORDINARY GENERAL MEETING

Notice is hereby given that an Extraordinary General Meeting of the Association will be held in the British Medical Association House, Tavistock Square, London, W.C.1, on Saturday, June 4, 1955, at 12.30 p.m. or as soon thereafter as the Annual General Meeting of the Association shall be terminated, when the following resolution will be proposed as a special resolution:

RESOLUTION

That Articles 5, 6, 10, and 18 be altered in the following manner:

- (1) By altering Article 5 as follows: After "Each Branch" add "of the Association not in Great Britain or Ireland."
- (2) By altering Article 6 as follows: After "1st January, 1938," delete "but so that this proviso" and add "Provided further that the Regulations and By-laws may provide that any member admitted to membership before the 31st December next occurring after the date of the grant to him of a qualifying diploma within the meaning of the Medical Acts may compound his subscriptions for such period as may be prescribed by the payment of a lump sum but so that each of the foregoing provisos."
- (3) By altering Article 10(c) as follows: After "or (vi)" add "in the case of an Associate on the 31st day of December next following after he shall have ceased to reside within the area of the Branch by which he was elected or (vii)."
- (4) By altering Article 18 as follows: At the beginning insert "Subject as hereinafter provided." After the words "Corporate Group and of no other" insert "Provided Always that any member whose address as registered for the time being in the Register of Members of the Association is within Great Britain or Northern Ireland who has become a member of a Division other than that in which he resides in manner provided by the By-laws shall be an ordinary member of such first mentioned Division and of no other."

By order of the Council.

A. MACRAE,
Secretary.

Diary of Central Meetings

MAY

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| 3 Tues. | S.H.M.O.s Group Executive Committee, 2 p.m. |
| 4 Wed. | Office Committee, 11 a.m. |
| 4 Wed. | Committee re Remuneration Policy, 2 p.m. |
| 4 Wed. | Physical Medicine Group Committee, 2 p.m. |
| 4 Wed. | Private Practice Committee, 2 p.m. |
| 5 Thurs. | Chairman's Subcommittee, Constitution Committee, 11.15 a.m. |
| 5 Thurs. | Committee on Homosexuality and Prostitution, 2 p.m. (Date changed from April 20.) |
| 5 Thurs. | Rural Practices Subcommittee, G.M.S. Committee, 2 p.m. |
| 10 Tues. | Ethical Review Subcommittee, Central Ethical Committee, 1.30 p.m. |
| 10 Tues. | Amending Acts Committee, 2 p.m. |
| 11 Wed. | A.R.M. Agenda Committee, 11 a.m. |
| 11 Wed. | Central Ethical Committee, 12 noon. |
| 12 Thurs. | Central Consultants and Specialists Committee, 10.30 a.m. |

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| 13 Fri. | Ophthalmic Qualifications Committee, 1.45 p.m. |
| 13 Fri. | Ophthalmic Group Committee, 2 p.m. |
| 19 Thurs. | Annual Conference of Representatives of Local Medical Committees, 10 a.m. |
| 19 Thurs. | Tuberculosis and Diseases of the Chest Group Committee, 2 p.m. (Date changed from May 18.) |
| 20 Fri. | Conference of Regional Officers, 12 noon (to be preceded by an informal meeting of the Officers at 10.30 a.m.). |
| 20 Fri. | Registrars Group Council, 2 p.m. |
| 25 Wed. | Evidence Committee on Divine Healing, 10 a.m. |

Branch and Division Meetings to be Held

- ALDERSHOT AND FARNHAM DIVISION.**—At Northfield Hospital, Aldershot (lately the Civil Isolation Hospital), Friday, April 29, 8.30 p.m., meeting. Talk by Chief Constable of Hampshire on medico-legal subjects.
- BROMLEY DIVISION.**—At Bell Hotel, Bromley, Wednesday, May 4, 8 p.m., meeting. Lecture discussion on marriage guidance work introduced by Mr. J. Brayshaw (General Secretary, National Marriage Guidance Council).
- DORSET DIVISION.**—At the Clinic, Glyde Path Road, Dorchester, Monday, May 2, 8.30 p.m., meeting.
- EASTBOURNE DIVISION.**—At Burlington Hotel, Saturday, May 7, 7.15 for 7.45 p.m., annual dinner and dance. Members may bring guests.
- FINCHLEY DIVISION.**—At Finchley Memorial Hospital, Granville Road, N. Finchley, N., Tuesday, May 3, 8.30 for 9 p.m., annual general meeting.
- HARROW DIVISION.**—At Rayners Hotel, Rayners Lane, Harrow, Monday, May 2, 8.30 p.m., business meeting.
- HOLLAND DIVISION.**—At the Bridge Hotel, Sutton Bridge, Saturday, April 30, 7.15 for 7.45 p.m., meeting preceded by supper. B.M.A. lecture by Mr. A. Lawrence Abel: "Common Diseases of the Rectum and Anal Canal." Followed by coloured films.
- ISLE OF WIGHT DIVISION.**—At Unity Hall, Newport, Tuesday, May 3, 3.30 p.m., annual general meeting.
- LAMBETH AND SOUTHWARK DIVISION.**—(1) At Lambeth Hospital, Brook Drive, Kennington Road, S.E., Monday, May 2, 8.30 p.m., annual general meeting. (2) At Belgrave Hospital for Children, Clapham Road, S.W., Tuesday, May 3, 2.30 p.m., clinical meeting.
- LEICESTERSHIRE AND RUTLAND BRANCH.**—At the King's Head Hotel, Loughborough, Wednesday, May 4, 7.45 p.m., buffet supper.
- LEWISHAM DIVISION.**—At Lewisham General Hospital, High Street, Lewisham, S.E., Friday, May 6, 8.30 p.m., annual general meeting.
- MANCHESTER DIVISION.**—At the Fallowfield Hotel, Wilbraham Road, Manchester, Tuesday, May 3, 8.30 p.m., A.G.M.
- METROPOLITAN COUNTIES BRANCH.**—At B.M.A. House, Tavistock Square, London, W.C., Tuesday, May 3, 3 p.m., annual general meeting. President's address by Dr. R. Hale-White: "Patients, Politics, or Both?"
- MID-HERTS DIVISION.**—At Wellington Court Clinic, Brickett Road, St. Albans, Friday, May 6, 8.45 p.m., annual general meeting.
- ST. PANCRAS DIVISION.**—At Committee Room C, B.M.A. House, Tavistock Square, London, W.C., Monday, May 2, 8.30 p.m., annual general meeting.
- SCUNTHORPE DIVISION.**—At Scunthorpe and District War Memorial Hospital, Sunday, May 8, 10 a.m., clinical meeting.
- SOUTH WALES AND MONMOUTHSHIRE BRANCH.**—At East Glamorgan Hospital, Church Village, near Pontypridd, Glam., Thursday, May 5, 3 p.m., joint clinical meeting with North Glamorgan and Brecknock Division.
- SOUTH-WEST WALES DIVISION.**—At St. David's Hospital, Carmarthen, Sunday, May 1, 3 p.m., annual meeting.
- STIRLING BRANCH.**—At Bellsdyke Mental Hospital, Larbert, Sunday, May 1, 3 p.m., annual general meeting.
- TROWBRIDGE DIVISION.**—At the Angel Hotel, Chippenham, Sunday, May 1, 11 a.m., annual general meeting.
- WAKEFIELD DIVISION.**—At Clayton Hospital, Wakefield, Thursday, May 5, 8 p.m., meeting. Annual B.M.A. lecture by Dr. J. D. Allan Gray: "The Clinical Application of Antibiotics."
- WEST HERTS DIVISION.**—At Mount Vernon Hospital, Northwood (in the Plastic Surgery Centre), Friday, May 6, 8.30 p.m., general meeting.
- WEST SOMERSET DIVISION.**—At Musgrove Park Hospital, Taunton, Tuesday, May 3, 8 p.m., annual general meeting.

Meetings of Branches and Divisions

BLACKPOOL AND FYLDE DIVISION

A meeting was held on March 9, when Dr. Macdonald Critchley delivered the B.M.A. lecture for the year. Dr. T. S. Blackledge was in the chair and 51 members were present. Dr. Critchley spoke on "The Body Image," and his lecture was illustrated by lantern slides.

CHELSEA AND FULHAM DIVISION

A general meeting was held at the Cheyne Hospital, Chelsea, on March 25. Dr. G. Rosemont was in the chair. Dr. Dunham spoke on research among spastic children, and was followed by Mrs. Collis and Dr. Ian Anderson.

ANNUAL MEETING: TORONTO, JUNE 20-24

SUPPLEMENT TO THE
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THE LAW ON MENTAL ILLNESS AND MENTAL DEFICIENCY

ASSOCIATION'S EVIDENCE TO ROYAL COMMISSION

As announced in the Annual Report of the Council of the B.M.A. (*Supplement*, March 19, p. 108) the Association has submitted a memorandum of evidence to the Royal Commission on the Law Relating to Mental Illness. The memorandum was drawn up at the Council's request by the Association's Psychological Medicine Group Committee, which was augmented for the purpose by co-opted representatives of the Central Consultants and Specialists Committee, the General Medical Services Committee, and the Public Health Committee, a nominee of the Royal Medico-Psychological Association, and a legal expert on mental law and procedure (Mr. C. F. Penton).

The Chairman of the evidence committee was Dr. N. H. M. Burke. The Psychological Medicine Group Committee members were: Dr. A. Harris, Dr. P. K. McCowan, Dr. Doris M. Odum, Dr. J. D. W. Pearce, Professor T. Ferguson Rodger, Dr. J. C. Sawle Thomas, and Dr. J. Valentine. The co-opted members were: Dr. M. J. Brookes, Dr. H. M. Cohen, Dr. W. H. Patterson, Mr. C. F. Penton, Dr. S. Wand, and Dr. Elspeth M. Warwick.

Oral evidence was given before the Royal Commission on April 27 by the following members of the Committee: Drs. Burke, Cohen, Brookes, Odum, and Wand.

In preparing its memorandum the Committee was in close liaison with the Royal Medico-Psychological Association, a practice which has been followed on previous occasions when the two Associations have been invited to give evidence on matters relating to psychological medicine. The Committee found a very considerable measure of agreement with the R.M.P.A., and the memorandum therefore varies very little from that already submitted by the latter body. Such variations as were made were due to the wider outlook resulting from the presence on the B.M.A. Committee of the co-opted members.

The Association's memorandum of evidence recommends a new and comprehensive Mental Health Act to cover the whole psychiatric field, with parts for mental illness, mental deficiency and psychopathy.

Mental Illness

The main aim in the treatment of mental illness should be that the voluntary and temporary methods of admission to hospital should be those of usual choice, and that admission by judicial order should be reserved for the comparatively few for whom it is unavoidable. The introduction of voluntary admissions in the Mental Treatment Act (1930)

had been an unqualified success, and some 80% of all admissions were now in this category.

The Association's evidence recommended that the formalities should be reduced for both admission and discharge.

Though the provision under the Act of 1930 (section 5) for temporary treatment without certification had not been used as much as was hoped and expected, 23 years' experience had shown that admission to mental hospital without judicial intervention was practicable and also acceptable to public opinion.

Temporary Admissions

The Association has recommended that all patients should now normally be admitted to hospitals on a temporary status except for those who are admitted on a voluntary basis or those who require emergency procedure. Application for admission should be made by a relative or by a mental welfare officer, and should be accompanied by two medical recommendations.

In order to ensure that as many as possible should receive all their treatment under the temporary category, the Association has advised that admission should be for six months and that it should be extendible, under safeguards, for up to two years. Before this time most recoverable patients will have got well, and the stigma of certification will have been avoided.

The temporary category should provide a suitable umbrella for many of the senile patients whose disposal at present caused anxiety, and should enable their mental illness or decay to be treated without certification.

The judicial reception order, the Association considers, should be used only for those who have been tried as temporary patients and have failed to recover. The order should have force for one year, and should be renewable by the Board of Control for suitable periods on presentation of special reports and certificates from the hospital.

Immediate Supervision

Under the existing Act there are several different procedures, of which section 20 and section 11 provide the chief, by which a patient, where necessary, can be removed under immediate supervision.

The Association has recommended that a single unified procedure should be used. The mental welfare officer, the Association thinks, should have power to remove a patient in need of immediate care to a hospital (general or mental)

which has been designated for the purpose. The order should cover three days and be extendible to 21 days by the order of the medical superintendent of the mental hospital or the medical officer in charge of the observation ward, as the case might be.

Mental Deficiency

Part Two of the memorandum of evidence dealt with mental deficiency and discussed the varied aspects and causation of arrested or incomplete development of the mind.

Social inadequacy was regarded as the criterion for bringing into operation the measures of special care provided by the law, and it was immaterial whether the inadequacy was associated with a lack of intelligence or with an emotional or adaptive defect.

The present terminology, the Committee thought, was disturbing to the relatives and should be modified. The classes of idiot, imbecile, and feeble-minded, for instance, were unnecessary except, perhaps, for clinical use and should cease to appear in any legal document, while the class of moral defective had already been discarded in common practice.

Treatment

Treatment within the community should be developed, especially by increase of occupation centres and of home training. There should be power to make attendance at centres compulsory, and the management should be in the hands of the education authority.

There should be two kinds of hostel, and many more were needed of the kind which extended the work of the hospital by providing a stage towards licence and discharge. The local health authority should have hostels for patients not needing full hospital treatment. Where convenient it should be possible for the former hostel to receive voluntary patients from the local authority hostel, and for the latter hostel to take some on licence from the hospital, a useful field for co-operation.

The Association's memorandum recommends that the main method of entry to care for the higher-grade patient who is over 16 and can appreciate what is involved should be by a voluntary procedure, and for those under 16, and those over 16 whose understanding is inadequate for voluntary entry, there should be a revised method of placement.

No judicial order was involved in this procedure and the Association hoped that many patients would fall into this uncertified group. Judicial order should be reserved for those whose admission to care was necessary but had not been arranged by the voluntary or placing methods, or those whose claim for discharge was barred by the medical officer.

In place of the old list of conditions which render a patient "subject to be dealt with" there should be evidence showing clearly that admission to in-patient care or to guardianship was essential in the interest of the patient or for the protection of the public.

Under section 8 of the present Act a court may make an order. The memorandum suggested a further, and less drastic, power whereby the court may refer the case for such action as the local authority might think suitable.

The memorandum advised that there should be an extra visit at the third year, but saw no value in the visit at the age of 21 years. The parents should have the right of being present or represented at each visit and of presenting an independent psychiatric report, and the visitors should be able to discharge at any visit, but only on the advice of the medical officer.

Except for this method, the power of discharge should continue to be vested in the Board of Control.

The Justice

Dealing with the certification of a defective the memorandum stated that "the intervention of a Justice is essential for the reassurance of the relatives and the public, the protection of the medical practitioner and other officials concerned, and the public assertion of the principle of the liberty of the subject."

Among the safeguards proposed for the temporary patient who is detained in a mental hospital without order, it was suggested that he should have the right of an interview, within four weeks of admission, with a judicial authority who was not connected with the management of the hospital. This magistrate would either endorse the form of application for admission or could recommend to the hospital management committee a reconsideration of the case.

Psychopathy

The evidence dealt next with forms of mental abnormality which were difficult to classify or to relate to the more accepted and definite forms of mental illness or defect, but which influenced behaviour adversely and might produce family unhappiness, anti-social conduct, or even gross delinquency.

Such conditions were loosely called psychopathic, and it was clear to the Association that facilities were needed for voluntary treatment of those psychopaths who would accept it and for compulsory control where it was necessary for the protection of others.

The memorandum discussed the possibilities of treatment in prison, as advocated by the East-Hubert report of 1939, and under the measure of compulsion introduced by section 4 of the Criminal Justice Act of 1948. Both methods suffered, in the Association's opinion, from the limitation of the time available for treatment.

The memorandum suggested that the court should be given power to order admission to an appropriate institution. The order should be made only on the basis of two medical recommendations and for a limited period, but there should be the possibility of extension after reconsideration by visiting justices or by a special visiting board. This was put forward to meet the difficulty of the unpopular indeterminate sentence.

The psychopath who was not a delinquent but was a serious disrupter of family happiness presented a special problem and the memorandum proposed that a form of petition should be allowed from the relatives, the probation officer, or the duly authorized officer. This should be accompanied by a full statement of the facts and by two medical recommendations. Of these, one should preferably be by the family doctor, and the other by a psychiatric specialist. The court, if satisfied of the strength of this evidence, would order further examination by an independent specialist, and would then be able to order admission to a suitable institution. For these cases the court should be of a kind, such as a juvenile court, which could hear cases in private.

The allocation of these psychopathic patients should be by an elastic method designed to fit the individual into the appropriate institution, and should be done on the advice of such a person as the regional psychiatrist, who had comprehensive knowledge of the facilities which were available and an understanding of the patient's needs.

The Board of Control

Much anxiety had been caused to the Association by the recommendations of the Ministry of Health, which seemed to reduce the status and functions of the Board of Control and to weaken its powers, or distribute them to others.

The Association's opinion was put strongly that "the continued existence of the Board, substantially in its present form, is in the interests of the patients, the hospitals, and the public... it should be maintained in a position of complete independence as a central authority whose reports would have the value attaching to those of an impartial inspectorate."

It had already been stated in the evidence that special legislation was necessary to regulate conditions for the treatment of patients with mental diseases, and this very fact required that the hospitals for these patients "shall be inspected and reported upon by persons empowered to report and to criticize solely from this point of view, uninfluenced by any consideration of departmental policy."

It was recommended that the admission documents and the continuation certificates should continue to be scrutinized by the Board, as this was the only way to achieve uniformity in standard.

Further, the Board should be strengthened in number and maintained in professional quality so that its members might have more time for inspections and reports, and time also to visit any case which may seem to call for inquiry.

THE ADOLESCENT IN INDUSTRY

JOINT CONFERENCE OF ADVISORY COUNCILS ON OCCUPATIONAL HEALTH

The second Joint Conference of Advisory Councils on Occupational Health was held at B.M.A. House, London, on April 20. Mr. C. F. GOTHARD (Burton-on-Trent) presided, and was supported by Dr. I. D. GRANT (Chairman of the Representative Body of the Association) and Dr. J. A. L. VAUGHAN JONES (Chairman of the B.M.A.'s Occupational Health Committee). In addition to representatives of the councils and members of the Occupational Health Committee, there were present observers from the Ministries of Health and of Labour and National Service, the Society of Medical Officers of Health, the Royal College of Nursing, the Association of British Chambers of Commerce, the British Employers Confederation, the Trades Union Congress, and various industrial welfare organizations.

Dr. I. D. GRANT, in welcoming the conference, said that the British Medical Association was really its godparent, for the Representative Body had passed a resolution recommending the setting up of advisory councils in the various areas, and the first to be set up, at Dr. Vaughan Jones's instigation, was at Leeds. The Minister of Labour had set up an Industrial Health Advisory Council on which the British Medical Association was represented. The full co-operation of the Association could be assured in every endeavour to improve the working conditions of the people of this country.

Learners not Earners

Dr. A. W. RIDDOLLS (York) moved a composite resolution:

That there is a need for improvement in the liaison between education and industry, and that the interests of the nation are best served when its young people are primarily regarded not as "earnings" but as "learners."

He said that the best person to deal with the young person entering industry was not necessarily the foreman or charge hand, but someone particularly fitted to deal with and understand young people. The adolescent had two great needs: to belong to and be accepted by a group, and to acquire personal adequacy and self-confidence. The change from school to industry should be made a more gradual process, and some responsibility should be taken not only by the employing authority but by the school. Each local education authority should have a psychologist on its staff to give guidance to children before leaving school as to the vocation for which they were suited, and in each senior school one teacher should be careers master or mistress. Children in their last year at school might be given part-time work to see if they liked the employment and to introduce them into industry.

Mr. H. RAMSDEN (York), in seconding, said that in some industries new entrants were pitchforked into piece-work, which was detrimental to their health. Too many parents were concerned only with the amount of money that the children could bring home.

Dr. VAUGHAN JONES said that the parents' responsibility must be emphasized. The fact that young people change from job to job was sometimes an evidence, not of drift, but of real individuality. There was not nearly enough liaison between the school medical service and the factory doctor.

Dr. M. E. M. HERFORD said that the factory doctor was in an exceptionally favourable position to help young people when they entered or changed employment. A great many firms were unaware of their statutory duty to notify the factory doctor of the taking on of young people. In Slough, with which he was acquainted, the young people changed jobs very frequently, but not 10% could be described as drifters. Those who were not apprentices had little to attract them unless the conditions of work were particularly good, but if the lad found someone who had a genuine interest in him he was likely to make a good start.

Mr. F. H. MARTIN (Wolverhampton) spoke as a teacher. In Wolverhampton they had done quite a lot in forming a liaison between industry and education. It was recommended that some teachers should visit the factories, and people training in factory supervision should go into the schools. Mr. Martin made the point that nowadays the more intelligent children go to grammar schools and a number who previously went into industry no longer do so.

Mr. E. A. LEWIS (Association of British Chambers of Commerce) said that the careers master's job was one that ought to be very greatly developed. The grammar school gave such a master a great deal more scope than the secondary modern school. The liaison between employers and schools was a very thorny problem, but the resistance really came neither from the employers nor the schools, but from the pupils who wanted to earn as much as possible as quickly as possible and for as little as possible.

The resolution was carried.

Vocational Guidance

Another composite resolution by York declared that young persons entering industry should be given vocational guidance; that in this connexion a more comprehensive use should be made of all medical records by the health services of the country; that schemes of induction and encouragement of initiative should be provided; that there should be co-operation between parents and teachers initially, and between doctors, welfare workers, trade union officials, and employers in stimulating a sense of responsibility among adolescents entering industry; that it is primarily the responsibility of parents, assisted by teachers, the Church, youth leaders, and other agencies, to inculcate the right attitudes towards work; that more use should be made of the youth employment service, and that the service itself should make more use of the advice of general practitioners regarding the choice of suitable vocations, particularly in the case of physically handicapped children.

Mr. A. MACDONALD, in moving, said that it would be of value if school medical records could be passed on to the factory surgeon, to which would be added the records of his own yearly examination until the adolescent was 18, and then the whole be sent to the family doctor.

Mr. W. B. SIMPSON (Wandsworth) said that the youth employment service was doing an excellent job, but parents should be stimulated to take more interest in their children entering industry.

Dr. H. ALEXANDER (Wandsworth) said that in Wandsworth occupational guidance had been the subject of special talks to juveniles, but it was disappointing that at school-leaving interviews only 50% or fewer of the parents took the trouble to attend. He added that the general practitioner was in a position to know more about the family and social background than any other member of the team concerned, and should be able to give valuable information which the youth employment service could use.

Mr. S. J. BATCHELDER (Leeds) reminded the conference of the great number of small firms which were not able to provide facilities. One point to be remembered was that in these days very many of the mothers worked in the factory and thus knew something of the industrial conditions which their children would encounter.

Dr. R. C. SCOTT (Burton-on-Trent) could not agree that the school medical officer was the best man to do the job of

the appointed factory surgeon. It was the general practitioner who had and must have some definite knowledge of industry.

Dr. VAUGHAN JONES spoke of the responsibility of the churches, as well as of the parents, to take an interest in this matter. He did not accept the criticism that juveniles of the working classes were to any greater extent than any other groups in the community out to get as much and give as little as possible.

The composite resolution was carried, as was a further resolution by York urging that no undue emphasis should be placed on the problems confronting young people leaving school and entering industry. The mover said that it must not be forgotten that, while adolescence gave rise to difficulties, it also brought out admirable qualities of idealism and service.

On another resolution, "That the immediate supervisor of young people at their place of work should be a person of understanding who appreciated the problems of adolescence," some objection was raised to the word "immediate," and the phrase was altered to "the individual responsible for young people at their place of work," etc., and in that form was carried.

Another resolution, from Southampton, proposed to urge the Government to implement fully those recommendations of the Gowers Report which dealt with the employment of juveniles. Mr. A. E. GREGORY, in moving, referred particularly to the juveniles in some trades who were required to begin work at a very early hour in the morning and to continue for many hours during the day.

Many members of the Conference said that they had not had the opportunity of studying the Gowers Report, and after a short discussion the resolution was referred back to the Occupational Health Advisory Council for consideration and report to the next Conference.

The Conference concluded with votes of thanks to the Chairman, to Dr. Vaughan Jones and the Occupational Health Committee, and to the British Medical Association for acting as hosts, including luncheon hospitality.

Mr. F. H. Martin, of Wolverhampton, was appointed chairman for next year's conference.

REMUNERATION OF MEDICAL OFFICERS IN PUBLIC HEALTH SERVICE

INDUSTRIAL COURT AWARD

The Industrial Court has announced its arbitration award on the dispute in Committee C of the Medical Whitley Council over the Staff Side's claim for a revision of the salary scales of medical officers employed by local authorities. The award is largely in favour of the Management Side, and the doctors affected by it number approximately 2,000. Details of the present commencing salary ranges,

the Staff Side claim, and the Management Side offer are set out in the table at the foot of this page.

Both sides to the dispute were agreed that, when the award was made in respect of the categories of medical officers named in the table, they would be able to agree on the salaries of the remaining categories of medical officers—that is, deputy medical officers of health, holders of mixed appointments and combined appointments, and divisional medical officers—and also on the method of assimilation to the new scales.

The Award

The award is announced in the following terms: "The Court, having given careful consideration to the evidence and submissions of the parties, find and so award that, with effect from January 1, 1955, the salary scales for medical officers of health, senior medical officers and medical officers in departments (assistant medical officers) shall be as follows:

MEDICAL OFFICERS OF HEALTH			
Population Group	Commencing Salary	Increments	
Not exceeding	Between		
75,000 ..	£1,625 and £1,830	4 × £52 10s.	
100,000 ..	£1,730 and £2,040	5 × £51 10s.	
150,000 ..	£1,940 and £2,250	5 × £51 10s.	
250,000 ..	£2,150 and £2,450	2 × £100	
		1 × £50	
400,000 ..	£2,400 and £2,700	2 × £100	
		1 × £50	
600,000 ..	£2,500 and £2,900	3 × £100	
Over 600,000	At discretion	At discretion	

SENIOR MEDICAL OFFICERS

£1,415 × £50—£1,765 × £65—£1,830.

MEDICAL OFFICERS IN DEPARTMENTS (ASSISTANT MEDICAL OFFICERS)

£975 × £50—£1,375.

"The Court find against the proposal of the Management Side for the introduction, in the case of Scotland, of a salary scale for a medical officer of health with a population group not exceeding 60,000 and award accordingly.—(Signed) JOHN FORSTER, President, G. MAURICE HANN, KENNETH SCOTT."

A Matter of Principle

The Staff Side, as part of its case, claimed that medical officers' salaries should be related to remuneration in other branches of the profession, whereas the Management Side's offer linked medical salaries in the local authority service to those of the local authority hierarchy as a whole. Although the Court has not made a specific pronouncement of its views on this matter of principle (to which the Staff Side attached great importance), comparison of the award with the Management Side's offer before arbitration (see table) shows that the figures are substantially the same.

1. Medical Officers of Health

Population Group not Exceeding	Present Time		Staff Side Claim		Management Side Offer	
	Commencing Salary Between	Increments	Commencing Salary Between	Increments	Commencing Salary Between	Increments
60,000*	—	—	—	—	£1,520 and £1,730	4 × £52 10s.
75,000 ..	£1,450 and £1,650	4 × £50	£1,850 and £2,050	4 × £50	£1,625 .. £1,830	4 × £52 10s.
100,000 ..	£1,550 .. £1,850	5 × £50	£1,950 .. £2,250	5 × £50	£1,730 .. £2,040	5 × £51 10s.
150,000 ..	£1,750 .. £2,050	5 × £50	£2,150 .. £2,450	6 × £50	£1,940 .. £2,250	5 × £51 10s.
250,000 ..	£1,950 .. £2,250	2 × £100	£2,350 .. £2,650	2 × £50	£2,150 .. £2,450	2 × £100
		1 × £50				1 × £50
400,000 ..	£2,200 .. £2,500	2 × £100	£2,600 .. £2,900	4 × £100	£2,400 .. £2,700	2 × £100
		1 × £50				1 × £50
600,000 ..	£2,300 .. £2,700	3 × £100	£2,700 .. £3,100	4 × £100	£2,500 .. £2,900	3 × £100
Over 600,000	At discretion	At discretion	At discretion	At discretion	At discretion	At discretion
2. Senior Medical Officers £1,250, by 8 increments of £50, to £1,650			£1,550, by 8 increments of £50, to £1,950		£1,415, by 7 increments of £50, and 1 of £65, to £1,830	
3. Medical Officers in Departments (Assistant Medical Officers) £950, by 7 increments of £50, to £1,300			£950, by 10 increments of £50, to £1,450		£975, by 8 increments of £50, to £1,375	

* Applicable to Scotland only. † Scale offered by Management Side at the hearing.

British Medical Association, Canadian Medical Association, and Ontario Medical Association

JOINT ANNUAL MEETING—TORONTO, JUNE 20-24, 1955

President-Elect: THOMAS CLARENCE ROUTLEY, C.B.E., LL.D., M.D., F.R.C.P.(C.).

PROGRAMME

The 123rd Annual Meeting of the British Medical Association will be held in Toronto from Monday, June 20, to Friday, June 24, inclusive, as a joint meeting with the Canadian Medical Association and the Ontario Medical Association.

Those members arriving by the *Saxonia* will be the guests in Montreal of the local doctors on Thursday, June 16. Members arriving in Montreal by the *Empress of France* will similarly be entertained on Friday, June 17.

Members in Toronto on the afternoon of Friday, June 17, are to be the guests of Lady Eaton at a reception and supper at Eaton Hall Farm, King, Ontario.

Preceding the Meeting, there will be a Civic Reception on the evening of Saturday, June 18, and Religious Services on the afternoon of Sunday, June 19.

The British Medical Association Adjourned Annual General Meeting and President's Address will take place at 8 p.m. on Monday, June 20, followed by the President's Reception, at the Royal York Hotel. The Annual Dinner of the Ontario Medical Association is arranged for Tuesday, June 21, at 7 p.m., and is to be followed by Square Dancing. The Annual General Meeting of the Canadian Medical Association will be held on the evening of Wednesday, June 22, in the same place, and will be followed by a reception.

The Annual Dinner of the British Medical Association will be held in the Royal York Hotel on Thursday, June 23, at 7.30 p.m.

The C.M.A. is arranging luncheons each day of the meeting except Friday. At the luncheon on Monday Sir Henry Dale is to be presented with the Medal of Honour of the Canadian Pharmaceutical Manufacturers Association.

An all-day visit to Niagara Falls has been arranged for Friday, June 24, and various special functions have been planned for the ladies accompanying members.

Members of the Association and their ladies are invited to attend all the above functions (except the C.M.A. luncheons, which are for members only).

Information on arrangements for currency, travel, and accommodation may be obtained from the Secretary, B.M.A. House, Tavistock Square, London, W.C.1.

DRESS

Evening Dress (Tails or Dinner Jacket) with Decorations (Miniatures) will be worn at the evening functions on June 20, 22, and 23. Members have been advised that, as many will be travelling by air to Canada and their luggage accordingly limited, a dinner jacket will be quite adequate for all formal occasions.

Informal Dress will be worn at the evening functions on June 17, 18, 19, and 21.

Academic Dress will not be worn (except by those taking an official part in the Religious Services and B.M.A. Adjourned Annual General Meeting) owing to luggage restrictions and the difficulty of hiring robes in Canada.

REGISTRATION

Registration for B.M.A. members and ladies will take place before the meeting in the Royal York Hotel, commencing at 7.30 a.m. on Friday, June 17, continuing on Saturday, June 18. The main registration office opens at the Royal York Hotel on Monday, June 20. Members arriving by air at Malton Airport should take the airport

bus to the Royal York Hotel; those travelling by train will arrive at the Union Station, which is immediately opposite the Royal York Hotel.

CHRISTIAN MEDICAL FELLOWSHIP ANNUAL BREAKFAST

The Annual Breakfast of the Christian Medical Fellowship will be held in the Royal York Hotel from 7.45 to 8.45 a.m. on Thursday, June 23. The Chairman will be Dr. T. C. Routley, and the speaker Dr. John R. Brobeck, Ph.D., Professor of Physiology, University of Pennsylvania. Those intending to be present are asked to notify the local secretary, Dr. I. H. Erb, 299, St. Clair Avenue West, Toronto, 7.

DINNER OF THE MAIMONIDES MEDICAL SOCIETY OF ONTARIO

There will be a dinner of the newly formed Maimonides Medical Society of Ontario on the evening of Wednesday, June 22, at the Royal York Hotel. (Membership is open to all Jewish physicians qualified to practise in Ontario.) Special guests will be the Jewish doctors and their wives who will be attending the Meeting from overseas. Advance information of intention to be present should be sent to Dr. A. Leventhal, 425, Palmerston Boulevard, Toronto.

SCIENTIFIC MEETINGS

Scientific meetings will be held daily from June 20 to 24, beginning each day with Round Table Conferences from 9 to 10.15 a.m., followed by Plenary or General Sessions from 10.30 a.m. to 12.15 p.m. The Scientific Sections will be held daily from 2 to 5 p.m., and there will be a Panel Discussion on the National Health Service on June 22 at 3 p.m. A Scientific Exhibition will be held in conjunction with the Joint Meeting, in addition to a Pharmaceutical Exhibition.

Details of the scientific meetings, all of which will be held in the Royal York Hotel (unless otherwise stated), are given below.

SCIENTIFIC PROGRAMME

Monday, June 20

Round Table Conferences

9 to 10.15 a.m.—(a) The Management of Prostatic Obstruction. *Chairman*: Dr. C. L. GOSSE,* Halifax. (b) Pain. *Chairman*: Dr. FRANK TURNBULL,* Vancouver. (c) The Role of the General Practitioner in the Diagnosis and Treatment of Glaucoma. *Chairman*: Dr. A. J. ELLIOT,* Toronto. (d) The Problem of the Anaemias. *Chairman*: Dr. E. S. MILLS,* Montreal.

Plenary Session

10.30 a.m. to 12.15 p.m.—The Present Status of Chemotherapy of Bacterial Infections. *Chairman and Opening Speaker*: Professor L. P. GARROD, London. *Speakers*: Dr. T. E. ROY,* Toronto; Professor J. W. CROFTON, Edinburgh; Dr. K. J. R. WIGHTMAN,* Toronto. (*Official Reporter*: Professor R. CRICKSHANK.)

Tuesday, June 21

Round Table Conferences

9 to 10.15 a.m.—(a) Surgery of the Lungs. *Chairman*: Dr. R. M. JANES,* Toronto. (b) Is Prenatal Care Worth

Canadian speakers are denoted by an asterisk ().

While? *Chairman:* Dr. ELINOR F. E. BLACK,* Winnipeg. (c) The Prevention and Treatment of Poliomyelitis. *Chairman:* Dr. C. E. VAN ROOYEN,* Toronto. (d) Alcoholism in Industry. *Chairman:* Dr. W. HARVEY CRUICKSHANK,* Montreal.

General Session

10.30 a.m. to 12.15 p.m.—(1) The Blackader Lecture—Professor STANLEY GRAHAM, Glasgow. The Changing Pattern of Paediatrics. (2) Sir GEOFFREY JEFFERSON, Manchester. Variations on a Neurological Theme. (3) Dr. R. M. B. MACKENNA, London. The Art of Dermatology.

Wednesday, June 22

Round Table Conferences

9 to 10.15 a.m.—(a) The Management of Coronary Thrombosis. *Chairman:* Dr. HAROLD SEGALL,* Montreal. (b) Deafness. *Chairman:* Dr. W. J. McNALLY,* Montreal. (c) The Management of Rheumatoid Arthritis. *Chairman:* Dr. WALLACE GRAHAM,* Toronto. (d) The Recognition and Management of Depressive Reactions. *Chairman:* Dr. R. O. JONES,* Halifax.

Plenary Session

10.30 a.m. to 12.15 p.m.—The Clinical Application of Physiology to Medicine and Surgery. *Chairman and Opening Speaker:* Professor Sir HENRY COHEN, Liverpool. *Speakers:* Dr. JOSEPH DOUPE,* Winnipeg; Sir HENRY DALE, London; Dr. J. S. L. BROWNE,* Montreal. (*Official Reporter:* Dr. F. PRESCOTT.)

Panel on National Health Service

3 p.m.—*Chairman:* Dr. R. W. RICHARDSON,* Winnipeg. (1) Dr. E. A. GREGG, London. Background of the Service. (2) Dr. A. TALBOT ROGERS, Bromley. The Family Doctor Service. (3) Dr. T. ROWLAND HILL, London. The Hospital Service. (4) Dr. S. C. GAWNE, Preston. The Public Health Service. (*Official Reporter:* Dr. A. TALBOT ROGERS.)

Thursday, June 23

Round Table Conferences

9 to 10.15 a.m.—(a) The Management of Bronchial Asthma. *Chairman:* Dr. BRAM ROSE,* Montreal. (b) The Care of Premature Infants. *Chairman:* Dr. J. F. McCREARY,* Vancouver. (c) Anaesthesia for the Aged Patient. *Chairman:* Dr. HAROLD GRIFFITH,* Montreal. (d) Problems in Dermatology. *Chairman:* Dr. GEORGE S. WILLIAMSON,* Ottawa.

General Session

10.30 a.m. to 12.15 p.m.—(1) Professor Sir ROBERT MACINTOSH, Oxford. A Plea for Simplicity in Anaesthesia. (2) Professor DUGALD BAIRD, Aberdeen. Caesarean Section, Its Use in Difficult Labour in Primigravidae. (3) Dr. WILLIAM PICKLES, Aysgarth, Yorks. The General Practitioner and the Laboratory.

Friday, June 24

Round Table Conferences

9 to 10.15 a.m.—(a) The Value of Mass Radiography. *Chairman:* Dr. G. C. BRINK,* Toronto. (b) The Treatment of Burns. *Chairman:* Dr. S. D. GORDON,* Toronto. (c) Lumbar Pain. *Chairman:* Dr. R. I. HARRIS,* Toronto. (d) Rehabilitation Following Industrial Injury. *Chairman:* Dr. BRUCE YOUNG,* Toronto.

General Session

10.30 a.m. to 12.15 p.m.—(1) The Gordon Richards Memorial Lecture—Mr. J. RALSTON PATERSON, Manchester. Why do Cancer Patients Delay? (2) Sir HENEAGE OGILVIE, London. What Not to Do in Gall-bladder Surgery. (3) Dr. DESMOND CURRAN, London. The Place of Psychology and Psychiatry in Medical Education.

SECTIONAL MEETINGS

ANAESTHESIA

President: Professor Sir ROBERT MACINTOSH (Oxford). *Vice-Presidents:* Dr. GEORGES COUSINEAU* (Montreal). Dr. B. C. LEECH* (Regina), Dr. G. S. W. ORGANE (London), Dr. H. J. SHIELDS* (Toronto). *Hon. Secretary:* Dr. R. A. GORDON* (Toronto). *Official Reporter:* Dr. F. PRESCOTT.

Sessions

(Banting Institute Lecture Room)

Wednesday, June 22

2 to 5 p.m.—(1) Dr. C. LANGTON HEWER (London). Physiology and Complications of the Trendelenburg Position. (2) Dr. H. R. GRIFFITH* (Montreal). Whither Now in Anaesthesia? (3) Dr. A. R. HUNTER (Manchester). Antidotes to Curarizing Drugs. (4) Dr. LEON LONGTIN* (Montreal). A New Technique of Intubation for the Prevention of Contralateral Infection During Lung Surgery. (5) Quiz Session. *Moderator:* Dr. B. C. LEECH* (Regina).

Thursday, June 23

2 to 5 p.m.—(1) Dr. D. A. BUXTON HOPKIN (London). Chlorpromazine. (2) Dr. H. J. SHIELDS* (Toronto). History of Anaesthesia in Canada. (3) Dr. RONALD JARMAN (London). The Anaesthetic and the Anaesthetist. (4) Dr. FERNANDO HUDON* (Quebec). Considerations on Recovery Rooms. (5) Dr. R. W. COPE (London). Anaesthesia for Children and the Newborn. (6) Dr. PHILIP R. BROMAGE (Emsworth). Spirometry in the Assessment of Analgesia after Abdominal Surgery.

CHILD HEALTH

President: Professor A. A. MONCRIEFF (London). *Vice-Presidents:* Dr. ALAN G. BROWN* (Toronto), Professor W. F. GAISFORD (Manchester), Dr. ALTON GOLDBLOOM* (Montreal), Dr. D. B. LEITCH* (Edmonton). *Hon. Secretary:* Dr. A. L. CHUTE* (Toronto). *Official Reporters:* Dr. D. V. HUBBLE (June 21); Professor WILFRID GAISFORD (June 22).

Sessions

(Hospital for Sick Children)

Tuesday, June 21

2 to 5 p.m.—*Some Problems of the Neonatal Period:*—(1) Dr. MARY CROSSE (Birmingham). Dr. JEAN WEBB* (Ottawa). Vital Statistics—Causes of Neonatal Mortality and Morbidity. (2) Professor W. S. CRAIG (Leeds). Anoxia and Respiratory Failure. (3) Dr. PETER SPOHN* (Vancouver). Retrolental Fibroplasia. (4) Dr. BRUCE CHOWN* (Winnipeg). Erythroblastosis. (5) Dr. WM. DONOHUE* (Toronto). Causes of Death in Prematurity. (6) Professor ALAN MONCRIEFF (London). Congenital Malformations, Causation and Prevention. (7) Mr. DENIS BROWNE (London). Congenital Malformations, Surgery.

Wednesday, June 22

2 to 5 p.m.—(A) *Problems of Gastro-enteritis:*—(1) Dr. FRANCES PRESSICK* (Montreal). Bacteriology. (2) Dr. B. E. SCHLESINGER (London). Drugs and Antibiotics. (3) Dr. W. W. PAYNE (London). Fluid and Electrolyte Balance. (B) *Respiratory Diseases:*—(1) Professor W. F. GAISFORD (Manchester). Experiences with B.C.G. (2) Dr. GLADYS BOYD* (Toronto). Bronchiectasis.

DERMATOLOGY

President: Dr. R. M. B. MACKENNA (London). *Vice-Presidents:* Dr. D. E. H. CLEVELAND* (Vancouver), Dr. EMILE GAUMOND* (Quebec), Dr. E. J. TROW, sen.* (Toronto), Dr. D. I. WILLIAMS (London). *Hon. Secretary:* Dr. RAYMOND C. SMITH* (Toronto). *Official Reporter:* Dr. R. MASON BOLAM.

Sessions

(Tudor Rooms 4 and 5)

Wednesday, June 22

2 to 5 p.m.—(1) Further Studies on the Pathogenesis of Rosacea, by Drs. BARNEY USHER* and GORDON YOUNG* (both of Montreal). (2) The Whitfield Tradition in Modern Therapy, by Dr. D. I. WILLIAMS (London). (3) Ringworm of the Scalp (this paper will be presented by Dr. BRITAIN SAUNDERS* (Toronto), but as a co-operative effort by the staff of the Hospital for Sick Children: NORMAN WRONG,* STUART ROGERS,* CHARLES HAIR,* and Dr. RAYMOND C. SMITH.* (4) Acute Skin Diseases in General Practice, by Dr. R. MASON BOLAM (Newcastle-upon-Tyne).

Thursday, June 23

2 to 5 p.m.—Clinical session at Toronto General Hospital presented by the Section of Dermatology, Academy of Medicine, Toronto.

GENERAL PRACTICE

President: Dr. IAN D. GRANT (Glasgow). *Vice-Presidents:* Dr. J. HOWARD BLACK* (Vancouver), Dr. C. L. GASS* (Tatamagouche, N.S.), Dr. F. M. ROSE (Preston), Dr. MURRAY STALKER* (Ormskirk, P.Q.). *Hon. Secretary:* Dr. H. G. HALL* (Toronto). *Official Reporter:* Dr. A. TALBOT ROGERS.

Sessions

(Tudor Rooms 1-5)

Monday, June 20

2 to 5 p.m.—Symposium:—The Management of Abortion in General Practice. *Moderator:* Dr. JOHN MANN* (Toronto). *Participants:* Mr. J. R. NICHOLSON-LAILEY (Taunton), Dr. MARY ESSLEMONT (Aberdeen), Dr. JOSLYN ROGERS* (Toronto).

Thursday, June 23

2 to 5 p.m.—(1) Dr. IAN D. GRANT (Glasgow). Problems in the Management of the Aged. (2) Dr. ALISTAIR McCONE (Glasgow). Let me see your Tongue: Why? (3) Dr. F. M. ROSE (Preston). Problems of Hypertension in General Practice. (4) Dr. HAROLD F. ROBERTSON* (Toronto). Occluding Arterial Lesions of the Leg. (5) Dr. J. A. McDONALD* (Gloucester). Subject to be announced.

MEDICINE

President: Professor Sir HENRY COHEN (Liverpool). *Vice-Presidents:* Dr. E. R. CULLINAN (London), Dr. R. F. FARQUHARSON* (Toronto), Dr. R. B. KERR* (Vancouver), Dr. WALTER DE M. SCRIVER* (Montreal). *Hon. Secretary:* Dr. R. C. DICKSON* (Toronto). *Official Reporters:* Dr. D. A. LONG (June 20 and 22), Dr. D. V. HUBBLE (June 23).

Sessions

(Concert Hall)

Monday, June 20

2 to 5 p.m.—(1) (a) Dr. H. GARFIELD KELLY* (Kingston). The Mechanism of Heart Failure. (b) Dr. STEPHEN WHITTAKER (Warwick). The Treatment of Heart Failure. (2) Dr. PAUL DAVID* (Montreal). Indications for and Results of Mitral Valvulotomy. (3) Dr. HUGH STANSFIELD* (Vancouver). Electrocardiographic Patterns in Atypical Acute Coronary Occlusion. (4) Dr. KENNETH HARRIS (London). Clinical Aspects of Atypical Coronary Disease. (5) Dr. WILLIAM EVANS (London). Treatment of Cardiac Infarction—Immediate and Late.

Wednesday, June 22

2 to 5 p.m.—(1) Dr. E. R. CULLINAN (London). The Essential Nature, Effects, and Treatment of Simple Obesity. (2) The Sprue Syndrome: (a) Professor A. C. FRAZER (Birmingham). Idiopathic Steatorrhea. (b) Dr. DOUGLAS CAMERON* (Montreal). Secondary Steatorrhea. (3) Dr. A. W. BAGNALL* (Vancouver). Post-Menopausal Osteoporosis. (4) Dr. GUY E. JORON* (Montreal). Diagnosis and Treatment of Acute Pyelonephritis in Diabetes Mellitus.

Thursday, June 23

2 to 5 p.m.—(1) Dr. DAVID A. LONG (London). The Aetiology of Rheumatic Fever. (2) (a) Dr. E. C. WARNER (London). The Nature of the Physiological Disturbance in Chronic Pulmonary Emphysema. (b) Dr. T. H. AARON* (Edmonton). The Modern Treatment of Chronic Pulmonary Emphysema. (3) Dr. WILLIAM J. MORSE* (Boston). Investigation of the Haemorrhagic Diatheses. (4) Dr. JOHN P. GEMMELL* (Winnipeg). Choice of Treatment in Hyperthyroidism.

NEUROLOGY

President: Sir GEOFFREY JEFFERSON (Manchester). *Vice-Presidents:* Dr. GILBERT L. ADAMSON* (Winnipeg), Dr. WILDER G. PENFIELD* (Montreal), Dr. W. RITCHIE RUSSELL (Oxford), Dr. FRANK A. TURNBULL* (Vancouver). *Hon. Secretary:* Dr. J. ALLAN WALTERS* (Toronto). *Official Reporter:* Dr. W. RITCHIE RUSSELL.

Sessions

(Best Institute)

Monday, June 20

2 to 5 p.m.—(1) Dr. HUGH GARLAND (Leeds). Diabetic Neuropathy. (2) Sir CHARLES SYMONDS (London). Cough Headache—A Benign Syndrome. (3) Dr. E. H. BOTTERELL* (Toronto). Hypothermia in Cerebral Vascular Surgery. (4) Dr. W. M. LOUGHEED* (Toronto). Hypothermia for Neurological Surgery: Evaluation of the Method. (5) Dr. W. RITCHIE RUSSELL (Oxford). Observations on Interstitial Neuritis. (6) Dr. T. ROWLAND HILL (London). Some Problems of Peripheral Neuropathy.

Wednesday, June 22

2 to 5 p.m.—(1) Mr. D. W. C. NORTHFIELD (London). The Results of Treatment of Cervical Spondylosis with Neurological Manifestations. (2) Sir GEOFFREY JEFFERSON (Manchester). The Integration of Coma. (3) Dr. WILDER PENFIELD* (Montreal). The Results of Cortical Excision in the Treatment of Focal Epilepsy. (4) Dr. DOUGLAS McALPINE (London). Some Observations on the Diagnosis and Treatment of Multiple Sclerosis.

OBSTETRICS AND GYNAECOLOGY

President: Professor DUGALD BAIRD (Aberdeen). *Vice-Presidents:* Dr. D. M. LOW* (Toronto), Mr. JOHN PEEL (London), Dr. W. P. TEW* (London, Ont.), Dr. J. ROSS VANT* (Edmonton). *Hon. Secretary:* Dr. R. B. MEIKLEJOHN* (Toronto). *Official Reporter:* Mr. S. BENDER.

Sessions

(Concert Hall, June 21; P.D.R.10, June 23)

Tuesday, June 21

2 to 5 p.m.—(1) Dr. DOUGLAS FREW* (Edmonton). What is Adequate Prenatal Care To-day? (2) Mr. S. BENDER (Chester). Fertility after Tubal Pregnancy. (3) Dr. F. L. JOHNSON* (Hamilton). The Management of Breech Presentations. (4) Mr. JOHN PEEL (London). The Management of the Diabetic Patient in Pregnancy. (5) Dr. OTTO SCHMIDT* (Winnipeg). Induction of Labour—Its Use and Abuse.

Thursday, June 23

2 to 5 p.m.—(1) Dr. CARL TUPPER* (Halifax). The Management of Spontaneous Abortion—A Combined Approach. (2) Mr. MALCOLM DONALDSON (London) and Dr. PAUL LATOUR* (Montreal). The Early Diagnosis of Cancer of the Cervix. (3) Miss GLADYS HILL (London). Functional Bleeding. (4) Professor DAVID STEWART (Jamaica). Treatment of Suppression of Urine Following Eclampsia.

OCCUPATIONAL MEDICINE

President: Dr. J. M. ROGAN (London).
Vice-Presidents: Dr. J. G. CUNNINGHAM* (Toronto), Dr. J. J. O'DWYER (London), Dr. H. GRAHAM ROSS* (Montreal), Dr. W. G. SAUNDERS* (Vancouver).
Hon. Secretary: Dr. J. H. BAILLIE* (Toronto).

Sessions

(P.D.R. 7, June 21; Bell Telephone Building, June 23)

Tuesday, June 21

2 to 5 p.m.—(1) Dr. A. H. SELLERS* (Toronto). The Procuring of Comparable Industrial Medical Statistics. (2) Dr. J. E. GOODWIN* (Toronto). Indicating in Advance a Susceptibility to Noise. (3) Dr. IAN URQUHART* (Toronto). Problems of Resuscitation in Industry. (4) Dr. J. H. BAILLIE* (Toronto). Some Considerations of Sickness Absenteeism in a Non-hazardous Industry. (5) Dr. J. J. O'DWYER (London). The Contribution of the Doctor to the Management Team.

Thursday, June 23

2 to 5 p.m.—(1) Dr. JOHN ROGAN (London). The Health of the British Coal-miner. (2) Dr. R. APPLEFORD* (Oakville). The Detection of Diabetes on Preplacement Blood Examinations. (3) Dr. C. G. SHAVER* (St. Catharines). Silicon Carbide as an Industrial Hazard. (4) Dr. S. D. MCCLEAN (London). Some Aspects of Health in the Oil Industry. (5) Surgeon Commander F. P. ELLIS, R.N. (Washington). Environmental Health in the Royal Navy. The Changing Scene.

OPHTHALMOLOGY

President: Mr. J. W. TUDOR THOMAS (Cardiff).
Vice-Presidents: Mr. J. H. DOGGART (London), Dr. NORMAN L. ELVIN* (Winnipeg), Dr. R. T. HAYES* (St. John, N.B.), Dr. KENNETH B. JOHNSTON* (Montreal).
Hon. Secretary: Dr. CLEMENT MCCULLOCH* (Toronto).
Official Reporter: Mr. J. H. DOGGART.

Session

(P.D.R. 7)

Monday, June 20

2 to 5 p.m.—(1) Mr. JAMES H. DOGGART (London). Vessels of the Ocular Fundus as a Guide to Prognosis. (2) Mr. J. W. TUDOR THOMAS (Cardiff). On Advising a Corneal Graft. (3) Dr. I. LLOYD JOHNSTONE (Worcester). The Operative Treatment of Abducens Palsy. (4) Dr. CHARLES DYSON* (London). Chordomata of Ocular Interest. (5) Dr. HOWARD REED* (Winnipeg). Some Observations on the Results of Cataract Extraction. (6) Dr. C. D. BAIRD* (Chatham). Diseases of the Meibomian Glands.

ORTHOPAEDIC SURGERY

President: Mr. PHILIP WILES (London).
Vice-Presidents: Mr. H. JACKSON BURROWS (London), Dr. J. CALIXTE FAVREAU* (Montreal), Dr. ALEXANDER GIBSON* (Winnipeg), Dr. R. I. HARRIS* (Toronto).
Hon. Secretary: Dr. HERBERT M. COLEMAN* (Toronto).
Official Reporter: Mr. H. JACKSON BURROWS.

Sessions

(Academy of Medicine)

Wednesday, June 22

2 to 5 p.m.—(1) Mr. H. JACKSON BURROWS (London). Replacement of Bone by Internal Prostheses. (2) Dr. J. BATEMAN* (Toronto). Management of Acute Nerve Injuries. (3) Dr. J. M. JAMES* (Rochester). Peripheral Vascular Surgery from the Standpoint of the Orthopaedic Surgeon. (4) Mr. J. P. JACKSON (London). Results of Chemotherapy in Bone and Joint Tuberculosis. (5) Dr. GEORGE PENNAL* (Toronto). The Thomas Splint. (6) Mr. H. H. LANGSTON (Winchester). A Plea for a Rational Outlook on the Internal Fixation of Fractures. (7) Dr. A. JOUSSE* (Toronto) (*chairman*). Symposium on Traumatic Paraplegia.

Thursday, June 23

2 to 5 p.m.—(1) Mr. PHILIP WILES (London). The Aetiology of Postural Defects. (2) Mr. DENIS BROWNE (London). The Causation of Certain Congenital Deformities and Their Treatment by Controlled Movement. (3) Dr. L. P. ROY* (Quebec). Bone Tumours. (4) Dr. F. P. PATTERSON* (Vancouver). Complications of External Pin Fixation in Orthopaedic Surgery. (5) Dr. G. L. BURKE* (Vancouver). Some Observations on the Feet and Legs in Childhood. (6) Dr. A. A. BUTLER* (Montreal). Evaluation of the Use of Hydrocortone in Orthopaedic Surgery. (7) Mr. J. P. CAMPBELL (Nottingham). Treatment of Osteoarthritis of the Hip by Osteotomy. (8) Dr. R. GARIEPY* (Montreal). The Surgical Management of Osteoarthritis of the Knee-Joint. (9) Dr. J. N. SWANSON* (Toronto). Some Orthopaedic Problems Connected with Gouty Arthritis.

OTOLARYNGOLOGY

President: Mr. V. E. NEGUS (London).
Vice-Presidents: Mr. T. E. CAWTHORNE (London), Dr. G. M. T. HAZEN* (Saskatoon), Dr. D. M. MACRAE* (Halifax, N.S.), Dr. G. E. TREMBLE* (Montreal).
Hon. Secretary: Dr. H. W. D. MCCART* (Toronto).
Official Reporter: Mr. R. G. MACBETH.

Sessions

(P.D.R. 10)

Tuesday, June 21

2 to 5 p.m.—(1) Dr. DAVID H. BALLON* (Montreal). Review of Foreign Body Endoscopy Over a Period of Thirty years. (2) Dr. R. E. GREENWAY* (London). Results of Cobalt Therapy in Malignancies of the Nose and Throat. (3) Dr. J. A. SULLIVAN* (Toronto). Clinical Testing of Vertigo. (4) Mr. VICTOR NEGUS (London). Air Conditioning Mechanism of the Nose.

Wednesday, June 22

2 to 5 p.m.—(1) Mr. TERENCE CAWTHORNE (London). Facial Palsy. (2) Mr. RONALD MACBETH (Oxford). The Treatment of Oesophageal Varices in Portal Hypertension by Means of Sclerosing Injections. (3) Dr. EDWARD TREMBLE* (Montreal). A Few Highlights Concerning Respiratory Cilia. (4) Dr. HOWARD MCCART* (Toronto). Parotid Tumours.

PREVENTIVE MEDICINE

President: Professor L. P. GARROD (London).
Vice-Presidents: Dr. G. D. W. CAMERON* (Ottawa), Dr. ROBERT DEFRIES* (Toronto), Dr. S. C. GAWNE (Preston), Dr. LEONARD A. MILLER* (St. John's, Newfoundland).
Hon. Secretary: Dr. L. A. PEQUEGNAT* (Toronto).
Official Reporter: Professor R. CRUICKSHANK.

Sessions

(Hall B)

Monday, June 20

2 to 5 p.m.—(1) (a) Professor R. CRUICKSHANK (London). The Epidemiology of Upper Respiratory Tract Infections. (b) Dr. G. DEMPSTER* (Toronto). Acute Respiratory Disease. (c) Dr. ELIZABETH CHANT ROBERTSON* (Toronto). Ultra-violet Radiation in the Control of Respiratory Disease. (2) *Occasional Paper.*—Dr. JOHN GARDINER* (Toronto). The Heart Registry.

Wednesday, June 22

2.30 to 5 p.m.—(1) Dr. H. J. PARISH (London). Combined Prophylactics. (2) Dr. A. R. FOLEY* (Quebec) and Dr. JAMES M. MATHER* (Vancouver). Combined Immunization from the Viewpoint of the User in the Field. (3) Dr. P. J. MOLONEY* (Toronto). Antigenic and Immunological Aspects of Combined Immunization.

PSYCHIATRY

President: Professor AUBREY J. LEWIS (London).
Vice-Presidents: Dr. R. O. JONES* (Halifax, N.S.), Dr. D. G. McKERRACHER* (Regina), Dr. W. C. M. SCOTT* (Montreal), Dr. ALDWYN B. STOKES* (Toronto).
Hon. Secretary: Dr. A. M. DOYLE* (Toronto).
Official Reporter: Dr. DESMOND CURRAN.

Session on Suicide

(Hall B)

Tuesday, June 21

2 to 5 p.m.—(1) Professor AUBREY LEWIS (London). Statistical Aspects of Suicide. (2) Dr. A. E. MOLL* (Montreal). The Psychopathology of Suicide. (3) Dr. G. C. SISLER* (Winnipeg). The Treatment of Suicidal Attempts. (4) Dr. E. STENGEL (London). The Social Significance of the Suicidal Attempt.

Session on Basic Sciences in Psychiatry

Thursday, June 23

2 to 5 p.m.—(1) Dr. WM. C. GIBSON* (Vancouver). Physiology. (2) Dr. JOHN W. LOVETT DOUST* (Toronto). Psychology. (3) Dr. W. C. M. SCOTT* (Montreal). Psychobiology. (4) Dr. DENIS LEIGH (London). The Contribution of Neuro-anatomy and Neuro-pathology to Psychiatry.

RADIOLOGY

President: Mr. J. RALSTON PATERSON (Manchester).
Vice-Presidents: Dr. E. A. PETRIE* (St. John, N.B.), Dr. A. C. SINGLETON* (Toronto), Dr. ETHLYN TRAPP* (Vancouver), Dr. JOHN WILKIE (Sheffield).
Hon. Secretary: Dr. M. M. R. HALL* (Toronto).
Official Reporter: Dr. EDITH PATERSON.

Sessions

(Tudor Rooms 1-3, June 22; P.D.R. 9, June 23)

Wednesday, June 22

2 to 5 p.m.—*Diagnosis*—(1) Dr. L. R. HARNICK* (Toronto). Diodrast Arthrography of the Knee, and Surgical Correlation. (2) Dr. R. A. MACPHERSON* (Winnipeg). Ulceration of the Duodenal Bulb without Deformity—A Clinical-Radiological Correlation. (3) Dr. J. WILKIE (Sheffield). Intracranial Calcifications. (4) Dr. GUILLAUME GILL* (Montreal). Ureteral Block and Kidney Function. (5) Dr. D. G. WOLLIN* (Toronto). Experimental Rupture of Transverse Ligament of the Atlas.

Thursday, June 23

2 to 5 p.m.—*Therapy*—(1) Dr. ETHLYN TRAPP* (Vancouver). Treatment of Carcinoma of the Body of the Uterus. (2) Dr. JEAN BOUCHARD* (Montreal). Subject to be announced later. (3) Dr. EDITH PATERSON (Manchester).

Treatment of the Leukaemias. (4) Dr. RONALD BURR* (Kingston, Ont.). Intracavity Irradiation of Carcinoma of the Bladder. (5) Dr. OWEN MILLAR* (Toronto). The Use of Radioactive Gold in Malignant Effusion.

SURGERY

President: Mr. A. LAWRENCE ABEL (London).
Vice-Presidents: Dr. C. W. BURNS* (Winnipeg), Dr. R. M. JAMES* (Toronto), Dr. W. J. P. MACMILLAN* (Charlottetown, P.E.I.), Mr. T. HOLMES SELLORS (London).
Hon. Secretary: Dr. BURNS PLEWES* (Toronto).
Official Reporter: Mr. R. S. MURLEY.

Sessions

(Roof Garden)

Monday, June 20

2 to 5 p.m.—*Symposium on Abdominal Surgery*—Mr. IAN FRASER (Belfast). Some Problems of the Small Intestine. Mr. L. R. BROSTER (London). Intersexuality. Mr. A. DICKSON WRIGHT (London). Intestinal Obstruction. Mr. C. PATRICK SAMES (Bath). Obstructions at the Lower End of the Common Bile Duct. Mr. A. LAWRENCE ABEL (London). Treatment of Ulcerative Colitis by Total Colectomy and Ileo-Rectal Anastomosis. *Short Paper*—Dr. W. BIGELOW* (Toronto). Effects of Hypothermia on Risks of Surgery.

Tuesday, June 21

2 to 5 p.m.—*Symposium on Cancer*—Mr. R. W. RAVEN (London). The Present Position of the Treatment of Cancer of the Oesophagus. Mr. D. N. MATTHEWS (London). Pharyngeal Reconstruction after Excision for Cancer. Mr. R. S. MURLEY (London). The Assessment of Results in Breast Cancer. Mr. MICHAEL HARMER (London). Bilateral Adrenalectomy in Breast Cancer. *Symposium on Cardiovascular Diseases*—Dr. DOS SANTOS (Lisbon). Arterial Surgery. Mr. T. HOLMES SELLORS (London). Intracardiac Surgery. Dr. ED. GAGNON* (Heart Surgery). Professor A. M. BOYD (Manchester). Vasodilator Drugs in Obliterative Arterial Disease. Mr. R. E. HORTON (Bristol). The Use of Grafts in Arterial Disease of the Lower Limb.

UROLOGY

President: Mr. H. P. WINSBURY-WHITE (London).
Vice-Presidents: Mr. A. W. BADENOCH (London), Dr. PAUL BOURGEOIS* (Montreal), Dr. GORDON N. ELLIS* (Edmonton), Dr. J. C. MCCLELLAND* (Toronto).
Hon. Secretary: Dr. CHARLES J. ROBSON* (Toronto).
Official Reporter: Mr. R. S. MURLEY.

Session

(P.D.R. 8)

Wednesday, June 22

2 to 5 p.m.—(1) Mr. H. P. WINSBURY-WHITE (London). Early Signs of Bladder-neck Disease. (2) Dr. JOHN K. LATHIMER (New York). The Role of the General Practitioner in the Treatment of Genito-urinary Tuberculosis. (3) Mr. LESLIE N. PYRAH (Leeds). The Use of the Ileum in Genito-urinary Surgery. (4) Mr. A. W. BADENOCH (London). Haematuria. (5) Dr. THOMAS RUSSELL* (Toronto). Urinary Tract Infections. (6) Mr. NOEL ADENEY (Bournemouth). Vesical Neoplasms—A Provincial Surgeon's Bogy.

SCIENTIFIC EXHIBITION

Exhibits and Exhibitors

Dr. G. M. WYANT* Controlled Hypotension in General Surgery.
Dr. E. A. LEW* Prognostic Value of Life Insurance Mortality Investigations.
Group Captain D. G. M. NELSON* Personal Survival Equipment and Test Equipment.

Dr. DONALD MACRAE.* Bony Abnormalities at the Cranio-vertebral Junction of Neurological Importance.

Dr. K. A. BAIRD.* Sensitivity to Products of Bacteria—Practice and Theory.

Dr. HAMILTON BAXTER.* Team-work in the Rehabilitation of Cleft-palate Patients.

Dr. COLIN C. FERGUSON.* Surgical Emergencies in the Newborn.

Dr. W. L. DONOHUE.* Foetal and Neonatal Morbidity and Mortality.

Mr. F. W. ROWSE.* Canada's National Public Health Services.

Dr. R. D. DEFRIES.* Preparation of Poliomyelitis Vaccine (Salk).

Dr. EVAN V. SHUTE.* The Effect of Alpha Tocopherol on Peripheral Vascular Conditions and Burns.

Mr. MICHAEL HARMER. Cancer of the Breast.

Dr. WALLACE TROUP.* Cardiovascular-Renal Mortality in Western Countries.

Dr. A. J. RHODES.* Isolation of Poliomyelitis and Other Viruses by Tissue Culture.

GENERAL TIME-TABLE

L.—Events primarily arranged for Ladies.
U.—Events for all Members and Ladies accompanying them
*—Evening Dress.
†—Decorations.

Friday, June 17

5.30 p.m.—U. Buses leave Royal York Hotel for reception and supper given by Lady Eaton at Eaton Hall Farm, King, Ontario.

Saturday, June 18

8.00 p.m.—U. Civic reception and musicale, Royal York Hotel.

Sunday, June 19

3.00 p.m.—Protestant Service, St. James's Cathedral.

3.00 p.m.—Roman Catholic Service, St. Michael's Cathedral.

U. Private supper parties by Toronto hostesses for all visitors.

Monday, June 20

3.00 p.m.—L. Fashion Show and Tea—Georgian Room, T. Eaton Co.

8.00 p.m.—U*†. B.M.A. Adjourned Annual General Meeting and President's Address—Royal York Hotel.
U*†. President's Reception. Dancing.

Tuesday, June 21

3.00 p.m.—L. Garden Tea, Hart House, University of Toronto.

7.00 p.m.—U. Annual Dinner, Ontario Medical Association (informal dress), followed by Square Dancing—Royal York Hotel.

Wednesday, June 22

12.30 p.m.—L. Ladies' Lunch—Stoddleigh Restaurant, Exhibition Park, Toronto.

Dinner, Maimonides Medical Society of Ontario, Royal York Hotel.

8.00 p.m.—U*†. C.M.A. Annual General Meeting—Royal York Hotel.

10.00 p.m.—U*†. Reception—Dancing.

Thursday, June 23

7.45 a.m.—Annual Breakfast of the Christian Medical Fellowship, Royal York Hotel.

11.00 a.m.—L. Buses leave Royal York Hotel for Garden Tour and Luncheon at Oakville, Ontario.

7.30 p.m.—U*†. Annual Dinner, B.M.A.—Royal York Hotel.

Friday, June 24

9.30 a.m.—U. Buses leave Royal York Hotel for excursion to Niagara Falls, arranged by the Hydro-Electric Power Commission of Ontario. Luncheon stop at the Mountain Sanatorium, Hamilton. Sightseeing at Niagara. Tea at Niagara Falls Club, by courtesy of the Niagara Falls Medical Society. 7.45 p.m., Dinner. Return to Toronto by 11 p.m.

CONSULTANTS AND SPECIALISTS

OPTION FOR WHOLE- OR PART-TIME SERVICE

The Joint Consultants Committees have had recent discussions with the Ministry of Health and the Department of Health for Scotland about whole-time and maximum part-time service for consultants in the National Health Service, and the following is an agreed statement of the position.

It is recognized that some consultants, while prepared to devote substantially the whole of their time to hospital work and to give it priority on all occasions, would prefer a maximum part-time to a whole-time contract. Ever since 1948 it has been the Ministry's view that, subject always to the needs of the hospital service, employing boards should in this matter take into account the circumstances and preferences of the consultants concerned. While there has been no previous statement on this point as regards Scotland, the practice in that country has been similar.

Where a new appointment is being made this means that, except where the board decides that the needs of the hospital service (considered in conjunction with those of the local health services, where the consultant is to undertake duties on behalf of a local authority) demand a whole-time appointment, the competition should be thrown open to all applicants who are prepared to give substantially the whole of their time to the post, whether they prefer a whole-time or a maximum part-time contract. In such a case the successful candidate should not be asked to state his preference until after he has been selected for appointment.

Similarly, if a consultant who is already employed in a whole-time post wishes to transfer to a maximum part-time contract, or *vice versa*, the board should, before reaching a decision, take his circumstances and preferences into account, again subject to the overriding needs of the hospital service.

This statement does not, of course, deal with the many cases where the services of a consultant are needed in the aggregate for only a limited volume of work, and where therefore a part-time appointment would in all cases be appropriate.

MEDICAL WHITLEY COUNCIL COMMITTEE B

MANAGEMENT SIDE'S "NO" TO CLAIMS

A meeting of Committee B of the Medical Whitley Council was held on Tuesday, April 26, and some outstanding problems affecting hospital medical staffs were discussed.

Remuneration of S.H.M.O.s

A claim had been lodged by the Staff Side for an immediate increase in the remuneration of S.H.M.O.s to restore the overlap between the maximum of the S.H.M.O. and the minimum of the consultant salary scales which existed before the agreed revision of hospital medical staff remuneration in April last year. The Management Side did not agree that the present circumstances were in any way different from those when the agreement was reached last year, and rejected the claim.

The Staff Side will consider the position at its next meeting.

Locum Rates for Consultants and S.H.M.O.s

Although the Management Side agreed to increase the locum rates for junior medical staffs (*Supplement*, March 19, p. 91) it has so far refused to agree to any increase for locums of consultant and S.H.M.O. status. The Staff Side claimed that the existing rates for consultant and S.H.M.O. locums should be increased proportionately to the increases granted to permanent staff, but the Management Side maintained that the existing rates were generous and that there was no case for an increase.

Matters Still Under Discussion

Discussions are still continuing in Whitley Committee B on the Staff Side's claim that whole-time consultants should be paid for domiciliary consultations. Likewise the questions of remuneration of medical superintendents and the board and lodging charges for resident staff have not yet been resolved. The Management Side hopes to deal with the Staff Side's claim for an increase in the remuneration of administrative medical officers of regional hospital boards at the next meeting in July.

DOCTOR'S FAILURE TO PERMIT SURGERY INSPECTION

FINE RECOMMENDED

The London Executive Council has made representations to the Minister of Health that 30 gns. should be withheld from the remuneration of a doctor who failed to permit inspection of his surgery and waiting-room.

In February the chairman of the Council, at the request of the local medical committee, gave authority for the practitioner's surgery to be inspected. The practitioner agreed, but subsequently notified the Council that the date arranged was inconvenient and suggested another date, which however, was not convenient to one of the visitors. The Council again wrote to the doctor on February 15, stating that the visit would be made on March 11, but on March 6 the doctor sent a letter to the Council stating that this date was not convenient as certain decorations had not been completed, and suggested deferring the visit until the middle of May.

The Council replied on March 7 that the repeated alteration of arrangements was troublesome and that it had not asked that the surgery should be redecorated prior to inspection. The duty of the officers was to report on the present condition of the premises, and any information about redecoration, etc., would be included in the report.

Reference to Service Committee

On March 11 the doctor was notified that it had been decided to refer the matter to the Medical Service Committee for investigation unless he could indicate several days during the following fortnight on which the surgery could be inspected.

The doctor made no reply to this, and registered letters regarding the meeting of the Medical Service Committee were returned through the post office. A further, unregistered, letter notifying him of the date and time of the meeting was sent prior to the meeting. The practitioner failed to attend before the Committee.

Terms of Service Flouted

In its report to the Executive Council, the Committee stated that it was of the opinion that the practitioner had shown a complete disregard of the obligations into which he entered when he applied to join the medical list and accepted the terms of service. It was unable to consider his conduct in the matter as anything less than a deliberate flouting of the terms of service.

The practitioner has the right of appeal against the recommendations of the Executive Council.

A report of the General Benefits Committee of the London Executive Council states that two medical practitioners practising in partnership in London have a combined list of 828 in excess of the permitted maximum. The committee has decided that payment for these patients for the three months ended March 31 should not be allowed, and the practitioners have been advised that the Council will take action to limit their lists in accordance with the regulations if the services of a full-time assistant have not been secured by May 6.

N.O.T.B.A. ANNUAL MEETING

The formation of area committees was approved at the sixth Annual General Meeting of the National Ophthalmic Treatment Board Association, which was held at B.M.A. House on Friday, April 1. The meeting also discussed ways and means of combating the growth of unregistered medical eye-centres. It was considered that this was an undesirable development owing to the lack of supervision which could be exercised over these centres by a body such as the N.O.T.B.A.

Questions Answered

Vaccination of Hospital Staff

Q.—*I am a casualty officer and house-surgeon, and carry out vaccination both of domestic and of nursing staff as required by the hospital. Am I entitled to claim a vaccination fee from the local health authority?*

A.—Vaccination of members of hospital staffs is regarded as part of the duties assigned to the officer under his contract. Consequently, the officer cannot receive a fee for this work. With regard to the payment of a fee for notification to the local health authority, an officer would be entitled to this only where the authority required such a notification and had specifically asked for notification of each individual case. For example, the passing of information to a local health authority merely giving the vaccination state of the staff of the hospital would not entitle an officer to a fee.

General Practitioner Course

Q.—*I have for several years attended a G.P. course on psychotherapy in general practice. The fee is 5 guineas per term. On some occasions the fees were paid by the post-graduate education people centrally to the clinic. I find that the inspector of taxes refuses to accept it as a deductible item on the basis that it is a capital cost. What is your opinion, and have I any redress?*

A.—The question of whether the cost of attending a course in a professional subject should be regarded as a current allowable expense or an outlay of capital is sometimes difficult to decide. Basically it depends on whether attendance at the course is for the purpose of (a) maintaining the individual's standard of professional competence, or (b) of adding to his status and the extent of his professional qualifications. The crux of the difficulty is that the constant advance of technical knowledge demands an increase in the individual's own knowledge if his or her professional standard is to be maintained. A point in favour of the questioner's claim is that the course is for the assistance of general practitioners. The claim can be pressed by lodging an appeal either to the district commissioners or to the special commissioners of income tax. On the facts stated, the questioner would seem to have a reasonable chance of success at a personal hearing.

Policy Maturing Abroad

Q.—*Shall I be liable for U.K. income tax on the proceeds of a paid-up endowment policy which I bought in Kenya from a colonial service pension which will soon be mature in E. Africa, and which I desire to receive in the United Kingdom?*

A.—The proceeds resulting from the maturing of a life insurance policy are essentially "capital" in their nature, and are not liable to British income tax.

The visit of Dr. E. Grey-Turner, Assistant Secretary, to West Africa (*Supplement*, February 5, p. 39) which was to have taken place in March was unavoidably postponed.

EXCHANGE OF STUDENT NURSES

TRAINING LINK BETWEEN GENERAL AND
MENTAL HOSPITALS

Hospital authorities in England and Wales have been asked by the Minister of Health to promote schemes wherever possible for the interchange of student nurses between general and mental hospitals. In the Minister's view this step will help to improve the quality of the mental nurse's training, introduce a valuable element into the training of general nurses, and have a beneficial effect in breaking down the isolation from which many mental hospitals still suffer.

The General Nursing Council has agreed that for student mental nurses a six-months secondment to a general hospital would be satisfactory for that part of the syllabus dealing with bodily diseases. The council is also willing to consider proposals for the secondment of student general nurses to mental hospitals for part of their training.

Appointments to Senior Posts

The Minister also announces an important change in the qualifications required for appointment to the most senior posts in mental hospitals. Formerly promotion to matron or deputy matron in mental and mental deficiency hospitals was limited to applicants who had trained in both mental and general nursing. The Central Health Services Council has expressed the view that this requirement is a deterrent to recruitment in the mental nursing field, and the hospital authorities are now advised that they should not regard candidates for the senior posts as ineligible solely because they do not possess the double qualification, if they are otherwise suitable.

FUNCTIONS OF THE MEDICAL OFFICER
OF HEALTH

The Society of Medical Officers of Health has recently published a booklet¹ on the functions of the medical officer of health. The operation of the National Health Service and National Assistance Acts, quite apart from the changes in medical administration, has resulted in increased attention being paid to the amount of sickness among the people and the increasingly heavy cost of remedial measures. The introduction to the booklet states: "Special skills needed for applying means of prevention do not seem to be well understood, and the tendency remains to concentrate upon perfecting and extending methods of treating specific diseases rather than upon measures for raising the standard of community health as a whole, whereby much of the sickness could be avoided."

The Society believes that, by strengthening the means of prevention available to-day, the amount of ill-health could be reduced within a reasonably short period.

Guardian and Adviser

The booklet gives an account, in broad general principles, of what, in the Society's view, should be—and in many progressive authorities are—the functions of the medical officer of health.

Part I develops the theme that the medical officer of health should be the guardian of the community health. An appeal is made for a recognition of the integrity of the subject of community health in place of the past and present tendency to split it up into watertight sections. It is pointed out that this does not in any sense entail or demand a return to past administrative structures. On the contrary, the medical officer of health is concerned much more with the application of principles governing his work than with forms of

¹ *The Functions of the Medical Officer of Health*, 1955. Society of Medical Officers of Health, London. Price 1s. 6d.
² *Memorandum on the Duties of Medical Officers of Health*, 1925. Ministry of Health, London.

government. Looking to the future, he is confident that these principles can be successfully applied and that he can be accorded a sufficient place of authority whether the administrative structure of the health service is united into a single whole or divided into separate parts, whether it remains under local government or central government.

The services for which the medical officer of health should be executive responsible are set out in Part II, and under each heading a few of the main controversial points are discussed with the object of defining the boundaries of the community health services.

Part III emphasizes the need for the medical officer of health to be placed in a position to advise on the medical aspects of other services, of which he need not be in executive control, where these affect the community health. Part IV states his overall duty to have regard for all circumstances which may adversely affect the community health of his area. According to the Ministry's memorandum,² quoted by the Society, the general duty of a medical officer of health is "to acquire an accurate knowledge of the influences, social, environmental, and industrial, which may operate prejudicially to health in the area, and of the agencies, official and unofficial, whose help can be invoked in amelioration of such influences."

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Rewards for Skill

SIR.—The question of reward for skill is going to be the main problem of our welfare State in the coming decade. Ever since unskilled labour won its great victory in the dock strike of 1889 the "differential reward" between skilled and unskilled work, which had in many trades been fixed by the craft guilds in the Middle Ages, has been growing smaller. Indeed, in some trades it is now possible for the unskilled workman, on overtime, to earn more than his skilled companion.

The medical profession has, in part, solved this problem by the extraordinary method of merit awards, whereby a cabal of master-craftsmen have privy access to State funds for the reward of their fellow specialists. As the problem of "differentials" becomes more acute in other professions and skilled trades, this precedent of medical merit awards is certain to be quoted. The vision of each skilled trade drawing a secret fund from the Treasury would be a fine nightmare for any Chancellor of the Exchequer. I am sure, however, that the recent rail dispute would have been solved most expeditiously if secret merit awards could have been given to the drivers of the "Flying Scotsman" and the "Bristolian."—I am, etc.,

Wells.

M. W. BIRD.

Maternity Record Card

SIR.—I was most interested to see Dr. R. Owen's obstetric record card (*Supplement*, April 23, p. 203). Since he asks for other practitioners' suggestions, I venture to enclose a copy of the card which I have been using for the past 18 months. This has hitherto been duplicated on pasteboard, as I have delayed ordering printed cards until finally satisfied that the best use was being made of available space. The card is of the same size as the Form E.C.6 (continuation record sheet). The rather large amount of space devoted to the confinement was intended to allow for the collection of information for a statistical study at some future date.

I feel that Dr. Owen's section for the post-natal examination is an improvement on my own, which has proved rather cumbersome. On the other hand, my sections "General Health" and "Obstetric History" are rather more adaptable than his "P.O.B.H.," "P. Med. H.," and "Examn. Gen."

MAY 7, 1955

CORRESPONDENCE

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL 223

[FRONT]

Surname		Prenames	
Address		Date of booking	
		Place of confinement	
General health		Age	
		Teeth	
		Nipple	R L
		V.Vs.	R L
		Vag'l disch	
Obstetric history Para-		BLOOD Hb	
		WR ABO gp. Rh Antibodies (1) 8kg (2) 36 wk.	
LMP		EDD	
Pelvic assessment			

Date	Week	BP	Weight	Urine	Fundus	Posn.	HS.

[BACK]

CONFINEMENT		Date	Time
1st Stage		Type of delivery Analgesics Anaesthetics:	
2nd Stage			
3rd Stage			
Placenta			
CHILD	Sex	Weight	
Post-natal visits:			

POST-NATAL EXAMINATION		Date
General health		Hb
Discharge		BP
Pain		Urine:
Bladder		Alb
Menstruation		Sug.
Abd'l exam		
Scurae		
Musculature		
Vag'l exam		
Perineum		Vagina
Cervix		Appendages
Uterus: Size		Shape
Posn		Mobility
Lactation		Contraception

If you are willing, Sir, to allow space for a number of practitioners' ideas on this subject, I am certain that an extremely useful form will result.—I am, etc.,

Lechlade, Glos.

J. V. GROUNDES-PEACE.

Entry into Practice

SIR.—Knowing how much justifiable pride the British Medical Association takes in helping its members and others into general practice by the agency of the Medical Practices Advisory Bureau, I was surprised to note that the Bureau publicized in its report (*Supplement*, March 26, p. 120) the instance of two principals who asked for introductions for assistants without a view. In the first, after 140 introductions, "the post still remains vacant for lack of applicants," and in the second, after 200 introductions, only two inquiries were received. The Bureau gives this as a "convincing answer to the statement that doctors cannot get posts in general practice." I communicated with a member of the Assistants and Young Practitioners Subcommittee and asked for an explanation. He told me he had inquired into these practices, the localities, and the remunerations offered, and in the opinion of his Subcommittee the conditions of these practices were so unattractive that no young man was likely to consider them.

I note, too, that in the report it is stated that "the number [of doctors] out of work involuntarily is rather less than 5% and that this percentage is not increasing." Would it be possible for me to be informed how that 5% is computed, and whether unemployment amongst members is divided into casual and permanent, and what is the criterion of permanency in months? I recall that this is not the first time that the Medical Practices Advisory Bureau has quoted a practice where an assistant could not be obtained though the practice was widely circularized to counter the case that there is unemployment amongst doctors.

It is my opinion as a member of the British Medical Association that it is one thing for a great organization loyally to try to help its members and at the same time loyally to try to work out a scheme whose defects are apparent to many, always excluding those who administer it, and another thing to cover up the grave difficulties of entry into practice. Surely the British Medical Association could use its powerful influence to press for greater freedom for members of the medical profession and easier entry into practice. Many of us would feel happier if the British Medical Association did not "play down" these difficulties.—I am, etc.,

GEORGE ROSSDALE,

Honorary Treasurer,

The Fellowship for Freedom in Medicine.

London, W 1.

Government Department Salaries

SIR.—I see that the Civil Service Commissioners are advertising a number of medical vacancies in several Government departments in the *Journal* of April 23 (advertisement page 40). In these advertisements the London salary scales are given, and it is stated that salaries are "slightly lower" outside London. I think that your readers should know that in some areas of the country, when a London salary of £1,577 or more is appropriate, the provincial salary may be as much as £100 less than the London rate. In my opinion a difference of £100 is rather more than "slightly lower."—I am, etc.,

"PROVINCIAL."

Mothers who had arranged to have their baby at home, but who are admitted to hospital for an emergency confinement and return home within a few days, will in future become eligible for a home confinement grant under the National Insurance (Maternity Benefit and Miscellaneous Provisions) Amendment Regulations, 1955, which apply to confinements taking place on or after April 6. The £3 grant is being increased to £4 from May 16, 1955.

GENERAL MEDICAL SERVICES COMMITTEE

ELECTION OF DIRECT REPRESENTATIVES, 1955-6

The following direct representatives upon the General Medical Services Committee have been elected unopposed for the Groups mentioned:

- Group A1**
Dr. J. T. Baldwin (Milton Bridge, Midlothian).
- Group A2**
Dr. C. J. Swanson (Aberfeldy, Perthshire).
- Group A3**
Dr. W. M. Knox (Glasgow).
- Group A4**
Dr. R. C. Hamilton (Kilmarnock).
- Group C**
Dr. H. F. Hollis (Leeds).
Dr. H. Thorp (Tadmorden).
- Group E**
Dr. Miles Parkes (Crewe).
- Group F**
Dr. T. J. Hargest (Clydach, Swansea).
Dr. G. P. Williams (Holyhead).
- Group H**
Dr. A. B. Davies (Walsall).
- Group I**
Dr. F. A. Smoritt (Southam, Warwicks).
- Group K**
Dr. R. W. McConnel (Wendover, Bucks).
- Group L**
Dr. S. Noy Scott (Plympton).
- Group M**
Dr. K. S. Maurice-Smith (Ely).
- Group N**
Dr. H. S. Howie Wood (Isle of Wight).
- Group O**
Dr. D. F. Whitaker (Guildford).
- Group P**
Dr. R. Green (Hurstpierpoint, Sussex).
- Group Q**
Dr. A. Talbot Rogers (Bromley, Kent).
- Group R**
Dr. D. F. Hutchinson (Middlesex).
Dr. A. N. Mathias (Cricklewood, N.W.2).
- Group S**
Dr. H. N. Rose (Ilford, Essex).
Dr. C. M. Scott (New Barnet).
- Group T**
Dr. M. Sorsby (London, E.5).
Dr. H. H. D. Sutherland (London, W.10).
- Group U**
To be notified.
- In the contested Groups—namely, B, D, G, and J—the results were as follows:
- Group B**
Dr. T. S. Blaiklock (Morpeth). *Elected.*
Dr. F. Lishman (Crook, Co. Durham). *Elected.*
Dr. F. J. Stevenson (Carlisle).
- Group D**
Dr. F. S. Catto (Manchester). *Elected.*
Dr. A. Campbell (Accrington). *Elected.*
Dr. P. J. Gibbons (Liverpool). *Elected.*
Dr. I. M. Dove (Blackpool).
- Group G**
Dr. E. W. Goodwin (Leicester). *Elected.*
Dr. A. S. Wilson (Gosberton). *Elected.*
Dr. A. D. Stoker (Winster).
- Group J**
Dr. C. F. R. Killick (Williton, Somerset). *Elected.*
Dr. W. B. S. Crawford (Bath).

Dangerous Drugs Act: Withdrawal of Authority

The Home Office announces that Dr. Ian Fleming Macleod (Stirling) is no longer authorized to be in possession of or to prescribe those drugs to which the Dangerous Drugs Regulations apply.

Association Notices

Diary of Central Meetings

MAY

- 10 Tues. Ethical Review Subcommittee, Central Ethical Committee, 1.30 p.m.
10 Tues. Amending Acts Committee, 2 p.m.
11 Wed. A.R.M. Agenda Committee, 11 a.m.
11 Wed. Central Ethical Committee, 12 noon.
12 Thurs. Central Consultants and Specialists Committee, 10.30 a.m.
13 Fri. Ophthalmic Qualifications Committee, 1.45 p.m.
13 Fri. Ophthalmic Group Committee, 2 p.m.
17 Tues. Estates Committee, 2 p.m.
18 Wed. Financial Advisory Committee, 11 a.m.
18 Wed. Journal Committee, 2 p.m.
18 Wed. Subcommittee on Admission of Students to Medical Schools, G.M.S. Committee, 3 p.m.
19 Thurs. Annual Conference of Representatives of Local Medical Committees, 10 a.m.
19 Thurs. Tuberculosis and Diseases of the Chest Group Committee, 2 p.m. (*Date changed from May 18.*)
20 Fri. Conference of Regional Officers, 12 noon (to be preceded by an informal meeting of the Officers at 10.30 a.m.).
20 Fri. Registrars Group Council, 2 p.m.
25 Wed. Evidence Committee on Divine Healing, 10 a.m.
25 Wed. Committee on the Control of Medical Manpower in War, 2 p.m.

JUNE

- 1 Wed. Annual Representative Meeting, 10 a.m.
2 Thurs. Annual Representative Meeting, 9.30 a.m.
3 Fri. Council, 9 a.m.
3 Fri. Annual Representative Meeting, 10 a.m.
4 Sat. Annual Representative Meeting, 9.30 a.m.
4 Sat. Annual General Meeting and Extraordinary General Meeting, 12.30 p.m.
4 Sat. Council (at conclusion of A.R.M.).

Branch and Division Meetings to be Held

- BURNLEY DIVISION.—At Lecture Room, Reedly Hall Nurses' Training School, Friday, May 6, 8.30 p.m., A.G.M.
- BURTON-ON-TRENT DIVISION.—At Stanhope Arms Hotel, Bretby, Burton-on-Trent, Tuesday, May 10, 7.45 p.m., A.G.M.
- CROYDON DIVISION.—At 43, Wellesley Road, Croydon, Tuesday, May 10, 8.30 p.m., annual general meeting followed by films: "Some Aspects of Accessible Cancers": (1) Breast; (2) Rectum.
- EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, Herne Bay, Thursday, May 12, 7.30 p.m., dinner; 8.45 p.m., discourse and demonstration by Dr. Quentin F. Evans: "Holger Nielsen Method of Artificial Respiration"; discussion to be opened by Dr. D. M. Lyon: "General Practitioner and the Health Visitor."
- GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, May 12, 8.30 p.m., general practitioner's clinical meeting.
- HENDON DIVISION.—At Hendon Hall Hotel, London, N.W., Thursday, May 12, 7.30 for 8 p.m., annual dinner. Guests of honour, Mr. and Mrs. Dickson Wright.
- KENSINGTON AND HAMMERSMITH DIVISION.—At St. Charles's Hospital, Ladbroke Grove, London, W., Friday, May 13, 3.30 for 4 p.m., clinical meeting.
- KESTEVEN DIVISION.—At Nurses' Recreation Hall, Grantham and Kesteven General Hospital, Sunday, May 8, 11 a.m., meeting.
- KINGSTON-ON-THAMES DIVISION.—At Nurses' Home, Kingston Hospital, Tuesday, May 10, 8 p.m., annual general meeting.
- NORTH MIDDLESEX DIVISION.—At North Middlesex Hospital (in the Committee Room), Silver Street, Edmonton, N., Tuesday, May 10, 8.45 p.m., meeting. Annual B.M.A. Lecture by Professor M. L. Rosenheim: "The Management of Hypertension." Members of the Enfield and Potters Bar Division are invited.
- NORWICH DIVISION.—At Museum, Norfolk and Norwich Hospital, Wednesday, May 11, 8.30 p.m., meeting. Lecture by Mr. H. P. Whiteside, F.P.S.: "The National Formulary 1955." Members of the Norwich Branch of the Pharmaceutical Society are invited.
- PADDINGTON DIVISION.—At Royal National Throat, Nose, and Ear Hospital, Gray's Inn Road, London, W.C., Friday, May 13, 3.30 p.m., clinical meeting and discussion. Mr. A. R. Dingley: "Tonsillectomy in Children and Adults."
- SOUTH-WEST WALES DIVISION.—At Ashburnham Hotel, Thursday, May 12, 7.15 p.m., social meeting for members and their wives. Cocktail party.
- WANDSWORTH DIVISION.—At St. James' Hospital, Sarsfield Road, Balham, S.W., Wednesday, May 11, 2 p.m., clinical meeting. Medical friends are welcome. All members of the Camberwell, Lambeth and Southwark, and Chelsea and Fulham Divisions are invited.

S.H.M.O. Meeting

There will be a meeting of the Senior Hospital Medical Officers in the North-east Metropolitan Region on Tuesday, May 10, at 8 p.m. at B.M.A. House (Committee Room C), Tavistock Square, London, W.C.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 14 1955

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PRESIDENTIAL ADDRESS TO
METROPOLITAN COUNTIES BRANCH
DR. HALE-WHITE ON MEDICO-POLITICAL
APATHY

The 97th annual general meeting of the Metropolitan Counties Branch was held at B.M.A. House on May 3, when Dr. R. HALE-WHITE was invested with the badge of office as President of the Branch for 1955-6, and proceeded to deliver what was afterwards described as a forthright address under the title "Patients, Politics, or Both?"

Dr. Hale-White's address was a plea that every member of the profession should take his share in medical politics, although, of course, his service to his patients remained his primary duty. The alternative, which would not bear serious examination, was to engage a few men well versed in the ramifications of the National Health Service and pay them handsomely to man the ground where medicine and politics coalesced, while behind the picket thus formed doctors got on with their own medical work in peace.

He proceeded to give the meeting some idea of the muddled state of the National Health Service as he saw it. For example, it was said that many doctors were over-worked, yet it was difficult for a young man to enter the Service and even more difficult for an ageing doctor to ease off. It was exceedingly hard for a doctor to do what he would wish for his patients, and in most cases practically impossible for him to follow them through an illness in hospital. But he would never say that the National Health Service could not have been worse. It would have been much worse but for those despised committees and sub-committees, those 50 B.M.A. Council meetings and 10 Representative Meetings during the last seven years. If these bodies had not done their work the bringing in of a whole-time salaried service would have been an almost automatic development within a short time of the Act coming into force. Regulations and directions relating to what a doctor might or might not do would have descended on the profession like confetti. The general practitioner might easily have been told by a Government department upon what signs and symptoms he could reach a certain diagnosis and what action to take when the diagnosis was reached. The general practitioner would have been written off as a mere "filterer" or as a "thermometer officer."

The Real Fighters

Fortunately there were a few members of the Association who had reached an eminent position in the medico-political

field. Dr. Hale-White said that he was not one of those who carp at the efforts of their representatives to seek improvements in the Service by the necessary route of consultation with the Ministry.

"Rather do our troubles lie at the other end," he said. "The British Medical Association is at present considering its own constitution to see if it can improve itself in any way to fit in with modern conditions. But, even as it is, the Association is quite a good medico-political weapon. There is only one thing really wrong with it and that is its members. The lack of communal interest is unbelievable. The number who take the opportunity of attending meetings at which policy has its birth reaches only about 10% in such a large number of instances as to make one despair of the profession's interest in its own survival. Even when it comes to electing people to relatively important positions, such as members of Council, the great mass are quite uninterested. Indeed, I doubt if the percentage of members who realize the way in which the Council is elected amounts to double figures. There are 40 seats on the Council elected by Regions, so in the last four years there have been 160 possibilities of electoral contests: there have actually been 15, and when there is a contest the number who vote is pathetically small. I cannot believe that apathy has not a great part to play in this situation. I am the first to admit that a leavening of age and experience is essential in the Council, but double or treble the competition to be a member would be an excellent thing."

It was often heard that doctors, busy at their practice all day, had not time for committee work. The Association did not want people who were not busy, because otherwise its affairs would get into the hands of indifferent doctors. The Association must be controlled by those whose practical ability as doctors made them busy and successful, men who could not find the time without some sacrifice. Personal and financial sacrifice was inevitable, and he was appalled by the enormous number of doctors who were not prepared to make any sacrifice. Those who did not lift a finger to help the Association in its policy or in its fight were debarred by their own inertia from any right to criticize the Association for its achievement or lack of it.

A Democratic Structure

The Association's structure, Dr. Hale-White continued, was ideal for anyone who held an opinion, constructive or destructive. He had only to attend a divisional meeting and "say his piece." If he was supported, a motion would go to the Annual Representative Meeting, and before long he would find that his idea had become the policy of the Association. But this seldom happened: there was rarely any infusion of new ideas by new people. The Association's affairs were left in the hands of a few hard-working souls—willing horses—whose efforts were largely wasted because there was not enough backing behind them.

It was a common supposition that medicine and the National Health Service were synonymous. This was quite untrue. So far the country had been spared a State monopoly in medicine, which was the undoubted target of those who introduced the N.H.S. Though not yet flourishing enough to be safe, private practice was with us. For this, every patient and every doctor should say, "Thank goodness," not because private practitioners were necessarily better than their colleagues in the Service, but because, for as long as there were two systems in healthy competition, complete disaster could not overwhelm medicine in this country, and the principle of free choice was still left to the public. But medico-political indolence was equally rife among private practitioners. They must not congratulate themselves that they were outside the scope of medico-politics. Were not pay-beds an acknowledged party-political pawn?

The most helpful contribution towards keeping private practice alive had been made by two or three provident associations, one of which during the last four years had increased its membership from 60,000 to 200,000. There must now be more than half a million people entitled to a very large proportion of the cost of hospital and specialist treatment through the enterprise of these associations and the independent spirit of the individuals who paid the premiums.

The Need for Political Awareness

Having entitled his address "Patients, Politics, or Both?" Dr. Hale-White said that he came down heavily in favour of "Both."

"I look upon it as a doctor's duty to take a personal part in medico-politics. . . . The happy conditions in which a doctor could devote his whole mind to his patients and to medical reading are unfortunately gone—and gone for ever so far as I can see. If he is to serve his patients truly it is as important that a doctor shall devote a part of his time to medico-politics as it is that he shall keep himself up to date with medical literature. . . . We should always be 'at the ready' if we value what is left of our freedom."

Being "at the ready" enhanced the ability to recognize political clichés for the rubbish they were. If the profession found itself in a sudden crisis, some of the "ostriches" might pull their heads out of the sand and be quite impressed by such phrases as "administratively impracticable," or "retrograde step," or "putting the clock back." Politicians assumed, without the slightest evidence or reason, that every step they took was a step in the right direction. It followed, therefore, that every retrograde step was wrong. Real progress was not so easy. It did not consist in discarding all the old in favour of the new. It was achieved most surely by keeping the best of the old and adding the best of the new, and only discarding things when their uselessness or inferiority was proved up to the hilt, in which event they must be discarded, however old or however new.

Standard of Medical Practice Going Down

Dr. Hale-White went on to express the view that the standard of medical practice in this country was going down and would continue to go down unless far-reaching changes were made. "Any downward slope, however slight, gets to the bottom in the end." Those who were worried about the future of medicine in this country should not hesitate to say so. Censure of the National Health Service would be much greater were it not for indolence and cowardice. Tinkering with the Service was not sufficient; it was the whole pattern of the thing that was wrong, and not the personnel. If, as he believed, there was a really large body in the profession that was genuinely satisfied that the public were not getting the "best service that the country can afford"—to quote the words of the manifesto of one of the political parties—the first thing to do was to say so, and the next was to map out a better system, in which a whole-time salaried service as an alternative should not even be considered as a "starter."

But this needed a great awakening of medico-political consciousness. If there were a vital interest among 90%

instead of only 10% of its members there would be no limit to what the Association could achieve. In 1951 a Special Representative Meeting was held in which many resolutions were passed calling for amendments in the Service. How many members of the Association cared what, if anything, had happened to those resolutions of 3½ years ago? And if nothing much had happened, whose was the fault? It was largely the fault of those members who did not care, for if they had cared a great deal more would have happened. If an accusation of inertia or procrastination could be made against the centre, it was nothing to the charge of indifference and shortsightedness that could be made against the periphery—and by "periphery" he meant the individual members who in their thousands never attended a meeting or lifted a finger to help. Somehow they must be awakened to a sense of their personal responsibility for the welfare of medicine in this country.

A vote of thanks to Dr. Hale-White, proposed by Dr. Frank Gray, was very warmly accorded, also a vote of thanks to Dr. D. F. Hutchinson, the retiring President. Dr. Alistair French was unanimously chosen as President-elect for 1955-6, and Dr. Annis Gillie Treasurer.

M.C.B. HOSPITALITY FUND

The Metropolitan Counties Branch Council thanks those who have already contributed to its hospitality fund. A good start has been made, but more money is still needed. Donations are not being acknowledged individually, as this would add to the administrative costs, but anyone wishing to know if his contribution has been received should ring Euston 2111, ext. 5.

VALUATION FOR RATING ACT, 1953

EFFECT ON DOCTORS' PREMISES

The General Medical Services Committee has considered the possible effects upon the rating valuation of doctors' premises of the Valuation for Rating Act, 1953. The Act applies to England and Wales only. It appears that in some cases the Act can result in a considerable increase in the rating valuation of premises used by general practitioners as, *inter alia*, the residential and professional aspects can be valued separately in order to arrive at a valuation for the premises as a whole.

The Committee draws the attention of general practitioners to the following effects of the Act:

(1) In cases where the professional premises are also used as part of the ordinary residential accommodation the whole house is normally to be valued on a 1939 basis.

(2) If specially constructed surgery premises are added to residential accommodation, general practitioners will not only be adding to their rates in the ordinary course of events, but also the added premises will be rated on a different and higher basis than the residential accommodation.

(3) If separate accommodation is not added to the existing premises, but certain rooms are adapted specifically for the purposes of the practice, then much the same position will apply as in (2)—that is, the professional section of the existing accommodation will then be assessed at a higher rate than hitherto.

(4) If, however, the house is divided into two—namely, one part used for professional purposes and the other part as an ordinary dwelling-house, by the doctor himself, or an assistant, or a caretaker—then (a) the benefit of a valuation on a 1939 basis which can be secured if the professional premises are also used as part of the residential accommodation will be lost, and (b) if the value of the part of the premises used as residential accommodation is not less than one-tenth of the whole, the benefit of valuation on the 1939 basis for any part of the premises will be lost.

PART-TIME CONSULTANTS AND INCOME TAX

DISCUSSION AT SOMERSET HOUSE

A deputation from the Council of the British Medical Association, consisting of the Treasurer (Mr. L. Dougal Callander) and the Chairman of the Central Consultants and Specialists Committee (Dr. T. Rowland Hill), visited Somerset House on April 6 to discuss the position of part-time consultants in relation to the method of assessment to income tax of their income from hospital appointments in the National Health Service. The deputation was received by representatives of the Board of Inland Revenue.

Dr. Rowland Hill began by explaining the position of the B.M.A. as being by far the largest representative organization of the medical profession in this country. He pointed out that it represented, in particular, some 6,000 to 7,000 consultants working in the National Health Service, the great majority on a part-time basis.

Change in Assessment Procedure

Dr. Rowland Hill went on to say that the Association was seriously disturbed about the recent change in procedure which had resulted in the hospital income of many part-time consultants being assessed to income tax under Schedule E. He said that the Association had consulted the highest legal authority on the subject, Mr. Millard Tucker, Q.C., who had stated that, in his opinion, this practice was wrong. In the light of his advice the Association, with the co-operation of certain other professional organizations, had decided to finance four test cases and was prepared to carry these cases, if necessary, right up to the House of Lords. Two of these cases were already before the special commissioners; in the other two cases the assessments of the local inspectors of taxes were still awaited.

Dr. Rowland Hill explained, however, that the deputation had not come as amateur lawyers to argue about the legal aspects of the matter. They had deliberately decided not to bring with them any legal representative. They had come as doctors to explain their views on the professional implications of the change from Schedule D to Schedule E assessment.

The Implications

The medical profession had feared that the N.H.S. might prove the first step towards the introduction of a whole-time salaried service—a form of service to which both general practitioners and consultants were strongly opposed. After much discussion with the Minister of Health of the time, the profession obtained an agreement in 1948 when the Minister promised an amending Act (placed on the Statute Book in 1949) to provide that the profession would not be converted into a whole-time salaried service unless—should Parliament so decide—by further legislation.

Ever since the inception of the N.H.S. it had been the policy of the Ministry of Health as well as the policy of the profession that—except in a small minority of cases in which the needs of the hospital service made whole-time appointments necessary—consultants should be allowed part-time contracts. Consultants favoured this arrangement because they were anxious to maintain their status as practitioners of a profession and to avoid becoming salaried servants of employing bodies.

It was possible, however, that by indirect and insidious methods the status of consultants might suffer a change of the very character that the N.H.S. (Amendment) Act of 1949 was designed to prevent. It was for this reason that disquiet was felt about the proposed Schedule E assessment, which was the form of assessment applied to employees but not to practitioners of a profession.

Dr. Rowland Hill pointed out that the N.H.S. had been in operation for nearly seven years, during which time the pre-existing method of income-tax assessment—under Schedule D—had continued to be applied to part-time con-

sultants. He said that the deputation would welcome an explanation of why it was thought necessary at this stage to disturb the traditional arrangement. He explained the partnership between the B.M.A. and the Royal Colleges, and said (on his, Dr. Rowland Hill's, own responsibility) that the deputation might be regarded as expressing the views of the Colleges, which were fully in accord with those of the Association.

Relative Earnings

In reply the representatives of the Inland Revenue said that, although the N.H.S. had been in existence for some time, they had only gradually become aware of the fact that in many cases it seemed to be bringing about a fundamental change in the relative weight of hospital and private work and in the relative earnings from the two activities. It had come to their notice also that the methods used by inspectors of taxes in assessing the income of part-time consultants were varying and inconsistent. It was for this reason that they had thought it desirable to issue some guidance, based on the principles enunciated in the case of *Davies v. Braithwaite* (Tax Cases, Vol. XVIII, page 198). There was no question of their having made any special "drive" in the case of the part-time consultant. Their interest had been, not in the amount of the tax collected, but solely in the desirability of uniform administration of the law as they understood it. Briefly, the position was that a part-time appointment was within Schedule E unless the consultant was engaged primarily in private practice and any hospital appointments were merely incidental thereto. All the facts of a particular case must be considered, but, speaking generally, they would find it difficult to agree that a consultant was engaged primarily in private practice unless he devoted to it more than half his time and unless the net income from the private practice exceeded the income from the hospital appointments.

In reply to a question, the representatives of the Inland Revenue agreed that their view of the position was based on the assumption that the hospital work of the part-time consultant in the N.H.S. was an "employment" for the purposes of the Income Tax Acts. They considered that the part-time consultant was employed under a contract of service which gave rise to the legal relationship of master and servant, and they thought that this view derived some support from decisions in the courts (including the Scottish courts) in cases concerned with the responsibility of a hospital for the negligence of its staff.

Two Assurances

They gave, however, two important assurances. First, they stated that, where a consultant suffered hardship through having to pay the second instalment of Schedule D tax on the income of the preceding year while the tax for the current year was being deducted from his hospital income under P.A.Y.E., the collector could be asked to agree to some reasonable latitude in payment. Secondly, they said that, where the admissible expenses of private practice exceeded the income from private practice, tax on the resultant loss could be allowed by repayment against tax on the other income of the consultant, including his hospital income if that income was assessed under Schedule E. They pointed out also that there was an advantage in being assessed under Schedule E, since this obviated the embarrassment of having to continue making heavy tax payments after retirement on a much reduced income.

The deputation pointed out that the position of a consultant was liable to change in respect of the proportion of his total professional income which was earned in private practice. At the outset of his career the income from this source might be negligible, but in the course of time it might become very substantial. Questioned about the extent of private practice at the present time, the deputation stated that a very considerable amount of private consultant practice still remained—though its distribution throughout the country was patchy—and that in the last year or two it had shown a tendency to increase.

In reply to questions Dr. Rowland Hill explained that, apart from consultants, S.H.M.O.s were the only members of hospital medical staffs affected by the changed method of assessment, and he gave a description of the domiciliary consultation arrangements, making it clear that, in general, part-time consultants were not obliged to undertake this work as a part of their hospital contracts. The general practitioner called in the consultant of his choice exactly as he would in private practice, and the consultant regarded the consultation as essentially of the nature of private practice, although the fee did not come out of the patient's pocket.

Test Cases

The deputation stated that it would obviously be convenient for the four test cases to be considered together and that the B.M.A. solicitors were anxious to have the co-operation of the Revenue in expediting the outstanding assessments so that the four cases could be taken concurrently. The representatives of the Revenue replied that of course they would co-operate in the manner suggested, but they could not say, until they had seen the cases, whether they were sufficiently typical to be regarded by the Revenue as test cases. They asked whether the four cases had been specially chosen, and it was explained that the solicitors had selected them from a larger number and had submitted them to Mr. Millard Tucker, who had approved them as suitable for the purpose.

The representatives of the Revenue said that, although they had been informed from various quarters that test appeals were to be taken, they had received no official information about them. They would like to receive full details of the four cases, and they would be very glad if they could also be given a sight of Mr. Millard Tucker's opinion.

Dr. Rowland Hill undertook to pass on these requests to the solicitors, and asked whether the Inland Revenue, while not undoing anything already done, would feel disposed, pending the results of the test cases, to hold their hand as regards the extension of the Schedule E method of assessment to additional consultants. The representatives of the Revenue doubted whether they could agree to this, but promised to consider the suggestion in the light of Mr. Millard Tucker's opinion, if this was made available to them.

MEDICAL PRACTICES COMMITTEE

AMENDMENT OF CLASSIFICATION OF AREAS

The following areas have been classified by the Medical Practices Committee (March 8 to April 30, 1955) as "designated":

Worcestershire.—Oldbury.

Preston.—Whole of County Borough.

The following areas as "intermediate":

Bedfordshire.—Luton.

Essex.—Basildon New Town (Billericay U.D.).

Kent and Canterbury.—Borough of Erith.

London.—Borough of Lambeth: Prince's and Oval Wards.

Northamptonshire.—Burton Latimer and Finedon.

Nottingham County and City.—Carlton and Netherfield.

Staffordshire.—Urban District of Kidsgrove.

Warwickshire.—Parishes of Barford, Cubbington, Radford Semele, Stoneleigh and Whitnash (rest of Warwick Rural District to remain classified as "restricted").

Worcestershire.—Kidderminster.

Barrow-in-Furness.—Whole of County Borough.

Derby.—Whole of County Borough.

Ipswich.—Whole of County Borough.

Southend-on-Sea.—Shoeburyness.

Glamorganshire.—Urban District of Ogmore and Garw (except Nantymoel).

Monmouthshire and Newport.—Urban District of Bedwelty.

The following areas as "restricted":

Cornwall.—Saltash.

Dorsetshire.—Sherborne and District.

Surrey.—Urban District of Dorking.

Glamorganshire.—Llanharen (Cowbridge Rural District).

IMPROPER ISSUE OF FORMS E.C.10

200-GUINEA FINE RECOMMENDED

The Norwich Executive Council at its meeting on April 27 decided, on the recommendation of its Medical Services Committee, to make representations to the Minister that the sum of 200 guineas be withheld from the remuneration of Dr. "A." The following is the report on the case by the Medical Services Committee to the Executive Council.

Committee's Report

"The Committee met on April 1, 1955, to investigate whether a doctor (hereinafter referred to as Dr. 'A') whose name is included in the Council's medical list had failed to comply with the Terms of Service of medical practitioners by

"(a) issuing or allowing to be issued on January 22, 1954, to a Mrs. 'X' a prescription form (E.C.10) which had been made out by another doctor (hereinafter referred to as Dr. 'B') but signed by Dr. 'A' when the name of Mrs. 'X' was not included in the list of persons registered with him,

"(b) issuing prescription forms (E.C.10) on February 26, April 26, May 11, and July 8, 1954, to a Mr. 'Y' when the name of Mr. 'Y' was not included in the list of persons registered with him,

"(c) issuing or allowing to be issued from January 1, 1954, to September 30, 1954, to persons included in his list a total of 305 prescription forms (E.C.10) which had been made out by Dr. 'B' but signed by Dr. 'A'."

"The matters for investigation had been referred to the Committee by the Finance and General Purposes Committee of the Executive Council under Regulation 4 (5) of the National Health Service (Service Committees and Tribunal) Regulations.

"The Medical Service Committee felt it necessary at the outset of this report to make it clear that, although the statement of matters to be investigated mentioned that prescription forms had been made out by a Dr. 'B,' those forms were not in fact signed by him and therefore the conduct of Dr. 'B' was not the subject of question, even though from the facts mentioned hereinafter it may appear that Dr. 'B' was also involved. The Committee also felt it necessary, for the full understanding of the matter, to state that Dr. 'B,' while under contract with the Executive Council is only under contract to provide general medical services in a limited field. Also Dr. 'B' is not a specialist as defined in Regulations made under the National Health Service Act.

"Dr. 'A' together with Dr. 'B' appeared before the Committee. The Secretary of the Local Medical Committee was also present. The Committee received the evidence of Dr. 'A' and also allowed Dr. 'B' to give evidence, as well as assist Dr. 'A.' The Committee also had before it documents put in evidence by the Finance and General Purposes Committee, copies of which had been circulated to Dr. 'A,' Dr. 'B,' and members of the Committee 11 days before the hearing.

"The facts as found by the Committee from the aforementioned evidence and from such admissions as were made by Dr. 'A' and Dr. 'B' during the course of the hearing were as follows:

1. Case of Mrs. "X"

"On January 22, 1954, a prescription form E.C.10 was issued to Mrs. 'X.' The name and address of Mrs. 'X,' the prescription details, and the date had been written on the form by Dr. 'B.' The signature on the form was, however, that of Dr. 'A.' At the time of issue of the form the name of Mrs. 'X' was not included in the list of persons registered with Dr. 'A' under the National Health Service; in fact her name was not included in any doctors' National Health Service list.

"The form was given by Dr. 'B' to Mrs. 'X' when he was treating her as a private patient. It was one of a number which had been signed in blank state by Dr. 'A' and which had been given to Dr. 'B' with Dr. 'A's' permission to use in any cases where persons in need of drugs and appliances, who, although consulting Dr. 'B' as their private doctor, were registered on the National Health Service list of Dr. 'A.' Dr. 'B' was not a deputy of Dr. 'A' when he saw Mrs. 'X.'

"In answer to a written inquiry by the Finance and General Purposes Committee Dr. 'A' had stated that Mrs. 'X' was a private patient, but at the hearing, Dr. 'A' stated that both he and Mrs. 'X' were under the impression that she was registered on his (Dr. 'A's') National Health Service list.

"At this stage it must be stated that both Dr. 'A' and Dr. 'B' submitted that the circumstances in the case of Mrs. 'X' were closely related to those of the issues of the 305 prescription forms which also formed part of the matters for investigation, and, while the Committee dealt with the case of Mrs. 'X' as a separate item, the explanations of Dr. 'A' and Dr. 'B' of the arrangements existing between the two doctors have, to avoid duplication, been left until later in this report.

"Returning to the case of Mrs. 'X,' Dr. 'A' agreed that he did not see Mrs. 'X' on January 22, 1954, nor had he seen her professionally for some time. He also agreed she was not under treatment by him on that date. He was fully aware that private patients are not entitled to have their drugs under the National Health Service, although he thought they became so entitled under the arrangements he and Dr. 'B' had evolved.

2. Case of Mr. "Y"

"On February 26, 1954, April 26, 1954, May 11, 1954, and July 8, 1954, Dr. 'A' issued prescription forms (E.C.10) to a Mr. 'Y.' At no time had the name of Mr. 'Y' been included in the list of persons registered with Dr. 'A' under the National Health Service.

"Mr. 'Y,' according to Dr. 'A,' had been a private patient of his for some time, but recently he had given up charging him fees. He (Dr. 'A') believed that he had confused Mr. 'Y' with another person of similar name and age, whose name was included in his National Health Service list and whose illness was coincidentally running astonishingly parallel to that of Mr. 'Y.' He also believed that the prescription forms (even though the drugs ordered were different on each occasion) were issued as the result of telephone requests from Mr. 'Y,' because he had no record, in his day book, of visits or attendances on the material dates, nor any note of charging fees to Mr. 'Y' for service on those dates.

"Dr. 'A' agreed he had not accepted or agreed to accept Mr. 'Y' for treatment under the National Health Service and that he was not entitled to issue National Health Service prescription forms to him.

3. Issue of 305 Prescription Forms

"From January 1, 1954, to September 30, 1954, 305 National Health Service prescription forms (E.C.10) which had been issued to persons registered on the list of Dr. 'A' were made out (name and address of patients, prescription details, and date) by Dr. 'B' but signed in the hand of Dr. 'A.' These forms were signed, in blank state, by Dr. 'A,' who gave them to Dr. 'B' for the purpose of their being used for persons who, although consulting Dr. 'B' as a private doctor and on a fee-paying basis, were, however, registered on Dr. 'A's' National Health Service list, and these forms were, in fact, used in that way.

"At the time of the issue of these forms the patients were not seen by Dr. 'A,' nor were they treated by him even though he was available to give, and responsible for, their treatment under the National Health Service had they wished him to provide such treatment. Neither were they receiving their treatment from Dr. 'B' as a deputy to Dr. 'A.' They were in fact receiving their treatment as private patients of Dr. 'B.'

"The explanations of Dr. 'A' and Dr. 'B' to the foregoing were that, whilst they are not in partnership nor financially associated, their practices are closely connected. Many of Dr. 'B's' private patients are registered on the National Health Service list of Dr. 'A.' Dr. 'B' stated that he encouraged his private patients to register with Dr. 'A' so that such patients could call on a National Health Service doctor whenever they required one and at the same time be free to consult their private doctor. According to both Dr. 'A' and Dr. 'B' they have in the course of time got to know many of the patients of each other.

"They thought that, although the patients who were registered on Dr. 'A's' National Health Service list were receiving their treatment from Dr. 'B' as a private doctor, so long as the forms were signed by Dr. 'A' he was thus making himself responsible for their treatment even though he was not seeing the patients when the forms were issued. According to Dr. 'A' and Dr. 'B' this arrangement was formulated by them in the early days of the National Health

Service and they had been carrying it on ever since, thinking that it was within the Regulations, even though they knew private patients were not entitled to drugs and appliances under the Service.

"According to Dr. 'B' he had never asked any other general medical practitioner to enter into such an arrangement with him, neither had any offer come from any other practitioner who may have had private patients of Dr. 'B' registered with him under the National Health Service.

"Finally, both Dr. 'A' and Dr. 'B' submitted that their arrangements for this method of prescribing had been done openly and in good faith, in the belief that they were acting within the Regulations. Since the whole matter had been questioned they had taken expert legal advice and found that their actions were in fact transgressing the Regulations. They submitted that their transgression was the result of a genuine case of mistaken interpretation of the Regulations. They offered their apologies and asked the Committee to believe that they had tried to act in the spirit of the National Health Service and to give their patients the best service they could. They also gave their assurances that they would do their best in the future to keep strictly within both the spirit and the letter of the Regulations.

Committee's Recommendations

"From the foregoing the Committee were unanimously of the opinion that Dr. 'A' had failed to comply with Clause 7 (10) of his Terms of Service in that the prescription forms E.C.10 referred to in (1), (2), and (3) of this report were improperly issued.

"In the opinion of the Committee the arrangements between Dr. 'A' and Dr. 'B' had been designed to obtain drugs and appliances through the National Health Service for the private patients of Dr. 'B,' and, in view of the publicity which had been given in both the medical and lay press almost continuously from the inception of the National Health Service that private patients are not entitled to their drugs and appliances from the Service, the Committee felt they could not reasonably be expected to accept the final submissions of Dr. 'A' and Dr. 'B,' and considered that this breach of the Terms of Service by Dr. 'A' was a very serious one.

"The Committee unanimously agreed to recommend to the Executive Council that representations be made to the Minister of Health that, owing to Dr. 'A's' failure to comply with his Terms of Service, the sum of 200 guineas be withheld from his (Dr. 'A's') remuneration."

The practitioner has the right of appeal against the recommendations of the Executive Council.

The Terms of Service

The following are the relevant clauses of the Terms of Service.

Clause 7 (10) of the Terms of Service provides that "the forms (E.C.10) provided shall not be used for persons other than the patients who are under treatment by him."

Clause 1 of the Terms of Service interprets "patient" as meaning a person for whose treatment a practitioner is responsible under his Terms of Service.

The Terms of Service provide that all treatment shall be given by a practitioner personally, except where he is prevented by reason of other professional duties, temporary absence from home, or other reasonable cause.

WELSH DINNER

The Welsh Dinner will be held at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2, on Friday, June 3. All Welsh representatives, Welsh graduates, and others with Welsh associations, accompanied by their ladies, will be welcome at this dinner.

Tickets will be 30s. per head (exclusive of wines), and those wishing to attend are asked to apply, with remittance, to Dr. S. J. Hadfield, B.M.A. House, Tavistock Square, London, W.C.1.

Northern Ireland News

REPORT ON BRANCH COUNCIL'S WORK

The Honorary Secretary of the Northern Ireland Branch Council, Dr. H. J. CRONHELM, has furnished a report on the work of the Branch during the session 1954-5. The Branch Council held eleven meetings during the year.

Negotiations were carried on with the Ministry of Health and Local Government regarding the setting up of appeals machinery for Northern Ireland. The Branch Council turned down Ministry proposals submitted by the Northern Ireland Hospitals Authority regarding the composition of an appeals advisory council. A reply is awaited from the Ministry, and meanwhile the Branch Council has made it clear that it would not accept any committee upon which the medical profession was not adequately represented.

Among matters discussed at regular meetings during the year with representatives of the Northern Ireland Hospitals Authority was the alleged misuse of the domiciliary visits scheme, and the Branch Council was not in favour of the Association taking part in disciplinary measures against those alleged to be responsible for the misuse. The Authority agreed to consider setting up a committee similar to the Central Medical Committee to investigate these cases. The Northern Ireland Hospitals Authority proposed to introduce a new grade of assistant physician and assistant surgeon to the hospital service. The Association could not accept the immediate introduction of this grade, which must wait until the findings of the Strachan Committee had been made known to the Council of the Association. Also discussed with the Authority were the inspection of ophthalmic medical practitioners' premises, radiological services in the mid-Antrim area, and delay in country areas of patients being seen by an orthopaedic surgeon.

Minister's Committee of Inquiry

The Branch Council was invited to give evidence at the Committee of Inquiry set up by the Minister of Health and Local Government to investigate questions of principle relating to the health services in Northern Ireland. In August, 1954, at an interview with the Committee the following members represented the Association: Dr. R. Marshall, President-elect of the Branch; Dr. H. J. Cronhelm, Honorary Secretary; Mr. G. D. F. McFadden, Chairman of the Consultants and Specialists Group; Dr. N. S. Dickson, Chairman of the G.M.S. Committee (N.I.); Dr. J. Bleakley, Honorary Secretary of the G.M.S. Committee (N.I.); Dr. J. B. McKinney, public health section; Dr. R. N. Beck, Honorary Secretary of the Registrars' Group; and Dr. S. L. W. Erskine, Honorary Secretary of the Tuberculosis and Diseases of the Chest Group. They discussed with the Committee the setting up of appeals machinery for the medical profession in Northern Ireland, alteration of the constitution of the Northern Ireland Tuberculosis Authority so that one-third of the total members should be medical and one-half of these chest physicians of the Authority, and the suggestion that there should be one health and welfare committee responsible for all public health and welfare services, or alternatively that the children's services should be administered by the Health Committee and not the Welfare Committee. They also discussed many other matters, including the inadequacy in certain areas of the Hospital Authority's Ophthalmic and E.N.T. Services. The publication of the report of the Committee of Inquiry is still awaited.

Other Activities

Replies to a questionnaire issued to general practitioners by the Northern Ireland Hospitals Authority dealing with the hospital and specialist services were considered by representatives of the Branch Council and a special *ad hoc* com-

mittee of the Authority. The admission and discharge of patients from hospital, general practitioners working in hospitals, and radiological and pathological examinations in hospital were discussed.

At the invitation of the Northern Ireland Hospitals Authority the Branch Council nominated Dr. W. H. Hood to the Authority's subcommittee on old people and chronic sick.

The Branch Council gave two graduates' luncheons during the year, which resulted in 82 graduates becoming members of the Association. The Presidential Dinner was held on February 10, 1955, and the Branch entertained His Excellency the Governor of Northern Ireland and Lady Wakehurst, and the President of the Association and Lady McNee.

A conference of Honorary Secretaries, Chairmen, and Representatives of the Divisions of the Association in Northern Ireland was held on March 6, 1955. Dr. L. S. Potter from Headquarters attended, and the meeting discussed the membership of the Association and methods for increasing it, and problems in connexion with the running of Divisions.

Dr. S. M. Bolton gave the Presidential Address for the year at the Pharmaceutical Society of Northern Ireland, Belfast, on May 5.

Sir Alexander Fleming Memorial Service

A memorial service for the late Sir Alexander Fleming, arranged by the Branch, was held in the parish church of St. Mary's, Belfast, on April 24. Representatives of the Queen's University, hospital services, and the Royal College of Nursing attended, together with the officers of the Branch and a large congregation.

Scottish News

NEW SCOTTISH HEALTH CENTRE

The Stranraer Health Centre, the second one to be built in Scotland, and the first to adjoin an existing hospital, was opened on May 6 by Mr. H. R. Smith, Secretary, Department of Health for Scotland.

The L-shaped building was designed and built by the Department of Health for Scotland after consultation with the Western Regional Hospital Board, and it incorporates an extension to the Garrick Hospital. Five consulting suites for the five family doctors practising in Stranraer (who have a total of 13,200 patients on their N.H.S. lists) form one wing. In the other wing the local health authority will have three rooms and a dental workshop, and will share four rooms with the Garrick Hospital board of management. The hospital has in addition a changing-room, a plaster room, and a suite for the x-ray unit.

The cost of the centre is about £33,000, of which about £12,000 will be contributed by the hospital authority for its accommodation.

The Industrial Diseases Subcommittee of the Industrial Injuries Advisory Council is to review the provision made for byssinosis under the National Insurance (Industrial Injuries) Acts. Professor Sir Arnold Plant is chairman of the Subcommittee and of the Advisory Council. The Acts provide insurance cover against byssinosis for persons who have been employed at some time since July 5, 1948, and for at least 20 years in all, "in any occupation in any room where any process up to and including the carding process is performed in factories in which the spinning or manipulation of raw or waste cotton is carried on." Because of the difficulty of distinguishing byssinosis from bronchitis and emphysema of non-occupational origin, benefit is not available unless the person concerned has died from byssinosis or is more than 50% disabled by it, probably permanently. Persons and organizations interested in any aspect of the provision made under the Acts are invited to submit written evidence to the Secretary, Industrial Injuries Advisory Council, 10, John Adam Street, London, W.C.2, as soon as possible and not after June 6, 1955. An explanatory memorandum can be obtained on request.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Entry into Practice

SIR.—Dr. George Rossdale quotes (*Supplement*, May 7, p. 223) a member of the Assistants and Young Practitioners Subcommittee as saying that "in the opinion of his Subcommittee the conditions of these practices were so unattractive that no young man was likely to consider them." The Subcommittee has neither considered nor expressed an opinion on any individual practice, and Dr. Rossdale's statement, therefore, is completely inaccurate.—I am, etc.,

F. GRAY,

London, W.C.1.

Chairman, Assistants and Young
Practitioners Subcommittee

Hospital Medical Staffing

SIR.—The report of the Special Subcommittee on Hospital Medical Staffing (*Supplement*, April 23, p. 177) contains a great deal of sound sense and prepares the way for beneficial and long-overdue reforms in the system of hospital staffing. However, it does not appear to offer a solution to the present serious shortage of house officers.

First, it is apparent that the salaries of these posts are irrationally and unjustly low, and that the report recommends the maintenance of this injustice. On comparing the situations of other new graduates, we find that the scientist (chemist, physicist) entering industry after a three-year course can expect roughly £550-£650 per annum, a graduate teacher £582 (£612 for a good honours degree) for 27½ hours' teaching time weekly. There is therefore a strong case on moral grounds alone for an increase for house-officer grades. Secondly, if the number of students is not to be increased (a measure which would "speedily result in overcrowding of the profession," to quote the report), registered practitioners must be encouraged to fill the gap. That they are not doing so is probably due to the very low salary, under which a married man who took such a post might suffer actual hardship. There might therefore have to be a differential rate as at present—the equitable minima envisaged would be £550-£600 for the pre-registration graduate, £600 × £100-£800 for the registered practitioner. It is clear that the alternative of obtaining part-time services of general practitioners would be impracticable at this grade.

In conclusion, we wish to express our regret that it has fallen to us as students to point out the financial injustices suffered by junior hospital medical staff.—We are, etc.,

J. L. HORNER,

R. C. INGREY-SENN,

Z. F. M. NEWTON,

M. D. MCGRATH,

E. C. PYE.

Leeds, 2.

REFERENCE

Wootton, Barbara, *Social Foundations of Wages Policy*, 1955, p. 48. Allen and Unwin.

Assistants in General Practice

SIR.—What a relief it was to see Dr. D. E. Peake's letter (*Supplement*, April 16, p. 167). Surely it is time that it was made manifest to all and sundry that in no profession can success be guaranteed. My partners and I have had ample experience of locums and assistants over some 20 years. The fact that since 1948 we have established two young men as full and equal partners in our practice should be evidence that we do not seek to profit at the expense of assistants. There will always be those who are not suited to be principals—just as there have been, and will always be, registrars who are not capable of sustaining consultant rank.

Before 1948 there was the small band of "failed principals" (or consultants) which railed at the financing com-

panies because they insisted on some contribution towards security before investing capital in assisting a young (or not so young) aspirant to become a principal. What about the modern exploitation of principals by assistants and locums? Twenty guineas a week, but no night calls or midwifery—or if out at night the cancellation of morning surgery to ensure a compensating long "lie in." Dr. Lennox Johnston (*Supplement*, April 30, p. 209) must be very naive if he really believes that the average assistant would tolerate "exploitation," as he describes it. The unfortunate lone practitioner who suffers any extended period of ill-health must be wellnigh ruined by the charges of his locums and the loss of patients resulting from their inadequacy. No doubt there are unpleasant types established in practice—but how many? what percentage? One has had the unusual locum who has really proved worth the fees paid.—I am, etc.,

Bristol, 6.

J. L. FAULL.

Geriatrics

SIR.—The Geriatrics Joint Subcommittee has set itself a formidable task in trying to set out in a brief report (Appendix IX to Supplementary Report of Council (*Supplement*, April 23, p. 181)) all that is being done and all that might be done for the prevention and treatment of disease in the aged. In spite of all that has been written in this and previous reports on the desirability of keeping old people in their homes, the fact remains that there is a large number of old people in need of hospital or institutional care and for whom no beds are available. There are the frail elderly without relatives who must depend on neighbours for help; there are the acutely ill whose numbers are subject to violent seasonal fluctuation, but above all there is that pathetic group of old people suffering from varying degrees of mental deterioration who just cannot be fitted into home life and against whom the doors of every institution are barred.

The local authority have the necessary powers to expand their accommodation, but their resources are controlled by the Treasury above and the popular vote below. The loyal official of the local authority tends to reject as many applicants for Part III accommodation as he can. The mental health department of the regional hospital boards are hard pressed for accommodation and reserve their beds where possible for the treatment of young remediables. Furthermore, it could be argued that it is most undesirable for an old person to end his life in a mental hospital under the stigma of certification. Finally there is the chronic hospital which has taken over the beds but not the responsibilities of the old workhouse. We all know, or think we know, the defects of the workhouse system and why it had to disappear. The conscious rectitude of Bumble has gone, but it has been replaced by the frigid efficiency of the geriatric unit. The success of the unit is measured by turnover of beds. We can prevent beds from "sitting up" by controlling admissions. You admit what you know you can "rehabilitate" and discharge just as the acute hospitals do. So you keep up "turnover," get "the right patient in the right bed," and live up to current slogans.

The problem is not solved by pious exhortations to the relatives to look after their aged folk. A schoolmaster pays 9 guineas a week to keep his father in a nursing-home. The old man wanders during the day and is restless at night. Once he knocked over an electric fire. A secretary has lost her job—and her job meant a lot to her—because she had to stay at home to look after her mother. A harbour pilot who is kept awake at night by a restless mother-in-law goes drowsy on the bridge at a time when the most intense mental concentration is required. All three cases have been considered unsuitable for admission to hospital or hostel.

Arguments based on moral principles and economic necessity have been advanced in this and previous reports to show that an increase in hospital accommodation for old people is unnecessary or undesirable. Such arguments do

not convince the family doctor or the relatives of patients in the category I have described. Do we really increase the sum total of human happiness when we improve our "turnover" by discharging a cantankerous old patient to his unwilling relatives? The fact is that these difficult old people form only a small fraction—less than 1%—of the total aged population. I believe they are more expensive to maintain outside of hospital than within. In a recent case the patient in his home had the district nurse call twice daily, a session of home help, a daughter home from work, alternate daily visits from the doctor, not to mention additional extramural services from the local authority and voluntary organizations. On economic grounds alone I suggest we should have a surplus of institutional beds to accommodate these elderly patients and so relieve their relatives for productive work in industry. Not only would this allow us to give a better service from the humanitarian point of view but it would give us room for classification, research, and better treatment in the hospitals.

Might I make one more practical suggestion? The Subcommittee recognizes the existence of malnutrition in old people who live alone. Occasionally we see a case of scurvy, and recently I have seen a case of frank pellagra. Such cases are rare and do not necessarily signify a severe degree of widespread malnutrition in this age group. All the same I think there is enough malnutrition to justify cheaper milk and fruit juices for old people. It would not cost much to offer the same concessions already granted to infants and expectant mothers.—I am, etc.,

Bristol.

WILLIAM HUGHES.

H.M. Forces Appointments

ROYAL NAVY

Surgeon Commanders T. F. Miles, L. R. Norsworthy, and T. W. Froggatt, O.B.E., have retired.
Surgeon Lieutenants P. J. Preston and J. S. P. Rawlins to be Surgeon Lieutenant-Commanders.
G. O. C. Davies-Webb has been granted a Short Service Commission in the rank of Surgeon Lieutenant-Commander.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Lieutenant W. A. Wilson to be Surgeon Lieutenant-Commander.

ARMY

Colonel W. J. Robertson, late R.A.M.C., has retired on retired pay.

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel J. B. Bunting, O.B.E., has retired, receiving a gratuity, and has been granted the honorary rank of Colonel.
Lieutenant-Colonel J. J. O'Connell, O.B.E., has retired on retired pay, and has been granted the honorary rank of Colonel.
Lieutenant-Colonel J. C. Babbage, M.B.E., has retired.
Majors A. L. J. Webb, D. B. Jagger, M.B.E., and R. A. R. Topping to be Lieutenant-Colonels.
Major H. R. Vincent has retired, receiving a gratuity, and has been granted the honorary rank of Lieutenant-Colonel.
Captain P. M. Bretland to be Major.

HER MAJESTY'S OVERSEA SERVICE

The following appointments have been announced: G. C. Butler, M.B., B.Ch., Senior Medical Officer, Sleeping Sickness Service, Northern Region, Nigeria; H. D. Chambers, M.D., Senior Medical Officer, Jamaica; P. I. Franks, M.R.C.S., L.R.C.P., D.O.M.S., Specialist Officer (Ophthalmologist), Federation of Malaya; S. Mawson, Chief Mental Hospital Superintendent, Gold Coast; Jean K. Ritchie, B.M., B.Ch., M.R.C.P., D.M.R.T., Radiologist, Singapore; J. R. Currie, M.R.C.S., L.R.C.P., Pathologist, Sierra Leone; O. C. Fung, F.R.C.S., Medical Officer, Grade B, Trinidad; D. J. Jones, M.B., B.Ch., Medical Officer, Federation of Nigeria; W. Scheurer, M.D., Medical Officer, Gold Coast; M. O. Thomas, L.R.C.P.&S.I., Medical Officer, Sierra Leone.

Correction.—In the Section of Neurology in the programme of the Joint Annual Meeting, Toronto, June, 1955 (*Supplement*, May 7, p. 217), "Sir Charles Symonds (London). Cough Headache—A Benign Syndrome" should be deleted, as Sir Charles Symonds is unable to attend the Annual Meeting.

Association Notices

Diary of Central Meetings

MAY

17	Tues.	Estates Committee, 2 p.m.
18	Wed.	Working Party Subcommittee, Joint Consultants Committee, 10.30 a.m.
18	Wed.	Financial Advisory Committee, 11 a.m.
18	Wed.	Journal Committee, 2 p.m.
18	Wed.	Subcommittee on Admission of Students to Medical Schools, G.M.S. Committee, 3 p.m.
18	Wed.	Joint Subcommittee of Rehabilitation and Film Committees, 4 p.m.
19	Thurs.	Annual Conference of Representatives of Local Medical Committees, 10 a.m.
19	Thurs.	G.M.S. Committee (to follow Annual Conference of Representatives of L.M.C.s).
19	Thurs.	Tuberculosis and Diseases of the Chest Group Committee, 2 p.m. (Date changed from May 18.)
20	Fri.	Conference of Regional Officers, 12 noon (to be preceded by an informal meeting of the Officers at 10.30 a.m.).
20	Fri.	Registrars Group Council, 2 p.m.
24	Tues.	Joint Conference on Meat Production and Control, 3 p.m.
25	Wed.	Subcommittee on the Acceptance of Patients of a Vacant Practice, G.M.S. Committee, 11 a.m.
25	Wed.	Evidence Committee on Divine Healing, 10 a.m.
25	Wed.	Committee on the Control of Medical Manpower in War, 2 p.m.
25	Wed.	Staff Side, Committee "C," Medical Whitley Council, 2 p.m.

Branch and Division Meetings to be Held

BARNSELY DIVISION.—At Queen's Hotel, Barnsley, Monday, May 16, 8.30 p.m., annual general meeting.

BIRMINGHAM DIVISION.—At Chadwick Manor, Knowle, Friday, May 20, 8 p.m., annual dinner dance.

BRISTOL DIVISION.—At Main Physics Lecture Theatre, Royal Fort, Wednesday, May 18, 8.30 p.m., annual general meeting.

DEWSBURY DIVISION.—At the Three Nuns Inn, Cooper Bridge, Mirfield, Tuesday, May 17, 7.45 for 8.15 p.m., annual dinner.

EAST HERTS DIVISION.—At Cranborne Rooms, Red Lion Hotel, Hatfield, Friday, May 20, 9 p.m. to 1.30 a.m., supper dance.

HERTFORDSHIRE BRANCH.—At the Old Fold Manor Golf Club, Hadley, Barnet, Thursday, May 19, 8.45 p.m., annual general meeting. B.M.A. Lecture by Dr. F. E. Camps: "Forensic Medicine, Past, Present, and Future." Members of the legal profession are invited.

HOLLAND DIVISION.—At White Hart Hotel, Boston, Saturday, May 14, 7.15 for 7.45 p.m., supper; 9 p.m., address by Dr. S. Wand: "Observations on the National Health Service Retrospective and Prospective."

KENSINGTON AND HAMMERSMITH DIVISION.—At St. Mary Abbots Hospital, Marloes Road, Kensington, W., Tuesday, May 17, 8.30 p.m., annual general meeting.

LINCOLN DIVISION.—At County Hospital, Lincoln, Thursday, May 19, 8.30 p.m., annual general meeting.

MACCLESFIELD AND EAST CHESHIRE DIVISION.—At Macclesfield Arms Hotel, Macclesfield, Friday, May 20, 8.30 p.m., A.G.M.

ROCHDALE DIVISION.—At Kingsway Hotel, Rochdale, Monday, May 16, 8.30 p.m., annual general meeting.

SHROPSHIRE AND MID-WALES BRANCH.—At 49, Church Street, Wellington, Thursday, May 19, 8.30 p.m., meeting of Clinical and Pathological Section. Paper by Mr. G. K. Rose: "Symptoms Arising from Cervical Spondylosis."

SOUTH ESSEX DIVISION.—At Oldchurch Hospital (in the Nurses' Lecture Room), Romford, Friday, May 20, 9 p.m., meeting. Lecture by Dr. R. S. Bruce Pearson: "Asthma."

SOUTH MIDDLESEX DIVISION.—At the Anchor Hotel, Shepperton, Wednesday, May 18, 9 p.m., meeting. Address by Dr. W. N. Pickles: "Research in General Practice." Members of the Guildford, Kingston-on-Thames, and West Middlesex Divisions are invited.

SOUTH-WEST ESSEX DIVISION.—At New Out-patients Department, Connaught Hospital, Orford Road, Walthamstow, E., Wednesday, May 18, 8.30 p.m., annual general meeting.

STOCKPORT DIVISION.—At Physiotherapy Department, Stockport Infirmary, Tuesday, May 17, 8.30 p.m., demonstration by Stockport Branch of Chartered Society of Physiotherapy of modern forms of physiotherapy. Members of the Stockport Division, B.M.A., have been invited.

WEST SUSSEX DIVISION.—(1) At Southlands Hospital, Shoreham-by-Sea, Thursday, May 19, 2.30 p.m., clinical meeting. (2) At 2, Longfellow Road, Worthing, Sunday, May 22, 4 p.m., annual general meeting.

ANNUAL MEETING: TORONTO, JUNE 20 - 24

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 21 1955

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A HEALTH CENTRE IN THE ARMY

BY

M. C. WINTER, M.B., Ch.B.

Captain, R.A.M.C.

AND

J. A. FLEMING, M.B., B.S., D.Obst.R.C.O.G.

Captain, R.A.M.C.

We are presenting a description of an Army Medical Centre in the Canal Zone of Egypt which is being conducted along the lines of a health centre. We think that it may be of interest as an example of how the various health services may be co-ordinated and provided from a single centre at a financial cost no greater than if they were provided separately.

The centre was developed with three objectives: (1) giving the patients a better and more comprehensive health service; (2) studying the advantages of a health centre as compared with a medical centre; and (3) training medical officers for subsequent general practice.

Type of Practice

At the time of writing the centre provides medical attention for 2,600 people, composed of 2,350 Service personnel and wives, children, and servants and about 250 locally engaged civilians and families.

The type of practice might be compared to that on a housing estate in England. The patients live in three main villages, although, in addition, about 450 people live in outlying quarters. The medical centre itself is situated in the largest of the three villages, which houses 1,400 people.

The number of attendances per patient per year at this centre is similar to that in civilian general practice in England, although we do rather more than twice the number of visits. This statement is based on figures given by Taylor (1954). Our figures for the twelve-months period ending in June, 1954, are: attendances, 3.70 per patient per year; visits 2.71 per patient per year. In addition to these figures there are a further 1.26 attendances per patient per year for inoculations, vaccinations, and school medical examinations.

Staff

There are two doctors, one of whom is part-time, as he spends approximately one-third of his time as medical officer

to a near-by Women's Royal Army Corps battalion. In addition there are two S.S.A.F.A. (Soldiers', Sailors', and Airmen's Families Association) nursing sisters, one of whom is also part-time, as she spends approximately half her time attending clinics in near-by garrisons. There are also two Q.A.R.A.N.C. (Queen Alexandra's Royal Army Nursing Corps) nursing orderlies; these are nurse trainees, who are posted from the near-by military hospital for periods of three months for experience in a clinic. Finally, there are voluntary workers who help at the centre at various times in capacities that will be mentioned later in the paper.

This is an apparently generous staff to deal with the number of patients judged by civilian standards of general practice in the United Kingdom; however, they are providing the additional services mentioned and are working under subtropical conditions.

Buildings and Furnishings

The buildings were originally substandard married quarters, and, without alteration, they have been adapted for use as a medical centre. The main building is single-storied and contains five rooms—combined reception room and office, waiting-room, consulting-room with an examination lobby, treatment room, and the medical officers' quarters. In a separate building are lavatories, a bathroom, a washing-up scullery, and store-rooms. The lay-out is by no means perfect, the main criticism being that the treatment room lies between the waiting-room and the consulting-room, so that patients have to walk along a verandah from the waiting-room to see the doctor in the consulting-room. Immediately adjacent to the centre is the garrison families welfare centre, run by a voluntary committee and staffed by voluntary workers under the general direction of S.S.A.F.A. This welfare centre is open twice a week during the antenatal and child welfare clinics for the sale of baby foods, chemists' goods, various other domestic articles, and light refreshments.

The combined reception room and office contains the receptionist's desk and record card file, a separate table with a typewriter, and a filing cabinet for administrative documents. There are also cupboards for linen and cleaning materials. In the waiting-room are twelve chairs and four occasional tables. Eight toddlers' wicker chairs and two matching wicker tables are a recent acquisition. The three built-in cupboards in this room are used for storing medicines not in immediate use. The treatment room contains an instrument cupboard and instrument table, an electric sterilizer, a refrigerator, a dressing trolley, a urine-test table, an examination couch, weighing scales, shelves for

medicines in use, a lock-up dangerous-drugs cupboard, and two cupboards for medicines and medicine bottles. The examination lobby contains an examination couch and instrument table; it is separated by curtains from the main consulting-room; a permanent hard-wood partition is shortly to be erected. The toddlers' chairs and tables, pictures, and flower vases have all been supplied through S.S.A.F.A.

Services Provided

Surgeries and Visits.—Morning surgeries are held each weekday; on two mornings a week, when the child welfare and antenatal clinics are held, the surgeries take a shortened form and are intended for emergencies only. Evening surgeries are held on five days a week and visits are done in the usual way. Patients are received by a nurse-receptionist, who extracts their record cards from an alphabetical file. Each patient in turn is taken in to the doctor. The consultation over, the patient returns to the waiting-room and a prescription is given to the nurse in the treatment room, who calls in the patient and carries out the treatment or dispenses the medicines prescribed.

Consultant Services.—Once a week the senior physician and the senior surgeon of the command each visit the centre, and the medical officers are able to ask patients to attend at these times and see them with the consultant. This system gives us the advantage of being able to discuss each case on the spot with the consultant. The patients like it better because it saves them the journey to the hospital, and it also helps to relieve any congestion that may occur in the hospital out-patient department. Any x-ray or other special investigations that the medical officers think may be necessary are done beforehand; if the consultant requires further investigations, these are done subsequently at an appointed time at the hospital. In addition, consultant advice in the various specialties is available at the hospital.

Child Welfare.—A weekly child welfare clinic is held for children under 5 years of age. The S.S.A.F.A. sisters see all the mothers and give advice on general management and feeding. If the sister or the mother so desires, they are then seen by the doctor. All infants on their first attendance are routinely seen and examined by the doctor. The babies are weighed by voluntary helpers. If any child is absent from the clinic on account of the mother's illness or for some other reason which may not be apparent, the S.S.A.F.A. sister calls to see the family. Mothers are encouraged as much as possible to bring their children to the clinic. A crèche is run on a private basis by an officer's wife in the main village. We find this of particular value as a means of looking after children if their mother is in hospital or ill at home.

Maternity Services.—A consultant obstetrician holds a weekly ante- and post-natal clinic at the centre. All confinements are conducted in hospital.

School Health.—There are three schools in the main village, with a total of some 700 pupils. The primary school takes children from 5 to 8 years of age, the junior from 8 to 11 years, and the secondary over 11 years. The medical officers do monthly hygiene and epidemiology visits to the school premises and also carry out regular medical examinations of each pupil every three years. Starting during the next school term, it is intended that the S.S.A.F.A. sisters will give health lectures to the children at school.

Health Visiting and Home Nursing.—The S.S.A.F.A. sisters spend a large part of their time health-visiting. Every new family arriving in the garrison is visited within the first week or two, when advice about health matters is given; periodic visits are also made subsequently. They also carry out any domiciliary treatment, such as the giving of injections, and home nursing.

Epidemiology.—Monthly inspections of communal kitchens and dining-rooms are made by the medical officers. If it is thought that an epidemic of any disease is threatening, a specialist in Army health is called in for consultation.

Inoculations and Vaccinations.—A weekly clinic is held for the purpose of keeping the families up to date with their various inoculations and vaccinations; between twenty and thirty inoculations and vaccinations, mainly T.A.B. and smallpox, are done at each clinic; a voluntary worker helps at this clinic. The technique used for mass inoculations is that described by Fleming and Ogilvie (1951); each syringe is loaded with a single dose of the prophylactic and the injection given; after the injection the needle is held in hot oil (about 120° C.) for 10 seconds with the syringe plunger depressed; another single dose is then drawn up and a further injection given. For all injections dry sterilized or autoclaved syringes are used; a supply of these is obtained daily on a one-for-one basis from the parent military hospital, which maintains a central syringe service similar to that described by Colquhoun (1954).

Dispensing.—Most medicines are dispensed direct from the medical centre. Stock mixtures and drugs are obtained monthly from the hospital; any drugs that are required that are not in stock can be obtained in a matter of hours from the hospital dispensary.

Dressings.—A "no-touch" technique and individual dressing packets are used for dressings. A kidney-shaped basin containing two gallipots and two pairs of dressing forceps, covered by a matching inverted kidney basin, is the apparatus used; while one set is in use a duplicate set is sterilized. Each individual dressing packet contains a square of gauze, a square of lint, and a piece of cotton-wool, wrapped together in plain paper; about a hundred of these packets are packed in a dressing drum and autoclaved at the hospital. A freshly sterilized kidney basin and its contents and a new dressing packet are used for each dressing. As a further measure of asepsis, elbow-operated hot- and cold-water taps and a foot-operated soiled dressing-bin have been installed.

Dental Service.—There is no dental surgery at the moment, but it is hoped that it will be possible to build and equip one in the future. Dental treatment at present is given at an Army dental centre, which is situated about a mile from our centre.

Physiotherapy, Radiology, and Pathology.—To carry the idea of a health centre to its logical conclusion these services should also be provided; it is, however, not considered justifiable to install expensive apparatus in a building which is serving only some 2,600 patients; the medical officers have these services available to them on request at the military hospital, which is only about two miles from the centre.

Discussion

This centre has been developed as an experiment to see how far the various branches of the medical services can be co-ordinated into a harmoniously working whole operating from one building, giving the patient a better service with a minimum of financial expenditure. It is also intended as a training-ground for medical officers for subsequent general practice in civilian life.

The layout of the rooms is not ideal. Owing to the smallness of the building there is at the moment only one consulting-room, and because of the shortage of transport the doctors have to share a car. Each doctor has a week "in" doing surgeries and a week "out" doing visits; in this way a patient does not know which doctor is going to attend him and there must be a loss of continuity, which is overcome to some extent by keeping adequate records and by a free interchange of views about patients between the doctors. It is hoped that some of these defects may be remedied by another car becoming available and by converting part of the medical officers' quarters into an additional consulting and examination room.

The cost of converting the building has been negligible. The building and equipping of a dental surgery and another consulting-room will be the most expensive items encountered. Apart from surgery furniture and small articles of

diagnostic equipment and surgical instruments, it has not been necessary to spend money on costly apparatus.

We have the great advantage of close liaison with the hospital, which does the dispensing and autoclaving and provides the consultant and special diagnostic services.

We believe that similar centres to the one described here are working in Malaya and in the Aldershot Command.

We would like to thank Major-General W. A. D. Drummond, F.R.C.S., Director of Medical Services, Middle East Land Forces, for the suggestion to write this paper, for his helpful advice in its preparation, and for permission for it to be published.

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CHILD WELFARE CENTRES

PRESENT AND FUTURE NEEDS

The Maternity and Child Welfare Group of the Society of Medical Officers of Health has been considering the future of child welfare centres. The following is an abridged version of a memorandum prepared by the group.*

The purpose of this memorandum is to consider the needs of the mother and child of to-day, the part played by the child welfare centre in meeting these needs, and any necessary modification or extension of the traditional welfare centre pattern.

Although more general information and advice is available nowadays through the radio, television, and the Press, most mothers still need expert instruction in child care and welcome an opportunity to obtain individual advice and reassurance. Certain aspects of child health requiring particular attention to-day are mentioned below in relation to the work of child welfare centres.

Mental and Emotional Development.—Some at least of the great volume of mental ill-health has its origin in psychic trauma in childhood, often in the earliest years. Herein lies an opportunity for preventive work in the child welfare centres. Toddlers' clinics offer special opportunities for the study of behaviour difficulties in their early phases. To enable the clinics to play a greater part in preventive psychiatry a closer association is needed between the child welfare services and the psychiatric services for children.

Prevention of Respiratory Disease.—This is now a matter of far more urgency than the prevention of alimentary disorders—formerly the most pressing problem of child health work. The part played by the child welfare centre in the prevention of such disease lies in education and medical supervision. While most of the respiratory infections originate at home, the child welfare centre itself may not be blameless. More attention must be paid to the warmth and ventilation of the rooms and the prevention of overcrowding. Unnecessarily frequent attendances of young babies should be discouraged, and for them more emphasis should be placed on home visiting than on clinic attendance.

Prophylaxis of Infectious Diseases.—Infectious disease is still one of the major causes of mortality and morbidity in early childhood, although well-established prophylactic measures are available. The memorandum discusses in particular the prevention of tuberculosis, whooping-cough, diphtheria, and smallpox. Everything should be done to make it easy for mothers to have their children immunized and vaccinated, and the use of the child welfare clinic for this purpose has obvious advantages.

Prevention of Accidents.—Accidents (including poisoning) are the most frequent cause of death in children between 1 and 5 years of age, and the proportion of accidental

*Published in full in *Public Health*, 1955, 68, 51.

deaths rises with each year of age. While the most effective work may be done in the home, where the family doctor, the health visitor, and the sanitary inspector can point out the dangers, these warnings can be dramatically supplemented by group teaching at the welfare centre, especially if illustrated by local statistics and incidents.

Detection of "Defects" and Care of Handicapped Children.—The value of regular medical examination throughout the pre-school years cannot be too strongly emphasized. If it reveals the need for treatment, this should be arranged in association with the family doctor, with whom the health visitor will co-operate in any subsequent medical and social care. It is a statutory duty of the local education authority to ascertain the presence of handicapped children over the age of 2 years. In the case of children under 5 years it must rely on the health services to find these children. Recent advances in treatment emphasize the need for the early recognition of certain conditions, notably deafness (with consequent speech defect), spasticity, and congenital disease of the heart. The memorandum also stresses the importance of giving sound advice to the parents when children are found to be suffering from defects in the skeletal system, squint, or dental caries. Many conditions requiring postural re-education can be dealt with at the child welfare centre, and unnecessary separation of the young handicapped child from his mother should be avoided.

Medico-social Needs of Special Groups.—Approximately 7% of live births are premature, and the neonatal mortality of these infants is nine times as great as the general neonatal mortality. Though the maternity and child welfare services as a whole have a responsibility in influencing the incidence of prematurity and the neonatal death rate, the child welfare centre is concerned with those who survive. There is a special need for regular assessment of their physical and mental development, and for constant guidance and encouragement to the mother. The care of children who are illegitimate, "deprived," neglected, or members of "problem families" is also important, since they are likely to form the resistant "hard core" of child mortality, morbidity, and maladjustment. The clinic medical officer should know of all such children in the area and act as the leader of the local authority team, in consultation with the family doctor and with other local services. Every endeavour should be made to promote the attendance of these families at a welfare centre, where the contact with other mothers and with standards of care otherwise unknown can have far-reaching effects.

Meeting the Present Needs

Within the immediate sphere of the health services there are four principal lines of attack by which the standard of child health can be raised: (1) education of parents and the general public in child care; (2) regular medical supervision of every child's health and development; (3) treatment of illness and abnormality; and (4) medical and medico-social research. The prime function of the child welfare centre is to develop as fully as possible the first two of these methods.

EDUCATION IN CHILD CARE

McNeill, in the Fleming Memorial Lecture (*British Medical Journal*, 1954, 1, 533), stated that the aim of the child welfare service is "to reduce to a minimum the number of infant and child deaths, and to raise to a maximum the quality in the survivors," and strongly emphasized "a single method of achieving it by the education of mothers." Individual teaching has always been given by the health visitor in the home and by the health visitor and medical officer in the welfare centre. Now is the time to extend the practice and methods of group education. A useful technique for the clinic medical officer is to discuss a common problem with small groups of mothers and to

answer their questions, and there are many other methods of catching the interest of small audiences. Reading matter should be used sparingly and must be linked to the individual child or subject under discussion. Indiscriminate use of leaflets is valueless and wasteful.

Teaching in the welfare centre must be supported by a central organization in the health department. Those responsible for the specialist services, such as the chief dental officer and consultant psychiatrist, should take their part in the planning, and it is an advantage if other members of the health services—for example, general practitioners, nurses, midwives, and oral hygienists—are invited to join in the health education programme.

THE MEDICAL CONSULTATION

The objects of the medical consultation at a welfare centre are: (1) to provide a periodic assessment of the child's mental, emotional, and physical development, and (2) to help and reassure the mother in dealing with problems as they arise. In the earliest weeks supervision should be mainly by home visiting. Unless there is a special reason it is probably better for babies not to be brought to a welfare centre before they are 4 to 6 weeks old. At the first visit the child should be referred to the doctor for a thorough medical examination, which, if the child has not already been under medical supervision, may provide the first opportunity to detect congenital defects and conditions arising from birth trauma. Thereafter, as a minimum, the child should be medically examined at 6 months, 1 year, and 18 months old, and then near the subsequent birthdays. In addition, the prophylactic procedures already mentioned form an essential part of the medical supervision and provide further opportunities for consultation with the doctor.

Far too little attention has been given in the past to children beyond the age of infancy. To encourage mothers to obtain regular medical supervision of their children between 1 and 5 years old a system of appointments, either at ordinary child welfare sessions or at special toddlers' sessions, is strongly recommended—for example, "birthday appointments." If treatment is needed it should be arranged by, or in association with, the family doctor, but the whole purpose of regular supervision is to obviate the need for treatment arising.

Periodic medical supervision does not conflict with the care given by the family doctor during illness: it may well be undertaken by the family doctor himself if he can spare time and do it separately from his other work.

The Future of Welfare Centres

At the majority of hospitals there can be little time for educational work and no opportunity at all for routine supervision. Nevertheless co-operation between the hospital and child health service can give a greater appreciation of the social background of ill-health and can be instrumental in bringing the preventive and educational services to bear in just those cases where they may be most needed.

The general practitioner also has many opportunities. He has a responsibility for the health of every child on his list and often teaches some of the essentials of child care to those parents who consult him about their children during illness. It is probable that, at present, only a minority of general practitioners will have the time or the inclination to undertake regular medical supervision and sustained teaching of child care for more than a small proportion of the infants and young children on their lists. A recent inquiry in one area showed that of the children between 1 and 2 years old attending a welfare centre more than half had been seen by the family doctor only once since birth, and a considerable number had never been seen by him at all. This would probably be a common experience, but with the increasing emphasis on child health in the medical curriculum more general practitioners will feel equipped to give the equivalent of a clinic service to the children on their lists.

THE CHILD WELFARE CENTRE

It is neither possible nor desirable to delineate uniform standards for the future. At present the arrangements for clinic work should emphasize regular medical examination of all children up to the age of 5 years, prophylaxis against infectious disease, and the constant education of parents in child care. Dental services should be regarded as an integral part of child welfare work, and other services, such as child guidance and physiotherapy, should be readily available.

The premises should be easy of access to mothers. Integration of the child health services will be facilitated if the larger clinics are located close to or in the same building as the school clinic and the dental, physiotherapy, and child guidance departments. The establishment of health centres will favour this integration. Though elaborate equipment is unnecessary, the premises must be bright and welcoming and suitable for the work.

The keeping of accurate records is important and research should be encouraged.

THE STAFF

All doctors undertaking child welfare clinic work should have special training or experience in child health and disease, in preventive medicine, and preferably also in the methods of medico-social research; previous experience in general practice is also of great value. They should not work in isolation, but should guide the general work of the centre and share in the planning and execution of the health education programme. They should keep in close personal touch with paediatricians and general practitioners, and with colleagues on the administrative staff of the health department. In areas employing more than a few doctors, a senior medical officer should be responsible for co-ordinating the work of the clinic medical officers and for planning and developing the maternity and child welfare service in relation to local circumstances.

Where the doctor in charge of the child welfare clinic is a whole-time medical officer he should also be the school medical officer and, wherever possible, do other public health field work.

Every nurse undertaking advisory work in the clinics should have the health visitor's certificate. She also should play a part in the school health service and be in touch with practitioners in the area.

In addition to postgraduate training to prepare them for their special work, the staff should have frequent opportunities to keep abreast of recent developments through in-service training. It would be an advantage for all health departments to be in close touch with a university department of child health, so that the local authority services can be linked with the medical teaching centres on a regional basis and, with them, can arrange courses for doctors, nurses, and other staff, offering practical and theoretical instruction on recent advances in appropriate subjects.

It is concluded that the child welfare centre, with a wider approach to its task, with a well-trained staff, and adequate premises, must be the principal focus of the preventive medical and educational work that is unrelentingly needed to raise the standard of the health of young children.

The Interdepartmental Committee, under the chairmanship of Sir Arnold McNair, which has been set up by the Minister of Health and the Secretary of State for Scotland to ascertain the reasons for the lack of candidates for training as dentists (*Journal*, April 16, p. 979), has now held its first meeting and is ready to receive evidence.

Persons or organizations wishing to give evidence should, in the first instance, communicate in writing with the Secretary of the Committee, Mr. T. C. L. Nicole, at the Ministry of Health, Savile Row, London, W.1.

British Medical Association

AGENDA OF ANNUAL REPRESENTATIVE MEETING, JUNE 1, 2, 3, AND 4, 1955, IN THE GREAT HALL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1

CHAIRMAN: Dr. I. D. GRANT, Glasgow

PRELIMINARY BUSINESS

Items 1 to 7 relate to preliminary business.

REPORT OF AGENDA COMMITTEE

Grouping of Motions and Amendments: Order of Business

8. The Committee has arranged certain Motions and Amendments which cover substantially the same ground in groups and has selected in each group one Motion or Amendment (marked with an asterisk*) on which it proposes that discussion should take place. The Representatives of the constituencies concerned have been informed of these proposals in accordance with Standing Order 21 (iii).

The Committee recommends:

Recommendation: (1) That the business under "Overseas" be taken at 11.0 a.m. on Friday, June 3:

(2) That "Other motions by Divisions," if not previously dealt with, be considered as the first business on Saturday, June 4, after the Official Vote of Thanks:

(3) That, with these exceptions, the order of the business be as set out in the Agenda.

STANDING ORDERS

9. **Motion** by the Chairman: That the Standing Orders (Doc. A.R.M. 5) as circulated with this Agenda be adopted as the Standing Orders of the Meeting.

PRELIMINARY

10. **Motion** by the Chairman of Council on behalf of the Council: That the Annual and Supplementary Reports of Council under "Preliminary" (Doc. A.R.M. 2, paras. 1-15, and Doc. A.R.M. 3, paras. 208-12) be received.

The President, 1955-6

11. **Motion** by the Chairman of Council: That in the absence of the President during the session 1955-6, Sir John McNee, who will then be the Immediate Past-President, be invited to act for the President on all appropriate occasions.

The President, 1956-7

12. **Motion** by the Chairman of Council: That Alexander H. Hall, O.B.E., M.D., Hove, be elected President of the Association for session 1956-7.

Election of Vice-Presidents

13. **Motion** by the Chairman of Council: That A. W. S. Sichel, LL.D., M.D. (Capetown), be elected a Vice-President in recognition of his valuable services to the Association.

14. **Motion** by the Chairman of Council: That P. T. O'Farrell, LL.D., M.D., F.R.C.P.I. (Dublin), be elected a Vice-President in recognition of his valuable services to the Association.

Representative of the Medical Branch of the Royal Navy on the Council

15. **Motion** by the Chairman of Council: That Surgeon Rear-Admiral James Hamilton, C.B., C.B.E., Q.H.S., be elected as the representative of the Medical Branch, Royal Navy, on the Council for the period 1955-8.

Remainder of Report under "Preliminary"

16. **Motion** by the Chairman of Council: That the remainder of the Annual and Supplementary Reports of Council under "Preliminary" be approved.

"BRITISH MEDICAL JOURNAL"

17. **Motion** by the Chairman of the Journal Committee on behalf of the Council: That the Annual Report of Council under "British Medical Journal" (Doc. A.R.M. 2, para. 128) be received.

18. **Motion** by the Chairman of the Journal Committee: That the Annual Report of Council under "British Medical Journal" be approved.

"FAMILY DOCTOR"

19. **Motion** by the Chairman of the Family Doctor Committee on behalf of the Council: That the Annual Report of Council under "Family Doctor" (Doc. A.R.M. 2, para. 129) be received.

20. **Motion** by the Chairman of the Family Doctor Committee: That the Annual Report of Council under "Family Doctor" be approved.

FINANCE

21. **Motion** by the Treasurer on behalf of the Council: That the Annual and Supplementary Reports of Council under "Finance" (Docs. A.R.M. 2, paras. 130-6, and A.R.M. 3, para. 235) and Appendix XI and the Financial Statement for the year ending December 31, 1954 (Doc. A.R.M. 3A), be received.

Membership Subscription

22. **Motion** by the Treasurer: That para. 136 of the Annual Report of Council be approved.

23. **Amendment** by NORTH-WEST WALES: That para. 136 of the Annual Report of Council be referred back to the Council for further consideration with a view to reduction of the standard rate of annual subscription to £4 4s.

24. **Motion** by EAST AND MID-LOTHIAN: That there appear to be anomalies in the rates of subscription payable and that the reduced rate should be payable by medical administrators; and that the Council should be asked to consider this matter.

25. **Motion** by GATESHEAD: That the Council be instructed to consider the proposal that in those cases where members' subscriptions are not chargeable against income tax some compensatory adjustment should be made in them.

26. **Motion** by MID-ESSEX: That the Council be instructed to consider the proposal that until the income-tax authorities make an allowance of the B.M.A. subscription to all doctors in their assessments, those not getting such an allowance should pay a subscription of four guineas instead of six guineas.

27. **Motion** by DUNDEE: That this Meeting requests Council to consider the formulation of a sliding scale of annual subscriptions so that those members having the use of B.M.A. House or of a Regional office should pay at a higher rate than those unable to make use of such facilities.

28. **Motion** by ISLE OF WIGHT: That the Council be instructed to consider the proposal that the annual subscription to the British Medical Association be reduced by excluding the *British Medical Journal* as a free issue, making it instead an optional extra. The *Supplement* to the *B.M.J.* to continue as a general issue to all members.

Remainder of Report under "Finance"

29. **Motion** by the Treasurer: That the remainder of the Annual and Supplementary Reports of Council under "Finance" be approved.

Hospitality Fund

30. **Motion** by DUNDEE: That this Meeting requests Council to examine the question of setting up a hospitality fund within the Association to enable visitors from abroad to be accommodated and entertained at Association expense.

GENERAL MEDICAL SERVICES

31. **Motion** by the Chairman of the General Medical Services Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "General Medical Services" (Docs. A.R.M. 2, paras 16-37, and Doc. A.R.M. 3, paras 213-22), the Report of a Discussion with the Minister of Health on December 9, 1954, on the Provision of Drugs for Private Patients (Appendix II), and the report of the Subcommittee on Assistants in General Practice (Appendix VII) be received.

Remuneration

32. **Motion** by the Chairman of the General Medical Services Committee: That paras. 16 and 213 of the Annual and Supplementary Reports of Council be approved.

33. **Amendment** by NEWCASTLE-UPON-TYNE: That the Association rejects any attempts to assess income from private practice in assessing the global sum payable to general practitioners.

34. **Amendment** by GATESHEAD: That if £2,000,000 was an approximately correct figure for the income of general practitioners from private practice at the time of the Danckwerts Award, it is too high now.

*35. **Motion** by NORTH GLAMORGAN AND BRECKNOCK: That, in view of the ever increasing cost of living, the Minister should be approached with a view to obtaining a corresponding increase in the remuneration of general practitioners.

36. **Motion** by EAST HERTFORDSHIRE: That in view of the considerable increase in the cost of living since 1950, a corresponding increase in the Central Pool should now be made.

37. **Motion** by NORTH MIDDLESEX: That this Meeting expresses dissatisfaction with the present capitation fee.

38. **Motion** by NEWCASTLE-UPON-TYNE: That Council be instructed to review the present level of remuneration in the profession in view of the continuously rising cost of living and the consequent fall in the real value of the Danckwerts award.

39. **Motion** by SOUTH-EAST ESSEX: That this Meeting instructs the Council to press for, and open negotiations to obtain, the full betterment rate as laid down in the judgment of Mr. Justice Danckwerts, instead of the percentage which he then awarded.

Group Practice

40. **Motion** by the Chairman of the General Medical Services Committee: That paras. 19 and 215 of the Annual and Supplementary Reports of Council be approved.

41. **Amendment** by SOUTHAMPTON: That this Meeting is concerned with the policy of the Association in regard to group practice, and, having regard for the full implications of this policy, suggests that the Council give this matter further consideration.

Drugs for Private Patients

*42. **Motion** by MID-CHESHIRE: That this Meeting considers that the British Medical Association should continue to press for the supply of drugs and appliances under the National Health Service to private patients.

43. **Motion** by BATH: That the Council be asked to continue to press for the provision of free drugs for private patients.

44. **Motion** by HARROW: That this Meeting instructs Council to bring influence to bear on the new Government from every possible source in order to convince it of the just entitlement of private patients to receive their medications by means of Form E.C.10.

45. **Motion** by WESTMINSTER AND HOLBORN: That the A.R.M. requests Council to press the new Administration to take immediate steps to allow the issue of medicines on E.C.10 forms to private patients.

46. **Motion** by HEXHAM: That this Meeting is dissatisfied with the principle that private patients should be debarred from obtaining drugs under the National Health Service, and considers that pressure should be continued to remove this anomaly.

47. **Motion** by BRIGHTON AND MID-SUSSEX: That this Representative Body notes with regret the contents of Appendix II of the Annual Report of Council and reaffirms its conviction that the opinions of the Cohen Committee on this matter are unacceptable. It deprecates the total absence of reference to the interests of the patient in Appendix II and considers that private patients have an equal right to free medicine and that this right should be granted.

48. **Motion** by GUILDFORD: That this Meeting regrets that no minority report in favour of the supply of drugs for private patients was issued by the Cohen Committee, and instructs the Council to make inquiries of individual private practitioners concerned to find out how many would be prepared to accept suitable safeguards.

Prescribing of Proprietary Preparations

49. **Motion** by EAST KENT: That when an executive council becomes aware that a new preparation is being prescribed which does not appear to be a drug forming part of the pharmaceutical services provided under the Act, it shall immediately circularize all general practitioners on its list informing them of the fact; that no general practitioner shall be liable to be surcharged for prescribing such a preparation until such time as the aforesaid notice shall be circulated, and that attention should be drawn to excessive delay in notifying general practitioners of unacceptable prescribing.

Economy in Prescribing

50. **Motion** by NORTH MIDDLESEX: That in view of the widespread disquiet in the medical profession, full information be published on the present definition of excessive prescribing, and also how the penalties to which doctors are liable are defined.

Surgery and Waiting-Room Accommodation

51. **Motion** by HEXHAM: That representations should be made to the Inland Revenue authorities that capital expenditure involved in bringing surgery accommodation up to modern requirements should be subject to income-tax relief.

General Practitioner Refresher Courses

52. **Motion** by the Chairman of the General Medical Services Committee: That para. 28 of the Annual Report of Council be approved.

53. **Amendment** by DORSET: That this Meeting considers that the grant which is made towards the expenses of engaging a locum during the period that a general practitioner is attending a postgraduate course should be twenty guineas per week.

54. **Motion** by MID-CHESHIRE: That this Meeting considers that general practitioners should receive mileage fees for attendance at refresher courses.

General Practitioners and Institutional Midwifery

55. **Motion** by STRATFORD: That every general-practitioner obstetrician who desires it should have access to maternity beds at his local maternity hospital.

Trainee General Practitioners

56. **Motion** by SOUTH-EAST ESSEX: That the Trainee Practitioner Scheme supported by public funds is unnecessary and extravagant and we would welcome its abolition.

Dental Anaesthetics

57. **Motion** by CITY OF ABERDEEN: That this Meeting considers that the fee for the administration of a dental anaesthetic by a medical practitioner should depend not upon the number of teeth to be extracted but upon the degree of care, skill, and responsibility involved.

Dental Haemorrhages

58. **Motion** by GATESHEAD: That the principle of payment for arrest of dental haemorrhage should apply universally to haemorrhages following extractions at local authority clinics.

59. **Motion** by SOUTH ESSEX: That this Meeting considers that claims for the treatment of dental haemorrhage should not be submitted to the dentist concerned but should go direct to the executive council.

60. **Motion** by BISHOP AUCKLAND: That the Council be asked to explore with representatives of the dental profession the possibility of the formation of local dental rotas on a 24 hours' basis to deal with emergencies, and that the requisite information be given to both doctors and patients.

National Insurance Contributions

61. **Motion** by the Chairman of the General Medical Services Committee: That para. 35 of the Annual Report of Council be approved.

62. **Amendment** by RUGBY AND SOUTH WARWICKSHIRE: That this Meeting has difficulty in accepting the contention of the Ministry of National Insurance that implementation of Minute 240 of the A.R.M., 1954, "would completely upset the actuarial basis of the National Insurance Scheme" and refers the matter back for further information and consideration.

(Minute 240 of the A.R.M., 1954, reads:

PROPOSED by RUGBY AND SOUTH WARWICKSHIRE: That this Meeting considers that the present practice of requiring a full week's national insurance contribution for any portion of a week, for which a person (not otherwise exempt) is certified as fit for work, is unfair not only to the contributors but also to the doctors, since it at times jeopardizes the doctor-patient relationship. This meeting therefore urges Council, in the interests of common justice, to raise this matter with the Ministry, notwithstanding the slight administrative problem which the adoption of the proposed alteration might involve.

RESOLVED: That the matter be referred to the Council.)

Assistants in General Practice

63. **Motion** by the Chairman of the General Medical Services Committee: That para. 216 of the Supplementary Report of Council and the Report of the Subcommittee on Assistants in General Practice set out in Appendix VII be approved.

64. **Amendment** by BIRMINGHAM: That in the recommendation contained in para. 16 of the Report of the Subcommittee on Assistants in General Practice the words—honorary secretaries of B.M.A. Divisions—be inserted after

—deans of medical schools; and that "honorary"—with regard to secretaries of the local medical committees be deleted.

The recommendation would then read:

"That further efforts should be made, through the deans of medical schools, honorary secretaries of B.M.A. Divisions, and secretaries of local medical committees, to ensure that final-year students and newly qualified practitioners are fully informed of the importance of entering into a formal agreement when accepting a post as an assistant, either with or without view."

Employment of General Practitioners in Hospitals

65. **Motion** by STRATFORD: That the Association reaffirms its policy to press for the provision of more beds under general-practitioner care and for diagnostic facilities for the general practitioner, where these are not already available.

Remainder of Report under "General Medical Services"

66. **Motion** by the Chairman of the General Medical Services Committee: That the remainder of the Annual and Supplementary Reports of Council under "General Medical Services" be approved.

General Practitioners and Hospitals

67. **Motion** by MID-CHESHIRE: That this Meeting considers that further and more urgent consideration should be given to bring the hospitals and general practitioner closer together.

Monthly Payments

*68. **Motion** by NEWCASTLE-UPON-TYNE: That doctors in the National Health Service be paid monthly by right without having to make application.

69. **Motion** by DUNDEE: That this Meeting is disappointed that no satisfactory solution has been arrived at with the Ministry whereby monthly payments may be received on application as a matter of right and without any plea of hardship being given.

Reclassification of Closed Areas

70. **Motion** by SOUTH-WEST WALES: That, in view of the fact that areas which had been closed since the start of the National Health Service have recently been reclassified and declared intermediate despite no change in the ratio of doctors to patients, this Meeting instructs the Council to keep a close watch on the activities of the Medical Practices Committee and to take action to safeguard the interests of the Association's members.

Obstetric List

71. **Motion** by GATESHEAD: That in view of the wide variation, in different executive council areas, of criteria for admission to the obstetric list, it is more than ever desirable that this list be abolished.

Differential Fee for Midwifery

72. **Motion** by HEXHAM: That the principle of a differential fee for midwifery is highly undesirable, and that the lower fee of five guineas should be abolished. It is suggested that a newly qualified practitioner should produce evidence of adequate experience under supervision before undertaking unaided midwifery.

Domiciliary Obstetric Scheme

73. **Motion** by GLASGOW: That this Meeting recommends to the Representative Body that the services of a specialist anaesthetist should be available to the general practitioner in obstetric cases under the domiciliary scheme.

Intermediate Certificates

74. **Motion** by BUCKINGHAMSHIRE: That an intermediate certificate of incapacity covering a period of up to four weeks be allowed after an initial certificate covering the first week.

Insulin Pack

75. **Motion** by SOUTH SHIELDS: That this Meeting considers that the terms (c.c. or ml.) on the insulin pack should correspond with the terms (c.c. or ml.) on the insulin syringe.

Advertising Methods of Pharmaceutical Industry

76. **Motion** by ST. PANCRAS: That the Council be asked to take note of the irritation and inconvenience caused to general practitioners by the advertising methods of the pharmaceutical industry as a whole, and that they should inquire into the problem and confer with representatives of the industry to alleviate it.

COMPENSATION AND SUPERANNUATION

77. **Motion** by the Chairman of the Compensation and Superannuation Committee on behalf of the Council: That the Annual Report of Council under "Compensation and Superannuation" (Doc. A.R.M. 2, paras. 38-44) be received.

Compensation

78. **Motion** by the Chairman of the Compensation and Superannuation Committee: That para. 38 of the Annual Report of Council be approved.

*79. **Amendment** by HENDON: That the Representative Body reaffirms its decision (Min. 163, A.R.M., 1951) that compensation for practices should be paid forthwith.

(Min. 163 was as follows:

Resolved: That, in view of the grave inflation that the country is confronted with at the present time, steps be taken to represent to the Minister the need for the payment of compensation forthwith.)

80. **Amendment** by NEWCASTLE-UPON-TYNE: That we continue to press strenuously for payment of compensation for practices.

*81. **Amendment** by HALIFAX: That this Meeting considers that the Minister should now pay compensation in full for medical practices, and that, until this compensation is paid, the rate of interest should be raised to an adequate level.

82. **Amendment** by LEEDS: That the Minister of Health be requested to pay forthwith the outstanding sums of compensation due to general practitioners; and that, in the event of the Minister being unwilling to pay the outstanding sums of compensation forthwith, a request be made to the Minister for an increase in the rate of interest thereon.

83. **Amendment** by DUNDEE: That this Meeting requests Council to open negotiations with the Ministry to consider raising the percentage of interest paid on compensation in view of the present financial position—for example, the bank rate.

*84. **Amendment** by GATESHEAD: That doctors wishing to incur capital expenditure on new or improved surgery premises should be able to obtain an advance payment of compensation.

85. **Amendment** by HUDDERSFIELD: That, in view of the recent demand for improvement to surgery premises, the compensation at present held by the Ministry (until death or retirement) should be made available for this purpose.

*86. **Amendment** by SHEFFIELD: That this A.R.M. is of the opinion that a principal who relinquishes a proportion of his patients by taking a partner should be entitled to claim immediate payment of an appropriate proportion of his compensation.

87. **Amendment** by BLYTH AND MORPETH: That the A.R.M. reaffirms the recommendation of the General Medical Services Committee that a practitioner on taking another into partnership should thereupon be entitled to at least a part of the compensation moneys due to him.

Assessment of Pension of Practitioners

88. **Motion** by GATESHEAD: That parity of assessment of pension with salaried officers will be obtained only if practitioners are allowed to opt, at the time of their retirement, for the system most advantageous in their particular case.

Remainder of Report under "Compensation and Superannuation"

89. **Motion** by the Chairman of the Compensation and Superannuation Committee: That the remainder of the Annual Report of Council under "Compensation and Superannuation" be approved.

Superannuation Payments on Sessional Fees

90. **Motion** by WILLESSEN: That Council be requested to explore the possibility of superannuation payments being made on sessional fees paid by Government departments to part-time medical officers.

MEDICAL BENEVOLENCE

91. **Motion** by the Chairman of the Charities Committee on behalf of the Council: That the Supplementary Report of Council under "Medical Benevolence" (Doc. A.R.M. 3, paras. 239-41) be received.

92. **Motion** by the Chairman of the Charities Committee: That the Supplementary Report of Council under "Medical Benevolence" be approved.

PRIVATE PRACTICE

93. **Motion** by the Chairman of the Private Practice Committee on behalf of the Council: That the Annual Report of Council under "Private Practice" (Doc. A.R.M. 2, paras. 109-27) be received.

Remuneration of Local Treasury Medical Officers

*94. **Motion** by GATESHEAD: That the fees for practitioners acting as regional medical officers for the Treasury should be £2 2s. for a full examination and £1 1s. for a short report.

95. **Motion** by EAST HERTFORDSHIRE: That the fees payable by the Treasury Medical Service for full medical examination should be increased to an amount similar to that payable for a life insurance examination.

96. **Motion** by WORCESTER AND BROMSGROVE: That this Meeting considers the fee of 25s. per examination and report paid to Treasury medical officers is inadequate and should be brought into line with the fees for life insurance examinations at present paid.

Remainder of Report under "Private Practice"

97. **Motion** by the Chairman of the Private Practice Committee: That the remainder of the Annual Report of Council under "Private Practice" be approved.

Duration Certificates

98. **Motion** by BISHOP AUCKLAND: That a medical certificate should not be required by an insurance company in the case of a deceased person not previously examined for life insurance.

(The decision of the A.R.M., 1937, reaffirmed in 1949, on this matter is:

Min. 74. **Resolved:** That the Representative Body is of the opinion that where any medical certificate is required by an insurance company in the case of a deceased person

not previously examined for life insurance such certificate should be obtained direct from the medical practitioner of the deceased; that it should not be furnished without the previous consent of the nearest available competent relative; and that a fee should be paid by the insurance companies for any such certificate.

A motion before the Representative Body in 1953 that a practitioner should never comply with a request for a "duration" certificate, was referred to the Council; and the view of the Council that there was no reason to depart from existing policy as laid down in 1937 and 1949 was endorsed by the Representative Body, 1954.)

Fees for Emergency Treatment under Road Traffic Act

99. **Motion** by DERBY: That this Meeting is of the opinion that the time is now appropriate for an upward revision of the 12s. 6d. fee and 6d. mileage for emergency treatment under the Road Traffic Act, 1934.

Families of Service Personnel Proceeding Abroad

100. **Motion** by BELFAST: That this Meeting considers that where medical services are provided on the requirement of Service departments for the families of Service personnel proceeding abroad the fees payable are inadequate and should be raised to a minimum of:

	£	s.	d.
Examination for fitness to reside abroad ..	1	5	0
Examination for fitness to travel ..	..	10	6
Vaccination ..	..	10	6
Inoculations ..	..	(each) 10	6

Report on Ministry of Pensions Form M.P.A.O. 38

101. **Motion** by BELFAST: That this Meeting considers that the fee of 5s. paid for a medical report on Form M.P.A.O. 38 for submission to the Ministry of Pensions is inadequate and requests that representations be made for its increase to a minimum of £1 1s.

OCCUPATIONAL HEALTH

102. **Motion** by the Chairman of the Occupational Health Committee on behalf of the Council: That the Annual Report of Council under "Occupational Health" (Doc. A.R.M. 2, paras. 75-86), and Statement on the Definitions, Qualifications, and Remuneration of Industrial Medical Officers (Appendix III), and the Terms of Service for Industrial Medical Officers (Appendix IV) be received.

Remuneration of Industrial Medical Officers

103. **Motion** by the Chairman of the Occupational Health Committee: That the following recommendation of the Council be adopted:

That the revised Statement on the Remuneration of Industrial Medical Officers set out in Appendix III of the Annual Report of Council be approved.

Duties and Ethical Rules for Industrial Medical Officers

104. **Motion** by the Chairman of the Occupational Health Committee: That para. 83 of the Annual Report of Council be approved.

105. **Amendment** by RUGBY AND SOUTH WARWICKSHIRE: That this Meeting urges Council to circulate among all non-members of the Association a copy of "The Duties and Ethical Rules for Industrial Medical Officers."

Remainder of Report under "Occupational Health"

106. **Motion** by the Chairman of the Occupational Health Committee: That the remainder of the Annual Report of Council under "Occupational Health" be approved.

MEDICAL ETHICS

107. **Motion** by the Chairman of the Central Ethical Committee on behalf of the Council: That the Annual Report of Council under "Medical Ethics" (Doc. A.R.M. 2, paras. 103-8) be received.

Loan of Hospital Records to Government Departments

108. **Motion** by the Chairman of the Central Ethical Committee: That the following recommendation of the Council be adopted:—

That the following statement on the loan of hospital records to Government departments be approved:

(a) That medical records be lent to the medical officers employed by Government departments only when written consent has been given by or on behalf of the patient.

(b) That the form of consent signed by or on behalf of the patient should include a statement that the patient agrees to his hospital records being made available to the medical board in order to assist them to consider and assess claims.

(c) That, wherever practicable, and particularly where disclosure of information may have an adverse psychological effect upon the patient, the practitioner who compiled the record or, if he is not available, one nominated by the hospital authority for the purpose, should be consulted on the wisdom of disclosing to the patient all of the confidential information contained therein, and should take the opportunity of reviewing the notes before they leave the hospital.

109. **Motion** by WORCESTER AND BROMSGROVE: That the statement that the patient agrees to his hospital records being made available to a medical board should not be requested or demanded until the need for the loan of such records arises.

Professional Secrecy

110. **Motion** by SOUTH ESSEX: That this Meeting considers the exchange of medical details concerning patients should take place only between doctors, and deplores the increasing tendency to exchange confidential medical details direct with lay persons.

Remainder of Report under "Medical Ethics"

111. **Motion** by the Chairman of the Central Ethical Committee: That the remainder of the Annual Report of Council under "Medical Ethics" be approved.

PUBLIC HEALTH

112. **Motion** by the Chairman of the Public Health Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "Public Health" (Docs. A.R.M. 2, paras. 87-101, and A.R.M. 3, paras. 233-34), and the Rules for D.P.H. Courses (Appendix V) be received.

Remuneration in the Public Health Service

113. **Motion** by GATESHEAD: That in view of the dangers presented to the medical profession by the low levels of remuneration in the salaried medical services of the State and local authorities, steps be taken urgently by the Association to bring the remuneration of medical personnel in these services to a level comparable to that of the rest of the profession engaged in hospital and general practice.

Remuneration of Divisional Medical Officers, London County Council

114. **Motion** by GREENWICH AND DEPTFORD: That this A.R.M. recommends that the salary of divisional medical officers of the London County Council be raised forthwith and be in accordance with the scales for medical officers of health—that is, in relation to the population served.

Fees for Part-time Work for Local Authorities

115. **Motion** by EAST KENT: That, consequent on the rise in salary of public health medical officers, the scale of fees for part-time sessional work with local authorities should be increased immediately.

School Health Service

116. **Motion** by WORCESTER AND BROMSGROVE: That the Council take all possible steps to ensure that the arrangements set out in para. 94, (a) and (b), be universally adopted throughout the country.

Milk

117. **Motion** by ISLE OF WIGHT: That this Meeting is in favour of the transfer of the responsibility for clean milk production from the Ministry of Agriculture and Fisheries to the local sanitary authority.

Remainder of Report under "Public Health"

118. **Motion** by the Chairman of the Public Health Committee: That the remainder of the Annual and Supplementary Reports of Council under "Public Health" be approved.

Notification of Infectious Diseases

119. **Motion** by DARTFORD: That this Meeting is of the opinion that a review of the legislation concerning the notification of infectious diseases should be carried out by the Association with a view to making recommendations to the Ministry regarding the form of revision, which is long overdue.

Diesel Oil

120. **Motion** by GUILDFORD: That this Meeting of the Representative Body urges the Council of the B.M.A. to draw the attention of transport authorities to the possible dangers of fumes from diesel engines; to the remarkable coincidence between the increased use of diesel fuel for transport and the rise of mortality from lung cancer and other respiratory diseases; and views with alarm the forthcoming replacement, in London, of 1,800 electric trolley buses by diesel-engined vehicles.

ARBITRATION MACHINERY

121. **Motion** by the Chairman of the Committee *re* Arbitration Machinery on behalf of the Council: That the Annual and Supplementary Reports of Council under "Arbitration Machinery" (Docs. A.R.M. 2, para. 74, and A.R.M. 3, para. 232) be received.

122. **Motion** by the Chairman of the Committee *re* Arbitration Machinery: That the Annual and Supplementary Reports of Council under "Arbitration Machinery" be approved.

123. **Motion** by WESTMINSTER AND HOLBORN: That the Council should examine the possibility of getting some form of arbitration for the profession alone, and press that the arbitration tribunal should be comprised of personnel permanently appointed, independent and mutually agreed.

SCIENCE

124. **Motion** by the Chairman of the Science Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "Science" (Docs. A.R.M. 2, paras. 141-7, and A.R.M. 3, paras. 236-7) be received.

Crash Helmets

125. **Motion** by MARYLEBONE: That this Meeting again stresses the life-saving value of crash helmets when worn by motor-cyclists.

126. **Motion** by ABERDEEN AND KINCARDINE COUNTIES: That this Meeting considers that the wearing of a crash helmet should be compulsory to all users of a motor-cycle, and asks the Council to take all possible action to achieve this end.

127. **Motion** by GREENWICH AND DEPTFORD: That this A.R.M. recommends that all forms of protective clothing, including crash helmets, should be free of purchase tax.

128. **Motion** by RUGBY AND SOUTH WARWICKSHIRE: That this Meeting considers that crash helmets are a valuable

protection for motor-cyclists, and urges Council to appoint a deputation to seek a personal meeting with the Chancellor of the Exchequer to stress this point and to press for the abolition of purchase tax on crash helmets, and similar protective clothing, such as firemen's and policemen's helmets.

Postage on Library Books

129. **Motion** by the Chairman of the Science Committee: That para. 144 of the Annual Report of Council be approved.

130. **Amendment** by NORTH-WEST WALES: That the first 10s. of the charge for postage on books from the B.M.A. Library should be a charge on the annual subscription.

B.M.A. Lectures

131. **Motion** by READING: That Divisions should have the option of applying for an additional B.M.A. lecture, at the discretion of the divisional executive committee.

Remainder of Report under "Science"

132. **Motion** by the Chairman of the Science Committee: That the remainder of the Annual and Supplementary Reports of Council under "Science" be approved.

Heroin

*133. **Motion** by ABERDEEN AND KINCARDINE COUNTIES: That this Meeting protests against the threatened withdrawal of that most excellent sedative heroin, which is of inestimable value in so many conditions, and recommends that it should still be manufactured in this country for use by medical practitioners but not exported.

134. **Motion** by LANCASTER: That this Meeting requests Council to protest against the order prohibiting the import or manufacture of heroin in this country.

135. **Motion** by WINCHESTER: That in view of the great value of heroin in medical practice, this Meeting congratulates Council on approaching the Government concerning the action which has recently been taken to ban this drug. This Meeting instructs Council to ensure that in future no drug be prohibited without full discussion with representative practising members of the profession in this country.

136. **Motion** by MARYLEBONE: That this Meeting deplores the action of the Government in banning the manufacture and the use of heroin for medical purposes without prior consultation with the representatives of the medical profession.

137. **Motion** by BLYTH AND MORPETH: That the A.R.M. resents the method by which decisions are taken concerning the banning of certain drugs, and feels that before each change is made the profession at large should be consulted and given the opportunity of expressing its views.

138. **Motion** by GLASGOW: That whilst appreciating that good reasons may exist for the prohibition of the export of heroin, this Meeting is not satisfied that there is proof of addiction to the drug in this country and considers that the prohibition of the importation and manufacture of heroin will deprive patients of a drug which has been of proved therapeutic value for many years.

HOSPITAL AND CONSULTANT SERVICES

139. **Motion** by the Chairman of the Central Consultants and Specialists Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "Hospital and Consultant Services" (Docs. A.R.M. 2, paras. 45-72, and A.R.M. 3, paras. 223-30), the Revised Report of the Special Subcommittee on Hospital Medical Staffing (Appendix VIII), the Report of the Geriatrics Joint Subcommittee (Appendix IX), and the Report on the Medical Use of Hypnotism—by a Subcommittee of the Psychological Medicine Group Committee (Appendix X) be received.

Negotiating Machinery

140. **Motion** by the Chairman of the Central Consultants and Specialists Committee: That para. 45 of the Annual Report of Council be approved.

141. **Amendment** by MARYLEBONE: That this Meeting strongly recommends to the Council that in all negotiations with the Ministry of Health on matters of hospital medical staffing professional legal and financial advisers shall be consulted before final decisions are reached.

142. **Amendment** by MARYLEBONE: That this Meeting instructs the Council to consider the desirability of advising the Staff Side to withdraw from Committee B of the Whitley Medical Council, in view of the fact that this negotiating machinery is not working satisfactorily.

143. **Motion** by DORSET: That the Representative Body requests Council to review the relationship of the Central Consultants and Specialists Committee to the Joint Committee.

Remuneration of Hospital Medical Staff

144. **Motion** by the Chairman of the Central Consultants and Specialists Committee: That paras. 46 and 223 of the Annual and Supplementary Reports of Council be approved.

145. **Amendment** by MANCHESTER: That this Meeting deplores the fact that the instructions to Council contained in Minute 70 (Annual Representative Meeting, 1954) have not been carried out, and demands that the Council do so forthwith.

(Minute 70 of the A.R.M., 1954, reads:

RESOLVED: That this Meeting deplores the inadequacy of the recent agreement reached on the remuneration of hospital medical staffs, and urges that steps be taken to reopen this matter immediately, with a view to obtaining the implementation of the Spens Report as applied to consultants and specialists and obtaining adequate betterment. In the event of disagreement, the matter should be referred to arbitration.)

146. **Amendment** by DERBY: That this Meeting expresses dissatisfaction with the results so far obtained for whole-time consultants and specialists, and urges that renewed efforts be made on their behalf.

*147. **Motion** by SHEFFIELD: That, pending the full implementation of the Strachan proposals and irrespective of the claim at present before Whitley Committee B, the maximum of the S.H.M.O. salary scale should be increased to 80% of the consultant maximum.

148. **Motion** by LIVERPOOL: That this Meeting recommends that the S.H.M.O. maximum rate of remuneration be raised to 80% of the consultant maximum.

149. **Motion** by DORSET: That this Meeting considers that the sum of money available for distribution for merit awards should be used to raise S.H.M.O.s to consultant status.

150. **Motion** by DORSET: That this Meeting considers that the shortage of hospital house officers is due to underpayment, and that their remuneration should be brought into line with that of newly appointed National Service medical officers.

151. **Motion** by NEWCASTLE-UPON-TYNE: That the remuneration of general practitioners doing sessional work in hospitals be increased.

Hospital Medical Staffing

152. **Motion** by the Chairman of the Central Consultants and Specialists Committee: That paras. 47 and 224 of the Annual Report of Council, and the Revised Report on Hospital Medical Staffing (Appendix VII) be approved.

153. **Amendment** by MARYLEBONE: That this Meeting instructs the Council that a survey of consultant establishments is essential before decisions are taken on any changes in hospital medical staffing. Review should be undertaken

by representatives appointed by the Ministry and by the Joint Consultants Committee. Any review committee so appointed should include representatives of the Consultants and Specialists Committee of the region concerned.

154. **Motion** by LEICESTERSHIRE AND RUTLAND: That there should be a maximum expansion of the consultant establishment so as to provide a service adequate for the needs of the country in accordance with the expressed policy of the Central Consultants and Specialists and Joint Committees.

155. **Motion** by SHEFFIELD: That there should be an expansion of the consultant establishment in the hospital services, particularly in those specialties in which the present ratio of consultants to S.H.M.O.s is low.

156. **Motion** by READING: That this Meeting takes note of the need for expansion of the consultant grade, but considers that any such expansion should absorb existing S.H.M.O.s who are already doing consultant work.

157. **Motion** by LEICESTERSHIRE AND RUTLAND: That all grades of medical staff who will be vitally affected should have representation on all committees dealing with the preliminary review of hospital staffing, and on all later committees concerned with putting the report into effect.

158. **Motion** by DARTFORD: That this Meeting draws attention to the position of doctors graded as S.H.M.O.s in the hospital service who, despite the fact they have been engaged in consultant work, are now faced with the prospect of being down-graded, and considers that the Council should be requested to treat this problem as a matter of priority and that the B.M.A. should do everything to ensure that S.H.M.O.s at present unfairly and inappropriately graded should be graded as consultants as soon as possible.

159. **Motion** by LIVERPOOL: That this Meeting believes that, in the event of the reforming of the structure of hospital medical staffing, the grade immediately below that of consultant should be linked with the consultant grade and be regarded as part of the senior medical staff.

S.H.M.O. Appointments

160. **Motion** by LIVERPOOL: That this Meeting reiterates the resolution passed last year by the A.R.M.: "That no further S.H.M.O. posts be established and that existing posts should be subject to biennial review with a view to up-grading." (Min. 121.)

161. **Motion** by READING: That all existing S.H.M.O. posts should be subjected to a review by an independent central committee with a view to upgrading.

Internal Administration of Hospitals

162. **Motion** by the Chairman of the Central Consultants and Specialists Committee: That para. 54 of the Annual Report of Council be approved.

163. **Amendment** by LIVERPOOL: (a) That this Meeting, believing everything concerning the patient must be of importance to the clinician in charge, and that, therefore, the lay and ancillary services must be subordinate to the medical, considers that the recommendation of equal tripartite administration by the Bradbeer Committee on Internal Administration of Hospitals is not in the interest of the patient (Bradbeer Report, paras. 20-21);

(b) That this Meeting affirms that under no circumstances shall the medical and nursing personnel of hospitals be under the control of lay administrators (para. 67);

(c) That this Meeting affirms that it should be obligatory for the hospital management committee to consult with the representatives of the senior medical and dental staff (para. 67);

(d) That this Meeting welcomes the recommendation in para. 72 of the report that, when medical administrators are appointed, they should be of consultant status with clinical responsibility. It considers that paras. 77-8 are unworkable;

(e) That this Meeting deplores the suggested down-grading of deputy medical administrators, when such are considered desirable, to an R.M.O./R.S.O. grade (para. 81);

(f) That this Meeting reaffirms its belief that it is in the interest of the patient to maintain the close link that at present exists between the medical and nursing professions.

NOTE:—The following are extracts from the Bradbeer Report:

Para. 20. "Hospital administration can be sub-divided into: (a) medical administration; (b) nursing administration; and (c) lay, or business, administration. . . . It is amply clear that the borderlines between the three parts cannot be sharply defined . . . but we are fully persuaded that the conception of partnership between the three parts of the whole administration should be regarded as fundamental."

Para. 21. "Partnership is the important word. None of the three parts can do without either of the others, each has its own set of functions which it is better adapted to perform than the others, and none should regard itself as superior to the others."

Para. 22. "Nevertheless there is one important qualification of the tripartite principle which must be set down at once. We have no doubt whatever—and this view was expressed by several of the bodies who gave evidence before us—that for the efficient administration of the hospitals it controls the governing body must have one officer to whom it can look for securing that its policy is carried out in all hospitals in the group and for co-ordinating and reviewing all group activities. That is to say, at group level—and this includes 'groups' consisting of a single hospital—there must be one chief administrative officer."

Para. 65. "The medical committee system needs strengthening, both at hospital and group level. . . . Every hospital should, in our opinion, have a medical staff committee."

Para. 66. "In all cases the medical staff committee will be constituted by the medical staff themselves, not appointed by the governing body of the hospital. It should be a self-generated committee existing in its own right, not a subcommittee of the group medical advisory committee."

Para. 67. "The Ministry has recently issued a memorandum on medical committees in hospitals and hospital groups, which contains the following examples of matters within the sphere of interest of medical committees at both levels. . . . The list is not intended to be exhaustive but to illustrate the wide field within which committees can, and already often do, give regular and valuable help to hospital authorities."

Para. 72. "The medical administrator must be a consultant in active clinical practice. . . . Generally, we do not think he should be required to, or should, give more than a reasonable proportion of his time to administration. . . . Medical administrative work at this level should be paid on the same basis as other clinical work."

Para. 77. "We are convinced that the best way of filling the post is to select one from among the consultant staff of the hospital (which would include any consultant newly appointed to fill a clinical vacancy). We recommend that the medical administrator should be selected jointly by representatives of the medical staff committee and of the hospital management committee, with one or more representatives from the regional board who could put the board's point of view from the clinical angle. The formal appointment as medical administrator would then be made by the hospital management committee and any necessary adjustment in the consultant's contract made by the board. If the consultant selected finds it necessary to reduce the amount of his clinical work, there should be no reduction in the sessions provided for in his contract with the board—this follows from what we have said in paragraph 72. The alternative would be for him to do the same amount of clinical work with an increase in his total sessions."

Para. 78. "Exceptionally—and most of us think it would be exceptional—it may happen in a large hospital desiring a medical administrator of the kind we contemplate that not one of the existing consultants is able or willing to take on the work even for a limited time. In this case we think that the regional hospital board should be asked for their help. We cannot but believe that the board, the medical staff committee, and the hospital management committee will be able between them to resolve the difficulty. In the last resort there may be no alternative but to wait for a clinical vacancy and then for the regional board, after consultation with the medical staff committee and the hospital management committee, to advertise the clinical appointment definitely linked with the medical administrative duties. But because of the medical administrator's special functions it is important that both the hospital management committee and the medical staff whose colleague he is to be should have a larger say in his appointment than they have for consultant posts at present. Under the Act and regulations, the management committee is already represented on the advisory appointments committee for consultants, but we are not convinced that the strength of their representation is sufficient for

the purpose of filling medical administrator posts. We recommend, therefore, that the representation of the hospital management committee, both lay and medical, should be augmented for these appointments. We recognize that this recommendation, if accepted, would involve an amendment of the regulations, but we think that amendment would be justified."

Para. 81. "In order, therefore, to help meet the needs of medical administration and to attract young men into this field of work, we recommend the recognition, in non-teaching hospitals only, of a new R.M.O. or R.S.O. grade covering salary ranges between the lowest registrar salary and the highest point in the S.H.M.O. grade. Whilst it is not suggested that such appointments would be necessary in all general hospitals, the new grade (in addition to its clinical value) would be useful in hospitals where the consultants find it difficult to take on much administrative, on top of clinical, work. It should, we suggest, be divided into salary ranges in accordance with the size and type of hospitals. In each case the appointment might be for four years, subject to one year in the first instance, and should be made by regional boards in close consultation with hospital management committee and the medical staff committees concerned."

164. **Amendment** by EAST KENT: That a medical superintendent should be appointed to each general hospital where there is no such appointment, by election from existing senior medical staff by the group medical advisory committee, in consultation with the medical staff committee, and that the tenure of office should be for periods of three years.

165. **Motion** by LIVERPOOL: That this Meeting recommends that all medical boards and all medical advisory committees in hospitals should become statutory bodies within the framework of the National Health Service.

Review of Consultant Organization

166. **Motion** by WORCESTER AND BROMSGROVE: That the A.R.M. be informed what stage the deliberations mentioned in the Report of Council, para. 59, have reached.

Geriatric Units: Treatment and Rehabilitation of Chronic Disablement

167. **Motion** by the Chairman of the Central Consultants and Specialists Committee: That paras. 67 and 227 of the Annual and Supplementary Reports of Council and the Report of the Geriatrics Joint Subcommittee on the Treatment and Rehabilitation of Chronic Disablement, set out in Appendix IX, be approved.

168. **Amendment** by WORCESTER AND BROMSGROVE: That recommendation 17 of the Report be amended to read: "There should be an increase in Part III accommodation to meet present and future needs, particularly with regard to the provision of an increased proportion of single rooms."

169. **Motion** by HEXHAM: That the inadequacy of local authority accommodation under Part III of the National Assistance Act is embarrassing to both general practitioner and hospital services.

170. **Motion** by MID-CHESHIRE: That this Meeting recommends that stress be put on the need for more accommodation for the aged, in addition to supporting the appointment of assessing officers.

171. **Motion** by BATH: That the Council should be asked to make representation to the Government to produce homes for old people, accommodating a sufficient number in each to be an economical proposition; thereby relieving hospital beds for geriatric cases.

172. **Motion** by GREENWICH AND DEPTFORD: That this A.R.M. recommends that the Minister be urged to provide wherever necessary geriatric and chronic sick hospital facilities, and further suggests that the Minister urges closer co-operation between hospital and local government authorities.

173. **Motion** by WANDSWORTH: That age should not act as a bar to admission to hospital.

174. **Motion** by MID-CHESHIRE: That the Association should consider propaganda to arouse the public conscience on the need for people to accept the responsibility for their aged relatives, except where hospital treatment is essential.

Remainder of Report under "Hospital and Consultant Services"

175. **Motion** by the Chairman of the Central Consultants and Specialists Committee: That the remainder of the Annual and Supplementary Reports of Council under "Hospital and Consultant Services" be approved.

Representation of Whole-time Consultants and Specialists on Central Consultants and Specialists Committee

176. **Motion** by DERBY: That this Meeting proposes that there should be a higher proportion of whole-time consultants and specialists on the Central Consultants and Specialists Committee.

Private Beds

177. **Motion** by BATH: That in view of the fact that membership of the various provident schemes is increasing the Minister should be asked to arrange that more private beds should be available in hospitals.

Domiciliary Psychiatric Service in Wales

178. **Motion** by CARDIFF: That this Meeting presses for the institution of a domiciliary psychiatric service in Wales.

Study Leave

179. **Motion** by STIRLING: That this Meeting is of opinion that the Ministry should be asked to state its policy in respect of "study leave" and to reinforce its instructions to regional hospital boards to make study leave available to hospital officers.

ESTATES

180. **Motion** by the Chairman of the Estates Committee on behalf of the Council: That the Annual Report of Council under "Estates" (Doc. A.R.M. 2, paras. 137-40) be received.

181. **Motion** by the Chairman of the Estates Committee: That the Annual Report of Council under "Estates" be approved.

PUBLIC RELATIONS

182. **Motion** by the Chairman of the Public Relations Committee on behalf of the Council: That the Annual Report of Council under "Public Relations" (Doc. A.R.M. 2, paras. 148-52) be received.

183. **Motion** by the Chairman of the Public Relations Committee: That the Annual Report of Council under "Public Relations" be approved.

ARMED FORCES

184. **Motion** by the Chairman of the Armed Forces Committee on behalf of the Council: That the Annual Report of Council under "Armed Forces" (Doc. A.R.M. 2, paras. 153-4) be received.

185. **Motion** by the Chairman of the Armed Forces Committee: That the Annual Report of Council under "Armed Forces" be approved.

ORGANIZATION

186. **Motion** by the Chairman of the Organization Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "Organization" (Docs. A.R.M. 2, paras. 155-69, and A.R.M. 3, para. 238) and proposals for amendments of Articles and By-laws (Appendix VI) be received.

Membership

187. **Motion** by RUGBY AND SOUTH WARWICKSHIRE: (1) That the net fall in membership of 366 over the years 1953 and 1954 contrasts unfavourably with the net increase of 3,718 in the years 1951 and 1952—this should be considered as a challenge, not a catastrophe. (2) That a small committee or subcommittee should be set up forthwith to consider this particular problem, seeking causes and suggesting remedies.

The Newly Qualified Practitioner: Pre-registration Posts

188. **Motion** by WESTMINSTER AND HOLBORN: That the Council should examine the availability of pre-registration posts in hospitals and report to the next A.R.M. (1956).

Autonomous Bodies

189. **Motion** by the Chairman of the Organization Committee: That the following recommendation of the Council be adopted:

That the autonomous powers of the General Medical Services Committee and the Central Consultants and Specialists Committee be renewed in respect of the year 1955-6.

That the Representative Body looks to these Committees to ensure (1) that no action be taken by either which may prejudice the interests of another part of the profession without full prior consultation with the appropriate interests, and (2) that their autonomous powers will be used so as to expedite and not delay the work of the Association.

190. **Amendment** by CITY OF EDINBURGH: That the word "affect" be substituted for the word "prejudice" in the recommendation.

Associates

191. **Motion** by the Chairman of the Organization Committee: That the following recommendation of the Council be adopted:

That in view of the provision under By-law 12 for the election of Complimentary Members of Divisions and Branches, the election of Associates be restricted to overseas Branches.

Amendments of Articles and By-laws

192. **Motion** by the Chairman of the Organization Committee: That the following recommendation of the Council be adopted:

That the Articles and By-laws of the Association be altered in the manner shown in Appendix VI to the Annual Report of Council, and that the Council be instructed to submit the amendments of the Articles concerned to an Extraordinary General Meeting of the Association.

193. **Motion** by RUGBY AND SOUTH WARWICKSHIRE: That if a motion adopted by the A.R.M. requires, for its implementation, an alteration to the Articles and/or By-laws, a draft of the proposed alterations should be forwarded to the sponsoring body for comment before publication. After publication thereof in the Annual Report of Council, it should be possible for any Division to move an amendment thereto which, if carried after due notice, would not delay implementation for a further year.

Remainder of Report under "Organization"

194. **Motion** by the Chairman of the Organization Committee: That the remainder of the Annual and Supplementary Reports of Council under "Organization" be approved.

CONSTITUTION OF THE ASSOCIATION

195. **Motion** by the Chairman of the Constitution Committee on behalf of the Council: That the Annual Report of Council under "Constitution of the Association" (Doc. A.R.M. 2, para. 170) be received.

196. **Motion** by the Chairman of the Constitution Committee: That the Annual Report of Council under "Constitution of the Association" be approved.

197. **Motion** by BATH: That in view of the fact that the medical profession is now divided into three sections, each organized as an autonomous body, the whole constitution of the B.M.A. should be revised to fit the requirements of

the present time; and that the Council of the Association should essentially be formed from the autonomous bodies, so that it can speak for the profession as a whole.

District Liaison Committees

198. **Motion** by CRY: That this Meeting considers that liaison committees organized on a district basis under the National Health Service, and consisting of members representing general practice, hospitals, and public health work, should be commended to all Divisions of the Association.

Divisions and Branch Functions

199. **Motion** by BUCKINGHAMSHIRE: That in the opinion of this Meeting, provided the Divisions in the Branch agree, each Division should be able to take on the functions of that Branch individually; and that the matter be referred to the Council for consideration.

Time Limits for Speeches

200. **Motion** by MID-CHESHIRE: That in order to expedite the work of the A.R.M. and yet allow further discussion of important matters, the time limit for speeches in the future should be reduced on all except specified motions and resolutions.

Delegation and Co-option

201. **Motion** by MID-CHESHIRE: That in order to relieve the burden of the Council and also to stimulate interest in the periphery, wider use should be made of delegation and co-option.

Combining of Annual Scientific and Representative Meetings

202. **Motion** by MARYLEBONE: That this Meeting asks the Council to investigate the possibility of combining the Scientific Meeting and the Annual Representative Meeting so that all members of the Association may have the opportunity of taking part in both the scientific and the medico-political activities of the Association.

Resident Medical Secretaries to Association Regional Offices

203. **Motion** by GLASGOW: That this Meeting recommends for the consideration of Council the appointment of resident medical secretaries to the regional offices in the larger cities throughout the United Kingdom, on the same lines as the successful Glasgow regional office. By such means, there would be decentralization of the Association's activities and a more efficient personal service would be made available to members in each area.

REFORM OF THE NATIONAL HEALTH SERVICE

204. **Motion** by the Chairman of the Amending Acts Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "Reform of the National Health Service" (Docs. A.R.M. 2, para. 73, and A.R.M. 3, para. 231) be received.

205. **Motion** by MARYLEBONE: That this Meeting desires further information on "the appropriate action taken with the Departments concerned on a number of the recommendations" passed by the Special Representative Meeting, December, 1951, and on the recommendations which necessitate amending legislation.

206. **Motion** by the Chairman of the Amending Acts Committee: That the Annual and Supplementary Reports of Council under "Reform of the National Health Service" be approved.

National Health Service and Politics

207. **Motion** by HARROW: That it is undesirable and detrimental to the interests of the health of the nation for the facilities and services of the National Health Service to be the means of gaining political capital, and the Council of the B.M.A. is requested to take such action as will cause the Health Service to be removed from the political arena.

REMUNERATION POLICY

208. **Motion** by the Chairman of the Committee *re* Remuneration Policy on behalf of the Council: That the Annual Report of Council under "Remuneration Policy" (Doc. A.R.M. 2, para. 102) be received.

209. **Motion** by the Chairman of the Committee *re* Remuneration Policy: That the Annual Report of Council under "Remuneration Policy" be approved.

SCOTLAND

210. **Motion** by the Chairman of the Scottish Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "Scotland" (Docs. A.R.M. 2, paras. 171-81, and A.R.M. 3, para. 242) be received.

211. **Motion** by the Chairman of the Scottish Committee: That the Annual and Supplementary Reports of Council under "Scotland" be approved.

WALES

212. **Motion** by the Chairman of the Welsh Committee on behalf of the Council: That the Annual Report of Council under "Wales" (Doc. A.R.M. 2, para. 182) be received.

213. **Motion** by the Chairman of the Welsh Committee: That the Annual Report of Council under "Wales" be approved.

OVERSEAS

214. **Motion** by the Chairman of the Overseas Committee on behalf of the Council: That the Annual Report of Council under "Overseas" (Doc. A.R.M. 2, paras. 183-6) be received.

215. **Motion** by the Chairman of the Overseas Committee: That the Annual Report of Council under "Overseas" be approved.

EMPIRE MEDICAL ADVISORY BUREAU

216. **Motion** by the Chairman of the Committee of Management of the Empire Medical Advisory Bureau on behalf of the Council: That the Annual Report of Council under "Empire Medical Advisory Bureau" (Doc. A.R.M. 2, para. 187) be received.

217. **Motion** by the Chairman of the Committee of Management of the Empire Medical Advisory Bureau: That the Annual Report of Council under "Empire Medical Advisory Bureau" be approved.

INTERNATIONAL MEDICAL VISITORS' BUREAU

218. **Motion** by the Chairman of the Committee of Management of the International Medical Visitors' Bureau on behalf of the Council: That the Annual Report of Council under "International Medical Visitors' Bureau" (Doc. A.R.M. 2, para. 188) be received.

219. **Motion** by the Chairman of the Committee of Management of the International Medical Visitors' Bureau: That the Annual Report of Council under "International Medical Visitors' Bureau" be approved.

MEDICAL FILMS

220. **Motion** by the Chairman of the Film Committee on behalf of the Council: That the Annual Report of Council under "Medical Films" (Doc. A.R.M. 2, para. 189) be received.

221. **Motion** by the Chairman of the Film Committee: That the Annual Report of Council under "Medical Films" be approved.

INTERNATIONAL RELATIONS

222. **Motion** by the Chairman of the International Relations Committee on behalf of the Council: That the Annual Report of Council under "International Relations" (Doc. A.R.M. 2, paras. 190-2) be received.

223. **Motion** by the Chairman of the International Relations Committee: That the Annual Report of Council under "International Relations" be approved.

OTHER ASSOCIATION ACTIVITIES

224. **Motion** by the Chairman of Council: That the Annual Report of Council under "Other Association Activities" (Doc. A.R.M. 2, paras. 193-207) be received.

Catering

225. **Motion** by the Chairman of Council: That para. 197 of the Annual Report of Council be approved.

226. **Amendment** by WINCHESTER: That it is, in the view of this Body, essential to improve the social amenities at Headquarters; and, to this end, this Meeting instructs Council to install a bar in the Hastings Room, with appropriate attendants during normal licensing hours.

227. **Amendment** by WINCHESTER: That Council be instructed to improve the quality of the catering and service in the dining-room.

Mental Illness

228. **Motion** by WANDSWORTH: That in acute mental illness the procedure required in order to obtain effective treatment and supervision is not satisfactory, and that Council be asked to examine and report on the problem.

Remainder of Report under "Other Association Activities"

229. **Motion** by the Chairman of Council: That the remainder of the Annual Report of Council under "Other Association Activities" be approved.

OTHER MOTIONS BY DIVISIONS

Whole-time State Salaried Medical Service

*230. **Motion** by MARYLEBONE: That this Meeting, representative of all branches of the profession, expresses its strong opposition to a full-time State salaried service, and reaffirms the resolution passed in May, 1946, in July, 1953, and again in July, 1954: "The medical profession is, in the public interest, opposed to any form of service which leads directly or indirectly to the profession as a whole becoming full-time salaried servants of the State or local authorities."

231. **Motion** by SOUTH STAFFORDSHIRE: That this Meeting reaffirms its opposition to any form of whole-time State salaried medical service.

Spens Reports

232. **Motion** by MARYLEBONE: That this Meeting reaffirms that the Spens Reports still remain the basis and yardstick in all negotiations on remuneration of doctors in every branch of the National Health Service.

Goodwill

233. **Motion** by HARROW: That this Meeting wishes to register a protest to the fact that such an important matter as the "goodwill issue" was debated by Council for a second time before the A.R.M. of 1954 and the previous decision rescinded after suspension of standing orders without previous notice of the motion being given to members of Council.

Annual Report of Council

234. **Motion** by SOUTH STAFFORDSHIRE: That Council be instructed to include in their Annual Report each year a list of resolutions affecting policy passed by the previous A.R.M. and the action which has been taken on each.

235. **Motion** by HARROW: That this Meeting instructs Council to include in its Annual Report a section tabulating the instructions received from the previous year's Representative Meeting and the action taken in each case.

ELECTIONS

236. **Elect**: Chairman; Deputy Chairman; 10 Members of Council by R.B. as a whole; 2 members of Council by Representatives of Scottish Constituencies; 1 member of Council by Representatives of Constituencies in Wales (including Monmouthshire); and members of Standing Committees and of A.R.M. Agenda Committee.

MINUTES

237. **Motion**: That the Chairman be empowered, on behalf of the Meeting, provisionally to approve the Minutes of this Meeting.

238. Any other business.

DISTINCTION AWARDS TO CLINICAL TEACHERS

STATEMENT BY JOINT CONSULTANTS COMMITTEE

In the terms and conditions of service for hospital medical staff, introduced in 1949, provision was made for the payment of distinction awards to university clinical teachers holding honorary contracts in respect of their hospital work. Thus, the holder of a whole-time clinical teaching post was to receive the whole of any award made, and a part-time teacher the same proportion of the award as his university salary bore to the salary he would have received if his post had been a whole-time one.

After giving the matter a great deal of thought the Ministry came to the conclusion that it was illogical that a clinical teacher, whose contribution to the National Health Service might be comparatively small, should receive the whole of a distinction award simply because he was a whole-time member of a university teaching staff. On the contrary, it felt that the distinction award should bear some relation to the amount of time devoted to the hospital service.

Accordingly, the Ministry approached the Joint Consultants Committee on the matter, and, when advising hospital boards, in 1951, upon the arrangements to be made for the payment of distinction awards to clinical teachers, instructed that they should be notified that the basis of apportionment was provisional and subject to review.

Discussions with Ministry

The Joint Committee and the Ministry thereupon entered into detailed discussion of the problem, in the course of which the Joint Committee consulted representatives of clinical professors, and the Ministry consulted the University Grants Committee and the Committee of Vice-Chancellors.

The view which the Joint Committee conveyed to the Ministry was that, while it was anxious to avoid real anomalies, there were important considerations that should not be lost sight of in applying distinction awards to whole-time clinical teachers. For example, the Committee thought that it would be quite wrong to assume that the contribution of a clinical teacher to the National Health Service should be measured solely on the basis of the time actually spent in hospital. Moreover, it would ultimately be detrimental to the Service if, in seeking a solution to possible anomalies in the payment of distinction awards, anything was done which would have the effect of attracting the best candidates away from an academic career.

As a basis for discussion the Joint Committee therefore suggested (a) that the holders of whole-time clinical teaching posts responsible for a "substantial" amount of clinical work related to the National Health Service should receive the whole of the award, except where they were entitled to engage in private practice and retain the fees accruing therefrom; in these exceptional cases the teacher should be

treated in the same way as a part-time consultant and be paid a fraction of the award directly related to the amount of time devoted to clinical responsibility under the National Health Service; and (b) that in the case of holders of whole-time teaching posts responsible for a "less substantial" amount of clinical work the award should be apportioned in relation to the time devoted to the National Health Service; this, the Committee urged, might in some instances appropriately be assessed as full-time, and in all cases should take account not only of the actual clinical work but of the responsibilities assumed, and of the less easily assessed value to the Service of being constantly on hand for the giving of advice, which contribution to the National Health Service should be liberally assessed.

Agreement

The Ministry accepted this approach to the problem, but felt that it would be necessary to define "substantial" and "less substantial" more precisely in order to determine which teachers should continue to receive the full award, and to work out a basis for apportioning awards in other cases.

To this the Joint Committee agreed, and eventually the formula for applying distinction awards to clinical teachers recently announced was agreed in Committee B of the Medical Whitley Council.

Boards were advised by the Ministry that, before determining the amount of the award in accordance with the formula, the time spent on clinical work by the teacher should be assessed not at a nominal figure, such as might appear in the teacher's honorary contract, but by reference to the average amount of time he might properly be said to spend on such work in actual practice. Moreover, "clinical" work was defined in fairly wide terms, including research related to the diagnosis or treatment of individual patients.

The new arrangements have been notified to hospital boards, and through them to clinical teachers holding honorary contracts to whom distinction awards have been made. It is understood, however, that already difficulty has been experienced in arriving at a fair assessment of the time given by clinical teachers to hospital work, and the Joint Committee wishes to remind any clinical teachers who may be affected by these new arrangements that they should in the first place endeavour to reach agreement with their employing authority on whether the whole award, or what proportion of it, would be appropriate in their case. Where agreement is not possible, the Joint Committee wishes to remind those concerned of the Ministry's instruction that in cases of difficulty boards may refer to the Ministry for guidance. In any case the Joint Committee itself would be very pleased to advise in individual cases.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.
Urban District Councils.—Houghton-le-Spring.

The following amendments to the *National Formulary, 1955*, have been issued: Page 15, line 24: for "sodium carbonate" read "exsiccated sodium carbonate"; Page 27, lines 14 to 19: amend to: "The usual dose [of chloramphenicol] for adults is 2 to 3 grammes, daily, in divided doses at six-hourly intervals. Children should receive 50 to 75 milligrams per kilogram of body weight, daily, in divided doses. The total dose for adults should not exceed 26 grammes; for children it should not exceed 100 milligrams per kilogram (2.2 lb.) of body weight for seven days"; Page 107, lines 24 to 26: amend to: "When mist. alumin. hydrox. et bellad. is prescribed, mist. alumin. hydrox. containing tincture of belladonna, 7½ m. in each dose, shall be dispensed. Dose: One teaspoonful, suitably diluted."

PRIVATE PRACTICE COMMITTEE

A meeting of the Private Practice Committee of the Association, under the chairmanship of Dr. ALEXANDER BROWN, was held on May 4.

Dr. T. L. SCOTT, honorary secretary of the Medical Officers of Schools Association, attended for a discussion on a matter which had previously occupied the Committee, the practice of boarding schools to place all their pupils on the list of the school medical officer, treatment being given under the National Health Service. Some members of the Committee had felt that an important point of principle was involved here, and that parents should have freedom of choice, not only to select a doctor for their children at school, but also to decide whether treatment should be under the National Health Service or given privately. Dr. Scott said that his association felt that any alteration of the present arrangements whereby all pupils were on the list of the school medical officer would be impracticable. Moreover, it would be psychologically bad for the individual pupil to be isolated from the rest of his community so far as medical treatment was concerned, and might deprive him of the nursing and sanatorium facilities which boarding schools provided.

In discussion it was pointed out that the choice had really been made before the pupil entered the school, and that "freedom of choice" must be modified in these circumstances. Dr. O. C. CARTER contended that although it might be administratively convenient to have all the pupils in one school under one doctor it did cut across the principle of private practice. Dr. L. W. BATTEN pointed out the hardship on the child or the parent who had no confidence in the school doctor. Others, however, argued that the free choice lay in the choice of the school, which included the medical officer. One member said that Dr. Scott had referred to the psychological effect on the isolated child who was receiving treatment in a different way from the rest of the school, and asked why he should be considered as isolated. Under different arrangements, might there not be many parents who would choose to have their children treated privately? Dr. SCOTT replied that requests to that effect had been very rare.

The Committee came to the conclusion that, although this special position cut across the principle of private practice, the headmaster, while the children were at boarding school, was in the position of parent, and had the right to choose a doctor for his pupils just as he chose a teacher for them, and that it would be undesirable to alter existing practice.

Payment of Admiralty Surgeons

The Committee also received a practitioner who had protested against the new scheme of payment for Admiralty surgeons and agents who were also in contract with the N.H.S. He said that in his case the new rate—a temporary resident fee plus mileage—worked out at a financial disadvantage. Some members of the Committee suggested that Admiralty surgeons were not really in a different position from other practitioners in regard to the treatment of Service personnel on leave as temporary residents, but it was agreed to take up with the Admiralty the special points which had been brought forward.

At a previous meeting the Committee had agreed to recommend that practitioners engaged predominantly in private practice should be asked whether they wished to prescribe for private patients on Form E.C.10, and would agree to any reasonable safeguards against wrongful prescribing. This was in connexion with the question of the provision of drugs for private patients. When the recommendation came before Council, however, it was withdrawn on the request of the Chairman of the General Medical Services Committee, and that Committee subsequently asked that it should be amended by the substitution of the word "solely" for "predominantly." After some discussion the amendment proposed by the General Medical Services Committee was accepted.

The Committee had before it a report that some 15 nominations had been made by Divisions in England in connexion with the selection at the Annual Representative Meeting of six candidates for the support of the Association in the election to the General Medical Council in April, 1956. A member drew attention to the fact that the direct representatives on the General Medical Council were the only representatives of general practice on that body, the other members being academic representatives and so forth, practically all of them specialists or teachers. Direct representation was therefore the only port of entry for general practitioners, and that was a point to be borne in mind in deciding on nominations.

The question of revising previous agreements on fees for medical examinations and reports in the light of the recent increase in the fee for the ordinary form of life assurance was considered. A document setting out the details of fees agreed by the Committee since the war was put in, and it was agreed to remit the examination to a small subcommittee headed by the Chairman.

Hire Purchase Control Order

It was reported that representations had been made to the Board of Trade seeking a special concession, similar to that made under the previous Order, to enable young doctors entering practice to purchase their initial car over a period extending to three years. It was reported that the Board of Trade had indicated that no general relaxation of this kind could be entertained, and that the type of concession sought must be reserved for dealing with quite exceptional individual emergencies.

Candidates for Teachers' Training Colleges

The Ministry of Education is to be asked to agree to the completion by the candidate's own doctor of medical reports required for admission to teachers' training colleges.

Representations for an increase in fees are to be made to the New Zealand Government for the examination reports required by emigrants, and to the Services departments for certificates of inoculation of families proceeding overseas.

TIME IN COURT

At the 1954 Representative Meeting in Glasgow a resolution from Swansea was debated (*Supplement*, July 10, 1954, p. 13) calling on the Association to approach the Lord Chancellor's Department to seek drastic changes for the better in the present methods of calling and hearing medical witnesses. This resolution, which was referred to Council, had arisen as the result of a case in which it was stated that a single-handed general practitioner had been required to spend four days away from his practice, his evidence being taken only on the fourth day.

Recently a deputation from the Medical Witnesses Subcommittee of the Private Practice Committee met representatives of the Lord Chancellor's Office at the House of Lords, and the difficulties of doctors attending court were discussed. A number of cases were quoted. Stress was laid on the shortness of the notice given to attend court and the consequent difficulties in making deputizing arrangements. Assurance was received that the points raised, and the suggestions made for relief of the difficulties, would be put before the Lord Chancellor. In addition, an undertaking was received that the Department would be prepared to look into any case brought to the notice of the Association where serious and apparently unnecessary hardship had been caused to medical witnesses.

Dr. S. A. Forbes has retired from the chairmanship of the Croydon Executive Council. At a meeting of the Council tributes were paid to Dr. Forbes's work over a long period for Croydon's Health Services, and a presentation was made to him and Mrs. Forbes.

THE DAIN FUND

REPORT OF THE TRUSTEES, 1954-5

This report covers the period April 21, 1954, to April 20, 1955, during which many requests for advice and help have been received. It has been possible for the Fund to continue the grants for the school year 1954-5 to three old applicants and in addition to assist eight new cases. The continuing grants involve an expenditure of £191. Satisfactory reports have been received on the progress of these children from the schools and universities at which they are studying.

Grants to meet sudden financial emergencies were made in connexion with three of the new cases:

Case 1.—A doctor's widow applied for help towards the school fees of one of her three children in order that he might remain at his present school until he sat for the Epsom College entrance and scholarship examination.

Case 2.—A young newly qualified doctor asked for assistance towards his daughter's school fees during his pre-registration year.

Case 3.—An elderly doctor, who had retired from practice owing to ill health, was finding great difficulty in maintaining his son during his final year of music study. The Trustees were able to ensure that the boy's studies would not be interrupted.

The grants allowed in these emergencies amounted to £145. Details of the other new applicants are given below:

Case 4.—The son of a deceased doctor asked for help with his university fees. He had embarked on a three-year course of training with a view to taking up teaching. He is also being assisted by the Royal Medical Benevolent Fund, and it is hoped that, after his first year, the local education authority will be prepared to make a grant available to him.

Case 5.—A doctor's widow made application for assistance for her two children, both training for the medical profession. The younger child holds a scholarship to the medical school and is in receipt of a Ministry grant.

Case 6.—A doctor's widow made application for help towards the medical school fees of one of her sons. A younger boy, still at school, is in receipt of a bursary and his fees are at present fully met.

Case 7.—A doctor's widow asked for help to maintain her son at university, where he is training to be a doctor.

Case 8.—A doctor's widow applied for assistance towards the school fees of one of her two daughters. It was possible, in co-operation with the local medical committee, to make arrangements for this child.

The grants allowed in these cases amounted to a total sum of £594. It is likely that some of these applicants will need assistance over a number of years.

This report shows the importance of the work of the Dain Fund, a total of £930 having been given in grants during the past year.

The support of many individuals and committees is greatly appreciated by the Trustees. As the Fund relies almost entirely on this support the Trustees are particularly grateful to those local medical committees who so generously give regular contributions. It is hoped that other committees will follow their example and that members of the profession will give real and practical help to the Fund by completing a form of covenant for seven years or by sending a donation to the Secretary.

The Trustees wish to acknowledge the help and co-operation of the Royal Medical Benevolent Fund, the Royal Medical Foundation of Epsom College, and certain local medical committees for their share in the responsibility of some of the cases assisted during the year.

H. GUY DAIN,
Chairman of the Trustees.

If draft regulations submitted to the National Insurance Committee are approved, people will be able to draw their benefit in any country in the world. At present National Insurance retirement pensions, widows' benefits, or guardian's allowance can be paid to people resident abroad only if they are living in the Commonwealth or in the Republic of Ireland.

HEALTH SERVICES IN NORTHERN IRELAND

In June of last year the Minister of Health and Local Government in Northern Ireland (Dame Dehra Parker) appointed a committee to look into the health services of the province. Its terms of reference were restricted to matters mainly local in character, falling outside those of the Guillebaud Committee which are common to both Northern Ireland and Great Britain, but inevitably there has been some overlapping. The chairman of the committee was Mr. H. G. TANNER, for seven years chairman of the South-western Regional Hospital Board, Bristol, and the other members were Sir GEORGE HENDERSON, lately Permanent Secretary of the Department of Health for Scotland, and Mr. J. V. S. MILLS, formerly Chief Crown Solicitor for Northern Ireland. The committee, to which the Northern Ireland Branch of the British Medical Association, along with many other bodies, gave evidence,¹ has now reported.²

The administrative structure of the National Health Service in Northern Ireland differs from that of Great Britain in that the powers are placed in the hands of nominated bodies which cannot readily be called to parliamentary account. The principal body is the Hospitals Authority, which provides hospital and specialist services throughout the province, and whose members are appointed by the Minister with the proviso that not fewer than one-third must be medical practitioners, and not less than one-fourth must be appointed in consultation with management committees. The other principal body is the General Health Services Board, which arranges for the provision of general medical and other services and controls the admission of doctors to the medical list. Its members are again appointed by the Minister with certain provisos.

Criticisms of the Service

There has been some parliamentary criticism of the service, but except on one point—a constitutional one—this does not seem to have been directed to any laxity or maladministration. The Hospitals Authority has indeed an impressive record of achievement. During the seven years of its existence the number of hospital beds has increased by 10%, laboratories have been built or enlarged, and x-ray departments provided. Admissions to hospitals in 1953 were 40% higher than in the year before the health service was instituted, and out-patient attendances have increased by 77%.

"The general picture," says the report of the committee, "is of vigorous and continuous growth. . . . In a field where true comparisons are difficult to make, we venture the opinion that the Northern Ireland record of progress in the last few years will bear examination against the record of any other area of the United Kingdom."

Nevertheless, the committee has a sheaf of recommendations to present. The chief of these is that the Hospitals Authority and the General Health Services Board should become agents of the Ministry. It is with the Ministry and not with nominated bodies that responsibility at the highest level for finance and policy should rest. At present the status of these bodies is equivocal. If the recommendation is carried out these authorities will be in the same position in respect to the Ministry as the regional hospital boards in Great Britain.

The committee goes on to make certain detailed recommendations: that the number of members of the Hospitals Authority should be 20 or 24 instead of a possible 37; that only one-fourth and not one-third should be doctors; that the terms of office of members should be reduced from five years to three; and that, both on the Hospitals Authority and on hospital management committees, members who have served for two consecutive terms should be ineligible for reappointment for twelve months. It is also felt that the

hospitals should be in fewer groups; at present 36 hospital management committees control 67 hospitals. A more equitable distribution of hospital endowments is suggested, not a strict pooling, but some redistribution whereby each management committee may have a reasonable fund at its disposal. At present, to take an extreme case, a general teaching hospital has several hundred thousand pounds' worth of endowments under its control, while a hospital of similar size, though not strictly of comparable type, has virtually no endowment funds.

Consultant Appointments

It is recommended that, while hospital management committees should be consulted about consultant appointments, the Authority should not be required to consult hospital or medical staffs committees; any consultation of the latter should be by the management committee. Contracts held by consultants and specialists should be reviewed at regular intervals. Facilities should be afforded to consultants and specialists to keep abreast of the latest developments of medical knowledge by attending teaching hospitals in Belfast. Distinction awards should not be made by the Authority—a practice which might lead to the suspicion of nepotism or corruption, though the committee is careful to say that the integrity of the present awards committee is beyond reproach. It favours distinctions being granted through a central committee having jurisdiction over the whole of the United Kingdom, to which Northern Ireland advisers could be attached.

General Practice

With regard to the General Health Services Board, whose functions are primarily regulatory and offer less scope for the determination of policies with important financial implications, the committee nevertheless recommends that, like the Hospitals Authority, it should become the agent of the Ministry, the size of its membership be reduced, and the proportion of its lay membership be increased. Part-time appointments of general practitioners to hospitals should be encouraged, and opportunities given to hospital doctors to engage in part-time general practice. The young graduate in the early stages of his career should not be confronted with the formal choice of a career in hospital or in general practice.

The committee has examined the possibilities of some alternative method of payment for general practitioners, such as a basic salary combined with a smaller capitation fee or payment on a fee-for-service basis, but neither commends itself. The first would be an uneasy compromise, and the second would create more difficulties than it solved. Nor does it suggest any change in the present limits of maximum permitted lists.

Some criticism has been made of the General Health Services Board on the ground that it has not so far established a health centre in the province; recently it has been more attracted by the idea of encouraging group practice. The committee thinks it would be desirable if the Board were, in collaboration with the professions concerned, to establish a small centre as a pilot scheme. Experiments in group practice could proceed simultaneously.

Prescribing and Certification

High prescribing costs are troublesome in Northern Ireland as elsewhere. Prescribing costs there are higher than the average for England or Scotland. Figures for individual, areal, and provincial costs are to be issued quarterly to practitioners, and it is hoped in this way to elicit their co-operation. Consultants cannot escape responsibility. They frequently call for the prescription of most expensive drugs on a lavish scale. One consultant is mentioned as prescribing 11 different items for a single patient.

An even more serious indictment concerns lax certification. Doctors interviewed by the Ministry invariably say

that they would lose their patients if they adopted more rigorous standards. One practitioner said that he never refused a certificate. The committee thinks that the practice of interviewing doctors whose certification appears to be lax should be continued, and the possibility of disciplinary action under the regulations should not be dismissed. A concerted effort should be made to bring home to general practitioners the necessity for a higher standard of certification, and it is suggested that the British Medical Association would be prepared to co-operate with the Ministry in this respect.

The committee concludes on an appreciative note. Given the spirit of subordinating local interests to the common good, it sees no reason "why the health services of Northern Ireland, an area small enough to simplify the task of co-operation at all levels, should not be among the most efficient and effective in the United Kingdom."

THE HOSPITAL, THE G.P., AND THE DISTRICT NURSING SERVICE

The Queen's Institute of District Nursing held a meeting at Church House, Westminster, on May 12, when the subject of discussion was the link between the hospital, the general practitioner, and the district nursing service. In the discussion, to which hospital almoners and district nursing superintendents contributed, the general-practitioner point of view was put forward by Dr. G. O. BARBER, of Great Dunmow, Essex.

Dr. Barber said that the link between the general practitioner and the nursing service was a close one, but the link between the hospital, the general practitioner, and the nursing service was tenuous and non-existent. His personal experience of district nurses was confined to rural areas, where the nurse was in the same position in relation to the general practitioner as the house staff of a hospital in relation to the consultant. She knew what was going on in the village, the general set-up and the social background, much better than the practitioner did, and it was from the district nurse that he obtained much useful information about the anxieties and difficulties in the homes of his patients. There were six district nurses in his neighbourhood, Dr. Barber said, and he met every one of them at least once a week. He worked with them nearly as closely as a doctor in a hospital worked with the nurses there, and he felt that this happy relationship should be extended into the towns so far as possible. The difficulty in the towns was that a district nurse might cover an area where there were as many as sixty doctors, and she could hardly keep in touch with all of them.

Teaching the Student

Until he had started in general practice in Essex, about two years after he had qualified, he had not known even of the existence of district nurses, but this lack of knowledge on the part of medical students and young house-surgeons was now realized and was being remedied. Until recently medical students had not been taught anything about general practice and the way in which it differed from hospital work, but now, during their time in hospital, they were being sent out to general practitioners, so that they could see a little of the work that was done by general practitioners, the treatment that they gave to their patients, and the kind of relationship which they had with their patients. The general practitioners to whom the students were sent should also introduce them to the workers in the other health services, including the district nurse and the health visitor.

Dr. Stephen Taylor, in his book entitled *Good General Practice*, had devoted a chapter to the work of the district nurse, which he regarded as of great importance, and he referred to the very great variations that existed in different parts of the country. Dr. Taylor had said that in some

districts the hospital, the general practitioner, and the district nurse worked closely together, whereas in other districts the general practitioner was hardly conscious of the existence of the district nurse and did not want her help.

The health visitor also should be a member of the team, and the link should be extended to her. It was only recently that she had been encouraged to get into contact with the local general practitioners, but unless she did so she would not be of as much help to the patient or to the health service as a whole as she might be. She could be of particular help in the case of problem families.

Getting Together

To the district nurse he would say: "Get to know your general practitioners. Push past any little difficulties there may be, particularly with the young ones, and sometimes with the old-established ones." To the general practitioner he would say: "The important thing is to get to know your district nurses." To the health visitor he would say: "Get to know your general practitioners. Show them that you want to help them." To the teacher in the hospital he would say: "Learn something about general practice before you set up to teach young students to be general practitioners, and if you start scratching the surface of general practice you will come across the district nurse straight away."

He would like, in conclusion, to describe a way in which an attempt was made to carry this out in the little place in Essex where he practised. For many years now it had been the custom for a bus-load of medical students to come there from hospital one afternoon in the summer, and he and his wife invited them to an afternoon party, to which they invited also the other doctors in the neighbourhood and their wives, the dispensers and the secretaries, the district nurses with their bags, the health visitors, the local medical officer of health, the assistant medical officer of health, the duly authorized officer, and others. After the medical students had been introduced to them in the garden, the different sections of workers went to different rooms in the house, and the students spent about half an hour in each room. The district nurses had a large room to themselves, where they spread out all their equipment. The students returned to London with a different idea about general practice and about the subject which would play such a large part in their future lives—the link between the hospital, the general practitioner, and the district nursing service.

HEALTH SERVICE FRAUDS IN SCOTLAND

In his report in the summarized accounts (published as a White Paper, H.M.S.O.) for the year ended March 31, 1954, of the Scottish regional hospital boards, boards of management, executive councils, and Dental Estimates Board, the Comptroller and Auditor General, Sir Frank Tribe, refers to two cases of fraud. One case concerned a hospital board of management and the other an executive council. According to a report in the *Scotsman*, Sir Frank Tribe said that both frauds—one involving the sum of £5,919 and the other £8,309—were made possible by failures "to observe normal rules and safeguards in the conduct of financial transactions."

In the board of management fraud the loss was owing to misappropriation of cash receipts by a cashier over a period of more than two years. The other case occurred through the defalcations of the former clerk and finance officer to an executive council over a period of four years from 1949. Both men received prison sentences. In the executive council case members of the council had signed incomplete or blank cheques.

Health Service authorities in Scotland have been informed that in no circumstances are cheques to be signed unless they are complete in every respect and are supported by documentary evidence enabling the signatories to verify that the payments to be made are fully approved and in order.

¹ Supplement, May 14, p. 230.
² Belfast: H.M. Stationery Office. Cmd. 334. 3s. net.

CENTRAL CONSULTANTS AND SPECIALISTS

An all-day meeting of the Central Consultants and Specialists Committee was held on May 12, with Dr. T. ROWLAND HILL in the chair.

Proposed Conference of Hospital Medical Staffs

The CHAIRMAN reported that at the request of the Committee the Executive had considered the advantages and disadvantages of holding a representative annual conference of hospital medical staffs. Such a conference would enable problems affecting hospitals and consultants services to be ventilated on a national scale, and there were other obvious advantages. The difficulty lay in arranging a representative conference which was not unwieldy. There were 500 management committees throughout the country, and even one representative sent up from each group hospital medical advisory committee would produce a conference unreasonably large. Nevertheless it was thought that the advantages outweighed the disadvantages.

Mr. C. E. KINDERSLEY pointed out that there already existed regional committees which, coming together, might well form the basis for any conference designed to elicit consultant opinion, and he suggested that the regions should discuss this matter before any new organization was evolved.

Dr. D. F. HUTCHINSON said that on the side of general medical services the annual conference of representatives of local medical committees had proved very valuable; but, in reply to a suggestion that one of the possible advantages ascribed to a consultants' conference was that it would enable the forces of publicity to be marshalled in support of consultants' interests, he stated that the press had always been excluded from the conference of local medical committees.

It was agreed that before proceeding further with the idea, which was generally favoured, the views of the regional committees should be sought.

Waiting-time in Out-patients

It was reported that a questionnaire on waiting-time in out-patients was to be sent to all hospital group committees. It was the view of the Committee that the questionnaire would be useful from the point of view of ascertaining the correlation between the number of patients and the number of nursing and lay staff in attendance. Professor STRACHAN pointed out that one factor often overlooked was the number of patients who turned up at the hospital without any appointment.

Civilian Consultants Employed by War Office

The CHAIRMAN said that the terms and conditions of civilian consultants employed by the War Office were being examined. The Armed Forces Committee of the Association had submitted proposals for improvement in remuneration and conditions of service of serving officers, and it was agreed that consultations should take place on the subject between representatives of the Consultants Committee and of the Armed Forces Committee.

Hospital Medical Staffing

The CHAIRMAN gave a report on the consideration given by the Joint Committee to the revised report of the Medical Staffing Committee and the comments made upon it. Preliminary discussions had been opened with officers of the Ministry.

It had been made clear to the Ministry that the Joint Committee had in mind a survey of consultant establishments initiated at the periphery, the results of which should be collated at regional level and submitted to a central committee on which the profession would be represented.

Outline for Whole-time and Part-time Service

The Ministry and the Joint Committee had agreed to a statement to be published in the medical press on the

question of option for whole-time and for maximum part-time service for consultants in the National Health Service.

Mr. HOLMES SELLORS said that this statement was an advance on anything which had been said before. Hitherto they had had oral statements; now they had it in black and white. Mr. LAWRENCE ABEL referred to the indefiniteness of whole-time employment. Did it mean that the whole-time consultant was to do no medical work outside his prescribed 38½ hours a week? One whole-time consultant on the Committee stated that one of his colleagues—also a whole-timer—had recently been working 60 hours a week. Mr. LAWRENCE ABEL thereupon asked why their colleagues should be allowed to do double time without being properly paid for it. It was also pointed out that part-time consultants were frequently putting in far more than the prescribed time, some surgeons operating for six or eight hours in what was called one session.

Remuneration of S.H.M.O.s

The representative of the S.H.M.O. Group Executive Committee brought forward a resolution of his Group expressing grave dissatisfaction at the rejection by the Management Side of the Staff Side's claims for an increase in the salaries of S.H.M.O.s (*Supplement*, May 7, p. 220) and for remuneration in accordance with the consultant scale of all S.H.M.O.s occupying posts established as consultant or which would, for the purpose of replacement, be so regarded.

He said that at the meeting of his Group extreme dissatisfaction was expressed at the refusal of this reasonable claim, and it was urged that both matters be pressed to arbitration at the earliest possible moment. The differential award last year had occasioned a good deal of bitterness, but they had been led to believe that the justice of their claim would still be recognized. It was difficult for the rank and file S.H.M.O.s not to feel that they had suffered a further decline in status. It was not solely a question of the inequity of the award of April, 1954, from the point of view of cost of living or the Spens report; the S.H.M.O. was now one of the most poorly paid grades in medicine, and the rejection of so modest a claim was a bad omen for other claims, especially those put forward in the Strachan report.

Mr. NICHOLSON-LAILEY, Dr. PETER EDWARDS, and other members of the Committee supported this protest, and it was agreed to pursue these matters with the Management Side. The S.H.M.O. Group Council also asked for permission to appoint a second representative on the Central Committee, which, the single representative said, would be of great assistance in putting forward their point of view.

After some discussion, however, it was felt inadvisable to add to the number of seats on the Committee. On another point concerning S.H.M.O. representation on regional committees, the CHAIRMAN pointed out that the organization subcommittee of their own Committee was studying the problem. It was agreed to ask the subcommittee to look into both proposals concerning S.H.M.O. representation.

Mileage Allowances

Detailed statements on the estimated cost per mile of running and maintenance of cars, obtained from the Automobile Association and the Royal Automobile Club, were remitted to the Executive for examination and comparison with the present mileage allowances paid to hospital staff.

Part-time Consultants' Income Tax

A report was laid before the Committee of a meeting between representatives of the Association, headed by the Chairman of the Committee (Dr. Rowland Hill), and of the Board of Inland Revenue on the question of assessment of part-time consultants for income tax. (The report appeared in the *Supplement* on May 14, p. 227.) Dr. Rowland Hill was congratulated by the Committee on the way in which he had presented the case.

It was pointed out that it might help to allay the anxieties of consultants if attention were drawn to the significant point that Somerset House agreed explicitly that any man who was running his private practice at a loss could set off his loss against his hospital salary. This document might well be brought to the attention of local inspectors of taxes. Another point was that the officials of Somerset House expressed themselves ready to co-operate in the test cases. It was made clear that the report was an agreed one between the officials of Somerset House and themselves.

Correspondence

The Problem of the Aged

SIR.—The mis-statements attributed to Lord Beveridge in his Winchester Address (*Supplement*, April 30, p. 207) cannot be allowed to pass. Table I shows his figures for the age distribution in Great Britain together with those from the Registrar-General's *Quarterly Return for England and Wales* adjusted to Great Britain by the addition of one-ninth for Scotland.

TABLE I.—Age Distribution, Great Britain, in Millions

Age Group	1951 B.	1953 R.-G.	1973 R.-G.	1979 B.	1983 R.-G.
0-14	6.0	11.0	10.3	5.5	10.4
Men 15-64, women 15-59	22.0	31.4	31.9	24.0	31.6
Men 65 and over, women 60 and over	6.8	6.9	9.2	9.5	9.8
Total	34.8	49.3	51.4	39.0	51.8

B., Lord Beveridge; R.-G., Registrar-General.

It will be seen that Lord Beveridge credits the country with little more than one-half of the children and only about two-thirds of the workers actually existing. Table II shows that Lord Beveridge is equally at fault in his estimate of the number of workers per pensioner.

TABLE II.—No. of Workers per Pensioner

	1951	1953	1973	1979	1983
B.	3.25	4.6	3.7	2.5	3.3
R.-G.					

Apart from these inaccuracies Lord Beveridge makes two cardinal blunders. In the first place, he says that the problem of the aged "arose through the dramatic decline of birth rates in Britain 75 years ago, changing the age structure of our population in this century." Between 1891 and 1931 the number of births fell by about one-third. Suppose this change had taken place suddenly in 1892, that the number of births had since remained unchanged at the lower figure (as indeed it did) and there was no change in mortality. The resulting age distribution would have been as shown in Table III.

TABLE III

Age Group	1891		1921		1951		1981		1983 Projected by R.-G.	
	No.	%	No.	%	No.	%	No.	%	No.	%
0-14	10.4	35.0	7.0	29.7	7.0	34.0	7.0	35.0	9.4	20.1
M 15-64, F 15-59	17.4	58.7	14.7	62.3	11.7	57.0	11.6	58.7	28.6	61.0
M 65 and over, F 60 and over	1.9	6.3	1.9	8.0	1.9	9.0	1.3	6.3	8.8	18.9
Total	29.7		23.5		20.6		19.8		46.8	

Figures in millions.

By 1921 pensioners, unchanged in number, would have risen from 6.3 to 8.0 through the decline in those aged 0-30. By 1951 the percentage of pensioners would have risen still further to 9.0 because all the workers as well as

the children would have suffered a one-third loss. By 1981 the pensioners would themselves have become involved in the one-third loss, so that the original age distribution would have been restored. A drastic reduction in births therefore has only a transient effect on the percentage of pensioners.

I have assumed that after 1891 the number of births remained constant at the lower figure. Actually this could not have happened. For the reduction in children would in course of time have led to a reduction in parents, and this in turn to a further reduction in children. A fall in the birth rate acting alone must continue until the race is extinguished.

The fall in the birth rate was accompanied by a more momentous event, a rise in the expectation of life. This brings us to Lord Beveridge's second blunder, his statement that "the whole problem was one for the next 30 to 50 years. The distortion of the age structure would pass." But how can it pass? The whole aim, or at least the chief aim, of the Welfare State is to increase the expectation of life, to convert the triangular age-pyramid into a rectangle, so that everyone lives to 80 or 90. Comparison of 1891 and the projection for 1983 (Table III) shows how far we are moving in this direction. An aged population is a permanent feature of civilized society. Nothing could prevent it except wholesale slaughter of the aged. The sooner everyone understands this the better. It is astonishing that Lord Beveridge appears to have such an imperfect comprehension of the consequence of policies which he has done so much to further.—I am, etc.,

Chesham.

FERANGCON ROBERTS.

Anonymity in Broadcasting

SIR.—Professor L. J. WITTS has expressed the opinion that "it is contrary to the public interest that responsible medical men should be prohibited from speaking or appearing in person in sound and visual broadcasting" (*Supplement*, January 8, p. 12). Dr. F. H. TYLER, of Birmingham, believes that "no other profession has attempted to impose such a ridiculous restriction on the presentation to the public of the views and personalities of its members . . . broadcasting provides unrivalled opportunities for the doctor as a health educator which are vitiated by anonymity" (*Supplement*, January 22, p. 23).

In paragraph 105 of this year's Report of Council it is stated that "the Council has under review the question of the publicity arising when medical practitioners take part in radio and television programmes or contribute to the Press" (*Supplement*, March 19, p. 95). The question is undoubtedly one of the first importance to the life of the profession and should be carefully considered from different points of view by the Representative Body. May I suggest that the Agenda Committee could help by arranging for the report of the Central Ethical Committee to be discussed at a much earlier stage in the proceedings of the forthcoming A.R.M.? I endeavoured to express a dissentient view when the report of the Central Ethical Committee was being considered at Cardiff in 1953. It was most difficult: many members had left for home and others on the platform and in the body of the hall had their eyes on the clock. On that occasion I did submit that anonymous views and statements by professional men were most undesirable. Indeed, Sir, the serious disadvantages of anonymity may well outweigh those of improper publicity.—I am, etc.,

West Clandon, Surrey.

C. P. WALLACE.

Remuneration of Public Health Medical Officers

SIR.—There will be profound disappointment at the award of the Industrial Court (*Supplement*, May 7, p. 214), which leaves public health medical officers still the worst-paid branch of the profession. I cannot agree with your annotator (*Journal*, p. 1142) that the "long-term effect . . . is difficult to foresee." I should have thought it was all too obvious that the long-term effect will be to discourage

the recruitment of able and ambitious men to preventive medicine. The most disturbing feature of the award, however, is not the meagre increases granted but the fact that local authorities are still given discretion in fixing salary scales within a range determined by population. I understand the Association has not yet finished fighting the more clamant injustices which followed the earlier award, and medical officers of county boroughs, health resorts, and similar areas with special claims can have but little confidence that they will receive adequate recognition for their additional responsibilities.

The employers' argument that the earlier award (No. 2285) showed that the Court accepted the principle of parity with other local government officers is refuted by the fact that the minimum commencing salaries for medical officers were fixed at a higher point than those of comparable local government officers. This principle has been adhered to in the present award, although it can be rendered nugatory by the employing authority giving the medical officer of health a smaller increment above his minimum than the other officers receive above their respective minima, and thus equalizing the salary scales of the various officers.

What is the next step? It is gratifying, if surprising, to read that "both sides to the dispute were agreed that . . . they would be able to agree on the salaries of the remaining categories of medical officers." Under Award No. 2321 deputy medical officers at present receive a commencing salary which is 66½% of the minimum of the scale adopted for the medical officer of health and the same increments. Other deputy local government officers, however, are remunerated in accordance with a series of scales recommended by the Joint Negotiating Committee for Chief Officers of Local Authorities in 1952, and revised in January, 1955. Some, if not all, authorities have placed these deputies on salary scales which represent a significantly lower fraction than 66½% of the relevant chief officer's salary, and carry lower increments.

In 1951 the Staff Side claimed, unsuccessfully, that a deputy medical officer of health should receive 75% of the medical officer of health's commencing salary. There will undoubtedly be an attempt now to secure the application of the J.N.C. scales to deputy medical officers of health. It should be made abundantly clear that anything less favourable than the 66½% ratio awarded by the Court in 1951 will be wholly unacceptable. May I end on a note of thanks to our representatives? We are not sufficiently numerous to be politically important and have voluntarily renounced the right to strike. I hope there will be no disposition to blame our negotiators for the unsuccessful outcome of their efforts. I should, perhaps, make it clear that my remarks are of general application and are not intended to anticipate the decision of any individual authority.—I am, etc.,

Thorpe Bay.

J. C. PRESTON.

Association Notices

Diary of Central Meetings

MAY

- 24 Tues. Joint Conference on Meat Production and Control, 3 p.m.
- 25 Wed. Evidence Committee on Divine Healing, 10 a.m.
- 25 Wed. Committee on the Control of Medical Manpower in War, 2 p.m.
- 25 Wed. Staff Side, Committee "C," Medical Whitley Council, 2 p.m.
- 31 Tues. Joint meeting of the Coroners and Medical Witnesses Subcommittee, Private Practice Committee, 2.30 p.m.
- 31 Tues. Library Subcommittee, Science Committee, 3 p.m.

JUNE

- 1 Wed. Annual Representative Meeting, 10 a.m.
- 2 Thurs. Annual Representative Meeting, 9.30 a.m.
- 3 Fri. Council, 9 a.m.
- 3 Fri. Annual Representative Meeting, 10 a.m.

- 4 Sat. Annual Representative Meeting, 9.30 a.m.
- 4 Sat. Council (at conclusion of A.R.M.).
- 4 Sat. Annual General Meeting and Extraordinary General Meeting, 12.30 p.m.
- 16 Thurs. Executive Subcommittee, Joint Formulary Committee, 2 p.m.
- 16 Thurs. Subcommittee on Coal Gas Poisoning, Science Committee, 2 p.m.
- 24 Fri. Consulting Pathologists Group Committee, 11 a.m.

Branch and Division Meetings to be Held

BATH, BRISTOL, AND SOMERSET BRANCH.—At Grand Atlantic Hotel, Weston-super-Mare, Saturday, May 21, 8.30 p.m., meeting. B.M.A. Lecture by Dr. Ffrangcon Roberts: "Are Doctors Necessary?" Members' wives are invited, and any lay persons who may be interested are welcome.

BELFAST DIVISION.—At Rooms of the Pharmaceutical Society of Northern Ireland, 73, University Street, Belfast, Tuesday, May 24, 8.30 p.m., annual meeting.

BRADFORD DIVISION.—At Medical Societies' Room, Bradford Royal Infirmary, Wednesday, May 25, 8.15 p.m., A.G.M.

CARDIFF DIVISION.—At Miners' Rehabilitation Centre, Talygar, Wednesday, May 25, (1) 3 p.m., demonstration of work carried out at the Hospital; (2) 5 p.m., annual general meeting.

CHELSEA AND FULHAM DIVISION.—At Fulham Town Hall, London, S.W., Friday, May 27, 9 p.m., annual general meeting.

CITY DIVISION.—(1) At Mildmay Mission Hospital, Austin Street, Bethnal Green, London, E., Tuesday, May 24, 8.30 p.m., clinical meeting. (2) At Hackney Hospital (G5 Ward), Homerton High Street, London, E., Wednesday, May 25, 2 p.m., film meeting.

DORSET DIVISION.—At Askers Roadhouse, near Bridport, Monday, May 23, 8.30 p.m., meeting.

EASTBOURNE DIVISION.—At Princess Alice Memorial Hospital, Eastbourne, Tuesday, May 24, 8.30 p.m., meeting.

GLASGOW AND WEST OF SCOTLAND BRANCH.—At Belvidere Infectious Diseases Hospital, Glasgow, Wednesday, May 25, 3 p.m., annual general meeting, followed by visits to, and inspection of, the new Tuberculosis Clinic, the new Admission Unit, and the Poliomyelitis Unit, with a demonstration of positive pressure respirator.

HASTINGS DIVISION.—At Royal East Sussex Hospital, Hastings, Tuesday, May 24, 8.15 p.m., annual general meeting.

HUDDERSFIELD DIVISION.—At Huddersfield Royal Infirmary, Tuesday, May 24, 8.15 p.m., general meeting.

KENSINGTON AND HAMMERSMITH DIVISION.—At St. Charles's Hospital, Ladbroke Grove, London, W., Friday, May 27, 3.30 for 4 p.m., clinical meeting.

MID-HERTS DIVISION.—At Mid-Herts Wing, St. Albans City Hospital, Friday, May 27, 8.15 p.m., clinical meeting.

NORTHERN IRELAND BRANCH.—At Musson House, Royal Victoria Hospital, Grosvenor Road, Belfast, Thursday, May 26, (1) 2.30 p.m., clinical meeting; (2) 4 p.m., annual meeting.

NORTH LANCASHIRE AND WESTMORLAND BRANCH.—At Reedy Hall Nurses' Training School, Burnley, Thursday, May 26, 12 noon for 12.30 p.m., lunch at invitation of Burnley Division, followed by sixth annual meeting of the Branch.

NORTH STAFFS DIVISION.—At Pathological Laboratory, North Staffordshire Royal Infirmary, Stoke-on-Trent, Tuesday, May 24, 8 p.m., meeting.

NORTH WALES BRANCH.—At Wynnstay Arms Hotel, Wrexham, Thursday, May 26, 3 p.m., annual meeting. Presidential Address by Dr. A. Wesley Hill: "Old Cures."

NUNEATON AND TAMWORTH DIVISION.—At Gymnasium, Manor Hospital, Nuneaton, Thursday, May 26, 9 p.m., A.G.M.

OXFORD DIVISION.—At Maternity Department Lecture Theatre, Radcliffe Infirmary, Oxford, Wednesday, May 25, 8.15 p.m., meeting. Dr. R. Bodley Scott: "The Doctor in Contemporary Fiction."

REIGATE DIVISION.—At Redhill County Hospital, Tuesday, May 24, 8.30 p.m., annual general meeting.

SHROPSHIRE AND MID-WALES BRANCH.—At Board Room, Royal Salop Infirmary, Shrewsbury, Thursday, May 26, 8.30 p.m., general meeting, followed by film: "Relief of Pain in Child-birth."

SOUTHAMPTON DIVISION.—At Royal South Hants Hospital, Southampton, Wednesday, May 25, 8.30 p.m., extraordinary general meeting.

SOUTH MIDDLESEX DIVISION.—At Anchor Hotel, Shepperton, Monday, May 23, 8.45 p.m., general Divisional meeting.

SOUTH STAFFS DIVISION.—At Medical Lecture Hall, Royal Hospital, Wolverhampton, Tuesday, May 24, 8.30 p.m., meeting.

TOWER HAMLETS DIVISION.—At Mile End Hospital, Bancroft Road, E., Friday, May 27, 3 p.m., clinical meeting. Group laboratory demonstration.

TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Tunbridge Wells, Wednesday, May 25, 8.30 p.m., meeting.

WEST SUFFOLK DIVISION.—At Everards Hotel, Thursday, May 24, 8.30 p.m., meeting.

WOOLWICH DIVISION.—At Eltham and Mottingham Hospital, London, S.E., Tuesday, May 24, 8.30 p.m., annual general meeting. Talk by Dr. Gerald Slot: "Virus Diseases in Children."

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 28 1955

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ANNUAL CONFERENCE OF REPRESENTATIVES OF LOCAL MEDICAL COMMITTEES

The Annual Conference of Representatives of Local Medical Committees was held in the Great Hall of the British Medical Association House, London, on Thursday, May 19. Practically all the areas in Great Britain and Northern Ireland were represented. The Chairman of the Conference was Dr. A. BEAUCHAMP (Birmingham), who was supported by Dr. A. TALBOT ROGERS (Chairman of the General Medical Services Committee). There were 144 motions and amendments on the agenda, the great majority of which arose out of the annual report of the Committee, published in the *Supplement* of April 2, 1955.

Statement by Chairman of Committee

Dr. TALBOT ROGERS, in moving the reception of the report, referred to the setting up of the Government committee on the admission of students to medical schools. From the point of view of the G.M.S. Committee a Working Party would have been preferable, but they had reason for congratulation in that the Government committee included two general practitioners, Dr. J. T. Baldwin and Dr. A. B. Davies, who were familiar with the problems of general practice.

A number of important subcommittees had been at work during the year, and one which merited special commendation was that which had concerned itself with Services Committees and Tribunals regulations. It had done three years of very intricate and specialized work under the chairmanship of Dr. H. G. Dain. This subcommittee had worked together with representatives of the dental and pharmaceutical professions, who were equally concerned in the problem, and who had given great assistance. Another subcommittee, under the chairmanship of Dr. B. Cardew, was concerned with the position of assistants in general practice.

In the matter of prescriptions, the old system of estimating areal averages was being resumed. It was only partial so far, and they were not certain that the sampling system gave as good a picture as they would like. They were investigating with the Ministry the manner in which these figures were compiled.

A question on which no progress could be recorded was that of the supply to private patients of drugs and appliances under the N.H.S. It was a matter to be pursued as soon as the right opportunity arose. A matter which had been carried to finality was the method of remuneration on account of Service personnel on leave. These personnel were to be treated as temporary residents by doctors in the

N.H.S., and it had been possible at the same time to protect doctors who were in private practice and not in the service. In this matter the General Medical Services and the Private Practice Committees had acted together.

In previous speeches to the Conference it had been necessary for him to call attention to the fact that some political pressure had been exercised concerning the adequacy of surgery and waiting-room accommodation. At the beginning of the past session this matter became of more immediate importance and it was learned that the Government felt they were not in a position to answer critics, and that the only way of getting a proper assessment was by official inspection. The Committee felt that this matter was one that could be more effectively dealt with by the doctors themselves, and representations were made to the Ministry. The Government agreed to the representations, and arrangements were made for a nation-wide inspection under local medical committee auspices. Most of this had now been done. He himself had taken part in it and had been pleasantly surprised at the reception he had had from doctors with whom he had discussed possible improvements and their appreciation that this was being carried out by their colleagues and not by officials of the department. (Applause.)

Remuneration

Dr. TALBOT ROGERS proceeded to present the section of the Annual Report on remuneration. The question of the assessment of the full amount of remuneration due to the doctor had been a rather more complicated matter since the Danckwerts award. Before then the doctors were being paid from a fixed pool varied only in respect of the number of patients under care. One of the most important things which resulted from the Danckwerts inquiry was the recognition of the fact that the central pool needed to be varied in direct ratio to the number of doctors employed in the service. The main factors in assessing how much money there was to share were four: (1) the number of doctors in the service; (2) the practice expense ratio; (3) professional receipts from other sources, and (4) earnings of N.H.S. doctors in private practice. In so far as receipts from private practice were concerned, his Committee maintained that nothing short of a complete survey would be really valid. In view of the fact that such a survey was not at present possible they had taken the attitude that it would be better to continue to accept the compromise figure proposed by Mr. Justice Danckwerts—namely, £2m.

The practice expense ratio was difficult to work out. On visiting the Ministry rather more than a year ago the officials there claimed that the proper ratio for 1952-3 was 32.23%, but it was pointed out that this was the result only of a sample inquiry and that the right must be reserved to discuss adjustments to the figure which came out of the inquiry. The officials did shift their figure to 32.30, which might not seem much, but it did mean that they were prepared to make adjustments. The Committee felt that in the following year doctors' expenses had gone up, and the Inland Revenue agreed to undertake a further inquiry. The figure of 33.36 was reached, and this was eventually rounded up to 33.40, which meant a global increase of about £650,000.

The amounts paid out of the Central pool by way of capitation fees, loadings, temporary resident fees, emergency and anaesthetic fees, initial practice allowances, hardship payments and supplementary annual payments under the old distribution scheme in 1952-3, and the corresponding amounts for the first two years under the new distribution scheme were approximately as follows: 1952-3 £49m., 1953-4 £50½m., and 1954-5 £51m.

In addition there were the final settlements to come for each of these years. So far as was known, these amounted in 1952-3 to £50,000 approximately, and in 1953-4 to £1,400,000 approximately. It was hoped that this money would be available in December of this year.

He had said that there had been great difficulty in getting out the practice expense ratio. The Committee was anxious that there should be as little further delay as possible. During the previous week there had been discussions with the Ministry on this matter. It became clear that for some time to come the Inland Revenue could not carry out any further inquiry, and after discussion it had been agreed to do without another sample inquiry for the next four years. They had got an agreement that year by year, as a result of discussion between the representatives of the Committee and the Ministry, any alterations to modify the position which had led to the acceptance of 33.40 as a round figure would be taken into account.

The aim would be to get the first final settlement paid out by the end of June, 1955, and there was no reason why doctors should not be paid year after year at the end of June, thereby cutting out what had been a quite appreciable time lag. He thought that a very satisfactory settlement had been reached in the final settlement for 1953-4. (Applause.)

Following Dr. Talbot Rogers's statement, a motion in the name of Southampton that in view of the increased cost of living the whole question of remuneration should be reconsidered was withdrawn, and a motion by Gateshead that in view of the continued diminution in the amount of private practice the figure of £2m., as representing receipts from this source, if correct at the time of the Danckwerts award, was too high now, was taken as a reference for consideration by the Committee.

Supplementary Annual Payments

Dr. P. D. CROSBIE (Middlesex) urged that eligibility for supplementary annual payments should be modified so that the period of ten years in single-handed practice in one area, as laid down in the official circular on the subject, might not be required—in other words, the period might be spent as a principal in two or more practices, provided that each such practice conformed with the criteria. The fact that a man had moved his practice during those ten years should not be a bar to supplementary annual payment.

Dr. A. S. RUSSELL (Wolverhampton), in supporting the motion, said that he believed that discretion could be exercised in cases where hardship appeared to obtain, and it was possible for appeals to be made to a central committee.

On the suggestion of Dr. D. F. WHITAKER (G.M.S. Committee) the matter was referred for consideration by the Committee, and was so accepted by Dr. TALBOT ROGERS, who said that there were genuine cases which needed reconsideration under this scheme.

Back Debits and Back Credits

Dr. W. M. EVANS (Middlesex) asked the Conference to pronounce in favour of the abolition of the present system of awarding back debits and back credits. When this system was started it was expected that credits and debits would eliminate themselves on a knock-for-knock basis, but in Middlesex at least this had by no means proved to be the case. The question had been the most acrimonious topic that had arisen between the executive council and the practitioners. It was doing more to cause friction than any other single thing. Someone would raise the question of inflation, but he was told that actually there was little risk of this.

Dr. J. C. ARTHUR (Gateshead) said that if a motion to abolish back debits and back credits were carried it would rule out a motion which he had put down, that an ex-Service man who presented himself for treatment more than six months after demobilization, not having been on the list of any other doctor during this time, should be regarded as a "back credit" to the date of demobilization. He thought that this would be a perfectly simple way of dealing with a vexed problem.

Dr. TALBOT ROGERS said that the matter was not quite so simple as Dr. Arthur had suggested. It involved a not inconsiderable amount of calculation and checking. On the general question he could well believe that the back debits throughout the country were probably more than the back credits. His committee would see to it that there was no falling off in the efforts made through the Service departments to get demobilized men to have their names put on a doctor's list at the earliest possible moment.

Representatives from Glasgow and from Perth and Kinross also advocated the abolition of back debits and back credits.

Dr. FRANK GRAY (London) said that this was purely an administrative matter. An extraordinary number of people came to him and complained because they had been treating people and could not get credits for them. Having decided only last year to continue the system as a reasonable compromise, he thought the Conference should allow it to go on and not take a hasty decision.

Dr. W. M. EVANS urged again that the whole system be abolished. It did make a financial difference to individual doctors. In Middlesex the back debits outnumbered the back credits by two to one.

By a show of hands the Conference pronounced itself in favour of the abolition of the system.

Dr. L. V. BROADHEAD (Barnsley) moved that practitioners should in all cases—irrespective of any plea of hardship—be paid monthly instead of quarterly. He was supported by Dr. N. NELSON (Dundee), who pointed out that monthly payments were usual in comparable professions and services, and that consultants and registrars were paid monthly.

Dr. TALBOT ROGERS hoped the Conference would not press this. It would mean more work at the centre. Moreover, it was not difficult for any doctor who really did require payment monthly to obtain it. If there were any areas where the doctors who wanted payment monthly were not getting a fair interpretation of the regulations, the Deputy Secretary would be glad to hear of them.

In reply to an expression of dissatisfaction from Dundee, that in view of the opinion given at the last Conference no approach had been made to the Secretary of State for Scotland that monthly payment should be made without any previous plea of hardship, Dr. C. J. SWANSON, chairman of the G.M.S. Subcommittee (Scotland), said that as regards remuneration Scotland would never try to get a "fast one" over their colleagues south of the border.

The proposal that monthly payments instead of quarterly payments be made was lost.

Temporary Resident Fees

Dr. B. HALFPENNY (Kent and Canterbury) moved that it be a reference to the Committee to discuss with the Ministry a revised scale of fees of 5s., 8s. 6d., and 17s. for

temporary residents in relevant cases under the distribution scheme, the amount of the fee to be at the discretion of the executive council in consultation with the local medical committee. He said that there were certain cases, mainly surgical ones, which were discharged early from hospitals to convalescent homes and which required considerably more care than could be appropriately represented by a 5s. fee. The need for differentiation was apparent.

Dr. J. V. LOPE (Surrey) said that the 5s. fee was not adequate for the work done in many cases. Dr. F. M. ROSE (Preston) felt that the introduction of an intermediate fee (8s. 6d.) would only complicate matters and make things worse. Strong pressure would be brought to bear that the minimum fee should never be paid.

Dr. TALBOT ROGERS said that the present rigid method whereby there were only two recognized fees did give rise to anomalies in some parts of the country, especially Kent, which perhaps had more temporary residents than any other area. He suggested that Dr. Halfpenny's motion should be taken as a reference to the Committee to be discussed along with suggestions from other quarters.

This was agreed to.

Mileage Payments

Dr. J. E. DARLOW (Lincolnshire, Holland) had a motion expressing profound dissatisfaction with the Mileage Committee set up by the Minister of Health under the Distribution Scheme and requesting the Committee to take appropriate action to speed up its report. For the last five years they had been hoping that some report from the Mileage Committee would come up.

Dr. A. M. MAIDEN (Lincoln) said that they were expecting a revision of the mileage scheme at an early date. Many of them felt that the whole question should be referred back to local medical committees. It was obviously difficult to get agreement on a standard scheme in view of the differentiation of areas.

Dr. C. F. R. KILLICK (Chairman of the Rural Practices Subcommittee) said that the Mileage Committee was a Government committee, and, like all Government committees, it did not work very quickly. In fact it had had a rough passage. Before it had got far in its deliberations it was interrupted by the Danckwerts inquiry. Since then it had been faced with the discovery of the troubles of the present scheme and the way to correct them. Every suggestion that had been made had had to be checked up by the Ministry to find out what effect it would have on the profession as a whole, and that meant delay. At the last meeting of the committee the Ministry did put forward a scheme, and he (Dr. Killick) was the only one who voted against it; he did so simply because he considered the scheme not fair to the profession. It was no better—perhaps even worse—than the scheme they had to-day.

The Lincolnshire motion was carried.

Group Practice Loans

Dr. D. F. HUTCHINSON (Chairman of the Group Practice Loans Committee) said that up to May 4 the actual number of applications for loans for group practice totalled 152 in England and Wales: Scotland had its own share of the fund and its own committee to administer it. The total amount applied for in England and Wales was £526,905, and the amount of money they had available up to now was considerably less than half this. Of the 152 applications 69 had been rejected solely because they did not come within the agreed definition of a group practice. Some eight applications had been withdrawn; in five which had been approved, the applicants subsequently decided that they did not want the loan, and up to now 47 applications, involving £204,000, had been approved. The amounts had been determined and would be paid out as soon as legal arrangements were complete. A further six applications had been approved in principle, but the actual amount was not settled, and some 14 others were being investigated. The average amount asked for was £3,500; the highest £13,000, and

there had been one or two as low as £200. In each case before approval was given the practice was visited. The committee had been very conscious that it was doctors' money they were using and they tried to use it in the best way to encourage group practice. Presently they would be getting small amounts coming back: in the current financial year these returns were expected to be £7,000.

In reply to the Southampton representative, Dr. Hutchinson said that he saw no reason why a balance sheet should not be produced every year; it would have to be agreed by the Ministry.

The Medical Practices Committee

Dr. J. E. ELLIOTT (Buckinghamshire), on the section of the report relating to classification of areas, moved that a local medical committee should automatically be afforded an opportunity of placing its problems personally before the Medical Practices Committee if a difference of opinion existed between two bodies or if there was an intention to change the classification of an area. He stressed the word "automatically."

Dr. ANNIS GILLIE (London) said that a great deal of time was spent in ensuring that for this purpose the doctor was located in the centre of his practice area, not necessarily the area in which he resided, which might be as much as 10 miles away.

Dr. TALBOT ROGERS said that in all their work throughout there had never been any difficulty in access to the Medical Practices Committee, and they were glad to feel that on that committee there were four valued members of that Conference. Whenever a local medical committee wished to make representations there was no difficulty about it being heard. Any question of "automatic" consultation would mean delay.

The Buckinghamshire motion was referred to the G.M.S. Committee.

A late motion by Cardiganshire deprecating reclassification of areas in that county was carried.

A motion by Norfolk, supported by Lancashire, requested the Committee to continue discussions with the Ministry, pressing for an amendment of the General Medical and Pharmaceutical Services Regulations, 1954, to provide that actual appointments to general practice vacancies should be made by the executive councils in consultation with local medical committees, subject to right of appeal to the Medical Practices Committee only. The mover said that it was impossible for the Medical Practices Committee to understand the local conditions.

Dr. J. A. PRIDHAM spoke as a member of the Conference, not primarily as a member of the Medical Practices Committee. The latter committee itself had never taken any steps to oppose what was actually the policy of the Conference as set out in the present motion. This matter should be put in its proper perspective. In 1953 there were 1,382 admissions to the list in England and Wales. Most of these people came in by succession, partnership, ordinary application, and so on, and there were only 132 advertised vacancies. Among these 132 any disagreement with the executive council occurred only in seven. There was no large field of disagreement. The executive councils scrutinized every application, and only in a negligible number of cases did any difficulty arise.

The Norfolk motion, which the Chairman declared to be already the policy of the Conference, was carried.

Dr. C. W. MARSHALL (Devon and Exeter) asked the Conference to express the view that where possible six months' notice should be required of the retiring doctor. Dr. TALBOT ROGERS thought it would be unwise for the Conference to come to any decision on this matter, which should be thrashed out carefully in the Committee. It was agreed that it be referred to the Committee.

Dr. L. DAVIES (Flintshire and Denbighshire) urged that there be no further delay in introducing methods of "freezing" or other form of vacant practice protection. His area was exercised about this matter because of what could

happen before a successful applicant was able to take up a practice vacancy. Dr. TALBOT ROGERS said that a subcommittee had been set up to look into this matter, which was fraught with difficulties, some of them ethical. It would not be easy to find a solution satisfactory to everybody.

Reinstatement of Ex-Service Personnel

Dr. J. C. ARTHUR (Gateshead) moved that continued attention be given to the question of the reinstatement of Services personnel on doctors' lists. Dr. TALBOT ROGERS said that the Committee was keeping matters of this nature continually under its surveillance, and he was prepared to accept the motion as an instruction.

Dr. G. PURDY (Leicestershire and Rutland) moved that the Conference was dissatisfied with the decision of the Committee not to pursue the suggestion that Services personnel be automatically registered on doctors' lists on discharge, and urged that the whole matter be reopened in consultation with the Executive Councils Association.

The Leicestershire and Rutland amendment was put to the Conference three times in view of the fewness of the hands that were held up either way, but it was at length declared carried.

Dr. C. D. MEADOWCRAFT (Middlesex) moved that the following words be printed in large letters on the top of the appropriate section of the demobilization leaflet, "You will not be restored to the list of your civilian doctor until you have presented this form to him," and this was carried.

Examination of Inflation

Dr. M. SORSBY (London) moved:

That this Conference notes with grave concern that the present system of registration does not prevent inflation, and is of opinion that (1) a central registry on an alphabetical basis would make for greater efficiency, and (2) a joint meeting of all interested parties should be convened immediately to decide the best means of establishing an alphabetical register.

He said that in London they were becoming very concerned about difficulties regarding inflation. Among the several causes of inflation was the failure on the part of the patient to provide a number by which he could be identified. Another fruitful cause was migration. They had got into the position that nothing could prevent inflation unless they got the support of the Ministry. In London the figure now stood at 99.7% on doctors' lists, and before the end of this quarter they might expect that there would be more people on doctors' lists than the estimated population. In two counties adjacent to London the figure for January was 98% plus. It was becoming a very serious matter.

Dr. F. E. GOULD (Birmingham) said that on January 1 in his city 99.69% of the population were on doctors' lists, which meant that out of 1,118,500 people, only 3,000 were private patients.

Dr. TALBOT ROGERS said that the Ministry was just as much concerned as themselves. They could not have another "purge." The only way of stopping it was by having an alphabetical index.

The motion was carried.

Prescribing and Dispensing

Dr. J. E. DARLOW (Lincolnshire: Holland) moved that the Committee ask the Minister to notify consultants that they should not request general practitioners to prescribe substances which general practitioners were not allowed to prescribe as drugs on E.C.10.

Dr. FRANK GRAY (London) moved as an amendment that instead of the Minister the request be made to the Central Consultants and Specialists Committee. This matter arose out of a perfectly genuine misunderstanding, because consultants might in certain circumstances prescribe these substances themselves and were unaware of the limitations imposed on general practitioners in this respect. There was no need to bring the Minister into a domestic matter between two sections of the profession.

The amendment was accepted by the proposer of the motion, and in that form the motion was carried.

Dr. G. O. S. REID (Kent and Canterbury) moved that prescriptions of dispensing practitioners should be submitted monthly for pricing and accounts paid monthly. Dr. C. F. R. KILLICK said that if any doctor was in difficulty about these payments he had only to make application. Dr. A. D. STOKER (Derbyshire) said that in his area doctors had to wait five months for payment, whereas chemists had to wait only one month.

The motion was carried, as was a further motion from the same proposer affirming that it should not be necessary for a dispensing practitioner to make an application for an advance payment which, if there were any delay in pricing, could be recovered by the executive council from other moneys due to him.

The Banning of Heroin

Aberdeen and Kincardine moved a resolution of protest against the discontinuance of the use of heroin in the treatment of suitable cases.

This motion was on the point of being agreed to without discussion, when Dr. TALBOT ROGERS, after saying that he felt as strongly as anyone on the subject, suggested that the Conference should first hear the point of view of the Medical Advisory Committee of the Central Health Services Council.

Dr. WAND said that it was stated that the profession had not been consulted, but in 1946-7 when the new service was formed the strongest possible representations were made to the Minister that there should be a Medical Advisory Committee, with doctors from every branch of medical practice appointed on the nomination of interested bodies, of which the British Medical Association was one. Since 1948 the Council had been asked for nominations to be considered by the Minister, and he was one of those who had been appointed. It was before this committee that there came the suggestion that heroin should be discontinued. He went to the committee with the firm opinion that a general practitioner should not have a drug taken from him which he wanted quite properly to use. But he learned that the problem of heroin addiction throughout the world and possibly in this country was a very grave one, only to be solved by international action. Such action had been taken by some of the countries in the Commonwealth and by the United States. From his own experience he could not but agree that there were adequate substitutes. He had not used heroin for a considerable time and he had found no need for it. Ours was a great country, a country to which others looked for a lead. Were they as medical men prepared to allow heroin addiction as a world problem to go unchallenged? He was persuaded by that sort of argument not to oppose the prohibition of heroin.

On a show of hands the resolution of protest was carried.

Restrictions on Appliances

Dr. A. D. STOKER (Derbyshire) asked that the Ministry be pressed to make appliances as freely prescribable, under the National Health Service, as drugs. He said that practitioners were allowed to prescribe almost any drug, however exotic, but with appliances the practitioner was at the mercy of any clerk in a pricing bureau. He was faced with a very restricted list. Dr. TALBOT ROGERS opposed the motion: they must draw the line somewhere. The motion was lost. A better fate, however, attended another motion by Berkshire, that the Committee press the Ministry to make appliances more freely prescribable under the National Health Service, and Dr. TALBOT ROGERS said they would be glad to receive from local medical committees suggestions as to the type of appliance they had in mind.

A motion by Wiltshire asked that, when a new drug was released to general practitioners and might be prescribed on E.C.10, it should, if considered to be an expensive drug, be placed on the specially expensive list for dispensing doctors on the same date.

Dr. KILLICK said that they were most anxious that dispensing doctors should not be in a worse position than their colleagues, but each item added to the expensive drugs list was a charge on the central pool, and therefore they would like to have control themselves of what went on the expensive drugs list.

The motion was lost.

A number of motions dealing with prescriptions and dispensing were referred to the Committee for consideration. One of them related to the case of dispensing doctors whose practices were in the area of more than one executive council, and it was urged that they should be allowed to write all prescriptions on form E.C.10 (D).

The following motion by Devon and Exeter was carried apparently without dissent:

That in view of the Minister's statement that the provision of drugs for private patients is not repugnant in principle, this Conference expresses the hope that further consideration may be given to this matter with a view to its early implementation.

Discount on Drugs

Dr. C. F. R. KILLICK (chairman of the Rural Practices Subcommittee) made a statement on the meetings which had taken place with representatives of the pharmaceutical industry. The matter at issue was that, while retail chemists could get from the manufacturing chemists discounts of up to 33%, dispensing doctors up to now had been able to get only 10%. At the last meeting they had to tell the chemists that at this Conference they would have to advise doctors who did dispensing to make their own individual arrangements with the manufacturers as to the rate of discount. A letter had since been received stating that the chemists were prepared to allow the doctors half the rate of discount they themselves obtained, and a further statement had now been made that they would be prepared to offer 15% discount on all proprietary medicines. He suggested that the matter be referred back again to the Rural Practices Subcommittee to take a final decision as to whether this 15% discount should be accepted. His feeling was that the offer of the pharmaceutical industry should be refused.

Dr. TALBOT ROGERS said that this was a matter which must be settled by the Rural Practices Subcommittee, and a report would be made to the next Conference.

Dr. A. BROWN (Cambridge) said that it was quite wrong to suppose that the dispensing doctor was not carrying the same risk as the chemist. About nine months ago they took stock of the drugs in his practice—a partnership of four—and the total stock carried at that time came to £1,000. After further discussion the Conference decided not to accept the offer of 15% on all proprietaries.

Surgery and Waiting-room Accommodation

Dr. E. V. KUENSSBERG (Edinburgh) moved:

That this Conference recognizes it to be necessary under a National Service that regulations should provide for the inspection of a doctor's premises where there is reason to believe that these may be inadequate, but deploring the Government's decision to institute a general survey and views with concern the implications of this decision and directs that this motion be brought to the notice of the Minister of Health and the Secretary of State for Scotland.

He supposed that in due course they would be required to exhibit a licence in the surgery to the effect that they had been annually inspected and perhaps graded in one of a number of classes! He begged the Conference not to allow the present inspection to become a precedent. It was regarded by many practitioners as a grave intrusion into their professional privacy, particularly when their own homes were used for professional purposes. It was, of course, a different matter if premises were inspected after a definite complaint.

Dr. P. J. GIBBONS (Liverpool) supported this motion. The inspection was an unjustifiable intrusion. The patient and the doctor had hitherto been the two people concerned,

and the patient had always been at liberty to initiate a complaint, but now a new element was introduced in the shape of the local medical committee.

Dr. TALBOT ROGERS said that there was no doubt there would have been a general inspection of surgeries, whatever the Committee had done, in view of the general impression in Parliament that accommodation was very often inadequate.

Dr. KUENSSBERG said that the Edinburgh motion was directed to the future and not to the past.

The motion was lost.

Service Committees and Tribunal Regulations

Dr. H. G. DAIN (chairman of the subcommittee on Service Committees and Tribunal Regulations), in moving approval of this part of the report (Appendix C), said that the subcommittee had been sitting for three years or more. Valuable suggestions had been forthcoming from many local medical committees, and a great measure of agreement with the Ministry had been obtained, and he thought they had achieved fair play for both doctor and patient.

Mr. G. PURDY (Leicestershire and Rutland) had a motion deploring the decision of the subcommittee not to pursue the recommendation concerning a principal's responsibility for the acts and omissions of his deputy.

Dr. M. J. CUTLER (Hastings) said that the Conference should not be put off by the statement in the report that it had not been possible to pursue this matter further.

Dr. DAIN said they had got the position established that a deputy who was properly ascertained to be such by the executive council and who was a principal on the same list would be responsible for his actions while acting as a deputy. It had been pointed out to them that there would be practically no cases where the principal and the deputy were not both on the same list. An assistant could not be on the list of the executive council, and if he was not on the list he would not be responsible to that body.

The Leicestershire and Rutland amendment which recommended the reference back of the paragraphs of the appendix concerning the responsibility for the acts and omissions of deputies was carried.

Dr. W. G. LOVE (Derbyshire) moved that no decision by a medical service committee should constitute a verdict against a doctor unless it was reached by at least a two-thirds majority of the members.

Dr. F. E. GOULD (Birmingham) opposed the motion and said that he was satisfied that doctors got a very fair hearing.

Dr. DAIN said that his experience of medical service committees was that there was never any difficulty about voting. To lay down a requirement that there must be a particular majority on a body of six was being fantastically meticulous.

The motion was lost.

Dr. DAIN, referring to the Leicestershire and Rutland amendment which had been carried, said that the reference back of these paragraphs flew right in the face of one of their established principles, that assistants should not go on the lists of executive councils. The Committee could not do as the Conference requested unless the Conference was prepared to reverse its decision and to put assistants and locumtenents in the same position as principals. This was a matter of such importance, involving the rescinding of a previous decision, which could not be done without notice, that the matter would have to be put off for another year. The Ministry had not been able to agree that a principal's immunity for the acts and omissions of his deputies should extend to locumtenents and assistants, and as it had not been possible to pursue the point further it had been agreed that where the deputy was also a principal on the medical list he should be responsible for his own acts and omissions.

The CHAIRMAN at this point introduced Dr. W. M. PICKLES, President of the College of General Practitioners, who was a visitor to the Conference. Dr. Pickles said that his proper place was in the gallery, but he welcomed the

opportunity of saying how much the College of General Practitioners appreciated the help and encouragement it had received from the British Medical Association.

Maternity Medical Services

Dr. CATHERINE HARROWER introduced the part of the report concerning maternity medical services, and specially drew attention to what had been done to secure smooth working of arrangements in all areas for ante- and post-natal care.

A motion by West Suffolk calling for a revision of fees for maternity medical services was referred to the Committee, and other motions concerning the calculation of mileage in maternity cases and of the apportionment of fees when these had to be divided between two doctors were carried. A motion by Bath was also carried, that regional hospital boards be asked to ensure that expectant mothers who may be confined in hospital on social or medical grounds have the opportunity of being attended by their own general practitioner, subject only to the requirements of training centres for students and midwives.

Dr. H. SOUTHWORTH (Blackburn) moved:

That this Conference (a) deplores the peremptory method employed in closing the Springfield Maternity Home in Blackburn, whereby a lay person acted in utter disregard of representations made by local doctors and of the condition of their patients; (b) hereby affirms its decision to resist any interference in clinical matters by lay persons, whether they be executives or members of a public body; and (c) instructs the General Medical Services Committee to make the strongest representations to the Minister of Health to ensure that such methods of closure or similar conduct will not be repeated in future.

He said that he would not repeat the history of the Blackburn episode, which was now familiar. The closure occurred despite the protests of two executive councils and two local medical committees. No doctor was asked his consent to the removal of the patients, and the evacuation was carried out under lay instruction.

Other Lancashire representatives spoke with similar indignation.

Dr. TALBOT ROGERS said that the G.M.S. Committee was wholeheartedly with Lancashire in this matter. They must make sure that there was no repetition of it, and the Committee would be glad to know in advance of any projected action of the kind in any area. He added that Dr. A. Campbell, of Accrington, who was to have spoken on this subject, had been prevented from attending the Conference by illness, and their good wishes for a speedy recovery would go out to him.

The Blackburn motion was carried unanimously.

A motion by Middlesex calling for the Committee to press for a more positive attitude with regard to general-practitioner hospitals and for the taking of more active steps with the Minister was taken as a reference to the Committee.

Two motions by Hertfordshire concerned with the improvement of diagnostic and ancillary facilities for general practitioners were agreed to without discussion.

Employment of General Practitioners in Hospital

Dr. J. C. ARTHUR (Gateshead) moved that appointments for general practitioners in hospitals as clinical assistants should be for a period of six months, and should not be renewable if other practitioners were able and willing to take the appointment. They were all in favour, he said, of the employment of general practitioners in hospital, but care should be taken to see that the arrangements were equitable for those concerned.

Dr. TALBOT ROGERS said that he disliked laying down rules to which there could be no exception. In this case a distinction should be made between two types of clinical assistantships—one in which the doctor became attached to a particular department of the hospital in order to get post-graduate experience, and the other in which he was actually a member of a team dealing with a specialty. In the former case a rotation of six months might be advisable; in the

latter there might also be a review from time to time, but to pin it down to six months would be a mistake.

The motion was lost.

Assistants in General Practice

Dr. BASIL CARDEW introduced the report of the subcommittee (Appendix D) which was set up during the year to investigate the matter of the employment of assistants. He said that since September, 1952, this question had been under discussion, and various schemes had been put forward by the Assistants and Young Practitioners Subcommittee. The General Medical Services Committee had never committed itself to the view that abuses of various kinds in the employment of assistants were widespread. Nevertheless, some individual cases of abuse did occur, and it was the Committee's duty always to be conscious of the rights of minorities. The various proposals put forward by the Assistants Subcommittee were mainly directed to restricting the number of patients which a principal could have on his list by virtue of his employment of an assistant, but the parent committee did not find itself able to accept any of the suggestions. It thereupon set up another subcommittee of its own members to find a solution, and it was the report of this subcommittee which was now before the Conference.

The subcommittee felt that there was no advantage whatever in looking at the size of the list; it proceeded to examine the underlying problem of cases of exploitation and came to its first recommendation:

(1) That further efforts should be made, through the deans of medical schools, and through honorary secretaries of local medical committees, to ensure that final-year students and newly qualified practitioners are fully informed of the importance of entering into a formal agreement when accepting a post as an assistant, either with or without a view.

The subcommittee then looked at the regulations to see whether executive councils had the power to go into the whole question of the employment of particular assistants in their area, and it found that they had already the power to limit the size of the extra list. What was not so clear was the power of refusal. The first proposed solution was to throw the whole thing back on to local medical committees and grant them the power, and in fact the duty, of looking at all assistantships in their areas at intervals to see whether the employment of an assistant was fully justified. This brought him to their second recommendation:

(2) That the Ministry of Health should be asked:

(i) To insert an additional section in paragraph 8 of the Terms of Service of General Practitioners so as to make it clear that local executive councils shall, in consultation with local medical committees, periodically review all cases in which consent has been given to the employment of an assistant;

(ii) By means of a circular letter to executive councils to point out that, whereas under the regulations the normal maximum additional list of patients permitted by virtue of the employment of an assistant is 2,000, local executive councils have power, where after consultation with local medical committees they are satisfied that a reasonable case exists for so doing, either after due notice to withdraw their original consent to the employment of an assistant or modify the number of additional patients otherwise permitted under their allocation schemes.

The intention was that in all material respects the local medical committee should be the body which would look at each case and bring forward a recommendation to the executive council. The local medical committee would need to have some guidance as to general principles, and some uniformity throughout the country was desirable. This was the import of their third recommendation:

(3) That an appropriate letter be sent to local medical committees, drawing their attention to the proposed arrangements, and offering general guidance upon the principles they should adopt when advising their local executive councils that in a particular instance it would be appropriate to withdraw the consent already given to the employment of an assistant, or to modify the size of list.

It was felt that that would ensure that there was no gross exploitation. But one thing more was necessary, and that was to give some help to the individual principal who hesitated to bring an assistant into partnership. It was felt that the fourth recommendation would constitute a real inducement:

(4) That a principal implementing a "view" registered with the executive council should have a right to claim retrospective payment on the basis of notional lists for a period up to a maximum of one year.

These recommendations had been accepted *nem. con.* by the General Medical Services Committee, and the Assistants and Young Practitioners Subcommittee had welcomed them as a first step.

Dr. J. C. ARTHUR moved that a practitioner be required, within six months of engaging an assistant, to notify the executive council, who should inform the assistant, whether he was employing the assistant "with a view" or not. The assistant should know whether or not, within a certain time, he had the prospect of a partnership.

Dr. CARDEW asked the Conference to reject this motion. It was quite clear that no Government would so alter the terms of service as to require a principal under contract with his executive council to declare any such intention. But, what was more serious, no executive council could ever be required in law to enter into communication with an assistant with whom it had no contractual relationship and inform him of a certain eventuality.

The Gateshead motion was lost.

Dr. H. H. D. SUTHERLAND (London) raised an objection to the last of the four recommendations brought forward by Dr. Cardew. If there was formal agreement under the first and second recommendations, the inducement offered in the fourth might be interpreted as something like a bribe, and he thought it was important to take legal advice on the subject before accepting it.

Opposition to the fourth recommendation was also voiced by Dr. W. W. HUDSON (Oxford) and Dr. H. G. ST. M. REES (West Suffolk), who considered the recommendation dangerous. Dr. F. M. ROSE (Preston) said that it was not a bribe, it was merely an inducement.

Dr. CARDEW said that if it was a bribe it was not more of a bribe than the notional list in a partnership. He did not think there was anything inequitable or in the way of abuse here, and he asked the Conference to express general agreement with the principle, subject to legal opinion.

The Conference adopted recommendations (1), (2), and (3) set out in Dr. Cardew's speech, but recommendation (4), that a principal implementing a "view" registered with the executive council should have the right to claim retrospective payment on the basis of notional lists for a period up to one year, was rejected on a show of hands.

Other Matters Arising from Report

The Conference rejected an amendment by Surrey to refer back the paragraphs dealing with post-mortem arrangements, with particular reference to the facilities available to local practitioners, but a motion by Derby was carried, recommending further attempts to ensure that where a post-mortem examination had been carried out in any circumstances a report should be sent to the practitioner concerned. Another motion by Kent and Canterbury concerning the information to be given by the coroner to the general practitioner was accepted as a reference to the Committee.

A motion by Derby was agreed to expressing dissatisfaction with the reply of the Minister that it was impracticable to give automatic information where a patient was rejected by a Medical Board as unfit for National Service, and calling for further pressure to be exerted on the Minister to arrange for appropriate information to be conveyed to the patient's doctor in cases where the patient's consent had been obtained.

The question of the charging of a fee for a report requested by a patient's employer came forward. It was the view of the Committee that when only a brief statement as

to the patient's fitness or unfitness for work was required, and it was in the patient's own interests that it should be given, no fee should be charged. Surrey carried a motion protesting against this suggestion, although Dr. H. D. CHALKE had explained that all that was asked for was a note from one doctor to another giving some slight information about the case.

An amendment by Manchester was also carried declaring that no distinction should be made between cases where a report was required in the patient's own interests and those in which reports were required by an employer for administrative convenience; in both cases the practitioner was fully justified in charging a fee.

On the motion of London, para. 207 of the report, concerning the method of selection of doctors for private practice appointments, was referred back for further consideration.

Miscellaneous Motions

This concluded the matters arising from the annual report. A number of miscellaneous motions remained on the agenda. Norfolk asked for an increase in the rate of interest on the compensation moneys due to general practitioners. This was referred to the Committee for consideration. Dr. A. N. MATHIAS said that it would require legislation, and this would be difficult, but the Committee would see what it could do and report next year. Two other motions concerning compensation were also referred to the Committee.

Dr. L. F. EVANS (Bolton) moved "That it is not ethical for a practitioner to treat, as a private patient, a person on the N.H.S. list of a neighbouring practitioner without informing the latter of his action." Dr. NOY SCOTT asked that the words "whilst still under treatment" should be inserted. It was only whilst the patient was under treatment that the practice was ethically wrong. Dr. EVANS quoted the ethical rules, which read, "Where a patient is under the care of . . ." and said that he interpreted "care" as meaning being on a practitioner's list. The motion was lost.

Cardiff wanted it made possible for those practitioners who opted out of the superannuation scheme in 1948 to enter it now if they so desired. Dr. MATHIAS said that this seemed to be an attempt to make the best of both worlds, but, if the Conference desired, the Committee would look into the matter.

Dr. L. V. BROADHEAD (Barnsley) said that during the last eighteen months the practice of referring patients to chest consultants by the Ministry of National Insurance for a report as to fitness for work without the knowledge of the patient's own practitioner had increased. He moved a protesting motion, which was carried.

An Ipswich resolution, asking that it be outside the range of general medical services to issue certificates of incapacity for conditions of less than 72 hours' duration which do not ordinarily require medical attention, was described by Dr. TALBOT ROGERS as badly phrased, but he promised that the Committee would consider what he thought was the meaning behind it.

Finally the Conference agreed to a motion by London expressing grave disquiet at the amount of communicable disease discovered in immigrants in this country, and recommending that the Government should make arrangements for adequate medical examination of all intending immigrants before passing the necessary papers for transport. Dr. F. GRAY said that this was brought forward with a view to safeguarding the public health of citizens of the United Kingdom from the risk of certain communicable diseases, such as syphilis and tuberculosis.

Trust Funds

Dr. CATHERINE HARROWER (treasurer) presented the income and expenditure account and the balance sheet of the National Insurance Defence Trust and the General Medical Services Defence Trust, and these were approved. She said that 55 areas had fulfilled—in some cases more than fulfilled—their quota of payment.

Dr. H. G. DAIN reported on the Dain Fund. He said that 20 years ago when a magnificent present was made to him, and he turned it over for the education of doctors' children, he had no idea of the magnitude to which the work would extend. The trustees at a recent meeting made grants during the next academic year amounting to over £1,000. They had never failed to get the money to meet most of the claims they received. Many local medical committees had subscribed, and the reason why some had not subscribed was often because they were helping cases in their own areas. It was agreed on the motion of Dr. F. E. GOULD (Birmingham) that the General Medical Services Committee should be asked to invite regular subscriptions to the Dain Fund from local medical committees.

Dr. S. WAND presented the report of the Claire Wand Fund, the capital of which now amounted to about £13,000. The Trustees had continued to examine ideas which would enable them to achieve their aim of establishing the Fund as a means of enhancing the status of general practice. One proposal was that the Fund should be used as a means of suitably rewarding any practitioner who had made some outstanding contribution which had resulted in raising the status of that branch of the profession. An essay competition on the postgraduate education of newly qualified doctors was now under way. An investigation which was proceeding under a grant from the Fund was into the aetiology and treatment of fibrositis on cases seen in general practice.

Elections

Dr. A. BEAUCHAMP was re-elected unopposed as Chairman of the Conference, and the following were the six members elected by the Conference to the General Medical Services Committee: Dr. J. C. ARTHUR, Dr. A. BROWN, Dr. I. G. INNES, Dr. J. A. PRIDHAM, Dr. F. M. ROSE, and Dr. S. WAND.

On the motion of Dr. J. M. LEES (Walsall), the Joint Formulary Committee was congratulated on the results of its intensive work culminating in the publication of the *National Formulary, 1955*, which had been received with great satisfaction.

Dr. A. G. CHAMBERLAIN (Dorset) moved to place on record the appreciation of the Conference of the excellent and continued work of all members of the General Medical Services Committee, and this was carried with applause, as was a vote of thanks to the Chairman for his conduct of the business of the day.

The Conference went on from 10 a.m. to 6.45 p.m., and afterwards, under the chairmanship of Dr. Beauchamp, the representatives dined together at the Dorchester Hotel.

The Conference Dinner was held at the Dorchester Hotel. Dr. A. Beauchamp presided, and the members of the General Medical Services Committee and officers of the Association were guests. Other guests included Dr. W. E. Dorman, Chairman of the Medical Practices Committee; Mr. A. Shanks, President of the Executive Councils Association of England and Wales; Dr. J. O. McDonagh, Chairman of the Scottish Association of Executive Councils; Dr. W. N. Pickles, President of the College of General Practitioners; Dr. G. F. Abercrombie, Chairman of the Council, and Dr. J. H. Hunt, Honorary Secretary of the College of General Practitioners. Dr. H. W. Donovan (Birmingham) proposed the toast of the G.M.S. Committee in a speech happily blended with humour and wisdom, to which Dr. Talbot Rogers replied. Dr. Rogers paid tribute to the work of the headquarters staff of the Committee. The toast of the Chairman of the Conference was proposed by Dr. A. B. Davies and replied to by Dr. Beauchamp.

The collection for the Dain Fund taken after the Dinner realized a record figure of £206.

After more than 25 years as honorary secretary of the Glasgow Division of the B.M.A., Dr. J. Inglis Cameron has resigned his office.

NATIONAL HEALTH SERVICE ACCOUNTS

In England and Wales at December 31, 1953, 2,175 (or 33.9% of the total of 6,412) full- and part-time consultants were in receipt of distinction awards, says Sir Frank Tribe, comptroller and auditor general, in his report on the summarized Health Service Accounts for England and Wales for the year 1953-4 (H.M.S.O., price 2s.). Two years previously 34% of the 5,885 consultants were receiving awards. The spread of distinction awards between whole-time and part-time consultants is not known.

Theft and Fraud

Losses by theft or fraud which had to be written off in the accounts for the years 1948-9 to 1953-4 amounted to £37,051. Sir Frank referred to the "laxity of financial control and absence of elementary safeguards" which had made such a figure possible. The Treasury too, he said, has "also commented on the inadequacy of the disciplinary action taken by the authorities against officers whose negligence had contributed to the losses." He illustrated his point by referring to a case in which £5,535 in cash was stolen from a locked steel cupboard whose keys had been left overnight on the top of a cupboard in an adjoining hut which had not been locked. Notified of this, the Treasury had asked the Ministry of Health in February, 1952, to take disciplinary action against those responsible. "As it was difficult to imagine a greater degree of negligence," the Treasury suggested that the person primarily responsible should be dismissed. During May the Ministry told the authority of this recommendation, but by then the authority had already decided that the three officers found negligent should be deprived of certain salary increases for six months, so the Ministry had to inform the Treasury that it had now to regard the case as closed as "it would have been constitutionally improper for them to have interfered with the exercise of the authority's discretion." While the Treasury approved the write-off of the loss in May, 1953, it made it known that it was disturbed "by the apparent inability of the Ministry to make its influence more effectively felt in bodies to whom it had delegated so much responsibility." The actual deductions from salaries were not made until October, 1954, after Sir Frank's officers had visited the hospital concerned in July.

Claims for Damages

The 1,100 (approximate) claims for damages made by patients—this figure is for claims against hospital authorities only, not including those against general practitioners—in the year under review cost the National Health Service £159,047. From July, 1948, to March, 1949, with 180 cases £7,560 was spent. Sir Frank pointed out that by a judgment in 1951 hospitals were responsible for the surgeons and doctors on their permanent staff—a responsibility which a further judgment in 1954 extended to cover the whole staff, resident or visiting. To prevent the conflicting interests of doctor and hospital prejudicing the case for the defence, the Ministry came to an agreement in 1954 that the doctor and hospital would collaborate, any damages proportioned as they agreed, or, failing agreement, they would pay in equal shares.

Cost of Maintenance

An examination of the total, inclusive cost of keeping a patient in hospital for a week during 1953-4 is given by J. M. K. Hawton, accounting officer. A general patient in a general teaching hospital may cost as much as £31 4s. 1d. per week, a maternity case £26 11s. 2d., an orthopaedic case £32 11s. 9d. The cost of hospitals run by management committees may be slightly less: here the figures would be £20 7s. 3d., £19 10s. 4d., and £13 12s. 7d. Against the running charges of bedding, crockery, cleaning, etc., and the standing charges of wages, maintenance of building, etc., the hospital has only the direct credit received from staff rent, etc., trading services, and other direct receipts, which are valued at an average of 9d.

ANONYMITY IN BROADCASTING

BY

L. J. WITTS, M.D., F.R.C.P.

Nuffield Professor of Clinical Medicine, Oxford

A letter I wrote to the *Supplement* (January 8, p. 12), arguing against the Central Ethical Committee's insistence on anonymity in broadcasting, was meant as a challenging shot, but the Old Guard reserved its fire. However, in a letter to *The Times* dated February 28, 1955, Dr. Robert Forbes wrote as follows:

"A doctor is ethically bound to refuse to allow his name and cases to be published abroad in such a manner that his professional reputation and status is deliberately promoted to the detriment of his colleagues, of whom some may be equally efficient or possessed of greater skill and knowledge. It was for this reason that the British Medical Association requested the British Broadcasting Corporation to ensure that medical practitioners when discussing medical subjects on the radio should speak or appear anonymously."

Dr. Forbes completely misrepresents the conditions and purposes of broadcasting. Scripts are censored by the B.B.C., and anything savouring of personal advertisement would stand small chance of getting through. Medical men are not invited to broadcast at the expense of their colleagues but for the education of the public. Doctors are trained in medical schools, whose main source of income is the State, and they subsequently work in the National Health Service or other public services. It is therefore essential that the public should be well informed about medicine. Two of the main channels of information are sound radio and television, and to get into vital communication with the audience the message must be personal whenever possible.

For the ordinary listener a talk without a name is like an egg without salt, and in this the listener is right. We should not wish him to take a patent medicine because it is advertised in the newspapers as "recommended by a Harley Street physician." Why, then, should we expect him to pay attention to a broadcast or television programme which is similarly advertised as "by a physician"? The public is entitled to know that it is Dr. T. F. Fox, Editor of the *Lancet*, who is telling them about a medical visit to Russia, Lord Horder who is talking about the medical aspects of cremation, or Dr. L. J. Wits, Nuffield Professor of Medicine, who is describing an attack of fibrositis. The name and description of the broadcaster should be published in the same form as they would appear at the head of an article in the *British Medical Journal*.

"Fame is the Spur"

Broadcasting and television are time-consuming and tiring, and for anyone already earning an average medical income the financial reward after payment of tax, though agreeable, is not a powerful incentive. There are two main reasons why I should wish to broadcast. The first is the fun of doing it, of being allowed to use this expensive and persuasive piece of machinery. The second is the desire to achieve success in the medium. "Fame is the spur that the clear spirit doth raise." If this last incentive is removed the game is not worth the candle. To get a good audience for a radio programme one must have not only good material but also a reputation. If medical broadcasters are to attract an audience comparable with that of Lord Russell, they will only do so by making themselves known to the listener through a number of interesting broadcasts under their own names.

I have several times broadcast under my own name, and, though I have received both abuse and requests for advice, I do not remember being asked to see a patient in consequence. Moreover, as Dr. F. H. Tyrer pointed out (*Supplement*, January 22, p. 23), less than half the profession is now in private practice and able to gain financially from publicity. It would be interesting, therefore, to learn what

evidence the Central Ethical Committee has that broadcasting has been used to obtain patients for doctors or to promote their own professional advantage. I am rather afraid that the ban is merely a symptom of a tendency which is prevalent throughout British life at the present time, a tendency to say that what everyone cannot have no one shall have. Every patient cannot have a pay-bed in hospital, therefore there shall be no pay-beds in hospital. Every medical practitioner cannot broadcast, therefore no doctor shall broadcast under his own name. Envy is a vice under whatever name it is disguised, whether social justice or professional ethics, and it is numbered among the seven deadly sins.

The American Way

The Americans seem to manage this thing better than we do, despite the fact that their radio is commercial. Far from being discouraged, personal broadcasting is actively encouraged by the American Medical Association, and the names of medical speakers are published in their journal. It is frankly realized that tact and discretion are necessary and that there may be circumstances in which it may be better for a broadcaster to use a pseudonym. A number of American medical societies which put out programmes have adopted rules about anyone appearing more than once in a session or making a use of television that might be construed as improper by the usual ethical standards. It is to be hoped that some of these points will be borne in mind if the matter is discussed by the Representative Body, for insistence on the anonymity of practitioners appearing in B.B.C. programmes is likely to have a restrictive effect on broadcasting by the medically qualified and to militate against the ideal of an educated democracy.

Scottish News

GENERAL MEDICAL SERVICES SUBCOMMITTEE (SCOTLAND)

A meeting of the General Medical Services Subcommittee (Scotland) was held on April 28, with Dr. C. J. SWANSON in the chair.

It was reported that the Scottish Committee had appointed Dr. H. B. MUIR, Auchtermuchty, Fife, as a representative to the Subcommittee to fill a vacancy which had arisen.

Grants for Training of Assistants

A motion by Dr. P. W. PHILIP, of Huntly, seconded by Dr. C. HARROWER, that the payment of the allowance of £150 per annum to trainers under the trainee general practitioner scheme be abolished, was discussed. In view of the discussions recently started with the Department of Health on possible developments in connexion with the trainee scheme, the motion was withdrawn.

Service Personnel on Leave

It was reported that the position with regard to Service men on leave had now been brought into line with that in England and Wales. If they are more than two miles from the nearest Service hospital or unit at which a Service medical officer is posted for duty, Service men on leave may be accepted and treated as temporary residents under the National Health Service arrangements.

Highlands and Islands Practitioners Subcommittee

It was reported that the Highlands and Islands Practitioners Subcommittee had been concerned about the substantial expense involved, in some cases, by patients having to attend hospitals. It was appreciated that machinery did exist whereby reimbursement could be made under certain circumstances, but the Subcommittee felt that consideration

might be given to a return to the original scheme whereby the necessary expenses could be met from National Health Service funds. After discussion it was decided to refer this matter to the Joint Committee of the General Medical Services Subcommittee, and the Consultants and Specialists Committee (Scotland) for examination.

On the matter of doctors' houses in the Highlands and Islands, it was reported that the Highlands and Islands Practitioners Subcommittee proposed to give evidence to the Highlands and Islands Standing Advisory Committee of the Scottish Health Services Council on practitioners' houses in the more remote areas.

Maternity Services Subcommittee

Dr. HARROWER stated that the revision of the Maternity Services Record Card (Form E.C. 24R) had now been completed. The Subcommittee has agreed to the Department of Health's suggestion that doctors should be asked to submit their maternity medical services claims as soon as possible after the completion of treatment, and certainly within three months.

Local Authority Surgery Accommodation

Communications from the Scottish Committee and from the Scottish Association of Executive Councils on the possibility of consulting accommodation being provided in certain areas by local authorities were discussed, and in view of the major importance of the subject the matter was remitted to the Chairman's Subcommittee for detailed consideration.

The Subcommittee considered the Department of Health's proposals for the exchange of practices and approved in principle the new procedure. The essential change was the provision for an appeal to the Scottish Medical Practices Committee by a practitioner when an executive council has declined to agree to the exchange.

GLASGOW MEDICAL GRADUATES DINNER

A Reunion Dinner of Glasgow medical graduates and their ladies has been arranged for Friday, June 3, at Bush House Restaurant, Aldwych, London, W.C.2, at 7.30 for 8 p.m. The price of the dinner, including an aperitif, is 30s. per head. Applications for tickets, which should be accompanied by a remittance, should be addressed to Dr. A. M. Maiden, B.M.A. House, Tavistock Square, London, W.C.1. Any Glasgow medical graduates and their ladies who would like to be present will be welcomed.

CENTRAL HEALTH SERVICES COUNCIL AND STANDING ADVISORY COMMITTEES

MEMBERSHIP CHANGES

The Minister of Health has appointed or reappointed the following medical and dental members to the Central Health Services Council and Standing Advisory Committees for the period ending March 31, 1958.

Central Health Services Council.—Sir Stanford Cade (London), new member; Professor Sir Henry Cohen (Liverpool); Professor A. J. Lewis (London); Dr. W. P. H. Sheldon (London); Dr. S. Wand (Birmingham), new member; Mr. T. Hindle (Blackburn), new member.

Standing Medical Advisory Committee.—Sir Stanford Cade (London), new member; Professor Sir Henry Cohen (Liverpool); Professor A. J. Lewis (London); Dr. H. M. C. Macaulay (London); Dr. W. P. H. Sheldon (London); Dr. Stanley Thomas (East Ham, London), new member; Dr. S. Wand (Birmingham).

Standing Dental Advisory Committee.—Mr. M. Beverley Burton (Abergavenny), new member; Mr. T. Hindle (Blackburn); Professor M. A. Rushton (London); Mr. R. W. Swiss (Harrow), new member; Professor F. C. Wilkinson (London).

Standing Ophthalmic Advisory Committee.—Dr. M. Critchley (London); Mr. O. G. Morgan (London).

Standing Maternity and Midwifery Advisory Committee.—Professor W. C. W. Nixon (London), new member.

Standing Mental Health Advisory Committee.—Dr. N. H. M. Burke (Wimbledon); Dr. T. M. Cuthbert (Middlesbrough), new member; Professor A. J. Lewis (London); Dr. C. A. H. Watts (Ibstock), new member; Dr. D. J. Williams (London).

Standing Tuberculosis Advisory Committee.—Dr. P. M. D'Arcy Hart (London); Dr. P. Kerley (London).

Standing Cancer and Radiotherapy Advisory Committee.—Sir Stanford Cade (London); Sir Ernest Rock Carling (London); Professor Sir Henry Cohen (Liverpool); Professor Sir Charles Dodds (London); Professor J. S. Mitchell (Cambridge); Mr. V. E. Negus (London); Sir Clement Price Thomas (London), new, until March 31, 1957.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Part-time Consultants and Income Tax

SIR.—The discussion of this problem reported in the *Supplement* of May 14 (p. 227) is disturbing to those who wish to make the best of our present Health Service. It concerns mainly those part-time consultants who will become liable to pay something like two years' tax in one. There are probably quite a lot of them, and it is difficult to believe they will not quite often be embarrassed by this extra demand, which must amount, at the least, to several hundred pounds. The trouble is that this money is taken from them while they are still in the Service. They are bound to be affected by it, and so, to quite an extent, is their value to the Service.

A whole-time service has undoubted attractions. There is no doubt, however, that our present severely restricted finances produce such delays and limitations that if every consultant in the country were whole-time the apparatus used in the Service, the mutual professional contacts made, the membership of societies and attendances at meetings, and the subscriptions to journals, would all be reduced. Part-time consultants who want these things pay for them when some whole-time consultants cannot, because in effect the part-timer is subsidized by the State. He gets the apparatus he wants quickly, the surroundings where he works and thinks best; he improves his standards and attempts original work, to quite an extent out of his own pocket, aided with this indirect subsidy.

If this subsidy is in part withdrawn by imposing an extra financial charge for one or more years, it seems to me that much of this voluntary activity is very likely to be restricted. The charge will, of course, fall on a number of men with families to educate. These are also the younger men, from whom most energy and originality are to be expected, to whom the loss of a few hundred pounds will be a serious matter. It is no great help to them or their children, and none at all to the Health Service, to give them back the money when they are 65, grandparents, and have no entry to hospitals anyway. When they are young enough to want to spend money in the Service, and have the chance, it is taken from them.

The scales are also loaded against the more able. A man with a Merit Award is more liable to a change of schedule. It is unlikely that his income from private practice will increase automatically at the same rate as his income from the Service. Thus, among the particular sufferers will be the energetic and original, the parents of the next generation, and the consultant leaders. They will need to reduce their pretty certainly closely balanced expenditure still further. Their professional work, their contributions to medical science, the education of their children, will all be jeopardized sufficiently to disturb their peace of mind more than a little. Few measures could seem less necessary, or more detrimental to the welfare of the Service and to the public interest.—I am, etc.,

Hove.

W. A. BOURNE.

Remuneration of S.H.M.O.s

SIR.—The widespread indignation amongst many of my S.H.M.O. colleagues at the recent rejection (*Supplement*, May 7, p. 220) by the Management Side of Committee B of the Medical Whitley Council of the claim for an increased remuneration for S.H.M.O.s has prompted me to write this letter. It is hoped that by enlisting the sympathy of our colleagues in all branches of medicine we may endeavour to prevent yet another injustice from being perpetrated on this already unjustly treated group of the profession.

A considerable amount of dissatisfaction has existed about the treatment of S.H.M.O.s since the National Health Service came into being. Had the Spens Report been properly implemented many of us would have been graded as consultants and remunerated as such. There was no mention of the S.H.M.O. grade in the Spens Report, and the grade was introduced without the consent of the profession. The system by which specialists were graded as S.H.M.O.s resulted in gross injustice to many, since there was no uniform set of criteria in use by the different grading committees, and one's chances of suitable grading were infinitely better in some regions than in others.

S.H.M.O. remuneration was fixed at a scale which overlapped the lower range of consultant salary, but which was even then considered to be too low for many specialists whose qualifications, experience, and duties resembled very closely those of their consultant colleagues. It was hoped that the award of 1954 would bring S.H.M.O. remuneration more into line with that of consultants. Instead, the gap between the two grades was increased and the remuneration of the most experienced S.H.M.O. no longer overlapped that of the newly fledged consultant. Our negotiators recognized that S.H.M.O.s had been unfairly dealt with and a special claim was lodged on their behalf to try to restore the position which had existed prior to 1954, even although this was already an unsatisfactory one. It is this claim that the Management Side has rejected. Their motives for doing so can only be surmised. It is certainly not due to any lack of cause for the claim. It is to be hoped that the Staff Side will now ask that the dispute should be submitted to arbitration and that if this does not have a satisfactory result the full resources of the B.M.A. will be brought to bear to help to rectify the unjust way S.H.M.O.s have been treated.—I am, etc.,

Meols, Cheshire.

E. SNELL.

Ship Surgeons

SIR.—May I correct Dr. M. Dillon's statement (*Supplement*, April 30, p. 209) about remuneration of Australian house-surgeons before too much damage is done? The usual rate of pay in most general hospitals is in the region of £A.500 per annum, increasing by £A.100 per annum for the next two or three years. Certainly there are a few Australian hospitals which have posts with a salary of approximately £A.1,100 per annum, but these posts are not available to the newly qualified doctor. The majority of these posts are in tuberculosis sanatoria, mental hospitals, or repatriation hospitals, and special qualifications are usually necessary. They are also available in the more outlying areas, as in parts of Queensland. While £A.500 per annum is a princely sum compared with £2 per week, so is £2 per week compared with nothing—as was the case some years back at the Royal Melbourne Hospital. Salaries of the present level have only been paid for about three years. The exception has been chosen and quoted as the rule.

Dr. Dillon states that he is mainly concerned about casual labour and implies that casual labour is of a lower standard than permanent labour. This must therefore apply to house-physician and surgeon posts. These posts are only held for six months or so, and are really casual posts. I feel sure Dr. Dillon would not wish to dispense with these posts. Also, the shipping companies appear to be quite satisfied with casual labour. Dr. Dillon seems very anxious that the ship surgeon should primarily be a sailor ("employ-

ment of amateurs"). A doctor, wherever he is, is primarily a doctor, and, whether he be in the Merchant Navy, missionary service, public health department, or anywhere else, this fact should always be borne in mind. Even at sea one must still attend sick people—usually very few. It is hard to understand why anyone would make only one or two voyages with cheap gin as the main object, as is suggested.—I am, etc.,

Chertsey, Surrey.

D. McLAREN.

Compensation for Loss of Goodwill

SIR.—I heartily corroborate the word "swindle," as used by Dr. J. Macleod (*Supplement*, April 30, p. 209) in connexion with our impounded compensation. My surgery and waiting-room accommodation, in my own opinion, could do with enlargement and improvement, although it passed a recent inspection as to fitness. The estimated cost of alteration involved an expenditure of less than £800, and this I felt would be an excellent way to spend some of my compensation. A request for an advance was emphatically turned down, although help and advice were given to me from the local B.M.A. office.

Eight hundred pounds not at the moment being readily available from other sources, and I having no wish to land myself with debt, the attractive improvements in my working, and the patients' waiting, conditions will have to remain in abeyance.—I am, etc.,

Birmingham, 31.

JOHN H. SHANN.

Entry into Practice

SIR.—With reference to Dr. F. Gray's letter (*Supplement*, May 14, p. 231) may I, through you, state that the medical man to whom I referred in my letter in the *Supplement* of May 7 (p. 223) is no longer a member of Dr. Gray's committee, the Assistants and Young Practitioners Subcommittee, but a member of the former Unestablished Practitioners Group (now called the General Practice Reform Association). In my letter to the *Supplement* I referred to the Assistants and Young Practitioners Group, but the Editor amended my letter to read "Assistants and Young Practitioners Subcommittee" without advising me. This misunderstanding led Dr. Gray to assert that my statement is "completely inaccurate," but this is unacceptable, as the main contention of my letter still stands.—I am, etc.,

London, W.1.

GEORGE ROSSDALE.

Civil Service Medical Officers

SIR.—After reading the advertisements for medical officer posts in the Civil Service published in the *Journal* of April 23 (advertisement p. 40) I must own to a feeling of bewilderment, not untainted by cynicism, at a certain aspect of the wording of these advertisements. In each one the same phrase is repeated with a glib assurance inviting doctors to apply for the glittering prize of a promotion-studded career in the Civil Service, with the bland statement that there are "promotion prospects."

Now this is interesting indeed, but it is just not good enough, for we in the Civil Service know that it is not so, or is so unlikely that it is impossibly remote. Perhaps, though, we have not yet been informed of those rich rewards for our years of service, or could it be that they are only applicable to new entrants? We shall all be most happy to hear of these promotion prospects, for the battle of complementation is one which we have been fighting for many years with little success.

The nearest approach to increasing the number of senior posts was arrived at by the despised and rejected Howitt Committee, which in its report advised personal promotion to the holder of a post which would not normally apply to the subsequent holder of the post, a form of grace and favour preferment which is not only distasteful but open to many forms of abuse by both sides.

I feel that this should all be made clear to applicants for posts as medical officers in the Civil Service, and also the

widely held view that for all practical purposes there will not be any promotion, except on retirement and death grounds, for many years to come. No doubt the red herring of the Royal Commission and its recommendations will be dangled before the applicant's eyes, but he has only to read the Treasury views of medical officers and their claims as given to the Royal Commission for this rosy dream to fade. My apologies for a pseudonym, but it is, I am afraid, necessary for the usual reasons.—I am, etc.,
CIVIL SERVANT DOCTOR.

H.M. Forces Appointments

ARMY

Colonel T. I. Dun, D.S.O., M.C., late R.A.M.C., has retired on retired pay, and has been granted the honorary rank of Brigadier. Colonels L. Handy, G. T. Gimlette, and T. B. H. Tabuteau, O.B.E., late R.A.M.C., have retired on retired pay.

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel J. M. Savege has retired on retired pay, and has been granted the honorary rank of Colonel. Captains H. S. Gavourin, R. O. J. Fry, H. F. McElligott, F. R. D. Minett, W. G. Miln, M.B.E., K. H. Fraser, and P. C. Barry to be Majors.

Short Service Commission.—Captain J. B. Spearman to be Major.

REGULAR ARMY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Captain P. V. MacGarry, having attained the age limit of liability to recall, has ceased to belong to the R.A.R.O. and has been granted the honorary rank of Major.

Class III.—Major M. S. Howe, M.C., from Active List, Short Service Commission, to be Major. Captain (Honorary Major) R. B. Crombie, from R.A.R.O., to be Captain (Honorary Major).

ARMY EMERGENCY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel C. Berens, T.D., from T.A., to be Lieutenant-Colonel.

Major J. G. A. Gilruth, from T.A., to be Major.

TERRITORIAL ARMY

Lieutenant-Colonel (Acting Colonel) J. A. Dudgeon, M.C., T.D., R.A.M.C., to be Colonel.

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonels N. C. Oswald, T.D., and V. K. Drennan, T.D., have been granted the acting rank of Colonel.

Major (Acting Lieutenant-Colonel) R. Lamb has relinquished the acting rank of Lieutenant-Colonel.

Majors T. G. Cameron, M.C., C. T. A. Burgess, O.B.E., C. H. Imrie, and J. L. D. Roberts have been granted the acting rank of Lieutenant-Colonel.

Major T. I. Palmer, R.A.R.O., to be Major.
Honorary Major J. V. L. Farquhar, formerly R.A.R.O., to be Major.

Captain (Acting Lieutenant-Colonel) R. B. McConnell to be Major.

Captain (Acting Major) J. H. Garson has been granted the acting rank of Lieutenant-Colonel.

Captains (Acting Majors) D. E. Sharvill, R. B. Raffle, B. J. Harries, and A. C. P. D. Thomson to be Majors.

Captain (Acting Major) J. C. Campbell has relinquished his commission.

Captains E. R. Cole and J. A. Paterson to be Majors.

Captains P. W. S. Gray, S. Myers, N. T. Nicol, R. J. Howat, T. D. A. Gray, A. Ross, J. B. Walter, R. H. Freeman, and J. H. Parry have been granted the acting rank of Major.

Lieutenant S. E. J. Smith, T.D., has been granted the acting rank of Major.

HER MAJESTY'S OVERSEA SERVICE

The following appointments have been announced: A. A. Alderice, M.B., B.S., M.R.C.P., A. J. Boase, F.R.C.S., D.O.M.S., and H. C. Trowell, M.D., F.R.C.P., Senior Specialists, Uganda; G. H. K. Gentle, M.R.C.S., L.R.C.P., Superintending Medical Officer (Specialist), V.D. Division, Trinidad; J. R. Harries, M.B., B.S., M.R.C.P., Medical Specialist, Kenya; J. C. Baird, M.B., Medical Officer, Northern Region, Nigeria; W. L. H. L. Bell, M.R.C.S., L.R.C.P., and S. P. Maurer, M.B., B.Ch., Health Officer, Federation of Malaya; L. B. G. Bennett, M.B., B.Ch., Surgeon, St. Lucia; A. J. Coello, M.D., D.P.H., Medical Officer, Grade A, Physician, Trinidad; E. P. Hamblett, M.B., Ch.B., D.C.H., District Medical Officer, Dominica; Margaret M. R. O'Garra, M.B., B.S., District Medical Officer, Antigua.

Association Notices

Diary of Central Meetings

MAY

- 31 Tues. Joint meeting of the Coroners and Medical Witnesses Subcommittee, Private Practice Committee, 2.30 p.m.
31 Tues. Library Subcommittee, Science Committee, 3 p.m.

JUNE

- 1 Wed. Annual Representative Meeting, 10 a.m.
2 Thurs. Annual Representative Meeting, 9.30 a.m.
3 Fri. Council, 9 a.m.
3 Fri. Annual Representative Meeting, 10 a.m.
4 Sat. Annual Representative Meeting, 9.30 a.m.
4 Sat. Council (at conclusion of A.R.M.)
4 Sat. Annual General Meeting and Extraordinary General Meeting, 12.30 p.m.
10 Fri. Committee on Homosexuality and Prostitution, 2 p.m.
16 Thurs. Executive Subcommittee, Joint Formulary Committee, 2 p.m.
16 Thurs. Subcommittee on Coal Gas Poisoning, Science Committee, 2 p.m.
22 Wed. Consultant, General Practitioner, and Public Health Liaison Committee, 2.30 p.m.
24 Fri. Consulting Pathologists Group Committee, 11 a.m.

Branch and Division Meetings to be Held

BOURNEMOUTH DIVISION.—At Board Room, Royal Victoria Hospital, Boscombe, Friday, May 27, 8.15 p.m., meeting. Address by Dr. A. C. Crooke: "The Influence of the Endocrines in Carcinoma."

ENFIELD AND POTTERS BAR DIVISION.—Saturday, June 4, summer social meeting, 6.45 p.m., reception; 7.15 p.m., visit to the House of Lords and the House of Commons; 8 p.m., dinner at the House of Commons. Guests of the Division: The Rt. Hon. Iain Macleod, Dr. E. A. Gregg, and Lord Webb-Johnson. Members' ladies and their medical guests are invited.

MID-HERTS DIVISION.—At Ashwell House, Verulam Road, St. Albans, Friday, June 3, 8.30 p.m., meeting. Annual B.M.A. Lecture by Dr. Ffrangcon Roberts: "The Influence of Medicine on Civilization," illustrated by slides.

MONMOUTHSHIRE DIVISION.—At St. Mellon's County Club, Friday, May 27, 8.30 p.m. to 2 a.m., summer dance.

PADDINGTON DIVISION.—At Royal National Throat, Nose, and Ear Hospital, Gray's Inn Road, London, W.C., Friday, June 3, 3.30 p.m., clinical meeting and discussion. Mr. N. Asherson: "Intra-cranial Complications of Ear and Sinus Disease."

SALISBURY DIVISION.—At the Roundabout, Little Durnford, near Salisbury, Tuesday, May 31, 8.15 p.m., A.G.M.

SOUTH MIDDLESEX DIVISION.—At Great Fosters, Egham, Wednesday, June 1, 8 p.m., cocktail party to be held jointly with local division of the British Dental Association.

SOUTH STAFFS DIVISION.—Thursday, June 2, 2.30 p.m., tour of Stuart Crystal Glass Works, Wordsley. Members' wives are invited.

SWANSEA DIVISION.—At Swansea Hospital, Thursday, June 2, annual meeting.

WEMBLEY DIVISION.—At Wembley Hospital (in the Gymnasium), Fairview Avenue, High Road, Wembley, Tuesday, May 31, 9 p.m., meeting. Symposium: "The Value of Surgical Treatment in Congenital Heart Diseases." Speakers, Dr. I. M. Anderson and Mr. C. E. Drew. To be illustrated with films and pictures. Members from surrounding Divisions are invited.

WILLESDEN DIVISION.—Wednesday, June 1, visit to Ovaltine Factory at King's Langley, Herts. Assemble 1.15 p.m. at Willesden General Hospital. Members and their ladies or other guest, and health visitor staff, are invited.

Meetings of Branches and Divisions

DORSET DIVISION

A meeting of the Division was held on March 14. Dr. C. Hollins was in the chair, and 21 members were present.

Dr. A. S. Hall gave a lecture on "The Differential Diagnosis of Eruptions of the Extremities." The meeting instructed the secretary to write to the county medical officer of health to ask if he would make known to parents that their own doctors were able to undertake the immunization of children against diphtheria, pertussis, and tetanus. Parents were often unaware of this and thought that immunization could be carried out only at local authority clinics.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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GENERAL MEDICAL COUNCIL

190th SESSION

The 190th session of the General Medical Council opened at 44, Hallam Street, London, on May 24, with Sir DAVID CAMPBELL in the chair.

Dr. KENNETH COWAN was introduced as Crown Nominee for Scotland in succession to Sir Andrew Davidson. Dr. Cowan, who is Chief Medical Officer for the Department of Health for Scotland, was welcomed by the President and took his seat.

Notice was intimated of the reappointment of the following members, each of them for a term of five years: Professor E. R. BOLAND, representing the University of London; Sir HENRY COHEN, Crown Nominee; Professor W. J. TULLOCH, representing the University of St. Andrews; and Dr. ANDREW ALISON, representing the Royal Faculty of Physicians and Surgeons of Glasgow. Sir CECIL WAKELEY's reappointment as representative of the Royal College of Surgeons of England for the period March 8 to July 31, 1955, was also intimated.

Sir SYDNEY SMITH was re-elected Chairman of Business and Dr. G. A. CLARK was elected co-treasurer in place of Sir Cecil Wakeley, who ceases to be a member of the Council after July 31.

The Council proceeded to the election of the Executive and Dental Executive Committees, the Finance Committee, the Pharmacopoeia Committee, the Medical Disciplinary Committee, and the Dental Education and Examination Committee.

PRESIDENT'S ADDRESS

Sir DAVID CAMPBELL delivered his address from the Chair. He referred to the death early this year of the Council's former colleague, Sir Henry Wade, and paid tribute to his 10 years of service as the representative of the Royal College of Surgeons of Edinburgh, and particularly to his work for medical education. The President also recorded the regret of the Council at the death of Dr. Hampshire, whose 21-year occupancy of the office of Secretary to the Pharmacopoeia Commission saw the *British Pharmacopoeia* achieve an excellence which was respected throughout the world. The President also deplored the death of Dr. Harry Rae, for many years head of the Department of Public Health in Aberdeen University, and medical officer of health for the city and county of Aberdeen and a visitor of medical schools and examinations in public health for the General Medical Council.

Sir David Campbell referred to the retirement from the Council of Sir Andrew Davidson, and commended his work as chairman of the Special Committee set up in 1953 to revise the Rules of Courses of Study and Examinations for Diplomas in Public Health. He regretted the resignation from the Pharmacopoeia Commission of Professor Linstead, and congratulated him on his appointment as Rector of the Imperial College of Science and Technology.

Medical Colleges in India

The President said that the Government of India had for some time been engaged in a programme to secure a large increase in the number of qualified medical practitioners. This was being done by creating new medical colleges or by upgrading to university standard institutions which previously trained licentiates. Some of the new or upgraded medical colleges had been affiliated to universities which had for many years granted medical degrees. Others had been affiliated to or incorporated in new universities, or in universities which previously had no medical faculty. The standard of these new medical colleges was supervised by the Medical Council of India, who arranged for the inspection of the teaching at the colleges and of the examinations of the universities, under powers similar to those possessed by this Council.

Last May the Executive Committee had granted recognition for the purpose of registration in this country to the degrees of four Indian Universities which the Medical Council of India had recently recognized. Since then the Medical Council of India had notified the G.M.C. that they had recognized a number of further Indian qualifications, and had requested that their recognition in this country might in turn be considered. As a result, the Executive Committee in February decided to recognize the degrees of the University of Bihar in respect of the Darbhanga Medical College, the degrees of the University of Poona in respect of the B.J. Medical College, Poona, the degrees of the University of Utkal in respect of the S.C.B. Medical College, and the degrees of the University of Gujarat in respect of the B.J. Medical College, Ahmedabad. It also decided to extend the recognition of the degrees of the University of Agra, which was granted last year in respect of the Agra Medical College, to include persons who had undergone a course of study and been examined at the Gajra Raja Medical College, Gwalior.

Correctness of the "Medical Register"

One of the duties imposed by the Medical Acts upon the registrars of the General and Branch Councils is to keep the *Register* correct. But Sir David pointed out that, no matter with what diligence the registrars pursued their task, a successful result must depend to a large extent on the co-operation of the profession in keeping the Council informed of changes in their address.

The Acts authorized the registrars to write to any registered medical practitioner at his registered address to inquire whether he had ceased to practise or had changed his residence. If no answer was returned to this letter within six months, it became lawful to erase the name of the practitioner from the *Register*. In view of the great importance to the public of keeping the *Register* correct, it was the practice of the Council to direct that this power should be exercised. Since 1951, when the process was resumed, letters had been sent to approximately 50,000 practitioners. The

sections of the *Register* which had thereby been covered comprised those practitioners registered in the United Kingdom list whose names began with the letters A to N inclusive, and the whole of the Commonwealth and Foreign Lists. In one year one-third, and in no year less than one-sixth, of the practitioners to whom such letters were sent failed to reply and thereby rendered themselves liable to erasure from the *Register*. In spite of considerable efforts by the registrars, 2,659 could not be traced and their names were eventually erased. The fact that 309 names had been restored to the *Register* during the past four years after erasure under these provisions, including 146 in 1954, indicated that a proportion of those erased were still in practice.

Recommendations as to the Medical Curriculum

Sir David Campbell emphasized that the duty of the Council was to see that the courses of study and the tests of professional fitness actually applied by the examining bodies were "sufficient"—that is, the tests must ensure that those who passed them possessed, in the words of the Act of 1886, "the knowledge and skill requisite for the sufficient practice of medicine, surgery, and midwifery."

From the sixties of the last century onwards the Council had issued public statements, roughly at intervals of ten years, of the subjects in which students should be instructed and examined, the order in which the subjects should be taken, the period to be covered by the curriculum and its main subdivisions, and the general scope of the examinations. These statements were recommendations.

It might be, however, that with the passage of the years the recommendations had acquired the force of regulations, and thus had come to have a restrictive effect on the diversity, freedom, and responsibilities of universities and medical schools. That, in the President's view, was the fundamental problem which the Council would have to try to solve in its consideration of the amendment of its recommendations of 1947. They would also have to consider how far the introduction of the compulsory year of residence in hospital would affect the recommendations.

The "British Pharmacopoeia"

Dr. H. G. DAIN, chairman of the Pharmacopoeia Committee, presented its report.

The Commission had agreed that the apothecaries system of measurement should be eliminated from the *British Pharmacopoeia* and that the metric system should take its place. The Commission felt, however, that reasonable notice should be given of the intention to use the metric system only, and that it would be premature to make the change as early as 1958, when the next edition of the *Pharmacopoeia* will be published. The earliest appropriate date for the change appeared to be the year in which the following edition was due for publication, namely, 1963.

Study and Examinations for the D.P.H.

Dr. R. M. F. PICKEN, chairman of the Special Committee on Public Health, said that the Committee had invited, as a first step in considering the revision of the current rules on courses of study and examinations for the D.P.H., the views of a number of bodies and persons who were concerned with the training of candidates or were interested in public health administration. In general the Committee had found a consensus of opinion that no substantial amendment in the subject-matter prescribed in the existing rules was required. Criticism was made, however, on two grounds of the Certificate in Public Health. It was stated that little advantage was taken by practitioners of the provision enabling them to obtain a certificate. In the great majority of centres practitioners who had obtained the certificate proceeded normally to study for the diploma. In these circumstances the Committee felt that there could be little justification for the retention in the rules of specific provision for a separate Certificate in Public Health.

These recommendations were agreed to by the Council.

A report of the Medical Disciplinary Committee will appear in the Supplement next week.

RESEARCH IN GENERAL PRACTICE DR. W. N. PICKLES AT SOUTH MIDDLESEX DIVISION MEETING

Dr. W. N. PICKLES, President of the College of General Practitioners, gave an address on "Research in General Practice" to the South Middlesex Division of the B.M.A. on May 18. Members of the Guildford, Kingston, and West Middlesex Divisions of the B.M.A. were present by invitation. Dr. C. D. MEADOWCROFT was in the chair.

A Great Trio

Dr. Pickles chose a trio of "the greatest of our general practitioners" to build up his story. Starting with Edward Jenner—"A man who unhurriedly followed up a country belief and patiently waited to confirm it"—Dr. Pickles went on to William Budd, who, as a boy of 12 when Jenner died in 1823, "was being brought up in the traditions of medical practice in the family home at North Tawton in Devon." The speaker referred to Budd's *Typhoid Fever* as "one of the treasures of the epidemiologist, and his cold reasoning is a pattern for all those who essay to study the natural history of disease."

Budd was first a country practitioner, and of himself he wrote: "Having been born and brought up in the village. I was personally acquainted with every inhabitant of it, and being, as a medical practitioner, in almost exclusive possession of the field, nearly everyone who fell ill, not only in the village itself but over a large area around it, came immediately under my care." He later became a consulting physician in Bristol, where the idea that phthisis was a self-propagated zymotic disease and that all the leading phenomena of its distribution might be explained by supposing that it was disseminated through society by specific germs contained in the tuberculous matter cast off by persons already suffering from the disease, first came into his mind. It was his earlier experience in general practice. Dr. Pickles felt, that inspired Budd in his later work.

Of James Mackenzie (later Sir James) the speaker said that every young doctor should read the life of this lovable man. It shows how he began to take notes of all his patients and then decided to narrow it down to those whose signs and symptoms were connected with the heart; and that was where general practice came in—there was continuity. He was waiting to see what would happen to men, women, and children who showed these symptoms, and he was able to wait "as we in general practice are able to wait." Dr. Pickles quoted a story which illustrated Mackenzie's attitude very clearly: "A surgeon at the Edinburgh Royal was hesitating to perform a major operation on a rather decrepit elderly woman, and when he heard Mackenzie was in the city he asked for his advice. Mackenzie arrived without any of his paraphernalia—not even a stethoscope—felt the pulse, inquired where she lived, and, learning it was on the top story of a well-known tenement block and that she regularly went up and down, decided that she would stand the operation well, and she did."

Recording and Observing

Following humbly in the steps of James Mackenzie, Dr. Pickles said he believed that the keeping of records was essential, if not the basis of all good clinical work. "Let these notes be brief and let them be legible." Old-fashioned people like himself looked upon careless illegible handwriting as a form of bad manners, and notes written in this fashion were worthless and a source of irritation often to those who wrote them. He told young doctors to choose a fine pen and to take time over the procedure.

In research, said Dr. Pickles, the outlook of the country doctor was largely epidemiological in its widest sense. If he were to find a proportion of his young women patients victims of enlargement of the thyroid gland it would be fitting in him to inquire into local conditions and find out if there were anything in these which might contribute to the knowledge of its causation. There were problems of

heredity which were readily available: the hereditary nature of skin diseases such as psoriasis, for example, as well as the more obviously hereditary diseases, Friedreich's ataxia and conditions such as polydactyly.

Dr. Pickles spoke of a remarkable rheumatic family which he had had under his care during his years of practice. He had found it possible to work out a family tree which showed that out of 53 traceable descendants of a man, himself a victim, who died before his time, 23 had had rheumatic fever or showed unmistakable signs of valvular heart disease. The causation of rheumatic fever was very rightly one of the important objects of research at the present time, and, as environmental influence, dietary influence, and other factors were bound to loom large, it was as well to remember the existence of such families.

Writers of textbooks on infectious disease were handicapped by lack of definite information and were often bound to give approximations, say, on the length of the incubation period and the duration of infectiousness. Yet this information lay within the grasp of the country doctor, if he were interested and if he would give his mind to it. In country places that short and only possible exposure which alone gives this accurate information could often be traced, in a way that was well-nigh impossible in a town with the varied experiences of the town dweller. Dr. Pickles gave two instances of how he had obtained this information in a measles epidemic.

The Mind Prepared

In conclusion Dr. Pickles said: "We country doctors particularly should realize how great are our opportunities, and how much better and more interesting would be our lives if the lead which lies near to hand were assiduously followed. Work of this sort in the field is a possibility in itself, but its value is greatly increased if the practitioner is able to form a close liaison with the director of a laboratory, a man he knows and not just an impersonal bureau. This liaison is now possible in my own and many other districts and will be possible to all in the future."

"Research is not a matter of gusts of inspiration, but the results of patient observation undertaken so often with no sense of self-advancement. 'In the fields of observation chance favours only the mind which is prepared'—so wrote Pasteur. May those of us in general practice see that our minds are thus prepared."

A vote of thanks to Dr. Pickles was proposed by Dr. MORTIMER O'SULLIVAN, and Dr. W. A. LETHAM seconded.

REGISTRARS AND HOSPITAL MEDICAL STAFFING

MEETING OF REGISTRARS GROUP COUNCIL

A meeting of the Registrars Group Council was held at B.M.A. Headquarters on May 20. Dr. J. N. WALTON, a former chairman of the Group, who has recently returned following the completion of an overseas appointment, was invited to the chair. It was intimated that Dr. R. M. FORRESTER, who has represented the Group on the Central Consultants and Specialists Committee, was resigning on accepting a lectureship appointment, and warm thanks were tendered to him for his services.

The report of the Executive Committee for the session 1954-5 was approved, and this report will be circulated to regional registrars groups.

The principal matter for discussion was the revised report on hospital medical staffing prepared by the subcommittee, under the chairmanship of Professor G. I. Strachan, of the Central Consultants and Specialists Committee, and published in the *Supplement* of April 23 (p. 177). It was stated that this revised report had gone forward to the Joint Consultants Committee, together with statements by regional committees and special groups, including their own group.

The Minority Report

The CHAIRMAN said that much disapproval of the Strachan report had been expressed by registrars, and he wished to stress the difficult position in which Dr. Forrester, the one registrar on the Strachan subcommittee, had been placed. When his minority report came to be discussed in the Central Committee there were people who said in effect that the tail must not be allowed to wag the dog, and it was clear that there was no chance of acceptance of the report, so that he had no alternative but to withdraw it and devote himself to obtaining the best possible modifications of the hospital staffing structure. Since then the revised report had gone forward to the Ministry, not as the policy of the Central Consultants Committee of the B.M.A., but as a basis for discussion, and with it the views of other bodies, including a brief report from their own Group.

Dr. Forrester had explained that he had felt it necessary to withdraw the minority report because to have maintained it would have resulted in acrimonious discussion without the registrars being able to speak at the stage of future negotiations. It would also have held up discussions between the Ministry and the Joint Consultants Committee, and the former had been pressing hard for such discussions now for over a year. Whether it was regarded as a strategic retreat or a precipitate surrender, at least it had been agreed that a ratio should be established between those in training appointments and those in jobs not recognized as such, so that the position was ended whereby numbers of people were being taken in at one end and piled up at the other. The Joint Consultants Committee had now started to negotiate with the Ministry on a number of points. One of these which he found difficulty in understanding was that a minimum establishment of assistants in all specialties should be agreed to ensure that there would be sufficient practitioners in training to fill vacancies in the consultant establishment. That apparently went through unchallenged at the last meeting of the Central Consultants Committee. He did not quite know what was meant by "assistant," and it seemed to him that they had got the position upside down. The Chairman said that the Group Council would draw the attention of the chairman of the Central Committee to this ambiguous statement, and state their view that the governing word should be "maximum" rather than "minimum."

Three Points

The Chairman went on to say that many proposals were before the Council from regional registrars groups, most of them adverse to the Strachan report. It would not be profitable to discuss these individually but rather to concentrate on certain points. The Executive had set out three of these, the first being the interpolation of national service in a professional career. The continuing necessity for this service must be accepted, but the question of deferment and of inducement to return to hospital after service needed urgent attention. The Ministry had sent a circular to regional boards indicating the necessity for the provision of married quarters where required, but not drawing any attention to salary scale on completion of national service.

The question of house officers and their payment before and after their national service arose, with the difficulty of people doing the same job being paid at different rates. A representative suggested that this might be justified by the larger experience of the man coming out of national service, but Dr. FORRESTER pointed out that the Strachan subcommittee had envisaged that men after military service would normally be appointed to posts above the house-officer grade, though there was nothing in the report to say that this should be done.

The next question considered was the move from hospital to general practice. Attention was drawn to the scheme of rotating internships already initiated in the Oxford Region (see *Supplement*, January 29, p. 30). It was the strong feeling that any move to make doctors spend a longer time in hospital before entering general practice should work by inducement rather than by compulsion.

The CHAIRMAN said that the integration of hospital and general-practitioner service was one of the most important aspects of the whole problem. It must be made attractive to a man who intended to go into general practice to spend a further period in hospital after his national service. An important point was that many posts in the senior grade were to be part-time posts, and thus it should be possible for a man to go into general practice but work part-time in hospital.

Expansion of Consultant Service

The third question considered was the need for expansion of the consultant service. One further argument brought forward for such expansion was that the poor prospects of promotion from posts of the senior registrar type were acting as a deterrent to recruitment at all levels, and the ratio of senior registrars to consultant posts must be adjusted to involve a reduction in the number of the former and an increase in the latter.

The Chairman said that the increase in the number of consultant posts was not simply to find work for senior registrars but to carry on the work of the hospitals efficiently; it was necessary also because the present ratio of senior registrars to consultant posts was totally wrong, so that many senior registrars were doing consultant work. He suggested that the point be made that all senior registrars and S.H.M.O.s now serving should be redistributed in that grade or in the consultants grade according to their experience. The senior registrar who was regraded must be safeguarded perhaps by doing away with the gap between the surgical assistant and the senior surgical assistant. Dr. FORRESTER said that the redistribution envisaged was not so much of registrar personnel as of registrar posts, though this, of course, would necessarily entail in many cases a redistribution of individuals.

Various suggestions were made from the body of the meeting. The feeling was that without an increase in the number of consultant posts the whole of the suggestions would come to nothing. The CHAIRMAN said that the suggestions had all been noted and would be considered by the Executive in preparing a memorandum.

S.H.M.O.s GROUP EXECUTIVE COMMITTEE

CRITERIA FOR REGRADING S.H.M.O.s

The Senior Hospital Medical Officers Group Executive Committee of the S.H.M.O.s Group of the B.M.A. held its first meeting on May 3. G. WARING ROBINSON was appointed Chairman. It was reported that the membership of the Group had risen to 640.

Following the Group Council's consideration of the report of the Hospital Medical Staffing Subcommittee (the Strachan Committee) of the Central Consultants and Specialists Committee (see *Supplement*, April 9, page 162), the Committee discussed the criteria for redistributing existing S.H.M.O.s between the consultant grade and any new senior assistant grade which may be introduced.

Four Categories for Promotion

The Committee suggested that four categories of S.H.M.O.s should be distributed into the consultant establishment:

- (1) Those who were doing specialist work before the appointed day (July 5, 1948) and who subsequently accepted employment in the hospital service under the National Health Service Act in the same specialty.
- (2) Those who had held for a period of five years an appointment (or appointments) in the S.H.M.O. grade which has involved a large measure of personal responsibility in a hospital ward, out-patient clinic, special department, or specialist unit—for example, mass radiography, blood transfusion.
- (3) Those who had at least seven years' experience in the specialty (as senior registrars or S.H.M.O.s) and had held an appointment (or appointments) as S.H.M.O.s for a period of three years which had involved a large measure of personal responsibility in a hospital ward, out-patient clinic, special department, or specialist unit—for example, mass radiography, blood transfusion.

- (4) Those who had held an appointment as S.H.M.O. for at least two years and who held a major higher qualification (M.R.C.P., F.R.C.S., or M.R.C.O.G.).

Other Categories

S.H.M.O.s not in the above categories should, in the Committee's opinion, be given individual consideration with regard not only to academic qualifications but also to the length and nature of their experience and to their standing amongst their colleagues, and, where appropriate, they should be absorbed into the consultant establishment.

There should be safeguards for existing S.H.M.O.s who, as a result of being placed in the senior assistant grade, would suffer a lowering of status or responsibility or remuneration.

Senior hospital medical officers (whole-time) are defined in the terms and conditions of service as "Senior officers, age 32 or over, performing clinical duties, who are not of consultant status but are not registrars."

The Committee thinks that, for the purpose of these criteria, the definition should include part-time officers provided they spend a minimum of three sessions weekly in the hospital service.

These criteria are intended to be used for existing S.H.M.O.s only, since the abolition of the grade would entitle them to special consideration. They are not intended to apply to the future appointment of consultants from intermediate grades.

The Strachan Report recommended that only a small number should make their permanent career in the hospital service in a grade below that of consultant, and the S.H.M.O. Executive Committee believes it to be essential, therefore, that a large number of existing S.H.M.O.s should be redistributed into the consultant grade, and only a small minority into any new intermediate grade.

CENTRAL HEALTH SERVICES COUNCIL REPORT

The Central Health Services Council for England and Wales (chairman, Sir Frederick Messer) has made its report¹ to the Minister of Health on its proceedings, and on those of its standing advisory committees, for the year ending December 31, 1954. Much of the work reviewed has already been the subject of separate reports—for instance, the Report on General Practice Within the Health Service² (the Cohen Committee) and the Report on the Internal Administration of Hospitals³ (the Bradbeer Committee).

Thanking the members of the Council and advisory committees for their work, the Minister of Health writes in his introductory statement to the Council's report: "I am conscious that the collective advice I have been given is derived from the personal, unbiased contributions of each individual member, and, especially on questions which may be the subject of current controversy, these cannot always be entirely easy to make."

Nursing Assistants in Mental and Mental Deficiency Hospitals

In the early part of the year both the Standing Mental Health Advisory Committee and the Standing Nursing Advisory Committee considered the supply of nurses for mental and mental deficiency hospitals. The Standing Nursing Advisory Committee thought that there was a place in such hospitals for "a statutory grade of enrolled assistant nurse for whom there would be a roll distinct from the existing roll of assistant nurses." The Mental Health

¹ Central Health Services Council. Report for the Year Ended December 31, 1954. H.M.S.O., London.

² Central Health Services Council. Report of the Committee on General Practice within the National Health Service, 1954. H.M.S.O., London.

³ Central Health Services Council. Report of the Committee on the Internal Administration of Hospitals, 1954. H.M.S.O., London.

Committee took the opposite view. The two committees agreed that it would be necessary to employ two categories of nursing staff in this field for a considerable time ahead, but could get no further than recommending a full inquiry into the whole question.

The Council therefore appointed a working party of representatives of the two Standing Advisory Committees, under the chairmanship of Sir Henry Cohen. They produced a unanimous report which the Council accepted. The Working Party found no fundamental differences between the two sides in principles to govern a short-term policy. It agreed that there was an urgent need in both types of hospital which could be filled by nursing assistants appropriately experienced and supervised. There was a great deal in favour of a statutory roll of assistant mental nurses, especially regarding status, but legislation would be needed. Meanwhile, to achieve the best standard of work, the nursing assistant should undergo a training course for which a "practical proficiency" certificate should be awarded. The Working Party suggested that this short-term proposal should be given a three-year trial.

Medical Care of Epileptics

The Standing Medical Advisory Committee considered, among other things, the medical care of epileptics. A considerable proportion of patients, especially those with major epilepsy, could now be made fit to take their place in the normal working community. The Committee thought, therefore, that the medical services available to the epileptic should be reviewed.

In the medical field the immediate needs of epileptics appeared to be: (1) adequate facilities for advice on diagnosis and treatment; (2) some beds set aside for short-term stabilization and assessment; (3) long-term institutional accommodation for rehabilitation of more difficult cases and those unfit for life in the community; (4) adequate after-care and resettlement facilities. Problems arose under each of these headings—for instance, on (1), was there sufficient medical manpower, particularly at consultant level, and, if not, how could the position be improved? On (2), how many beds were likely to be required and could they be provided on a regional basis? How long would stabilization and assessment take? On (3), would the future intake to epileptic colonies be reduced if intensive treatment were available immediately on diagnosis? What was the prospect of mental deterioration if fits were not completely controlled? How far was psychopathy a symptom of epilepsy and how far was it due to faulty handling, particularly in the early stages?

The Medical Committee decided to set up a subcommittee with the following terms of reference: "To review arrangements for the care of the epileptic and to make recommendations."

The Ban on Heroin

The Minister referred to the Medical Advisory Committee three resolutions adopted by the Economic and Social Council of the United Nations, urging Governments to prohibit diacetylmorphine (heroin) and ketobemidone, and to discontinue cannabis, as used in medical preparations. The Medical Committee had advised in 1950 that it would be justifiable to prohibit heroin in this country if international agreement were reached to prohibit its manufacture and sale. Arrangements for prohibition were in fact now being made. Of the two other drugs, ketobemidone was not manufactured in this country, and cannabis, which had not appeared in the *British Pharmacopoeia* since 1914, had practically no recognized use.

The Committee advised the Minister that in its view it would be right to accept the resolutions of the Economic and Social Council of the United Nations relating to ketobemidone and cannabis.

Dental Manpower

The Standing Dental Advisory Committee examined the evidence on the number of dentists likely to be available in

future years in relation to the demand likely to be made upon their services. The Teviot Committee, reporting in February, 1946, had observed that "it was not possible to say with any accuracy how many dentists it would ultimately be desirable to have practising in this country. . . . Nevertheless, we can say with confidence that up to a total of about 20,000 in active practice there is no likelihood of securing entrants more quickly than they are needed."

In the light of the later information available to it, the Committee saw no reason to amend this appraisal. There was likely, however, to be a continuing increase in demand for provision of treatment in the Health Service. The Committee noted that, of the 15,000 dentists now on the *Register* who were practising, some 40% were aged over 55, so that in the next ten years retirement would be at a very high rate. The Teviot Committee estimated that, to reach the total of 20,000 practising dentists in Great Britain within 20 years, entry to the *Register* would have to be raised to 800 a year. Allowing for 10% wastage, some 900 new dental students were therefore needed each year. A peak of about 650 new students in dental schools in Great Britain was reached in the immediate post-war years, but there had been a fall to 470 in 1953.

The Committee concluded that unless some action was taken there would be an acute shortage of dentists in the near future.

The Minister has set up an interdepartmental committee (the McNair Committee) to ascertain the reasons for the lack of candidates of suitable quality for training as dentists and indicate possible directions in which remedies might be sought (see *Supplement*, May 21, p. 236).

PRACTICE COMPENSATION AUCTIONED

On May 26 in a City of London sale-room there took place what is believed to be the first public auction of a doctor's compensation for the loss of the right, under the provisions of the National Health Service Act, to sell the goodwill of his practice. The notice of sale described "Lot 1" as "The medical practice compensation amounting to £4,089, payable on the death of a medical practitioner, a gentleman aged 57, or on his retirement from the National Health Service, whichever event first happens." The interest of 24% per annum payable on the capital was included in the sale.

At the outset the vendor's solicitor read a letter from the Ministry of Health which said that it had no objection to the selling or assigning of practice compensation and the interest thereon. With any doubts thus dispelled, and after it was made clear that there was no retiring age for general practitioners in the N.H.S., the sale proceeded. An opening bid of £2,500 was briskly raised by hundreds to £3,200 and then to £3,250, beyond which none was prepared to go. As this exceeded the reserve, the hammer fell and the lot was sold.

TRANSFER OF L.C.C. HEALTH SERVICES

OPPOSITION BY LONDON EXECUTIVE COUNCIL

The London County Council has been seeking views on the possibility of returning to metropolitan borough councils certain of the personal health services, including maternity and child welfare, vaccination, day nurseries, and foot clinics, and of the sharing of powers for the provision of domestic help and health visitors (see *Supplement*, March 5, p. 70).

The London Executive Council at its meeting on May 26 agreed with the London Local Medical Committee that to hand back the present efficiently administered personal health services to the borough councils "would not be in the best interests of the population of London" and "would be highly undesirable."

Correspondence

Patients, Politics, or Both?

SIR.—A report on the presidential address delivered to the Metropolitan Counties Branch of the B.M.A. by Dr. R. Hale-White appeared in the *Supplement* of May 14 (p. 225). It was described as a forthright address, as indeed it was, and, as it was considered that the views expressed deserved publicity, it should be open to equally forthright comment.

May I say at the outset that I wholeheartedly agree with many of Dr. Hale-White's statements? I, too, am sure that the standard of medicine is going down, and will continue to go down. I, too, am sure that tinkering with the Service is not enough, but when I am told that the muddle we are in, and the worse muddle we are drifting into, is because of my apathy and the indifference of many like me, I have not sufficient sense of humour to laugh at the joke.

Does Dr. Hale-White forget completely the dynamic short-lived surge of leadership just before July, 1948? Has he forgotten that there then was neither apathy nor indifference at the periphery? In case he has, may I remind him that we were told by our elected representatives, by members and the Chairman of Council, by the Presidents of the Royal Colleges, that we had won all the essential points in the battle of will and wits with the then Minister of Health, and that we should enter the Health Service and ourselves smooth off its roughnesses and lack of proper finish. Many of us at the periphery were utterly dumb-founded at this startling inexplicable volte-face. I was told at a Divisional meeting that the doubts I felt were quite unjustified, my expression of fears that we were being led gently into a gilded (?) cage were most smoothly dismissed. Yet all this seemed to come about because, on that one occasion, the Minister was polite to the demure deputation from the B.M.A. and by simple tactics persuaded our ingenuous spokesmen to believe a number of noncommittal assurances which were worth precisely nothing.

I doubt if many at the periphery have ever quite got over that episode, and what have we seen since? Long-drawn-out talks with inconclusive endings, evasive answers, delaying tactics, in fact all the tricks employed by those who have succeeded in dividing and ruling. What seems to me as bad as this ineffectual negotiation is the acquiescence, by the very committees which Dr. Hale-White claims are fighting on our behalf, to the increasing number of obstacles which the Ministry of Health is putting in the way of good doctoring.

Why, in the name of sanity, was it agreed that I should be ordered to write my prescriptions on either a white or a green coloured form, when all my prescriptions are priced and my dispensary is in effect the same as a chemist's shop? Why on earth agree that I must have a knowledge of the technicalities of haberdashery? Imagine accepting and, I am told, helping to devise that utterly absurd pantomime of sticking stamps on a sheet of paper when paying over the taxes we have been made to collect. Who would ever have believed that I would be placed in the invidious position of asking for shillings from my old friends, some of whom subscribe to the widespread belief that the whole National Insurance contribution as well as these shillings form a part of my income? There have been occasions when I have gone out late at night, taking dressings with me, and in response to my request for "the Government shilling" I have been asked to accept two, as it was so good of me to come out so late!

Enough of examples, of which there are many more. As things are at present there is no way of countering the insidious changes that are taking place, more particularly when some of our medical brethren are acquiring a liking for bureaucracy. Many of us at the periphery are very much awake "to a sense of personal responsibility for the welfare of medicine in this country," and we feel, not apathy, indifference, and lack of interest, but an intense sense of

frustration, which grows with every added burden that our own representatives allow to be loaded on to our shoulders. The whole profession, with a few exceptions, is in the same drifting boat, and idealism, wisdom, and enthusiasm among that ship's crew cannot make up for bad navigation, complacency, and lack of directions from those on the bridge.—I am, etc.,

Ilminster, Somerset.

HUGH CARTWRIGHT.

Entry into Practice

SIR.—Dr. F. Gray, chairman of the Assistants and Young Practitioners Subcommittee (*Supplement*, May 14, p. 231), refutes a statement made by Dr. George Rosedale (*Supplement*, May 7, p. 223) regarding the two assistantships which could not be filled owing to a lack of applicants. Regrettably, he does not comment further. These two posts were quoted by Dr. L. S. Potter, medical director of the Medical Practices Advisory Bureau (*Supplement*, March 26, p. 120), as a "convincing answer to the statement that doctors cannot get posts in general practice." Such generalization from specific instances may surely give rise to erroneous conclusions.

There is undeniably a widespread belief amongst young practitioners that there is a shortage of assistantship posts compared with the number of available doctors, having due regard to reasonable demands by potential applicants for certain standards of employment. In the presence of such divergent views on the opportunities for obtaining such a post, many young practitioners would welcome a survey to determine, as accurately as possible, the involuntary unemployment rate in the profession and the average number of applicants for assistantship posts. Dr. Gray's Committee might appropriately investigate such vacancies as those quoted by Dr. Potter, with a view to assessing whether the sole deterrent is, in fact, an unattractive area.—I am, etc.,

London, N.W.2.

G. H. ISAAC.

*. We understand that the Medical Practices Advisory Bureau is carrying out a survey similar to the one referred to and that the figures will be published shortly.—ED., B.M.J.

Employment on Return from the Tropics

SIR.—With reference to Dr. E. R. Blay's letter (*Supplement*, April 23, p. 202) a return to the United Kingdom must usually be borne in mind by doctors who go to the Tropics, but if their home of origin was Northern Ireland they will find the door closed to them on their return, as before an appointment can be obtained there the previous five years must have been spent in the United Kingdom. Moreover, as regards the public health service in the Imperial Province, they will also find that the upward age limit is 45 years, and that even for a clinical post the applicant must hold the Diploma in Public Health.

Such restrictive regulations do not, of course, obtain in England, and, although the Northern Ireland Government makes much play of being constitutionally a part of the United Kingdom, the Northern Ireland Branch of the British Medical Association appears cheerfully to condone this state of affairs. Yet the great majority of medical graduates whose homes are in Northern Ireland seek employment outside the country, and some, of course, go to the Tropics. Indeed, practice in the Gold Coast particularly has been recommended by the Association's official representative from Belfast who recently visited that country.—I am, etc.,

Canterbury.

C. J. MACQUILLAN.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.

Non-County Borough Councils.—Crewe.

Urban District Councils.—Houghton-le-Spring.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

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British Medical Association

ANNUAL REPRESENTATIVE MEETING, LONDON, 1955

The Annual Representative Meeting was held in the Great Hall of B.M.A. House, London, from Wednesday, June 1, to Saturday, June 4. The chair was taken by Dr. I. D. GRANT (Glasgow). In addition to the 212 constituencies in Great Britain and Northern Ireland, 20 overseas constituencies were represented. The total number of acting and deputy acting representatives on the list was 430.

On the main agenda there were 238 motions and amendments. Almost all the business arose out of the Annual and Supplementary Reports of Council, which were published in the *Supplements* of March 19 and April 23 respectively.

The meeting opened at 10 a.m. The CHAIRMAN commented on the "wonderful attendance" of representatives notwithstanding the railway strike.

THE WORK OF THE ASSOCIATION

The CHAIRMAN OF COUNCIL (Dr. E. A. Gregg), in presenting the Annual and Supplementary Reports, said that the Council had accomplished a great deal of useful work in a session unusually short owing to the necessity of holding the Annual Representative Meeting before the Scientific Meeting in Toronto.

During the session death had taken many highly esteemed members of the Association. Perhaps it might not be invidious to mention two for whom the Representative Body had special regard and affection—Dr. J. B. Miller, a former Chairman of this Meeting, and Dr. Alfred Cox, who was Medical Secretary for 20 years.

Expanding requirements in respect of accommodation for the Annual Meeting had made it increasingly difficult to find centres which could provide all the necessary facilities, and it was with regret that the Council had felt obliged to decline invitations received from Belfast, Bristol, and Oxford. Next year they would go to Brighton, and it would be his pleasure to recommend for election to the office of President a general practitioner in that locality, the first general practitioner to be selected for the office since it was held by Dr. Thomas Fraser, of Aberdeen, in session 1939-40.

More than 250 members of the Association were about to attend the Joint Meeting with the Canadian Medical Association in Toronto. Their Canadian colleagues were preparing hospitality on an unexampled scale.

The Annual Report recorded a delightful gift to the Association by a member of Council, Mr. D. S. Pracy. Mr. A. M. A. Moore, who resigned the Treasurership a year ago, was now about to present a beautiful badge to be worn by the holder of that office. Mr. Moore would make the presentation at the Annual General Meeting.

There were two long and animated debates in the Representative Body in Glasgow last July. The first was on the proposed restoration of the right to buy and sell the goodwill of general medical practices—which, at least for the

time being, had ceased to be a live issue. The second was on the new salary scales for hospital medical staffs which came into operation in April, 1954, as a result of an agreement concluded in Committee B of the Medical Whitley Council. In this field there was, as yet, little progress to report, although a number of fresh claims made by the Staff Side of Committee B were under consideration. It was regrettable that the new salary claim made on behalf of the senior hospital medical officers had not found immediate acceptance. The Representative Body would be sorry to learn that, because of an illness from which they hoped he would speedily recover, Dr. T. Rowland Hill could not attend the meeting to explain the present situation. In his absence the task would be in the hands of Mr. J. R. Nicholson-Lailey.

No less important than the problem of remuneration was that of the structure of hospital medical staffing. The discussion of this difficult problem between the Health Departments and the Joint Consultants Committees was still at a preliminary stage, but, whatever solution might ultimately be found acceptable, much credit was due to the Association for the initiative it had taken in the matter and for the laborious and constructive work carried out by the special subcommittee under the chairmanship of Professor G. I. Strachan.

An attempt to negotiate improved salary scales for medical officers employed by local authorities had not been completely successful. The most disappointing feature of the recent award of the Industrial Court was the apparent acceptance by the Court of the contention, strongly resisted by the Staff Side of Whitley Committee C, that the remuneration of public health medical officers should be related, not to that of other branches of the medical profession, but to that of other professional officers in the employment of the local authorities. This disturbing position would receive careful study by the Council during the coming session.

Finally, from much other material on which he would have liked to comment if time permitted, he selected the problem of the Government's decision to prohibit the manufacture, export, and import of heroin. It was right that the Association should guard jealously the clinical freedom of the doctor, and when the Council looked at this problem last December it expressed the view that, while it was the duty of the Government to legislate against misuse of heroin, the medical profession should not be deprived of this drug or any other drug that was of use in the treatment of patients.

The Presidency

On the motion of the CHAIRMAN OF COUNCIL, it was agreed that in the absence of the President (in Canada) during the session 1955-6 Sir John McNee, who would be the immediate Past President, be invited to act for the President on all appropriate occasions.

It was also agreed on the motion of the CHAIRMAN OF COUNCIL that Dr. Alexander H. Hall, O.B.E., M.D., of Hove, be elected President of the Association for the session 1956-7.

Dr. ALEXANDER HALL, who was received with cheers, acknowledged his election, which he, as "a humble general practitioner," felt to be an expression by his Division of their belief in the importance of the part which the general practitioner played in the structure of the country's medical services.

Election of Vice-Presidents

The CHAIRMAN OF COUNCIL moved that Dr. A. W. S. Sichel, of Capetown, and Dr. P. T. J. O'Farrell, of Dublin, be elected Vice-Presidents in recognition of their valuable services to the Association. Dr. Sichel was President in 1951-2 and Dr. O'Farrell in 1952-3.

This was agreed with applause.

"BRITISH MEDICAL JOURNAL"

Dr. J. G. M. HAMILTON (Chairman of the Journal Committee) presented the Annual Report under "British Medical Journal." So largely did medical political affairs bulk in the activities of the Association that its efforts in connexion with the promotion of medical and allied sciences—the first of its primary objectives—tended to be lost sight of. The accusation sometimes advanced that the Association was little more than a "medical trade union" was palpably refuted by the fact that the journal department was now a publishing house of considerable magnitude with an annual turnover approaching £500,000—a very notable contribution towards the furtherance of the Association's first objective.

Overseas readership had steadily increased in the last 10 years. The *Journal* was read in virtually every country in the world.

The 14 special journals had in 1954 shown a steady rise in circulation in respect of each one.

Every effort would be made, said Dr. Hamilton, to ensure that the *British Medical Journal* reached its readers during the present railway strike. Deliveries would doubtless be delayed, but the department relied with assurance on the understanding and forbearance of members. He explained that the reduction in size was due to the necessity of keeping postal packages below 8 oz. in weight.

Dr. B. HIRSH (Manchester) complained that a large portion of the contents of the *Journal* was uninteresting to general practitioners. He said that the section which interested them most was the *Supplement* correspondence, and asked why it was restricted to about three letters per week on general-practitioner subjects.

Dr. HAMILTON replied that, while criticism of the *Journal* was healthy, it ought to be based on some knowledge both of the subject-matter of the criticism itself and of the clear objectives which the Editor and his assistants were obliged to follow.

It had been found as a result of a recent estimate that about 85% of the letters received were published either in the *Journal* or in the *Supplement*. The amount of space devoted to correspondence had to be determined by a variety of factors, including the nature of the other editorial matter which it was necessary to include. The technical job of making up such a journal, because of the manifold character of the Association's activities, was a very difficult one, but it lay in the hands of one who could justifiably be regarded as the most notable and distinguished medical editor in the world to-day.

About two-thirds of the *Journal's* readership, he reminded Dr. Hirsh, comprised members of the Association who were not general practitioners. It was the Editor's task to provide "something for everyone" and certainly not "everything for someone." Medical scientist and medical specialist readers had also to be catered for, and their interests were not the same as those of the general practitioners.

The report under "Journal" was approved.

"FAMILY DOCTOR"

Dr. O. C. CARTER (Chairman of the Family Doctor Committee) presented the Annual Report under "Family

Doctor." Four years ago, he said, the publication had been in a very frail state; its survival had been problematical. The Representative Body had wisely decided to give it a further chance, and last year it had been produced at no cost to the Association and had provided a small surplus.

"We are building up a large business asset for the Association which has a very considerable capital value," he said. This had been achieved by ploughing back a good deal of the money it had earned. The volume of editorial work had increased considerably over the past year and *Family Doctor* was now more and more widely accepted, approved, and quoted. An assistant medical editor was now needed.

A modest surplus for this year had been budgeted for, despite increased costs. It was intended to develop the magazine's interests by increasing its circulation; its size was to be increased from 64 to 90 pages. The publication of *Family Doctor* pamphlets was to be widened.

At December last year the value of advertising space booked in advance for 1955 had been about equal to the total advertising revenue of 1954. For the first new half-year the revenue had exceeded that of last year's corresponding period by £14,000, despite the fact that advertising copy had been subjected to an even finer screening than before. This year's February, March, and April numbers had been completely sold out. Dr. Carter paid a tribute to the work of the Editor, Dr. Flack, the assistant editor, Miss Ward, and to the business manager, Mr. Edsall.

Dr. C. P. WALLACE (Guildford) deprecated the possibility of *Family Doctor* being regarded primarily as a business asset for the improvement of capital value and thought that attention should be paid to its objects.

Dr. CARTER said it had never been the publication's object merely to make money; its purpose was to give public education and information on healthy living—the reason why its earnings had been ploughed back in order to improve it as a publication and to make it more widely known.

The report under "Family Doctor" was approved.

Dr. W. WOOLLEY moved and Dr. H. M. GOLDING (Bristol) seconded:

That this meeting warmly congratulates the Editor and staff of *Family Doctor* on their fine achievement this year.

This was carried with applause.

ASSOCIATION FINANCE

The TREASURER (Mr. L. Dougal Callander) presented the Financial Statement for the year 1954. At the close of 1953 the Association had had substantial debts to liquidate before the finances could be stabilized. By practising every economy, and particularly by careful budgeting, stabilization had been achieved and by the end of 1954 the Association was out of debt. (Applause.) The seeming paradox of last year's subscriptions being slightly less though membership was slightly higher was due to a greater number of overseas applications, where the subscription was at a smaller rate. Current membership figures were appreciably up. The increased total expenditure for 1954 had been anticipated. Several new and important committees had been set up, including a Constitution Committee. Capitation grants had cost a little more because the balances in the Branches and Divisions had been used up. One of last year's greatest reductions had arisen from the small amount having to be paid on interest on loans.

Current liabilities had been reduced from £192,000 to £164,000. "The picture is a pleasing one," said Mr. Callander, "but, as your Treasurer, I must ask this meeting of representatives to be very cautious in making any decisions which might reduce the income of the Association at present. We can only carry on with a reasonable balance from the income we have at the present moment. We must have a reserve." The past year should be regarded as a period of stabilization; the Association must now consolidate its position so as to be able to weather any unforeseen financial crisis. If the position which the Association had reached in the eyes of the Commonwealth and the world was to be retained emissaries must be sent abroad and paid for, while emissaries from other countries must be received

here. Income from members' subscriptions was just sufficient to deal with the running costs of the Association as at present constituted.

Reduction of the subscription was not at the present moment a practicable proposition; in fact, it would be thoroughly bad finance. As soon as he felt such a step to be justified, he would be the first to advise the Council accordingly.

Mr. Callander ended by thanking the staff of the Association for their help and co-operation and paid a tribute to the work of Mr. Giles, the Financial Comptroller.

Membership Subscription

Several motions were on the order paper pressing for a reduction of membership subscription or its modification for certain classes of members. North-west Wales moved that the relevant paragraph in the Annual Report be referred back with a view to reduction of the standard rate of annual subscription to four guineas. Dr. L. W. JONES (North-west Wales) said that the increase from four to six guineas was made so that the additional income could be devoted to debt redemption, and after three years sufficient should have been subscribed for this purpose and to set some aside to reserve. Also, a subscription reduction would be offset by a greatly increased membership.

Dr. ANGUS WESTON (Council) asked that the motion be rejected. A lower income would mean a lowering of the standard of all the Association's activities.

Dr. J. C. KNOX (Tyneside) pointed out that the accounts disclosed a lowering of subscription income for the first time, and wondered whether this was due to the increased subscription.

Dr. O. C. CARTER (Bournemouth) said it would be impossible to build up a reserve if the subscription were reduced.

The TREASURER said there had been a tremendous rise in membership since the war, which had almost reached saturation point. A reduction of two guineas in the subscription would result in £50,000 a year less income, which would mean going bankrupt unless the Association's functions were drastically reduced.

The North-west Wales amendment was lost.

Gateshead asked that in those cases where members' subscriptions were not chargeable against income tax some compensatory adjustment should be made. Dr. J. C. ARTHUR said members would feel less aggrieved if there could be held out a possibility that when more money was available subscriptions would be reduced.

Dr. FRANK GRAY (Council), speaking as one of the "victims," said the disadvantages had to be weighed against the advantages, and there was no reason for making a difference in subscription between classes of members.

The CHAIRMAN OF COUNCIL said this was a matter which should be taken up with the income-tax authorities, and the Association was engaged on questions concerning members' taxation.

The Gateshead proposal was lost.

Dr. T. O. McKANE (Mid-Essex) moved to instruct the Council to consider a proposal that those not getting an allowance of the B.M.A. subscription on their income-tax assessments should pay a subscription of four guineas instead of six guineas. He said that the resultant increased membership would compensate for the loss sustained. Dr. D. L. GULLICK (East Herts) supported the motion, which was lost.

GENERAL MEDICAL SERVICES

Dr. A. TALBOT ROGERS (Chairman of the General Medical Services Committee) presented the section of the Annual Report and Appendices under "General Medical Services."

He stressed the importance of the setting up of the Willink Committee, and referred to the advantage of having on it Drs. J. T. Baldwin and A. B. Davies, who would ensure that the general practitioners' point of view would be properly understood. He stressed also the general inspection of doctors' surgeries by the local medical committees, which had created a precedent which might well lead to even more tasks being performed by doctors themselves with a minimum

of executive council interference. He repeated many of the points he made in his speech to the Conference of Representatives of Local Medical Committees, reported in the *Supplement* of May 28.

Suggestions that dispensing doctors should receive discounts from wholesale houses had been rejected by the conference on this subject, and at present dispensing practitioners must make the best bargain they could with wholesale houses.

Attempts had been made to get improved rates of payment for trainee assistants, and an offer by the Government, that the remuneration should be raised by £75 a year, had been accepted, starting from July 1. It had not yet been decided how to divide this sum in respect of car allowances.

Income from Private Practice

Dr. H. H. GOODMAN (Newcastle-upon-Tyne) moved that any attempt to assess income from private practice in arriving at the global sum payable to general practitioners be rejected.

The £2m. figure agreed, after the Danckwerts award, as covering private practice for all general practitioners had been confirmed by the Association for the present year, and would again be deducted from the central pool, but doctors who had had private patients at the time the National Health Service started had lost a good deal of their private practice, so that if the figure of £2m. had been correct in 1950 it was too high to-day. The system operated badly for the young general practitioners who had no private practice at all, but rather favoured the older ones with a large number of private patients.

Dr. A. B. DAVIES (Walsall and Lichfield) strongly opposed the Newcastle amendment. Assessment of the private receipts of general practitioners was one of the four legs of the Danckwerts award. The effect of the amendment would be to throw over the Danckwerts award and the Spens recommendations.

Dr. TALBOT ROGERS replied that the £2m. figure had never been accurately checked but had been a compromise. To decide whether or not it was the correct amount it would be necessary to have a proper inquiry. The Ministry and the Association were agreed that the incidence of private practice up and down the country was now so uneven that nothing short of a complete inquiry through income-tax figures could provide the proper answer. Such an inquiry could not be undertaken at present because of the burden of work it would impose upon the Inland Revenue authorities—in fact, there was no likelihood of such an inquiry being held for many years, if ever.

He hoped that the position would always obtain whereby the Association could negotiate the amount to be reckoned for private practice and eventually that it could be negotiated down and not up, but in the meantime it would be unwise to place obstacles in the way of the existing method, which had been working successfully in the past few years.

The Newcastle-upon-Tyne amendment was lost.

Call for Increased Remuneration

Dr. A. COLEMAN (North Glamorgan and Brecknock) moved:

That in view of the ever-increasing cost of living, the Minister should be approached with a view to obtaining a corresponding increase in the remuneration of general practitioners.

The betterment factor, which fluctuated with the cost of living, was an important consideration not yet fully taken into account. The Government had so far declined to admit that a fresh betterment factor should be applied each year, yet it seemed a reasonable request. He quoted comparative figures to illustrate earnings, cost of living, and retail prices on a national scale.

"The time has now arrived when we should insist on the Government immediately reviewing the whole betterment factor question," he said. "An increase of at least 25% should be asked for, and it should be backdated, if possible, to the date of the Danckwerts award." As a long-term policy, he asked if it were possible to work out some easier and totally different scheme from the central pool.

Representatives of East Hertfordshire, North Middlesex, Newcastle-upon-Tyne, and South-east Essex, all of whom had similar motions on the agenda, supported North Glamorgan and Brecknock.

Dr. A. V. RUSSELL (Council) suggested that they should exercise discretion in this matter. If they were going to tie remuneration to cost of living, what was going to happen when the cost of living went down? Recently he read a headline in the Press, "Doctors on the ramp for more money." He begged them not to approach this matter from a trade union point of view.

Dr. TALBOT ROGERS said that it was very important that they should not try to get something at the wrong moment and in the wrong way. They had been told that the most important factor in their remuneration was betterment; he did not agree. The rise in the cost-of-living index, of which so much had been made by the previous speakers, was very largely an industrial figure; it did not include many of the things which cost the professional classes more. The most important thing they got out of the Danckwerts award was the flexibility of the central pool. The amount paid to the profession in capitation fees, loadings, etc., under the whole distribution scheme for the year 1952-3 amounted to £49m. Since then there had been two financial years, 1953-4 and 1954-5. In addition to that £49m. there had been paid out to general practitioners as a whole another £14m., and a further £100,000 in group practice loans. There was still another £1,400,000 to be paid out as a final settlement, and he hoped the final payment would be received in June, 1956. He did not agree that, as one speaker had said, the Danckwerts award was being whittled away; he thought it was being maintained and used intelligently. Many of the things referred to by speakers supporting the North Glamorgan and Brecknock motion as raising the cost of living, such as the higher cost of electricity, petrol, etc., were reflected in the rise of the practice expense allowance.

Dr. F. SMITH (Lanarkshire) pointed out that at the Glasgow meeting an *ad hoc* committee was set up to examine the whole question of medical remuneration, and until it had reported it was inopportune to debate the question at length.

Dr. S. WAND (Birmingham) reminded the meeting that the figures making up betterment were compounded according to the purpose for which they were needed, which for their purpose did not conform with any of the patterns quoted. It was clear that it was no part of Government policy to attach higher income levels to the cost of living. Appropriate action must be taken at the appropriate time. Was a time of strikes and Government changes the atmosphere in which to conduct negotiations?

Dr. A. COLEMAN (North Glamorgan and Brecknock), in reply said that he had in mind mainly the betterment factor, which so far had been refused revision by the Government. He agreed that the moment was not appropriate for negotiation, but pointed out that the motion had been put down before the present situation developed, and asked that the motion be referred to Council.

The meeting refused to allow this motion to be referred to Council, and it was lost by a very large majority.

Group Practice

Dr. R. M. WARREN (Southampton) moved:

That this meeting is concerned with the policy of the Association in regard to group practice, and, having regard for the full implications of this policy, suggests that the Council give this matter further consideration.

He recalled that acceptance of the Danckwerts award by the Ministry of Health was conditional on the setting aside of £100,000 a year for the encouragement of group practice. Practitioners would eventually provide sufficient premises for a nation-wide workable health centre scheme. Might there not be a risk, when the time was ripe, of the State acquiring those premises? Practitioners then working in them would be on a par with those working in State-owned hospitals and be salaried servants, which would be a great step towards establishing a full-time State medical service.

Dr. TALBOT ROGERS said that the danger had been foreseen and avoided. By the time any Government could say to a doctor, "These are not your premises. You built them with State money and the State has a lien in them," the doctor would be able to reply, "But I have paid that money back. I merely had a loan." Everything had been done to ensure that in rural areas the definition of a "group practice" would be interpreted very leniently.

The Southampton amendment was lost.

Drugs for Private Patients

Dr. F. BOOTH (Mid-Cheshire) moved:

That this meeting considers that the British Medical Association should continue to press for the supply of drugs and appliances under the National Health Service to private patients.

He said that at previous meetings it had been stated that this service should be given as a part of the National Health Acts and not as a concession. The Council should continue its efforts to achieve this end, but it did not seem to have been very successful so far.

Dr. R. A. G. HAMILTON (Harrow) asked whether, as a matter of expediency, a concession could be obtained in respect of life-saving drugs.

Dr. R. P. HENDRY (Rugby, with South Warwickshire) supported the motion.

Dr. C. W. WALKER (Cambridge and Huntingdon), speaking as a member of the Cohen Committee, opposed the motion. Everybody was entitled to State medicine provided they complied with the regulations. What could justifiably be debated was whether the present regulations were good, just, and reasonable, and he thought they were. (Cries of "No.") He said he himself had very few private patients, and there was no outcry from them that they were not allowed State medicine. The outcry came from doctors. The permanent officials of the Ministry disliked the idea, probably because it was more difficult administratively, and, he thought, because they felt, as he did, that it was liable to abuse. ("Why?") Also, there would be no difficulty, if the motion were carried, in the Ministry knowing exactly how much private practice there was, and if the sum came to £20m. instead of £2m. the £20m. would be deducted from the central pool. ("Oh!")

The case of the purely private practitioner was hard, and something might be done to alleviate it.

If the principle were accepted private patients could be "bribed" with the offer of State medicine, and State patients could be made to feel so uncomfortable that they would want to become private patients. ("Shame.") He did not like the idea that he should debase the standard of his State practice in order to get more private patients.

Dr. A. BROWN (Chairman, Private Practice Committee) said that the Committee would go ahead as soon as the Council gave the word.

Dr. TALBOT ROGERS said that the point was one which would be pressed with the new Minister (as soon as it was known who that was to be) at the coming session of Parliament. Nothing had so far been said which seemed to question the wisdom of the Association's existing policy on the matter. A point which had not so far been stressed was that a number of private patients were penalized through being unable to afford some of the new and expensive life-saving drugs. The fears that had been expressed over the possibility of having two standards of practice did not appear to constitute such an important risk as that of private patients being penalized in the way he had mentioned.

Dr. BOOTH, in reply, said it was unfortunate that Dr. Walker should have shown such a lack of appreciation of the moral standards of the general practitioner. (Applause.)

The Mid-Cheshire motion was carried with three dissentients.

Dr. R. GREEN (Brighton and Mid-Sussex) moved:

That this Representative Body notes with regret the contents of Appendix II of the Annual Report of Council, and reaffirms its conviction that the opinions of the Cohen Committee on this matter are unacceptable. It deprecates the total absence of reference to the interests of the patient in Appendix II and considers

that private patients have an equal right to free medicine and that this right should be granted.

He disagreed strongly with the idea that the use of E.C.10 for private patients would lead to different standards of practice. Such a statement was little short of a gratuitous insult to the profession. A former Minister had once remarked that if a patient could afford to pay his doctor he could afford to pay for his drugs too. If that was the view of all the Governments since 1948 it implied that only the wealthier members of the community were private patients. That was far from being the case. "We all know that some of our wealthiest patients are on the State, whilst some of the most impecunious have elected to remain private patients." Private patients were of three kinds: (1) Those who were too old for insurance contributions in 1948—and they, as a class, were literally dying out; (2) those who preferred on principle to pay for their doctor's services rather than that they should be paid by capitation; and, finally, (3) those who were accustomed to consulting their doctor in the privacy of their own homes and who felt that it would be unfair to call upon a State doctor to attend them in that way. Many private patients remained so at financial sacrifice to themselves, and the cost of drugs to them was an additional burden. Private patients, he thought, were much less likely to call upon their doctor unnecessarily. The provision of E.C.10 for them would not be likely to alter that position, as they had to pay a fee in any case. If all the remaining private patients decided to put themselves on State doctors' lists and were accepted the Government would have to pay a capitation fee for each one of them and provide all the drugs they needed. Surely those who preferred to pay their doctors for actual attendance should be allowed to do so while the Government paid for the drugs without having to pay a capitation fee. The refusal of this request seemed stupid and unjust.

Dr. W. WOOLLEY (Bristol) took strong exception to the statement that many doctors in private practice would be unwilling to accept the imposition of any necessary safeguards. The Bristol Local Medical Committee had sent out 253 letters and a questionnaire on the subject, and, out of 240 replies, only 3 had expressed unwillingness.

Dr. ENID HUGHES (Denbigh and West of Flint) said that the Cohen Committee's opinion that treatment and prescription of drugs were so intimately bound as to be one particular action was quite unacceptable. The mere writing of a prescription by a consultant did not constitute the treatment of a patient.

The Brighton motion was carried unanimously.

The Cohen Committee Report

Dr. F. A. BELAM (Guildford) moved a resolution regretting that no minority report in favour of the supply of drugs for private patients was issued by the Cohen Committee, and instructing the Council to make inquiries of individual private practitioners concerned to find out how many would be prepared to accept suitable safeguards.

Attention had already been drawn to the very invidious remarks of the Cohen Committee as to what would happen if the private patient were allowed to have his drugs free.

Dr. W. E. DORNAN (Sheffield) opposed the motion. The first part he considered to be thoroughly bad, as it implied criticism of the members whom the Association had nominated to the Cohen Committee. Those members had, after carefully considering the whole matter, decided not to press for the issue of a minority report on what was quite a small proportion of the report as a whole, because there had been other much more important aspects concerning general practitioners on which there had also been strong minority opinions. To have published a minority report on a comparatively small though admittedly important aspect of the committee's work would have resulted in a flood of other minority reports on much more important aspects of the work of the committee.

The CHAIRMAN OF COUNCIL said that he agreed with Dr. Dornan. The publication of the minority report asked for would have led to the issue of a number of other reports of a character which might perhaps have been regretted

afterwards. It was therefore felt to have been better that there should be no minority reports at all.

Dr. A. BROWN (Chairman of the Private Practice Committee) said that, provided the Council consented, an investigation into the willingness of private practitioners to accept suitable safeguards would soon be undertaken.

Dr. C. P. WALLACE (Guildford) said it was important that the Representative Body should establish the principle that whenever a committee was appointed to inquire into any matter, if members of the Association disagreed on important points they should definitely state so in a minority report.

The Guildford motion was put to the meeting in two parts and both were carried.

Prescribing of Proprietary Preparations

Dr. A. BARKER (East Kent) moved:

That when an executive council becomes aware that a new preparation is being prescribed, which does not appear to be a drug forming part of the pharmaceutical services provided under the Act, it shall immediately circularize all general practitioners on its list informing them of the fact; that no general practitioner shall be liable to be surcharged for prescribing such a preparation until such time as the aforesaid notice shall be circulated; and that attention should be drawn to excessive delay in notifying general practitioners of unacceptable prescribing.

He asked that this be referred to Council for consideration. Mr. A. B. DAVIES hoped that the motion would be thrown out. He mentioned that there were about a thousand new preparations issued every year. If this were passed, *carte blanche* would be given immediately to the prescribing of them.

Dr. FRANK GRAY and Dr. TALBOT ROGERS also spoke against the motion, the latter saying that prescribing must be a matter for the clinical judgment of the practitioner, subject, on the question of excessive prescribing, to the opinion of his colleagues on the local medical committee. The motion was lost.

Economy in Prescribing

Dr. SHAW SMITH (North Middlesex) moved that, in view of the manifest disquiet in the profession, full information be published on the present definition of excessive prescribing and also how the penalties to which doctors are liable are defined.

Dr. TALBOT ROGERS referred the meeting to the article by Dr. D. F. HUTCHINSON in the *Supplement* of March 26, and described the procedure taken in cases of possible excessive prescribing.

Dr. R. H. MOORE (North Middlesex) said that, while there were risks in having a definition, the Council should consider the matter and make a report.

Dr. J. D. BOTTOMLEY (Goole and Selby, with Wakefield, Pontefract, and Castleford) and Dr. G. P. HENRY (Glasgow) supported the motion.

Dr. FRANK GRAY (Council) said that the reports of the referees on these cases should be published.

Dr. D. F. HUTCHINSON (Council) said that in the past three years only 14 cases had been investigated. The procedure set out in his article was that followed in every case. If anybody could suggest a better method of dealing with complaints the General Medical Services Committee would examine it.

Dr. G. D. THOMPSON (Lancaster) said that, as a member of a local medical committee, he had been astounded to discover what some doctors had been prescribing, and not only young doctors.

The North Middlesex motion was lost.

Surgery and Waiting-room Accommodation

Dr. K. T. GREY (Consett with Hexham) moved that representations be made to the Inland Revenue authorities that capital expenditure involved in bringing surgery accommodation up to modern requirements should be subject to income-tax relief.

Dr. TALBOT ROGERS said it would be impossible for the Government to allow such a concession for doctors' premises

and deny it to other professional and commercial enterprises. At present, income-tax relief could be claimed for expenditure on renewals and repairs to surgeries, and this might be prejudiced if an attempt were made to extend the principle.

Dr. J. B. W. ROWE (Harrow) said that, commercially speaking, the outlay of capital expenditure was expected to produce an increase of trade—a consideration which did not apply to the expansion or improvement of a doctor's surgery, because there would be no scope for it.

The motion was lost.

Refresher Courses

Dr. A. G. CHAMBERLAIN (Dorset) asked the meeting to express the view that the grant made towards the expenses of engaging a locum tenens during the period that a general practitioner was attending a postgraduate course should be 20 guineas a week. Much as the Ministry's efforts were appreciated, it was felt that 16 guineas was still inadequate. It was the Ministry's policy to encourage attendance at such courses, and they therefore ought to help doctors to meet the expenses involved.

The Dorset motion was lost.

Dr. W. N. LEAK (Mid-Cheshire) asked that general practitioners should receive mileage fees for attendance at refresher courses. He said that the one-day type of course was most useful for the rural doctor who was out of touch with hospital activities and consultant colleagues, and it seemed unfair that he should be put to extra expense and loss of time and still have to pay travelling expenses.

Dr. A. B. DAVIES (Walsall and Lichfield) said that the resolution was "not asking for butter on bread but for jam on cake!"

Dr. TALBOT ROGERS said that every effort had been made to secure the best terms for doctors attending such courses, but asked that the matter should be referred to Council.

The motion was so referred.

General Practitioners and Institutional Midwifery

Dr. A. ELLIOTT (Stratford) moved that every general practitioner who desired it should have access to maternity beds at his local maternity hospital. One disturbing feature of the Health Service was the isolation of the general practitioner in relation to maternity and local hospital services. There had been a recent trend towards institutional midwifery which the Minister had tried to stem, but it was doubtful if he would succeed. There were prominent obstetricians who still declared that it was safer for a woman to have a child in hospital than at home. It was only by access to hospitals that the general practitioner could keep up his technique in this regard.

Mr. D. S. PRACY (Nuneaton and Tamworth) said that the encouragement of domiciliary midwifery would prove an encouragement to the country as a whole and would, further, ensure against a breakdown of the midwifery service should an epidemic break out in a maternity hospital.

Dr. J. S. M. ORD (Glasgow) said that anything which would help the general-practitioner obstetrician should be wholeheartedly supported.

Dr. D. L. GULLICK (East Herts) was doubtful about the practicability of the motion, although he supported it in principle.

Dr. A. W. HENDERSON (Oxford), supporting the motion, said there had been a falling off in the general practitioners' approach to maternity since the National Health Service started. Doctors would have to show the authorities that they were really interested in the subject before they could get very far.

Dr. J. A. PRIDHAM (Dorset) supported the motion, and said that the problem was grave and widespread in his area.

Dr. L. CRAWFORD (St. Helens) disagreed that the suggestion was impracticable. Ready access to the maternity unit in his area had been granted and the consultants had not been upset.

Dr. H. C. PALIN (Burnley) said it depended on the size of the maternity hospital, and thought that the project was impracticable if it were sought to be applied to teaching hospitals.

Mr. A. STAVELEY GOUGH (West Herts) opposed the motion on the grounds that the Association was already doing all it could by way of attachment of general practitioners to hospitals in order to get what they needed.

Mr. J. R. NICHOLSON-LAILEY (Taunton) said that if the country was to have good obstetric general practitioners they must be furnished with the facilities to do their job properly. He suggested the deletion of the words "at his local maternity hospital," which he thought limited the possibilities.

Dr. TALBOT ROGERS agreed with the proposed amendment. If there were no local maternity hospital, the motion as it stood would rule the general practitioner out of having any access to beds at all.

The motion was agreed as follows:

That every general practitioner who desires it should have access to maternity beds.

Trainee General Practitioner Scheme

Dr. H. F. HISCOCKS (South-east Essex) moved that the trainee practitioner scheme supported by public funds is unnecessary and extravagant and that its abolition would be welcomed.

He referred to Appendix VII of the Council's Supplementary Report, para. 13, and said that there seemed to be a tendency nowadays to use spoon-feeding methods in many walks of life, but in medicine the hard way of gaining experience was good and provided all that was necessary. Published accounts for the National Health Service revealed that in 1952-3 the scheme cost £97,278 in Scotland and £351,012 in England and Wales.

Dr. J. A. BROWN (Birmingham) said the scheme was an excellent one which had been a great success in many areas. After further debate:

Dr. TALBOT ROGERS said the scheme was subject to careful observation by the General Medical Services Committee, and asked the meeting to turn the motion down.

The CHAIRMAN said that the motion if carried would mean an alteration of the policy of the Association, and therefore it would require a two-thirds majority.

Dr. HISCOCKS, in replying on the debate, said that those in charge of this motion were not stressing the abuses of the scheme, but only that the observation period was now at an end, and the results had shown it to lack what they regarded as essential.

The motion was lost by a large majority.

The meeting stood adjourned at 5.35 p.m., and the representatives with their ladies afterwards dined together at the Dorchester Hotel, and the dinner was followed by a dance.

Thursday, June 2

The meeting resumed at 9.30 a.m., with Dr. GRANT in the chair.

On the suggestion of the CHAIRMAN, a telegram of congratulation was sent to Mr. Charles Evans, F.R.C.S., the leader of the successful Kangchenjunga expedition.

GENERAL MEDICAL SERVICES (continued)

Dental Services

Dr. J. LECKIE (Aberdeen) moved that the fee for administration of a dental anaesthetic by a medical practitioner should depend not upon the number of teeth extracted but upon the degree of care and skill and the responsibility involved.

Dr. FRANK GRAY asked that this be referred to Council. This was a matter which concerned the dental as well as the medical profession. The medical profession had always received the greatest courtesy and consideration from the representatives of the dentists.

The reference to Council was agreed to.

Dr. J. C. ARTHUR (Gateshead) moved that the principle of payment for the arrest of dental haemorrhages should apply universally to haemorrhages following extractions at local authority clinics.

This also was agreed to as a reference to Council.

Dr. R. D. MILFORD (South Essex) asked that claims for treatment of dental haemorrhage should not be submitted to the dentist concerned but should go direct to the executive council. Dr. TALBOT ROGERS gave reasons why, unless there was any great difficulty, it would be better to leave the matter as it was, and the meeting endorsed this view.

Dr. F. LISHMAN (Bishop Auckland) asked the Council to explore with representatives of the dental profession the possibility of forming local dental rosters on a 24 hours' basis to deal with emergencies. Dr. F. GRAY hoped that the meeting would not express a definite opinion on a matter which was one for discussion between the two professions.

The CHAIRMAN pointed out that the motion was a reference to Council, and in this form it was accepted.

National Insurance Contributions

Dr. R. P. HENDRY (Rugby and South Warwickshire) said that at the last Annual Representative Meeting it was referred to Council to take up with the Ministry the present practice of requiring a full week's national insurance contribution for any portion of a week for which a person was certified as fit for work. It was now stated that the Ministry contended that the proposed alteration would completely upset the whole actuarial basis of the national insurance scheme. He asked the meeting to reject this contention and to refer the matter back for further information and consideration.

Dr. TALBOT ROGERS opposed the motion on the ground that the Ministry was right in its contention. It was not possible to isolate the matter from its possible other applications; what applied to sickness would inevitably have to apply also to short spells of unemployment. The proposal would mean a rise in the cost of the weekly national insurance stamp and would add to the difficulties of employers.

Dr. J. B. W. ROWE (Harrow) said that the primary advantage of the proposal would be its stimulus to further production by encouraging people to go back to work sooner than they might otherwise do. He thought that the Ministry were taking a superficial view *vis à vis* the national economy.

Dr. HENDRY, in reply, said that illogicalities resulting from the applications of the scheme were matters for the Ministry to deal with rather than the medical profession.

The voting on the Rugby motion was at first declared as 109 in favour and 108 against. On a recount the figures were 134 to 115, and the motion was declared carried.

Assistants in General Practice

Dr. TALBOT ROGERS moved the approval of the report of the subcommittee on Assistants in General Practice set out in Appendix VII.

Dr. D. F. HEATH (Birmingham) moved to insert the words "Honorary Secretaries of B.M.A. Divisions" in the appropriate recommendation, so that they, along with deans of medical schools and others mentioned in the recommendation, should help to ensure that final-year students and newly qualified practitioners were made aware of the importance of entering into a formal agreement when accepting a post as assistant.

Dr. J. B. W. ROWE (Harrow) moved to insert the words "obtaining a legal, written agreement" in the Birmingham amendment instead of "entering into a formal agreement."

Dr. ALISTAIR FRENCH (Marylebone) supported Dr. Rowe's suggested amendment.

The Harrow amendment was agreed.

Dr. TALBOT ROGERS moved the recommendation in the Appendix which sought to make it clear that executive councils shall, in consultation with local medical committees, periodically review all cases in which consent had been given to the employment of an assistant; also that executive councils may, after due notice, withdraw their original consent to the employment of an assistant or modify the number of additional patients otherwise permitted under their allocation scheme.

Dr. R. S. V. MARSHALL (South Staffs) thought that the matter was one for the profession itself and that the execu-

tive councils should be kept out of it. He thought that the G.M.S. Committee had been the victim of its own good intentions.

Dr. K. C. BAILEY (West Somerset) said that the problem was not as great as had been made out. The subcommittee's own figures showed that less than 1,600 assistants were employed in England and Wales, and only about two-thirds of single-handed doctors' assistants had been so employed for the sake of the additional numbers alone. Many of the difficulties were not of a nature to be left to the decision of executive councils, with their majority of non-medical members. If the assistant and the principal agreed with each other as to what was expected there would be protection for everybody and the matter would be dealt with in relative privacy.

Dr. W. E. DORNAN (Sheffield) said that in July, 1952, approximately 1,760 whole-time assistants had been employed in England and Wales; by July, 1953, the number had shrunk to under 1,600, and by July, 1954, it had gone down to between 1,300 to 1,400, according to official figures in the possession of the Medical Practices Committee. It was absolute nonsense to suggest that the principle was unworkable in so far as executive councils were brought into the assistant-principal relationship, for they were in it already. The G.M.S. Committee merely asked them to exercise the powers they already had.

Dr. FRANK GRAY (Council) asked the meeting to consider the case for the assistants very carefully, as they were not represented at the meeting, and could not speak for themselves. They had claimed, through their subcommittee, over a period of three years, that cases of abuse did exist, although no one suggested that such cases were more than a minority. If the review which the recommendation sought showed that no such abuses in fact existed, then all would be satisfied; if it showed that there were a few cases, then matters could be put right.

Dr. A. V. RUSSELL (Council) said that while there were bad principals, there were also bad assistants. Surely all that was needed was a really well-drawn-up agreement.

Dr. TALBOT ROGERS said it was not intended to give the executive councils more power; the recommendation merely suggested that there were times when those powers they already had might wisely be used.

Dr. S. WAND said that the future of the profession was in the hands of the assistants, and their attitude of mind towards the National Health Service—indeed, towards a State-salaried service—might be coloured by what happened to them in their early years of practice as assistants. The recommendations provided practical suggestions for dealing with the grievances that undoubtedly existed—suggestions which the assistants were satisfied were well worth trying in their present form.

The recommendation was carried.

Dr. TALBOT ROGERS then moved the further recommendation that a principal implementing a "view" registered with the executive council should have a right to claim retrospective payment on the basis of notional lists for a period of up to a maximum of one year. He said it would provide some incentive to the doctor to take his assistants into partnership during the difficult period when the practice was not sufficient to support two partners although it was supporting a principal and an assistant.

Dr. H. H. D. SUTHERLAND (Council) said the recommendation might be construed as a means of securing a hidden sale of goodwill, which was expressly forbidden.

Dr. JOAN CHAPPELL (North Middlesex) agreed that the recommendation amounted to a "bribe."

Dr. I. M. JONES (Sunderland) said the suggestion was no more immoral than the basis of payment enunciated as a result of the Danckwerts award: both were financial devices for overcoming a particular difficulty. Some principals were subjected to a definite hardship when they took a partner. In such a case the principal felt that he was being financially punished for doing what he believed to be right in the interests both of the Service as a whole and of the younger unestablished members. The argument about the sale of goodwill did not apply.

Dr. R. B. L. RIDGE (Enfield and Potters Bar) strongly opposed the recommendation on the ground that it was one of a series designed to stop improper practices by rewarding the perpetrators when they ceased to carry them out.

Dr. TALBOT ROGERS thought the payment of money would not contravene the Act, being another adjustment similar to the payment by notional lists and loaded capitation fees.

The recommendation concerning retrospective payment was lost, and the report as a whole, amended, was adopted.

General Practitioners and Hospitals

Dr. A. ELLIOTT (Stratford) asked for a reaffirmation of the policy of pressing for the provision of more beds under general-practitioner care and for diagnostic facilities in hospitals for general practitioners. As the Ministry had said that new hospitals were to be built in 1956-7 and 1957-8 it was important to reaffirm B.M.A. policy for more general-practitioner beds. Diagnostic facilities had increased, but in some areas general practitioners still had no access to them.

The motion was carried.

Dr. R. P. HENDRY (Rugby) moved a resolution viewing with dismay the continued disregard of the wishes of the profession locally regarding the general-practitioner member of regional hospital boards, and instructing the Council to press immediately for the inclusion in the personnel of the boards names submitted by the B.M.A. and local medical committees.

Dr. F. E. GOULD (Birmingham) said that at present people did not know whether the general-practitioner member was appointed by the Minister, the regional hospital board, or the senior administrative medical officer.

Dr. T. D. CULBERT (Manchester), speaking as a consultant, supported the motion, and suggested that there might be specialist representation on local executive councils.

Dr. W. WOOLLEY (Bristol) said that more notice should be taken of who the doctors locally wanted to represent them on the board.

Dr. TALBOT ROGERS pointed out that there was no absolute right under the Act to have a general practitioner on any board, but in practice there was no board with no practitioner member, and several with two.

Dr. HENDRY, in reply, said that while there was no legal right to have a general practitioner on a board, there was a moral right.

The Rugby motion was carried.

Dr. B. HIRSH (Manchester), on the general approval of the report under "General Medical Services," said that some penalty should be imposed on people who brought complaints adjudged frivolous, or were found guilty of deliberate falsification. That complainants could perjure themselves without risk of penalty was encouraging the bringing of complaints against doctors.

Dr. H. GUY DAIN (Birmingham) said that the disciplinary machinery was protective, and it was in the interests of a doctor that when a complaint was made he should have a fair chance of rebutting it. People who were dissatisfied could not be prevented from expressing their dissatisfaction, but he hoped nobody would leave with the idea that there was no protection against frivolous and stupid complaints.

The remainder of the report was approved.

Dr. W. N. LEAK (Mid-Cheshire) moved that further and more urgent consideration be given to bringing hospitals and general practitioners closer together. He said that the breakdown of the old custom of a combined appointment on the staff of a local hospital with a general practice had done irreparable harm to doctors and to patients. The dichotomy between the general practitioner and the hospital should be removed or mitigated as much as possible.

Dr. D. L. GULLICK (East Herts) said there was almost a division of the medical profession into two, and anything to bring the profession closer together would be for everybody's good. Dr. P. A. MCCALLUM (Torquay) said that a consultant called in for a domiciliary consultation should always be met by the general practitioner, and Mr. A. DICKSON WRIGHT (Marylebone) hoped there would be unanimous support for the motion.

The Mid-Cheshire motion was carried.

Monthly Payments

Dr. H. H. GOODMAN (Newcastle-upon-Tyne) moved that doctors in the National Health Service be paid monthly by right without having to make application. He said that all doctors in Newcastle were paid monthly and were well satisfied with the system, and the executive council had not had to increase their staff. Although all doctors could apply for monthly payments on hardship grounds, they did not like a "means test."

Dr. D. W. K. BUCHANAN (Dundee) supported the motion, and Dr. J. B. FORRESTER (Glasgow) spoke in opposition.

Dr. TALBOT ROGERS said that the great majority of part-time consultants were also paid quarterly. It was thought by the Ministry and the Association of Clerks of Executive Councils that a monthly payment system would mean an increase in administrative work. It was open to local medical committees to negotiate with executive councils to change the system. A doctor who applied for monthly payment on hardship grounds did not have to undergo a "means test"; his word was taken.

Dr. R. P. HENDRY (Warwick): "Is it more hardship for the council to write three cheques a quarter than for a doctor to live on his hump for three months?"

The Newcastle motion was carried by 138 to 123.

Reclassification of Closed Areas

Dr. M. J. EVANS (South-west Wales) moved:

That, in view of the fact that areas which had been closed since the start of the National Health Service have recently been reclassified and declared intermediate despite no change in the ratio of doctors to patients, this meeting instructs the Council to keep a close watch on the activities of the Medical Practices Committee and to take action to safeguard the interests of the Association's members.

He said that over the last five or six years there had been no alteration of the character of his district, no influx of population, and only a few extra doctors owing to elderly practitioners taking in assistants, yet the area had been declared intermediate, the average list in the area being only 1,250 per doctor.

Dr. W. E. DORNAN (Chairman of the Medical Practices Committee) said that the power, reluctantly given by Parliament and more reluctantly agreed to by the Representative Body, to impose restrictions was in order to ensure that the best use was made of available medical manpower, so that additional doctors should not be introduced into general practice in relatively over-doctored areas, and not for the protection of the interests of established practitioners. Areas in South-west Wales had been recently declared intermediate because since 1948 more complete information had been obtained about the possibility of newcomers establishing successful practices and because the relative position of the area had altered enormously, one area in Wales having had an increase in the number of principals of nearly 300% since 1948.

Dr. A. M. MAIDEN (Lincoln) said that much of the uneasiness felt about certain decisions of the Medical Practices Committee could be removed if full reasons were given to local doctors for refusing an application.

The South-west Wales motion was lost.

Obstetric Services

Dr. J. C. ARTHUR (Gateshead) moved that in view of the wide variation in different executive council areas of criteria for admission to the obstetric list, it was more than ever essential that this list should be abolished. Executive councils had been advised on the qualifications required of new entrants to the obstetric list, but local committees interpreted this advice in widely differing ways. Gynaecology and obstetrics should remain a major subject, but its teaching should be similar to that of medicine and surgery, and those who practised it should be free from any necessity of having extra qualifications.

Dr. P. G. TODD (Southampton) moved as an amendment the deletion of the words "it is more than ever desirable that this list should be abolished" and the substitution of

the words "that any duly qualified registered medical practitioner who applies to go on to the obstetric list should be placed on it without further question."

Dr. J. S. NOBLE (Blyth) said that the conception of the original motive had been good, but the result had been abortive. To abolish the list would open the way to the abolition of general-practitioner obstetricians—something which many people would like to see happen. All the meeting could do was to reject the motions, because even the Winchester motion, which asked for an integration of standards, brought in the obstetricians and gynaecologists. He asked the Council to note that the feeling of the meeting on the matter of obstetrics was that its criteria should be looked into.

Dr. L. H. BOOTH (Hastings) said that the passage of time had proved the value of the list and had shown that the standard of midwifery practice among general practitioners was higher.

The CHAIRMAN pointed out that the present policy of the British Medical Association regarding obstetric lists was that any practitioner who was a qualified medical practitioner should be entitled without question to put his name on the obstetric list.

Dr. J. S. M. ORD (Glasgow) said that the policy just outlined by the Chairman had been adopted in Scotland since 1948. It was felt in Scotland that midwifery was done as well there as anywhere else.

The Southampton amendment was carried, and also as the substantive motion.

Dr. CATHERINE HARROWER (Glasgow) moved that the services of a specialist anaesthetist should be available to the general practitioner in obstetric cases under the domiciliary scheme. There were many general practitioners who were perfectly capable of carrying out complicated manoeuvres provided that they had the proper facilities at hand. There was admittedly a great shortage of qualified anaesthetists, but if the meeting accepted the proposal in principle the difficulties could be dealt with afterwards.

Mr. J. R. NICHOLSON-LAILEY (Couch) strongly supported the motion. Although under the domiciliary scheme it was theoretically possible for a consultant anaesthetist to be called it had always been resisted by the regional boards.

Dr. TALBOT ROGERS said that all would agree the proposal was worth while, but he felt that it was something which should be discussed and thoroughly investigated by the Council before the Minister was approached.

Dr. T. D. CULBERT (Manchester), speaking as a specialist anaesthetist whole-heartedly supported the motion.

The motion was carried.

Intermediate Certificates

Dr. R. W. MCCONNEL (Buckinghamshire) moved that an intermediate certificate of incapacity covering a period of up to four weeks be allowed after an initial certificate covering the first week. Although it might be said to be open to be abused, the profession could be trusted to make proper use of such a time-saving facility.

Dr. H. S. HOWIE WOOD (Isle of Wight) supported the motion, but thought it ought to carry some sort of safeguard to prevent its use in unsuitable cases.

Dr. TALBOT ROGERS asked that the motion should be rejected. Discussions had taken place with the Ministry on this and kindred matters, and already the concession had been made that a certificate could be granted after four weeks for much longer periods. It was essential for the proper administration of the fund that the Ministry should have frequent certificates in the earliest stages of illness, and the provision of these was surely not too much of a hardship upon doctors.

The Buckinghamshire motion was lost.

Advertising Methods of the Pharmaceutical Industry

Dr. DAVID BLEND (St. Pancras) moved:

That the Council be asked to take note of the irritation and inconvenience caused to general practitioners by the advertising methods of the pharmaceutical industry as a whole and to inquire

into the problem and confer with representatives of the industry to alleviate it.

Most doctors found postal advertising a nuisance and most of it found its way into the waste-paper basket. There were always the advertisements in the *British Medical Journal*, and if a doctor required further information on them he could ring up or write to the firms concerned. Some doctors received many visits from travellers, resulting in much waste of time.

Dr. A. G. MANLEY (Richmond) said the motion did not proceed from any desire on the part of the medical profession to dictate to pharmaceutical firms how to conduct their business; rather was co-operation with those firms sought in order that they might be able to utilize their resources to better advantage. Thousands a year were spent on advertising that could be put to better use, possibly in the way of research, to the greater benefit of the country.

Dr. ELSIE WARREN (Kensington) hoped that the meeting would vote against "irritating our pharmaceutical colleagues." Dr. S. SMITH (Tower Hamlets) said that it would be an advantage to have pharmaceutical advertisements issued in a standard form which could be filed for easy reference.

Dr. TALBOT ROGERS hailed Dr. Smith's suggestion as one which was highly constructive. Firms must receive some sort of response from doctors, otherwise they would cease to spend their money.

Dr. E. C. DAWSON (Council) said that the pharmaceutical firms had advertising managers to advise them, and they would not take any notice of what the Association said.

It was agreed to pass to the next business.

COMPENSATION AND SUPERANNUATION

Dr. A. N. MATHIAS (Chairman of the Compensation and Superannuation Committee) moved the annual report under this heading.

Dr. J. W. MCCARTHY (Hendon) moved to reaffirm the decision of the Representative Body in 1951 that compensation for practices should be paid forthwith.

He said that the arguments applicable in 1951 were now more cogent owing to the lower purchasing power of the £. Practices increased in value as the value of the £ decreased, and they must be worth more now than in 1951. The money could be used to better advantage than getting interest at 2½%.

Dr. H. L. TAYLOR (Newcastle-upon-Tyne) said that they saw their capital value dwindling month by month. All other undertakings nationalized by the Government had been repaid in full.

Dr. D. L. S. JOHNSTON (Halifax) pointed out that the profession had not asked for nationalization; it was thrust upon them, and the compensation was a pistol held at their heads, because unless they had signed on the appointed day the right to compensation would have been lost. This was the doctors' money, and the Government was getting it at very cheap interest.

Dr. J. A. L. VAUGHAN JONES (Leeds) said that when negotiating the £66m. it had not been realized that inflation would ensue to the extent it had. About £44m. remained to be paid, and the Government could devise means of paying this without causing further inflation. He was confident that with sufficient pressure the Treasury must yield to proper representations.

Dr. A. MCGLASHAN (Manchester) pointed out how he could have invested his compensation and increased its value.

Dr. MATHIAS said the Ministry's view was contained in one sentence from a letter:

"We are quite clear that the original settlement was intended as a once-for-all settlement which would stand irrespective of any changes in the level of values."

To get the money would involve legislation, because present conditions were written into the Act and not made by regulation. It would also be argued that to release £44m. would be a further step in the inflationary direction.

The Hendon amendment was carried with one dissentient. Dr. J. C. ARTHUR (Gateshead) moved:

That doctors wishing to incur capital expenditure or new or improved surgery premises should be able to obtain an advance payment of compensation.

He said this would be a very good use to make of the money, because a doctor would have to pay more than 2½% on money obtained for the purpose from elsewhere.

Mr. F. W. SHEPHERD (Huddersfield) supported the motion. While the Treasury may find it difficult to pay out the full sum, it might be willing to pay out a certain proportion a little sooner than anticipated.

Dr. MATHIAS asked the meeting to pass the motion and to give them a mandate to go to the Ministry.

The Gateshead motion was carried.

Dr. J. S. NOBLE (Blyth) moved to reaffirm the recommendation of the General Medical Services Committee that a practitioner on taking another into partnership should thereupon be entitled to at least a part of the compensation moneys due to him.

This was carried.

An amendment by Halifax was next taken, that the rate of interest should be raised to an adequate level. This was carried.

Assessment of Pension

Dr. J. C. ARTHUR (Gateshead) moved that parity of assessment of pension with salaried officers would be obtained only if practitioners were allowed to opt, at the time of their retirement, for the system most advantageous in their particular case.

Dr. MATHIAS submitted that the motion was premature, as there was at present no information on the curve of a practitioner's remuneration, but it was hoped that by the next meeting, as a result of the first actuarial investigation of the superannuation fund, the information would be available.

Dr. ARTHUR agreed that more information was required, and the motion was carried as a reference to Council.

Superannuation Payments on Sessional Fees

Willesden requested the Council to explore the possibility of superannuation payments being made on sessional fees paid by Government departments to part-time medical officers. Dr. J. G. FREEMAN HEAL, in moving, said there was an appreciable minority of general practitioners who earned a regular income from this kind of work.

Dr. I. M. JONES (Sunderland), supporting the motion, said that the money which was paid out for Government work was already taken into account in the calculations of the central pool; it should therefore be considered as part of the general practitioners' income for superannuation.

Dr. H. M. COHEN (Birmingham) moved to insert after "Government departments" the words "and local authorities."

Dr. HEAL opposed the Birmingham amendment.

Dr. MATHIAS hoped that the meeting would not accept the amendment. As the motion stood, the matter could be dealt with directly by negotiation with the Ministry of Health, but if the amendment were passed special legislation would be required to enable local authorities to deal with it under a totally different set of regulations.

The Birmingham amendment was withdrawn and the Willesden motion was carried.

MEDICAL BENEVOLENCE

Dr. H. M. GOLDING (Chairman of the Charities Committee) moved the section under "Medical Benevolence." It was not the custom to single out individual charities for mention, but this was a year of some significance for Epsom College, which was holding its centenary, and an appeal had been made for a centenary fund. The Council had voted £1,000 towards the appeal. As this year's meeting was in London, it was also appropriate to mention the Clothing Guild organized by the Ladies' Guild of the Royal Medical Benevolent Fund. Dr. Golding said that the fact that he had been speaking to Motion 91 reminded him of the words in the 91st Psalm, "Thou shalt not be afraid." That

was the message that the Charities Committee wished to give to all members who might fall upon times of distress. (Applause.)

PRIVATE PRACTICE

Dr. A. BROWN (Chairman of the Private Practice Committee) presented the Annual Report under this heading.

Remuneration of Local Treasury Medical Officers

Dr. J. C. ARTHUR (Gateshead) moved that the fees for practitioners acting as regional medical officers for the Treasury should be two guineas for a full examination and one guinea for a short report.

Dr. R. COVE-SMITH (Marylebone) asked that consideration should also be given to the examinations that had to be conducted at the request of the Treasury Solicitor for compensation cases. The guinea fee offered for that work should be brought into line with other Treasury medical work.

The Gateshead motion was carried.

Emergency Treatment under Road Traffic Act

Dr. E. C. DAWSON (Derby) asked the meeting to express the view that the time is now appropriate for an upward revision of the 12s. 6d. fee and 6d. mileage for emergency treatment under the Road Traffic Act, 1934.

Dr. R. FORBES (Hendon) said that the existing fee had been included in the Road Traffic Act, and to alter it would require an amending Act. If the fee were taken out of the Act and put into regulations the Ministry of Health might say that the service was one which doctors might reasonably be expected to undertake under the terms and conditions of service.

The Derby motion was lost.

Ministry of Pensions Form

Belfast drew attention to the inadequacy of the fee of 5s. paid for a medical report on Form M.P.A.O.38 for submission to the Ministry of Pensions, and asked that representations should be made for its increase to a fee of one guinea.

Dr. S. NOY SCOTT (Council) asked the meeting to reject the motion. No opinion was required on the form, but merely the copying of information from the record card.

Dr. R. P. HENDRY (Rugby) pointed out that sometimes a very long and complicated history had to be reported. The motion was lost.

OCCUPATIONAL HEALTH

Dr. J. A. L. VAUGHAN JONES (Chairman of the Occupational Health Committee) presented the reports and appendices under "Occupational Health."

He said it was still Association policy that the Ministry of Health should exercise overall supervision of all the health services, with possible delegated responsibility to other departments. The setting up of an Industrial Health Advisory Committee by the Ministry of Labour was a step warmly welcomed, the constitution of it seeming reasonable. The reference of the Committee was limited to workers covered by the Factory Acts, but it was hoped that eventually the Government might implement the Gowers Report, thus including supervision of most of the working population.

There was growing recognition of the contribution to be made by the profession in attaining positive health in industry. It was clear from inquiries to the Association that the work of the Occupational Health Committee was becoming increasingly scientific.

The Ministry of Transport had accepted many of a sub-committee's recommendations on medical standards for road, rail, and air transport; three years ago the Ministry of Agriculture had been assisted by the Committee informing the profession about the increasing use of toxic chemicals in agriculture; and this year they had collaborated with the Association of British Insecticide Manufacturers in the preparation and circulation of precautionary measures against possible fatalities from careless handling of these dangerous

insecticides. Recently the Committee had been asked by the Ministry of Pensions if it wished to make any representations on the question of cadmium poisoning and the present restrictions on the prescription of byssinosis. The Association, through its Occupational Health Committee, must accept the new scientific and technical responsibilities being placed upon it, and this might require a re-organization of the Committee's work in possible collaboration with the Science Committee.

Remuneration of Industrial Medical Officers

Dr. VAUGHAN JONES proposed that the following recommendation of Council be adopted:

That the revised statement on the remuneration of industrial medical officers set out in Appendix III of the Annual Report of Council be approved.

He said the revised remuneration ranges were a considerable increase over the former scale and bore comparison with similar grades in other services.

Ethical Rules for Industrial Medical Officers

Dr. R. P. HENDRY (Rugby and South Warwickshire) moved to urge the Council to circulate among all non-members of the Association a copy of "The Duties and Ethical Rules for Industrial Medical Officers."

Dr. VAUGHAN JONES said that there were extreme difficulties in getting hold of non-members who were known to be industrial medical officers. He thought that the matter could be dealt with by the exercise of good will on both sides.

The motion was lost.

MEDICAL ETHICS

Dr. ROBERT FORBES (Chairman of the Central Ethical Committee) moved the report of Council under "Medical Ethics." He said that the Ethical Committee had kept under scrutiny professional ethical standards. Many letters were received from members posing ethical situations and problems. The committee realized that there was some danger that the ethical standards of the profession might be lowered. Some were over-critical of the Committee's efforts. Indeed, one writer in the *Supplement* last week had described the Committee as the "Old Guard." He did not know whether that term was meant to be complimentary, but some committee appointed by the Association had to accept the responsibility of examining the behaviour of members of the profession, to promote ethical conduct, and, on occasion, to chide, exhort, or advise. He asked members to imagine the reactions of a young man entering the profession in 1948, who had since that time followed all its discussions, deliberations, and activities. Such a young man might not be wrong (although Dr. Forbes personally thought he would be) if he were to assume that the profession was over-anxious in the matter of money. Members would all agree that there was much more in medicine and its pursuit than the making of money. (Cheers.) They would also agree that if the highest concept of medicine was to be maintained and achieved its members must proceed along strictly ethical lines.

Loans of Hospital Records to Government Departments

Dr. FORBES moved for approval the following recommendation of Council:

That the following statement on the loan of hospital records to Government departments be approved:

(a) That medical records be lent to the medical officers employed by Government departments only when written consent has been given by or on behalf of the patient.

(b) That the form of consent signed by or on behalf of the patient should include a statement that the patient agrees to his hospital records being made available to the medical board in order to assist them to consider and assess claims.

(c) That, wherever practicable, and particularly where disclosure of information may have an adverse psychological effect upon the patient, the practitioner who compiled the record or,

if he is not available, one nominated by the hospital authority for the purpose, should be consulted on the wisdom of disclosing to the patient all of the confidential information contained therein, and should take the opportunity of reviewing the notes before they leave the hospital.

In answer to Dr. J. B. W. ROWE (Harrow), Dr. FORBES replied that the recommendation was designed deliberately to relate solely to hospital records. He also explained to Dr. A. A. VICKERS (Worcester and Bromsgrove) that the consent form mentioned was a specific one and had no relation to the ordinary form of consent to anaesthesia and operation.

Dr. I. M. JONES (Sunderland) thought there was some misapprehension about the procedure. In fact, nothing was done until a claim was made by a particular person for a disablement pension under either the Ministry of National Insurance or the Ministry of Pensions. It was within the power of the chairman of the medical board, if he felt that he could not assess the claim properly without access to the records, to ask for the original hospital record to be made available to him. There was no question of it going to lay persons.

The Council's recommendation was accepted.

Professional Secrecy

Dr. R. D. MILFORD (South Essex) moved:

That this meeting considers that the exchange of medical details concerning patients should take place only between doctors and deploras the increasing tendency to exchange confidential medical details direct with lay persons.

He hoped the motion would not be regarded as the expression of a pious hope. It was an appeal to the Representative Body to review the whole question of professional secrecy and the changes that had taken place over recent years.

Mr. A. STAVELEY GOUGH (West Herts) asked for the deletion of the word "only." The emergency bed service could only work if a clerk could take details and in due course forward them to the hospital and arrange for the admission of a patient. There were cases which, in the interests of the patient and of the doctor, needed the intervention of clerical assistants.

Dr. FORBES said that it would be impracticable to conduct the health service if it were insisted that medical information should pass only through the hands of doctors. He suggested the insertion of the words "wherever practicable" after "That this meeting considers . . ."

Dr. MILFORD said he was agreeable to the deletion of the word "only." The motion was accepted.

Dr. C. P. WALLACE (Guildford) moved for the appointment of a special committee by the Council to consider the effects on the future of the profession of the continued operation of rules with regard to anonymity in broadcasting and press publication. He said that the question of anonymity had been approached from too narrow and special an angle. It should be approached from the point of view of the public. It was most important that members of the profession should have the opportunity of declaring their views on medical matters, subject, of course, to the ethical code.

Dr. FORBES said that there was a subcommittee already in session, set up by the Central Ethical Committee, to do this job.

Dr. WALLACE withdrew his motion.

PUBLIC HEALTH

The Award of the Industrial Court

Dr. J. B. TILLEY (Chairman of the Public Health Committee) presented the Annual and Supplementary Reports under "Public Health" and also the appendix on Rules for D.P.H. Courses.

He said that the staff side of Committee C of the Whitley machinery had carefully considered the salaries in the public health service and made representations to the Management Side which were not acceptable; the matter had been taken to arbitration, the result of which was of the very gravest

concern, but having gone to arbitration the award must be accepted. This branch of the profession which chose to practise preventive medicine received, under the award, a different rate of remuneration from that reasonably to be expected in other branches. Those who went to the arbitration did so considering not only money but status within the profession, and there was no other easy means of assessing status than income. Unless the profession as a whole showed what it thought was the proper place for public health in relation to other branches of the profession, then public health would surely die.

It was a great satisfaction, Dr. Tilley said, that with one exception the findings of appeals committees had been accepted by employing authorities, and the management side of Committee C had done all it could towards this end. Only Middlesbrough had refused to implement the findings of an appeals committee, and the only possible action had been taken in making an advertisement for a post in Middlesbrough the subject of an Important Notice.

The Public Health Committee had been asked to examine its constitution to see whether it could not widen the representation, but it was the Representative Body which elected the Committee and could nominate young people as members.

The Committee felt strongly that the responsibility for food hygiene should be transferred to the Ministry of Health.

Remuneration in the Public Health Service

Dr. J. C. ARTHUR (Gateshead) moved:

That in view of the dangers presented to the medical profession by the low levels of remuneration in the salaried medical services of the State and local authorities, steps be taken urgently by the Association to bring the remuneration of medical personnel in these services to a level comparable with that of the rest of the profession engaged in hospital and general practice.

Dr. H. GUY DAIN (Birmingham) stressed the importance of the effect of the recent disappointing award of the Industrial Court on the public. So few candidates were coming forward for the D.P.H. that many medical schools had stopped the course. Medical officers of health could help to raise the standard of health of the whole community, yet so poor a reward was offered that doctors did not think it worth while. General practitioners and consultants had been given more money, but those in the public health service had been left behind, to the great public danger.

The Gateshead motion was carried.

Greenwich and Deptford moved to recommend that the salary of divisional medical officers of the London County Council be raised forthwith and be in accordance with the scales for medical officers of health—that is, in relation to the population served.

Dr. J. B. S. MORGAN (Derbyshire) said the salaries of those in the London area should not be treated in isolation, and moved that the matter be referred to the Council.

This was carried as a reference to Council.

Part-time Work for Local Authorities

Dr. A. BARKER (East Kent) moved that the scale of fees for part-time sessional work with local authorities should be increased immediately following on the rise in salary of public health medical officers.

This was also carried as a reference to Council.

School Health Service

Dr. A. A. VICKERS (Worcester and Bromsgrove) moved that the Council take all possible steps to ensure that the arrangements in para. 94 of the Annual Report be universally adopted throughout the country. These arrangements relate to obtaining the concurrence of the general practitioner before local authority medical officers refer school-children for special investigation and to the sending of any special report to the child's own doctor.

Dr. TILLEY accepted the motion as a reference to Council.

Clean Milk

Dr. H. S. HOWIE WOOD (Isle of Wight) called upon the meeting to declare in favour of the transfer of the responsibility for clean milk production from the Ministry of Agriculture and Fisheries to the local sanitary authority.

Dr. TILLEY said that there had been dissatisfaction in some areas with the present position, but local sanitary authorities varied so much in size that it would be unwise to accept a direct transfer of the whole responsibility, and he felt the proper course was to refer it to Council. The meeting agreed.

Notification of Infectious Diseases

On behalf of Dartford it was moved:

That this meeting is of the opinion that a review of the legislation concerning the notification of infectious diseases should be carried out by the Association with a view to making recommendations to the Ministry regarding the form of revision, which is long overdue.

The Dartford motion was carried.

Dangers of Fumes from Diesel Oil

Dr. D. F. WHITAKER (Guildford) urged the Council to draw the attention of the transport authorities to the possible dangers of fumes from diesel engines and the remarkable coincidence between the increased use of diesel fuel for transport and the rise of mortality from lung cancer and other respiratory diseases. He viewed with alarm the forthcoming replacement in London of 1,800 electric trolley buses by diesel-engined vehicles.

The motion was supported by Dr. F. A. BELAM (Guildford), Dr. R. HALE-WHITE (Marylebone), Mr. J. R. NICHOLSON-LAILEY (Taunton), and Dr. J. B. W. ROWE (Harrow), and was carried.

ARBITRATION MACHINERY

Dr. E. A. GREGG (Chairman of the Committee on Arbitration Machinery) presented the section of the Annual and Supplementary Reports under that heading. He said that this question was not as simple as some people imagined. General practitioners had never participated in Committee A of Whitley. They were determined that when any question of such urgency arose as to demand arbitration they should have a full say in what type of arbitration it should be. Their friends in the public health field had felt able to get some assistance through Whitley machinery and some through the Industrial Court. They had had recently one outstanding example of how such machinery worked, and he would not be surprised if they did not find them coming round to the kind of idea which general practitioners had on this subject. He drew special attention to the closing words of the section in the Supplementary Report of Council:

"After careful consideration of the whole position the Council is of the opinion that the profession would be well advised to rely, for the present, on *ad hoc* arbitration arrangements when disputes occur."

The sections of the report were approved.

Dr. J. L. McCALLUM (Westminster and Holborn) moved: That the Council should examine the possibility of getting some form of arbitration for the profession alone, and press that the arbitration tribunal should be comprised of personnel permanently appointed, independent and mutually agreed.

He said that the crux of the matter was whether or no they were to appeal to an umpire in arguments with the Government, and what form the arbitration tribunal should take. The matter had become complicated by the fact that they were not being considered as a profession, but in relation to other parts of the National Health Service.

Dr. GREGG hoped that this motion would not be passed in its present form. He was prepared to have it referred to Council.

The Westminster and Holborn motion was carried as a reference to Council for consideration.

The meeting adjourned at 6.30 p.m.

The Report of the A.R.M. will be continued in next week's Supplement.

REMUNERATION OF PUBLIC HEALTH MEDICAL OFFICERS

RECOMMENDATION TO LOCAL AUTHORITIES

A circular (M.D.C. No. 24) signed by the Joint Secretaries of Committee C of the Medical Whitley Council has been sent to all local authorities in England, Wales, and Scotland. The circular advises these authorities that Committee C has accepted the Industrial Court's award¹ on the recent claim by the Staff Side for increases in the remuneration of public health medical officers, which was submitted to the Court for arbitration (see Supplement, May 7, p. 214).

The Committee C circular recommends that all local authorities should put the award into effect as from January 1, 1955.

Committee C recommends that the following arrangements should also be given effect as from January 1, 1955:

(1) Deputy medical officers of health should, as from January 1, 1955, be placed on a scale the minimum of which should be 66½% of the minimum of the scale for the post of medical officer of health. Their annual increments should be the same as those for the medical officer of health. Detailed arrangements for calculating the salaries of deputy medical officers of health are set out in M.D.C. circular No. 8.

(2) Medical officers, not acting as county district medical officers of health, duly appointed as divisional or area medical officers for divisional administration of the health services (including the school health service) should be placed on the revised salary scale applicable to senior medical officers as from January 1, 1955—that is, £1,415 × £50—£1,765 × £65—£1,830—with the following additions according to the population of the division:

	£
Not exceeding 150,000	50
" " 250,000	150
" " 400,000	250
Over 400,000	at discretion

Committee C also recommends that the following arrangements, promulgated in previous M.D.C. circulars, should continue to be observed:

(1) Medical officers of health holding combined appointments should receive £100 per annum above the appropriate salary scale indicated by the total population of the combined districts for which they are medical officers of health (M.D.C. circular No. 1).

(2) Medical officers who are assistant medical officers or divisional or area medical officers under a county council, acting as district medical officers of health (either for single or combined districts) for a definite proportion of their time should receive as regards the salary relating to county council work the appropriate portion (calculated in accordance with the Spens formula, as set out in appendix B to M.D.C. circular No. 2) of their salary as assistant medical officers, divisional or area medical officers, as the case may be, together with the appropriate proportion of the salary selected from the appropriate range for county district medical officers of health plus a similar proportion of £100. (M.D.C. circular No. 3).

(3) Medical officers of health holding part-time appointments should be remunerated in accordance with the Spens formula.

Committee C recommends that assimilation to the new salary scales shall be on the "corresponding points" principle. An illustration of how this would work in practice in regard to medical officers of health and their deputies may be helpful. In a county borough (population 125,000) the authority had selected a salary scale of £1,950 to £2,200 for the post of medical officer of health, the range of commencing salaries under the previous award (No. 2285) for population groups not exceeding 150,000 being £1,750 to £2,050. Under the new award (No. 2565) the range is £1,940 to £2,250; and, on the basis of "corresponding points," the new scale for the post of medical officer of health will be £2,146 13s. 4d. to £2,404 3s. 4d. If the medical officer of health is, on January 1, 1955, on the fourth point of the old scale—that is, with a salary of £2,100—he should be assimilated on the fourth point of the new scale—that is, given three increments of £51 10s. on the new scale—and his salary will therefore become £2,301 3s. 4d.

¹ Copies of the complete Industrial Court Award (No. 2565) can be obtained from H.M. Stationery Office, price 9d.

The minimum of the scale for a deputy medical officer of health with the same authority would be 66½% of £2,146 13s. 4d.—that is, £1,431 2s. 3d.—and if, on January 1, 1955, he is on the third point of the old scale he should be assimilated on the third point of the new scale—that is, given two increments of £51 10s. on the new scale—bringing his salary to £1,534 2s. 3d.

The figure of £2,146 13s. 4d. stands in the same position in the new range of commencing salaries (£1,940 to £2,250) as the minimum of the old scale (£1,950) stood in the old range of commencing salaries (£1,750 to £2,050). £1,950 was £200 above the minimum possible commencing salary and £100 below the maximum possible commencing salary. To preserve this ratio of £200 to £100 it is necessary to take the minimum (£1,940) of the new range of commencing salaries and add to it two-thirds of the difference between £1,940 and the maximum of the new range of commencing salaries (£2,250). The difference amounts to £310, and two-thirds of it is £206 13s. 4d. When added to £1,940 this gives £2,146 13s. 4d.

In one case—the assistant medical officer scale—the new scale has one more increment than the old. In this case it is recommended that officers on the maximum of the old scale (£1,300) at January 1, 1955, should be placed at the seventh point (£1,325) of the new scale as from that date, and should thereafter proceed to the new maximum (£1,375).

Committee C recommends that the incremental date of all officers should remain unchanged, except as is provided in the paragraph above.

GENERAL MEDICAL COUNCIL

MEDICAL DISCIPLINARY COMMITTEE

The Medical Disciplinary Committee of the General Medical Council met on May 26 and 27, and dealt with some twenty penal cases. Sir DAVID CAMPBELL presided.

Adultery Arising out of Professional Relationship

The Committee considered the case of EBENEZER FRANCIS THOMAS, registered as of Tullamore, Offaly, Eire, M.R.C.S. Eng., L.R.C.P.Lond. 1941, who was charged that, having entered into professional relationship with a married woman, he had been found guilty of adultery with her by decree of the Divorce Court.

The Committee found the facts alleged against Dr. Thomas proved to its satisfaction, and judged him to have been guilty of infamous conduct in a professional respect. The Committee instructed the Registrar to erase Dr. Thomas's name from the *Medical Register*, subject to his right of appeal within 28 days to the Judicial Committee of the Privy Council.

Charges of Indecency

The Committee considered the case of ROBERT TAYLOR NOEL SIMPSON, registered as of High Street, Great Wakering, Essex, M.B., B.Ch., 1942, Q.U. Belf., who appeared on the charge of committing a serious offence against a woman patient, indecently assaulting three other women patients, and making indecent suggestions to three others.

The Committee found that Dr. Simpson had been guilty of infamous conduct in a professional respect and directed the Registrar to erase his name, subject to the right of appeal within 28 days.

"Grievous Bodily Harm"

The Committee considered a charge against ROBERT PHILIP STRANG, registered as of 40, Harley Street, M.R.C.S. Eng. 1940, M.R.C.P.Lond. 1946, who appeared on the charge that he had been convicted of shooting at a police detective, and imprisoned for 18 months.

The Chairman said that the Committee took a grave view of this conviction, but it had taken into consideration the representations made on Dr. Strang's behalf and had postponed judgment for two years.

Drug Offences

The Committee considered the case of JAMES MCKENZIE, registered as of Rochdale Road, Middleton, Manchester, M.B., Ch.B. 1944, U. Aberd., who was summoned on the charge that he was convicted at the magistrates' court at Middleton on September 13, 1954, of five charges of unlawfully procuring and supplying a quantity of amideone to himself. He was further charged that he had been convicted at the assizes in Manchester in November, 1954, upon an indictment of five counts of unlawfully procuring a dangerous drug, and was ordered to be imprisoned for 12 months, 26 other charges being taken into consideration.

The Committee postponed judgment for two years.

The Committee gave further consideration to the case of RALPH MARTIN CASE, registered as of Edgbaston, Birmingham, who at the session of the Committee a year ago had been found to have been convicted in 1953 at Grantham of unlawfully procuring dangerous drugs. Judgment had been postponed until May, 1955.

The Committee postponed judgment for one further year.

The case of THOMAS LEVEN, registered as of Irvine, Ayrshire, also came up for judgment, which had been postponed since May, 1953. Dr. Leven had been found to have been convicted in 1952 of contravening the Dangerous Drugs Regulations by procuring for himself *in cumulo* 567 grains of morphine sulphate by presenting to chemists prescriptions in the name of his patients.

The Committee decided not to instruct the Registrar to erase the name, and this closed the case.

The case next considered was that of JAMES ROSS, registered as of Park Grove, Barnsley, against whom the Committee had found at its May, 1954, session that he was convicted in 1953 of failing to enter in a register true particulars of certain drugs obtained by him.

In this case also the Committee decided not to instruct the Registrar to erase the name and closed the case.

Other Convictions

The Committee considered the case of FRANCIS CARMINOW DOBLE, registered as of Dean Street, London, W.1, who was summoned on the charge that at the Central Criminal Court in November, 1954, he had been convicted on indictment of having used an instrument on a woman to procure her miscarriage, and had been imprisoned for twelve months.

The Committee instructed the Registrar to erase Dr. Doble's name from the *Medical Register*.

The case next considered was that of ROBERT LINDSAY, registered as of St. Ninian Drive, Inverness, who in November, 1954, was summoned to appear before the Committee on charges relating to convictions of committing a breach of the peace and of resisting arrest and of being found drunk. In March, 1955, there had been a further conviction of committing a breach of the peace.

The Committee found the convictions proved, but postponed judgment for one year.

The next case was that of WILLIAM JAMES, registered as of Richmond Villa, Llandyssul, Cards., who was summoned on two convictions of being in charge of or driving a motor-car whilst under the influence of drink. The Committee postponed judgment for one year.

Adjourned Cases for Judgment

The remaining cases on the list were those in which the inquiry had taken place at a previous session, and the facts had been found proved, but judgment had been suspended for a period and the practitioner was required to produce testimonials.

The first of the adjourned cases was that of MOREEN CATHERINE O'BRIEN, registered as of Woodhouse, Sheffield, against whom it had been found in May, 1954, that she had forged 17 medical certificates for national insurance purposes which purported to relate to herself and to have been issued by other practitioners. The Committee did not direct the Registrar to erase the name, and this closed the case.

The next case was that of WILLIAM FRANK CRUICKSHANK, registered as of Westwood, Brechin, against whom it was found in May, 1954, that, being on the Medical List for the

county of Angus, on frequent occasions he had failed to be at his surgery during his consulting hours or to make arrangements for the treatment of patients in his absence; also that he had failed without reasonable cause to visit or treat certain individual patients. The Committee was not satisfied with some of the evidence that Dr. Cruickshank now brought forward, and postponed judgment for a further year.

The Committee decided not to erase the name of HERBERT ALBERT KENNETH ROWLAND, registered as of Cleator, Cumberland, who in July, 1954, had been found to have submitted prescriptions to a pricing bureau with a view to obtaining payment from the executive council with intent to defraud.

The same course was taken in the case of PATRICK ALOYSIUS GALLEN, registered as of Grant Street, Glasgow, against whom in 1953 certain convictions of being in charge of a motor-car when he was under the influence of drink were found proved.

In the case of GRAHAM GEORGE ROBERTSON, registered as of North Ridge, Bedlington, Northumberland, who had been convicted in March, 1954, of driving a motor-car while under the influence of drink, the Committee decided not to erase his name.

The Committee also decided, on the production of testimonials and other evidence, not to erase the names of ROBERT JOHN GORDON WILLIAMS, registered as of Abersoch, Caernarvonshire, who had twice been convicted, in 1948 and in 1953, of driving or being in charge of a motor vehicle when under the influence of drink, and of PATRICK STEPHEN GERRARD CAMERON, registered as of Kirton Park Terrace, North Shields, against whom convictions had been recorded in 1946 and in 1953 of driving a motor vehicle when under the influence of drink.

In the case of PATRICK JOSEPH CONLIN, registered as of c/o Barclay's Bank, Dudley, Worcestershire, who had been found to have been convicted in 1950 of being in charge of a motor-car whilst under the influence of drink, the Committee again postponed judgment for a further year.

Finally, in the case of HERBERT TREVOR DUKE, registered as of Manchester Street, London, W., who in May, 1954, had been found by the Committee to have been convicted of an act of indecency, the Committee decided not to instruct the Registrar to erase the name, and thereby closed the case.

Correspondence**Checking the "Medical Register"**

SIR,—As one of the 2,659 practitioners who were struck off the *Register* recently, owing to the General Medical Council being "unable to trace me," I was interested in the report in *The Times* of Sir David Campbell's remarks on this subject.

In the first place, what is the object of this inquisition? Is not a duly registered practitioner entitled to practise as and when he wishes and to change his address at will? Secondly, if we grant that it is necessary, why, when the missing practitioner has duly disclosed his whereabouts, is it necessary to fine him one guinea and require him to find two colleagues to vouch for his identity? Thirdly, in my own case, I admit that a registered letter was sent to me, and by an extraordinary set of circumstances did not reach me, and the Council was therefore legally justified in its action, but I should be interested to know what were the "considerable efforts to trace" in my case. The block of flats where I live is only a stone's throw from the offices of the General Medical Council, and personal or telephone inquiry would have immediately supplied the necessary information.

It is significant that within 48 hours of my being "struck off" I received a communication to that effect both from the B.M.A. and the Medical Defence Union; neither of these bodies appear to have had any difficulty in tracing me.—I am, etc.,

London, N.W.1.

R. N. B. BYATT.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY JUNE 18 1955

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British Medical Association**ANNUAL REPRESENTATIVE MEETING, LONDON, 1955***

Friday, June 3

The meeting resumed at 10 a.m., with Dr. GRANT in the chair. A meeting of the Council had taken place earlier.

SCIENCE ACTIVITIES

Mr. J. R. NICHOLSON-LAILEY (Chairman of the Science Committee) presented the several matters in the Annual Report under "Science."

Crash Helmets

Mr. DICKSON WRIGHT (Marylebone) moved that the meeting again affirm the life-saving value of crash helmets for motor-cyclists. He said that crash helmets had proved their great value during the war. The major contribution to road accidents came from motor-cyclists, who often suffered head injuries which made them permanently mentally and physically incapacitated.

Dr. J. M. C. GILL (Aberdeen and Kincardine Counties) asked the Council to take action with a view to securing that the wearing of a crash helmet was compulsory for all users of a motor-cycle. He said the Road Accident Research Laboratory had stated that in 1952 2% of motor-cyclists wore protective helmets, and in 1955 30%, which he thought a generous estimate. In the 15 months ending March, 1955, of all motor-cyclists involved in accidents in the Metropolitan Police District, 18.28% wore crash helmets, and in the north-east counties of Scotland Police District 5.17%. Splinter-proof glass was now compulsory for car windcreens, and the compulsory wearing of crash helmets would reduce the ghastly slaughter on the roads.

Dr. J. A. PRIDHAM (Dorset) opposed the motion. We were now riddled with regulations, he said; let us not have more compulsion. Educating public opinion would produce the desired result. Dr. J. S. M. ORD (Glasgow) also opposed the motion.

The motion was lost.

Dr. R. P. HENDRY (Rugby and South Warwickshire) urged the appointment of a deputation to the Chancellor of the Exchequer to press for the abolition of purchase tax on crash helmets and similar protective clothing. He said that protective clothing was not a luxury, and the revenue should not be boosted at the expense of risk to life and limb.

Mr. NICHOLSON-LAILEY asked the meeting to reject the motion as it stood. In conjunction with other organizations a further and concentrated attack was being made on the Department of Customs and Excise.

The motion was lost.

Mr. LAWRENCE ABEL (Marylebone) gave details of a meeting which he had attended on behalf of the Association with the Board of Customs and Excise on January 14.

*The first part of this report appeared in last week's *Supplement*.

on the subject of crash helmets. The Board officials were told that many injuries would have been avoided had crash helmets for motor-cyclists been compulsory. Sir Hugh Cairns's figures had been quoted, showing that during the early part of the war 15% of Army motor-cyclists who did not have crash helmets and who received fractured skulls were invalidated out as permanently unfit for service, while 85% of those who recovered were absent from duty for approximately four months. Head injuries accounted for more than 90% of road fatalities. The deputation had suggested that the first thing to do was to take off purchase tax from crash helmets. The Act relating to industrial injuries included a clause exempting miners' and quarrymen's crash helmets from purchase tax. But the deputation were told that it was not possible to include helmets for motor-cyclists.

HOSPITAL AND CONSULTANT SERVICES

In the absence, through illness, of Dr. T. Rowland Hill (Chairman of the Central Consultants and Specialists Committee), Mr. J. R. NICHOLSON-LAILEY presented the Annual and Supplementary Reports of Council under this heading, also the revised report of the Special Subcommittee on Hospital Medical Staffing, the report of the Geriatrics Joint Committee, and the report, by a subcommittee of the Psychological Medicine Group Committee, on the Medical Use of Hypnotism.

Mr. NICHOLSON-LAILEY outlined the negotiating machinery for consultants. He said that it had been attempted to model the negotiating machinery on the efficient machine of the general practitioners. It could not be an exact copy, since the problems were different in each case. Although the addition of the Joint Consultants Committee might seem to have made the business of negotiation cumbersome, slow, and at times exasperating not only to the medical profession as a whole but to the consultants themselves, it must be clearly understood that any semblance of fission between the Royal Colleges and the Central Consultants and Specialists Committee would be a most disastrous thing, particularly if the Minister had to consult three or four influential bodies in order to get advice or endorsement of some medical policy. He asked the Representative Body not to do anything which would suggest that the profession as a whole were so critical of the consultants and specialists, so condemnatory of their methods, that they would drive them away from the main body of the profession. Three times in the past five years he had sat in responsible committees of consultants and specialists and had heard it seriously proposed that they should form their own organization and negotiate without the Association. He had been the first person to rise and condemn such an attitude. The profession had to work together, and he appealed for a spirit of tolerance, understanding, and patience.

OVERSEAS BUSINESS

The order of the agenda was interrupted at this point to permit of overseas business being taken. Dr. GREGG drew particular attention to the award of the Gold Medal of the Association to Sir Henry Newland.

Major-General J. C. A. DOWSE, in the absence of Mr. Gilks (Chairman of the Overseas Committee), welcomed overseas representatives. He said the very high proportion of membership outside the British Isles was an indication of the keenness and enthusiasm shown by overseas colleagues for the affairs of the Association.

The Colonial Service, with its magnificent tradition of service and achievement, was in a stage of rapid transition and faced an uncertain future. Many Colonial territories were moving rapidly towards self-government, an essential feature of which was the assumption of full control of the services provided by the Government in those territories, including the medical service. Very few could supply the full demand for doctors, and doubtless would continue to rely for some time to come on recruitment from the United Kingdom. The advent of self-government gave rise to present and future problems closely affecting the well-being of the medical services. Some step towards solving these problems had been taken by the creation of H.M. Overseas Civil Service, but the B.M.A. hoped the U.K. Government was determined to retain some measure of responsibility for looking after the interests of those recruited.

The following representatives of Overseas constituencies then briefly addressed the meeting and brought greetings: Mr. E. G. GIBBS (New Zealand), Mr. K. B. FRASER (Queensland), Dr. J. LEON JONA (Victoria), Sir PHILIP MESSENT (South Australia), Dr. CHANG HOEY CHAN (Malaya), Dr. L. O. ABEYARATNE (Ceylon), Dr. A. M. M. WILSON (Uganda), Dr. H. PITT GRAHAM (Gold Coast), and Dr. J. C. McFEELY (Irish Medical Association).

The Empire and International Bureaux

Dr. H. G. DAIN moved approval of the reports of the Committees of Management of the Empire Medical Advisory Bureau and of the International Medical Visitors' Bureau.

The reports were approved.

HOSPITAL AND CONSULTANT SERVICES (resumed)

Negotiating Machinery

Dr. R. P. LISTON (Council) reminded the meeting of the note of warning sounded by the Chairman of Council at the Conference of Honorary Secretaries on March 31 about the spirit of sectionalism which had crept into the profession. Dr. Gregg had said that the British Medical Association was the only body which could claim to represent the profession in this country, but had not mentioned the vital reason which had justified that statement. It was one which gave the lie to the suggestion that the Association was the trade union of the general practitioner. The Association was nothing of the sort. The latest available figures showed that 81% of general practitioners and 70% of consultants and specialists were members. The Representative Body would be well aware of the dangers which lay ahead if Dr. Gregg's warning went unheeded, but the Representative Body would do well to ask themselves whether they were taking any steps to prevent sectionalism becoming a permanent feature of its members' professional lives. The Representative Body was the governing body of the Association and determined its policy. He asked whether it could in truth be said that it was at present carrying out or being allowed to carry out those functions. The Representative Body was becoming, if it had not already become, the rubber stamp for decisions already reached by the autonomous bodies. It was fair to say that the G.M.S. Committee had not at any stage departed from Association policy, though there might have been signs of strain at times, but

that did not apply to the Central Consultants and Specialists Committee.

"You will recall the *fait accompli* with which we were presented last year," he said. "The Joint Committee rose to the tarnished fly of £3m. thrown to it in secrecy, gobbled it hook, line, and sinker, and, in doing so, spewed up Spens and the yardstick accepted by the Representative Body!"

At the Council meeting of April 13 disquiet had been expressed by various members that decisions on proposals now being discussed by the Central Consultants and Specialists Committee might be reached before the Representative Body itself had considered them. The reply given by the Chairman of that Committee (Dr. Rowland Hill) had not been at all convincing. The Association was faced to-day with a very real danger in this matter of autonomy. The Representative Body was in the same helpless position in which the Trades Union Congress found itself in dealing with its own autonomous bodies. He asked whether, in granting autonomy, the Association had not given up its power and authority to speak for the profession as a whole.

"We must resist such influences which are not and cannot be for the good of the profession. We should make it our endeavour to persuade others that within the fold of the British Medical Association lies strength and progress, and that without lies weakness and regression." (Applause.)

Mr. LAWRENCE ABEL (Marylebone) moved to recommend to the Council that, where it is considered necessary, in all negotiations with the Ministry of Health on matters of hospital medical staffing professional, legal, and financial advisers should be consulted before final decisions were reached.

Dealing with the Defence Trust, he said that the general practitioners had saved for some 40 years. The consultants had not done their duty in paying for negotiations and the work that the Association had carried out.

The CHAIRMAN OF COUNCIL said that, in gathering their funds, consultants had difficulties which were not shared by the general practitioners, who had their contributions to the fund deducted at source. The consultants had tried but had not succeeded in getting their contributions treated in that way. Dr. A. SMITH (Lanarkshire) said that in Scotland there was a defence levy deducted at source by the regional hospital board.

The Marylebone motion was carried.

Mr. LAWRENCE ABEL (Marylebone) further moved to instruct the Council to consider the desirability of advising the Staff Side to withdraw from Committee B of the Medical Whitley Council in view of the fact that this negotiating machinery was not working satisfactorily.

Dr. J. B. TILLEY (Chairman of the Public Health Committee) thought that Committee C should be included in the motion.

The motion was carried.

Relationship with Joint Committee

Dr. J. A. PRIDHAM (Dorset) moved to request the Council to review the relationship of the Central Consultants and Specialists Committee to the Joint Consultants Committee. He said the Joint Committee had come out on top of the machinery which the Representative Body had authorized in 1948 and consisted of six people appointed by the Central Consultants (B.M.A.) Committee, the remaining 17 being appointed by the Royal Colleges of England and the Royal Scottish Corporations. The Joint Committee had been entrusted with negotiations with the Government, acting through Whitley B Committee, of which the staff side was the same committee under a different name. All respected the colleges, with their great traditions, but when they came down from their academic groves to the dusty realm of medical politics it did not necessarily follow that they were the best men to represent the consultants in the political field. However, the Joint Committee had been presented as a *fait accompli*, and it had been decided to see how it worked, hoping that in time it would recognize

the value of the Association, with its experience and the fairness with which the Representative Body could deal with any matter presented to it. The present arrangements made matters difficult for the Association because it was often blamed for decisions of the Joint Committee. A most important document which had recently emerged was the Strachan Report, containing references to the employment conditions and pay of the most junior members of hospital staffs. The only way in which those junior members could voice their views was through their divisional machinery and through the Representative Body. It now appeared that, although the report was to come before the Representative Body, it could not be altered by it without appearing to split the profession.

Dr. A. SMITH (Lanarkshire) said that a precipitate move to dissolve the Joint Committee or remove the association with the Royal Colleges would be a step towards setting up a separate organization having nothing to do with the B.M.A., and would be playing into the hands of politicians.

Dr. DORIS ODLUM (Bournemouth), while supporting the motion, said the meeting should not be carried away by emotional appeals. Some kind of joint structure should be maintained. Dr. S. F. L. DAHNE (Reading) opposed the motion, but thought there were several ways of working out better machinery, preserving the prestige of the Royal Colleges and the Scottish Corporations. The Council should examine the matter and in a year's time suggest what would be the right machinery. Dr. V. COTTON-CORNWALL (Liverpool) said consultants throughout the country were seriously disturbed at the way in which the machinery was working, and hoped the motion would be carried unanimously.

Mr. NICHOLSON-LEILEY said that the Joint Committee had to represent so many different types that there were bound to be divergences of opinion, but in the six and a half years of its existence there had been no serious disagreement between Consultants and Specialists Committee representatives and representatives of the Colleges. The "Escape Clause," by which one side was empowered to negotiate separately with the Ministry if it thought the other side was being unreasonable, had never been invoked.

The Central Consultants and Specialists Committee had given the Strachan report provisional approval, and the Joint Committee would eventually formulate their own policy on it. Any suggested alteration of the terms and conditions of hospital staffs would go back to the Central Consultants and Specialists Committee, and thence to regional committees, and the endorsement of the whole profession would have to be received before any agreement was made with the Ministry.

Mr. G. J. CLELAND (Ayrshire) said the democratic principles on which the Consultants and Specialists Committee was appointed must be maintained and enlarged as far as possible, and he strongly supported the motion. Dr. C. P. WALLACE (Guildford) suggested that representatives of the Royal Colleges on the Joint Committee might be made *ex officio* members of the Representative Body and be invited to have an adequate representation on the Council.

Mr. LAWRENCE ABEL (Marylebone) maintained that the organization was not clumsy and had worked well for six years. There was no evidence that consultants were disgruntled; most of them were doing very good work, and thousands were paid better than they had ever been. All members of hospital staffs could get their ideas to the Central Consultants and Specialists Committee or the Joint Committee through attending meetings of regional committees or writing to their representatives.

The CHAIRMAN OF COUNCIL said that in such a matter he had a jealous regard for the interests and importance of the Association. There was only one British Medical Association, which included all kinds and conditions of men, and its doors were open to them all. He was not very keen on doctors who put more emphasis on things specially associated with their branch rather than on being members of a great profession. Any fear he had was lest the influence and importance of the B.M.A. should suffer in any way.

The cure lay with all members of the profession being willing to meet in their local Divisions, being available to be sent to the Representative Body if they were the best men in the Division, and taking their place as doctors among other doctors.

The Dorset motion was carried almost unanimously.

The Withdrawal of Heroin

Dr. J. W. TAYLOR (Aberdeen and Kincardine Counties) moved a composite resolution:

That this meeting protests against the threatened withdrawal of that most excellent sedative heroin, which is of inestimable value in so many conditions, and recommends that it should still be manufactured in this country for use by medical practitioners, but not exported. It instructs the Council to seek direct access to the Government (a) to obtain the reversal of the decision on the banning of heroin, and (b) to ensure that in future no drug be prohibited without full discussion with the British Medical Association.

Dr. Taylor said that there was no adequate substitute for this most valuable drug. Those who used it were fully conscious of its dangers as well as its benefits, and not enough consideration had been paid to the views of the general practitioners—its main users. It had been stated in the House of Lords that a perfectly good substitute was now available in adequate supply and that the Government had taken the opinions of the statutory bodies (the Central Health Services Council, the Standing Medical Advisory Committee, and the appropriate bodies in Scotland and Northern Ireland) and that the Government could do no more than follow the technical advice and guidance given them. That was a fair enough statement, but the question arose whether the advice given was strong enough or the representation adequate. Such matters ought to be referred to the British Medical Association as the representative of all branches of the profession. Proprietary substitutes were stated to be no more than "as good as," which was not good enough. When something better was introduced the medical profession would abandon heroin of its own accord. The manufacture and sale of heroin was already well controlled, and an extension of the control to forbid its export would possibly satisfy the other nations concerned while leaving it possible still to use this most effective and excellent drug.

The CHAIRMAN OF COUNCIL said that in discussions in the Standing Medical Advisory Committee of the Ministry of Health such a dreadful picture of world heroin addiction had emerged that it was felt that any small sacrifice which might be involved in this country in forgoing the use of heroin was well worth making in the interests of the international situation in this respect. He wished to make it plain that those who had attended the Committee were not there as representatives of the Association; they had attended in their individual capacity. Had the B.M.A. had the opportunity of circularizing Divisions in the ordinary way, information might easily have been obtained from all over the country from bodies of doctors regarding the use of this drug.

Dr. J. S. HAPPEL (Winchester) supported the motion and welcomed the Chairman of Council's statement that the Committee had not been voicing the views of the Association. The ban was a bad decision and the motion now before the meeting offered a neat and satisfactory solution. Winchester was concerned with the precedent to be established. There were other addiction drugs in the country much more important, such as morphine, the barbiturates, or pethidine. He asked which would be the next to be banned. All through the years medical men had varied in their clinical estimation of the value of any particular drug; fashions had changed and changed back again. So it was with heroin. He asked the Representative Body to vote against this ban irrespective of their personal clinical assessments of the value of heroin.

Dr. R. HALE-WHITE (Marylebone) said that he knew of no satisfactory substitute for heroin, and even if there were

such a thing the argument was still false, because all general practitioners knew that individuals reacted to different things, and a long and depressing case of pain sometimes required three or four alternative treatments before the patient was made comfortable. He referred to the large majority of countries mentioned in the House of Lords debate on April 27 as having abandoned heroin, and said that Great Britain had been one of the few to stand out against the ban when it was first requested by United Nations. Yet heroin addiction had persisted and increased in countries where its use had been forbidden, which was exactly what might be expected. Prohibition of any drug or of alcohol only succeeded in encouraging its illicit and subversive use.

Dr. J. S. M. ORD (Glasgow) said that as a police surgeon he had not come across any abuse of heroin in his district. He felt that the distribution and use of the drug ought to be in the hands of the medical profession rather than that, by its prohibition, it should fall into the hands of unscrupulous persons, as would most likely happen.

Dr. G. D. THOMPSON (Lancaster) said the export and use of the drug should not be banned simply because another country could not control its use. Dr. ENID HUGHES (Denbigh) asked whether regulations similar to those controlling the use of cocaine could not be used to prevent heroin addiction. Dr. J. S. NOBLE (Blyth) said that pethidine was doled out to the nursing profession and morphine was doled out to miners, yet heroin was to be withdrawn from everybody.

Dr. A. J. MACLEOD (Outer Isles) said that, just as doctors deliberately did without other things which might be used in the interests of some patients, they should go without heroin in the interests of the world.

Mr. G. E. MOLONEY (Oxford) was sure there were more addicts to morphine than to heroin: "Why pick on the demon heroin when there are many more physical wrecks in Britain due to addiction to the demons gin, rum, and whisky?"

Dr. J. G. M. HAMILTON (Edinburgh) said that to be effective international action was seldom painless. Britain's reputation in the control of drugs of addiction was by no means a good one, and was the cause of much disrepute attaching to us internationally. "In this instance there is a bucket with a hole in it, and we have an opportunity of plugging the hole." The use of heroin was to some extent a prescribing habit, and on many occasions substitutes would be effective. He asked the meeting to be adult and responsible in its attitude to this matter.

Dr. H. G. DAIN (Birmingham) proposed an amendment which he thought more properly gave their view of the Association's position. (The text of this amendment forms the latter part of the motion as finally carried. See below.)

Dr. S. WARD said the debate had been on a parochial level, with little reference to the grave international situation. He deprecated that, on a matter affecting the well-being of unfortunate people throughout the world, a clever emotional appeal should have been made. Statements had been made seeming to indicate that doctors were treating carcinoma of the lung every day. He asked the meeting to take a decision dispassionately on the merits. Should a few sufferers be allowed a little extra suffering in order to try to solve a grave international problem which undoubtedly was spreading? "It may not prove the solution, but surely it is worth trying."

Dr. J. W. TAYLOR, in reply, said that in spite of the large quantity of heroin prescribed annually there were only about 40 addicts in the country.

The motion was taken in three parts, the third part being Dr. Dain's amendment, as follows:

(a) That this meeting instructs Council against the threatened withdrawal of the most excellent sedative heroin which is of inestimable value in so many conditions, and recommends that it should still be manufactured in this country for use by medical practitioners but not exported.

(b) That the meeting instructs Council to seek direct access to the Government to obtain the reversal of the decision on the banning of heroin.

(c) That this Representative Meeting of the British Medical Association wishes it to be known that the Association has not been consulted or asked for an expression of its views in any way on the question of the abolition of the manufacture and use of heroin. The Association, representing as it does the doctors of this country, considers this a serious omission on the part of the Government, and in the absence of such consultation the Government cannot claim to have ascertained the views of the medical profession before arriving at its decision.

On a show of hands, the first and second parts of the resolution were so obviously carried as not to require a count, and the third part was carried with three dissentients.

Remuneration of Hospital Medical Staff

Mr. J. R. NICHOLSON-LAILEY moved approval of the paras. (46 and 223 respectively) of the Annual and Supplementary Reports of Council.

He said that claims had been made for a further increase in the remuneration of S.H.M.O.s, an increase in the remuneration of non-clinical medical superintendents, the payment of domiciliary consultation fees to members of hospital staffs holding whole-time contract, an increase in the salary scales for regional hospital board headquarters medical staff corresponding with that given to hospital medical staff, and for certain improvements in the emoluments of house-officers, and these would continue to be made until satisfaction was obtained. Retrospective payment of the increased salaries agreed upon last session had not been pressed because the operative date was accepted as part of the agreement, and a claim for an increase in the basic rate of consultants' remuneration could not be pursued until there was more solid ground to go on, and more time was needed to see what could be done.

Dr. T. D. CULBERT (Manchester) moved:

That this meeting deplores the fact that the instructions to Council contained in the resolution of the last Annual Representative Meeting have not been carried out, and demands that the Council do so forthwith.

This resolution of 1954 deplored the inadequacy of the agreement reached on the remuneration of hospital medical staffs and urged that steps be taken to reopen the matter immediately with a view to implementing the Spens report as applied to consultants and specialists and obtaining adequate betterment; in the event of disagreement the matter to be referred to arbitration.

He said it seemed that the Spens report had been allowed quietly and tacitly to drop, and instead of its implementation there was to be an inquiry, and no one could say when that would finish. Mr. NICHOLSON-LAILEY said more time must be allowed before confronting skilled, hard-headed negotiators, trained for the job and doing it every day of their lives.

The Manchester amendment was carried.

Dr. J. B. S. MORGAN (Derby) moved to express dissatisfaction with the results so far obtained for whole-time consultants and specialists and to urge that renewed efforts be made on their behalf. Dr. E. C. DAWSON (Derby) supported the motion.

Mr. NICHOLSON-LAILEY said the matter was under discussion.

The Derby amendment was carried.

Dr. V. COTTON-CORNWALL (Liverpool) moved to refer to Council that the S.H.M.O. maximum rate of remuneration be raised to 80% of the consultant maximum.

This was agreed.

Dr. A. G. CHAMBERLAIN (Dorset) moved that the remuneration of hospital house-officers should be brought into line with that of newly appointed national service medical officers. He could see very little difference between the work done and the responsibilities taken by house-officers as compared with the work and responsibilities of serving officers doing their two years' national service. The respective remunerations of the two classes varied between £425 in the case of the house-officer and about £900 plus a ration allowance in the case of the service officer.

The motion was referred to Council.

Mr. WELDON WATTS (Newcastle-upon-Tyne) moved that the remuneration of general practitioners doing sessional work in hospitals be increased.

This was carried.

The Revised Report on Hospital Medical Staffs

Mr. NICHOLSON-LAILEY moved approval of the revised report on Hospital Medical Staffing. He also outlined some of the features of the Strachan Report.

Miss GLADYS SANDES (Marylebone) moved:

That this meeting instructs the Council that a survey of consultant establishments is essential before decisions are taken on any changes in hospital medical staffing. The review should be undertaken by representatives appointed by the Ministry and by the Joint Consultants Committee. Any review committee so appointed should include representatives of the Consultants and Specialists Committee of the region concerned.

The motion was carried.

Dr. E. W. GOODWIN (Leicestershire and Rutland) moved:

That there should be a maximum expansion of the consultant establishment so as to provide a service adequate for the needs of the country in accordance with the expressed policy of the Central Consultants and Specialists and Joint Committees.

The motion was carried.

Dr. D. J. CAMPBELL (Sheffield) called for an expansion of the consultant establishment in the hospital services, particularly in those specialties in which the present ratio of consultants to S.H.M.O.s was low.

A motion to this effect was carried.

Dr. S. F. L. DAHNE (Reading) said that, while taking note of the need for expansion of the consultant grade, any such expansion should absorb existing S.H.M.O.s who were already doing consultant work.

Mr. A. STAVELEY GOUGH (West Herts) asked that the motion should be taken as a reference to Council because it had very wide implications and might be bad in relation to the report's effect on the senior registrars who had a very serious grievance in trying to get jobs with an under-established consultant's fee. Mr. NICHOLSON-LAILEY also asked for its reference to Council.

Dr. DAHNE, in reply, pressed for a straight vote on his motion, reiterating that the majority of S.H.M.O.s were doing consultants work, whether or not other people thought they were.

The Reading motion was carried.

Dr. E. W. GOODWIN (Leicestershire and Rutland) moved that all grades of medical staff who will be vitally affected should have representation on all committees dealing with the preliminary review of hospital staffing, and on all later committees concerned with putting the report into effect.

This was agreed as a reference to Council.

Dr. DAHNE moved an amendment to a motion by Dartford which the Dartford representative had wished to withdraw, but the meeting withheld permission. The amendment sought to draw attention to the position of doctors graded as S.H.M.O.s who, despite the fact that they are engaged in consultant work, are remunerated at S.H.M.O. rates, and to ask the Council to treat the matter as one of urgency.

Dr. D. L. PUGH (Maidstone) spoke in support. He said many such doctors undertook consultant work without supervision. It was a common adage in the economic and social life of the country that a fair rate should be given for the job concerned. The limited number of doctors concerned in this motion did feel a sense of injustice and hoped to secure the support of the Association in their negotiations.

The Reading amendment was carried.

A motion by Liverpool was also carried that in any reformed structure of staffing the grade immediately below that of consultant should be linked with the consultant grade and be regarded as part of the senior medical staff.

Dr. ANNIS GILLIE (Women Members' Representative on Council) spoke on paragraph 29 of the Strachan report, which she said referred specifically to medical women, and

married medical women, as a source of part-time staffing. Owing to social changes to-day young married medical women found it more difficult than before to undertake part-time work. They could often, however, undertake such work if it was in the immediate vicinity of their homes, but found that it was not available there. She thought that full use ought to be made of the services of such women, and that regard should be had to the fact that their inability to undertake regular part-time work while rearing families was a temporary phase in their lives; later on, when their domestic conditions allowed them greater freedom, they would be able to undertake more work, but they ought not to be made to feel handicapped at that stage by having been put in a pool with no outlet earlier on because of the limited opportunities they had for working while bringing up their families.

A motion by Liverpool reiterated the resolution passed last year by the A.R.M. that no further S.H.M.O. posts be established and that existing posts should be subject to biennial review with a view to upgrading.

This was agreed to.

A motion by Reading, that all existing S.H.M.O. posts should be subjected to a review by an independent central committee with a view to upgrading, was also carried.

Internal Administration of Hospitals

Mr. J. R. NICHOLSON-LAILEY introduced the section of the report on internal administration of hospitals.

Dr. V. COTTON-CORNWALL (Liverpool) had a long resolution on the subject of the Bradbeer report:

(a) That this meeting, believing everything concerning the patient must be of importance to the clinician in charge and that, therefore, the lay and ancillary services must be subordinate to the medical, considers that the recommendation of equal tripartite administration by the Bradbeer Committee on Internal Administration of Hospitals is not in the interest of the patient.

(b) That this meeting affirms that under no circumstances shall the medical and nursing personnel of hospitals be under the control of lay administrators.

(c) That this meeting affirms that it should be obligatory for the hospital management committee to consult with the representatives of the senior medical and dental staff.

(d) That this meeting welcomes the recommendation in para. 72 of the Report that, when medical administrators are appointed, they should be of consultant status with clinical responsibility. It considers that paras. 77-8 are unworkable.

(e) That this meeting deplores the suggested downgrading of deputy medical administrators, when such are considered desirable, to an R.M.O./R.S.O. grade.

(f) That this meeting reaffirms its belief that it is in the interest of the patient to maintain the close link that at present exists between the medical and nursing professions.

(The paragraphs in the Bradbeer report to which this resolution referred were set out in the *Supplement* of May 21.)

He said that Liverpool was very disturbed by the implications of the Bradbeer report, and hoped the meeting would express itself as equally disturbed.

Dr. L. A. GIBBONS (Council) said it was obvious from the Minister's answer to a question in the House that he preferred information obtained through the Ministry from the secretaries of local hospital management committees. He supported the amendment. Mr. A. STAVELEY GOUGH (West Herts) thought that too much had been read into the report, which was in some ways constructive and helpful to the medical profession by establishing their rights to be consulted at staff level on all occasions. Dr. A. SKENE (Liverpool), referring to the proposed tripartite administration arrangement, said that it clearly implied that the medical and nursing administrators would be subordinate to the lay secretary of the management committee.

Dr. J. G. M. HAMILTON (Edinburgh), referring to para. (d), said that in Scotland there was almost unanimous agreement that the present Scottish system of non-clinical medical administrative superintendents was desirable and should not be altered.

Dr. COTTON-CORNWALL, in reply, said that the Bradbeer report did not refer to Scotland.

The Liverpool amendment was carried except that para. (d) was taken as a reference to Council.

Dr. D. P. CRAWFORD (East Kent) moved as a reference to Council that a medical superintendent should be appointed to each general hospital where there was no such appointment, by election from senior medical staff by group medical advisory committees, in consultation with the medical staff committee, and that the tenure of office should be for periods of three years.

This was carried.

Dr. COTTON-CORNWALL further moved a recommendation that all medical boards and medical advisory committees in hospitals should become statutory bodies within the framework of the National Health Service, and this was agreed.

Dr. A. A. VICKERS (Worcester and Bromsgrove) asked to what stage the deliberations of the Central Consultants and Specialists Committee on consultant organization had reached. Mr. NICHOLSON-LAILEY said that they were still engaged in an inquiry into and consideration of the organization of consultants and specialists and hospital group committees and everything pertaining to it.

Geriatric Units

Dr. H. D. CHALKE (Chairman) introduced the report of the Geriatrics Joint Subcommittee on the treatment and rehabilitation of chronic disablement (Appendix IX attached to Supplementary Report of Council).

He said the basic principle was that the whole problem of the aged was centred on the home and very closely bound up with the general practitioner, and there should be somebody in each area to whom the general practitioner could turn, and who had responsibility for deciding the temporary or permanent disposal of the infirm. It was essential that the welfare service should be under the same control as the public health service and part and parcel of the local health authority in order to deal more effectively with the need for more hospital bed accommodation. Also, something must be done preventively before the ageing became helpless, chargeable, and useless.

Dr. J. E. BLUNDELL WILLIAMS (Worcester and Bromsgrove) moved that in recommendation 17 in the report of the Geriatrics Joint Subcommittee, which read, "There should be an increase in Part III accommodation to meet present and future needs," the words should be added, "particularly with regard to the provision of an increased proportion of single rooms."

The motion was carried.

A motion by Mid-Cheshire was met by an amendment by Dr. R. W. MCCONNELL (Buckinghamshire) to expand it to read: "That this meeting recommends that stress be put on the need for more domiciliary and institutional accommodation for the aged, elderly, and middle-aged," and this was carried.

Bath asked that the Council should make representation to the Government to produce homes for old people, accommodating a sufficient number in each to be an economical proposition, and this was agreed to. A recommendation by Greenwich and Deptford was also carried urging the provision of geriatric and chronic sick hospital facilities. A motion by Wandsworth asked that age should not be a bar to admission to hospital, and this was agreed to.

Dr. W. N. LEAK (Mid-Cheshire) asked that propaganda be considered to arouse the public conscience on the need for people to accept the responsibility for their aged relatives, except where hospital treatment was essential.

A motion calling for such propaganda was carried.

At the end of the business on the report on "Hospital and Consultants Services," Mr. Nicholson-Lailey received an ovation for the way in which he had dealt with the business in Dr. Rowland Hill's absence.

Representation of Whole-time Consultants

Dr. J. B. S. MORGAN (Derby) urged that there be a higher proportion of whole-time consultants and specialists on the Central Consultants and Specialists Committee. He felt that the present representation was disproportionate.

Dr. E. C. DAWSON (Derby) said that since a Derby motion on similar lines had been defeated two years ago the Association had set up a Constitution Committee which it was hoped would deal with the question, and also with the constitution of the Consultants and Specialists Committee. He asked for a reference to Council.

Mr. NICHOLSON-LAILEY also asked for a reference to Council. The Association was most anxious to avoid sectional interests in allocating the proportions on committees.

The motion was referred to Council.

Private Beds

Dr. A. SUTHERLAND (Bath) moved that in view of the increasing membership of the various provident schemes the Minister be asked to arrange that more private beds should be available in hospitals.

Dr. W. M. EVANS (South Middlesex) moved as an amendment that the Minister should be asked to arrange that some section 4 and 5 beds be available at all major hospitals. Although the Minister had said on several occasions that the overall picture for the country showed a sufficiency of these beds, regionally there had been a shortage.

Dr. F. E. GOULD (Birmingham) said there were very many reasons why the Minister should be asked to provide private beds, but to suggest that they should be provided because payment for them was being subsidized by provident schemes was immoral and unwise. Dr. A. V. RUSSELL (Council) said there was nothing immoral in somebody being willing to pay for what they wanted. Payment for a section 4 or 5 bed was one step in the direction of cutting down the expenses of the health service.

Mr. G. E. MOLONEY (Oxford) said that private practice seemed to be regarded by some doctors as well as by many potential patients as something rather shady. There was nothing wrong in a patient relieving the State by paying his way with the aid of a provident society.

The South Middlesex amendment was carried.

Study Leave

Dr. D. S. GREIG (Stirling) moved that the Ministry be asked to state its policy in respect of study leave and to reinforce its instructions to regional hospital boards to make study leave available to hospital officers.

Mr. NICHOLSON-LAILEY said that boards were not making all the efforts they could to provide the necessary facilities. There was a sum of money provided by the Government specifically for study leave expenses; it was not much, but the people in the smaller areas ought to get their share of it.

The motion was carried.

ASSOCIATION BUILDING

Mr. L. DOUGAL CALLANDER (Chairman of the Estates Committee) presented the report of Council under "Estates." He said that arrangements had been made for the redecoration of Tavistock House over a period of five years. The Council Chamber was to be redecorated and the lighting, heating, and acoustics of the building would also receive attention. The alterations to the Scottish House would be completed in about twelve months' time. It was also hoped to have very much better library accommodation. Town planning consent was being awaited with regard to the Burton Street side. The buildings were in fairly good condition, but there were certain costly repairs which had to be carried out.

PUBLIC RELATIONS

Dr. H. GUY DAIN (Chairman of the Public Relations Committee) presented the report under "Public Relations." He said that each year there had been an increase not only in the amount of work passing through the public relations department but in its value. Opportunities that had

presented themselves had been taken. Whenever the Council wished to issue an important document on such subjects as geriatrics or hypnosis or any other the Press were invited to attend and learn what it was about in order that the public might appreciate the scientific work which the Association carried out. A place had been secured on the Independent Television Advisory Committee for the Association. The Advisory Committee had drawn up a code of behaviour for advertisers, and this was now available. "We have had," said Dr. Dain, "a busier and more useful year than we have ever had before in our Public Relations Department."

The report was approved without discussion or dissent.

The final business of the day was the approval of the paragraphs under "Armed Forces," which were moved by Major-General J. C. A. DOWSE, chairman of the Committee.

The meeting adjourned at 6 p.m.

Saturday, June 4

The meeting resumed at 9.30 a.m., with Dr. GRANT in the chair.

Votes of Thanks

A warm vote of thanks was accorded to all who had contributed to the pleasure and convenience of the representatives and their ladies. These included the Council of the Metropolitan Counties Branch, the Ladies Committee of the Branch, and the London Association of the Medical Women's Federation.

OTHER MOTIONS BY DIVISIONS

Opposition to Whole-time State Salaried Service

Dr. ALISTAIR FRENCH (Marylebone) moved:

That this meeting, representative of all branches of the profession, expresses its strong opposition to a full-time State-salaried service, and reaffirms the resolution passed in May, 1946, July, 1953, and July, 1954: "The medical profession is, in the public interest, opposed to any form of service which leads directly or indirectly to the profession as a whole becoming full-time salaried servants of the State or local authorities."

This was not an attack on a salaried medical service, but his Division felt that no member should be compelled to practise his profession in such a service.

The motion was supported by South Staffordshire.

Dr. H. C. PALIN (Burnley) moved as an amendment that the meeting affirms its objection to any form of whole-time State-salaried service, and asked that the Council should state what immediate counter measures should be taken in the event of an attempt to bring in such a service.

Dr. FRENCH hoped the amendment would be withdrawn. His motion had been carefully thought out. No steps could be taken to introduce a comprehensive salaried medical service without amending legislation.

The CHAIRMAN OF COUNCIL said that he had sympathy with anybody who wanted to maintain the fighting spirit of the profession. But it was impossible to forecast along what lines an attack might come. The matter should be left to Council.

Burnley withdrew the amendment, and the Marylebone motion was carried without a dissentient.

Another motion by Marylebone reaffirming that the Spens reports still remain the yardstick and basis of all negotiations on remuneration for doctors in every branch of the National Health Service was carried unanimously without discussion.

ORGANIZATION

Dr. J. A. PRIDHAM (Chairman of the Organization Committee) presented the report under "Organization," including proposals for amendments of Articles and By-laws. He praised the work of hon. secretaries of Branches and Divisions. Circumstances of recent years had made their work more difficult, and but for what they did the B.M.A. would collapse. His committee had set up a strong sub-committee under the chairmanship of Dr. Dornan to help

the newly qualified and pre-registered. They had had a letter of appreciation from the British Medical Students Association.

Association Membership

Dr. R. P. HENDRY (Rugby and South Warwickshire) drew attention to the fact that there had been a net fall in Association membership of 366 over the years 1953 and 1954, contrasting with a net increase of 3,718 in the years 1951 and 1952. This should be considered as a challenge, not a catastrophe, and a small committee should be set up to consider this problem. He thought that the assurances given, in good faith, last year were on the optimistic side. Medical schools were turning out doctors by the hundred, but the Association would have to have been founded before Julius Caesar to reach its present size if its rate of increase (33) had been only that of last year. He agreed that the time was not quite ripe for a reduction of subscription, but something needed to be done which was not being done. He was reluctant to suggest a new committee, for the profession was riddled with committees, but some inquiry should be made.

Dr. R. G. GIBSON (Council) thought the Organization Committee was capable of doing this without more committees. Dr. D. L. GULLICK (East Herts) agreed with Dr. Gibson. Dr. R. H. MOORE (North Middlesex) said that members at the periphery did not feel they had a sufficiently active part in the Association.

Dr. PRIDHAM said that between May 31, 1954, and the corresponding date in 1955 there had been a rise in membership of 1,125. Many factors affected membership, including the pre-registration year and the call-up.

Dr. HENDRY said that last year 1,400 members resigned, and 2,900 the year before, compared with 700 in 1951. The figures were not satisfactory.

The proposal for the setting up of a new committee was withdrawn and the rest of the motion, drawing attention to the membership position, was carried.

Newly Qualified Practitioners

Dr. ALICE GILBY (Westminster and Holborn) asked the Council to examine the availability of pre-registration posts in hospitals and report to the next Annual Representative Meeting. Some young doctors had to wait unemployed for from a few weeks to six months, and they could not fill in the time as locumtenents.

Mr. C. D. MEADOWCROFT (South Middlesex) said that in view of the urgency of this matter the Council should be instructed to take immediate action.

A motion on these lines was carried.

Autonomous Bodies

Dr. J. A. PRIDHAM moved as a recommendation to Council:

That the autonomous powers of the General Medical Services Committee and the Central Consultants and Specialists Committee be renewed in respect of the year 1955-6.

That the Representative Body looks to these committees to ensure (1) that no action be taken by either which may prejudice the interests of another part of the profession without full prior consultation with the appropriate interests, and (2) that their autonomous powers will be used so as to expedite and not delay the work of the Association.

Mr. G. A. POLLOCK (Edinburgh) said that the motion as it stood suggested that consultation should take place only if the activities of one part of the profession affected adversely another part. He suggested that the word "affect" should replace the word "prejudice."

The amendment was rejected and the recommendation of Council carried.

CONSTITUTION OF THE ASSOCIATION

Dr. R. G. GIBSON, in the absence of Mr. H. H. Langston (Chairman of the Constitution Committee), moved that the report under "Constitution of the Association" be approved.

He briefly described how the work of the Committee was proceeding.

Dr. J. M. ALSTON (City of London) proposed that liaison committees organized on a district basis under the National Health Service, and consisting of members representing general practice, hospitals, and public health work, should be commended to all Divisions. In North London a committee with two representatives from each of these sides of the profession had presented a report on what could be done for the old people of the district, and were now engaged in a similar inquiry into small epidemics in families and small communities.

Dr. E. C. DAWSON complained that they had too many committees already. This was a job for the Divisional Executive.

The motion was carried with the proviso that such committees should be organized only when an equally desirable end could not be attained through existing organizations.

Dr. W. N. LEAK (Mid-Cheshire) proposed that in order to relieve the burden of the Council and also to stimulate interest at the periphery wider use should be made of delegation and co-option.

This was accepted as a reference to Council.

Miss GLADYS SANDES (Marylebone) moved to ask the Council to investigate the possibility of combining the Scientific Meeting and the Representative Meeting so that all members might have the opportunity of taking part in both the scientific and the medico-political activities of the Association.

The CHAIRMAN said that it would be helpful if representatives expressed their opinions on this point. It would mean that instead of giving three or four days to the Annual Representative Meeting they would have to give seven or eight.

Dr. J. S. M. ORD (Glasgow) urged that it be turned down on the score of increased expenditure. Dr. R. W. MCCONNELL (Buckinghamshire) thought it a good idea. People attending the Representative Meeting tended to become too politically minded. Dr. R. HALE-WHITE (Marylebone) thought it would be of the greatest value. It would mix together people interested in the political and in the scientific side.

The CHAIRMAN OF COUNCIL supported the idea. It was the kind of thing which had been done in the World Medical Association.

The Marylebone motion was carried.

Dr. J. E. MILLER (Glasgow) moved that the Council consider the appointment of resident medical secretaries to the regional officers in the larger cities of the United Kingdom, on the same lines as the successful Glasgow regional office, thus making for decentralization of the Association's activities and the making of a more efficient personal service available to members in each area. Provincial members were entitled to a more efficient regional service. Periodical visits by an officer from Headquarters in London were not adequate. In the Glasgow regional office Dr. McCutcheon had succeeded in making Glasgow one of the most B.M.A.-conscious cities in the country.

Dr. DAIN suggested that they might be better off as they were. The secretaries visiting the regions from Headquarters had the advantage of being in constant touch with the work of the Association in London.

Dr. J. C. MACARTHUR (Lanarkshire) supported the motion. The visiting secretaries from London had closer affiliation with the central office than with the regions.

The motion was supported by representatives from Manchester and Liverpool and was carried.

REFORM OF THE NATIONAL HEALTH SERVICE

Dr. H. H. D. SUTHERLAND (Chairman of the Amending Acts Committee) reported on what had been achieved and attempted since the Special Representative Meeting, 1951. One matter which had been under close consideration was whether there were adequate safeguards in section 10 of the Amending Act, 1949. The section, good enough so far as

it went, was not a complete cover, and it was possible that they might have to think again on this matter and take legal opinion.

Dr. E. C. WARNER asked for further information concerning the action taken with the departments on a number of recommendations passed in 1951.

The CHAIRMAN OF COUNCIL was proceeding to read a long document setting out the recommendations to which reference had been made and the action taken, upon them when a representative protested at the waste of time involved in reading such an elaborate document and suggested that it be circulated to representatives. This was agreed to. Dr. Gregg said that everything that was in the document had been published at various times, but here the information had been brought together.

Dr. WARNER withdrew his motion, saying that he had achieved his object.

The N.H.S. and Politics

Dr. J. B. WRATHALL ROWE (Harrow) moved:

That it is undesirable and detrimental to the interests of the health of the nation for the facilities and services of the National Health Service to be the means of gaining political capital, and the Council is requested to take such action as will cause the Health Service to be removed from the political arena.

He said that the National Health Service had been subjected to political influences. If anyone had any doubt of that he had only to read the manifestos of the political parties in the recent General Election. A situation might arise when a party, in the hope of reaching office, would make the most extravagant promises in which the doctors working the service might find themselves involved.

The motion was carried.

REMUNERATION POLICY

Dr. J. G. M. HAMILTON (Chairman of the Committee on Remuneration Policy) moved for approval the report of Council under that heading. He was not in a position to say anything more than that the Council hoped and expected to be able to report next year.

SCOTLAND AND WALES

Dr. HAMILTON also presented the report under "Scotland." Speaking of the visit of Danish doctors, he said that a sum of over £1,000 had been contributed for their entertainment. He also mentioned the successful conference of area secretaries in Scotland, which would be repeated again this year.

The report was approved, as also was the report under "Wales," moved by Dr. LESLIE W. JONES.

OTHER ASSOCIATION ACTIVITIES

Motions by Winchester concerning the improvement of catering and other social amenities at Headquarters were referred to Council.

A motion was moved by Wandsworth that in acute mental illness the procedure for obtaining effective treatment and supervision is not satisfactory, and that the Council be asked to examine and report on the problem.

Dr. S. WAND said that a few weeks ago representatives of the Association gave evidence to the Royal Commission on the law relating to Mental Disease and Deficiency. The deputation consisted of three psychiatrists representing various groups in that specialty, and representatives of public health and general practice. Various recommendations were made which would ease the lot of these unfortunate people and improve their conditions. Dr. DORIS ODLUM endorsed what Dr. Wand had said.

The Wandsworth motion was carried.

Dr. C. P. WALLACE (Guildford), referring to the paragraph in the Annual Report concerning the suggestion made by the Council to the Minister of Health to set up a working party to review the intake of medical students from the point of view of the number of newly qualified practitioners likely to be absorbed into the various branches of the

profession, protested against such interference on the part of the Council. The last thing they should wish to do was to regiment the administration and education of medical students. He thought the Council had been guilty of a grave strategic error.

The CHAIRMAN OF COUNCIL said that Dr. Wallace's criticism did not seem to him justifiable in the circumstances.

Miss GLADYS SANDES (Marylebone) moved a vote of thanks to the Chairman of the Representative Body for his excellent conduct of the four-day meeting.

The vote was carried by the representatives standing and applauding.

Dr. GRANT thanked the meeting, and associated Dr. Beauchamp, the Deputy Chairman, who had at times taken the chair, with the compliment. He also thanked the entire staff of the Association for their work throughout the year.

The meeting terminated at 1.20 p.m., and a Council meeting followed.

ELECTIONS

During the course of the meeting the following elections took place: *Chairman:* Dr. IAN D. GRANT. *Deputy Chairman:* Dr. A. BEAUCHAMP. *Ten Members of Council by meeting as a whole:* Mr. A. LAWRENCE ABEL, Dr. O. C. CARTER, Dr. H. GUY DAIN, Dr. ROBERT FORBES, Dr. FRANK GRAY, Dr. I. M. JONES, Mr. H. H. LANGSTON, Dr. J. A. PRIDHAM, Dr. S. WAND, and Mr. A. DICKSON WRIGHT. *Two members of Council by representatives of Scottish Constituencies:* Dr. G. W. IRELAND, Dr. J. C. MACARTHUR. *One member of Council by representatives of Constituencies in Wales (including Monmouthshire):* Dr. T. W. DAVIES.

Surgeon Rear-Admiral JAMES HAMILTON was elected by the meeting as representative of the Medical Branch, Royal Navy, on the Council for the period 1955-8.

Six members nominated as Direct Representatives in the approaching election to the General Medical Council: Dr. J. A. BROWN, Mr. L. DOUGAL CALLANDER, Dr. O. C. CARTER, Dr. H. GUY DAIN, Dr. E. A. GREGG, and Dr. S. NOY SCOTT.

ANNUAL GENERAL MEETING

The 123rd Annual General Meeting of the British Medical Association was held in the Great Hall of B.M.A. House, Tavistock Square, London, on Saturday, June 4, 1955. In the absence of the President, who was in America, the chair was taken by the CHAIRMAN OF COUNCIL (Dr. E. A. GREGG).

The notice of the meeting, which had appeared in the *Supplement* of April 30, was received.

The minutes of the last Annual General Meeting, held in Glasgow on July 5, 1954, and published in the *Supplement* of July 10, were confirmed.

Balance Sheet and Income and Expenditure Account

On the motion of Dr. KATE HARROWER, seconded by Dr. R. L. CORNIE, the Balance Sheet and Income and Expenditure Account for the year ending December 31, 1954, were approved.

Appointment of Auditors

On the motion of Dr. ENID HUGHES, seconded by Dr. J. HAZLETON, the following resolution was adopted:

That Messrs. Price Waterhouse and Co. be and are hereby appointed Auditors of the British Medical Association until the next Annual General Meeting, at a fee to be arranged by the Council.

President, 1955-6

The CHAIRMAN said that Dr. T. C. Routley, the incoming President, was not with them, and the induction speech which would have been made on that occasion could be appropriately made when they met him in Toronto. Meanwhile they would wish to express their thanks and appreciation to Sir John McNee, the Immediate Past President, for his services during the year. In these words of appreciation they associated Lady McNee.

He announced that in the absence of the President for 1955-6 Sir John McNee had been invited to act for the President on all appropriate occasions.

President-elect

The CHAIRMAN reported that Dr. Alexander H. Hall, O.B.E., M.D., of Hove, had been elected by the Representative Body as President of the Association, 1956-7. (Applause.)

Presentation of Treasurer's Badge

The CHAIRMAN said that Mr. A. M. A. Moore, who had held the office of Treasurer for six years, and had performed his duties in the quiet unobtrusive way which was natural to him, rendering most useful service, was kindly presenting to the Association a Treasurer's badge, to be worn by his successors.

Mr. MOORE, who was received with applause, said that he was very grateful to the Representative Body for electing him a Vice-President of the Association, and he hoped that he might continue to serve it in some capacity. He wished also to take this opportunity of expressing to Dr. Macrae and his colleagues in the secretariat, and on the financial side to Mr. Giles and his staff, his grateful thanks for their great loyalty and support during his time as Treasurer. He now had pleasure in presenting to the Association a badge to be worn by the Treasurer on certain formal occasions, and amid applause he invested Mr. Dougal Callander with the badge.

Mr. CALLANDER thanked Mr. Moore for this handsome emblem, and said that he felt himself fortunate to be the first Treasurer to wear it.

The meeting then stood adjourned until 8 p.m. on Monday, June 20, 1955, at the Royal York Hotel, Toronto.

EXTRAORDINARY GENERAL MEETING

An Extraordinary General Meeting of the British Medical Association was held, following the Annual General Meeting, on June 4, 1955, in the Great Hall of B.M.A. House, Tavistock Square, London. In the absence of the President the chair was taken by Dr. E. A. GREGG (Chairman of Council).

The notice convening the meeting, which had appeared in the *Supplement* of April 30, was taken as read.

The following resolution was proposed from the chair as a special resolution:

That Articles 5, 6, 10, and 18 be altered in the following manner:

(1) By altering Article 5 as follows: After "Each Branch" add "of the Association not in Great Britain or Ireland."

(2) By altering Article 6 as follows: After "1st January, 1938," delete "but so that this proviso" and add "Provided further that the Regulations and By-laws may provide that any member admitted to membership before the 31st December next occurring after the date of the grant to him of a qualifying diploma within the meaning of the Medical Acts may compound his subscriptions for such period as may be prescribed by the By-laws of a lump sum but so that each of the foregoing provisos."

(3) By altering Article 10 (c) as follows: After "(vii)" add "in the case of an Associate on the 31st day of December next following after he shall have ceased to reside within the area of the Branch by which he was elected or (viii)."

(4) By altering Article 18 as follows: At the beginning insert "Subject as hereinafter provided." After the words "Corporate Group and of no other" insert "Provided, however, that any member whose address as registered for the time being in the Register of Members of the Association is within Great Britain or Northern Ireland who has become a member of a Division other than that in which he resides in manner provided by the By-laws shall be an ordinary member of such first-mentioned Division and of no other."

The CHAIRMAN formally moved: That this Extraordinary General Meeting amend the Articles of the British Medical Association in the manner above indicated.

This was carried by a show of hands, none dissenting.

The meeting then terminated.

OVERSEAS CONFERENCE

The Overseas Conference was held in the Old Library at B.M.A. House on Saturday afternoon, June 4. Mr. J. L. GILKS, Chairman of the Overseas Committee, was prevented from attending because of the railway strike, and the chair was taken by Professor P. C. C. GARNHAM.

Seventy-four Branches

The Secretary of the Overseas Committee, Dr. E. GREY-TURNER, recalled that the first Overseas Conference was held at the Centenary Meeting of the Association in London in 1932.

There were, Dr. Grey-Turner said, 74 B.M.A. branches outside the United Kingdom. Thirty-eight of these were "corporate branches," which managed their own affairs. They included the six Australian branches, the New Zealand Branch, the Ceylon Branch (which, as the Ceylon Medical Association, was about to become affiliated to the B.M.A.), the four branches of Southern Rhodesia, known collectively as the Medical Association of Southern Rhodesia, and the 26 branches in the Irish Republic, which collectively formed the Irish Medical Association. Then there were 33 unincorporated branches, mostly in the British Commonwealth but including three in foreign countries; the smallest was that on the island of St. Vincent, which had only eight members. The overseas branches were represented on the Council and the Overseas Committee, and were entitled to send representatives to the Annual Representative Meeting. Finally there were the organizations which were now independent associations affiliated to the B.M.A.—the medical associations of Canada, South Africa, and India. The branches in Pakistan were dormant and that in the Sudan inactive.

Incorrect Information

Dr. Grey-Turner said the problem about advertisements for overseas appointments was to obtain information where there was no branch or affiliated organization. The Council had agreed that in the case of certain advertisements a clause should be added that information could be obtained from the Secretary; the information so given was shown to the advertiser. Advertisements by the Sudan Government offering five-year appointments were misleading. It appeared that the Sudan Government were replacing British medical officers by Sudanese whenever these became available, using the three-month option to terminate the agreement.

The Association had had instances of the Colonial Office supplying misleading information to doctors whom they recruited for Her Majesty's Overseas Civil Service. The difficulty was that the Colonial Office was recruiting doctors for governments over whom they had little or no control. The Association suggested that when a man was interested in an appointment he should be put into direct contact with the employing government, but the Colonial Office would not agree.

Insecurity

Why was the Overseas Civil Service not getting the doctors it wanted? Dr. Grey-Turner gave three causes. First, there was the general feeling of insecurity of tenure. Good compensation terms were not wholly the answer. Coupled with insecurity of tenure was the fear that a man returning to this country would be unable to obtain an appointment. It was a justified fear. Second, there was fear of civil disturbance, which might not deter the doctor but influenced his wife a little and his mother-in-law a great deal. Thirdly, there were pay and conditions of service: this cause was the only one which the colonial governments could remedy.

The official view was that if more payment was made to doctors all other grades would make demands. The Overseas Committee took the view that this was a nettle which the Colonial authorities had to grasp. It was important that the doctors recruited should be men of the highest quality, which could be the case if selection was possible.

Dr. Grey-Turner announced that the Colonial Office had made representation to the Treasury that the gratuity of a

short-service colonial medical officer should be exempt from taxation in the same way as that of a short-service commission-holder in the Services.

In a reference to the long-standing dispute with the Cyprus Government, Dr. Grey-Turner said that the difficulty arose in the first place because the administration did not consult the B.M.A. The Association was trying to persuade the Colonial Office to induce colonial governments to consult the local profession—as was done in this country—when changes affecting doctors were to be made. Failure to consult, as in Cyprus, had taken place in Gibraltar and the Leeward Islands. It was noticeable that in every case it was a small colony that was at fault.

Speaking of the activities of overseas branches, Dr. Grey-Turner instanced the clinical meetings organized by the Middle East Branch, which functioned as a supranational medical society in the area, and the 17 meetings, addressed by distinguished medical men, held during the year by the Matabeleland Branch.

Discussion

Dr. A. M. M. WILSON (Uganda) said that the Association should be prepared to give unbiased information to applicants applying for overseas posts.

Mr. W. A. L. TUCKER (Aden) spoke of "very out of date" information supplied by the Colonial Office. He warned that a junior officer going to the colonies must be prepared to take the rough with the smooth. He referred to the time lag in filling posts, and said he would like to see more direct contact between the colonial governments and the B.M.A. and the various teaching hospitals.

Dr. T. WILSON (Malaya) agreed that anyone recruited as a general duty officer had to take what came; this should be made clear to him.

Dr. H. PITT GRAHAM (Gold Coast) remarked that the standing order that an officer would be posted without regard to his family circumstances was known to the Colonial Office.

Dr. J. LEON JONA (Victoria) said that the B.M.A. should say it was not going to encourage young men to go overseas unless they could be guaranteed a career.

Dr. A. C. E. COLE (Tanganyika) thought that a difficulty in recruitment was that, whilst a young doctor would like to go overseas, he did not want to stay there all the time and certainly did not want to be thrown on the scrap heap. The Colonial Office should arrange for a channel for the employment of doctors on their return.

Dr. J. O. MABAYOJE (Nigeria) thought that all the outcry against expatriate officers in the colonies would die out with self-government. He stressed the importance of salaries.

Mr. C. BELFIELD CLARKE (Council) supported Dr. Grey-Turner's remark about the lack of any sense of urgency in the Colonial Office on the shortage of recruits for the overseas medical service, and noted a similar lack of urgency over supplies.

Dr. J. R. LAUCKNER (Nigeria), Dr. G. H. WATTLEY (Trinidad), Dr. B. H. GANDEVIA (Victoria), and Dr. A. D. WILLIAMSON (Malaya) also spoke.

OVERSEAS LUNCHEON

A luncheon in honour of the overseas Representatives was given by the Council of the Association at the Russell Hotel on Thursday, June 2. The chair was taken by the Chairman of the Representative Body (Dr. I. D. GRANT), who proposed the health of the overseas Representatives, of whom 25 were present.

Dr. A. NIMALASURIA (Ceylon Branch) responded to the toast, and thanked the parent body for the hospitality shown.

Empire Medical Advisory Bureau Reception

In the evening the chairman, Mr. L. R. BROSTER, with Mrs. Broster and members of the committee of management of the Empire Medical Advisory Bureau, welcomed the overseas Representatives and Delegates at an "At Home" in the Bureau's offices in B.M.A. House.

PROCEEDINGS OF COUNCIL

Meetings of Council were held on June 3 and on June 4, the latter being the first meeting of the new Council. Dr. E. A. GREGG presided over both meetings.

Deaths were reported of two former members of Council—Dr. James Hudson, of Newcastle-upon-Tyne, who was a member of Council for 13 years, and Dr. R. Langdon-Down, a Vice-President of the Association. The Chairman was authorized to send letters of condolence to the relatives.

A letter was read from Sir Henry Newland expressing his appreciation of the honour conferred on him by the Council in awarding him the Gold Medal, and from Dr. P. T. O'Farrell, thanking the Council for recommending him for election as Vice-President.

The assistance rendered to Canadian doctors pursuing postgraduate training in the United Kingdom by the Empire Medical Advisory Bureau was the subject of appreciation in a letter read from the Canadian Medical Association.

The Council of the World Medical Association conveyed its thanks for a voluntary gift to help to tide it over its present financial difficulties.

It was reported that Professor D. E. C. Mekie, of Singapore, had been elected to represent the Far Eastern Branches on the Council.

Dr. J. B. Tilley was asked to act as delegate of the Association at the annual meeting of the Norwegian Medical Association being held at Oslo from June 16 to 18.

The award of the Industrial Court on the remuneration of public health medical officers, which had now been accepted by both sides of Committee C of the Medical Whitley Council, was reported. The Council agreed with the terms of a letter which the Secretary had written to the Ministry of Labour and National Service concerning the possibility of making *ad hoc* arrangements for arbitration by a tribunal composed of persons chosen for their special competence to deal with the affairs of professional people, in the event of any dispute which might occur in Committee C in the future.

Dr. J. A. Moody was reappointed representative of the Association to the Governing Body of the British Postgraduate Medical Federation for the year 1955-6.

Dr. H. Guy Dain was appointed to act, if necessary, for the Chairman of Council during the absence of the Chairman from June 12 to 26 in Toronto.

Committee Reports

A report was made by Dr. ROBERT FORBES, chairman of the Central Ethical Committee, on the conduct of a member, and a recommendation for expulsion was carried.

On the report of the Science Committee, moved by Mr. NICHOLSON-LAILEY, recommendations for awards in the Nurses Essay Competition were agreed to.

On the recommendations of the Private Practice Committee the Ministry of Education is to be asked to agree that the medical examination of entrants to courses of training for teaching is a matter for the family doctor.

Mr. Nicholson-Lalley presented the report of the Central Consultants and Specialists Committee, which contained one recommendation—namely, that the British Commonwealth Medical Conference be asked to consider the possibility of undertaking the arrangements for interchanges of senior registrar appointments between the United Kingdom and other parts of the Commonwealth.

Reports by the Amending Acts, Compensation and Superannuation, General Medical Services, and Journal Committees were presented and approved.

It was agreed that the constitution of the Welsh Committee be amended to include the presidents of the North Wales, the Shropshire and Mid-Wales, and the South Wales and Monmouthshire Branches.

The Council approved a recommendation that a reception be arranged for members of the Society of Medical Officers of Health on the occasion of the centenary of the Society in May, 1956, and that an address of congratulation for presentation to the Society be prepared.

Approval was given in principle to the purchase of a house for the Belfast Regional Office, suitable for conversion into an appropriate centre for the Association in Northern Ireland.

Medical Manpower

The Minister of Health had invited the Association to submit a list of medical practitioners whose names it wished to be considered for appointment to fill vacancies which will arise on the National Medical Manpower Committee in July, 1955. The Council agreed that the following names be submitted: Sir Russell Brain, Dr. H. D. Chalke, Sir Zachary Cope, and Dr. D. F. Hutchinson. It was understood that the Minister would shortly consult the profession on the chairmanship for the three years from July, 1955. In anticipation of such an approach it was agreed that Sir Zachary Cope (if appointed a member) be nominated for the chairmanship.

On the question of heroin, which had been before the Representative Body, it was agreed that the Home Secretary be asked to receive a deputation.

British Medical Guild

The meeting of Council was succeeded by a formal meeting of the trustees of the British Medical Guild, when the Chairman (Dr. Gregg), other officers, and staff were re-appointed. The Executive Committee was also reappointed, with one change, that of Dr. H. D. Chalke in place of Dr. Kenneth Cowan. The financial statement was also presented.

DINNER AT THE HOUSE OF COMMONS

ENFIELD AND POTTERS' BAR DIVISION

Through the courtesy of the Member of Parliament for Enfield West (Rt. Hon. Iain Macleod, M.P.) the Enfield and Potters Bar Division's summer social meeting was held at the Houses of Parliament in the evening of June 4. The chairman of the Division, Mr. R. M. Millen, and Mrs. Millen received some 170 members, their ladies and their guests, and after a conducted tour of the House of Lords and the House of Commons the chairman presided over a dinner in the Members' Dining-room of the House of Commons. The principal guests were Mr. Macleod, Lord Webb-Johnson, and Dr. E. A. Gregg. Lord Webb-Johnson, proposing the toast of the B.M.A., said that he was proud to have been at one time an active partner in its deliberations. In semi-humorous vein he spoke of some of the things in the medical field to which a canvasser for the Government in the recent election might now expect it to give attention. More seriously, he reminded his audience that the spirit of service was a tender part of medicine: "Regulations plus plus equals spirit minus minus." Dr. E. A. Gregg, replying, stressed that the life of the Association was in its Divisions. Mr. Macleod proposed the health of the Enfield and Potters Bar Division. He spoke of his ties with the medical profession, and referred to the fact that his father when in practice in Skipton had been chairman of the B.M.A. Division. Mr. R. M. Millen responded.

PROFESSIONAL SECRECY IN THE PUBLIC HEALTH SERVICE

The Council of the B.M.A. has approved the following statement which has been agreed by its Public Health and Central Ethical Committees:

There are occasions when disclosure of confidential medical information is demanded from medical officers in the public health service. The general relationship between doctor and patient will inevitably suffer unless reasonable precaution is taken to ensure that disclosure is authorized by the individual patient, his parent in the case of a minor, or by some other competent person. It must be remembered that there are instances when the local

authority is possessed of statutory authority to receive or to make disclosure of medical information.

To maintain the confidential relationship of doctor and patient (or examinee), it is desirable that information only of a general nature be given to lay persons without revealing intimate or personal details. Not infrequently detailed personal information is sought by such bodies as the children's committee or the welfare committee of the local authority. In those circumstances information should be submitted only through a medical officer nominated for the purpose, who would be responsible for appraising the medical report and deciding the extent to which personal information could be disclosed.

The medical officer of health as adviser on medical matters to the council of the local authority and its committees should be consulted whenever it was proposed to review medical reports.

HOSPITALITY

A Swiss doctor, living in Thusis, 2,200 ft. above sea level, would like to exchange his very pleasant house for similar accommodation from July 24 to August 13. He can offer accommodation for 8 people and would like a house for his family of 6.

A Norwegian doctor would like to arrange exchange holiday for himself, his wife, and 2 small sons. They live on the west coast of Norway.

A Danish doctor, unmarried, aged 29, would like to stay as a paying guest with a British medical family for 3 weeks during August. He would prefer a country district.

Several German and Norwegian children would like to take part in holiday exchanges with British children, and there are some requests for accommodation as paying guests outstanding.

For full details, please communicate with Brigadier H. A. Sandiford, Medical Director, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

Correspondence

Patients, Politics or Both?

SIR.—Dr. Hugh Cartwright (*Supplement*, June 4, p. 272) says he agrees with many of the statements I made in my Presidential Address to the Metropolitan Counties Branch (*Supplement*, May 14, p. 225), but he takes me to task on others. You were good enough to give much space to this address, but it was, of necessity, abbreviated. Otherwise Dr. Cartwright would have realized that I am not quite so happy about our activities as he thinks, nor am I quite so hard on the periphery. May I correct this impression with two further references to what I said?

Speaking of the delaying tactics adopted by the Ministry of Health, I said I sympathized with any representative of ours who had to cope with this, provided he did not himself become affected in the same way and did not permit this technique to undermine his enthusiasm. Later I said that some might feel that our spokesmen were losing a sense of urgency. Referring to the periphery, I made it plain that I was not using the term in the ordinary geographical sense, and said that if anyone "does not think the present state is good enough they must say so openly instead of grumbling to themselves." I am very glad that Dr. Cartwright has spoken openly.

I agree entirely with him about the events of 1948, and I can see how bitter a great part of the profession must be feeling still. I can understand that the blow was so stunning that it may well have temporarily paralysed action and even thought, but I cannot understand how an individual doctor can feel justified in palsied acquiescence because of something that happened seven years ago. Surely the time has come when anyone who is really dissatisfied with medicine as it is to-day should make any effort of which he is capable for its improvement. It is no longer any excuse to say, "Look what happened in 1948," and if the crew of the Association is dissatisfied with those on the bridge (to use Dr. Cartwright's simile) it should see that they either

amend their ways or are replaced. Members of the B.M.A. are free to say what they like openly, without fear of a charge of insurrection or mutiny or of being put in irons. The trouble is that many do not use their freedom of expression and action, but, unlike Dr. Cartwright, prefer to remain inert, or content themselves with complaining of frustration to each other.—I am, etc.,

London, N.W.1.

R. HALE-WHITE.

Patients of a Vacant Practice

SIR.—Dr. Donald M. O'Connor's letter (*Supplement*, April 30, p. 209) gave me great pleasure. I also am the second oldest practitioner within miles, having joined the panel on its first day—January 1, 1913.

Keeping a practice intact so that the goodwill can be sold for the sake of a deceased doctor's dependants is one thing; refusing patients who want to come on one's list at the request of the Ministry or of the B.M.A. is quite another. The final price was fixed in July, 1948, and I have never had any compunction about taking over patients from a vacant practice.

After being absent on two wars, I had a lean time after each recovering an income above existence level; and why should not a newcomer, who has been given a list without any payment, not blaze a trail for himself? Further, I think this fortnight's notice to change doctor is a big interference with liberty. The last person I personally wish to see in my surgery is one who wishes he was on someone else's panel, and, whilst I am writing, I am further of the opinion, after being 43 years in general practice, that 2,500 is the limit that any doctor can really look after thoroughly. —I am, etc.,

London, N. 21.

E. C. WHITE.

Entry into Practice

SIR.—Doubtless there have always been difficulties in the way of the entrant to medical practice. Since 1948 I have received two offers of partnership in general practice, both of which were on terms which I felt unable to accept. I am sure that there were good reasons for the reservations which were made by the principals concerned, but I wonder how many of the new partnerships entered into since the Danckwerts award have been on terms less favourable to the junior partner than those which the Medical Practices Committee recommend.—I am, etc.,

London, N. 3.

G. W. PIPER.

Association Notices

AREA OF MOMBASA DIVISION OF KENYA BRANCH

Notice is hereby given by the Council to all concerned that as from the date of this notice the area of the Mombasa Division of the Kenya Branch, which at present covers the Island of Mombasa, will include the Coast Province of the Colony and Protectorate of Kenya.

NURSES PRIZE ESSAY COMPETITION, 1955

The following prizes have been awarded in the Nurses Prize Essay Competition, 1955.

1. *Student Nurses*.—Subject: "The use a Student Nurse can make of the varied recreational and cultural pursuits available to-day." First Prize: Joan M. Anstey-Cooke (Bristol Homoeopathic Hospital), 20 guineas; Second Prize: Lesley W. Elliott (Radcliffe Infirmary, Oxford), 10 guineas; Highly Commended: Anne G. Stirling (Aberdeen Royal Infirmary) and June Davis (Addenbroke's Hospital, Cambridge); Commended: Kathleen Forbes (St. Charles Hospital, London).

2. *State Registered Nurses working in hospital*.—Subject: "Cross-infection in hospital wards and departments and its control." First Prize: Claire B. Chetwynd (Royal Northern Hospital, London), 20 guineas; Second Prize: John Sayer (Hackney Hospital, London), 10 guineas; Highly Commended: Lorna G. Newman (Queen Mary's Hospital, Carshalton) and Muriel S. Willa (Queen Alexandra Hospital, Portsmouth).

3. *State Registered Nurses working outside hospital*.—Prize: Elizabeth C. N. Wilson (Martock, Somerset), 10 guineas.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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A DAY WITH A HEALTH VISITOR

A GENERAL PRACTITIONER'S POINT OF VIEW

BY

NIGEL G. NICHOLSON, M.B., B.S.

As a result of being elected to a Divisional B.M.A. Committee to study the question of co-operation between general practitioners and health visitors I decided to spend a day as an observer with health visitors outside my own practice area. The morning was spent with a health visitor visiting people's homes, and the afternoon in the infant welfare clinic.

My terms of reference were to answer the following questions: (1) Were health visitors necessary? (2) Could district nurses and midwives do the same job if their numbers were increased correspondingly to the health visitors displaced? (3) Assuming that health visitors were necessary, how could better co-operation be achieved with general practitioners? (4) The type of case in which the health visitor was likely to be most useful to the general practitioner.

Visiting

Most of the 11 visits in the morning were to mothers whose children had not been brought to the clinic, and whom the health visitor had good reason to believe needed attention. The health visitor introduced me by saying, "This is a colleague of mine. Do you mind if he comes in too?" The family did not know, therefore, that I was a doctor, and my opinion was not sought; I was thus enabled to stand aside and take notes. Both the health visitor and myself were admitted without hesitation in every case.

Visit No. 1.—Large family newly arrived in the district—not previously visited. Three previous calls were made, but no reply. Two boys and five girls—youngest girl, aged 1½ years, still at home. The health visitor was reserved until she had established the mother's confidence, but she did find out that the baby was not taking cod-liver oil and had not been immunized. The house was untidy, but not unexpectedly at this time of the morning with six children just gone to school. The mother was recommended to bring the child to the clinic to get "adexolin" and for immunization.

Comment.—A useful visit.

Visit No. 2.—To a school to see a child belonging to a problem family; this child had previously been to school shivering with inadequate clothing. The health visitor had been informed by the teacher. The child's clothes were found to be adequate.

Visit No. 3.—Follow-up of twins delivered five weeks prematurely by caesarean because of toxæmia, and now 4 months old. The mother had not attended a clinic; she had relied upon the health visitor to call, and would probably not have gone to the clinic otherwise. The health visitor advised generally on feeding as she had previously done. She also advised on questions of prophylaxis, but the parents were against vaccination. The mother also needed abdominal exercises, but there were no facilities available without seeing a specialist at a hospital in order to get physiotherapy.

Comment.—Useful visit.

Visit No. 4.—Illegitimate baby aged 1 month. The mother had not attended a clinic so far. Baby on artificial feeding; not taking cod-liver oil. General advice given and accepted. Mother complained of feeling off-colour, and stated that she had had iron injections in hospital. She was recommended to seek further advice.

Comment.—Useful visit.

Visit No. 5.—Problem family, of which one child had been seen at school already (visit No. 2). It had taken the health visitor, by the gentle art of persuasion, years to get into this house at all. A previous health visitor had failed. The mother used to go out and leave her mother-in-law to look after the children. She did not go to work but spent her time drinking coffee in cafés. When the health visitor first got beyond the room grandma occupied, she saw piles of dirty clothes, some of which were covered in dried faeces, and there was not a clean article of clothing in the house. The sink was full of firewood. The stench was the usual one familiar to all general practitioners, but unbelievable to the public as a whole. At the time of the visit great strides had been made. The house was far from clean, but there were some clean clothes, and a fire-guard, which was apparently an innovation. The mother was deaf, which made communication difficult; the children, except for the baby of 9 months, and one other child at school, had at least one square meal a day—at school. The mother could afford to smoke, but could not afford to pay the nominal sum for this child to have a lunch at school. The bedrooms were inspected, but it was difficult to find out who slept where. Two girls slept in one 3 ft. bed, so-called "double" by the mother, and one of them had enuresis, but the mother was not sure which one it was. There were no sheets and the blankets were filthy. The floor was covered with feathers from a burst pillow—they had obviously been there for some time. The child was not taking cod-liver oil.

Grandma was also visited—she complained of various aches and pains, and it was suggested that the general practitioner should be asked to see her. The grandmother said that she had had nine operations, and did not like doctors.

Comment.—Hard work for the health visitor, but she was achieving a great deal by patience and persistence.

Visit No. 6.—Door answered—mother and baby moved to a different area.

Visit No. 7.—No reply; mother handed over from midwife—obviously out.

Visit No. 8.—Called to see an old man as a follow-up, but he was found to have died nine months previously. The health visitor called out of interest, as a result of checking through her files. The widow was advised about various welfare services.

Visit No. 9.—Visit to old lady, who was found to have died suddenly a few weeks previously. The health visitor had been calling because a neighbour had informed her about the old lady.

Visit No. 10.—Follow-up visit to mother of two children; the youngest, aged 4, was at home and was not taking cod-liver oil. The health visitor had been calling because the mother had previously been in the care of a psychiatrist. She was now found to be keeping reasonably well.

Visit No. 11.—Child who had recently had operation for squint. Not immunized—mother was apathetic and unlikely to respond to advice. Child not taking cod-liver oil.

Infant Welfare Clinic

The afternoon was spent with one of the health visitors watching her advise mothers in her area, while other health visitors did the weighing and sundry other duties. In all, twenty-eight consultations took place and the mothers had obvious confidence in the advice they were given. Most of the advice given was on feeding and minor complaints, and reassurance of the mother on the progress of her child.

One case, a child aged 4 years, had been referred to a paediatrician, who confirmed rickets when much younger. At the interview, the mother said that he had never taken cod-liver oil, whereas the health visitor said that at the time the mother was very definite that he had done so. Since diagnosis was confirmed he has done well on adexolin drops, and there are no obvious reminders of the past.

In another case the mother refused vaccination either from general practitioner or clinic. She was advised of the added dangers of smallpox near London Airport, but she was still adamant.

Once satisfactory feeding was established with a steady weight gain, whether it was on the breast or by artificial feeding, the mothers came to the clinic as they considered fit. If they asked how often to come, they would be told once a month up to six months, and thereafter three- to six-monthly. Many mothers chose to come up more frequently, especially with their first baby. The health visitors were fully aware that over-attendance at the clinic would lead to overcrowding and the risk of unnecessary cross-infection. Where there were feeding difficulties, attendances were made according to the need.

All mothers were advised of the importance of vaccination and immunization and given a free choice of either their own or the clinic doctor. It appeared that fifty-fifty was the choice.

Following the clinic we held a meeting which was attended by the deputy area medical officer, the senior health visitor for the area, and a number of health visitors attached to the clinic. Various points of view were brought forward, and quite a lively discussion took place.

Duties of a Health Visitor

The duties of a health visitor must be clearly understood. First, they attend at local authority clinics—infant welfare, school clinics, antenatal clinics, and other clinics organized by the local health authority. Quite a large part of the health visitor's time is absorbed in the organization of these clinics. It is probable that the training of a health visitor is not necessary for much of these duties. For example, filing, marshalling children, and weighing of babies could be done by less skilled people with very little training. In some clinics these duties, which have to be done on a sessional basis, absorb so much time that there is little time left for visiting.

Secondly, they visit. Since the National Health Service began, health visiting has been concerned with not only the children but the whole family where necessary. Naturally, old people are the greatest liability in this respect. I understand that in some areas health visitors have so little

time left after clinics that they cannot do the infant visiting they would like to do, and there is no time left for visiting the aged.

Selection of Cases for Visiting

The mothers visited were selected as being in need of advice for the following reasons: (1) Where those handed over from midwives were unable or unlikely to attend the clinic, and for whom further advice was considered necessary. (2) Where mothers had failed to attend the clinic and were known by the health visitor to require advice. (3) Any cases where the general practitioner had asked the health visitor to call for some reason.

This method is known as "selective visiting" and is obviously making good use of the health visitor's time.

The health visitor did not visit old people unless she had received information from some source that there was a patient to whom she might be of assistance. Whereas the doctor visits old people with the object of treating ailments, the health visitor acts as a welfare visitor; in other words, she goes to advise on any problems they might have. For example, she may be able to get the help of the W.V.S. to go round visiting the lonely and bringing papers and flowers. In some areas there are funds to provide wireless for the bed-ridden—no doubt the health visitor would be in contact with them. The health visitor would arrange for blind registration through the blind visitor, and thus obtain for blind people the various benefits to which they are entitled. The health visitor may also be able to advise on public assistance and other questions in relation to money. In some districts the house-bound elderly have the benefit of a "meals on wheels" service organized by the W.V.S. The health visitor would be able to help in this direction, and she may be able to recommend a home help when she thinks it is justified. Making arrangements for old people's linen to be washed and advising patients where they can get chiropody free are other functions of the health visitor.

Are Health Visitors Necessary?

Health visitors, I feel, do perform a useful job. Their greatest use lies in the tedious task of trying to upgrade the filthy homes, and the day-to-day management of babies.

Mothers can be classified into three categories. First, the intelligent mothers who will study infant welfare for themselves and require no advice except in extreme circumstances, when a doctor is usually necessary. Secondly, the mothers of moderate intelligence who need, especially with their first child, advice from some authority and are willing to attend the clinic. If all these mothers flooded the doctor's consulting-room he would be snowed under. And, thirdly, the mothers of low intelligence who jog along from day to day on tit-bits of advice from grandmothers and neighbours. These mothers rarely come to the clinic without goading, and the health visitor has to go out and train them. No doctor could afford the time to give these women intimate advice on how they should bring up their children, wash them, tidy the home, do the washing, manage their budget, and many other details of domestic life which the health visitor includes in her repertory.

I conclude, therefore, that the health visitor services, properly run, are a great asset to the community, and that it would be a retrograde step if they were disbanded.

Could District Nurses and Midwives do the Same Job?

In country districts, district nurses and midwives do manage to advise the community as a whole on health matters, and are often very useful in this capacity. The more experienced district nurse with a shrewd personality manages to learn the essence of a health visitor's job. My own personal feelings are that in the more industrial and populated areas it would be better to maintain the health visitor services as they are to-day than to increase the number of district nurses in proportion to the number of health visitors, provided a better liaison with general practitioners

can be achieved. More emphasis should be laid on the health visitors' visiting duties than on those of acting as clinic receptionists.

Co-operation with the General Practitioner

Occasionally a doctor will find that a parent quotes the health visitor as offering advice contrary to his own. This apparent contradiction is usually due to a misapprehension on the part of the mother. Nevertheless, even the most minor difference in advice can be exaggerated to such an extent that the parent is hopelessly confused.

It is easy for general practitioners to be exasperated by having to go out in the evening to see a child that has already been seen at the clinic earlier in the day, only to find that it is a minor ailment which could have waited until the morning. Health visitors should be prepared to accept the responsibility of telling the mother in obvious cases that there is no need to call the doctor until the next day, and that an aspirin, or part of one, is all that is required for a reasonable night's sleep. The more experienced health visitor does in fact do this.

Occasionally a health visitor will suggest that a patient should be seen by the doctor without giving adequate reasons. Sometimes this will result in the doctor being called to see an elderly patient rather against the patient's will. When he gets there the patient does not give all the details that the health visitor was given, and he will find his visit wasted. If on the other hand the health visitor had written a note to the doctor describing briefly the symptoms of the case as she saw it, and where she thought he might be able to render assistance, he would have been enabled to grasp the situation at once.

Suggestions for Improving Co-operation

The all-important establishment of liaison between health visitors and doctors should not depend on chance meetings. It seems reasonable to ask that when a health visitor is appointed to a district she should make an effort to visit the local general practitioners as a matter of courtesy. For example, it might be a good idea to drop in at the end of morning surgery, or write and suggest that they meet, or else wait until some opportunity arises which affects a patient and where the health visitor feels that useful work could be done by co-operation.

The average doctor at qualification knows very little about the health visitor's duties, and in what instances co-operation would be to their mutual advantage.

The general practitioner should not leave the entire onus of establishing contact to the health visitor. He should visit the school and infant welfare clinics, especially when he has a particular case to discuss. Tea-parties have been tried to achieve contact, but this can be accomplished far better by exchanges of view on specific cases.

The sort of controversial subjects on which mothers delight in playing the doctor versus the health visitor are: should a child be reduced in its feed if it is gaining over eight to ten ounces a week? Should a child be fed by the clock, by demand, or by convenience to mother and child? Should a hungry child be fed in the middle of the night? Should a baby wear wool next to its skin? Circumcision. And complementary feeding—does it work?

Should there be any divergences of opinion most health visitors are prepared to fit in with the doctor.

Cases Where the Health Visitor is Most Useful

Many doctors are not aware of all the duties which health visitors will willingly undertake. For example, they are prepared to take scales round to a patient's house and do test feeds on the spot if a doctor requires it.

Where a doctor encounters feeding difficulties, the health visitor will be only too glad to help by providing National dried milk, and advising the mother of all the finer details that her doctor cannot be expected to do—for example,

sterilization of bottles and teats. The health visitor's eye is trained for a different type of detail from that of the doctor.

The health visitor will be only too glad to observe any behaviour problems in children and report back details which the doctor will find invaluable in his handling of the case—details which sometimes only come to light from neighbours by accident.

Any health visitor of experience must be able to recall many instances in which she has achieved great improvement in people's way of living in dirty homes by gentle tact and persuasion continued over long periods.

Cod-liver Oil

No doctor would question the importance of vitamins A and D in the first few years of life. As a result of this study, I was very intrigued by the high incidence of children who were not being given cod-liver oil, although the health visitors with whom I spent the day were very insistent on its importance when interviewing the mothers. In every instance children who were not taking it were given adexolin drops as a substitute.

In all there were twenty-five mothers questioned on whether their children took cod-liver oil, as distinct from other sources of vitamins A and D, and only ten of these were actually taking it; this means that over half the children refused it. It is interesting to note that none of the mothers visited could get their children to take cod-liver oil, whereas those seen at the clinic gave a higher incidence of success. This was possibly due to the fact that the mothers who needed to be visited were of lower intellect than those who came to the clinic.

It is possible that many mothers smell the cod-liver oil for themselves, and are reluctant to press it on their infants when they show the slightest signs of rejecting it. They are glad to have an excuse to give it up without further trial. It is well known that the smell is very persistent and difficult to eliminate. Some of the Ministry cod-liver oil was sampled by the health visitors and myself, and we all agreed that it was very unpleasant.

I investigated the possibility of giving children B.P.C. emulsion of cod-liver oil made by two different manufacturers. These emulsions have the added advantage that they contain calcium. One made sold under the B.P.C. title was sampled by myself and my own babies, both under 2 years, and we were unanimous that it was no better to take than the Ministry cod-liver oil. It is generally agreed that the emulsion manufactured by Messrs. Scott and Bowne is readily taken by most children. Unfortunately the comparative cost in terms of units of vitamins A and D was unfavourable in the case of "Scott's emulsion", as against adexolin drops in the proportion of 3:1. Scott's emulsion would not therefore be an economic substitute to issue in place of adexolin.

On the other hand many children who will not take the Ministry form will take "seven seas" cod-liver oil. It would appear, therefore, that if an effort was made to refine the Ministry cod-liver oil and make it more palatable there would be less recourse to substitutes on the part of the clinic. This might result in an overall economy.

I wish to thank Dr. Maddison, Medical Officer of Health for Area 10 of Middlesex, and his staff for their great kindness and help in making it possible for me to visit one of the clinics in his area.

Corrections.—In the report of the Annual Representative Meeting under the heading "General Practitioners and Institutional Midwifery" (*Supplement*, June 11, p. 278) Dr. H. N. Rose moved the resolution on behalf of the Stratford Division, and not Dr. A. Elliott as stated. Mr. D. S. Pracy in the following paragraph said that "the encouragement of domiciliary midwifery would prove an economy to the country," and not "an encouragement to the country" as printed.

Dr. J. O. M. Rees presented the Guildford motion on diesel oil (p. 284), and not Dr. D. F. Whitaker as stated.

OPHTHALMIC GROUP COMMITTEE

EARLY TREATMENT OF BLINDNESS

A meeting of the Ophthalmic Group Committee was held on Friday, May 13, with Mr. O. GAYER MORGAN in the chair.

A report was received of a discussion between a deputation appointed by the Committee and representatives of the Ministry of Health on a number of recommendations submitted to the Ministry by the Committee for achieving earlier diagnosis and treatment of diseases causing blindness. These recommendations had been adopted from the report of a subcommittee of the Ophthalmic Group Committee, consisting of Mr. G. W. Black, Mr. J. Marshall, and Mr. O. Gayer Morgan, who had considered the subject in the light of the Ministry of Health circular on the subject (R.H.B.(53)115) and the Sorsby Report.¹

The Size of the Problem

Figures before the subcommittee had shown that the number of people registered as blind was increasing and that this increase was largely concentrated in the higher age groups of 70 years and over. It might be expected, therefore, that the problem would grow. Figures had also shown that, although 90% of cataract cases were fundamentally remedial, only 20% received treatment, which convinced the subcommittee that there must be a positive drive to achieve earlier recognition and treatment of this condition. It was believed that "a substantial proportion of untreated cases may well be elderly people who apply to the National Assistance Board for relief and are passed on by officers of the Board to the local authority, examined by local authority medical officers, and registered without being referred to an eye clinic to see whether treatment is needed." The subcommittee had been informed that in one geriatric unit it was found that out of 128 patients 12 needed ophthalmic attention, 4 of whom needed operation for cataract and 5 treatment for glaucoma.

With these considerations in mind the subcommittee recommended, and the Group Committee subsequently recommended to the Ministry:

Recommendation (1).—That examinations for registration purposes should be undertaken only by consultant ophthalmologists;

Recommendation (2).—That when a person is referred to the local authority because of defective vision the medical officer of health of the authority should at once get in touch with the person's family doctor, and, having obtained from him information as to the person's general health, arrange through the family doctor for an examination to be carried out by a consultant ophthalmologist;

Recommendation (3).—That when a person is registered as blind the general practitioner should be notified of the fact and should be informed of any treatment which is proposed.

Diagnosis of Glaucoma

The subcommittee did not think that the provision of more glaucoma clinics, although maybe desirable, would by itself help to achieve earlier diagnosis of glaucoma. In its view the main difficulty was that persons in need of treatment do not reach the eye clinics for examination by an ophthalmologist. The following recommendations were therefore put to the Ministry:

Recommendation (4).—That ophthalmic opticians should be required to adhere strictly to a procedure whereby the general practitioner would be informed if the patient had any abnormality of the eyes, or vision which could not be improved to a satisfactory level with glasses, or otherwise required treatment outside the scope of the supplementary ophthalmic service; and

Recommendation (5).—That paragraph 2 (c) of E.C.L. 78 51, which states that a patient who is referred back to his general practitioner should not normally at that stage have glasses prescribed, should be replaced by an instruction that glasses shall not be prescribed in such cases.

¹ *The Causes of Blindness in England, 1948-50*. 1953. H.M.S.O., London.

The Sorsby Report found that 98% of glaucoma cases occur from the age of 50 onwards, and the subcommittee thought that the significance of this fact should not be disregarded. The Group Committee therefore decided to ask the Ministry of Health for its support in adopting a policy that sight-testing in the case of persons over the age of 50 should be undertaken by ophthalmologists, or that no person over the age of 50 should have glasses prescribed without a medical eye examination (Recommendation 6).

Discussion with the Ministry

Following the Group Committee's discussions with the Ministry of Health on its recommendations, and after consultation with the Faculty of Ophthalmologists, the Ministry has issued a circular (No. 4/55) requesting local authorities to arrange for examination and certification of blind and partially sighted persons to be carried out in future only by ophthalmologists of consultant status. The Group Committee asked the Ministry to safeguard the position of S.H.M.O.s who have been doing this work.

The Ministry thought that the effect of this circular would be to bring the patient's general practitioner into the picture. It would see what could be done to encourage the organization of postgraduate refresher courses for general practitioners on this subject.

The Ministry approved the Group Committee's third recommendation, and the Committee has since recommended that medical officers of health should be responsible for sending the necessary information to general practitioners.

The Ministry hoped that circular E.C.L. 15/55 to executive councils would help to achieve the object of the Group Committee's fourth recommendation. In this circular the Ministry requested executive councils to remind ophthalmic medical practitioners and ophthalmic opticians of their obligations to inform the patient's general practitioner in specified circumstances, and to emphasize the importance of observing it particularly where there is any suspicion of glaucoma or other serious disease of the eyes, so that the general practitioner might then arrange for treatment at hospital if necessary.

The Group Committee's deputation to the Ministry stressed that a temporary improvement in sight as a result of glasses being provided, or even the fact that glasses have been obtained, makes it unlikely that many patients will go back to the general practitioner so that treatment may be arranged. The Ministry said it would be difficult to insist that in no case should glasses be prescribed when the patient is referred back. For instance, on humanitarian grounds it was sometimes necessary for the patient to have glasses straight away. For this and other reasons the Ministry was not able to accept the Committee's fifth recommendation.

The Ministry was in favour of recommendation (6), but said that it was impracticable at the present time owing to the large increase in out-patient facilities which would be necessary to deal with the extra two million sight tests which would be thrown on to the hospital service.

Other Business

Certification of Blindness

The Committee was of the opinion that as this was now recognized as consultant work, and as the revised form of report (B.D.8) was more detailed, there was every justification for seeking an increase in the present fee of 2 guineas. The Committee decided to recommend that the fee should be raised to 3 guineas, and that where the examination is carried out at the patient's home it should be 4 guineas.

Form O.S.C.1

The Committee considered a suggestion from a local medical committee that, as a contribution towards the earlier recognition of serious ocular disease, form O.S.C.1

should be valid only for three years, instead of indefinitely as at present, and that a person needing a retest after that time should be required to obtain a new O.S.C.1 from his doctor.

The Committee was doubtful whether such a procedure would be practicable owing to the difficulties which would arise in checking the date of issue of O.S.C.1's. It thought that it would be preferable to require a new O.S.C.1 for every sight test and decided to invite the General Medical Services Committee's comments on the matter.

Criteria for Central Professional List

Because of the importance of making a medical sight test available to as large a proportion of the population as possible, and taking into account the fact that the Supplementary Ophthalmic Service is likely to continue in being for some time, the Committee discussed whether the present standard required for admission to the central list of practitioners entitled to test sight under the supplementary service is too high. The Committee had no definite evidence, however, that the diminishing number of applicants for admission to the list is a result of the present criteria and it was not therefore in a position to reach any conclusions. It intends to go further into the matter at a future meeting.

Appointments on Ophthalmic Services Committees

The Committee decided, with the object of facilitating the appointment of ophthalmic medical practitioners to fill vacancies on ophthalmic medical services committees, to ask the Ministry to consider making these appointments valid for three years.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Health Centre in the Army

SIR,—I noted the article, "A Health Centre in the Army" (*Supplement*, May 21, p. 233). As a similar centre is in operation in Kuala Lumpur, Malaya, I thought that a few comparisons might be of interest.

This centre has a larger practice extending over the whole Kuala Lumpur area. There are about 2,000 British women and children with smaller numbers of Malay and Gurkha families. British and Malay troops and a few local civilians, Malay, Chinese, and Indian, also come under the care of the centre. In all about 5,000. The staff consists of two R.A.M.C. medical officers, a Soldiers, Sailors, and Air Force Association sister (a State-registered nurse, State-certified midwife, and health visitor), a civilian State-registered nurse, who is also a State-certified midwife, a sergeant and four male nursing orderlies—two British and two Malay—the latter invaluable as interpreters. This is not excessive in a tropical climate such as this.

The building and furnishings are good; each room is decorated with a washable plastic paint, the colour being chosen by those using each room. The medical equipment is perfectly satisfactory. The centre includes a large waiting-room, two consulting-rooms, two treatment rooms, store, office, night orderlies' room, bathroom and toilet facilities. The experience of working in the centre does underline the great importance of the actual layout in saving the time and feet of the staff and in providing easily cleaned, quiet consulting-rooms.

The advantages of working in such a centre are several. There is a staff able to provide a service similar to that of a hospital casualty department 24 hours a day. In addition, usual outside visiting is maintained. Health visiting, a school health service, and child welfare clinics are also undertaken. The close co-operation with the medical, surgical, and obstetric specialists, who visit the centre

weekly, is valuable both to the doctor new to the Tropics and to the patient. It is particularly useful to be able to discuss problems directly with the specialist, and has many of the advantages of a domiciliary visit by an N.H.S. consultant. The ready availability of all the diagnostic aids of the British Military Hospital, Kinrara, which is some nine miles away, and the luxury of a dental centre 20 yards away, help to make a high standard of medicine possible. It is pleasant to work in such conditions as these, and for one about to return to civilian practice it is cogent to consider the likelihood of similar conditions and facilities obtaining in general practice.—I am, etc.,

Kuala Lumpur.

J. B. CHAPMAN.

Charges for Prescriptions

SIR,—How much longer do we G.P.s who do our own dispensing have to wait before the B.M.A. presses on our behalf for a change in the present absurd method by which we have to account each month for the shilling taxes we have collected for items dispensed to N.H.S. patients? I often wonder who it was who "dreamed up" the existing laborious administrative arrangement and who agreed to it on our behalf. Under it the patients get no receipt and many think the money goes to the doctor, while we members of an honourable profession are subjected to the further indignity that we may be called to account if the total of our (unpaid) monthly tax-gathering falls short of our colleagues' average.

If we must have this method of taxation, what is there to prevent executive councils from issuing us with serially numbered rolls of tear-off tax receipts to hand to patients, the amounts so collected to be deducted from our quarterly N.H.S. cheques? This would be simple, practical, business-like, and not open to abuse. The only hope of securing it will be, I suppose, a revolution led by irate village post-mistresses and children who cannot bear to see Daddy run his pen through those lovely stamps he has just stuck so carefully on all those bits of paper.—I am, etc.,

East Dereham.

CHARLES S. THOMSON.

Ship Surgeons

SIR,—I have read the various letters on the question of ship surgeons with some interest. It is likely that the question of the salaries of ships' doctors could merit some discussion between the profession and the companies. The argument that a doctor has only a few hours' surgery a day at sea, and that he is having a free trip, is not really cogent. A policeman on his beat is not paid for the trouble taking place there, but for the preventive effect of his being on it. The doctor likewise is paid for being aboard. Nothing much may happen on a ship, but something may. Doctors who have experienced one or the other have entirely different views on the sinecure of being a ship surgeon.

Things happen suddenly, strangely, and often dramatically. Ships pass through dangerous areas where smallpox, yellow fever, malaria, and so on are endemic. The surgeon has to see that none become endemic on the ship. He has a lot to do with morale aboard, where crews are notoriously hypochondriacal and passengers even more so. He will begin to hear their problems and worries too, since he is privileged to move among all ranks without ceremony, and professional secrecy is respected. There is no specialist's opinion available, buck-passing cannot be done, and it is up to him alone. He sweats with fear lest an appendix case should present itself. He wonders, if he himself should get ill, just where he is likely to get a specialist's opinion.

There are only 300 ships in the Merchant Navy with over a 100 souls aboard necessitating a doctor. Of these, most are passenger cargo ships which largely carry migrant doctors, recuperant ones, the young man seeing the world, or any medical men who wish to travel for a while. Their pay is about £57-£70 a month—equivalent to a second mate. The doctor is one of the four senior officers, but pay does not necessarily go with seniority. Doctors working for a permanent career at sea graduate to the larger passenger

ships, are adequately paid, and charge their passengers. But I doubt that there will ever be enough to take on this wandering life permanently and man all 300 ships. Meanwhile, the companies are obliged to employ the services of doctors inexperienced in this very different form of practice. Salary to them must be a matter of economics, the acquiring of the services of doctors for such pay as they will accept to do it. If the basic pay for fleetling employees is inadequate the fault is in ourselves. When you think of it, shipping companies are extraordinarily accommodating employers. At least I know of no other walk in life where, if one should wish to go to sea for a year or two and see how others live, you can do so, find time while doing it to study, write, or anything you care to within reason. It would be a pity if such an opportunity were removed.—I am, etc.,

Dublin.

CORMAC SWAN.

Association Notices

G.M.S. COMMITTEE

ASSISTANTS AND YOUNG PRACTITIONERS SUBCOMMITTEE

Elections will be held in August to appoint representatives of assistants and unestablished principals to the Assistants and Young Practitioners Subcommittee of the General Medical Services Committee for the session 1955-6. The newly appointed Subcommittee will come into office on September 1, 1955.

For the purposes of election, England and Wales is divided into five regions: (1) South-west and Wales, (2) South-east, (3) North-west and Midlands, (4) North-east, and (5) London and Home Counties. The General Medical Services Subcommittee (Scotland) appoints two representatives for that country as a whole.

Each region is based upon a regional office of the Association and elects two direct representatives to the Subcommittee—one assistant and one unestablished principal. The G.M.S. Committee appoints six of its members to serve on the Subcommittee. One assistant and one unestablished principal from the Subcommittee are co-opted to the G.M.S. Committee.

The electorate and membership of the Subcommittee, apart from the representatives of the G.M.S. Committee, are restricted to the following classes of practitioners:

- (i) Assistants in general practice.
- (ii) Practitioners engaged predominantly in general practice as principals (including those in partnership) whose total gross professional income does not exceed £1,500 per annum.

Assistants

The electoral roll for assistants is compiled from the Association's records and each eligible assistant should by now have received a letter from the secretary of the Committee advising him that unless he signifies to the contrary his name will automatically be included in the roll. Any assistant who does not receive such a letter should inform himself to be eligible for inclusion in the roll should communicate with the Secretary, B.M.A. House, Tavistock Square, London, W.C.1, not later than Wednesday, July 6.

Unestablished Principals

Applications are invited from principals whose total gross professional income does not exceed £1,500 and whose names are not already included in the electoral roll. Such applications should be made not later than Wednesday, July 6, on the form set out below.

Nominations

Electoral rolls will, as indicated above, be closed on July 6. On July 12 a copy of the revised roll for his area will be sent to each eligible assistant or unestablished principal,

asking for the submission of nominations not later than August 2. If there is a contest in any particular area, voting papers will then be issued.

For the use of unestablished principals only.

GENERAL MEDICAL SERVICES COMMITTEE ASSISTANTS AND YOUNG PRACTITIONERS SUBCOMMITTEE UNESTABLISHED PRINCIPALS

I
(Block letters, please)

of
hereby apply for inclusion in the electoral roll of unestablished principals.

I declare that I am engaged predominantly in general practice as a principal with a total gross professional income not exceeding £1,500 per annum.

and I undertake to inform the Secretary of the Committee at B.M.A. House of any change in my status which affects my eligibility for membership of the electorate.

Signed

Date

TO BE RETURNED NOT LATER THAN FIRST POST ON
JULY 6, 1955.

Diary of Central Meetings

JUNE

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|-----------|--|
| 27 Mon. | Medico-Legal Subcommittee Central Consultants and Specialists Committee, 2.30 p.m. |
| 28 Tues. | Remuneration of Medical Teachers Subcommittee, Non-Professorial Group Committee, 2.15 p.m. |
| 30 Thurs. | Committee on Homosexuality and Prostitution, 10.30 a.m. |

JULY

- | | |
|----------|---|
| 6 Wed. | Occupational Health Committee, 10 a.m. |
| 6 Wed. | Willink Evidence Subcommittee, G.M.S. Committee, 3 p.m. |
| 8 Fri. | Evidence Committee on Divine Healing, 10 a.m. |
| 8 Fri. | Overseas Committee, 2 p.m. |
| 8 Fri. | Public Health Committee, special meeting, 2 p.m. |
| 8 Fri. | Joint Subcommittee of Rehabilitation and Film Committees, 4 p.m. |
| 12 Tues. | Joint Committee of the Medical Profession and the Press, 10.30 a.m. |
| 12 Tues. | Central Consultants and Specialists Committee, 10.30 a.m. |
| 12 Tues. | Committee on Remuneration Policy, 2 p.m. |
| 12 Tues. | International Relations Committee, 2 p.m. |

Branch and Division Meetings to be Held

- HEREFORD DIVISION.—At Hereford General Hospital, Friday, July 1, 7.30 p.m., annual meeting.
- PARLIAMENTARY DIVISION.—At Royal National Throat, Nose and Ear Hospital, Gray's Inn Road, London, W.C.1, Friday, July 1, 8 p.m., technical meeting and discussion. Mr. Wallace Black: "Congenital Deafness."
- WIMBORNE DIVISION.—At Guinness Brewery, Park Royal, Wembley, Wednesday, June 29, 2.30 p.m., conducted tour of Brewery. Members and other guests are invited.

FIRST NEW HOSPITALS SINCE 1939

The Minister of Health, addressing the Annual Conference of the Association of Hospital Management Committees at Hastings on June 17, said that he hoped very shortly to be able to announce the complete list of those new hospitals to be included in the expanded capital investment programme covering the two years 1956-7 and 1957-8. Sixty-million pounds had been spent during the first seven years of the Health Service on "make do and mend," so far as capital work was concerned, with repairs, adaptations, conversions, and extensions. Now, at long last, paper plans were going to be translated into actual structures embodying all that was considered best in modern methods of construction, design, and layout.